

Drain Master RV and Marine Inc.
SVT Switch Mounting and Wiring Instructions – Marine

Doc MDM85

Contents

1. Single SVT Switch Mounting, Dimensions, Cutouts	– Pg. 2
2. Single SVT Switch - Panel Thickness and Clearances	– Pg. 3
3.1, 3.2 Multi Switch Housing Mounting, Dimensions, Cutouts	– Pgs. 4-5
3.3 Multi Switch Housing - Panel Thickness and Clearances	– Pg. 6
4. Multiple Single Switches - Inter-Spacing and Orientation	– Pgs. 7-8
5. Daisy Chain Operation	– Pg. 9
6. Optional Switch layouts	– Pgs. 10-11
7. IP 66 Cable Routing	– Pg. 12
8. 12 V Power considerations	– Pg. 12-13
9. 12 V Power CAUTIONS	– Pg. 13
10. Single Switch Insertion Method & steps	– Pgs. 14-16



SVT Switch Mounting and Wiring Instructions – Marine

1. Single SVT switch Mounting: Single switches fit the industry standard cutout and will normally drop-in fit into a pre-existing standard panel opening. If the panel needs a new cutout or for panel design refer to Fig. 1. If using the included Dress plate refer to Fig 2. For panel thickness and behind-panel clearance refer Fig. 3 Pg 2

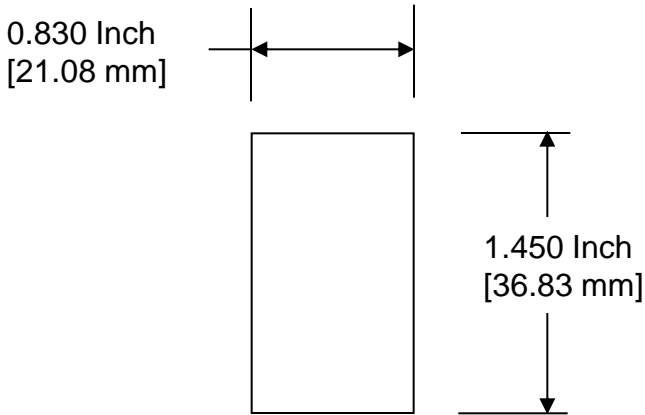


Fig.1 Panel cutout



Appearance direct mount

1. Dimensions in Inches [mm]
2. DO NOT USE as template – NOT TO SCALE
3. Cutout template is included with Switch

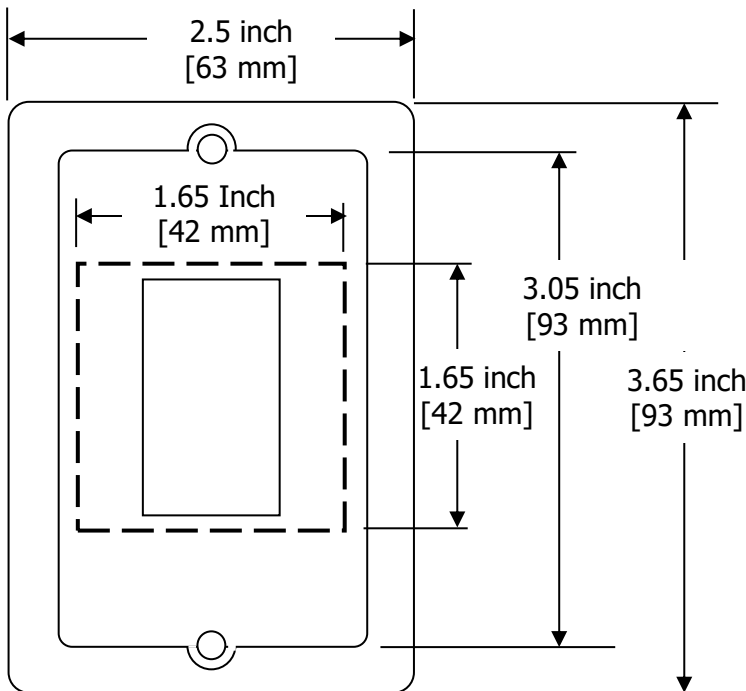


Fig 2. Panel cutout (dotted) with Dress Plate



Appearance with Dress Plate



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2. Single SVT switch mounting panel thickness and rear clearance

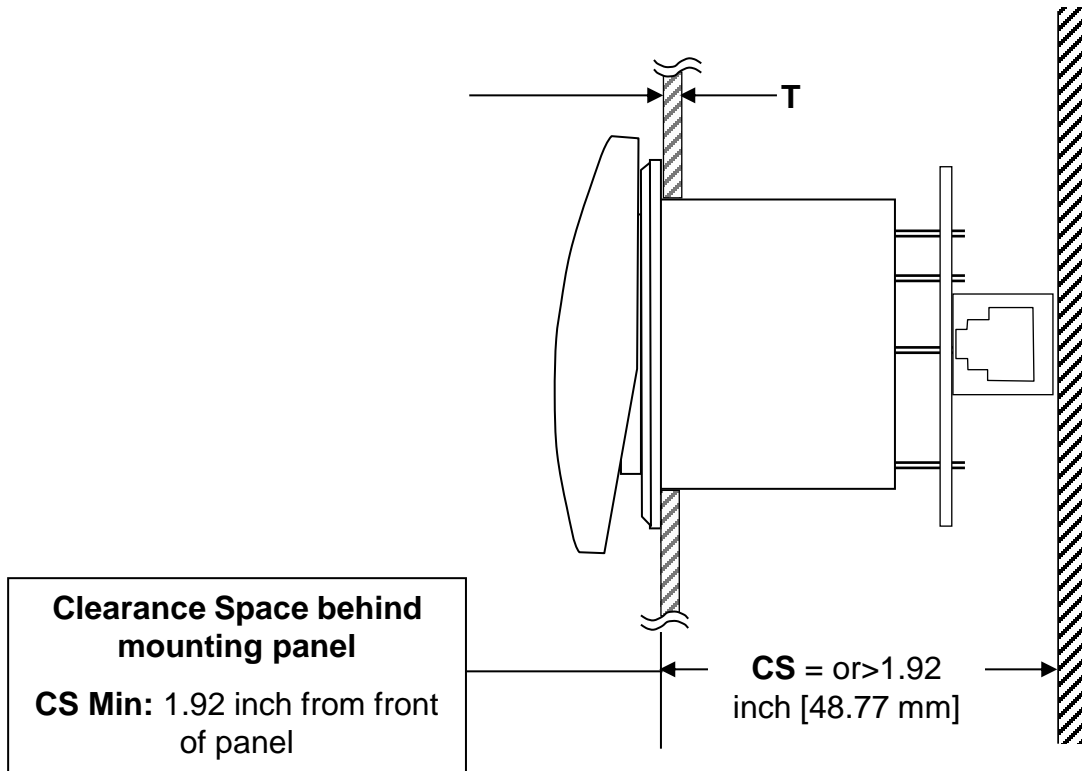


Fig. 3

Panel Thickness, T

Min: 0.030 inch [0.76mm]
Max: 0.187 inch [4.75 mm]

