



# a-c and d-c switchboard instruments 6" rectangular • 100° scale

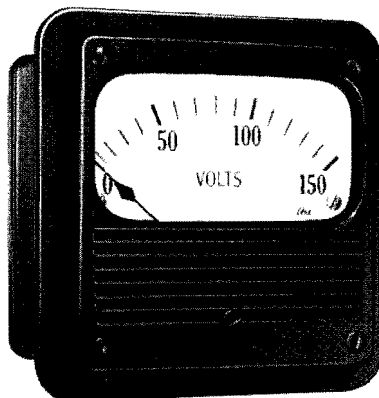
featuring *the*® electrical  
measuring instruments

catalog  
section

43-250

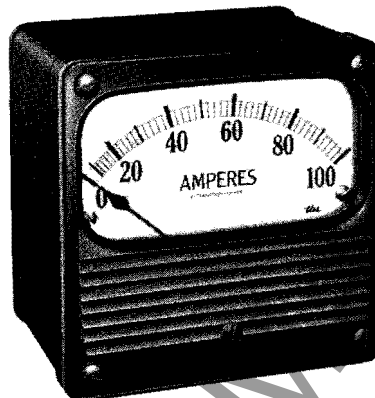
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flush mounting



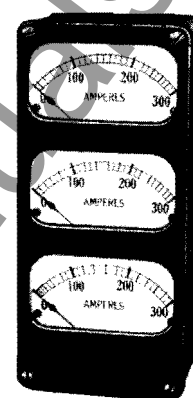
type K( )-251: taut band suspension  
type K( )-25: pivot and jewel bearing

projection mounting



type U( )-251: taut band suspension  
type U( )-25: pivot and jewel bearing

Triplex



type KA-25: flush mounting  
type UA-25: projection  
mounting

Westinghouse 6" rectangular instruments accurately measure all electrical values associated with switchboard applications. They combine easy readability and reliable performance, and are specifically designed for switchboard use in large and small utility generating stations and substations, steel mills, chemical processing and aluminum reduction plants, and textile and paper mills. Other applications include use on ma-

chine tools, and in college and university laboratories.

*The* instruments (type 251) assure almost infallible repeatability and higher sensitivity and eliminate the need for replacing pivots and jewels.

All Westinghouse types 251 and 25 6" rectangular instruments meet or exceed the requirements of ASA standard C-39.1, and Joint Military Specification MIL-M-16034A for switchboard instruments.

## types available

| instrument class  | type designation†    | bearing system       | type of mechanism                              | see page    |
|---|----------------------|----------------------|--|-------------|
| d-c ammeters milliammeters, voltmeters millivoltmeters, microammeters | ( ) X-251            | taut band suspension | permanent magnet-moving coil                   | 4, 6, 7     |
| rectifier type voltmeters and milliammeters                           | ( ) C-251            | taut band suspension | permanent magnet-moving coil                   | 4, 10       |
| frequency meters (with external transducer)                           | ( ) X-251            | taut band suspension | permanent magnet-moving coil                   | 4, 9, 11    |
| a-c milliammeters, ammeters, voltmeters                               | ( ) A-251            | taut band suspension | repulsion iron                                 | 4, 7, 8     |
| a-c ammeters and voltmeters (Triplex)                                 | ( ) A-25             | pivot and jewel      | repulsion iron                                 | 10          |
| a-c wattmeters and varmeters  | ( ) Y-25             | pivot and jewel      | air-core dynamometer                           | 5, 8, 9, 11 |
| synchroscopes and 360° scale power factor meters                      | ( ) I-25             | pivot and jewel      | rotating vane                                  | 5, 9        |
| power factor meters, 100° scale                                       | ( ) Y-25             | pivot and jewel      | cross coil dynamometer                         | 5, 9, 11    |
| r.f. ammeters and milliammeters                                       | ( ) T-251            | taut band suspension | permanent magnet-moving coil                   | 4, 11       |
| d-c wattmeters  | ( ) Z-25             | pivot and jewel      | iron core dynamometer                          | 7           |
| temperature indicators and ground detectors                           | ( ) X-251, ( ) A-251 | taut band suspension | permanent magnet-moving coil or repulsion iron | 9           |

† First letter of type designation indicates flush (K) or projection (U) mounting.

December 15, 1960

new information

mailed to: E/332/PL; D/823/CS; C/384/PL

discounts: see selling policy 43-000

TYPE U-X-251

**specifications**

|                   |   |
|-------------------|---|
| accuracy          | $\pm 1\%$ of full scale deflection        |
| case size         | 5 $\frac{9}{16}$ " square                 |
| insulation rating | 800 volts                                 |
| shielding         | magnetically shielded                     |
| net weight◆       | 4 to 5 $\frac{1}{2}$ lbs (Triplex, 9 lbs) |
| shipping weight◆  | 6 to 7 lbs (Triplex, 13 lbs)              |
| scale length      | 5 inches                                  |

◆ Does not include external accessories, if required.

**burden characteristics** at 60 cycles**burden on current transformers at 5 amps**

| instrument and rating                          | impedance: ohms | resistance: ohms | reactance: ohms | volt-amperes | percent power factor |
|--|-----------------|------------------|-----------------|--------------|----------------------|
| ammeters: 5 amps                               | .018            | .017             | .0057           | .44          | 94                   |
| wattmeters and varmeters (per element): 5 amps | .078            | .077             | .012            | 1.95         | 99                   |
| power factor meters: 5 amps                    |                 |                  |                 |              |                      |
| 100° scale                                     | .016            | .016             | .05             | 1.9          | 99.5                 |
| 360° scale                                     | .174            | .14              | .104            | 4.35         | 82                   |

**burden on voltage transformers at 120 volts**

| instrument and rating              | volt-amperes | watts | vars | percent power factor |
|------------------------------------|--------------|-------|------|----------------------|
| voltmeters, 0-150 volts            | 1.92         | 1.92  | .074 | 100                  |
| wattmeters: 120 volts              |              |       |      |                      |
| single phase                       | 5            | 5     | 0    | 100                  |
| polyphase (per element)            | 3.6          | 3.6   | 0    | 100                  |
| frequency meters: 120 volts        | 3.5          | 2.5   | 2.46 | 70                   |
| power factor meters: 120 volts     |              |       |      |                      |
| single phase                       | 18           | 14    | 11   | 78                   |
| 100° scale polyphase (per element) | 3.7          | 3.7   | 0    | 100                  |
| single phase                       | 4.75         | 4.75  | 0    | 100                  |
| 360° scale polyphase (per element) | 6.7          | 6.7   | 0    | 100                  |
| synchrosopes: 120 volts            |              |       |      |                      |
| running                            | 4.75         | 4.75  | 0    | 100                  |
| incoming                           | 4.6          | 3.7   | 2.8  | 80                   |

**general ordering information****when ordering, specify**

1. quantity
2. style number
3. type
4. scale marking
5. full scale deflection
6. special features, if any

**design features**

**taut band suspension:** All type 251 instruments are supplied with taut band suspension mechanism to eliminate friction, and reduce damage from shock and vibration. Eliminates the necessity of replacing pivots and jewels.

**screwdriver calibration adjustment:** On KA-251 a-c ammeters and voltmeters, only a screwdriver is required to obtain 5% adjustment of full scale calibration by changing the position of the stationary vane.

**shielding:** D-c instruments employing core-magnet construction can be used in external magnetic fields of 500 gauss . . . which allows them to be mounted very close to high current conductors. This feature is particularly advantageous in the aluminum and electrochemical industries.

**permanently white dials:** Dials will not discolor, crack, fade or craze.

**high sensitivity for d-c applications:** On d-c ammeters for use with external shunts, for instance, lead resistances can be changed over a fairly wide range without noticeable effect on the instrument's calibration.

**high overload capacity:** Instruments will withstand from 35 to 150 times instantaneous overload without damage.

**attractive, modern appearance:** Design is coordinated with that of other Westinghouse switchboard components.

**special features**

**black dials with white markings:** Add \$10.00 list.

**electro-luminescent dials:** Energized from 120 volt, 60 cycle external source to provide soft, even light against which pointer, scale divisions, and numerals are outlined in bold relief. Add \$20.00 list (\$40.00 list for Triplex instruments).

