

Installation, Operation and Maintenance Manual

PROVAL A250 Series

Limit Switch Boxes



IOM-A250-2401



Section 1: Before You Start

This section explains:

- Base Safety Procedures
- Protection Guidelines
- Storage Guidelines
- Handling Guidelines

Installation, adjustment, putting into service, use, assembly, disassembly and maintenance of the limit switch box must be performed by qualified personnel.

WARNING !

Nonobservance of the safety instructions may lead to personal injury and danger for both the environment and the limit switch box itself. Nonobservance of these safety instructions will also forfeit the user's warranty

1.1 Base Safety Procedures

- Personnel making any adjustment to the limit switch boxes should utilize suitable equipment. All required personal protection means should be worn.
- Installation and handling of the c should only be done by personnel that is trained in all aspects of manual and mechanical handling techniques.
- Ensure that limit switch box pressure/temperature limitations marked on the limit switch boxes tagplate are within the service conditions

1.2 Receipt and Inspection

Limit switch boxes should be inspected for damage before being removed from the delivery vehicle or signing the delivery receipt.

Care should be taken to ensure proper rigging of the limit switch box for lifting and appropriate lifting equipment is being used. Limit switch boxes should never be lifted by the hinge, lever arm, spring, weight, limit switch, and/or air cushion. It is recommended that the following checks be made prior to installing this limit switch box:

- Recheck the limit switch box for damage
- Check all nuts and bolts to make sure they are properly tightened.
- Check the limit switch box is properly selected / supplied to meet your electrical signal requirements.

PROVAL A250 Series

Limit Switch Boxes



1.3 Storage & Handling

Whenever possible, check limit switch boxes should be stored inside. However, when this is not possible or feasible, some outdoor protection must be provided. The limit switch boxes must be stored in such a manner to protect them from weather, blowing dirt and debris. A tarp covering will minimize exterior coating damage from these elements and reduce fading or chalking due to exposure to the sun. The limit switch boxes should also be placed in a location where they will not be damaged by collision from vehicles, lift trucks or falling items. Limit switch boxes should be stored so that water does not stand in the body. In cold climates, if water is allowed to freeze in the limit switch box, severe damage to the components could result. The limit switch boxes are shipped in the closed position and should remain in the closed position during long-term storage. Any packaging removed for inspection of the limit switch boxes should be replaced before placing the limit switch boxes into long-term storage. Proper slinging and handling methods should be used when moving limit switch boxes. The limit switch boxes should be handled only with apparatus that will safely support the full limit switch box weight. Do not place slings or other devices around the operating hinge, around the lever arm or air cushion cylinder, or through the limit switch box port opening. Do not lift adjacent piping or components by lifting (or placing) the limit switch box provided.

Section 2: Introduction of Limit Switch Box

2.1 Purpose

This installation and operating manual explains how to install, operate, and maintain limit switch boxes.

PROVAL A250 Series limit switch boxes are used on rotary valve actuators to generate open/close signals and monitor the valve position.

2.2 Safety Notice

For a safe installation of a switchbox in the hazardous area the following must be observed. The module must only be installed by qualified personnel who are familiar with the national and international laws, directives, and standards that apply to this area and all instructions in this manual.

The Switchbox can be only connected to certified intrinsically safe apparatus or according to EN 50020 standards. These combinations must be compatible as regards the electrical parameters.

This EC Type examination certification relates only to the design and construction of this specified equipment or protective system in accordance with the directive 2014/34/EU (ATEX)

Intrinsically safe switch boxes should only be wired via intrinsic safety barriers located in safe area.

Do not open a flameproof switch box cover if energized or explosive atmosphere is present !

Refer to personal safety. Alert the user of danger or harm. The hazard or unsafe practice will result in severe injury or death.

PROVAL A250 Series



Limit Switch Boxes

2.2 Marking

The limit switch box nameplate is located on the top cover casing. The nameplate contains the following:

- Logo
- Type number
- Enclosure
- Rated current
- Accreditations, certifications
- Traceability QR code or Serial / Order Number

2.3 Technical Specifications

- 3D continuous visual position indicator
- Easily adjustable spring-forced CAM system
- Standard IP67 enclosure
- 2 pcs Open/Close mechanical or proximity switches
- Easily adjustable brackets and suitable for all NAMUR VDI/VDE interface actuators
- 8 strips on the terminal box allow direct connection of the solenoid valve inside the switch box.
- Threaded or push-in terminal selections

