

RC1990

Explosion proof Switch Box

Instruction


Manufacturer: Rotork Sweden AB

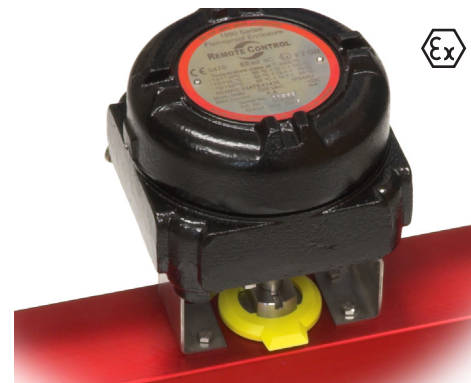
Directive conformity: 2014/34/EU

Standard conformity: EN 60079-0:2018, IEC 60079-0:2017
EN 60079-1:2014, IEC 60079-1:2014
EN 60079-31:2014, IEC 60079-31:2013

Certificate

EC Presafe: 20ATEX48896X, IECEx PRE 20.0020X
19ATEX14857X, IECEx PRE 20.0118X

Group and category: **CE** 0470  II 2 GD
Ex db IIC T6-T4 Gb / Ex tb IIIC T80-127°C Db
Ex ib IIC T6-T5 Gb / Ex ib IIIC T80-100°C Db
For use in potentially explosive atmospheres.



Transport and storage

Keep the RC1990 in the original package until use. RC1990 should be stored at room temperature and protected from dirt and moisture. The connection holes must be closed.

Commissioning

Ensure that the switch box correspond to the ordered part specifications. If needed contact the manufacturer Rotork Sweden AB.

The electrical connection between the RC1990 switch box and the control system is to be established according to the standards for installation. The installer must also refer to the label on the switch box and the EC-type examination certificate (available on request) to ensure that the electrical and environmental parameters correspond to the installation requirements.

Fit suitable ATEX and IECEx certified cable gland, Ex d approved for Ex d/t switch box and Ex e approved for Ex ib switch box.

Specific conditions of use:

- 1: ATEX and IECEx certified cable gland to be used.
- 2: For Ex d: Repairs of the flameproof joints must be made in compliance with the structural specifications provided by the manufacturer. Repairs must not be made on the basis of values specified in tables 3 of EN/IEC 60079-1.
- 3: With types of protection Ex db and Ex tb temperature rating for the cable and cable glands shall have a service temperature according to Ta on the label with the upper level increased by 17°C. For Ex ib, upper level is increased by 13°C. Maximum range is for Ex ib -55°C to +100°C, for Ex db/tb -50°C to +110°C.
- 4: Certified Zener barriers or isolation amplifiers must be used with Ex ib equipment.

Maintenance see Fig.1 page 3

1. Check that the threaded gaps between the cover (2) and the RC1990 housing (7) do not have any damage, due to mechanical or corrosion affection.
2. If needed touch up the painting, according to current standards for explosion proofed equipment and manufacturers specifications.
3. Check the condition of the cable glands and that they are correctly mounted.
4. If necessary protect the gaps and threads against corrosion with nonhardening grease. Klüber Isoflex Topas NCA 52 or identical. The gaps and threads must not be painted or treated with silicone oil based grease.
5. Check that O-rings for cover (2) and shaft (8) are intact. Damaged O-rings must be replaced with genuine spare parts only.
6. Check that all screws and the cover are correctly tightened. Secure the cover (2) with the locking screw (1).
7. Check that the switch box is centered over the actuator/valve stem and that the mounting kit between the actuator/valve and switch box is unharmed.

Mounting see Fig.1 page 3

1. Operate the actuator to the "closed valve position".
2. Fasten the Namur console (10) to the RC1990 switch box (7) with 4 pcs M6 screws (11) according to Fig 1.
3. Dismantle the cover (2) on the switch box. Loosen the locking screw (1), unscrew the cover and lift it straight up.
4. Mount the RC1990 switch box shaft (8) through the brass bearing bush (9). Turn the RC1990 shaft so that it aligns with the groove in the actuator drive shaft (13).
5. Mount the RC1990 box and console with the shaft in the groove on the top side of the actuator drive shaft (13).
6. Fasten the console with 4 pcs M5 screws (12) to the upper side of the actuator and centre the units with each other before tightening the screws.
7. Slide the two cams (5) over the shaft (8). The cams shall be turned according to Fig 1.