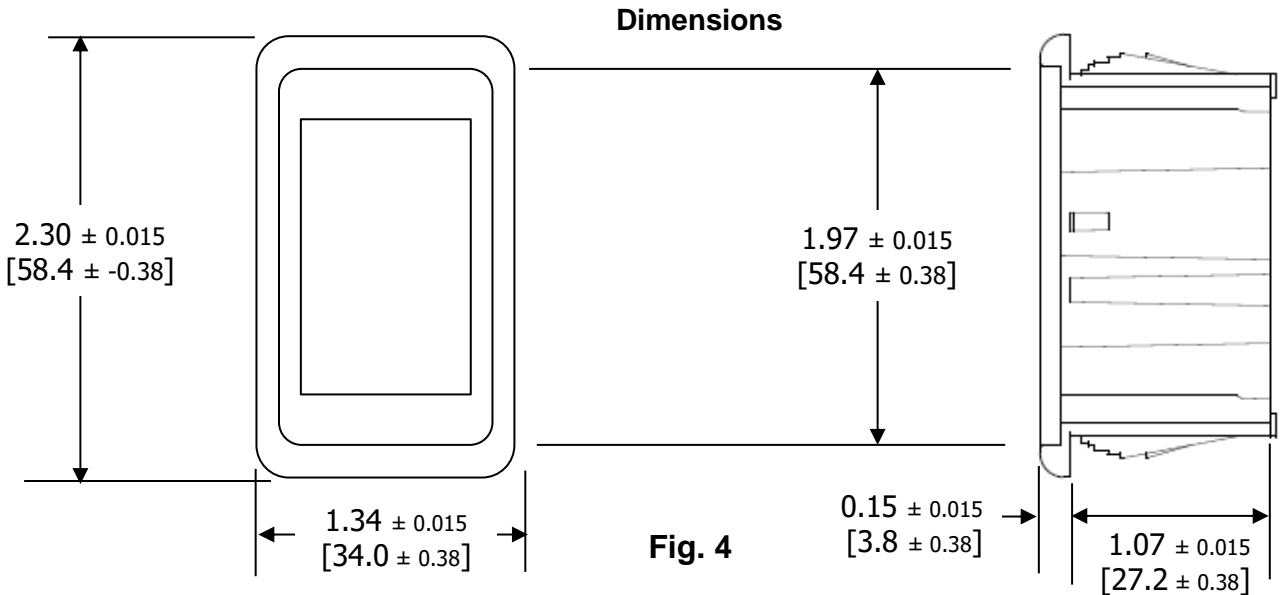
Note: Panel thickness greater than 0.187 [4.75 mm] requires use dress plate mounting method shown in **Fig. 2**



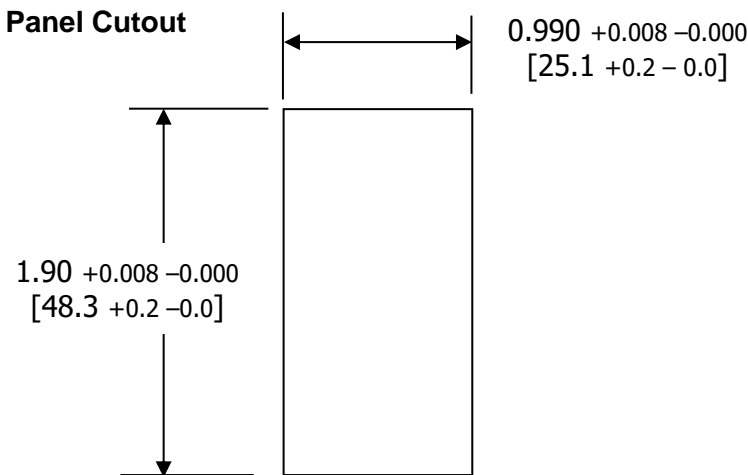
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3. Multi Switch Housing Mounting: Multi Switch Housings have one or more switches pre- installed in a snap – in housing, providing a compact and elegant layout. Only one cutout is required for a Multi -Switch housing. For Mono (single switch) Housing dimensions refer Fig. 4 and for Cutout refer Fig. 5