2.4 Switch Models

Model	Switch Brand	Switch Type
A250 PSM-1	Zippy	Micro
A250 PSM-2	Crouzet	EF83161.3
A250 PSP-1	P+F	NBB2-V3-E2
A250 PSP-2	P+F	NJ2-V3-N
A250 PSP-3	P+F	SJ3,5-N
A250 PSP-4	IFM	IS5076
A250 PSP-5	P+F	NBB3-V3-Z4
A250 PSP-6	IFM	NS5002

PROVAL A250 Series

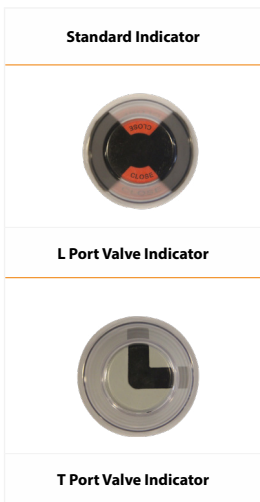
Limit Switch Boxes



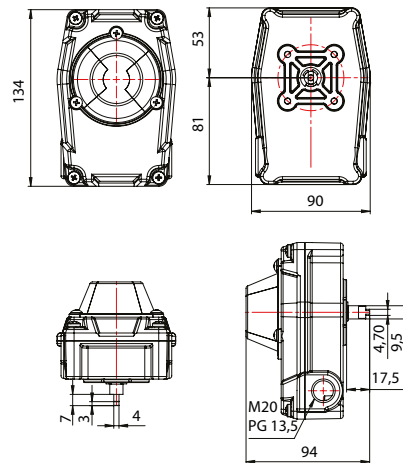
2.5 Part List

No	Part Name	Material	Qty
1	Screw	AISI304	3
2	Cover	ABS	1
3	Body Seal Ring	NBR	1
4	O/C Indicator	ABS	1
5	Cap Screw	AISI304	4
6	Cap	Alu Die Cast	1
7	Body Seal Ring	NBR	1
8	Cam	PA66	1
9	Cam	PA66	1
10	Spring	AISI304	1
11	Close Cam	PA66	1
12	Close Cam Fixing	PA66	1
13	O-Ring	NBR	1

No	Part Name	Material	Qty
14	Switch Screw	AISI304	2
15	Switch Screw Washer	AISI304	2
16	Pinion	AISI304	1
17	Terminal Block Screw	AISI304	2
18	Terminal Block	PA66	1
19	Limit Switch	Plastic	2
20	Cable Set	Copper & Plastic	1
21	Bushing	Bronz	1
22	Bling Plug	Polyamid	1
23	Body	Alu Die Cast	1
24	Circlip	AISI304	1
25	Bracket	Epoxy Coated Bracket	1
26	Washer	AISI304	4
27	Screw	AISI304	4

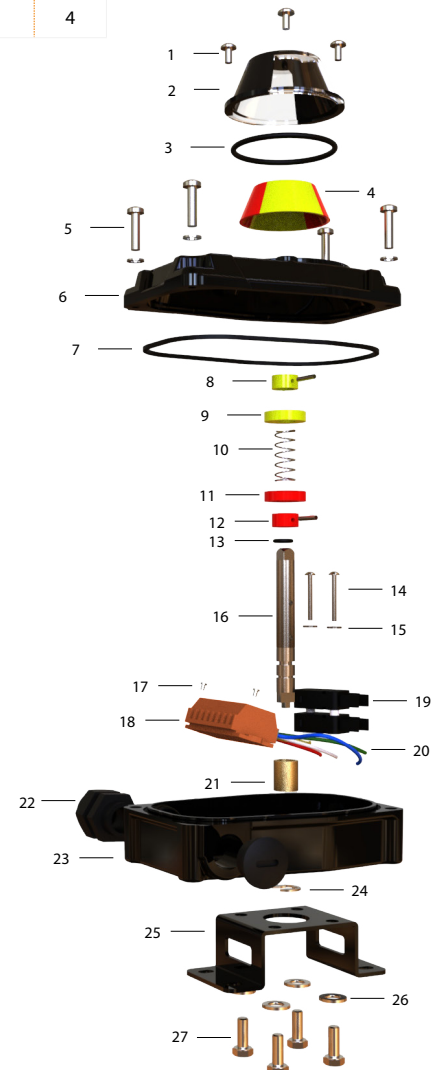


Dimensions(mm)



Bracket Dimensions

Model	Bracket Type	Mounting Dimension
MB-1		30x80 H: 20
MB-2		30x80 - 30x130 H: 20-30 Adjustable
MB-3		30x80 - 30x130 H: 40-50 Adjustable





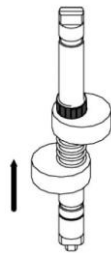
Section 3: Installation Instructions

If the Proval switch box is already assembled on an actuator and valve, please follow the instructions from point 4.

