FORM NO 248

**DO NOT SCALE — WORK TO DIMENSIONS**

| | | |
|---|---|---|
| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | LINEAL DIM. | TWO PLACE DECIMAL ± .030 ; THREE PLACE DECIMAL ± .005 |
| | HOLE DIA | FRACTIONAL, LETTER, OR NUMBERED DRILL + .004 ; THREE PLACE DECIMAL ± .003 − .003 |
| | ANGLE | DIMENSIONED ± 1° ; UNDIMENSIONED 90° ± 2° |

| REV. | C.N. | DATE | BY |
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# ① METAL CLAD CIRCUIT BREAKER RATINGS

| IDENTIFICATION | | RATED VALUES | | | | | | RELATED REQUIRED CAPABILITIES | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | CURRENT VALUES | | |
| VAD-1 | CIRCUIT BREAKER DESIGNATION ⑥ | NOMINAL VOLTAGE CLASS KV, RMS | NOMINAL 3 PHASE MVA CLASS | RATED MAXIMUM VOLTAGE KV, RMS | VOLTAGE K RATED VOLTAGE RANGE FACTOR | RATED WITHSTAND TEST VOLTAGE: LOW FREQUENCY KV, RMS | RATED WITHSTAND TEST VOLTAGE: IMPULSE 1.2 X 50 KV, CREST | CURRENT: RATED CONTINUOUS CURRENT @ 60 HZ AMPS RMS | CURRENT: RATED INTERRUPTING CAPACITY AT MAXIMUM RATED VOLTAGE ② K AMPS RMS | CURRENT: RATED INTERRUPTING TIME 60HZ CYCLES | CURRENT: RATED PERMISSABLE TRIPPING DELAY SEC. | RATED MINIMUM VOLTAGE ③ KV, RMS | MAXIMUM SYMMETRICAL INTERRUPTING CAPABILITY ④ KA, RMS | 3 SECOND SHORT TIME CURRENT CARRYING CAPABILITY KA, RMS | CLOSE AND LATCH CAPABILITY KA, RMS |
| 05025-12 | | 4.16 | 250 | 4.76 | 1.24 | 19 | 60 | 1200 | 29 | 3 | 2 | 3.85 | 36 | 36 | 58 |
| 05025-20 | | 4.16 | 250 | 4.76 | 1.24 | 19 | 60 | 2000 | 29 | 3 | 2 | 3.85 | 36 | 36 | 58 |
| 15050-12 | | 13.8 | 500 | 15 | 1.30 | 36 | 95 | 1200 | 18 | 3 | 2 | 11.5 | 23 | 23 | 37 |
| 15050-20 | | 13.8 | 500 | 15 | 1.30 | 36 | 95 | 2000 | 18 | 3 | 2 | 11.5 | 23 | 23 | 37 |
| 15075-12 | | 13.8 | 750 | 15 | 1.30 | 36 | 95 | 1200 | 28 | 3 | 2 | 11.5 | 36 | 36 | 58 |
| 15075-20 | | 13.8 | 750 | 15 | 1.30 | 36 | 95 | 2000 | 28 | 3 | 2 | 11.5 | 36 | 36 | 58 |
| 08035-12 | ⑤ | 7.2 | 350 | 8.25 | 1.25 | 36 | 95 | 1200 | 29 | 3 | 2 | 6.6 | 36 | 36 | 58 |
| 08035-20 | | 7.2 | 350 | 8.25 | 1.25 | 36 | 95 | 2000 | 29 | 3 | 2 | 6.6 | 36 | 36 | 58 |

FOOTNOTES:

Footnotes for Metal Clad Breaker Ratings
1. Refer to ANSI Standard C37.04 for definitions of terms used.
2. Rated short circuit current at Maximum Rated Voltage.
3. Rated Maximum Voltage divided by K.
4. Rated short circuit current at Minimum Rated Voltage.
5. Not standard ANSI rating.
6. Breakers are reclosure rated provided that the breaker is equipped with a latch check switch.



| SCALE | DRAWN | CHKD | DATE | C.N. |
|---|---|---|---|---|
| | V. King | | 5/30/84 | 10063 |

TITLE: Metal Clad Circuit Breaker Ratings

USED ON: VAD-1

RAWSTOCK: B46002-127

SQUARE D COMPANY
SMYRNA, TENNESSEE USA

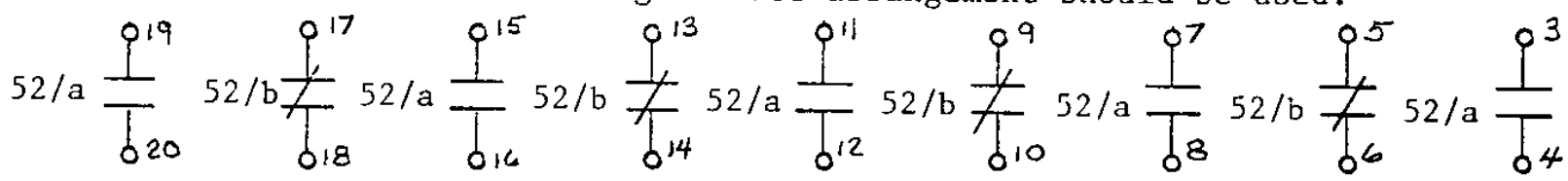
PRINTS TO

## MOC & TOC Contacts

Both the MOC and TOC contacts are rated 600 volts/20 amps continuous. These contacts are very difficult to convert from a to b or b to a thus control schemes should be designed such that conversion is not necessary.

### MOC Limits

The MOC switch is operated through a series of linkages located on the right hand side or the breaker cell. The switch is located inside the low voltage wire trough and is available with 9 contacts (5a & 4b). The following contact arrangement should be used:

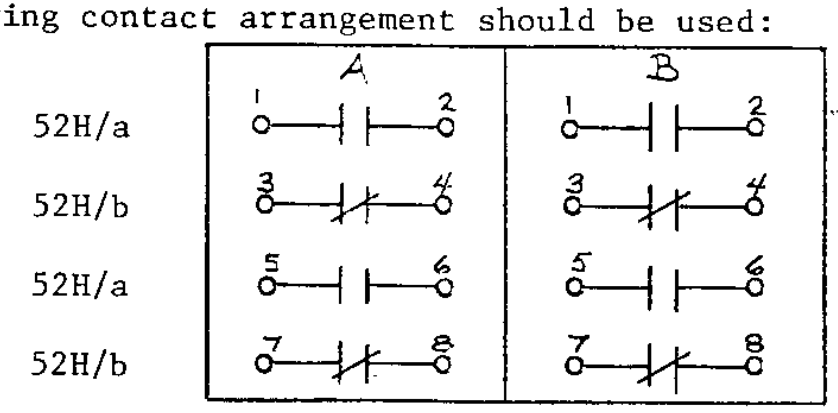



Viewed From Front

### TOC Limits

The TOC switch is operated by a plate mounted around the racking screw on the breaker this plate depresses a spring loaded plunger which in turn, rotates the switch.

The switch has 4 contacts (2a & 2b) and a maximum of two switches is available. This allows for a total of 8 contacts (4a & 4b). The following contact arrangement should be used:



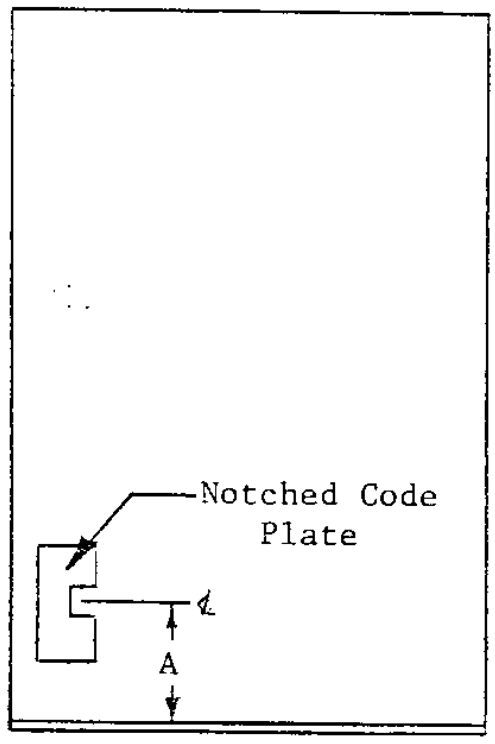

Viewed From Front

Note: 1. TOC contacts shown with breaker in disconnected position.
2. Two switches shown. If only one switch required, omit right hand switch block.