3.1 Mono Switch Housing



1. Dimensions in Inches [mm]
2. DO NOT USE as template – NOT TO SCALE
3. Cutout template is included with Switch



Appearance



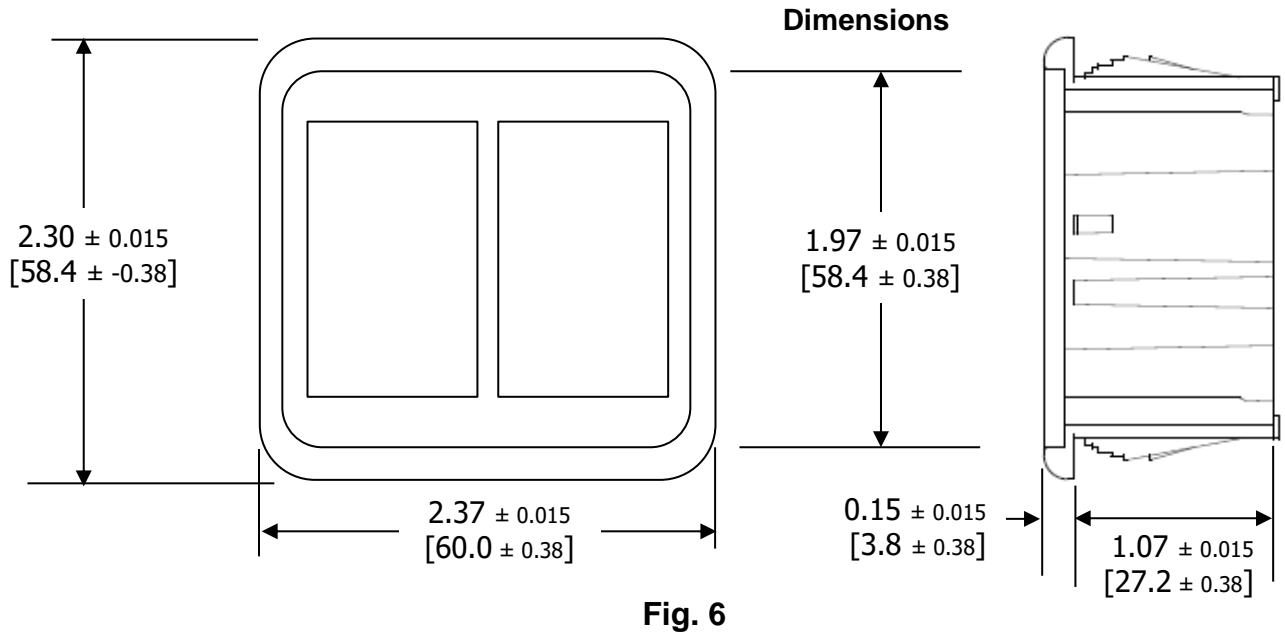
Questions?
Call 1 877 787 8833



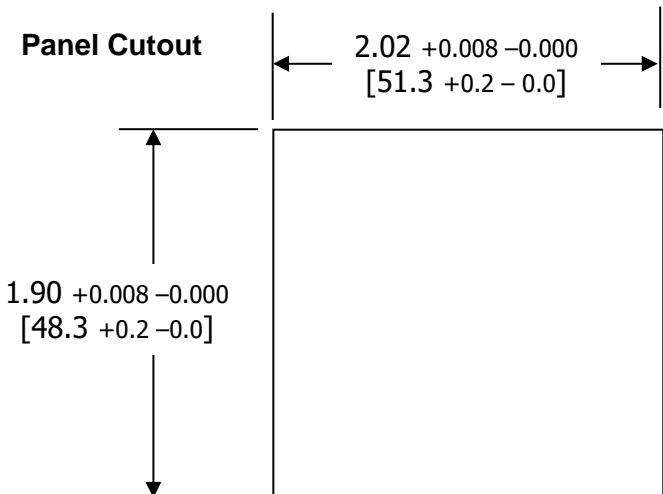
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3.2 Dual Switch Housing Mounting:

For Dual (2 switches) Housing dimensions refer Fig. 6 and for Cutout refer Fig. 7



1. Dimensions in Inches [mm]
2. DO NOT USE as template – NOT TO SCALE
3. Cutout template is included with Switch



Appearance



Fig. 7



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3.3 Multi Switch Housing Panel Thickness and Behind-Panel Clearance Requirements

Refer to Figure 8 and Table 1.

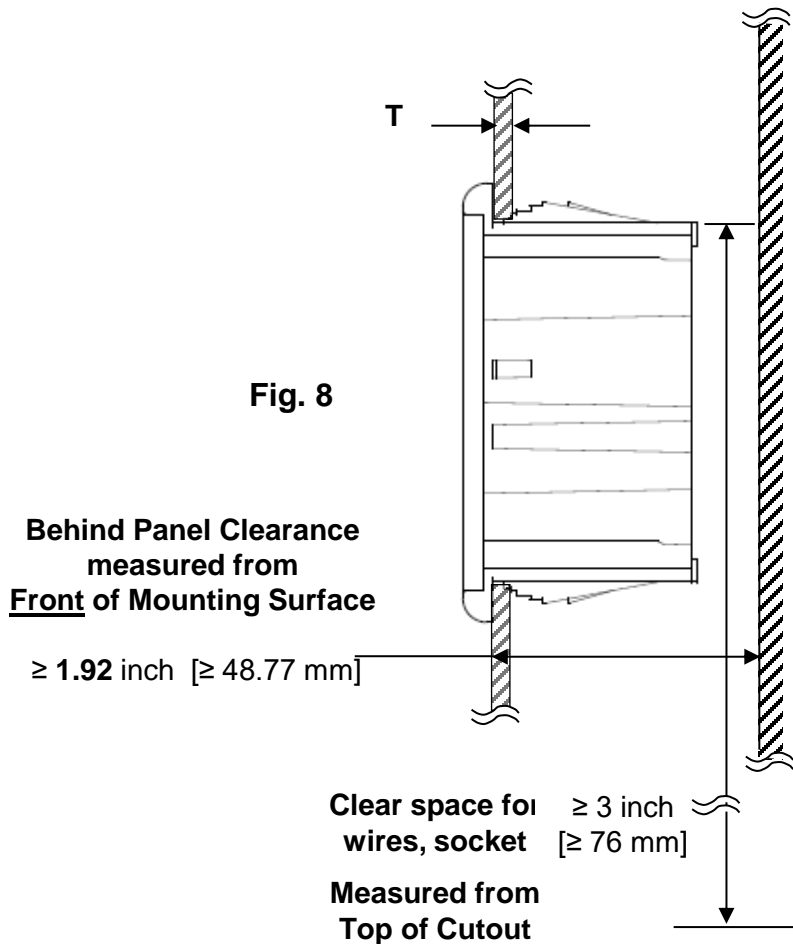


Table . 1

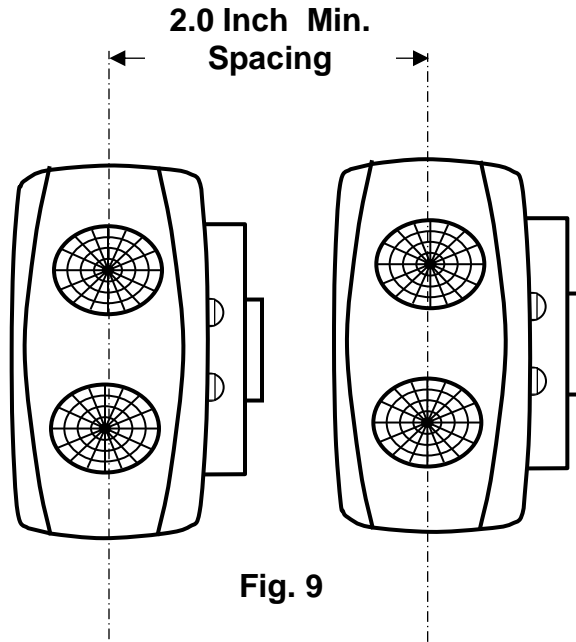
Std. Panel Thicknesses, T, to Snap-fit Housing			
INCHES		MILLIMETERS	
0.062	± 0.003	1.57	± 0.08
0.093	± 0.003	2.36	± 0.08
0.125	± 0.005	3.17	± 0.13
0.187	± 0.005	4.75	± 0.13
0.250	± 0.005	6.35	± 0.13
0.375	± 0.005	9.52	± 0.13