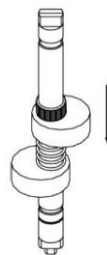
WARNING!

Intrinsically safe switch boxes should only be wired via intrinsic safety barriers located in the safe area. Do not open the A250PSX flameproof switch box cover if the switch box is energized or an explosive atmosphere is present!

1. Attach the proper mounting bracket and adapter to the actuator.
2. Operate the actuator to the full closed position
3. Attach the Proval switch box to the mounting bracket and adapter on the actuator
4. If the Switchbox is fitted with a beacon: Remove the beacon
5. Loose the four screws in the switch box-lid and remove the lid
6. Connect the cables according to the wiring diagram
7. To set switches, lift the bottom cam and turn until the open switch is activated and then release. The spring will push the cam into the splined shaft. Operate the actuator to the opposite extreme, push down on the top cam turn until the close switch is activated, and then release. The spring will push the cam into the splined shaft,



Lift up and release



Push down and release

8. Operate the actuator from one extreme to the other several times to check switch operation
9. Mount the switchbox-lid. Confirm that you have noted the final position of the valve (full-open or full-close). Make sure that the screws on the lid are correctly mounted in the thread
10. If the Switchbox is fitted with a beacon: Mount the beacon. Confirm that the beacon coincides with the position of the valve.
11. The unit is now ready for automatic operation.
12. If any assistance is required, please feel free to contact Proval offices or local representatives.

Section 4: Operation Instructions

4.1 Electrical Connections and Preliminary Test

- Work on the electrical system or equipment must only be carried out by a skilled electrician himself or by specially instructed personnel under the control and supervision of such an electrician and by the applicable electrical engineering rules
- Cable gland or conduit entries shall be controlled by qualified engineers to ensure correct protection against water damages etc.
- Treat limit switch casing top with care. A gap between limit switch box housing parts may lead to unexpected damages. Do not jam the cover during fitting.

PROVAL A250 Series

Limit Switch Boxes



4.2 Wiring

Please refer to the enclosed wiring diagram or contact us for further details. Each positioner contains its own connection diagram inside the box.

If the enclosed diagram is not followed the proximity switches will be broken and the warranty will be void.

4.3 Operation

As to the fact that the limit switch are fully controlled / operated by the actuator shaft no manual operation is necessary.

Section 5: Maintenance

Caution: Turn off all power services before attempting to perform service on the limit switch box. Before removing or disassembling the limit switch box ensure that the valve or other actuated device is isolated and not under pressure.

When/if replacing any part use only original PROVAL spare parts.

All though no real maintenance is necessary on the limit switch box, regular maintenance checks should, under normal conditions, be carried out with intervals of maximum six months. But if service conditions are severe more frequent inspections may be advisable.

- Ensure limit switch box / actuator alignment
- Ensure wiring insulation is intact, connected and terminated properly
- Ensure all screws are present and tight
- Ensure cleanliness of internal electrical parts / devices
- Ensure conduits connections are installed properly and dry
- Check enclosure o-ring seals and verify that the o-ring is not pinched between the body and cover
- Visual inspect during open/close cycle
- Inspect identification labels for wear and replace if necessary

WARNING!

Before starting work on the limit switch box, please check all conditions of the limit switch box, other related equipment and site for safety purposes.

