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600 Volts, 8 Ampere  
300 Volts, 20 Ampere  
Continuous Capacity  
UL Recognized

## Instrument and Control Switches Type W-2

### Application

The Type W-2 switch is designed for use as an instrument, control or general purpose switch. It is compact, yet of sufficient size to provide long, trouble-free service when applied within the specified ratings.

Design flexibility of internal parts and contacting, plus external jumpering of the contact studs affords almost limitless switching combinations for relatively few standard components. The design flexibility is provided in the basic switch styles. A complete switch is made up of a basic switch, one of several styled handles, external jumper, (when required) and a nameplate.

The W-2 switch may be ordered as a single style unit where such a style meets a specific application. Where a single listed style does not meet a specific application, the desired switch may be ordered by specifying the required styled components. As separate items or by completing Contact Tabulation Form 34219-A.

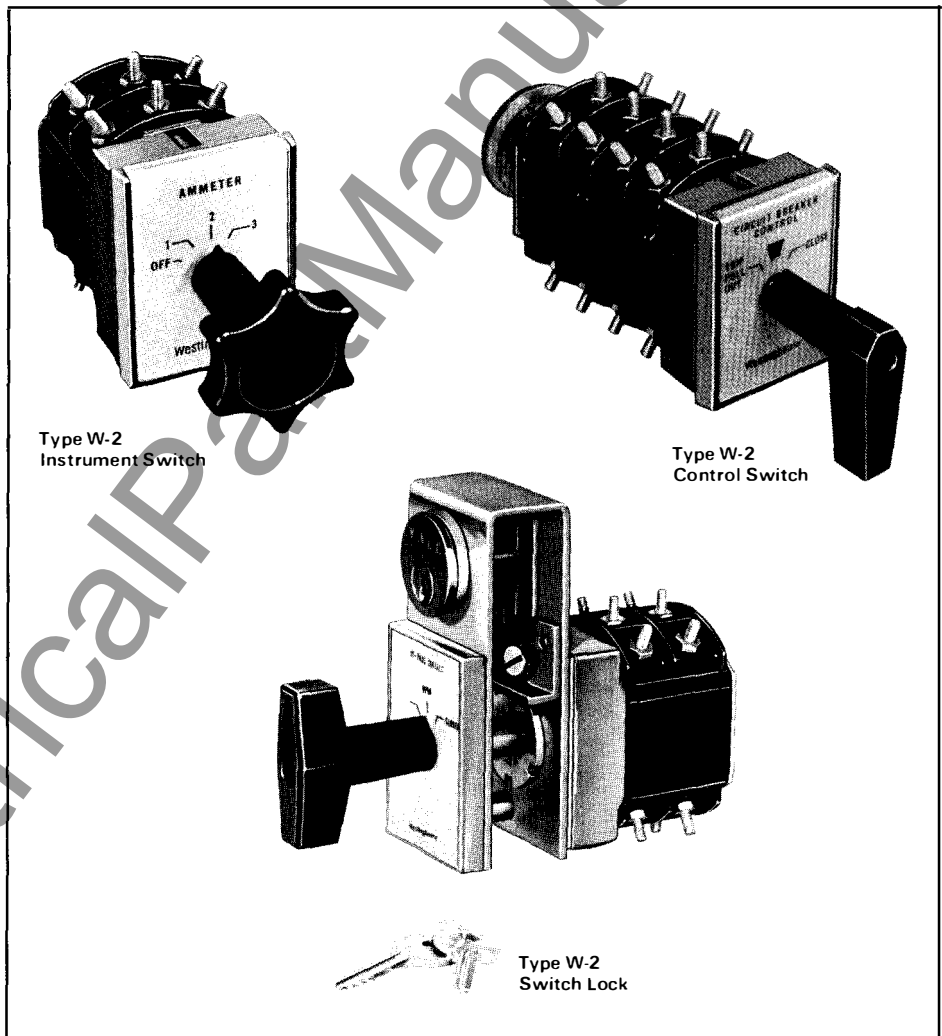
The style numbers shown in this bulletin apply to switches for mounting on 1/8 to 1/4 inch thick panels. Switches for thicker panels (up to two inches) are available on special order. Refer to the factory.

**Instrument Switches:** Maintained contact type for use with all classes of electrical instruments, relays, meters, and for performing various circuit combinations. Designed for panel mounting and equipped with handles for manual operation.

**Control Switches:** Are designed as spring return to the original or neutral position. They are used for circuit breaker control and other types of electrically controlled apparatus where momentary contact is required. They are designed for panel mounting and equipped with a handle for manual operation.

### Advantages

- Small Size
- Variable Circuitry by "You Wire It"
- More Contacts per Unit Volume
- Roller-Wipe Spring Actuated Contacting
- Momentary and Maintained Contact Designs, or in Combination
- Affords almost limitless switching combinations
- Identification for Automated Wiring or Application Changes in Field
- Double Break Contacts per Stage
- UL recognized



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## Design Features

### General Construction

The W-2 switch consists essentially of an operating handle, face plate, control housing, contact frame assembly and rotor assembly. It can be built up in any number of stages from 1 to 8, which stages are clamped together and to the control housing by two tie bolts. A steel operating shaft ties the contact rotors together. A metal cover on the rear holds the position stop pins, retains the shaft and provides switch identification. For push or pull switches, the metal cover is replaced by a polycarbonate cover which houses the pull-out mechanism.

### Switch Positions

The Type W-2 switch has a minimum of two and a maximum of twelve rotary positions with a 30° throw between positions, irrespective of the number. Each rotary position coincides precisely with the nameplate markings. The degree of throw between positions is fixed and cannot be changed. The number of positions of each switch can be altered by removing the rear cover and changing the position of the "stop" pin or pins located in the rear housing spacer. In addition to rotary motion, the W-2 switch can be provided with a lateral movement (push-pull) of the handle and shaft.

### Contact Frames

Two contact frame sizes are available; the half frame with six sets of contacts; three sets on the top at 11, 12 and 1 o'clock positions and three sets on the bottom at 5, 6 and 7 o'clock positions. The full frame with 12 sets of contacts, each set located at 30° intervals around its perimeter as are the numbers on a clock. The contact frames are made of glass polyester insulating material.

### Contacts

Switches are usually referred to as "so many stages long". For a W-2 switch, a stage of contacts consists of a contact frame (either 6 or 12 contact sets) and a rotor.

At every position location on the frame, there are two contact terminal studs in line (a set) per stage. Each of these studs is one piece, made of bronze alloy and silver plated.

### Rotors

The rotors are standard in design and hold the roller contacts. Each rotor, made of glass polyester insulating material, rotates independently between the stage spacer plates. The rotor assembly is equipped with one to six rollers (as determined by the required circuitry) each of which makes contact with two adjacent

stationary terminal studs to complete a circuit and so affording a double, series break contact. The silver-plated bronze alloy roller contacts provide a rolling, wiping action, are self-aligning on assembly and require no adjustment of contact pressure for the life of the switch. Contact springs do not carry current.

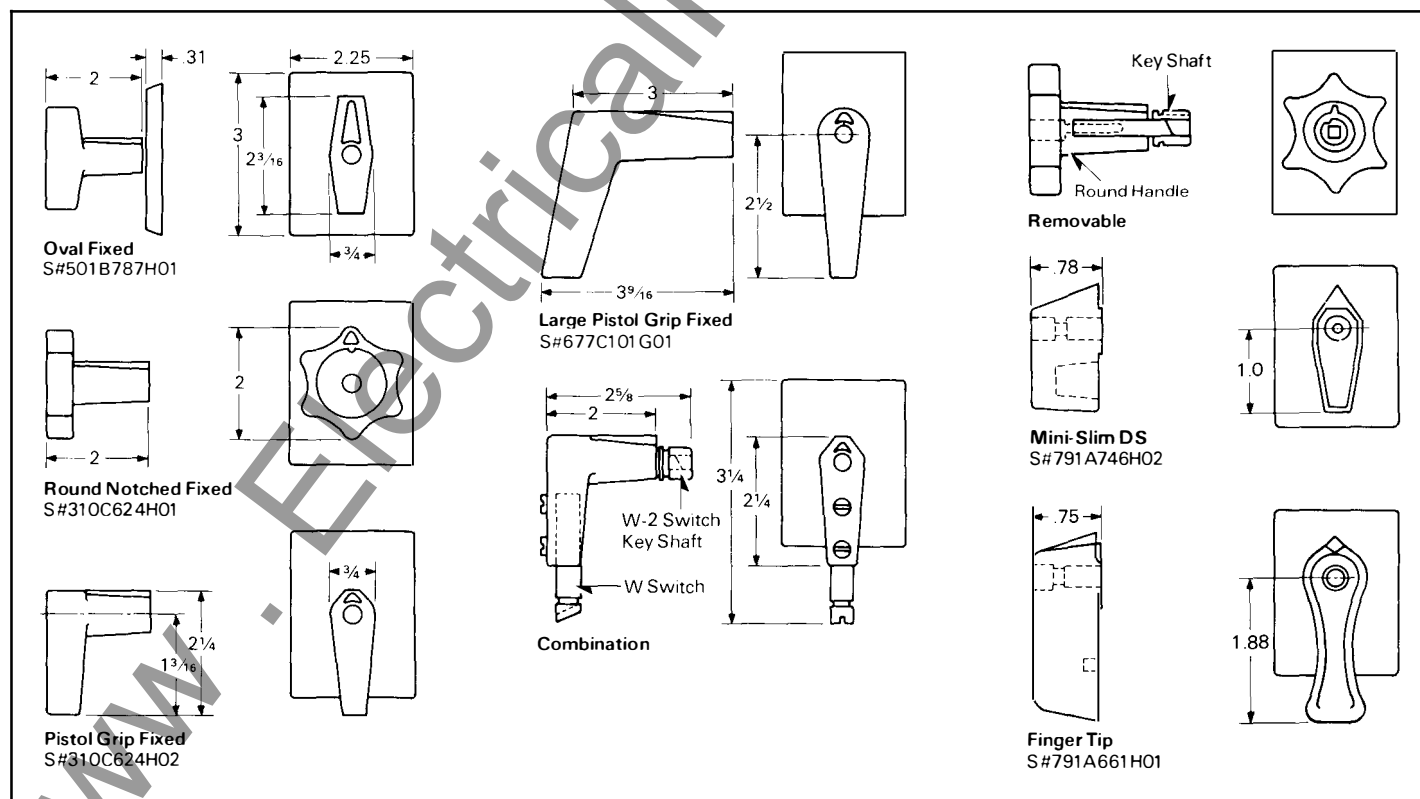
### Contact Flexibility

Basic "you wire it" flexibility is available in the Type W-2 switch. While the internal contacting is standardized for each basic type of switch; such as ammeter, voltmeter, circuit breaker, etc., by using available insulated jumpers, connections between external switch terminals can be made to obtain the desired circuitry for a specific application. This minimizes the number of basic styled switches that otherwise would be required.

### Switch Dial

The Type W-2 switch dial consists of two parts; i.e., a dial plate and a nameplate.

The standard control switch dial plate is die cast aluminum, with red and green target parts, where required, and serves as the base for mounting the nameplate. The nameplate is made of a white Cycolac ABS material on which is engraved in black the desired position markings.





### Handles

Handles for the Type W-2 switch are made of a phenolic insulating material designed to afford a smooth, easy, and comfortable grip of pleasing appearance. Each handle has a recessed arrow molded into it as a visual aid in positioning.

The handles are made in six shapes: Oval, round, pistol grip, large pistol grip, finger tip and mini-slim DS.

They can be obtained in the fixed type or the removable key type. All handles are fastened to the shaft by a screw through the front of the handle.

There is also available a combination removable key type handle in the pistol grip shape that can be used to operate both the Type W-2 and the Type W switches designed for removable key operation.

Switches using mini-slim or finger tip handles require a shorter shaft extension than do the shank type handles. Therefore mini-slim and finger tip handles are not interchangeable with the other 4 shank type handles.

### Operation

The Type W-2 switch is a rotary roller action switch. Rotation of the shaft causes the rotor rollers to roll from one set of stationary contacts to another. The number of roller contacts can vary from 1 to 6 depending on the number of rotary positions required for the switch application. Each roller contact, moving radially, is held in and guided by a slot in the rotor arm. The rollers are pushed outward by spring pressure. Between roller and spring there is an insulated spring seat to reduce friction and wear. On standard potential contacts, an insulated wheel is used on both ends of the roller contact which wheels roll inside the switch stator frame. This arrangement reduces the friction of the spring-loaded roller in riding up on the stationary contact and also results in an increased air gap and faster contact separation.

Overlapping contacts are obtained by increasing the diameter of the contact rollers of the shorting bar. At mid-position the roller spans the space between the stationary contacts. Such rollers provide a make-before-break contact in going from one position to an adjacent position.

The Type W-2 switch is available in both the maintained and the spring return types. Both types use a common housing that is  $\frac{7}{8}$ " deep, located between the back surface of the dial plate and the frame-rotor unit. This feature permits easy conversion from one type to another with a minimum of parts, time and experience.

**Maintained Type:** On a switch of this type, the switch is held in each rotary position by a starwheel mechanism. The mechanism consists of a pointed notched, molded wheel rotating between two metal rollers mounted on spring loaded arms. This arrangement provides a positive snap action as the handle is turned.

**Momentary Type:** This type uses a rotor that is returned to its original position by a double coil wound spring. The spring offers minimum opposition to movement of the switch handle, but is sufficiently strong to operate the rotor for all required contacting.

For current circuits, there is available an assembly of normally closed contact between front and rear terminals at each position on a stage. The assembly consists of a shorting bar across the two terminals and held closed by spring pressure. Turning the switch handle causes a cam to push the shorting bar away from the two terminals. Operating simultaneously with this contact assembly, in a different stage, are regular rollers designed and arranged so that they make a parallel circuit just prior to opening of the normally closed contact. This arrangement permits overlapping transition in current metering of circuits.

On three-position switches, slip contacts are available. These contacts close when the switch operating handle is turned to the right position and remain closed after the operating handle has returned to the center position. The contacts open when the operating handle is turned to the left position and remain open upon return of the handle to the center position.

In addition to rotary motion, the W-2 switch can be provided with lateral movement (push-pull). Spring actuated roller contacts are mounted in a wafer housing fastened to the operating shaft by "E" rings. The wafer housing can only be moved by a push or pull movement. The roller contact spans two adjacent terminals on a band and it moves back and forth between two bands in a stage.

### Interrupting Ratings

| Voltage                 | Amperes         |                            |        |                                      |
|-------------------------|-----------------|----------------------------|--------|--------------------------------------|
|                         | General Purpose | Pilot Duty 35% P.F. Normal | Inrush | 2 Contacts in Series General Purpose |
| <b>Standard Contact</b> |                 |                            |        |                                      |
| 600 Volts Ac            | 8               | 2.4                        | 12     | 20                                   |
| 240 Volts Ac            | 20              | 6                          | 30     | 40                                   |
| 110 Volts Ac            | 30              | 10                         | 60     | 60                                   |
| 250 Volts Dc            | 1.65            | 1.1                        | ..     | 9.5                                  |
| 125 Volts Dc            | 5               | 2.2                        | ..     | 20                                   |

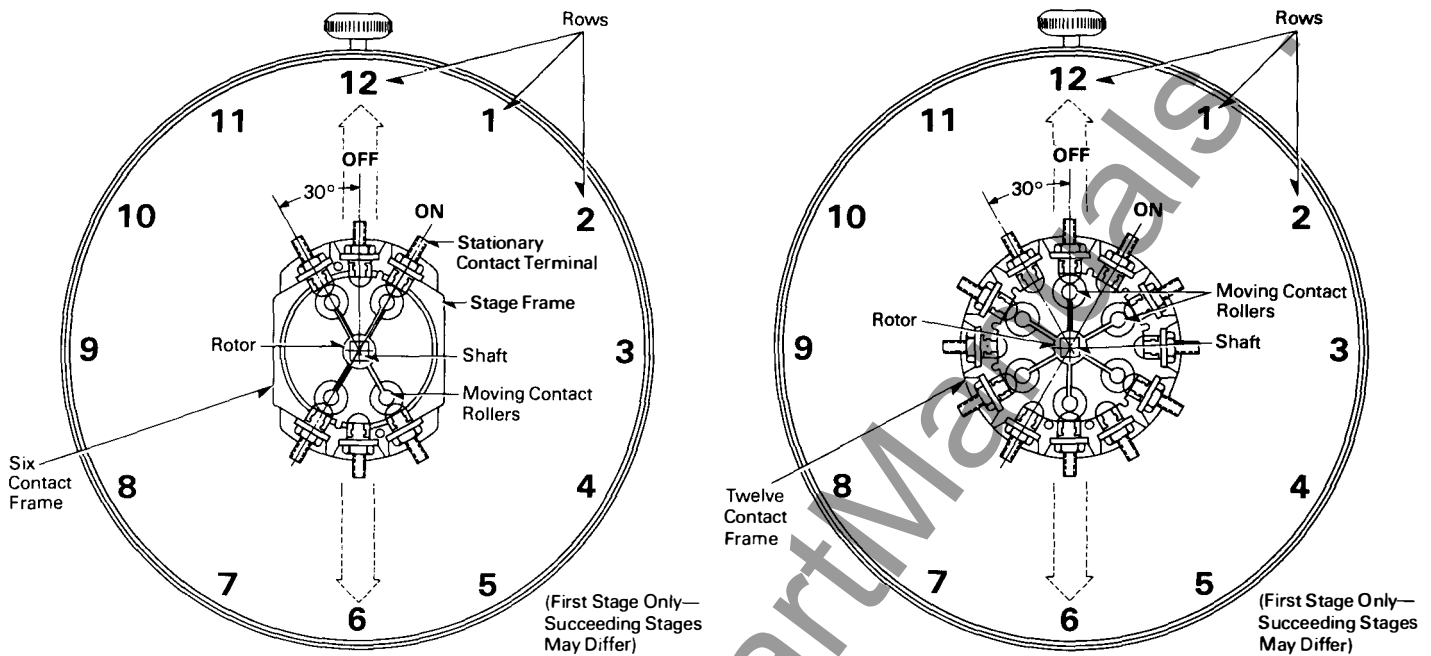
**Note:** Adjacent poles (contacts in same chamber) must be connected at same polarity

### Slip Contacts

|              |     |     |    |     |
|--------------|-----|-----|----|-----|
| 600 Volts Ac | 8   | 2.4 | 12 | ... |
| 240 Volts Ac | 20  | 6   | 30 | ... |
| 110 Volts Ac | 30  | 10  | 60 | ... |
| 250 Volts Dc | 1   | 55  | .. | ... |
| 125 Volts Dc | 3.5 | 1.1 | .. | ... |

**Note:** 2 adjacent side pole double throw contacts (in same chamber or stage) must be connected at same polarity

Pull and ammeter contacts are not given ratings as they do not interrupt loads. Normally closed ammeter contact has a continuous rating of 10 amperes



#### Contact Interpretation

The contacts of the Type W-2 Switch are identified by the combination of Bands and Rows.

#### Rows

Viewing the switch from the handle end (front), it is noted the terminals are arranged in rows from front to back. The rows are set 30 degrees apart as is the face of a clock. On the six contact frame, the top three rows are identified as 11, 12 and 1 o'clock. The three rows at the bottom of the stage are 5, 6 and 7 o'clock. On the twelve contact frame, the rows are set as per each number on the face of a clock.

#### Bands

As the switch is viewed from the side, bands of terminals are readily seen around the outer perimeter of the stage frame. Such bands are lettered. The band nearest the handle end is band "A", the second band is band "B", etc. Bands "A" and "B" constitute stage one, bands "C" and "D" constitute stage two, etc.

The row numbers and band letters are then combined to form full terminal identification as shown above and in the contact tabulations shown in this bulletin.

#### Contacts

The stationary contact (terminal) is a solid one piece forging. The moving (roller) contact is a solid bar.

To complete a circuit the roller contact internally bridges the stationary terminals in adjacent bands in the same row, for example, bands A & B in row twelve (A12-B12) etc.

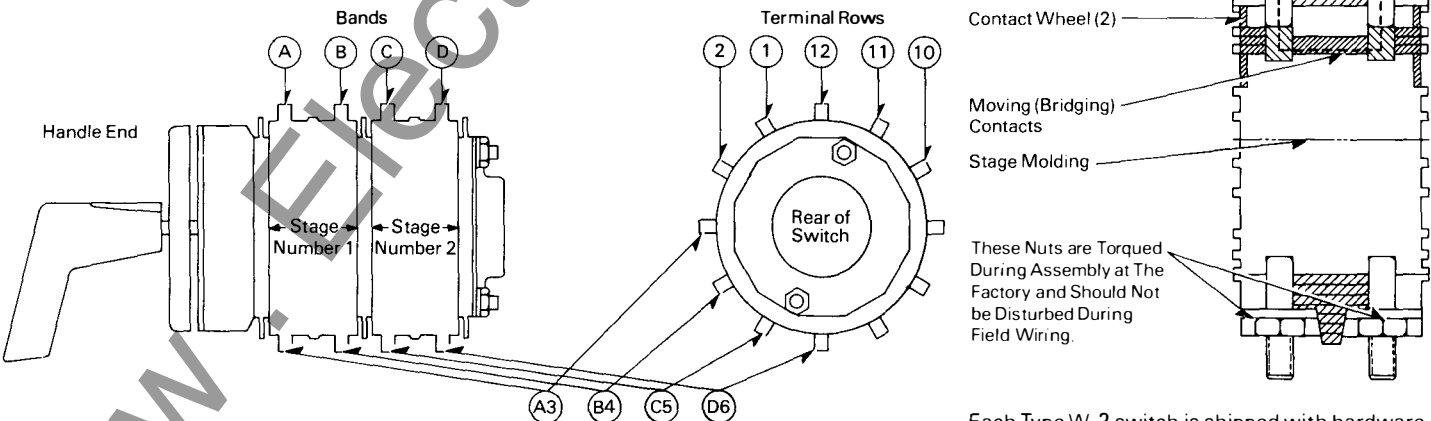


Figure 1: Methods of Identifying Contact Terminal Letter of Bands, Numbered Rows.

Each Type W-2 switch is shipped with hardware packet containing one nut for each switch terminal to facilitate field wiring.



## Construction Details

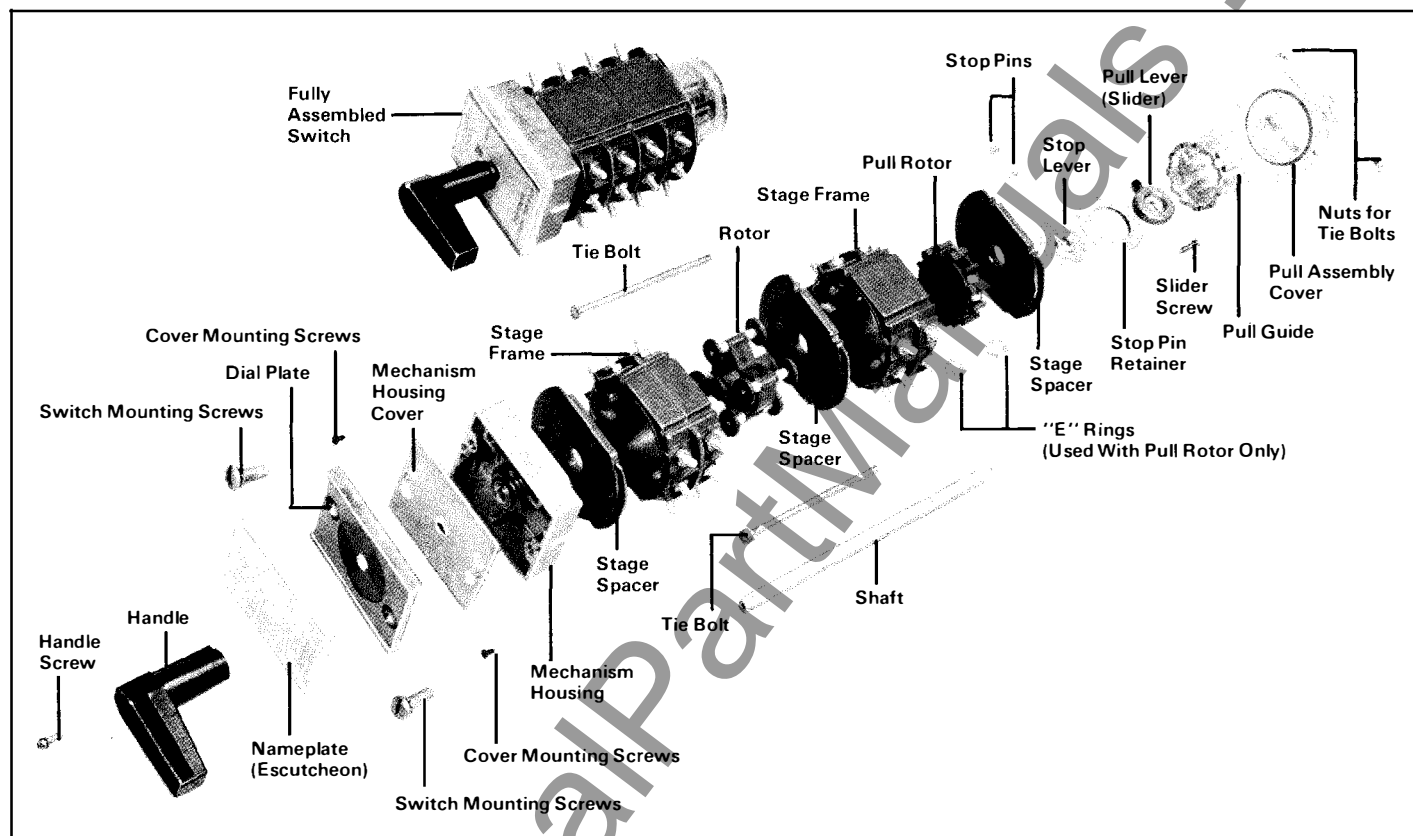


Figure 2: Exploded View of Typical Control Switch.

## Construction Details of Important Sub-assemblies

### Frame 6 Contacts

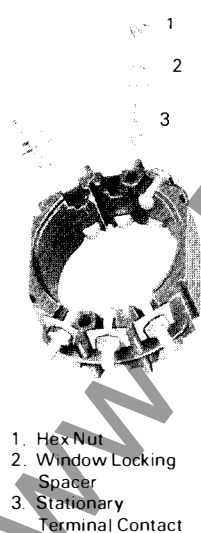


Figure 3 ①

### Rotor Pull Contact

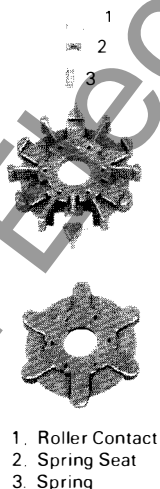


Figure 4 ①

### Rotor Standard 4 Roller Potential Contacts

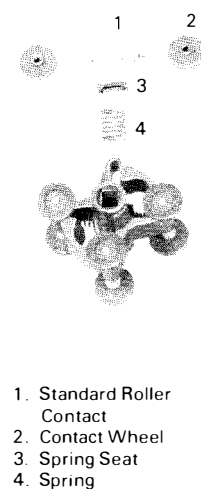


Figure 5 ①

### Rotor Standard 6 Roller Overlap Contacts



Figure 6 ①

### Control Housing With Maintained Contact Mechanism

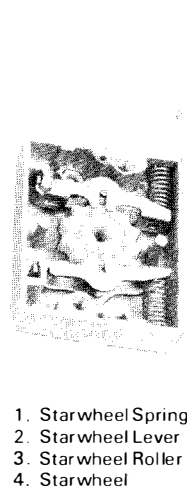


Figure 7 ①

### Control Housing With Momentary Mechanism

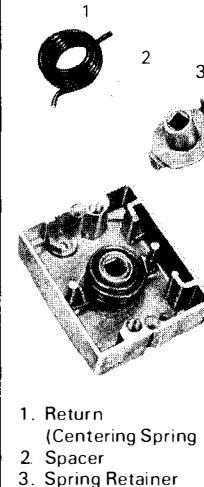
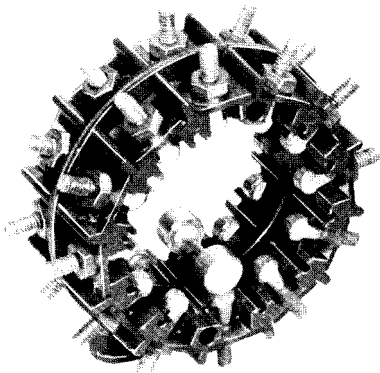


Figure 8 ①

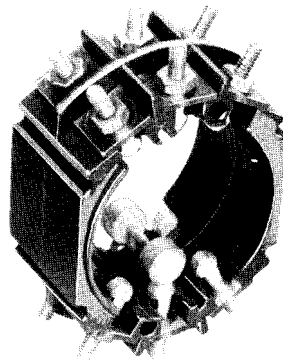
① Subassemblies listed above are available in spare parts kits. Refer to Instruction Leaflet 34-251.



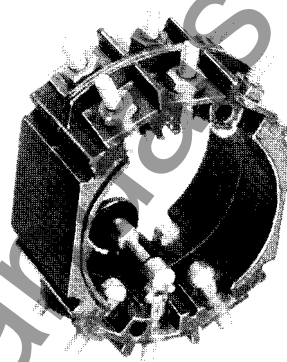
### Stage Frame Construction



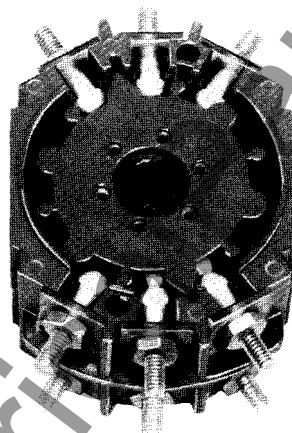
12 Contact Frame With Overlapping Contact Roller  
(Make Before Break)



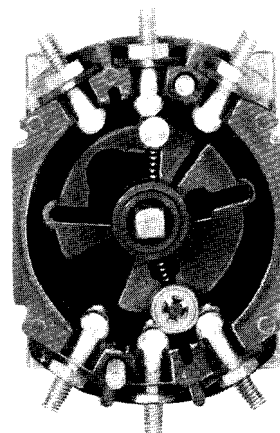
6 Contact Frame With Overlapping Contact Roller  
(Make Before Break)



6 Contact Frame With Standard Potential Contact  
Roller (Break Before Make)



6 Contact Frame With Push-Pull Rotor



6 Contact Frame With Slip Contact Rotor



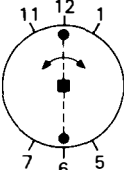
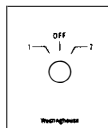
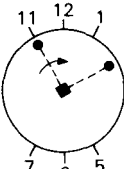
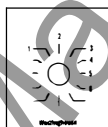
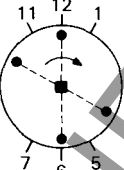
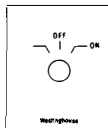
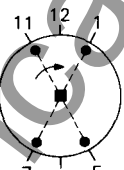
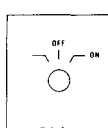
### Rotor Construction

Contacting of the Type W-2 Switch is derived from the varied assembly of fully standard parts. The stators (stage frames) are of the 6-contact and 12-contact designs per stage. The number of contacts per position and the number of required positions determine the rotor configuration. The stage frames remain unaltered, but the rotors are assembled to suit the application.

In the following is illustrated the contact tabulation derived from a particular rotor configuration. All illustrations are for a single stage. The Type W-2 Switch can be made up of several duplicate stages or a combination of varied compatible stages.

The following illustrations are intended to permit a fuller understanding of the internal construction and flexibility of the Type W-2 Switch.

### Rotor Configurations Used With The Six Contact Frame

| Rotor Configuration                                                                 | Resulting Contact Operation                                                                                                                                                                                                                                                                           | Position Available | Function |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|--|---------|---------|---|---------|---|-------|---|-------|---|-------|---|-------|---|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
|    | <table><tr><th>CONTACT</th><th>POSITION</th></tr><tr><td></td><td>1 2</td></tr><tr><td>A11-B11</td><td>X</td></tr><tr><td>A12-B12</td><td>X</td></tr><tr><td>A1-B1</td><td>X</td></tr><tr><td>A5-B5</td><td>X</td></tr><tr><td>A6-B6</td><td>X</td></tr><tr><td>A7-B7</td><td>X</td></tr></table>     | CONTACT            | POSITION |  | 1 2     | A11-B11 | X | A12-B12 | X | A1-B1 | X | A5-B5 | X | A6-B6 | X | A7-B7 | X |    | Two Contacts Closed in Each of Three Positions                                              |
| CONTACT                                                                             | POSITION                                                                                                                                                                                                                                                                                              |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
|                                                                                     | 1 2                                                                                                                                                                                                                                                                                                   |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A11-B11                                                                             | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A12-B12                                                                             | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A1-B1                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A5-B5                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A6-B6                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A7-B7                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
|    | <table><tr><th>CONTACT</th><th>POSITION</th></tr><tr><td></td><td>1 2 3 4</td></tr><tr><td>A11-B11</td><td>X</td></tr><tr><td>A12-B12</td><td>X</td></tr><tr><td>A1-B1</td><td>X</td></tr><tr><td>A5-B5</td><td>X</td></tr><tr><td>A6-B6</td><td>X</td></tr><tr><td>A7-B7</td><td>X</td></tr></table> | CONTACT            | POSITION |  | 1 2 3 4 | A11-B11 | X | A12-B12 | X | A1-B1 | X | A5-B5 | X | A6-B6 | X | A7-B7 | X |    | One Contact Closed in Each of Six Positions                                                 |
| CONTACT                                                                             | POSITION                                                                                                                                                                                                                                                                                              |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
|                                                                                     | 1 2 3 4                                                                                                                                                                                                                                                                                               |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A11-B11                                                                             | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A12-B12                                                                             | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A1-B1                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A5-B5                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A6-B6                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A7-B7                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
|   | <table><tr><th>CONTACT</th><th>POSITION</th></tr><tr><td></td><td>1 2 1</td></tr><tr><td>A11-B11</td><td>X</td></tr><tr><td>A12-B12</td><td>X</td></tr><tr><td>A1-B1</td><td>X</td></tr><tr><td>A5-B5</td><td>X</td></tr><tr><td>A6-B6</td><td>X</td></tr><tr><td>A7-B7</td><td>X</td></tr></table>   | CONTACT            | POSITION |  | 1 2 1   | A11-B11 | X | A12-B12 | X | A1-B1 | X | A5-B5 | X | A6-B6 | X | A7-B7 | X |   | Two Contacts Closed in Twelve O'clock Position—Four Contacts Closed in One O'clock Position |
| CONTACT                                                                             | POSITION                                                                                                                                                                                                                                                                                              |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
|                                                                                     | 1 2 1                                                                                                                                                                                                                                                                                                 |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A11-B11                                                                             | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A12-B12                                                                             | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A1-B1                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A5-B5                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A6-B6                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A7-B7                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
|  | <table><tr><th>CONTACT</th><th>POSITION</th></tr><tr><td></td><td>1 2 1</td></tr><tr><td>A11-B11</td><td>X</td></tr><tr><td>A12-B12</td><td>X</td></tr><tr><td>A1-B1</td><td>X</td></tr><tr><td>A5-B5</td><td>X</td></tr><tr><td>A6-B6</td><td>X</td></tr><tr><td>A7-B7</td><td>X</td></tr></table>   | CONTACT            | POSITION |  | 1 2 1   | A11-B11 | X | A12-B12 | X | A1-B1 | X | A5-B5 | X | A6-B6 | X | A7-B7 | X |  | Four Contacts Closed in Twelve O'clock Position—Two Contacts Closed in One O'clock Position |
| CONTACT                                                                             | POSITION                                                                                                                                                                                                                                                                                              |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
|                                                                                     | 1 2 1                                                                                                                                                                                                                                                                                                 |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A11-B11                                                                             | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A12-B12                                                                             | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A1-B1                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A5-B5                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A6-B6                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |
| A7-B7                                                                               | X                                                                                                                                                                                                                                                                                                     |                    |          |  |         |         |   |         |   |       |   |       |   |       |   |       |   |                                                                                      |                                                                                             |

### Slip Rotor Used With The Six Contact Frame



| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | 11       | 12 | 12 | 1 |
|         |          | A  | A  |   |
|         |          | 11 | 1  |   |
| A11-B11 | X        |    |    |   |
| A12-B12 |          | X  | X  |   |
| A1-B1   |          |    |    | X |
| A5-A6   | X        | X  |    |   |
| A6-A7   |          |    | X  | X |
| B5-B6   | X        | X  |    |   |
| B6-B7   |          |    | X  | X |

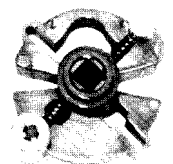
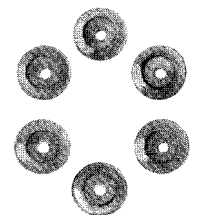
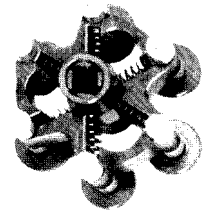
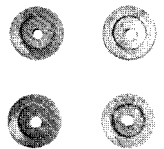
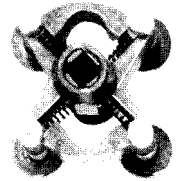
CIRCUIT BREAKER  
CONTROL

TRIP  CLOSE

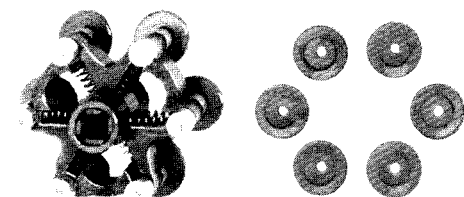


Hydramatic

**Slip Rotor:**  
Top Portion—One Contact Closed in Each of Three Positions. Lower Portion—Two Contacts Closed in Each of Two Positions.

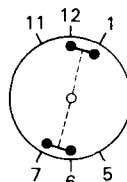
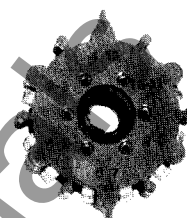
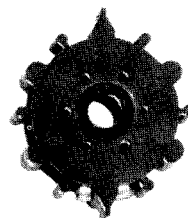


## Rotor Configurations Used With The Twelve Contact Frame



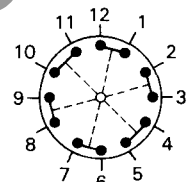
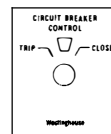
| Rotor Configuration | Resulting Contact Operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Position Available | Function |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|---|---------|---------|---|---------|---|---------|-------|----|----|---------|---|--|-------|-------|--|-------|--|-------|-------|--|--|-------|--|---|-------|-------|--|-------|--|-------|-------|--|--|---------|--|--|---|-------------------------------------------------|--|--|--|-------|--|--|--|-------|--|--|--|---|----------------------------------------------|--|--|--|--|--|--|-------|--|--|--|--|---|--|--|--|--|--|--|-------|--|--|--|--|--|---|--|--|--|--|--|-------|--|--|--|--|--|--|---|--|--|--|--|-------|--|--|--|--|--|--|--|---|--|--|--|-------|--|--|--|--|--|--|--|--|---|--|--|-------|--|--|--|--|--|--|--|--|--|---|--|---------|--|--|--|--|--|--|--|--|--|--|---|---------|--|--|--|--|--|--|--|--|--|--|--|--|------------------------------------------------|
|                     | <table><thead><tr><th>CONTACT</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th></tr></thead><tbody><tr><td>A12-B12</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>A1-B1</td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>A2-B2</td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>A3-B3</td><td></td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>A4-B4</td><td></td><td></td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>A5-B5</td><td></td><td></td><td></td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>A6-B6</td><td></td><td></td><td></td><td></td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td></tr><tr><td>A7-B7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>X</td><td></td><td></td><td></td></tr><tr><td>A8-B8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>X</td><td></td><td></td></tr><tr><td>A9-B9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>X</td><td></td></tr><tr><td>A10-B10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>X</td></tr><tr><td>A11-B11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table> | CONTACT            | 1        | 2 | 3       | 4       | 5 | 6       | 7 | 8       | 9     | 10 | 11 | A12-B12 | X |  |       |       |  |       |  |       |       |  |  | A1-B1 |  | X |       |       |  |       |  |       |       |  |  | A2-B2   |  |  | X |                                                 |  |  |  |       |  |  |  | A3-B3 |  |  |  | X |                                              |  |  |  |  |  |  | A4-B4 |  |  |  |  | X |  |  |  |  |  |  | A5-B5 |  |  |  |  |  | X |  |  |  |  |  | A6-B6 |  |  |  |  |  |  | X |  |  |  |  | A7-B7 |  |  |  |  |  |  |  | X |  |  |  | A8-B8 |  |  |  |  |  |  |  |  | X |  |  | A9-B9 |  |  |  |  |  |  |  |  |  | X |  | A10-B10 |  |  |  |  |  |  |  |  |  |  | X | A11-B11 |  |  |  |  |  |  |  |  |  |  |  |  | One Contact Closed in Each of Twelve Positions |
| CONTACT             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                  | 3        | 4 | 5       | 6       | 7 | 8       | 9 | 10      | 11    |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A12-B12             | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A1-B1               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | X                  |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A2-B2               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    | X        |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A3-B3               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          | X |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A4-B4               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   | X       |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A5-B5               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         | X       |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A6-B6               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         | X |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A7-B7               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   | X       |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A8-B8               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         | X |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A9-B9               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   | X       |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A10-B10             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         | X     |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A11-B11             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
|                     | <table><thead><tr><th>CONTACT</th><th>1</th><th>2</th><th>3</th></tr></thead><tbody><tr><td>A10-B10</td><td>X</td><td></td><td></td></tr><tr><td>A11-B11</td><td></td><td>X</td><td></td></tr><tr><td>A12-B12</td><td></td><td></td><td>X</td></tr><tr><td>A1-B1</td><td></td><td></td><td></td></tr><tr><td>A2-B2</td><td></td><td></td><td></td></tr><tr><td>A3-B3</td><td></td><td></td><td></td></tr><tr><td>A4-B4</td><td></td><td></td><td></td></tr><tr><td>A5-B5</td><td></td><td></td><td></td></tr><tr><td>A6-B6</td><td></td><td></td><td></td></tr><tr><td>A7-B7</td><td></td><td></td><td></td></tr><tr><td>A8-B8</td><td></td><td></td><td></td></tr><tr><td>A9-B9</td><td></td><td></td><td></td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CONTACT            | 1        | 2 | 3       | A10-B10 | X |         |   | A11-B11 |       | X  |    | A12-B12 |   |  | X     | A1-B1 |  |       |  | A2-B2 |       |  |  | A3-B3 |  |   |       | A4-B4 |  |       |  | A5-B5 |       |  |  | A6-B6   |  |  |   | A7-B7                                           |  |  |  | A8-B8 |  |  |  | A9-B9 |  |  |  |   | Two Contacts Closed in Each of Six Positions |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| CONTACT             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                  | 3        |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A10-B10             | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A11-B11             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | X                  |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A12-B12             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    | X        |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A1-B1               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A2-B2               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A3-B3               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A4-B4               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A5-B5               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A6-B6               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A7-B7               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A8-B8               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A9-B9               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
|                     | <table><thead><tr><th>CONTACT</th><th>1</th><th>2</th></tr></thead><tbody><tr><td>A11-B11</td><td>X</td><td></td></tr><tr><td>A12-B12</td><td></td><td>X</td></tr><tr><td>A1-B1</td><td></td><td></td></tr><tr><td>A2-B2</td><td></td><td></td></tr><tr><td>A3-B3</td><td></td><td></td></tr><tr><td>A4-B4</td><td></td><td></td></tr><tr><td>A5-B5</td><td></td><td></td></tr><tr><td>A6-B6</td><td></td><td></td></tr><tr><td>A7-B7</td><td></td><td></td></tr><tr><td>A8-B8</td><td></td><td></td></tr><tr><td>A9-B9</td><td></td><td></td></tr><tr><td>A10-B10</td><td></td><td></td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CONTACT            | 1        | 2 | A11-B11 | X       |   | A12-B12 |   | X       | A1-B1 |    |    | A2-B2   |   |  | A3-B3 |       |  | A4-B4 |  |       | A5-B5 |  |  | A6-B6 |  |   | A7-B7 |       |  | A8-B8 |  |       | A9-B9 |  |  | A10-B10 |  |  |   | Three Contacts Closed in Each of Four Positions |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| CONTACT             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                  |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A11-B11             | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A12-B12             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | X                  |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A1-B1               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A2-B2               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A3-B3               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A4-B4               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A5-B5               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A6-B6               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A7-B7               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A8-B8               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A9-B9               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A10-B10             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
|                     | <table><thead><tr><th>CONTACT</th><th>1</th><th>2</th></tr></thead><tbody><tr><td>A11-B11</td><td>X</td><td></td></tr><tr><td>A12-B12</td><td></td><td>X</td></tr><tr><td>A1-B1</td><td></td><td></td></tr><tr><td>A2-B2</td><td></td><td></td></tr><tr><td>A3-B3</td><td></td><td></td></tr><tr><td>A4-B4</td><td></td><td></td></tr><tr><td>A5-B5</td><td></td><td></td></tr><tr><td>A6-B6</td><td></td><td></td></tr><tr><td>A7-B7</td><td></td><td></td></tr><tr><td>A8-B8</td><td></td><td></td></tr><tr><td>A9-B9</td><td></td><td></td></tr><tr><td>A10-B10</td><td></td><td></td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CONTACT            | 1        | 2 | A11-B11 | X       |   | A12-B12 |   | X       | A1-B1 |    |    | A2-B2   |   |  | A3-B3 |       |  | A4-B4 |  |       | A5-B5 |  |  | A6-B6 |  |   | A7-B7 |       |  | A8-B8 |  |       | A9-B9 |  |  | A10-B10 |  |  |   | Four Contacts Closed in Each of Three Positions |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| CONTACT             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                  |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A11-B11             | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A12-B12             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | X                  |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A1-B1               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A2-B2               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A3-B3               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A4-B4               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A5-B5               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A6-B6               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A7-B7               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A8-B8               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A9-B9               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A10-B10             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
|                     | <table><thead><tr><th>CONTACT</th><th>1</th><th>2</th></tr></thead><tbody><tr><td>A11-B11</td><td>X</td><td></td></tr><tr><td>A12-B12</td><td></td><td>X</td></tr><tr><td>A1-B1</td><td></td><td></td></tr><tr><td>A2-B2</td><td></td><td></td></tr><tr><td>A3-B3</td><td></td><td></td></tr><tr><td>A4-B4</td><td></td><td></td></tr><tr><td>A5-B5</td><td></td><td></td></tr><tr><td>A6-B6</td><td></td><td></td></tr><tr><td>A7-B7</td><td></td><td></td></tr><tr><td>A8-B8</td><td></td><td></td></tr><tr><td>A9-B9</td><td></td><td></td></tr><tr><td>A10-B10</td><td></td><td></td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CONTACT            | 1        | 2 | A11-B11 | X       |   | A12-B12 |   | X       | A1-B1 |    |    | A2-B2   |   |  | A3-B3 |       |  | A4-B4 |  |       | A5-B5 |  |  | A6-B6 |  |   | A7-B7 |       |  | A8-B8 |  |       | A9-B9 |  |  | A10-B10 |  |  |   | Six Contacts Closed in Each of Two Positions    |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| CONTACT             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                  |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A11-B11             | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A12-B12             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | X                  |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A1-B1               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A2-B2               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A3-B3               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A4-B4               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A5-B5               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A6-B6               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A7-B7               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A8-B8               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A9-B9               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |
| A10-B10             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |   |         |         |   |         |   |         |       |    |    |         |   |  |       |       |  |       |  |       |       |  |  |       |  |   |       |       |  |       |  |       |       |  |  |         |  |  |   |                                                 |  |  |  |       |  |  |  |       |  |  |  |   |                                              |  |  |  |  |  |  |       |  |  |  |  |   |  |  |  |  |  |  |       |  |  |  |  |  |   |  |  |  |  |  |       |  |  |  |  |  |  |   |  |  |  |  |       |  |  |  |  |  |  |  |   |  |  |  |       |  |  |  |  |  |  |  |  |   |  |  |       |  |  |  |  |  |  |  |  |  |   |  |         |  |  |  |  |  |  |  |  |  |  |   |         |  |  |  |  |  |  |  |  |  |  |  |  |                                                |

## Push-Pull Rotors



Six Contact Stage With Pull Rotor—Two Pull to Break and Two Pull Make Contacts

| CONTACT | 1 | 2 | 3 | 4 | 5 | 6 |
|---------|---|---|---|---|---|---|
| D12-D1  | X | X | X | X | X | X |
| C6-C7   | X | X | X | X | X | X |
| D6-D7   | X | X | X | X | X | X |



Twelve Contact Stage With Pull Rotor—Six Pull to Break and Six Pull to Make Contacts

| CONTACT | IN | OUT | IN | OUT | IN | OUT | IN | OUT | IN | OUT | IN | OUT |
|---------|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|
| C12-C1  | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| D12-D1  | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| C2-C3   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| D2-D3   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| C4-C5   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| D4-D5   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| C6-C7   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| D6-D7   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| C8-C9   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| D8-D9   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| C10-C11 | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |
| D10-D11 | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   | X  | X   |

## Type W-2 Switch Materials

|                       |                                |
|-----------------------|--------------------------------|
| Handle                | Moldarta, General Purpose      |
| Nameplate             | Cyclac, ABS Molded Composition |
| Dial Plate            | Aluminum Die Cast              |
| Housing               | Aluminum Die Cast              |
| Stage Frame           | Glass Polyester                |
| Rotor                 | Glass Polyester                |
| Stationary Contact    | Silicon Bronze, Silver Plated  |
| Roller Contact        | Silicon Bronze, Silver Plated  |
| Springs               | Stainless Steel                |
| Locking Spacer Window | Polysulfone                    |
| Starwheel             | Nylon                          |
| Pull Cover and Guide  | Polycarbonate                  |
| Shaft                 | Stainless Steel                |



**Ordering Instructions**

All type W-2 switches must be ordered by style number. If the style number is unknown, Form 34219-A, (refer to page 61) must be completed and sent to:

Westinghouse Electric Corporation  
Route 9, P.O. Box 555D  
Marketing Department  
London, KY 40741

The London division will assign and advise style number. Contact tabulation form 34219-A is available from either the Westinghouse Printing Division, Trafford, PA or from the London division.

The type W-2 switch can be furnished in either of two ways;

- 1) as a complete unit consisting of the switch unit, handle, nameplate and external jumpers when required (as listed in Table 1, pages 9 and 10) or
- 2) as a basic switch with all desired components being ordered as separate items (as listed in Table 2, page 11).

Switches requiring external jumpers in order to perform a specific function and which are ordered as a complete switch from Table 1, will be furnished with the jumpers installed. Basic switches ordered from Table 2, are not furnished with jumpers installed.

The rear end cap of each switch will be marked with the style number of the switch as ordered, whether a complete unit or basic switch.

Style numbers of switches to be operated by a removable key handle do not include the handle. The switch and key handle must be identified and ordered as separate items.

The style numbers shown in this bulletin apply to switches for mounting on 1/8 to 1/4 inch thick panels. Switches for thicker panels (up to two inches) are available on special order (refer to factory).

Each type W-2 switch, complete or basic, is shrink packed in a carton with a contact tabulation sheet, and packets of terminal nuts sufficient for connecting to each switch terminal. Type W-2 switches shipped as complete units also include a nameplate, dialplate, and handle hardware.

Additional ordering information can be found including;

|                            |                  |
|----------------------------|------------------|
| Nameplates .....           | Pages 13, 14, 15 |
| Handles .....              | Pages 2, 3       |
| Terminal Connectors .....  | Page 12          |
| Tumbler Pin Key Lock ..... | Page 17          |
| Key Interlocking .....     | Page 17          |
| Protective Covers .....    | Page 16          |
| Auxiliary Switch .....     | Page 18          |

**Note:** Switches listed are only a minute percentage of switches actually available.

**Table 1: Complete Switches, Continued**

Complete switches are those with nameplates, handles, and external jumpers (where required) except that switches to be operated by a removable key handle do not include the key handle. All removable key handles must be ordered as separate items. (All for 1/8-1/4 inch thick panel mounting.)

| Style       | Figure | Application                                       |
|-------------|--------|---------------------------------------------------|
| 505A700G01  | 1      | Ammeter - 2 Phase                                 |
| 505A701G01  | 2A     | Ammeter - 3 Phase - 3 CT's - Independent Circuits |
| 505A701G02  | 2      | Ammeter - 3 Phase - 2 CT's                        |
| 505A701G05  | 3      | Ammeter - 3 Phase - 3 CT's - No "OFF" Position    |
| 505A702L02  | 103    | 1 or 2 Pole with OFF                              |
| 505A702L03  | 92     | OFF - ON                                          |
| 505A702G01  | 20     | Voltmeter - 2 Phase - AC - 3 Wire                 |
| 505A702G02  | 21     | Voltmeter - 2 Circuit - DC - 2 Wire               |
| 505A702G03  | 22     | Voltmeter - 3 Wire DC                             |
| 505A702G04  | 23     | Voltmeter - 3 Phase - 3 Wire                      |
| 505A702G05  | 24     | Voltmeter - 3 Phase - 4 Wire                      |
| 505A703G01  | 38     | Voltage Control                                   |
| 505A703G02  | 62     | Speed Control                                     |
| 505A703G06  | 38     | Voltage Control                                   |
| 505A703G07  | 62     | Speed Control                                     |
| 505A703G51  | 103    | 2 Pole - 2 Throw                                  |
| 505A704G01  | 25     | Voltmeter - 4 Circuit                             |
| 505A705G01  | 26     | Voltmeter - 3 Phase and Phase-to-Neut.            |
| 505A705G02  | 27     | Voltmeter - Two 3-Phase Circuits                  |
| 505A705G03  | 28     | Voltmeter - 6 Circuit                             |
| 505A706G01  | 91     | OFF - ON                                          |
| 505A706G02  | 91     | OFF - ON                                          |
| 505A706G03  | 91     | OFF - ON                                          |
| 505A706G55  | 97     | 1 or 2 Pole - 2 Throw                             |
| 505A709G01  | 85     | Temperature - 4 RTD - Accurate Lead Compensation  |
| 505A711G01① | 86     | Temperature - 4 RTD - Accurate Lead Compensation  |
| 505A711G03  | 86     | Temperature Removable Key Handle                  |
| 505A712G01  | 57     | Regulator Cutout                                  |
| 505A712G90  | 44     | Wattmeter                                         |
| 505A712G91  | 53     | Power Factor                                      |
| 505A712G92  | 106    | 4 Pole - 2 Throw                                  |
| 505A713G01  | 63     | Circuit Breaker Control                           |
| 505A713G02  | 64     | Circuit Breaker Control                           |
| 505A713G03  | 63     | Circuit Breaker Control                           |
| 505A714G01  | 65     | Circuit Breaker Control                           |
| 505A714G02  | 65     | Circuit Breaker Control                           |
| 505A715G01  | 39     | Voltage Control                                   |
| 505A715G05  | 39     | Voltage Control                                   |
| 505A715G32  | 106    | 4 Pole - 2 Throw                                  |
| 505A716G01  | 40     | Voltage Control                                   |
| 505A716G02  | 59     | Electrode Control                                 |
| 505A716G03  | 60     | Motor Control                                     |
| 505A716G04  | 59     | Electrode Control                                 |
| 505A716G05  | 60     | Motor Control                                     |
| 505A717G01  | 68     | Circuit Breaker Control                           |
| 505A717G03  | 68     | Circuit Breaker Control                           |
| 505A718G01  | 66     | Circuit Breaker Control                           |
| 505A718G15  | 67     | Circuit Breaker Control                           |
| 505A720G01  | 69     | Circuit Breaker Control                           |
| 505A720G03  | 69     | Circuit Breaker Control                           |
| 505A722G01  | 95     | OFF - ON                                          |
| 505A722G02  | 95     | OFF - ON                                          |
| 505A722G03  | 95     | OFF - ON                                          |
| 505A723G01  | 91     | OFF - ON                                          |
| 505A723G02  | 91     | OFF - ON                                          |
| 505A723G03  | 91     | OFF - ON                                          |
| 505A725G01  | 95     | OFF - ON                                          |
| 505A725G06  | 95     | OFF - ON                                          |
| 505A725G11  | 95     | OFF - ON                                          |
| 505A726G14  | 107    | 6 Pole - 2 Throw                                  |
| 505A727G15  | 107    | 6 Pole - 2 Throw                                  |
| 505A733G01  | 93     | OFF - ON                                          |
| 505A733G17  | 98     | 1 Pole - 4 Throw                                  |
| 505A733G18  | 99     | 1 Pole - 5 Throw                                  |
| 505A734G09  | 45     | Wattmeter                                         |

① Switch requires removable key handle which is not included with switch style - switch and removable key handle must be ordered as separate items.



**Table 1: Complete Switches, Continued**

Complete switches are those with nameplates, handles, and external jumpers (where required) except that switches to be operated by a removable key handle do not include the key handle. All removable key handles must be ordered as separate items. (All for 1/8-1/4 inch thick panel mounting.)

| Style        | Figure | Application                                        | Style        | Figure | Application                                                         |
|--------------|--------|----------------------------------------------------|--------------|--------|---------------------------------------------------------------------|
| 505A738G07   | 75     | Circuit Breaker Control                            | 508A496G03   | 54     | Power Factor Meter                                                  |
| 505A740G06   | 47     | Watt Meter                                         | 661A208G01 ① | 2A     | Ammeter - 3 Phase, 3 Ct's.                                          |
| 505A740G07   | 48     | Watt Meter                                         | 661A210G01   | 89     | Temperature - 10 RTD - Accurate Lead Compensation                   |
| 505A745G01   | 94     | OFF - ON                                           | 661A210G06   | 87     | Temperature - 6 RTD - Accurate Lead Compensation                    |
| 505A745G17   | 100    | 1 Pole - 7 Throw                                   | 663A245G06   | 61     | Motor Control                                                       |
| 505A745G18   | 101    | 1 Pole - 8 Throw                                   | 663A454G01 ① | 90     | Temperature, 10 RTD - Accurate Lead Compensation                    |
| 505A745G19   | 102    | 1 Pole - 10 Throw                                  | 781A252G01   | 11     | Ammeter, Two 3 Phase Circuits                                       |
| 505A747G01   | 19     | Voltmeter - Single Phase                           | 781A254G01   | 84     | Temperature, 1 RTD, Accurate Lead Compensation                      |
| 505A747G02   | 19     | Voltmeter Removable Key Handle                     | 781A489G01 ① | 88     | Temperature, 6 RTD, Accurate Lead Compensation                      |
| 505A748G01 ① | 21     | Voltmeter - 2 Circuit - DC - 2 Wire                | 787A976G01   | 4      | Ammeter, 3 Phase, 3 Ct's., End of Circuit                           |
| 505A748G02   | 21     | Voltmeter - Removable Key Handle                   | 787A976G02   | 5      | Ammeter, 3 Phase, 2 Ct's., End of Circuit                           |
| 505A749G01 ① | 23     | Voltmeter - 3 Phase, 3 Wire                        | 787A976G03   | 6      | Ammeter, 3 Phase, 3 Ct's., End of Circuit                           |
| 505A749G02   | 23     | Removable Key Handle                               | 787A976G04   | 7      | Ammeter, 3 Phase, 2 Ct's., End of Circuit                           |
| 505A752G01 ① | 50     | Wattmeter                                          | 787A977G01   | 36     | Voltmeter/Ammeter/3 Phase - 4 Wire, 3 Ct's., 3 Pt's./End of Circuit |
| 505A752G02   | 50     | Removable Key Handle                               | 787A977G02   | 37     | Voltmeter/Ammeter/3 Phase - 3 Wire, 3 Ct's., 2 Pt's./End of Circuit |
| 505A753G01 ① | 51     | Power Factor Meter                                 | 787A984G01   | 12     | Ammeter, 3 Phase - 2 Ct's., End of Circuit                          |
| 505A753G02   | 51     | Removable Key Handle                               | 787A984G02   | 13     | Ammeter, 3 Phase - 2 Ct's., End of Circuit                          |
| 505A754G01 ① | 52     | Power Factor Meter                                 | 787A984G03   | 14     | Ammeter, 3 Phase - 3 Ct's., End of Circuit                          |
| 505A754G02   | 52     | Removable Key Handle                               | 787A984G04   | 15     | Ammeter, 3 Phase - 3 Ct's., End of Circuit                          |
| 505A754G03   | 55     | Removable Key Handle                               | 787A984G05   | 16     | Ammeter, ON - OFF, 1 Ct., End of Circuit                            |
| 505A754G04 ① | 46     | Wattmeter                                          | 787A984G06   | 17     | Ammeter, 3 Phase - 2 Ct's., End of Circuit                          |
| 505A755G01 ① | 41     | Synchroscope - Machine to Bus                      | 787A984G07   | 18     | Ammeter, 3 Phase - 3 Ct's., End of Circuit                          |
| 505A755G02   | 41     | Removable Key Handle                               | 800A426G01 ① | 4      | Ammeter, 3 Phase - 3 Ct's., End of Circuit                          |
| 505A757G01 ① | 42     | Synchroscope - Between Machines                    | 800A426G02 ① | 5      | Ammeter, 3 Phase - 2 Ct's., End of Circuit                          |
| 505A757G02   | 42     | Removable Key Handle - Running                     | 802A231G01   | 76     | Circuit Breaker Control                                             |
| 505A757G03   | 42     | Removable Key Handle - Incoming                    | 802A469G01   | 80     | Circuit Breaker Control                                             |
| 505A762G01 ① | 24     | Voltmeter - 3 Phase, 4 Wire                        | 802A470G01 ① | 55     | Power Factor Meter                                                  |
| 505A762G02   | 24     | Removable Key Handle                               | 3562A01G01   | 29     | Voltmeter - 3 Phase; 3 Wire, End of Circuit                         |
| 505A779G05 ① | 49     | Wattmeter                                          | 3562A01G02   | 30     | Voltmeter - 3 Phase; 3 Wire, End of Circuit                         |
| 505A781G03   | 96     | OFF - ON                                           | 3562A01G03   | 31     | Voltmeter - 3 Phase; 4 Wire, End of Circuit                         |
| 505A782G01   | 96     | OFF - ON                                           | 3562A01G04   | 32     | Voltmeter - 3 Phase; 4 Wire, End of Circuit                         |
| 505A797G02   | 46     | Removable Key Handle                               | 3562A01G05   | 33     | Voltmeter - 3 Phase; 3 Wire, End of Circuit                         |
| 508A207G02   | 77     | Circuit Breaker Control                            | 3669A41G01 ① | 2      | Ammeter - 3 Phase; 2 Ct's.                                          |
| 508A218G07   | 78     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A224G02   | 58     | Regulator Cutout                                   |              |        |                                                                     |
| 508A229G01   | 79     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A244G01   | 70     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A244G02   | 70     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A247G02   | 49     | Removable Key Handle                               |              |        |                                                                     |
| 508A255G03   | 83     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A262G01   | 71     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A262G03   | 71     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A264G01   | 72     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A264G02   | 72     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A281G02   | 73     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A284G01   | 74     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A298G02   | 4      | Removable Key Handle                               |              |        |                                                                     |
| 508A299G03   | 34     | Voltmeter/Ammeter/3 Phase, 3 Wire/3 Ct's., 2 Pt's. |              |        |                                                                     |
| 508A299G09   | 35     | Voltmeter/Ammeter/3 Phase, 3 Wire/3 Ct's., 2 Pt's. |              |        |                                                                     |
| 508A423G16   | 104    | 2 Pole - 8 Throw                                   |              |        |                                                                     |
| 508A423G17   | 105    | 2 Pole - 12 Throw                                  |              |        |                                                                     |
| 508A463G04   | 8      | Ammeter - 3 Ct's. and Neutral                      |              |        |                                                                     |
| 508A463G05   | 9      | Ammeter - 4 Ct's.                                  |              |        |                                                                     |
| 508A467G01 ① | 43     | Frequency Meter                                    |              |        |                                                                     |
| 508A467G02   | 43     | Removable Key Handle                               |              |        |                                                                     |
| 508A468G01   | 56     | Pilot Wire Test                                    |              |        |                                                                     |
| 508A474G02   | 2      | Removable Key Handle                               |              |        |                                                                     |
| 508A480G01   | 81     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A480G08   | 82     | Circuit Breaker Control                            |              |        |                                                                     |
| 508A481G01   | 10     | Ammeter - 6 Ct's. Independent                      |              |        |                                                                     |

① Switch requires removable key handle which is not included with switch style - switch and removable key handle must be ordered as separate items.

**Table 2: Basic Switches**

Basic switches **DO NOT** include handle, nameplate or jumpers which should be ordered separately from pages 2, 3, 12, 13, 14 and 15. (All for 1/8 - 1/4 inch Thick Panel Mounting)

**Symbols**

Fixed Handle (F or unmarked)  
Removable key handle (R)  
Momentary Contacts (MO)  
Maintained Contacts (MA)  
Switch includes target (T)

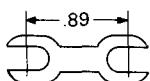
| Style Number | Handle | Contacts | Stages | Figure | Style Number | Handle | Contacts | Stages | Figure |
|--------------|--------|----------|--------|--------|--------------|--------|----------|--------|--------|
| 505A600G01   | F      | MA       | 1      | 116    | 508A128G01   | F      | MO       | 2      | 121    |
| 505A601G01   | F      | MA       | 2      | 2      | 508A129G01   | F      | MO       | 2      | 121    |
| 505A602G01   | F      | MA       | 1      | 115    | 508A133G01   | F      | MO       | 2      | 122    |
| 505A603G01   | F      | MO       | 1      | 115    | 508A143G01   | F      | MO       | 2      | 123    |
| 505A604G01   | F      | MA       | 2      | 25     | 508A144G01   | F      | MO       | 2      | 123    |
| 505A605G01   | F      | MA       | 2      | 26     | 508A145G01   | F      | MO       | 3      | 124    |
| 505A606G01   | F      | MA       | 1      | 108    | 508A146G01   | R      | MA       | 3      | 124    |
| 505A607G01   | F      | MO       | 1      | 111    | 508A161G01   | F      | MO       | 3      | 125    |
| 505A612G01   | F      | MA       | 2      | 118    | 508A162G01   | F      | MO       | 3      | 126    |
| 505A613G01   | F      | MO       | 1      | 63     | 508A163G01   | F      | MO       | 3      | 127    |
| 505A614G01   | F      | MO       | 1      | 65     | 508A164G01   | F      | MO       | 3      | 127    |
| 505A615G01   | F      | MO       | 2      | 118    | 508A166G01   | F      | MA       | 3      | 129    |
| 505A616G01   | F      | MO       | 2      | 59     | 508A167G01   | F      | MO       | 3      | 129    |
| 505A617G01   | F      | MO       | 2      | 68     | 508A173G01   | R      | MA       | 5      | 133    |
| 505A618G01   | F      | MO       | 2      | 66     | 508A175G01   | R      | MA       | 4      | 130    |
| 505A619G01   | F      | MO       | 3      | 128    | 508A181G01   | F      | MO       | 4      | 131    |
| 505A620G01   | F      | MO       | 2      | 122    | 508A183G01   | F      | MO       | 4      | 132    |
| 505A621G01   | F      | MA       | 2      | 113    | 508A184G01   | F      | MO       | 4      | 132    |
| 505A622G01   | F      | MA       | 2      | 112    | 508A189G01   | F      | MO       | 3      | 125    |
| 505A623G01   | F      | MO       | 1      | 108    | 508A196G01   | F      | MA       | 6      | 134    |
| 505A624G01   | F      | MO       | 2      | 113    | 508A199G01   | F      | MA       | 3      | 135    |
| 505A625G01   | F      | MO       | 2      | 112    | 508A300G01   | R      | MA       | 3      | 135    |
| 505A626G01   | F      | MA       | 3      | 124    | 508A301G01   | R      | MA       | 1      | 136    |
| 505A627G01   | F      | MO       | 3      | 124    | 508A302G01   | F      | MA       | 1      | 137    |
| 505A628G01   | F      | MA       | 3      | 114    | 508A303G01   | R      | MA       | 1      | 137    |
| 505A630G01   | F      | MO       | 4      | 130    | 508A307G01   | F      | MA       | 3      | 139    |
| 505A631G01   | F      | MA       | 5      | 133    | 508A308G01   | R      | MA       | 3      | 139    |
| 505A632G01   | F      | MO       | 5      | 133    | 508A310G01   | F      | MA       | 3      | 140    |
| 505A633G01   | F      | MA       | 1      | 136    | 508A311G01   | R      | MA       | 3      | 140    |
| 505A634G01   | F      | MA       | 1      | 111    | 508A314G01   | F      | MA       | 4      | 141    |
| 505A635G01   | F      | MO       | 2      | 5      | 508A317G01   | F      | MA       | 6      | 142    |
| 505A638G01   | F      | MO       | 1      | 117    | 508A320G01   | R      | MA       | 2      | 143    |
| 505A644G01   | F      | MA       | 1      | 154    | 508A323G01   | F      | MA       | 4      | 144    |
| 505A645G01   | F      | MA       | 2      | 143    | 508A326G01   | F      | MA       | 6      | 145    |
| 505A647G01   | R      | MA       | 1      | 108    | 508A334G01   | F      | MA       | 2      | 149    |
| 505A649G01   | R      | MA       | 1      | 115    | 508A342G01   | F      | MO       | 2      | 151    |
| 505A650G01   | F      | MA       | 1      | 146    | 508A343G01   | F      | MA       | 1      | 152    |
| 505A651G01   | F      | MO       | 1      | 146    | 508A344G01   | F      | MO       | 1      | 152    |
| 505A652G01   | R      | MA       | 2      | 50     | 508A351G01   | F      | MA       | 1      | 153    |
| 505A653G01   | R      | MA       | 2      | 51     | 508A363G01   | F      | MA       | 3      | 138    |
| 505A654G01   | R      | MA       | 1      | 111    | 508A364G01   | R      | MA       | 3      | 138    |
| 505A655G01   | R      | MA       | 1      | 41     | 508A368G01   | F      | MA       | 3      | 56     |
| 505A657G01   | R      | MA       | 1      | 115    | 508A370G01   | R      | MA       | 4      | 141    |
| 505A659G01   | F      | MA       | 2      | 147    | 508A396G01   | F      | MA       | 1      | 110    |
| 505A660G01   | F      | MA       | 1      | 148    | 658A578G01   | F      | MO       | 1      | 148    |
| 505A661G01   | F      | MO       | 1      | 150    | 658A594G01   | F      | MA       | 2      | 122    |
| 505A664G01   | F      | MA       | 4      | 130    | 661A105G01   | R      | MA       | 1      | 116    |
| 505A667G01   | F      | MA       | 1      | 109    | 661A150G01   | R      | MA       | 2      | 147    |
| 505A668G01   | F      | MO       | 1      | 109    | 661A152G01   | R      | MA       | 1      | 146    |
| 505A669G01   | R      | MA       | 1      | 109    | 663A175G01   | R      | MA       | 2      | 149    |
| 505A670G01   | R      | MA       | 2      | 112    | 663A176G01   | R      | MA       | 1      | 148    |
| 505A672G01   | R      | MA       | 2      | 113    | 663A177G01   | R      | MO       | 1      | 108    |
| 505A684G01   | F      | MO       | 3      | 114    | 663A195G01   | R      | MO       | 1      | 115    |
| 505A685G01   | R      | MA       | 3      | 114    | 663A340G01   | R      | MA       | 1      | 154    |
| 508A107G01   | F      | MO       | 1      | 115    | 781A123G01   | R      | MA       | 1      | 152    |
| 508A108G01   | R      | MA       | 1      | 115    | 781A167G01   | R      | MA       | 6      | 134    |
| 508A110G01   | F      | MO       | 1      | 116    | 781A181G01   | R      | MA       | 4      | 144    |
| 508A111G01   | F      | MO       | 1      | 117    | 781A377G01   | F      | MA       | 1      | 117    |
| 508A112G01   | R      | MA       | 1      | 117    |              |        |          |        |        |
| 508A118G01   | F      | MO       | 2      | 118    |              |        |          |        |        |
| 508A119G01   | R      | MA       | 2      | 118    |              |        |          |        |        |
| 508A124G01   | F      | MA       | 2      | 119    |              |        |          |        |        |
| 508A125G01   | F      | MO       | 2      | 119    |              |        |          |        |        |
| 508A126G01   | F      | MA       | 2      | 120    |              |        |          |        |        |
| 508A127G01   | F      | MO       | 2      | 120    |              |        |          |        |        |

### Terminal Connectors

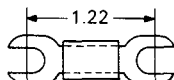
Additional flexibility of the type W-2 switch is gained with the use of terminal connectors (jumpers) applied to the switch terminals.

Complete type W-2 switches ordered for specific applications where the circuitry requires jumpers, are applied at the factory.

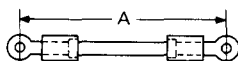
When basic switches are used and when field changes of existing switches becomes necessary, terminal connectors (jumpers) may be obtained from the factory. The following charts will aid in identifying the terminal connectors. These charts identify the terminals to be connected and the connectors by number to accomplish such connection.



S# 677C519H08

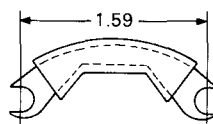


S# 677C519G07

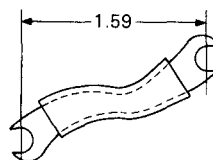


Style No. Dim. "A"

|            |      |
|------------|------|
| 677C782G01 | 3.50 |
| 677C782G02 | 4.25 |
| 677C782G03 | 5.00 |
| 677C782G04 | 5.50 |



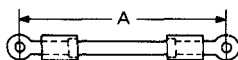
S# 677G519G01



S# 677C519G05

### Terminal Connectors

The terminal connectors listed below are those to be selected and ordered separately. These connectors may be applied to the general application switches shown in Figures 108 through 154.



Dim. "A"

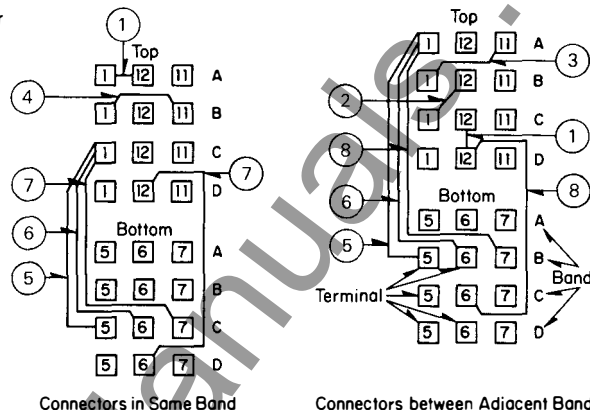
| Style Number | Dim. "A" |
|--------------|----------|
| 677C519H08   | .89      |
| 677C519G01   | 1.59     |
| 677C519G05   | 1.59     |
| 677C519G07   | 1.22     |
| 677C782G01   | 3.50     |
| 677C782G02   | 4.25     |
| 677C782G03   | 5.00     |
| 677C782G04   | 5.50     |
| 677C782G05   | 6.00     |
| 677C782G06   | 7.25     |
| 677C782G07   | 9.75     |
| 677C782G08   | 10.50    |

### 6-Contact Stage Connector

Connector Style No.

|   |            |
|---|------------|
| 1 | 677C519H08 |
| 2 | 677C519G07 |
| 3 | 677C519G05 |
| 4 | 677C519G01 |

|   |            |
|---|------------|
| 5 | 677C782G01 |
| 6 | 677C782G02 |
| 7 | 677C782G03 |
| 8 | 677C782G04 |

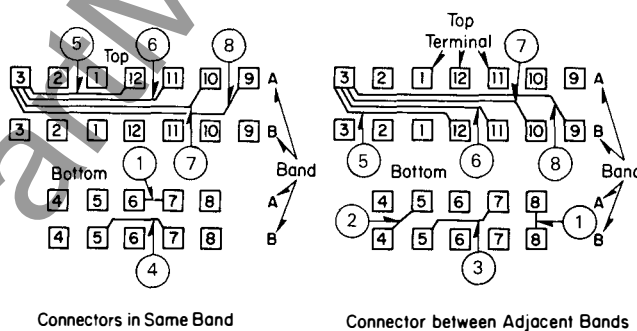


### 12-Contact Stage Connector

Connector Style No.

|   |            |
|---|------------|
| 1 | 677C519H08 |
| 2 | 677C519G07 |
| 3 | 677C519G05 |
| 4 | 677C519G01 |

|   |            |
|---|------------|
| 5 | 677C782G01 |
| 6 | 677C782G02 |
| 7 | 677C782G03 |
| 8 | 677C782G04 |





### Ordering Nameplates

Nameplates can be ordered:

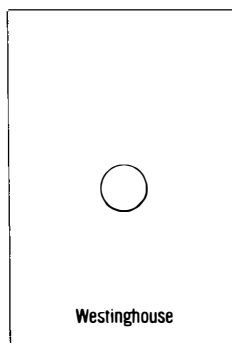
- 1) Blank
- 2) Blank to be Engraved
- 3) Preengraved

Each request is specifically outlined.