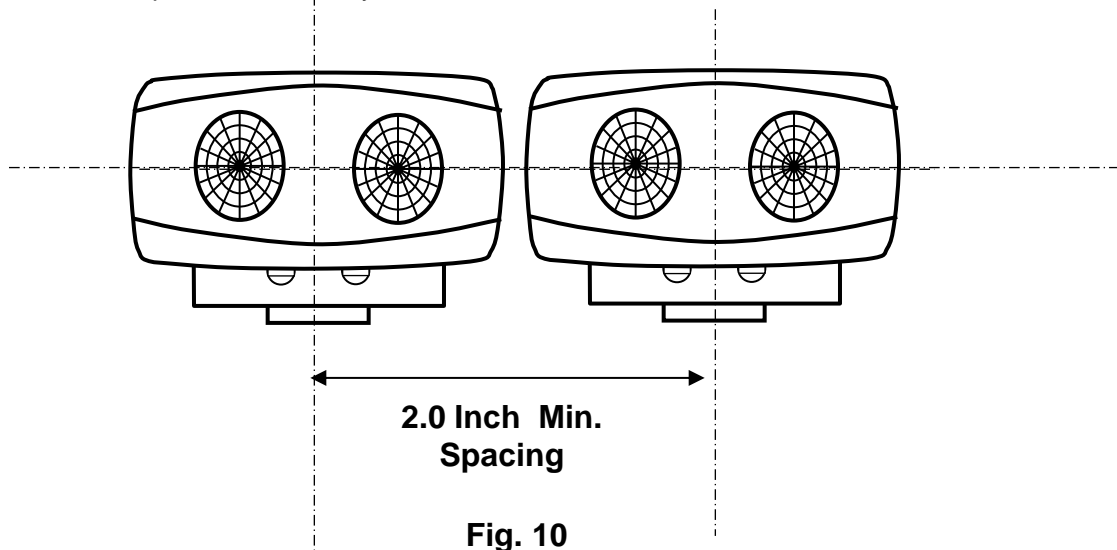
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4. Multiple Single Switches Inter-spacing: For panels involving multiple Single Switches [PN 578Z](#), space is required between adjacent cutouts not only to prevent interference but also to avoid wire crowding or tight bends / sharp turns near the RJ 11 plug.

4.1 Vertical Orientation layout: By default Vertical layout is most prevalent in the industry Fig. 9 below shows minimum inter-switch spacing with switches oriented vertically.



4.2 Horizontal Orientation layout: The layout in Fig. 10 below shows minimum spacing with switches oriented horizontally. Horizontal layout is used if space limitations do not permit vertical layout 3.1 or for designs intended for specific functionality.

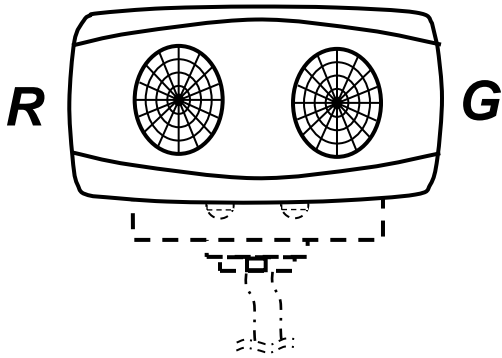


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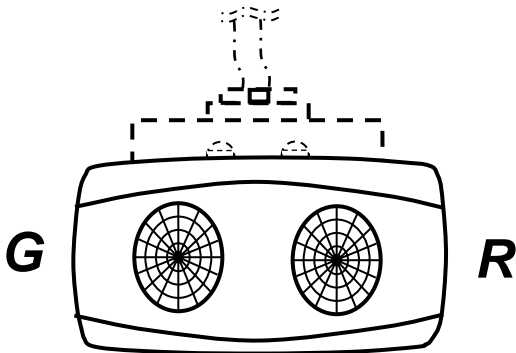
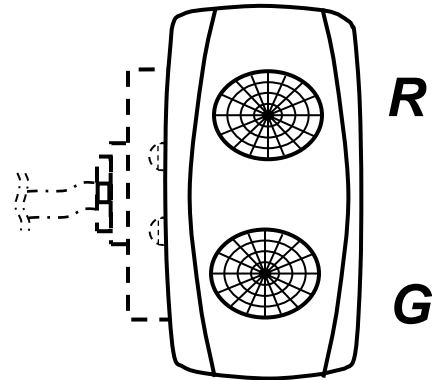
4.3 Single Switch Operating Orientation: To achieve specific designs or functionality Switch/s may be oriented for either Left press (Fig. 11) or Right press (Fig. 12) operation or Top press (Fig. 13) or Bottom press (Fig.14) operation.

NOTE: The RED LED ('Valve Open') Indicator is on the 'Press ' or 'Operate' side of the switch
R-Red LED G-Green LED

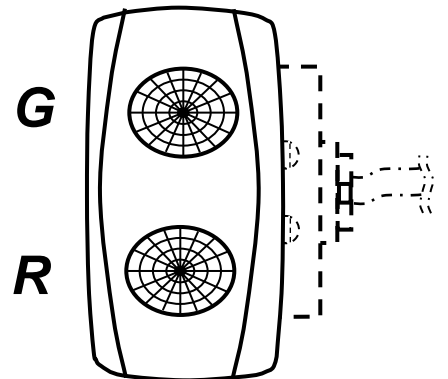
Left Press Operation
Fig. 11



Top Press Operation
Fig. 12



Right Press Operation
Fig. 13



Bottom Press Operation
Fig. 14



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5. Daisy Chain Operation – SVT switches and the dual ports of the Pro-Series valves facilitate daisy chain operation – one SVT switch and up to 3 valves can be wired using the IP66 cables to provide simultaneous synchronized operation of all valves. Refer Fig 15

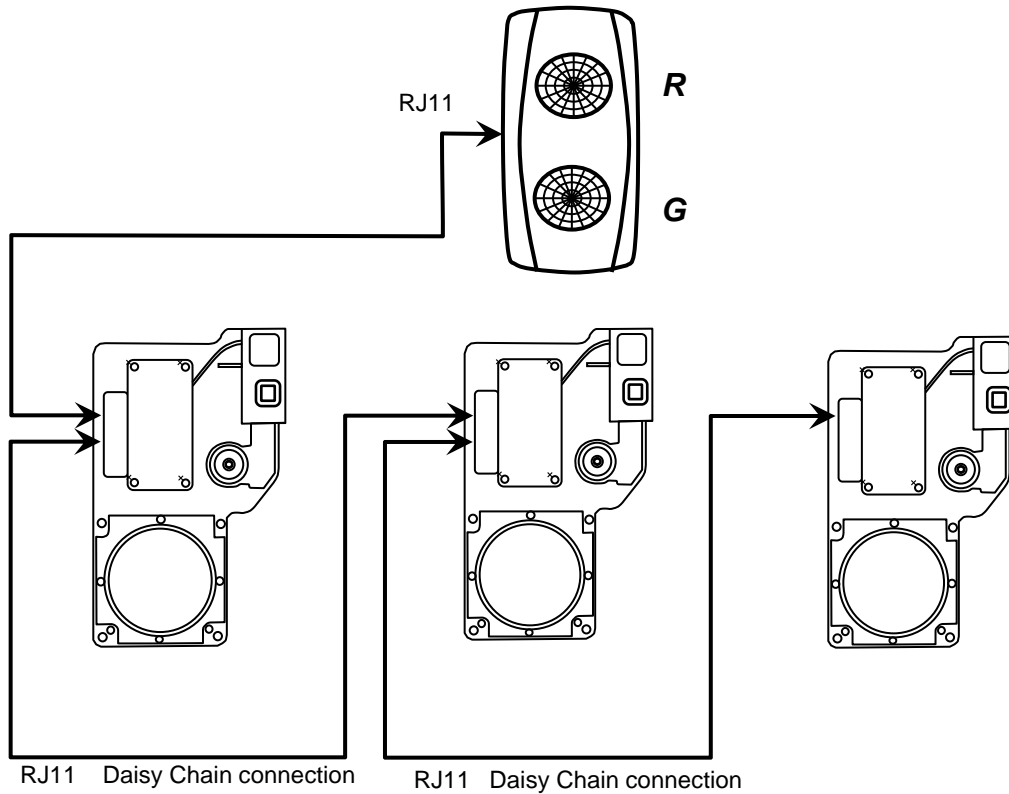


Fig. 15

IMPORTANT NOTES ON MULTIPLE VALVES DAISY CHAIN OPERATION.