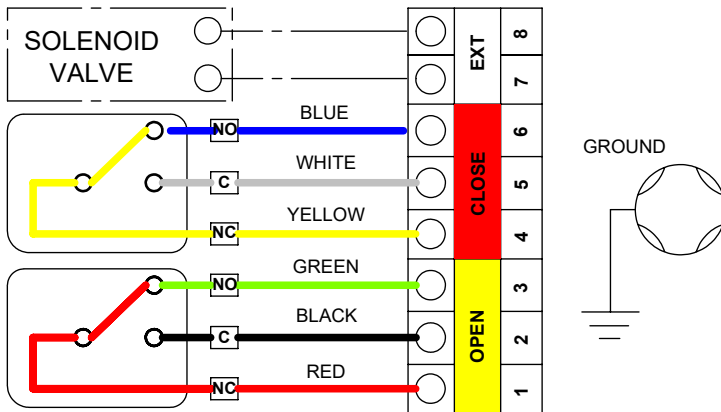


Troubleshooting

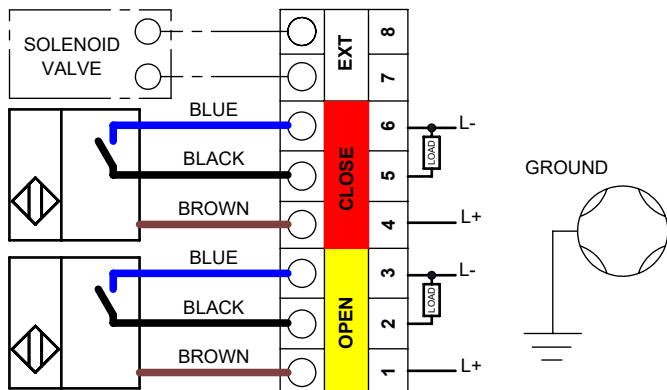
Description of trouble	Probable cause	Solution
No Open/Close Signal Detected	<ol style="list-style-type: none"> Misalignment of cam parts Limit switch failure Wire disconnected Improper power supply 	<ol style="list-style-type: none"> Adjust the cam parts Replace the limit switches Check the wiring on the terminal Check for the power supply of switches
Opposite Open / Close Signal	Misaligned assembly	Check for valve position, while valve closed set the below-closed cam – switch in the contact position and top open switch while in open position.
Humidity on Indicator	<ol style="list-style-type: none"> Improper tightness on cable glands Improper assembly of the body-cap seal. 	<ol style="list-style-type: none"> Check/replace the cable glands or tight properly to avoid internal leaks from rain Check / replace the O-ring seal between body-cap
Shaft does not rotate	Improper brackets/height adjustment	Check and replace the bracket to suit the actuator shaft height.

Section-6: Wiring Diagrams

PSM-1 / PSM-2 / PSXM SPDT Limit Switch Boxes



PSP-1 / PSXP1 P+F NBB2-V3-E2 Proximity Limit Switch Boxes (NO / PNP, Op. Voltage 10..30VDC)



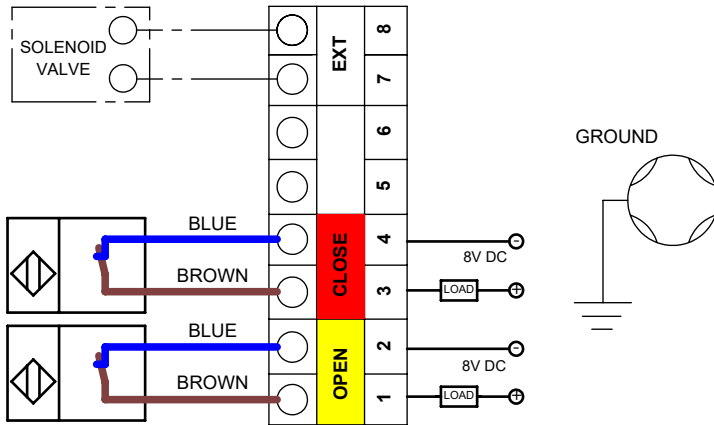
PROVAL A250 Series



Limit Switch Boxes

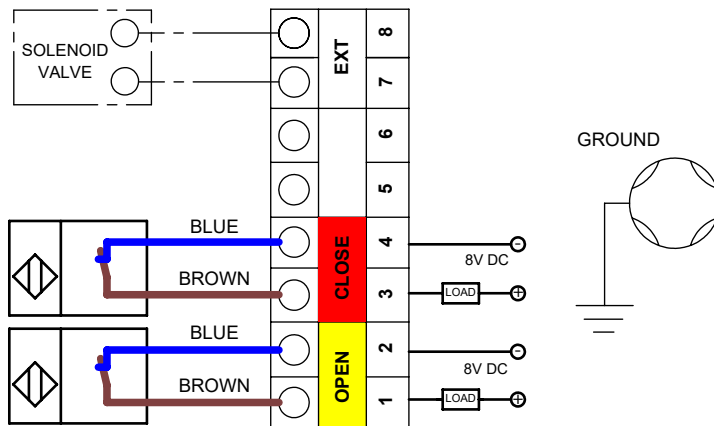
PSP-2 / PSXP2 P+F NJ2-V3-N Proximity Limit Switch Boxes (NC / NPN, Op. Voltage 8.2VDC)

Attention : Intrinsically safe limit switches must be powered via safety barrier located in safe area.