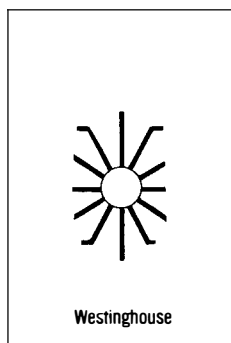
### Blank Nameplates

The nameplates listed below are inclusive of the entire stock of blank nameplates available at the factory. To order select the style number to meet application.

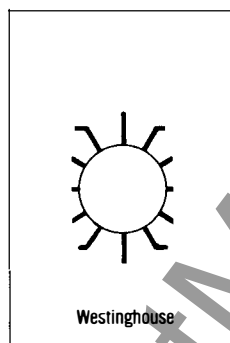
**Note:** Radial lines etched on blank nameplates will not be blackened in.



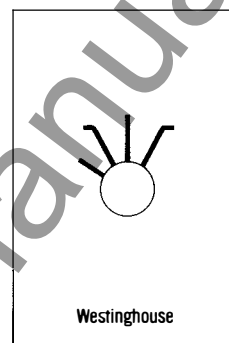
692C707H01  
(Fixed Handle)



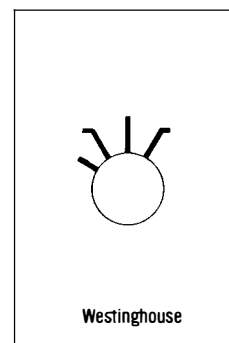
692C707H02  
(Fixed Handle)



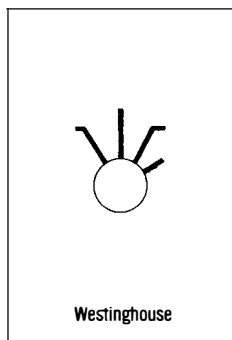
692C707H03  
(Removable Key)



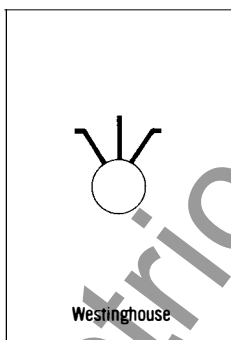
692C707H04  
(Fixed Handle)



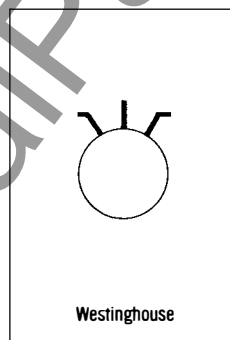
692C707H05  
(Removable Key)



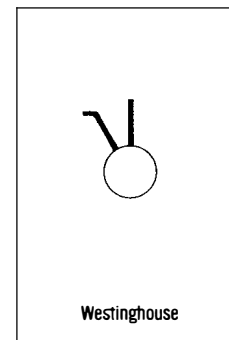
692C707H06  
(Fixed Handle)



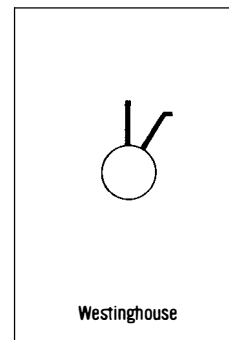
692C707H08  
(Fixed Handle)



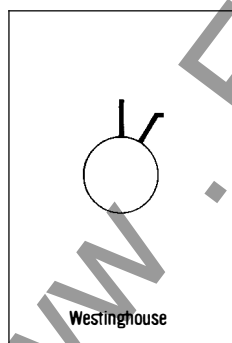
692C707H09  
(Removable Key)



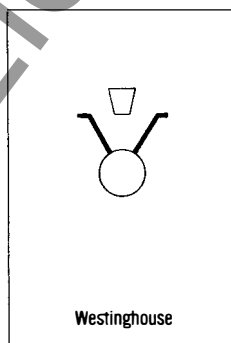
692C707H10  
(Fixed Handle)



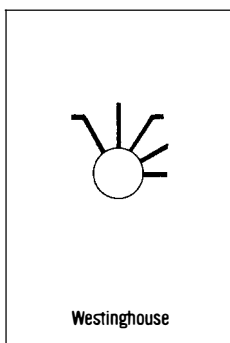
692C707H12  
(Fixed Handle)



692C707H13  
(Removable Key)



692C707H14  
(Fixed Handle with  
Target)



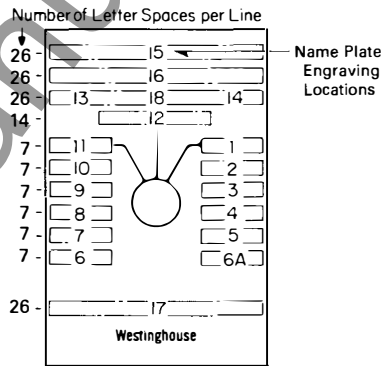
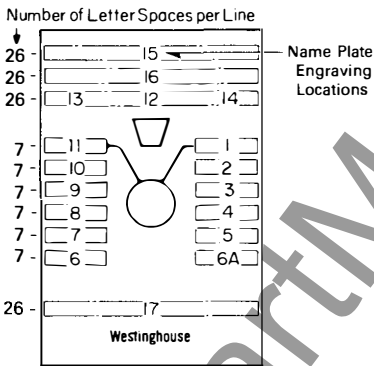
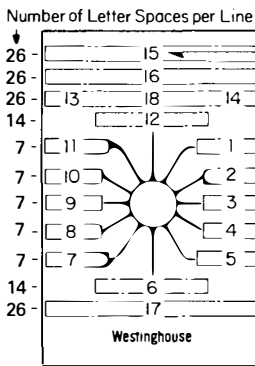
692C707H16  
(Fixed Handle)



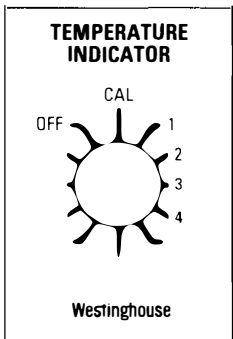
**Blank Nameplates to be Ordered**  
Refer to Page 13 and select style number of blank nameplate. Refer to Table 3 and specify required markings to be engraved. Required markings must be less than or equal to the number of letter spaces allowed per line.

**Note:** Letter spacing allowance shown in Table 3 is also applicable to Removable Key style nameplates.

Table 3



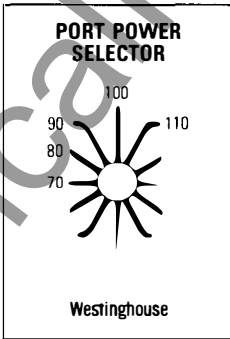
Example 1



Similar to 692C707H03  
EXCEPT  
nameplate to read;

- 15 = TEMPERATURE
- 16 = INDICATOR
- 11 = OFF
- 12 = CAL
- 1 = 1
- 2 = 2
- 3 = 3
- 4 = 4

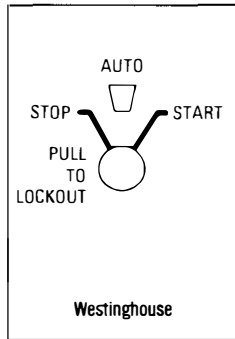
Example 2



Similar to 692C707H04  
EXCEPT  
nameplate to read;

- 15 = PORT POWER
- 16 = SELECTOR
- 9 = 70
- 10 = 80
- 12 = 100
- 1 = 110

Example 3



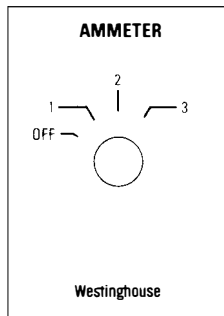
Similar to 692C707H14  
EXCEPT  
nameplate to read;

- 7 = LOCKOUT
- 8 = TO
- 9 = PULL
- 11 = STOP
- 12 = AUTO
- 1 = START

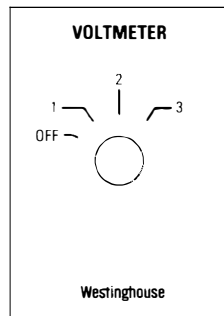
**Preengraved Nameplates**

The nameplates listed below are inclusive of the entire stock of preengraved nameplates available at the factory. Any desired name-

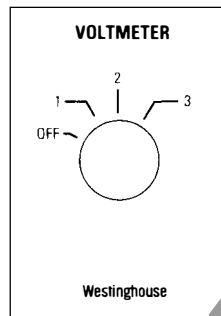
plate markings deviating from the outline below must be ordered as a blank nameplate to be engraved. To order select the style number to meet the application.



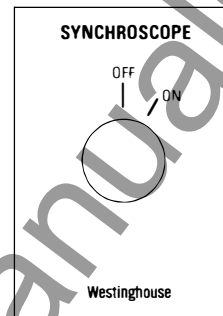
677C524H01



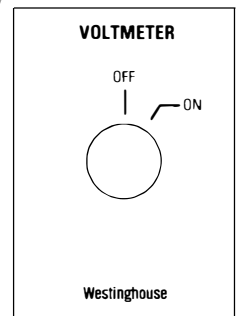
677C524H02



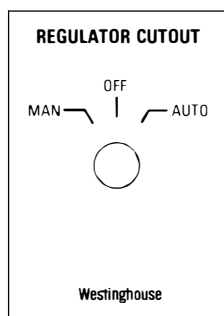
677C524H03



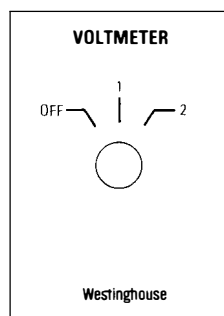
677C524H04



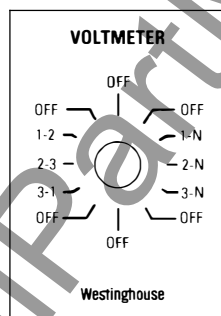
677C524H06



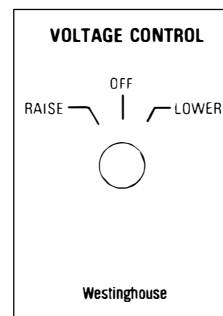
677C524H09



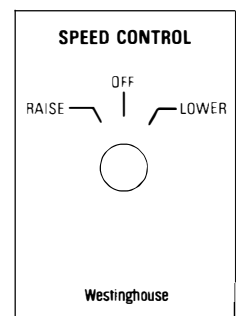
677C524H10



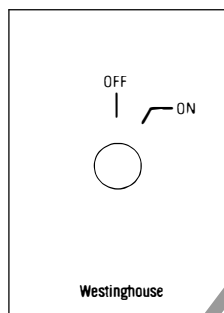
677C524H11



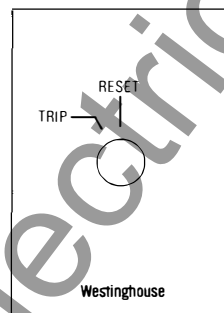
677C524H13



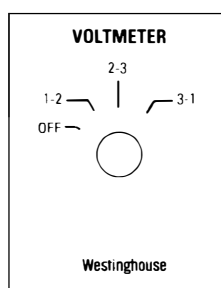
677C524H14



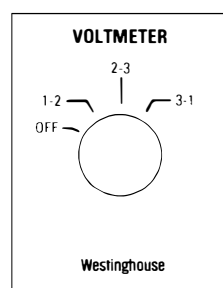
677C524H15



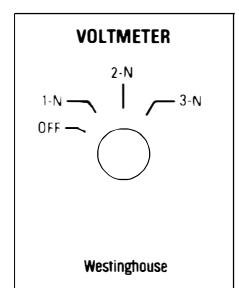
677C524H16



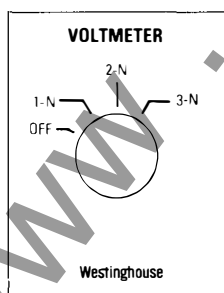
677C524H17



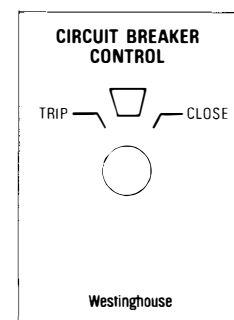
677C524H18



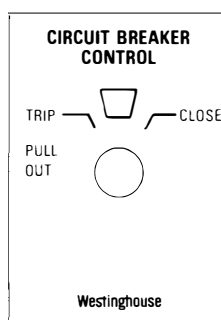
677C524H19



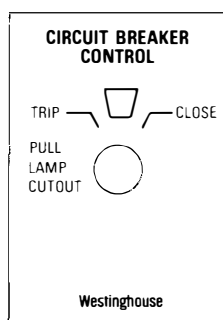
677C524H20



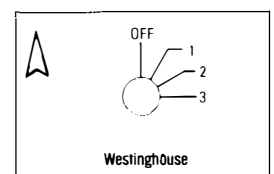
677C525H01



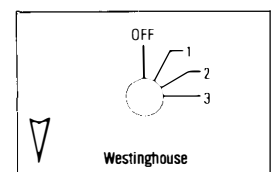
677C525H02



677C525H03



791A737H01



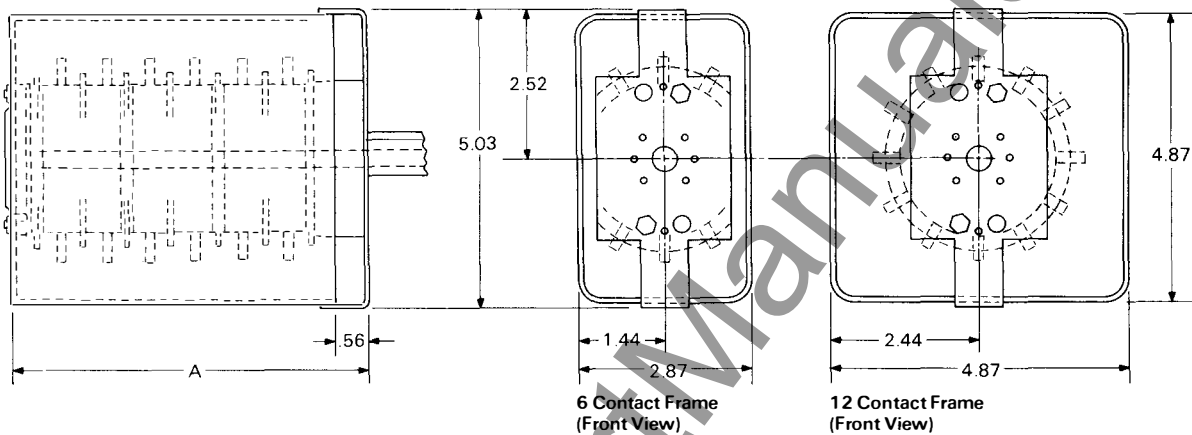
791A737H02



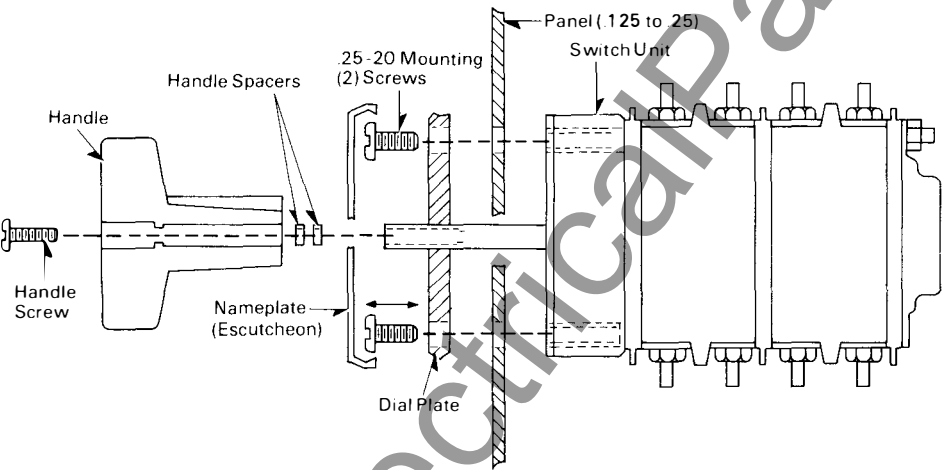
**Protective Covers, Type W-2 Switch**

Designed to totally enclose all contact terminals. Made of high density black Polyethylene. Provides no conduit connection. Wiring enters through opening between panel and front opening of enclosure. Secured in position by switch tie bolts. Switch identification remains visible.

| Switch Stage | A     |
|--------------|-------|
| 1            | 2.88  |
| 2            | 4.38  |
| 3            | 5.88  |
| 4            | 7.38  |
| 5            | 8.88  |
| 6            | 10.38 |
| 7            | 11.88 |
| 8            | 13.38 |

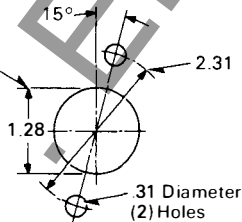


**Typical Mounting**



**Drilling Plan**

**Note:**  
For Removable Key Designs Panel Hole Must be 1.28 Diameter.  
For Fixed Handle Designs Hole May be Reduced to .43 Diameter.





**Tumbler Pin Key Lock**

The Type W-2 switch can be supplied with either 1, 2, or 3 locks. In the case of one lock, it can be mounted either at the top or to the left or to the right of the switch handle. For one lock, top mounting is considered the standard. When two locks are required, the normal mounting is one lock to the left and one lock to the right of the switch handle.

Where several switches are supplied with locks, they may be keyed alike or differently as required.

When a single switch is furnished with more than one lock, such locks may be keyed alike or keyed differently as the application may require.

The above considers that key interlocking with other equipment is not required and that the switch only is to be locked and in which cases we would supply Yale lock cylinders from factory stock. When ordering, specify in what position(s) the switch is to be locked. Key(s) may be removable in switch locked position(s) only.

To order tumbler pin key locks the following questions apply:

1) Identify how many locks are needed.

- A) 1
- B) 2
- C) 3

2) Specify location of the lock.

- A) Above the handle
- B) To the left of the handle
- C) To the right of the handle

3) Specify what position(s) the key is to be removed.

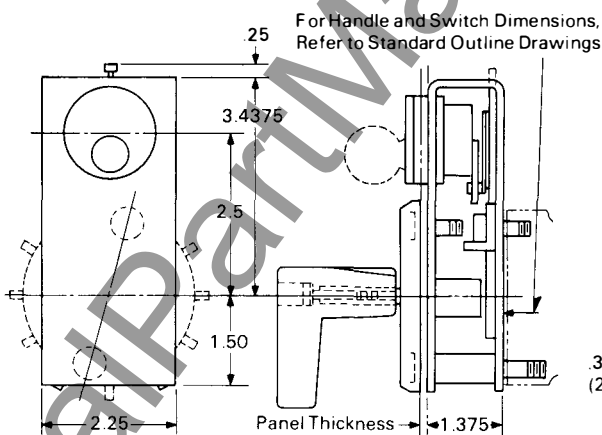
- A) 12 o'clock position
  - B) 1 o'clock position
  - C) 2 o'clock position
- Etc.

4) If more than a quantity of one switch is ordered specify if the locks are to be;

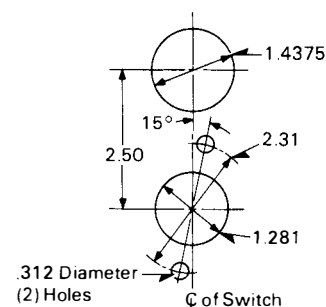
- A) Keyed differently
- B) Keyed alike

5) If one switch is furnished with more than one lock specify if the locks are to be;

- A) Keyed differently
- B) Keyed alike



Drilling Plan (Key Lock)

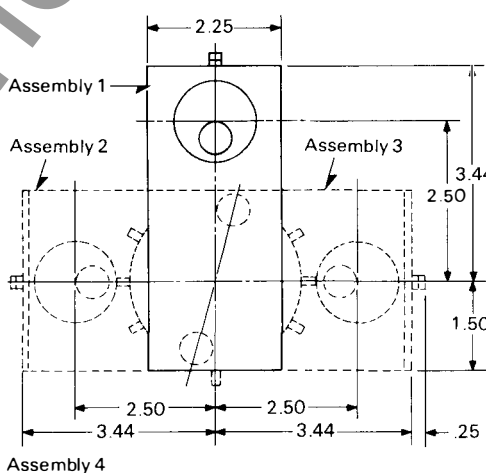
**Key Interlocking**

When key interlocking with other equipment is required, Kirk locks would be specially ordered by the customer from Brown Boveri Company separately, but mounted by Westinghouse. Contact:

Westinghouse Electric Corporation  
Marketing Department  
London, Kentucky 40741

When ordering Type W-2 switches with key interlocking, i.e., switches to be furnished with locks having keys which are to be used in locks applied to other apparatus such as circuit breakers, disconnect switches, etc., the customer needs to furnish the following information:

- 1) Customer's purchase order number and field sales office general order number on which lock switches were originally ordered.
- 2) Lock numbers and mounting instructions. (Lock number referred to style and mounting location.)
- 3) Locks need to be sent to the attention of:  
Westinghouse Electric Corp.  
% Production Department  
Daniel Boone Parkway  
London, Kentucky 40741



Key interlocking can be furnished on Type W-2 switches utilizing either 1, 2, or 3 locks with keying as required.

The drilling plan shown is a composite drilling for three (3) locks. If less than three locks are used, apply the appropriate portion of the drilling plan.

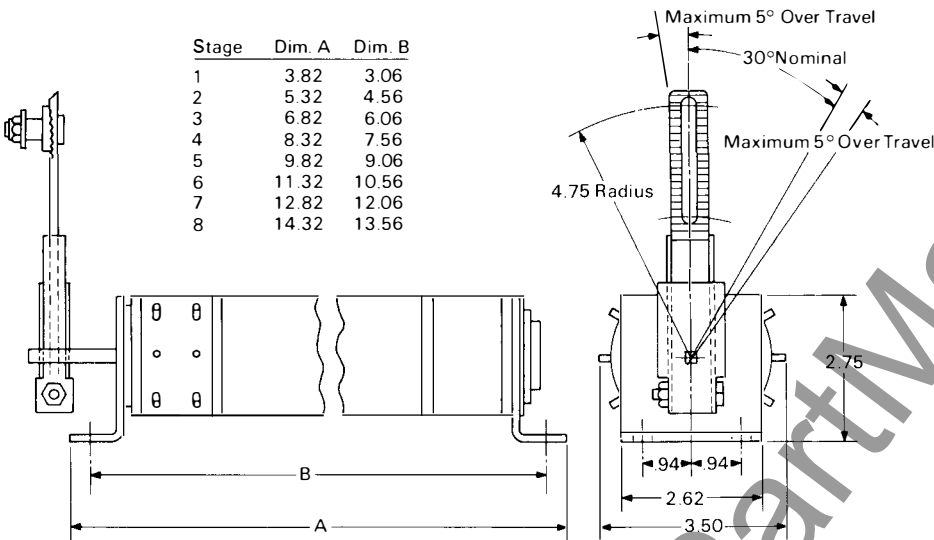
For further classification and specific reference:

- Assembly #1 - one lock mounted above handle
- Assembly #2 - one lock mounted to left of handle.
- Assembly #3 - one lock mounted to right of handle.
- Assembly #4 - three locks—including assemblies 1, 2 and 3.



Auxiliary Switch, Type W-2

The type W-2 auxiliary switch is designed around the six contact stage frame and rotor of the type W-2 instrument and control switch. This switch is a two position device and can be supplied with an overtravel lever or without lever. Levers are available with adjustable linkage (serrated styles) or non-adjustable (solid lever with pin). Nameplates are not supplied with auxiliary switches.



Contacting of one stage may take the form of either Figure #1 or Figure #2.

For multiple stages contacting may take the form of Figure #1 or Figure #2 or a combination of both as shown in Figure #3.

Switch Position Tabulations

| CONTACT | POSITION |   |
|---------|----------|---|
|         | 12       | 1 |
| A11-B11 | X        |   |
| A12-B12 |          | X |
| A1-B1   | X        |   |
| A5-B5   | X        |   |
| A6-B6   |          | X |
| A7-B7   | X        |   |

Figure 1

| CONTACT | POSITION |   |
|---------|----------|---|
|         | 12       | 1 |
| A11-B11 |          | X |
| A12-B12 | X        |   |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   | X        |   |
| A7-B7   |          | X |

Figure 2

| CONTACT | POSITION |   |
|---------|----------|---|
|         | 12       | 1 |
| A11-B11 |          | X |
| A12-B12 | X        |   |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   | X        |   |
| A7-B7   |          | X |
| C11-D11 | X        |   |
| C12-D12 |          | X |
| C1-D1   | X        |   |
| C5-D5   | X        |   |
| C6-D6   |          | X |
| C7-D7   | X        |   |

Figure 3

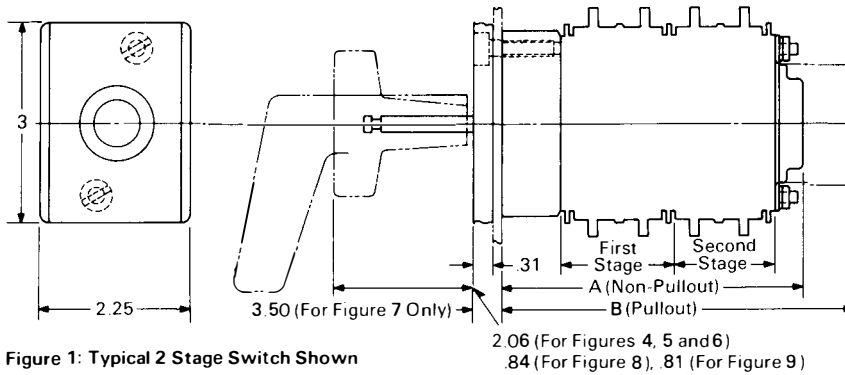
**Outline Dimensions**  
**Six and Twelve Contact Frame Pull Out and Non-Pull Out**

Figure 1: Typical 2 Stage Switch Shown

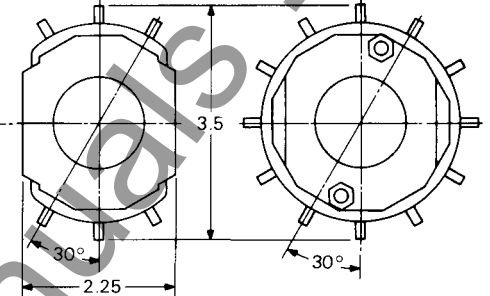


Figure 2

Figure 3

**Non-Pull Out**

| Line No. | No. of Stages | A     | Description | Net Weight Pounds |                  |
|----------|---------------|-------|-------------|-------------------|------------------|
|          |               |       |             | 6 Contact Frame   | 12 Contact Frame |
| 1        | 1             | 2.97  | STD.        | 1.12              | 1.50             |
| 2        | 2             | 4.47  | STD.        | 1.50              | 2.12             |
| 3        | 3             | 5.97  | STD.        | 1.85              | 2.70             |
| 4        | 4             | 7.47  | STD.        | 2.35              | 3.25             |
| 5        | 5             | 8.97  | STD.        | 2.75              | 3.80             |
| 6        | 6             | 10.47 | STD.        | 3.12              | 4.50             |
| 7        | 7             | 11.97 | STD.        | 3.60              | 5.00             |
| 8        | 8             | 13.47 | STD.        | 4.00              | 5.60             |
| 21       | 1             | 3.85  | 2-Mech HSG. | 1.52              | 1.90             |
| 22       | 2             | 5.35  | 2-Mech HSG. | 1.90              | 2.52             |
| 23       | 3             | 6.85  | 2-Mech HSG. | 2.25              | 3.10             |
| 24       | 4             | 8.35  | 2-Mech HSG. | 2.75              | 3.65             |
| 25       | 5             | 9.85  | 2-Mech HSG. | 3.15              | 4.20             |
| 26       | 6             | 11.35 | 2-Mech HSG. | 3.52              | 4.90             |
| 27       | 7             | 12.85 | 2-Mech HSG. | 4.00              | 5.40             |
| 28       | 8             | 14.35 | 2-Mech HSG. | 4.40              | 6.00             |

**With Pull Out**

| Line No. | No. of Stages | B     | Description | Line No. | Panel THK | Net Weight Pounds |                  |
|----------|---------------|-------|-------------|----------|-----------|-------------------|------------------|
|          |               |       |             |          |           | 6 Contact Frame   | 12 Contact Frame |
| 31       | 1             | 3.81  | STD.        | 51       | .125      | 1.25              | 1.65             |
| 32       | 2             | 5.31  | STD.        |          | to .250   | 1.60              | 2.60             |
| 33       | 3             | 6.81  | STD.        |          |           | 2.00              | 2.80             |
| 34       | 4             | 8.31  | STD.        | 52       |           | 2.50              | 3.40             |
| 35       | 5             | 9.81  | STD.        | 53       |           | 2.85              | 4.00             |
| 36       | 6             | 11.31 | STD.        | 54       | .38       | 3.25              | 4.60             |
| 37       | 7             | 12.81 | STD.        | 55       | .50       | 3.70              | 5.12             |
| 38       | 8             | 14.31 | STD.        | 56       | 1.00      | 4.12              | 5.70             |
| 41       | 1             | 4.69  | 2-Mech HSG. | 59       | 2.00      | 1.65              | 2.05             |
| 42       | 2             | 6.19  | 2-Mech HSG. | 60       | 2.25      | 2.00              | 3.00             |
| 43       | 3             | 7.69  | 2-Mech HSG. |          |           | 2.40              | 3.20             |
| 44       | 4             | 9.19  | 2-Mech HSG. |          |           | 2.90              | 3.80             |
| 45       | 5             | 10.69 | 2-Mech HSG. |          |           | 3.25              | 4.40             |
| 46       | 6             | 12.19 | 2-Mech HSG. |          |           | 3.65              | 5.00             |
| 47       | 7             | 13.69 | 2-Mech HSG. |          |           | 4.10              | 5.52             |
| 48       | 8             | 15.19 | 2-Mech HSG. |          |           | 4.52              | 6.10             |

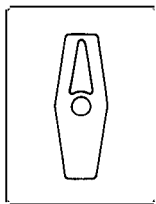


Figure 4: Oval

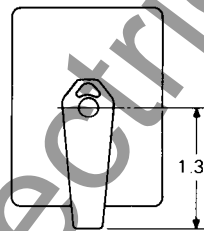


Figure 5: Pistol Grip

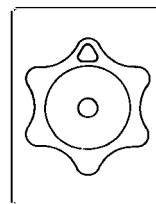
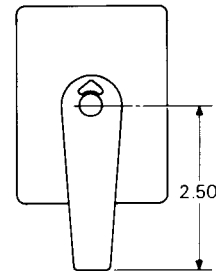
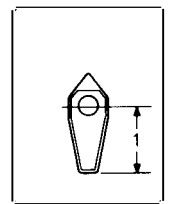
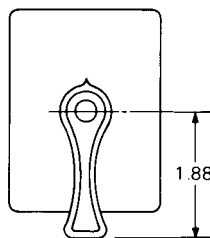
Figure 6:  
Round NotchedFigure 7:  
Heavy Duty Pistol GripFigure 8:  
Mini-Slimline "DS"

Figure 9: Removable Key

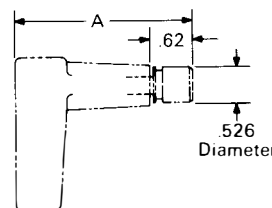


Figure 10

**Removable  
Key Dimension**  
Figure A

|   |      |
|---|------|
| 1 | 2.62 |
| 2 | 2.62 |
| 3 | 2.62 |
| 4 | 4.12 |
| 5 | 1.40 |
| 6 | 1.37 |

| Application                                                   | Style Number             | Handle Shape | Contact Type | Figure Number | Application                                                                | Style Number | Handle Shape | Contact Type | Figure Number |
|---------------------------------------------------------------|--------------------------|--------------|--------------|---------------|----------------------------------------------------------------------------|--------------|--------------|--------------|---------------|
| <b>Ammeter</b>                                                |                          |              |              |               | <b>Voltmeter/Ammeter</b> (Combination on One Shaft)                        |              |              |              |               |
| 2 Phase                                                       | 505A700G01               | Round        | MA           | 1             | 3 Phase, 3 Wire System<br>(3 Circuits and 2 PT's)                          | 508A299G03   | Round        | MA           | 34            |
| 3 Phase, 2 CT's                                               | 505A701G02               | Round        | MA           | 2             |                                                                            |              |              |              |               |
| 3 Phase, 2 CT's<br>(Use Removable Key)                        | 3669A41G01<br>787A989G02 | (Key)*       | MA           | 2             | 3 Phase, 4 Wire System<br>(3 CT's and 3 PT's)                              | 508A299G09   | Round        | MA           | 35            |
| 3 Phase, 3 CT's<br>(Independent Circuit)                      | 505A701G01               | Round        | MA           | 2A            | 3 Phase, 4 Wire System<br>(3 CT's and 3 PT's)                              | 787A977G01   | Round        | MA           | 36            |
| 3 Phase, 3 CT's<br>(Independent Circuit)<br>Use Removable Key | 661A208G01<br>661A208G03 | (Key)*       | MA           | 2A            | End of Circuit Connection<br>3 Phase, 3 Wire System<br>(3 CT's and 2 PT's) | 787A977G02   | Round        | MA           | 37            |
| 3 Phase, 3 CT's<br>(No OFF Position)                          | 505A701G05               | Round        | MA           | 3             | End of Circuit Connection                                                  |              |              |              |               |
| 3 Phase, 3 CT's<br>(End of Circuit)                           | 787A976G01               | Round        | MA           | 4             | <b>Voltage Control</b>                                                     |              |              |              |               |
| 3 Phase, 3 CT's<br>(End of Circuit)<br>Use Removable Key      | 800A426G01<br>508A298G02 | (Key)*       | MA           | 4             | Raise-OFF-Lower                                                            | 505A703G01   | Pistol       | MO           | 38            |
| 3 Phase, 2 CT's<br>(End of Circuit)                           | 787A976G02               | Round        | MA           | 5             | Raise-OFF-Lower                                                            | 505A703G06   | Oval         | MO           | 38            |
| 3 Phase, 2 CT's<br>(End of Circuit)<br>Use Removable Key      | 800A426G02<br>508A298G02 | (Key)*       | MA           | 5             | Raise-OFF-Lower                                                            | 505A715G01   | Pistol       | MO           | 39            |
| 3 Phase, 3 CT's<br>(End of Circuit)                           | 787A976G03               | Round        | MA           | 6             | Raise-OFF-Lower                                                            | 505A715G05   | Oval         | MO           | 39            |
| 3 Phase, 3 CT's<br>(End of Circuit)<br>No OFF Position        | 787A976G04               | Round        | MA           | 7             | Raise-OFF-Lower                                                            | 505A716G01   | Oval         | MO           | 40            |
| 3 Phase, 2 CT's<br>(End of Circuit)<br>No OFF Position        | 508A463G04               | Round        | MA           | 8             | <b>Synchroscope</b>                                                        |              |              |              |               |
| 3 CT's and Neutral                                            | 508A463G05               | Round        | MA           | 9             | Machine to Bus<br>(Removable Key)                                          | 505A755G01   | (Key)*       | MA           | 41            |
| 6 CT's Independently<br>on One Meter                          | 508A481G01               | Round        | MA           | 10            | Between Machines<br>(Running Key)                                          | 505A755G02   | (Key)*       | MA           | 41            |
| 2 Three Phase CT's                                            | 658A615G02               | Round        | MA           | 11            | (Incoming Key)                                                             | 505A757G01   | (Key)*       | MA           | 42            |
| 3 Phase, 2 CT's<br>(End of Circuit) ↓                         | 787A984G01               | Mini-Slim    | MA           | 12            |                                                                            | 505A757G02   |              |              | 42            |
| 3 Phase, 2 CT's<br>(End of Circuit) ↑                         | 787A984G02               | Mini-Slim    | MA           | 13            | <b>Frequency Meter</b>                                                     |              |              |              |               |
| 3 Phase, 3 CT's<br>(End of Circuit) ↓                         | 787A984G03               | Mini-Slim    | MA           | 14            | ON-OFF                                                                     | 508A467G01   | (Key)*       | MA           | 43            |
| 3 Phase, 3 CT's<br>(End of Circuit) ↑                         | 787A984G04               | Mini-Slim    | MA           | 15            | (Removable Key)                                                            | 508A467G02   | Round        |              | 43            |
| ON-OFF, 1 CT's<br>(End of Circuit) ↓                          | 787A984G05               |              |              | 16            |                                                                            | 508A467G08   | Oval         |              | 43            |
| 3 Phase, 2 CT's<br>(End of Circuit)                           | 787A984G06               | Mini-Slim    | MA           | 17            | <b>Wattmeter</b>                                                           |              |              |              |               |
| 3 Phase, 3 CT's                                               | 787A984G07               | Mini-Slim    | MA           | 13            | In-Out                                                                     | 505A712G90   | Round        | MA           | 44            |
| <b>Voltmeter</b>                                              |                          |              |              |               | OFF-ON                                                                     | 505A734G09   | Round        | MA           | 45            |
| Single Phase                                                  | 505A747G01               | (Key)*       | MA           | 19            | OFF-ON                                                                     | 505A754G04   | (Key)*       | MA           | 46            |
| (Use Removable Key)                                           | 505A747G02               |              |              |               | (Removable Key)                                                            | 505A797G02   | Oval         |              | 46            |
| 2 Phase, Ac, 3 Wire                                           | 505A702G01               | Round        | MA           | 20            | OFF-ON                                                                     | 505A740G06   | Round        | MA           | 47            |
| 2 Circuit, Dc, 2 Wire                                         | 505A702G02               | Round        | MA           | 21            | OFF-ON                                                                     | 505A740G07   | Round        | MA           | 48            |
| 2 Circuit, Dc, 2 Wire<br>(Use Removable Key)                  | 505A748G01<br>505A748G02 | (Key)*       | MA           | 21            | OFF-ON                                                                     | 505A779G05   | (Key)*       | MA           | 49            |
| 3 Wire, Dc                                                    | 505A702G03               | Round        | MA           | 22            | (Removable Key)                                                            | 508A247G02   | Oval         |              | 49            |
| 3 Phase, 3 Wire                                               | 505A702G04               | Round        | MA           | 23            | OFF-ON                                                                     | 505A752G01   | (Key)*       | MA           | 50            |
| 3 Phase, 3 Wire<br>(Use Removable Key)                        | 505A749G01<br>505A749G02 | (Key)*       | MA           | 23            | (Removable Key)                                                            | 505A752G02   | Round        |              | 50            |
| 3 Phase, 4 Wire                                               | 505A702G05               | Round        | MA           | 24            | <b>Power Factor Meter</b>                                                  |              |              |              |               |
| 3 Phase, 4 Wire<br>(Use Removable Key)                        | 505A762G01<br>505A762G02 | (Key)*       | MA           | 24            | OFF-ON                                                                     | 505A753G01   | (Key)*       | MA           | 51            |
| 4 Circuit                                                     | 505A704G01               | Round        | MA           | 25            | (Removable Key)                                                            | 505A753G02   |              |              | 51            |
| 3 Phase and Neutral                                           | 505A705G01               | Round        | MA           | 26            | OFF-ON                                                                     | 505A754G01   | (Key)*       | MA           | 52            |
| Two 3 Phase Circuits                                          | 505A705G02               | Round        | MA           | 27            | (Removable Key)                                                            | 505A754G02   |              |              | 52            |
| 6 Circuits                                                    | 505A705G03               | Round        | MA           | 28            | W-OFF-RVA                                                                  | 505A712G91   | Round        | MA           | 53            |
| 3 Phase, 3 Wire<br>(End of Circuit) ↓                         | 3562A01G01               | Mini-Slim    | MA           | 29            | OFF-ON                                                                     | 508A496G03   | Round        | MA           | 54            |
| 3 Phase, 3 Wire<br>(End of Circuit) ↑                         | 3562A01G02               | Mini-Slim    | MA           | 30            | OFF-ON                                                                     | 802A470G01   | (Key)*       | MA           | 55            |
| 3 Phase, 4 Wire<br>(End of Circuit) ↓                         | 3562A01G03               | Mini-Slim    | MA           | 31            | (Removable Key)                                                            | 505A754G03   |              |              | 55            |
| 3 Phase, 4 Wire<br>(End of Circuit) ↑                         | 3562A01G04               | Mini-Slim    | MA           | 32            | Pilot Wire Test                                                            | 508A468G01   | Round        | MO           | 56            |
| 3 Phase, 3 Wire                                               |                          |              |              |               |                                                                            |              |              |              |               |

Standard Application Switches, Style Numbers, *Continued*

## Circuit Breaker Control

| Style Number | Handle Shape | Handle ①<br>Operation | Figure ②<br>Number |
|--------------|--------------|-----------------------|--------------------|
| 505A713G01   | Pistol       | MO                    | 63                 |
| 505A713G03   | Oval         | MO                    | 63                 |
| 505A713G02   | Pistol       | MO                    | 64                 |
| 505A714G01   | Pistol       | MO                    | 65                 |
| 505A714G02   | Oval         | MO                    | 65                 |
| 505A718G01   | Pistol       | MO                    | 66                 |
| 505A718G15   | Pistol       | MO                    | 67                 |
| 505A717G01   | Pistol       | MO                    | 68                 |
| 505A717G03   | Oval         | MO                    | 68                 |
| 505A720G01   | Pistol       | MO                    | 69                 |
| 505A720G03   | Oval         | MO                    | 69                 |
| 508A244G01   | Pistol       | MO                    | 70                 |
| 508A244G02   | Oval         | MO                    | 70                 |
| 508A262G01   | Pistol       | MO                    | 71                 |
| 508A262G03   | Oval         | MO                    | 71                 |
| 508A264G01   | Oval         | MO                    | 72                 |
| 508A264G02   | Pistol       | MO                    | 72                 |
| 508A281G02   | Pistol       | MO                    | 73                 |
| 508A284G01   | Pistol       | MO                    | 74                 |
| 505A738G07   | Pistol       | MO                    | 75                 |
| 802A231G01   | Pistol       | MO                    | 76                 |
| 508A207G02   | Pistol       | MO                    | 77                 |
| 508A218G07   | Pistol       | MO                    | 78                 |
| 508A229G01   | Pistol       | MO                    | 79                 |
| 802A469G01   | Pistol       | MO                    | 80                 |
| 508A480G01   | Pistol       | MO                    | 81                 |
| 508A480G08   | Pistol       | MO                    | 82                 |
| 508A255G03   | Pistol       | MO                    | 83                 |

① All circuit breaker control switches listed are momentary operation, i.e., spring return to neutral.

② Figures 63 to 74 include a "Pull-to-Lock" or "Pull-Lamp Cutout" feature. Figures 75 to 83 do not include a "Pull-out" feature.

## Temperature Switches

All Type W-2 Temperature Switches Furnished by Westinghouse Have Gold Plated Contacts.

| Number of<br>Thermocouples | Style<br>Number | Handle | Handle<br>Shape | Figure<br>Number |
|----------------------------|-----------------|--------|-----------------|------------------|
|----------------------------|-----------------|--------|-----------------|------------------|

## Accurate Lead Compensation

|      |            |            |       |    |
|------|------------|------------|-------|----|
| One  | 781A254G01 | Fixed      | Round | 84 |
| Four | 505A709G01 | Fixed      | Round | 85 |
|      | 505A711G01 | Key        |       | 86 |
|      |            | 505A711G03 | Round |    |
| Six  | 661A210G06 | Fixed      | Round | 87 |
|      | 781A489G01 | Key        |       | 88 |
|      |            | 505A765G03 | Round |    |
| Ten  | 661A210G01 | Fixed      | Round | 89 |
|      | 663A454G01 | Key        |       | 90 |
|      |            | 505A711G03 | Round |    |

## OFF-ON Switches and Selector Switches

| Style Number | Handle Operation | Figure Number |
|--------------|------------------|---------------|
| 505A706G01   | MA               | 91            |
| 505A706G02   | MA               | 91            |
| 505A706G03   | MA               | 91            |
| 505A723G01   | MO               | 91            |
| 505A723G02   | MO               | 91            |
| 505A723G03   | MO               | 91            |
| 505A702L03   | MA               | 92            |
| 505A733G01   | MA               | 93            |
| 505A745G01   | MA               | 94            |
| 505A722G01   | MA               | 95            |
| 505A725G06   | MO               | 95            |
| 505A722G01   | MA               | 95            |
| 505A722G02   | MA               | 95            |
| 505A722G03   | MA               | 95            |
| 505A725G01   | MO               | 95            |
| 505A725G11   | MO               | 95            |
| 505A781G03   | MA               | 96            |
| 505A782G01   | MO               | 96            |

## General Application Switches

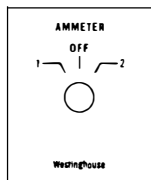
| Style<br>Number | Application          | Handle<br>Operation | Figure<br>Number |
|-----------------|----------------------|---------------------|------------------|
| 505A706G55      | 1 or 2 Pole-2 Throw  | MA                  | 97               |
| 505A733G17      | 1 Pole-4 Throw       | MA                  | 98               |
| 505A733G18      | 1 Pole-5 Throw       | MA                  | 99               |
| 505A745G17      | 1 Pole-7 Throw       | MA                  | 100              |
| 505A745G18      | 1 Pole-8 Throw       | MA                  | 101              |
| 505A745G19      | 1 Pole-10 Throw      | MA                  | 102              |
| 505A702L02      | 1 or 2 Pole with OFF | MA                  | 103              |
| 505A703G51      | 2 Pole-2 Throw       | MO                  | 103              |
| 508A423G16      | 2 Pole-8 Throw       | MA                  | 104              |
| 508A423G17      | 2 Pole-12 Throw      | MA                  | 105              |
| 505A712G92      | 4 Pole-2 Throw       | MA                  | 106              |
| 505A715G32      | 4 Pole-2 Throw       | MO                  | 106              |
| 505A726G14      | 6 Pole-2 Throw       | MA                  | 107              |
| 505A727G15      | 6 Pole-2 Throw       | MO                  | 107              |



## Position Tabulations

All Wiring Diagrams Contained in This Bulletin are to be Considered as "TYPICAL."

1

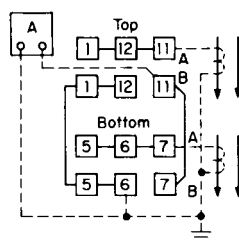


### Ammeter

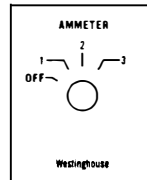
#### 2 Phase

Style No. 505A700G01  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | 1        | 2 | 3 |
| A11-B11 | X        | X |   |
| A12-B12 | X        | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        | X |   |
| A6-B6   | X        | X |   |
| A7-B7   | X        | X |   |



2A

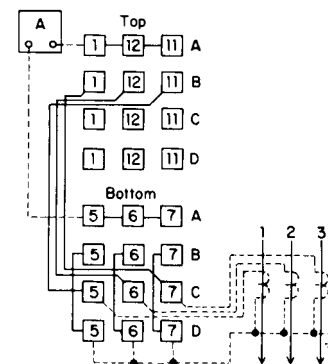


### Ammeter

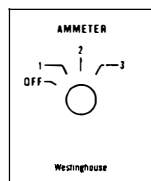
#### 3 Phase-3 CT's

Style No. 505A701G01  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

(R) Switch: S#661A208G01  
Removable Key Handle: S#661A208G03  
Key Removable in OFF Position Only  
S=30°



2



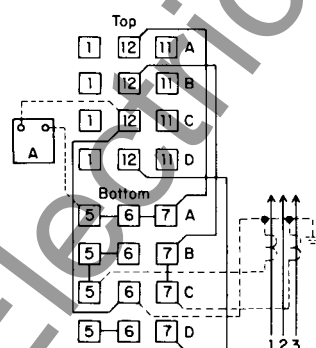
### Ammeter

#### 3 Phase-2 CT's

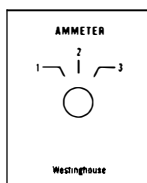
Style No. 505A701G02  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | 1        | 2 | 3 |
| A11-B11 | X        | X |   |
| A12-B12 | X        | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        | X |   |
| A6-B6   | X        | X |   |
| A7-B7   | X        | X |   |
| C11-D11 | X        | X |   |
| C12-D12 | X        | X |   |
| C1-D1   |          |   | X |
| C5-D5   | X        | X |   |
| C6-D6   | X        | X |   |
| C7-D7   | X        | X |   |

(R) Switch: S#3669A41G01  
Removable Key Handle: S#787A989G02  
Key Removable in OFF Position Only  
S=240°



3

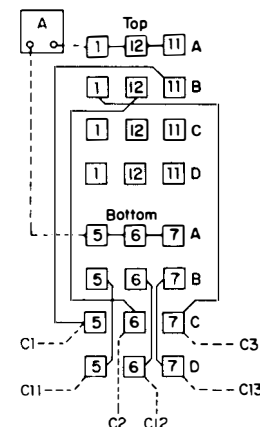


### Ammeter

#### 3 Phase-3 CT's

Style No. 505A701G05  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | 1        | 2 | 3 |
| A11-B11 | X        | X |   |
| A12-B12 | X        | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        | X |   |
| A6-B6   | X        | X |   |
| A7-B7   | X        | X |   |
| C11-D11 | X        | X |   |
| C12-D12 | X        | X |   |
| C1-D1   |          |   | X |
| C5-D5   | X        | X |   |
| C6-D6   | X        | X |   |
| C7-D7   | X        | X |   |



## Notes:

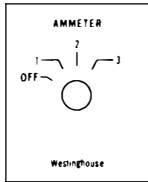
"S" Angle Refers to Key Bearing Setting for Switches With Removable Key Handles.

"R" = Removable Key Switch.



## Position Tabulations, Continued

4

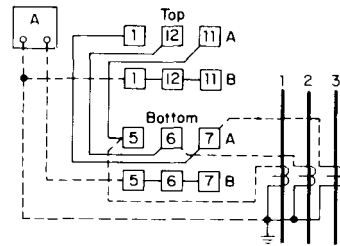
**Ammeter**

3 Phase-3 CT's (End of Circuit)

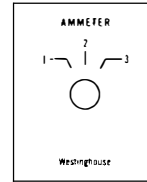
Style No. 787A976G01  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No

(R) Switch: S#800A426G01  
Removable Key Handle: S#508A298G02  
Key Removable in OFF Position Only  
S-O

| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|---|---|
|         | OFF      | - | 1 | - | 2 | - | 3 | - | 4 | - |
| A11-B11 | X        | X | X | X | X | X | X | X | X | X |
| A12-B12 | X        | X | X | X | X | X | X | X | X | X |
| A1-B1   | X        | X | X | X | X | X | X | X | X | X |
| A5-B5   |          |   | X | X | X |   |   |   |   |   |
| A6-B6   |          |   |   |   |   | X | X | X |   |   |
| A7-B7   |          |   |   |   |   |   |   | X | X |   |



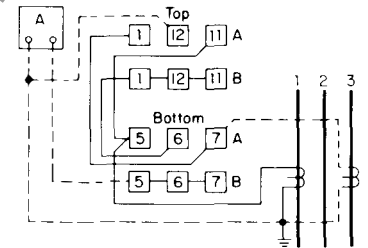
7

**Ammeter**

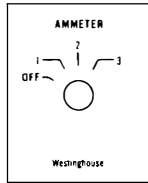
3 Phase-2 CT's (End of Circuit)

Style No. 787A976G04  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|---|---|
|         | OFF      | - | 1 | - | 2 | - | 3 | - | 4 | - |
| A11-B11 | X        | X | X | X | X | X | X | X | X | X |
| A12-B12 | X        | X | X | X | X | X | X | X | X | X |
| A1-B1   | X        | X | X | X | X | X | X | X | X | X |
| A5-B5   | X        | X |   |   |   |   |   |   |   |   |
| A6-B6   |          |   | X | X | X |   |   |   |   |   |
| A7-B7   |          |   |   |   |   | X | X |   |   |   |



5

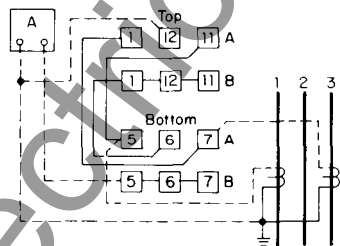
**Ammeter**

3 Phase-2 CT's (End of Circuit)

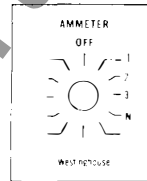
Style No. 787A976G02  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No

(R) Switch: S#800A426G02  
Removable Key Handle: S#508A298G02  
Key Removable in OFF Position Only  
S-O

| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|---|---|
|         | OFF      | - | 1 | - | 2 | - | 3 | - | 4 | - |
| A11-B11 | X        | X | X | X | X | X | X | X | X | X |
| A12-B12 | X        | X | X | X | X | X | X | X | X | X |
| A1-B1   | X        | X | X | X | X | X | X | X | X | X |
| A5-B5   |          |   | X | X | X |   |   |   |   |   |
| A6-B6   |          |   |   |   |   | X | X | X |   |   |
| A7-B7   |          |   |   |   |   |   |   | X | X |   |

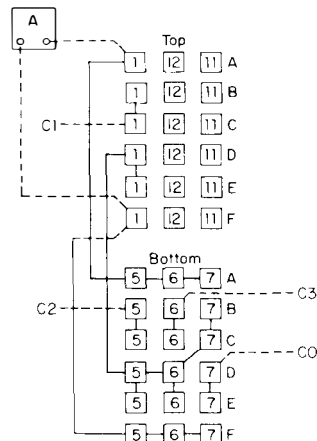


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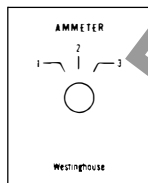
**Ammeter**

Style No. 508A463G04  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 3, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|---|---|---|---|---|
|         | OFF      | - | 1 | - | 2 | - | 3 | - | 4 | - | 5 | - | N |
| A11-B11 |          |   |   |   |   |   |   |   |   |   |   |   |   |
| A12-B12 | X        | X |   |   |   |   |   |   |   |   |   |   |   |
| A1-B1   |          |   | X | X | X |   |   |   |   |   |   |   |   |
| A5-B5   |          |   |   |   |   | X | X | X |   |   |   |   |   |
| A6-B6   |          |   |   |   |   |   |   |   | X | X | X |   |   |
| A7-B7   |          |   |   |   |   |   |   |   |   |   |   | X | X |
| C11-D11 | X        | X | X | X | X | X | X | X | X | X | X | X | X |
| C12-D12 | X        | X | X | X | X | X | X | X | X | X | X | X | X |
| C1-D1   | X        | X | X | X | X | X | X | X | X | X | X | X | X |
| C5-D5   | X        | X | X | X | X | X | X | X | X | X | X | X | X |
| C6-D6   | X        | X | X | X | X | X | X | X | X | X | X | X | X |
| C7-D7   | X        | X | X | X | X | X | X | X | X | X | X | X | X |
| E11-F11 |          |   |   |   |   |   |   |   |   |   |   |   |   |
| E12-F12 | X        | X |   |   |   |   |   |   |   |   |   |   |   |
| E1-F1   |          |   | X | X | X |   |   |   |   |   |   |   |   |
| E5-F5   |          |   |   |   |   | X | X | X |   |   |   |   |   |
| E6-F6   |          |   |   |   |   |   |   |   | X | X | X |   |   |
| E7-F7   |          |   |   |   |   |   |   |   |   |   |   | X | X |



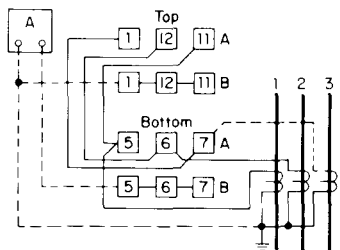
6

**Ammeter**

3 Phase-3 CT's (End of Circuit)

Style No. 787A976G03  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No

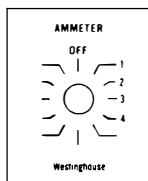
| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|---|---|
|         | OFF      | - | 1 | - | 2 | - | 3 | - | 4 | - |
| A11-B11 | X        | X | X | X | X | X | X | X | X | X |
| A12-B12 | X        | X | X | X | X | X | X | X | X | X |
| A1-B1   | X        | X | X | X | X | X | X | X | X | X |
| A5-B5   | X        | X |   |   |   |   |   |   |   |   |
| A6-B6   |          |   | X | X | X |   |   |   |   |   |
| A7-B7   |          |   |   |   |   | X | X |   |   |   |





Position Tabulations, *Continued*

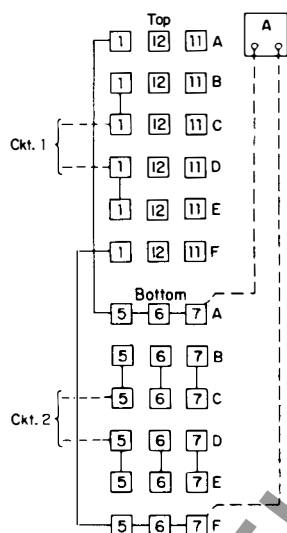
9



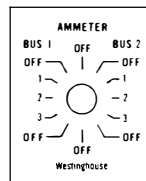
**Ammeter**

Style No. 508A463G05  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------|----------|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|         | -        | - | OFF | - | - | 1 | - | - | 2 | - | - | 3 | - | - | 4 |   |
| A11-B11 | X        | X |     |   |   |   |   |   |   |   |   |   |   |   |   |   |
| A12-B12 |          |   | X   | X | X |   |   |   |   |   |   |   |   |   |   |   |
| A1-B1   |          |   |     |   |   | X | X | X |   |   |   |   |   |   |   |   |
| A5-B5   |          |   |     |   |   |   |   |   | X | X | X |   |   |   |   |   |
| A6-B6   |          |   |     |   |   |   |   |   |   |   |   | X | X | X |   |   |
| A7-B7   |          |   |     |   |   |   |   |   |   |   |   |   |   |   | X | X |
| C11-D11 |          | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C12-D12 | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C1-D1   | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C5-D5   | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C6-D6   | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C7-D7   | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| E11-F11 | X        | X |     |   |   |   |   |   |   |   |   |   |   |   |   |   |
| E12-F12 |          |   | X   | X | X |   |   |   |   |   |   |   |   |   |   |   |
| E1-F1   |          |   |     |   |   | X | X | X |   |   |   |   |   |   |   |   |
| E5-F5   |          |   |     |   |   |   |   |   | X | X | X |   |   |   |   |   |
| E6-F6   |          |   |     |   |   |   |   |   |   |   |   | X | X | X |   |   |
| E7-F7   |          |   |     |   |   |   |   |   |   |   |   |   |   |   | X | X |



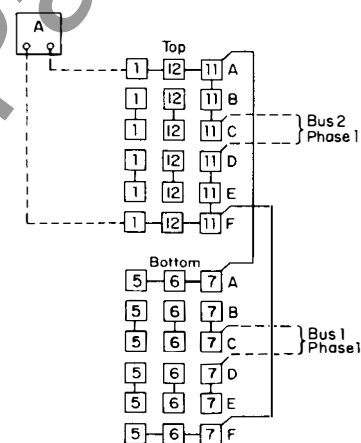
10



**Ammeter**

Style No. 508A481G01  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------|----------|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|         | -        | - | OFF | - | - | 1 | - | - | 2 | - | - | 3 | - | - | 4 |   |
| A11-B11 | X        | X |     |   |   |   |   |   |   |   |   |   |   |   |   |   |
| A12-B12 |          |   | X   | X | X |   |   |   |   |   |   |   |   |   |   |   |
| A1-B1   |          |   |     |   |   | X | X | X |   |   |   |   |   |   |   |   |
| A5-B5   |          |   |     |   |   |   |   |   | X | X | X |   |   |   |   |   |
| A6-B6   |          |   |     |   |   |   |   |   |   |   |   | X | X | X |   |   |
| A7-B7   |          |   |     |   |   |   |   |   |   |   |   |   |   |   | X | X |
| C11-D11 | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C12-D12 | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C1-D1   | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C5-D5   | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C6-D6   | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| C7-D7   | X        | X | X   | X | X | X | X | X | X | X | X | X | X | X | X | X |
| E11-F11 | X        | X |     |   |   |   |   |   |   |   |   |   |   |   |   |   |
| E12-F12 |          |   | X   | X | X |   |   |   |   |   |   |   |   |   |   |   |
| E1-F1   |          |   |     |   |   | X | X | X |   |   |   |   |   |   |   |   |
| E5-F5   |          |   |     |   |   |   |   |   | X | X | X |   |   |   |   |   |
| E6-F6   |          |   |     |   |   |   |   |   |   |   |   | X | X | X |   |   |
| E7-F7   |          |   |     |   |   |   |   |   |   |   |   |   |   |   | X | X |



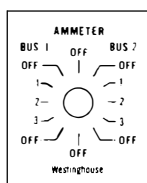
Balance of Incoming Connections are Similar.





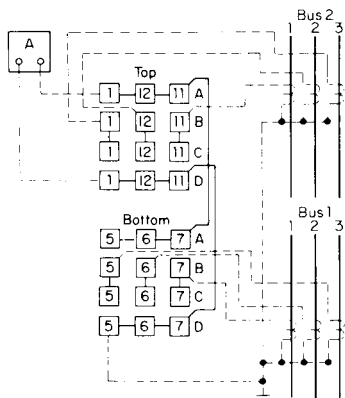
## Position Tabulations, Continued

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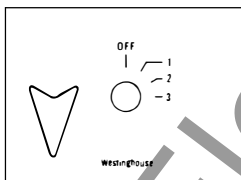
**Ammeter**

Style No. 658A615G02  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No.

| CONTACT | POSITION |   |   |   |   |   |       |   |   |   |   |   |
|---------|----------|---|---|---|---|---|-------|---|---|---|---|---|
|         | BUS 2    |   |   |   |   |   | BUS 1 |   |   |   |   |   |
|         | 0        | 0 | 0 | 1 | 2 | 3 | 0     | 0 | 0 | 1 | 2 | 3 |
| A11-B11 |          |   |   | X | X | X |       |   |   |   |   |   |
| A12-B12 |          |   |   |   | X | X |       |   |   |   |   |   |
| A1-B1   |          |   |   |   |   |   | X     | X | X |   |   |   |
| A5-B5   |          |   |   |   |   |   |       |   |   | X | X | X |
| A6-B6   |          |   |   |   |   |   |       |   |   | X | X | X |
| A7-B7   |          |   |   |   |   |   |       |   |   |   | X | X |
| C11-D11 | X        | X | X | X | X | X | X     | X | X | X | X | X |
| C12-D12 | X        | X | X | X | X | X | X     | X | X | X | X | X |
| C1-D1   | X        | X | X | X | X | X | X     | X | X | X | X | X |
| C5-D5   | X        | X | X | X | X | X | X     | X | X | X | X | X |
| C6-D6   | X        | X | X | X | X | X | X     | X | X | X | X | X |
| C7-D7   | X        | X | X | X | X | X | X     | X | X | X | X | X |



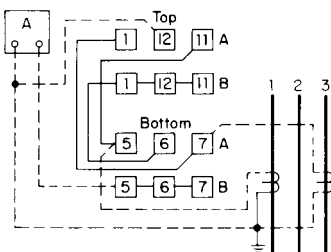
12

**Ammeter**

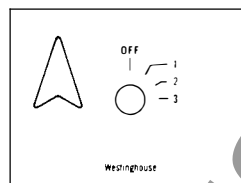
3 Phase-2 CT's (End of Circuit)  
Style No. 787A984G01  
Handle: Fixed, Mini-Slim DS  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |     |   |   |   |   |
|---------|----------|---|---|---|---|---|---|-----|---|---|---|---|
|         | OFF      | - | 1 | - | 2 | - | 3 | OFF | - | 1 | - | 2 |
| A11-B11 | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A12-B12 | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A1-B1   | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A5-B5   |          |   |   |   | X | X | X |     |   |   |   |   |
| A6-B6   |          |   |   |   | X | X | X |     |   |   |   |   |
| A7-B7   |          |   |   |   |   |   |   | X   | X |   |   |   |

Note:  
Switch Mounted 90° From Standard.



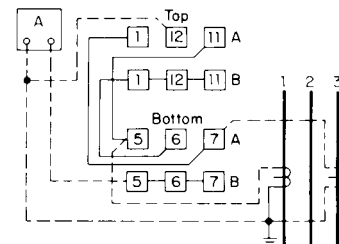
13

**Ammeter**

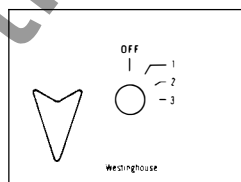
3 Phase-2 CT's (End of Circuit)  
Style No. 787A984G02  
Handle: Fixed, Mini-Slim DS  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |     |   |   |   |   |
|---------|----------|---|---|---|---|---|---|-----|---|---|---|---|
|         | OFF      | - | 1 | - | 2 | - | 3 | OFF | - | 1 | - | 2 |
| A11-B11 | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A12-B12 | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A1-B1   | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A5-B5   |          |   |   |   | X | X | X |     |   |   |   |   |
| A6-B6   |          |   |   |   | X | X | X |     |   |   |   |   |
| A7-B7   |          |   |   |   |   |   |   | X   | X |   |   |   |

Note:  
Switch Mounted 90° From Standard.



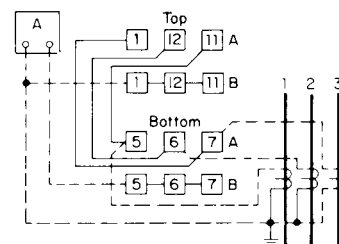
14

**Ammeter**

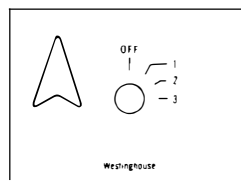
3 Phase-3 CT's (End of Circuit)  
Style No. 787A984G03  
Handle: Fixed, Mini-Slim DS  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |     |   |   |   |   |
|---------|----------|---|---|---|---|---|---|-----|---|---|---|---|
|         | OFF      | - | 1 | - | 2 | - | 3 | OFF | - | 1 | - | 2 |
| A11-B11 | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A12-B12 | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A1-B1   | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A5-B5   |          |   |   |   | X | X | X |     |   |   |   |   |
| A6-B6   |          |   |   |   | X | X | X |     |   |   |   |   |
| A7-B7   |          |   |   |   |   |   |   | X   | X |   |   |   |

Note:  
Switch Mounted 90° From Standard.



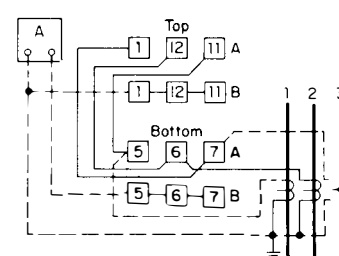
15

**Ammeter**

3 Phase-3 CT's (End of Circuit)  
Style No. 787A984G04  
Handle: Fixed, Mini-Slim  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No

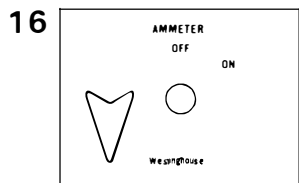
| CONTACT | POSITION |   |   |   |   |   |   |     |   |   |   |   |
|---------|----------|---|---|---|---|---|---|-----|---|---|---|---|
|         | OFF      | - | 1 | - | 2 | - | 3 | OFF | - | 1 | - | 2 |
| A11-B11 | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A12-B12 | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A1-B1   | X        | X | X |   | X | X | X | X   | X | X |   | X |
| A5-B5   |          |   |   |   | X | X | X |     |   |   |   |   |
| A6-B6   |          |   |   |   | X | X | X |     |   |   |   |   |
| A7-B7   |          |   |   |   |   |   |   | X   | X |   |   |   |

Note:  
Switch Mounted 90° From Standard.





