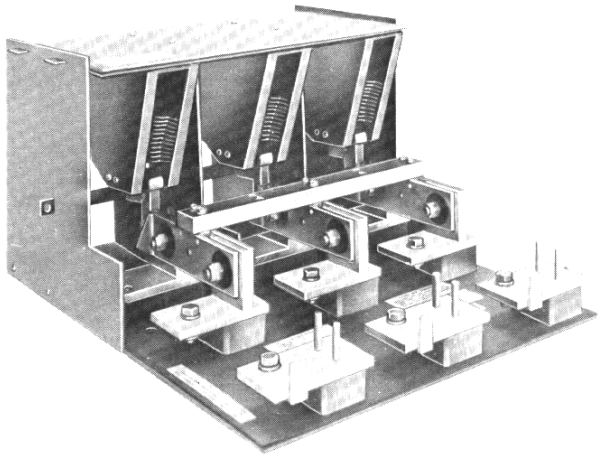
AV Switches — Series 3



CAUTION:
BEFORE ATTEMPTING ANY SERVICE WORK, BE SURE SWITCH IS COMPLETELY DE-ENERGIZED.

DESCRIPTION

Class 9820 type AV 800 and 1200 ampere switches are available as an open type device with separate front or side operators which make it suitable for use in switchboards or as the interior of an enclosed safety switch.

This manual pertains to the **SWITCH AND OPERATOR-INSTALLATION, OPERATION, MAINTENANCE, ADJUSTMENT PROCEDURE AND REPLACEMENT PARTS.**

Unpack the switch carefully and check the nameplate information against similar information listed on order.

Prior to 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, a careful inspection should be made to determine if any damage might have occurred during transit. If damage is evident or there is any visible indication of rough handling, claims for damage should be filed at once with the transportation company. The local Square D field sales office should be notifed.

The type AV switch operating mechanisms are available in a front operated (switchboard design) or a side operator (safety switch) design. All operators are quick-make, quick-break kinematic action. This exclusive Square D feature assures anti-tease operation by moving the switch blades at high speed on both opening and closing of the switch, regardless of the speed with which the operating handle is moved.

All fusible type switches have successfully passed the tests as outlined in UL subject 98 standard for enclosed switches.

MAINTENANCE
Lubrication Instructions

Type AV Switches as received from the factory have been properly lubricated. Periodic cleaning and lubrication of the switch will be required and the maintenance interval between lubrications will be dependent upon the amount of usage, ambient conditions, etc. The maximum recommended maintenance intervals should not exceed one year. When performed, lubrication should be applied to all moving parts and the application of Alvania grease #2 (multi-purpose-lithium base) Shell part no. 71012 or equivalent should be used on the hinge area and the clip contact surfaces and arc tips. A lightweight oil should be sparingly used on the other moving parts. The operating mechanism should be periodically exercised to ensure proper operation. Lubrication of the mechanism should be performed using Molybdenum Disulfide Grease when required.

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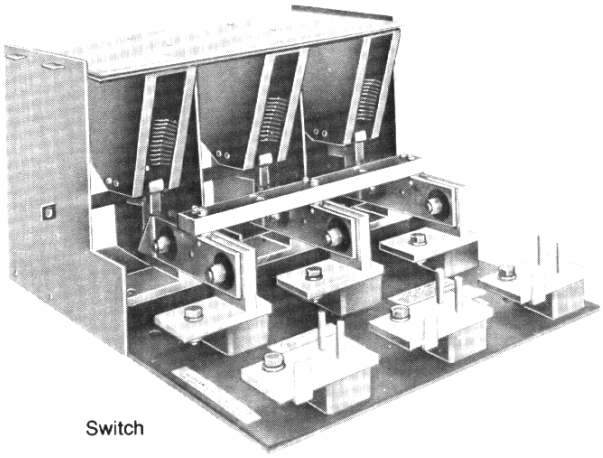
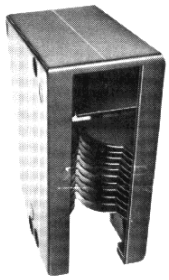
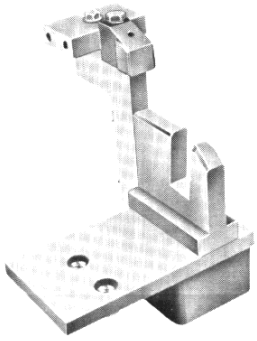