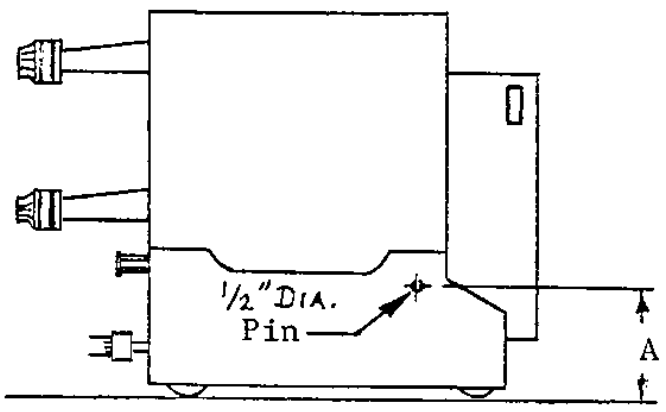


| REVISIONS | | | MOC & TOC Contacts | DRAWN BY- J. King<br>CHECKED BY-<br>DATE- 5-30-84<br>V0063 | |
|---|---|---|---|---|---|
| | | | SQUARE D COMPANY<br>POWER EQUIPMENT GROUP<br>SMYRNA, TENNESSEE | A- 46002-128 | REV. |
| | | | | | |

FORM NO 245




Front View of
Breaker Cell




Left side view of
Circuit Breaker

Only the correct Breaker Rating is to be inserted into the Breaker Cell. This interlocking is accomplished by a pin welded to the left side of the circuit breaker at dimension 'A' and a notched code plate bolted to the cell at Dimension 'A'.

| Breaker Rating | | | |
|---|---|---|---|
| KV | MVA | Ampacity | Dim. 'A' |
| 5 | 250 | 1200 | 6.44 |
| 5 | 250 | 2000 | 3.81 |
| 15 | 500 | 1200 | 4.69 |
| 15 | 500 | 2000 | 7.31 |
| 15 | 750 | 1200 | 6.44 |
| 15 | 750 | 2000 | 3.81 |
| 8.25 | 350 | 1200 | 6.44 |
| 8.25 | 350 | 2000 | 3.81 |



| REV. | C. R. | DATE | BY |
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PRINTS TO

DO NOT SCALE — WORK TO DIMENSIONS

| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | | |
|---|---|---|
| | LINEAL DIM. | TWO PLACE DECIMAL ± .030<br>THREE PLACE DECIMAL ± .009 |
| | HOLE DIA. | FRACTIONAL LETTER OR NUMBERED DRILL + .004<br>THREE PLACE DECIMAL ± .002 − .002 |
| | ANGLE | DIMENSIONED ± 1° UNDIMENSIONED 90° ± 2° |

| SCALE | DRAWN | CHKD | DATE | C R |
|---|---|---|---|---|
| | J.King | | 5-30-84 | V0063 |

TITLE: Breaker/Cell Interlocking

USED ON: Vac - Arc

RAWSTOCK:

SQUARE D COMPANY
SMYRNA, TENNESSEE USA

A46002-129

A B C D E F G

## VAD-1 Breaker Operating Motors & Solenoids

| YIN Part No. | Description | Nominal Voltage | ANSI Range | Current (AMP) |
|---|---|---|---|---|
| 1715D-01 | Motor | 48VDC | 36-52 | 9.0 |
| -02 | " | 125VDC | 90-130 | 5.0 |
| -02 | " | 250VDC | 180-260 | 5.0 |
| -02 | " | 120VAC | 95-125 | 5.0 |
| -02 | " | 240VAC | 190-250 | 5.0 |
| 2022D-01 | Closing Solenoid | 24VDC | 20-28 | 28.0 |
| -02 | " | 48VDC | 36-52 | 13.6 |
| -03 | " | 125VDC | 90-130 | 6.0 |
| -04 | " | 250VDC | 180-260 | 3.0 |
| -05 | " | 120VAC | 90-125 | 6.0 |
| -06 | " | 240VAC | 190-250 | 3.0 |
| 2033D-01 | Anti Pump Relay | 24VDC | 18-28 | .083 |
| -02 | " | 48VDC | 30-52 | .042 |
| -03 | " | 125VDC | 70-130 | .016 |
| -04 | " | 250VDC | 150-260 | .008 |
| -05 | " | 120VAC | 95-125 | .083 |
| -01 | " | 240VAC | 190-250 | .042 |
| 2021D-01 | Trip Solenoid | 24VDC | 14-30 | 28.0 |
| -02 | " | 48VDC | 28-60 | 13.6 |
| -03 | " | 125VDC | 70-140 | 6.0 |
| -04 | " | 250VDC | 140-280 | 3.0 |
| -05 | " | 120VAC | 95-125 | 6.0 |
| -06 | " | 240VAC | 190-250 | 3.0 |
| 2032D-02 | Motor Relay | 48VDC | 30-52 | .083 |
| -03 | " | 125VDC | 70-130 | .042 |
| -04 | " | 250VDC | 150-260 | .016 |
| -05 | " | 120VAC | 95-125 | .008 |
| -06 | " | 240VAC | 190-250 | .042 |



| REVISIONS | | | VAD-1 Motors & Solenoids | DRAWN BY- J. King<br>CHECKED BY-<br>DATE- 5-30-84<br>V0063 | |
|---|---|---|---|---|---|
| | | | SQUARE D COMPANY<br>POWER EQUIPMENT GROUP<br>SMYRNA, TENNESSEE | A- 46002-130 | REV. |
| | | | | | |

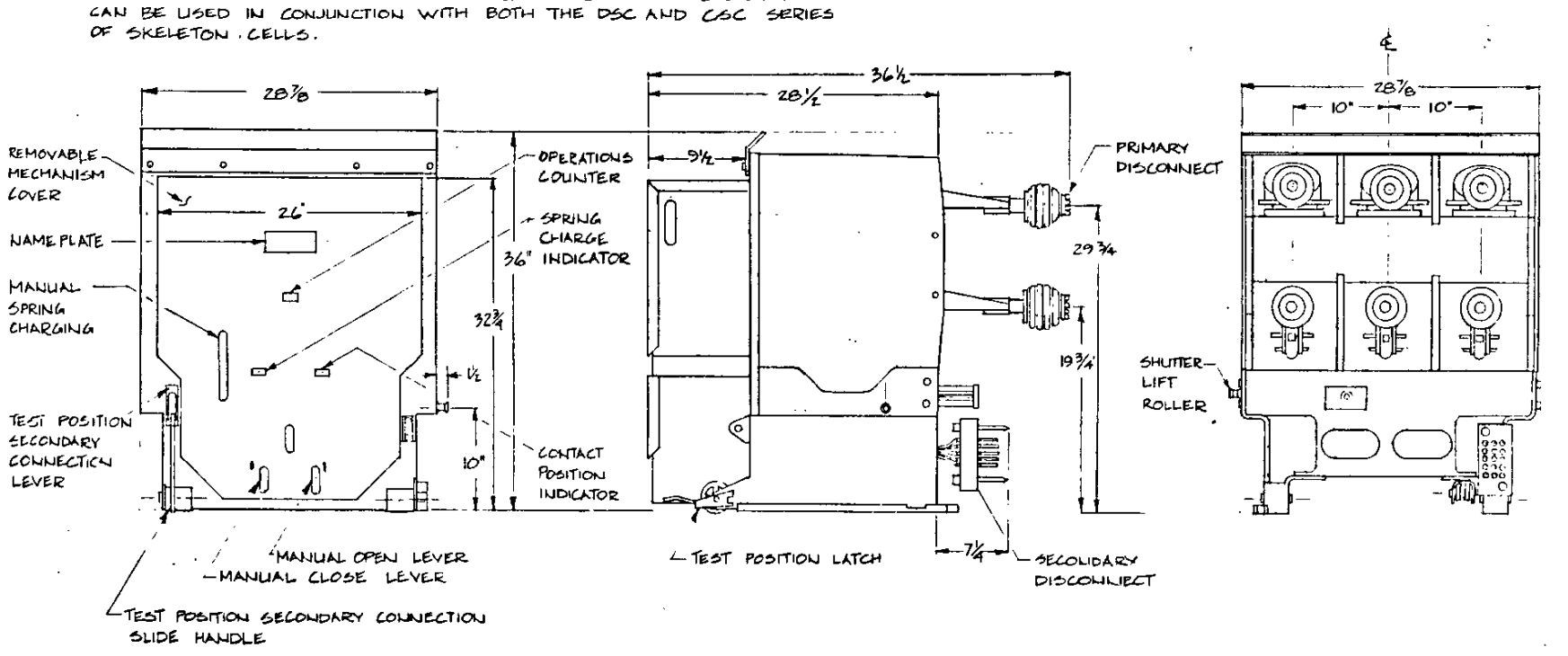
| PROPRIETARY INFORMATION | LET | REVISION | D. | DRWN. | DATE |
|---|---|---|---|---|---|
| YIN, INC. | | | | | |

NOTES:

1. THE DIMENSIONS BELOW COVER THE FOLLOWING RATINGS:

| MODEL NO | RATING | Square D No. |
|---|---|---|
| HVD-1550-12 | 15 KV/ 500 MVA/ 1200 A | VAD-15050-12 |
| HVD-1550-20 | 15 KV/ 500 MVA/ 2000 A | VAD-15050-20 |
| HVD-1575-12 | 15 KV/ 750 MVA/ 1200 A | VAD-15075-12 |
| HVD-1575-20 | 15 KV/ 750 MVA/ 2000 A | VAD-15075-20 |
| HVD-0525-12 | 5 KV/ 250 MVA/ 1200 A | VAD-05025-12 |
| HVD-0525-20 | 5 KV/ 250 MVA/ 2000 A | VAD-05025-20 |
| HVD-0835-12 | 7.2 KV/ 350 MVA/ 1200 A | VAD-08035-12 |
| HVD-0835-20 | 7.2 KV/ 350 MVA/ 2000 A | VAD-08035-20 |

2. THE HVD SERIES OF HORIZONTAL DRAWOUT VACUUM CIRCUIT BREAKERS CAN BE USED IN CONJUNCTION WITH BOTH THE DSC AND CSC SERIES OF SKELETON CELLS.




