

Metal-Enclosed Switchgear

Instruction Manual

Includes:	M.6020	Handling & Installation Instructions
	I.S.6040A-3	Transformer Cable Termination Instructions
	I.S.C44050-276-01	Cable Connection Through CTs
	S.B.9840-2	Service Bulletin—HVL Switches
	HVL-89-1	Spare Parts List for HVL Switches
	CAT. 6040	Power-Zone HVL Application/Dimension Data

IB 44036-900-50, 3/91

Square D Company
330 Weakley Road
Smyrna, TN 37167



SQUARE D

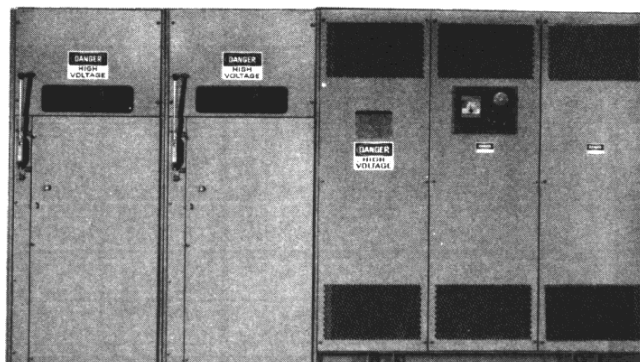
August, 1985
Rev. 3/91

Manual 6020-1
Supersedes Manual SU-4100 Dated 4/80

Instruction Manual

Metal-Enclosed Switchgear

- Lifting and Handling
- Initial Inspection
- Storage
- Installation

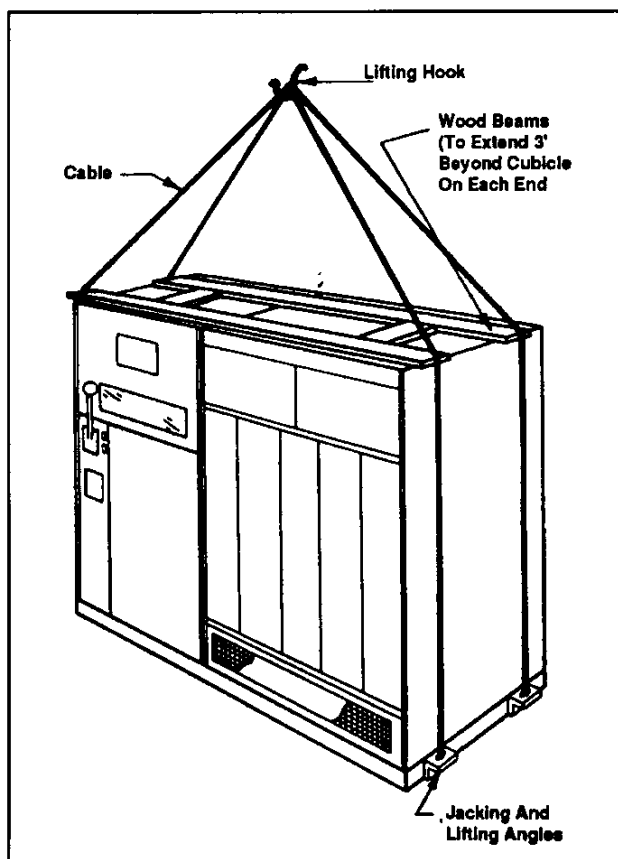


SQUARE D COMPANY

LIFTING AND HANDLING

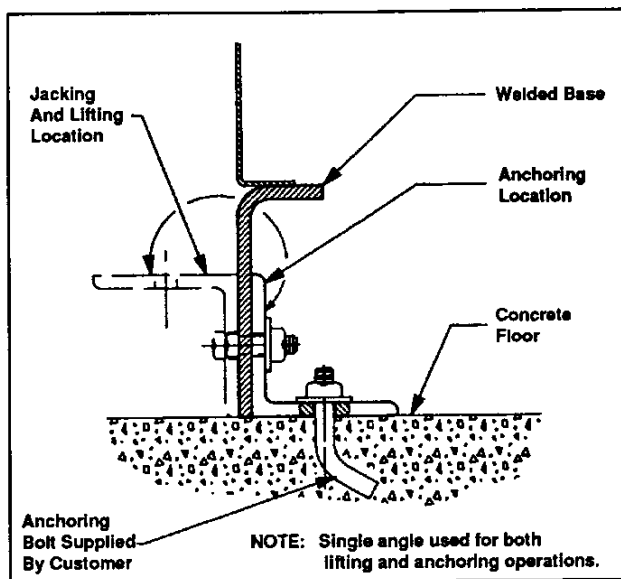
Large equipment will be shipped in separate shipping sections to facilitate handling. The equipment may be moved by one of the following two methods:

1. **Jacking angles and pipe rollers:** Each completed equipment is supplied with at least four jacking angles (Unit Substations) or a wooden skid (Switchgear) at the lower base assembly. The unit may be jacked up and pipe rollers placed beneath, to facilitate rolling the equipment across the floor. The jacking angles may be removed after equipment is in position and used for anchoring purposes.
2. **Cable sling:** The equipment may be lifted by crane with a sling around the entire structure. A spreader beam (not furnished) should be used across the top to prevent the cables from applying pressure to the top sides of the equipment.

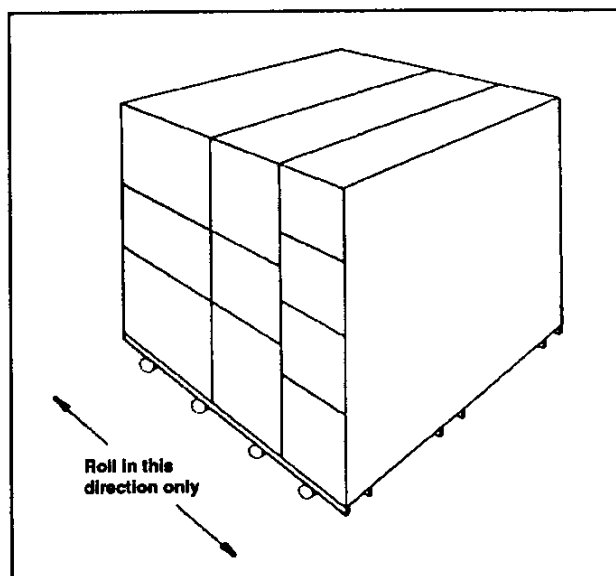


RECOMMENDED METHOD OF
LIFTING POWER ZONE®
SUBSTATION





DETAIL SHOWING ANCHORING
OF UNITS



MOVEMENT OF SWITCHGEAR

INITIAL INSPECTION

Prior to leaving the factory, all equipment is carefully inspected and packed by workmen experienced in the proper handling and packing of electrical equipment. Upon receipt of the equipment, carefully inspect it to determine any damage that might have occurred during transit. If damage is evident, or there is any visible indication of rough handling, immediately file a claim with the transportation company; and notify the local Square D Company field office. The Square D Company is not responsible for damage that occurs in the hands of the carrier. Upon request, the Company will assist in securing an adjustment. All information concerning the shipment, such as order number, case numbers, and damaged parts, should accompany all claims.

STORAGE

If it is necessary to store equipment for any period of time, take the following precautions to provide the best care for the equipment until such time as it may be installed and put into service:

1. Uncrate the equipment, but leave on skids for subsequent moving.
2. Check for missing or damaged parts.
3. Store the entire structure in a clean, dry location.

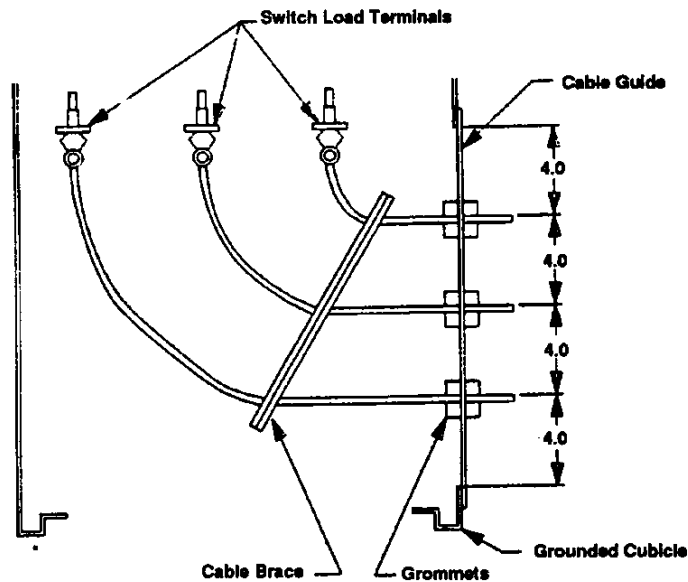
4. Cover the unit to prevent deposits of dirt or other foreign material on movable parts and electrical contact surfaces. The cover should be sufficiently ventilated.
5. When necessary, provide heat to keep equipment dry. Furnish approximately 100 watts for each compartment of each frame. On outdoor switchgear, a temporary power connection to the strip heaters installed in the unit will accomplish this purpose.

INSTALLATION

To ensure that the various switchgear parts are assembled in the correct order, it is essential to first study the general arrangement drawings. In most cases, the heaviest single piece of equipment is located first on the foundation. If the switchgear is to connect to bus duct runs which are already installed, it is essential to mount those sections connecting to the bus duct connections before installing the rest of the equipment. Mount the various shipping sections in the same plane; level them to ensure proper connection between sections. The weight of the equipment is generally sufficient to eliminate the necessity for anchoring the completed equipment to the foundation. However, each equipment is provided with necessary means for anchoring it to the floor. These locations are shown on the equipment drawings. Remove all shipping supports and packaging materials.



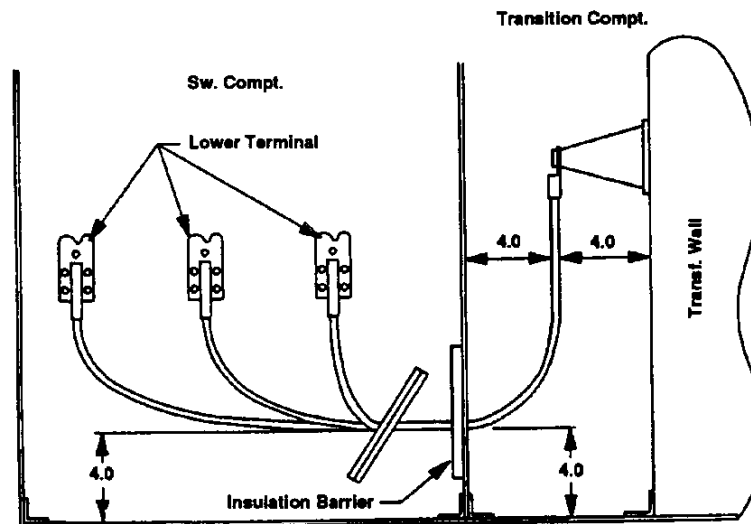
Transformer Cable Termination Instructions (Unshielded Cable)



TOP SECTIONAL VIEW OF HVL SWITCH

PROCEDURE

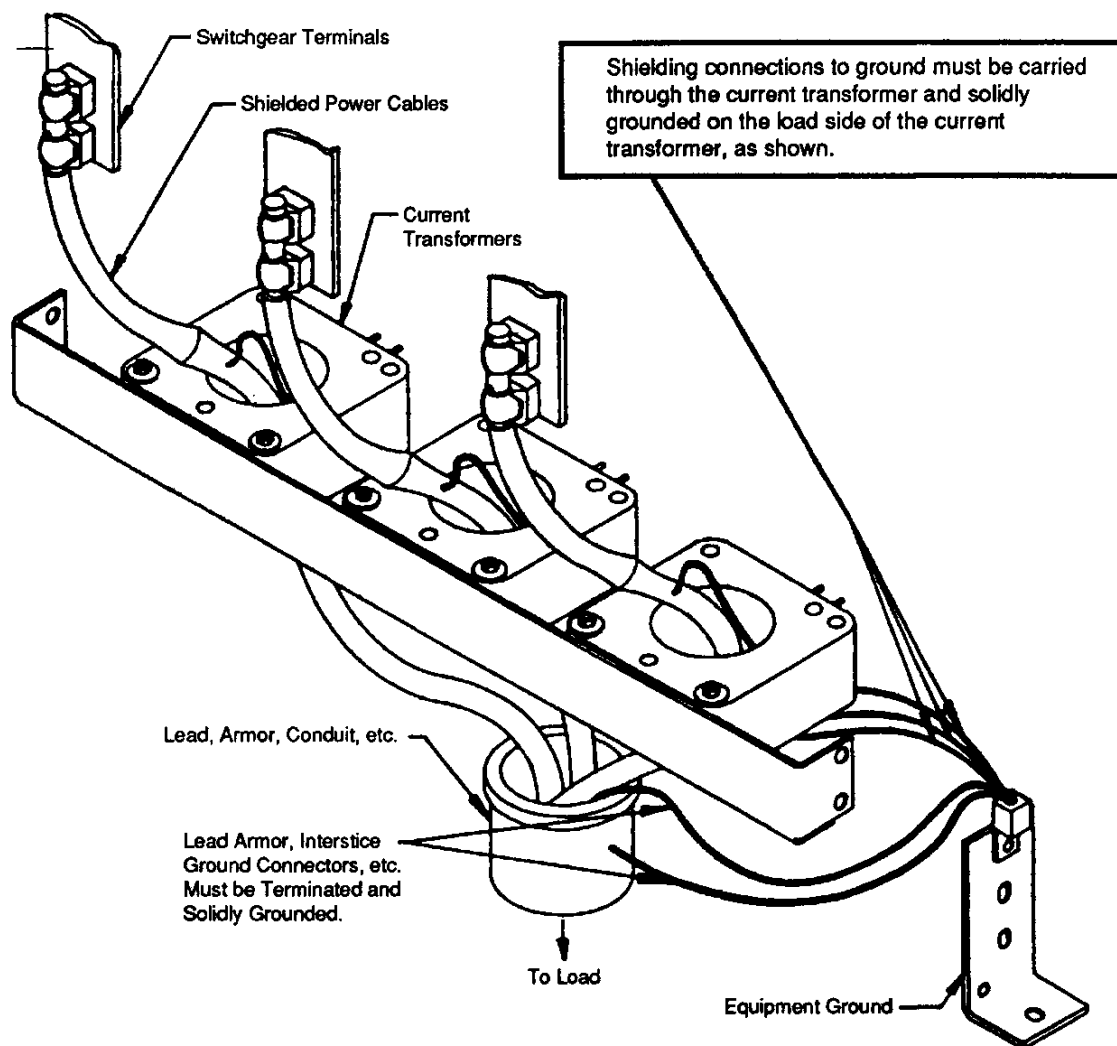
1. Maintain a minimum of 4" clearances phase-to-phase and phase-to-ground for full length of cable from switch enclosures to transformer terminals.
2. Place cable brace every 18" to 24" of unsupported cable length for lengths over 36"!



FRONT SECTIONAL VIEW



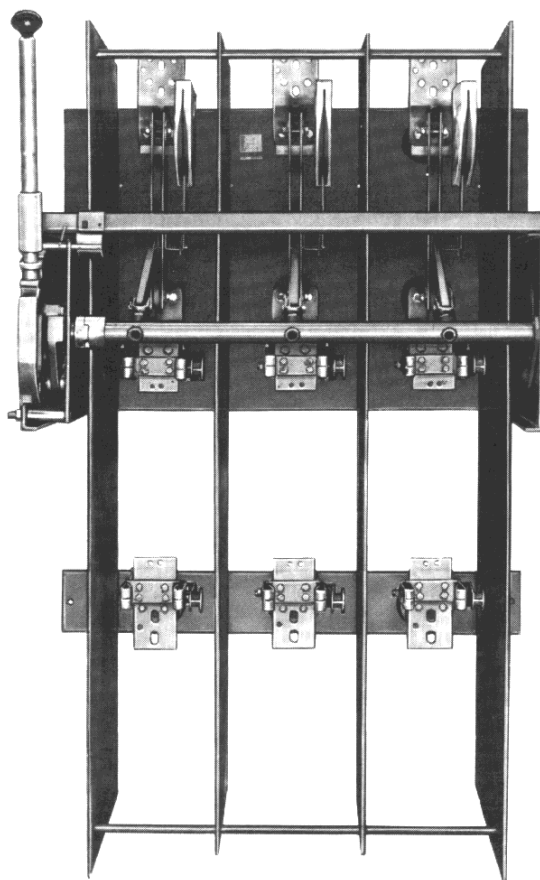
SHIELDED CABLE CONNECTIONS THROUGH CURRENT TRANSFORMERS



P/N: C44050-276-01



HVL Switches



CAUTION:

Before attempting any service work, be sure switch is completely de-energized.