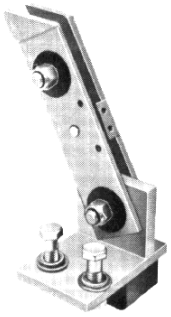
Switch



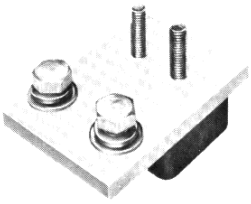
Arc
Quencher
Assembly



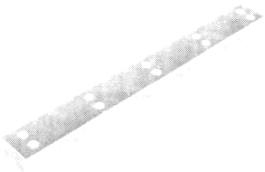
Line Terminal
Assembly



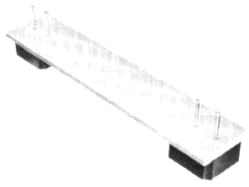
Hinge and Blade
Assembly



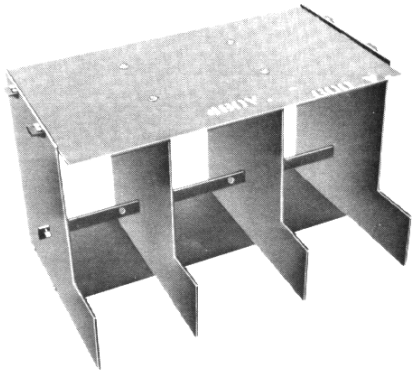
Fuse Terminal
Assembly



Crossbar



Neutral Assembly



Phase Barrier

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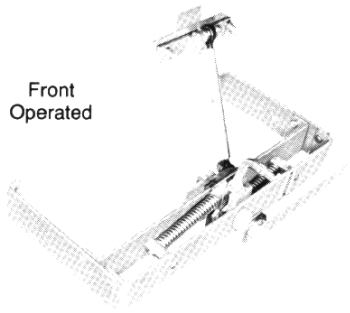
OPERATORS

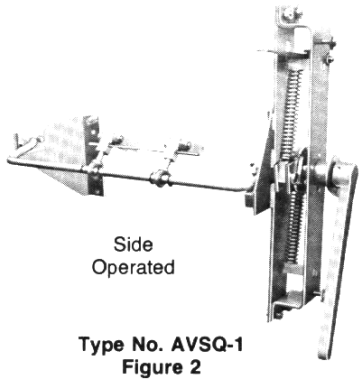
Quick Make — Quick Break

Front Operated



Type No. AVFQ-1
Figure 1

Side Operated



Type No. AVSQ-1
Figure 2

HANDLES

Front or Side Operated

Figure 3

INSTALLATION INSTRUCTIONS

CAUTION:
DO NOT ATTEMPT TO OPERATE THE OPERATOR MECHANISM WITHOUT THE LINKAGE BEING ATTACHED TO THE SWITCH CROSSBAR.

I. FRONT OPERATED (Switchboard Design)

1. The switch and operating mechanism are shipped from the factory in the closed position. Be sure the switch blades are in the fully closed position. The operator handle should be located to the left of the vertical centerline at approximately the 10 o'clock position.
2. Mount the switch and operating mechanism with particular care to make sure they are adequateiy supported. Check the vertical and horizontal centerline alignment. If alignment problems exist, refer to switch and operator outline dimensional drawings.
3. Attach the connecting clevis on the operator mechanism to the switch crossbar with the hardware provided. Position the clevis on the insulating crossbar with the insulator shield protruding to the top over the center blade (Figure 1). The connecting rod has left and right hand threads, with one spherical bearing on each end. The length of the connecting rod should be adjusted to achieve a reasonably tight fit between the crossbar and the operating mechanism.
4. Operate the switch to the open and closed positions several times. When the handle is in the closed position the switch blades should be fully closed. Operate the handle to the open position and check the open gap dimension of 1.5″ min. (38mm) which is the shortest distance through air between the blade and clip (refer to Figure 4). The open gap can be adjusted by loosening the locking nut and turning the Connecting Rod to obtain the desired Open Gap. Re-tighten the locking nut against the spherical bearing.