**knife-edge pointers and fine-line scale divisions:** Add \$10.00 list.

**non-glare glass:** May be required where lighting conditions are extremely poor. No addition in price.

# a-c and d-c switchboard instruments

6" rectangular • 100° scale

catalog  
section

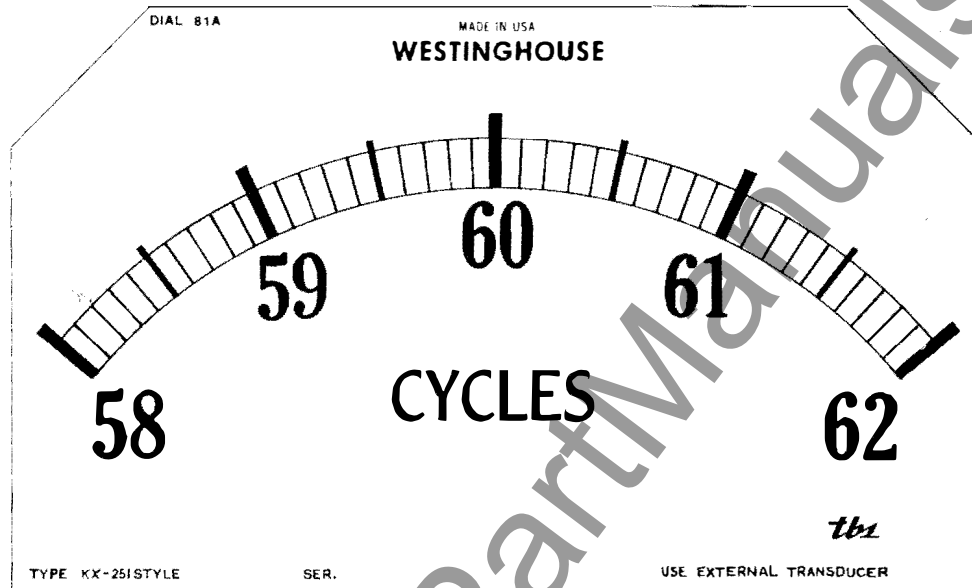
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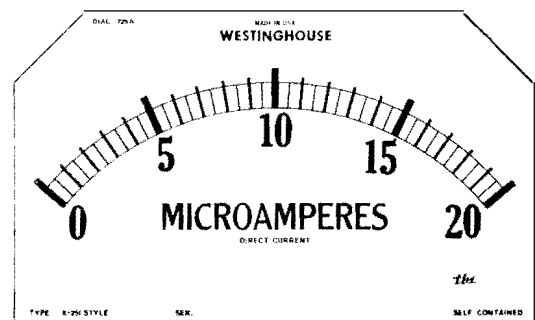
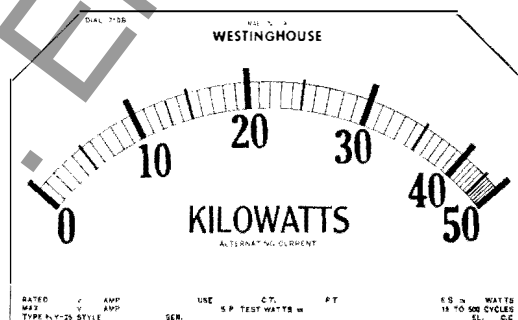
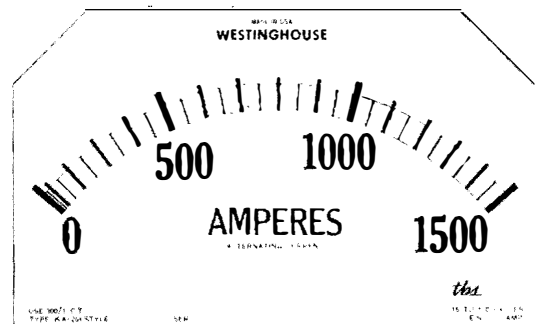
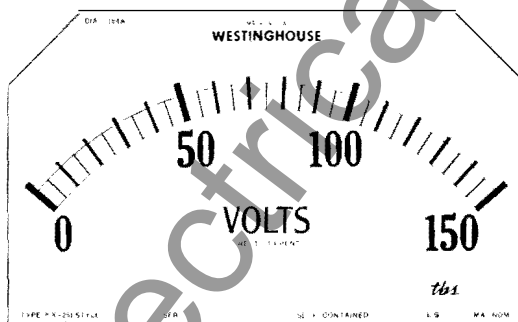
featuring *tbs* electrical  
measuring instruments

## typical dials

actual size dial



other typical dials shown reduced in size





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## list prices

### d-c ammeters • self-contained

taut band suspension

| full scale dial marking and rating | scale divisions | KX-251 flush mtg style number | UX-251 projection mtg style number | list price |
|------------------------------------|-----------------|-------------------------------|------------------------------------|------------|
| 1                                  | 50              | 291B406A09                    | 291B407A09                         | \$108      |
| 1.5                                | 30              | 291B406A10                    | 291B407A10                         | 108        |
| 2                                  | 40              | 291B406A11                    | 291B407A11                         | 108        |
| 2.5                                | 50              | 291B406A12                    | 291B407A12                         | 108        |
| 3                                  | 30              | 291B406A13                    | 291B407A13                         | 108        |
| 5                                  | 50              | 291B406A14                    | 291B407A14                         | 108        |
| 8                                  | 40              | 291B406A15                    | 291B407A15                         | 108        |
| 10                                 | 50              | 291B406A16 (S)                | 291B407A16                         | 108        |
| 15                                 | 30              | 291B406A17 (S)                | 291B407A17                         | 108        |
| 20                                 | 40              | 291B406A18 (S)                | 291B407A18                         | 108        |
| 25                                 | 50              | 291B406A19                    | 291B407A19                         | 108        |
| 30                                 | 30              | 291B406A20 (S)                | 291B407A20                         | 108        |
| 40                                 | 40              | 291B406A21                    | 291B407A21                         | 108        |
| 50                                 | 50              | 291B406A22 (S)                | 291B407A22                         | 108        |

† Self-contained d-c ammeters have 50-mv internal shunts.

0-800 Amp. meter.  
TYPE UX-251 FOR USE  
WITH 0-15 OHM 75-100

### d-c ammeters • external shunt type

for use with but not including external 50-millivolt shunts:

full scale deflection: 50-mv

(for use with from 0 to .13 ohm shunt lead resistance)†

taut band suspension

| full scale dial marking | scale divisions | shunt rating: amps | KX-251 flush mtg style number | UX-251 projection mtg style number | list price |
|-------------------------|-----------------|--------------------|-------------------------------|------------------------------------|------------|
| 5                       | 50              | 5                  | 291B395A09                    | 291B396A09                         | \$97       |
| 10                      | 50              | 10                 | 291B395A10                    | 291B396A10                         | 97         |
| 15                      | 30              | 15                 | 291B395A11                    | 291B396A11                         | 97         |
| 25                      | 50              | 25                 | 291B395A12 (S)                | 291B396A12                         | 97         |
| 50                      | 50              | 50                 | 291B395A13 (S)                | 291B396A13                         | 97         |
| 75                      | 75              | 75                 | 291B395A14 (S)                | 291B396A14                         | 97         |
| 100                     | 50              | 100                | 291B395A15 (S)                | 291B396A15                         | 97         |
| 150                     | 30              | 150                | 291B395A16 (S)                | 291B396A16                         | 97         |
| 200                     | 40              | 200                | 291B395A17 (S)                | 291B396A17                         | 97         |
| 250                     | 50              | 250                | 291B395A18 (S)                | 291B396A18                         | 97         |
| 300                     | 30              | 300                | 291B395A19                    | 291B396A19                         | 97         |
| 400                     | 40              | 400                | 291B395A20                    | 291B396A20                         | 97         |
| 500                     | 50              | 500                | 291B395A21                    | 291B396A21                         | 97         |
| 600                     | 30              | 600                | 291B395A22                    | 291B396A22                         | 97         |
| 800                     | 40              | 800                | 291B395A23                    | 291B396A23                         | 97         |
| 1,000                   | 50              | 1,000              | 291B395A24                    | 291B396A24                         | 97         |
| 1,500                   | 30              | 1,500              | 291B395A25                    | 291B396A25                         | 97         |
| 2,000                   | 40              | 2,000              | 291B395A26                    | 291B396A26                         | 97         |
| 2,500                   | 50              | 2,500              | 291B395A27                    | 291B396A27                         | 97         |
| 3,000                   | 30              | 3,000              | 291B395A28                    | 291B396A28                         | 97         |
| 4,000                   | 40              | 4,000              | 291B395A29                    | 291B396A29                         | 97         |
| 5,000                   | 50              | 5,000              | 291B395A30                    | 291B396A30                         | 97         |
| 6,000                   | 30              | 6,000              | 291B395A31                    | 291B396A31                         | 97         |
| 8,000                   | 40              | 8,000              | 291B395A32                    | 291B396A32                         | 97         |
| 10,000                  | 50              | 10,000             | 291B395A33                    | 291B396A33                         | 97         |

### d-c ammeters • external shunt type

for use with shunts and/or lead resistances

(not included in above listing)

taut band suspension

| full<br>scale<br>dial<br>marking | shunt lead resistance values: ohms+ |                 | KX-251<br>flush mtg | UX-251<br>projection mtg | list<br>price |
|----------------------------------|-------------------------------------|-----------------|---------------------|--------------------------|---------------|
|                                  | 50 mv<br>shunt                      | 100 mv<br>shunt | style<br>number     | style<br>number          |               |
| +                                | 0.35                                |                 | 291B405A10          | 291B405A25               | \$97.00       |
| +                                | ...                                 | 0.16.3          | 291B405A11          | 291B405A26               | 97.00         |

† To suit shunt. Where full scale rating is 10,000 amperes or greater, the dial is marked in terms of kiloamperes. Specify shunt current and millivolt rating on order.

† Order shunts and leads from catalog section 43-800. If specified, standard 5-foot shunt leads will be supplied at no charge if shunt and instrument are ordered together.

† These ammeters are actually calibrated for .065 ohms lead resistance. If used with any lead resistance between 0 and .13 ohms, error due to lead resistance variation will be .13% or less.

♦ Scale marked in kiloamperes.