Position Tabulations, *Continued*



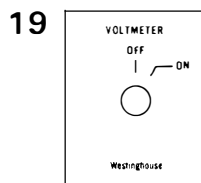
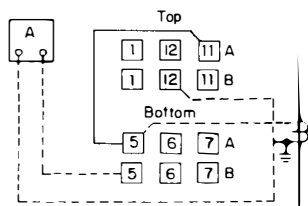
| CONTACT | POSITION |
|---------|----------|
|         | OFF ON   |
| A11-B11 | X X      |
| A5-B5   | X X      |

**Note:**  
Switch Mounted 90° From Standard

**Ammeter**

**3 Phase-1 CT**

Style No 787A984G05  
Handle: Mini-Slim, Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No



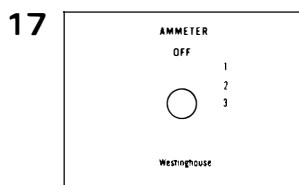
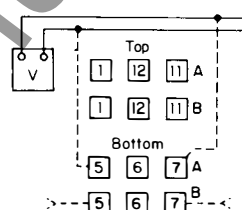
| CONTACT | POSITION |
|---------|----------|
|         | OFF ON   |
| A11-B11 | X X      |
| A12-B12 | X X      |
| A1-B1   | X X      |
| A5-B5   | X X      |
| A6-B6   | X X      |
| A7-B7   | X X      |

**Voltmeter**

**Single Phase**

(R) Switch: S#505A747G01  
Removable Key Handle: S# 505A747G02  
Key Removable in OFF Position Only  
S=0°

Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No



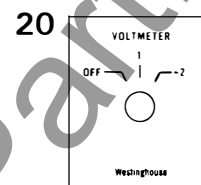
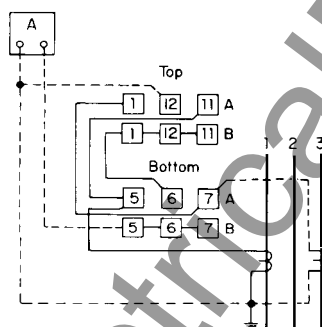
| CONTACT | POSITION        |
|---------|-----------------|
|         | OFF 1 2 3       |
| A11-B11 | X X X X X X X X |
| A12-B12 | X X X X X X X X |
| A1-B1   | X X X X X X X X |
| A5-B5   | X X X X X X X X |
| A6-B6   | X X X X X X X X |
| A7-B7   | X X X X X X X X |

**Note:**  
Switch Mounted 90° From Standard.

**Ammeter**

**3 Phase-2 CT's (End of Circuit)**

Style No. 787A984G06  
Handle: Mini-Slim DS, Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

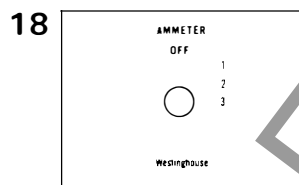
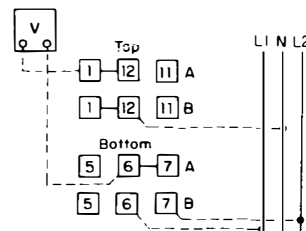


| CONTACT | POSITION |
|---------|----------|
|         | OFF 1 2  |
| A11-B11 | X X      |
| A12-B12 | X X      |
| A1-B1   | X X      |
| A5-B5   | X X      |
| A6-B6   | X X      |
| A7-B7   | X X      |

**Voltmeter**

**2 Phase-Ac-3 Wire**

Style No. 505A702G01  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No



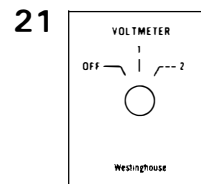
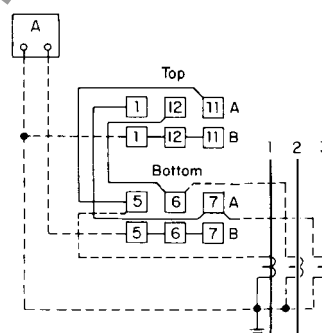
| CONTACT | POSITION        |
|---------|-----------------|
|         | OFF 1 2 3       |
| A11-B11 | X X X X X X X X |
| A12-B12 | X X X X X X X X |
| A1-B1   | X X X X X X X X |
| A5-B5   | X X X X X X X X |
| A6-B6   | X X X X X X X X |
| A7-B7   | X X X X X X X X |

**Note:**  
Switch Mounted 90° From Standard.

**Ammeter**

**3 Phase-3 CT's (End of Circuit)**

Style No. 787A984G07  
Handle: Mini-Slim DS, Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No



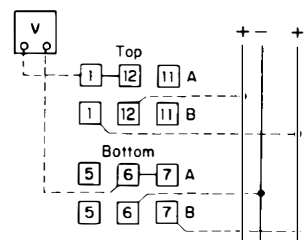
| CONTACT | POSITION |
|---------|----------|
|         | OFF 1 2  |
| A11-B11 | X X      |
| A12-B12 | X X      |
| A1-B1   | X X      |
| A5-B5   | X X      |
| A6-B6   | X X      |
| A7-B7   | X X      |

**Voltmeter**

**2 Circuit-Dc-2 Wire**

Style No. 505A702G02  
Handle: Round Fixed  
(R) Switch Only: S#505A748G01  
Removable Key Handle: S# 505A748G02  
Key Removable in OFF Position Only  
S=0°

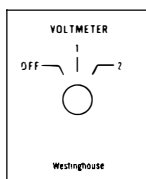
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No





## Position Tabulations, Continued

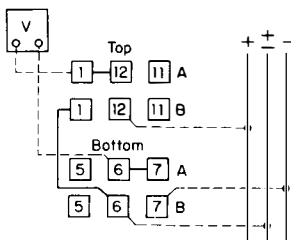
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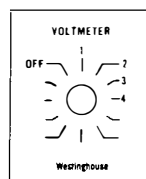
| CONTACT | POSITION |
|---------|----------|
| A11-B11 | OFF 1 2  |
| A12-B12 | X        |
| A1-B1   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |

**Voltmeter**  
**Dc-3 Wire**

Style No. 505A702G03  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

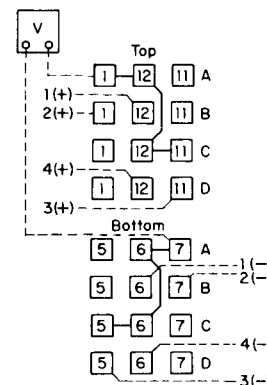


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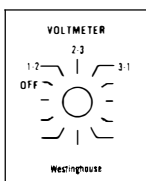
**Voltmeter**  
**4 Circuit**

Style No. 505A704G01  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION    |
|---------|-------------|
| A11-B11 | OFF 1 2 3 4 |
| A12-B12 | X           |
| A1-B1   | X           |
| A5-B5   | X           |
| A6-B6   | X           |
| A7-B7   | X           |
| C11-D11 | X           |
| C12-D12 | X           |
| C1-D1   | X           |
| C5-D5   | X           |
| C6-D6   | X           |
| C7-D7   | X           |



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| CONTACT | POSITION  |
|---------|-----------|
| A11-B11 | 0 1 2 3 1 |
| A12-B12 | X         |
| A1-B1   | X         |
| A5-B5   | X         |
| A6-B6   | X         |
| A7-B7   | X         |

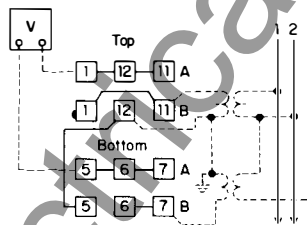
**Tabulation of**  
**Switch as Jumped**

|        |   |   |
|--------|---|---|
| A1-B1  | X | X |
| A1-B12 | X | X |
| A5-B5  | X | X |
| A6-B6  | X | X |
| A7-B7  | X | X |

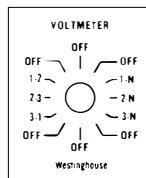
**Voltmeter**  
**3 Phase-3 Wire**

Style No. 505A702G04  
Handle: Round Fixed  
(R) Switch Only: S#505A749G01  
Removable Key Handle: S# 505A749G02  
Key Removable in OFF Position Only  
S=60\*

Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

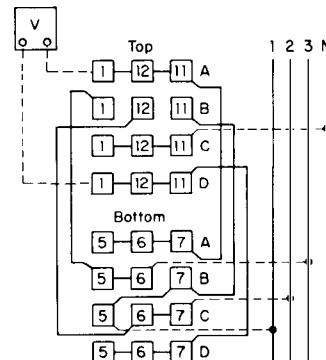


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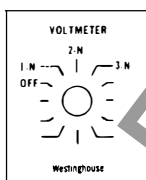
**Voltmeter****Phase to Neutral and Phase to Phase**

Style No. 505A705G01  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION                                    |
|---------|---------------------------------------------|
| A11-B11 | OFF OFF OFF 1 N 2 N 3 N OFF OFF 3 1 2 3 1 2 |
| A12-B12 | X                                           |
| A1-B1   | X                                           |
| A5-B5   | X                                           |
| A6-B6   | X                                           |
| A7-B7   | X                                           |
| C11-D11 | X                                           |
| C12-D12 | X                                           |
| C1-D1   | X                                           |
| C5-D5   | X                                           |
| C6-D6   | X                                           |
| C7-D7   | X                                           |



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| CONTACT | POSITION      |
|---------|---------------|
| A11-B11 | 0 1 N 2 N 3 N |
| A12-B12 | X             |
| A1-B1   | X             |
| A5-B5   | X             |
| A6-B6   | X             |
| A7-B7   | X             |

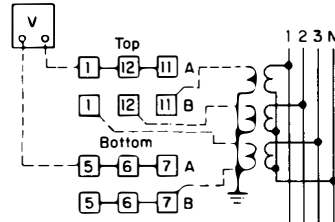
**Tabulation of**  
**Switch as Jumped**

|        |   |   |
|--------|---|---|
| A1-B1  | X | X |
| A1-B12 | X | X |
| A5-B5  | X | X |
| A6-B6  | X | X |
| A7-B7  | X | X |

**Voltmeter**  
**3 Phase-4 Wire**

Style No. 505A702G05  
Handle: Round Fixed  
(R) Switch Only: S#505A762G01  
Removable Key Handle: S# 505A762G02  
Key Removable in OFF Position Only  
S=315\*

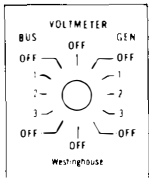
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No





Position Tabulations, *Continued*

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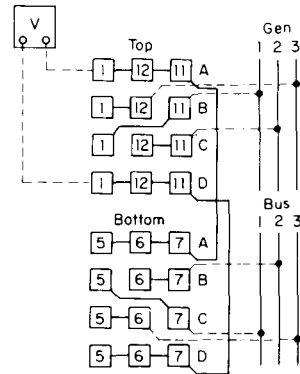


**Voltmeter**

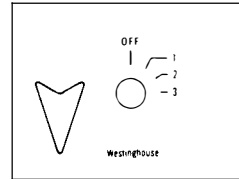
**Two 3 Phase Circuits**

Style No. 505A705G02  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1-8-1-4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|---|---|---|---|
|         | 0        | 0 | 0 | 1 | 2 | 3 | 0 | 0 | 0 | 3 | 2 | 1 |
| A11-B11 |          |   |   | X |   |   |   |   |   |   |   |   |
| A12-B12 |          |   |   |   | X |   |   |   |   |   |   |   |
| A1-B1   |          |   |   |   |   | X |   |   |   |   |   |   |
| A5-B5   |          |   |   |   |   |   |   |   | X |   |   |   |
| A6-B6   |          |   |   |   |   |   |   |   |   | X |   |   |
| A7-B7   |          |   |   |   |   |   |   |   |   |   | X |   |
| C11-D11 |          |   |   | X |   |   |   |   |   |   |   |   |
| C12-D12 |          |   |   |   | X |   |   |   |   |   |   |   |
| C1-D1   |          |   |   |   |   | X |   |   |   |   |   |   |
| C5-D5   |          |   |   |   |   |   |   |   | X |   |   |   |
| C6-D6   |          |   |   |   |   |   |   |   |   | X |   |   |
| C7-D7   |          |   |   |   |   |   |   |   |   |   | X |   |



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**Voltmeter**

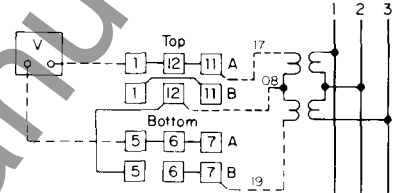
**3 Phase-3 Wire**

Style No. 3562A01G01  
Handle: Mini-Slim DS, Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1-8-1-4  
Target: No

| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | 0        | 1 | 2 | 3 |
| A11-B11 |          | X |   |   |
| A12-B12 |          |   | X |   |
| A1-B1   |          |   |   | X |
| A5-B5   |          | X |   |   |
| A6-B6   |          |   | X |   |
| A7-B7   |          |   |   | X |

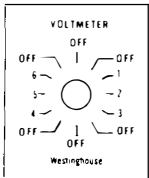
Tabulation of Switch With  
Extra Connectors Added.

|        |  |   |   |  |
|--------|--|---|---|--|
| A1-B11 |  | X | X |  |
| A1-B12 |  |   | X |  |
| A5-B5  |  | X |   |  |
| A5-B7  |  |   | X |  |



Note:  
Switch Mounted 90° From Standard.  
Nameplate Arrow Down.

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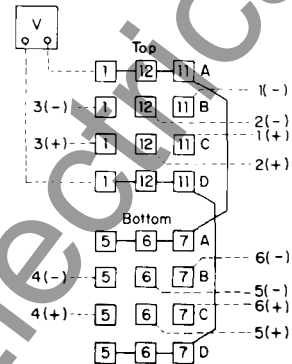


**Voltmeter**

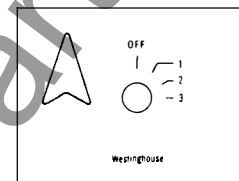
**6 Circuit**

Style No. 505A705G03  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1-8-1-4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|---|---|---|---|
|         | 0        | 0 | 0 | 1 | 2 | 3 | 0 | 0 | 0 | 4 | 5 | 6 |
| A11-B11 |          |   |   | X |   |   |   |   |   |   |   |   |
| A12-B12 |          |   |   |   | X |   |   |   |   |   |   |   |
| A1-B1   |          |   |   |   |   | X |   |   |   |   |   |   |
| A5-B5   |          |   |   |   |   |   |   |   | X |   |   |   |
| A6-B6   |          |   |   |   |   |   |   |   |   | X |   |   |
| A7-B7   |          |   |   |   |   |   |   |   |   |   | X |   |
| C11-D11 |          |   |   | X |   |   |   |   |   |   |   |   |
| C12-D12 |          |   |   |   | X |   |   |   |   |   |   |   |
| C1-D1   |          |   |   |   |   | X |   |   |   |   |   |   |
| C5-D5   |          |   |   |   |   |   |   |   | X |   |   |   |
| C6-D6   |          |   |   |   |   |   |   |   |   | X |   |   |
| C7-D7   |          |   |   |   |   |   |   |   |   |   | X |   |



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**Voltmeter**

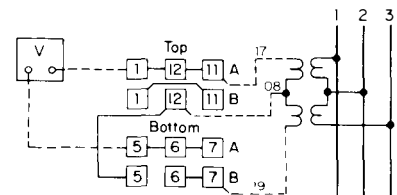
**3 Phase-3 Wire**

Style No. 3562A01G01  
Handle: Mini-Slim DS, Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1-8-1-4  
Target: No

| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | 0        | 1 | 2 | 3 |
| A11-B11 |          | X |   |   |
| A12-B12 |          |   | X |   |
| A1-B1   |          |   |   | X |
| A5-B5   |          | X |   |   |
| A6-B6   |          |   | X |   |
| A7-B7   |          |   |   | X |

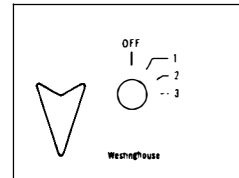
Tabulation of Switch With  
Extra Connectors Added.

|        |  |   |   |  |
|--------|--|---|---|--|
| A1-B11 |  | X | X |  |
| A1-B12 |  |   | X |  |
| A5-B5  |  | X |   |  |
| A5-B7  |  |   | X |  |



Note:  
Switch Mounted 90° From Standard.  
Nameplate Arrow Up.

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**Voltmeter**

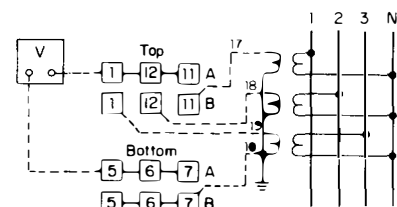
**3 Phase-4 Wire**

Style No. 3562A01G03  
Handle: Mini-Slim DS, Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1-8-1-4  
Target: No

| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | 0        | 1 | 2 | 3 |
| A11-B11 |          | X |   |   |
| A12-B12 |          |   | X |   |
| A1-B1   |          |   |   | X |
| A5-B5   |          | X |   |   |
| A6-B6   |          |   | X |   |
| A7-B7   |          |   |   | X |

Tabulation of Switch With  
Extra Connectors Added.

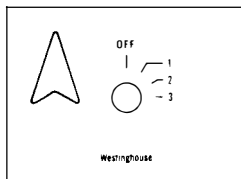
|        |  |   |   |   |
|--------|--|---|---|---|
| A1-B11 |  | X |   |   |
| A1-B12 |  |   | X |   |
| A1-B1  |  |   |   | X |
| A5-B5  |  | X | X | X |



Note:  
Switch Mounted 90° From Standard.  
Nameplate Arrow Down.

Position Tabulations, *Continued*

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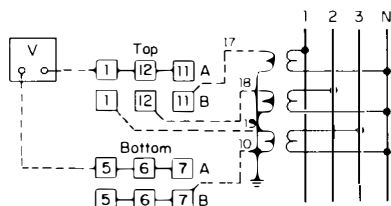
**Voltmeter****3 Phase-4 Wire**

Style No. 3562A01G04  
Handle: Mini-Slim DS, Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | 0        | 1 | 2 | 3 |
| A11-B11 |          | X |   |   |
| A12-B12 |          |   | X |   |
| A1-B1   |          |   |   | X |
| A5-B5   |          | X |   |   |
| A6-B6   |          |   | X |   |
| A7-B7   |          |   |   | X |

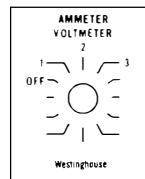
**Tabulation of Switch With  
Extra Connectors Added.**

|        |   |   |   |
|--------|---|---|---|
| A1-B11 |   | X |   |
| A1-B12 |   |   | X |
| A1-B1  |   |   | X |
| A5-B5  | X | X | X |



**Note:**  
Switch Mounted 90° From Standard.  
Nameplate Arrow Up.

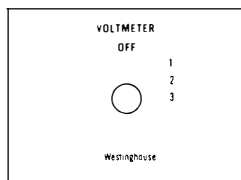
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**Ammeter/Voltmeter**

Style No. 508A299G03  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |
|---------|----------|---|---|---|---|---|
|         | 0        | 1 | 2 | 3 | 4 | 5 |
| A11-B11 |          | X | X | X | X | X |
| A12-B12 |          |   | X | X | X | X |
| A1-B1   |          |   |   | X | X | X |
| A5-B5   |          | X | X | X | X | X |
| A6-B6   |          |   | X | X | X | X |
| A7-B7   |          |   |   | X | X | X |
| C11-D11 | X        | X | X | X | X | X |
| C12-D12 | X        | X | X | X | X | X |
| C1-B1   | X        | X | X | X | X | X |
| C5-D5   | X        | X | X | X | X | X |
| C6-D6   | X        | X | X | X | X | X |
| C7-D7   | X        | X | X | X | X | X |
| E11-F11 |          |   |   |   |   |   |
| E12-F12 |          |   |   | X |   |   |
| E1-F1   |          |   |   |   | X |   |
| E5-F5   |          | X |   |   |   |   |
| E6-F6   |          |   | X |   |   |   |
| E7-F7   |          |   |   | X |   |   |

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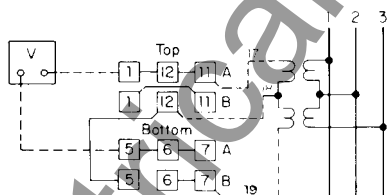
**Voltmeter****3 Phase-3 Wire**

Style No. 3562A01G05  
Handle: Mini-Slim DS, Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

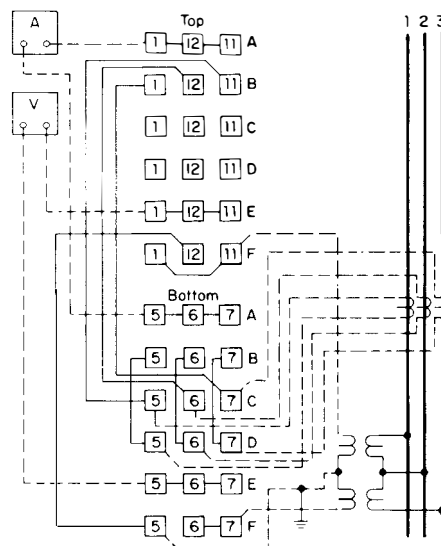
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | 0        | 1 | 2 | 3 |
| A11-B11 |          | X |   |   |
| A12-B12 |          |   | X |   |
| A1-B1   |          |   |   | X |
| A5-B5   |          | X |   |   |
| A6-B6   |          |   | X |   |
| A7-B7   |          |   |   | X |

**Tabulation of Switch With  
Extra Connectors Added.**

|        |   |   |   |
|--------|---|---|---|
| A1-B11 |   | X | X |
| A1-B12 |   |   | X |
| A5-B5  | X | X | X |
| A5-B7  |   | X | X |



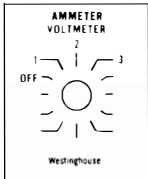
**Note:**  
Switch Mounted 90° From Standard





Position Tabulations, Continued

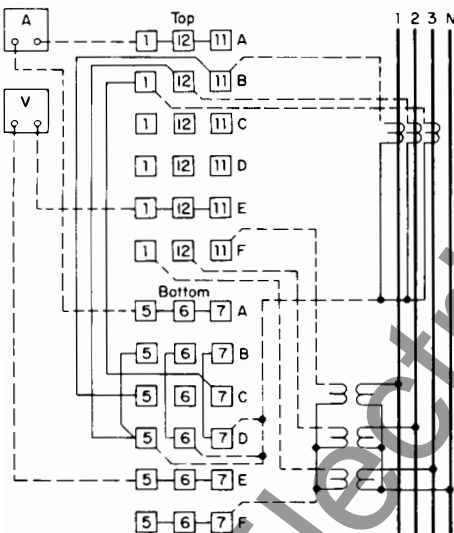
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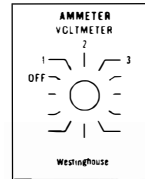
Ammeter/Voltmeter

Style No. 508A299G09  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|
|         | 0        | 1 | 2 | 3 | 4 | 5 | 6 |
| A11-B11 | X        | X | X |   |   |   |   |
| A12-B12 |          |   |   | X | X | X |   |
| A1-B1   |          |   |   |   |   |   | X |
| A5-B5   | X        | X | X |   |   |   |   |
| A6-B6   |          |   |   | X | X | X |   |
| A7-B7   |          |   |   |   |   |   | X |
| C11-D11 | X        | X | X | X | X | X | X |
| C12-D12 | X        | X | X | X | X | X | X |
| C1-D1   | X        | X | X | X | X | X | X |
| C5-D5   | X        | X | X | X | X | X | X |
| C6-D6   | X        | X | X | X | X | X | X |
| C7-D7   | X        | X | X | X | X | X | X |
| E11-F11 |          | X |   |   |   |   |   |
| E12-F12 |          |   |   | X |   |   |   |
| E1-F1   |          |   |   |   |   |   | X |
| E5-F5   |          | X |   |   |   |   |   |
| E6-F6   |          |   |   | X |   |   |   |
| E7-F7   |          |   |   |   |   |   | X |



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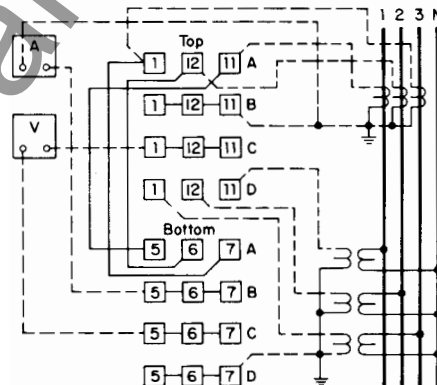


Ammeter/Voltmeter

3 Phase-4 Wire-3 CT's and 3 PT's  
(End of Line Application)

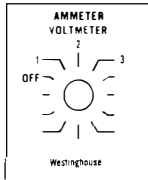
Style No. 787A977G01  
Handle: Round Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|
|         | Off      | 1 | 2 | 3 | 4 | 5 | 6 |
| A11-B11 | X        | X | X | X | X | X | X |
| A12-B12 | X        | X | X | X | X | X | X |
| A1-B1   | X        | X | X | X | X | X | X |
| A5-B5   |          | X | X | X |   |   |   |
| A6-B6   |          |   |   | X | X | X |   |
| A7-B7   |          |   |   |   |   |   | X |
| C11-D11 |          |   | X |   |   |   |   |
| C12-D12 |          |   |   | X |   |   |   |
| C1-D1   |          |   |   |   |   |   | X |
| C5-D5   |          | X |   |   |   |   |   |
| C6-D6   |          |   |   | X |   |   |   |
| C7-D7   |          |   |   |   |   |   | X |



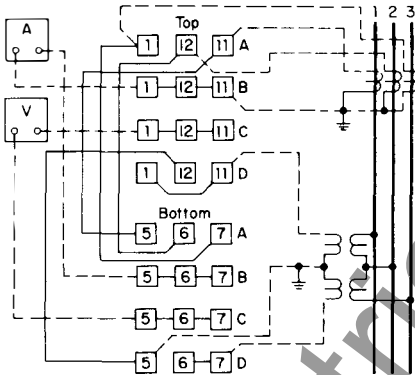
Position Tabulations, *Continued*

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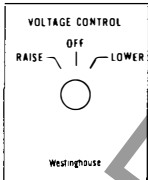
**Ammeter/Voltmeter****3 Phase-Wire-3 CT's and 3 PT's**  
(End of Line Application)

Style No. 787A977G02  
 Handle: Round Fixed  
 Contacts: Maintained  
 Stages: 2, Six Contact Frame  
 Mounting: 1/8-1/4  
 Target: No

| CONTACT | POSITION |   |   |   |   |   |
|---------|----------|---|---|---|---|---|
|         | Off      | 1 | 2 | 3 | 4 | 5 |
| A11-B11 | X        | X | X | X | X | X |
| A12-B12 | X        | X | X | X | X | X |
| A1-B1   | X        | X | X | X | X | X |
| A5-B5   | X        | X | X | X | X | X |
| A6-B6   |          |   |   | X | X | X |
| A7-B7   |          |   |   |   |   | X |
| C11-D11 |          | X |   |   |   | X |
| C12-D12 |          |   |   | X |   | X |
| C1-D1   |          |   |   |   |   | X |
| C5-D5   |          | X |   |   |   | X |
| C6-D6   |          |   |   | X |   | X |
| C7-D7   |          |   |   |   |   | X |



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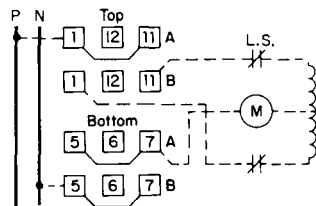
**Voltage Control**

Style No. 505A703G01  
 Handle: Pistol Grip Fixed  
 Contacts: Momentary  
 Stages: 1, Six Contact Frame  
 Mounting: 1/8-1/4  
 Target: No

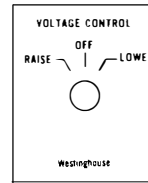
Oval Fixed Handle  
 Switch: S# 505A703G06

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | R        | O | L |
| A11-B11 | X        |   |   |
| A12-B12 |          | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        |   |   |
| A6-B6   |          | X |   |
| A7-B7   |          |   | X |

**Note:**  
 Spring Return to  
 OFF Position.



39

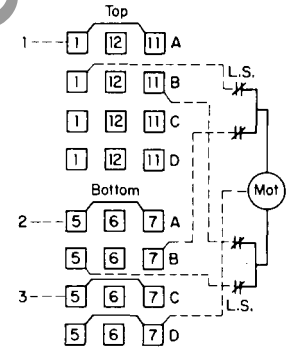
**Voltage Control**

Style No. 505A715G01  
 Handle: Pistol Grip Fixed  
 Contacts: Momentary  
 Stages: 2, Six Contact Frame  
 Mounting: 1/8-1/4  
 Target: No

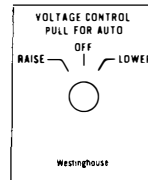
Oval Fixed Handle  
 Switch: S# 505A715G05

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | R        | O | L |
| A11-B11 | X        |   |   |
| A12-B12 |          | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        |   |   |
| A6-B6   |          | X |   |
| A7-B7   |          |   | X |
| C11-D11 | X        |   |   |
| C12-D12 |          | X |   |
| C1-D1   |          |   | X |
| C5-D5   | X        |   |   |
| C6-D6   |          | X |   |
| C7-D7   |          |   | X |

**Note:**  
 Spring Return to OFF Position.



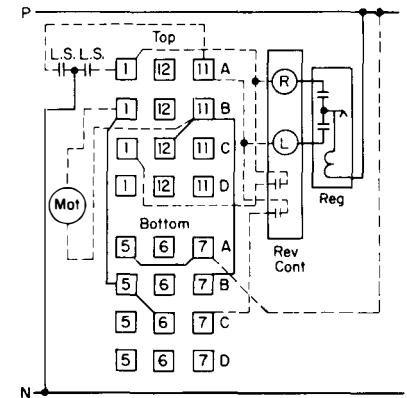
40

**Voltage Control**

Style No. 505A716G01  
 Handle: Oval Fixed  
 Contacts: Momentary  
 Stages: 2, Six Contact Frame  
 Mounting: 1/8-1/4  
 Target: No

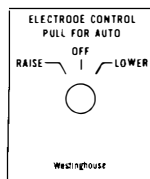
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | R        | O | P | L |
| A11-B11 | X        |   |   |   |
| A12-B12 |          | X |   |   |
| A1-B1   |          |   | X |   |
| A5-B5   | X        |   |   |   |
| A6-B6   |          | X |   |   |
| A7-B7   |          |   | X |   |
| C12-C1  |          |   | X |   |
| D12-D1  | X        |   | X |   |
| C6-C7   |          | X |   |   |
| D6-D7   | X        | X |   | X |

**Note:**  
 Spring Return to OFF Position.  
 Maintained In Pull Out at OFF.



Position Tabulations, *Continued*

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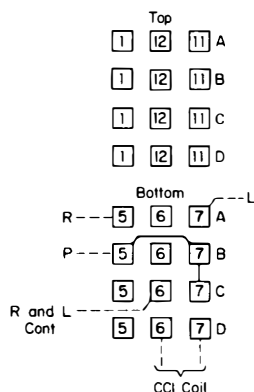
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | R        | O | P | L |
| A11-B11 | X        |   |   |   |
| A12-B12 |          | X | X |   |
| A1-B1   |          |   |   | X |
| A5-B5   | X        |   |   |   |
| A6-B6   |          | X | X |   |
| A7-B7   |          |   |   | X |
| C12-C1  |          |   | X |   |
| D12-D1  | X        | X | X |   |
| C6-C7   |          |   | X |   |
| D6-D7   | X        | X | X |   |

**Electrode Control**

Switch S#505A716G02  
(Oval Fixed Handle)

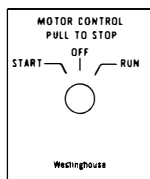
Switch S#505A716G04  
(Pistol Grip Fixed Handle)

Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No



**Note:**  
Maintained in Pull Out at OFF

60



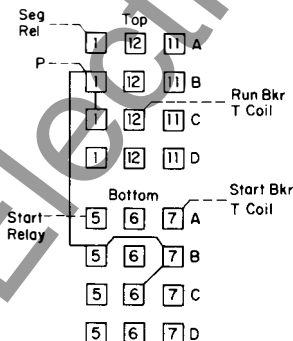
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | S        | O | P | R |
| A11-B11 | X        |   |   |   |
| A12-B12 |          | X | X |   |
| A1-B1   |          |   |   | X |
| A5-B5   | X        |   |   |   |
| A6-B6   |          | X | X |   |
| A7-B7   |          |   |   | X |
| C12-C1  |          |   | X |   |
| D12-D1  | X        | X | X |   |
| C6-C7   |          |   | X |   |
| D6-D7   | X        | X | X |   |

**Motor Control**

Switch S#505A716G03  
(Oval Fixed Handle)

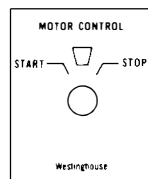
Switch S#505A716G05  
(Pistol Grip Fixed Handle)

Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No



**Note:**  
Spring Return to OFF Position.  
Maintained in Pull Out at OFF  
Position.

61

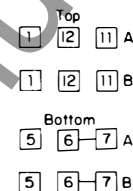


| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | STOP     | N | SRT |   |
| A11-B11 | X        |   |     |   |
| A12-B12 |          | X |     |   |
| A1-B1   |          |   |     | X |
| A5-B5   | X        | X |     |   |
| A6-B6   |          | X | X   | X |
| A7-B7   |          |   | X   | X |

**\* Note:**  
Adjacent Overlap Contacts  
are Electrically Connected  
Together During Transfer.

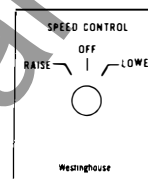
**Motor Control**

Style No. 663A245G06  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: Yes



**Note:**  
Spring Return to Center (N) Position

62



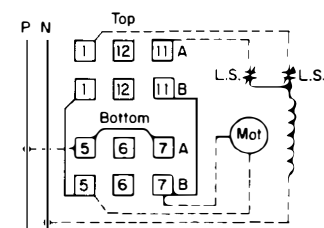
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | R        | O | L |   |
| A11-B11 | X        |   |   |   |
| A12-B12 |          | X |   |   |
| A1-B1   |          |   |   | X |
| A5-B5   | X        |   |   |   |
| A6-B6   |          | X |   |   |
| A7-B7   |          |   | X |   |

**Speed Control**

Switch S#505A703G02  
(Pistol Grip Fixed Handle)

Switch S#505A703G07  
(Oval Fixed Handle)

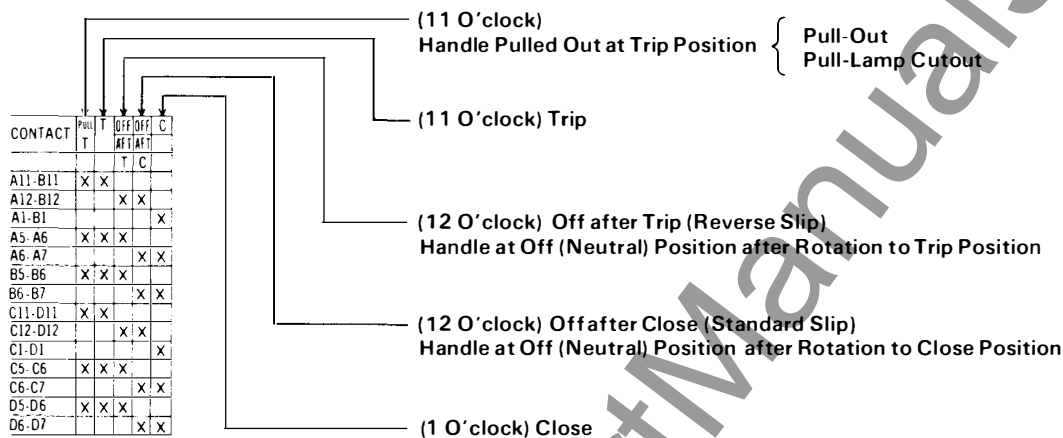
Contacts: Momentary  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: No



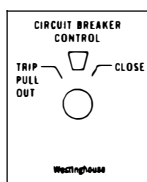


Position Tabulations, *Continued*

Interpretation of position designations for Figures 63 through 83 and other switches using slip and/or pull contacts.

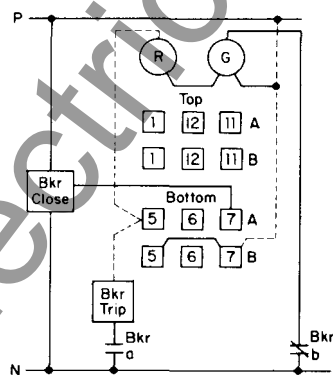


63

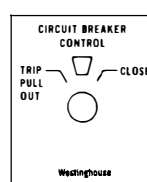


| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | P        | T | O | C |
| A11-B11 | X        | X |   |   |
| A12-B12 |          |   | X | X |
| A1-B1   |          |   |   | X |
| A5-B5   | X        | X |   |   |
| A6-B6   |          |   | X | X |
| A7-B7   |          |   |   | X |

## Circuit Breaker Control

Switch S#505A713G01  
(Pistol Grip Fixed Handle)Switch S#505A713G03  
(Oval Fixed Handle)Contacts: Momentary  
Stages: 1, Six Contact Frame  
Mounting: 1 8-1 4  
Target: Yes

64



| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | P        | T | O | C |
| A11-B11 | X        | X |   |   |
| A12-B12 |          |   | X | X |
| A1-B1   |          |   |   | X |
| A5-B5   | X        | X |   |   |
| A6-B6   |          |   | X | X |
| A7-B7   |          |   |   | X |

## Circuit Breaker Control

Style No. 505A713G02

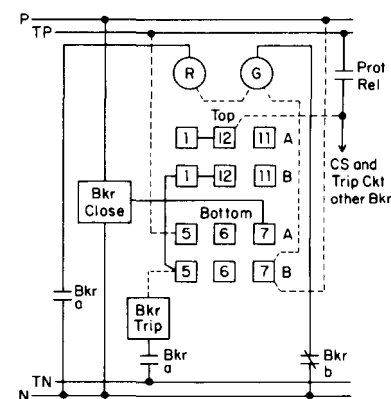
Handle: Pistol Grip Fixed

Contacts: Momentary

Stages: 1, Six Contact Frame

Mounting: 1/8-1/4

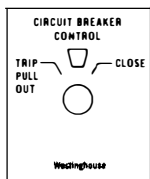
Target: Yes





Position Tabulations, *Continued*

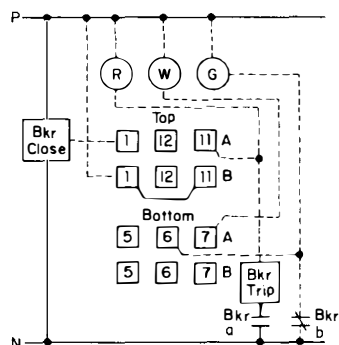
65



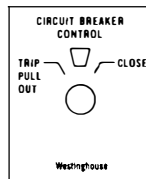
| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | OFF | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   |     |     | X |
| A5-A6   | X        | X | X   |     |   |
| A6-A7   |          |   |     |     | X |
| B5-B6   | X        | X | X   |     |   |
| B6-B7   |          |   |     |     | X |

**Circuit Breaker Control**

Switch S#505A714G01  
(Pistol Grip Fixed Handle)  
Switch S#505A714G02  
(Oval Fixed Handle)  
Contacts: Momentary  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes



67



| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | OFF | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   |     |     | X |
| A5-B5   | X        | X |     |     |   |
| A6-B6   |          |   | X   | X   |   |
| A7-B7   |          |   |     |     | X |
| C11-D11 | X        | X |     |     |   |
| C12-D12 |          |   | X   | X   |   |
| C1-D1   |          |   |     |     | X |
| C5-C6   | X        | X | X   |     |   |
| C6-C7   |          |   |     |     | X |
| D5-D6   | X        | X | X   |     |   |
| D6-D7   |          |   |     |     | X |

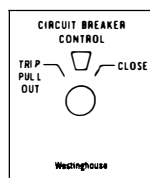
**Circuit Breaker Control**

Style No 505A718G15  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

| Top    |    |    |   |  |
|--------|----|----|---|--|
| 1      | 12 | 11 | A |  |
| 1      | 12 | 11 | B |  |
| 1      | 12 | 11 | C |  |
| 1      | 12 | 11 | D |  |
| Bottom |    |    |   |  |
| 5      | 6  | 7  | A |  |
| 5      | 6  | 7  | B |  |
| 5      | 6  | 7  | C |  |
| 5      | 6  | 7  | D |  |

**Note:**  
Connectors Added to  
Obtain Contact A1-B1  
Closed in Close, Trip  
and Trip Pull Out  
Positions

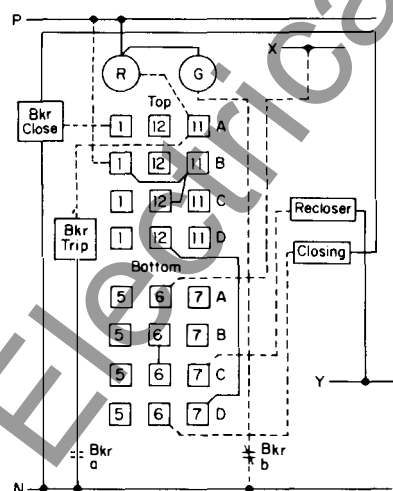
66



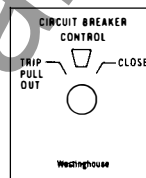
| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | OFF | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   |     |     | X |
| A5-B5   | X        | X |     |     |   |
| A6-B6   |          |   | X   | X   |   |
| A7-B7   |          |   |     |     | X |
| C11-D11 | X        | X |     |     |   |
| C12-D12 |          |   | X   | X   |   |
| C1-D1   |          |   |     |     | X |
| C5-C6   | X        | X | X   |     |   |
| C6-C7   |          |   |     |     | X |
| D5-D6   | X        | X | X   |     |   |
| D6-D7   |          |   |     |     | X |

**Circuit Breaker Control**

Style No 505A718G01  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes



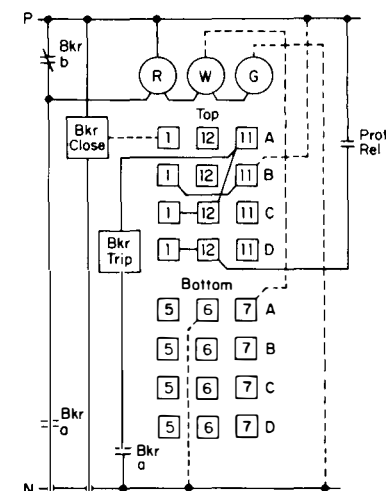
68



| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | OFF | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   |     |     | X |
| A5-A6   | X        | X |     |     |   |
| A6-A7   |          |   | X   | X   |   |
| B5-B5   | X        | X |     |     |   |
| B6-B7   |          |   | X   | X   |   |
| C11-D11 | X        | X |     |     |   |
| C12-D12 |          |   | X   | X   |   |
| C1-D1   |          |   |     |     | X |
| C5-C6   | X        | X | X   |     |   |
| C6-C7   |          |   |     |     | X |
| D5-D6   | X        | X | X   |     |   |
| D6-D7   |          |   |     |     | X |

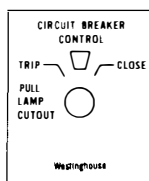
**Circuit Breaker Control**

Switch S#505A717G02  
(Pistol Grip Fixed Handle)  
  
Switch S#505A717G03  
(Oval Fixed Handle and No Connectors)  
  
Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

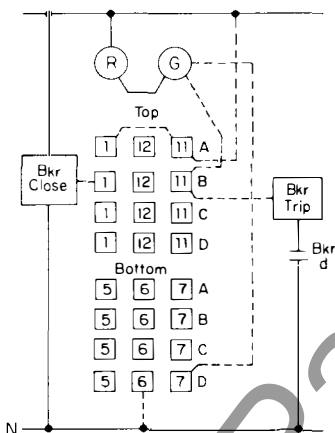


Position Tabulations, *Continued*

69

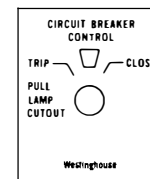


| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | P        | T | OFF | C |
| A11-B11 | X        | X |     |   |
| A12-B12 |          |   | X   | X |
| A1-B1   |          |   |     | X |
| A5-B5   | X        | X |     |   |
| A6-B6   |          |   | X   | X |
| A7-B7   |          |   |     | X |
| C12-D1  | X        | X |     |   |
| D12-D1  |          |   | X   | X |
| C6-C7   | X        | X |     |   |
| D6-D7   |          |   | X   | X |

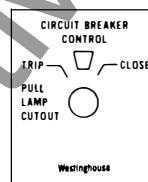
**Circuit Breaker Control**Switch S#505A720G01  
(Pistol Grip Fixed Handle)Switch S#505A720G03  
(Oval Fixed Handle)Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes  
No Connectors Furnished

72

| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | P        | T | OFF | C |
| A11-B11 | X        | X |     |   |
| A12-B12 |          |   | X   | X |
| A1-B1   |          |   |     | X |
| A5-B5   | X        | X |     |   |
| A6-B6   |          |   | X   | X |
| A7-B7   |          |   |     | X |
| C11-D11 | X        | X |     |   |
| C12-D12 |          |   | X   | X |
| C1-D1   |          |   |     | X |
| C5-C6   | X        | X |     |   |
| C6-C7   |          |   | X   | X |
| D5-D6   | X        | X |     |   |
| D6-D7   |          |   | X   | X |
| E12-E1  | X        | X |     |   |
| F12-F1  |          |   | X   | X |
| E6-E7   | X        | X |     |   |
| F6-F7   |          |   | X   | X |

**Circuit Breaker Control**Switch S#508A264G02  
(Pistol Grip Fixed Handle)Switch S#508A264G01  
(Oval Fixed Handle)Contacts: Momentary  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

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**Circuit Breaker Control**

Style No. 508A281G02

Handle: Pistol Grip Fixed

Contacts: Momentary

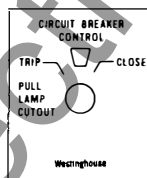
Stages: 4, Six Contact Frame

Mounting: 1/8-1/4

Target: Yes

70

| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | P        | T | OFF | C |
| A11-B11 | X        | X |     |   |
| A12-B12 |          |   | X   | X |
| A1-B1   |          |   |     | X |
| A5-A6   | X        | X |     |   |
| A6-A7   |          |   | X   | X |
| B5-B6   | X        | X |     |   |
| B6-B7   |          |   | X   | X |
| C12-C1  | X        | X |     |   |
| D12-D1  |          |   | X   | X |
| C6-C7   | X        | X |     |   |
| D6-D7   |          |   | X   | X |

**Circuit Breaker Control**Switch S#508A244G01  
(Pistol Grip Fixed Handle)Switch S#508A244G02  
(Oval Fixed Handle)Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

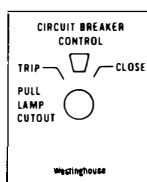
| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | PULL     | T | OFF | C |
| A11-B11 | X        | X |     |   |
| A12-B12 |          |   | X   | X |
| A1-B1   |          |   |     | X |
| A5-B5   | X        | X |     |   |
| A6-B6   |          |   | X   | X |
| A7-B7   |          |   |     | X |
| C11-D11 | X        | X |     |   |
| C12-D12 |          |   | X   | X |
| C1-D1   |          |   |     | X |
| C5-C6   | X        | X |     |   |
| C6-C7   |          |   | X   | X |
| D5-D6   | X        | X |     |   |
| D6-D7   |          |   | X   | X |
| E11-F11 | X        | X |     |   |
| E12-F12 |          |   | X   | X |
| E1-F1   |          |   |     | X |
| E5-E6   | X        | X |     |   |
| E6-E7   |          |   | X   | X |
| F5-F6   | X        | X |     |   |
| F6-F7   |          |   | X   | X |
| G12-G1  | X        | X |     |   |
| H12-H1  |          |   | X   | X |
| G6-G7   | X        | X |     |   |
| H6-H7   |          |   | X   | X |

| Top |    |    |   |
|-----|----|----|---|
| 1   | 12 | 11 | A |
| 1   | 12 | 11 | B |
| 1   | 12 | 11 | C |
| 1   | 12 | 11 | D |
| 1   | 12 | 11 | E |
| 1   | 12 | 11 | F |
| 1   | 12 | 11 | G |
| 1   | 12 | 11 | H |

| Bottom |   |   |   |
|--------|---|---|---|
| 5      | 6 | 7 | A |
| 5      | 6 | 7 | B |
| 5      | 6 | 7 | C |
| 5      | 6 | 7 | D |
| 5      | 6 | 7 | E |
| 5      | 6 | 7 | F |
| 5      | 6 | 7 | G |
| 5      | 6 | 7 | H |

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| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | P        | T | OFF | C |
| A11-B11 | X        | X |     |   |
| A12-B12 |          |   | X   | X |
| A1-B1   |          |   |     | X |
| A5-A6   | X        | X |     |   |
| A6-A7   |          |   | X   | X |
| B5-B6   | X        | X |     |   |
| B6-B7   |          |   | X   | X |
| C11-D11 | X        | X |     |   |
| C12-D12 |          |   | X   | X |
| C1-D1   |          |   |     | X |
| C5-C6   | X        | X |     |   |
| C6-C7   |          |   | X   | X |
| D5-D6   | X        | X |     |   |
| D6-D7   |          |   | X   | X |
| E12-E1  | X        | X |     |   |
| F12-F1  |          |   | X   | X |
| E6-E7   | X        | X |     |   |
| F6-F7   |          |   | X   | X |

**Circuit Breaker Control**Switch S#508A262G01  
(Pistol Grip Fixed Handle)Switch S#508A262G03  
(Oval Fixed Handle)Contacts: Momentary  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

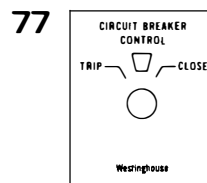
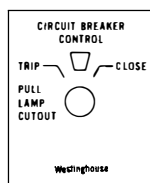


Position Tabulations, *Continued*

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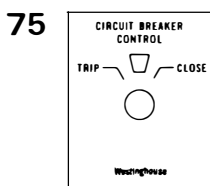
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | PULL     | T | N | C |
| A11-B11 | X        | X |   |   |
| A12-B12 |          |   | X | X |
| A1-B1   |          |   |   | X |
| A5-A6   | X        | X | X |   |
| A6-A7   |          |   |   | X |
| B5-B6   | X        | X | X |   |
| B6-B7   |          |   |   | X |
| C11-D11 | X        | X |   |   |
| C12-D12 |          |   | X | X |
| C1-D1   |          |   |   | X |
| C5-C6   | X        | X | X |   |
| C6-C7   |          |   |   | X |
| D5-D6   | X        | X | X |   |
| D6-D7   |          |   |   | X |
| E11-F11 | X        | X |   |   |
| E12-F12 |          |   | X | X |
| E1-F1   |          |   |   | X |
| E5-E6   | X        | X | X |   |
| E6-E7   |          |   |   | X |
| F5-F6   | X        | X | X |   |
| F6-F7   |          |   |   | X |
| G12-G1  | X        |   |   |   |
| H12-H1  |          | X | X | X |
| G6-G7   | X        |   |   |   |
| H6-H7   |          | X | X | X |

**Circuit Breaker Control**  
Style No. 508A284G01  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 4, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes



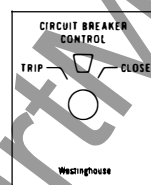
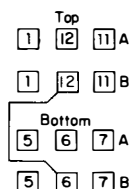
**Circuit Breaker Control**  
Style No. 508A207G02  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | T        | O | C |
| A11-B11 | X        |   |   |
| A12-B12 |          | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        |   |   |
| A6-B6   |          | X |   |
| A7-B7   |          |   | X |



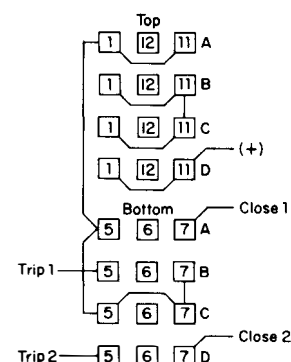
**Circuit Breaker Control**  
Style No. 505A738G07  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | T        | N | N | C |
| A11-B11 | X        |   |   |   |
| A12-B12 |          | X | X |   |
| A1-B1   |          |   |   | X |
| A5-A6   | X        | X |   |   |
| A6-A7   |          |   |   | X |
| B5-B6   | X        | X |   |   |
| B6-B7   |          |   |   | X |



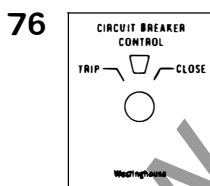
**Circuit Breaker Control**  
**For Operating Two Breakers**  
Style No. 508A218G07  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | T        | N | C |
| A11-B11 | X        |   |   |
| A12-B12 |          | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        |   |   |
| A6-B6   |          | X |   |
| A7-B7   |          |   | X |
| C11-D11 | X        |   |   |
| C12-D12 |          | X |   |
| C1-D1   |          |   | X |
| C5-D5   | X        |   |   |
| C6-D6   |          | X |   |
| C7-D7   |          |   | X |



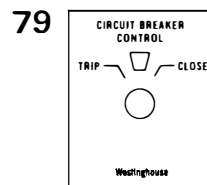
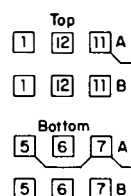
**Tabulation of Switch With Extra Connectors Added.**

|         |   |   |   |
|---------|---|---|---|
| A11-B11 | X |   |   |
| A1-B1   |   |   | X |
| A5-A6   | X | X |   |
| A6-A7   |   |   | X |
| A12-B5  |   | X |   |
| A12-B7  |   |   | X |



**Circuit Breaker Control**  
Style No. 802A231G01  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | T        | N | C |
| A11-B11 | X        |   |   |
| A12-B12 |          | X |   |
| A1-B1   |          |   | X |
| A5-B5   |          |   | X |
| A6-B6   |          |   | X |
| A7-B7   | X        |   |   |

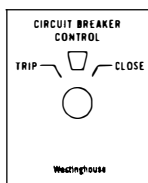


**Circuit Breaker Control**  
Style No. 508A229G01  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | T        | N | N | C |
| A11-B11 | X        |   |   |   |
| A12-B12 |          | X | X |   |
| A1-B1   |          |   |   | X |
| A5-B5   | X        |   |   |   |
| A6-B6   |          | X | X |   |
| A7-B7   |          |   |   | X |
| C11-D11 | X        |   |   |   |
| C12-D12 |          | X | X |   |
| C1-D1   |          |   |   | X |
| C5-C6   | X        | X |   |   |
| C6-C7   |          |   | X | X |
| D5-D6   | X        | X |   |   |
| D6-D7   |          |   | X | X |

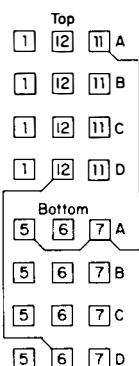
Position Tabulations, *Continued*

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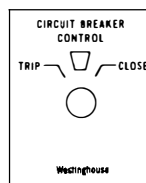


| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | T        | N | N   | C |
|         | AFT      |   | AFT |   |
|         | T        |   | C   |   |
| A11-B11 | X        |   |     |   |
| A12-B12 |          | X | X   |   |
| A1-B1   |          |   |     | X |
| A5-B5   |          |   |     | X |
| A6-B6   |          |   |     |   |
| A7-B7   | X        |   |     |   |
| C11-D11 | X        |   |     |   |
| C12-D12 |          | X | X   |   |
| C1-D1   |          |   |     | X |
| C5-C6   | X        | X |     |   |
| C6-C7   |          |   | X   | X |
| D5-D6   | X        | X |     |   |
| D6-D7   |          |   | X   | X |

**Circuit Breaker Control**  
Style No. 8116A39G01  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

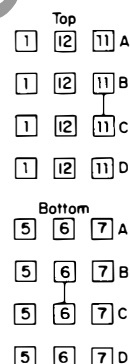


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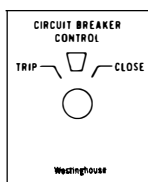


| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | T        | N | N   | C |
|         | AFT      |   | AFT |   |
|         | T        |   | C   |   |
| A11-B11 | X        |   |     |   |
| A12-B12 |          | X | X   |   |
| A1-B1   |          |   |     | X |
| A5-A6   | X        | X |     |   |
| A6-A7   |          | X | X   |   |
| B5-B6   | X        | X |     |   |
| B6-B7   |          | X | X   |   |
| C11-D11 | X        |   |     |   |
| C12-D12 |          | X | X   |   |
| C1-D1   |          |   |     | X |
| C5-C6   | X        | X |     |   |
| C6-C7   |          |   | X   | X |
| D5-D6   | X        | X |     |   |
| D6-D7   |          |   | X   | X |

**Circuit Breaker Control**  
Style No. 508A480G08  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes



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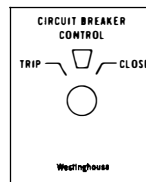


| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | T        | W | OFF | C |
|         | AFT      |   | AFT |   |
|         | T        |   | C   |   |
| A11-B11 | X        |   |     |   |
| A12-B12 |          | X | X   |   |
| A1-B1   |          |   |     | X |
| A5-A6   | X        | X |     |   |
| A6-A7   |          | X | X   |   |
| B5-B6   | X        | X |     |   |
| B6-B7   |          | X | X   |   |
| C11-D11 | X        |   |     |   |
| C12-D12 |          | X | X   |   |
| C1-D1   |          |   |     | X |
| C5-C6   | X        | X |     |   |
| C6-C7   |          |   | X   | X |
| D5-D6   | X        | X |     |   |
| D6-D7   |          |   | X   | X |

**Circuit Breaker Control**  
Style No. 508A480G01  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

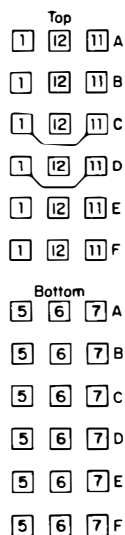


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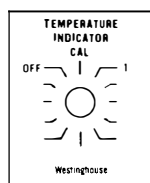
| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | T        | N | N   | C |
|         | AFT      |   | AFT |   |
|         | T        |   | C   |   |
| A11-B11 | X        |   |     |   |
| A12-B12 |          | X | X   |   |
| A1-B1   |          |   |     | X |
| A5-B5   | X        |   |     |   |
| A6-B6   |          | X | X   |   |
| A7-B7   |          |   |     | X |
| C11-D11 | X        |   |     |   |
| C12-D12 |          | X | X   |   |
| C1-D1   |          |   |     | X |
| C5-C6   | X        | X |     |   |
| C6-C7   |          |   | X   | X |
| D5-D6   | X        | X |     |   |
| D6-D7   |          |   | X   | X |
| E11-F11 | X        |   |     |   |
| E12-F12 |          | X | X   |   |
| E1-F1   |          |   |     | X |
| E5-E6   | X        | X |     |   |
| E6-E7   |          |   | X   | X |
| F5-F6   | X        | X |     |   |
| F6-F7   |          |   | X   | X |

**Circuit Breaker Control**  
Style No. 508A255G03  
Handle: Pistol Grip Fixed  
Contacts: Momentary  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target: Yes

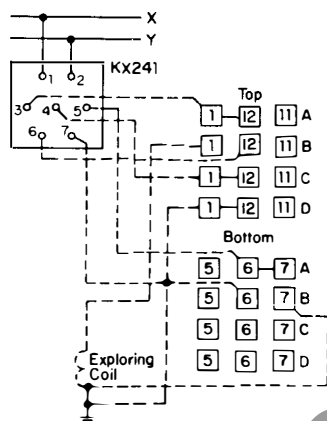
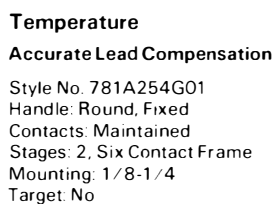




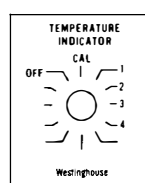
## 84



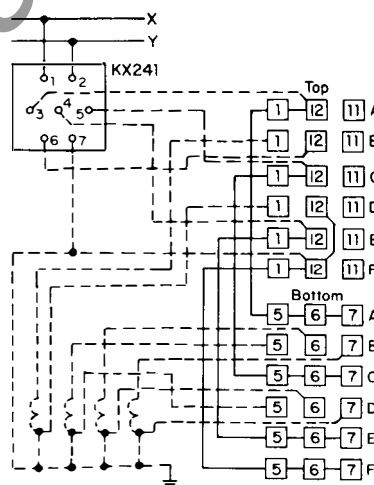
| CONTACT | POSITION |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|
|         | O        | - | C | - | 1 |   |   |
| A11-B11 | X        | X |   |   |   | } |   |
| A12-B12 |          | X | X | X |   |   | } |
| A1-B1   |          |   |   | X | X |   |   |
| A5-B5   | X        | X |   |   |   | } |   |
| A6-B6   |          | X | X | X |   |   | } |
| A7-B7   |          |   |   | X | X |   |   |
| C11-D11 | X        |   |   |   |   |   |   |
| C12-D12 |          |   | X |   |   |   |   |
| C1-D1   |          |   |   |   | X |   |   |
| C5-D5   | X        |   |   |   |   |   |   |
| C6-D6   |          |   | X |   |   |   |   |
| C7-D7   |          |   |   |   | X |   |   |



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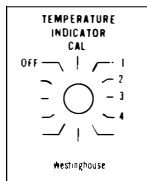
Style No. 505A709G01  
Handle: Round, Fixed  
Contacts: Maintained  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target No

[illegible]

**\* Note:** Adjacent Overlap Contacts are Electrically Connected Together During Transfer

Position Tabulations, *Continued*

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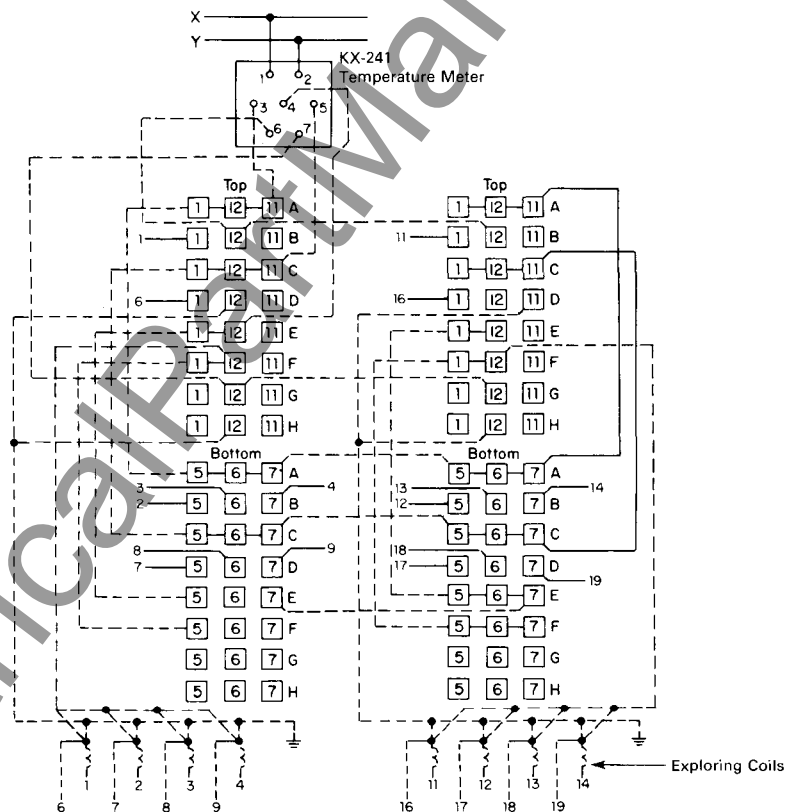
## Temperature

## Accurate Lead Compensation

(R) Style No. 505A711G01  
Handle Removable Key  
Contacts Maintained  
Stages 4, Six Contact Frame  
Mounting 1 8-1 4  
Target No

Key Handle Removable in OFF Position Only  
Ref. to Removable Key Handle S#505A711G03  
S 90

| CONTACT | POSITION |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|
|         | -        | - | 1 | - | 2 | - | 3 | 4 |
| A11-B11 | X        | X |   |   |   |   |   |   |
| A12-B12 |          | X | X | X |   |   |   |   |
| A1-B1   |          |   | X | X | X |   |   |   |
| A5-B5   |          |   |   |   | X | X | X |   |
| A6-B6   |          |   |   |   |   | X | X | X |
| A7-B7   |          |   |   |   |   |   | X | X |
| C11-D11 | X        | X |   |   |   |   |   |   |
| C12-D12 |          | X | X | X |   |   |   |   |
| C1-D1   |          |   | X | X | X |   |   |   |
| C5-D5   |          |   |   |   | X | X | X |   |
| C6-D6   |          |   |   |   |   | X | X | X |
| C7-D7   |          |   |   |   |   |   | X | X |
| E11-F11 | X        |   |   |   |   |   |   |   |
| E12-F12 |          |   | X |   |   |   |   |   |
| E1-F1   |          |   |   | X |   |   |   |   |
| E5-F5   |          |   |   |   | X |   |   |   |
| E6-F6   |          |   |   |   |   | X |   |   |
| E7-F7   |          |   |   |   |   |   |   | X |
| G11-H11 | X        | X |   |   |   |   |   |   |
| G12-H12 |          | X | X | X |   |   |   |   |
| G1-H1   |          |   | X | X | X |   |   |   |
| G5-H5   |          |   |   |   | X | X | X |   |
| G6-H6   |          |   |   |   |   | X | X | X |
| G7-H7   |          |   |   |   |   |   | X | X |



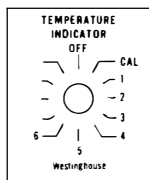
\* Note: Adjacent Overlap Contacts  
are Electrically Connected  
Together During Transfer.

April, 1987



Position Tabulations, *Continued*

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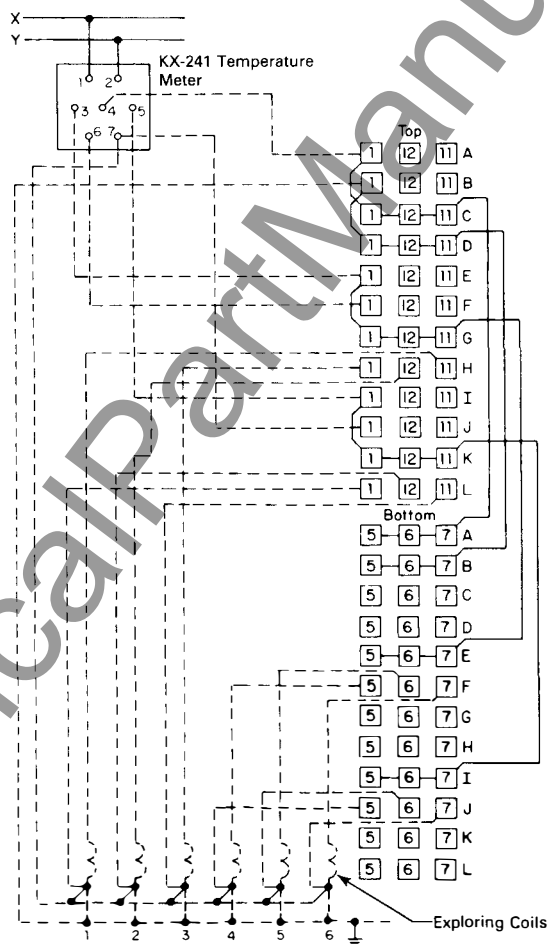


Temperature

Accurate Lead Compensation

Style No. 661A210G06  
Handle: Round, Fixed  
Contacts: Maintained  
Stages: 6, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No.

| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |   |  |
|---------|----------|---|---|---|---|---|---|---|---|---|---|--|
|         | 0        | 1 | C | 1 | 2 | 3 | 4 | 5 | 6 |   |   |  |
| A12-B12 | X        |   |   |   |   |   |   |   |   |   |   |  |
| A1-B1   |          |   | X |   |   |   |   |   |   |   |   |  |
| A5-B5   |          |   |   |   |   |   | X |   |   |   |   |  |
| A6-B6   |          |   |   |   |   |   |   | X |   |   |   |  |
| A7-B7   |          |   |   |   |   |   |   |   | X |   |   |  |
| C11-D11 |          |   |   | X |   |   |   |   |   |   |   |  |
| C12-D12 |          |   |   |   | X |   |   |   |   |   |   |  |
| C1-D1   |          |   |   |   |   | X |   |   |   |   |   |  |
| E12-F12 | X        | X |   |   |   |   |   |   |   |   |   |  |
| E1-F1   |          | X | X | X |   |   |   |   |   |   |   |  |
| E5-F5   |          |   |   |   |   |   | X | X | X |   |   |  |
| E6-F6   |          |   |   |   |   |   |   | X | X | X |   |  |
| E7-F7   |          |   |   |   |   |   |   |   | X | X | X |  |
| G11-H11 |          |   | X | X | X |   |   |   |   |   |   |  |
| G12-H12 |          |   |   | X | X | X |   |   |   |   |   |  |
| G1-H1   |          |   |   |   | X | X | X |   |   |   |   |  |
| I12-J12 | X        | X |   |   |   |   |   |   |   |   |   |  |
| I1-J1   |          | X | X | X |   |   |   |   |   |   |   |  |
| I5-J5   |          |   |   |   |   |   | X | X | X |   |   |  |
| I6-J6   |          |   |   |   |   |   |   | X | X | X |   |  |
| I7-J7   |          |   |   |   |   |   |   |   | X | X | X |  |
| K11-L11 |          |   | X | X | X |   |   |   |   |   |   |  |
| K12-L12 |          |   |   | X | X | X |   |   |   |   |   |  |
| K1-L1   |          |   |   |   | X | X | X |   |   |   |   |  |

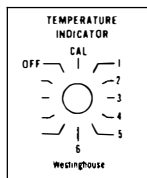






Position Tabulations, *Continued*

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Temperature

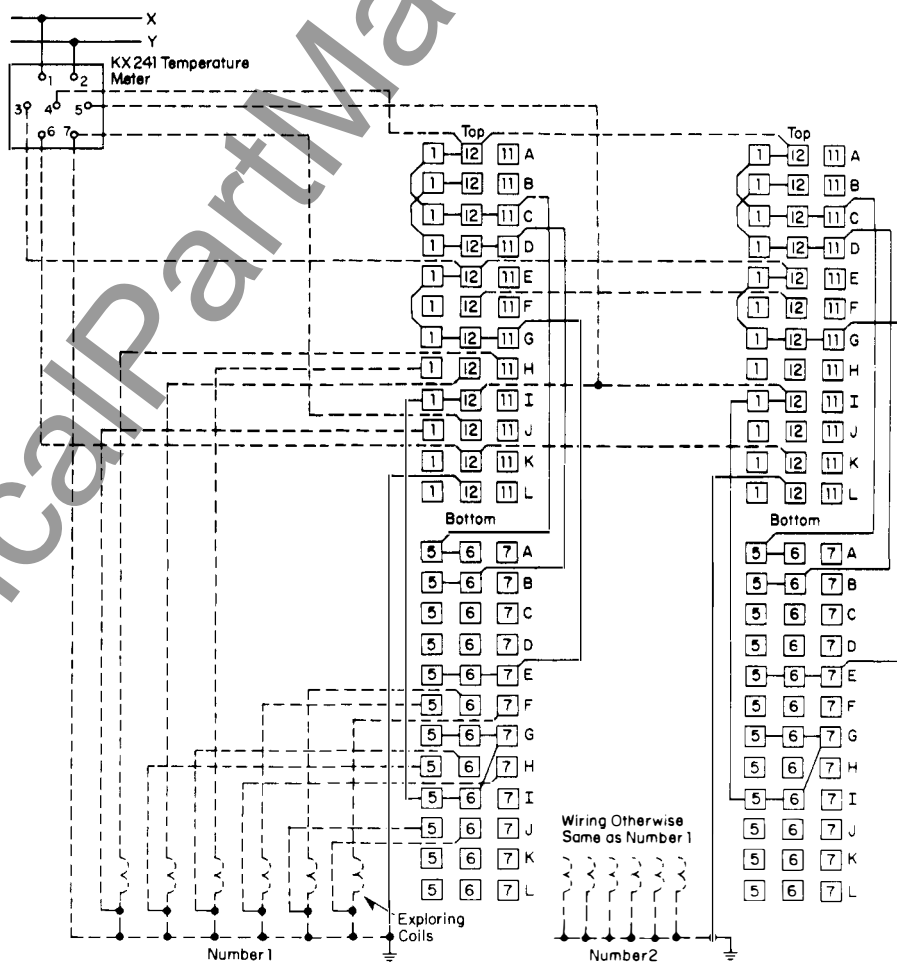
Accurate Lead Compensation

(R) Style No. 781 A489G01  
Handle Removable Key  
Contacts Maintained  
Stages 6, Six Contact Frame  
Mounting 1/8-1/4  
Target: No

Note:

Key Handle Removable in OFF Position Only.  
Key Handle Not Furnished With Switch.  
Ref. to Key Handle S#505A765G03 (Round)  
S-240<sup>2</sup>

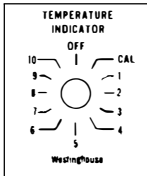
| CONTACT | POSITION |   |   |   |   |   |
|---------|----------|---|---|---|---|---|
|         | 0        | 1 | 2 | 3 | 4 | 5 |
| A11-B11 | X        |   |   |   |   |   |
| A12-B12 |          | X |   |   |   |   |
| A1-B1   |          |   | X |   |   |   |
| A5-B5   |          |   |   |   | X |   |
| A6-B6   |          |   |   |   |   | X |
| A7-B7   |          |   |   |   |   |   |
| C11-D11 |          |   | X |   |   |   |
| C12-D12 |          |   |   | X |   |   |
| C1-D1   |          |   |   |   | X |   |
| C5-D5   |          |   | X |   |   |   |
| C6-D6   |          |   |   | X |   |   |
| C7-D7   |          |   |   |   | X |   |
| E11-F11 | X        | X |   |   |   |   |
| E12-F12 | X        | X | X |   |   |   |
| E1-F1   |          | X | X | X |   |   |
| E5-F5   |          |   |   |   | X | X |
| E6-F6   |          |   |   |   |   | X |
| E7-F7   |          |   |   |   |   |   |
| G11-H11 |          |   | X | X | X |   |
| G12-H12 |          |   |   | X | X | X |
| G1-J1   |          |   |   |   | X | X |
| G5-H5   |          |   | X | X | X |   |
| G6-H6   |          |   |   | X | X | X |
| G7-H7   |          |   |   |   | X | X |
| I11-J11 | X        | X |   |   |   |   |
| I12-J12 | X        | X | X |   |   |   |
| I1-J1   |          | X | X | X |   |   |
| I5-J5   |          |   |   |   | X | X |
| I6-J6   |          |   |   |   |   | X |
| I7-J7   |          |   |   |   |   |   |
| K11-L11 | X        | X |   |   |   |   |
| K12-L12 | X        | X | X |   |   |   |
| K1-L1   |          | X | X | X |   |   |
| K5-L5   |          |   |   |   | X | X |
| K6-L6   |          |   |   |   |   | X |
| K7-L7   |          |   |   |   |   |   |





Position Tabulations, *Continued*

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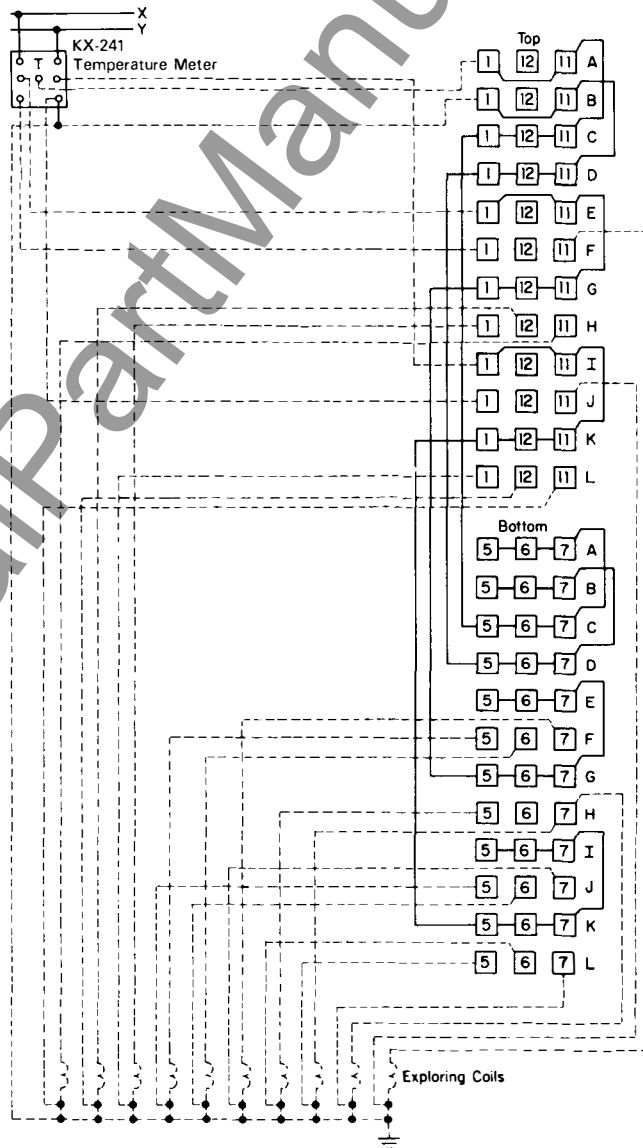


Temperature

Accurate Lead Compensation

Style No. 661A210G01  
Handle: Round, Fixed  
Contacts: Maintained  
Stages: 6, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

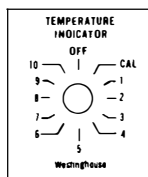
| CONTACT | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---|---|---|---|---|---|---|---|---|---|----|
| A11-B11 |   |   |   |   |   |   |   |   |   |   |    |
| A12-B12 | X |   |   |   |   |   |   |   |   |   |    |
| A1-B1   |   | X |   |   |   |   |   |   |   |   |    |
| A5-B5   |   |   |   |   | X |   |   |   |   |   |    |
| A6-B6   |   |   |   |   |   | X |   |   |   |   |    |
| A7-B7   |   |   |   |   |   |   | X |   |   |   |    |
| C11-D11 |   |   | X |   |   |   |   |   |   |   |    |
| C12-D12 |   |   |   | X |   |   |   |   |   |   |    |
| C1-D1   |   |   |   |   | X |   |   |   |   |   |    |
| C5-D5   |   |   |   |   |   | X |   |   |   |   |    |
| C6-D6   |   |   |   |   |   |   | X |   |   |   |    |
| C7-D7   |   |   |   |   |   |   |   | X |   |   |    |
| E11-F11 |   |   |   |   |   |   |   |   | X | X | X  |
| E12-F12 | X | X |   |   |   |   |   |   |   | X | X  |
| E1-F1   |   | X | X | X |   |   |   |   |   |   |    |
| E5-F5   |   |   |   |   | X | X | X |   |   |   |    |
| E6-F6   |   |   |   |   |   | X | X | X |   |   |    |
| E7-F7   |   |   |   |   |   |   | X | X | X |   |    |
| G11-H11 |   | X | X | X |   |   |   |   |   |   |    |
| G12-H12 |   |   | X | X | X |   |   |   |   |   |    |
| G1-H1   |   |   |   | X | X | X |   |   |   |   |    |
| G5-H5   |   |   |   |   | X | X | X | X |   |   |    |
| G6-H6   |   |   |   |   |   | X | X | X | X |   |    |
| G7-H7   |   |   |   |   |   |   | X | X | X |   |    |
| I11-J11 |   |   |   |   |   |   |   |   | X | X | X  |
| I12-J12 | X | X |   |   |   |   |   |   |   | X |    |
| I1-J1   |   | X | X | X |   |   |   |   |   |   |    |
| I5-J5   |   |   |   |   | X | X | X | X |   |   |    |
| I6-J6   |   |   |   |   |   | X | X | X |   |   |    |
| I7-J7   |   |   |   |   |   |   | X | X | X |   |    |
| K11-L11 |   | X | X | X |   |   |   |   |   |   |    |
| K12-L12 |   |   | X | X | X |   |   |   |   |   |    |
| K1-L1   |   |   |   | X | X | X |   |   |   |   |    |
| K5-L5   |   |   |   |   | X | X | X | X |   |   |    |
| K6-L6   |   |   |   |   |   | X | X | X | X |   |    |
| K7-L7   |   |   |   |   |   |   | X | X | X |   |    |



\* Note: Adjacent Overlap Contacts  
are Electrically Connected  
Together During Transfer.

Position Tabulations, *Continued*

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## Temperature

## Accurate Lead Compensation

(R) Style No. 663A454G01

Handle: Removable Key

Contacts: Maintained

Stages: 7, Six Contact Frame

Mounting: 1/8-1/4

Target: No.