8. *Adjustment of the switch for "closed valve position" indication:*

Mechanical switches Fig.1

Turn the lower cam (5) clockwise until the switch is actuated. When a click is heard, lock the cam with the locking screw (3).

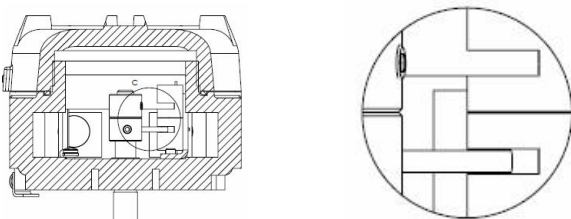
Inductive sensors V3 type Fig.1

Turn the lower cam until the rivet head ends up in front of sensing mark on the sensor. Lock with the locking screw (3).

Inductive slot type Fig.2

Turn the lower cam until the pin is located in the middle, height wise, in the sensor slot. Lock with the locking screw (3). The pin shall be centered in the slot.

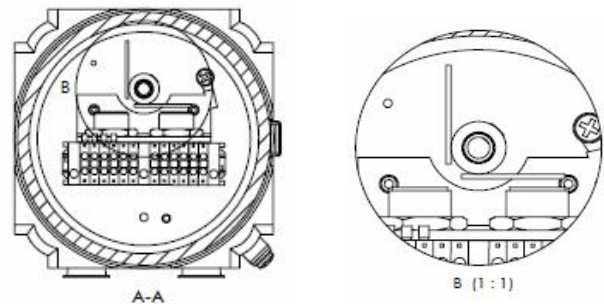
Fig.2



Inductive sensor, cylindric Fig.4

Turn the indication wing until it is in front of the sensing mark on the right sensor. Lock with the locking screw (3). The distance to the sensor is adjusted and locked with the nuts on the sensor.

Fig.4



9. Operate the actuator to the "open valve position".

10. *Adjustment of the switch for "open valve position" indication:*

Mechanical switches Fig.1

Turn the upper cam (5) counterclockwise until the switch is actuated. When a click is heard, lock the cam with the locking screw (3).

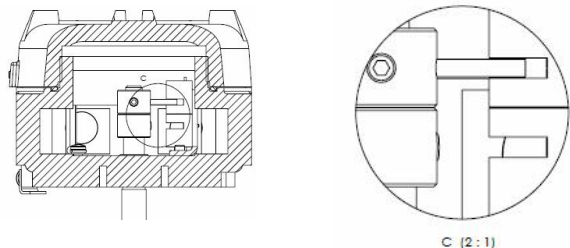
Inductive sensors V3 type Fig.1

Turn the upper cam until the rivet head ends up in front of sensing mark on the sensor. Lock with the locking screw (3).

Inductive slot type Fig.3

Turn the upper cam until the pin is located in the middle, height wise, in the sensor slot. Lock with the locking screw (3). The pin shall be centered in the slot.

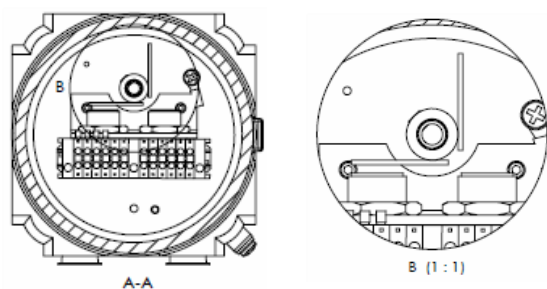
Fig.3



Inductive sensor, cylindric Fig.5

Turn the indication wing until it is in front of the sensing mark on the left sensor. Lock with the locking screw (3). The distance to the sensor is adjusted and locked with the nuts on the sensor.