DESCRIPTION

Square D HVL load interrupter switches are single throw, and are designed for use on 2.4 kV to 38 kV power distribution systems. They function as a prime component in the system providing switching and overcurrent protection for the high voltage circuits. These switches are frequently used in service entrance equipment, unit substations or for sectionalizing high-voltage feeder systems.

INSPECTION, STORAGE & INSTALLATION

Before leaving the factory, all switches are carefully inspected and packaged by workmen experienced in the proper handling and packaging of electrical equipment. Upon receipt of the switch, carefully inspect it to determine if any damage might have occurred during transit. If damage is evident, or there is any visible indication of rough handling, file a claim for damage immediately with the transportation company. Notify the local Square D field office of the damage.

If it is necessary to store the switch for any period of time, take the following precautions to provide the best care for the equipment until it is installed and put into service:

1. Uncrate the switch
2. Check for missing or damaged parts
3. Store the device in a clean, dry location
4. Cover to prevent deposit of dirt or other foreign materials on movable parts and electrical contact surfaces

To ensure proper operation of the switch, check to be sure that there is no binding or misaligned parts. If the device is not properly aligned, the switch may be damaged during operation.

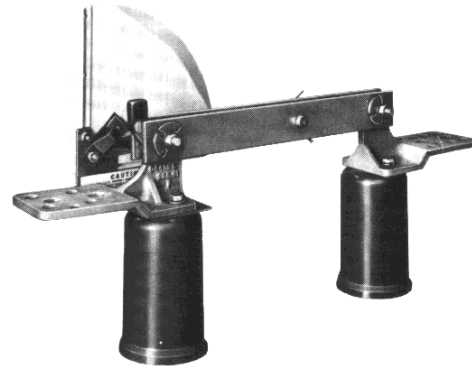


HVL Switches

SEQUENCE OF OPERATION OPENING THE SWITCH

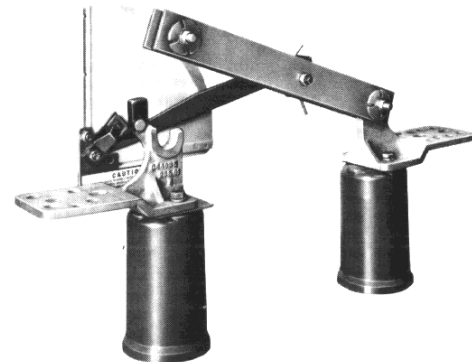
In the closed position, the main switch blade is engaged on the stationary main contacts. The circuit current flows through the main blades.

As the switch operating handle is moved towards the open position, the springs are charged. After the springs become fully charged, they toggle over the dead center position, discharging force to the switch operating mechanism.



SWITCH BLADES CLOSED

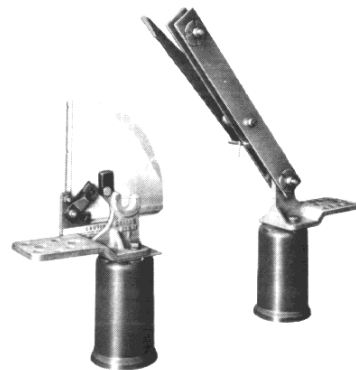
The action of the switch operating mechanism forces the movable main blade off the stationary main contacts, without arcing, while the interrupting contacts are held closed momentarily, carrying all the current. Once the main contacts have separated well beyond arc striking distance, the interrupting blade contact, held captive, has charged the interrupter blade spring. The interrupter blade end moves to disengage from under the stationary contacts in the arc chute, and the interrupter blade moves to the "open" position.



MAIN BLADE OPEN, INTERRUPTER BLADE CLOSED

The resulting arc drawn between the stationary and movable interrupting contacts, is elongated and cooled as the plastic arc chute absorbs heat and generates an arc extinguishing gas to break up and blow out the arc. The combination of arc stretching, arc cooling, and extinguishing gas causes a quick interruption with only minor erosion of the contacts and arc chutes.

The movable main and interrupting contacts continue to the fully-open position and are maintained there by spring pressure.



SWITCH BLADES OPEN



HVL Switches

MAINTENANCE AND ADJUSTMENT

INSPECTION

With normal use, the switch should require a minimum of maintenance. The quick break interrupter blade, however, should be inspected after about every 100 operations. If the interrupter blade arcing tip is burned away approximately one-third, the interrupter blade and the arc-chute assembly should be replaced.

MAIN BLADE CONTACT ADJUSTMENT

The contact pressure of the switch main blades is factory adjustment and should require no readjustment with normal switch operation. If field adjustment is required, the following procedures should be used.

Start with the switch in the closed position. Disconnect the connector link from the main shaft ("R" in the sketch on page 5). With the connecting links disconnected, tighten bolt "A" in figure 1 until the blades will be supported at the hinge in any position. Tighten bolt "B" in figure 1 until a force required to disconnect blades (applied at bolt "B") is as follows:

	UPRIGHT SWITCH JAW	INVERTED SWITCH JAW (bottom)
40 kA	70 pounds	74 pounds
61 kA	90 pounds	94 pounds

Reassemble connecting links with the main blades closed. No adjustment should be required on operating crank if not changed. Check adjustment by ensuring that:

- there is a small amount of play in the main blades, and
- the spacer between blades turns freely

Overtravel of the main blades will cause the spacer to hit the jaw, causing subsequent insulator damage. Check that main blade travel is far enough by ensuring that there is a small amount of play with the interrupter blade in the arc chute. Adjust operating crank length, if necessary.

Do not operate the switch mechanism unless the connecting links are coupled to the operating shaft and the shaft is coupled to the operating mechanism.

LUBRICATION

Wipe the switch contacts occasionally to remove dust accumulation. Then lubricate the contacts with a light film of no-oxide grease or equivalent. The contacts should never be cleaned with an abrasive material.

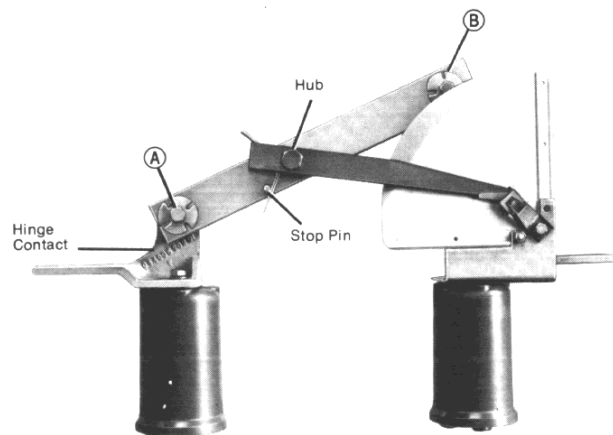


FIGURE 1 CONTACT PRESSURE ADJUSTMENT



HVL Switches

POWER-ZONE LOAD INTERRUPTER SWITCH

Part Index Letter	Description	Recommended Spares For Number Of Switches Installed			
		1-4	5-10	11-15	16-25
▲A	Arc Chute Assembly	0	3	6	9
▲B-G	Main and Interrupter Blade Assembly	0	3	6	9
B	Interrupter Switch Blade	0	0	0	0
C	Stop Pin	0	0	0	0
D	Shoulder Bolt	0	0	0	0
E	Spacer	0	0	0	0
F	Quick Break Mechanism Spring	0	0	0	0
G	Main Blade Assembly	0	0	0	0
▲H	Switch Jaw Casting	0	1	2	3
▲J	Switch Hinge Casting	0	0	0	3
▲L	Insulators	1	2	3	3
▲M	Insulating Connector Link	1	2	3	3
▲N	Outside Barriers	0	1	2	3
▲O	Interphase Barriers	0	2	2	2
▲P	Barrier Spacers	0	0	2 ea.	2 ea.
Q	Operating Cranks	0	0	0	0
R	Operating Shaft Assembly	0	0	0	0
S	Operating Mechanism Assembly	0	0	0	0
T	Mechanical Interlock	0	0	0	0

▲ Recommended Spare Parts List.

ORDERING INFORMATION FOR SPARE PARTS

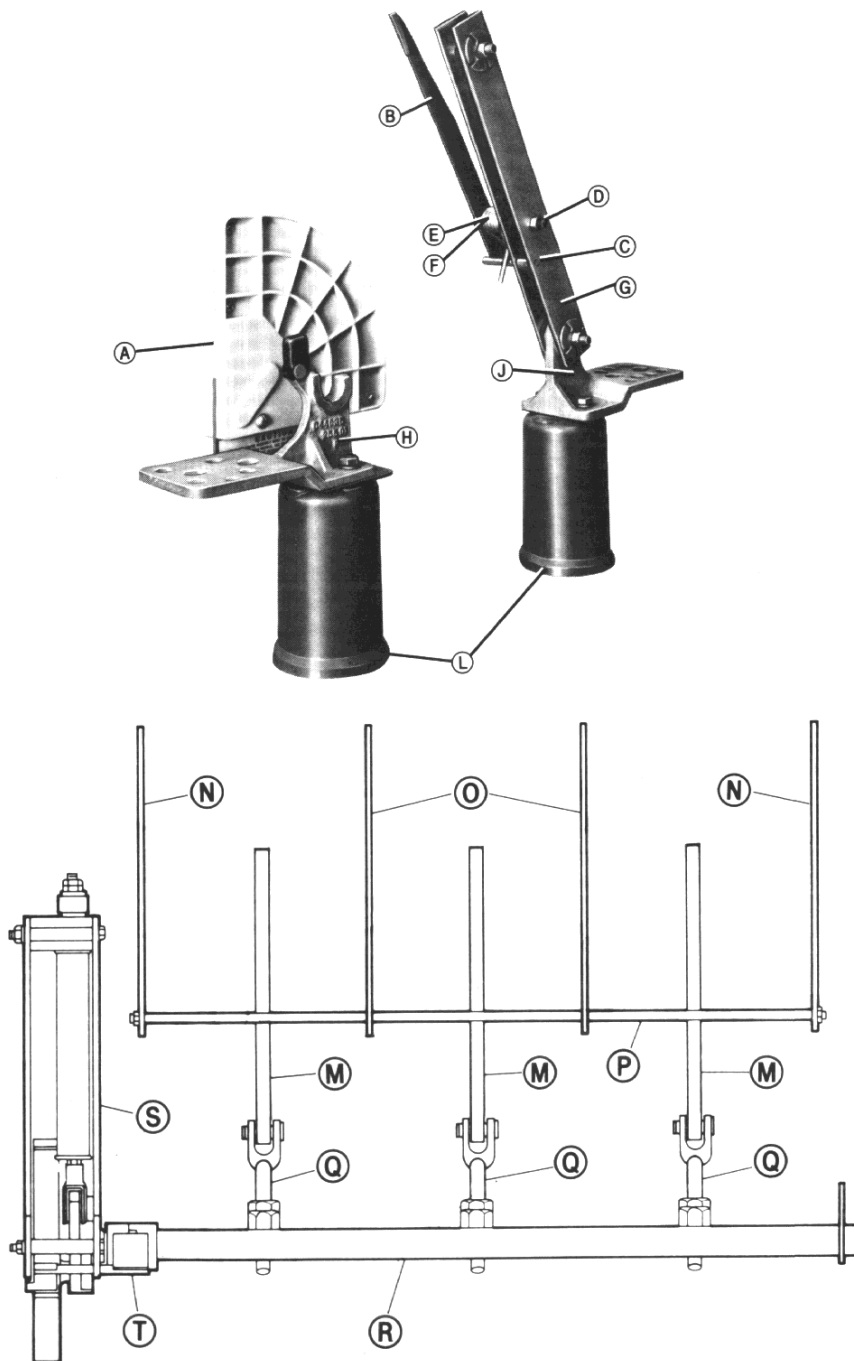
Specify

1. Description of part.
2. Quantity desired.
3. Part index number.
4. Serial number of switch.
5. Original order information shown on switch nameplate.



HVL Switches

PARTS IDENTIFICATION





HVL Switches

INSTALLATION INSTRUCTIONS FOR REPLACEMENT PARTS

ARC CHUTE ASSEMBLY

1. Switch must be in closed position before removing any parts of assemblies.
2. Disconnect insulating connector link (M) by removing cotter pin and connecting pin on operating cranks (Q). **Do not change length of the operating crank (Q).**
3. Open main interrupter blade assembly.
4. Remove the two bolts holding the jaw and arc chute assembly to the insulator. See assembly drawing, figure 2.
5. Reassemble jaw and new arc chute assembly, and tighten mounting bolts by hand until they are only finger tight.
6. Close main and interrupter blade assembly, aligning jaw with main blade and arc chute with interrupter blade. The arc chute must be in the extreme upper position to ensure the end of the interrupter blade does not strike the mounting bracket inside the chute. Tighten mounting screws securely once alignment is completed.
7. Open the switch blades by hand, grasping the main blades. The interrupter blade must remain in the arc chute until the interrupter blade end disengages from under the stationary contacts in the arc chute, allowing the interrupter blade to spring outward.
8. Reconnect the insulating connector link assembly, disconnected in step 2 above, with the switch in the closed position.
9. If the length of the operating crank has not been changed, there should not be any adjustment required. Before operating the switch, grasp the main blades making sure there is a slight amount of play such that the main blades can be moved without the spacer between the main blades hitting the jaw. This spacer should turn freely at all times with the switch closed. Overtravel of the main blades with the spacer hitting the jaw will result in insulator damage. Check that main blade travel is enough by ensuring there is a small amount of play in the interrupter blade with the interrupter blade seated in the arc chute. Adjust length of operating crank, if required, until both checks are satisfied.

MAIN AND INTERRUPTER BLADE ASSEMBLY

1. Switch must be open before removing any parts or assemblies.
2. Disconnect insulating connector link by removing cotter pin and connecting pin on main blade. **Do not change length of the operating crank (Q).**
3. Remove main and interrupter blade assembly by removing the hinge bolt "A." (See assembly sketch, figure 1).
4. Assemble main and interrupter blade assembly to hinge. Ensure the silver tungsten arcing tip on the interrupter blade faces the arc chute assembly. Tighten bolt "A" until the friction on the hinge is just enough to hold the blade in any position.

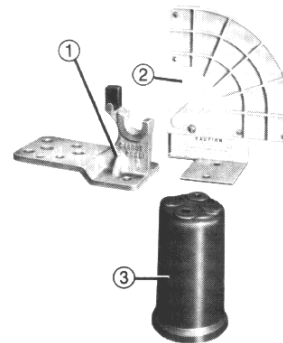


FIGURE 2 REPLACING ARC CHUTE ASSEMBLY

5. Close the main blade on the jaw. Tighten bolt "B" in figure 1 until a force required to disconnect blades (applied at bolt "B") is as follows:

	UPRIGHT SWITCH JAW	INVERTED SWITCH JAW (bottom)
40 kA	70 pounds	74 pounds
61 kA	90 pounds	94 pounds

6. Check alignment of the main blade with the jaw. The interrupter blade must be centered with the arc chute. The arc chute must be in the extreme upper position to ensure the end of the interrupter blade does not strike the mounting bracket inside the chute.
7. If alignment is necessary in step 6, loosen the jaw casting mounting bolts, align blades and retighten bolts.
8. Open switch blades by hand. The interrupter blade must remain in the arc chute until the interrupter blade end disengages from under the stationary contacts in the arc chute, allowing the blade to spring outward.
9. Reconnect the insulating connector link disconnected in step 2 with the switch in the closed position.
10. Grasp the main blades firmly and make sure there is a slight amount of play so the main blades can be moved without the spacer between the main blades hitting the jaw. This spacer should turn freely at all times with the switch closed. The insulating connector link is made to a predetermined length. However, manufacturing tolerances may require shortening the length slightly if the spacer does not turn freely and hits the jaw. Overtravel of the main blades, with the spacer hitting the jaw, will result in insulator damage. Check that main blade travel is enough by ensuring there is a small amount of play in the interrupter blade with the interrupter blade seated in the arc chute. Adjust length of operating crank if required until both checks are satisfied.