+ Specify exact lead resistance value on order.

### d-c milliammeters • self-contained

taut band suspension

| full scale dial marking and rating | scale divisions | approx resistance ohms | KX-251 flush mtg style number | UX-251 projection mtg style number | list price |
|------------------------------------|-----------------|------------------------|-------------------------------|------------------------------------|------------|
| 1                                  | 50              | 12                     | 291B399A09                    | 291B398A09                         | \$97       |
| 2                                  | 40              | 5.0                    | 291B399A10                    | 291B398A10                         | 97         |
| 3                                  | 30              | 3.5                    | 291B399A11                    | 291B398A11                         | 97         |
| 5                                  | 50              | 8.6                    | 291B399A12                    | 291B398A12                         | 97         |
| 8                                  | 40              | 6.25                   | 291B399A13                    | 291B398A13                         | 97         |
| 10                                 | 50              | 4.9                    | 291B399A14                    | 291B398A14                         | 97         |
| 15                                 | 30              | 3.3                    | 291B399A15                    | 291B398A15                         | 97         |
| 20                                 | 40              | 2.5                    | 291B399A16                    | 291B398A16                         | 97         |
| 30                                 | 30              | 1.67                   | 291B399A17                    | 291B398A17                         | 97         |
| 50                                 | 50              | 1.0                    | 291B399A18                    | 291B398A18                         | 97         |
| 80                                 | 40              | .626                   | 291B399A19                    | 291B398A19                         | 97         |
| 100                                | 50              | .500                   | 291B399A20                    | 291B398A20                         | 97         |
| 200                                | 40              | .250                   | 291B399A21                    | 291B398A21                         | 97         |
| 300                                | 30              | .167                   | 291B399A22                    | 291B398A22                         | 97         |
| 400                                | 40              | .125                   | 291B399A23                    | 291B398A23                         | 97         |
| 500                                | 50              | .100                   | 291B399A24                    | 291B398A24                         | 97         |
| 600                                | 30              | .0835                  | 291B399A25                    | 291B398A25                         | 97         |
| 800                                | 40              | .0626                  | 291B399A26                    | 291B398A26                         | 97         |

### d-c microammeters • self-contained

taut band suspension

| full scale dial marking and rating | scale divisions | approx resistance ohms | KX-251 flush mtg style number | UX-251 projection mtg style number | list price |
|------------------------------------|-----------------|------------------------|-------------------------------|------------------------------------|------------|
| 20                                 | 40              | 2240                   | 291B394A10                    | 291B394A22                         | \$165      |
| 30                                 | 30              | 950                    | 291B394A11                    | 291B394A23                         | 155        |
| 50                                 | 50              | 580                    | 291B394A12                    | 291B394A24                         | 145        |
| 100                                | 50              | 765                    | 291B394A13                    | 291B394A25                         | 127        |
| 200                                | 40              | 240                    | 291B394A14                    | 291B394A26                         | 118        |
| 300                                | 30              | 85                     | 291B394A15                    | 291B394A27                         | 114        |
| 500                                | 50              | 41                     | 291B394A16                    | 291B394A28                         | 108        |
| 800                                | 40              | 14.5                   | 291B394A17                    | 291B394A29                         | 103        |

featuring *the* electrical  
measuring instruments**d-c voltmeters • self-contained**resistance: 1000 ohms per volt  
taut band suspension

| full scale<br>dial<br>marking<br>and rating | scale<br>divi-<br>sions | KX-251<br>flush mtg<br>style<br>number | UX-251<br>projection mtg<br>style<br>number | list<br>price |
|---|-------------------------|--|---|---------------|
| 2   | 40                      | 291B404A09                             | 291B403A09                                  | \$ 99         |
| 5   | 50                      | 291B404A10                             | 291B403A10                                  | 99            |
| 8   | 40                      | 291B404A11                             | 291B403A11                                  | 99            |
| 10  | 50                      | 291B404A12                             | 291B403A12                                  | 99            |
| 15  | 30                      | 291B404A13                             | 291B403A13                                  | 99            |
| 30  | 30                      | 291B404A14                             | 291B403A14                                  | 99            |
| 50  | 50                      | 291B404A15                             | 291B403A15                                  | 99            |
| 80  | 40                      | 291B404A16                             | 291B403A16                                  | 99            |
| 100   | 50                      | 291B404A17                             | 291B403A17                                  | 99            |
| 150   | 30                      | 291B404A18                             | 291B403A18                                  | 99            |
| 300   | 30                      | 291B404A19                             | 291B403A19                                  | 105           |
| 600   | 30                      | 291B404A20                             | 291B403A20                                  | 120           |
| 800   | 40                      | 291B404A21                             | 291B403A21                                  | 128           |

Electrically suppressed d-c voltmeters are available with scale ranges approximately 10% either side of mid-scale point. Scales are linear. For example, with a 250-volt mid-point a 225-275 volt range can be supplied. Accuracy is 1/4% of the mid-scale voltage. Lowest mid-scale range is 15 volts. Current drain on circuit is 10-13 milliamperes. These voltmeters are self-contained up to and including 500 volts mid-scale, with external resistor for higher voltages.

For higher ratings, order 1-milliamper instrument with dial marked for voltage range desired and use sectional resistors. See catalog section 43-800.

**d-c millivoltmeters • self-contained**

taut band suspension

| full scale<br>dial<br>marking<br>and rating | scale<br>divi-<br>sions | KX-251<br>flush mtg<br>style<br>number | UX-251<br>projection mtg<br>style<br>number | list<br>price |
|---|-------------------------|--|---|---------------|
| 50  | 50                      | 1957 233                               | 1957 237                                    |               |
| 100   | 50                      | 1957 234                               | 1957 238                                    |               |
| 200   | 40                      | 1957 235                               | 1957 239                                    |               |
| 500   | 50                      | 1957 236                               | 1957 240                                    |               |

D-c millivoltmeters not used with external shunts should be negotiated with nearest Westinghouse sales representative, since external impedance must be considered in designing instrument. Styles shown are for reference only.

**d-c wattmeters • for use with but not including external shunt (including external resistor)**

pivot and jewel bearing

| full<br>scale<br>dial<br>marking | rating |       | range of<br>shunt lead<br>resistance<br>for 50 mv<br>shunt □ | KX-25<br>flush mtg | UX-25<br>projection mtg | list<br>price |
|----------------------------------|--------|-------|--|--------------------|-------------------------|---------------|
|                                  | mv     | volts |  | style<br>number    | style<br>number         |               |
| △                                | 50     | 120   | 0-0.10   | 1730 454           | 1876 595                | \$280         |
| △                                | 50     | 240   | 0-0.10   | 1730 455           | 1876 596                | 300           |

Order shunts and leads from catalog section 43-800. If specified, standard 5-foot leads will be supplied at no charge if shunt and instrument are ordered together.

Specify exact resistance on order.

To suit application. Where full scale rating is 10,000 watts or greater, dial is marked in terms of kilowatts. Specify shunt current and millivolt rating on order.

**a-c ammeters • self-contained**15 to 500 cycles;  
taut band suspension

| full scale<br>dial<br>marking<br>and rating | scale<br>divi-<br>sions | KA-251<br>flush mtg<br>style<br>number | UA-251<br>projection mtg<br>style<br>number | list<br>price |
|---|-------------------------|--|---|---------------|
| 1   | 50                      | 291B497A09                             | 291B498A09                                  | \$90          |
| 1.5   | 30                      | 291B497A10                             | 291B498A10                                  | 90            |
| 2   | 40                      | 291B497A11                             | 291B498A11                                  | 90            |
| 3   | 30                      | 291B497A12                             | 291B498A12                                  | 90            |
| 5   | 50                      | 291B497A13                             | 291B498A13                                  | 90            |
| 8   | 40                      | 291B497A14                             | 291B498A14                                  | 90            |
| 10  | 50                      | 291B497A15                             | 291B498A15                                  | 90            |
| 15  | 30                      | 291B497A16                             | 291B498A16                                  | 90            |
| 20  | 40                      | 291B497A17                             | 291B498A17                                  | 90            |
| 25  | 50                      | 291B497A18                             | 291B498A18                                  | 90            |
| 30  | 30                      | 291B497A19                             | 291B498A19                                  | 95            |
| 40  | 40                      | 291B497A20                             | 291B498A20                                  | 95            |
| 50  | 50                      | 291B497A21                             | 291B498A21                                  | 95            |