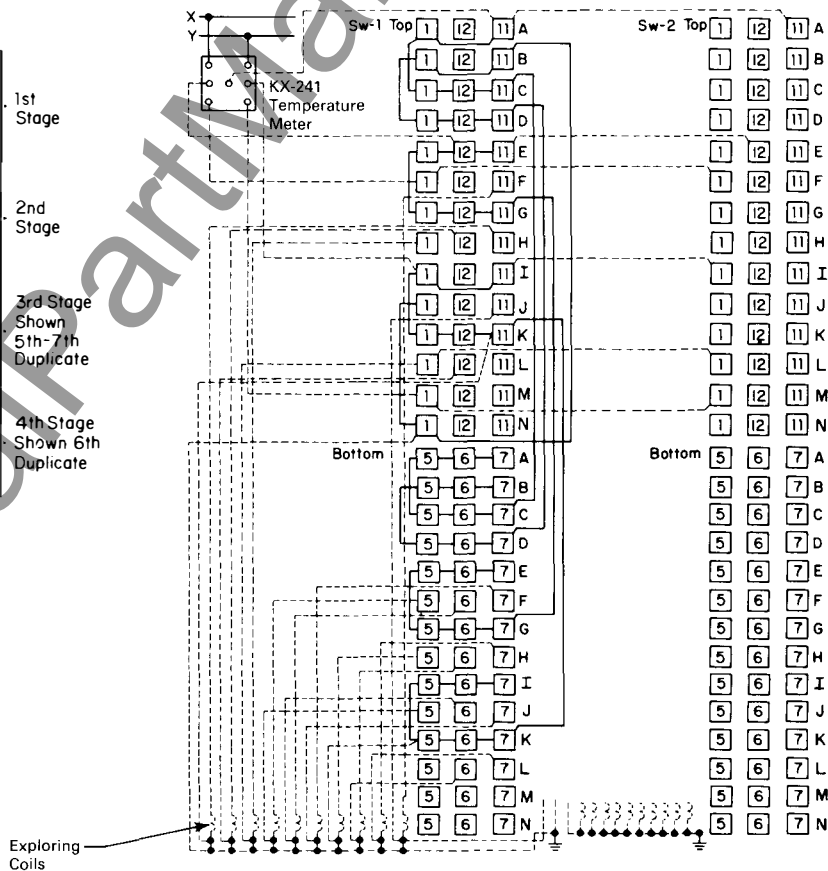
## Note:

Key Removable in OFF Position Only

Ref to Removable Key Handle S#505A711G03

S-120<sup>3</sup>

| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|---|---|---|
|         | O        | C | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| A11-B11 |          |   |   |   |   |   |   |   |   |   | X |
| A12-B12 | X        |   |   |   |   |   |   |   |   |   |   |
| A1-B1   |          | X |   |   |   |   |   |   |   |   |   |
| A5-B5   |          |   |   |   |   | X |   |   |   |   |   |
| A6-B6   |          |   |   |   |   |   | X |   |   |   |   |
| A7-B7   |          |   |   |   |   |   |   | X |   |   |   |
| C11-D11 |          |   | X |   |   |   |   |   |   |   |   |
| C12-D12 |          |   |   | X |   |   |   |   |   |   |   |
| C1-D1   |          |   |   |   | X |   |   |   |   |   |   |
| C5-D5   |          |   |   |   |   |   |   | X |   |   |   |
| C6-D6   |          |   |   |   |   |   |   |   | X |   |   |
| C7-D7   |          |   |   |   |   |   |   |   |   | X |   |
| E11-F11 |          |   |   |   |   |   |   |   |   |   | X |
| E12-F12 | X        | X |   |   |   |   |   |   |   |   | X |
| E1-F1   | X        | X | X |   |   |   |   |   |   |   |   |
| E5-F5   |          |   |   |   | X | X | X |   |   |   |   |
| E6-F6   |          |   |   |   | X | X | X | X |   |   |   |
| E7-F7   |          |   |   |   |   | X | X | X |   |   |   |
| G11-H11 |          |   | X | X | X |   |   |   |   |   |   |
| G12-H12 |          |   |   | X | X | X |   |   |   |   |   |
| G1-H1   |          |   |   | X | X | X |   |   |   |   |   |
| G5-H5   |          |   |   |   |   |   | X | X | X |   |   |
| G6-H6   |          |   |   |   |   |   | X | X | X |   |   |
| G7-H7   |          |   |   |   |   |   |   | X | X | X |   |

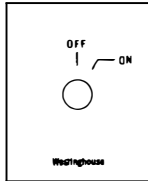


Note: Wiring for Sw-2 Same as for Sw-1



Position Tabulations, *Continued*

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**OFF-ON Switch**

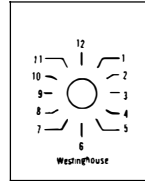
**Fixed Handle** Maintained Momentary  
Oval 505A706G01 505A723G01  
Pistol Grip 505A706G02 505A723G02  
Round 505A706G03 505A723G03

Stage: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |    |
|---------|----------|----|
|         | OFF      | ON |
| A11-B11 |          | X  |
| A12-B12 | X        |    |
| A1-B1   |          | X  |
| A5-B5   |          | X  |
| A6-B6   | X        |    |
| A7-B7   |          | X  |

**Top**  
1 12 11 A  
1 12 11 B  
**Bottom**  
5 6 7 A  
5 6 7 B

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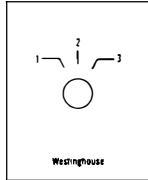
**Selector Switch**

Style No. 505A745G01  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |    |   |   |   |   |   |   |   |   |
|---------|----------|----|---|---|---|---|---|---|---|---|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A11-B11 | X        |    |   |   |   |   |   |   |   |   |
| A12-B12 |          | X  |   |   |   |   |   |   |   |   |
| A1-B1   |          |    | X |   |   |   |   |   |   |   |
| A5-B5   |          |    |   | X |   |   |   |   |   |   |
| A6-B6   |          |    |   |   |   | X |   |   |   |   |
| A7-B7   |          |    |   |   |   |   | X |   |   |   |
| C11-D11 |          |    | X |   |   |   |   |   |   |   |
| C12-D12 |          |    |   | X |   |   |   |   |   |   |
| C1-D1   |          |    |   |   | X |   |   |   |   |   |
| C5-D5   |          |    |   |   |   |   |   | X |   |   |
| C6-D6   |          |    |   |   |   |   |   |   | X |   |
| C7-D7   |          |    |   |   |   |   |   |   |   | X |

**Top**  
1 12 11 A  
1 12 11 B  
1 12 11 C  
1 12 11 D  
**Bottom**  
5 6 7 A  
5 6 7 B  
5 6 7 C  
5 6 7 D

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**Selector Switch**

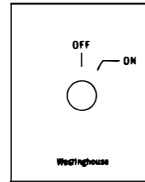
Style No. 505A702L03  
Handle: Oval Fixed  
Contacts: Maintained

Style No. 3745A75G23  
Handle: Oval Fixed  
Contacts: Momentary  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | 1        | 2 | 3 |
| A11-B11 | X        |   |   |
| A12-B12 |          | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        |   |   |
| A6-B6   |          | X |   |
| A7-B7   |          |   | X |

**Top**  
1 12 11 A  
1 12 11 B  
**Bottom**  
5 6 7 A  
5 6 7 B

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**OFF-ON Switch**

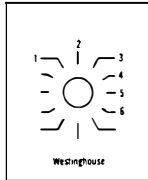
**Fixed Handle** Maintained Momentary  
Oval 505A722G01 505A725G06  
Pistol Grip 505A722G02 505A725G01  
Round 505A722G03 505A725G11

Stage: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No.

| CONTACT | POSITION |    |
|---------|----------|----|
|         | OFF      | ON |
| A11-B11 |          | X  |
| A12-B12 | X        |    |
| A1-B1   |          | X  |
| A5-B5   |          | X  |
| A6-B6   | X        |    |
| A7-B7   |          | X  |
| C11-D11 |          | X  |
| C12-D12 | X        |    |
| C1-D1   |          | X  |
| C5-D5   |          | X  |
| C6-D6   | X        |    |
| C7-D7   |          | X  |

**Top**  
1 12 11 A  
1 12 11 B  
1 12 11 C  
1 12 11 D  
**Bottom**  
5 6 7 A  
5 6 7 B  
5 6 7 C  
5 6 7 D

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**Selector Switch**

Style No. 505A733G01  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

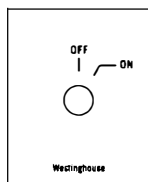
| CONTACT | POSITION |   |   |   |   |   |
|---------|----------|---|---|---|---|---|
|         | 1        | 2 | 3 | 4 | 5 | 6 |
| A11-B11 | X        |   |   |   |   |   |
| A12-B12 |          | X |   |   |   |   |
| A1-B1   |          |   | X |   |   |   |
| A5-B5   |          |   |   | X |   |   |
| A6-B6   |          |   |   |   | X |   |
| A7-B7   |          |   |   |   |   | X |

**Top**  
1 12 11 A  
1 12 11 B  
**Bottom**  
5 6 7 A  
5 6 7 B



Position Tabulations, Continued

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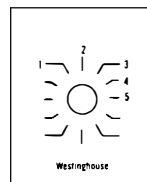


OFF-ON Switch

Style No. 505A781G03  
Handle: Oval Fixed  
Contacts: Maintained  
  
Style No. 505A782G01  
Handle: Oval Fixed  
Contacts: Momentary  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |    |
|---------|----------|----|
|         | OFF      | ON |
| A11-B11 |          | X  |
| A12-B12 | X        |    |
| A1-B1   |          | X  |
| A5-B5   |          | X  |
| A6-B6   | X        |    |
| A7-B7   |          | X  |
| C11-D11 |          | X  |
| C12-D12 | X        |    |
| C1-D1   |          | X  |
| C5-D5   |          | X  |
| C6-D6   | X        |    |
| C7-D7   |          | X  |
| E11-F11 |          | X  |
| E12-F12 | X        |    |
| E1-F1   |          | X  |
| E5-F5   |          | X  |
| E6-F6   | X        |    |
| E7-F7   |          | X  |

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General Application Switch

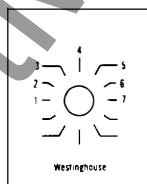
1 Pole - 5 Throw

Style No. 505A733G18  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |   |   |
|---------|----------|---|---|---|---|
|         | 1        | 2 | 3 | 4 | 5 |
| A11-B11 | X        |   |   |   |   |
| A12-B12 |          | X |   |   |   |
| A1-B1   |          |   | X |   |   |
| A5-B5   |          |   |   | X |   |
| A6-B6   |          |   |   |   | X |

| Top    |    |      |
|--------|----|------|
| 1      | 12 | 11 A |
| 1      | 12 | 11 B |
| Bottom |    |      |
| 5      | 6  | 7 A  |
| 5      | 6  | 7 B  |

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General Application Switch

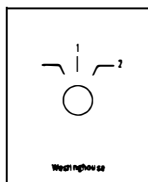
1 Pole - 7 Throw

Style No. 505A745G17  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|
|         | 1        | 2 | 3 | 4 | 5 | 6 | 7 |
| A11-B11 |          |   | X |   |   |   |   |
| A12-B12 |          |   |   | X |   |   |   |
| A1-B1   |          |   |   |   | X |   |   |
| C11-D11 |          |   |   |   |   | X |   |
| C12-D12 |          |   |   |   |   |   | X |
| C6-D6   | X        |   |   |   |   |   |   |
| C7-D7   |          | X |   |   |   |   |   |

| Top    |    |      |
|--------|----|------|
| 1      | 12 | 11 A |
| 1      | 12 | 11 B |
| 1      | 12 | 11 C |
| 1      | 12 | 11 D |
| Bottom |    |      |
| 5      | 6  | 7 A  |
| 5      | 6  | 7 B  |
| 5      | 6  | 7 C  |
| 5      | 6  | 7 D  |

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General Application Switch

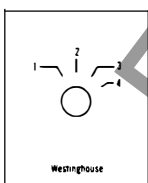
1 and 2 Pole - 2 Throw

Style No. 505A706G55  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |
|---------|----------|---|
|         | 1        | 2 |
| A11-B11 |          | X |
| A12-B12 | X        |   |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   | X        |   |
| A7-B7   |          | X |

| Top    |    |      |
|--------|----|------|
| 1      | 12 | 11 A |
| 1      | 12 | 11 B |
| Bottom |    |      |
| 5      | 6  | 7 A  |
| 5      | 6  | 7 B  |

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General Application Switch

1 Pole - 4 Throw

Style No. 505A733G17  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

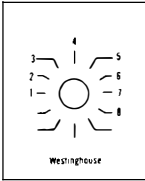
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | 1        | 2 | 3 | 4 |
| A11-B11 | X        |   |   |   |
| A12-B12 |          | X |   |   |
| A1-B1   |          |   | X |   |
| A5-B5   |          |   |   | X |

| Top    |    |    |   |
|--------|----|----|---|
| 1      | 12 | 11 | A |
| 1      | 12 | 11 | B |
| Bottom |    |    |   |
| 5      | 6  | 7  | A |
| 5      | 6  | 7  | B |



Position Tabulations, *Continued*

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| CONTACT | POSITION |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|
|         | 1        | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A11-B11 |          |   | X |   |   |   |   |   |
| A12-B12 |          |   |   | X |   |   |   |   |
| A1-B1   |          |   |   |   | X |   |   |   |
| C11-D11 |          |   |   |   |   | X |   |   |
| C12-D12 |          |   |   |   |   |   | X |   |
| C1-D1   |          |   |   |   |   |   |   | X |
| C6-D6   | X        |   |   |   |   |   |   |   |
| C7-D7   |          | X |   |   |   |   |   |   |

General Application Switch

1 Pole - 8 Throw

Style No. 505A 745G18  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

Top  
1 12 11 A

1 12 11 B

1 12 11 C

1 12 11 D

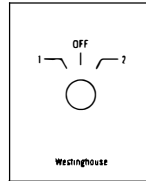
Bottom  
5 6 7 A

5 6 7 B

5 6 7 C

5 6 7 D

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General Application Switch

1 Pole or 2 Pole With OFF

Style No. 505A702L02  
Handle: Oval Fixed  
Contacts: Maintained  
Style No. 505A703G51  
Handle: Oval Fixed  
Contacts: Momentary  
Stages: 1, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

Top  
1 12 11 A

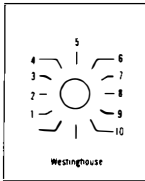
1 12 11 B

Bottom  
5 6 7 A

5 6 7 B

| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | 1        | 0 | 2 |
| A11-B11 | X        |   |   |
| A12-B12 |          | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        |   |   |
| A6-B6   |          | X |   |
| A7-B7   |          |   | X |

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| CONTACT | POSITION |   |   |   |   |   |   |   |   |    |
|---------|----------|---|---|---|---|---|---|---|---|----|
|         | 1        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A11-B11 |          |   | X |   |   |   |   |   |   |    |
| A12-B12 |          |   |   | X |   |   |   |   |   |    |
| A1-B1   |          |   |   |   | X |   |   |   |   |    |
| C11-D11 |          |   |   |   |   | X |   |   |   |    |
| C12-D12 |          |   |   |   |   |   | X |   |   |    |
| C1-D1   |          |   |   |   |   |   |   | X |   |    |
| A5-B5   |          |   |   |   |   |   |   |   | X |    |
| C5-D5   | X        |   |   |   |   |   |   |   |   |    |
| C6-D6   |          | X |   |   |   |   |   |   |   |    |
| C7-D7   |          |   | X |   |   |   |   |   |   |    |

General Application Switch

1 Pole - 10 Throw

Style No. 505A745G19  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

Top  
1 12 11 A

1 12 11 B

1 12 11 C

1 12 11 D

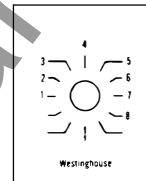
Bottom  
5 6 7 A

5 6 7 B

5 6 7 C

5 6 7 D

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General Application Switch

2 Pole - 8 Throw

Style No. 508A423G16  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 4, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|
|         | 1        | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A11-B11 |          |   | X |   |   |   |   |   |
| A12-B12 |          |   |   | X |   |   |   |   |
| A1-B1   |          |   |   |   | X |   |   |   |
| C11-D11 |          |   |   |   |   | X |   |   |
| C12-D12 |          |   |   |   |   |   | X |   |
| C1-D1   |          |   |   |   |   |   |   | X |
| C6-D6   | X        |   |   |   |   |   |   |   |
| C7-D7   |          | X |   |   |   |   |   |   |
| E11-F11 |          |   | X |   |   |   |   |   |
| E12-F12 |          |   |   | X |   |   |   |   |
| E1-F1   |          |   |   |   | X |   |   |   |
| G11-H11 |          |   |   |   |   | X |   |   |
| G12-H12 |          |   |   |   |   |   | X |   |
| G1-H1   |          |   |   |   |   |   |   | X |
| G6-H6   | X        |   |   |   |   |   |   |   |
| G7-H7   |          | X |   |   |   |   |   |   |

Top  
1 12 11 A

1 12 11 B

1 12 11 C

1 12 11 D

1 12 11 E

1 12 11 F

1 12 11 G

1 12 11 H

Bottom  
5 6 7 A

5 6 7 B

5 6 7 C

5 6 7 D

5 6 7 E

5 6 7 F

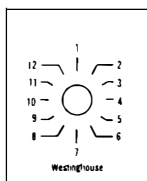
5 6 7 G

5 6 7 H



Position Tabulations, *Continued*

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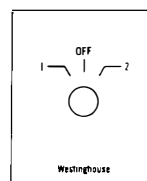
General Application Switch

2 Pole - 12 Throw

Style No. 508A423G17  
Handle: Oval Fixed  
Contacts: Maintained  
Stages: 4, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |   |   |   |   |   |   |   |   |    |
|---------|----------|---|---|---|---|---|---|---|---|---|----|
|         | 12       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A11-B11 | X        |   |   |   |   |   |   |   |   |   |    |
| A12-B12 |          | X |   |   |   |   |   |   |   |   |    |
| A1-B1   |          |   | X |   |   |   |   |   |   |   |    |
| A5-B5   |          |   |   |   |   | X |   |   |   |   |    |
| A6-B6   |          |   |   |   |   |   | X |   |   |   |    |
| A7-B7   |          |   |   |   |   |   |   | X |   |   |    |
| C11-D11 |          |   | X |   |   |   |   |   |   |   |    |
| C12-D12 |          |   |   | X |   |   |   |   |   |   |    |
| C1-D1   |          |   |   |   | X |   |   |   |   |   |    |
| C5-D5   |          |   |   |   |   |   |   |   | X |   |    |
| C6-D6   |          |   |   |   |   |   |   |   |   | X |    |
| C7-D7   |          |   |   |   |   |   |   |   |   |   | X  |
| E11-F11 | X        |   |   |   |   |   |   |   |   |   |    |
| E12-F12 |          | X |   |   |   |   |   |   |   |   |    |
| E1-F1   |          |   | X |   |   |   |   |   |   |   |    |
| E5-F5   |          |   |   |   |   | X |   |   |   |   |    |
| E6-F6   |          |   |   |   |   |   | X |   |   |   |    |
| E7-F7   |          |   |   |   |   |   |   | X |   |   |    |
| G11-H11 |          |   |   | X |   |   |   |   |   |   |    |
| G12-H12 |          |   |   |   | X |   |   |   |   |   |    |
| G1-H1   |          |   |   |   |   | X |   |   |   |   |    |
| G5-H5   |          |   |   |   |   |   |   |   | X |   |    |
| G6-H6   |          |   |   |   |   |   |   |   |   | X |    |
| G7-H7   |          |   |   |   |   |   |   |   |   |   | X  |

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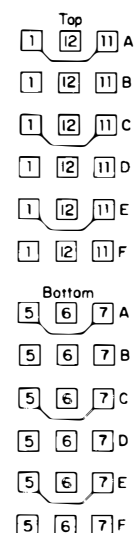
General Application Switch

6 Pole - 2 Throw

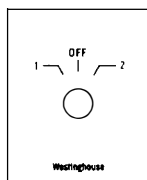
Style No. 505A726G14  
Handle: Oval Fixed  
Contacts: Maintained

Style No. 505A727G15  
Handle: Oval Fixed  
Contacts: Momentary  
Stages: 3, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |
|---------|----------|---|
|         | 1        | 2 |
| A11-B11 | X        |   |
| A12-B12 |          | X |
| A1-B1   |          | X |
| A5-B5   | X        |   |
| A6-B6   |          | X |
| A7-B7   |          | X |
| C11-D11 | X        |   |
| C12-D12 |          | X |
| C1-D1   |          | X |
| C5-D5   | X        |   |
| C6-D6   |          | X |
| C7-D7   |          | X |
| E11-F11 | X        |   |
| E12-F12 |          | X |
| E1-F1   |          | X |
| E5-F5   | X        |   |
| E6-F6   |          | X |
| E7-F7   |          | X |



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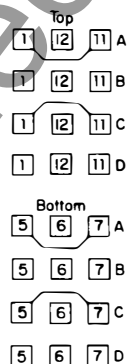
General Application Switch

4 Pole - 2 Throw

Style No. 505A712G92  
Handle: Oval Fixed  
Contacts: Maintained

Style No. 505A715G32  
Handle: Oval Fixed  
Contacts: Momentary  
Stages: 2, Six Contact Frame  
Mounting: 1/8-1/4  
Target: No

| CONTACT | POSITION |   |
|---------|----------|---|
|         | 1        | 2 |
| A11-B11 | X        |   |
| A12-B12 |          | X |
| A1-B1   |          | X |
| A5-B5   | X        |   |
| A6-B6   |          | X |
| A7-B7   |          | X |
| C11-D11 | X        |   |
| C12-D12 |          | X |
| C1-D1   |          | X |
| C5-D5   | X        |   |
| C6-D6   |          | X |
| C7-D7   |          | X |





## Basic Switches-Style Numbers

Basic switches **DO NOT** include handle, nameplate nor external jumpers; these items may be ordered separately. For handles see page 2, nameplates see page 9 and external jumpers see page 9. For complete switch style including handle, nameplate and jumpers, refer to the Distribution and Control Business Unit, London Division.

### Momentary Contacts (Control Switch)

| Figure | Basic Switch | Target | Handle Type     |
|--------|--------------|--------|-----------------|
| 108    | 505A623G01 ① | No     | Fixed           |
| 108    | 663A177G01 ① | No     | Removable Key ① |
| 109    | 505A668G01 ① | No     | Fixed           |
| 111    | 505A607G01 ① | No     | Fixed           |
| 112    | 505A625G01 ① | No     | Fixed           |
| 113    | 505A624G01 ① | No     | Fixed           |
| 114    | 505A684G01 ① | No     | Fixed           |
| 115    | 505A603G01 ① | No     | Fixed           |
| 115    | 508A107G01 ① | Yes    | Fixed           |
| 115    | 663A195G01 ① | No     | Removable Key ② |
| 116    | 508A110G01 ① | No     | Fixed           |
| 117    | 508A111G01 ① | No     | Fixed           |
| 117    | 505A638G01 ① | Yes    | Fixed           |
| 118    | 505A615G01 ① | No     | Fixed           |
| 118    | 508A118G01 ① | Yes    | Fixed           |
| 119    | 508A125G01 ① | No     | Fixed           |
| 120    | 508A127G01 ① | No     | Fixed           |
| 121    | 508A128G01 ① | No     | Fixed           |
| 121    | 508A129G01 ① | Yes    | Fixed           |
| 122    | 508A133G01 ① | No     | Fixed           |
| 122    | 505A620G01 ① | Yes    | Fixed           |
| 123    | 508A143G01 ① | No     | Fixed           |
| 123    | 508A144G01 ① | Yes    | Fixed           |
| 124    | 505A627G01 ① | No     | Fixed           |
| 124    | 508A145G01 ① | Yes    | Fixed           |
| 125    | 508A189G01 ① | No     | Fixed           |
| 125    | 508A161G01 ① | Yes    | Fixed           |
| 126    | 508A162G01 ① | Yes    | Fixed           |
| 127    | 508A163G01 ① | No     | Fixed           |
| 127    | 508A164G01 ① | Yes    | Fixed           |
| 128    | 505A619G01 ① | Yes    | Fixed           |
| 129    | 508A167G01 ① | Yes    | Fixed           |
| 130    | 505A630G01 ① | No     | Fixed           |
| 131    | 508A181G01 ① | Yes    | Fixed           |
| 132    | 508A183G01 ① | No     | Fixed           |
| 132    | 508A184G01 ① | Yes    | Fixed           |
| 133    | 505A632G01 ① | No     | Fixed           |
| 146    | 505A651G01 ① | No     | Fixed           |
| 147    | 658A542G01 ① | No     | Fixed           |
| 148    | 658A578G01 ① | No     | Fixed           |
| 150    | 505A661G01 ① | Yes    | Fixed           |
| 151    | 508A342G01 ① | Yes    | Fixed           |
| 152    | 508A344G01 ① | No     | Fixed           |

### Maintained Contacts (Instrument Switch)

| Figure | Basic Switch | Target | Handle Type     |
|--------|--------------|--------|-----------------|
| 108    | 505A606G01 ① | No     | Fixed           |
| 108    | 505A647G01 ① | No     | Removable Key ① |
| 109    | 505A667G01 ① | No     | Fixed           |
| 109    | 505A669G01 ① | No     | Removable Key ② |
| 110    | 508A396G01 ① | No     | Fixed           |
| 111    | 505A634G01 ① | No     | Fixed           |
| 111    | 505A654G01 ① | No     | Removable Key ② |
| 112    | 505A622G01 ① | No     | Fixed           |
| 112    | 505A670G01 ① | No     | Removable Key ② |
| 113    | 505A621G01 ① | No     | Fixed           |
| 113    | 505A672G01 ① | No     | Removable Key ② |
| 114    | 505A628G01 ① | No     | Fixed           |
| 114    | 505A685G01 ① | No     | Removable Key ② |
| 115    | 505A602G01 ① | No     | Fixed           |
| 115    | 508A108G01 ① | No     | Removable Key ② |
| 116    | 505A600G01 ① | No     | Fixed           |
| 116    | 661A105G01 ① | No     | Removable Key ② |
| 117    | 781A377G01 ① | Yes    | Fixed           |
| 117    | 508A112G01 ② | No     | Removable Key ② |
| 118    | 505A612G01 ① | No     | Fixed           |
| 118    | 508A119G01 ① | No     | Removable Key ② |
| 119    | 508A124G01 ① | No     | Fixed           |
| 120    | 508A126G01 ① | No     | Fixed           |
| 122    | 658A594G01 ① | Yes    | Fixed           |
| 124    | 505A626G01 ① | No     | Fixed           |
| 124    | 508A146G01 ① | No     | Removable Key ② |
| 129    | 508A166G01 ① | No     | Fixed           |
| 130    | 505A664G01 ① | No     | Fixed           |
| 133    | 505A631G01 ① | No     | Fixed           |
| 133    | 508A173G01 ① | No     | Removable Key ② |
| 134    | 508A196G01 ① | No     | Fixed           |
| 134    | 781A167G01 ① | No     | Removable Key ② |
| 135    | 508A199G01 ① | No     | Fixed           |
| 135    | 508A300G01 ① | No     | Removable Key ① |
| 136    | 505A633G01 ① | No     | Fixed           |
| 137    | 508A302G01 ① | No     | Fixed           |
| 138    | 508A363G01 ① | No     | Fixed           |
| 139    | 508A307G01 ① | No     | Fixed           |
| 139    | 508A308G01 ① | No     | Removable Key ① |
| 140    | 508A310G01 ① | No     | Fixed           |
| 140    | 508A311G01 ② | No     | Removable Key ① |
| 141    | 508A314G01 ① | No     | Fixed           |
| 141    | 508A370G01 ② | No     | Removable Key ② |
| 142    | 508A317G01 ① | No     | Fixed           |
| 143    | 505A645G01 ① | No     | Fixed           |
| 143    | 508A320G01 ② | No     | Removable Key ① |
| 144    | 508A323G01 ① | No     | Fixed           |
| 144    | 781A181G01 ② | No     | Removable Key ① |
| 145    | 508A326G01 ① | No     | Fixed           |
| 146    | 505A650G01 ① | No     | Fixed           |
| 146    | 661A152G01 ② | No     | Removable Key ① |
| 147    | 505A659G01 ① | No     | Fixed           |
| 147    | 661A150G01 ② | No     | Removable Key ② |
| 148    | 505A660G01 ① | No     | Fixed           |
| 148    | 663A176G01 ② | No     | Removable Key ① |
| 149    | 508A334G01 ① | No     | Fixed           |
| 149    | 663A175G01 ② | No     | Removable Key ② |
| 152    | 508A343G01 ① | No     | Fixed           |
| 152    | 781A123G01 ① | No     | Removable Key ① |
| 153    | 508A351G01 ① | No     | Fixed           |
| 154    | 505A644G01 ① | No     | Fixed           |
| 154    | 663A340G01 ② | No     | Removable Key ② |

① Spring return to "12" position.

② If key is desired, the following must be specified:

(a) Shape of handle.

(b) If to be interchangeable with other keys, specify the position or positions in which the key is to be removable and the style of the existing switch.

(c) If the key is to be removable in a different position than indicated for the basic switch, or is to be non-interchangeable with other key handles, order the basic switch as "similar to" a style number and give specific requirements.

③ Key removable in "12" position.

④ Key removable in "11" position.

⑤ Key removable in "10" position.





## Additional Position Tabulations

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        |   |
| A12-B12 | X        |   |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   | X        |   |
| A7-B7   |          | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        |   |
| A12-B12 |          | X |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   |          | X |
| A7-B7   |          | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 |          | X |
| A12-B12 | X        |   |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 |          | X |
| A12-B12 |          | X |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   | X        |   |
| A7-B7   |          | X |
| C11-D11 | X        |   |
| C12-D12 | X        |   |
| C1-D1   |          | X |
| C5-D5   |          | X |
| C6-D6   | X        |   |
| C7-D7   |          | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 |          | X |
| A12-B12 | X        |   |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   | X        |   |
| A7-B7   |          | X |
| C11-D11 | X        |   |
| C12-D12 | X        |   |
| C1-D1   |          | X |
| C5-D5   |          | X |
| C6-D6   | X        |   |
| C7-D7   |          | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 |          | X |
| A12-B12 |          | X |
| A1-B1   |          | X |
| A5-B5   |          | X |
| A6-B6   | X        |   |
| A7-B7   |          | X |
| C11-D11 |          | X |
| C12-D12 | X        |   |
| C1-D1   |          | X |
| C5-D5   |          | X |
| C6-D6   | X        |   |
| C7-D7   |          | X |
| E11-F11 | X        |   |
| E12-F12 |          | X |
| E1-F1   |          | X |
| E5-F5   |          | X |
| E6-F6   |          | X |
| E7-F7   |          | X |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | I1       | I2 |
| A11-B11 | X        |    |
| A12-B12 |          | X  |
| A1-B1   |          | X  |
| A5-B5   | X        |    |
| A6-B6   |          | X  |
| A7-B7   |          | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | I1       | I2 |
| A11-B11 | X        |    |
| A12-B12 | X        | X  |
| A1-B1   |          | X  |
| A5-B5   | X        | X  |
| A6-B6   | X        | X  |
| A7-B7   | X        | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | I1       | I2 |
| A11-B11 | X        |    |
| A12-B12 | X        | X  |
| A1-B1   |          | X  |
| A5-A6   | X        | X  |
| A6-A7   |          | X  |
| B5-B6   | X        | X  |
| B6-B7   |          | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | I1       | I2 |
| A11-B11 | X        |    |
| A12-B12 |          | X  |
| A1-B1   |          | X  |
| A5-B5   | X        |    |
| A6-B6   |          | X  |
| A7-B7   |          | X  |
| C11-D11 | X        |    |
| C12-D12 |          | X  |
| C1-D1   |          | X  |
| C5-D5   | X        |    |
| C6-D6   |          | X  |
| C7-D7   |          | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | I1       | I2 |
| A11-B11 | X        | X  |
| A12-B12 | X        | X  |
| A1-B1   |          | X  |
| A5-B5   | X        | X  |
| A6-B6   | X        | X  |
| A7-B7   | X        | X  |
| C11-D11 | X        | X  |
| C12-D12 | X        | X  |
| C1-D1   | X        | X  |
| C5-D5   | X        | X  |
| C6-D6   | X        | X  |
| C7-D7   | X        | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | I1       | I2 |
| A11-B11 | X        | X  |
| A12-B12 | X        | X  |
| A1-B1   |          | X  |
| A5-B5   | X        | X  |
| A6-B6   | X        | X  |
| A7-B7   | X        | X  |
| C11-D11 | X        | X  |
| C12-D12 |          | X  |
| C1-D1   |          | X  |
| C5-D5   | X        |    |
| C6-D6   |          | X  |
| C7-D7   |          | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | I1       | I2 |
| A11-B11 | X        |    |
| A12-B12 | X        | X  |
| A1-B1   |          | X  |
| A5-B5   | X        |    |
| A6-B6   | X        | X  |
| A7-B7   |          | X  |
| C11-D11 | X        |    |
| C12-D12 | X        | X  |
| C1-D1   |          | X  |
| C5-C6   | X        | X  |
| C6-C7   |          | X  |
| C7-D7   | X        | X  |
| D6-D7   |          | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | P        | I1 |
| A11-B11 | X        |    |
| A12-B12 |          | X  |
| A1-B1   |          | X  |
| A5-B5   | X        | X  |
| A6-B6   |          | X  |
| A7-B7   |          | X  |
| C12-C1  | X        |    |
| D12-D1  | X        | X  |
| C6-C7   | X        | X  |
| D6-D7   | X        | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | P        | I1 |
| A11-B11 | X        |    |
| A12-B12 | X        | X  |
| A1-B1   |          | X  |
| A5-A6   | X        | X  |
| A6-A7   |          | X  |
| B5-B6   | X        | X  |
| B6-B7   |          | X  |
| C12-C1  | X        |    |
| D12-D1  | X        | X  |
| C6-C7   | X        | X  |
| D6-D7   | X        | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | I1       | I2 |
| A11-B11 | X        |    |
| A12-B12 |          | X  |
| A1-B1   |          | X  |
| A5-B5   | X        |    |
| A6-B6   |          | X  |
| A7-B7   |          | X  |
| C11-D11 | X        |    |
| C12-D12 |          | X  |
| C1-D1   |          | X  |
| C5-D5   | X        |    |
| C6-D6   |          | X  |
| C7-D7   |          | X  |
| E11-F11 | X        |    |
| E12-F12 |          | X  |
| E1-F1   |          | X  |
| E5-F5   | X        |    |
| E6-F6   |          | X  |
| E7-F7   |          | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | P        | I1 |
| A11-B11 | X        |    |
| A12-B12 |          | X  |
| A1-B1   |          | X  |
| A5-B5   | X        | X  |
| A6-B6   |          | X  |
| A7-B7   |          | X  |
| C12-C1  | X        |    |
| D12-D1  | X        | X  |
| C6-C7   | X        | X  |
| D6-D7   | X        | X  |
| E12-E1  | X        | X  |
| F12-F1  | X        | X  |
| E6-E7   | X        | X  |
| F6-F7   | X        | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | P        | I1 |
| A11-B11 | X        |    |
| A12-B12 |          | X  |
| A1-B1   |          | X  |
| A5-A6   | X        | X  |
| A6-A7   |          | X  |
| B5-B6   | X        | X  |
| B6-B7   |          | X  |
| C11-D11 | X        | X  |
| C12-D12 |          | X  |
| C1-D1   |          | X  |
| C5-C6   | X        | X  |
| C6-C7   |          | X  |
| D5-D6   | X        | X  |
| D6-D7   |          | X  |
| E12-E1  | X        | X  |
| F12-F1  | X        | X  |
| E6-E7   | X        | X  |
| F6-F7   | X        | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | P        | I1 |
| A11-B11 | X        |    |
| A12-B12 |          | X  |
| A1-B1   |          | X  |
| A5-B5   | X        | X  |
| A6-B6   |          | X  |
| A7-B7   |          | X  |
| C11-D11 | X        | X  |
| C12-D12 |          | X  |
| C1-D1   |          | X  |
| C5-C6   | X        | X  |
| C6-C7   |          | X  |
| D5-D6   | X        | X  |
| D6-D7   |          | X  |
| E12-E1  | X        | X  |
| F12-F1  | X        | X  |
| E6-E7   | X        | X  |
| F6-F7   | X        | X  |

| CONTACT | POSITION |    |
|---------|----------|----|
|         | P        | I1 |
| A11-B11 | X        |    |
| A12-B12 |          | X  |
| A1-B1   |          | X  |
| A5-A6   | X        | X  |
| A6-A7   |          | X  |
| B5-B6   | X        | X  |
| B6-B7   |          | X  |
| C11-D11 | X        | X  |
| C12-D12 |          | X  |
| C1-D1   |          | X  |
| C5-C6   | X        | X  |
| C6-C7   |          | X  |
| D5-D6   | X        | X  |
| D6-D7   |          | X  |
| E11-F11 | X        | X  |
| E12-F12 |          | X  |
| E1-F1   |          | X  |
| E5-E6   | X        | X  |
| E6-E7   | X        | X  |
| F5-F6   | X        | X  |
| F6-F7   | X        | X  |

\* Adjacent overlap contacts are electrically connected together during transfer.

Additional Position Tabulations, Continued

**129**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | P | I |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  | X |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        |    |   |   |
| A6-B6   |          | X  | X |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 |          | X  | X |   |
| C1-D1   |          |    |   | X |
| C5-D5   | X        |    |   |   |
| C6-D6   |          | X  | X |   |
| C7-D7   |          |    |   | X |
| E12-F12 |          |    | X |   |
| F12-F1  | X        | X  |   | X |
| E6-E7   |          | X  | X |   |
| F6-F7   | X        | X  |   |   |

**130**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | P | I |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        |    |   |   |
| A6-B6   |          | X  |   |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 |          | X  |   |   |
| C1-D1   |          |    |   | X |
| C5-D5   | X        |    |   |   |
| C6-D6   |          | X  |   |   |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    |   | X |
| E5-F5   | X        |    |   |   |
| E6-F6   |          | X  |   |   |
| E7-F7   |          |    |   | X |
| G11-H11 | X        |    |   |   |
| G12-H12 |          | X  |   |   |
| G1-H1   |          |    |   | X |
| G5-H5   | X        |    |   |   |
| G6-H6   |          | X  |   |   |
| G7-H7   |          |    |   | X |

**131**

| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | P        | 11 | 12 | A |
| A11-B11 | X        | X  |    |   |
| A12-B12 |          |    | X  | X |
| A1-B1   |          |    |    | X |
| A5-B5   | X        | X  |    |   |
| A6-B6   |          |    | X  | X |
| A7-B7   |          |    |    | X |
| C11-D11 | X        | X  |    |   |
| C12-D12 |          |    | X  | X |
| C1-D1   |          |    |    | X |
| C5-C6   | X        | X  | X  |   |
| C6-C7   |          |    |    | X |
| D5-D6   | X        | X  | X  |   |
| D6-D7   |          |    |    | X |
| E11-F11 | X        | X  |    |   |
| E12-F12 |          |    | X  | X |
| E1-F1   |          |    |    | X |
| E5-E6   | X        | X  | X  |   |
| E6-E7   |          |    |    | X |
| F5-F6   | X        | X  | X  |   |
| F6-F7   |          |    |    | X |
| G12-G1  | X        |    |    |   |
| H12-H1  |          | X  | X  | X |
| G6-G7   | X        |    |    |   |
| H6-H7   |          | X  | X  | X |

**132**

| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | P        | 11 | 12 | A |
| A11-B11 | X        | X  |    |   |
| A12-B12 |          |    | X  | X |
| A1-B1   |          |    |    | X |
| A5-A6   | X        | X  | X  |   |
| A6-A7   |          |    |    | X |
| B5-B6   | X        | X  | X  |   |
| B6-B7   |          |    |    | X |
| C11-D11 | X        | X  |    |   |
| C12-D12 |          |    | X  | X |
| C1-D1   |          |    |    | X |
| C5-C6   | X        | X  | X  |   |
| C6-C7   |          |    |    | X |
| D5-D6   | X        | X  | X  |   |
| D6-D7   |          |    |    | X |
| E11-F11 | X        | X  |    |   |
| E12-F12 |          |    | X  | X |
| E1-F1   |          |    |    | X |
| E5-E6   | X        | X  | X  |   |
| E6-E7   |          |    |    | X |
| F5-F6   | X        | X  | X  |   |
| F6-F7   |          |    |    | X |
| G12-G1  | X        |    |    |   |
| H12-H1  | X        | X  | X  | X |
| G6-G7   | X        |    |    |   |
| H6-H7   |          | X  | X  | X |

**133**

| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | P        | 11 | 12 | I |
| A11-B11 | X        |    |    |   |
| A12-B12 |          | X  |    |   |
| A1-B1   |          |    |    | X |
| A5-B5   | X        |    |    |   |
| A6-B6   |          | X  |    |   |
| A7-B7   |          |    |    | X |
| C11-D11 | X        |    |    |   |
| C12-D12 |          | X  |    |   |
| C1-D1   |          |    |    | X |
| C5-D5   | X        |    |    |   |
| C6-D6   |          | X  |    |   |
| C7-D7   |          |    |    | X |
| E11-F11 | X        |    |    |   |
| E12-F12 |          | X  |    |   |
| E1-F1   |          |    |    | X |
| E5-F5   | X        |    |    |   |
| E6-F6   |          | X  |    |   |
| E7-F7   |          |    |    | X |
| G11-H11 | X        |    |    |   |
| G12-H12 |          | X  |    |   |
| G1-H1   |          |    |    | X |
| G5-H5   | X        |    |    |   |
| G6-H6   |          | X  |    |   |
| G7-H7   |          |    |    | X |
| I11-J11 | X        |    |    |   |
| I12-J12 |          | X  |    |   |
| I1-J1   |          |    |    | X |
| I5-J5   | X        |    |    |   |
| I6-J6   |          | X  |    |   |
| I7-J7   |          |    |    | X |

**134**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | P | I |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        |    |   |   |
| A6-B6   |          | X  |   |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 |          | X  |   |   |
| C1-D1   |          |    |   | X |
| C5-D5   | X        |    |   |   |
| C6-D6   |          | X  |   |   |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    |   | X |
| E5-F5   | X        |    |   |   |
| E6-F6   |          | X  |   |   |
| E7-F7   |          |    |   | X |
| G11-H11 | X        |    |   |   |
| G12-H12 |          | X  |   |   |
| G1-H1   |          |    |   | X |
| G5-H5   | X        |    |   |   |
| G6-H6   |          | X  |   |   |
| G7-H7   |          |    |   | X |
| I11-J11 | X        |    |   |   |
| I12-J12 |          | X  |   |   |
| I1-J1   |          |    |   | X |
| I5-J5   | X        |    |   |   |
| I6-J6   |          | X  |   |   |
| I7-J7   |          |    |   | X |
| K11-L11 | X        |    |   |   |
| K12-L12 |          | X  |   |   |
| K1-L1   |          |    |   | X |
| K5-L5   | X        |    |   |   |
| K6-L6   |          | X  |   |   |
| K7-L7   |          |    |   | X |

**135**

| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | 10       | 11 | 12 | P |
| A11-B11 | X        | X  | X  |   |
| A12-B12 |          | X  | X  | X |
| A1-B1   |          |    |    | X |
| A5-B5   | X        | X  | X  |   |
| A6-B6   |          |    | X  | X |
| A7-B7   |          |    |    | X |
| C11-D11 | X        | X  | X  | X |
| C12-D12 | X        | X  | X  | X |
| C1-D1   | X        | X  | X  | X |
| C5-D5   | X        | X  | X  | X |
| C6-D6   | X        | X  | X  | X |
| C7-D7   | X        | X  | X  | X |
| E11-F11 | X        |    |    |   |
| E12-F12 |          |    | X  |   |
| E1-F1   |          |    |    | X |
| E5-F5   | X        |    |    |   |
| E6-F6   |          |    | X  |   |
| E7-F7   |          |    |    | X |

**136**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 2 | 3 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    |   |   |
| A5-B5   |          |    | X |   |
| A6-B6   |          |    |   | X |
| A7-B7   |          |    |   | X |

**137**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        | X  |   |   |
| A12-B12 | X        | X  | X |   |
| A1-B1   |          | X  | X | X |
| A5-B5   |          |    | X | X |
| A6-B6   |          |    | X | X |
| A7-B7   |          |    | X | X |

**138**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        | X  |   |   |
| A12-B12 | X        | X  | X |   |
| A1-B1   |          | X  | X | X |
| A5-B5   |          |    | X | X |
| A6-B6   |          |    | X | X |
| A7-B7   |          |    | X | X |
| C11-D11 | X        | X  | X | X |
| C12-D12 | X        | X  | X | X |
| C1-D1   | X        | X  | X | X |
| C5-D5   | X        | X  | X | X |
| C6-D6   | X        | X  | X | X |
| C7-D7   | X        | X  | X | X |
| E11-F11 | X        | X  |   |   |
| E12-F12 | X        | X  |   |   |
| E1-F1   |          |    | X | X |
| E5-F5   |          |    | X | X |
| E6-F6   |          |    | X | X |
| E7-F7   |          |    | X | X |

**139**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 2 | 3 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    | X |   |
| A5-B5   |          |    | X |   |
| A6-B6   |          |    | X |   |
| A7-B7   |          |    | X |   |
| C11-D11 | X        |    |   |   |
| C12-D12 | X        |    |   |   |
| C1-D1   |          | X  |   |   |
| C5-D5   |          |    | X |   |
| C6-D6   |          |    | X |   |
| C7-D7   |          |    | X |   |
| E11-F11 | X        |    |   |   |
| E12-F12 | X        |    |   |   |
| E1-F1   |          | X  |   |   |
| E5-F5   |          |    | X |   |
| E6-F6   |          |    | X |   |
| E7-F7   |          |    | X |   |

**140**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        | X  |   |   |
| A12-B12 | X        | X  | X |   |
| A1-B1   |          | X  | X | X |
| A5-B5   |          |    | X | X |
| A6-B6   |          |    | X | X |
| A7-B7   |          |    | X | X |
| C11-D11 | X        | X  |   |   |
| C12-D12 | X        | X  |   |   |
| C1-D1   |          | X  | X | X |
| C5-D5   |          |    | X | X |
| C6-D6   |          |    | X | X |
| C7-D7   |          |    | X | X |
| E11-F11 | X        | X  |   |   |
| E12-F12 | X        | X  |   |   |
| E1-F1   |          | X  | X | X |
| E5-F5   |          |    | X | X |
| E6-F6   |          |    | X | X |
| E7-F7   |          |    | X | X |

\* Adjacent overlap contacts  
are electrically connected  
together during transfer.



## Additional Position Tabulations, Continued

| 141 | CONTACT | POSITION |    |   |   |
|-----|---------|----------|----|---|---|
|     |         | 11       | 12 | 1 | 2 |
|     | A11-B11 | x        |    |   |   |
|     | A12-B12 |          | x  |   |   |
|     | A1-B1   |          |    | x |   |
|     | A5-B5   | x        |    |   |   |
|     | A6-B6   |          | x  |   |   |
|     | A7-B7   |          |    | x |   |
|     | C11-D11 |          |    |   | x |
|     | C12-D12 |          |    |   | x |
|     | C1-D1   |          |    |   | x |
|     | C5-D5   |          |    | x |   |
|     | C6-D6   |          |    |   | x |
|     | C7-D7   |          |    |   | x |
|     | E11-F11 | x        |    |   |   |
|     | E12-F12 |          | x  |   |   |
|     | E1-F1   |          |    | x |   |
|     | E5-F5   | x        |    |   |   |
|     | E6-F6   |          | x  |   |   |
|     | E7-F7   |          |    | x |   |
|     | G11-H11 |          |    |   | x |
|     | G12-H12 |          |    |   | x |
|     | G1-H1   |          |    |   | x |
|     | G5-H5   |          |    | x |   |
|     | G6-H6   |          |    |   | x |
|     | G7-H7   |          |    |   | x |

| 143 | CONTACT | POSITION |    |   |   |   |   |   |   |   |   |
|-----|---------|----------|----|---|---|---|---|---|---|---|---|
|     |         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|     | A11-B11 | x        |    |   |   |   |   |   |   |   |   |
|     | A12-B12 |          | x  |   |   |   |   |   |   |   |   |
|     | A1-B1   |          |    | x |   |   |   |   |   |   |   |
|     | A5-B5   |          |    |   |   | x |   |   |   |   |   |
|     | A6-B6   |          |    |   |   |   | x |   |   |   |   |
|     | A7-B7   |          |    |   |   |   |   | x |   |   |   |
|     | C11-D11 |          |    | x |   |   |   |   |   |   |   |
|     | C12-D12 |          |    |   | x |   |   |   |   |   |   |
|     | C1-D1   |          |    |   |   | x |   |   |   |   |   |
|     | C5-D5   |          |    |   |   |   |   | x |   |   |   |
|     | C6-D6   |          |    |   |   |   |   |   | x |   |   |
|     | C7-D7   |          |    |   |   |   |   |   |   | x |   |

| 144 | CONTACT | POSITION |    |   |   |   |   |   |   |   |   |
|-----|---------|----------|----|---|---|---|---|---|---|---|---|
|     |         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|     | A11-B11 | x        |    |   |   |   |   |   |   |   |   |
|     | A12-B12 |          | x  |   |   |   |   |   |   |   |   |
|     | A1-B1   |          |    | x |   |   |   |   |   |   |   |
|     | A5-B5   |          |    |   |   | x |   |   |   |   |   |
|     | A6-B6   |          |    |   |   |   | x |   |   |   |   |
|     | A7-B7   |          |    |   |   |   |   | x |   |   |   |
|     | C11-D11 |          |    | x |   |   |   |   |   |   |   |
|     | C12-D12 |          |    |   | x |   |   |   |   |   |   |
|     | C1-D1   |          |    |   |   | x |   |   |   |   |   |
|     | C5-D5   |          |    |   |   |   |   | x |   |   |   |
|     | C6-D6   |          |    |   |   |   |   |   | x |   |   |
|     | C7-D7   |          |    |   |   |   |   |   |   | x |   |
|     | E11-F11 | x        |    |   |   |   |   |   |   |   |   |
|     | E12-F12 |          | x  |   |   |   |   |   |   |   |   |
|     | E1-F1   |          |    | x |   |   |   |   |   |   |   |
|     | E5-F5   |          |    |   |   | x |   |   |   |   |   |
|     | E6-F6   |          |    |   |   |   | x |   |   |   |   |
|     | E7-F7   |          |    |   |   |   |   | x |   |   |   |
|     | G11-H11 |          |    | x |   |   |   |   |   |   |   |
|     | G12-H12 |          |    |   | x |   |   |   |   |   |   |
|     | G1-H1   |          |    |   |   | x |   |   |   |   |   |
|     | G5-H5   |          |    |   |   |   |   | x |   |   |   |
|     | G6-H6   |          |    |   |   |   |   |   | x |   |   |
|     | G7-H7   |          |    |   |   |   |   |   |   | x |   |

| 146 | CONTACT | POSITION |    |
|-----|---------|----------|----|
|     |         | 11       | 12 |
|     | A11-B11 |          | x  |
|     | A12-B12 |          | x  |
|     | A1-B1   |          | x  |
|     | A2-B2   |          | x  |
|     | A3-B3   |          | x  |
|     | A4-B4   |          | x  |
|     | A5-B5   |          | x  |
|     | A6-B6   |          | x  |
|     | A7-B7   |          | x  |
|     | A8-B8   |          | x  |
|     | A9-B9   |          | x  |
|     | A10-B10 |          | x  |

| 147 | CONTACT | POSITION |    |
|-----|---------|----------|----|
|     |         | 11       | 12 |
|     | A12-B12 |          | x  |
|     | A1-B1   |          | x  |
|     | A2-B2   |          | x  |
|     | A3-B3   |          | x  |
|     | A4-B4   |          | x  |
|     | A5-B5   |          | x  |
|     | A6-B6   |          | x  |
|     | A7-B7   |          | x  |
|     | A8-B8   |          | x  |
|     | A9-B9   |          | x  |
|     | A10-B10 |          | x  |
|     | A11-B11 |          | x  |
|     | C12-D12 |          | x  |
|     | C1-D1   |          | x  |
|     | C2-D2   |          | x  |
|     | C3-D3   |          | x  |
|     | C4-D4   |          | x  |
|     | C5-D5   |          | x  |
|     | C6-D6   |          | x  |
|     | C7-D7   |          | x  |
|     | C8-D8   |          | x  |
|     | C9-D9   |          | x  |
|     | C10-D10 |          | x  |
|     | C11-D11 |          | x  |

| 142 | CONTACT | POSITION |    |   |   |
|-----|---------|----------|----|---|---|
|     |         | 11       | 12 | 1 | 2 |
|     | A11-B11 | x        |    |   |   |
|     | A12-B12 |          | x  |   |   |
|     | A1-B1   |          |    | x |   |
|     | A5-B5   | x        |    |   |   |
|     | A6-B6   |          | x  |   |   |
|     | A7-B7   |          |    | x |   |
|     | C11-D11 |          |    | x |   |
|     | C12-D12 |          |    |   | x |
|     | C1-D1   |          |    |   | x |
|     | C5-D5   |          |    | x |   |
|     | C6-D6   |          |    |   | x |
|     | C7-D7   |          |    |   | x |
|     | E11-F11 | x        |    |   |   |
|     | E12-F12 |          | x  |   |   |
|     | E1-F1   |          |    | x |   |
|     | E5-F5   | x        |    |   |   |
|     | E6-F6   |          | x  |   |   |
|     | E7-F7   |          |    | x |   |
|     | G11-H11 |          |    | x |   |
|     | G12-H12 |          |    |   | x |
|     | G1-H1   |          |    |   | x |
|     | G5-H5   |          |    | x |   |
|     | G6-H6   |          |    |   | x |
|     | G7-H7   |          |    |   | x |
|     | I11-J11 | x        |    |   |   |
|     | I12-J12 |          | x  |   |   |
|     | I1-J1   |          |    | x |   |
|     | I5-J5   | x        |    |   |   |
|     | I6-J6   |          | x  |   |   |
|     | I7-J7   |          |    | x |   |
|     | K11-L11 |          |    | x |   |
|     | K12-L12 |          |    |   | x |
|     | K1-L1   |          |    |   | x |
|     | K5-L5   |          |    | x |   |
|     | K6-L6   |          |    |   | x |
|     | K7-L7   |          |    |   | x |

| 145 | CONTACT | POSITION |    |   |   |   |   |   |   |   |   |   |    |    |    |   |   |   |   |
|-----|---------|----------|----|---|---|---|---|---|---|---|---|---|----|----|----|---|---|---|---|
|     |         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 |
|     | A11-B11 | x        | x  |   |   |   |   |   |   |   |   |   |    |    |    |   |   |   |   |
|     | A12-B12 |          |    | x | x | x |   |   |   |   |   |   |    |    |    |   |   |   |   |
|     | A1-B1   |          |    |   |   | x | x | x |   |   |   |   |    |    |    |   |   |   |   |
|     | A5-B5   |          |    |   |   |   |   |   | x | x | x |   |    |    |    |   |   |   |   |
|     | A6-B6   |          |    |   |   |   |   |   |   | x | x | x |    |    |    |   |   |   |   |
|     | A7-B7   |          |    |   |   |   |   |   |   |   | x | x | x  |    |    |   |   |   |   |
|     | C11-D11 | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | C12-D12 | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | C1-D1   | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | C5-D5   | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | C6-D6   | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | C7-D7   | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | E11-F11 | x        | x  |   |   |   |   |   |   |   |   |   |    |    |    |   |   |   |   |
|     | E12-F12 |          |    | x | x | x |   |   |   |   |   |   |    |    |    |   |   |   |   |
|     | E1-F1   |          |    |   |   | x | x | x |   |   |   |   |    |    |    |   |   |   |   |
|     | E5-F5   |          |    |   |   |   |   |   | x | x | x |   |    |    |    |   |   |   |   |
|     | E6-F6   |          |    |   |   |   |   |   |   | x | x | x |    |    |    |   |   |   |   |
|     | E7-F7   |          |    |   |   |   |   |   |   |   | x | x | x  |    |    |   |   |   |   |
|     | G11-H11 |          |    |   |   |   |   | x | x | x |   |   |    |    |    |   |   |   |   |
|     | G12-H12 |          |    |   |   |   |   |   | x | x | x |   |    |    |    |   |   |   |   |
|     | G1-H1   |          |    |   |   |   |   |   |   | x | x | x |    |    |    |   |   |   |   |
|     | G5-H5   |          |    |   |   |   |   |   |   |   |   |   | x  | x  | x  |   |   |   |   |
|     | G6-H6   |          |    |   |   |   |   |   |   |   |   |   |    |    | x  | x | x |   |   |
|     | G7-H7   |          |    |   |   |   |   |   |   |   |   |   |    |    |    |   | x | x | x |
|     | I11-J11 | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | I12-J12 | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | I1-J1   | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | I5-J5   | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | I6-J6   | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | I7-J7   | x        | x  | x | x | x | x | x | x | x | x | x | x  | x  | x  | x | x | x | x |
|     | K11-L11 |          |    |   |   |   |   | x | x | x |   |   |    |    |    |   |   |   |   |
|     | K12-L12 |          |    |   |   |   |   |   | x | x | x |   |    |    |    |   |   |   |   |
|     | K1-L1   |          |    |   |   |   |   |   |   | x | x | x |    |    |    |   |   |   |   |
|     | K5-L5   |          |    |   |   |   |   |   |   |   |   |   | x  | x  | x  |   |   |   |   |
|     | K6-L6   |          |    |   |   |   |   |   |   |   |   |   |    |    | x  | x | x |   |   |
|     | K7-L7   |          |    |   |   |   |   |   |   |   |   |   |    |    |    |   | x | x | x |

| 148 | CONTACT | POSITION |    |
|-----|---------|----------|----|
|     |         | 11       | 12 |
|     | A11-B11 |          | x  |
|     | A12-B12 |          | x  |
|     | A1-B1   |          | x  |
|     | A2-B2   |          | x  |
|     | A3-B3   |          | x  |
|     | A4-B4   |          | x  |
|     | A5-B5   |          | x  |
|     | A6-B6   |          | x  |
|     | A7-B7   |          | x  |
|     | A8-B8   |          | x  |
|     | A9-B9   |          | x  |
|     | A10-B10 |          | x  |



Additional Position Tabulations, Continued

**149**

| CONTACT | POSITION | 11 | 12 | 1 |
|---------|----------|----|----|---|
| A11-B11 | X        |    |    |   |
| A12-B12 | X        |    |    |   |
| A1-B1   |          |    |    | X |
| A2-B2   | X        |    |    |   |
| A3-B3   | X        |    |    |   |
| A4-B4   |          |    |    | X |
| A5-B5   | X        |    |    |   |
| A6-B6   | X        |    |    |   |
| A7-B7   |          |    |    | X |
| A8-B8   | X        |    |    |   |
| A9-B9   | X        |    |    |   |
| A10-B10 |          |    |    | X |
| C11-D11 | X        |    |    |   |
| C12-D12 | X        |    |    |   |
| C1-D1   |          |    |    | X |
| C2-D2   | X        |    |    |   |
| C3-D3   | X        |    |    |   |
| C4-D4   |          |    |    | X |
| C5-D5   | X        |    |    |   |
| C6-D6   | X        |    |    |   |
| C7-D7   |          |    |    | X |
| C8-D8   | X        |    |    |   |
| C9-D9   | X        |    |    |   |
| C10-D10 | X        |    |    |   |

**150**

| CONTACT | POSITION | P | 11 | 12 | A | 1 |
|---------|----------|---|----|----|---|---|
| A11-B11 | X        | X |    |    |   |   |
| A12-B12 |          |   |    |    |   |   |
| A1-B1   |          |   |    |    |   | X |
| A2-B2   | X        | X |    |    |   |   |
| A3-B3   |          |   |    |    |   | X |
| A4-B4   |          |   |    |    |   | X |
| A5-A6   | X        | X |    |    |   |   |
| A6-A7   |          |   |    |    |   | X |
| B5-B6   | X        | X |    |    |   | X |
| B6-B7   |          |   |    |    |   | X |
| A8-A9   | X        | X |    |    |   | X |
| A9-A10  |          |   |    |    |   | X |
| B8-B9   | X        | X |    |    |   | X |
| B9-B10  |          |   |    |    |   | X |

**151**

| CONTACT | POSITION | P | 11 | 12 | A | 1 |
|---------|----------|---|----|----|---|---|
| A11-B11 | X        | X |    |    |   |   |
| A12-B12 |          |   |    |    |   |   |
| A1-B1   |          |   |    |    |   | X |
| A2-B2   | X        | X |    |    |   |   |
| A3-B3   |          |   |    |    |   | X |
| A4-B4   |          |   |    |    |   | X |
| A5-A6   | X        | X |    |    |   |   |
| A6-A7   |          |   |    |    |   | X |
| B5-B6   | X        | X |    |    |   | X |
| B6-B7   |          |   |    |    |   | X |
| A8-A9   | X        | X |    |    |   | X |
| A9-A10  |          |   |    |    |   | X |
| B8-B9   | X        | X |    |    |   | X |
| B9-B10  |          |   |    |    |   | X |
| C12-C1  | X        |   |    |    |   | X |
| D12-D1  |          |   |    |    |   | X |
| C2-C3   | X        |   |    |    |   | X |
| D2-D3   |          |   |    |    |   | X |
| C4-C5   | X        |   |    |    |   | X |
| D4-D5   |          |   |    |    |   | X |
| C6-C6   | X        |   |    |    |   | X |
| D6-D7   |          |   |    |    |   | X |
| C8-C9   | X        |   |    |    |   | X |
| D8-D9   |          |   |    |    |   | X |
| C10-C11 | X        |   |    |    |   | X |
| D10-D11 |          |   |    |    |   | X |

**152**

| CONTACT | POSITION | 11 | 12 | 1 | 2 |
|---------|----------|----|----|---|---|
| A11-B11 | X        |    |    |   |   |
| A12-B12 | X        |    |    |   |   |
| A1-B1   |          |    |    |   | X |
| A2-B2   |          |    |    |   | X |
| A3-B3   | X        |    |    |   |   |
| A4-B4   |          |    |    |   | X |
| A5-B5   |          |    |    |   | X |
| A6-B6   |          |    |    |   | X |
| A7-B7   | X        |    |    |   |   |
| A8-B8   |          |    |    |   | X |
| A9-B9   |          |    |    |   | X |
| A10-B10 |          |    |    |   | X |

**153**

| CONTACT | POSITION | 10 | 11 | 12 | 1 | 2 | 3 |
|---------|----------|----|----|----|---|---|---|
| A10-B10 | X        |    |    |    |   |   |   |
| A11-B11 |          |    |    |    |   |   |   |
| A12-B12 |          |    |    |    |   |   |   |
| A1-B1   |          |    |    |    |   |   | X |
| A2-B2   |          |    |    |    |   |   | X |
| A3-B3   |          |    |    |    |   |   | X |
| A4-B4   | X        |    |    |    |   |   |   |
| A5-B5   |          |    |    |    |   |   |   |
| A6-B6   |          |    |    |    |   |   |   |
| A7-B7   |          |    |    |    |   |   | X |
| A8-B8   |          |    |    |    |   |   | X |
| A9-B9   |          |    |    |    |   |   | X |

**154**

| CONTACT | POSITION | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---------|----------|----|---|---|---|---|---|---|---|---|---|----|----|
| A12-B12 | X        |    |   |   |   |   |   |   |   |   |   |    |    |
| A1-B1   |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A2-B2   |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A3-B3   |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A4-B4   |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A5-B5   |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A6-B6   |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A7-B7   |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A8-B8   |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A9-B9   |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A10-B10 |          |    |   |   |   |   |   |   |   |   |   |    |    |
| A11-B11 |          |    |   |   |   |   |   |   |   |   |   |    | X  |

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**Form 34219-A** (For ordering switches not covered in this publication or to outline desired modifications.)

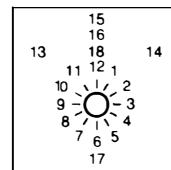
### SWITCH POSITION TABULATION

TYPE W2 SWITCH - REFER TO DESCRIPTIVE BULLETIN 34-251  
WESTINGHOUSE FORM 34219-A

|                                                                    |          |                            |    |          |    |      |   |                 |   |  |
|--------------------------------------------------------------------|----------|----------------------------|----|----------|----|------|---|-----------------|---|--|
| SWITCH STYLE NO.<br>LONDON DIVISION<br>WILL ASSIGN<br>STYLE NUMBER |          | PURCHASER<br>XYZ STEEL CO. |    | G.O. NO. |    | ENG. |   | DATE<br>9/09/99 |   |  |
| SWITCH POSITION TABULATION (Front View)                            |          |                            |    |          |    |      |   |                 |   |  |
| CONTACT                                                            | POSITION |                            |    |          |    |      |   |                 |   |  |
|                                                                    | 8        | 9                          | 10 | 11       | 12 | 1    | 2 | 3               | 4 |  |
| A8-B8                                                              | X        |                            |    |          |    |      |   |                 |   |  |
| A9-B9                                                              |          | X                          |    |          |    |      |   |                 |   |  |
| A10-B10                                                            |          |                            | X  |          |    |      |   |                 |   |  |
| A11-B11                                                            |          |                            |    | X        |    |      |   |                 |   |  |
| A12-B12                                                            |          |                            |    |          | X  |      |   |                 |   |  |
| A1-B1                                                              |          |                            |    |          |    | X    |   |                 |   |  |
| A2-B2                                                              |          |                            |    |          |    |      | X |                 |   |  |
| A3-B3                                                              |          |                            |    |          |    |      |   | X               |   |  |
| A4-B4                                                              |          |                            |    |          |    |      |   |                 | X |  |

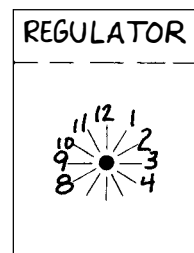
1<sup>ST</sup> STAGE SHOWN  
2<sup>ND</sup> TO 4<sup>TH</sup> STAGE (C-D,  
E-F, G-H) ARE SAME

CONNECTORS ON SW. TERMINALS AS FOLLOWS:

[illegible]

STAMP N.P. AS FOLLOWS:

|              |                      |
|--------------|----------------------|
| 1 = <u>1</u> | 10 = <u>10</u>       |
| 2 = <u>2</u> | 11 = <u>11</u>       |
| 3 = <u>3</u> | 12 = <u>12</u>       |
| 4 = <u>4</u> | 13 = _____           |
| 5 = _____    | 14 = _____           |
| 6 = _____    | 15 = <u>REGULATO</u> |
| 7 = _____    | 16 = _____           |
| 8 = <u>8</u> | 17 = _____           |
| 9 = <u>9</u> | 18 = _____           |



FACEPLATE (F.V.)  
SPECIFY MARKINGS

CONTACTS: ~~Momentary~~ - Maintained

HANDLE: Fixed - ~~Removable Key~~

~~Over~~ - Round - ~~Pistol Grip~~

MOUNTING: 1/8 - 1/4 - 1 1 1/2 2 Thick Panel

TARGET: ~~XXXX~~ - No

STAGE CONTACTS: 6 - 12

LOCATION

DEPT.

NAME \_\_\_\_\_

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Form 34219-A (For ordering switches not covered in this publication or to outline desired modifications.)

SWITCH POSITION TABULATION  
TYPE W2 SWITCH - REFER TO DESCRIPTIVE BULLETIN 34-251  
WESTINGHOUSE FORM 34219-A

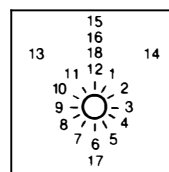
|                                                                    |  |                             |          |      |                 |
|--------------------------------------------------------------------|--|-----------------------------|----------|------|-----------------|
| SWITCH STYLE NO.<br>LONDON DIVISION<br>WILL ASSIGN STYLE<br>NUMBER |  | PURCHASER<br>WIDGET BUILDER | G.O. NO. | ENG. | DATE<br>9/09/99 |
|--------------------------------------------------------------------|--|-----------------------------|----------|------|-----------------|

| SWITCH POSITION TABULATION (Front View) |           |      |          |          |       |  |  |  |  |  |  |
|-----------------------------------------|-----------|------|----------|----------|-------|--|--|--|--|--|--|
| CONTACT                                 | POSITION  |      |          |          |       |  |  |  |  |  |  |
|                                         | PULL<br>T | TRIP | OFF<br>T | AFT<br>C | CLOSE |  |  |  |  |  |  |
| A11-B11                                 | X         | X    |          |          |       |  |  |  |  |  |  |
| A12-A12                                 |           |      | X        | X        |       |  |  |  |  |  |  |
| A1-B1                                   |           |      |          |          | X     |  |  |  |  |  |  |
| A5-A6                                   | X         | X    | X        |          |       |  |  |  |  |  |  |
| A6-A7                                   |           |      |          | X        | X     |  |  |  |  |  |  |
| B5-B6                                   | X         | X    | X        |          |       |  |  |  |  |  |  |
| B6-B7                                   |           |      |          | X        | X     |  |  |  |  |  |  |
| C11-D11                                 | X         | X    |          |          |       |  |  |  |  |  |  |
| C12-D12                                 |           |      | X        | X        |       |  |  |  |  |  |  |
| C1-D1                                   |           |      |          |          | X     |  |  |  |  |  |  |
| C5-C6                                   | X         | X    | X        |          |       |  |  |  |  |  |  |
| C6-C7                                   |           |      |          | X        | X     |  |  |  |  |  |  |
| D5-D6                                   | X         | X    | X        |          |       |  |  |  |  |  |  |
| D6-D7                                   |           |      |          | X        | X     |  |  |  |  |  |  |

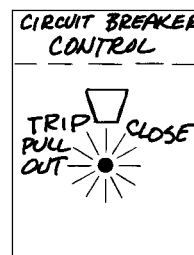
CONNECTORS ON SW. TERMINALS AS FOLLOWS.

| BETWEEN |       | BETWEEN |       | BETWEEN |       | BETWEEN |       |
|---------|-------|---------|-------|---------|-------|---------|-------|
| TERM.   | TERM. | TERM.   | TERM. | TERM.   | TERM. | TERM.   | TERM. |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |
|         |       |         |       |         |       |         |       |



STAMP N.P. AS FOLLOWS:

- 1 = CLOSE      10 = PULL  
2 =              11 = TRIP  
3 =              12 =  
4 =              13 =  
5 =              14 =  
6 =              15 =  
7 =              16 =  
8 =              17 =  
9 = OUT        18 =



CONTACTS: Momentary - Maintained  
HANDLE: Fixed - Removable Key  
Over - Round - Pistol Grip  
MOUNTING: 1/8 - 1/4 - 1 - 1 1/2 - 2, Thick Panel  
TARGET: Yes - No  
STAGE CONTACTS: 6 - 12

LOCATION

DEPT.

NAME

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**Form 34219-A** (For ordering switches not covered in this publication or to outline desired modifications.)

## SWITCH POSITION TABULATION

TYPE W2 SWITCH - REFER TO DESCRIPTIVE BULLETIN 34-251  
WESTINGHOUSE FORM 34219-A

[illegible]



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Westinghouse Electric Corporation  
Distribution and Control Business Unit  
London, Kentucky, U.S.A. 40741



Westinghouse



## Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

### Application

The Type W-2 switch is designed for use as an instrument, control or general purpose switch. It is compact, yet of sufficient size to provide long, trouble-free service when applied within the specified ratings.

Design flexibility of internal parts and contacting, plus external jumpering of the contact studs affords almost limitless switching combinations for relatively few standard components. The design flexibility is provided in the basic switch styles. A complete switch is made up of a basic switch style, one of several styled handles, a nameplate connector diagram style and a nameplate.

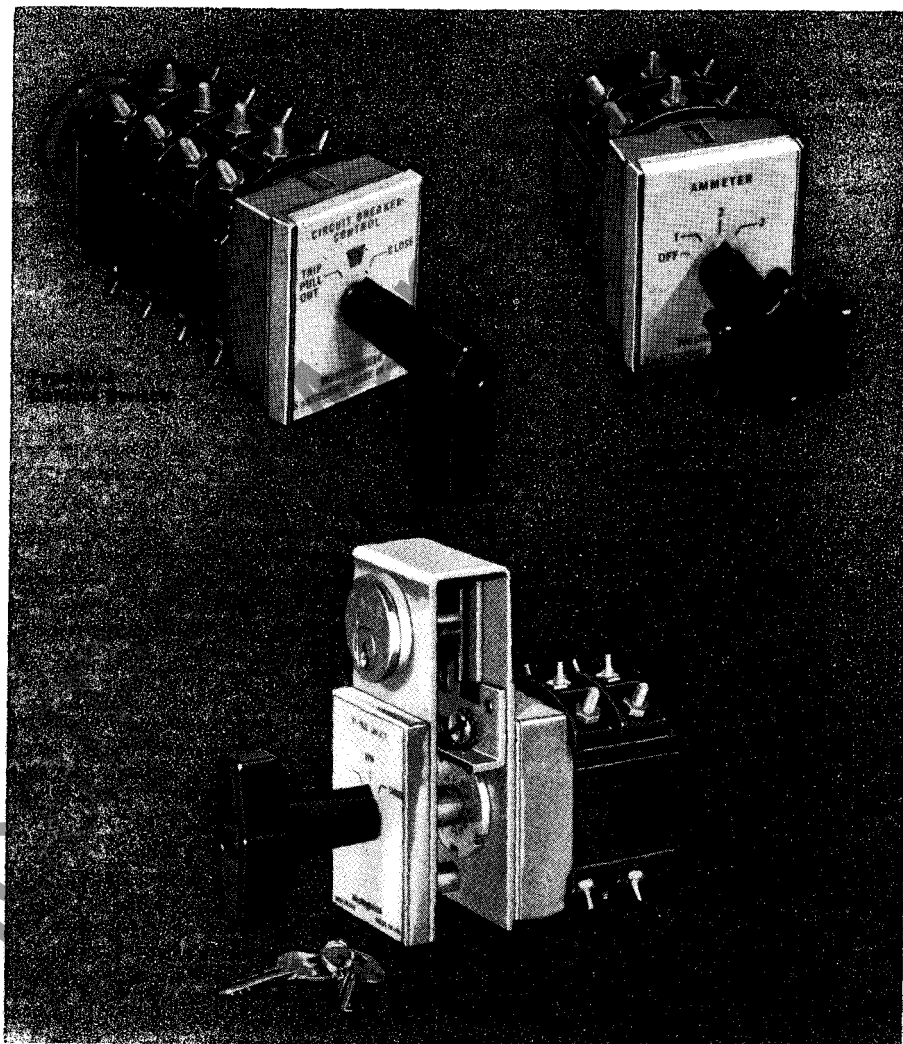
The W-2 switch may be ordered as a single style unit where such a style meets a specific application. Where a single listed style does not meet a specific application, the desired switch may be ordered by specifying the required styled components.

**Instrument Switches:** Maintained contact type for use with all classes of electrical instruments, relays, meters, and for performing various circuit combinations. Designed for panel mounting and equipped with handles for manual operation.

**Control Switches:** Momentary contact type being spring return to the original or "off" position. For use with circuit breakers and other electrically controlled apparatus. Panel mounting. Handles for manual operation.

The Type W-2 switch can be furnished with a tumbler pin keylock. Such lock can be assembled either to the right or to the left of the switch unit on the horizontal center line, or, as is considered standard, above the switch unit on the vertical center line as shown in the illustration. The unit is so designed as to permit locking the switch in any one or in each of several positions. The position or positions in which a switch is to be locked must be specified on order.

The style numbers shown in this bulletin apply to switches for mounting on  $\frac{1}{8}$  -  $\frac{1}{4}$  inch thick panels only. Switches for mounting on thicker panels may be ordered as "similar to" a desired style except for thick panel.



### Advantages

- Small Size
- Variable Circuitry by "You Wire It"
- More Contacts per Unit Volume
- Roller-Wipe Spring Actuated Contacting
- Momentary and Maintained Contact Designs, or in Combination
- Greater Availability of Contacts with Terminal Identification for Automated Wiring or Application Changes in Field, See Page 23
- Double Break Contacts per Stage

### In This Bulletin

| Instrument and Control Switches | Page  |
|---------------------------------|-------|
| Application                     | 1     |
| Design Features                 | 2     |
| Operation                       | 3     |
| Construction Details            | 4     |
| Standard Switches               | 5     |
| Position Tabulations            | 6-17  |
| Basic Switches                  | 18    |
| Additional Position Tabulations | 19-22 |
| Dimensions                      | 22    |
| Ordering Information            | 23-24 |

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## Design Features

### General Construction

The W-2 switch consists essentially of an operating handle, face plate, control housing, contact frame assembly and rotor assembly. It can be built up in any number of stages from 1 to 9, which stages are clamped together and to the control housing by two tie bolts. A steel operating shaft ties the contact rotors together. A metal cover on the rear holds the position stop pins, retains the shaft and provides basic switch identification. For push or pull switches, the metal cover is replaced by a polycarbonate cover which houses the pull-out mechanism.