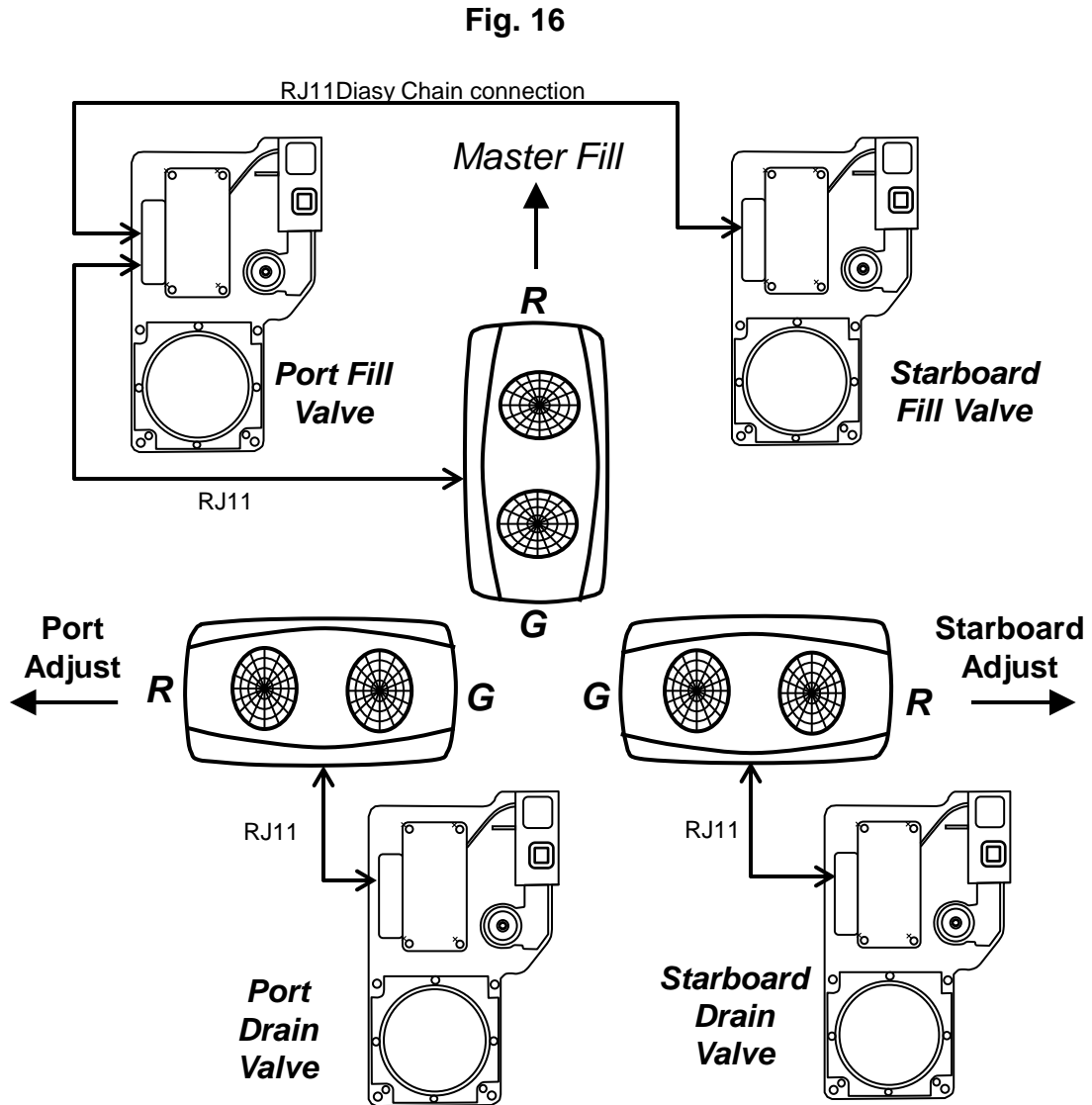
1. When operating multiple SVT valves daisy chained and off a common 12 V bus, the power source and wiring become more critical depending on the number of valves.
2. At power up ALL valves will independently attempt to home-in to the closed position. A very high total peak current will be drawn from the power source during power up = 10 amps DC x number of valves operating simultaneously. Ex.: 1 valve: 10 amps peak , 2 valves: 20 amps peak, 3 valves: 30 amps peak and so on.
3. The 12 V DC Source and supply wiring gauge must be capable of handling the peak current demand . A 10.8 volt minimum at the valve DC terminals during the current peak surge ensures valve speed. A properly charged and maintained Lead Acid marine deep cycle battery or equivalent is essential.
4. DO NOT ATTEMPT THIS TYPE OF OPERATION WITH BENCH POWER SUPPLIES. Failure of the DC source and wiring to meet peak current demand will cause the system to enter into repeated power-up cycling and excessive overheating leading to a failed valve SUCH FAILURE IS NOT COVERED UNDER WARRANTY.
5. Under normal daisy chain operation the position status indicator on the switch is based on whichever of the valves arrived at the target position first.



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6. Optional layouts – SVT switch layouts may be organized to provide an ‘intuitive’ feel to the switch function and operating direction.

6.1 Example Fig 16: 3 switches shown organized for 2 ballast tanks performing Master Fill, Port adjust and Starboard adjust operations respectively in an ‘intuitive’ manner.



1. Master Fill Switch: Opens and closes 2 Pro -Series valves for fill (intake), one on each ballast tank, using Daisy Chain connection feature of the Pro -Series
2. Port Adjust switch: Opens and closes Port drain valve
3. Starboard Adjust switch: Opens and closes Starboard drain valve
4. Switches organized to operate on the outside of the circle
5. Green LEDs are clustered in center – that is, ‘All Greens’ implies ‘good-to-go’



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6.2 Example Fig 17: 5 switches shown organized for 3 ballast tanks performing Bow, Port and Starboard fill and drain operations in an 'intuitive' manner. Switch positions relate to the tank location. Bow tank switch fills or drains. For Port and Starboard switches top switches fill, while lower switches drain respective tanks.