**a-c ammeters • calibrated for use with but not including current transformers**15 to 500 cycles; • 5 amperes full scale  
taut band suspension

| full<br>scale<br>dial<br>marking | current<br>trans-<br>former<br>ratio | scale<br>divi-<br>sions | KA-251<br>flush mtg<br>style<br>number | UA-251<br>projection mtg<br>style<br>number | list<br>price |
|----------------------------------|--------------------------------------|-------------------------|--|---|---------------|
| 10                               | 10/5                                 | 50                      | 291B499A09                             | 291B500A09                                  | \$90          |
| 15                               | 15/5                                 | 30                      | 291B499A10                             | 291B500A10                                  | 90            |
| 20                               | 20/5                                 | 40                      | 291B499A11                             | 291B500A11                                  | 90            |
| 25                               | 25/5                                 | 50                      | 291B499A12                             | 291B500A12                                  | 90            |
| 30                               | 30/5                                 | 30                      | 291B499A13                             | 291B500A13                                  | 90            |
| 40                               | 40/5                                 | 40                      | 291B499A14                             | 291B500A14                                  | 90            |
| 50                               | 50/5                                 | 50                      | 291B499A15                             | 291B500A15                                  | 90            |
| 60                               | 60/5                                 | 30                      | 291B499A16                             | 291B500A16                                  | 90            |
| 75                               | 75/5                                 | 75                      | 291B499A17                             | 291B500A17                                  | 90            |
| 80                               | 80/5                                 | 40                      | 291B499A18                             | 291B500A18                                  | 90            |
| 100                              | 100/5                                | 50                      | 291B499A19                             | 291B500A19                                  | 90            |
| 150                              | 150/5                                | 30                      | 291B499A20                             | 291B500A20                                  | 90            |
| 200                              | 200/5                                | 40                      | 291B499A21                             | 291B500A21                                  | 90            |
| 250                              | 250/5                                | 50                      | 291B499A22                             | 291B500A22                                  | 90            |
| 300                              | 300/5                                | 30                      | 291B499A23                             | 291B500A23                                  | 90            |
| 400                              | 400/5                                | 40                      | 291B499A24                             | 291B500A24                                  | 90            |
| 500                              | 500/5                                | 50                      | 291B499A25                             | 291B500A25                                  | 90            |
| 600                              | 600/5                                | 30                      | 291B499A26                             | 291B500A26                                  | 90            |
| 800                              | 800/5                                | 40                      | 291B499A27                             | 291B500A27                                  | 90            |
| 1,000                            | 1,000/5                              | 50                      | 291B499A28                             | 291B500A28                                  | 90            |
| 1,200                            | 1,200/5                              | 60                      | 291B499A29                             | 291B500A29                                  | 90            |
| 1,500                            | 1,500/5                              | 30                      | 291B499A30                             | 291B500A30                                  | 90            |
| 2,000                            | 2,000/5                              | 40                      | 291B499A31                             | 291B500A31                                  | 90            |
| 2,500                            | 2,500/5                              | 50                      | 291B499A32                             | 291B500A32                                  | 90            |
| 3,000                            | 3,000/5                              | 30                      | 291B499A33                             | 291B500A33                                  | 90            |
| 4,000                            | 4,000/5                              | 40                      | 291B499A34                             | 291B500A34                                  | 90            |
| 5,000                            | 5,000/5                              | 50                      | 291B499A35                             | 291B500A35                                  | 90            |

**a-c ammeters • calibrated for use with but not including current transformers • 15 to 500 cycles;**  
(dial marking and/or current transformer ratio not in above listing)

taut band suspension

| full scale<br>dial<br>marking | current<br>trans-<br>former<br>ratio | scale<br>divi-<br>sions | KA-251<br>flush mtg<br>style<br>number | UA-251<br>projection mtg<br>style<br>number | list<br>price |
|-------------------------------|--------------------------------------|-------------------------|--|---|---------------|
| ...                           | ...                                  | ...                     | 291B497A22                             | 291B498A22                                  | \$90          |

Ordering information: Specify similar to these styles. Give current transformer ratio and full scale marking. Over 10,000 amperes, scales are marked in terms of kiloamperes.

For higher frequency instruments, see page 10.



page 8

## list prices continued

### a-c voltmeters • self-contained

15 to 150 cycles+

taut band suspension

| full scale dial marking and rating | scale divisions | KA-251 flush mtg style number | UA-251 projection mtg style number | list price |
|------------------------------------|-----------------|-------------------------------|------------------------------------|------------|
| 15                                 | 30              | 291B495A10                    | 291B495A25                         | \$ 97      |
| 30                                 | 30              | 291B495A11                    | 291B495A26                         | 97         |
| 80                                 | 40              | 291B495A12                    | 291B495A27                         | 97         |
| 150                                | 30              | 291B495A13                    | 291B495A28                         | 97         |
| 300                                | 30              | 291B495A14                    | 291B495A29                         | 104        |
| 600                                | 30              | 291B495A15                    | 291B495A30                         | 120        |
| 800                                | 40              | 291B495A16                    | 291B495A31                         | 120        |

### a-c voltmeters • calibrated for use with but not including current transformers

15 to 150 cycles+

taut band suspension

| full scale dial marking | potential transformer ratio | full scale deflection volts | scale divisions | KA-251 flush mtg style number | UA-251 projection mtg style number | list price |
|-------------------------|-----------------------------|-----------------------------|-----------------|-------------------------------|------------------------------------|------------|
| 600                     | 4/1                         | 150                         | 30              | 291B496A11                    | 291B496A22                         | \$97       |
| 3,000                   | 20/1                        | 150                         | 30              | 291B496A12                    | 291B496A23                         | 97         |
| 5,000                   | 35/1                        | 143                         | 50              | 291B496A13                    | 291B496A24                         | 97         |
| 6,000                   | 40/1                        | 150                         | 30              | 291B496A14                    | 291B496A25                         | 97         |
| 9,000                   | 60/1                        | 150                         | 45              | 291B496A15                    | 291B496A26                         | 97         |

### a-c voltmeters • calibrated for use with but not including potential transformers

15 to 500 cycles+

dial markings and/or potential transformer ratio not in above listings

taut band suspension

| full scale dial marking | potential transformer ratio | scale divisions | KA-251 flush mtg style number | UA-251 projection mtg style number | list price |
|-------------------------|-----------------------------|-----------------|-------------------------------|------------------------------------|------------|
| ...                     | ...                         | ...             | 291B496A10                    | 291B496A21                         | \$97       |

### a-c milliammeters • self-contained

15 to 500 cycles+

taut band suspension

| full scale dial marking and rating | scale divisions | KA-251 flush mtg style number | UA-251 projection mtg style number | list price |
|------------------------------------|-----------------|-------------------------------|------------------------------------|------------|
| 10                                 | 50              | 291B494A10                    | 291B494A22                         | \$90       |
| 20                                 | 40              | 291B494A11                    | 291B494A23                         | 90         |
| 50                                 | 50              | 291B494A12                    | 291B494A24                         | 90         |
| 100                                | 50              | 291B494A13                    | 291B494A25                         | 90         |
| 200                                | 40              | 291B494A14                    | 291B494A26                         | 90         |
| 500                                | 50              | 291B494A15                    | 291B494A27                         | 90         |

✚ For higher frequency instruments, see page 10.

• ordering information: Specify similar to these styles. Give potential transformer ratio and full scale marking. Over 10,000 volts, scales are marked in terms of kilovolts.

• These styles carried in shipping stock ready for immediate shipment, subject to prior sale.

### a-c single phase wattmeters

15 to 150 cycles+

pivot and jewel bearing

| rating<br>amps<br>(as required<br>for correct<br>calibration) | volts | KY-25 flush mtg style number | UY-25 projection mtg style number | list price |
|---|-------|------------------------------|-----------------------------------|------------|
| self-contained  |       |                              |                                   |            |
| 0.1-20  | 120   | 1730 456                     | 1876 663                          | \$169      |
| 0.1-20  | 240   | 1730 457                     | 1876 664                          | 177        |

with external resistor

|        |     |          |          |     |
|--------|-----|----------|----------|-----|
| 0.1-20 | 480 | 1730 458 | 1876 665 | 187 |
| 0.1-20 | 600 | 1730 459 | 1876 666 | 187 |

### a-c polyphase wattmeters

15 to 150 cycles+

pivot and jewel bearing

| rating<br>amps<br>(as required<br>for correct<br>calibration) | volts | KY-25 flush mtg style number | UY-25 projection mtg style number | list price |
|---|-------|------------------------------|-----------------------------------|------------|
| self-contained  |       |                              |                                   |            |
| 0.1-20  | 120   | 1730 466                     | 1876 673                          | \$227      |
| 0.1-20  | 240   | 1730 469                     | 1876 676                          | 244        |
| with external resistor  |       |                              |                                   |            |
| 0.1-20  | 480   | 1730 472                     | 1876 679                          | 265        |
| 0.1-20  | 600   | 1730 475                     | 1876 682                          | 265        |

with 2 current coils and 2 voltage coils  
2 phase, 3 and 4 wire; 3 phase, 3 wire

|                |     |          |          |       |
|----------------|-----|----------|----------|-------|
| self-contained |     |          |          |       |
| 0.1-20         | 120 | 1730 466 | 1876 673 | \$227 |
| 0.1-20         | 240 | 1730 469 | 1876 676 | 244   |

with external resistor

|        |     |          |          |     |
|--------|-----|----------|----------|-----|
| 0.1-20 | 480 | 1730 472 | 1876 679 | 265 |
| 0.1-20 | 600 | 1730 475 | 1876 682 | 265 |

with 3 current coils and 2 voltage coils  
3 phase, 4 wire

|                |     |          |          |     |
|----------------|-----|----------|----------|-----|
| self-contained |     |          |          |     |
| 0.1-20         | 120 | 1730 479 | 1876 686 | 242 |

✚ For higher frequency instruments, see page 11.

• Also available with taut-band suspension mechanism using external Hall generator watt transducer described in catalog section 43-840. Consult nearest Westinghouse sales representative.