HVL Switches

INSTALLATION INSTRUCTIONS FOR REPLACEMENT PARTS

SWITCH JAW OR SWITCH HINGE CASTINGS

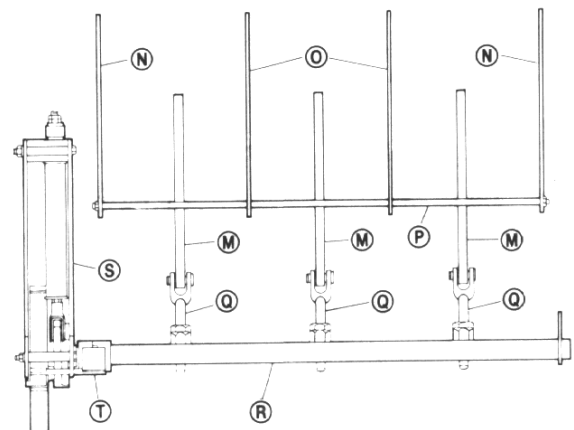
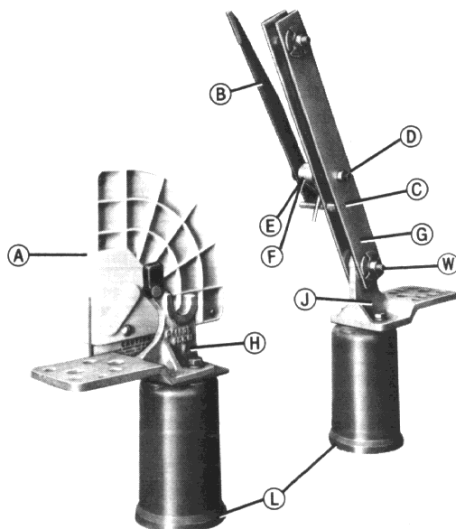
1. Start with the switch in the closed position.
2. Remove hinge bolt "W" and the hinge mounting bolts.
3. Remove and replace hinge being careful not to disturb the alignment.
4. Tighten hinge mounting bolts securely.
5. Tighten bolt "W" to produce some friction between main blades and hinge.
6. Replace jaw following same steps as for replacing arc chute assembly.
7. Before reassembling insulating line to main blade, check the friction on the hinge. It should be enough to hold the blade in any position.

INSULATING CONNECTOR LINK

1. Switch must be in closed position before removing any parts or assemblies.
2. Disconnect insulating link (M) by removing, bolt, spacer, and nut (at Q).
3. Using new insulator connector link, reassemble.
4. The insulating connector link is made to a predetermined length. Before operating the switch, grasp the main blades, making sure there is a slight amount of play such that the main blades can be moved without the spacer between the main blades hitting the jaw. This spacer should turn freely at all times with the switch closed. Overtravel of the main blades with the spacer hitting the jaw will result in insulator damage. Check that main blade travel is enough by ensuring there is a small amount of play in the interrupter blade with the interrupter blade seated in the arc chute. Adjust length of operating link/toggle if required until both checks are satisfied.

INSULATORS

Replacement of insulators (L) under the jaw or hinge support of the main interrupter blade requires checking of main and interrupter blade alignment as described under Main and Interrupter Blade Assembly replacement instructions.





SQUARE D COMPANY
330 WEAKLEY RD
SMYRNA, TN. 37167

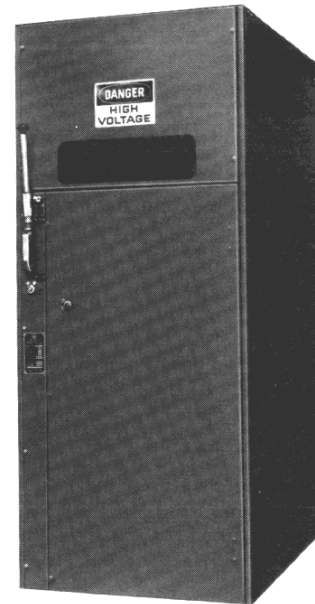
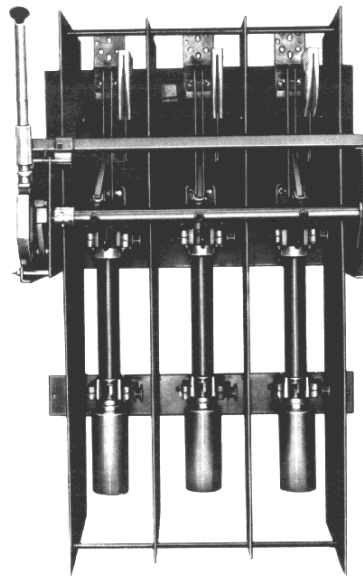
REF # HVL-89-1
DATE: 3/91

SUGGESTED SPARE PARTS LIST FOR HVL SWITCHGEAR
SERVICE BULLETIN 9840-2

ITEM # ON PUBLISHED LIST	PART NAME	5 & 15 kV SQUARE D PART #	25.8 kV SQUARE D PART #	38.0 kV SQUARE D PART #
A	ARC CHUTE ASSEMBLY	44035-198-50	44035-198-50	44035-198-50
B	ARC BLADE	44035-199-50	44035-199-50	44035-199-50
C	STOP PIN	44035-207-01	44035-207-01	44035-207-01
D	BOLT NUT	80025-005-01 23201-20250	80025-005-01 23201-20250	80025-005-01 23201-20250
E	SPACER	44035-002-01	44035-002-01	44035-002-01
F	SPRING	44035-216-01	44035-216-01	44035-216-01
G	** BLADE (1200A)	44035-204-01	44035-808-01	—
	** BLADE (600A)	44035-203-01	44035-807-01	44035-806-01
H	SWITCH JAW (1200A)	44035-001-02	44035-001-01	—
	(600A)	44035-001-01	44035-001-01	44035-001-01
J	HINGE TERMINAL (1200 A)	44035-202-02	44035-202-01	—
	(600 A)	44035-202-01	44035-202-01	44035-202-01
L	INSULATOR 15 kV (GP)	29903-01930	—	—
	15 kV (POR)	80029-002-03	—	—
	25.8/38 kV (POR)	—	29903-01996	29903-01996
M	CONNECTOR LINK	44035-208-01	44035-208-02	44035-208-05
Q	COTTER KEY	24201-06240	24201-06240	24201-05240
	NUT	23304-03200	23304-03200	23304-03200
	PIN	80026-012-03	80026-012-02	80026-012-02
	YOKE FORGING	44036-008-01	44036-008-01	44036-008-01
R	SHAFT ASS'Y. 5/15 kV, 1200 A (UPRIGHT)	44035-254-51	—	—
	5/15 kV, 1200 A (INVERTED)	44035-266-51	—	—
	5/15 kV, 600 A (UPRIGHT)	44035-196-51	—	—
	5/15 kV, 600 A (INVERTED)	44035-197-51	—	—
	25.8 kV, 1200 A	—	44035-201-50	—
	25.8 kV, 600 A	—	44035-201-50	—
	** 38 kV, 600 A	—	—	44035-201-51
S	MECHANISM 5/15 kV, 1200 A	44035-248-(52,53, 55, 57)	—	—
	5/15 kV, 600 A	44035-191-(52, 53)	—	—
	25.8 kV	—	44035-635-50	—
	38 kV	—	—	44035-635-51
T	INTERLOCK PIVOT ASS'Y	44036-161-50	44036-161-50	44036-161-50
N/A	HEATER, 1000W.	80031-030-01	80031-030-01	80031-030-01
	NO-OXIDE GREASE	MOBILUX EP1	MOBILUX EP1	MOBILUX EP1
	OPERATOR CRANK	44035-145-01	44035-145-01	44035-145-01
	SWITCH HANDLE (CENTER KNOB)	80026-001-50	80026-001-50	80026-001-50
	(SIDE KNOB)	80026-001-51	80026-001-51	80026-001-51
NOP	*BARRIER ASSEMBLIES	80024-101-(50, 51, 55, 56)	44035-629-(50, 51, 54)	44035-629-(52, 53)

* Shipped disassembled. Designate length or barrier group number.

** Continuous current rating



POWER-ZONE[®] HVL

Load Interrupter Switchgear

Voltage Ratings 5kV to 38kV

CONTENTS

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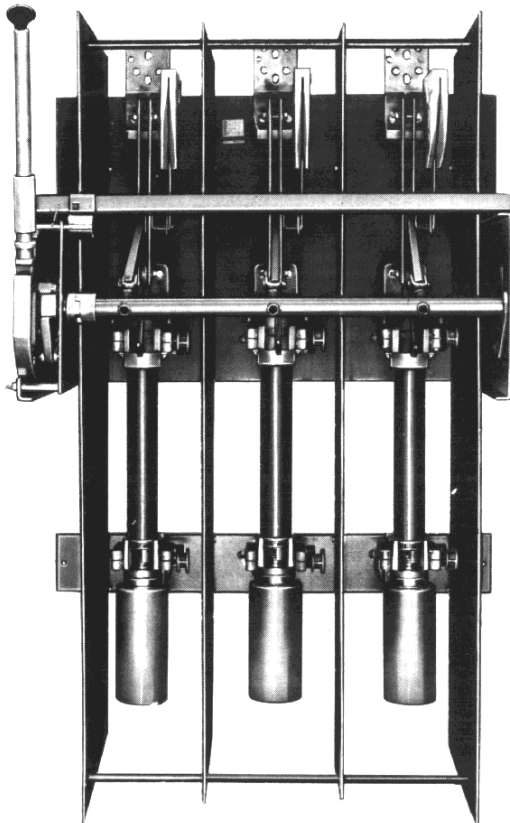
SQUARE D COMPANY

Dedicated to Growth • Committed to Quality

POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

 CLASS
6040

APPLICATION DATA



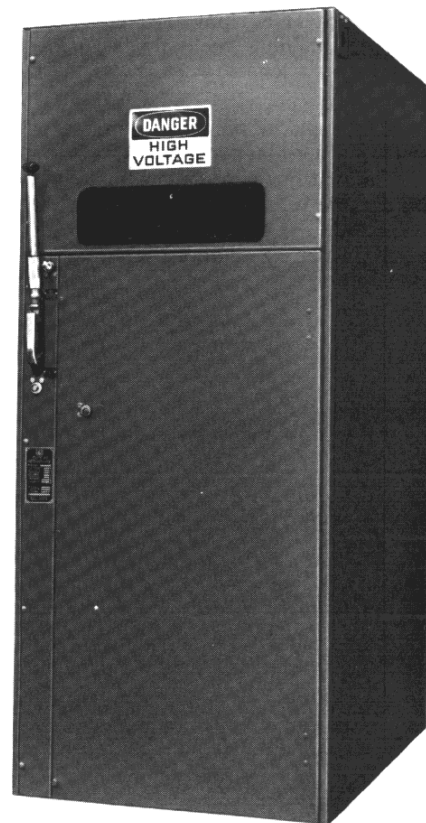
Square D Type HVL Interrupter Switch
With Boric Acid Type Fuses

- 5 to 38 KV
- 400, 600 and 1200 amperes
- 2 and 3 Pole
- Single Throw and Duplex Arrangements

GENERAL

Better system performance and reliability, lower electrical power cost, easier system expansion, and reduced equipment expense are advantages commanding serious attention to 2400 volt to 38000 volt power distribution in electrical system planning.

Square D Power-Zone Load Interrupter Switchgear functions as a prime component of these systems providing



4.16 KV Single Bay Switchgear Unit

- Fused and Not-fusible
- Indoor and Weatherproof
- Single Switch Bay
- Multiple Bay Line-up
- Primary Metering Bay

necessary switching and overcurrent protection for the high-voltage feeders. It is often used in conjunction with Square D unit substations. The switchgear is most frequently applied as service entrance equipment, although it performs equally well in controlling substation transformers and in sectionalizing high-voltage feeder systems.



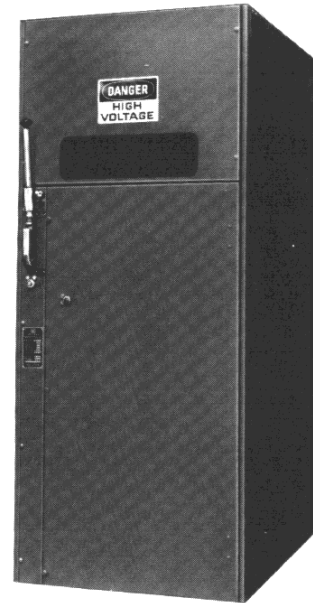
POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

MAY, 1988

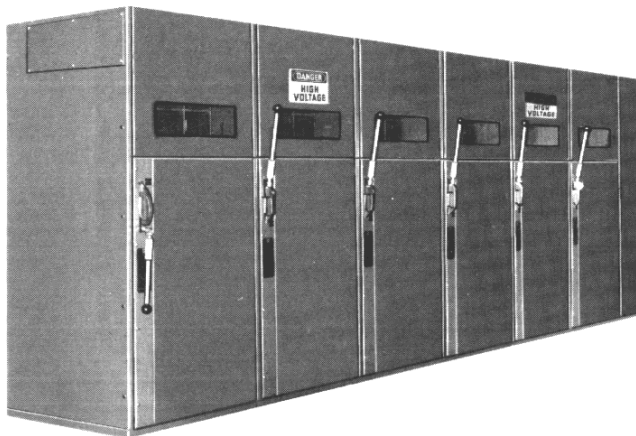
APPLICATION DATA TYPE OF EQUIPMENT AVAILABLE INDOOR AND WEATHERPROOF

Single Bay Switchgear equipment contains a single fused switch in a free standing enclosure. It is ideally suited for locating close to a load to control a single high-voltage circuit.

Special emphasis is placed on conduit area, cable entrance, cable supports and terminations. Normally, no main bus is furnished. A ground bus bonded to the steel frame is furnished with a cable lug termination. Where future expansion is anticipated, the unit can be furnished with main bus provisions to permit additional bays to be connected when needed.



Single Bay Switchgear Unit



Multiple Bay Indoor Load Interrupter Switchgear

Multiple Bay Switchgear generally consists of a lineup of individual feeder switch bays connected to a common main bus. A main switch, fused or not fused, can be included in the lineup with a utility or user metering cubicle depending on job requirements. A continuous ground bus is bonded to the frame of each bay for the complete length of the lineup. The end cubicle can be furnished with provisions for the addition of future feeder switch bays.

Outdoor single switch or multiple bay switchgear consists of high-voltage components in a completely weatherproof enclosure. Access is through a gasketed front bulkhead type door. The enclosure is designed so that the sheared edges of the steel are not exposed. The equipment is furnished with a welded commercial steel channel base and special weatherproof paint finish.