### Switch Positions

Each switch has a minimum of two and a maximum of twelve rotary positions with a 30° throw between positions, irrespective of the number. Each rotary position coincides precisely with the nameplate markings. The degree of throw between positions is fixed and cannot be changed. The number of positions of each switch can be altered by removing the rear cover and changing the position of the "stop" pin or pins located in the rear housing spacer. In addition to rotary motion, the W-2 switch can be provided with a lateral movement (push-pull) of the rotor.

### Contact Frames

Two contact frame sizes are available; the half frame with six sets of contacts; three sets on the top at 11, 12 and 1 o'clock positions and three sets on the bottom at 5, 6 and 7 o'clock positions. The full frame with 12 sets of contacts, each set located at 30° intervals around its perimeter as are the numbers on a clock. The contact frames are made of glass polyester insulating material.

### Contacts

Switches are usually referred to as "so many stages long". For a W-2 switch, a stage of contacts consists of a contact frame (either 6 or 12 contact sets) and a rotor.

At every position location on the frame, there are two contact terminal studs in line (a set) per stage. Each of these studs is one piece, made of bronze alloy and silver plated.

### Rotors

The rotors are standard in design and hold the roller contacts. Each rotor, made of glass polyester insulating material, rotates independently between the stage spacer plates. The rotor assembly is equipped with one to six rollers (as determined by the required circuitry) each of which makes contact with two adjacent stationary terminal studs to complete a circuit and so affording a double, series break contact. The silver-plated bronze

alloy roller contacts provide a rolling, wiping action, are self-aligning on assembly and require no adjustment of contact pressure for the life of the switch.

### Contact Flexibility

Basic "you wire it" flexibility is available in the Type W-2 switch. While the internal contacting is standardized for each basic type of switch; such as ammeter, voltmeter, circuit breaker, etc., by using available insulated jumpers, connections between external switch terminals can be made to obtain the desired contacting for a specific application. This minimizes the number of basic styled switches that otherwise would be required.

### Switch Dial

The Type W-2 switch dial consists of two parts; i.e., a dial plate and a nameplate.

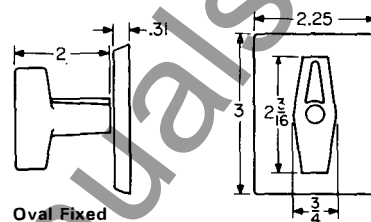
The standard control switch dial plate is die cast aluminum, with red and green target parts, where required, and serves as the base for mounting the nameplate. The nameplate is made of a white ABS material on which is stamped in black the desired position markings.

### Handles

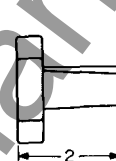
Handles for the Type W-2 switch are made of a phenolic insulating material designed to afford a smooth, easy, and comfortable grip of pleasing appearance. Each handle has a recessed arrow molded into it as a visual aid in positioning.

The handles are made in four shapes, i.e., oval, round, pistol grip, and large pistol grip. Each of the shapes can be obtained in the fixed type or the removable key type. The fixed handles are fastened to the switch shaft by a screw through the front of the handle.

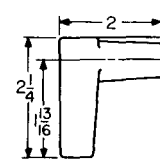
There is also available a combination removable key type handle in the pistol grip shape that can be used to operate both the Type W-2 and the Type W switches designed for removable key operation.



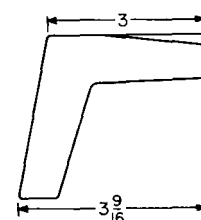
Oval Fixed  
S # 501B787H01



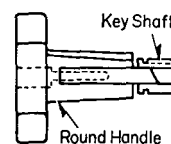
Round Notched Fixed  
S # 310C624H01



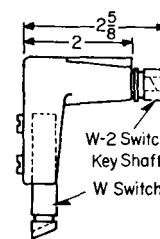
Pistol Grip Fixed  
S # 310C624H02



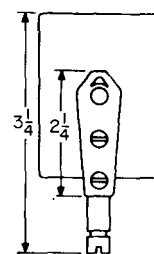
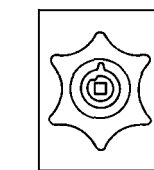
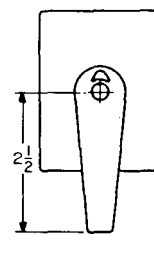
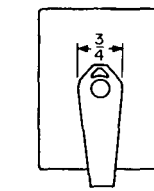
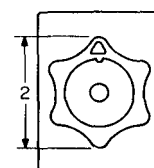
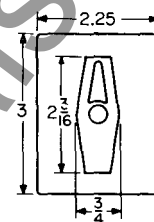
Large Pistol Grip Fixed  
S # 677C101H01



Removable



Combination



## Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

### Operation

The Type W-2 switch is a rotary roller action switch. Rotation of the shaft causes the rotor rollers to roll from one set of stationary contacts to another. The number of roller contacts can vary from 1 to 6 depending on the number of rotary positions required for the switch application. Each roller contact, moving radially, is held in and guided by a slot in the rotor arm. The rollers are pushed outward by spring pressure. Between roller and spring there is an insulated spring seat to reduce friction and wear. On standard potential contacts, an insulated wheel is used on both ends of the roller contact which wheels roll inside the switch stator frame. This arrangement reduces the friction of the spring-loaded roller in riding up on the stationary contact and also results in an increased air gap as a result of faster contact separation.

Overlapping contacts are obtained by increasing the diameter of the contact rollers of the shorting bar. At mid-position the roller spans the space between the stationary contacts. Such rollers provide a make-before-break contact in going from one position to an adjacent one.

The Type W-2 switch is available in both the maintained and the spring return types. Both types use a housing that is  $\frac{3}{8}$ " deep, located between the back surface of the dial plate and the frame-rotor unit. This feature permits conversion from one type to another with a minimum of parts, time and experience.

**Maintained Type:** On a switch of this type, the switch is held in rotary position by a starwheel mechanism. The mechanism consists of a notched, molded wheel rotating between two metal rollers mounted on spring loaded arms. This arrangement provides a positive snap action as the handle is turned.

**Momentary Type:** This type uses a rotor that is returned to its original position by a double coil wound spring. The spring offers minimum opposition to movement of the switch handle, but is sufficiently strong to operate the rotor for all required contacting.

For current circuits, there is available an assembly of normally closed contact between front and rear terminals at each position on a stage. The assembly consists of a shorting bar across the two terminals and held closed by spring pressure. Turning the switch handle causes a cam to push the shorting bar away from the two terminals. Operating simultaneously with this contact assembly, in a different stage, are regular rollers designed and arranged so that they make a parallel circuit just prior to opening of the normally closed contact. This arrange-

ment permits overlapping transition in current metering of circuits.

On three-position switches, slip contacts are available. These contacts close when the switch operating handle is turned to the right position and remain closed after the operating handle has returned to the center position. The contacts open when the operating handle is turned to the left position and remain open upon return of the handle to the center position.

In addition to rotary motion, the W-2 switch can be provided with lateral movement (push-pull). Spring actuated roller contacts are mounted in a wafer housing fastened to the operating shaft by "E" rings. The wafer housing can only be moved by a push or pull movement. The roller contact spans two adjacent terminals on a band and it moves back and forth between two bands in a stage.

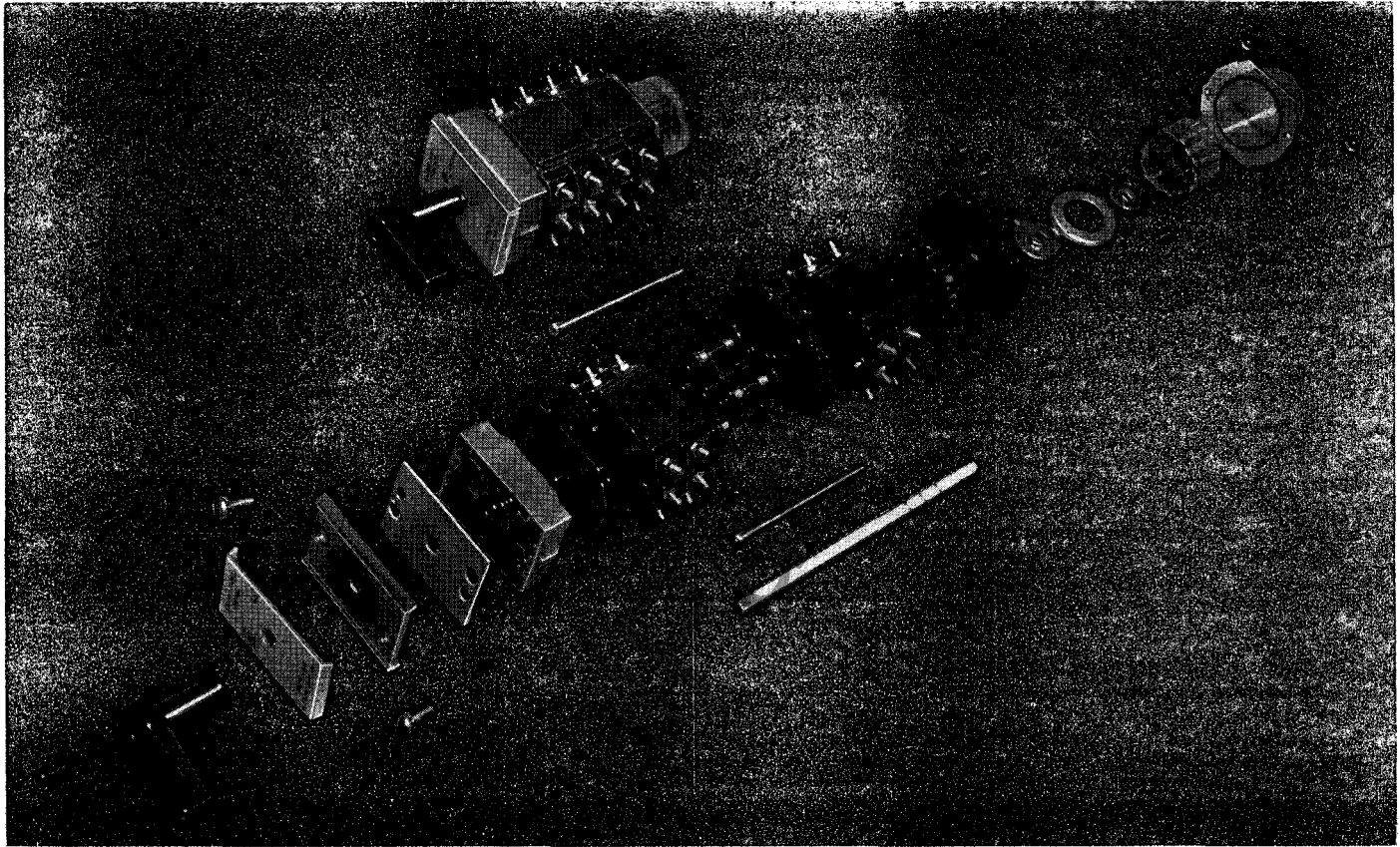
### Interrupting Ratings

| Voltage     | Amperes            |                            |                        |                            |
|-------------|--------------------|----------------------------|------------------------|----------------------------|
|             | Single Contact     |                            | Two Contacts in Series |                            |
|             | Non-Inductive Load | Inductive Load<br>.2 Henry | Non-Inductive Load     | Inductive Load<br>.2 Henry |
| 110V 60 Cy. | 60.0               | 30.0                       | ....                   | ...                        |
| 220V 60 Cy. | 30.0               | 20.0                       | 60.0                   | ...                        |
| 440V 60 Cy. | 25.0               | 10.0                       | 40.0                   | ...                        |
| 660V 60 Cy. | 15.0               | 8.0                        | 25.0                   | ...                        |
| 48V D.C.    | 40.0               | 5.0                        | ....                   | ...                        |
| 125V D.C.   | 8.0                | 2.4                        | 28.0                   | 5.0                        |
| 250V D.C.   | 1.8                | 1.1                        | 9.5                    | 3.3                        |
| 550V D.C.   | .6                 | .5                         | 2.0                    | 1.2                        |

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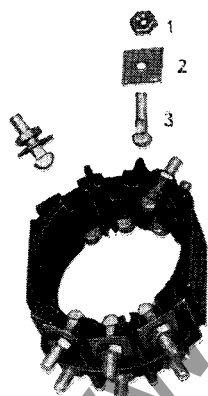


## Exploded View of Typical Control Switch



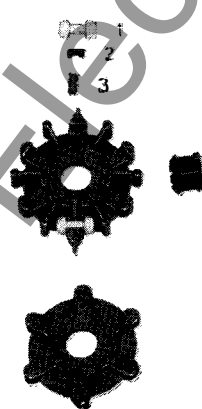
### Construction Details of Important Sub-assemblies

#### Frame 6 contacts



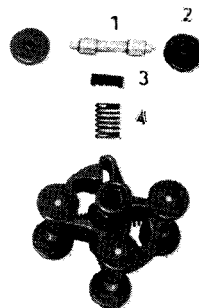
1. Hex nut
2. Window locking spacer
3. Stationary terminal contact

#### Rotor Pull contact



1. Roller contact
2. Spring seat
3. Spring

#### Rotor Standard 4 roller potential contacts



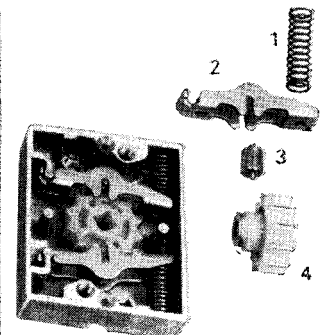
1. Standard roller contact
2. Contact wheel
3. Spring seat
4. Spring

#### Rotor Standard 6 roller overlap contacts



1. Overlap roller contact
2. Spring seat
3. Spring

#### Control housing with maintained contact mechanism



1. Starwheel spring
2. Starwheel lever
3. Starwheel roller
4. Starwheel

## Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

### Standard Switches – Style Numbers

| Figure | Switch Description                        | Complete Switch | Handle Type | Contact Type | Figure | Switch Description                     | Complete Switch | Handle Type | Contact Type |
|--------|-------------------------------------------|-----------------|-------------|--------------|--------|----------------------------------------|-----------------|-------------|--------------|
| 1      | Ammeter – 2 phase                         | 505A700G01      | R           | MA           | 18     | Temperature accurate lead compensation | 663A454G01+     | ...         | MA           |
| 2      | Ammeter – 3 phase – 2 CT's                | 505A701G02      | R           | MA           | 19     | Regulator Cutout                       | 505A712G01      | R           | MA           |
| 2A     | 3 phase – 3 independent circuits          | 505A701G01      | R           | MA           | 20     | Regulator Cutout                       | 508A224G02      | R           | MA           |
| 3      | Voltmeter – 1 phase                       | 505A747G01+     | ...         | MA           | 21     | Circuit Breaker                        | 505A713G01      | P           | MO           |
| 3A     | Frequency Meter                           | 508A467G01+     | ...         | MA           | 21A    | Circuit Breaker                        | 505A713G02      | P           | MO           |
| 3B     | Synchronizing – machine to bus            | 505A755G01+     | ...         | MA           | 21     | Circuit Breaker                        | 505A713G03      | O           | MO           |
| 4      | Voltmeter – 2 phase – 3 wire              | 505A702G01      | R           | MA           | 22     | Circuit Breaker                        | 505A714G01      | P           | MO           |
| 4A     | 2 circuit dc – 2 wire                     | 505A702G02      | R           | MA           |        | Circuit Breaker                        | 505A714G02      | O           | MO           |
| 4A     | 2 circuit dc – 2 wire                     | 505A748G01+     | ...         | MA           | 23     | Circuit Breaker                        | 505A717G01      | P           | MO           |
| 4B     | Dc – 3 wire                               | 505A702G03      | R           | MA           |        | Circuit Breaker                        | 505A717G03      | O           | MO           |
| 4C     | 3 phase – 3 wire                          | 505A702G04      | R           | MA           | 24     | Circuit Breaker                        | 505A718G01      | P           | MO           |
| 4C     | 3 phase – 3 wire                          | 505A749G01+     | ...         | MA           | 25     | Circuit Breaker                        | 505A720G01      | P           | MO           |
| 4D     | 3 phase – 4 wire                          | 505A702G05      | R           | MA           |        | Circuit Breaker                        | 505A720G03      | O           | MO           |
| 4D     | 3 phase – 4 wire                          | 505A762G01+     | ...         | MA           | 26     | Circuit Breaker                        | 508A244G01      | P           | MO           |
| 5      | Voltmeter – 4 circuit                     | 505A704G01      | R           | MA           |        | Circuit Breaker                        | 508A244G02      | O           | MO           |
| 6      | Voltmeter                                 |                 |             |              | 27     | Circuit Breaker                        | 508A262G01      | P           | MO           |
| 6A     | 3 phase and phase-to-neutral              | 505A705G01      | R           | MA           |        | Circuit Breaker                        | 508A262G03      | O           | MO           |
| 6A     | two 3 phase circuits                      | 505A705G02      | R           | MA           | 28     | Circuit Breaker                        | 508A264G01      | O           | MO           |
| 6B     | 6 circuit                                 | 505A705G03      | R           | MA           |        | Circuit Breaker                        | 508A264G02      | P           | MO           |
| 7      | Wattmeter                                 | 505A752G01+     | ...         | MA           | 29     | Voltage Control                        | 505A703G01      | P           | MO           |
| 8      | Power Factor Meter                        | 505A753G01+     | ...         | MA           |        | Voltage Control                        | 505A703G06      | O           | MO           |
| 9      | Power Factor Meter current transfer only  | 505A754G01+     | ...         | MA           | 29A    | Speed Control                          | 505A703G02      | P           | MO           |
| 10     | Synchronizing between machines            | 505A757G01+     | ...         | MA           |        | Speed Control                          | 505A703G07      | O           | MO           |
| 11     | Temperature approximate lead compensation | 658A667G01      | R           | MA           | 30     | Voltage Control                        | 505A715G01      | P           | MO           |
| 12     | Temperature approximate lead compensation | 663A488G01      | R           | MA           |        | Voltage Control                        | 505A715G05      | O           | MO           |
| 13     | Temperature accurate lead compensation    | 787A936G01      | R           | MA           | 31     | Voltage Control                        | 505A716G01      | O           | MO           |
| 14     | Temperature accurate lead compensation    | 661A210G01      | R           | MA           | 31A    | Electrode Control                      | 505A716G02      | O           | MO           |
| 15     | Temperature approximate lead compensation | 663A452G01+     | ...         | MA           |        | Electrode Control                      | 505A716G04      | P           | MO           |
| 16     | Temperature accurate lead compensation    | 661A287G03+     | ...         | MA           | 31B    | Motor Control                          | 505A716G03      | O           | MO           |
| 17     | Temperature approximate lead compensation | 663A453G01+     | ...         | MA           |        | Motor Control                          | 505A716G05      | P           | MO           |
|        |                                           |                 |             |              | 32     | Pilot Wire Test                        | 508A468G01      | P           | MA           |
|        |                                           |                 |             |              | 33     | OFF-ON                                 | 505A706G01      | O           | MA           |
|        |                                           |                 |             |              |        |                                        | 505A706G02      | P           | MA           |
|        |                                           |                 |             |              |        |                                        | 505A706G03      | R           | MA           |

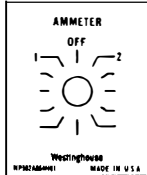
Handle Type: R=Round Fixed P=Pistol Grip Fixed O=Oval Fixed  
MA=Maintained Contacts  
MO=Momentary Contacts  
+ Switch requires but does not include removable key handle. Order as separate item, the number of keys desired, specifying style as shown in referenced figure.

Westinghouse



### Position Tabulations

All wiring diagrams contained in this bulletin are to be considered as "TYPICAL."

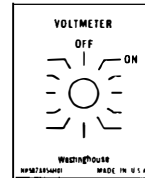
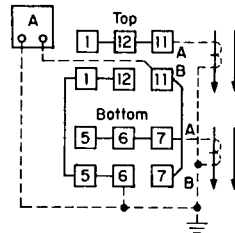


| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | 1        | 2 | 3 |
| A11-B11 | X        | X | X |
| A12-B12 | X        | X | X |
| A1-B1   | X        | X | X |
| A5-B5   | X        | X | X |
| A6-B6   | X        | X | X |
| A7-B7   | X        | X | X |

### Ammeter

#### 2 Phase

Round Fixed Handle  
Switch S# 505A700G01

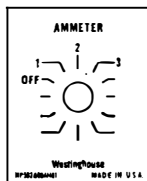
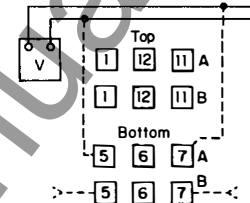


| CONTACT | POSITION |    |
|---------|----------|----|
|         | OFF      | ON |
| A11-B11 | X        | X  |
| A12-B12 | X        | X  |
| A1-B1   | X        | X  |
| A5-B5   | X        | X  |
| A6-B6   | X        | X  |
| A7-B7   | X        | X  |

### Voltmeter

#### Single Phase

Switch S# 505A747G01  
Removable Key Handle S# 505A747G02  
Key removable in off position only

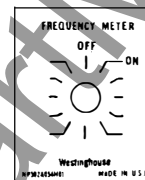
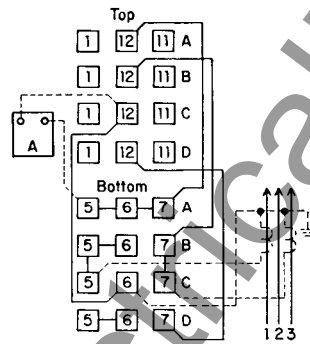


| CONTACT | POSITION |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|
|         | 0        | 1 | 2 | 3 | 4 | 5 | 6 |
| A11-B11 | X        | X | X | X | X | X | X |
| A12-B12 | X        | X | X | X | X | X | X |
| A1-B1   | X        | X | X | X | X | X | X |
| A5-B5   | X        | X | X | X | X | X | X |
| A6-B6   | X        | X | X | X | X | X | X |
| A7-B7   | X        | X | X | X | X | X | X |
| C11-D11 | X        | X | X | X | X | X | X |
| C12-D12 | X        | X | X | X | X | X | X |
| C1-D1   | X        | X | X | X | X | X | X |
| C5-D5   | X        | X | X | X | X | X | X |
| C6-D6   | X        | X | X | X | X | X | X |
| C7-D7   | X        | X | X | X | X | X | X |

### Ammeter

#### 3Phase-2CT's

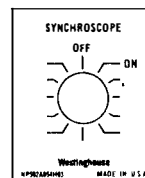
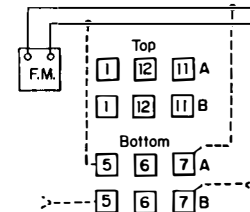
Round Fixed Handle  
Switch S# 505A701G02



| CONTACT | POSITION |    |
|---------|----------|----|
|         | OFF      | ON |
| A11-B11 | X        | X  |
| A12-B12 | X        | X  |
| A1-B1   | X        | X  |
| A5-B5   | X        | X  |
| A6-B6   | X        | X  |
| A7-B7   | X        | X  |

### Frequency Meter

Switch S# 508A467G01  
Removable Key Handle S# 508A467G02  
Key removable in off position only

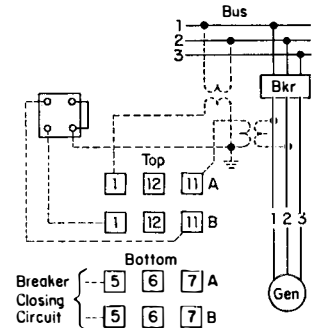


| CONTACT | POSITION |    |
|---------|----------|----|
|         | OFF      | ON |
| A11-B11 | X        | X  |
| A12-B12 | X        | X  |
| A1-B1   | X        | X  |
| A5-B5   | X        | X  |
| A6-B6   | X        | X  |
| A7-B7   | X        | X  |

### Synchronizing

#### Machine to Bus

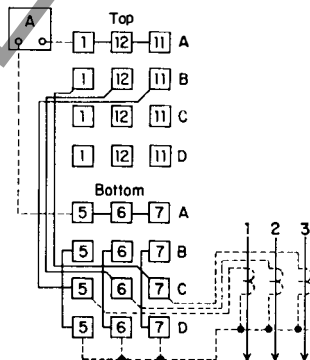
Switch S# 505A755G01  
Removable Key Handle S# 505A755G02  
Key removable in off position only



### Ammeter

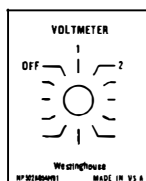
#### 3 Phase—3 Independent Circuits

Round Fixed Handle  
Switch S# 505A701G01



# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

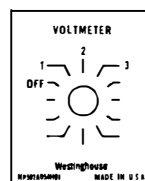
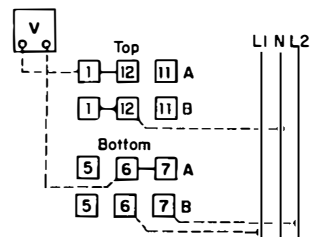


| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |

## Voltmeter

### 2 Phase—Ac—3 Wire

Round Fixed Handle  
Switch S# 505A702G01

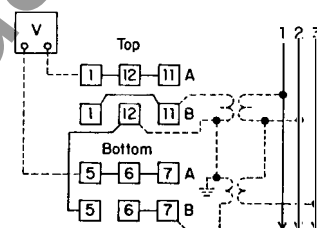


| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |

## Voltmeter

### 3 Phase—3 Wire

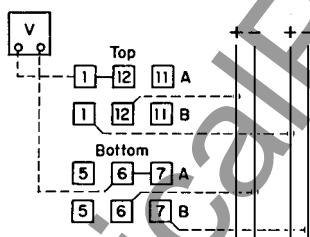
Round Fixed Handle  
Switch S# 505A702G04  
Switch Only S# 505A749G01  
Removable Key Handle S# 505A749G02  
Key removable in off position only



## Voltmeter

### 2 Circuit—Dc—2 Wire

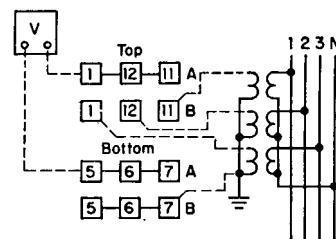
Round Fixed Handle  
Switch S# 505A702G02  
Switch Only S# 505A748G01  
Removable Key Handle S# 505A748G02  
Key removable in off position only



## Voltmeter

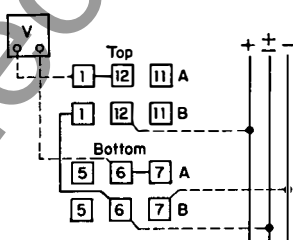
### 3 Phase—4 Wire

Round Fixed Handle  
Switch S# 505A702G05  
Switch Only S# 505A762G01  
Removable Key Handle S# 505A762G02  
Key removable in off position only

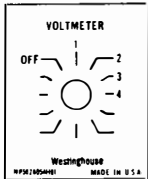


## Voltmeter—Dc—3 Wire

Round Fixed Handle  
Switch S# 505A702G03



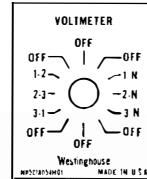
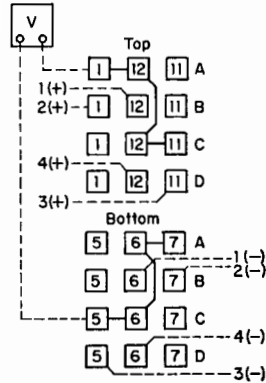
Westinghouse

Position Tabulations *Continued*

| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | OFF      | 1 | 2 | 3 |
| A11-B11 | X        |   |   |   |
| A12-B12 |          | X |   |   |
| A1-B1   |          |   | X |   |
| A5-B5   | X        |   |   |   |
| A6-B6   |          | X |   |   |
| A7-B7   |          |   | X |   |
| C11-D11 |          |   |   | X |
| C12-D12 |          |   | X |   |
| C1-D1   |          |   |   | X |
| C5-D5   |          |   | X |   |
| C6-D6   |          |   |   | X |
| C7-D7   |          |   |   | X |

## Voltmeter

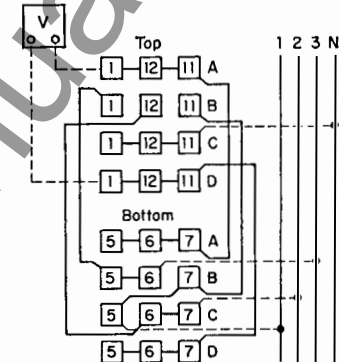
4 Circuit  
Round Fixed Handle  
Switch S# 505A704G01



| CONTACT | POSITION |   |   |   |   |     |   |   |   |   |     |   |
|---------|----------|---|---|---|---|-----|---|---|---|---|-----|---|
|         | OFF      | 1 | 2 | 3 | N | OFF | 1 | 2 | 3 | N | OFF | 1 |
| A11-B11 |          | X |   |   |   |     |   |   |   |   |     |   |
| A12-B12 |          |   | X |   |   |     |   |   |   |   |     |   |
| A1-B1   |          |   |   | X |   |     |   |   |   |   |     |   |
| A5-B5   |          |   |   |   | X |     |   |   |   |   |     |   |
| A6-B6   |          |   |   |   |   | X   |   |   |   |   |     |   |
| A7-B7   |          |   |   |   |   |     | X |   |   |   |     |   |
| C11-D11 |          |   |   |   |   |     |   | X |   |   |     |   |
| C12-D12 |          |   |   |   |   |     |   |   | X |   |     |   |
| C1-D1   |          |   |   |   |   |     |   |   |   | X |     |   |
| C5-D5   |          |   |   |   |   |     |   |   |   |   | X   |   |
| C6-D6   |          |   |   |   |   |     |   |   |   |   |     | X |
| C7-D7   |          |   |   |   |   |     |   |   |   |   |     | X |

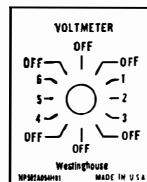
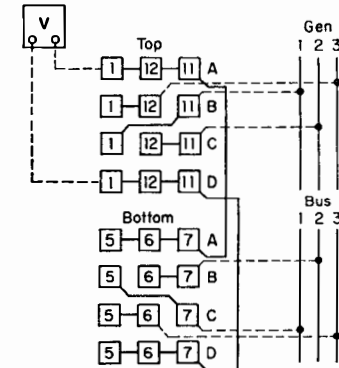
## Voltmeter

3 Phase and Phase to Neutral  
Round Fixed Handle  
Switch S# 505A705G01



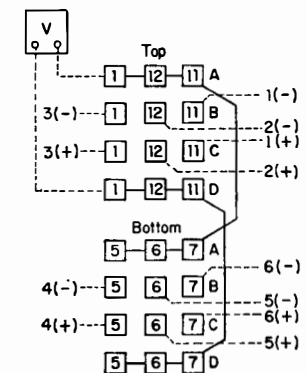
## Voltmeter

Two 3 Phase Circuits  
Round Fixed Handle  
Switch S# 505A705G02



## Voltmeter

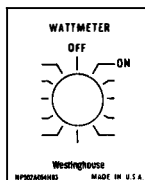
6 Circuit  
Round Fixed Handle  
Switch S# 505A705G03





# Instrument and Control Switches, Type W-2

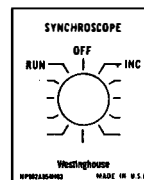
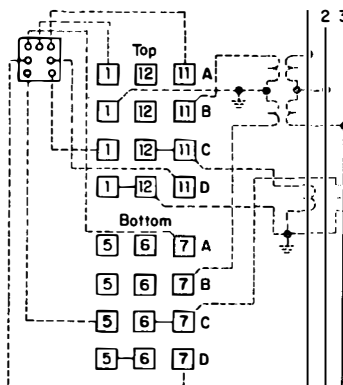
600 Volts, 20 Ampere  
Continuous Capacity



| CONTACT | POSITION | OFF | ON |
|---------|----------|-----|----|
| A11-B11 |          |     | X  |
| A12-B12 |          | X   |    |
| A1-B1   |          |     | X  |
| A5-B5   |          |     | X  |
| A6-B6   |          | X   |    |
| A7-B7   |          |     | X  |
| C11-D11 |          | X   | X  |
| C12-D12 |          | X   | X  |
| C1-D1   |          | X   | X  |
| C5-D5   |          | X   | X  |
| C6-D6   |          | X   | X  |
| C7-D7   |          | X   | X  |

## Wattmeter

Switch Only S# 505A752G01  
Removable Key Handle S# 505A752G02  
Key removable in off position only

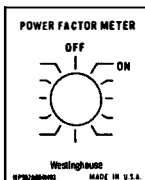
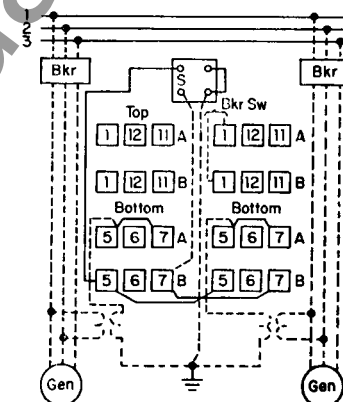


| CONTACT | POSITION | R | O | I |
|---------|----------|---|---|---|
| A11-B11 |          | X |   |   |
| A12-B12 |          | X |   |   |
| A1-B1   |          |   | X |   |
| A5-B5   |          | X |   |   |
| A6-B6   |          |   | X |   |
| A7-B7   |          |   | X |   |

## Synchronizing

### Between Machines

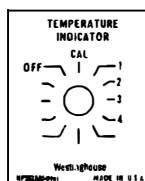
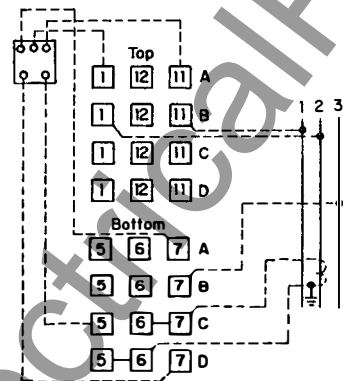
Switch Only S# 505A757G01  
Running Key S# 505A757G02  
Incoming Key S# 505A757G03  
Key removable in off position only



| CONTACT | POSITION | OFF | ON |
|---------|----------|-----|----|
| A11-B11 |          |     | X  |
| A12-B12 |          | X   |    |
| A1-B1   |          |     | X  |
| A5-B5   |          |     | X  |
| A6-B6   |          | X   |    |
| A7-B7   |          |     | X  |
| C11-D11 |          | X   | X  |
| C12-D12 |          | X   | X  |
| C1-D1   |          | X   | X  |
| C5-D5   |          | X   | X  |
| C6-D6   |          | X   | X  |
| C7-D7   |          | X   | X  |

## Power Factor Meter

Switch Only S# 505A753G01  
Removable Key Handle S# 505A753G02  
Key removable in off position only

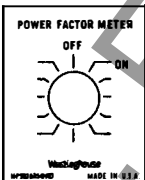
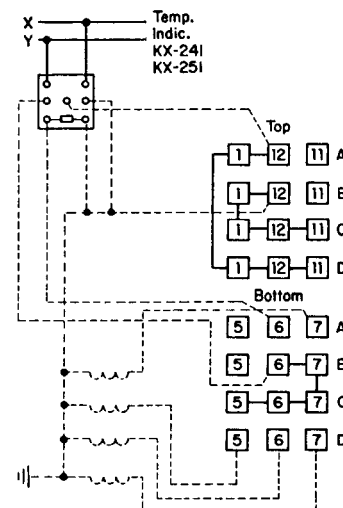


| CONTACT | POSITION | OFF | CAL | 1 | 2 | 3 | 4 |
|---------|----------|-----|-----|---|---|---|---|
| A11-B11 |          | X   |     |   |   |   |   |
| A12-B12 |          |     | X   |   |   |   |   |
| A1-B1   |          |     |     | X |   |   |   |
| A5-B5   |          | X   | X   |   |   |   |   |
| A6-B6   |          | X   | X   | X |   |   |   |
| A7-B7   |          |     | X   | X | X |   |   |
| C11-D11 |          |     |     |   | X |   |   |
| C12-D12 |          |     |     |   |   | X |   |
| C1-D1   |          |     |     |   |   |   | X |
| C5-D5   |          |     |     | X | X | X |   |
| C6-D6   |          |     |     |   | X | X | X |
| C7-D7   |          |     |     |   |   |   | X |

## Temperature

### Approximate Lead Compensation

Round Fixed Handle  
Switch S# 658A667G01

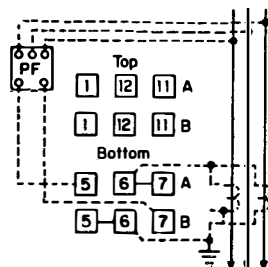


| CONTACT | POSITION | OFF | ON |
|---------|----------|-----|----|
| A11-B11 |          | X   | X  |
| A12-B12 |          | X   | X  |
| A1-B1   |          | X   | X  |
| A5-B5   |          | X   | X  |
| A6-B6   |          | X   | X  |
| A7-B7   |          | X   | X  |

## Power Factor Meter

### Current Transfer Only

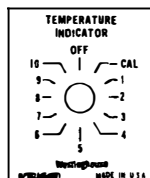
Switch Only S# 505A754G01  
Removable Key Handle S# 505A754G02  
Key removable in off position only



Westinghouse

Position Tabulations *Continued*

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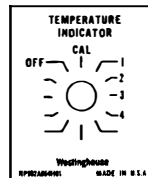
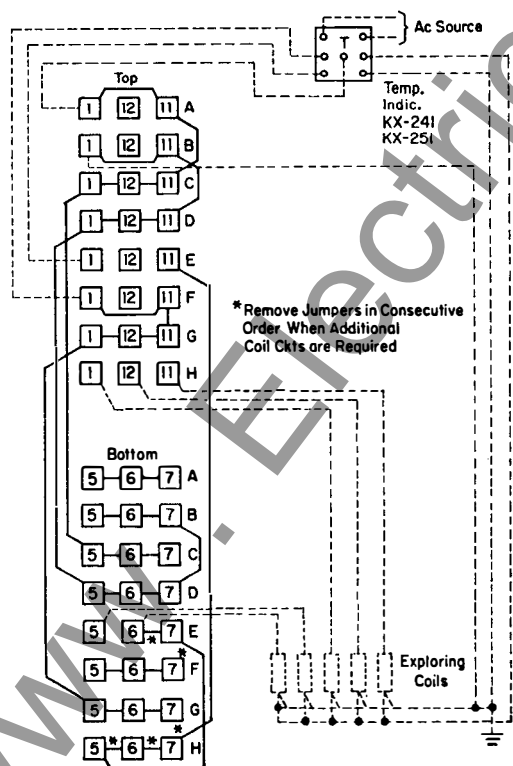


## Temperature

Approximate Lead Compensation

Round Fixed Handle  
Switch S# 663A488G01

| CONTACT | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---|---|---|---|---|---|---|---|---|---|----|
| A11-B11 |   |   |   |   |   |   |   |   |   |   | X  |
| A12-B12 | X |   |   |   |   |   |   |   |   |   |    |
| A1-B1   |   | X |   |   |   |   |   |   |   |   |    |
| A5-B5   |   |   |   |   | X |   |   |   |   |   |    |
| A6-B6   |   |   |   |   |   | X |   |   |   |   |    |
| A7-B7   |   |   |   |   |   |   | X |   |   |   |    |
| C11-D11 |   |   | X |   |   |   |   |   |   |   |    |
| C12-D12 |   |   |   | X |   |   |   |   |   |   |    |
| C1-D1   |   |   |   |   | X |   |   |   |   |   |    |
| C5-D5   |   |   |   |   |   |   |   | X |   |   |    |
| C6-D6   |   |   |   |   |   |   |   |   | X |   |    |
| C7-D7   |   |   |   |   |   |   |   |   |   | X |    |
| E11-F11 |   |   |   |   |   |   |   |   |   | X | X  |
| E12-F12 | X | X |   |   |   |   |   |   |   |   | X  |
| E1-F1   |   | X | X | X |   |   |   |   |   |   |    |
| E5-F5   |   |   |   |   | X | X | X |   |   |   |    |
| E6-F6   |   |   |   |   |   | X | X | X |   |   |    |
| E7-F7   |   |   |   |   |   |   | X | X | X |   |    |
| G11-H11 |   |   | X | X | X |   |   |   |   |   |    |
| G12-H12 |   |   |   | X | X | X |   |   |   |   |    |
| G1-H1   |   |   |   |   | X | X | X |   |   |   |    |
| G5-H5   |   |   |   |   |   |   |   | X | X | X |    |
| G6-H6   |   |   |   |   |   |   |   | X | X | X |    |
| G7-H7   |   |   |   |   |   |   |   |   | X | X | X  |

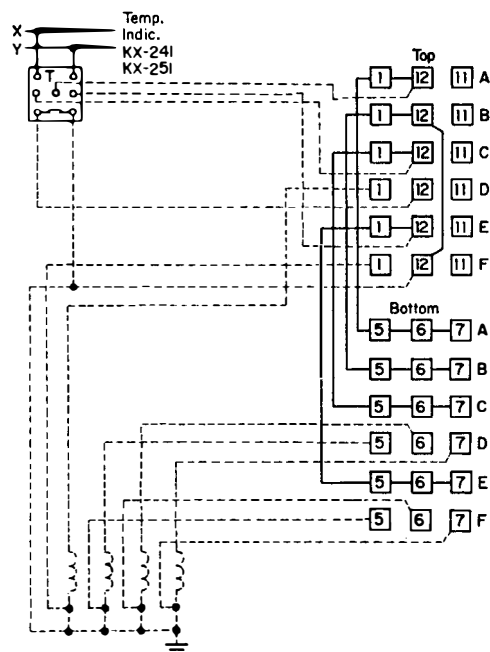


## Temperature

Accurate Lead Compensation

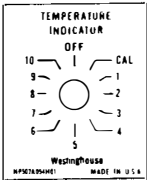
Round Fixed Handle  
Switch S# 787A936G01

| CONTACT | 0 | 1 | 2 | 3 | 4 |
|---------|---|---|---|---|---|
| A11-B11 | X |   |   |   |   |
| A12-B12 |   | X |   |   |   |
| A1-B1   |   |   | X |   |   |
| A5-B5   |   |   |   | X |   |
| A6-B6   |   |   |   |   | X |
| A7-B7   |   |   |   |   |   |
| C11-D11 | X | X |   |   |   |
| C12-D12 |   | X | X |   |   |
| C1-D1   |   |   | X | X |   |
| C5-D5   |   |   |   | X | X |
| C6-D6   |   |   |   |   | X |
| C7-D7   |   |   |   |   | X |
| E11-F11 | X | X |   |   |   |
| E12-F12 |   | X | X |   |   |
| E1-F1   |   |   | X | X |   |
| E5-F5   |   |   |   | X | X |
| E6-F6   |   |   |   |   | X |
| E7-F7   |   |   |   |   | X |



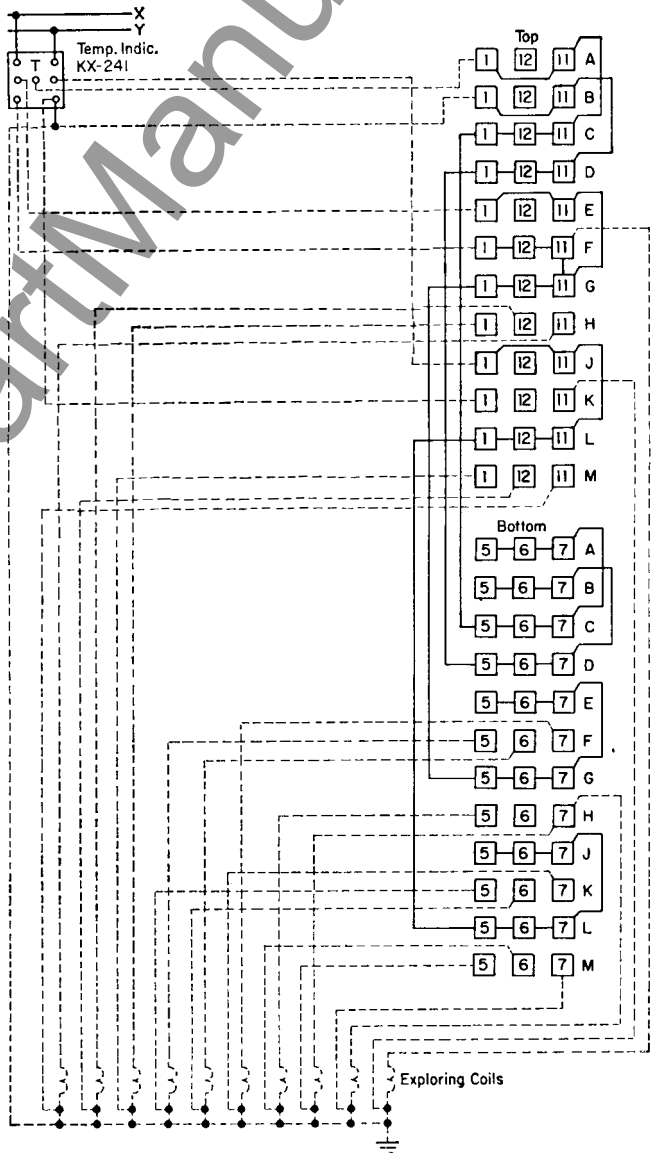
Instrument and Control  
Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

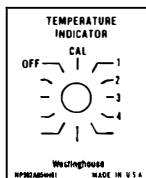


Temperature  
Accurate Lead Compensation  
Round Fixed Handle  
Switch S# 661A210G01

| CONTACT | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---|---|---|---|---|---|---|---|---|---|----|
| A11-B11 |   |   |   |   |   |   |   |   |   |   | X  |
| A12-B12 | X |   |   |   |   |   |   |   |   |   |    |
| A1-B1   |   | X |   |   |   |   |   |   |   |   |    |
| A5-B5   |   |   |   |   | X |   |   |   |   |   |    |
| A6-B6   |   |   |   |   |   | X |   |   |   |   |    |
| A7-B7   |   |   |   |   |   |   | X |   |   |   |    |
| C11-D11 |   | X |   |   |   |   |   |   |   |   |    |
| C12-D12 |   |   | X |   |   |   |   |   |   |   |    |
| C1-D1   |   |   |   | X |   |   |   |   |   |   |    |
| C5-D5   |   |   |   |   | X |   |   |   |   |   |    |
| C6-D6   |   |   |   |   |   | X |   |   |   |   |    |
| C7-D7   |   |   |   |   |   |   | X |   |   |   |    |
| E11-F11 | X | X |   |   |   |   |   |   | X | X | X  |
| E12-F12 | X | X | X |   |   |   |   |   |   |   | X  |
| E1-F1   | X | X | X |   |   |   |   |   |   |   |    |
| E5-F5   |   |   |   | X | X | X |   |   |   |   |    |
| E6-F6   |   |   |   |   | X | X | X |   |   |   |    |
| E7-F7   |   |   |   |   |   | X | X | X |   |   |    |
| G11-H11 |   | X | X | X |   |   |   |   | X | X |    |
| G12-H12 |   | X | X | X | X |   |   |   |   |   |    |
| G1-H1   |   |   |   | X | X | X |   |   |   |   |    |
| G5-H5   |   |   |   |   |   |   | X | X | X |   |    |
| G6-H6   |   |   |   |   |   |   | X | X | X | X |    |
| G7-H7   |   |   |   |   |   |   |   | X | X | X |    |
| I11-J11 | X | X |   |   |   |   |   |   |   | X | X  |
| I12-J12 | X | X | X |   |   |   |   |   |   |   | X  |
| I1-J1   | X | X | X |   |   |   |   |   |   |   |    |
| I5-J5   |   |   |   | X | X | X |   |   |   |   |    |
| I6-J6   |   |   |   |   | X | X | X |   |   |   |    |
| I7-J7   |   |   |   |   |   | X | X | X |   |   |    |
| K11-L11 |   | X | X | X |   |   |   |   |   |   |    |
| K12-L12 |   | X | X | X | X |   |   |   |   |   |    |
| K1-L1   |   |   |   | X | X | X |   |   |   |   |    |
| K5-L5   |   |   |   |   |   |   | X | X | X |   |    |
| K6-L6   |   |   |   |   |   |   | X | X | X | X |    |
| K7-L7   |   |   |   |   |   |   |   | X | X | X |    |



Westinghouse

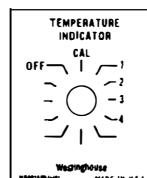
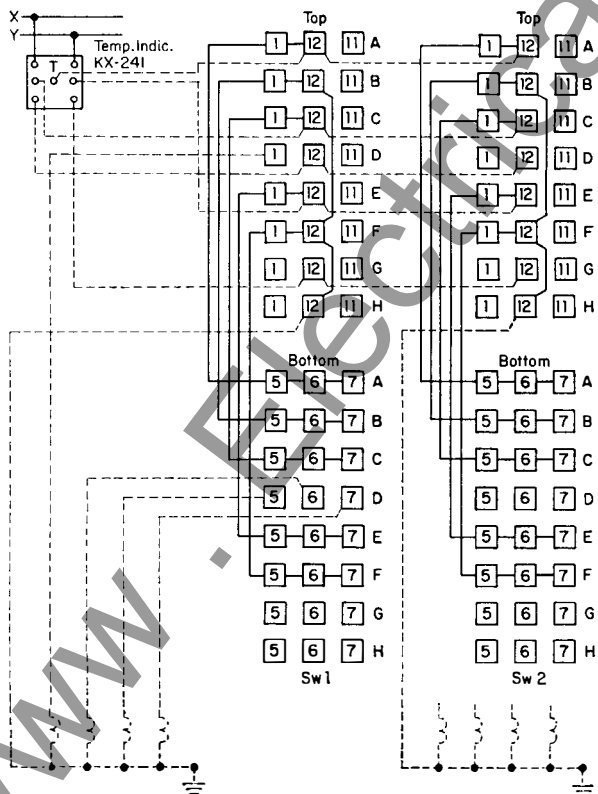
Position Tabulations *Continued*

## Temperature

## Approximate Lead Compensation

Switch Only S# 663A452G01  
Removable Key Handle S# 505A765G03  
Key removable in off position only

| CONTACT | POSITION |   |   |   |   |   |
|---------|----------|---|---|---|---|---|
|         | OFF      | C | 1 | 2 | 3 | 4 |
| A11-B11 | X        |   |   |   |   |   |
| A12-B12 |          | X |   |   |   |   |
| A1-B1   |          |   | X |   |   |   |
| A5-B5   |          |   |   | X |   |   |
| A6-B6   |          |   |   |   | X |   |
| A7-B7   |          |   |   |   |   | X |
| C11-D11 | X        | X |   |   |   |   |
| C12-D12 |          | X | X | X |   |   |
| C1-D1   |          |   | X | X | X |   |
| C5-D5   |          |   |   | X | X | X |
| C6-D6   |          |   |   |   | X | X |
| C7-D7   |          |   |   |   |   | X |
| E11-F11 | X        | X |   |   |   |   |
| E12-F12 |          | X | X | X |   |   |
| E1-F1   |          |   | X | X | X |   |
| E5-F5   |          |   |   | X | X | X |
| E6-F6   |          |   |   |   | X | X |
| E7-F7   |          |   |   |   |   | X |
| G11-H11 | X        | X |   |   |   |   |
| G12-H12 |          | X | X | X |   |   |
| G1-H1   |          |   | X | X | X |   |
| G5-H5   |          |   |   | X | X | X |
| G6-H6   |          |   |   |   | X | X |
| G7-H7   |          |   |   |   |   | X |

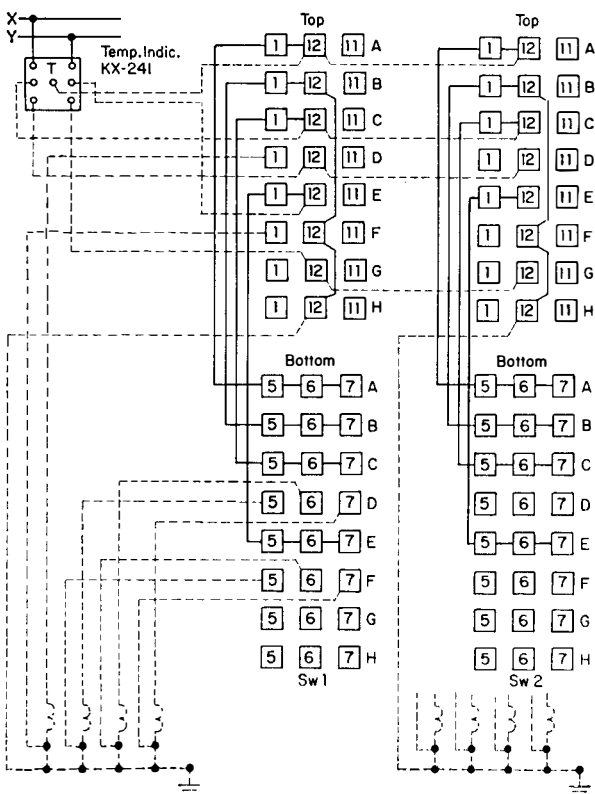


## Temperature

## Accurate Lead Compensation

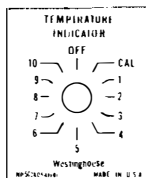
Switch Only S# 661A287G03  
Removable Key Handle S# 505A711G02  
Key removable in off position only

| CONTACT | POSITION |   |   |   |   |   |
|---------|----------|---|---|---|---|---|
|         | OFF      | C | 1 | 2 | 3 | 4 |
| A11-B11 | X        |   |   |   |   |   |
| A12-B12 |          | X |   |   |   |   |
| A1-B1   |          |   | X |   |   |   |
| A5-B5   |          |   |   | X |   |   |
| A6-B6   |          |   |   |   | X |   |
| A7-B7   |          |   |   |   |   | X |
| C11-D11 | X        | X |   |   |   |   |
| C12-D12 |          | X | X | X |   |   |
| C1-D1   |          |   | X | X | X |   |
| C5-D5   |          |   |   | X | X | X |
| C6-D6   |          |   |   |   | X | X |
| C7-D7   |          |   |   |   |   | X |
| E11-F11 | X        | X |   |   |   |   |
| E12-F12 |          | X | X | X |   |   |
| E1-F1   |          |   | X | X | X |   |
| E5-F5   |          |   |   | X | X | X |
| E6-F6   |          |   |   |   | X | X |
| E7-F7   |          |   |   |   |   | X |
| G11-H11 | X        | X |   |   |   |   |
| G12-H12 |          | X | X | X |   |   |
| G1-H1   |          |   | X | X | X |   |
| G5-H5   |          |   |   | X | X | X |
| G6-H6   |          |   |   |   | X | X |
| G7-H7   |          |   |   |   |   | X |



# Instrument and Control Switches, Type W-2

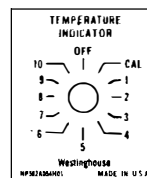
600 Volts, 20 Ampere  
Continuous Capacity



## Temperature

### Approximate Lead Compensation

Switch Only S# 663A453G01  
Removable Key Handle S# 505A765G03  
Key removable in off position only



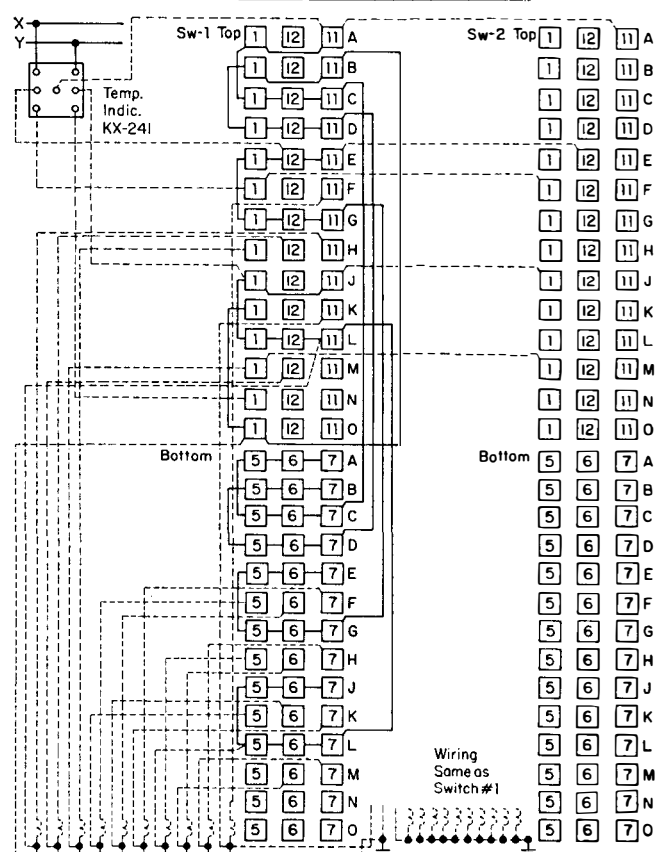
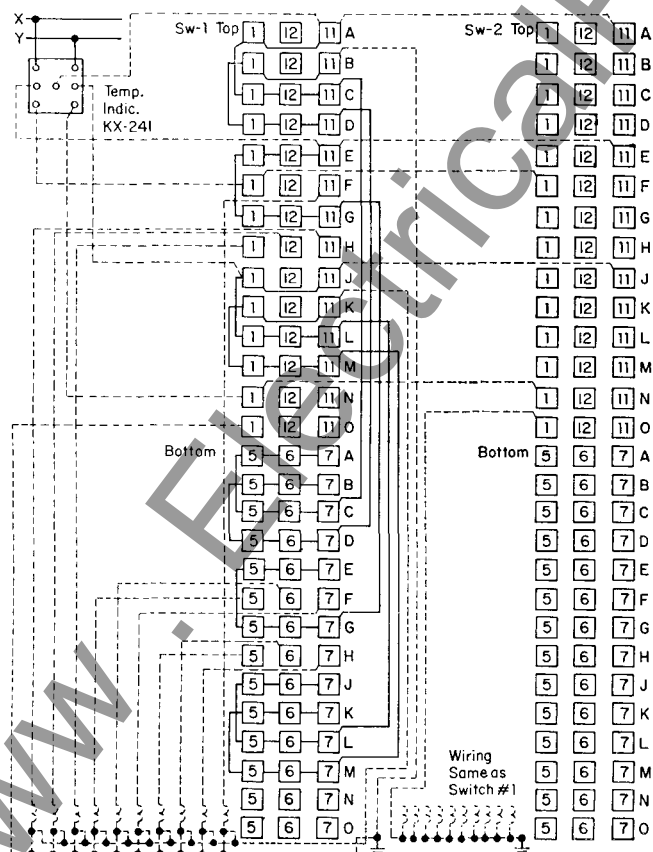
## Temperature

### Accurate Lead Compensation

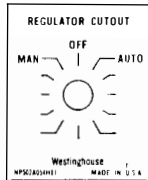
Switch Only S# 663A454G01  
Removable Key Handle S# 505A711G03  
Key removable in off position only

| CONTACT | O | C | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---|---|---|---|---|---|---|---|---|---|---|----|
| A11-B11 |   |   |   |   |   |   |   |   |   |   |   | X  |
| A12-B12 | X |   |   |   |   |   |   |   |   |   |   |    |
| A1-B1   |   | X |   |   |   |   |   |   |   |   |   |    |
| A5-B5   |   |   |   |   | X |   |   |   |   |   |   |    |
| A6-B6   |   |   |   |   |   | X |   |   |   |   |   |    |
| A7-B7   |   |   |   |   |   |   | X |   |   |   |   |    |
| C11-D11 |   |   | X |   |   |   |   |   |   |   |   |    |
| C12-D12 |   |   |   | X |   |   |   |   |   |   |   |    |
| C1-D1   |   |   |   |   | X |   |   |   |   |   |   |    |
| C5-D5   |   |   |   |   |   | X |   |   |   |   |   |    |
| C6-D6   |   |   |   |   |   |   | X |   |   |   |   |    |
| C7-D7   |   |   |   |   |   |   |   | X |   |   |   |    |
| E11-F11 |   |   |   |   |   |   |   |   | X | X | X |    |
| E12-F12 | X | X |   |   |   |   |   |   |   |   | X | X  |
| E1-F1   |   | X | X | X |   |   |   |   |   |   |   |    |
| E5-F5   |   |   |   |   | X | X | X |   |   |   |   |    |
| E6-F6   |   |   |   |   |   | X | X | X |   |   |   |    |
| E7-F7   |   |   |   |   |   |   | X | X | X |   |   |    |
| G11-H11 |   |   | X | X | X |   |   |   |   |   |   |    |
| G12-H12 |   |   |   | X | X | X |   |   |   |   |   |    |
| G1-H1   |   |   |   |   | X | X | X |   |   |   |   |    |
| G5-H5   |   |   |   |   |   | X | X | X |   |   |   |    |
| G6-H6   |   |   |   |   |   |   | X | X | X |   |   |    |
| G7-H7   |   |   |   |   |   |   |   | X | X | X |   |    |

| CONTACT | O | C | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---|---|---|---|---|---|---|---|---|---|---|----|
| A11-B11 |   |   |   |   |   |   |   |   |   |   |   | X  |
| A12-B12 | X |   |   |   |   |   |   |   |   |   |   |    |
| A1-B1   |   | X |   |   |   |   |   |   |   |   |   |    |
| A5-B5   |   |   |   |   | X |   |   |   |   |   |   |    |
| A6-B6   |   |   |   |   |   | X |   |   |   |   |   |    |
| A7-B7   |   |   |   |   |   |   | X |   |   |   |   |    |
| C11-D11 |   |   | X |   |   |   |   |   |   |   |   |    |
| C12-D12 |   |   |   | X |   |   |   |   |   |   |   |    |
| C1-D1   |   |   |   |   | X |   |   |   |   |   |   |    |
| C5-D5   |   |   |   |   |   | X |   |   |   |   |   |    |
| C6-D6   |   |   |   |   |   |   | X |   |   |   |   |    |
| C7-D7   |   |   |   |   |   |   |   | X |   |   |   |    |
| E11-F11 |   |   |   |   |   |   |   |   | X | X | X |    |
| E12-F12 | X | X |   |   |   |   |   |   |   |   | X | X  |
| E1-F1   |   | X | X | X |   |   |   |   |   |   |   |    |
| E5-F5   |   |   |   |   | X | X | X |   |   |   |   |    |
| E6-F6   |   |   |   |   |   | X | X | X |   |   |   |    |
| E7-F7   |   |   |   |   |   |   | X | X | X |   |   |    |
| G11-H11 |   |   | X | X | X |   |   |   |   |   |   |    |
| G12-H12 |   |   |   | X | X | X |   |   |   |   |   |    |
| G1-H1   |   |   |   |   | X | X | X |   |   |   |   |    |
| G5-H5   |   |   |   |   |   | X | X | X |   |   |   |    |
| G6-H6   |   |   |   |   |   |   | X | X | X |   |   |    |
| G7-H7   |   |   |   |   |   |   |   | X | X | X |   |    |

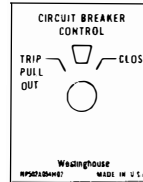
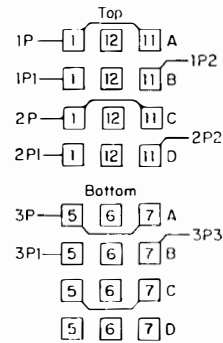


Westinghouse

Position Tabulations *Continued*

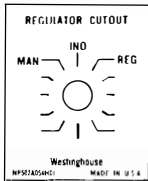
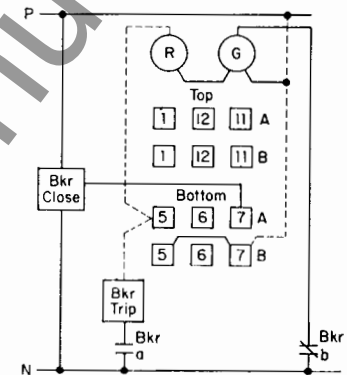
| CONTACT | POSITION |
|---------|----------|
| A11-B11 | M O A    |
| A12-B12 | X X      |
| A1-B1   | X X      |
| A5-B5   | X X      |
| A6-B6   | X X      |
| A7-B7   | X X      |
| C11-D11 | X X      |
| C12-D12 | X X      |
| C1-D1   | X X      |
| C5-D5   | X X      |
| C6-D6   | X X      |
| C7-D7   | X X      |

## Regulator Cutout

Round Fixed Handle  
Switch S# 505A712G01

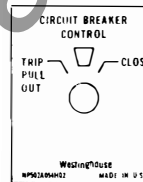
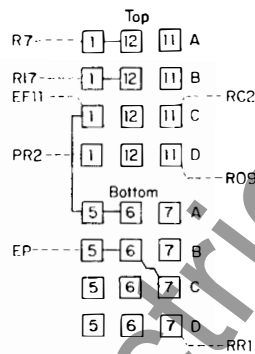
| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X X      |
| A12-B12 | X X      |
| A1-B1   | X X      |
| A5-B5   | X X      |
| A6-B6   | X X      |
| A7-B7   | X X      |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 505A713G01  
Oval Fixed Handle  
Switch S# 505A713G03

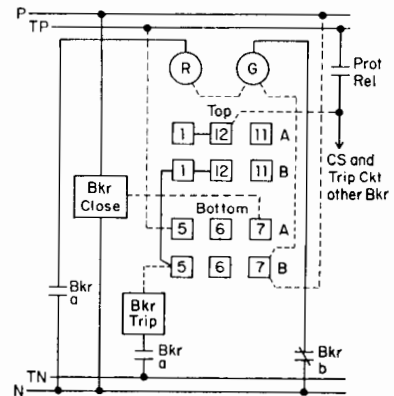
| CONTACT | POSITION |
|---------|----------|
| A11-B11 | M I R    |
| A12-B12 | X X X    |
| A1-B1   | X X X    |
| A5-B5   | X X X    |
| A6-B6   | X X X    |
| A7-B7   | X X X    |
| C11-D11 | X X X    |
| C12-D12 | X X X    |
| C1-D1   | X X X    |
| C5-D5   | X X X    |
| C6-D6   | X X X    |
| C7-D7   | X X X    |

## Regulator Cutout

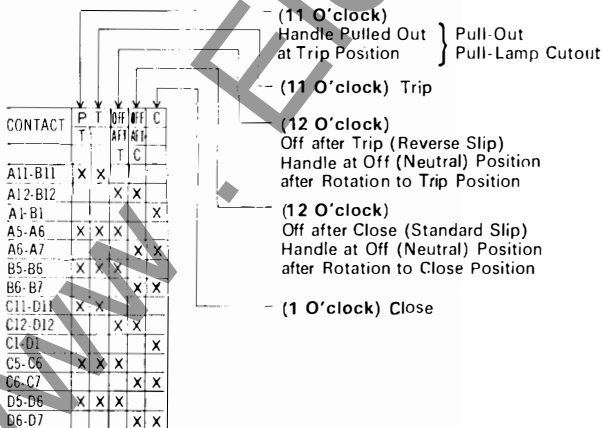
Round Fixed Handle  
Switch S# 508A224G02

| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X X      |
| A12-B12 | X X      |
| A1-B1   | X X      |
| A5-B5   | X X      |
| A6-B6   | X X      |
| A7-B7   | X X      |

## Circuit Breaker Control

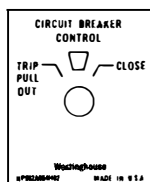
Pistol Grip Fixed Handle  
Switch S# 505A713G02

Interpretation of position designations for Figures 21 through 28, and other switches using slip and/or pull contacts.



# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

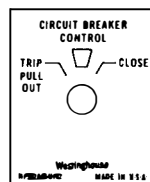
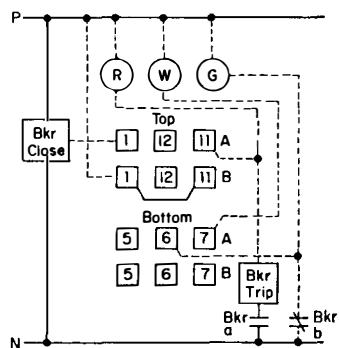


| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | INT | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   |     |     | X |
| A5-A6   | X        | X | X   |     |   |
| A6-A7   |          |   |     | X   | X |
| B5-B6   | X        | X | X   |     |   |
| B6-B7   |          |   |     | X   | X |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 505A714G01

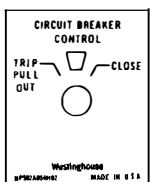
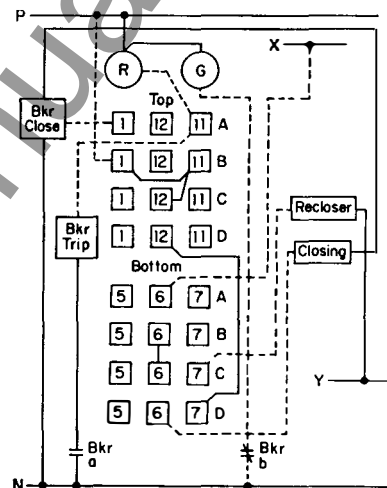
Oval Fixed Handle  
Switch S# 505A714G02



| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | INT | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   |     |     | X |
| A5-B5   | X        | X |     |     |   |
| A6-B6   |          |   | X   | X   |   |
| A7-B7   |          |   |     | X   | X |
| C11-D11 | X        | X |     |     |   |
| C12-D12 |          |   | X   | X   |   |
| C1-D1   |          |   |     |     | X |
| C5-C6   | X        | X | X   |     |   |
| C6-C7   |          |   |     | X   | X |
| D5-D6   | X        | X | X   |     |   |
| D6-D7   |          |   |     | X   | X |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 505A718G01

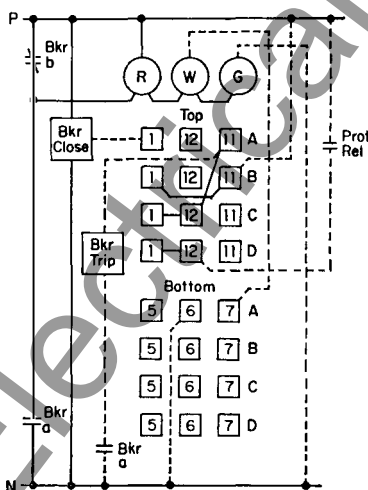


| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | INT | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   |     |     | X |
| A5-A6   | X        | X | X   |     |   |
| A6-A7   |          |   |     | X   | X |
| B5-B6   | X        | X | X   |     |   |
| B6-B7   |          |   |     | X   | X |
| C11-D11 | X        | X |     |     |   |
| C12-D12 |          |   | X   | X   |   |
| C1-D1   |          |   |     |     | X |
| C5-C6   | X        | X | X   |     |   |
| C6-C7   |          |   |     | X   | X |
| D5-D6   | X        | X | X   |     |   |
| D6-D7   |          |   |     | X   | X |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 505A717G01

Oval Fixed Handle  
Switch S# 505A717G03

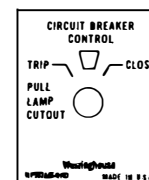


| CONTACT | POSITION |   |     |   |
|---------|----------|---|-----|---|
|         | P        | T | OFF | C |
| A11-B11 | X        | X |     |   |
| A12-B12 |          |   | X   |   |
| A1-B1   |          |   |     | X |
| A5-B5   | X        | X |     |   |
| A6-B6   |          |   | X   |   |
| A7-B7   |          |   |     | X |
| C12-C1  | X        |   |     |   |
| D12-D1  | X        | X | X   |   |
| C6-C7   | X        |   |     |   |
| D6-D7   |          | X | X   | X |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 505A720G01

Oval Fixed Handle  
Switch S# 505A720G03

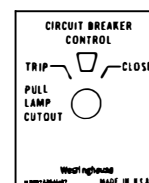


| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | INT | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   |     |     | X |
| A5-A6   | X        | X | X   |     |   |
| A6-A7   |          |   |     | X   | X |
| B5-B6   | X        | X | X   |     |   |
| B6-B7   |          |   |     | X   | X |
| C12-C1  | X        | X |     |     |   |
| D12-D1  | X        | X | X   | X   |   |
| C6-C7   | X        |   |     |     |   |
| D6-D7   |          | X | X   | X   | X |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 508A244G01

Oval Fixed Handle  
Switch S# 508A244G02



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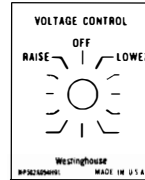
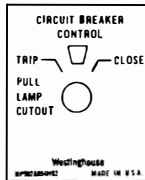
Position Tabulations *Continued*

| CONTACT | POSITION |   |     |      |
|---------|----------|---|-----|------|
|         | P        | T | OFF | MT C |
| A11-B11 | X        | X |     |      |
| A12-B12 |          |   | X   | X    |
| A1-B1   |          |   |     | X    |
| A5-A6   | X        | X | X   | X    |
| A6-A7   |          |   | X   | X    |
| B5-B6   | X        | X | X   | X    |
| B6-B7   |          |   | X   | X    |
| C11-D11 | X        | X |     |      |
| C12-D12 |          |   | X   | X    |
| C1-D1   |          |   |     | X    |
| C5-C6   | X        | X | X   | X    |
| C6-C7   |          |   | X   | X    |
| D5-D6   | X        | X | X   | X    |
| D6-D7   |          |   | X   | X    |
| E12-E1  | X        |   |     |      |
| F12-F1  | X        | X | X   | X    |
| E6-E7   | X        |   |     |      |
| F6-F7   | X        | X | X   | X    |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 508A262G01

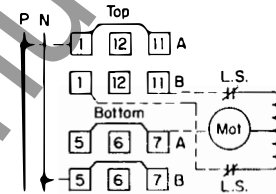
Oval Fixed Handle  
Switch S# 508A262G03



## Voltage Control

Pistol Grip Fixed Handle  
Switch S# 505A703G01

Oval Fixed Handle  
Switch S# 505A703G06

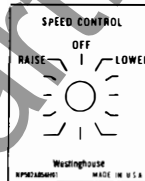
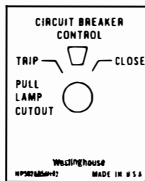


| CONTACT | POSITION |   |     |      |
|---------|----------|---|-----|------|
|         | P        | T | OFF | MT C |
| A11-B11 | X        | X |     |      |
| A12-B12 |          |   | X   | X    |
| A1-B1   |          |   |     | X    |
| A5-B5   | X        | X |     |      |
| A6-B6   |          |   | X   | X    |
| A7-B7   |          |   |     | X    |
| C11-D11 | X        | X |     |      |
| C12-D12 |          |   | X   | X    |
| C1-D1   |          |   |     | X    |
| C5-C6   | X        | X | X   | X    |
| C6-C7   |          |   | X   | X    |
| D5-D6   | X        | X | X   | X    |
| D6-D7   |          |   | X   | X    |
| E12-E1  | X        |   |     |      |
| F12-F1  | X        | X | X   | X    |
| E6-E7   | X        |   |     |      |
| F6-F7   | X        | X | X   | X    |

## Circuit Breaker Control

Oval Fixed Handle  
Switch S# 508A264G01

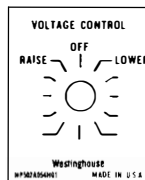
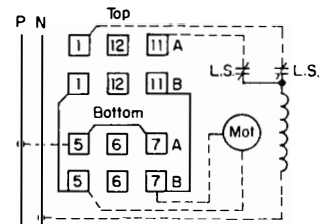
Pistol Grip Fixed Handle  
Switch S# 508A264G02



## Speed Control

Pistol Grip Handle  
Switch S# 505A703G02

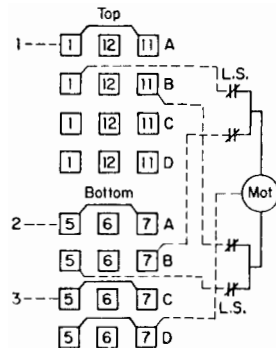
Oval Fixed Handle  
Switch S# 505A703G07



## Voltage Control

Pistol Grip Handle  
Switch S# 505A715G01

Oval Fixed Handle  
Switch S# 505A715G05

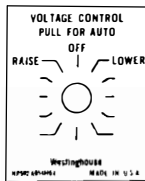


| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | R        | O | L |
| A11-B11 | X        |   |   |
| A12-B12 |          | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        |   |   |
| A6-B6   |          | X |   |
| A7-B7   |          |   | X |
| C11-D11 | X        |   |   |
| C12-D12 |          | X |   |
| C1-D1   |          |   | X |
| C5-D5   | X        |   |   |
| C6-D6   |          | X |   |
| C7-D7   |          |   | X |

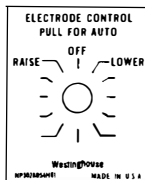


# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

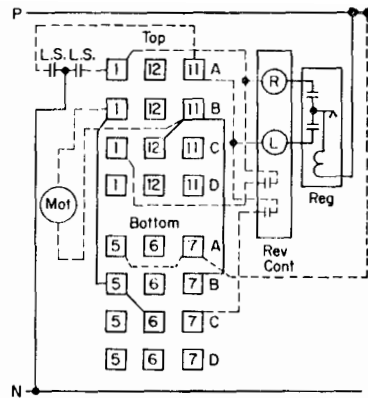


| CONTACT | R | O | P | L |
|---------|---|---|---|---|
| A11-B11 | X |   |   |   |
| A12-B12 |   | X | X |   |
| A1-B1   |   |   |   | X |
| A5-B5   | X |   |   |   |
| A6-B6   |   | X | X |   |
| A7-B7   |   |   |   | X |
| C12-D1  | X | X |   | X |
| C6-C7   |   |   | X |   |
| D6-D7   | X | X |   | X |



## Voltage Control

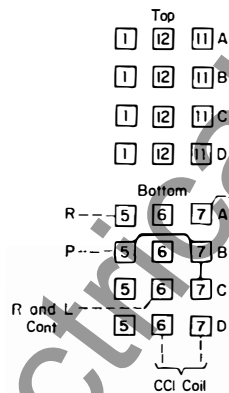
Oval Fixed Handle  
Switch S# 505A716G01



## Electrode Control

Pistol Grip Fixed Handle  
Switch S# 505A716G04

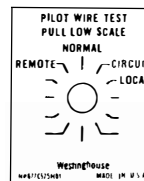
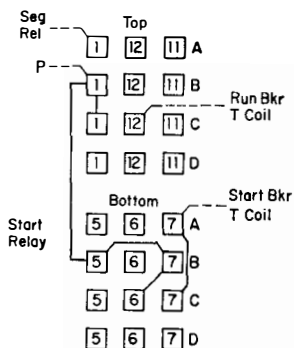
Oval Fixed Handle  
Switch S# 505A716G02



## Motor Control

Pistol Grip Fixed Handle  
Switch S# 505A716G05

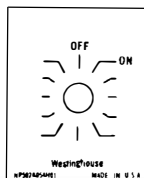
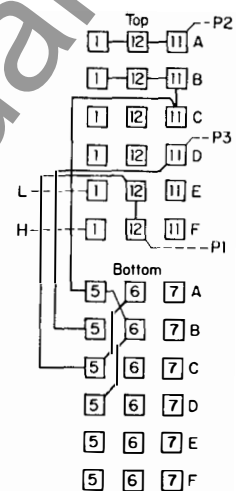
Oval Fixed Handle  
Switch S# 505A716G03



| CONTACT | R | P | N | C | L | P |
|---------|---|---|---|---|---|---|
| A11-B11 | X | X |   |   |   |   |
| A12-B12 |   |   | X | X |   |   |
| A1-B1   |   |   |   |   | X | X |
| A5-B5   | X | X |   |   |   |   |
| A6-B6   |   |   | X | X |   |   |
| A7-B7   |   |   |   |   | X | X |
| C11-D11 |   |   |   |   | X | X |
| C12-D12 |   |   |   |   | X | X |
| C1-D1   |   |   |   |   |   |   |
| C5-D5   |   |   |   |   | X | X |
| C6-D6   |   |   |   |   |   |   |
| C7-D7   |   |   |   |   |   |   |
| E12-F1  |   | X | X | X | X | X |
| F12-F1  | X | X | X | X | X | X |
| E6-E7   |   | X | X | X | X | X |
| F6-F7   | X | X | X | X | X | X |

## Pilot Wire Test

Pistol Grip Fixed Handle  
Switch S# 508A468G01



## Off-On Switch

Oval Fixed Handle  
Switch S# 505A706G01

Pistol Grip Fixed Handle  
Switch S# 505A706G02

Round Fixed Handle  
Switch S# 505A706G03

| CONTACT | POS    |
|---------|--------|
| A11-B11 | OFF ON |
| A12-B12 | X      |
| A1-B1   | X      |
| A5-B5   | X      |
| A6-B6   | X      |
| A7-B7   | X      |

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## Basic Switches – Style Numbers

Available for Special Application without Nameplate, Handle or Connectors<sup>Ⓢ</sup>

| Maintained Contacts |              |        |                | Momentary Contacts |              |        |                |
|---------------------|--------------|--------|----------------|--------------------|--------------|--------|----------------|
| Figure              | Basic Switch | Target | Handle+        | Figure             | Basic Switch | Target | Handle+        |
| 34                  | 505A606G01   | no     | fixed          | 34                 | 505A623G01   | no     | fixed          |
| 34                  | 505A647G01△  | no     | removable key▲ | 34                 | 663A177G01△  | no     | removable key▲ |
| 35                  | 505A667G01   | no     | fixed          | 35                 | 505A668G01   | no     | fixed          |
| 35                  | 505A669G01△  | no     | removable key▲ | 37                 | 505A607G01   | no     | fixed          |
| 36                  | 508A396G01   | no     | fixed          | 38                 | 505A625G01   | no     | fixed          |
| 37                  | 505A634G01   | no     | fixed          | 39                 | 505A624G01   | no     | fixed          |
| 37                  | 505A654G01△  | no     | removable key▲ | 40                 | 505A684G01   | no     | fixed          |
| 38                  | 505A622G01   | no     | fixed          | 41                 | 505A603G01   | no     | fixed          |
| 38                  | 505A670G01△  | no     | removable key▲ | 41                 | 508A107G01   | yes    | fixed          |
| 39                  | 505A621G01   | no     | fixed          | 41                 | 663A195G01△  | no     | removable key▲ |
| 39                  | 505A672G01△  | no     | removable key▲ | 42                 | 508A110G01   | no     | fixed          |
| 40                  | 505A628G01   | no     | fixed          | 43                 | 508A111G01   | no     | fixed          |
| 40                  | 505A685G01△  | no     | removable key▲ | 43                 | 505A638G01   | yes    | fixed          |
| 41                  | 505A602G01   | no     | fixed          | 44                 | 505A615G01   | no     | fixed          |
| 41                  | 508A108G01△  | no     | removable key▲ | 44                 | 508A118G01   | yes    | fixed          |
| 42                  | 505A600G01   | no     | fixed          | 45                 | 508A125G01   | no     | fixed          |
| 42                  | 661A105G01△  | no     | removable key▲ | 46                 | 508A127G01   | no     | fixed          |
| 43                  | 781A377G01   | yes    | fixed          | 47                 | 508A128G01   | no     | fixed          |
| 43                  | 508A112G01△  | no     | removable key▲ | 47                 | 508A129G01   | yes    | fixed          |
| 44                  | 505A612G01   | no     | fixed          | 48                 | 508A133G01   | no     | fixed          |
| 44                  | 508A119G01△  | no     | removable key▲ | 48                 | 505A620G01   | yes    | fixed          |
| 45                  | 508A124G01   | no     | fixed          | 49                 | 508A143G01   | no     | fixed          |
| 46                  | 508A126G01   | no     | fixed          | 49                 | 508A144G01   | yes    | fixed          |
| 48                  | 658A594G01   | yes    | fixed          | 50                 | 505A627G01   | no     | fixed          |
| 50                  | 505A626G01   | no     | fixed          | 50                 | 508A145G01   | yes    | fixed          |
| 50                  | 508A146G01△  | no     | removable key▲ | 51                 | 508A189G01   | no     | fixed          |
| 55                  | 508A166G01   | no     | fixed          | 51                 | 508A161G01   | yes    | fixed          |
| 56                  | 505A664G01   | no     | fixed          | 52                 | 508A162G01   | yes    | fixed          |
| 59                  | 505A631G01   | no     | fixed          | 53                 | 508A163G01   | no     | fixed          |
| 59                  | 508A173G01△  | no     | removable key▲ | 53                 | 508A164G01   | yes    | fixed          |
| 60                  | 508A196G01   | no     | fixed          | 54                 | 505A619G01   | yes    | fixed          |
| 60                  | 781A167G01△  | no     | removable key▲ | 55                 | 508A167G01   | yes    | fixed          |
| 61                  | 508A199G01   | no     | fixed          | 56                 | 505A630G01   | no     | fixed          |
| 61                  | 508A300G01□  | no     | removable key▲ | 57                 | 508A181G01   | yes    | fixed          |
| 62                  | 505A633G01   | no     | fixed          | 58                 | 508A183G01   | no     | fixed          |
| 63                  | 508A302G01   | no     | fixed          | 58                 | 508A184G01   | yes    | fixed          |
| 64                  | 508A363G01   | no     | fixed          | 59                 | 505A632G01   | no     | fixed          |
| 65                  | 508A307G01   | no     | fixed          | 72                 | 505A651G01   | no     | fixed          |
| 65                  | 508A308G01△  | no     | removable key▲ | 73                 | 658A542G01   | no     | fixed          |
| 66                  | 508A310G01   | no     | fixed          | 74                 | 658A578G01   | no     | fixed          |
| 66                  | 508A311G01△  | no     | removable key▲ | 76                 | 505A661G01   | yes    | fixed          |
| 67                  | 508A314G01   | no     | fixed          | 77                 | 508A342G01   | yes    | fixed          |
| 67                  | 508A370G01△  | no     | removable key▲ | 78                 | 508A344G01◆  | no     | fixed          |
| 68                  | 508A317G01   | no     | fixed          |                    |              |        |                |
| 69                  | 505A645G01   | no     | fixed          |                    |              |        |                |
| 69                  | 508A320G01△  | no     | removable key▲ |                    |              |        |                |
| 70                  | 508A323G01   | no     | fixed          |                    |              |        |                |
| 70                  | 781A181G01△  | no     | removable key▲ |                    |              |        |                |
| 71                  | 508A326G01   | no     | fixed          |                    |              |        |                |
| 72                  | 505A650G01   | no     | fixed          |                    |              |        |                |
| 72                  | 661A152G01△  | no     | removable key▲ |                    |              |        |                |
| 73                  | 505A659G01   | no     | fixed          |                    |              |        |                |
| 73                  | 661A150G01△  | no     | removable key▲ |                    |              |        |                |
| 74                  | 505A660G01   | no     | fixed          |                    |              |        |                |
| 74                  | 663A176G01△  | no     | removable key▲ |                    |              |        |                |
| 75                  | 508A334G01   | no     | fixed          |                    |              |        |                |
| 75                  | 663A175G01△  | no     | removable key▲ |                    |              |        |                |
| 78                  | 508A343G01   | no     | fixed          |                    |              |        |                |
| 78                  | 781A123G01◆  | no     | removable key▲ |                    |              |        |                |
| 79                  | 508A351G01   | no     | fixed          |                    |              |        |                |
| 80                  | 505A644G01   | no     | fixed          |                    |              |        |                |
| 80                  | 663A340G01△  | no     | removable key▲ |                    |              |        |                |

◆ = Spring return to "12" position.

Ⓢ Select and specify, if desired, nameplate and connectors from Page 23. Handles from the following:

Round Fixed S # 310C624H01  
Pistol Grip Fixed S # 310C624H02  
Oval Fixed S # 501B787H01  
Large Pistol Grip Fixed S # 677C101H01

+ Provision only.

▲ If key is desired, the following must be specified:

- Shape of handle.
- If to be interchangeable with other keys, specify the position or positions in which the key is to be removable and the style of the existing switch.
- If the key is to be removable in a different position than indicated for the basic switch, or is to be non-interchangeable with other key handles, order the basic switch as "similar to" a style number and give specific requirements.

△ Key removable in "12" position.

□ Key removable in "10" position.

◆ Key removable in "11" position.

# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

## Additional Position Tabulations

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-D5   | X        | X |
| C6-D6   | X        | X |
| C7-D7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-D5   | X        | X |
| C6-D6   | X        | X |
| C7-D7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-D5   | X        | X |
| C6-D6   | X        | X |
| C7-D7   | X        | X |
| E11-F11 | X        | X |
| E12-F12 | X        | X |
| E1-F1   | X        | X |
| E5-F5   | X        | X |
| E6-F6   | X        | X |
| E7-F7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-A6   | X        | X |
| A6-A7   | X        | X |
| B5-B6   | X        | X |
| B6-B7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-D5   | X        | X |
| C6-D6   | X        | X |
| C7-D7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-D5   | X        | X |
| C6-D6   | X        | X |
| C7-D7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-D5   | X        | X |
| C6-D6   | X        | X |
| C7-D7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-C6   | X        | X |
| C6-C7   | X        | X |
| B5-B6   | X        | X |
| D6-D7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C12-C1  | X        | X |
| C12-D1  | X        | X |
| C6-C7   | X        | X |
| D6-D7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-A6   | X        | X |
| A6-A7   | X        | X |
| B5-B6   | X        | X |
| B6-B7   | X        | X |
| C12-C1  | X        | X |
| D12-D1  | X        | X |
| C6-C7   | X        | X |
| D6-D7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-D5   | X        | X |
| C6-D6   | X        | X |
| C7-D7   | X        | X |
| E11-F11 | X        | X |
| E12-F12 | X        | X |
| E1-F1   | X        | X |
| E5-F5   | X        | X |
| E6-F6   | X        | X |
| E7-F7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C12-C1  | X        | X |
| D12-D1  | X        | X |
| C6-C7   | X        | X |
| D6-D7   | X        | X |
| E12-E1  | X        | X |
| F12-F1  | X        | X |
| E6-E7   | X        | X |
| F6-F7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-A6   | X        | X |
| A6-A7   | X        | X |
| B5-B6   | X        | X |
| B6-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-C6   | X        | X |
| C6-C7   | X        | X |
| D5-D6   | X        | X |
| D6-D7   | X        | X |
| E12-E1  | X        | X |
| F12-F1  | X        | X |
| E6-E7   | X        | X |
| F6-F7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-B5   | X        | X |
| A6-B6   | X        | X |
| A7-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-C6   | X        | X |
| C6-C7   | X        | X |
| D5-D6   | X        | X |
| D6-D7   | X        | X |
| E12-E1  | X        | X |
| F12-F1  | X        | X |
| E6-E7   | X        | X |
| F6-F7   | X        | X |

| CONTACT | POSITION |   |
|---------|----------|---|
|         | I2       | I |
| A11-B11 | X        | X |
| A12-B12 | X        | X |
| A1-B1   | X        | X |
| A5-A6   | X        | X |
| A6-A7   | X        | X |
| B5-B6   | X        | X |
| B6-B7   | X        | X |
| C11-D11 | X        | X |
| C12-D12 | X        | X |
| C1-D1   | X        | X |
| C5-C6   | X        | X |
| C6-C7   | X        | X |
| D5-D6   | X        | X |
| D6-D7   | X        | X |
| E11-F11 | X        | X |
| E12-F12 | X        | X |
| E1-F1   | X        | X |
| E5-E6   | X        | X |
| E6-E7   | X        | X |
| F5-F6   | X        | X |
| F6-F7   | X        | X |

\*Adjacent overlap contacts are electrically connected together during transfer.

Westinghouse

Additional Position Tabulations *Continued*

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  | X |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        |    |   |   |
| A6-B6   |          | X  | X |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 |          | X  | X |   |
| C1-D1   |          |    |   | X |
| C5-D5   | X        |    |   |   |
| C6-D6   |          | X  | X |   |
| C7-D7   |          |    |   | X |
| E12-F12 |          |    | X |   |
| F12-F1  | X        | X  |   | X |
| E6-E7   |          |    | X |   |
| F6-F7   | X        | X  |   | X |

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        |    |   |   |
| A6-B6   |          | X  |   |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 |          | X  |   |   |
| C1-D1   |          |    |   | X |
| C5-D5   | X        |    |   |   |
| C6-D6   |          | X  |   |   |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    |   | X |
| E5-F5   | X        |    |   |   |
| E6-F6   |          | X  |   |   |
| E7-F7   |          |    |   | X |
| G11-H11 | X        |    |   |   |
| G12-H12 |          | X  |   |   |
| G1-H1   |          |    |   | X |
| G5-H5   | X        |    |   |   |
| G6-H6   |          | X  |   |   |
| G7-H7   |          |    |   | X |

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  | X |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        | X  |   |   |
| A6-B6   |          | X  | X |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        | X  |   |   |
| C12-D12 |          | X  | X |   |
| C1-D1   |          |    |   | X |
| C5-C6   | X        | X  | X |   |
| C6-C7   |          |    | X | X |
| D5-D6   | X        | X  | X |   |
| D6-D7   |          |    | X | X |
| E11-F11 | X        | X  |   |   |
| E12-F12 |          | X  | X |   |
| E1-F1   |          |    |   | X |
| E5-E6   | X        | X  | X |   |
| E6-E7   |          |    | X | X |
| F5-F6   | X        | X  | X |   |
| F6-F7   |          |    | X | X |
| G12-G1  | X        |    |   |   |
| H12-H1  |          | X  | X | X |
| G6-G7   | X        |    |   |   |
| H6-H7   |          | X  | X | X |

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        | X  |   |   |
| A12-B12 |          | X  | X |   |
| A1-B1   |          |    |   | X |
| A5-A6   | X        | X  | X |   |
| A6-A7   |          |    | X | X |
| B5-B6   | X        | X  | X |   |
| B6-B7   |          |    | X | X |
| C11-D11 | X        | X  |   |   |
| C12-D12 |          | X  | X |   |
| C1-D1   |          |    |   | X |
| C5-C6   | X        | X  | X |   |
| C6-C7   |          |    | X | X |
| D5-D6   | X        | X  | X |   |
| D6-D7   |          |    | X | X |
| E11-F11 | X        | X  |   |   |
| E12-F12 |          | X  | X |   |
| E1-F1   |          |    |   | X |
| E5-E6   | X        | X  | X |   |
| E6-E7   |          |    | X | X |
| F5-F6   | X        | X  | X |   |
| F6-F7   |          |    | X | X |
| G12-G1  | X        |    |   |   |
| H12-H1  | X        | X  | X |   |
| G6-G7   | X        |    |   |   |
| H6-H7   |          | X  | X | X |

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        |    |   |   |
| A6-B6   |          | X  |   |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 |          | X  |   |   |
| C1-D1   |          |    |   | X |
| C5-D5   | X        |    |   |   |
| C6-D6   |          | X  |   |   |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    |   | X |
| E5-F5   | X        |    |   |   |
| E6-F6   |          | X  |   |   |
| E7-F7   |          |    |   | X |
| G11-H11 | X        |    |   |   |
| G12-H12 |          | X  |   |   |
| G1-H1   |          |    |   | X |
| G5-H5   | X        |    |   |   |
| G6-H6   |          | X  |   |   |
| G7-H7   |          |    |   | X |
| I11-J11 | X        |    |   |   |
| I12-J12 |          | X  |   |   |
| I1-J1   |          |    |   | X |
| I5-J5   | X        |    |   |   |
| I6-J6   |          | X  |   |   |
| I7-J7   |          |    |   | X |

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        |    |   |   |
| A6-B6   |          | X  |   |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 |          | X  |   |   |
| C1-D1   |          |    |   | X |
| C5-D5   | X        |    |   |   |
| C6-D6   |          | X  |   |   |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    |   | X |
| E5-F5   | X        |    |   |   |
| E6-F6   |          | X  |   |   |
| E7-F7   |          |    |   | X |
| G11-H11 | X        |    |   |   |
| G12-H12 |          | X  |   |   |
| G1-H1   |          |    |   | X |
| G5-H5   | X        |    |   |   |
| G6-H6   |          | X  |   |   |
| G7-H7   |          |    |   | X |
| I11-L11 | X        |    |   |   |
| I12-L12 |          | X  |   |   |
| I1-J1   |          |    |   | X |
| I5-J5   | X        |    |   |   |
| I6-J6   |          | X  |   |   |
| I7-J7   |          |    |   | X |
| K11-L11 | X        |    |   |   |
| K12-L12 |          | X  |   |   |
| K1-L1   |          |    |   | X |
| K5-L5   | X        |    |   |   |
| K6-L6   |          | X  |   |   |
| K7-L7   |          |    |   | X |

| CONTACT | POSITION |    |    |   |   |   |   |   |
|---------|----------|----|----|---|---|---|---|---|
|         | 10       | 11 | 12 | 1 | 2 | 3 | 4 | 5 |
| A11-B11 | X        | X  | X  |   |   |   |   |   |
| A12-B12 |          | X  | X  | X |   |   |   |   |
| A1-B1   |          |    |    |   |   |   |   | X |
| A5-B5   | X        | X  | X  |   |   |   |   |   |
| A6-B6   |          |    |    | X | X | X |   |   |
| A7-B7   |          |    |    |   |   |   |   | X |
| C11-D11 | X        | X  | X  | X | X | X | X |   |
| C12-D12 | X        | X  | X  | X | X | X | X |   |
| C1-D1   | X        | X  | X  | X | X | X | X |   |
| C5-D5   | X        | X  | X  | X | X | X | X |   |
| C6-D6   | X        | X  | X  | X | X | X | X |   |
| C7-D7   | X        | X  | X  | X | X | X | X |   |
| E11-F11 | X        |    |    |   |   |   |   |   |
| E12-F12 |          |    |    | X |   |   |   |   |
| E1-F1   |          |    |    |   |   |   |   | X |
| E5-F5   | X        |    |    |   |   |   |   |   |
| E6-F6   |          |    |    | X |   |   |   |   |
| E7-F7   |          |    |    |   | X |   |   |   |

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    |   | X |
| A5-B5   |          |    |   | X |
| A6-B6   |          |    |   | X |
| A7-B7   |          |    |   | X |

| CONTACT | POSITION |    |   |   |   |   |   |   |
|---------|----------|----|---|---|---|---|---|---|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 |
| A11-B11 | X        | X  |   |   |   |   |   |   |
| A12-B12 |          | X  | X | X |   |   |   |   |
| A1-B1   |          |    | X | X | X |   |   |   |
| A5-B5   |          |    |   |   | X | X |   |   |
| A6-B6   |          |    |   |   | X | X | X |   |
| A7-B7   |          |    |   |   |   |   | X | X |

| CONTACT | POSITION |    |   |   |   |   |   |   |   |   |   |    |
|---------|----------|----|---|---|---|---|---|---|---|---|---|----|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A11-B11 | X        | X  |   |   |   |   |   |   |   |   |   |    |
| A12-B12 |          | X  | X | X |   |   |   |   |   |   |   |    |
| A1-B1   |          |    | X | X | X |   |   |   |   |   |   |    |
| A5-B5   |          |    |   |   | X | X | X |   |   |   |   |    |
| A6-B6   |          |    |   |   | X | X | X | X |   |   |   |    |
| A7-B7   |          |    |   |   |   |   |   | X | X | X |   |    |
| C11-D11 | X        | X  | X | X | X | X | X | X | X | X | X | X  |
| C12-D12 | X        | X  | X | X | X | X | X | X | X | X | X | X  |
| C1-D1   | X        | X  | X | X | X | X | X | X | X | X | X | X  |
| C5-D5   | X        | X  | X | X | X | X | X | X | X | X | X | X  |
| C6-D6   | X        | X  | X | X | X | X | X | X | X | X | X | X  |
| C7-D7   | X        | X  | X | X | X | X | X | X | X | X | X | X  |
| E11-F11 | X        | X  |   |   |   |   |   |   |   |   |   |    |
| E12-F12 |          | X  | X | X |   |   |   |   |   |   |   |    |
| E1-F1   |          |    |   | X | X | X |   |   |   |   |   |    |
| E5-F5   |          |    |   |   | X | X | X |   |   |   |   |    |
| E6-F6   |          |    |   |   |   | X | X | X |   |   |   |    |
| E7-F7   |          |    |   |   |   |   | X | X | X |   |   |    |

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    |   | X |
| A5-B5   |          |    |   | X |
| A6-B6   |          |    |   | X |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 |          | X  |   |   |
| C1-D1   |          |    |   | X |
| C5-D5   |          |    |   | X |
| C6-D6   |          |    |   | X |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    |   | X |
| E5-F5   |          |    |   | X |
| E6-F6   |          |    |   | X |
| E7-F7   |          |    |   | X |

| CONTACT | POSITION |    |   |   |   |   |   |   |
|---------|----------|----|---|---|---|---|---|---|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 |
| A11-B11 | X        | X  |   |   |   |   |   |   |
| A12-B12 |          | X  | X | X |   |   |   |   |
| A1-B1   |          |    | X | X | X |   |   |   |
| A5-B5   |          |    |   |   | X | X |   |   |
| A6-B6   |          |    |   |   | X | X | X |   |
| A7-B7   |          |    |   |   |   |   | X | X |
| C11-D11 | X        | X  |   |   |   |   |   |   |
| C12-D12 | X        | X  | X | X |   |   |   |   |
| C1-D1   |          |    | X | X | X |   |   |   |
| C5-D5   |          |    |   |   | X | X | X |   |
| C6-D6   |          |    |   |   | X | X | X |   |
| C7-D7   |          |    |   |   |   |   | X | X |
| E11-F11 | X        | X  |   |   |   |   |   |   |
| E12-F12 |          | X  | X | X |   |   |   |   |
| E1-F1   |          |    | X | X | X |   |   |   |
| E5-F5   |          |    |   | X | X | X |   |   |
| E6-F6   |          |    |   |   | X | X | X |   |
| E7-F7   |          |    |   |   |   |   | X | X |

\*Adjacent overlap contacts are electrically connected together during transfer.

# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

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| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    | X |   |
| A5-B5   | X        |    |   |   |
| A6-B6   |          | X  |   |   |
| A7-B7   |          |    | X |   |
| C11-D11 |          |    |   | X |
| C12-D12 |          |    |   | X |
| C1-D1   |          |    |   | X |
| C5-D5   |          |    |   | X |
| C6-D6   |          |    |   | X |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    | X |   |
| E5-F5   | X        |    |   |   |
| E6-F6   |          | X  |   |   |
| E7-F7   |          |    | X |   |
| G11-H11 |          |    |   | X |
| G12-H12 |          |    |   | X |
| G1-H1   |          |    |   | X |
| G5-H5   |          |    |   | X |
| G6-H6   |          |    |   | X |
| G7-H7   |          |    |   | X |

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| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    | X |   |
| A5-B5   | X        |    |   |   |
| A6-B6   |          | X  |   |   |
| A7-B7   |          |    | X |   |
| C11-D11 |          |    |   | X |
| C12-D12 |          |    |   | X |
| C1-D1   |          |    |   | X |
| C5-D5   |          |    |   | X |
| C6-D6   |          |    |   | X |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    | X |   |
| E5-F5   | X        |    |   |   |
| E6-F6   |          | X  |   |   |
| E7-F7   |          |    | X |   |
| G11-H11 |          |    |   | X |
| G12-H12 |          |    |   | X |
| G1-H1   |          |    |   | X |
| G5-H5   |          |    |   | X |
| G6-H6   |          |    |   | X |
| G7-H7   |          |    |   | X |
| I11-J11 | X        |    |   |   |
| I12-J12 |          | X  |   |   |
| I1-J1   |          |    | X |   |
| I5-J5   | X        |    |   |   |
| I6-J6   |          | X  |   |   |
| I7-J7   |          |    | X |   |
| K11-L11 |          |    |   | X |
| K12-L12 |          |    |   | X |
| K1-L1   |          |    |   | X |
| K5-L5   |          |    |   | X |
| K6-L6   |          |    |   | X |
| K7-L7   |          |    |   | X |

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| CONTACT | POSITION |    |   |   |   |   |   |   |   |   |
|---------|----------|----|---|---|---|---|---|---|---|---|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A11-B11 | X        |    |   |   |   |   |   |   |   |   |
| A12-B12 |          | X  |   |   |   |   |   |   |   |   |
| A1-B1   |          |    | X |   |   |   |   |   |   |   |
| A5-B5   |          |    |   |   | X |   |   |   |   |   |
| A6-B6   |          |    |   |   |   | X |   |   |   |   |
| A7-B7   |          |    |   |   |   |   | X |   |   |   |
| C11-D11 |          |    |   | X |   |   |   |   |   |   |
| C12-D12 |          |    |   |   | X |   |   |   |   |   |
| C1-D1   |          |    |   |   |   | X |   |   |   |   |
| C5-D5   |          |    |   |   |   |   |   | X |   |   |
| C6-D6   |          |    |   |   |   |   |   |   | X |   |
| C7-D7   |          |    |   |   |   |   |   |   |   | X |

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| CONTACT | POSITION |    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |
|---------|----------|----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| A11-B11 | X        | X  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |
| A12-B12 |          |    | X | X |   |   |   |   |   |   |   |    |    |    |    |    |
| A1-B1   |          |    |   |   | X | X |   |   |   |   |   |    |    |    |    |    |
| A5-B5   |          |    |   |   |   |   | X | X |   |   |   |    |    |    |    |    |
| A6-B6   |          |    |   |   |   |   |   |   | X | X |   |    |    |    |    |    |
| A7-B7   |          |    |   |   |   |   |   |   |   |   | X | X  |    |    |    |    |
| C11-D11 |          | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| C12-D12 |          | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| C1-D1   |          | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| C5-D5   |          | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| C6-D6   |          | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| C7-D7   |          | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| E11-F11 | X        | X  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |
| E12-F12 |          |    | X | X |   |   |   |   |   |   |   |    |    |    |    |    |
| E1-F1   |          |    |   |   | X | X |   |   |   |   |   |    |    |    |    |    |
| E5-F5   |          |    |   |   |   |   | X | X | X |   |   |    |    |    |    |    |
| E6-F6   |          |    |   |   |   |   |   |   | X | X | X |    |    |    |    |    |
| E7-F7   |          |    |   |   |   |   |   |   |   |   | X | X  | X  |    |    |    |
| G11-H11 |          |    |   |   |   | X | X | X |   |   |   |    |    |    |    |    |
| G12-H12 |          |    |   |   |   |   | X | X | X |   |   |    |    |    |    |    |
| G1-H1   |          |    |   |   |   |   |   | X | X | X |   |    |    |    |    |    |
| G5-H5   |          |    |   |   |   |   |   |   |   | X | X | X  |    |    |    |    |
| G6-H6   |          |    |   |   |   |   |   |   |   |   |   | X  | X  | X  |    |    |
| G7-H7   |          |    |   |   |   |   |   |   |   |   |   |    |    | X  | X  | X  |
| I11-J11 | X        | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| I12-J12 | X        | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| I1-J1   | X        | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| I5-J5   | X        | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| I6-J6   | X        | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| I7-J7   | X        | X  | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  |
| K11-L11 |          |    |   |   |   | X | X | X |   |   |   |    |    |    |    |    |
| K12-L12 |          |    |   |   |   |   | X | X | X |   |   |    |    |    |    |    |
| K1-L1   |          |    |   |   |   |   |   | X | X | X |   |    |    |    |    |    |
| K5-L5   |          |    |   |   |   |   |   |   |   | X | X | X  |    |    |    |    |
| K6-L6   |          |    |   |   |   |   |   |   |   |   |   | X  | X  | X  |    |    |
| K7-L7   |          |    |   |   |   |   |   |   |   |   |   |    |    | X  | X  | X  |

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| CONTACT | POSITION |    |   |   |   |   |   |   |   |   |
|---------|----------|----|---|---|---|---|---|---|---|---|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A11-B11 | X        |    |   |   |   |   |   |   |   |   |
| A12-B12 |          | X  |   |   |   |   |   |   |   |   |
| A1-B1   |          |    | X |   |   |   |   |   |   |   |
| A5-B5   |          |    |   |   | X |   |   |   |   |   |
| A6-B6   |          |    |   |   |   | X |   |   |   |   |
| A7-B7   |          |    |   |   |   |   | X |   |   |   |
| C11-D11 |          |    |   | X |   |   |   |   |   |   |
| C12-D12 |          |    |   |   | X |   |   |   |   |   |
| C1-D1   |          |    |   |   |   | X |   |   |   |   |
| C5-D5   |          |    |   |   |   |   |   | X |   |   |
| C6-D6   |          |    |   |   |   |   |   |   | X |   |
| C7-D7   |          |    |   |   |   |   |   |   |   | X |
| E11-F11 | X        |    |   |   |   |   |   |   |   |   |
| E12-F12 |          | X  |   |   |   |   |   |   |   |   |
| E1-F1   |          |    | X |   |   |   |   |   |   |   |
| E5-F5   |          |    |   |   | X |   |   |   |   |   |
| E6-F6   |          |    |   |   |   | X |   |   |   |   |
| E7-F7   |          |    |   |   |   |   | X |   |   |   |
| G11-H11 |          |    |   | X |   |   |   | X |   |   |
| G12-H12 |          |    |   |   | X |   |   |   |   |   |
| G1-H1   |          |    |   |   |   | X |   |   |   |   |
| G5-H5   |          |    |   |   |   |   |   | X |   |   |
| G6-H6   |          |    |   |   |   |   |   |   | X |   |
| G7-H7   |          |    |   |   |   |   |   |   |   | X |

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| CONTACT | POSITION |   |
|---------|----------|---|
|         | 12       | 1 |
| A11-B11 | X        |   |
| A12-B12 |          | X |
| A1-B1   |          | X |
| A2-B2   | X        |   |
| A3-B3   |          | X |
| A4-B4   | X        |   |
| A5-B5   |          | X |
| A6-B6   | X        |   |
| A7-B7   |          | X |
| A8-B8   | X        |   |
| A9-B9   |          | X |
| A10-B10 | X        |   |

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| CONTACT | POSITION |   |
|---------|----------|---|
|         | 12       | 1 |
| A12-B12 | X        |   |
| A1-B1   |          | X |
| A2-B2   | X        |   |
| A3-B3   |          | X |
| A4-B4   | X        |   |
| A5-B5   |          | X |
| A6-B6   | X        |   |
| A7-B7   |          | X |
| A8-B8   | X        |   |
| A9-B9   |          | X |
| A10-B10 | X        |   |
| A11-B11 |          | X |
| C12-D12 | X        |   |
| C1-D1   |          | X |
| C2-D2   | X        |   |
| C3-D3   |          | X |
| C4-D4   | X        |   |
| C5-D5   |          | X |
| C6-D6   | X        |   |
| C7-D7   |          | X |
| C8-D8   | X        |   |
| C9-D9   |          | X |
| C10-D10 | X        |   |
| C11-D11 |          | X |

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| CONTACT | POSITION |    |
|---------|----------|----|
|         | 11       | 12 |
| A11-B11 | X        |    |
| A12-B12 |          | X  |
| A1-B1   |          | X  |
| A2-B2   | X        |    |
| A3-B3   |          | X  |
| A4-B4   | X        |    |
| A5-B5   | X        |    |
| A6-B6   |          | X  |
| A7-B7   |          | X  |
| A8-B8   | X        |    |
| A9-B9   |          | X  |
| A10-B10 |          | X  |

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## Additional Position Tabulations Continued

| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A2-B2   | X        |
| A3-B3   | X        |
| A4-B4   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |
| A8-B8   | X        |
| A9-B9   | X        |
| A10-B10 | X        |
| C11-D11 | X        |
| C12-D12 | X        |
| C1-D1   | X        |
| C2-D2   | X        |
| C3-D3   | X        |
| C4-D4   | X        |
| C5-D5   | X        |
| C6-D6   | X        |
| C7-D7   | X        |
| C8-D8   | X        |
| C9-D9   | X        |
| C10-D10 | X        |

| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A2-B2   | X        |
| A3-B3   | X        |
| A4-B4   | X        |
| A5-A6   | X        |
| A6-A7   | X        |
| B5-B6   | X        |
| B6-B7   | X        |
| A8-A9   | X        |
| A9-A10  | X        |
| B8-B9   | X        |
| B9-B10  | X        |

| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A2-B2   | X        |
| A3-B3   | X        |
| A4-B4   | X        |
| A5-A6   | X        |
| A6-A7   | X        |
| B5-B6   | X        |
| B6-B7   | X        |
| A8-A9   | X        |
| A9-A10  | X        |
| B8-B9   | X        |
| B9-B10  | X        |
| C12-C1  | X        |
| D12-D1  | X        |
| C2-C3   | X        |
| D2-D3   | X        |
| C4-C5   | X        |
| D4-D5   | X        |
| C6-C6   | X        |
| D6-D7   | X        |
| C8-C9   | X        |
| D8-D9   | X        |
| C10-C11 | X        |
| D10-D11 | X        |

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| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A2-B2   | X        |
| A3-B3   | X        |
| A4-B4   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |
| A8-B8   | X        |
| A9-B9   | X        |
| A10-B10 | X        |

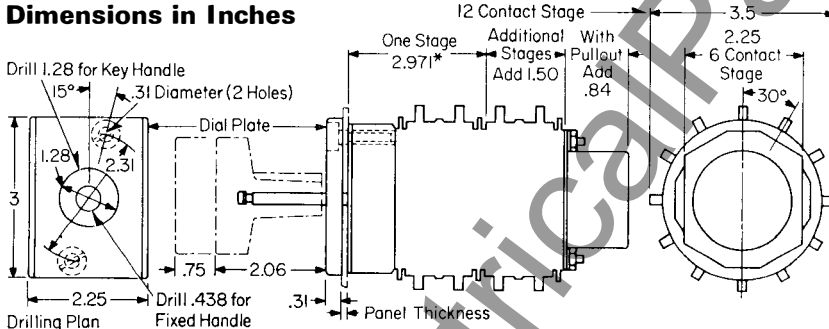
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| CONTACT | POSITION |
|---------|----------|
| A10-B10 | X        |
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A2-B2   | X        |
| A3-B3   | X        |
| A4-B4   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |
| A8-B8   | X        |
| A9-B9   | X        |

80

| CONTACT | POSITION |
|---------|----------|
| A12-B12 | X        |
| A1-B1   | X        |
| A2-B2   | X        |
| A3-B3   | X        |
| A4-B4   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |
| A8-B8   | X        |
| A9-B9   | X        |
| A10-B10 | X        |
| A11-B11 | X        |

## Dimensions in Inches



\* The above Dimensions Apply to Switches Having Either Momentary or Maintained Contacts. On Switches Requiring both Momentary and Maintained Contacts, add .88 Inch to The First Stage Only.

## Typical Arrangement of Type W-2 Switch with Type EZC Indicating Lamps

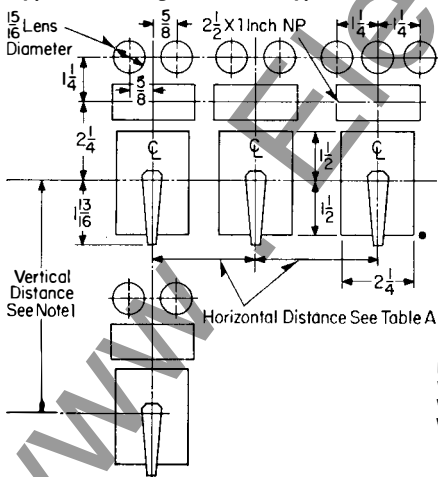
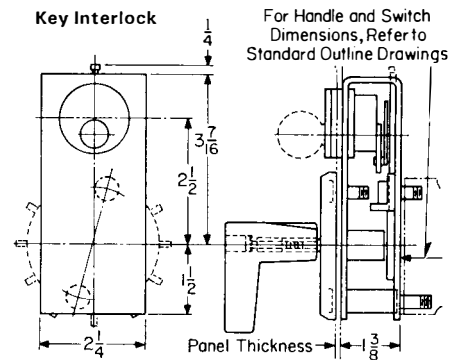


Table A

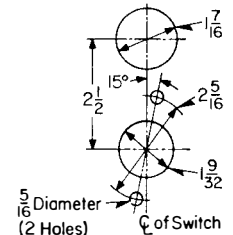
| Switch Contact Frame Size | Number of Lamps Above Each Switch |       | Horizontal Distance Inches |
|---------------------------|-----------------------------------|-------|----------------------------|
|                           | Sw. 1                             | Sw. 2 |                            |
| 6                         | 0                                 | 0     | 3                          |
| 12                        | 0                                 | 0     | 5 1/2                      |
| 6                         | 2                                 | 2     | 3                          |
| 12                        | 2                                 | 2     | 5 1/2                      |
| 6                         | 3                                 | 3     | 4 1/4                      |
| 12                        | 3                                 | 3     | 5 1/2                      |
| 6                         | 2                                 | 3     | 3 3/4                      |
| 12                        | 2                                 | 3     | 5 1/2                      |

**Note 1**—Vertical Distance Between Switches With Lamps and N. P. 7 Inches.  
Without Lamps/with N. P. 5 1/2 Inches.  
Without Lamps or N. P. 5 1/2 Inches.

## Key Interlock



## Drilling Plan Key Interlock



# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

## How to Order Stamped Dial Nameplates

NP 502A054H01 (Fixed Handle) Fig. 1  
NP 502A054H03 (Removable Key) Fig. 1  
NP 502A054H02  
(Fixed Handle with Target) Fig. 2  
NP 502A054H04 (Fixed Handle) Fig. 3  
NP 502A054H05 (Removable Key) Fig. 3

Select figure number meeting nameplate requirement. Specify the required blank nameplate style as given for the selected figure number and the desired markings at location numbers shown on the figures.

Example: Figure 2 – NP 502A054H02

Stamp 11 = Trip, 1 = Close, 15 = Circuit  
Breaker, 16 = Control.

Number of Letter Spaces per Line

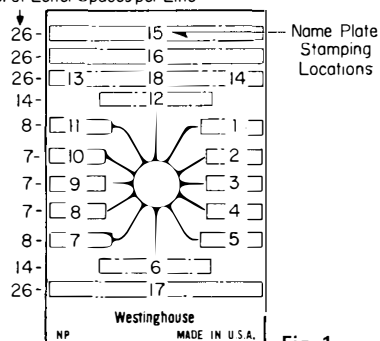


Fig. 1

Number of Letter Spaces per Line

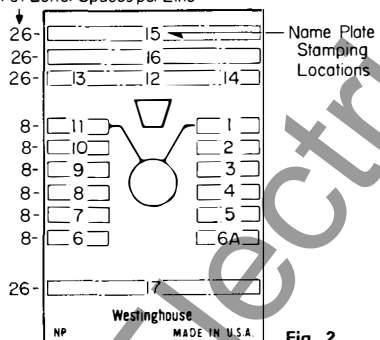


Fig. 2

Number of Letter Spaces per Line

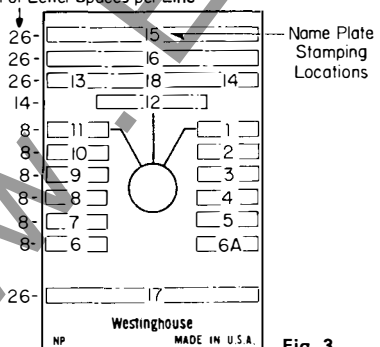
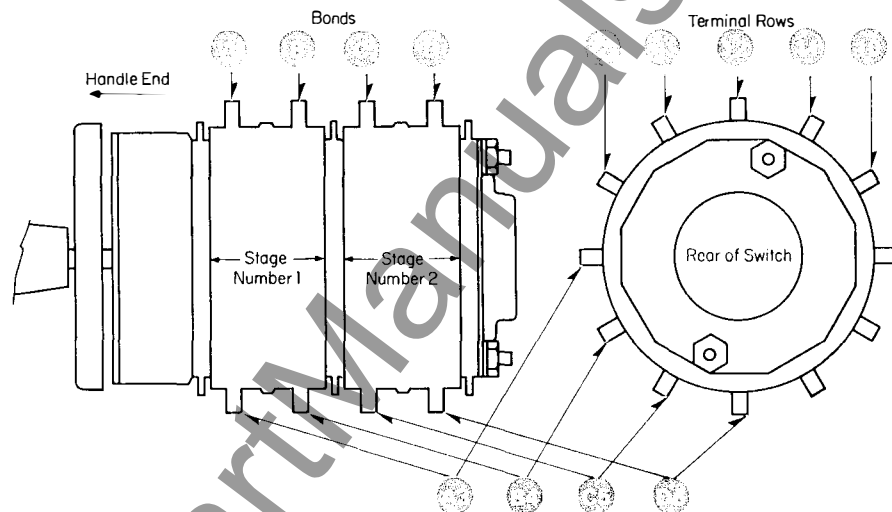


Fig. 3

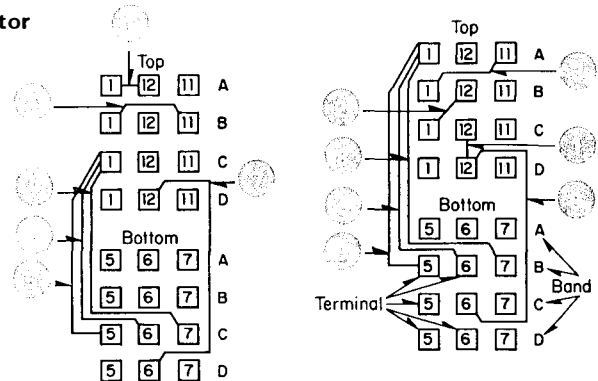
## Method of Identifying Contact Terminals Lettered Bands, Numbered Terminals



## 6-Contact Stage Connector

Connector Style No.

|   |            |
|---|------------|
| 1 | 677C519H08 |
| 2 | 677C519G07 |
| 3 | 677C519G05 |
| 4 | 677C519G01 |
| 5 | 677C782G01 |
| 6 | 677C782G02 |
| 7 | 677C782G03 |
| 8 | 677C782G04 |



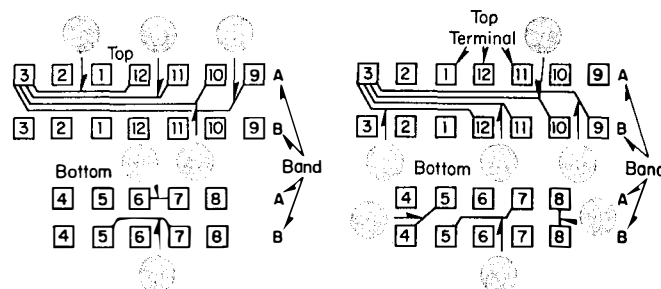
Connectors in Same Band

Connectors between Adjacent Bands

## 12-Contact Stage Connector

Connector Style No.

|   |            |
|---|------------|
| 1 | 677C519H08 |
| 2 | 677C519G07 |
| 3 | 677C519G05 |
| 4 | 677C519G01 |
| 5 | 677C782G01 |
| 6 | 677C782G02 |
| 7 | 677C782G03 |
| 8 | 677C782G04 |



Connectors in Same Band

Connector between Adjacent Bands





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## Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

### Application

The Type W-2 switch is designed for use as an instrument, control or general purpose switch. It is compact, yet of sufficient size to provide long, trouble-free service when applied within the specified ratings.

Design flexibility of internal parts and contacting, plus external jumpering of the contact studs affords almost limitless switching combinations for relatively few standard components. The design flexibility is provided in the basic switch styles. A complete switch is made up of a basic switch style, one of several styled handles, a nameplate connector diagram style and a nameplate.

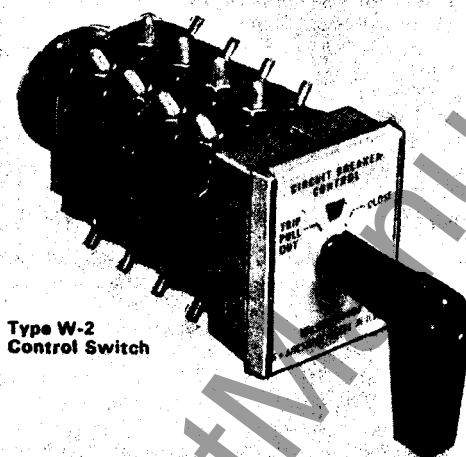
The W-2 switch may be ordered as a single style unit where such a style meets a specific application. Where a single listed style does not meet a specific application, the desired switch may be ordered by specifying the required styled components.

**Instrument Switches:** Maintained contact type for use with all classes of electrical instruments, relays, meters, and for performing various circuit combinations. Designed for panel mounting and equipped with handles for manual operation.

**Control Switches:** Momentary contact type being spring return to the original or "off" position. For use with circuit breakers and other electrically controlled apparatus. Panel mounting. Handles for manual operation.

The Type W-2 switch can be furnished with a tumbler pin keylock. Such lock can be assembled either to the right or to the left of the switch unit on the horizontal center line, or, as is considered standard, above the switch unit on the vertical center line as shown in the illustration. The unit is so designed as to permit locking the switch in any one or in each of several positions. The position or positions in which a switch is to be locked must be specified on order.

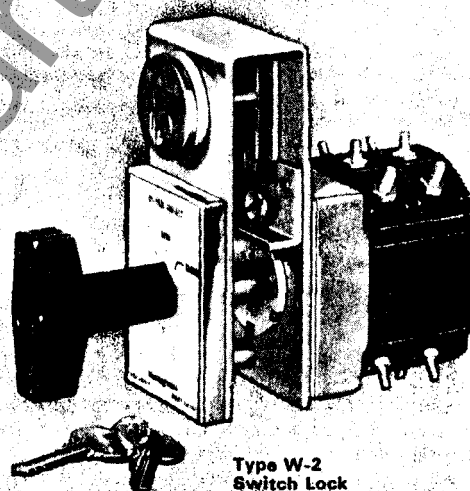
The style numbers shown in this bulletin apply to switches for mounting on  $\frac{1}{8}$  -  $\frac{1}{4}$  inch thick panels only. Switches for mounting on thicker panels may be ordered as "similar to" a desired style except for thick panel.



Type W-2  
Control Switch



Type W-2  
Instrument Switch



Type W-2  
Switch Lock

### Advantages

- Small Size
- Variable Circuitry by "You Wire It"
- More Contacts per Unit Volume
- Roller-Wipe Spring Actuated Contacting
- Momentary and Maintained Contact Designs, or in Combination
- Greater Availability of Contacts with Terminal Identification for Automated Wiring or Application Changes in Field, See Page 23
- Double Break Contacts per Stage

### In This Bulletin

| Instrument and Control Switches | Page  |
|---------------------------------|-------|
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| Design Features                 | 2     |
| Operation                       | 3     |
| Construction Details            | 4     |
| Standard Switches               | 5     |
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| Ordering Information            | 23-24 |

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## Design Features

### General Construction

The W-2 switch consists essentially of an operating handle, face plate, control housing, contact frame assembly and rotor assembly. It can be built up in any number of stages from 1 to 9, which stages are clamped together and to the control housing by two tie bolts. A steel operating shaft ties the contact rotors together. A metal cover on the rear holds the position stop pins, retains the shaft and provides basic switch identification. For push or pull switches, the metal cover is replaced by a polycarbonate cover which houses the pull-out mechanism.

### Switch Positions

Each switch has a minimum of two and a maximum of twelve rotary positions with a 30° throw between positions, irrespective of the number. Each rotary position coincides precisely with the nameplate markings. The degree of throw between positions is fixed and cannot be changed. The number of positions of each switch can be altered by removing the rear cover and changing the position of the "stop" pin or pins located in the rear housing spacer. In addition to rotary motion, the W-2 switch can be provided with a lateral movement (push-pull) of the rotor.

### Contact Frames

Two contact frame sizes are available; the half frame with six sets of contacts; three sets on the top at 11, 12 and 1 o'clock positions and three sets on the bottom at 5, 6 and 7 o'clock positions. The full frame with 12 sets of contacts, each set located at 30° intervals around its perimeter as are the numbers on a clock. The contact frames are made of glass polyester insulating material.

### Contacts

Switches are usually referred to as "so many stages long". For a W-2 switch, a stage of contacts consists of a contact frame (either 6 or 12 contact sets) and a rotor.

At every position location on the frame, there are two contact terminal studs in line (a set) per stage. Each of these studs is one piece, made of bronze alloy and silver plated.

### Rotors

The rotors are standard in design and hold the roller contacts. Each rotor, made of glass polyester insulating material, rotates independently between the stage spacer plates. The rotor assembly is equipped with one to six rollers (as determined by the required circuitry) each of which makes contact with two adjacent stationary terminal studs to complete a circuit and so affording a double, series break contact. The silver-plated bronze

alloy roller contacts provide a rolling, wiping action, are self-aligning on assembly and require no adjustment of contact pressure for the life of the switch.

### Contact Flexibility

Basic "you wire it" flexibility is available in the Type W-2 switch. While the internal contacting is standardized for each basic type of switch; such as ammeter, voltmeter, circuit breaker, etc., by using available insulated jumpers, connections between external switch terminals can be made to obtain the desired contacting for a specific application. This minimizes the number of basic styled switches that otherwise would be required.

### Switch Dial

The Type W-2 switch dial consists of two parts; i.e., a dial plate and a nameplate.

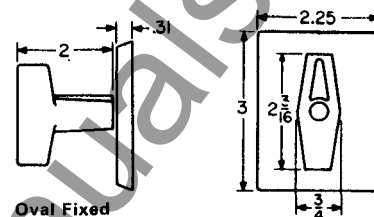
The standard control switch dial plate is die cast aluminum, with red and green target parts, where required, and serves as the base for mounting the nameplate. The nameplate is made of a white ABS material on which is stamped in black the desired position markings.

### Handles

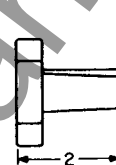
Handles for the Type W-2 switch are made of a phenolic insulating material designed to afford a smooth, easy, and comfortable grip of pleasing appearance. Each handle has a recessed arrow molded into it as a visual aid in positioning.

The handles are made in four shapes, i.e., oval, round, pistol grip, and large pistol grip. Each of the shapes can be obtained in the fixed type or the removable key type. The fixed handles are fastened to the switch shaft by a screw through the front of the handle.

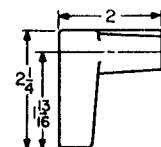
There is also available a combination removable key type handle in the pistol grip shape that can be used to operate both the Type W-2 and the Type W switches designed for removable key operation.



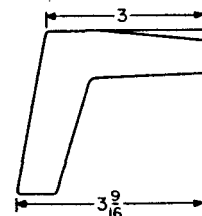
Oval Fixed  
S # 501B787H01



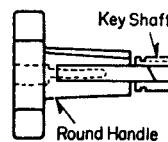
Round Notched Fixed  
S # 310C624H01



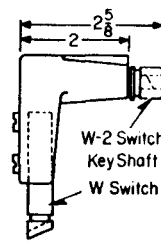
Pistol Grip Fixed  
S # 310C624H02



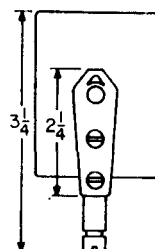
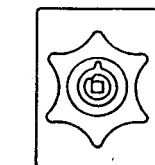
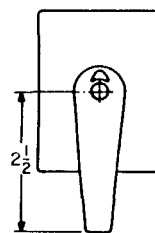
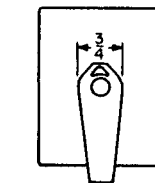
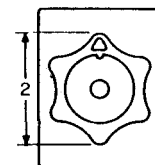
Large Pistol Grip Fixed  
S # 677C101H01



Removable



Combination



## Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

### Operation

The Type W-2 switch is a rotary roller action switch. Rotation of the shaft causes the rotor rollers to roll from one set of stationary contacts to another. The number of roller contacts can vary from 1 to 6 depending on the number of rotary positions required for the switch application. Each roller contact, moving radially, is held in and guided by a slot in the rotor arm. The rollers are pushed outward by spring pressure. Between roller and spring there is an insulated spring seat to reduce friction and wear. On standard potential contacts, an insulated wheel is used on both ends of the roller contact which wheels roll inside the switch stator frame. This arrangement reduces the friction of the spring-loaded roller in riding up on the stationary contact and also results in an increased air gap as a result of faster contact separation.

Overlapping contacts are obtained by increasing the diameter of the contact rollers of the shorting bar. At mid-position the roller spans the space between the stationary contacts. Such rollers provide a make-before-break contact in going from one position to an adjacent one.

The Type W-2 switch is available in both the maintained and the spring return types. Both types use a housing that is  $\frac{3}{8}$ " deep, located between the back surface of the dial plate and the frame-rotor unit. This feature permits conversion from one type to another with a minimum of parts, time and experience.

**Maintained Type:** On a switch of this type, the switch is held in rotary position by a starwheel mechanism. The mechanism consists of a notched, molded wheel rotating between two metal rollers mounted on spring loaded arms. This arrangement provides a positive snap action as the handle is turned.

**Momentary Type:** This type uses a rotor that is returned to its original position by a double coil wound spring. The spring offers minimum opposition to movement of the switch handle, but is sufficiently strong to operate the rotor for all required contacting.

For current circuits, there is available an assembly of normally closed contact between front and rear terminals at each position on a stage. The assembly consists of a shorting bar across the two terminals and held closed by spring pressure. Turning the switch handle causes a cam to push the shorting bar away from the two terminals. Operating simultaneously with this contact assembly, in a different stage, are regular rollers designed and arranged so that they make a parallel circuit just prior to opening of the normally closed contact. This arrange-

ment permits overlapping transition in current metering of circuits.

On three-position switches, slip contacts are available. These contacts close when the switch operating handle is turned to the right position and remain closed after the operating handle has returned to the center position. The contacts open when the operating handle is turned to the left position and remain open upon return of the handle to the center position.

In addition to rotary motion, the W-2 switch can be provided with lateral movement (push-pull). Spring actuated roller contacts are mounted in a wafer housing fastened to the operating shaft by "E" rings. The wafer housing can only be moved by a push or pull movement. The roller contact spans two adjacent terminals on a band and it moves back and forth between two bands in a stage.

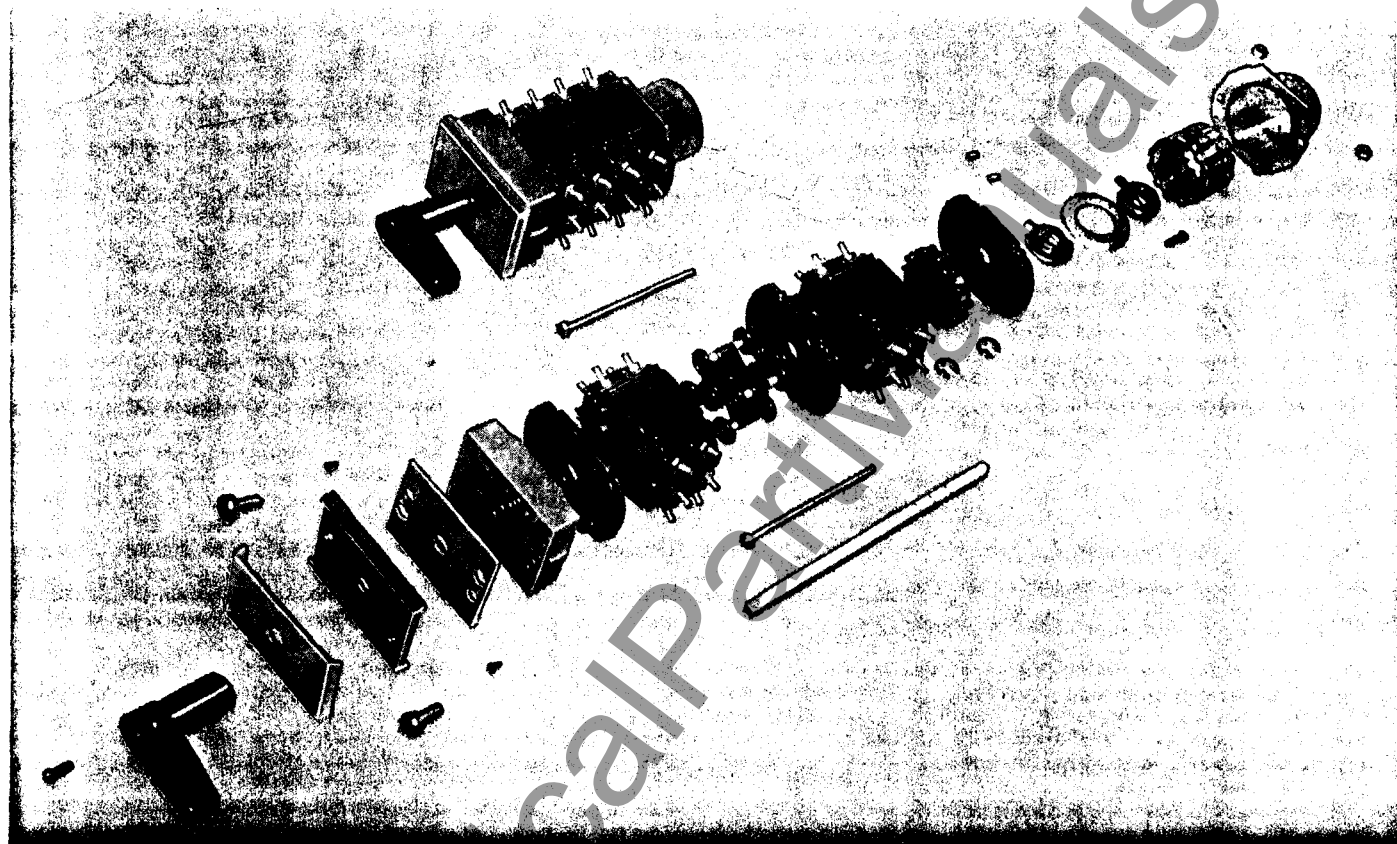
### Interrupting Ratings

| Voltage     | Amperes            |                            |                        |                            |
|-------------|--------------------|----------------------------|------------------------|----------------------------|
|             | Single Contact     |                            | Two Contacts in Series |                            |
|             | Non-Inductive Load | Inductive Load<br>.2 Henry | Non-Inductive Load     | Inductive Load<br>.2 Henry |
| 110V 60 Cy. | 60.0               | 30.0                       | ...                    | ...                        |
| 220V 60 Cy. | 30.0               | 20.0                       | 60.0                   | ...                        |
| 440V 60 Cy. | 25.0               | 10.0                       | 40.0                   | ...                        |
| 660V 60 Cy. | 15.0               | 8.0                        | 25.0                   | ...                        |
| 48V D.C.    | 40.0               | 5.0                        | ...                    | ...                        |
| 125V D.C.   | 8.0                | 2.4                        | 28.0                   | 5.0                        |
| 250V D.C.   | 1.8                | 1.1                        | 9.5                    | 3.3                        |
| 550V D.C.   | .6                 | .5                         | 2.0                    | 1.2                        |

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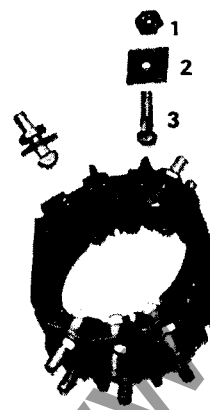


## Exploded View of Typical Control Switch



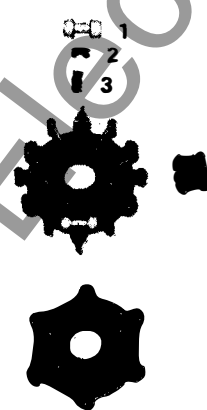
### Construction Details of Important Sub-assemblies

#### Frame 6 contacts



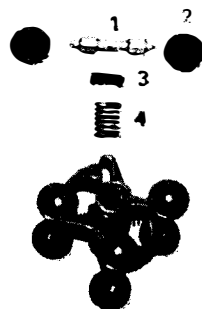
1. Hex nut
2. Window locking spacer
3. Stationary terminal contact

#### Rotor Pull contact



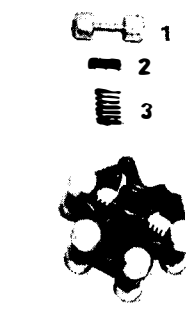
1. Roller contact
2. Spring seat
3. Spring

#### Rotor Standard 4 roller potential contacts



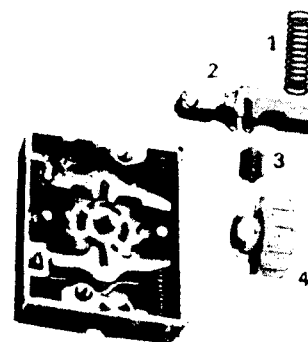
1. Standard roller contact
2. Contact wheel
3. Spring seat
4. Spring

#### Rotor Standard 6 roller overlap contacts



1. Overlap roller contact
2. Spring seat
3. Spring

#### Control housing with maintained contact mechanism



1. Starwheel spring
2. Starwheel lever
3. Starwheel roller
4. Starwheel

## Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

### Standard Switches – Style Numbers

| Figure | Switch Description                           | Complete Switch | Handle Type | Contact Type |
|--------|----------------------------------------------|-----------------|-------------|--------------|
| 1      | Ammeter – 2 phase                            | 505A700G01      | R           | MA           |
| 2      | Ammeter – 3 phase – 2 CT's                   | 505A701G02      | R           | MA           |
| 2A     | 3 phase – 3 independent circuits             | 505A701G01      | R           | MA           |
| 3      | Voltmeter – 1 phase                          | 505A747G01 +    | ...         | MA           |
| 3A     | Frequency Meter                              | 508A467G01 +    | ...         | MA           |
| 3B     | Synchronizing – machine to bus               | 505A755G01 +    | ...         | MA           |
| 4      | Voltmeter – 2 phase – 3 wire                 | 505A702G01      | R           | MA           |
| 4A     | 2 circuit dc – 2 wire                        | 505A702G02      | R           | MA           |
| 4A     | 2 circuit dc – 2 wire                        | 505A748G01 +    | ...         | MA           |
| 4B     | Dc – 3 wire                                  | 505A702G03      | R           | MA           |
| 4C     | 3 phase – 3 wire                             | 505A702G04      | R           | MA           |
| 4C     | 3 phase – 3 wire                             | 505A749G01 +    | ...         | MA           |
| 4D     | 3 phase – 4 wire                             | 505A702G05      | R           | MA           |
| 4D     | 3 phase – 4 wire                             | 505A762G01 +    | ...         | MA           |
| 5      | Voltmeter – 4 circuit                        | 505A704G01      | R           | MA           |
| 6      | Voltmeter                                    |                 |             |              |
|        | 3 phase and phase-to-neutral                 | 505A705G01      | R           | MA           |
| 6A     | two 3 phase circuits                         | 505A705G02      | R           | MA           |
| 6B     | 6 circuit                                    | 505A705G03      | R           | MA           |
| 7      | Wattmeter                                    | 505A752G01 +    | ...         | MA           |
| 8      | Power Factor Meter                           | 505A753G01 +    | ...         | MA           |
| 9      | Power Factor Meter<br>current transfer only  | 505A754G01 +    | ...         | MA           |
| 10     | Synchronizing<br>between machines            | 505A757G01 +    | ...         | MA           |
| 11     | Temperature<br>approximate lead compensation | 658A667G01      | R           | MA           |
| 12     | Temperature<br>approximate lead compensation | 663A488G01      | R           | MA           |
| 13     | Temperature<br>accurate lead compensation    | 787A936G01      | R           | MA           |
| 14     | Temperature<br>accurate lead compensation    | 661A210G01      | R           | MA           |
| 15     | Temperature<br>approximate lead compensation | 663A452G01 +    | ...         | MA           |
| 16     | Temperature<br>accurate lead compensation    | 661A287G03 +    | ...         | MA           |
| 17     | Temperature<br>approximate lead compensation | 663A453G01 +    | ...         | MA           |

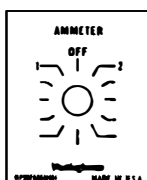
| Figure | Switch Description                        | Complete Switch | Handle Type | Contact Type |
|--------|-------------------------------------------|-----------------|-------------|--------------|
| 18     | Temperature<br>accurate lead compensation | 653A454G01 +    | ...         | MA           |
| 19     | Regulator Cutout                          | 505A712G01      | R           | MA           |
| 20     | Regulator Cutout                          | 508A224G02      | R           | MA           |
| 21     | Circuit Breaker                           | 505A713G01      | P           | MO           |
| 21A    | Circuit Breaker                           | 505A713G02      | P           | MO           |
| 21     | Circuit Breaker                           | 505A713G03      | O           | MO           |
| 22     | Circuit Breaker                           | 505A714G01      | P           | MO           |
|        | Circuit Breaker                           | 505A714G02      | O           | MO           |
| 23     | Circuit Breaker                           | 505A717G01      | P           | MO           |
|        | Circuit Breaker                           | 505A717G03      | O           | MO           |
| 24     | Circuit Breaker                           | 505A718G01      | P           | MO           |
| 25     | Circuit Breaker                           | 505A720G01      | P           | MO           |
|        | Circuit Breaker                           | 505A720G03      | O           | MO           |
| 26     | Circuit Breaker                           | 508A244G01      | P           | MO           |
|        | Circuit Breaker                           | 508A244G02      | O           | MO           |
| 27     | Circuit Breaker                           | 508A262G01      | P           | MO           |
|        | Circuit Breaker                           | 508A262G03      | O           | MO           |
| 28     | Circuit Breaker                           | 508A264G01      | O           | MO           |
|        | Circuit Breaker                           | 608A264G02      | P           | MO           |
| 29     | Voltage Control                           | 505A703G01      | P           | MO           |
|        | Voltage Control                           | 505A703G06      | O           | MO           |
| 29A    | Speed Control                             | 505A703G02      | P           | MO           |
|        | Speed Control                             | 505A703G07      | O           | MO           |
| 30     | Voltage Control                           | 505A715G01      | P           | MO           |
|        | Voltage Control                           | 505A715G05      | O           | MO           |
| 31     | Voltage Control                           | 505A716G01      | O           | MO           |
| 31A    | Electrode Control                         | 505A716G02      | O           | MO           |
|        | Electrode Control                         | 505A716G04      | P           | MO           |
| 31B    | Motor Control                             | 505A716G03      | O           | MO           |
|        | Motor Control                             | 505A716G05      | P           | MO           |
| 32     | Pilot Wire Test                           | 508A468G01      | P           | MA           |
| 33     | OFF-ON                                    | 505A706G01      | O           | MA           |
|        |                                           | 505A706G02      | P           | MA           |
|        |                                           | 505A706G03      | R           | MA           |

Handle Type: R=Round Fixed P=Pistol Grip Fixed O=Oval Fixed  
MA=Maintained Contacts  
MO=Momentary Contacts  
+ Switch requires but does not include removable key handle. Order as separate item, the number of keys desired, specifying style as shown in referenced figure.