II. SIDE OPERATED (Safety Switch Design)

1. The switch and operating mechanism are shipped from the factory in the closed position. Be sure the switch blades are in the fully closed position. The operating handle should be located to the top of horizontal centerline at approximately the 11 o'clock position.
2. Mount the switch and operating mechanism with particular care to make sure they are adequately supported. Check the vertical and horizontal centerline alignment. If alignment problems exist, refer to switch and operator outline dimensional drawings.
3. Attach the two "U"-shaped brackets which are located on the crossrod operator mechanism to the switch crossbar with the hardware provided (refer to Figure 5). Be sure the "U" brackets are mounted flat on the surface of the insulating crossbar. If the brackets are not flat mounted, rotate the turnbuckle-blocks in or out of eye bolts to achieve a flat surface mounting (refer to Figure 5).
4. Operate the switch to the open and closed positions several times. When the handle is in the closed position the switch blades should be fully closed. Operate the handle to the open position and check the open gap dimension of 1.5″ min. (38mm) which is the shortest distance through air between the blade and clip (refer to Figure 4). The open gap can be adjusted by removing the ½″-13 locknuts and bolts and rotating the turnbuckle-blocks to obtain the specified open gap.

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INSTALLATION INSTRUCTIONS

ADJUSTMENTS

Every AV switch goes through a routine test procedure before leaving the factory. The design is such that only three places of adjustment are built into the switch. The first two are for the switch operation and the third for the enclosure variations.

1. The connecting link on the operator.
2. The lock nut on the blade assembly.
3. The door interlocking assembly.

I. The connecting link attachment and adjustment procedures for both the front and side operator are given on page 3.

II. The lock nut (Figure 7) when rotated clockwise causes the Belleville washers to exert pressure between the blades and the clip and hinge contact area. The proper adjustment of the clip and hinge nut is made by measuring the contact resistance in micro-ohms. The switch is properly adjusted when the ducter reading from the clip terminal to the hinge terminal is 5.0 to 6.5 micro-ohms.

The proper adjustment of this clip and hinge nut is made with the switch blades in the closed position; check the tension of the Belleville washer under the lock nut. The Belleville washer should just barely be able to be turned by hand. Adjust the lock nut accordingly. When this initial tension adjustment on the washer has been reached, place two ¾" wrenches on the head of the bolt and the lock nut. Position both wrenches even. Holding one wrench steady turn the other wrench ¼ to ½ turn in a clockwise direction. Repeat the above steps on all phases until all lock nuts have been properly tightened. Refer to Figure 6.

If the lock nut is too loose, improper contact pressure will result and the switch will heat up. If the adjustable nut is too tight the switch will be sluggish on opening and closing.

III. The Mechanical interlock prevents switch closing when the door is open.

The door interlocking assembly is intended for field adjustment to compensate for enclosure variations and is not adjusted to any dimension at the factory.

A. **Front operated** (Figure 8). The adjustment consists of lengthening or shortening the interlock arm, so that when the fuse door is closed the interlock pin is withdrawn from the handle shaft and the switch is free to close. Convenient multiple holes in the interlock arm permit adjustment.

B. **Side operated** (Figure 9). The adjustment consists of locating the correct position of the door latch on the door bracket, so that when the door is closed the door latch will engage the interlocking arm. The interlocking arm will then be deflected from the spring guide rod hole in the bearing and permit rotation of the spring mechanism. The switch is free to close. Convenient 3-way door latch with slotted holes and spacers permit adjustments.

ILLUSTRATIONS

Open Gap

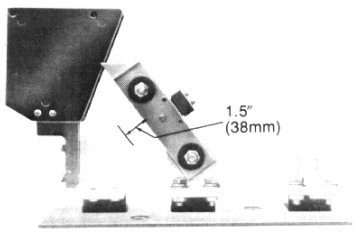


Figure 4

Crossrod & Brackets Installation

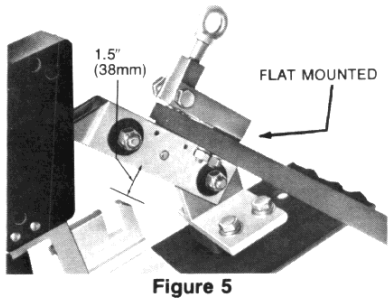


Figure 5

Clip & Hinge Bolt Adjustment

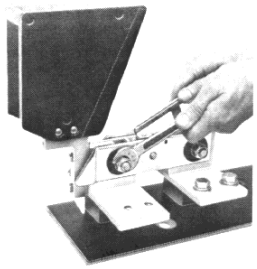


Figure 6

AV Switches — Series 3

ILLUSTRATIONS (CONTINUED)

