Installation, Operating and Maintenance Instructions for

Jola limit switches
RAT/../../Ex-M ⟨Ex⟩ I M2
Ex d I Mb
or
RAT/../../Ex-1G ⟨Ex⟩ II 2 G
Ex d IIB T4 or T5 or T6 Gb

These Installation, Operating and Maintenance Instructions must always be handed over to the fitter/operator/service personnel of our products together with all other user documentation and information! They should be stored in a safe place together with all other user documentation and information so they can be consulted again when necessary at any time!

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1. Area of application

The limit switches

JOLA
D-67466 Lambrecht

CE 0080

RAT/../../Ex-M Ex I M2 Ex d I Mb
or
RAT/../../Ex-1G Ex II 2 G Ex d IIB T4 or T5 or T6 Gb

(serial number)
(production year)

Tamb : - 20°C to + 60°C or to + 75°C or to + 85°C
INERIS 06ATEX0005X

Repair:
The thread of the head unit of the limit switch has the following dimensions: M 32 x 1.5 (length min. 13 mm).
The thread of the cable entry has the following dimensions: M 16 x 1.5 or M 20 x 1.5 (length min. 13 mm).
However, because of a resin filling inside the body of the limit switch, no repair is possible. All alterations to the limit switch must therefore be performed in the manufacturer's facility. Under no circumstances may other individuals or companies perform unauthorised alterations or repairs.

Installation:
In order to prevent an incorrect functioning of the limit switch and a cable break, a sufficient cable length must be left. Behind this "cable loop", the cable of the limit switch must be permanently fixed. The installing/operating company must ensure that adequate strain and twisting relief is provided.

Connection of the cable of the limit switch to the external circuits:
Connection of the cable of the limit switch to the external circuits is only permitted outside the explosion hazardous area or inside a certified Ex-connection box.

are binary contact devices for use

- **in underground areas in mines as well as in above-ground areas of mines which could be at risk due to firedamp and/or flammable dusts:**
  RAT/../../Ex-M Ex I M2
- **in above-ground areas which could be at risk due to a potentially explosive atmosphere:**
  RAT/../../Ex-1G Ex II 2 G
  in Zone 1 or 2

The RAT/../../Ex-.. limit switch is mounted via a borehole in the head section of the unit. This borehole is used to secure a customer-supplied metallic horizontal shaft, but this shaft should not rotate away from the horizontal plane by more than +/-90°. It is the rotational motion of this shaft that activates the switching process. In order to prevent an incorrect functioning of the limit switch and a cable break, a sufficient cable length must be left.

The limit switches RAT/../../Ex-.. are fitted with a micro-switch (changeover contact) as electrical switching element, and this element is activated by an internal metallic ball. Switchover takes place when the limit switch is positioned approx. 17° +/- 8°above or approx. 3° +/-3° below the horizontal plane.

The limit switches are not suitable for use on rotating shafts.

All **the technical parameters of the limit switch** are listed in this brochure and the accompanying product description. **You must always observe and follow all the instructions relating to these parameters. The probes may not be used for applications outside the specified parameter range.**

If the product description is not supplied with the product or is lost, **you must always request a copy of the description prior to installation, connection or start-up and ensure that it is read and observed by the suitably qualified specialist personnel. Otherwise the limit switch may not be installed, connected and started up.**

2. Preconditions for safe use

Maximum supply values:

U	I	P
AC/DC 24V up to max. AC/DC 250 V	**AC 20 mA up to max. 3 (1) A or DC 20 mA up to max. DC 100 mA**	**350 VA**

Repair:

The thread of the head unit of the limit switch has the following dimensions: M 32 x 1.5 (length min. 13 mm).
The thread of the cable entry has the following dimensions: M 16 x 1.5 or M 20 x 1.5 (length min. 13 mm).
However, because of a resin filling inside the body of the limit switch, no repair is possible. All alterations to the limit switch must therefore be performed in the manufacturer's facility. Under no circumstances may other individuals or companies perform unauthorised alterations or repairs.

Installation:
In order to prevent an incorrect functioning of the limit switch and a cable break, a sufficient cable length must be left. Behind this "cable loop", the cable of the limit switch must be permanently fixed. The installing/operating company must ensure that adequate strain and twisting relief is provided.

3. Special conditions for safe operation

Connection of the cable of the limit switch RAT/../../Ex-.. to the external circuits is only permitted outside the explosion hazardous area or inside a certified Ex-connection box.

4. Additional conditions for safe operation

Admissible temperature application range:
The temperature application range for the limit switches is
-for the types Ex d IIB T6: between - 20°C and + 60°C,
-for the types Ex d IIB T5: between - 20°C and + 75°C,
-for the types Ex d IIB T4: between - 20°C and + 85°C.
The operating temperatures must always be within this range.

Admissible pressure application range:
The limit switch may only be used under atmospheric conditions.