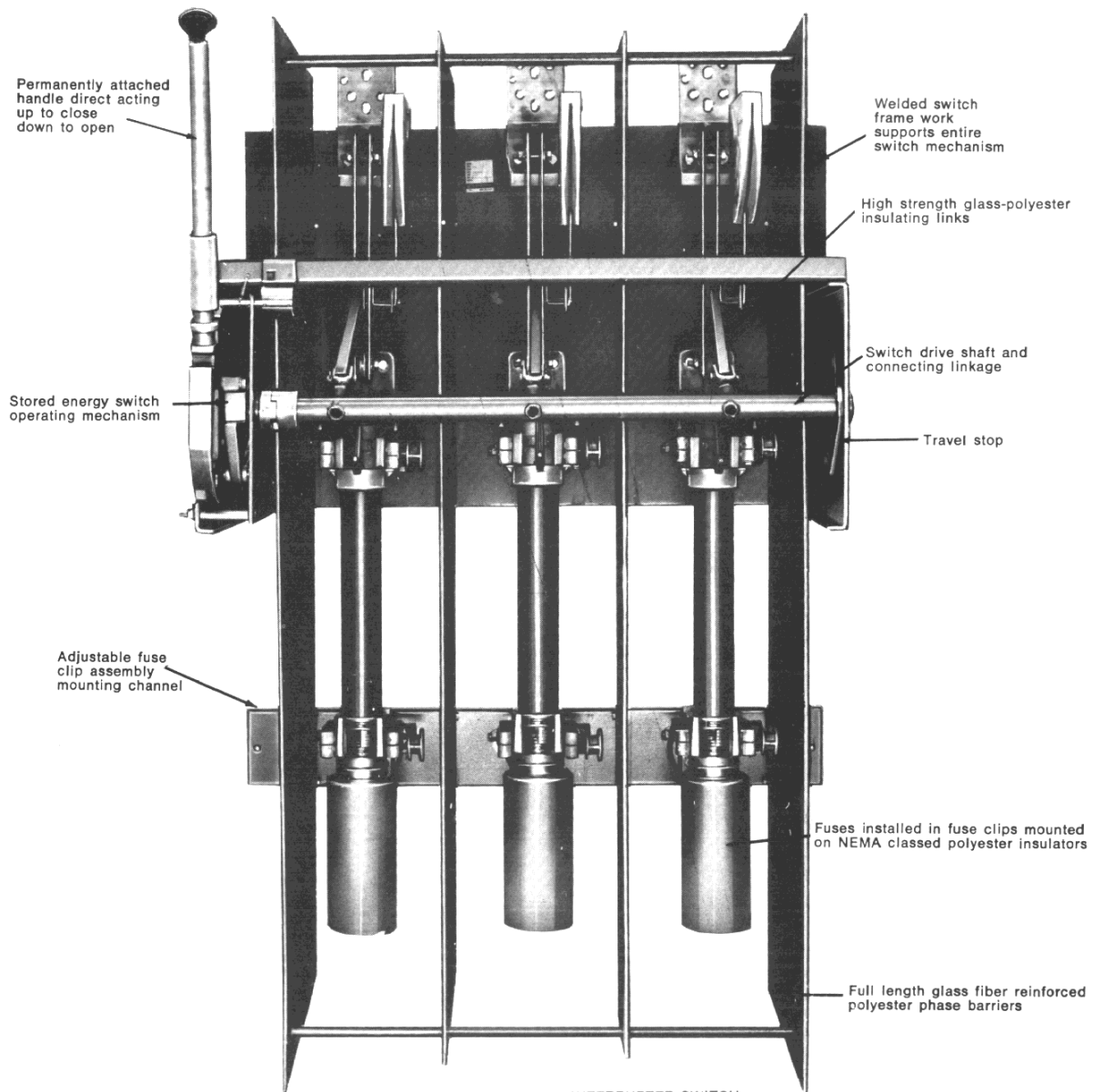
Outdoor Multiple Bay Load Interrupter Switchgear



POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

CLASS
6040

APPLICATION DATA



SQUARE D TYPE HVL LOAD INTERRUPTER SWITCH
WITH BORIC ACID TYPE FUSES

15 & 25 kV

- 5 kV–60 kV BIL
- 15 kV–95 kV BIL
- 25.8 kV–125 kV BIL
- 38 kV–150 kV BIL
- 600 Amperes
 - 40,000 Amperes Momentary Rating
 - 25,000 Amperes Short-Time Rating
- 1200 Amperes
 - 61,000 Amperes Momentary Rating
 - 38,000 Amperes Short-Time Rating (15 kV)
 - 25,000 Amperes Short-Time Rating (25 kV)

38 kV

- 600 Amperes
 - 28,000 Amperes Momentary Rating
 - 20,000 A Short-Time Rating



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POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

MAY, 1988
Rev. 3/91

APPLICATION DATA

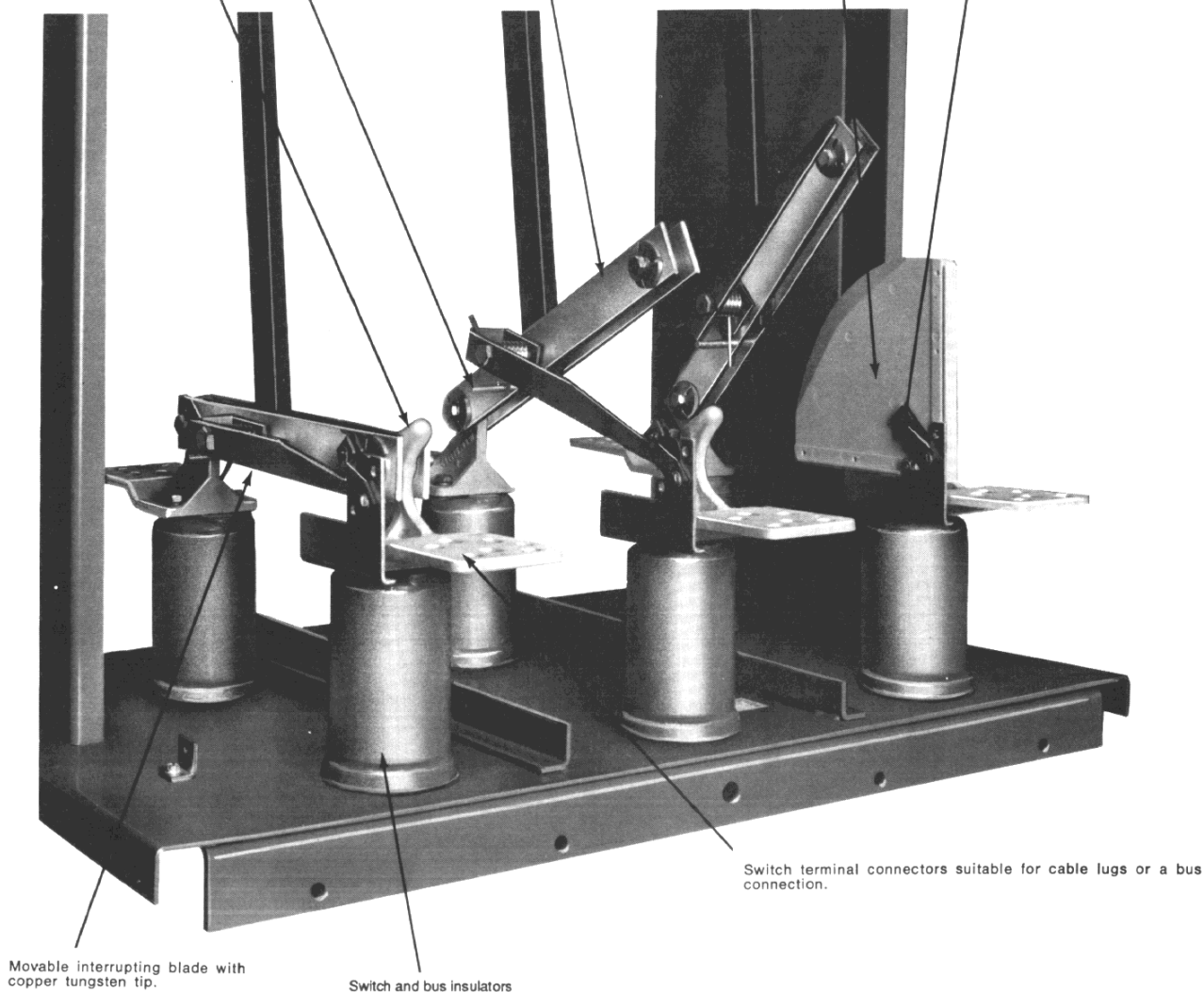
Limit stop to insure proper contact latch.

Stationary switch main contact with arcing tip which endures the closing arc.

Main movable contact consists of two silvered copper blades. Closing, arc occurs at the blade ends—not in the main contact area.

Arc chutes of special gas evolving plastic material for extinguishing the arc.

Copper tungsten tipped stationary interrupting contacts. Heat-resistant cantilever springs constantly maintain correct contact pressure.



HVL SWITCH AS VIEWED LESS INTER-PHASE BARRIERS & COMPLETED ARC CHUTE ASSEMBLIES



POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

CLASS
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APPLICATION DATA

SEQUENCE OF OPERATION—OPENING THE SWITCH

In the closed position (figure 1), the main switch blade is engaged on the stationary interrupting contacts. The circuit current flows through the main blades.

As the switch operating handle is moved towards the open position, the stored energy springs are charged. After the springs become fully charged, they toggle over the dead center position, discharging force to the switch operating mechanism.

The action of the switch operating mechanism forces the movable main blade off the stationary main contacts, without arcing, while the interrupting contacts are held closed, momentarily carrying all the current. Once the main contacts have separated well beyond arc striking distance (figure 2), the interrupting blade contact, held captive, has charged the interrupter blade spring. The interrupter blade end moves to disengage from under the stationary interrupter contacts in the arc chute and the interrupter blade moves to the "open" position.

The resulting arc, drawn between the stationary and movable interrupting contacts, is elongated and cooled as the plastic arc chute absorbs heat and generates an arc extinguishing gas to break up and blow out the arc. The combination of arc stretching, arc cooling, and extinguishing gas causes a quick interruption with only minor erosion of the contacts and arc chutes.

The movable main and interrupting contacts (figure 3), continue to the fully-open position and are maintained there by spring pressure.

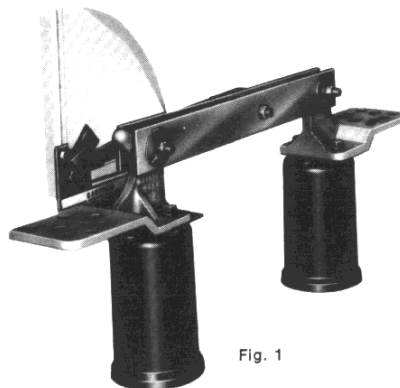


Fig. 1



Fig. 2

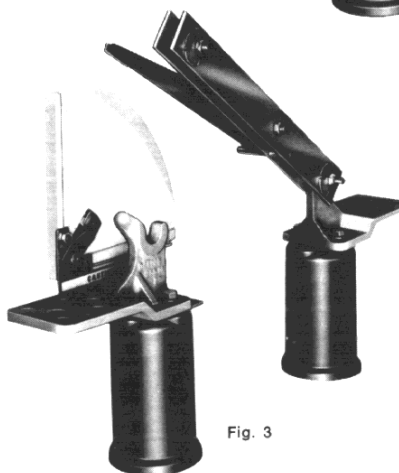


Fig. 3



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POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

MAY, 1988
Rev. 3/91

APPLICATION DATA

SEQUENCE OF OPERATION—CLOSING THE SWITCH

When the switch operating handle is moved towards the closed position, the stored energy springs are being charged and the main blades begin to move.

As the main and interrupter blades approach the arc chute, the stored energy springs become fully charged and toggle over the dead center position (figure 4). When the main and movable blades approach the main stationary contacts, a high-voltage arc leaps across the diminishing air gap attempting to complete the circuit. The arc occurs between the tip of the stationary main contacts and a remote corner of the movable main blades. This arc is short and brief since the fast closing blades minimize the arcing time.

Spring pressure and the momentum of the fast moving main blades completely close the contacts (figure 5). The force is great enough to cause the contacts to close even against repelling short circuit magnetic forces if a fault exists. At the same time, the interrupter blade tip is driven through the twin stationary interrupting contacts, definitely latching and preparing them for an interrupting operation when the switch is opened.



Fig. 4



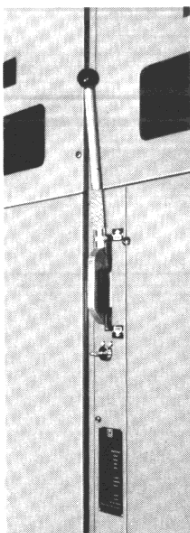
Fig. 5



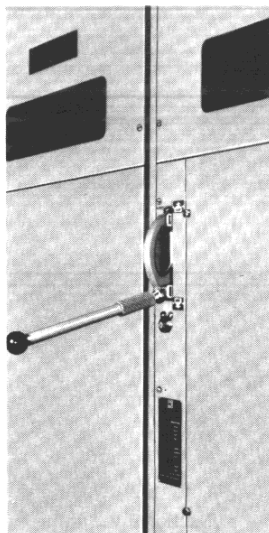
POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

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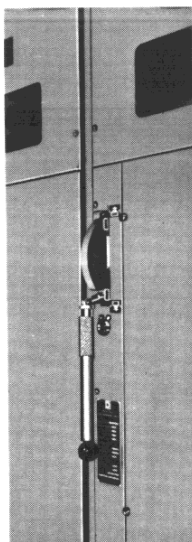
APPLICATION DATA



CLOSED

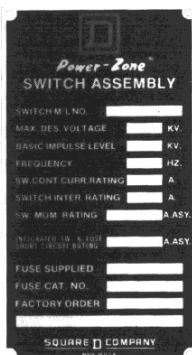


OPEN

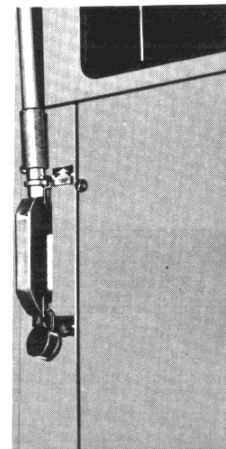
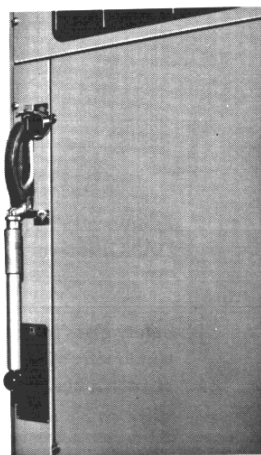


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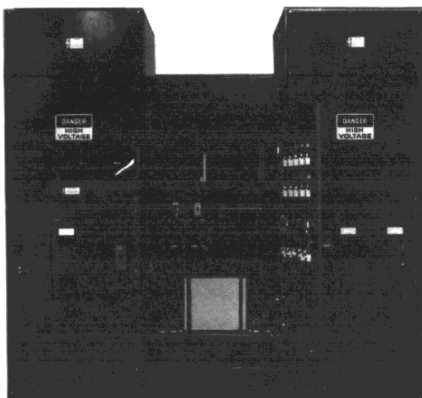
- Permanently mounted switch handle ready for immediate use. Handle gives positive indication of the switch position (up - closed; down - open). The spring-loaded sleeve permits the handle to fold down when the switch is in the open position.



- Switch nameplate prominently lists performance ratings, fuse supplied and equipment identification.



- Provisions for padlocking in the open and closed position.



- Motor operated HVL switches are available for applications requiring remote operation. Used in conjunction with Symax Programmable Controllers, motor operated switches may be used in automatic transfer applications.



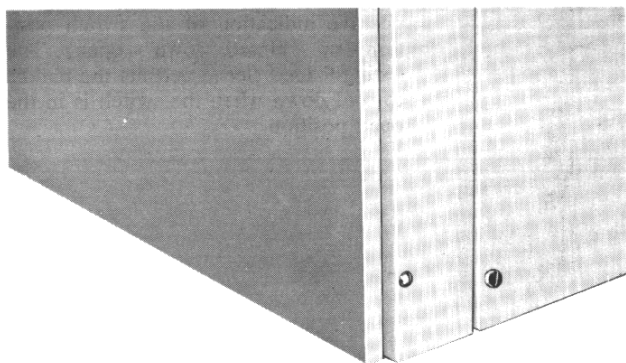
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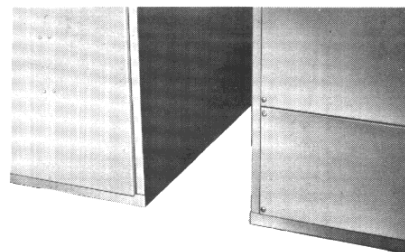
POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

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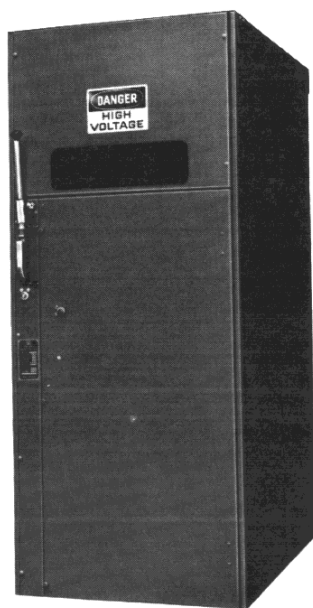
APPLICATION DATA CONSTRUCTION FEATURES OF INDOOR EQUIPMENT



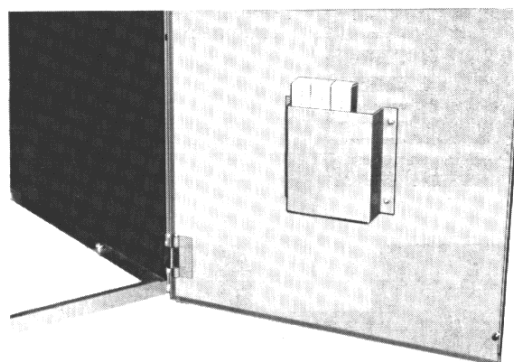
- Strong code-gauge steel enclosure completely grounded



- Sectionalized shipment when required



- Prominently displayed DANGER sign.
- Safety glass inspection window for visual assurance of switch blade position



- Spare fuse holder available when required.

