



Max-Air TECHNOLOGY

MS45/PS45 Limit Switch Box



INSTALLATION, OPERATION & MAINTENANCE MANUAL

Max-Air TECHNOLOGY, INC.



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CHAPTER 1: PRODUCT DESCRIPTION

Max-Air Technology series of switchboxes have been designed to provide rotary pneumatic actuators with positive signal indication of valve position in a variety of applications, from ordinary installations to environments where explosive hazards may be present. The MS45/PS45 series limit switch boxes are manufactured from die-cast aluminum and powder epoxy-coated for corrosion resistance, with stainless steel fasteners and shaft. With a weather-proof Nema 4, 4x rating, these switchboxes are corrosion resistant and suitable for most corrosive environments.

Max-Air Technology Limit Switch Boxes are equipped in a standard configuration with the following unique features:

- **Quick Set Cams:** the operating position of the switches can be easily changed by manually adjusting the high resolution spline cams. The cams are spring backed and will not be affected by normal vibration.
- **Easy wiring:** Max-Air switch boxes are easy to install with plenty of room to bring wires into the enclosure. Each unit comes standard with two ½" NPT conduit entries, an 8 or 10-point terminal strip, with 2 or 4 points for connecting a solenoid valve with up to two separate coils. The terminal strips are oriented to allow for ease in attaching external wires.
- **Compact Design:** Max-Air switch boxes have a compact construction, minimizing valve package envelope size.
- **Inclusive Mounting Bracket:** A mounting bracket is supplied as standard with each MAX-AIR Switch Box and it fits the NAMUR top-mounting hole spacing 80 mm x 30mm. The standard bracket comes with a NAMUR stem height of 30 mm. Also available is an optional "L" bracket design for universal mounting on any actuator. Please call for more information.
- **High Visibility Indicator:** Each Max-Air Limit Switch Box comes standard with a high visibility indicator for both open and closed positions in the actuator stroke. Special beacons for use with 3-way L-port and T-port valves are also available.

CHAPTER 2: LIMIT SWITCH BOX INSTALLATION

CAUTION — PLEASE READ CAREFULLY

- **BEFORE CARRYING OUT ANY OPERATIONS AND REMOVING THE COVER, IT IS ESSENTIAL THAT THE SWITCH BOX IS NOT ENERGIZED.**
- **THE CONDUIT CAP SUPPLIED WITH THE MAX-AIR SWITCH BOX IS FOR PROTECTION IN TRANSIT ONLY. IP 67 PROTECTION DEPENDS ON THE PLUG AND WIRING METHODS USED. ANY CONDUIT (USED OR UNUSED) MUST BE CLOSED WITH A PLUG SUITABLE FOR THE REQUIRED PROTECTION.**

INSTALLATION

- a. Align the shaft to the actuator pinion and engage it.
- b. Using the provided mounting bracket, screws and washers, tighten the brackets to the actuator, and the bracket to the switchbox.

SWITCH ADJUSTMENT

- a. Remove the four screws and remove the cover.
- b. Turn the actuator to the open position.
- c. Push the upper cam down, turn until the switch is activated and then release; the spring between the 2 cams will ensure the cam re-engagement onto the shaft. **Note:** on the shaft there is a spline and each spline tooth adjusts approximately 2°.
- d. Turn the actuator to the closed position.
- e. Pull the lower cam up, turn until the switch is activated and then release; the spring between the 2 cams will ensure the cam re-engagement onto the shaft. **Note:** on the shaft there is a spline and each spline tooth adjusts approximately 2°.
- f. Reassemble the cover and tighten the screws, taking care not to damage the seal.



PS45



MS45

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CHAPTER 3: TECHNICAL DATA

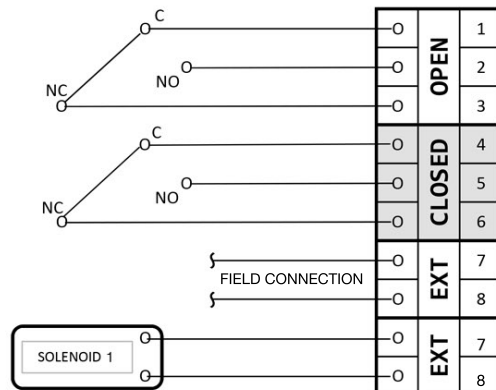
3 – 1 WIRING DIAGRAM

- Remove the four screws and remove the cover.
- Remove the protection cap and substitute it with the plug that ensures the desired protection. Conduits are threaded ½" NPT.

WARNING: NEMA 4, 4x / IP67 protection depends on the wiring connection, so the use of inappropriate components and/or wrong installation will result in a decrease in the protection rating of the switch box.

- Using a screwdriver, wire the 8 or 10 points terminal strips according to the diagram:
- Reassemble the cover and tighten the four screws.

7878 Board - Single Coil SV Applications



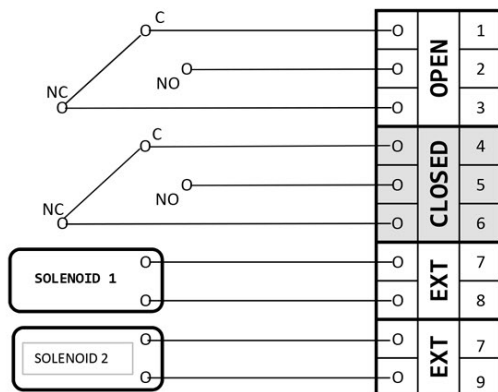
Wire Colors		
Cam Switch Position	Part No. MS45	Part No. QPS45 PS45
UPPER	Black	White
	Blue	Black
	Red	Blue
LOWER	White	White
	Green	Black
	Yellow	Blue
FIELD CONNECTION		
SV TO LIMIT SWITCH BOX		
FACTORY CONNECTION		
SV TO LIMIT SWITCH BOX		

Please Note: Cam colors do not correspond to beacon colors or open closed designation.