VAD & HVD VACUUM CIRCUIT BREAKER, BASIC DIMENSIONS

| USED ON: | DR. NO. | BY: | C'46007 - 31 |
|---|---|---|---|
| VAD-1 | V.1063 | J Yim | |

| ITEM NO. | PART NUMBER | DESCRIPTION |
|---|---|---|
| QTY REQD PER DASH NO | | |

NEXT ASSEMBLY | USED ON | APPLICATION

MATERIAL: N/A
FINISH: N/A

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES
TOLERANCES: 2 PLC ± | 3 PLC ± | ANGLE ±
THREADS CLASS 2 PER ASA Y14.6
REMOVE BURRS AND SHARP EDGES
COMM. TOL. APPLY TO STOCK SIZES
SURFACE FINISH
DO NOT SCALE THIS PRINT

YIN, INC.
SQUARE D COMPANY
SAN LEANDRO CALIFORNIA

HVD VACUUM CIRCUIT BREAKER
BASIC DIMENSIONS

| DATE | CATEGORY | SIZE | DRNG. NO | REV |
|---|---|---|---|---|
| 9-21-82 | HVD | C | 102499 | |
| DATE | | | | |

FORM NO. 245

SDSC (Square D Skeleton Cell)

Cell Description

The SDSC breaker cell is manufactured from sheet steel, welded together to form a free standing, self supporting structure.

The cell is steam cleaned, phosphatized then spray painted Ansi #49 with an air dry vinyl paint which is U.L. outdoor listed. The dry film thickness is 3 mils.
Current transformers can be mounted over porcelain bushings which are front accessible after removing the shutter plate and the C.T. cover.

The shutter is not padlockable and is made from 1/8" thick glastic. The C.T. cover is formed from .073 thick non-flammable red plastic.

A MOC (Mechanism Operated Contact) switch is available as an option and is located inside the low voltage wire trough on the right hand side. A maximum of one switch (9-contacts, 5a & 4b) is available. The switch is reached by removing an access plate on the front of the low voltage trough.

A TOC (Truck Operated Contact) switch is available as an option and is located directly below the C.T.'s, mounted on the back wall of the breaker compartment. A maximum of two switches (4 Contacts, 2a & 2b each) is available. The switch is reached by removing the circuit breaker from the cell.

Key interlocking provisions are available as an option. The key lock can be mounted in the front lower right hand corner of the breaker cell and interlocks with the breaker through mechanical linkages. To release the key, the breaker must be moved to the test/disconnect position and locked out of the connected position. A maximum of one cylinder can be mounted. When ordering key locks, a Square D type SFOE or equal should be used.

The cell, as supplied, requires many additions to make it into a functional unit of metal-clad switchgear. See drawing B46002-132 Pg 2 of 3 for Skeleton Cell and see drawing B46002-132 Pg 3 of 3 for required minimum additions.



| REV. | C. R. | DATE | BY |
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PRINTS TO

DO NOT SCALE — WORK TO DIMENSIONS

| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | | |
|---|---|---|
| | LINEAL DIM. | TWO PLACE DECIMAL ± .020<br>THREE PLACE DECIMAL ± .009 |
| | HOLE DIA. | FRACTIONAL, LETTER, OR NUMBERED DRILL + .004 − .002<br>THREE PLACE DECIMAL ± .002 |
| | ANGLE | DIMENSIONED ± 1° UNDIMENSIONED 90° ± 2° |

| SCALE | DRAWN | CHKD | DATE | C.R |
|---|---|---|---|---|
| | J.King | | 5-30-84 | V0063 |

TITLE: SDSC Cell

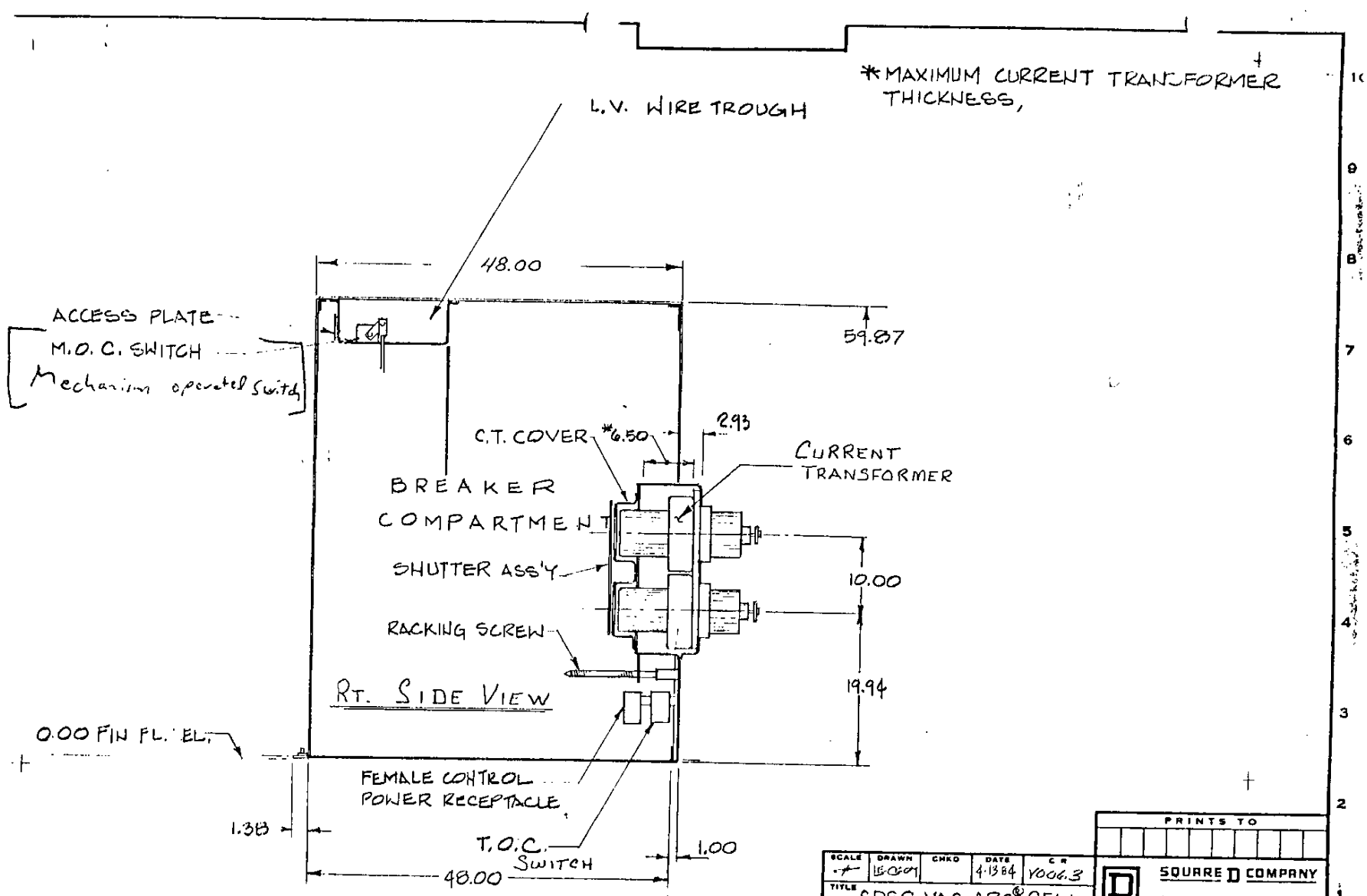
USED ON: Vac - Arc

RAWSTOCK:

SQUARE D COMPANY
SMYRNA, TENNESSEE USA

A46002-132 Pg 1 of 3

A B C D E F G




DO NOT SCALE — WORK TO DIMENSIONS

| REV. | C.R. | DATE | BY |
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| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | LINEAL DIM. | TWO PLACE DECIMAL ± .010<br>THREE PLACE DECIMAL ± .005 |
|---|---|---|
| | HOLE DIA. | FRACTIONAL, LETTER, OR NUMBERED DRILL + .004 − .002<br>THREE PLACE DECIMAL ± .002 |
| | ANGLE | MACHINED ± 1° UNMACHINED ± 2° |