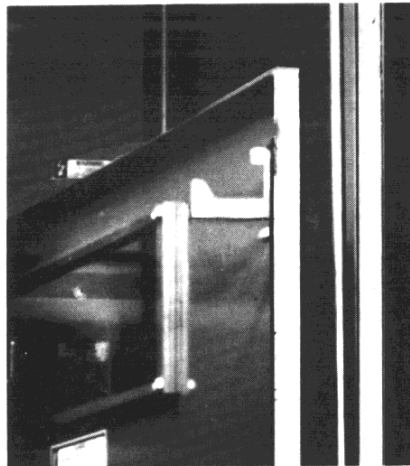
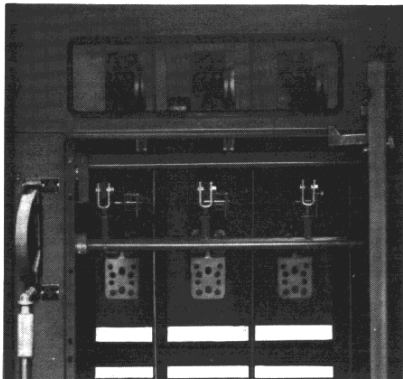
- Screw removable front, top, and rear closure plates



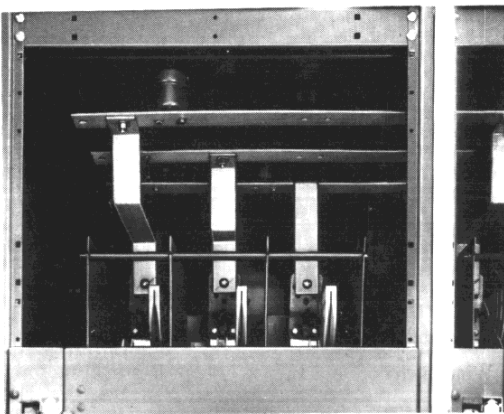
POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

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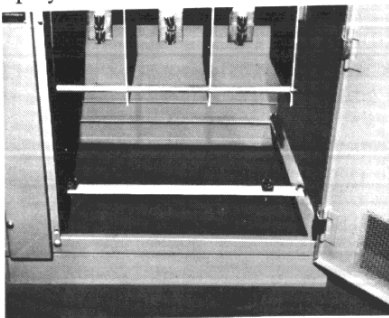
APPLICATION DATA CONSTRUCTION FEATURES OF INDOOR EQUIPMENT



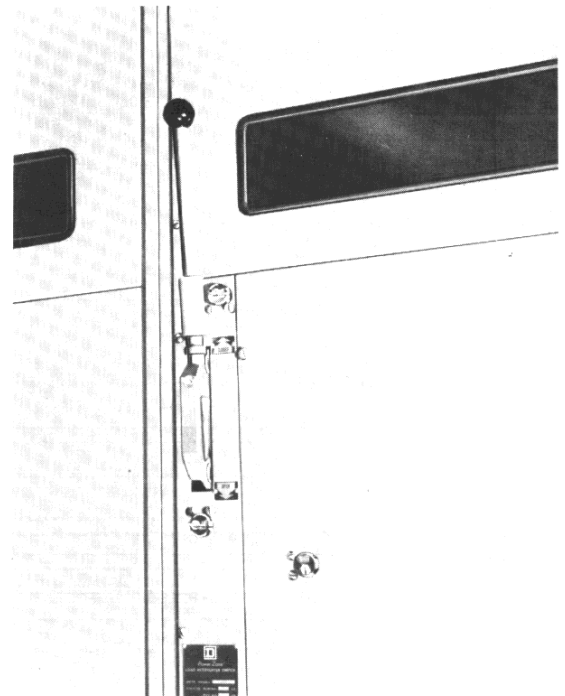
- Mechanically interlocked fuse access door permitting entry to fuses only when switch is open and the fuses de-energized.



- Plated main cross-over bus supported on NEMA classed polyester insulators.



- Plated ground bus bonded to equipment frame.



- Key interlocking available when required.



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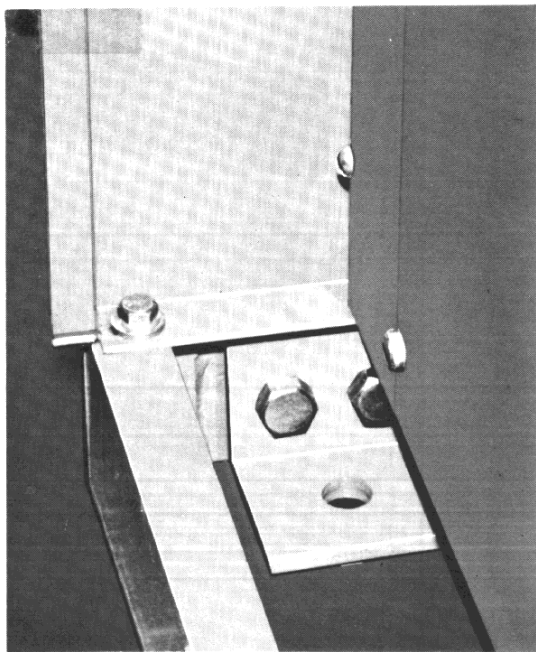
POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

MAY, 1988
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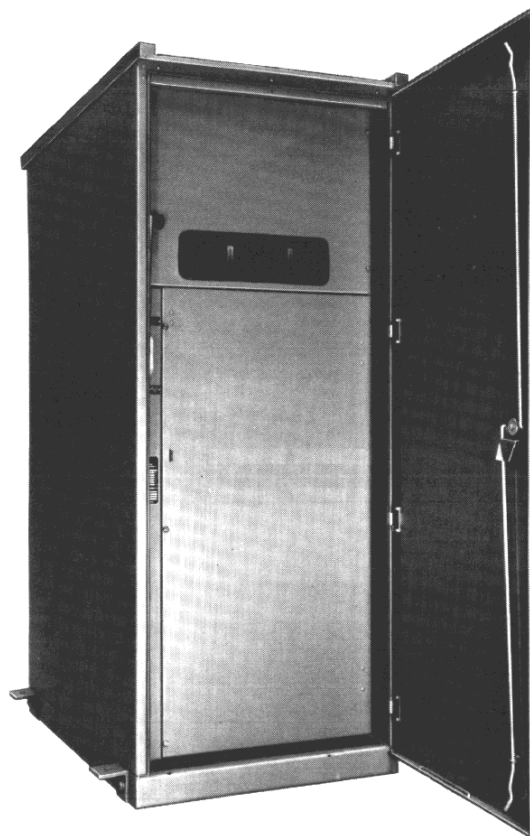
APPLICATION DATA CONSTRUCTION FEATURES OF OUTDOOR EQUIPMENT

In addition to the construction features of the indoor equipment, the following outdoor features are furnished:

- Roof sloped to rear for precipitation run-off.
- Enclosed operating handle prohibits tampering and vandalism.
- Front bulkhead door with 3-point latch and vault-type handle with provisions for padlocking.
- Non-rusting aluminum alloy bolts.
- Easily removable flanged full height rear panel.



- Combination lifting and anchoring bracket.



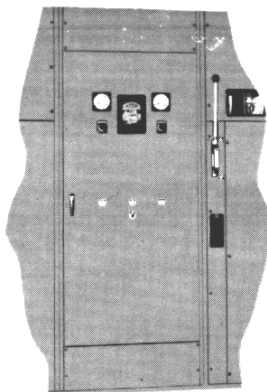
- Structural steel welded base.
- Wind latch door bracket.
- Space heaters.



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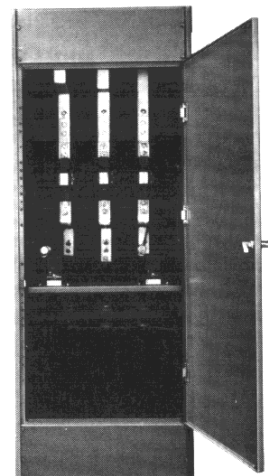
APPLICATION DATA ADDITIONAL COMPONENTS



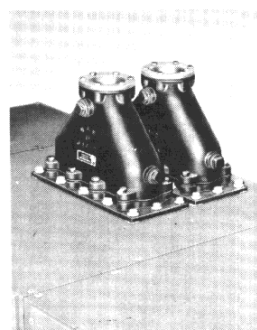
User Metering

Metering bays for user or power company equipment are available. They may be supplied fully equipped with necessary current transformers, potential transformers, meters, and associated devices or with provisions for installing power company components at the job site.

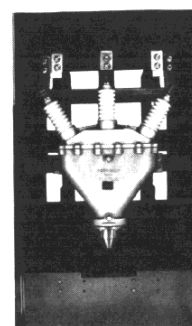
Standardized metering bays match the adjacent switchgear and incorporate all the special requirements of the power company.



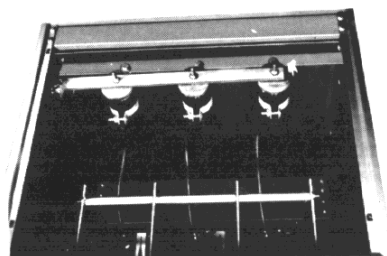
Potheads are available for all types of single or multiple conductor cable. They may be supplied for top or bottom cable entrance to interrupter switches, fuses and main bus. While potheads are a more expensive and time consuming termination and often necessitate larger equipment enclosures they are nevertheless desirable in many applications. Cable manufacturers' recommendations should guide the decision as to whether they should be used.



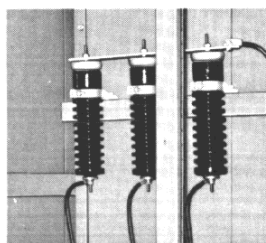
Flange Mounted



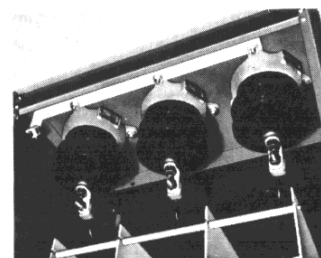
Internally Mounted



Distribution Class



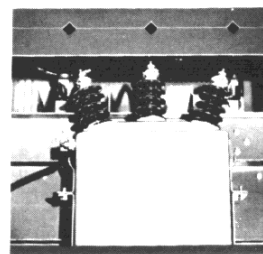
Intermediate Class



Station Class

Lightning arresters are available to protect the equipment and cable from high-voltage lightning and switching surges. Distribution type arresters are usually adequate, but larger more expensive station type arresters can be provided if desired. Surge capacitors also may be supplied with the lightning arresters to offer additional protection. Due to the peculiar nature of voltage surges, one set of lightning arresters often will not protect the entire system. It is usually desirable to place a set of lightning arresters near the terminals of all major equipment on the high-voltage system.

Surge Capacitor



POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

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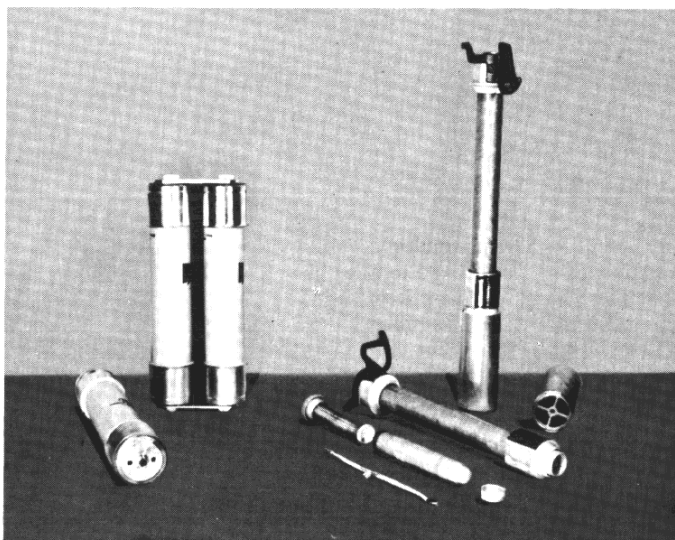
APPLICATION DATA

HIGH VOLTAGE FUSES

Fuses are usually used in conjunction with the high-voltage switch to provide overcurrent protection. They are normally mounted vertically below the switch to prevent the possibility of their falling into the mechanism during replacement; and when an inverted arrangement with fuses above is required, barriers provide the same safety. Unless user job requirements demand otherwise, fuses are always connected to the load-side of the switch and are de-energized when the switch is open. When mounted in the switchgear, the fuses are visible and readily accessible through an interlocked door, and are easily removed by

hand or with fuse handling tools. Fuses also may be supplied without an associated switch when the application requires, and special construction can be employed when unusual switch and fuse arrangements are necessary.

Current limiting fuses or boric acid type fuses can be provided in Square D high-voltage switchgear. These provide short-circuit interrupting protection as great as the short-circuit rating of the equipment, and regular overload protection in accordance with their nominal current ratings and characteristic curves.



CURRENT LIMITING FUSES:

- Fast-acting to limit available fault current stresses on the system
- Silent operation
- Completely factory assembled and sealed for consistent characteristics
- High-interrupting capacity
- Positive indication of blown fuse

BORIC ACID FUSES:

- Low cost refill units
- Available for high "E" ratings
- Silencer and snuffler type
- Discharge and condenser type

COMPLETE INTEGRATED EQUIPMENT RATINGS

High-voltage load interrupter switchgear is an integrated assembly of many components properly selected and coordinated to provide safe reliable operation of the over-all equipment. Each component has its own ratings defined by its own industry development standards. In the past, these individual component ratings have been emphasized since they are often quite impressive though often irrelevant to the component's specific application. The result has often been confusion and a shifting of the burden for analysis, selection and coordination of specific components from

the equipment manufacturer to the purchaser who would rather evaluate over-all equipment performance. Integrated ratings of the complete equipment are the natural solution and Square D switchgear is rated in this manner. These integral equipment ratings are readily comparable with the anticipated voltage, short-circuit and continuous current values obtained when designing a distribution system. Major ratings of complete Square D switchgear are arranged in the Switchgear Rating and Selection Table A for convenient equipment use.



POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

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 RATINGS & SELECTION
TABLE A

Current limiting type fuses are listed first to accentuate their application. They offer the maximum short circuit rating and are most economical in the majority of "E" ratings in which they are available in addition to the previously listed features.

Fuses supplied provide the following conditions when properly selected.

1. Fuse interrupting capacity will be in accordance with the integrated equipment short-circuit current rating.
2. Fuse continuous current "E" rating will be as required up to the maximum continuous current rating of the fuse.
3. Most applications seem to favor fast acting current limiting fuses. These fuses limit the let through current

and minimize the short circuit damage to a system. The fuses, completely factory assembled and sealed, exclude any dust or foreign material, and operate without any noise, pressure or expulsion of gas, flame and extinguishing material, even at maximum capacity.

Boric acid fuses employ the use of refill units for replacement in the holder. These fuses can expel gas and flame, and develop pressure within the enclosure during an interruption.

FUSE RATINGS

"E" rated fuses function as follows:

100E or less—must open in 300 seconds (5 minutes) on 200-240% of E (ampere) rating.

Over 100E—must open in 600 seconds (10 minutes) on 220-264% of E (ampere) rating.

"X" ratings define fuses where:

1. The minimum melting current is from two to three times the full load current.
2. The temperature rise on the plated, copper fuse ferrules may exceed recommended ANSI and IEC standards under full load conditions.