**All wiring diagrams contained in this bulletin are to be considered as "TYPICAL."**

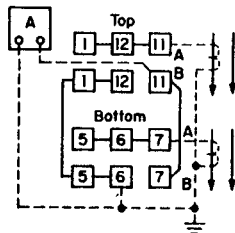
1



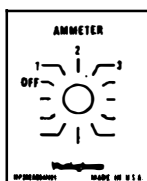
| CONTACT | POSITION |   |    |     |
|---------|----------|---|----|-----|
|         | 1        | - | WT | - 2 |
| A11-B11 | X        | X |    |     |
| A12-B12 |          | X | X  | X   |
| A1-B1   |          |   |    | X X |
| A5-B5   | X        | X |    |     |
| A6-B6   |          | X | X  | X   |
| A7-B7   |          |   |    | X X |

## 2 Phase

Round Fixed Handle  
Switch S# 505A700G01



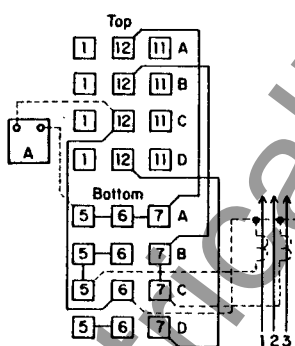
2



| CONTACT | POSITION |    |    |    |    |    |
|---------|----------|----|----|----|----|----|
|         | 0        | -1 | -2 | -3 | -4 | -5 |
| A11-B11 | X        | X  | X  |    |    |    |
| A12-B12 |          |    |    | X  | X  |    |
| A1-B1   |          |    |    |    |    | X  |
| A5-B5   |          | X  | X  |    |    |    |
| A6-B6   |          |    |    | X  | X  |    |
| A7-B7   |          |    |    |    |    | X  |
| C11-D11 | X        | X  | X  | X  | X  | X  |
| C12-D12 | X        | X  | X  | X  | X  | X  |
| C1-D1   | X        | X  | X  | X  | X  | X  |
| C5-D5   | X        | X  | X  | X  | X  | X  |
| C6-D6   | X        | X  | X  | X  | X  | X  |
| C7-D7   | X        | X  | X  | X  | X  | X  |

### 3Phase-2CT's

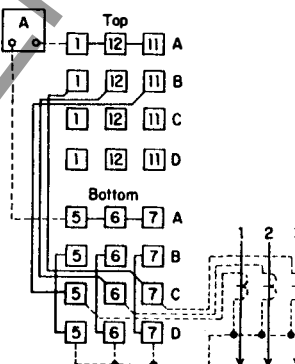
Round Fixed Handle  
Switch S# 505A701G02



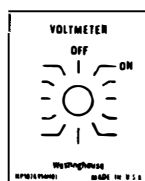
2A

### 3 Phase—3 Independent Circuits

Round Fixed Handle  
Switch S# 505A701 G01

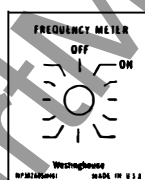


3

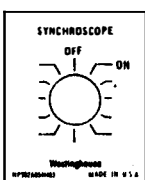


| CONTACT | POSITION |    |
|---------|----------|----|
|         | OFF      | ON |
| A11-B11 |          | X  |
| A12-B12 | X        |    |
| A1-B1   |          | X  |
| A5-B5   |          | X  |
| A6-B6   | X        |    |
| A7-B7   |          | X  |

3A

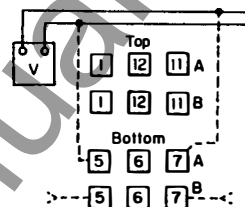


38

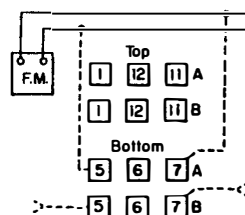


### Single Phase

Switch S# 505A747G01  
Removable Key Handle S# 505A747G02  
Key removable in off position only

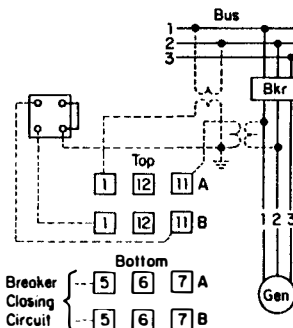


Switch S# 508A467G01  
Removable Key Handle S# 508A467G02  
Key removable in off position only



### Machine to Bus

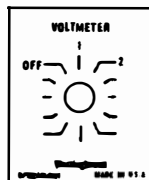
Switch S# 505A755G01  
Removable Key Handle S# 505A755G02  
Key removable in off position only



# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

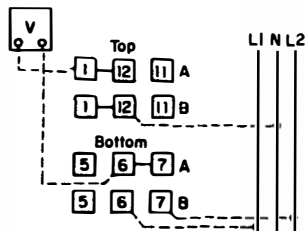
4



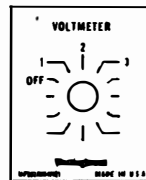
| CONTACT | POSITION |   |
|---------|----------|---|
|         | 1        | 2 |
| A11-B11 | X        |   |
| A12-B12 |          | X |
| A1-B1   |          | X |
| A5-B5   | X        |   |
| A6-B6   |          | X |
| A7-B7   |          | X |

## Voltmeter

2 Phase—Ac—3 Wire  
Round Fixed Handle  
Switch S# 505A702G01



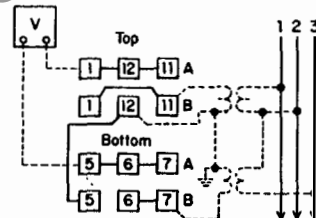
4C



| CONTACT | POSITION |   |   |
|---------|----------|---|---|
|         | 1        | 2 | 3 |
| A11-B11 | X        |   |   |
| A12-B12 |          | X |   |
| A1-B1   |          |   | X |
| A5-B5   | X        |   |   |
| A6-B6   |          | X |   |
| A7-B7   |          |   | X |

## Voltmeter

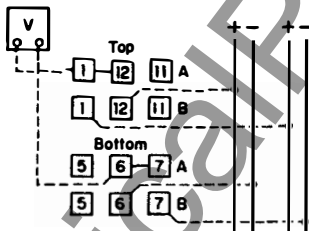
3 Phase—3 Wire  
Round Fixed Handle  
Switch S# 505A702G04  
Switch Only S# 505A749G01  
Removable Key Handle S# 505A749G02  
Key removable in off position only



4A

## Voltmeter

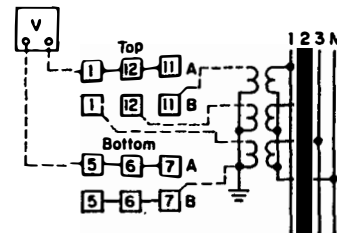
2 Circuit—Dc—2 Wire  
Round Fixed Handle  
Switch S# 505A702G02  
Switch Only S# 505A748G01  
Removable Key Handle S# 505A748G02  
Key removable in off position only



4D

## Voltmeter

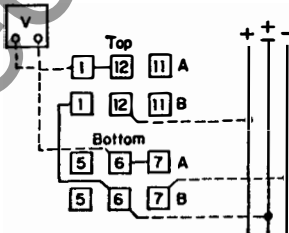
3 Phase—4 Wire  
Round Fixed Handle  
Switch S# 505A702G05  
Switch Only S# 505A762G01  
Removable Key Handle S# 505A762G02  
Key removable in off position only



4B

## Voltmeter—Dc—3 Wire

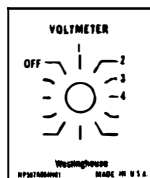
Round Fixed Handle  
Switch S# 505A702G03



Westinghouse

Position Tabulations *Continued*

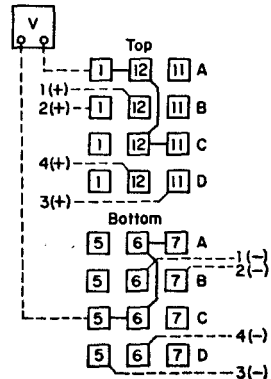
5



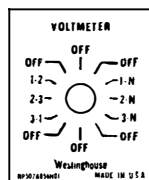
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | 1        | 2 | 3 | 4 |
| A11-B11 | X        |   |   |   |
| A12-B12 | X        |   |   |   |
| A1-B1   |          | X |   |   |
| A5-B5   | X        |   |   |   |
| A6-B6   | X        |   |   |   |
| A7-B7   |          | X |   |   |
| C11-D11 |          |   | X |   |
| C12-D12 |          |   | X |   |
| C1-D1   |          |   |   | X |
| C5-D5   |          |   | X |   |
| C6-D6   |          |   | X |   |
| C7-D7   |          |   | X |   |

## Voltmeter

## 4 Circuit

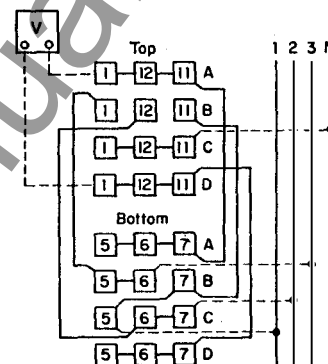
Round Fixed Handle  
Switch S# 505A704G01

6

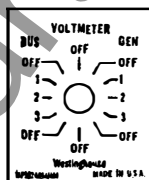


| CONTACT | POSITION |   |   |   |   |   |   |   |   |    |    |    |
|---------|----------|---|---|---|---|---|---|---|---|----|----|----|
|         | 1        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| A11-B11 |          |   | X |   |   |   |   |   |   |    |    |    |
| A12-B12 |          |   | X |   |   |   |   |   |   |    |    |    |
| A1-B1   |          |   |   | X |   |   |   |   |   |    |    |    |
| A5-B5   |          |   |   |   | X |   |   |   |   |    |    |    |
| A6-B6   |          |   |   |   |   | X |   |   |   |    |    |    |
| A7-B7   |          |   |   |   |   |   | X |   |   |    |    |    |
| C11-D11 |          |   |   |   |   |   |   | X |   |    |    |    |
| C12-D12 |          |   |   |   |   |   |   | X |   |    |    |    |
| C1-D1   |          |   |   |   |   |   |   |   | X |    |    |    |
| C5-D5   |          |   |   |   |   |   |   |   |   | X  |    |    |
| C6-D6   |          |   |   |   |   |   |   |   |   |    | X  |    |
| C7-D7   |          |   |   |   |   |   |   |   |   |    |    | X  |

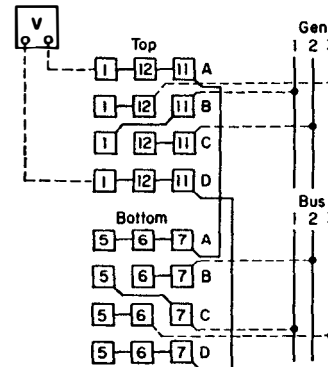
## Voltmeter

3 Phase and Phase to Neutral  
Round Fixed Handle  
Switch S# 505A705G01

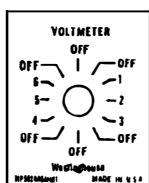
6A



## Voltmeter

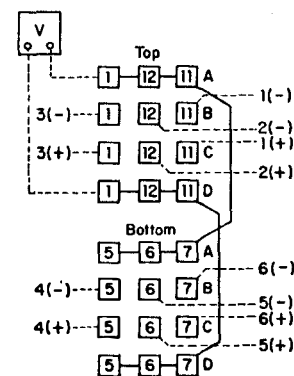
Two 3 Phase Circuits  
Round Fixed Handle  
Switch S# 505A705G02

6B



## Voltmeter

## 6 Circuit

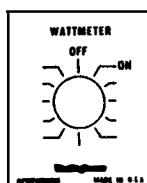
Round Fixed Handle  
Switch S# 505A705G03



# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

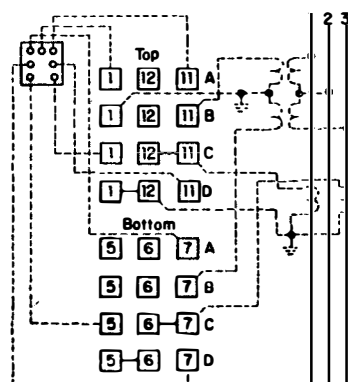
7



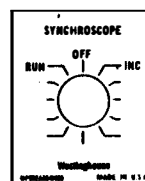
| CONTACT | POSITION | OFF | ON |
|---------|----------|-----|----|
| A11-B11 |          |     | X  |
| A12-B12 | X        |     |    |
| A1-B1   |          |     | X  |
| A5-B5   |          |     | X  |
| A6-B6   | X        |     |    |
| A7-B7   |          |     | X  |
| C11-D11 | X        | X   |    |
| C12-D12 | X        | X   |    |
| C1-D1   |          | X   | X  |
| C5-D5   |          | X   | X  |
| C6-D6   | X        | X   |    |
| C7-D7   |          | X   | X  |

## Wattmeter

Switch Only S# 505A752G01  
Removable Key Handle S# 505A752G02  
Key removable in off position only



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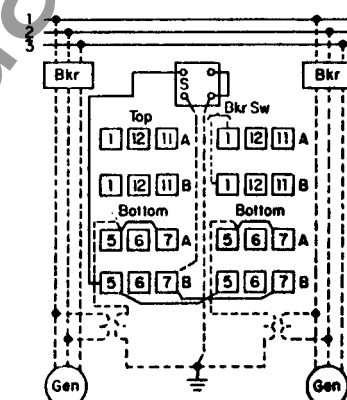


| CONTACT | POSITION | R | O | I |
|---------|----------|---|---|---|
| A11-B11 | X        |   |   |   |
| A12-B12 | X        |   |   |   |
| A1-B1   |          |   |   | X |
| A5-B5   | X        |   |   |   |
| A6-B6   | X        |   |   |   |
| A7-B7   |          |   |   | X |

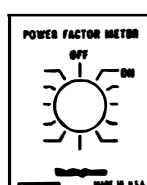
## Synchronizing

### Between Machines

Switch Only S# 505A757G01  
Running Key S# 505A757G02  
Incoming Key S# 505A757G03  
Key removable in off position only



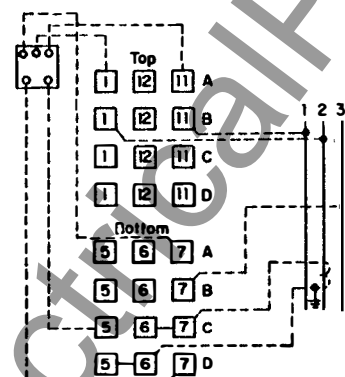
8



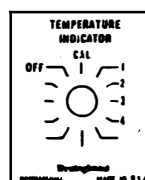
| CONTACT | POSITION | OFF | ON |
|---------|----------|-----|----|
| A11-B11 |          |     | X  |
| A12-B12 | X        |     |    |
| A1-B1   |          |     | X  |
| A5-B5   |          |     | X  |
| A6-B6   | X        |     |    |
| A7-B7   |          |     | X  |
| C11-D11 | X        | X   |    |
| C12-D12 | X        | X   |    |
| C1-D1   |          | X   | X  |
| C5-D5   |          | X   | X  |
| C6-D6   | X        | X   |    |
| C7-D7   |          | X   | X  |

## Power Factor Meter

Switch Only S# 505A753G01  
Removable Key Handle S# 505A753G02  
Key removable in off position only



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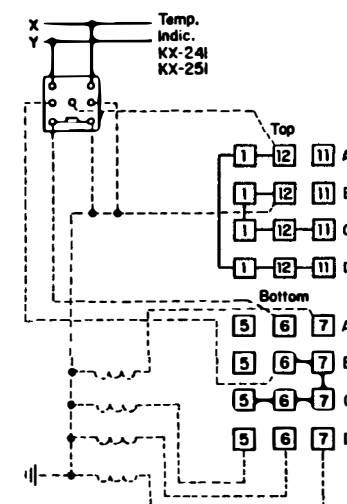


| CONTACT | POSITION | OFF | ON | 1 | 2 | 3 | 4 |
|---------|----------|-----|----|---|---|---|---|
| A11-B11 | X        |     |    |   |   |   |   |
| A12-B12 | X        |     |    |   |   |   |   |
| A1-B1   |          |     |    | X |   |   |   |
| A5-B5   | X        | X   |    |   |   |   |   |
| A6-B6   | X        | X   | X  |   |   |   |   |
| A7-B7   | X        | X   | X  | X |   |   |   |
| C11-D11 |          |     |    | X |   |   |   |
| C12-D12 |          |     |    |   | X |   |   |
| C1-D1   |          |     |    |   |   | X |   |
| C5-D5   |          |     |    | X | X | X |   |
| C6-D6   |          |     |    | X | X | X |   |
| C7-D7   |          |     |    | X | X | X |   |

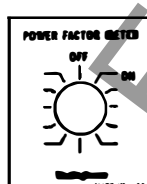
## Temperature

### Approximate Lead Compensation

Round Fixed Handle  
Switch S# 658A667G01



9

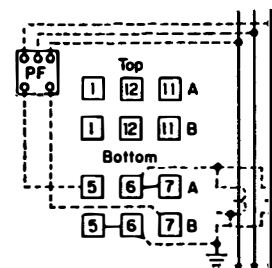


| CONTACT | POSITION | OFF | ON |
|---------|----------|-----|----|
| A11-B11 | X        | X   |    |
| A12-B12 | X        | X   |    |
| A1-B1   |          | X   | X  |
| A5-B5   |          | X   | X  |
| A6-B6   | X        | X   |    |
| A7-B7   |          | X   | X  |

## Power Factor Meter

### Current Transfer Only

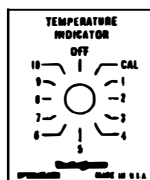
Switch Only S# 505A754G01  
Removable Key Handle S# 505A754G02  
Key removable in off position only



Westinghouse

Position Tabulations *Continued*

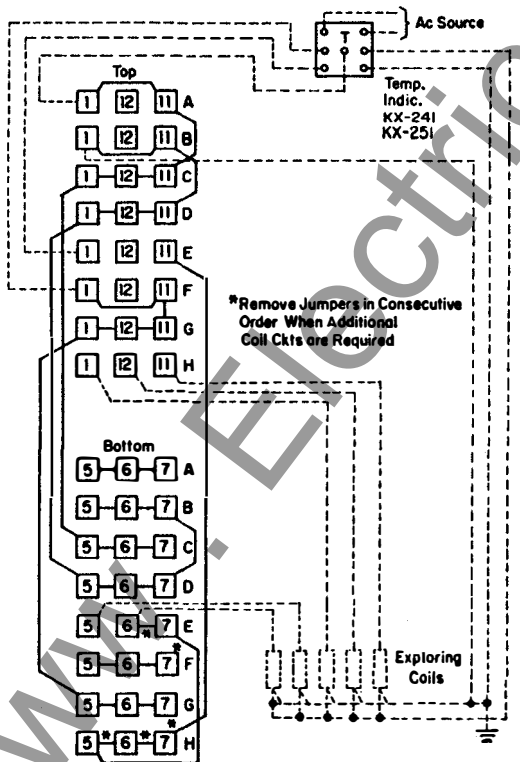
12



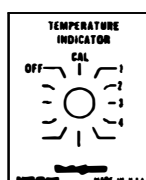
## Temperature

Approximate Lead Compensation  
Round Fixed Handle  
Switch S# 663A488G01

| CONTACT | 0 | -C | -1 | -2 | -3 | -4 | -5 | -6 | -7 | -8 | -9 | 0 |
|---------|---|----|----|----|----|----|----|----|----|----|----|---|
| A11-B11 |   |    |    |    |    |    |    |    |    |    |    | X |
| A12-B12 | X |    |    |    |    |    |    |    |    |    |    |   |
| A1-B1   |   | X  |    |    |    |    |    |    |    |    |    |   |
| A5-B5   |   |    |    |    | X  |    |    |    |    |    |    |   |
| A6-B6   |   |    |    |    |    | X  |    |    |    |    |    |   |
| A7-B7   |   |    |    |    |    |    | X  |    |    |    |    |   |
| C11-D11 |   |    | X  |    |    |    |    |    |    |    |    |   |
| C12-D12 |   |    |    | X  |    |    |    |    |    |    |    |   |
| C1-D1   |   |    |    |    | X  |    |    |    |    |    |    |   |
| C5-D5   |   |    |    |    |    |    | X  |    |    |    |    |   |
| C6-D6   |   |    |    |    |    |    |    | X  |    |    |    |   |
| C7-D7   |   |    |    |    |    |    |    |    | X  |    |    |   |
| E11-F11 |   |    |    |    |    |    |    |    |    | X  | X  | X |
| E12-F12 | X | X  | X  |    |    |    |    |    |    |    |    | X |
| E1-F1   | X | X  | X  |    |    |    |    |    |    |    |    |   |
| E5-F5   |   |    |    |    | X  | X  | X  |    |    |    |    |   |
| E6-F6   |   |    |    |    |    | X  | X  | X  |    |    |    |   |
| E7-F7   |   |    |    |    |    |    | X  | X  | X  |    |    |   |
| G11-H11 |   | X  | X  | X  |    |    |    |    |    |    |    |   |
| G12-H12 |   |    | X  | X  | X  | X  |    |    |    |    |    |   |
| G1-H1   |   |    |    | X  | X  | X  |    |    |    |    |    |   |
| G5-H5   |   |    |    |    |    |    | X  | X  | X  |    |    |   |
| G6-H6   |   |    |    |    |    |    |    | X  | X  | X  |    |   |
| G7-H7   |   |    |    |    |    |    |    |    | X  | X  | X  |   |



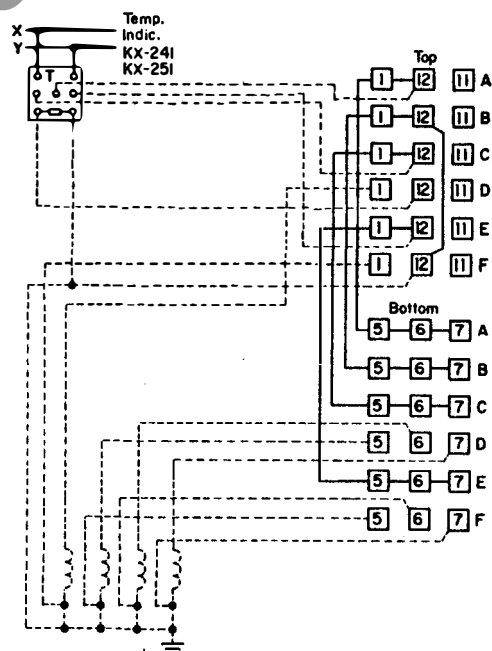
13



## Temperature

Accurate Lead Compensation  
Round Fixed Handle  
Switch S# 787A936G01

| CONTACT | 0 | -C | -1 | -2 | -3 | -4 |
|---------|---|----|----|----|----|----|
| A11-B11 | X |    |    |    |    |    |
| A12-B12 |   | X  |    |    |    |    |
| A1-B1   |   |    | X  |    |    |    |
| A5-B5   |   |    |    | X  |    |    |
| A6-B6   |   |    |    |    | X  |    |
| A7-B7   |   |    |    |    |    | X  |
| C11-D11 | X | X  |    |    |    |    |
| C12-D12 | X | X  | X  |    |    |    |
| C1-D1   |   | X  | X  | X  |    |    |
| C5-D5   |   |    | X  | X  | X  |    |
| C6-D6   |   |    |    | X  | X  | X  |
| C7-D7   |   |    |    |    | X  | X  |
| E11-F11 | X | X  |    |    |    | X  |
| E12-F12 | X | X  | X  |    |    |    |
| E1-F1   |   | X  | X  | X  |    |    |
| E5-F5   |   |    | X  | X  | X  |    |
| E6-F6   |   |    |    | X  | X  | X  |
| E7-F7   |   |    |    |    | X  | X  |



**600 Volts, 20 Ampere  
Continuous Capacity**

TEMPERATURE INDICATOR

OFF

CAL

1

2

3

4

5

6

7

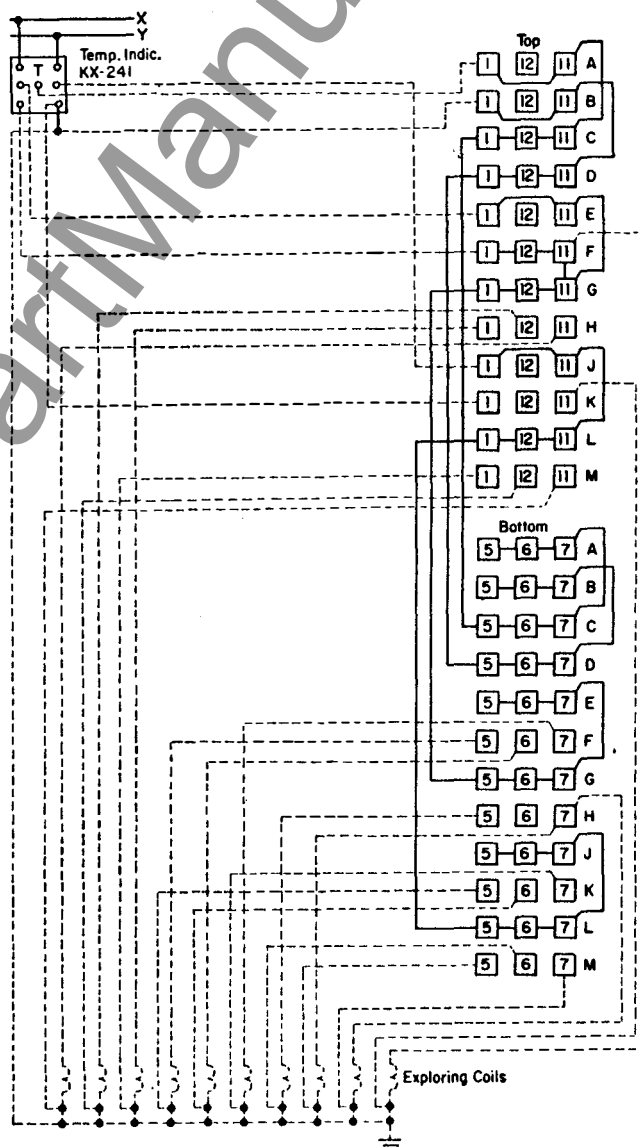
8

9

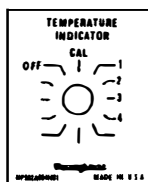
10

**Accurate Lead Compensation**  
Round Fixed Handle  
Switch S# 661A210G01

| CONTACT | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---|---|---|---|---|---|---|---|---|---|----|
| A11-B11 |   |   |   |   |   |   |   |   |   |   |    |
| A12-B12 | X |   |   |   |   |   |   |   |   |   | X  |
| A1-B1   |   | X |   |   |   |   |   |   |   |   |    |
| A5-B5   |   |   |   |   | X |   |   |   |   |   |    |
| A6-B6   |   |   |   |   |   | X |   |   |   |   |    |
| A7-B7   |   |   |   |   |   |   | X |   |   |   |    |
| C11-D11 |   |   | X |   |   |   |   |   |   |   |    |
| C12-D12 |   |   |   | X |   |   |   |   |   |   |    |
| C1-D1   |   |   |   |   | X |   |   |   |   |   |    |
| C5-D5   |   |   |   |   |   |   |   | X |   |   |    |
| C6-D6   |   |   |   |   |   |   |   |   | X |   |    |
| C7-D7   |   |   |   |   |   |   |   |   |   | X |    |
| E11-F11 |   |   |   |   |   |   |   |   |   |   | X  |
| E12-F12 | X | X |   |   |   |   |   |   |   | X | X  |
| E1-F1   |   | X | X | X |   |   |   |   |   |   |    |
| E5-F5   |   |   |   |   | X | X | X |   |   |   |    |
| E6-F6   |   |   |   |   |   | X | X | X |   |   |    |
| E7-F7   |   |   |   |   |   |   | X | X | X |   |    |
| G11-H11 |   |   | X | X |   |   |   |   |   |   |    |
| G12-H12 |   |   |   | X | X |   |   |   |   |   |    |
| G1-H1   |   |   |   |   | X | X |   |   |   |   |    |
| G5-H5   |   |   |   |   |   |   |   | X | X |   |    |
| G6-H6   |   |   |   |   |   |   |   |   | X | X |    |
| G7-H6   |   |   |   |   |   |   |   |   |   | X | X  |
| I11-J11 |   |   |   |   |   |   |   |   |   |   | X  |
| I12-J12 | X | X |   |   |   |   |   |   |   |   | X  |
| I1-J1   |   | X | X | X |   |   |   |   |   |   |    |
| I5-J5   |   |   |   |   | X | X | X |   |   |   |    |
| I6-J6   |   |   |   |   |   | X | X | X |   |   |    |
| I7-J7   |   |   |   |   |   |   | X | X | X |   |    |
| K11-L11 |   |   | X | X |   |   |   |   |   |   |    |
| K12-L12 |   |   |   | X | X |   |   |   |   |   |    |
| K1-L1   |   |   |   |   | X | X |   |   |   |   |    |
| K5-L5   |   |   |   |   |   |   |   |   |   |   |    |
| K6-L6   |   |   |   |   |   |   |   | X | X |   |    |
| K7-L7   |   |   |   |   |   |   |   |   | X | X |    |



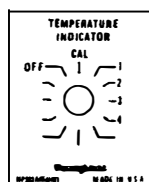
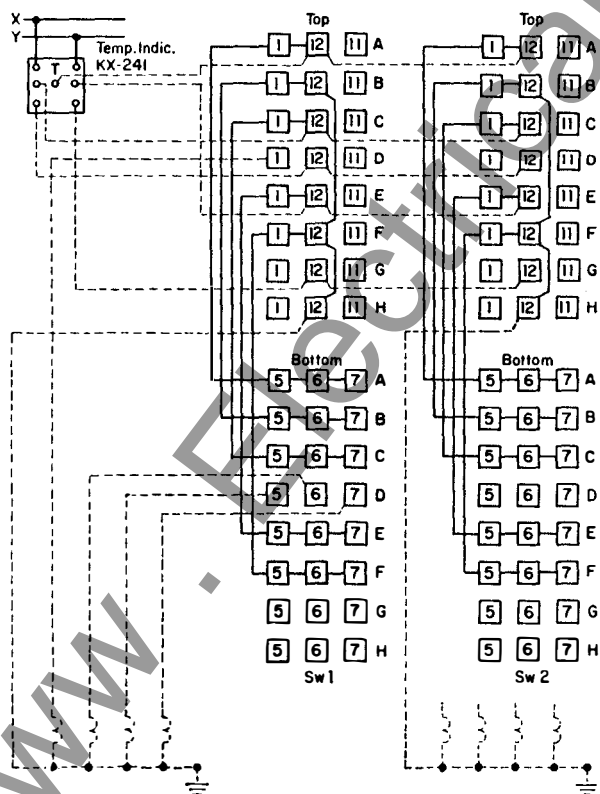
Westinghouse

Position Tabulations *Continued*

## Temperature

Approximate Lead Compensation  
Switch Only S# 663A452G01  
Removable Key Handle S# 505A765G03  
Key removable in off position only

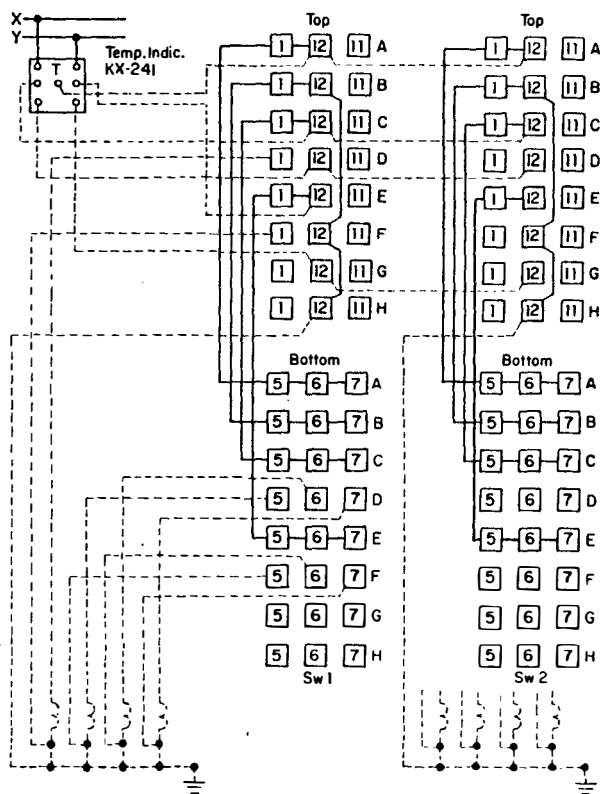
| CONTACT | POSITION |   |   |   |   |   |
|---------|----------|---|---|---|---|---|
|         | OFF      | C | 1 | 2 | 3 | 4 |
| A11-B11 | X        |   |   |   |   |   |
| A12-B12 |          | X |   |   |   |   |
| A1-B1   |          |   | X |   |   |   |
| A5-B5   |          |   |   | X |   |   |
| A6-B6   |          |   |   |   | X |   |
| A7-B7   |          |   |   |   |   | X |
| C11-D11 | X        | X |   |   |   |   |
| C12-D12 | X        | X | X |   |   |   |
| C1-D1   |          | X | X | X |   |   |
| C5-D5   |          |   | X | X | X |   |
| C6-D6   |          |   |   | X | X | X |
| C7-D7   |          |   |   |   | X | X |
| E11-F11 | X        | X |   |   |   |   |
| E12-F12 | X        | X | X |   |   |   |
| E1-F1   |          | X | X | X |   |   |
| E5-F5   |          |   | X | X | X |   |
| E6-F6   |          |   |   | X | X | X |
| E7-F7   |          |   |   |   | X | X |
| G11-H11 | X        | X |   |   |   |   |
| G12-H12 | X        | X | X |   |   |   |
| G1-H1   |          | X | X | X |   |   |
| G5-H5   |          |   | X | X | X |   |
| G6-H6   |          |   |   | X | X | X |
| G7-H7   |          |   |   |   | X | X |



## Temperature

Accurate Lead Compensation  
Switch Only S# 661A287G03  
Removable Key Handle S# 505A711G02  
Key removable in off position only

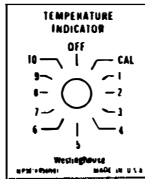
| CONTACT | POSITION |   |   |   |   |   |
|---------|----------|---|---|---|---|---|
|         | OFF      | C | 1 | 2 | 3 | 4 |
| A11-B11 | X        |   |   |   |   |   |
| A12-B12 |          | X |   |   |   |   |
| A1-B1   |          |   | X |   |   |   |
| A5-B5   |          |   |   | X |   |   |
| A6-B6   |          |   |   |   | X |   |
| A7-B7   |          |   |   |   |   | X |
| C11-D11 | X        | X |   |   |   |   |
| C12-D12 | X        | X | X |   |   |   |
| C1-D1   |          | X | X | X |   |   |
| C5-D5   |          |   | X | X | X |   |
| C6-D6   |          |   |   | X | X | X |
| C7-D7   |          |   |   |   | X | X |
| E11-F11 | X        | X |   |   |   |   |
| E12-F12 | X        | X | X |   |   |   |
| E1-F1   |          | X | X | X |   |   |
| E5-F5   |          |   | X | X | X |   |
| E6-F6   |          |   |   | X | X | X |
| E7-F7   |          |   |   |   | X | X |
| G11-H11 | X        | X |   |   |   |   |
| G12-H12 | X        | X | X |   |   |   |
| G1-H1   |          | X | X | X |   |   |
| G5-H5   |          |   | X | X | X |   |
| G6-H6   |          |   |   | X | X | X |
| G7-H7   |          |   |   |   | X | X |



# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

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## Temperature

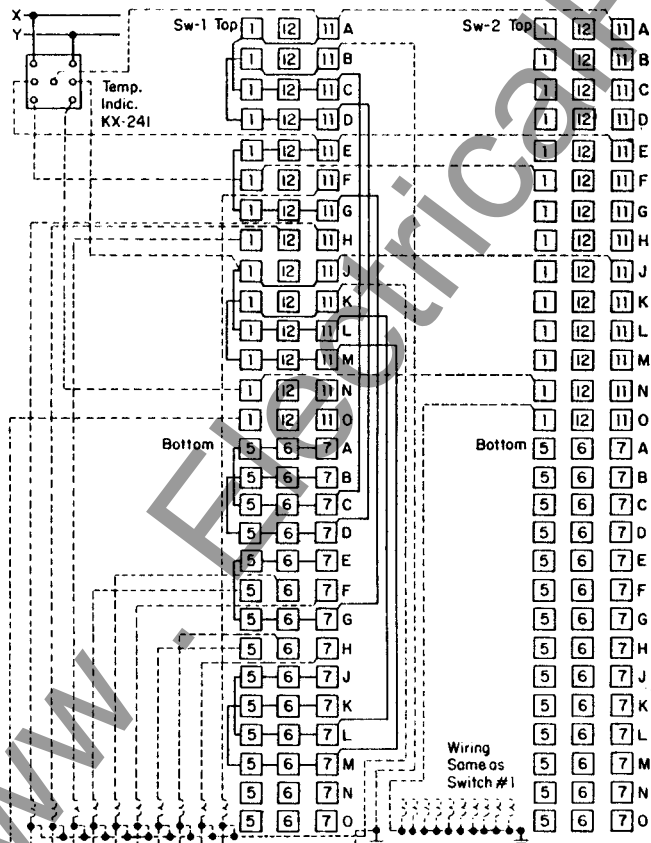
Approximate Lead Compensation

Switch Only S# 663A453G01

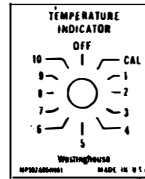
Removable Key Handle S# 505A765G03

Key removable in off position only

| CONTACT | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---|---|---|---|---|---|---|---|---|---|----|
| A11-B11 | X |   |   |   |   |   |   |   |   |   | X  |
| A12-B12 |   | X |   |   |   |   |   |   |   |   |    |
| A1-B1   |   |   | X |   |   |   |   |   |   |   |    |
| A5-B5   |   |   |   | X |   |   |   |   |   |   |    |
| A6-B6   |   |   |   |   | X |   |   |   |   |   |    |
| A7-B7   |   |   |   |   |   | X |   |   |   |   |    |
| C11-D11 |   | X |   |   |   |   |   |   |   |   |    |
| C12-D12 |   |   | X |   |   |   |   |   |   |   |    |
| C1-D1   |   |   |   | X |   |   |   |   |   |   |    |
| C5-D5   |   |   |   |   | X |   |   |   |   |   |    |
| C6-D6   |   |   |   |   |   | X |   |   |   |   |    |
| C7-D7   |   |   |   |   |   |   | X |   |   |   |    |
| E11-F11 |   |   |   |   |   |   |   | X |   |   |    |
| E12-F12 |   |   |   |   |   |   |   |   | X |   |    |
| E1-F1   | X | X | X |   |   |   |   |   |   |   | X  |
| E5-F5   |   |   |   | X | X | X |   |   |   |   |    |
| E6-F6   |   |   |   |   | X | X | X |   |   |   |    |
| E7-F7   |   |   |   |   |   | X | X | X |   |   |    |
| G11-H11 |   | X | X | X |   |   |   |   |   |   |    |
| G12-H12 |   |   | X | X | X |   |   |   |   |   |    |
| G1-H1   |   |   |   | X | X | X |   |   |   |   |    |
| G5-H5   |   |   |   |   |   |   | X | X | X |   |    |
| G6-H6   |   |   |   |   |   |   |   | X | X | X |    |
| G7-H7   |   |   |   |   |   |   |   |   | X | X | X  |



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## Temperature

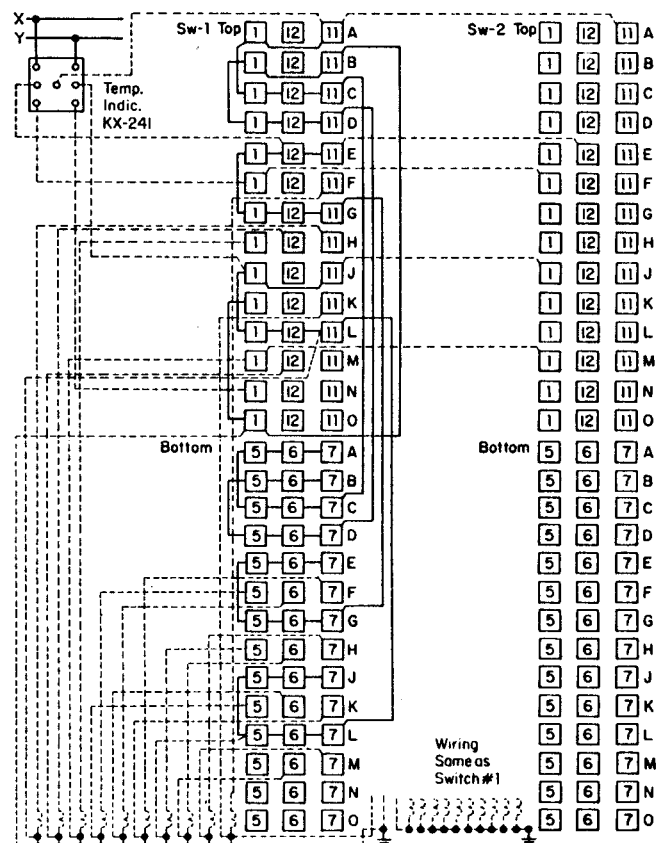
Accurate Lead Compensation

Switch Only S# 663A454G01

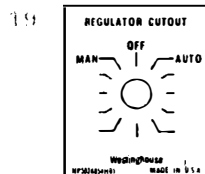
Removable Key Handle S# 505A711G03

Key removable in off position only

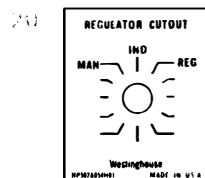
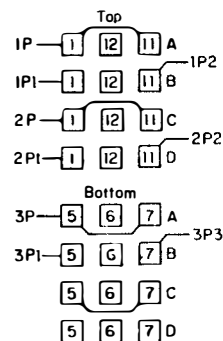
| CONTACT | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|---|---|---|---|---|---|---|---|---|---|----|
| A11-B11 | X |   |   |   |   |   |   |   |   |   | X  |
| A12-B12 |   | X |   |   |   |   |   |   |   |   |    |
| A1-B1   |   |   | X |   |   |   |   |   |   |   |    |
| A5-B5   |   |   |   | X |   |   |   |   |   |   |    |
| A6-B6   |   |   |   |   | X |   |   |   |   |   |    |
| A7-B7   |   |   |   |   |   | X |   |   |   |   |    |
| C11-D11 |   | X |   |   |   |   |   |   |   |   |    |
| C12-D12 |   |   | X |   |   |   |   |   |   |   |    |
| C1-D1   |   |   |   | X |   |   |   |   |   |   |    |
| C5-D5   |   |   |   |   | X |   |   |   |   |   |    |
| C6-D6   |   |   |   |   |   | X |   |   |   |   |    |
| C7-D7   |   |   |   |   |   |   | X |   |   |   |    |
| E11-F11 |   |   |   |   |   |   |   | X |   |   |    |
| E12-F12 |   |   |   |   |   |   |   |   | X |   |    |
| E1-F1   | X | X | X |   |   |   |   |   |   |   | X  |
| E5-F5   |   |   |   | X | X | X |   |   |   |   |    |
| E6-F6   |   |   |   |   | X | X | X |   |   |   |    |
| E7-F7   |   |   |   |   |   | X | X | X |   |   |    |
| G11-H11 |   | X | X | X |   |   |   |   |   |   |    |
| G12-H12 |   |   | X | X | X |   |   |   |   |   |    |
| G1-H1   |   |   |   | X | X | X |   |   |   |   |    |
| G5-H5   |   |   |   |   |   |   | X | X | X |   |    |
| G6-H6   |   |   |   |   |   |   |   | X | X | X |    |
| G7-H7   |   |   |   |   |   |   |   |   | X | X | X  |



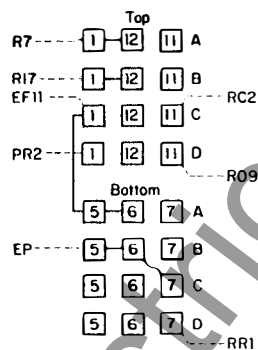
Westinghouse

Position Tabulations *Continued*

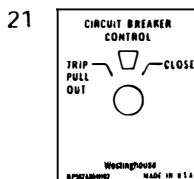
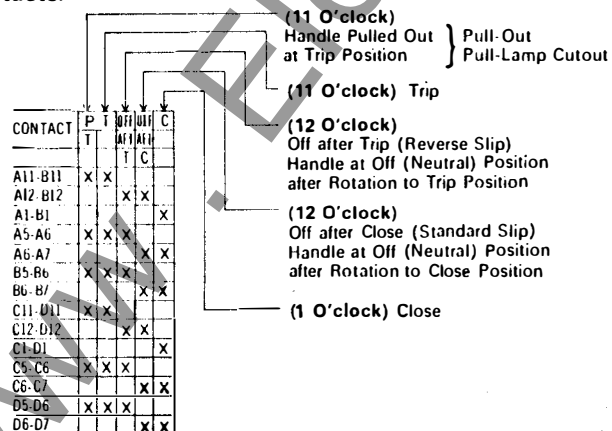
| CONTACT | POSITION |
|---------|----------|
|         | M O A    |
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |
| C11-D11 | X        |
| C12-D12 | X        |
| C1-D1   | X        |
| C5-D5   | X        |
| C6-D6   | X        |
| C7-D7   | X        |

**Regulator Cutout**Round Fixed Handle  
Switch S# 505A712G01

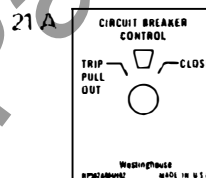
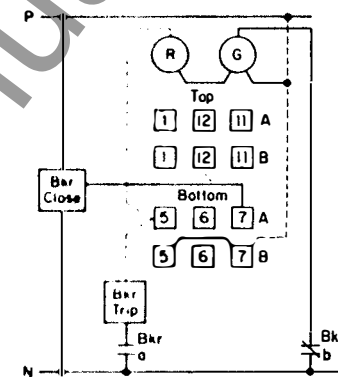
| CONTACT | POSITION  |
|---------|-----------|
|         | M - I - R |
| A11-B11 | X         |
| A12-B12 | X         |
| A1-B1   | X         |
| A5-B5   | X         |
| A6-B6   | X         |
| A7-B7   | X         |
| C11-D11 | X         |
| C12-D12 | X         |
| C1-D1   | X         |
| C5-D5   | X         |
| C6-D6   | X         |
| C7-D7   | X         |

**Regulator Cutout**Round Fixed Handle  
Switch S# 508A224G02

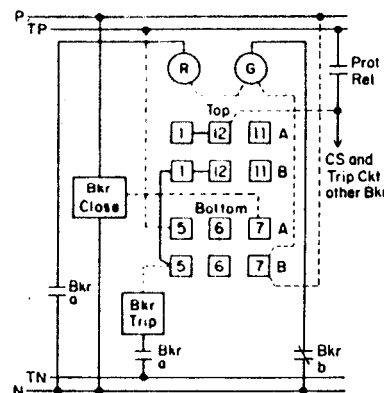
Interpretation of position designations for Figures 21 through 28, and other switches using slip and/or pull contacts.



| CONTACT | POSITION |
|---------|----------|
|         | T P O C  |
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |

**Circuit Breaker Control**Pistol Grip Fixed Handle  
Switch S# 505A713G01  
Oval Fixed Handle  
Switch S# 505A713G03

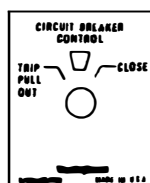
| CONTACT | POSITION |
|---------|----------|
|         | T P O C  |
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |

**Circuit Breaker Control**Pistol Grip Fixed Handle  
Switch S# 505A713G02

# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

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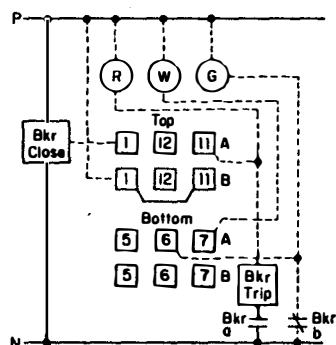


| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | INT | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   | X   | X   | X |
| A5-A6   | X        | X | X   |     |   |
| A6-A7   | X        | X | X   | X   | X |
| B5-B6   | X        | X | X   |     |   |
| B6-B7   |          |   | X   | X   | X |

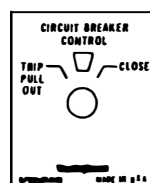
## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 505A714G01

Oval Fixed Handle  
Switch S# 505A714G02



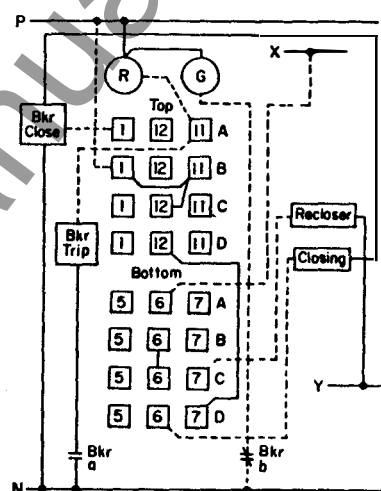
24



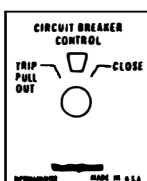
| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | INT | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   | X   | X   | X |
| A5-B5   | X        | X |     |     |   |
| A6-B6   | X        | X | X   |     |   |
| A7-B7   | X        | X | X   | X   | X |
| C11-D11 | X        | X |     |     |   |
| C12-D12 | X        | X | X   | X   | X |
| C1-D1   |          |   | X   | X   | X |
| C5-C6   | X        | X | X   | X   | X |
| C6-C7   | X        | X | X   | X   | X |
| D5-D6   | X        | X | X   | X   | X |
| D6-D7   |          |   | X   | X   | X |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 505A718G01



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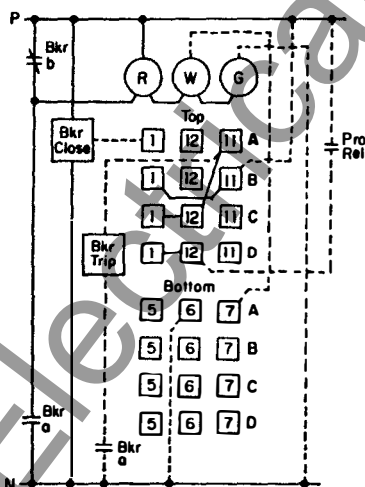


| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | INT | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   | X   | X   | X |
| A5-A6   | X        | X | X   |     |   |
| A6-A7   | X        | X | X   | X   | X |
| B5-B6   | X        | X | X   |     |   |
| B6-B7   |          |   | X   | X   | X |
| C11-D11 | X        | X |     |     |   |
| C12-D12 | X        | X | X   | X   | X |
| C1-D1   |          |   | X   | X   | X |
| C5-C6   | X        | X | X   | X   | X |
| C6-C7   | X        | X | X   | X   | X |
| D5-D6   | X        | X | X   | X   | X |
| D6-D7   |          |   | X   | X   | X |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 505A717G01

Oval Fixed Handle  
Switch S# 505A717G03



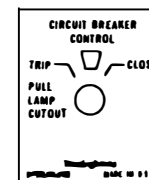
25

| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | INT | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   | X   | X   | X |
| A5-B5   | X        | X |     |     |   |
| A6-B6   | X        | X | X   |     |   |
| A7-B7   | X        | X | X   | X   | X |
| C12-C1  | X        | X |     |     |   |
| D12-D1  | X        | X | X   | X   | X |
| C6-C7   | X        | X | X   | X   | X |
| D6-D7   | X        | X | X   | X   | X |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 505A720G01

Oval Fixed Handle  
Switch S# 505A720G03



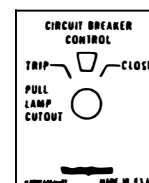
26

| CONTACT | POSITION |   |     |     |   |
|---------|----------|---|-----|-----|---|
|         | P        | T | OFF | INT | C |
| A11-B11 | X        | X |     |     |   |
| A12-B12 |          |   | X   | X   |   |
| A1-B1   |          |   | X   | X   | X |
| A5-A6   | X        | X | X   |     |   |
| A6-A7   | X        | X | X   | X   | X |
| B5-B6   | X        | X | X   |     |   |
| B6-B7   |          |   | X   | X   | X |
| C12-C1  | X        | X |     |     |   |
| D12-D1  | X        | X | X   | X   | X |
| C6-C7   | X        | X | X   | X   | X |
| D6-D7   | X        | X | X   | X   | X |

## Circuit Breaker Control

Pistol Grip Fixed Handle  
Switch S# 508A244G01

Oval Fixed Handle  
Switch S# 508A244G02

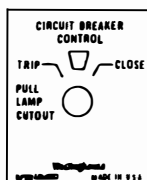


Westinghouse

Position Tabulations *Continued*

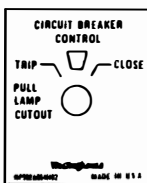
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | P        | T | M | C |
| A11-B11 | X        | X |   |   |
| A12-B12 |          |   | X | X |
| A1-B1   |          |   |   | X |
| A5-A6   | X        | X |   |   |
| A6-A7   |          |   | X | X |
| B5-B6   | X        | X |   |   |
| B6-B7   |          |   | X | X |
| C11-D11 | X        | X |   |   |
| C12-D12 |          |   | X | X |
| C1-D1   |          |   |   | X |
| C5-C6   | X        | X |   |   |
| C6-C7   |          |   | X | X |
| D5-D6   | X        | X |   |   |
| D6-D7   |          |   | X | X |
| E12-E1  | X        |   |   |   |
| F12-F1  |          | X | X | X |
| E6-E7   | X        |   |   |   |
| F6-F7   |          | X | X | X |

## Circuit Breaker Control

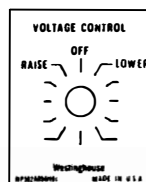
Pistol Grip Fixed Handle  
Switch S# 508A262G01Oval Fixed Handle  
Switch S# 508A262G03

| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | P        | T | M | C |
| A11-B11 | X        | X |   |   |
| A12-B12 |          |   | X | X |
| A1-B1   |          |   |   | X |
| A5-B5   | X        | X |   |   |
| A6-B6   |          |   | X | X |
| A7-B7   |          |   |   | X |
| C11-D11 | X        | X |   |   |
| C12-D12 |          |   | X | X |
| C1-D1   |          |   |   | X |
| C5-C6   | X        | X |   |   |
| C6-C7   |          |   | X | X |
| D5-D6   | X        | X |   |   |
| D6-D7   |          |   | X | X |
| E12-E1  | X        |   |   |   |
| F12-F1  |          | X | X | X |
| E6-E7   | X        |   |   |   |
| F6-F7   |          | X | X | X |

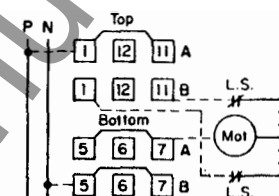
## Circuit Breaker Control

Oval Fixed Handle  
Switch S# 508A264G01Pistol Grip Fixed Handle  
Switch S# 508A264G02

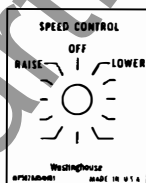
29



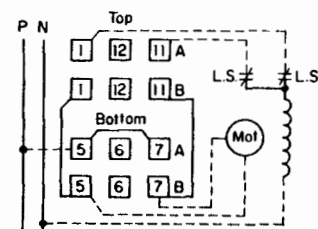
## Voltage Control

Pistol Grip Fixed Handle  
Switch S# 505A703G01Oval Fixed Handle  
Switch S# 505A703G06

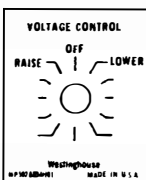
29A



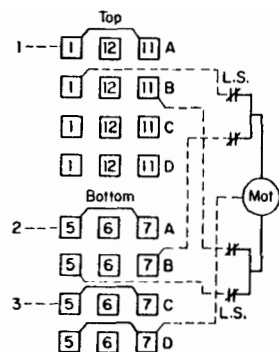
## Speed Control

Pistol Grip Handle  
Switch S# 505A703G02Oval Fixed Handle  
Switch S# 505A703G07

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## Voltage Control

Pistol Grip Handle  
Switch S# 505A715G01Oval Fixed Handle  
Switch S# 505A715G05

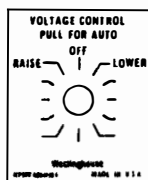
| CONTACT | POSITION |   |   |  |
|---------|----------|---|---|--|
|         | R        | O | L |  |
| A11-B11 | X        |   |   |  |
| A12-B12 |          | X |   |  |
| A1-B1   |          |   | X |  |
| A5-B5   | X        |   |   |  |
| A6-B6   |          | X |   |  |
| A7-B7   |          |   | X |  |
| C11-D11 | X        |   |   |  |
| C12-D12 |          | X |   |  |
| C1-D1   |          |   | X |  |
| C5-D5   | X        |   |   |  |
| C6-D6   |          | X |   |  |
| C7-D7   |          |   | X |  |



# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

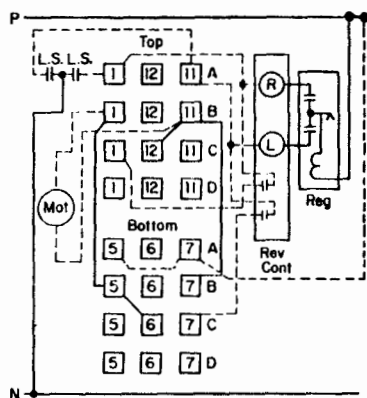
31



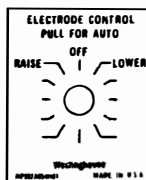
| CONTACT | POSITION |   |   |   |
|---------|----------|---|---|---|
|         | R        | O | P | L |
| A11-B11 | X        |   |   |   |
| A12-B12 |          | X | X |   |
| A1-B1   |          |   |   | X |
| A5-B5   | X        |   |   |   |
| A6-B6   |          | X | X |   |
| A7-B7   |          |   |   | X |
| C12-D1  | X        | X |   | X |
| C6-C7   |          |   | X |   |
| D6-D7   | X        | X |   | X |

## Voltage Control

Oval Fixed Handle  
Switch S# 505A716G01



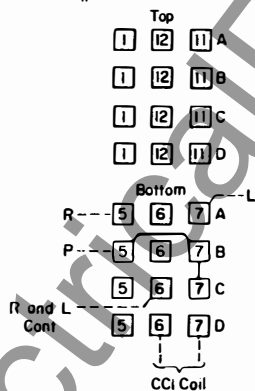
31A



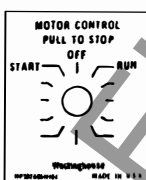
## Electrode Control

Pistol Grip Fixed Handle  
Switch S# 505A716G04

Oval Fixed Handle  
Switch S# 505A716G02



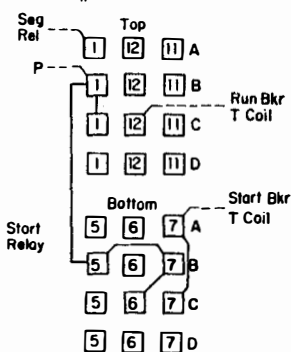
31B



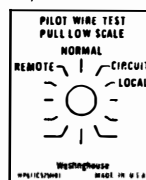
## Motor Control

Pistol Grip Fixed Handle  
Switch S# 505A716G05

Oval Fixed Handle  
Switch S# 505A716G03



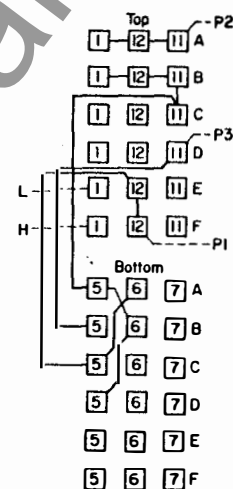
32



## Pilot Wire Test

Pistol Grip Fixed Handle  
Switch S# 508A468G01

| CONTACT | POSITION |   |   |   |   |   |   |   |
|---------|----------|---|---|---|---|---|---|---|
|         | R        | P | N | C | P | L | P | L |
| A11-B11 | X        | X |   |   |   |   |   |   |
| A12-B12 |          |   | X | X |   |   |   |   |
| A1-B1   |          |   |   |   | X | X |   |   |
| A5-B5   | X        | X |   |   |   |   |   |   |
| A6-B6   |          |   | X | X |   |   |   |   |
| A7-B7   |          |   |   |   | X | X |   |   |
| C11-D11 |          |   |   |   |   |   | X | X |
| C12-D12 |          |   |   |   |   |   |   | X |
| C1-D1   |          |   |   |   |   |   |   |   |
| C5-D5   |          |   |   |   |   |   | X | X |
| C6-D6   |          |   |   |   |   |   |   |   |
| C7-D7   |          |   |   |   |   |   |   |   |
| E12-E1  |          | X | X | X | X | X |   |   |
| F12-F1  | X        | X | X | X | X | X |   |   |
| E6-E7   |          | X | X | X | X | X |   |   |
| F6-F7   | X        | X | X | X | X | X |   |   |

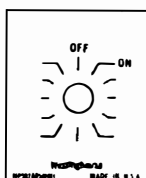


## Off-On Switch

Oval Fixed Handle  
Switch S# 505A706G01

Pistol Grip Fixed Handle  
Switch S# 505A706G02

Round Fixed Handle  
Switch S# 505A706G03



| CONTACT | POS |    |
|---------|-----|----|
|         | OFF | ON |
| A11-B11 |     | X  |
| A12-B12 | X   |    |
| A1-B1   |     | X  |
| A5-B5   |     | X  |
| A6-B6   | X   |    |
| A7-B7   |     | X  |

Westinghouse

**Basic Switches – Style Numbers**

Available for Special Application without Nameplate, Handle or Connectors®

**Maintained Contacts**

| Figure | Basic Switch | Target | Handle+        |
|--------|--------------|--------|----------------|
| 34     | 505A606G01   | no     | fixed          |
| 34     | 505A647G01△  | no     | removable key▲ |
| 35     | 505A667G01   | no     | fixed          |
| 35     | 505A669G01△  | no     | removable key▲ |
| 36     | 508A396G01   | no     | fixed          |
| 37     | 505A634G01   | no     | fixed          |
| 37     | 505A654G01△  | no     | removable key▲ |
| 38     | 505A622G01   | no     | fixed          |
| 38     | 505A670G01△  | no     | removable key▲ |
| 39     | 505A621G01   | no     | fixed          |
| 39     | 505A672G01△  | no     | removable key▲ |
| 40     | 505A628G01   | no     | fixed          |
| 40     | 505A685G01△  | no     | removable key▲ |
| 41     | 505A602G01   | no     | fixed          |
| 41     | 508A108G01△  | no     | removable key▲ |
| 42     | 505A600G01   | no     | fixed          |
| 42     | 661A105G01△  | no     | removable key▲ |
| 43     | 781A377G01   | yes    | fixed          |
| 43     | 508A112G01△  | no     | removable key▲ |
| 44     | 505A612G01   | no     | fixed          |
| 44     | 508A119G01△  | no     | removable key▲ |
| 45     | 508A124G01   | no     | fixed          |
| 46     | 508A126G01   | no     | fixed          |
| 48     | 658A594G01   | yes    | fixed          |
| 50     | 505A626G01   | no     | fixed          |
| 50     | 508A146G01△  | no     | removable key▲ |
| 55     | 508A166G01   | no     | fixed          |
| 56     | 505A664G01   | no     | fixed          |
| 59     | 505A631G01   | no     | fixed          |
| 59     | 508A173G01△  | no     | removable key▲ |
| 60     | 508A196G01   | no     | fixed          |
| 60     | 781A167G01△  | no     | removable key▲ |
| 61     | 508A199G01   | no     | fixed          |
| 61     | 508A300G01□  | no     | removable key▲ |
| 62     | 505A633G01   | no     | fixed          |
| 63     | 508A302G01   | no     | fixed          |
| 64     | 508A363G01   | no     | fixed          |
| 65     | 508A307G01   | no     | fixed          |
| 65     | 508A308G01△  | no     | removable key▲ |
| 66     | 508A310G01   | no     | fixed          |
| 66     | 508A311G01△  | no     | removable key▲ |
| 67     | 508A314G01   | no     | fixed          |
| 67     | 508A370G01△  | no     | removable key▲ |
| 68     | 508A317G01   | no     | fixed          |
| 69     | 505A645G01   | no     | fixed          |
| 69     | 508A320G01△  | no     | removable key▲ |
| 70     | 508A323G01   | no     | fixed          |
| 70     | 781A181G01△  | no     | removable key▲ |
| 71     | 508A326G01   | no     | fixed          |
| 72     | 505A650G01   | no     | fixed          |
| 72     | 661A152G01△  | no     | removable key▲ |
| 73     | 505A659G01   | no     | fixed          |
| 73     | 661A150G01△  | no     | removable key▲ |
| 74     | 505A660G01   | no     | fixed          |
| 74     | 663A176G01△  | no     | removable key▲ |
| 75     | 508A334G01   | no     | fixed          |
| 75     | 663A175G01△  | no     | removable key▲ |
| 78     | 508A343G01   | no     | fixed          |
| 78     | 781A123G01◆  | no     | removable key▲ |
| 79     | 508A351G01   | no     | fixed          |
| 80     | 505A644G01   | no     | fixed          |
| 80     | 663A340G01△  | no     | removable key▲ |

**Momentary Contacts**

| Figure | Basic Switch | Target | Handle+        |
|--------|--------------|--------|----------------|
| 34     | 505A623G01   | no     | fixed          |
| 34     | 663A177G01△  | no     | removable key▲ |
| 35     | 505A668G01   | no     | fixed          |
| 37     | 505A607G01   | no     | fixed          |
| 38     | 505A625G01   | no     | fixed          |
| 39     | 505A624G01   | no     | fixed          |
| 40     | 505A684G01   | no     | fixed          |
| 41     | 505A603G01   | no     | fixed          |
| 41     | 508A107G01   | yes    | fixed          |
| 41     | 663A195G01△  | no     | removable key▲ |
| 42     | 508A110G01   | no     | fixed          |
| 43     | 508A111G01   | no     | fixed          |
| 43     | 505A638G01   | yes    | fixed          |
| 44     | 505A615G01   | no     | fixed          |
| 44     | 508A118G01   | yes    | fixed          |
| 45     | 608A125G01   | no     | fixed          |
| 46     | 508A127G01   | no     | fixed          |
| 47     | 508A128G01   | no     | fixed          |
| 47     | 508A129G01   | yes    | fixed          |
| 48     | 508A133G01   | no     | fixed          |
| 48     | 505A620G01   | yes    | fixed          |
| 49     | 508A143G01   | no     | fixed          |
| 49     | 508A144G01   | yes    | fixed          |
| 50     | 505A627G01   | no     | fixed          |
| 50     | 508A145G01   | yes    | fixed          |
| 51     | 508A189G01   | no     | fixed          |
| 51     | 508A161G01   | yes    | fixed          |
| 52     | 508A162G01   | yes    | fixed          |
| 53     | 508A163G01   | no     | fixed          |
| 53     | 508A164G01   | yes    | fixed          |
| 54     | 505A619G01   | yes    | fixed          |
| 55     | 508A167G01   | yes    | fixed          |
| 56     | 505A630G01   | no     | fixed          |
| 57     | 508A181G01   | yes    | fixed          |
| 58     | 508A183G01   | no     | fixed          |
| 58     | 508A184G01   | yes    | fixed          |
| 59     | 505A632G01   | no     | fixed          |
| 72     | 505A651G01   | no     | fixed          |
| 73     | 658A542G01   | no     | fixed          |
| 74     | 658A578G01   | no     | fixed          |
| 76     | 505A661G01   | yes    | fixed          |
| 77     | 508A342G01   | yes    | fixed          |
| 78     | 508A344G01◆  | no     | fixed          |

◆ = Spring return to "12" position.

⑨ Select and specify, if desired, nameplate and connectors from Page 23. Handles from the following:

Round Fixed S # 310C624H01  
 Pistol Grip Fixed S # 310C624H02  
 Oval Fixed S # 501B787H01  
 Large Pistol Grip Fixed S # 677C101H01

+ Provision only.

▲ If key is desired, the following must be specified:

- Shape of handle.
- If to be interchangeable with other keys, specify the position or positions in which the key is to be removable and the style of the existing switch.
- If the key is to be removable in a different position than indicated for the basic switch, or is to be non-interchangeable with other key handles, order the basic switch as "similar to" a style number and give specific requirements.

△ Key removable in "12" position.

□ Key removable in "10" position.

◆ Key removable in "11" position.

# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

## Additional Position Tabulations

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |

35

| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |

39

| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |
| E11-F11 |          | X  |   |
| E12-F12 |          | X  |   |
| E1-F1   |          | X  |   |
| E5-F5   |          | X  |   |
| E6-F6   |          | X  |   |
| E7-F7   |          | X  |   |

41

| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |

43

| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |

44

| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |

45

| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |

46

| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |

50

| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |
| E11-F11 |          | X  |   |
| E12-F12 |          | X  |   |
| E1-F1   |          | X  |   |
| E5-F5   |          | X  |   |
| E6-F6   |          | X  |   |
| E7-F7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |
| E11-F11 |          | X  |   |
| E12-F12 |          | X  |   |
| E1-F1   |          | X  |   |
| E5-F5   |          | X  |   |
| E6-F6   |          | X  |   |
| E7-F7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |
| D5-D6   |          | X  |   |
| D6-D7   |          | X  |   |
| E12-F1  |          | X  |   |
| E6-E7   |          | X  |   |
| F6-F7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |
| D5-D6   |          | X  |   |
| D6-D7   |          | X  |   |
| E12-F1  |          | X  |   |
| E6-E7   |          | X  |   |
| F6-F7   |          | X  |   |

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| CONTACT | POSITION | I2 | I |
|---------|----------|----|---|
| A11-B11 |          | X  |   |
| A12-B12 |          | X  |   |
| A1-B1   |          | X  |   |
| A5-B5   |          | X  |   |
| A6-B6   |          | X  |   |
| A7-B7   |          | X  |   |
| C11-D11 |          | X  |   |
| C12-D12 |          | X  |   |
| C1-D1   |          | X  |   |
| C5-D5   |          | X  |   |
| C6-D6   |          | X  |   |
| C7-D7   |          | X  |   |
| D5-D6   |          | X  |   |
| D6-D7   |          | X  |   |
| E11-F11 |          | X  |   |
| E12-F12 |          | X  |   |
| E1-F1   |          | X  |   |
| E5-E6   |          | X  |   |
| E6-E7   |          | X  |   |
| F5-F6   |          | X  |   |
| F6-F7   |          | X  |   |

\*Adjacent overlap contacts are electrically connected together during transfer.

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Additional Position Tabulations *Continued*

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| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | P | I |
| A11-B11 | X        |    |   |   |
| A12-B12 | X        | X  |   |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        |    |   |   |
| A6-B6   | X        | X  |   |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 | X        | X  |   |   |
| C1-D1   |          |    |   | X |
| C5-D5   | X        |    |   |   |
| C6-D6   | X        | X  |   |   |
| C7-D7   |          |    |   | X |
| E12-F12 |          |    | X |   |
| F12-F1  | X        | X  |   | X |
| E6-E7   |          |    | X |   |
| F6-F7   | X        | X  |   | X |

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| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | P | I |
| A11-B11 | X        |    |   |   |
| A12-B12 | X        |    |   |   |
| A1-B1   |          |    |   | X |
| A5-B5   | X        |    |   |   |
| A6-B6   | X        |    |   |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 | X        |    |   |   |
| C1-D1   |          |    |   | X |
| C5-D5   | X        |    |   |   |
| C6-D6   | X        |    |   |   |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 | X        |    |   |   |
| E1-F1   |          |    |   | X |
| E5-F5   | X        | X  |   |   |
| E6-F6   | X        | X  |   | X |
| E7-F7   |          |    | X |   |
| G11-H11 | X        |    |   |   |
| G12-H12 | X        |    |   |   |
| G1-H1   |          |    |   | X |
| G5-H5   | X        |    |   |   |
| G6-H6   | X        |    |   |   |
| G7-H7   |          |    |   | X |

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| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | P        | 11 | 12 | I |
| A11-B11 | X        | X  |    |   |
| A12-B12 |          |    | X  | X |
| A1-B1   |          |    |    | X |
| A5-B5   | X        | X  |    |   |
| A6-B6   |          |    | X  | X |
| A7-B7   |          |    |    | X |
| C11-D11 | X        | X  |    |   |
| C12-D12 |          |    | X  | X |
| C1-D1   |          |    |    | X |
| C5-C6   | X        | X  |    |   |
| D5-D6   | X        | X  |    |   |
| D6-D7   |          |    | X  | X |
| E11-F11 | X        | X  |    |   |
| E12-F12 |          |    | X  | X |
| E1-F1   |          |    |    | X |
| E5-E6   | X        | X  |    |   |
| E6-E7   | X        | X  |    | X |
| F5-F6   | X        | X  |    | X |
| F6-F7   |          |    | X  | X |
| G12-G1  | X        |    |    |   |
| H12-H1  | X        | X  | X  | X |
| G6-G7   | X        |    |    |   |
| H6-H7   | X        | X  | X  | X |

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| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | P        | 11 | 12 | I |
| A11-B11 | X        | X  |    |   |
| A12-B12 |          |    | X  | X |
| A1-B1   |          |    |    | X |
| A5-A6   | X        | X  |    |   |
| A6-A7   |          |    | X  | X |
| B5-B6   | X        | X  |    |   |
| B6-B7   |          |    | X  | X |
| C11-D11 | X        | X  |    |   |
| C12-D12 |          |    | X  | X |
| C1-D1   |          |    |    | X |
| C5-C6   | X        | X  |    |   |
| C6-C7   |          |    | X  | X |
| D5-D6   | X        | X  |    |   |
| D6-D7   |          |    | X  | X |
| E11-F11 | X        | X  |    |   |
| E12-F12 |          |    | X  | X |
| E1-F1   |          |    |    | X |
| E5-E6   | X        | X  |    |   |
| E6-E7   |          |    | X  | X |
| F5-F6   | X        | X  |    |   |
| F6-F7   |          |    | X  | X |
| G12-G1  | X        |    |    |   |
| H12-H1  | X        | X  | X  | X |
| G6-G7   | X        |    |    |   |
| H6-H7   | X        | X  | X  | X |

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| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | P        | 11 | 12 | I |
| A11-B11 | X        |    |    |   |
| A12-B12 |          |    | X  |   |
| A1-B1   |          |    |    | X |
| A5-B5   | X        |    |    |   |
| A6-B6   | X        |    |    |   |
| A7-B7   |          |    |    | X |
| C11-D11 | X        |    |    |   |
| C12-D12 | X        |    |    |   |
| C1-D1   |          |    |    | X |
| C5-D5   | X        |    |    |   |
| C6-D6   | X        |    |    |   |
| C7-D7   |          |    |    | X |
| E11-F11 | X        |    |    |   |
| E12-F12 | X        |    |    |   |
| E1-F1   |          |    |    | X |
| E5-F5   | X        |    |    |   |
| E6-F6   | X        |    |    |   |
| E7-F7   |          |    |    | X |
| G11-H11 | X        |    |    |   |
| G12-H12 | X        |    |    |   |
| G1-H1   |          |    |    | X |
| G5-H5   | X        |    |    |   |
| G6-H6   | X        |    |    |   |
| G7-H7   |          |    |    | X |
| I11-J11 | X        |    |    |   |
| I12-J12 | X        |    |    |   |
| I1-J1   |          |    |    | X |
| I5-J5   | X        |    |    |   |
| I6-J6   | X        |    |    |   |
| I7-J7   |          |    |    | X |

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| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | 10       | 11 | 12 | I |
| A11-B11 | X        | X  | X  |   |
| A12-B12 |          |    | X  | X |
| A1-B1   |          |    |    | X |
| A5-B5   | X        | X  |    |   |
| A6-B6   |          |    | X  | X |
| A7-B7   |          |    |    | X |
| C11-D11 | X        | X  | X  | X |
| C12-D12 | X        | X  | X  | X |
| C1-D1   |          |    |    | X |
| C5-D5   | X        | X  | X  | X |
| C6-D6   | X        | X  | X  | X |
| C7-D7   | X        | X  | X  | X |
| E11-F11 | X        |    |    |   |
| E12-F12 | X        |    |    |   |
| E1-F1   |          |    |    | X |
| E5-F5   | X        |    |    |   |
| E6-F6   |          |    |    | X |
| E7-F7   |          |    |    | X |
| G11-H11 | X        |    |    |   |
| G12-H12 | X        |    |    |   |
| G1-H1   |          |    |    | X |
| G5-H5   | X        |    |    |   |
| G6-H6   | X        |    |    |   |
| G7-H7   |          |    |    | X |
| I11-J11 | X        |    |    |   |
| I12-J12 | X        |    |    |   |
| I1-J1   |          |    |    | X |
| I5-J5   | X        |    |    |   |
| I6-J6   | X        |    |    |   |
| I7-J7   |          |    |    | X |

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| CONTACT | POSITION |    |    |   |
|---------|----------|----|----|---|
|         | 10       | 11 | 12 | I |
| A11-B11 | X        | X  | X  |   |
| A12-B12 |          |    | X  | X |
| A1-B1   |          |    |    | X |
| A5-B5   | X        | X  |    |   |
| A6-B6   |          |    | X  | X |
| A7-B7   |          |    |    | X |
| C11-D11 | X        | X  | X  | X |
| C12-D12 | X        | X  | X  | X |
| C1-D1   |          |    |    | X |
| C5-D5   | X        | X  | X  | X |
| C6-D6   | X        | X  | X  | X |
| C7-D7   | X        | X  | X  | X |
| E11-F11 | X        |    |    |   |
| E12-F12 | X        |    |    |   |
| E1-F1   |          |    |    | X |
| E5-F5   | X        |    |    |   |
| E6-F6   |          |    |    | X |
| E7-F7   |          |    |    | X |

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| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 | X        |    |   |   |
| A1-B1   |          |    | X |   |
| A5-B5   |          |    | X |   |
| A6-B6   |          |    | X |   |
| A7-B7   |          |    |   | X |

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| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        | X  |   |   |
| A12-B12 | X        | X  |   |   |
| A1-B1   |          |    | X | X |
| A5-B5   |          |    | X | X |
| A6-B6   |          |    | X | X |
| A7-B7   |          |    | X | X |

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| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        | X  |   |   |
| A12-B12 | X        | X  |   |   |
| A1-B1   |          |    | X | X |
| A5-B5   |          |    | X | X |
| A6-B6   |          |    | X | X |
| A7-B7   |          |    | X | X |
| C11-D11 | X        | X  | X | X |
| C12-D12 | X        | X  | X | X |
| C1-D1   |          |    | X | X |
| C5-D5   | X        | X  | X | X |
| C6-D6   | X        | X  | X | X |
| C7-D7   | X        | X  | X | X |
| E11-F11 | X        | X  |   |   |
| E12-F12 | X        | X  |   |   |
| E1-F1   |          |    | X | X |
| E5-F5   |          |    | X | X |
| E6-F6   |          |    | X | X |
| E7-F7   |          |    | X | X |

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| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 | X        |    |   |   |
| A1-B1   |          |    | X |   |
| A5-B5   |          |    | X |   |
| A6-B6   |          |    | X |   |
| A7-B7   |          |    |   | X |
| C11-D11 | X        |    |   |   |
| C12-D12 | X        |    |   |   |
| C1-D1   |          |    | X |   |
| C5-D5   |          |    | X |   |
| C6-D6   |          |    | X |   |
| C7-D7   |          |    | X |   |
| E11-F11 | X        |    |   |   |
| E12-F12 | X        |    |   |   |
| E1-F1   |          |    | X |   |
| E5-F5   |          |    | X |   |
| E6-F6   |          |    | X |   |
| E7-F7   |          |    | X |   |

68

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        | X  |   |   |
| A12-B12 | X        | X  |   |   |
| A1-B1   |          |    | X | X |
| A5-B5   |          |    | X | X |
| A6-B6   |          |    | X | X |
| A7-B7   |          |    | X | X |
| C11-D11 | X        | X  |   |   |
| C12-D12 | X        | X  |   |   |
| C1-D1   |          |    | X | X |
| C5-D5   |          |    | X | X |
| C6-D6   |          |    | X | X |
| C7-D7   |          |    | X | X |
| E11-F11 | X        | X  |   |   |
| E12-F12 | X        | X  |   |   |
| E1-F1   |          |    | X | X |
| E5-F5   |          |    | X | X |
| E6-F6   |          |    | X | X |
| E7-F7   |          |    | X | X |

\*Adjacent overlap contacts are electrically connected together during transfer.

# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

**67**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    | X |   |
| A5-B5   |          |    |   | X |
| A6-B6   |          |    |   |   |
| A7-B7   |          |    |   |   |
| C11-D11 |          |    |   |   |
| C12-D12 |          |    |   | X |
| C1-D1   |          |    |   |   |
| C5-D5   |          |    |   | X |
| C6-D6   |          |    |   | X |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    | X |   |
| E5-F5   |          |    |   | X |
| E6-F6   |          |    |   |   |
| E7-F7   |          |    |   |   |
| G11-H11 |          |    |   | X |
| G12-H12 |          |    |   | X |
| G1-H1   |          |    |   | X |
| G5-H5   |          |    |   | X |
| G6-H6   |          |    |   | X |
| G7-H7   |          |    |   | X |

**69**

| CONTACT | POSITION |    |   |   |   |   |   |   |   |   |
|---------|----------|----|---|---|---|---|---|---|---|---|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A11-B11 | X        |    |   |   |   |   |   |   |   |   |
| A12-B12 |          | X  |   |   |   |   |   |   |   |   |
| A1-B1   |          |    | X |   |   |   |   |   |   |   |
| A5-B5   |          |    |   |   |   | X |   |   |   |   |
| A6-B6   |          |    |   |   |   |   | X |   |   |   |
| A7-B7   |          |    |   |   |   |   |   | X |   |   |
| C11-D11 |          |    |   | X |   |   |   |   |   |   |
| C12-D12 |          |    |   |   | X |   |   |   |   |   |
| C1-D1   |          |    |   |   |   | X |   |   |   |   |
| C5-D5   |          |    |   |   |   |   | X |   |   |   |
| C6-D6   |          |    |   |   |   |   |   | X |   |   |
| C7-D7   |          |    |   |   |   |   |   |   | X |   |

**70**

| CONTACT | POSITION |    |   |   |   |   |   |   |   |   |
|---------|----------|----|---|---|---|---|---|---|---|---|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A11-B11 | X        |    |   |   |   |   |   |   |   |   |
| A12-B12 |          | X  |   |   |   |   |   |   |   |   |
| A1-B1   |          |    | X |   |   |   |   |   |   |   |
| A5-B5   |          |    |   |   |   | X |   |   |   |   |
| A6-B6   |          |    |   |   |   |   | X |   |   |   |
| A7-B7   |          |    |   |   |   |   |   | X |   |   |
| C11-D11 |          |    |   | X |   |   |   |   |   |   |
| C12-D12 |          |    |   |   | X |   |   |   |   |   |
| C1-D1   |          |    |   |   |   | X |   |   |   |   |
| C5-D5   |          |    |   |   |   |   | X |   |   |   |
| C6-D6   |          |    |   |   |   |   |   | X |   |   |
| C7-D7   |          |    |   |   |   |   |   |   | X |   |
| E11-F11 | X        |    |   |   |   |   |   |   |   |   |
| E12-F12 |          | X  |   |   |   |   |   |   |   |   |
| E1-F1   |          |    | X |   |   |   |   |   |   |   |
| E5-F5   |          |    |   |   | X |   |   |   |   |   |
| E6-F6   |          |    |   |   |   | X |   |   |   |   |
| E7-F7   |          |    |   |   |   |   | X |   |   |   |
| G11-H11 |          |    |   |   |   |   |   | X |   |   |
| G12-H12 |          |    |   |   |   |   |   |   | X |   |
| G1-H1   |          |    |   |   |   |   |   |   |   | X |
| G5-H5   |          |    |   |   |   |   |   |   |   | X |
| G6-H6   |          |    |   |   |   |   |   |   |   | X |
| G7-H7   |          |    |   |   |   |   |   |   |   | X |

**72**

| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A2-B2   | X        |
| A3-B3   | X        |
| A4-B4   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |
| A8-B8   | X        |
| A9-B9   | X        |
| A10-B10 | X        |

**73**

| CONTACT | POSITION |
|---------|----------|
| A12-B12 | X        |
| A1-B1   | X        |
| A2-B2   | X        |
| A3-B3   | X        |
| A4-B4   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |
| A8-B8   | X        |
| A9-B9   | X        |
| A10-B10 | X        |
| A11-B11 | X        |
| C12-D12 | X        |
| C1-D1   | X        |
| C2-D2   | X        |
| C3-D3   | X        |
| C4-D4   | X        |
| C5-D5   | X        |
| C6-D6   | X        |
| C7-D7   | X        |
| C8-D8   | X        |
| C9-D9   | X        |
| C10-D10 | X        |
| C11-D11 | X        |

**68**

| CONTACT | POSITION |    |   |   |
|---------|----------|----|---|---|
|         | 11       | 12 | 1 | 2 |
| A11-B11 | X        |    |   |   |
| A12-B12 |          | X  |   |   |
| A1-B1   |          |    | X |   |
| A5-B5   |          |    |   | X |
| A6-B6   |          |    |   |   |
| A7-B7   |          |    |   |   |
| C11-D11 |          |    |   |   |
| C12-D12 |          |    |   | X |
| C1-D1   |          |    |   |   |
| C5-D5   |          |    |   | X |
| C6-D6   |          |    |   | X |
| C7-D7   |          |    |   | X |
| E11-F11 | X        |    |   |   |
| E12-F12 |          | X  |   |   |
| E1-F1   |          |    | X |   |
| E5-F5   |          |    |   | X |
| E6-F6   |          |    |   |   |
| E7-F7   |          |    |   |   |
| G11-H11 |          |    |   | X |
| G12-H12 |          |    |   | X |
| G1-H1   |          |    |   | X |
| G5-H5   |          |    |   | X |
| G6-H6   |          |    |   | X |
| G7-H7   |          |    |   | X |
| I11-J11 | X        |    |   |   |
| I12-J12 |          | X  |   |   |
| I1-J1   |          |    | X |   |
| I5-J5   |          |    |   | X |
| I6-J6   |          |    |   |   |
| I7-J7   |          |    |   |   |
| K11-L11 |          |    |   | X |
| K12-L12 |          |    |   | X |
| K1-L1   |          |    |   | X |
| K5-L5   |          |    |   | X |
| K6-L6   |          |    |   | X |
| K7-L7   |          |    |   | X |

**71**

| CONTACT | POSITION |    |   |   |   |   |   |   |   |   |
|---------|----------|----|---|---|---|---|---|---|---|---|
|         | 11       | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A11-B11 | X        |    |   |   |   |   |   |   |   |   |
| A12-B12 |          | X  |   |   |   |   |   |   |   |   |
| A1-B1   |          |    | X |   |   |   |   |   |   |   |
| A5-B5   |          |    |   | X |   |   |   |   |   |   |
| A6-B6   |          |    |   |   | X |   |   |   |   |   |
| A7-B7   |          |    |   |   |   | X |   |   |   |   |
| C11-D11 |          |    |   |   |   |   | X |   |   |   |
| C12-D12 |          |    |   |   |   |   |   | X |   |   |
| C1-D1   |          |    |   |   |   |   |   |   | X |   |
| C5-D5   |          |    |   |   |   |   |   |   |   | X |
| C6-D6   |          |    |   |   |   |   |   |   |   |   |
| C7-D7   |          |    |   |   |   |   |   |   |   |   |
| E11-F11 | X        |    |   |   |   |   |   |   |   |   |
| E12-F12 |          | X  |   |   |   |   |   |   |   |   |
| E1-F1   |          |    | X |   |   |   |   |   |   |   |
| E5-F5   |          |    |   | X |   |   |   |   |   |   |
| E6-F6   |          |    |   |   | X |   |   |   |   |   |
| E7-F7   |          |    |   |   |   | X |   |   |   |   |
| G11-H11 |          |    |   |   |   |   | X |   |   |   |
| G12-H12 |          |    |   |   |   |   |   | X |   |   |
| G1-H1   |          |    |   |   |   |   |   |   | X |   |
| G5-H5   |          |    |   |   |   |   |   |   |   | X |
| G6-H6   |          |    |   |   |   |   |   |   |   |   |
| G7-H7   |          |    |   |   |   |   |   |   |   |   |
| I11-J11 | X        |    |   |   |   |   |   |   |   |   |
| I12-J12 |          | X  |   |   |   |   |   |   |   |   |
| I1-J1   |          |    | X |   |   |   |   |   |   |   |
| I5-J5   |          |    |   | X |   |   |   |   |   |   |
| I6-J6   |          |    |   |   | X |   |   |   |   |   |
| I7-J7   |          |    |   |   |   | X |   |   |   |   |
| K11-L11 |          |    |   |   |   |   | X |   |   |   |
| K12-L12 |          |    |   |   |   |   |   | X |   |   |
| K1-L1   |          |    |   |   |   |   |   |   | X |   |
| K5-L5   |          |    |   |   |   |   |   |   |   | X |
| K6-L6   |          |    |   |   |   |   |   |   |   |   |
| K7-L7   |          |    |   |   |   |   |   |   |   |   |

**74**

| CONTACT | POSITION |
|---------|----------|
| A11-B11 | X        |
| A12-B12 | X        |
| A1-B1   | X        |
| A2-B2   | X        |
| A3-B3   | X        |
| A4-B4   | X        |
| A5-B5   | X        |
| A6-B6   | X        |
| A7-B7   | X        |
| A8-B8   | X        |
| A9-B9   | X        |
| A10-B10 | X        |



| 75 | CONTACT | POSITION |
|----|---------|----------|
|    | A11-B11 | X        |
|    | A17-B17 | X        |
|    | A1-B1   | X        |
|    | A2-B2   | X        |
|    | A3-B3   | X        |
|    | A4-B4   | X        |
|    | A5-B5   | X        |
|    | A6-B6   | X        |
|    | A7-B7   | X        |
|    | A8-B8   | X        |
|    | A9-B9   | X        |
|    | A10-B10 | X        |
|    | C11-D11 | X        |
|    | C12-D12 | X        |
|    | C1-D1   | X        |
|    | C2-D2   | X        |
|    | C3-D3   | X        |
|    | C4-D4   | X        |
|    | C5-D5   | X        |
|    | C6-D6   | X        |
|    | C7-D7   | X        |
|    | C8-D8   | X        |
|    | C9-D9   | X        |
|    | C10-D10 | X        |

| 76 | CONTACT | POSITION |    |                |                  |
|----|---------|----------|----|----------------|------------------|
|    |         | P        | I  | I <sub>2</sub> | I <sub>2</sub> ' |
|    |         | II       | II | A              | A                |
|    |         | II       | II | I              | I                |
|    | A11-B11 | X        | X  |                |                  |
|    | A12-B12 |          |    | X              | X                |
|    | A1-B1   |          |    |                | X                |
|    | A2-B2   | X        | X  |                |                  |
|    | A3-B3   |          |    | X              | X                |
|    | A4-B4   |          |    |                | X                |
|    | A5-A6   | X        | X  | X              |                  |
|    | A6-A7   |          |    |                |                  |
|    | B5-B6   | X        | X  |                |                  |
|    | B6-B7   |          |    | X              | X                |
|    | A8-A9   | X        | X  | X              |                  |
|    | A9-A10  |          |    |                | X                |
|    | B8-B9   | X        | X  | X              |                  |
|    | B9-B10  |          |    |                | X                |

| 77      | CONTACT | POSITION |   |    |   |   |
|---------|---------|----------|---|----|---|---|
|         |         | P        | H | 12 | A | I |
| A11-B11 | X       | X        |   |    |   |   |
| A12-B12 |         |          |   | X  | X |   |
| A1-B1   |         |          |   |    |   | X |
| A2-B2   | X       | X        |   |    |   |   |
| A3-B3   |         |          | X | X  |   |   |
| A4-B4   |         |          |   |    |   | X |
| A5-A6   | X       | X        | X |    |   |   |
| A6-A7   |         |          |   |    | X | X |
| B5-B6   | X       | X        | X |    |   |   |
| B6-B7   |         |          |   |    | X | X |
| A8-A9   | X       | X        | X |    |   |   |
| A9-A10  |         |          |   |    |   |   |
| B8-B9   | X       | X        | X |    |   |   |
| B9-B10  |         |          |   |    | X | X |
| C12-C1  | X       |          |   |    |   |   |
| D12-D1  |         | X        | X | X  |   |   |
| C2-C3   | X       |          |   |    |   |   |
| D2-D3   |         |          |   |    |   |   |
| C4-C5   | X       |          |   |    |   |   |
| D4-D5   |         |          |   |    |   |   |
| C6-C6   | X       |          |   |    |   |   |
| D6-D7   |         | X        | X | X  | X | X |
| C8-C9   | X       |          |   |    |   |   |
| D8-D9   |         | X        | X | X  |   |   |
| C10-C11 |         |          |   |    |   |   |
| D10-D11 |         | X        | X | X  |   |   |

| 78 | CONTACT | POSITION |    |   |
|----|---------|----------|----|---|
|    |         | 11       | 12 | 2 |
|    | A11-B11 | X        |    |   |
|    | A12-B12 |          | X  |   |
|    | A1-B1   |          |    | X |
|    | A2-B2   |          |    | X |
|    | A3-B3   | X        |    |   |
|    | A4-B4   |          | X  |   |
|    | A5-B5   |          |    | X |
|    | A6-B6   |          |    | X |
|    | A7-B7   | X        |    |   |
|    | A8-B8   |          | X  |   |
|    | A9-B9   |          | X  |   |
|    | A10-B10 |          |    | X |

| CONTACT | 0 | 1 | 2 | 1 | 2 | 3 |
|---------|---|---|---|---|---|---|
| A10-B10 | X |   |   |   |   |   |
| A11-B11 |   | X |   |   |   |   |
| A12-B12 |   |   | X |   |   |   |
| A1-B1   |   |   |   | X |   |   |
| A2-B2   |   |   |   |   | X |   |
| A3-B3   |   |   |   |   |   | X |
| A4-B4   | X |   |   |   |   |   |
| A5-B5   |   | X |   |   |   |   |
| A6-B6   |   |   | X |   |   |   |
| A7-B7   |   |   |   | X |   |   |
| A8-B8   |   |   |   |   | X |   |
| A9-B9   |   |   |   |   |   | X |

[illegible][illegible]

Figure 1: Typical Dimensions of a 2 1/2 X 1 1/2 Inch NP. The diagram illustrates the layout of three NP units. Key dimensions include: Lens Diameter (15/16 inch), horizontal spacing (1/4 inch), vertical spacing (2 1/4 inch), and unit width (1 1/2 inch).

| Switch<br>Contact<br>Frame<br>Size | Number of<br>Lamps Above<br>Each Switch |       | Horizontal<br>Distance<br>Inches |
|------------------------------------|-----------------------------------------|-------|----------------------------------|
|                                    | Sw. 1                                   | Sw. 2 |                                  |
| 6                                  | 0                                       | 0     | 3                                |
| 12                                 | 0                                       | 0     | 5½                               |
| 6                                  | 2                                       | 2     | 3                                |
| 12                                 | 2                                       | 2     | 5½                               |
| 6                                  | 3                                       | 3     | 4½                               |
| 12                                 | 3                                       | 3     | 5½                               |
| 6                                  | 2                                       | 3     | 3½                               |
| 12                                 | 2                                       | 3     | 5½                               |

**Note 1**—Vertical Distance Between Switches  
With Lamps and N. P. 7 Inches.  
Without Lamps/with N. P. 5½ Inches.  
Without Lamps or N. P. 5½ Inches.

**Key Interlock**

For Handle and Switch Dimensions, Refer to Standard Outline Drawings

Panel Thickness

Dimensions (inches):

- Top to Center:  $1\frac{1}{4}$
- Center to Bottom of Switch:  $3\frac{7}{16}$
- Bottom of Switch to Base:  $2\frac{1}{2}$
- Base to Bottom of Switch:  $1\frac{1}{2}$
- Base Width:  $2\frac{1}{4}$
- Panel Thickness:  $\frac{1}{8}$  and  $\frac{3}{8}$

# Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere  
Continuous Capacity

## How to Order Stamped Dial Nameplates

NP 502A054H01 (Fixed Handle) Fig. 1  
NP 502A054H03 (Removable Key) Fig. 1  
NP 502A054H02  
(Fixed Handle with Target) Fig. 2  
NP 502A054H04 (Fixed Handle) Fig. 3  
NP 502A054H05 (Removable Key) Fig. 3

Select figure number meeting nameplate requirement. Specify the required blank nameplate style as given for the selected figure number and the desired markings at location numbers shown on the figures.

Example: Figure 2 – NP 502A054H02  
Stamp 11 = Trip, 1 = Close, 15 = Circuit Breaker, 16 = Control.

Number of Letter Spaces per Line

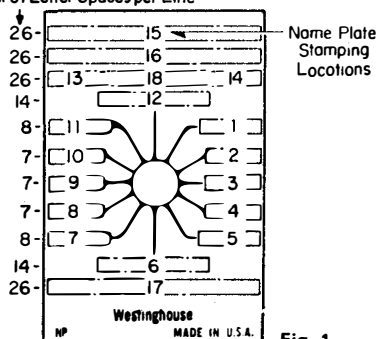


Fig. 1

Number of Letter Spaces per Line

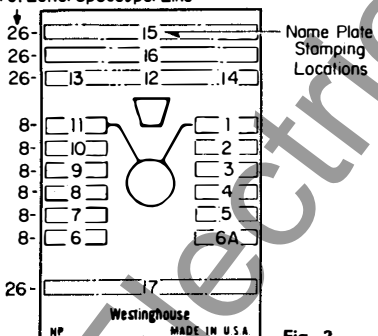


Fig. 2

Number of Letter Spaces per Line

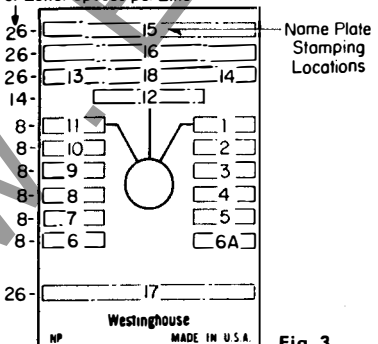
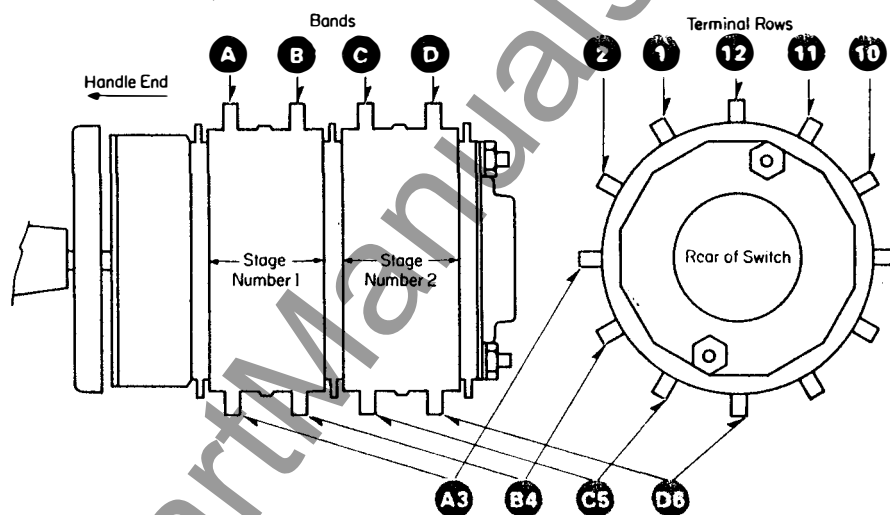


Fig. 3

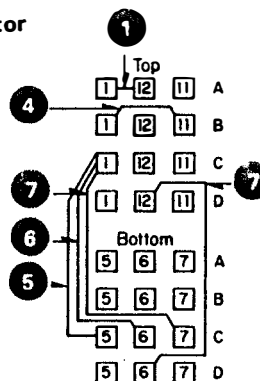
## Method of Identifying Contact Terminals Lettered Bands, Numbered Terminals



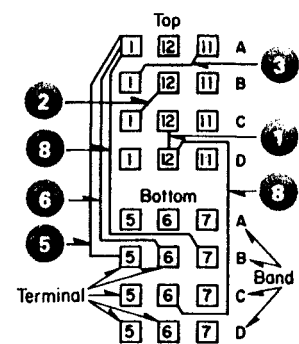
## 6-Contact Stage Connector

Connector Style No.

- |   |            |
|---|------------|
| 1 | 677C519H08 |
| 2 | 677C519G07 |
| 3 | 677C519G05 |
| 4 | 677C519G01 |
| 5 | 677C782G01 |
| 6 | 677C782G02 |
| 7 | 677C782G03 |
| 8 | 677C782G04 |



Connectors in Same Band

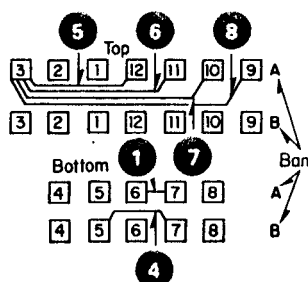


Connectors between Adjacent Bands

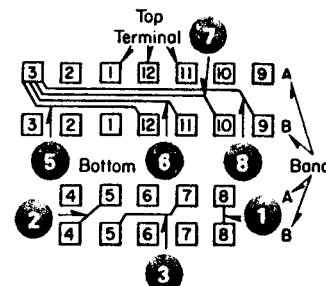
## 12-Contact Stage Connector

Connector Style No.

- |   |            |
|---|------------|
| 1 | 677C519H08 |
| 2 | 677C519G07 |
| 3 | 677C519G05 |
| 4 | 677C519G01 |
| 5 | 677C782G01 |
| 6 | 677C782G02 |
| 7 | 677C782G03 |
| 8 | 677C782G04 |



Connectors in Same Band



Connector between Adjacent Bands





INSTRUMENT AND CONTROL

SWITCHES

TYPE W-2

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Supplement to Descriptive Bulletin 34-251

[www.ElectricalPartManuals.com](http://www.ElectricalPartManuals.com)

## TYPE W-2 SWITCH

The following is presented as an aid in identifying contact terminals of the type W-2 Switch.

Referring to sketch Figure A, consider the radial lines (12 in number) positioned and numbered as the hours on the face of a clock, as being the ROWS of terminals.

Consider the circles of the sketch as BANDS of terminals around the circumference of the switch, the smallest circle representing the front BAND, or the BAND nearest the switch handle. Starting from the front, let the BANDS progressively be identified by the letters A - B - C, etc.

The intersection of the radial lines with the circles are used to locate specific terminals. Identification is by reference to both line and circle designation, i.e., A1, B2, C3, E7, etc.

The sequential grouping from front to back of two BANDS of terminals is designed as a STAGE.

The relationship between ROWS - BANDS - and STAGES is shown by figure A.

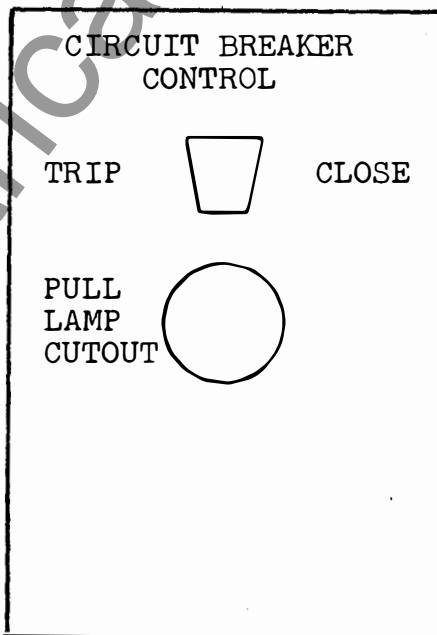
Contact positions for the type W-2 Switch are indicated by means of tabulations such as illustrated by Tab. 1. Closed contacts are indicated by X. Designation of closed contacts for the various switch handle positions is by means of the letter-number combinations in the left hand column of the tabulation. For example, with the switch handle in the trip or T position, terminals A11 and B11 are connected each to the other, also terminals A5 and A6, also B5 and B6, etc.

The tabulation used herein is for a circuit breaker control switch, having handle positions PULL TRIP - TRIP - OFF AFTER TRIP - OFF AFTER CLOSE - CLOSE.

Figures B-C-D-E-F are an expansion of tabulation 1, to diagrammatically show the contact positions, both open and close, for the various switch handle movements. (# indicated closed contacts, = indicates open contacts)

| CONTACT | POSITION |   |     |       |   |
|---------|----------|---|-----|-------|---|
|         | P        |   | Off | After |   |
|         | T        | T | T   | C     | C |
| A11-B11 | X        | X |     |       |   |
| A12-B12 |          |   | X   | X     |   |
| A1-B1   |          |   |     |       | X |
| A5-A6   | X        | X | X   |       |   |
| A6-A7   |          |   |     | X     | X |
| B5-B6   | X        | X | X   |       |   |
| B6-B7   |          |   |     | X     | X |
| C11-D11 | X        | X |     |       |   |
| C12-D12 |          |   | X   | X     |   |
| C1-D1   |          |   |     |       | X |
| C5-C6   | X        | X | X   |       |   |
| C6-C7   |          |   |     | X     | X |
| D5-D6   | X        | X | X   |       |   |
| D6-D7   |          |   |     | X     | X |
| E12-E1  | X        |   |     |       |   |
| F12-F1  |          | X | X   | X     | X |
| E6-E7   | X        |   |     |       |   |
| F6-F7   |          | X | X   | X     | X |

TAB. 1



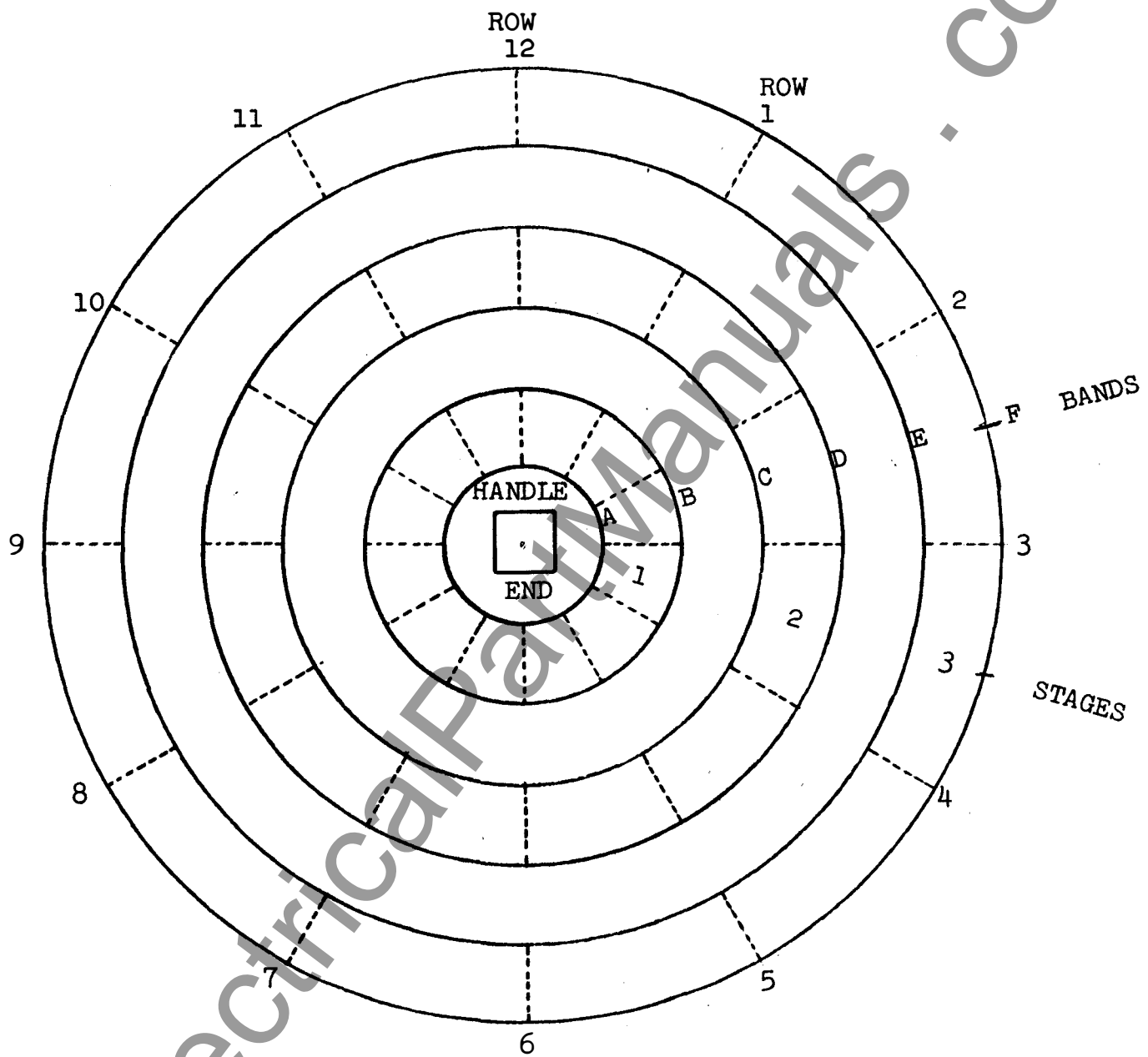


FIG. A

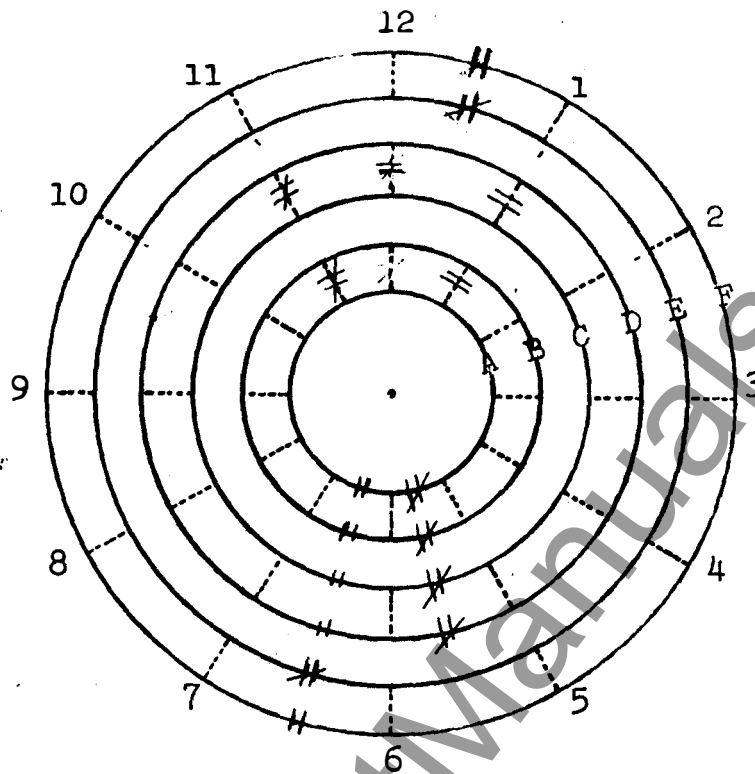


FIG. B.

Switch handle  
pulled out in  
TRIP (T) posi-  
tion.  
Breaker is  
TRIPPED AND  
indicating  
LAMPS ARE CUT  
OUT.

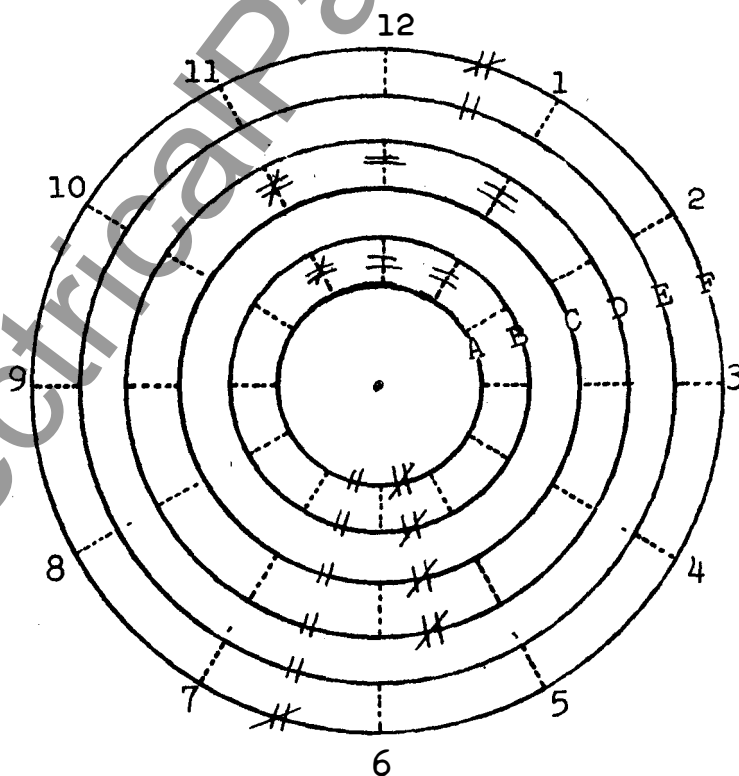


FIG. C

Switch handle  
held in TR  
(T) position.  
Handle not  
pulled out.  
Indicating  
lamps not cut  
out.

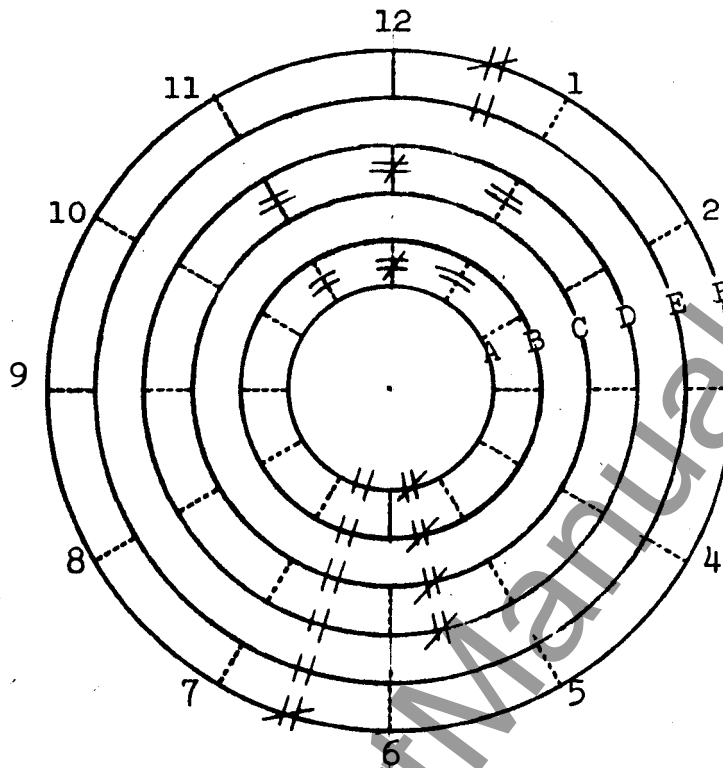


FIG. D

Switch handle  
spring return-  
ed to off posi-  
tion after  
being moved to  
TRIP (T) posi-  
tion.  
Indicating  
LAMPS NOT CUT  
OUT.

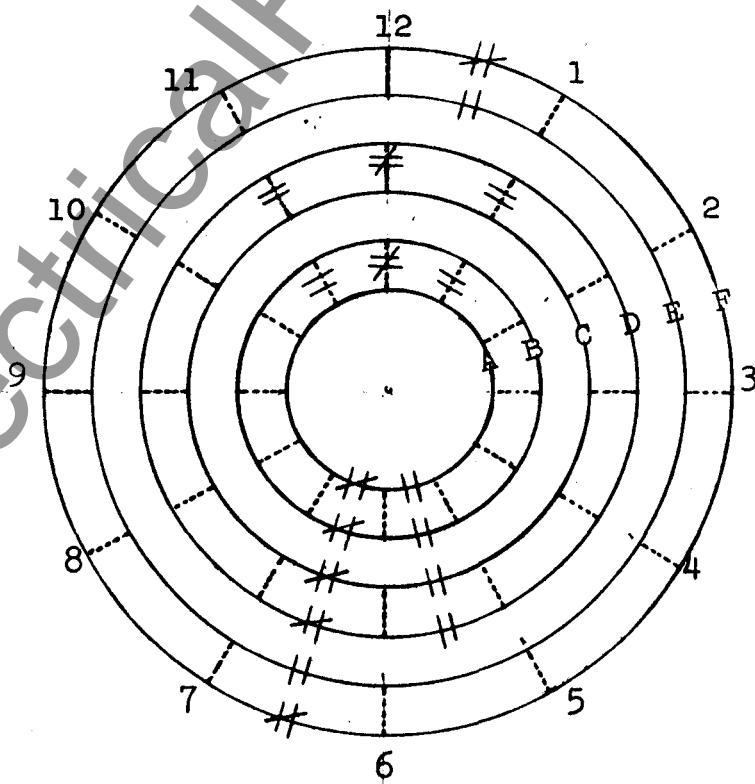
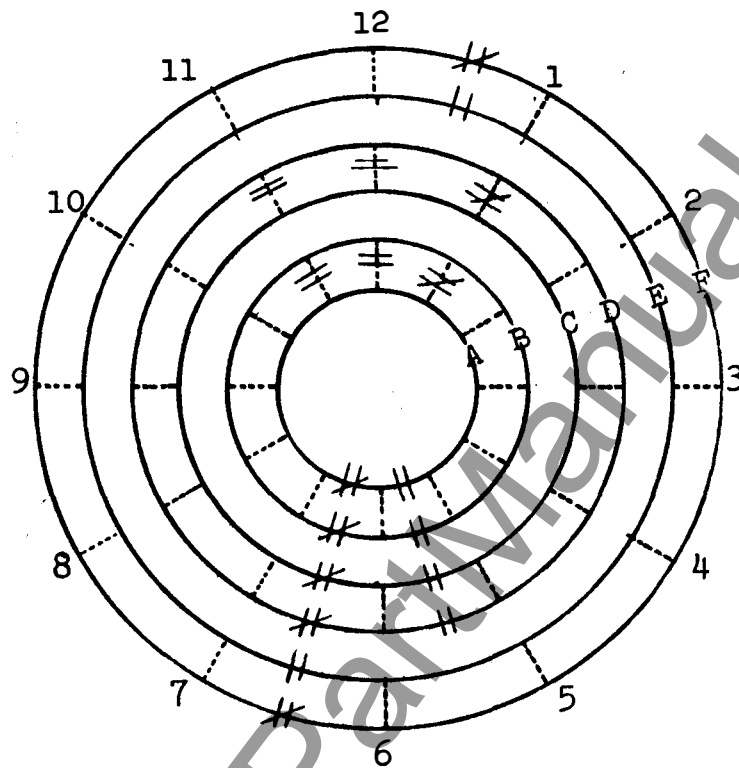


FIG. E

Switch handle  
spring return-  
ed to off posi-  
tion after  
being moved to  
CLOSE (C) posi-  
tion.  
Indicating  
lamps not cut  
out.



Switch handle  
held in CLOSE  
(C) position.  
Handle not  
pulled out.  
Indicating  
lamp not cut  
out

FIG. F



TYPE W-2 SWITCH  
Wiring Diagram

Fig. I is the wiring diagram for a circuit breaker control switch with positions as shown in Tab. 1. Referring to the Figure I, R and G are respectively Red and Green Indicating Lights. Breaker Close and Breaker Trip are respectively the closing and trip mechanisms of the controlled circuit breaker. The breaker A and B contacts are respectively the normal open and closed contacts of the circuit breaker auxiliary switch. Closing are the contacts of the Recloser relay that are in the closing circuit of the circuit breaker.

By comparing contact position table Tab. 1 and the wiring diagram Fig. I, it should be noted that the tabulation shows more contacts closed than are required in the wiring diagram Fig. I. The tabulation shows all the inherently available closed contacts for each position of the switch handle, from which the required wiring diagram can be made. For example, the switch under consideration is provided with two standard roller contacts, four slip roller contacts and two rotor pull contacts. With the handle in the CLOSE position, from Tab. 1, it is noted that eight closed contacts are available of which 2 (A1-B1, C1-D1) are closed in the CLOSE position only; 4 (A6-A7, B6-B7, C6-C7, D6-D7) are closed in the CLOSE and OFF AFTER CLOSE positions; and 2 (F12-F1, F6-F7) are closed in all positions except when the handle is pulled out. Referring to Fig. I, it is shown that the only CLOSE contact required is between A1 and B1; the circuit being from bus P through B1-A1 through breaker close to bus N.

With the handle in the OFF AFTER CLOSE position, eight closed contacts are available of which 2 (A12-B12, C12-D12) are closed in the OFF position only; 4 (A6-A7, B6-B7, C6-C7, D6-D7) are closed in the CLOSE and OFF AFTER CLOSE positions; and 2 (F12-F1, F6-F7) are closed in all positions except when the handle is pulled out.

Referring to Fig. I, only four of the closed contacts are required to complete two circuits, each of which is closed in the OFF AFTER CLOSE position only, and each circuit being obtained by the use of a standard contact and a slip contact in series. One circuit starts at bus P, through C12-D12, through D7-D6, through closing contact of the recloser, through breaker close to bus N. The other circuit starts at bus X, through A12-B12, through C6-C7, through recloser to bus Y.

Similarly other contact requirements and circuits can be identified for corresponding positions of the switch handle.

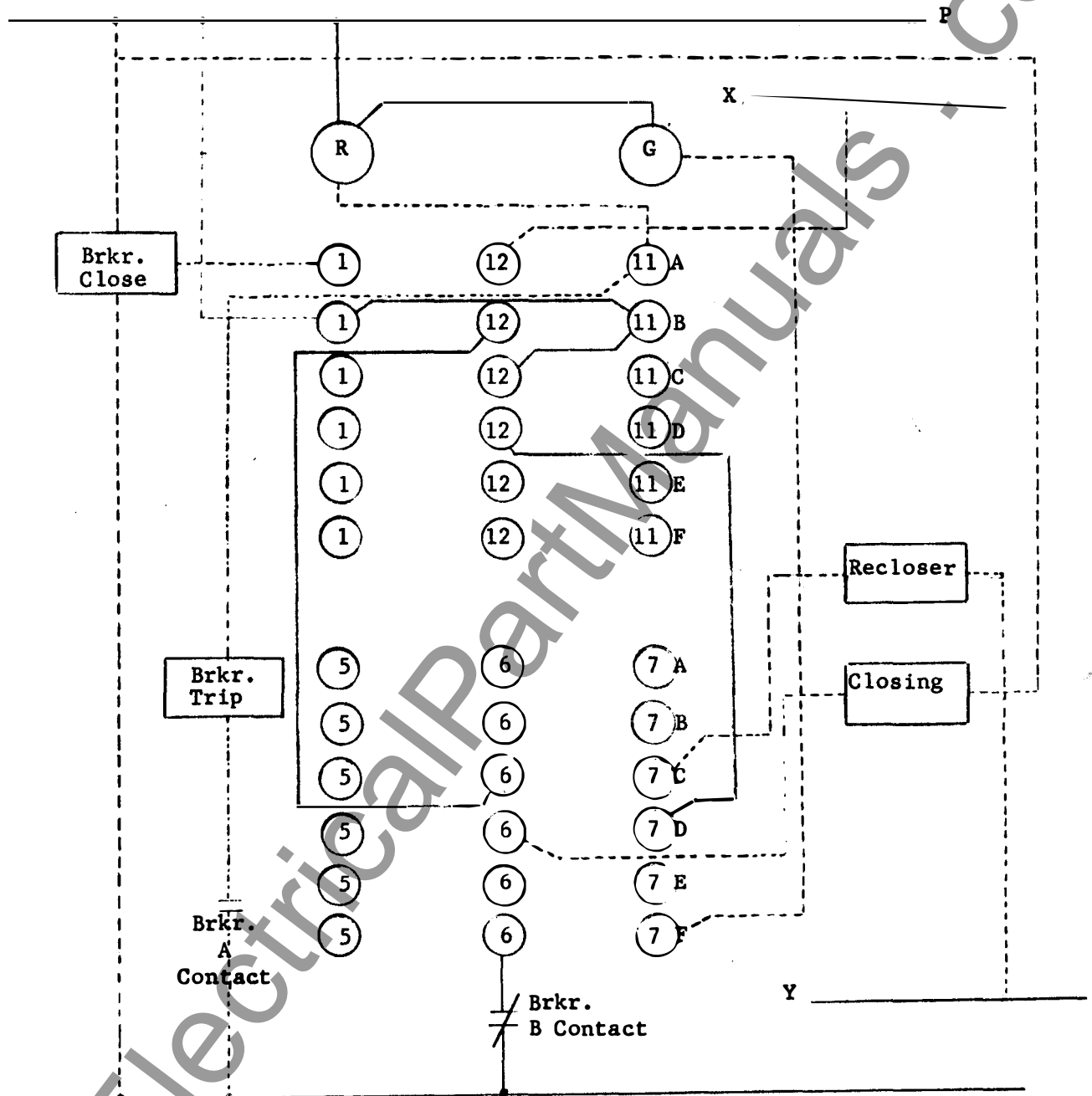


FIG. 1

## TYPE W-2 SWITCH Contact Details

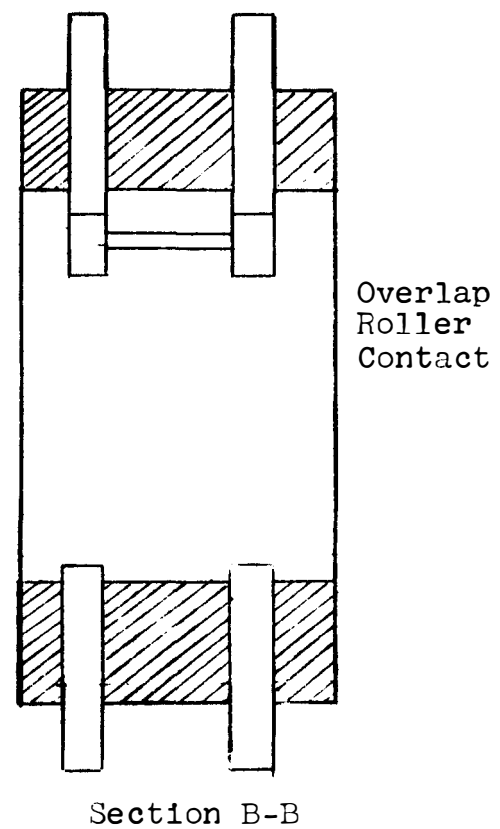
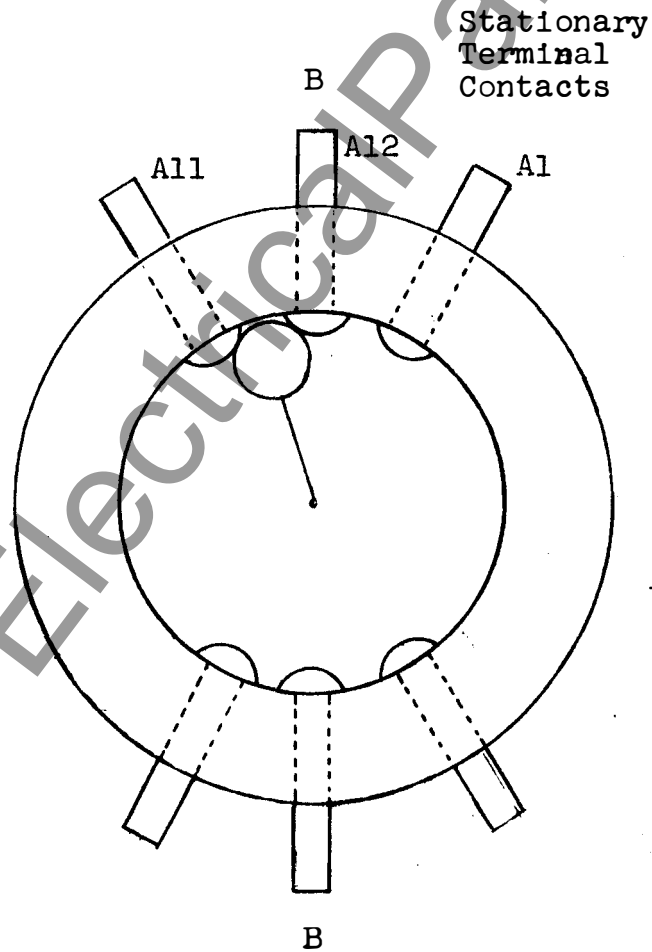
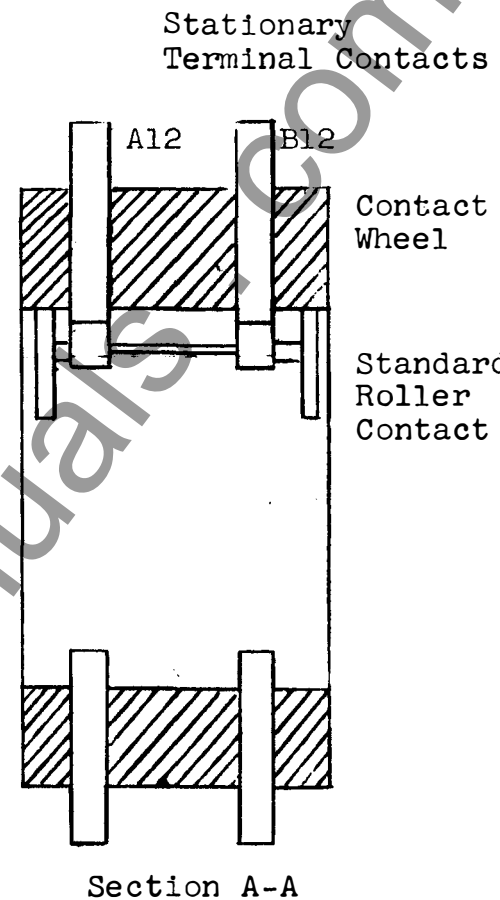
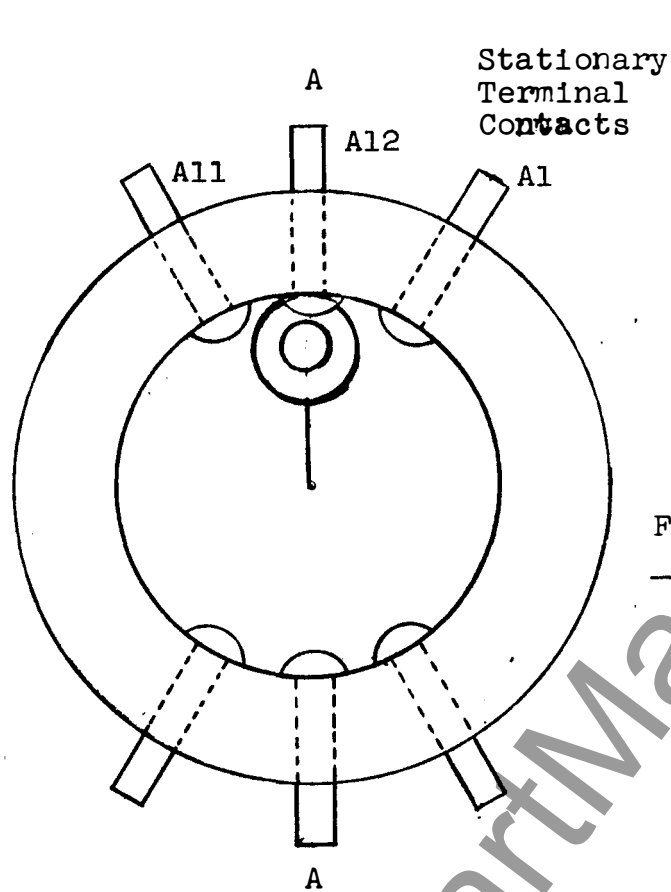
Sketches Fig. G and H were prepared to show how connection is made between the stationary terminal contacts and the roller contacts of the Type W-2 Switch. The figures represent one stage of the half frame stator size. For simplicity, only a single roller contact is diagrammatically shown. Stationary and roller contacts are made of bronze alloy, silver plated. Actual construction of contacts, stators and rotors is shown in Descriptive Bulletin 34-251 Page 4.

Figure G illustrates the standard roller contact, used to connect two adjacent stationary contacts in the same stage and row. In the position shown, the roller connects stationary contact A12 to B12. Turning the switch handle clockwise to its next position, the roller connects stationary contact A1 to B1. The roller is sufficiently small in diameter, so that in being moved from one set of contacts to the next, connection is broken before it is again made; ie, connection with terminals A12 is broken before connection is made with A1; the same being true for contacts B12 and B1. With this small roller, there are provided contact wheels made of glass polyester - an insulating material of high dielectric and mechanical strength. These wheels, riding on the stator frame provides for a smooth transition between stationary contacts and serve to maintain adequate electrical strike distance between roller and stationary contacts during transfer.

Fig. H illustrates the overlap roller contact. This contact differs from the standard roller contact in that it uses a roller of a larger diameter to effect a make - before - break transfer of contacts. Fig. H shows the roller midway in its travel from stationary contact A11 to A12. Contact wheels are not required.

Modification of this overlap roller by use of an insulating shaft between the two roller wheels and mounting it on segmented rotor makes us what is termed a slip contact. This arrangement allows the roller contact to rest between adjacent stationary contacts for certain positions of the switch handle. For example referring to Fig. H, stationary contacts A11 and A12 are connected together, and B11 and B12 are connected together. Due to the insulated roller shaft, there is no electrical connection between A11 and B11 or A12 and B12 stationary contacts when the roller contact is in the position shown.

The rotor pull contact, illustrated on page 4 of Descriptive Bulletin 34-251 is used to connect or disconnect two adjacent stationary terminal contacts in the same band. This is accomplished by the in and out axial movement of the switch handle which causes axial movement of the pull contact rotor and the associated roller contacts. For example, referring to Fig. C, with the switch handle pushed in, the roller bridges contacts F1 and F12. With the switch handle pulled out, Fig. B, the bridging is transferred from F1 - F12 to E1 - E12. When the handle is in the pulled-out position, rotary motion of the handle is not possible.



## TYPE W-2 SWITCH Rotor Construction

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Figs. 1 to 10 show the various types of circuit combinations possible per stage with rotor using the standard or overlapping types of contacts. Two rotor moldings are available to make up the illustrated combinations; ie, one using up to four roller contacts and one using up to six roller contacts.

Fig. 1 shows a four roller contact rotor with only one roller in the 12 o'clock position of a six contact frame. A switch with such a rotor assembly is suitable for two or three positions, with one contact closed in each position. The number of positions is controlled by the stop pins at the rear of the switch.

Fig. 2 shows the same rotor with two roller contacts 180 degrees apart. This is same as Fig. 1 except that two contacts are closed in each position. In Figs. 1 and 2 a stop can be utilized at 10 o'clock and, or 2 o'clock positions by locating stop pins at the rear of the switch as desired. This will provide for OFF positions as indicated in Figs. 1 and 2.

Fig. 3 shows the same rotor molding with two roller contacts 90 degrees apart. Such an arrangement permits one contact closed in each of up to six positions. With this arrangement, there would be no OFF position as such, however, one of the six positions could be used as an OFF position, if required, simply by not connecting the external stationary contact terminals in the circuit.

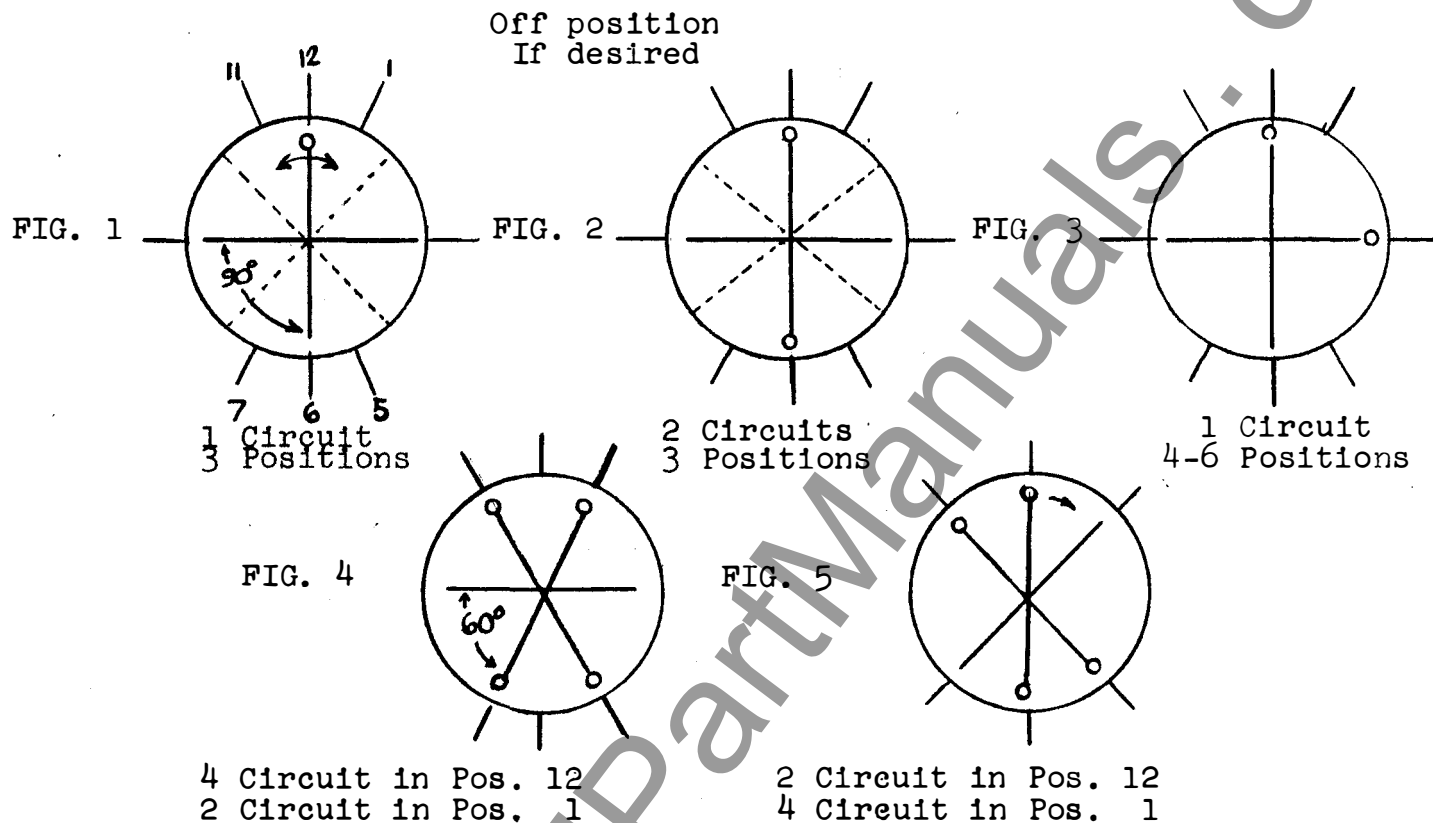
Figs. 6-7-8 also use the four roller contact rotor. The function of these figures is similar to those described above, except for the use of the twelve contact frame.

Fig. 4 illustrates the six roller contact rotor in the six contact frame, with but four "rollers" being used. This arrangement permits four contacts to be closed in one position and two closed in the other position.

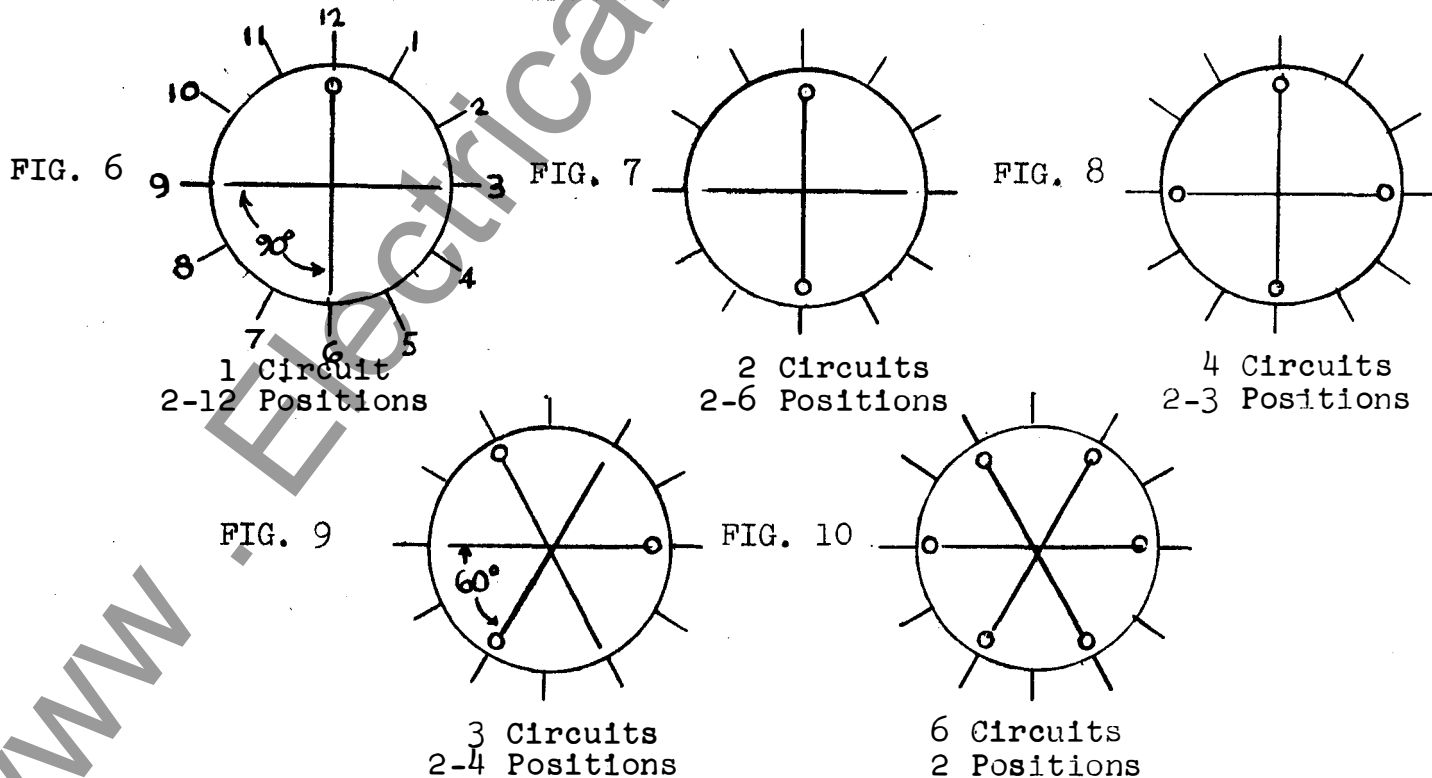
Figs. 5-9-10 use the six roller contact rotor in the twelve contact frame in combinations as shown in the figures.

# TYPE W-2 SWITCH Rotor Forms

## FOR USE WITH HALF FRAME



## FOR USE WITH FULL FRAME



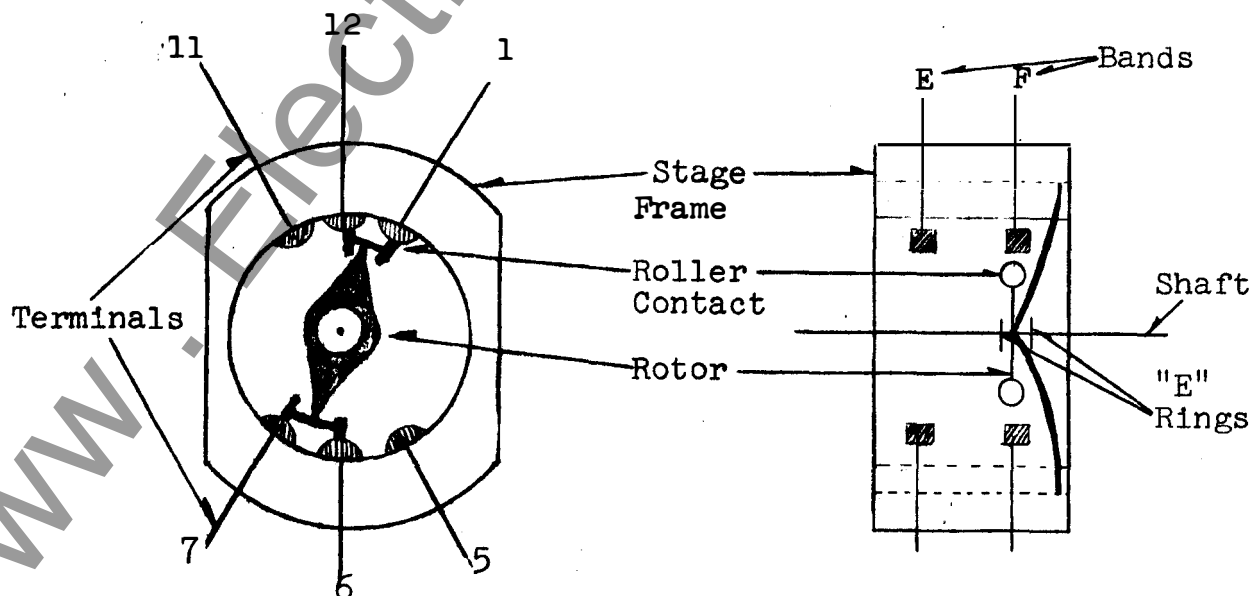
## PULL ROTOR

The pull rotor of the Type W-2 Switch is designed to close adjacent contacts in the same band. No other type of contact can be combined in the pull rotor and any requirement for a pull contact constitutes a separate stage.

The pull rotor is designed to remain stationary during any rotary movement of the switch shaft in that the shaft of the switch is free to rotate within the hub of the pull rotor. However, "E" rings are used to lock the pull rotor in position on the shaft, i.e. one E ring in front and one in back of the pull rotor, so that the rotor must follow the shaft when pulled out or pushed in.

The pull rotor is prevented from turning inside the stator frame by means of two projections, 180 degrees apart, on the pull rotor which engage and travel in slots molded into the inside surface of the stage frame.

In the "in" or normal position the rotor contacts will bridge, for example, terminals F12 - F1 at the top and F6 - F7 at the bottom of the stage frame and when the handle and rotor are pulled out, the pull rotor is drawn straight forward, guided by the slots in the stage frame, and the forementioned contacts open and when pull out is comp-





PULL ROTOR CONT'D

leted, contacts E12 - E1 and E6 - E7 are closed.

Here again, depending on how the terminals are wired, these can be either pull-to-open or pull-to-close contacts.

## SLIP CONTACTS

The slip contact as used in the Type W-2 Switch is a combination or hinging type of rotor with locations for four roller contacts. In the top two locations are placed standard potential type rollers with wheels. This top portion of the rotor contains the hub that fits onto the switch shaft and is therefore moved to various positions as the handle is rotated.

The lower portion of this rotor is that containing the slip contacts and will accommodate two slip contacts. Such contacts can be either slip or reverse slip depending on how the terminals are wired.

In working up a contact tabulation for the Type W-2 Switch it is important to know that the lower or slip contact has a diameter of inch and rides on an insulated shaft and is designed to bridge adjacent terminals in the same band i.e., A6 - A7 and B6 - B7 when in one position and A5 - A6 and B5 - B6 when in the other position.

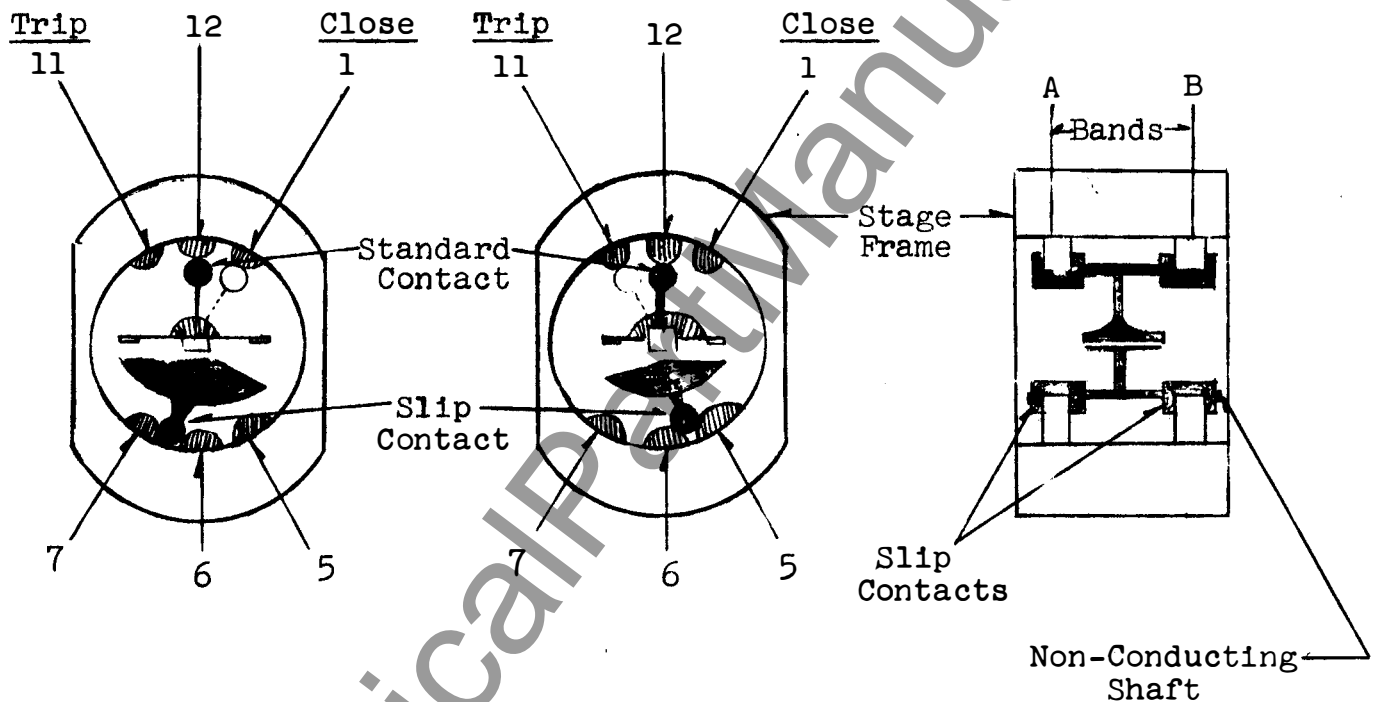
By way of illustration, consider a Circuit Breaker control switch where the slip rotor consists of one potential and one slip roller; being spring return, the handle and potential roller move to the neutral or 12 o'clock position. When the handle is rotated to the "CLOSE" (1 O'clock) position the potential roller closes (bridges) terminals A1 - B1 and in the rotating process the lower half of the rotor has been forced to it's extreme position where it closes terminals A6 - A7 for one circuit and B6 - B7 for a second circuit.

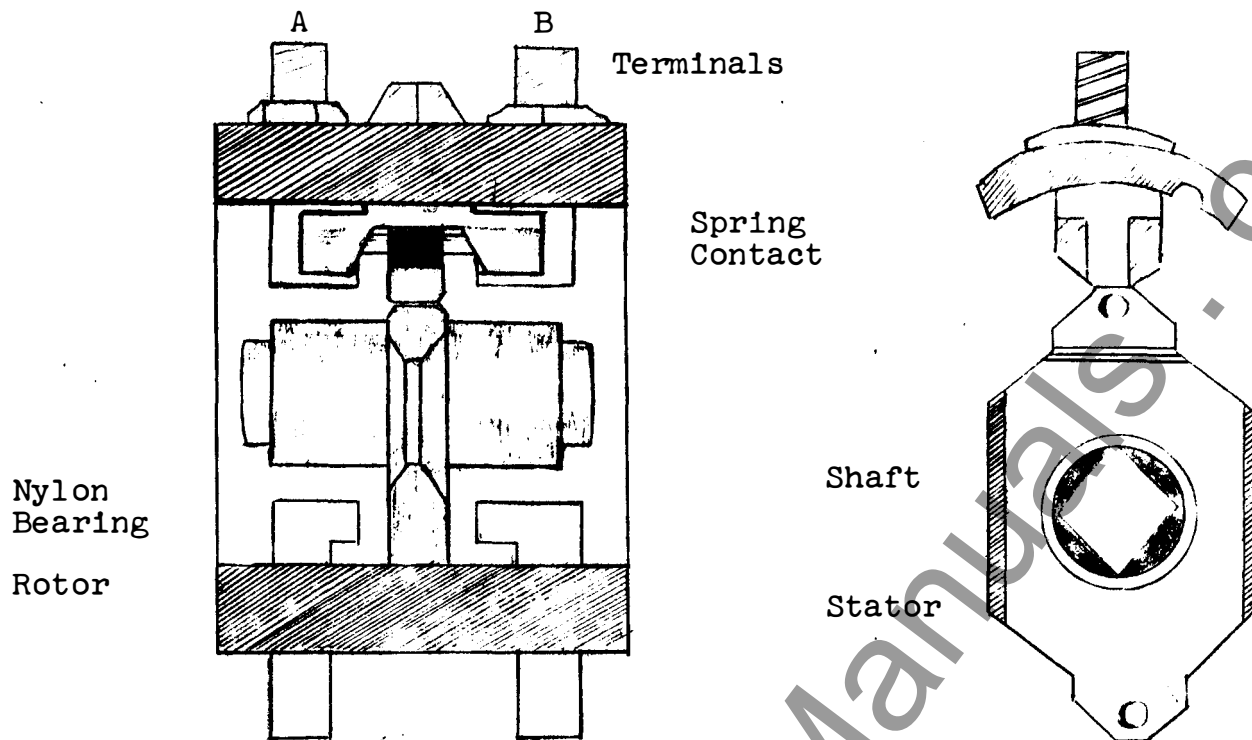
The slip contact will remain thus so long as the handle is rotated only between neutral and CLOSE.

When the handle is rotated to the TRIP position (11 O'clock) the potential roller will close (bridge) terminals A11 - B11 and in the rotating process the lower half or slip roller has been forced to position where it rests between terminals A5 - A6 and B5 - B6.

## SLIP CONTACT\* CONT'D

If reverse slip contacts are desired and if a common connection exists between the slip and reverse slip contacts then the latter four terminals may be wired. If no common connection exists then a separate stage of similar design must be added to obtain reverse slip of independent circuitry.





#### NORMALLY CLOSED CONTACT

The normally closed contact of the Type W-2 Switch differs from all others in that the actual contact is not on the rotor but is held captive between two stationary contacts.

The stationary contacts of this assembly are "L" shaped and the feet of opposite terminals face each other thus forming a "U". A spring actuated contact bar bridges the gap between the feet of the stationary contacts. The contact is held closed by spring pressure. The rotor used in this assy is of Glass Polyester material and is designed to open as many as four normally closed contacts in each position but is also designed so that certain desired projections can be removed that fewer than four "NC" contacts can be opened in each position.

Break away  
Lines