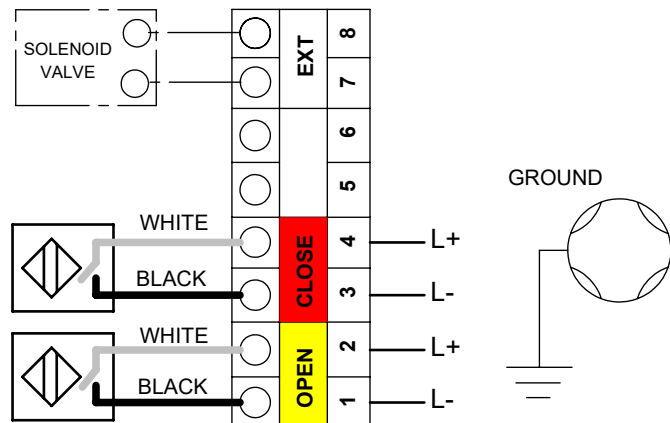
PSP-3 / PSXP3 P+F NJ2-V3-N Proximity Limit Switch Boxes (NC / NPN, Op. Voltage 8.2VDC)

Attention : Intrinsically safe limit switches must be powered via safety barrier located in safe area.

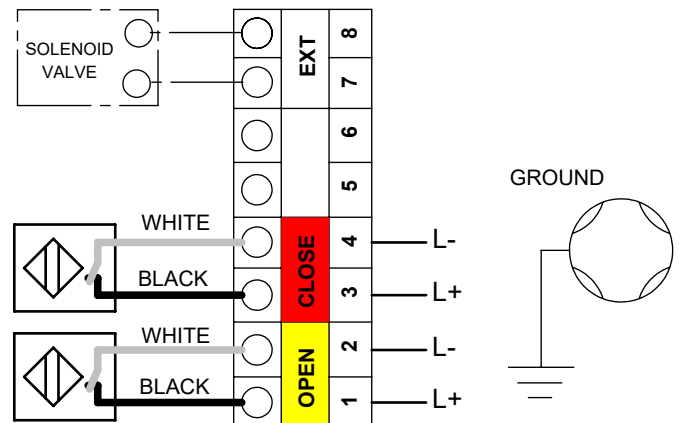


PSP-4 / PSXP4 IFM IS5076 Proximity Limit Switch Boxes (NO/NC Convertable, Op. Voltage 5..36VDC)

Option-1 PNP-NO Wiring



Option-2 NPN-NC Wiring

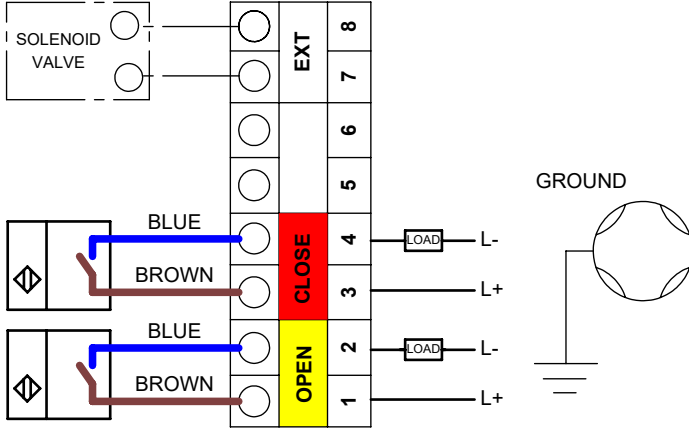


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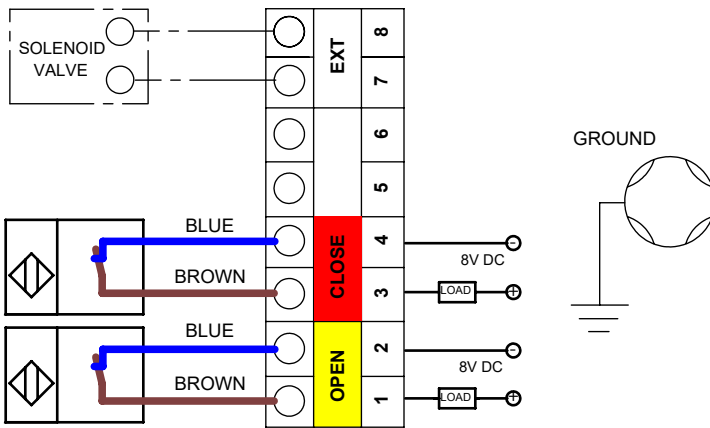
Limit Switch Boxes

PSP-5 /PSXP5 P+F NBB3-V3-Z4 Proximity Limit Switch Boxes (NO / PNP, Op. Voltage 5..60VDC)



PSP-6 /PSXP6 IFM NS5002 Proximity Limit Switch Boxes (NC / NPN, Op. Voltage 8.2VDC)

Attention : Intrinsically safe limit switches must be powered via safety barrier located in safe area.



For further technical support please contact the factory or your local representative,

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