INTEGRATED INTERRUPTING (SWITCH AND FUSE) AND MAXIMUM CONTINUOUS RATINGS (FUSES)												
CURRENT LIMITING FUSES (CLF)								BORIC ACID FUSES (BAF)				
Manufacturer	GOULD SHAWMUT		GE	WESTINGHOUSE				WESTINGHOUSE			S&C	
System Voltage (kV)	CS-3	CS-4	EJO-1	CLE-1	CLE-2	CLE-3	CLE-750	RBA-200 with Discharge Filter	RBA-400 with Discharge Filter	RBA-800 with Discharge Filter	SM-4Z	SM-5S
2.4	100000A 259MVA 450E	Not Available	80000A 207MVA 450E	80000A 207MVA 225E	80000A 207MVA 450X	Not Available	64000A 166MVA 750E	30000A 77MVA 200E	40000A 103MVA 400E	40000A 103MVA 720E	27500A 71MVA 200E	40000A 103MVA 400E
4.16	100000A 450MVA 450E	Not Available	80000A 360MVA 450E	80000A 360MVA 225E	64000A 360MVA 450X	Not Available	64000A 288MVA 750E	30000A 135MVA 200E	40000A 180MVA 400E	40000A 180MVA 720E	27500A 123MVA 200E	40000A 180MVA 400E
4.8	100000A 519MVA 450E	Not Available	80000A 415MVA 450E	80000A 415MVA 225E	64000A 415MVA 450X	Not Available	64000A 332MVA 750E	30000A 155MVA 200E	40000A 207MVA 400E	40000A 207MVA 720E	27500A 142MVA 200E	40000A 207MVA 400E
7.2	80000A 519MVA 200E	Not Available	80000A 623MVA 250E	80000A 623MVA 125E	80000A 623MVA 200E	Not Available	Not Available	23000A 179MVA 200E	40000A 311MVA 400E	40000A 311MVA 720E	20000A 155MVA 200E	40000A 311MVA 400E
12.0	Not Available	65000A 844MVA 200E	80000A 1039MVA 200E	135000A 1753MVA 65E	135000A 1753MVA 125X	80000A 1039MVA 200X	Not Available	23000A 298MVA 200E	40000A 519MVA 400E	40000A 519MVA 720E	20000A 259MVA 200E	40000A 519MVA 400E
12.47	Not Available	65000A 877MVA 200E	80000A 1079MVA 200E	135000A 1822MVA 65E	135000A 1822MVA 125X	80000A 1079MVA 200X	Not Available	23000A 310MVA 200E	40000A 539MVA 400E	40000A 539MVA 720E	20000A 269MVA 200E	40000A 539MVA 400E
13.2	Not Available	65000A 928MVA 200E	80000A 1143MVA 200E	135000A 1929MVA 65E	135000A 1929MVA 125X	80000A 1143MVA 200X	Not Available	23000A 328MVA 200E	40000A 571MVA 400E	40000A 571MVA 720E	20000A 285MVA 200E	40000A 571MVA 400E
13.8	Not Available	65000A 971MVA 200E	80000A 1195MVA 200E	135000A 2016MVA 65E	135000A 2016MVA 125X	80000A 1195MVA 200X	Not Available	23000A 343MVA 200E	40000A 597MVA 400E	40000A 597MVA 720E	20000A 298MVA 200E	40000A 597MVA 400E
22.9	Not Available	Not Available	40000A 991MVA 100E	Not Available	Not Available	Not Available	Not Available	16800A 416MVA 200E	28000A 694MVA 300E	Not Available	15000A 371MVA 200E	28000A 694MVA 300E
26.4	Not Available	Not Available	20000A 571MVA 80E	Not Available	Not Available	Not Available	Not Available	11100A 317MVA 200E	26800A 765MVA 300E	Not Available	15000A 429MVA 200E	28000A 800MVA 300E
34.5	Not Available	Not Available	20000A 746MVA 80E	Not Available	Not Available	Not Available	Not Available	11100A 414MVA 200E	20000A 746MVA 300E	Not Available	10000A 373MVA 200E	20000A 746MVA 300E

NOTE: Current ratings are asymmetrical rms current (1.6 symmetrical) at system voltage. MVA ratings are symmetrical at system voltage.

$$\text{Sym. Amps} = \text{Asym. Amps} \div 1.6 \text{ Nominal } 3\frac{1}{2} \text{ MVA sym.} = \text{System Voltage, kV} \times \frac{\text{Sym. amps} \times \sqrt{3}}{1000}$$



SQUARE D COMPANY

**POWER-ZONE® HVL
LOAD INTERRUPTER SWITCHGEAR**

MAY, 1988

SUPPLEMENTAL RATINGS

A	Switch (kV)	5		15		25.8		29		38
	B.I.L. (kV)	60		95		125		125		150
	Frequency (Hertz)	50/60		50/60		50/60		50/60		50/60
	Withstand (kV)	19		36		60		60		80
	Capacitor Switching (kVAR)	2400		2400		X		X		X
B	Fault Close (Amps ASYM)	40,000	61,000	40,000	61,000	28,000	28,000	28,000	28,000	20,000
	Momentary Current (Amps ASYM)	61,000	61,000	61,000	61,000	40,000	61,000	40,000	61,000	40,000
	Short Time Current (Amps)	25,000	38,000	25,000	38,000	25,000	25,000	25,000	25,000	25,000
C	Continuous Current (Amps)	600	1200	600	1200	600	1200	600	1200	600
	Interrupting Current (Amps)	600	1200	600	1200	600	1200	400	400	400

A. VOLTAGE

The nominal voltage rating is the rating most commonly used when describing and applying switchgear. Equipment is generally suitable for use on any system having a nominal voltage not exceeding the equipment design voltage. Nominal voltage ratings available are - 4,160 volts, 12,470 volts, 23,000 volts and 34,500 volts. These supplemental ratings indicate that the equipment can be operated at voltages up to the maximum design voltage, will withstand the 60 Hz. sustained voltage for one minute and not fail under the impulse (BIL) voltage applied in accordance with industry standards.

B. SHORT-CIRCUIT

Short-circuit rating denotes the maximum short-circuit current or KVA which the complete coordinated equipment can safely accommodate without impairing its performance. It is comparable with the available short-circuit MVA values derived in a systems short-circuit study. If the equipment short-circuit rating exceeds the system available short-circuit values, the switchgear may be safely applied. The short-circuit rating of unfused equipment is based on

the switch closing into and all the components withstanding the damaging effects of the short-circuit for 10 cycles. This is considered adequate time for any external over current protection on the system to function. Fuses interrupt fast to shorten the duration of the short-circuit, and thereby reduce the damaging magnetic and thermal effects. As a result, fused equipment will safely close into and withstand any current which the fuse can interrupt. The short-circuit rating of Square D fused equipment is therefore dependent upon the type of fuse selected.

C. CONTINUOUS CURRENT


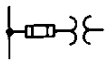





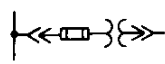











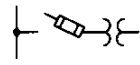





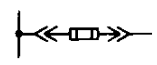









The over-all continuous current rating is determined by the component with the smallest capacity - bussing, switch, fuses, mountings, connections, etc. Unfused equipment is rated 600 or 1200 amperes. The continuous current rating of fused equipment is determined by the fuses since all other components have greater current capacities than the fuse. Available fuse sizes are listed in the rating and selection table A. The switchgear main bus feeding the circuit sections is 600 amperes unless 1200 amperes or 2000 ampere ratings are required.



POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

 CLASS
6040

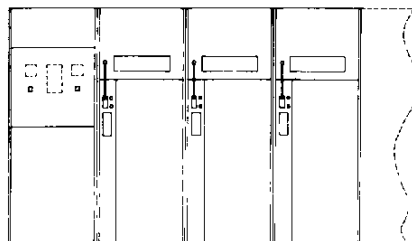
STANDARD SYMBOLS

	Upright HVL Switch (Manual Operated)		Fixed Mounted Potential Transformer With Primary Fuse		Surge Capacitor
	Inverted HVL Switch (Manual Operated)		Provisions For Fixed Mounted Potential Transformer		Lightning Arrestor
	Nondisconnect Type Fuse Assembly		Drawout Mounted Potential Transformer With Primary Fuse		Ammeter
	Disconnect Type Fuse Assembly		Provisions For Current Transformer		Voltmeter
	Mechanical Interlock		Bar-Type Current Transformer		Ammeter Selector Switch
	Key Interlock		Donut-Type Current Transformer		Voltmeter Selector Switch
	1-Double Clamping Lug/Phase		Control Power Transformer With Primary Fuses		Watt-hour Meter
	1-Compression Lug/Phase		Bus Shipping Split		Watt-hour Meter With Demand Attachment
	Provisions Only (1-NEMA 2 Hole Drilling) For 1-Double Clamping Lug/Phase		Drawout Mounted Primary Fuse		Power Factor Meter
	Provisions Only (1-NEMA 2 Hole Drilling) For 1-Compression Lug/Phase		1-3 Conductor Pothead		Varmeter
	Upright HVL Switch (Electrically Operated)		3-1 Conductor Pothead		Test Block
	Inverted HVL Switch (Electrically Operated)		Roof Bushing		

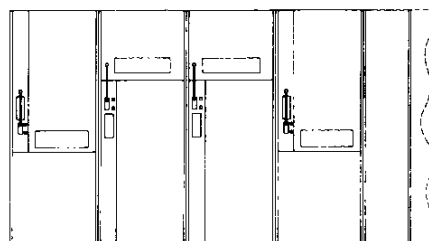
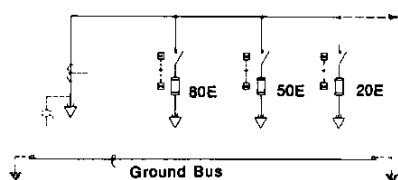
POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

MAY, 1988

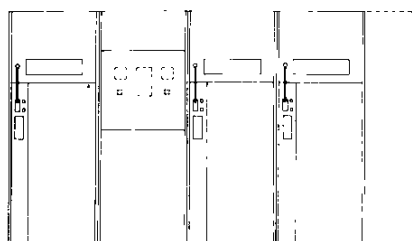
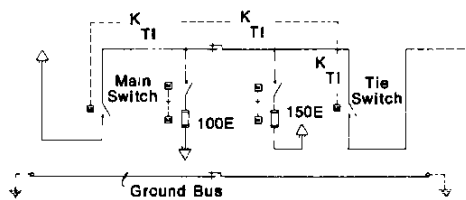
TYPICAL MULTIPLE BAY SWITCHGEAR ARRANGEMENTS



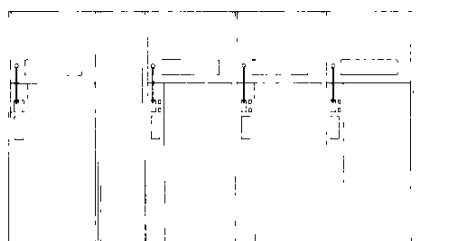
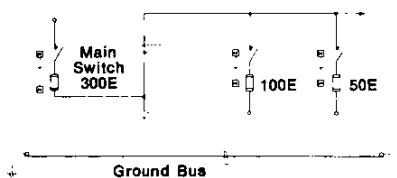
Future
Extension



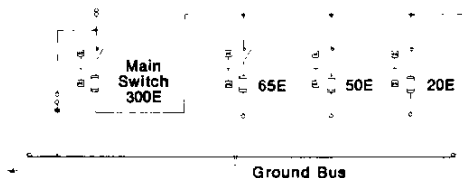
Future
Extension



Future
Extension



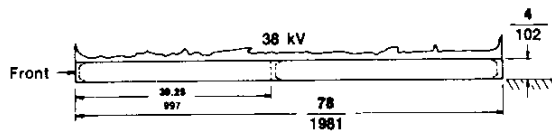
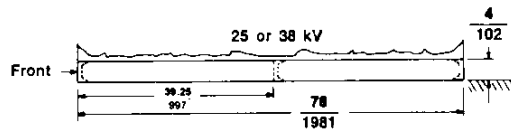
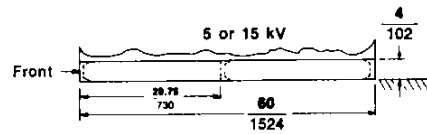
Future
Extension



POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR TYPICAL ARRANGEMENT OF BASE CHANNELS (SIDE VIEW)

CLASS
6040

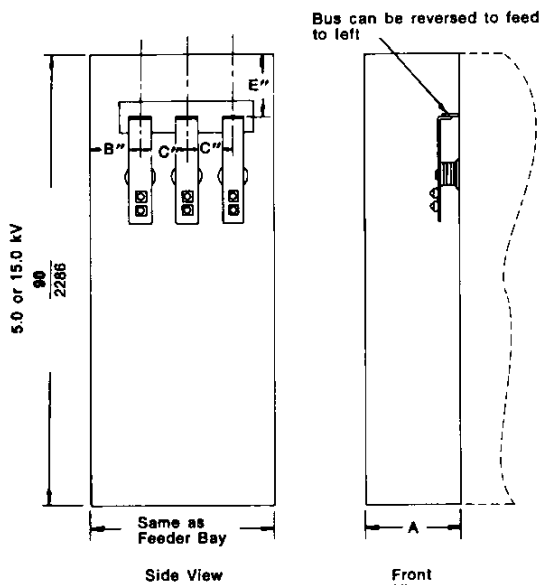
OUTDOOR
All Channels
2" x 4"



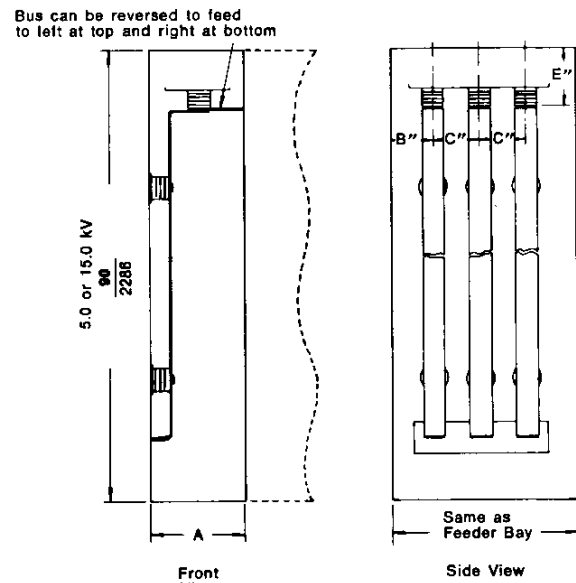
INCOMING LINE AND BUS BAR TRANSITION BAY DIMENSIONS

Equipment Nominal kV	A	B	C	E
5.0	$\frac{22}{559}$	$\frac{6.88}{175}$	$\frac{8.0}{203}$	$\frac{5.88}{149}$
15.0	$\frac{22}{559}$	$\frac{8.38}{213}$	$\frac{9.25}{235}$	$\frac{8.38}{213}$