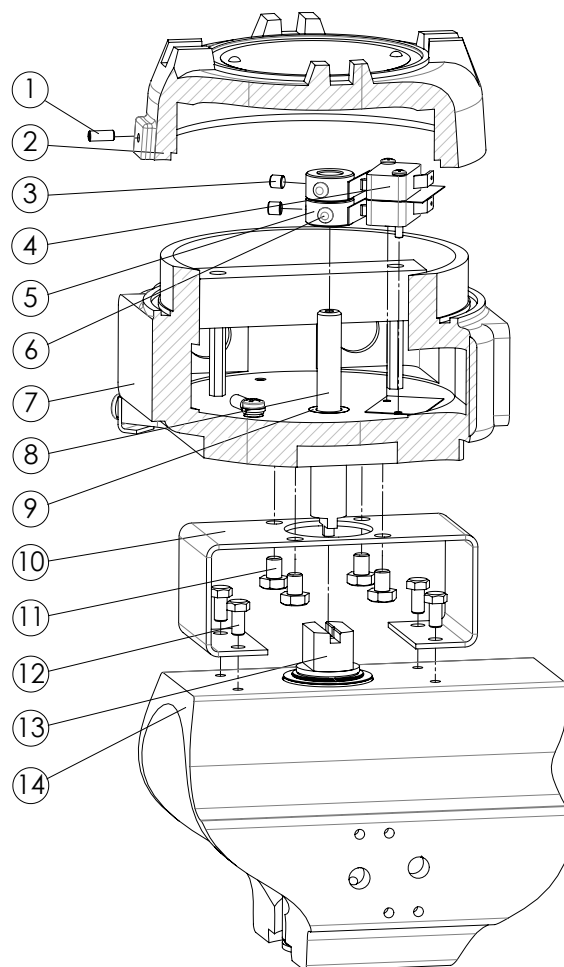
Fig.5



11. Mount cable gland/s and if necessary stopping plug. Connect according to the wiring diagram attached inside the switch box cover. The power must be switched off.
12. Screw the cover (2) back on the RC1990 switch box and secure the locking screw (1).

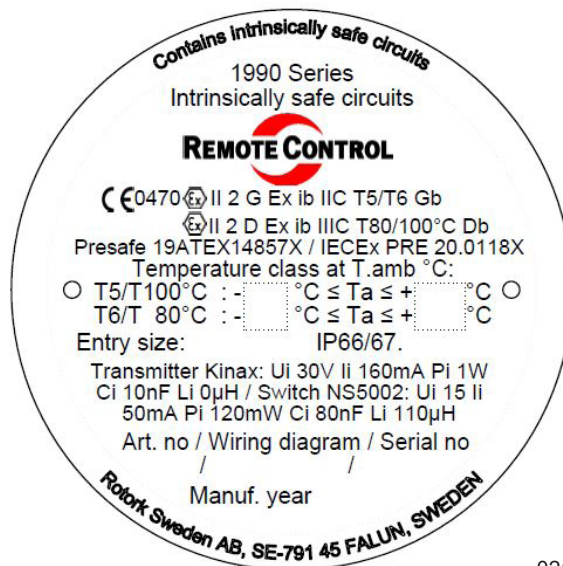
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Fig.1



Dismounting

1. Switch off the power to the switch box and vent the actuator.
2. Dismantle the cover (2) on the switch box. Loosen the locking screw (1), unscrew the cover and lift it straight up.
3. Disconnect the wires from the terminal strip and earthing point then open the cable gland/s. Remove the cables.
4. Loosen the mounting bracket (10) by the screws (12) to the upper side of the actuator. Remove the switch box. Put the cover back on the switch box. Lock with screw (1) and plug the cable inlets for protection against dirt.