• Prices apply to wattmeters having nominal power factor ratings of 60% or greater. For low power factor wattmeter applications consult nearest Westinghouse sales representative.

### ordering information:

for K-25 wattmeters and varimeters

When ordering, specify style number, type of service (single phase, 3 phase; 3-wire, etc.) current and potential transformer ratios, and desired scale markings. Scales may be center or left zero. Above 10,000 watts or vars, scales are marked in terms of kilowatts and kilovars. Above 10,000 kw or kvar, they are marked in terms of megawatts and megavars.

**a-c single phase varmeters • with external reactive compensator • 60 cycles+**

pivot and jewel bearing

| rating<br>amps<br>(as required<br>for correct<br>calibration) | volts | KY-25<br>flush mtg<br>style<br>number | UY-25<br>projection mtg<br>style<br>number | list<br>price |
|---|-------|---------------------------------------|--|---------------|
| 0.1-20  | 120   | 1730 464                              | 1876 671                                   | \$227         |

**a-c polyphase varmeters • with external phase-shifting transformer • 60 cycles+**

pivot and jewel bearing

| rating<br>amps<br>(as required<br>for correct<br>calibration) | volts | KY-25<br>flush mtg<br>style<br>number | UY-25<br>projection mtg<br>style<br>number | list<br>price |
|---|-------|---------------------------------------|--|---------------|
| with 2 current coils and 2 voltage coils<br>3 phase, 3 wire   |       |                                       |  |               |
| 0.1-20  | 120   | 1730 481                              | 1876 688                                   | \$271         |

with 3 current coils and 2 voltage coils  
3 phase, 4 wire

|        |     |          |          |       |
|--------|-----|----------|----------|-------|
| 0.1-20 | 120 | 1730 483 | 1876 690 | \$295 |
|--------|-----|----------|----------|-------|

Also available with taut band suspension mechanism using external Hall generator watt transducer described in catalog section 43-840. Consult nearest Westinghouse sales representative.

**temperature indicators ▲**

20 volt d-c control

taut band suspension

| temperature<br>range: °C | scale<br>divi-<br>sions | KX-251<br>flush mtg<br>style<br>number | UX-251<br>projection mtg<br>style<br>number | list<br>price |
|--------------------------|-------------------------|--|---|---------------|
| 0-100                    | 50                      | 291B393A10                             | 291B393A21                                  | \$226         |
| 0-150                    | 30                      | 291B393A11 <sup>§</sup>                | 291B393A22                                  | 226           |
| 0-200                    | 40                      | 291B393A12                             | 291B393A23                                  | 226           |

**ground detectors ▲**

taut band suspension

| rating ▲              | style<br>number | style<br>number | list<br>price |
|-----------------------|-----------------|-----------------|---------------|
| <b>d-c</b>            |                 |                 |               |
| 0.1 milliamperes      | 291B392A10      | 291B392A21      | \$ 97         |
| 0.5-0.05 milliamperes | 291B392A11      | 291B392A22      | 106           |
| <b>a-c</b>            |                 |                 |               |
| 0.50 milliamperes     | 291B501A10      | 291B401A21      | 107           |

▲ For complete details, including information on external accessories, refer to catalog section 43-270.

▲ Specify voltage rating on dial per instructions and wiring diagrams in catalog section 43-270.

**frequency meters • with external transducer 120 volts ♦**

taut band suspension

| scale:<br>cycles per<br>second ♦ | scale<br>divi-<br>sions | KX-251<br>flush mtg<br>style<br>number | UX-251<br>projection mtg<br>style<br>number | list<br>price |
|----------------------------------|-------------------------|--|---|---------------|
| 45-55                            | 50                      | 291B397A09                             | 291B397A22                                  | \$255         |
| 48-52                            | 40                      | 291B397A10                             | 291B397A23                                  | 319           |
| 50-70                            | 40                      | 291B397A11 <sup>§</sup>                | 291B397A24                                  | 255           |
| 55-65                            | 50                      | 291B397A12 <sup>§</sup>                | 291B397A25                                  | 255           |
| 58-62                            | 40                      | 291B397A13 <sup>§</sup>                | 291B397A26                                  | 319           |
| 59-61                            | 40                      | 291B397A14                             | 291B397A27                                  | 354           |

♦ For 240 volt operation, add \$17.00 list.

**synchrosopes • self-contained**

pivot and jewel bearing

| rating:<br>volts | frequency:<br>cycles | KI-25<br>flush mtg<br>style<br>number | UI-25<br>projection mtg<br>style<br>number | list<br>price |
|------------------|----------------------|---------------------------------------|--|---------------|
| 120              | 60                   | 409C631A10 <sup>§</sup>               | 409C631A11 <sup>§</sup>                    | \$251         |

**power factor meters • self-contained unless otherwise noted**

pivot and jewel bearing

| rating<br>phase  | amps | volts | frequency:<br>cycles<br>♦ | scale     | K-25<br>flush mtg<br>style<br>number | U-25<br>projection mtg<br>style<br>number | list<br>price |
|--|------|-------|---------------------------|-----------|--------------------------------------|---|---------------|
| 100 degree scales • two quadrant • types KY-25 and UY-25 |      |       |                           |           |                                      |   |               |
| 1  | 5    | 120   | 25                        | 50-100-50 | 1730 776                             | 1876 557                                  | \$262         |
| 1  | 5    | 120   | 60                        | 50-100-50 | 1730 777 <sup>§</sup>                | 1876 558                                  | 262           |
| 3  | 5    | 120   | 25-60                     | 50-100-50 | 1730 778 <sup>§</sup>                | 1876 559                                  | 207           |
| 3  | 5    | 120   | 25-60                     | 10-100-80 | 1730 779                             | 1876 560                                  | 207           |

360 degree scales • four quadrant • types KI-25 and UI-25

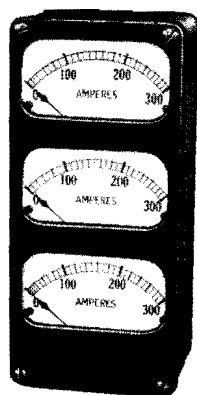
|   |   |     |       |           |                         |            |     |
|---|---|-----|-------|-----------|-------------------------|------------|-----|
| 1 | 5 | 120 | 60    | 100-0-100 | 409C631A16 <sup>§</sup> | 409C631A17 | 300 |
| 3 | 5 | 120 | 25-60 | 100-0-100 | 409C631A24 <sup>§</sup> | 409C631A25 | 242 |

§ For use on 3-phase, 3-wire systems only. Instruments will read correctly only under balanced conditions. For 3-phase, 4-wire systems, a separate single-phase power factor meter is recommended for each phase.

† Supplied with external reactive compensator.

‡ For 240-volt operation, add \$17.00 list.

♦ For higher frequency instruments, see page 11.

**list prices** continued**type 25 Triplex****a-c ammeters • 15 to 150 cycles****pivot and jewel bearing**

| full scale dial marking and rating | scale divisions | KA-25 Triplex flush mtg style number | UA-25 Triplex projection mtg style number | list price |
|------------------------------------|-----------------|--------------------------------------|---|------------|
|------------------------------------|-----------------|--------------------------------------|---|------------|

**self-contained**

|     |    |          |          |       |
|-----|----|----------|----------|-------|
| 1   | 50 | 1731 671 | 1731 663 | \$260 |
| 1.5 | 30 | 1731 672 | 1731 664 | 260   |
| 2   | 40 | 1731 673 | 1731 665 | 260   |
| 3   | 30 | 1731 674 | 1731 666 | 260   |
| 5   | 50 | 1731 675 | 1731 667 | 260   |
| 8   | 40 | 1731 676 | 1731 668 | 260   |
| 10  | 50 | 1731 677 | 1731 669 | 260   |

**calibrated for use with but not including current transformer**

|     |     |          |          |     |
|-----|-----|----------|----------|-----|
| ... | ... | 1731 670 | 1731 678 | 260 |
|-----|-----|----------|----------|-----|

♦ **ordering information:** Specify "similar to these styles", give current transformer ratio and desired scale marking. Over 10,000 amperes, dials are marked in terms of kiloamperes.

**a-c voltmeters • 15 to 150 cycles****pivot and jewel bearing**

| full scale dial marking and rating | scale divisions | KA-25 Triplex flush mtg style number | UA-25 Triplex projection mtg style number | list price |
|------------------------------------|-----------------|--------------------------------------|---|------------|
|------------------------------------|-----------------|--------------------------------------|---|------------|

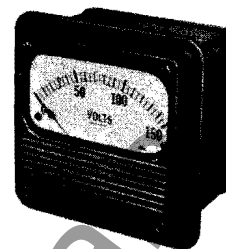
**self-contained**

|     |    |          |          |       |
|-----|----|----------|----------|-------|
| 15  | 30 | 1731 679 | 1731 687 | \$266 |
| 30  | 30 | 1731 680 | 1731 688 | 266   |
| 80  | 40 | 1731 681 | 1731 689 | 266   |
| 150 | 30 | 1731 682 | 1731 690 | 266   |
| 300 | 30 | 1731 683 | 1731 691 | 288   |
| 600 | 30 | 1731 684 | 1731 692 | 333   |
| 800 | 40 | 1731 685 | 1731 693 | 333   |

**calibrated for use with but not including potential transformers**

|     |     |          |          |     |
|-----|-----|----------|----------|-----|
| ... | ... | 1731 686 | 1731 694 | 266 |
|-----|-----|----------|----------|-----|

♦ **ordering information:** Specify "similar to these styles", give potential transformer ratio and desired scale marking. Over 10,000 volts, dials are marked in terms of kilovolts.