INCOMING LINE BAY



BUS BAR TRANSITION BAY



INCHES
Millimeters Dual Dimensions



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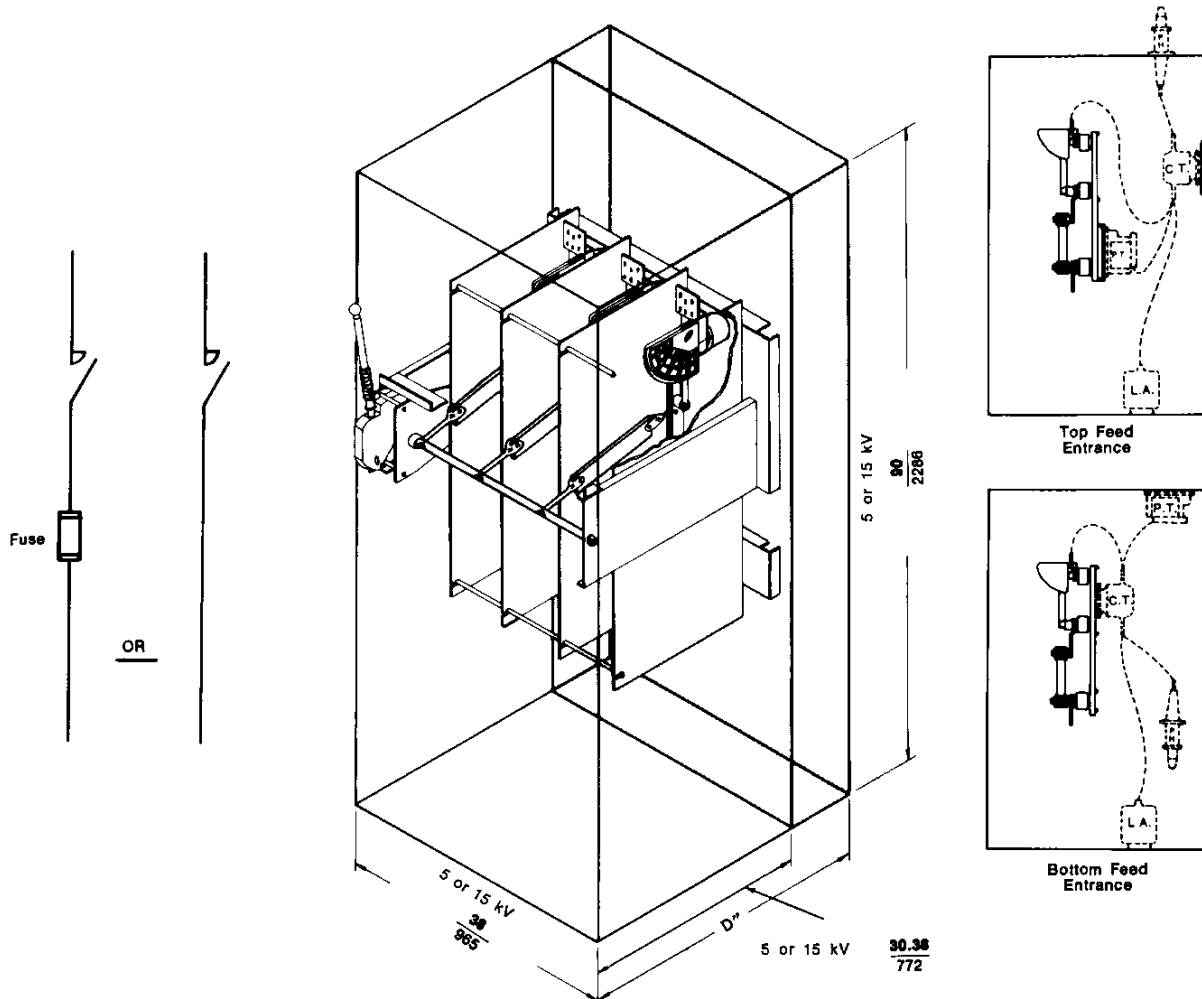
CLASS
6040

POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

MAY, 1988

MAIN SWITCH

5 OR 15 kV



OUTDOOR CONSTRUCTION: ADD $\frac{6.5}{165}$ TO THE TOTAL HEIGHT AND INCREASE THE BASE TO THE DEPTH DIMENSION OF $\frac{60}{1524}$

Approximate Shipping Weight Per Bay: Indoor — 1350 Lbs.
Outdoor — 1850 Lbs.

Dual Dimensions **INCHES**
Millimeters

DEPTH DIMENSION OF MAIN SWITCH BAY (INDOOR)

Type	Equip- ment Nominal kV	Cable Lugs Top or Bottom Entrance				Roof Bushings or Pothead Top Entrance				Pothead Bottom Entrance			
		Without CT's, PT's or L.A.	With L.A.	With CT's & PT's	With CT's, PT's & L.A.	Without CT's, PT's or L.A.	With L.A.	With CT's & PT's	With CT's, PT's & L.A.	Without CT's, PT's or L.A.	With L.A.	With CT's & PT's	With CT's, PT's & L.A.
		D	D	D	D	D	D	D	D	D	D	D	D
Fused or Unfused	5	$\frac{48}{1219}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{48}{1219}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{72^*}{1829}$
	15	$\frac{48}{1219}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{72^*}{1829}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{72^*}{1829}$	$\frac{72^*}{1829}$

*This arrangement consists of a full metering section mounted behind a standard switch. Instruments and instrument transformers to be selected by factory.
Note—If switch is unfused, current transformers can be mounted directly above the switch and be front accessible.

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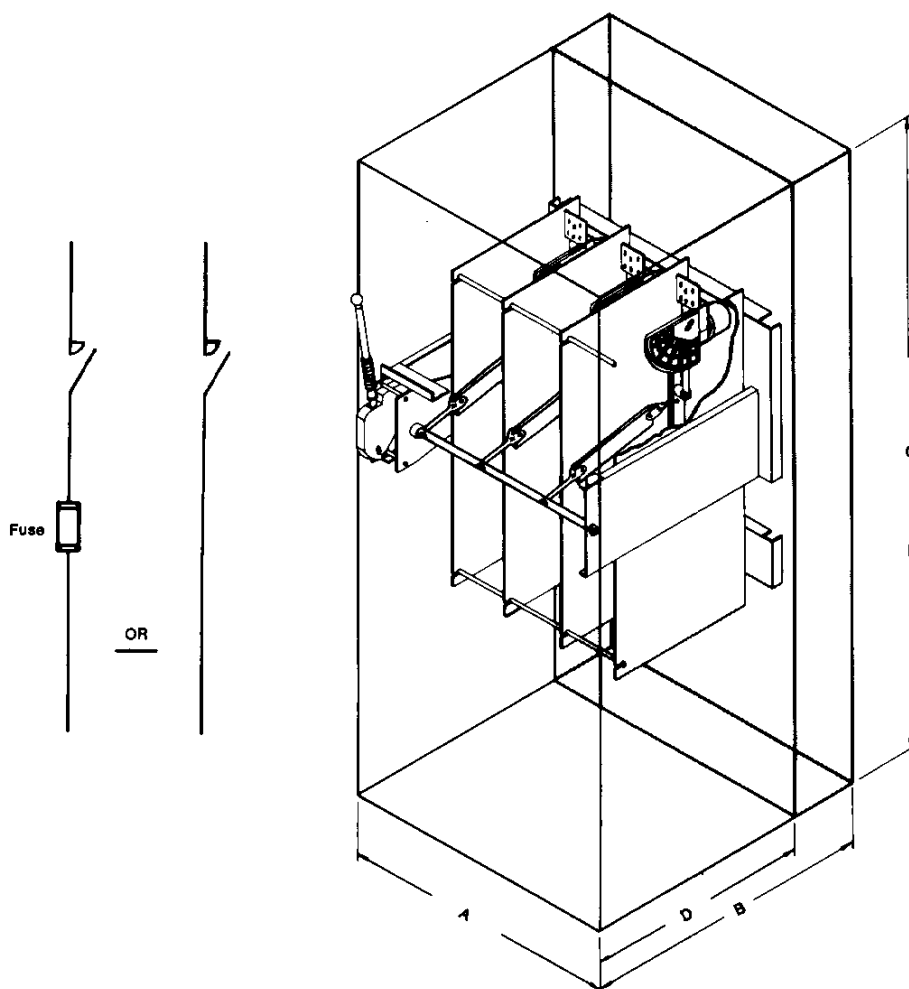


MAY, 1988

POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

**MAIN SWITCH OR FEEDER BAY
25 AND 38 kV**

6040



Approximate Shipping Weight Per Bay: Indoor — 2200 Lbs.
Outdoor — 2600 Lbs.

Dual Dimensions **INCHES**
Millimeters

DIMENSIONS OF MAIN OR FEEDER SWITCH BAY (INDOOR)

Type	Equipment Nominal kV	Single Switch				Line-up			
		A	B	C	D	A	B	C	D
Fused or Unfused	25	<u>48</u> 1219	<u>60</u> 1524	<u>105</u> 2667	<u>37.14</u> 943	<u>48</u> 1219	<u>72</u> 1829	<u>114</u> 2896	<u>37.14</u> 943
	38	<u>60</u> 1524	<u>72</u> 1829	<u>105</u> 2667	<u>40.14</u> 1020	<u>60</u> 1524	<u>80</u> 2032	<u>120</u> 3048	<u>40.14</u> 1020



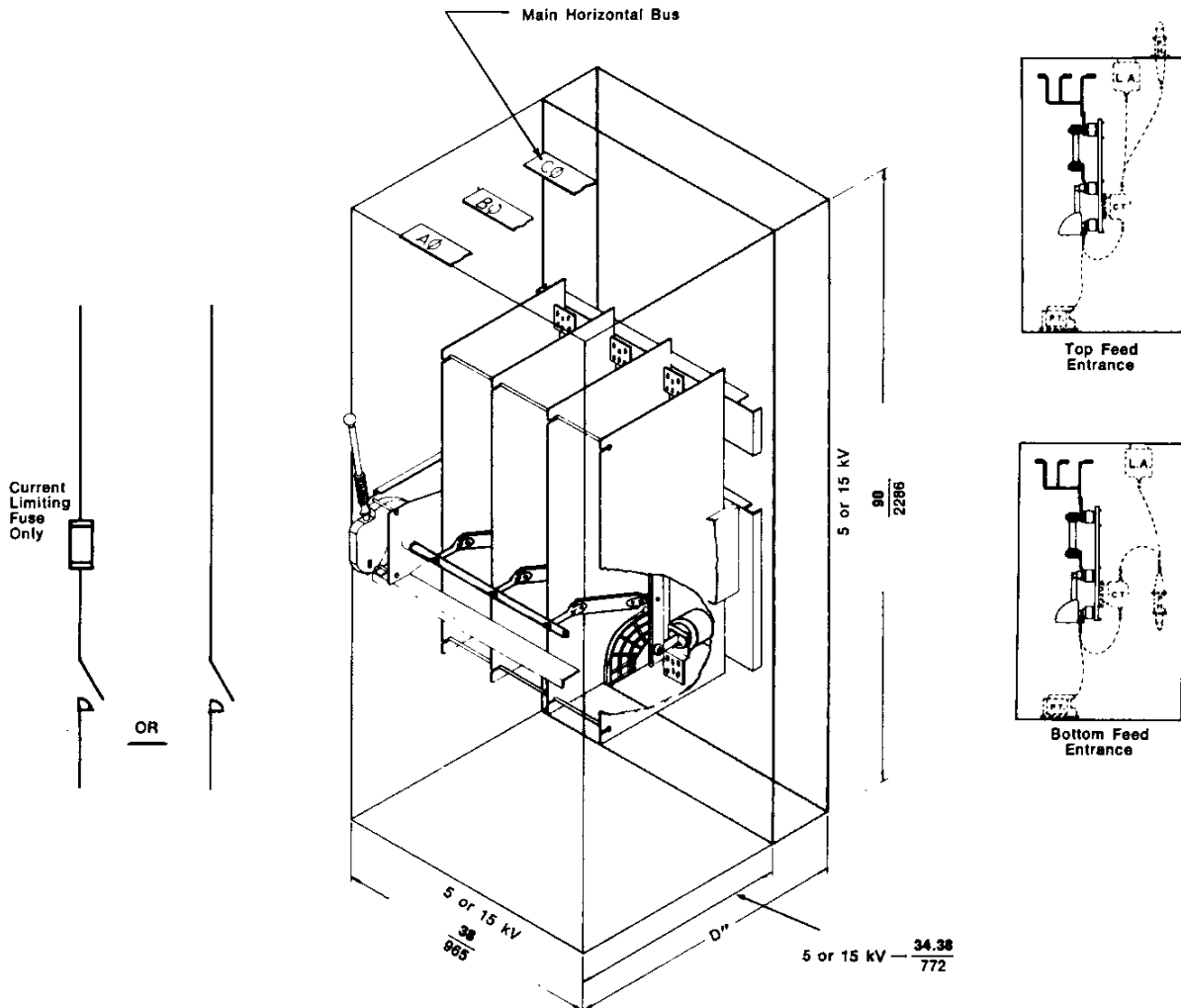
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POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

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INVERTED MAIN SWITCH BAY 5 AND 15 kV



OUTDOOR CONSTRUCTION: ADD $\frac{6.5}{165}$ TO THE TOTAL HEIGHT AND INCREASE THE BASE TO THE DEPTH DIMENSION OF $\frac{60}{1524}$

Approximate Shipping Weight Per Bay: Indoor — 1350 Lbs.
Outdoor — 1850 Lbs.

Dual Dimensions **INCHES**
Millimeters

DEPTH DIMENSION OF MAIN SWITCH BAY (INDOOR)

Type	Equipment Nominal kV	Cable Lugs Top or Bottom Entrance				Roof Bushings or Pothead Top Entrance				Pothead Bottom Entrance			
		Without CT's, PT's or L.A.	With L.A.	With CT's & PT's	With CT's, PT's & L.A.	Without CT's, PT's or L.A.	With L.A.	With CT's & PT's	With CT's, PT's & L.A.	Without CT's, PT's or L.A.	With L.A.	With CT's & PT's	With CT's, PT's & L.A.
		D	D	D	D	D	D	D	D	D	D	D	D
Fused or Unfused	5	$\frac{48}{1219}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{48}{1219}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{72^*}{1829}$
	15	$\frac{48}{1219}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{72^*}{1829}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{72^*}{1829}$	$\frac{72^*}{1829}$

*This arrangement consists of a full metering section mounted behind a standard switch. Instruments and instrument transformers to be selected by factory.
Note—If switch is unfused, current transformers can be mounted directly above the switch and be front accessible.

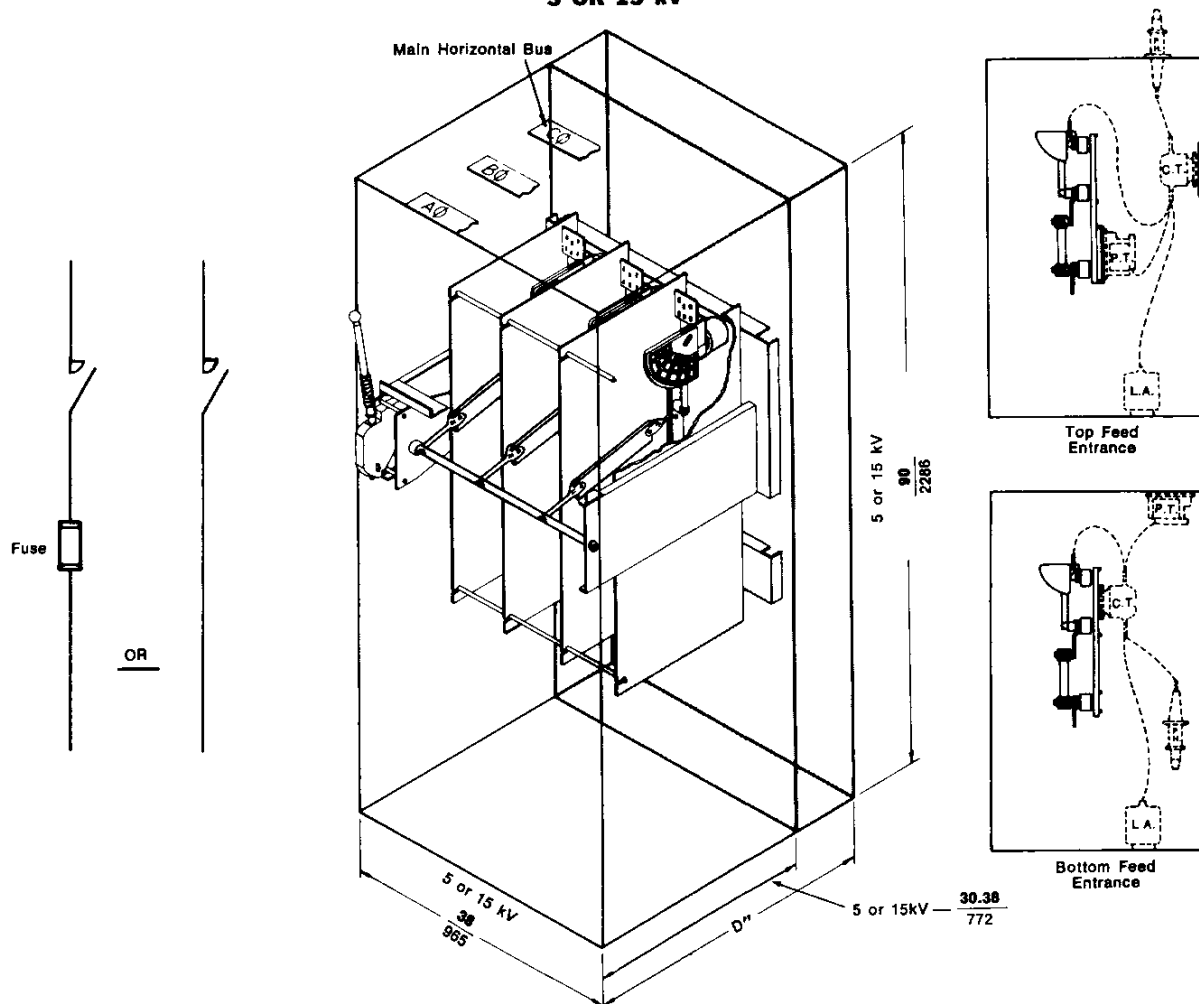


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POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

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FEEDER SWITCH BAY AND SINGLE BAY 5 OR 15 kV



OUTDOOR CONSTRUCTION: ADD $\frac{6.5}{165}$ TO THE TOTAL HEIGHT AND INCREASE THE BASE TO THE
DEPTH DIMENSION OF $\frac{60}{1524}$

Approximate Shipping Weight Per Bay: Indoor — 1350 Lbs.
Outdoor — 1850 Lbs.