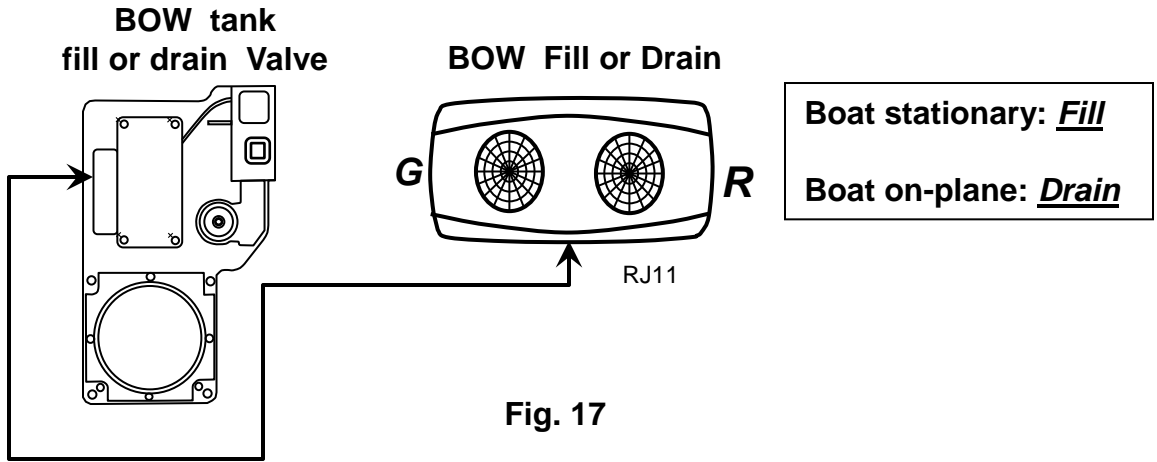
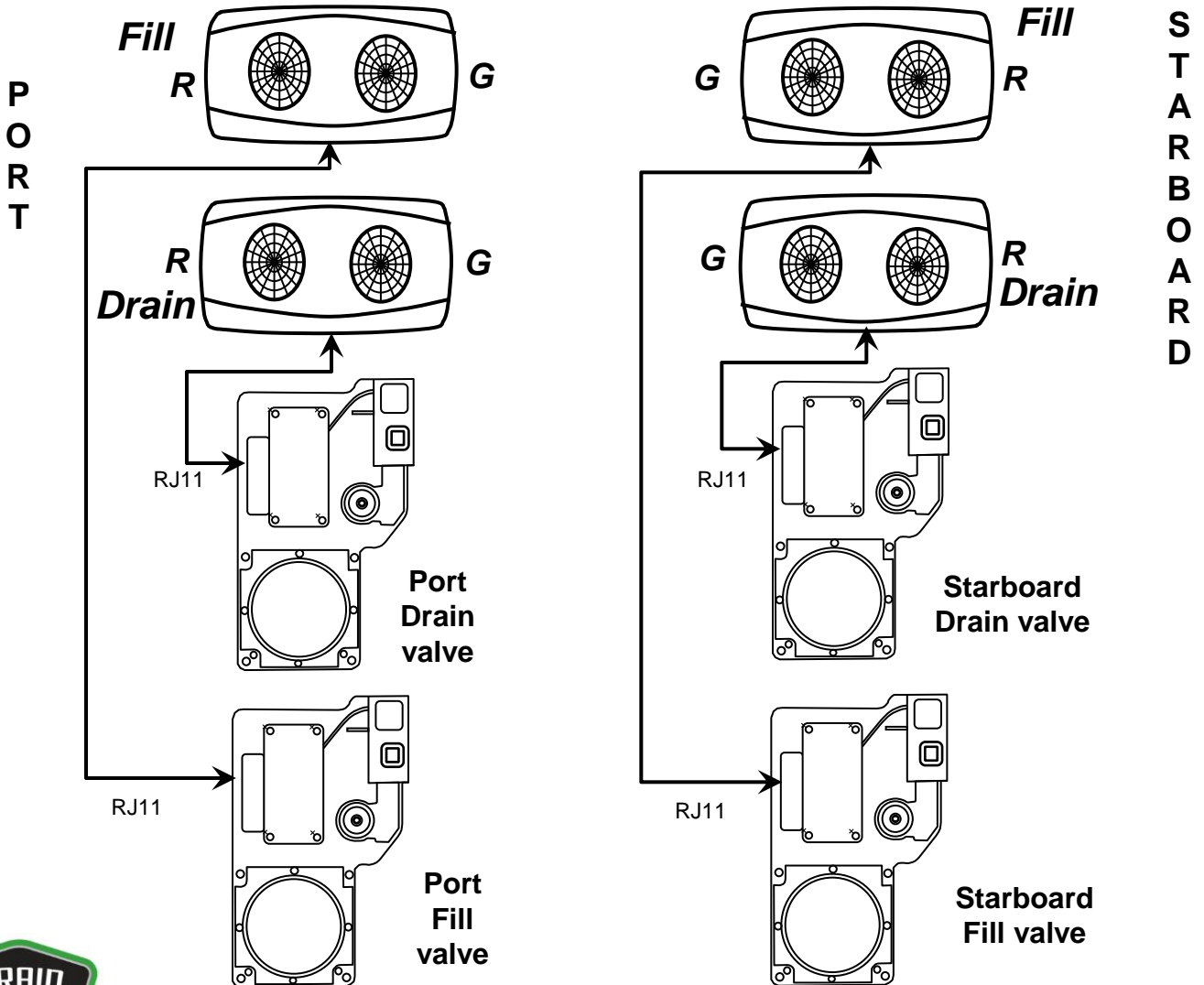


Fig. 17



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7. IP66 Cable Routing from Valve to Operating Switch

The IP66 cable is extremely easy to work with, layout out and route. It carries very low level currents leaving the main power to be handled directly by the controller making the system virtually loss-less and completely independent of the cable length to the operating switch.

Each RJ11 cable carries all the necessary signals to and fro the switch and the valve, making multi switch and/or multi valve installs a breeze.

Routing of the cables is not critical -Cables may be run singly or combined like a harness using automotive grade split sheathing (recommended). They may be routed alongside other wire bundles or harnesses.

Boat Owners : Please spend some time pre-planning the best routing options. Strain relief the RJ 11 cable close to the valve and to the switch. Bundle Excess cable, if any, with cable ties and secure to prevent snagging. Excess cable bundle should NEVER be left dangling or pulling down on the socket as it will stress the plastic tabs eventually causing intermittence or break away failure over time.

OEMs : RJ 11 and 12 V wiring can be embedded into the wire harness at the design stage. For Specifications and information please contact Drain Master.