SCALE —  DRAWN LE-0-09  CHKD  DATE 4-13-84  C R Y006.3

TITLE SDSC VAC ARC® CELL

USED ON VAC ARC®

RAWSTOCK

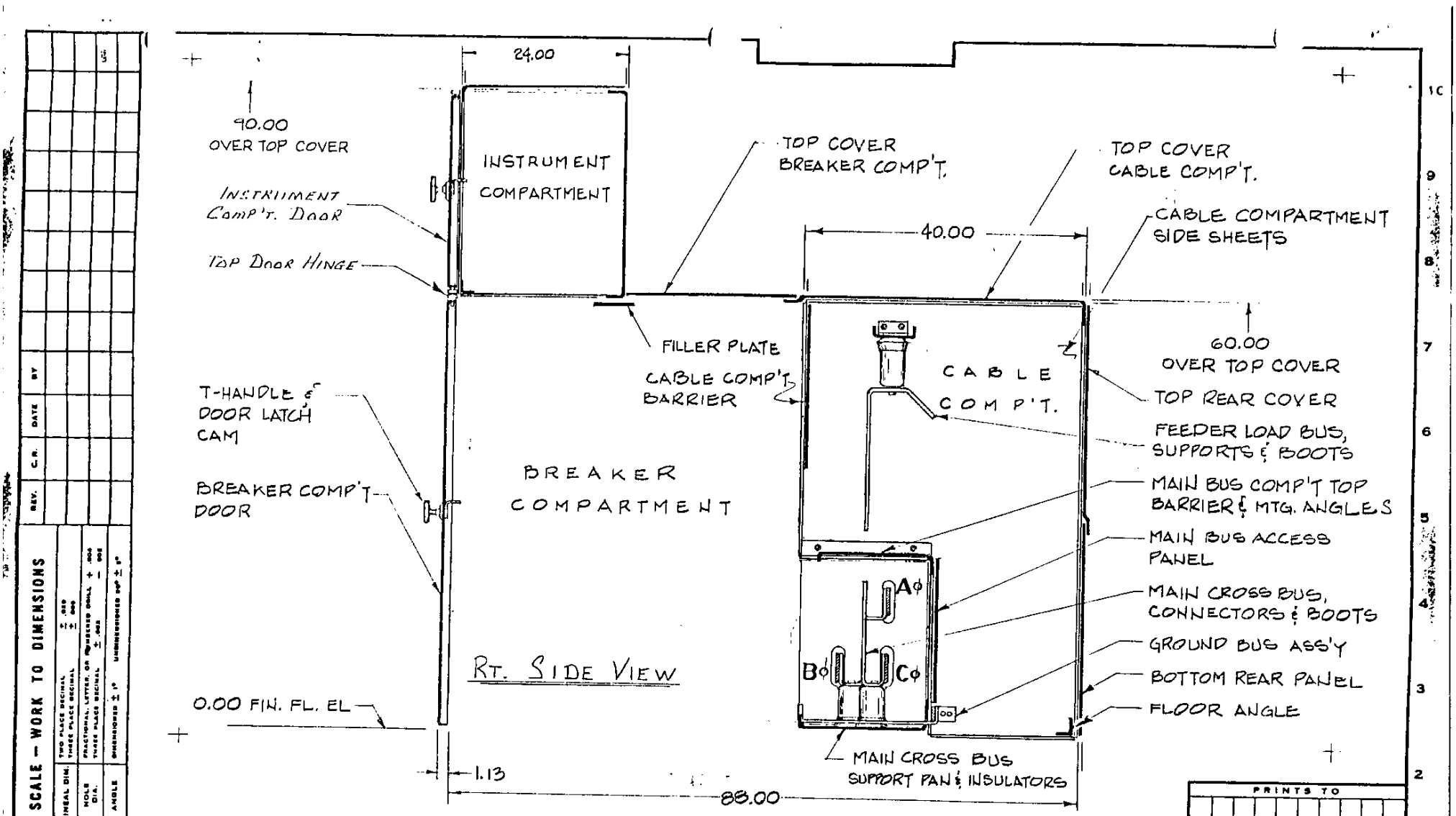
PRINTS TO

SQUARE D COMPANY
SMYRNA, TENNESSEE USA

B46002-132
SHEET 2 OF 3



FORM NO 248




DO NOT SCALE — WORK TO DIMENSIONS

| REV. | C.R. | DATE | BY |
|---|---|---|---|
| | | | |

| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | LINEAL DIM. | TWO PLACE DECIMAL ± .010<br>THREE PLACE DECIMAL ± .005 |
|---|---|---|
| | HOLE DIA. | FRACTIONAL, LETTER, OR NUMBERED DRILL + .004 − .000<br>THREE PLACE DECIMAL ± .002 |
| | ANGLE | DIMENSIONED ± 1° UNDIMENSIONED 90° ± 2° |

FORM NO 746



| SCALE | DRAWN | CHKD | DATE | C R |
|---|---|---|---|---|
| | LA Cruz | | 4-13-84 | 10063 |

TITLE: ADDITIONS TO VACARC® CELL

USED ON: VAC ARC®

RAWSTOCK

PRINTS TO

SQUARE D COMPANY
SMYRNA, TENNESSEE USA

B46002-132
SHEET 3 OF 3

## Ordering Vad Breakers and Breaker Cells

Breakers and breaker cells must be ordered from Yin, Incorporated/Square D Co. San Leandro, California as soon as the job requirements are known since lead times on these items are approximately 10 weeks.* To order breaker cells, a requisition must be filled out and a specification sheet must accompany it. (See page #2 for order specification sheet)

## Ordering Circuit Breaker

First select and mark the box next to the desired circuit breaker.

Example: Required breaker is 15KV, 500MVA, 1200A breaker, mark the box next to the VAD - 15050-12 breaker.

- Vacuum Circuit Breaker
- KV Class
- Nom. 3Ø MVA÷10
- Rated Cont. Current÷100

Next place a mark in the appropriate box for each of the different control devices.

Next if the breaker is to be used on reclosure circuits, place a mark in the box under "Latch Check Switch".

Next if MOC is required, place a mark in the box under "MOC Provisions".

## Ordering Breaker Cell

First mark the appropriate "NEMA Style" box (Mark NEMA I for NEMA 3R Walk-In Requirements).

Next mark the box next to the appropriate breaker cell. The catalogue number selected should match the circuit breaker number with the exception of SDSC (Square D Skeleton Cell) is substituted for VAD.

Next mark the box next to any of the desired options. Only one box under each option catagory may be marked. If MOC is marked, be sure to mark the MOC box under the breaker section.

## Auxiliary Equipment

Test cabinets and test jumper cables are also available from Yin, Inc.

*Lead times are subject to change. At the present, Yin does not stock 15KV, 750MVA Vacuum Interrupters which will result in a longer lead time for breakers using these bottles.



| REVISIONS | | | Ordering Breakers & Cells<br>Vac - Arc | DRAWN BY- J. King<br>CHECKED BY-<br>DATE- 5-30-84<br>V0063 | |
|---|---|---|---|---|---|
| | | | SQUARE D COMPANY<br>POWER EQUIPMENT GROUP<br>SMYRNA, TENNESSEE | A- 46002-133<br>Pg 1 of 2 | REV. |
| | | | | | |
| | | | | | |
| | | | | | |

SPECIFICATION SHEET

VAD - 1 Breaker and Breaker Cell

Breaker

| 5KV | 8.25KV | 15KV | |
|---|---|---|---|
| ☐ VAD-05025-12 | ☐ VAD-08035-12 | ☐ VAD-15050-12 | ☐ VAD-15075-12 |
| ☐ VAD-05025-20 | ☐ VAD-08035-20 | ☐ VAD-15050-20 | ☐ VAD-15075-20 |

| OPERATING VOLTAGE | CHARGING MOTOR | MOTOR RELAY | CLOSED COIL | ANTI-PUMP RELAY | TRIP COIL | LATCH CHECK SWITCH | MOC PROVISIONS |
|---|---|---|---|---|---|---|---|
| 24 VDC | N/A | N/A | ☐ | ☐ | ☐ | ☐ | ☐ |
| 48 VDC | ☐ | ☐ | ☐ | ☐ | ☐ | | |
| 125 VDC | ☐ | ☐ | ☐ | ☐ | ☐ | | |
| 250 VDC | ☐ | ☐ | ☐ | ☐ | ☐ | | |
| 120 VAC | ☐ | ☐ | ☐ | ☐ | ☐ | | |
| 240 VAC | ☐ | ☐ | ☐ | ☐ | ☐ | | |

Note: If controls are all DC, there will be 2a & 2b spare auxiliary "52" contacts. For other voltages, there will be 1a & 2b.

Breaker Cell

☐ NEMA I ☐ NEMA 3R NWI

| 5KV | 8.25KV | 15KV | |
|---|---|---|---|
| ☐ SDSC-05025-12 | ☐ SDSC-08035-12 | ☐ SDSC-15050-12 | ☐ SDSC-15075-12 |
| ☐ SDSC-05025-20 | ☐ SDSC-08035-20 | ☐ SDSC-15050-20 | ☐ SDSC-15075-20 |

Breaker Cell Options

MOC

☐ 9 Contacts (5a & 4b)

TOC

☐ 4 Contacts (2a & 2b)
☐ 8 Contacts (4a & 4b)