Chemical et mechanical resistance:
Before using the limit switch RAT/../../Ex-.., you must ensure that the materials used in the limit switch are sufficiently chemically and mechanically resistant to all external influences.
In case of doubt, consult a suitably trained expert prior to use. Do not use the product before these questions have been fully clarified.

5. Installation, connection, start-up and maintenance, general regulations

Installation, connection, start-up and maintenance of the limit switches may only be performed by suitably qualified specialist personnel in line with all the information material and documentation supplied with the probes and following all instructions contained therein.

The qualified specialist personnel must ensure that they are familiar with all valid standards, regulations, local requirements and specific conditions, in particular the standards, regulations, local requirements and specific conditions relating to explosion protection – and must proceed accordingly.

In potentially explosive atmospheres with gas hazards, the entire installation set-up of the limit switch RAT/../../Ex-.. must always comply with the standard EN 60 079-14 resp. the replacing standard.

You must always read – and adhere to the instructions outlined in - the yellow DIN A 5 leaflet "User information/Instructions for use with mounting, operating and maintenance instructions for the product...". If the leaflet is not supplied with the product or is lost, you must always request a replacement leaflet from Jola.

6. Installation of the limit switches RAT/../../Ex-..

General:
The limit switches RAT/../../Ex-.. must be installed **by qualified specialist personnel**.

Installation is not allowed if an explosive atmosphere is present.
The absence of explosive atmosphere has to be verified by qualified and competent personnel.

Mechanical mounting:
The limit switch is mounted via a borehole in the head section of the unit. This borehole is used to secure a customer-supplied metallic horizontal shaft, but this shaft should not rotate away from the horizontal plane by more than +/-90°. It is the rotational motion of this shaft that activates the switching process.
The attachment of the limit switch to the shaft has to be done in the way that the limit switch cannot move by its one, but only follow the movement of rotation of the shaft.
In order to prevent dangerous sparks and in order to allow correct functioning of the limit switch, the installer/operator must make sure that no parts made of metal or of any other material come into contact with the limit switch on its movement following the motion of the shaft.

In order to prevent an incorrect functioning of the limit switch and a cable break, a sufficient cable length must be left. Behind this “cable loop”, the cable of the limit switch must be permanently fixed. The installing/operating company must ensure that adequate strain and twisting relief is provided.

The limit switches are not suitable for use on rotating shafts.

7. Connection

Connection of the cable of the limit switch to the external circuits:
Connection of the cable of the limit switch RAT/../../Ex-.. to the external circuits is only permitted outside the explosion hazardous area or inside a certified Ex-connection box.

Circuit diagram:
Connect the limit switch RAT/../../Ex-.. as shown in the supplied circuit diagram.

Connection to the protection earth and potential equalization:
Connection to the protection earth and potential equalisation is necessary with the limit switches RAT/../../Ex-..:

Connect the green-yellow conductor of the cable of the unit to the protection earth.

Connect the external earth connection terminal situated on the body of the unit to the potential equalisation system.

Connection of the limit switch to the protection earth and to the potential equalisation system is essential for safe operation and must never be neglected.

For correct connection to the protection earth, refer to the standards relating to the Low Voltage Directive 2014/35/EU resp. the replacing directive.

For correct connection to the potential equalisation system, refer to the standards relating to protection against explosion hazards:
In potentially explosive atmospheres with gas hazards, the entire installation set-up must always comply with the standard EN 60 079-14 resp. the replacing standard.

8. Start-up

Prior to start-up, you must re-check the mounting position, the mechanical fastening and the electrical connection.

In addition, you must also check and verify that there is no possibility whatsoever of hazardous conditions occurring due to non-adherence to any of the relevant instructions, standards or official regulations.

Only then may the unit in question be started up electrically.

9. Maintenance

No action of maintenance is allowed if an explosive atmosphere is present. The absence of explosive atmosphere has to be verified by qualified and competent personnel.

Generally, the limit switches RAT/../../Ex-.. are maintenance-free.
To rule out any risks, however, the limit switch must be sight-checked and function-tested by qualified specialist personnel at least once a year.

Where risks cannot be ruled out, you should adhere to an inspection frequency suited to the application in question and laid down in consultation with the relevant supervisory authorities.

If the limit switch is installed as a safety element within a system, it must always be inspected and checked at intervals to be agreed with the local supervisory authorities.

Prior to all maintenance work, the qualified specialist personnel must inform themselves of all valid standards, regulations, local guidelines and special conditions, in particular standards, regulations, local guidelines and special conditions concerning explosion protection and proceed accordingly.

10. Repair

The thread of the head unit of the limit switch has the following dimensions:
M 32 x 1.5 (length min. 13 mm).
The thread of the cable entry has the following dimensions:
M 16 x 1.5 or M 20 x 1.5 (length min. 13 mm).
However, because of a resin filling inside the body of the limit switch, no repair is possible. All alterations to the limit switch must therefore be performed in the manufacturer's facility. Under no circumstances may other individuals or companies perform unauthorised alterations or repairs.

11. Disposal

The units must be disposed of by depositing them in conformity with the law at an appropriate collection point for electrical and electronic devices.