Dual Dimensions INCHES
Millimeters

DEPTH DIMENSION OF FEEDER SWITCH BAY (INDOOR)

Type	Equipment Nominal kV	Cable Lugs Top or Bottom Entrance		Roof Bushings or Pothead Top Entrance		Pothead Bottom Entrance	
		Without CT's	With CT's	Without CT's	With CT's	Without CT's	With CT's
		D	D	D	D	D	D
Fused	5 or 15 kV	$\frac{36}{914}$	$\frac{54}{1372}$	$\frac{48}{1219}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$
Unfused	5 or 15 kV	$\frac{36}{914}$	$\frac{54}{1372}$	$\frac{48}{1219}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$

Note—If switch is unfused, current transformers will be mounted directly below the switch and will be front accessible. One ammeter and 3Ø selector switch and/or one voltmeter and 3Ø selector switch may be located on the front of the switch bay — instruments and instrument transformers to be selected by factory.



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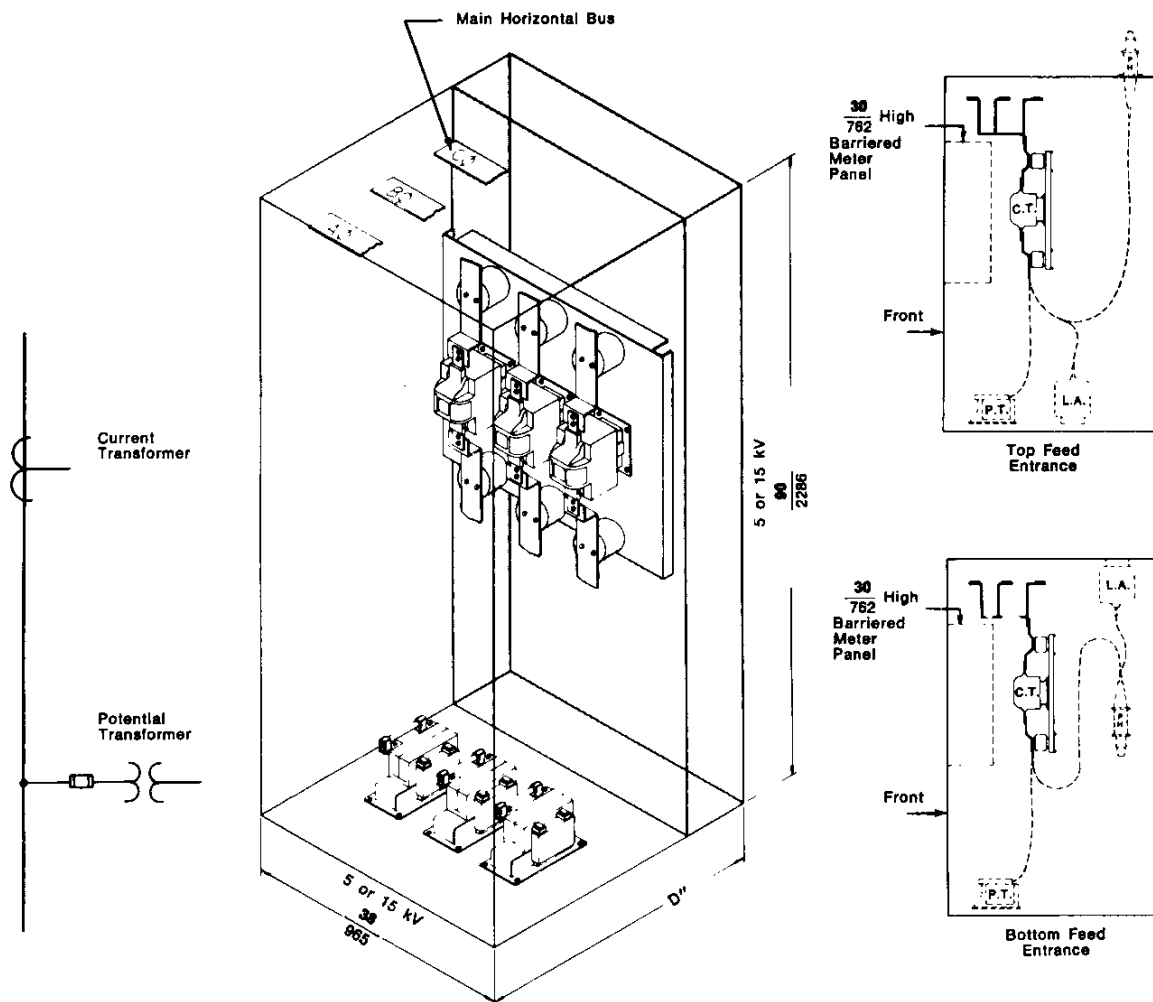
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POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

POWER COMPANY OR USER METERING BAY
5 OR 15 kV

CLASS
6040



OUTDOOR CONSTRUCTION: ADD $\frac{6.5}{165}$ TO THE TOTAL HEIGHT AND INCREASE THE BASE TO THE DEPTH DIMENSION OF $\frac{60}{1524}$

Approximate Shipping Weight Per Bay: Indoor — 1500 Lbs.
Outdoor — 2050 Lbs.

Dual Dimensions **INCHES**
Millimeters

DEPTH DIMENSION OF METERING BAY (INDOOR)

Equipment Nominal KV	Cable Lugs Only Top or Bottom Entrance		Roof Bushings or Pothead Top Entrance		Pothead Bottom Entrance	
	With CT's & PT's	With CT's, PT's & L.A.	With CT's & PT's	With CT's, PT's & L.A.	With CT's & PT's	With CT's, PT's & L.A.
	D	D	D	D	D	D
5 or 15 kV	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$	$\frac{54}{1372}$

Dimensions based on factory choice of instrument transformers.

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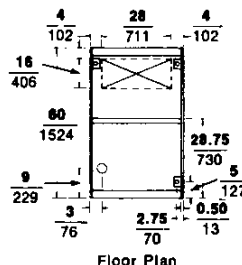
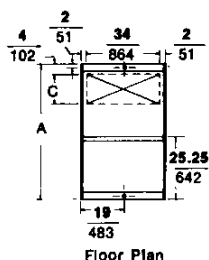
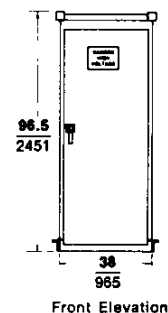
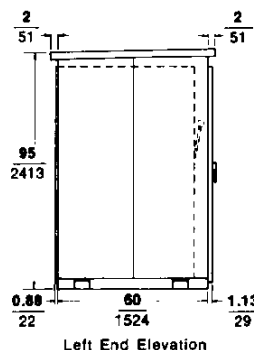
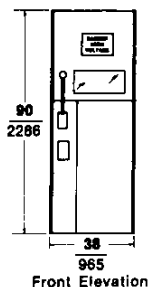
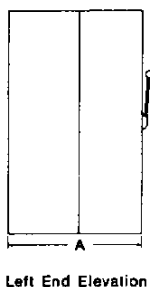
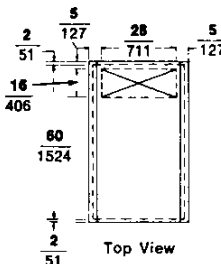
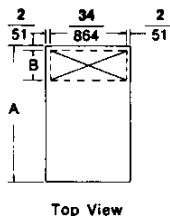
POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

CLASS
6040

STANDARD DIMENSIONS
(APPROXIMATE DIMENSIONS — NOT FOR CONSTRUCTION)
5 OR 15 kV

INDOOR EQUIPMENT

OUTDOOR EQUIPMENT



Dimensions subject to change without notice.

Approximate
Weights:
Indoor — 1350 Lbs.
Outdoor — 1850 Lbs.



Represents Suggested Conduit
Entrance Area

Dual Dimensions **INCHES**
Millimeters

DIMENSIONS FOR 15 kV SWITCHES		
INDOOR		
A	B	C
48 1219	12 305	12 305
54 1372	16 406	16 406



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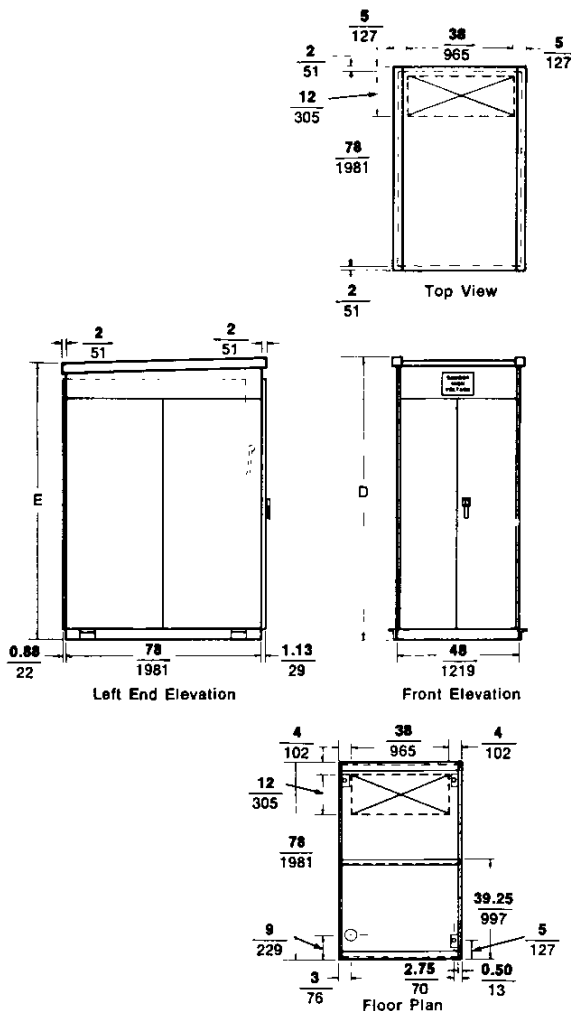
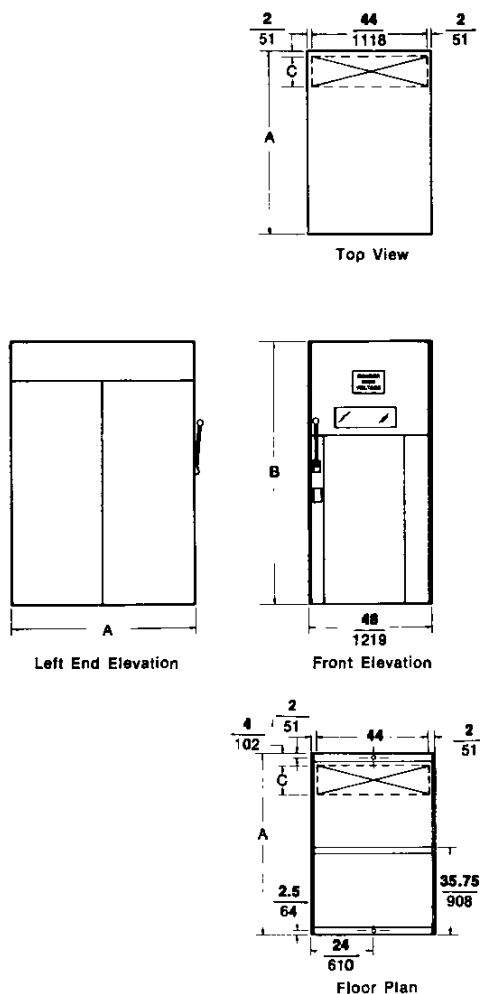
POWER-ZONE® HVL LOAD INTERRUPTER SWITCHGEAR

MAY, 1988

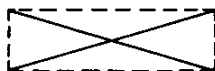
STANDARD DIMENSIONS
(APPROXIMATE DIMENSIONS — NOT FOR CONSTRUCTION)
25 kV

INDOOR EQUIPMENT

OUTDOOR EQUIPMENT



Dimensions subject to change without notice.



Represents Suggested Conduit
Entrance Area

Dual Dimensions **INCHES**
Millimeters

Approximate
Weight:
Indoor — 2000 Lbs.
Outdoor — 2500 Lbs.

Cubicle	DIMENSIONS FOR 25 kV SWITCHES				
	INDOOR			OUTDOOR	
	A	B	C	D	E
Single	60 1524	105 2667	12 305	112 2845	110 2794
Line-up	72 1829	114 2896	12 305	121 3073	119 3023



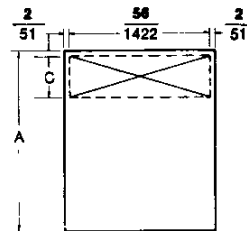
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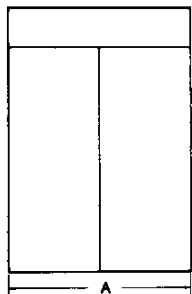
CLASS
6040

STANDARD DIMENSIONS (APPROXIMATE DIMENSIONS — NOT FOR CONSTRUCTION) 38 kV

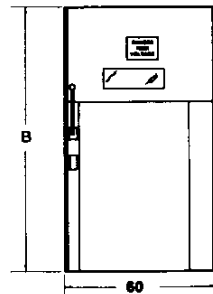
INDOOR EQUIPMENT



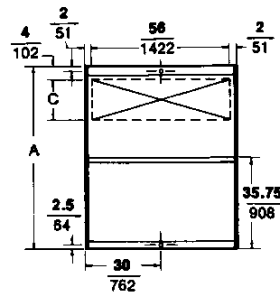
Top View



Left End Elevation

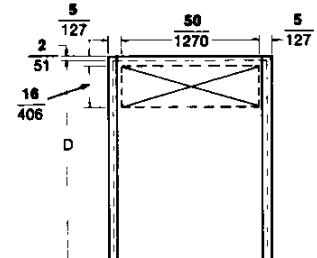


Front Elevation

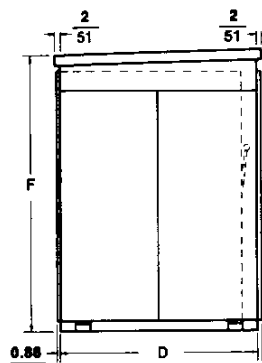


Floor Plan

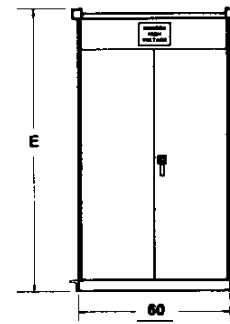
OUTDOOR EQUIPMENT



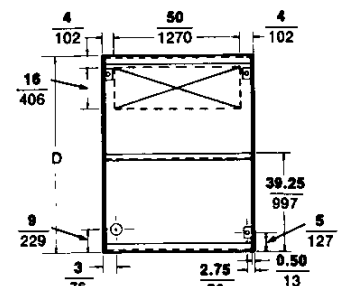
Top View



Left End Elevation

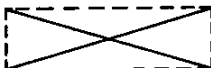


Front Elevation



Floor Plan

Dimensions subject to change without notice.



Represents Suggested Conduit
Entrance Area

Dual Dimensions **INCHES**
Millimeters

Approximate
Weight:
Indoor — 2200 Lbs.
Outdoor — 2700 Lbs.

DIMENSIONS FOR 38 kV SWITCHES

Cubicle	INDOOR			OUTDOOR		
	A	B	C	D	E	F
Single	72 1829	105 2667	16 406	78 1981	112 2845	110 2794
Line-up	80 2032	120 3048	16 406	88 2184	127 3226	125 3175



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