**high frequency instruments**(to 10,000 cycles) • **types 251 and 25****milliammeters • rectifier type • 25 to 10,000 cycles • self-contained****taut band suspension**

| full scale dial marking and rating | scale divisions | KC-251 flush mtg style number | UC-251 projection mtg style number | list price |
|------------------------------------|-----------------|-------------------------------|------------------------------------|------------|
|------------------------------------|-----------------|-------------------------------|------------------------------------|------------|

**voltmeters • rectifier type • 25 to 10,000 cycles self-contained**

resistance: 1,000 ohms per volt

**taut band suspension**

| full scale dial marking and rating | scale divisions | KC-251 flush mtg style number | UC-251 projection mtg style number | list price |
|------------------------------------|-----------------|-------------------------------|------------------------------------|------------|
|------------------------------------|-----------------|-------------------------------|------------------------------------|------------|

I Also suitable for use with external potential transformers. Specify transformer ratio and scale desired. Above 10,000 volts, dials are marked in terms of kilovolts.

**ammeters • repulsion iron type • self-contained****taut band suspension**

Any of the styles listed on page 7 can be calibrated for any single frequency up to 10,000 cycles. Add \$11.00 list.



**high frequency instruments (to 10,000 cycles) • types 251 and 25****varmeters • air core dynamometer type**  
for single frequency calibration only

pivot and jewel bearing

**single phase • with external reactive compensator**

Single-phase varmeters can be supplied for the following single frequencies only: 400, 960, 3000, 3600 or 9600 cycles.

| rating<br>amps | scale<br>volts | scale<br>marking | frequency:<br>cycles | KY-25<br>flush mtg<br>list price | UY-25<br>projection mtg<br>list price |
|----------------|----------------|------------------|----------------------|----------------------------------|---------------------------------------|
| 5              | 120            | ■                | ✚                    | \$238                            | \$238                                 |

■ To suit current and potential transformer ratios (which must be specified).

✚ Specify whether 400, 960, 3000, 3600 or 9600 cycle calibration is required.

**polyphase • with external phase shifting transformer**

Polyphase varmeters may be calibrated on any single frequency up to 400 cycles. Add \$11.00 list to the price of the corresponding varmeters shown on page 9.

**frequency meters**

supplied with external transducer

taut band suspension

| rating:<br>volts | scale<br>range:<br>cycles | scale<br>divi-<br>sions | KX-251<br>flush mtg<br>style<br>number | UX-251<br>projection mtg<br>style<br>number | list<br>price |
|------------------|---------------------------|-------------------------|--|---|---------------|
| 120+             | 350-450                   | 50                      | 291B397A15                             | 291B397A28                                  | \$266         |
| 120+             | 380-420                   | 40                      | 291B397A16                             | 291B397A29                                  | 330           |
| 120+             | 390-410                   | 40                      | 291B397A17                             | 291B397A30                                  | 365           |

† For 240-volt operation, add \$17.00 list.

**power factor meters • crossed coil dynamometer type**

100 degree scale only

pivot and jewel bearing

**single frequency calibration**

Both single phase and polyphase power factor meters can be supplied for 400 cycle calibration. Add \$11.00 list to the price of similar 60-cycle instruments listed on page 8.

**multiple frequency calibration**

Single phase power factor meters can also be supplied for calibration on 3000 cycles with an external capacitor. The capacitor value may be changed so that the instrument can be used at other frequencies from 960 to 4200 cycles.

| rating<br>volt | scale<br>amps | scale<br>marking | basic<br>fre-<br>quency:<br>cycles | KY-25<br>flush mtg<br>style<br>number | UY-25<br>projection mtg<br>style<br>number | list<br>price |
|----------------|---------------|------------------|------------------------------------|---------------------------------------|--|---------------|
| 120            | 5             | 50-100-50△       | 3000♦                              | 1728 972                              | 1728 973                                   | \$282□        |

△ Scales of 10-100-80 can be supplied at same price.

♦ For 9600 cycles, a single phase power factor meter can be supplied at the same price as shown for the equivalent 3000-cycle power factor meter.

□ Price includes capacitor for 3000 cycles only.

**wattmeters • air core dynamometer type**  
self-contained

pivot and jewel bearing

**for single frequency calibration**

Any of the wattmeter styles listed on page 8 can be calibrated for any single frequency up to 10,000 cycles. Add \$11.00 list.

**for wide range frequency calibration****single phase • self-contained**

| type  | full scale<br>dial<br>marking | rating<br>amps | volts | frequency<br>range:<br>cycles | style<br>number | list<br>price |
|-------|-------------------------------|----------------|-------|-------------------------------|-----------------|---------------|
| KY-25 | ●                             | 5              | 120   | 25-4200                       | 1728 974        | \$203         |
| UY-25 | ●                             | 5              | 120   | 25-4200                       | 1728 975        | 203           |

● To suit current and potential transformer ratios (which must be specified).

(above 10,000 cycles)

**radio frequency ammeters and milliammeters**  
square law scale distribution†

self-contained

taut band suspension

| full scale<br>dial<br>marking<br>and rating | scale<br>divi-<br>sions | KT-251<br>flush mtg<br>style<br>number | UT-251<br>projection mtg<br>style<br>number | list<br>price |
|---|-------------------------|--|---|---------------|
| 100 milliamperes                            | 50                      | 291B391A10                             | 291B391A16                                  | \$155         |
| 300 milliamperes                            | 30                      | 291B391A11                             | 291B391A17                                  | 155           |
| 800 milliamperes                            | 40                      | 291B391A12                             | 291B391A18                                  | 155           |
| 1 ampere                                    | 50                      | 291B391A22                             | 291B391A29                                  | 155           |
| 3 amperes                                   | 30                      | 291B391A23                             | 291B391A30                                  | 155           |
| 10 amperes                                  | 50                      | 291B391A24                             | 291B391A31                                  | 155           |
| 20 amperes                                  | 40                      | 291B391A25                             | 291B391A32                                  | 155           |

for use with external thermocouples+

| full scale<br>dial<br>marking | KT-251<br>flush mtg<br>style<br>number | UT-251<br>projection mtg<br>style<br>number | list<br>price |
|-------------------------------|--|---|---------------|
| □                             | 291B391A21                             | 291B391A28                                  | \$131         |

+ Price includes 5-foot leads, but not external thermocouple. Order thermocouples separately from catalog section 43-300. Instrument and thermocouple must be calibrated together.

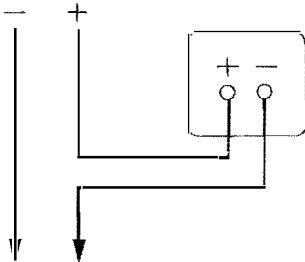
□ To suit thermocouple.

† May also be supplied with approximately linear scale distribution. Add \$21.00 list.

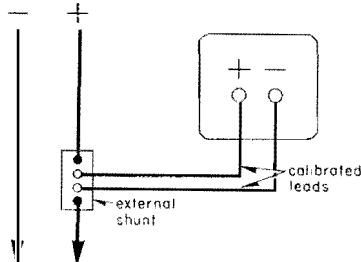


## wiring diagrams rear view

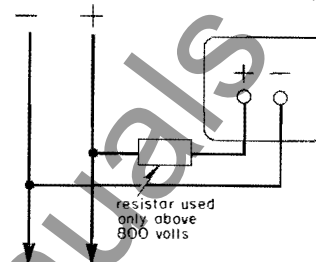
1: d-c ammeters and milliammeters, self-contained



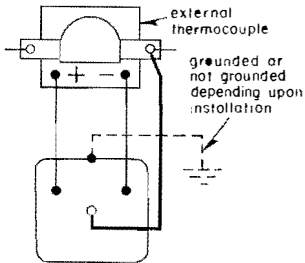
2: d-c ammeter with external shunt



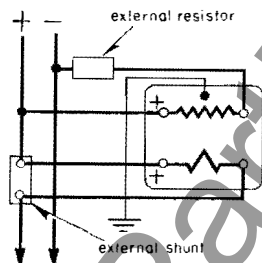
3: d-c voltmeter



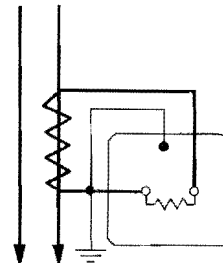
4: r.f. ammeter with external thermocouple



5: d-c wattmeter

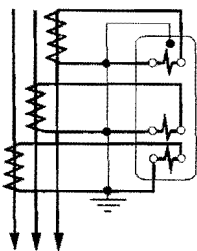


6: a-c ammeter with current transformer



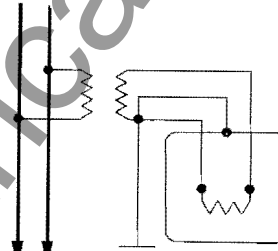
For self-contained a-c ammeters, connect so that current coil makes series connection in line.