Key Interlocks

☐ Provisions For

Additional Instructions



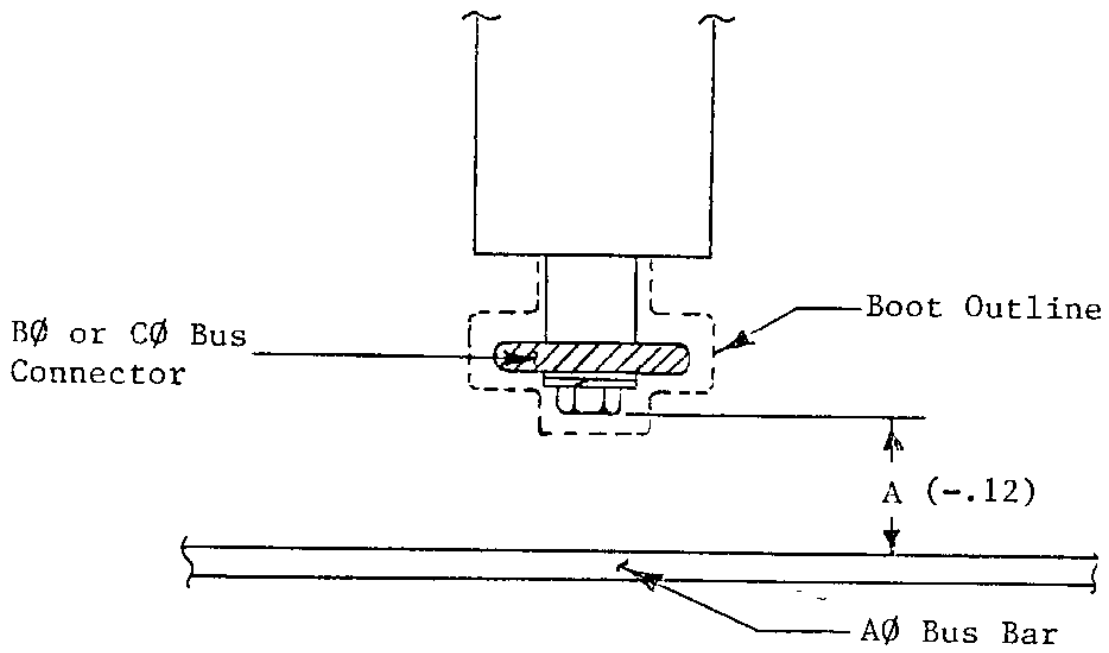
| REVISIONS | | | | |
|---|---|---|---|---|
| | | | Ordering Breakers & Cells<br>Vac - Arc | DRAWN BY- J. King<br>CHECKED BY-<br>DATE- 5-30-84<br>V0063 |
| | | | SQUARE D COMPANY<br>POWER EQUIPMENT GROUP<br>SMYRNA, TENNESSEE | A- 46002-133<br>Pg 2 of 2 |

REV.

FORM NO. 245

## Bus Bar Clearances for Vac-Arc

Through actual BIL testing at Square D Middletown, it has been proven that the standard design of the Vac-Arc main bus has sufficient clearances and insulation to withstand a 95 KV - B.I.L. test as outlined in ANSI C37.20. Bus bars were epoxy coated by the fluidized bed method and the bus joints were covered with molded PVC boots.




Top View Main Bus Compartment

| Main Bus Rating | Dim. A |
|---|---|
| 1200A | 2.18 |
| 2000A | 2.06* |

*Note: Testing was performed on 2000A Bus Assembly. All tests passed.



| REV. | C. R. | DATE | BY |
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PRINTS TO

DO NOT SCALE — WORK TO DIMENSIONS

| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | | |
|---|---|---|
| | LINEAL DIM. | TWO PLACE DECIMAL ± .020; THREE PLACE DECIMAL ± .009 |
| | HOLE DIA. | FRACTIONAL LETTER, OR NUMBERED DRILL + .004; THREE PLACE DECIMAL ± .002 — .002 |
| | ANGLE | DIMENSIONED ± 1° UNDIMENSIONED 90° ± 2° |

| SCALE | DRAWN | CHKD. | DATE | C R |
|---|---|---|---|---|
| | J. King | | 5-30-84 | V0063 |

TITLE: Bus Bar Clearances

USED ON: Vac-Arc

RAWSTOCK:

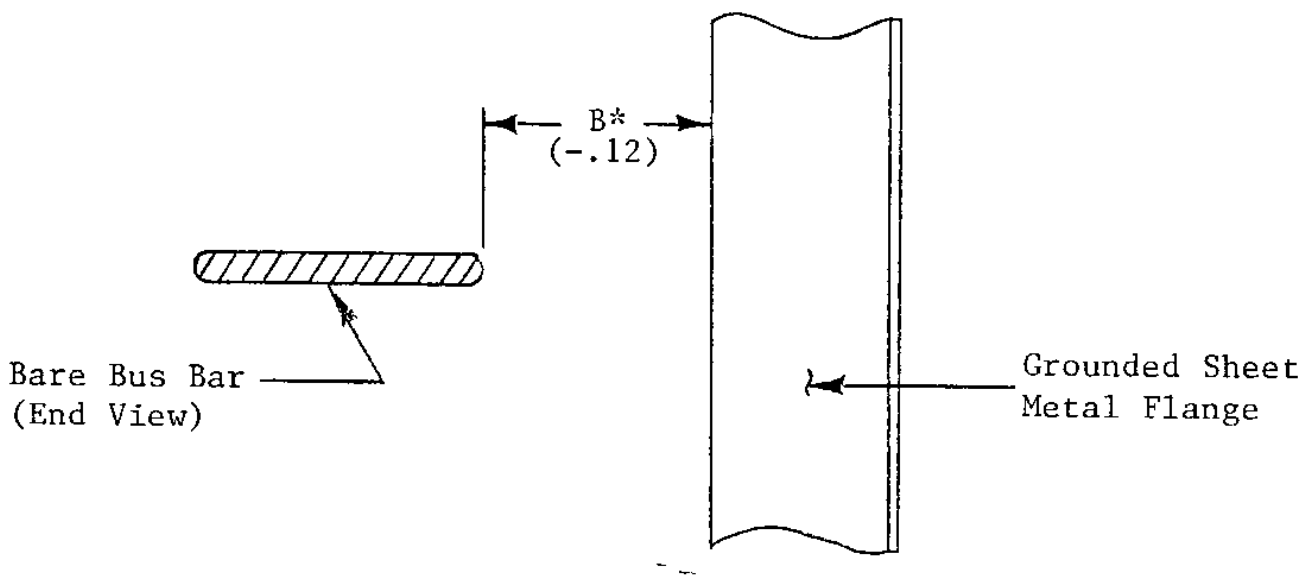
SQUARE D COMPANY
SMYRNA, TENNESSEE USA

A46002-134 Pg 1 of 3

A B C D E F G

FORM NO. 245

Additional testing was performed to prove that sheet metal flanges do not need to be notched when bus bars pass these flanges. Tests were performed at 95 KV - BIL as outlined in ANSI C37.20 with bare bus to prove the design even though Metal-Clad Swgr uses insulated bus bars.




*Dimension B was calculated at 4.00 but measurements on the test sample found it to be 3.84. All tests passed.



| REV. | C. R. | DATE | BY |
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PRINTS TO

DO NOT SCALE — WORK TO DIMENSIONS

| | | |
|---|---|---|
| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | LINEAL DIM. | TWO PLACE DECIMAL ± .020<br>THREE PLACE DECIMAL ± .009 |
| | HOLE DIA. | FRACTIONAL LETTER, OR NUMBERED DRILL + .004<br>THREE PLACE DECIMAL ± .002 — .002 |
| | ANGLE | DIMENSIONED ± 1° UNDIMENSIONED 90° ± 2° |

| SCALE | DRAWN | CHKD. | DATE | C R |
|---|---|---|---|---|
| | J.King | | 5-20-84 | V0063 |

TITLE: Bus Bar Clearance

USED ON: Vac - Arc

RAWSTOCK:

SQUARE D COMPANY
SMYRNA, TENNESSEE USA



A B C D E F G

FORM NO. 245

When engineering bus arrangements other than those previously illustrated, the following table should be used as a guide for bus clearances. Note: It is not recommended to ever engineer to "Minimum" dimensions.

| VOLTAGE CLASS KV | BIL KV | "PREFERRED" CLEARANCE | | "MINIMUM" CLEARANCE | |
|---|---|---|---|---|---|
| | | AIR | SURFACE | AIR | SURFACE |
| 5 | 60 | 3.00 | 3.50 | 1.92 | 3.00 |
| 8.25/15 | 95 | 5.00 | 6.00 | 4.38 | 5.00 |



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PRINTS TO

DO NOT SCALE — WORK TO DIMENSIONS

| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | | |
|---|---|---|
| | LINEAL DIM. | TWO PLACE DECIMAL ± .030<br>THREE PLACE DECIMAL ± .005 |
| | HOLE DIA. | FRACTIONAL, LETTER, OR NUMBERED DRILL + .004<br>THREE PLACE DECIMAL ± .002 − .002 |
| | ANGLE | DIMENSIONED ± 1° UNDIMENSIONED 90° ± 2° |

| SCALE | DRAWN | CHKD. | DATE | C R |
|---|---|---|---|---|
| | J.King | | 5-30-84 | V0.063 |

TITLE: Bus Bar Clearances

USED ON: Vac-Arc

RAWSTOCK:

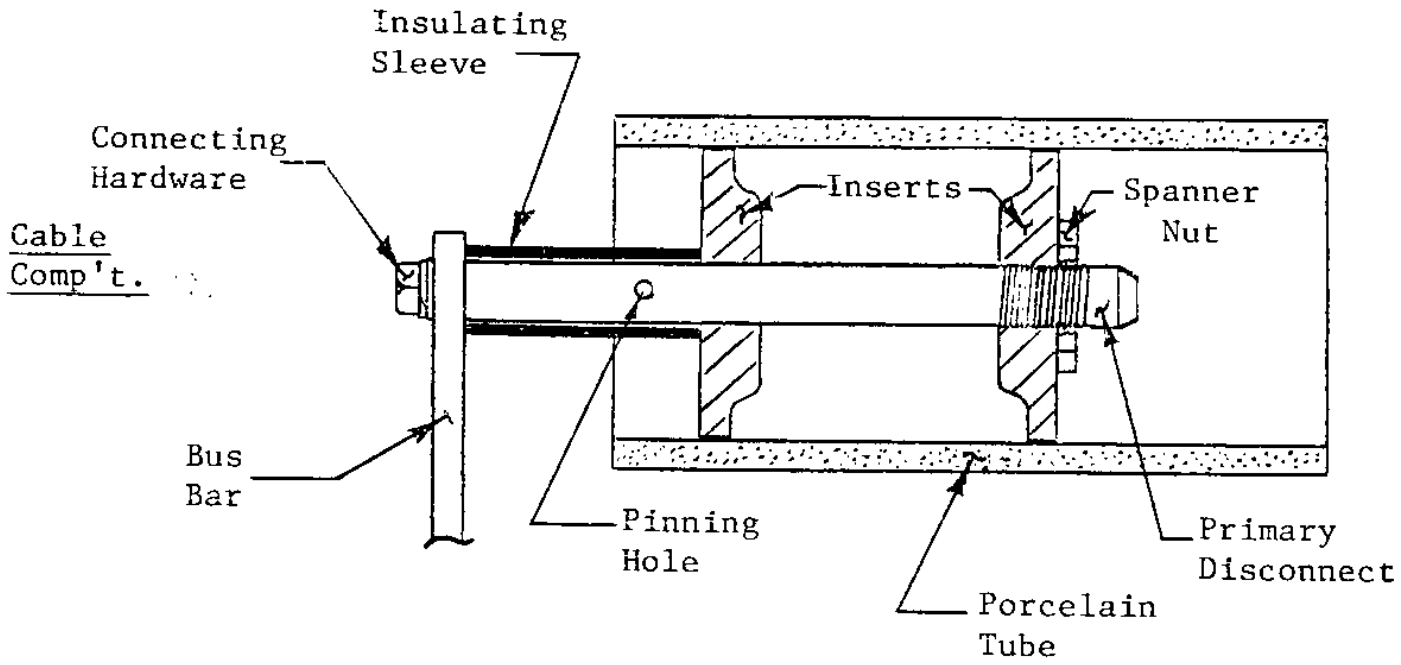
SQUARE D COMPANY
SMYRNA, TENNESSEE USA

A46002-134 Pg 3 of 3

A B C D E F G

FORM NO. 245

## Torquing Bus Bars To Primary Disconnect Stud




## Section View of Primary Bushing

Steps to connect bus bar to primary disconnect stud:

1) Loosen spanner nut and slide primary disconnect towards the cable compartment until pinning hole is accessible.

2) Attach bus bar to primary disconnect with existing 3/4-10 connecting hardware, insert any available tool into pinning hole (hole is 1/4" dia.) and torque connecting hardware to 125 ft. lbs.

3) Slide primary disconnect towards the breaker compartment, making sure insulating sleeve is in place.

4) Tighten the spanner nut snuggly against the insert.



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PRINTS TO

DO NOT SCALE — WORK TO DIMENSIONS

| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | | |
|---|---|---|
| | LINEAL DIM. | TWO PLACE DECIMAL ± .030<br>THREE PLACE DECIMAL ± .005 |
| | HOLE DIA. | FRACTIONAL LETTER OR NUMBERED DRILL + .004<br>THREE PLACE DECIMAL ± .002 − .002 |
| | ANGLE | DIMENSIONED ± 1° UNDIMENSIONED 90° ± 2° |

| SCALE | DRAWN | CHKD | DATE | C R |
|---|---|---|---|---|
| | J.King | | 5-30-84 | V0043 |

TITLE: Torquing Connector Bar

USED ON: Vac - Arc

RAWSTOCK:

SQUARE D COMPANY
SMYRNA, TENNESSEE USA

A46002-135

A B C D E F G

FORM NO. 245

# Bus Bracing for Vac-Arc Switchgear

## Main Bus

When applied on systems requiring bus bracing less than 40 KA RMS asymmetrical, no additional bracing other than the two (2) A-20 insulators on BØ & CØ connector bus is required.

When applied on systems requiring bus bracing greater than 40 KA RMS asymmetrical but less than or equal to 58 KA RMS asymmetrical, an additional bus brace (E.I. Part No. 63165-034-02) is required. (See Page #3 for location)

## Feeder Load Bus

The preferred maximum from the primary disconnect stud to the first A-20 insulator is 22.00 inches on systems requiring 42 KA RMS asymmetrical or less bus bracing.

On systems greater than this but less than or equal to 58 KA RMS asymmetrical, the preferred dimension is 12.00 inches. (See Page #3 for illustration)

## Other Insulator Spacings

The formula below may be used for calculating the distances between centerlines of insulators for special bus bar runs. Be sure to consider other limitations and bus geometry before using the calculated distance.

$$D = 3.221 \times 10^{6} \quad \frac{(C \times S)}{I^{2}}$$

Where:
- D = Distance Between Insulators In Inches
- C = Cantilever loading rating of insulator used in pounds
- S = Distance between centerlines of conductors in inches
- I = Maximum symmetrical interrupting rating in Amps (at minimum voltage) of circuit breaker used in swgr. lineup.



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PRINTS TO

DO NOT SCALE — WORK TO DIMENSIONS

| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | | |
|---|---|---|
| | LINEAL DIM. | TWO PLACE DECIMAL ± 030<br>THREE PLACE DECIMAL ± 009 |
| | HOLE DIA. | FRACTIONAL LETTER OR NUMBERED DRILL + 004<br>THREE PLACE DECIMAL ± 002 − 002 |
| | ANGLE | DIMENSIONED ± 1° UNDIMENSIONED 90° ± 2° |

| SCALE | DRAWN | CHKD. | DATE | C R |
|---|---|---|---|---|
| | J.King | | 5-30-84 | V0063 |

TITLE: Bus Bracing

USED ON: Vac - Arc

RAWSTOCK:

SQUARE D COMPANY
SMYRNA, TENNESSEE USA

A46002-136 Pg 1 of 3

A B C D E F G

FORM NO. 245

RATINGS FOR INSULATORS ①

| NOMINAL VOLTAGE RATING | WITHSTAND TEST VOLTAGE | | CLASS ③ | STRENGTH | | | |
|---|---|---|---|---|---|---|---|
| | Full Wave Impulse | 60Hz RMS Sym. 1 Minute | | Cantilever ④ | Torsion | Tension | Compression |
| KV | KV Crest | KV | | Pounds | Inch Pounds | Pounds | Pounds |
| 4.8 | 60 | 19 | A-20 | 1475 | 2500 | 2000 | 20000 |
| 13.2 ② | 95 | 36 | A-20 | 1620 | 3500 | 3000 | 20000 |
| 4.8 | 60 | 19 | A-30 | 2950 | 4500 | 3500 | 30000 |
| 13.2 ② | 95 | 36 | A-30 | 3240 | 6000 | 5000 | 30000 |

① Based on NEMA Standard No. SG-6-1974 Table 6-5.

② Also used on 7.2kV switchgear

③ Height of Insulators:

4.8kV = 3.5" High
13.2kV = 6.0" High

④ Cantilever strength ratings at 9/16 inch above insulator top surface.



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PRINTS TO

DO NOT SCALE — WORK TO DIMENSIONS

| | | |
|---|---|---|
| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | LINEAL DIM. | TWO PLACE DECIMAL ± .020<br>THREE PLACE DECIMAL ± .009 |
| | HOLE DIA. | FRACTIONAL, LETTER OR NUMBERED DRILL + .004<br>THREE PLACE DECIMAL ± .002 — .002 |
| | ANGLE | DIMENSIONED ± 1° UNDIMENSIONED 90° ± 2° |

| SCALE | DRAWN | CHKD. | DATE | C R |
|---|---|---|---|---|
| | J.King | | 5-30-84 | V0063 |

TITLE: Bus Bracing

USED ON: Vac - Arc

RAWSTOCK:

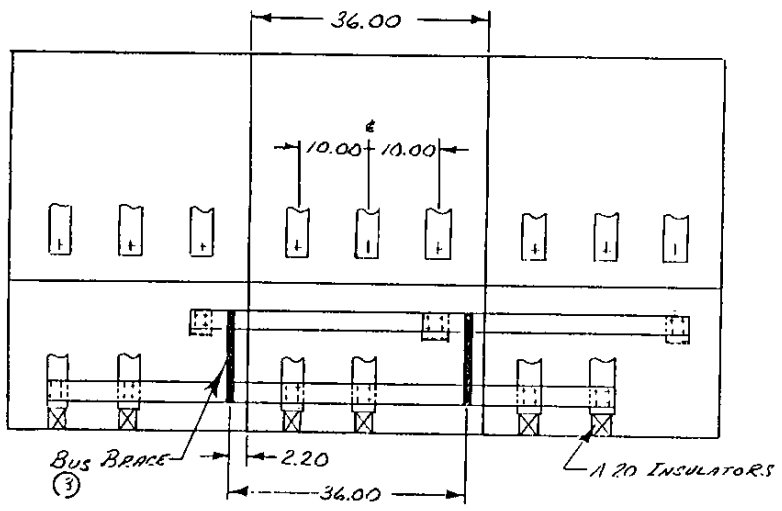
SQUARE D COMPANY
SMYRNA, TENNESSEE USA



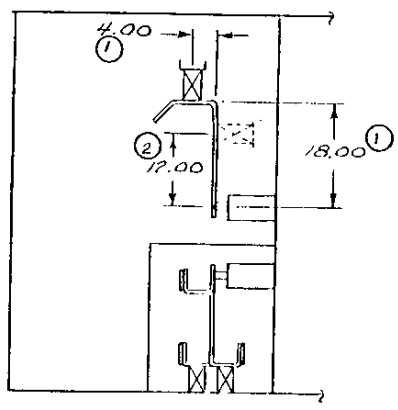
A B C D E F G

Notes:

1. Preferred Maximum To First Insulator Is 22.00 Inches For 42 KA And Below Bracing
2. Preferred Maximum To First Insulator Is 12.00 Inches For Greater Than 42KA But Less Than Or Equal To 58 KA
3. Bus Brace Required For Greater Than 40 KA But Less Than Or Equal To 58 KA.
4. All Currents Are RMS Asymmetrical
5. Insulators Are NEMA A-20 Class




Rear View




Left End View

DO NOT SCALE — WORK TO DIMENSIONS

| REV. | C.R. | DATE | BY |
|---|---|---|---|
| | | | |

| | | |
|---|---|---|
| LINEAL DIM. | TWO PLACE DECIMAL ± .030 THREE PLACE DECIMAL ± .005 | |
| HOLE DIA. | FRACTIONAL, LETTER, OR NUMBERED DRILL + .004 − .000 THREE PLACE DECIMAL ± .002 | |
| ANGLE | DIMENSIONED ± 1° | UNDIMENSIONED BAP ± 5° |
| STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED | | |



| SCALE | DRAWN | CHKD | DATE | C.R. |
|---|---|---|---|---|
| | | | 1/1/94 | V1063 |

TITLE: Side Bracing

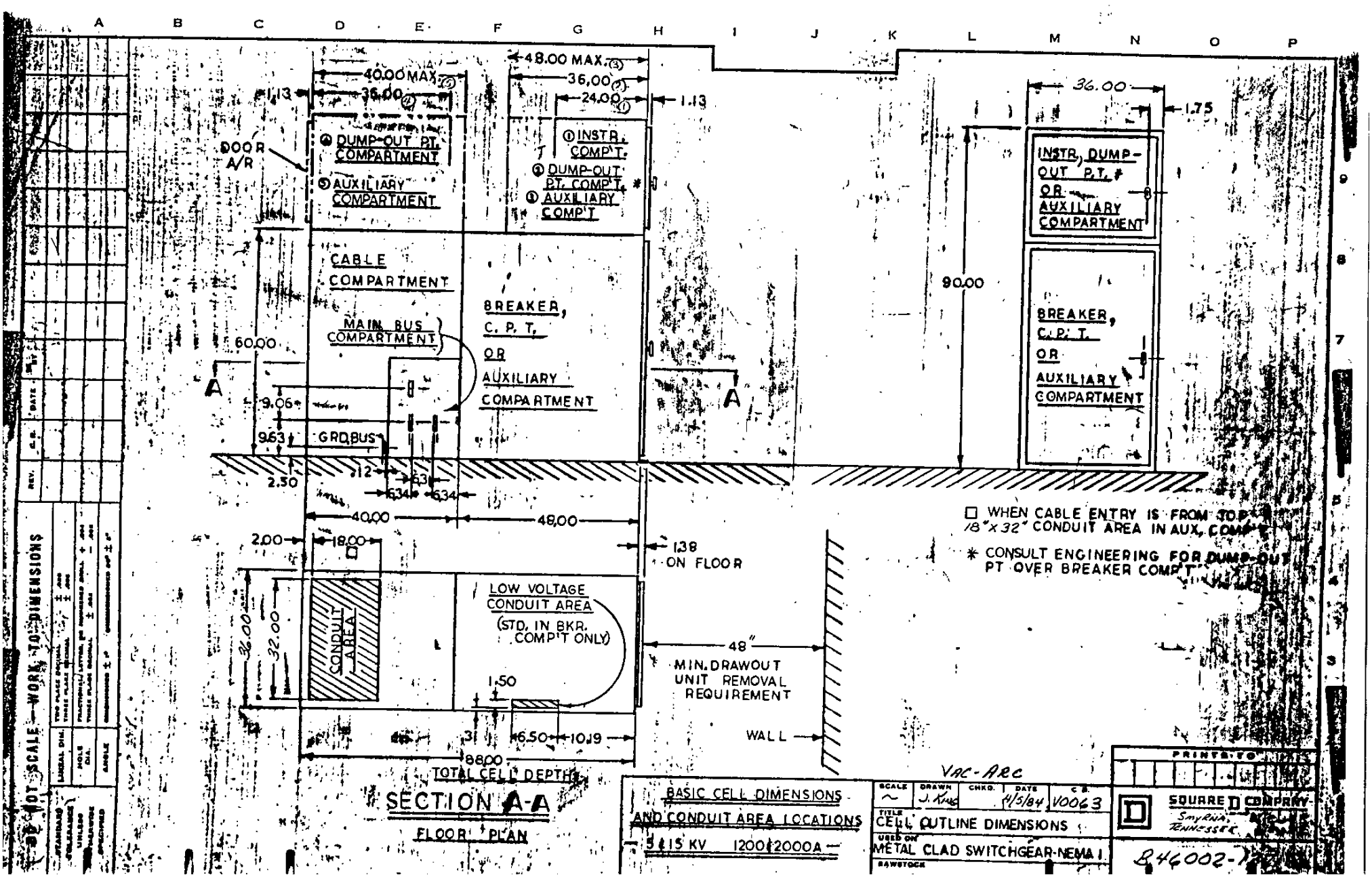
USED ON: V1063

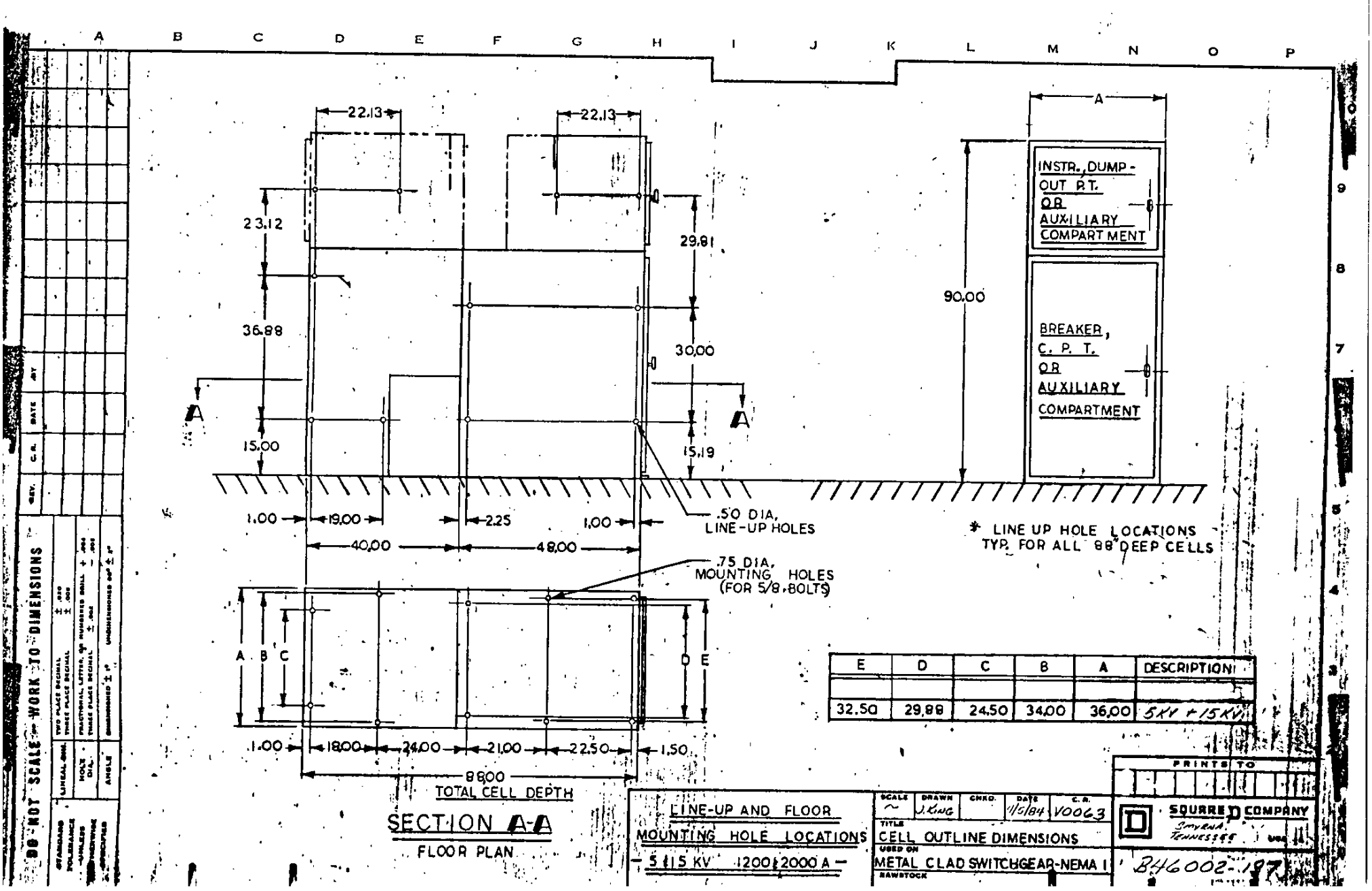
RAWSTOCK

PRINTS TO

SQUARE D COMPANY
SMYRNA, TENNESSEE USA

W46002-136


40.00 MAX.
36.00
48.00 MAX.
36.00
24.00
1.13
1.13
DOOR A/R
DUMP-OUT PT. COMPARTMENT
AUXILIARY COMPARTMENT
INSTR. COMP'T.
DUMP-OUT PT. COMP'T. *
AUXILIARY COMP'T
CABLE COMPARTMENT
MAIN BUS COMPARTMENT
BREAKER, C.P.T. OR AUXILIARY COMPARTMENT
60.00
9.06
9.63
GRD BUS
2.50
12
6.34
6.34
40.00
48.00
2.00
18.00
1.38 ON FLOOR
LOW VOLTAGE CONDUIT AREA (STD. IN BKR. COMP'T ONLY)
36.00
32.00
CONDUIT AREA
1.50
48"
MIN. DRAWOUT UNIT REMOVAL REQUIREMENT
WALL
3
6.50
10.19
88.00
TOTAL CELL DEPTH
SECTION A-A
FLOOR PLAN
36.00
1.75
INSTR, DUMP-OUT P.T. OR AUXILIARY COMPARTMENT
90.00
BREAKER, C.P.T. OR AUXILIARY COMPARTMENT
A
A
□ WHEN CABLE ENTRY IS FROM TOP 18"x32" CONDUIT AREA IN AUX. COMP'T
* CONSULT ENGINEERING FOR DUMP-OUT PT OVER BREAKER COMP'T
DO NOT SCALE — WORK TO DIMENSIONS
BASIC CELL DIMENSIONS AND CONDUIT AREA LOCATIONS
5 & 15 KV 1200 & 2000A
VAC-ARC
SCALE ~
DRAWN J. Knight
CHKD.
DATE 4/5/84
C.B. V0063
TITLE CELL OUTLINE DIMENSIONS
USED ON METAL CLAD SWITCHGEAR-NEMA 1
SQUARE D COMPANY
Smyrna, Tennessee
846002-1




| E | D | C | B | A | DESCRIPTION |
|---|---|---|---|---|---|
| 32.50 | 29.88 | 24.50 | 34.00 | 36.00 | 5KV & 15KV |

SECTION A-A

FLOOR PLAN

LINE-UP AND FLOOR MOUNTING HOLE LOCATIONS — 5 & 15 KV 1200 & 2000 A —

| SCALE | DRAWN | CHKD. | DATE | C. R. |
|---|---|---|---|---|
| ~ | J. King | | 11/5/84 | V0063 |

TITLE: CELL OUTLINE DIMENSIONS

USED ON: METAL CLAD SWITCHGEAR-NEMA 1

RAWSTOCK

PRINTS TO

SQUARE D COMPANY
SMYRNA, TENNESSEE

846002-197

DO NOT SCALE WORK TO DIMENSIONS

STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED

## Labels For Vac-Arc

Following is a list of standard labels and nameplates for use on Vac-Arc. (Refer to the factory order notes for additional requirements).

The first section lists labels and nameplates, along with where they are to be located, that must be on every Vac-Arc Switchgear line-up.

The second section lists labels and nameplates, along with where they are to be located, that may be required depending on optional assemblies used on the line-up.

I. Required Labels and Nameplates

| | | |
|---|---|---|
| 80030-154-01/02 | - | "Danger High Voltage" See PBD 41255 for location |
| 44025-328-01 | - | "Square D Company" See PBD 41255 for location |
| 46002-107-01 | - | "Switchgear Rating Label" (Blank info. must be filled in) See PBD 41255 for location |
| 80043-001-01 | - | "Danger - Hazard of Shock..." on all screw removable panels or doors which when opened, leads to high voltage. |