8. 12 V Power

8.1 Connector Polarity:

The connection polarity color codes are : BLACK to + 12 V. GREEN to Ground

NOTE: Pro Series valves feature Reverse polarity protection. The green LED on the Controller lights up only with correct polarity. IF LED is not lit, check polarity

If a different style of male / female 12 Power connector is to be installed for application reasons, use one that is polarized . 12 V power wires to valve may be bundled at a convenient point along the routing path with the IP66 cables. Use of P -Clamps and tie wraps to strain relief the 12 V power wires or cable bundles

8.2 Peak Currents: At power up a current peak of 10 amps peak per valve occurs. 12 V supply must be wired direct to a deep cycle marine battery or from an independent spare or auxiliary outlet on the DC distribution panel. DO NOT SHARE 12 V FEEDING OTHER LOADS. Ideally the 12 V power should be switched through a master on-off switch.

8.3 Wiring: If the valves are far apart and or /in different locations each valve can be individually fed 12 V with an independent set of wires from the source. Valves that are close up or lie sequentially along a path can be wired (hung) off a common 12 V bus. Always use a wire gauge commensurate with the distance from the DC source and the number of valves being fed, for example 3 valves fed off a common 12 V bus will incur a 30 amp current peak from the source in the initial (common) part of wire run. Refer to the wiring diagram Doc DM



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8.4 Terminations : Connect SVT connector pigtail to the 12 V power feed wires either by soldered joints covered over with heat shrink tubing or by crimping 2 way butt connectors (single connection) or 3 way butt connector (bus connection). We do not advise the use of over-the-wire (insulation piercing) splice connectors as these cannot always ensure low contact resistance nor ensure polarity. All connections should be insulated over with NO bare metal exposed.

The + 12 V source on distribution panel will invariably use screw terminals – tighten to the recommend torque.

Ground connection may be either to the battery ground common on the bus bar or at the distribution panel ground. Use a serrated or star washer to ensure solid ground contact.

Remember you are dealing with high currents – please recheck all connections, crimp quality and screw terminals – poor connections are not uncommon and cause hot spots (usually characterized by localized discoloration) leading to failure. Care exercised during this step will ensure years of reliable operation.

In multi valve and / or multi switch installs, labeling the cables according to the function greatly facilitates the install process and later serviceability.

8.5 12 V Power source: Use only a properly charged and maintained deep cycle marine battery to meet the current demands specially with multiple valves and / or daisy chain applications.

Check Voltage does not drop below 10.8V minimum at the power connector terminals during the peak current at start up. The Pro - Series valves will operate below 10.8 Volts but speed and reliable operation will progressively decline

8.6 Standby, Non-Usage and Storage:

The standby current when connected and valve not in motion is less than 30 milliamps per valve. This is an extremely small current drain and as long as the power source receives recharge, Pro- Series valves may be left on indefinitely.

During seasonal storage, prolonged inactive periods or if the battery is not receiving any recharge at all, Valve Power must be turned off by a dedicated valve Master switch or disconnecting the power connector from the 12 V supply.

9 CAUTION - IMPORTANT +12 V Power connection DO NOTS

9.1. **DO NOT** obtain valve +12 V by tying to other switched loads particularly motors such as pumps, fans etc. Power switch sharing may cause high voltage spikes on the +12 V line that are damaging to the valve. +12 V valve power must be direct from battery or a spare 12 v distribution panel or bus bar terminal. A dedicated Master Power switch for the valve/s is advised.

9.2 **DO NOT** connect to under-capacity power sources: Operating the Pro- Series valves from inadequate bench or other power supplies or depleted batteries can cause repeated power-up cycling leading to overheating damage to the motor and valve .

Damage from above violations is not covered under warranty.

A wiring diagram is available on our website:

<https://drainmaster.com/manuals/DM104-S3VT12VDCWiringDiagram.pdf>



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10. Single Switch Insertion : Fig. 18-1 through 18-4 show step sequence for single switch PN 5787 insertion into panel

Step 1

IMPORTANT : *Prior to insertion determine if the insertion is with the RJ11 wire plugged or unplugged. If rear access to the switch assembly is not available be sure to plug in RJ11 first. **Once Fully inserted Switch cannot be easily removed - Refer Insertion Step 4.***

With or without the wire plugged in, as the case may be, angle the switch as shown - this will gain the initial entry.

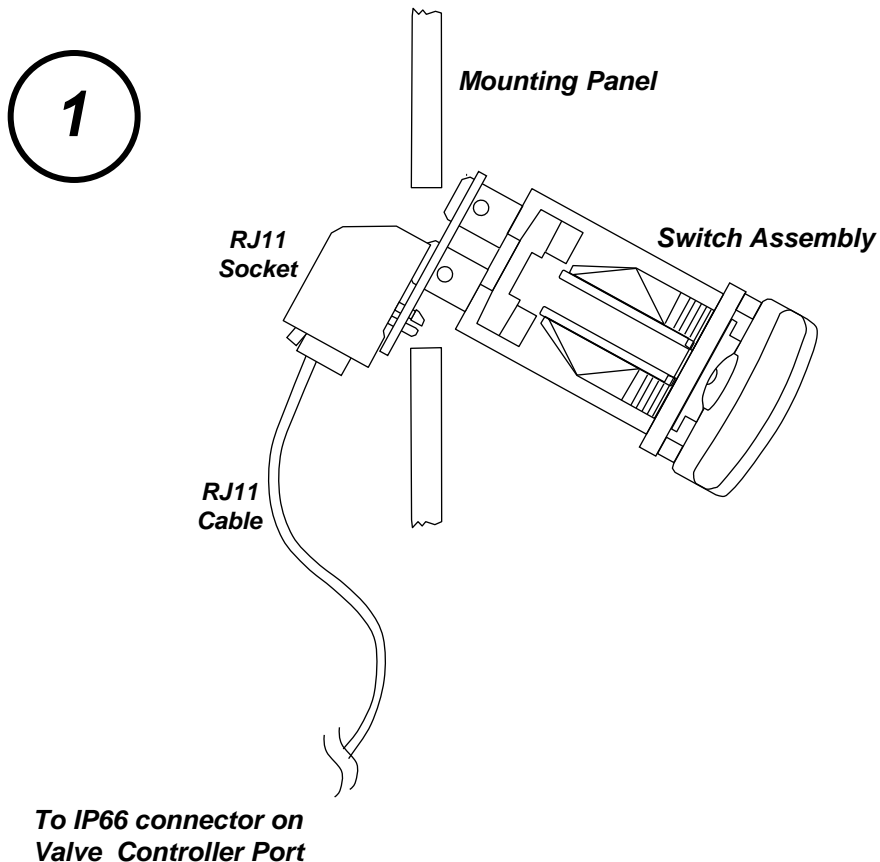


Fig. 18-1



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10. Switch Insertion : Step 2

Turn the switch assembly into the slot as shown till the mounting panel edge resides in the tab space **S** in the illustration. From this position the switch body can be eased into the slot without interference even with the maximum allowable panel thickness
(Refer Mounting Hole / Panel dimensions)