7: a-c Triplex ammeter with current transformer



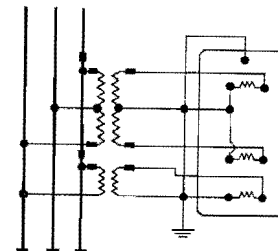
For self-contained Triplex a-c ammeters, connect each instrument current coil in series with one of the three phases.

8: a-c voltmeter with potential transformer



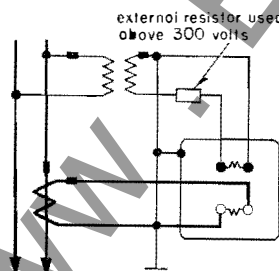
For self-contained a-c voltmeters, connect terminals directly across line.

9: a-c Triplex voltmeter with potential transformer

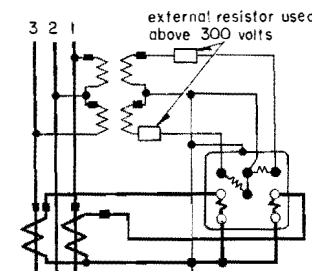


For self-contained Triplex a-c voltmeters, connect each voltage coil directly across two of the three available phases.

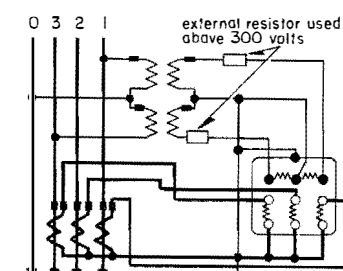
10: wattmeter, single phase



11: wattmeter, three phase, 3-wire



12: wattmeter, three phase, 4-wire



# a-c and d-c switchboard instruments

6" rectangular • 100° scale

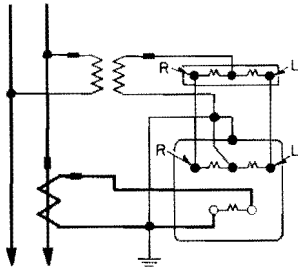
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measuring instruments

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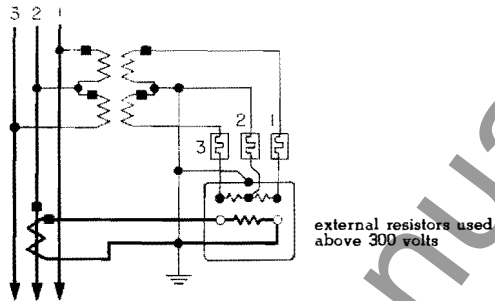
43-250

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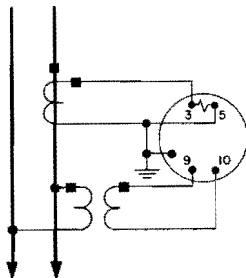
13: power factor meter, single phase,  
60 cycle, 100° scale



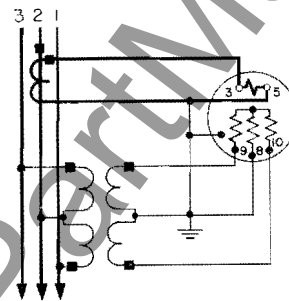
14: power factor meter, three phase, 3-wire, 100°  
scale



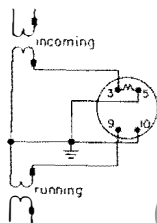
15: power factor meter, single phase,  
60 cycle, 360° scale



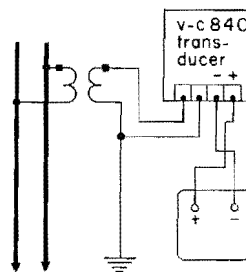
16: power factor meter, polyphase, 360° scale



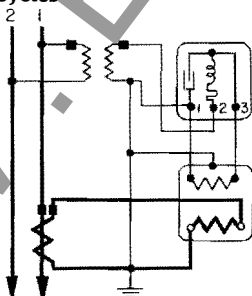
17: synchroscope



18: frequency meter

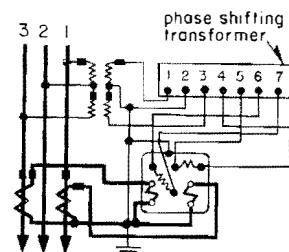


19: varmeter, single phase, 2-wire,  
60 cycles



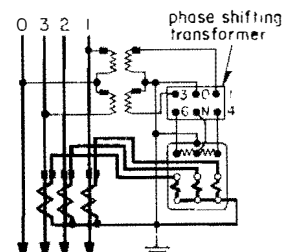
Voltmeters will deflect to the right for lagging  
var flow.

20: varmeter, three phase, 3-wire



Voltmeters will deflect to the right for lagging var flow.

21: varmeter, three phase,  
4-wire

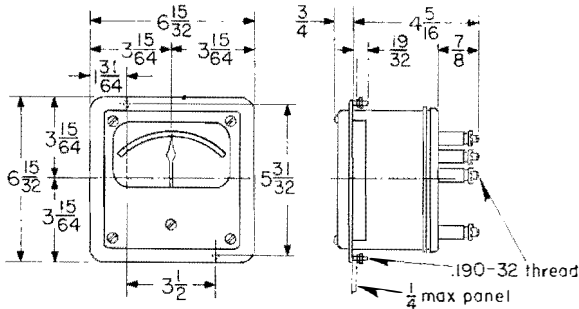


Voltmeters will deflect to the right for lagging var flow.



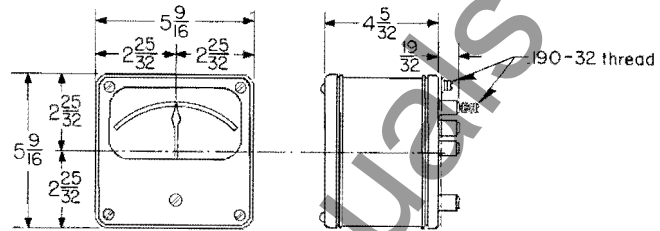
## outline dimensions (inches) • drilling plans for reference only

1: K-251 and K-25 • flush mounting dimensions (except KI-25)

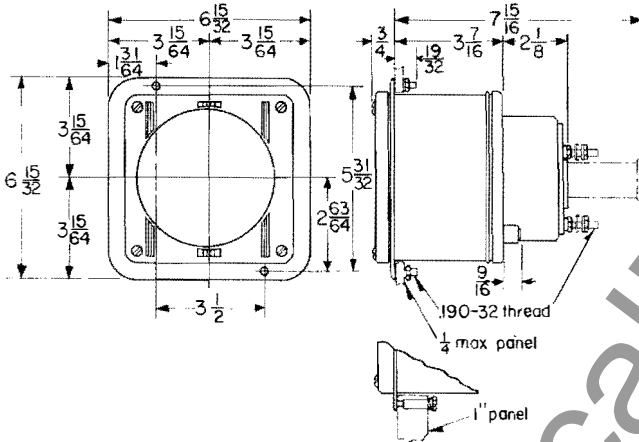


For  $\frac{1}{8}$ " or  $\frac{3}{16}$ " metal panel use screws for terminals and for mounting instrument.  
For panels thicker than  $\frac{3}{16}$ ", use special length .190-32 thread studs for terminals and for mounting instrument.

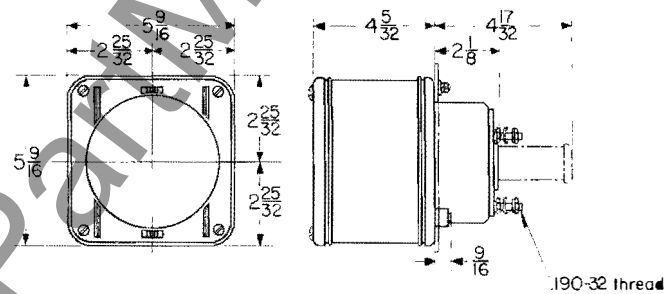
2: U-251 and U-25 • projection mounting dimensions (except UI-25)



3: KI-25 • flush mounting dimensions

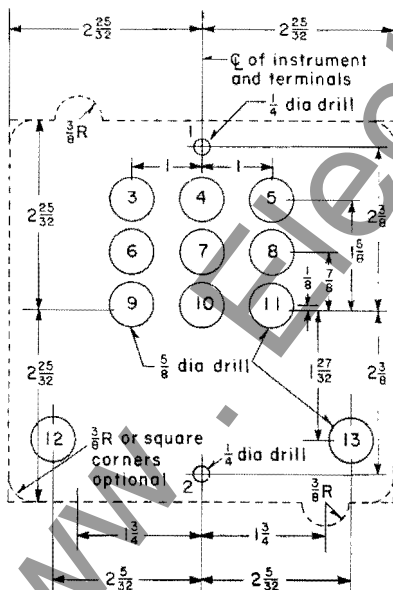


4: UI-25 • projection mounting dimensions

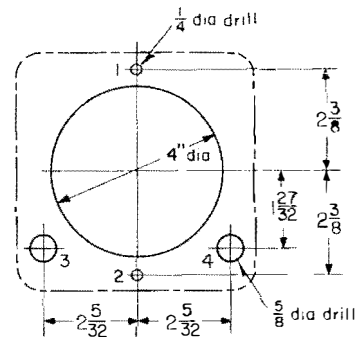


for  $\frac{1}{8}$ " or  $\frac{3}{16}$ " metal panel use screws for mounting instrument