| 44060-346-01 | - | "Danger High Voltage" one on each Glastic Shutter inside the breaker compartment. |
| 44060-246-01 | - | "Caution - Use Denatured Alcohol..." on steelwork close to or used in supporting bus bar insulators and also on the main bus rear access plate. |
| 44050-304-01 | - | "Attention... Phase Sequence..." one tag for each incoming line. Tag is to be hung where customer cables will terminate. |
| 44050-244-01 | - | "Device/ANSI Designation" used on each individual component identified on the wiring diagram. |
| 44060-189-01 | - | "Connected Position" |
| 44060-190-01 | - | "Test & Disconnected Position" on breaker compartment floor to identify circuit breaker position. |



| REVISIONS | | | | |
|---|---|---|---|---|
| | | | Labels for Vac-Arc | DRAWN BY- J. King<br>CHECKED BY-<br>DATE- 5-30-84<br>V0063 |
| | | | SQUARE D COMPANY<br>POWER EQUIPMENT GROUP<br>SMYRNA, TENNESSEE | A- 46002-138<br>Pg 1 of 2 |
| | | | | REV. |

| | | |
|---|---|---|
| 44060-523-01 | - | "Caution - Relays are not set..." at least one tag per instrument compartment containing protective relays. Tags to be filled out by engineering department. |

II. Optional Labels and Nameplates

| | | |
|---|---|---|
| 44035-902-01 | - | "Shipping Brace Label" used on any brace added to switchgear for shipping purposes only. |
| 44061-500-01 | - | "Danger ... H.V. Power Conductors Exposed" used where a service panel which when opened, would expose the operator to such a condition. Example: Behind C.P.T. fuse access panel for fixed mounted C.P.T. |
| 44061-764-01 | - | "Caution - Ground all transformer Taps..." used where a H.V. transformer is not automatically grounded when disconnected from the voltage source. |
| 44061-765-01 | - | "Padlock Provision - Padlock Door... CPT" mounted on fuse access door for fixed mounted C.P.T. |
| 44061-766-01 | - | "Control Power Transformer" has blanks which must be filled in depending on C.P.T. rating and is to be attached to the fuse access panel. |
| 44062-025-01 | - | "Customer to Connect Ground... This Screw" used where customer is to ground portable equipment. Example: Test cabinet |



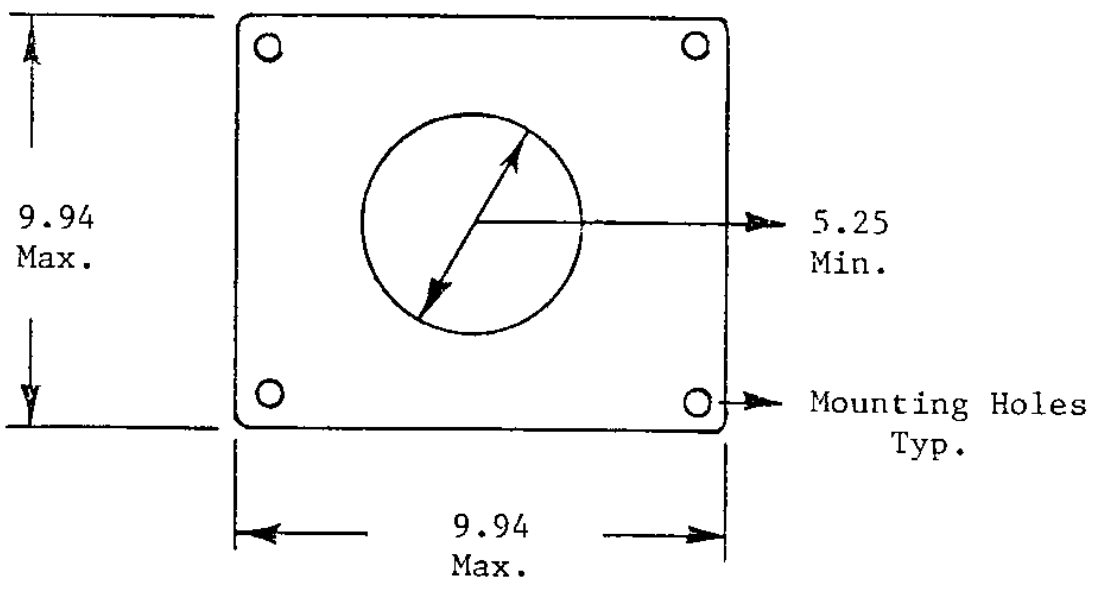
| REVISIONS | | | Labels For Vac-Arc | DRAWN BY- J. King<br>CHECKED BY-<br>DATE- 5-30-84<br>V0063 | |
|---|---|---|---|---|---|
| | | | SQUARE D COMPANY<br>POWER EQUIPMENT GROUP<br>SMYRNA, TENNESSEE | A- 46002-138<br>Pg 2 of 2 | REV. |

## Current Transformers for Vac - Arc

600 Volt Bushing type current transformers can be mounted in Vac-Arc switchgear. They mount over the porcelain tube which houses the H.V. primary disconnect. (see dwg B46002-132 pg 2 of 3).

When selecting C.T.'s for this application, the dimensions illustrated in drawing #1 below must be followed. A maximum of 6.50 inches of C.T. thickness is available on each the line and load porcelain tubes. This means that if two C.T.'s are to be mounted on the AØ line side tube, the combined thickness of the two C.T.'s must be equal to or less than 6.50 inches. (see dwg B46002-132 pg 2 of 3)

Type FG-2 current transformers (manufactured by Electromagnetic Industries) should be considered first when selecting C.T.'s since they meet the parameters outlined in dwg #1.




Drawing #1



| REVISIONS | | | Current Transformers for Vac - Arc | DRAWN BY- J. King<br>CHECKED BY-<br>DATE- 5-30-84<br>V0063 | |
|---|---|---|---|---|---|
| | | | SQUARE D COMPANY<br>POWER EQUIPMENT GROUP<br>SMYRNA, TENNESSEE | A-46002-139 | REV. |
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