Clip & Hinge Bolt

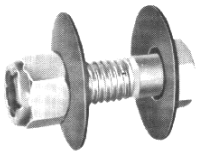
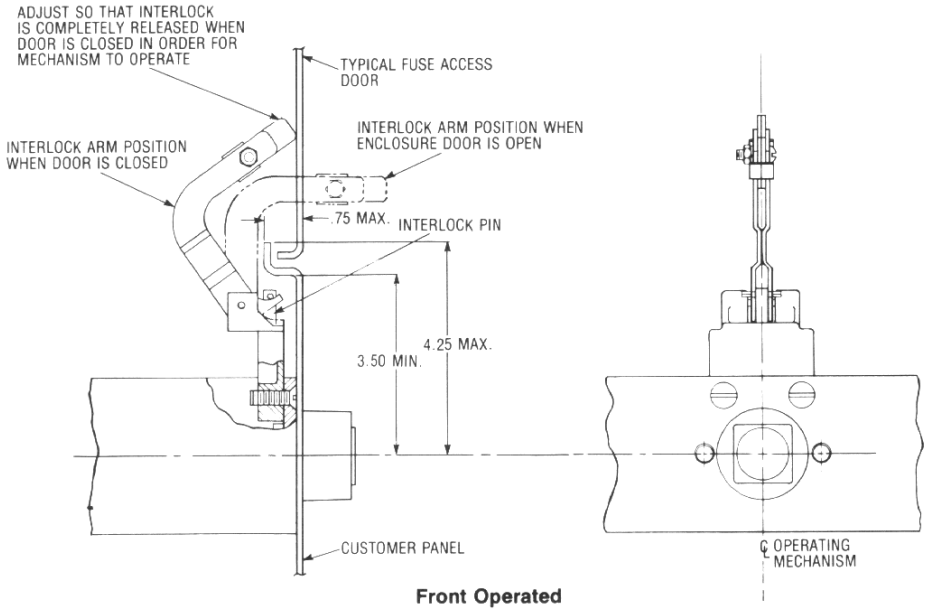
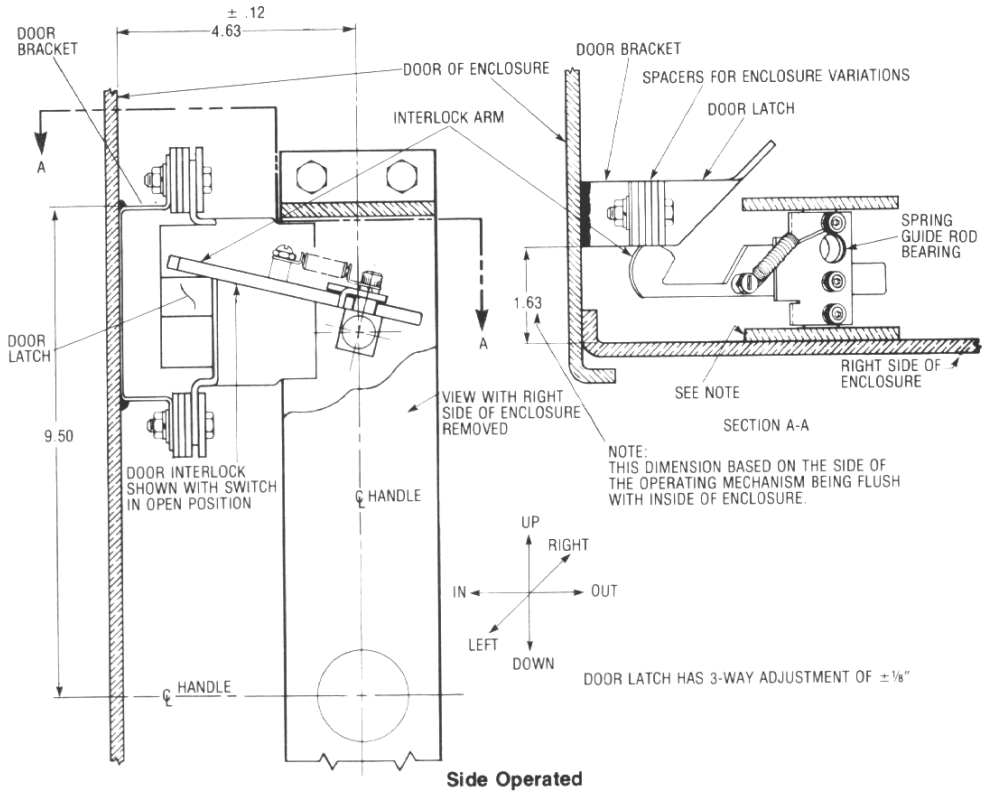


Figure 7



Front Operated
Figure 8



Side Operated
Figure 9

SERVICE BULLETIN

SERVICE BULLETIN

SQUARE D COMPANY
P. O. Box 558 • Middletown, Ohio 45042