5: K-251, K-25, U-251, U-25 drilling plan



6: I-25 drilling plan



### instrument

|  |                         |
|--|-------------------------|
| differential voltmeter or ground detector                              | 1-2-8-6                 |
| a-c or d-c ammeter or voltmeter and frequency meter                    | 1-2-8-6                 |
| single phase wattmeter and d-c wattmeter                               | 1-2-3-5-6-8             |
| 100° scale power factor meter and self-contained temperature indicator | 1-2-3-4-5-6-8           |
| synchroscope and 360° scale power factor meter                         | per fig. 6              |
| 2 current coil wattmeter   | 1-2-3-4-5-6-7-8-9-11    |
| 3 current coil wattmeter   | 1-2-3-4-5-6-7-8-9-10-11 |
| illumination   | 12-13                   |

### drill holes ♦

|                         |
|-------------------------|
| 1-2-8-6                 |
| 1-2-8-6                 |
| 1-2-3-5-6-8             |
| 1-2-3-4-5-6-8           |
| per fig. 6              |
| 1-2-3-4-5-6-7-8-9-11    |
| 1-2-3-4-5-6-7-8-9-10-11 |
| 12-13                   |

♦ For projection mounted instruments, drill holes indicated in table. For flush mounted instruments, cut panel as shown by dotted lines in figure 5.

‡ Terminals on varmeters are in same location as on wattmeters for similar service.

# a-c and d-c switchboard instruments

6" rectangular • 100° scale

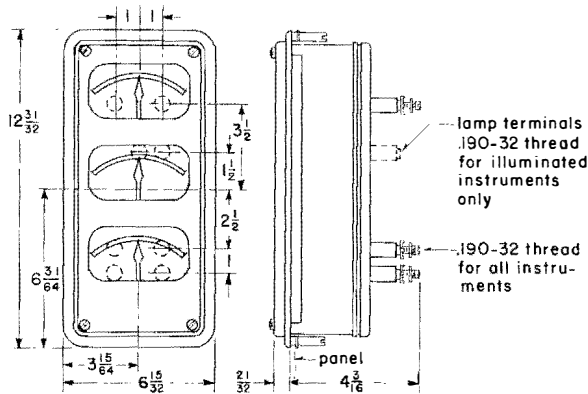
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measuring instruments

catalog  
section

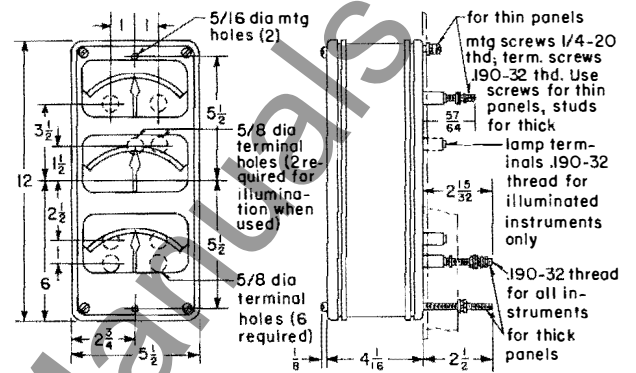
**43-250**

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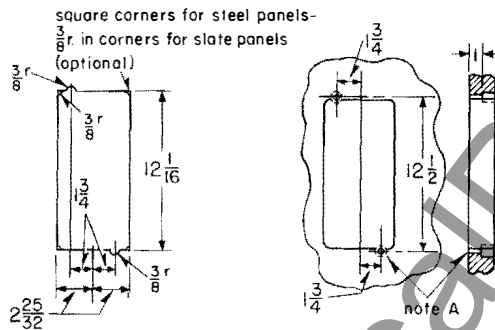
**7: KA-25 Triplex • flush mounting dimensions**



**8: UA-25 Triplex • projection mounting dimensions and drilling plan**



**9: KA-25 Triplex drilling plan**



**note A:** When panels are more than 1-inch thick, drill 1/4-inch and counterbore 1/2-inch diameter from rear before cutting square hole for body of instrument. Omit rectangular mounting plates.

## further information

portable instruments

other switchboard instruments

panel instruments

recording instruments

telemetering

socket instruments

auxiliaries

transducers

catalog section 43-100

catalog sections 43-240,  
43-260, 43-270

catalog section 43-300

catalog sections 43-440,  
43-450

catalog section 43-500

catalog section 43-600

catalog section 43-800

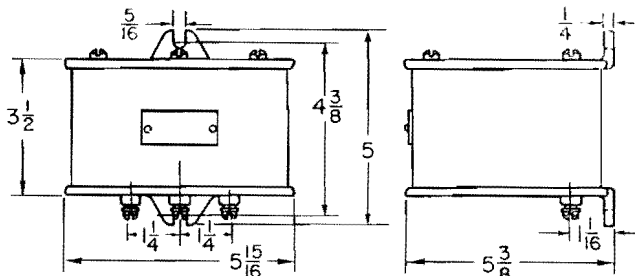
catalog section 43-840



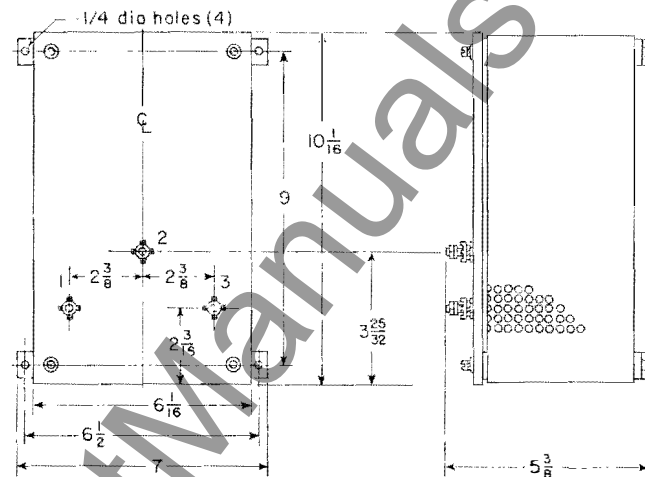
a-c and d-c switchboard instruments  
6" rectangular • 100° scale

accessories

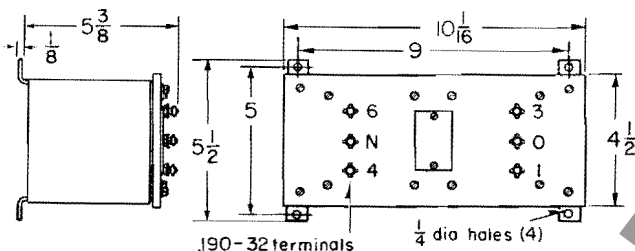
10: reactive compensator used with Y-25 100° scale single power factor meter, 60 cycles



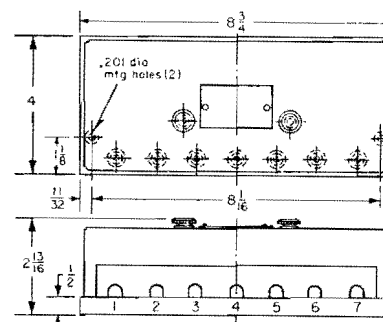
11: reactive compensator used with Y-25 single phase 60 cycle varmeter



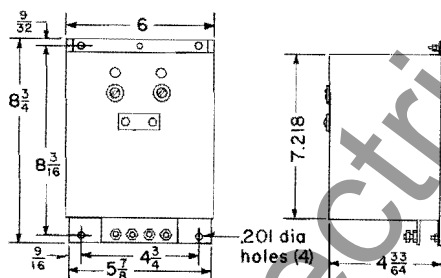
12: phase shifting transformer used with Y-25 3-phase 4-wire (3 current coil) varmeter



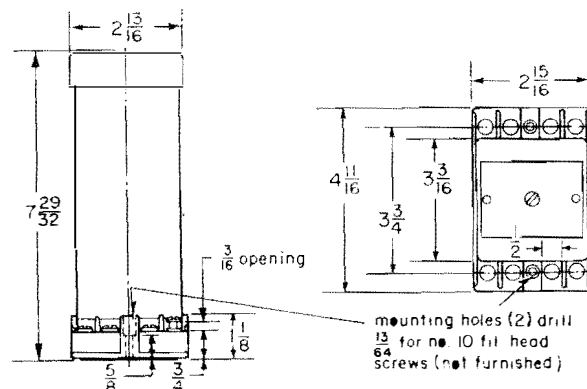
14: phase shifting transformer used with Y-25 3-phase 3-wire (2 current coil) varmeter



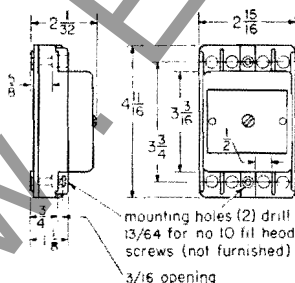
13: transducer used with X-251 frequency meter



16: external resistor used with A-251 voltmeter and Y-25 polyphase wattmeter and power factor meter



15: external resistor used with d-c ground detector



One resistor furnished wherever catalog section indicates that external resistor is required.