Notes:

- For AC powered solenoids, neutral wires should be connected to terminal(s) 7, hot wires to position 8.
- For DC powered solenoids, negative wires should be connected to terminal(s) 7, positive wires to position 8.
- The two terminal positions (points 9 and 10, labeled 7 and 9) for solenoid 2 are not available in the PS45 limit switch enclosure.
- The two "7" terminals are electrically connected as are the two "8" terminals.

7879 Board - Dual Coil SV Applications



Wire Colors		
Cam Switch Position	Part No. QMS45 MS45	Part No. QPS45 PS45
UPPER	Black	White
	Blue	Black
	Red	Blue
LOWER	White	White
	Green	Black
	Yellow	Blue
PASS THRU WIRING		
PASS THRU WIRING (ONLY ON MS45)		

Please Note: Cam colors do not correspond to beacon colors or open closed designation.

Notes:

1. For AC powered solenoids, neutral wires should be connected to terminal(s) 7, hot wires to positions 8 and 9.
2. For DC powered solenoids, negative wires should be connected to terminal(s) 7, positive wires to positions 8 and 9.
3. The two terminal positions (points 9 and 10, labeled 7 and 9) for solenoid 2 are not available in the PS45 limit switch enclosure.
4. The two "7" terminals are electrically connected.

3 – 2 LIMIT SWITCH BOX CLASSIFICATION

Max-Air Technology Limit Switch Boxes are designed to the following standards:

NEMA 4, 4x: Watertight and Dust-tight — indoor & outdoor: Protects against windblown dust rain, splashing water and hose directed water. Also corrosion resistant.

IP67: Watertight and Dust-tight — indoor & outdoor: No ingress of dust; no ingress of water in harmful quantities when immersed in water up to 1m.

3 – 3 MATERIAL

Materials

Box:	Die Cast Aluminum, Powder Epoxy-Coated or Stainless Steel
Brackets:	Stainless Steel
Position Indicator:	ABS/Polycarbonate
Fasteners:	Stainless Steel
Seals:	Buna-N
Operating Shafts:	304 Stainless Steel
Cams:	Plastic
Microswitches:	Polymer-housed Microswitch

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3 – 4 LIMIT SWITCH BOX SPECIFICATIONS

Technical Data

PS45 Proximity Switch Ratings (REED-TYPE)

SPDT Proximity Switches
With 8 Point Terminal Strip
on a printed circuit board

Nominal voltage	120VAC/48VDC
Max current	0.25 A
Max power	5 W
Switching frequency	1000 Hz
Self inductance	50 mH
Self capacitance	0.3 pF
Operating Temperature	-20°C-80°C / -4°F-176°F

MS45 Mechanical Switch Ratings

Rated Voltage	Resistive Load		Lamp Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	5 A(0.1 A)		1.5 A	0.7 A	3 A		2.5 A	1.3 A
250 VAC	3 A		1 A	0.5 A	2 A		1.5 A	0.8 A
8 VDC	5 A		2 A		5 A		3 A	
14 VDC	5 A		2 A		4 A		3 A	
30 VDC	4 A(0.1 A)		2 A		3 A		3 A	
125 VDC	0.4 A		0.05 A		0.4 A		0.05 A	
250 VDC	0.2 A		0.03 A		0.2 A		0.05 A	

Other switch types are available, call Max-Air for details.



WARRANTY

Max-Air Technology provides the following warranty regarding products it manufactures. THE WARRANTY STATED HEREIN IS EXPRESSED IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, OR STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. *Max-Air Technology* warrants its products to be free from defects in materials and workmanship when these products are used for the purpose for which they were designed and manufactured. *Max-Air Technology* does not warrant its products against chemical or stress corrosion or against any other failure other than from defects in materials or workmanship. The warranty period is for twelve (12) months from installation date or eighteen (18) months from shipment date, whichever date comes first. Any claims regarding this warranty must be in writing and received by *Max-Air Technology* before the last effective date of the warranty period. Upon *Max-Air Technology* receipt of a warranty claim, *Max-Air Technology* reserves the right to inspect the product(s) in question at either the field location or at *Max-Air Technology* Manufacturing plant. If, after inspection of the product(s) in question, *Max-Air Technology* determines that the purchaser's claim is covered by this warranty, *Max-Air Technology's* sole liability and the purchaser's sole remedy under this warranty is limited to the refunding of the purchase price or repair or replacement thereof a *Max-Air Technology* option. *Max-Air Technology* will not be liable for any repairs, labor, material or other expenses that are not specifically authorized in writing by *Max-Air Technology*, and in no event shall *Max-Air Technology* be liable for any direct or consequential damages arising out of any defect from any cause whatsoever. If any *Max-Air Technology* product is modified or altered at any location other than *Max-Air Technology* - St. Louis (Missouri) or *Max-Air Technology* - Sesto San Giovanni (Milan) ITALY without the express written authorization of *Max-Air Technology* are not covered by this warranty. The warranty for such products shall be subject only to the warranty relief, if any, provided by the suppliers and/or manufacturers of such products