Operating manual

Limit switch box type DR

Protection class: flame proof enclosure

ROTECH SYSTEMKOMPONENTEN

1. Description

Limit-switch-boxes are used to report and control the position of valves which are operated by pneumatic actuators. With the enclosed mounting parts the boxes can be easily and quickly mounted on actuators or valves.
This manual is valid for limit switch boxes type DR. These limit-switch-boxes may only be mounted, wired and installed by qualified personnel. The staff has to be trained in methods of explosion protection and must be well informed about the regulations of equipment in explosive areas.

2. Explosion protection and labeling

The limit-switch-boxes type DR are appropriate for the intended use in explosive areas.
The stainless steel housing has the protection class type flame proof enclosure „d" and dust protection „tb". The instruction manual of the proximity sensors or micro switches has to be regarded.

Applied standards: EN 60079-0:2009, EN 60079-1:2007 and EN 60079-31:2009

The device must be grounded

Labeling

II2G Ex d IIC T6 Gb and

II2D Ex tb IIIC T80°C Db

EC-type examination certificate: IBExU13ATEX1005X

CE 0123

The labeling is located on the type plate of the limit-switch-box. Before start of operation in explosive area make sure that the limit switch box and optionally wired solenoid valves are certified for the intended Ex-zone.

Electrical data

Electrical characteristics depend on the instruction manual of the used sensors or switches.
Maximum values:

Rated voltage	max. 250 V AC/DC
Rated current	max. 4 A
Rated cross-section	max. 4 mm^2

Temperature range

Min. ambient temperature: -40°C
Max. ambient temperature: +60°C

3. Cable entries and blind plugs

Depending on their design the limit switch boxes offer the possibility to mount up to four cable entries or blind plugs.

You may only use cable entries or blind plugs with protection class flame proof enclosure „d" and dust protection with certification for the required Ex zone. The threads for the cable entries or blind plugs are M20x1,5. Instruction manuals of the used cable entries and blind plugs have to be regarded.

Make sure that there is a sufficient mains lead cleat. All cables and wires as well as cable glands must be suitable for usage at ambient temperature from -40°C to +60°C.

Depending on the assembled parts the limit switch boxes can contain ignition sources acc. EN EN 60079-14, chapter 10.4.2.

When choosing cables and wires the relevant requirements have to be regarded.

Non-used threads for lead-in of cables and wires have to be locked permanently with appropriate pling plugs, approved according EN 60079-1, 11.9.

4. Mounting

You have to use cover screws with tightness class 8.8 as minimum.

WARNING	**Risk of injury** The electric components inside the box carry dangerous voltage. Moreover there is a risk of bruise by some rotating parts. → **Do not open the housing while operating!**

1. Bring the actuator to a completely „Open" or „Close" position.

   Close: *Valve closed: Channel position is abreast the actuators longitudnial axis*
   Open: *Valve open: Channel position is towards the actuators axis*

2. Equate the modules axis with the actuator.
3. Attach the box with bracket on the actuator and fix it.
4. Device must be switched to zero-potential. Unfasten cover screws and remove housing cover.
5. Device must be grounded. There is one external and one internal grounding connection.
6. Lead the system cable through the cable gland and wire it on the terminal block.

   Please note the wiring diagram in the technical data sheet.
   The wiring diagram can also be found inside the housing cover.

7. Refasten housing cover. Fastening torque of the cover screws: 5 Nm
   You may use cover screws with tightness class 8.8 as minimum only.

8. Make sure that there is a sufficient mains lead cleat.

5. Adjusting switch-points

Ex factory the limit-switch-boxes are adjusted in the following way:

Switch-point close: Position valve/actuator at 0° to 3°

Switch-point open: Position valve/actuator at 87° to 90°
(Switch-points of other switches optionally)

If readjustment should be necessary proceed as following:

1. Device must be switched to zero-potential. Unfasten cover screws and remove housing cover.

2. Depending on the type of proximity switch, the limit switch boxes are equipped with different activators.
Actuation with switch cams or switch plates: Push down the exterior ring of the switch cam of the sensor, which has to be readjusted. Turn the switch cam until the designated position has been reached. By disengaging the switch cam, it snaps into place again. Actuation with damping flag: Loosen the Hexagon socket head cap screw between the sensors. Now turn the switch cam underneath the sensors until the switch flag in its end position damps the sensors. Actuation with switch flag: Unscrew the fastening nuts and move the sensor forward or backward until the designated switch point has been reached. The switch flag may not contact the front side of the sensor!

3. Proceed similarly with other switch-points.
4. Refasten housing cover (fastening torque of the screws tightness class min. 8.8: 5 Nm)

6. Connection of solenoid valves

Depending on their design the switch-boxes offer the possibility to additionally connect up to two solenoid valves on the terminal block. You may only wire solenoid valves for the required Ex-zone. At some limit switch boxes it is not possible to additionally wire solenoid valves.

Consider the instruction manual and the explosive protection labeling of the solenoid valve.

If you want to wire solenoid valves additionally act as follows:

1. Device must be switched to zero-potential.
2. Remove the blind plug and replace it by a certified cable gland acc. point 3.
3. Unfasten cover screws and remove housing cover.
4. Lead the system cable through the cable gland and wire it on the terminal block.

   Please note the wiring diagram in the technical data sheet.
   The wiring diagram can also be found inside the housing cover.

5. Refasten housing cover (fastening torque of the screws tightness class min. 8.8: 5 Nm)

7. Maintenance

Long-time outdoor usage can cause gaskets to become brittle after some time. Safe operation can only be guaranteed with leak-proof boxes.

Gaskets should be exchanged immidiately when they are damaged, or at least after five years.
Gaskets may be replaced by qualified personell only.
Gaskets can be ordered at Rotech Systemkomponenten anytime.