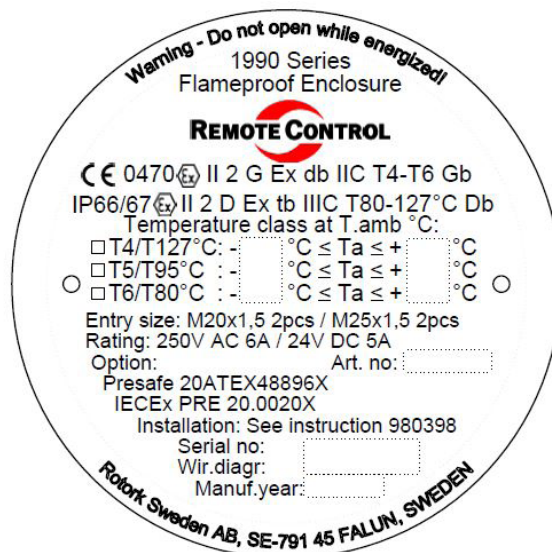


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The sign for 1990 in Ex ib-version looks as above. Ambient temperature (T.amb) ranges are filled in according to data of the included components. Min value is taken from the component with the highest min value and MaxT5/T6-values from the component with lowest max-value. Maximum values for Ui, li, Pi, Ci and Li are stated for each component in the table. Component values are included in the electric scheme inside the lid. Data according to DOK-000093.

Table for Ex ib

Description	Type	Tmin	Max T6/T5 (°C)	Ui (VDC)	li (mA)	Pi (mW)	Ci (nF)	Li (μH)
Transmitter 4-20mA	3W2 kod:708-xxx	-40°C	T6+52/T5+67	30	160	1000	10	0
Micro switch Gold plated	XGK2-81-S2x	-40°C	T6+67/T5+78	30	100	750	-	-
Inductive sensor	NJ2-V3-N	-25°C	T6+58/T5+73	16	25	64	40	50
Inductive sensor	NS5002	-20°C	T6+62/T5+72	15	50	120	80	110
Inductive sensor	NJ5-18GK-SN	-40°C	T6+61/T5+76	16	25	64	120	200
Inductive sensor	NCB2-V3-NO	-25°C	T6+58/T5+73	16	25	64	100	100
Inductive sensor	SJ3,5-SN	-50°C	T6+58/T5+73	16	25	64	30	100
Inductive sensor	NJ2-11-SN-G	-40°C	T6+65/T5+80	16	25	64	50	150
Inhead transmitter	IPAQ-HX/C300X	-40°C	T6+42/T5+73	Ui/Uo: 30	li 100/ lo 25	Pi 900/ Po 188	Ci 0/ Co 66	Li 0/ Lo 50



025135-A

The sign for 1990 in Ex d-version looks as above. Ambient temperature (T.amb) ranges are filled in according to data of the included components. Absolute max and min values according to DOK-000060. Marking on the sign: Min value is taken from the component with the highest min value and MaxT4/T5/T6-values from the component with lowest max-value. Nom. Volts and Max current are filled in. Component values are included in the electric scheme inside the lid.

Table for Ex d

Description	Type	Tmin	Max T6/T5/T4 (°C)	U (VDC)	I (mA)
Transmitter 4-20mA	3W2 kod:708-124D1ADH	-40°C	T6+60/T5+70	33	20
Transmitter 4-20mA Ex ia	3W2 kod:708-226D1AD	-40°C	T6+60/T5+75	30	20
Potentiometer 1k Ohm	FCP22AC	-50°C	T6+60/T5+75/T4+100	(1k Ohm, 1W)	
Inductive sensor	IS5001	-25°C	T6+60/T5+75	36	200
Inductive sensor	IS5026	-25°C	T6+60/T5+75	36	200
Inductive sensor	NJ2-V3-N	-25°C	T6+60/T5+75	8	
Inductive sensor	NBB2-V3-E2	-25°C	T6+60/T5+70	30	100
Inductive sensor	NBB3-V3-Z4	-25°C	T6+60/T5+70	60	100
Inductive sensor	NJ5-18GK-SN	-40°C	T6+60/T5+75	25	
Inductive sensor	SJ3,5-SN	-40°C	T6+60/T5+75	25	
Micro switch Gold plated	D413-V3LD	-40°C	T6+60	30	100
Micro switch	V15H16-CZ100/200-A02	-25°C	T6+60/T5+75/T4+110	250VAC	6A
Inhead transmitter	IPAQ-H / C330	-40°C	T6+50/T5+65/T4+85	36	20
Inhead transmitter	IPAQ-HX / C300X	-40°C	T6+60/T5+75/T4+85	30	20
Inhead transmitter	MESO-H / C530	-40°C	T6+50/T5+65/T4+85	42	20

We reserve the right to
make changes without notice

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