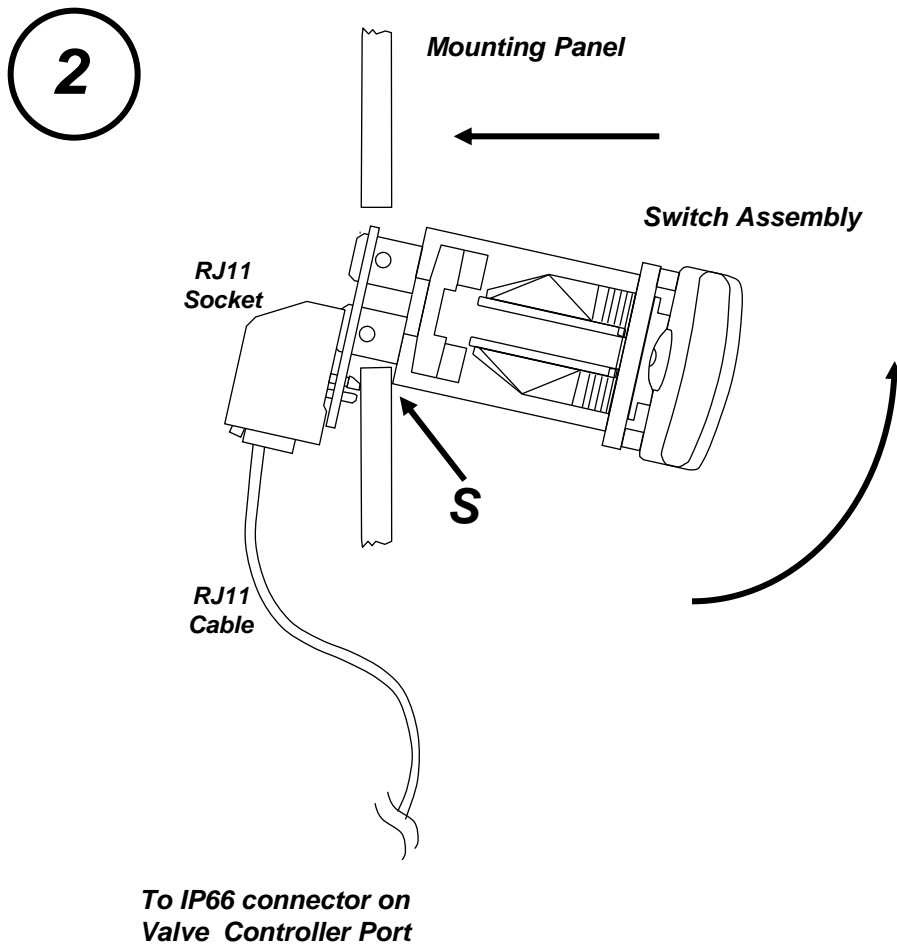


Fig. 18-2



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10. Switch Insertion : Step 3 and Step 4

Continue pushing the assembly into the Panel slot. It should slide in nicely till at the end resistance is felt - push in firmly till seated flush. The splined fins on the switch body will secure the switch in place. **Removal requires a special tool so be sure you are in complete readiness for step 4.**

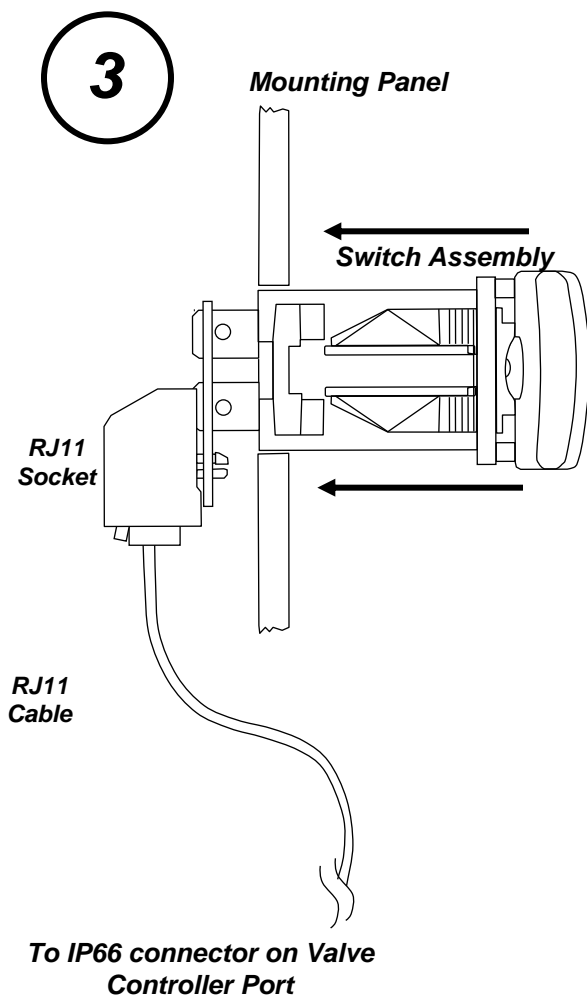


Fig. 18-3

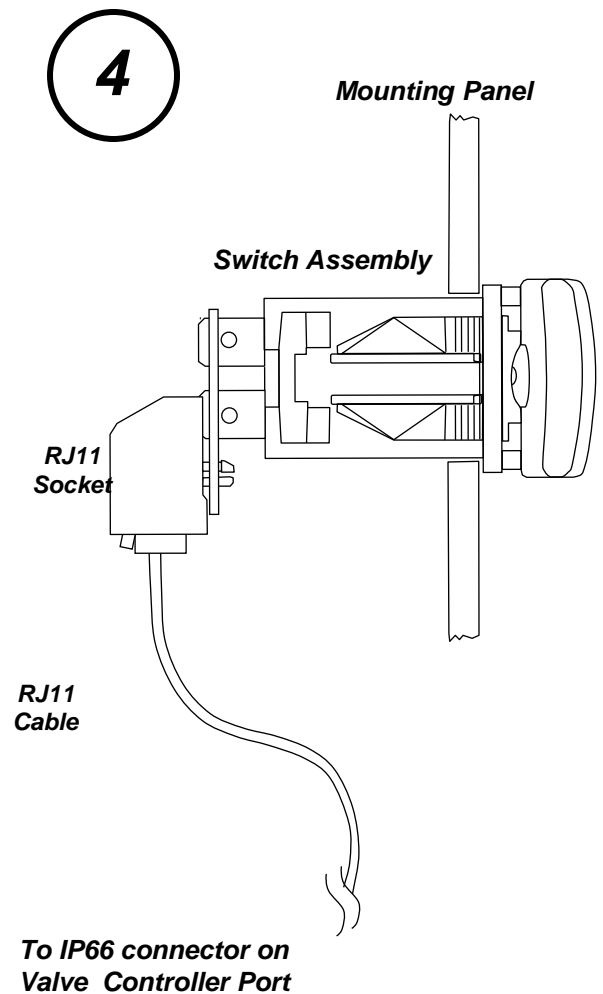


Fig. 18-4

