Installation, Operating and Maintenance Instructions for

Jola Float Switches
SM/..../..../../Ex-..

Ⓔx I M2 Ex ia I Mb
or
Ⓔx II 1/2 G Ex ia IIC T6 Ga/Gb
or
Ⓔx II 2 G Ex ia IIC T6 Gb
or
Ⓔx I M2 c ΔT=0
or
Ⓔx II 1/2 G c IIC ΔT=0
or
Ⓔx II 2 G c IIC ΔT=0

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 float switches

JOLA
D-67460 Lambrecht

CE 0080

SM/..../..../../Ex-..
(serial number)
(production year)

Ex I M2 Ex ia I Mb or
Ex II 1/2 G Ex ia IIC T6 Ga/Gb or
Ex II 2 G Ex ia IIC T6 Gb
Tamb : -20°C to + 60°C
or
Ex I M2 c ΔT=0 or
Ex II 1/2 G c IIC ΔT=0 or
Ex II 2 G c IIC ΔT=0
Tamb : 0°C to + 40°C

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Special precondition for safe use of the float switch:

The bellows of the float switch is made of stainless steel 316 Ti (1.4571). The thickness of this bellows is only 0.2 mm. The float switch has therefore only to be installed in a non-corrosive environment in order to grant the separation of the zones. Precautions have to be taken for the same reason before or during the installation of the float switch in order to protect the float switch efficiently against mechanic damages which may for example be caused by turbulences or heavy wave movements of the liquid to be monitored.

are binary electrical or pneumatic float switches for use

Electrical version:

- **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:**
  SM/..../..../EL/Ex-M Ex I M2

- **in above-ground areas which could be at risk due to a potentially explosive atmosphere:**

  SM/..../..../EL/Ex-0G Ⓔx II 1/2 G :
  float side in zone 0, 1 or 2,
  terminal box in zone 1 or 2

  SM/..../..../EL/Ex-1G Ⓔx II 2 G :
  float side in zone 1 or 2,
  terminal box in zone 1 or 2

Pneumatic version:

- **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:**

  SM/..../..../PN/Ex-M Ⓔx I M2

- **in above-ground areas which could be at risk due to a potentially explosive atmosphere:**

  SM/..../..../PN/Ex-0G Ⓔx II 1/2 G :
  float side in zone 0, 1 or 2,
  terminal box in zone 1 or 2

  SM/..../..../PN/Ex-1G Ⓔx II 2 G :
  float side in zone 1 or 2,
  terminal box in zone 1 or 2

The float switch SM/..../..../../Ex-.. serves as an individual switch that gives off an alarm signal when the liquid level reaches a certain point (e.g. high-level alarm or low-level alarm). The combination of 2 switches is used to control a pump, for example (ON-OFF via a suitable downstream external pump controller) or a solenoid valve (OPEN-CLOSE via a suitable downstream external solenoid valve controller).

The float switch is available in two versions:
- a version for mounting from the side and operation in horizontal orientation
and
- a version for mounting from above and operation in vertical orientation.

It may only be used to control low-viscosity, non-adhesive liquids that are free of solids.

If there is a risk of any kind that large solid particles might damage the bellows, the float rod or the float of the float switch, then the switch is not suitable for the application in question.

All **the technical parameters of the float 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 units 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 float switch may not be installed, connected and started up.**

2. Preconditions for safe use of the electrical float switch

To ensure safe operation, power supply to the float switch must be via a voltage source with output circuits which are approved as intrinsically safe for use in the potentially explosive atmosphere which corresponds to the gas explosion group in which the device is installed: IIC, IIB, IIA or I.

The output parameters of the voltage source must be compatible to the input parameters as defined below.

Maximum input parameters at the connection terminals of the float switch:

Terminal designations	Ui (V)	Ii (A)	Ci	Li
1, 2, 3	42	0.1	0	0

3. Preconditions for safe use of the pneumatic float switch

To ensure safe operation, the supply pressure of compressed air or a compressed gas to the pneumatic float switch may not exceed a max. pressure of 6 bar and not exceed a max. temperature of + 40° C.

This compressed air or compressed gas may contain neither abrasive substances nor components that chemically attack the polyurethane air hoses of the float switch.

4. Special precondition for safe use of the float switches

The bellows of the float switch is made of stainless steel 316 Ti (1.4571). The thickness of this bellows is only 0.2 mm. The float switch has therefore only to be installed in a non-corrosive environment in order to grant the separation of the zones. Precautions have to be taken for the same reason before or during the installation of the float switch in order to protect the float switch efficiently against mechanic damages which may for example be caused by turbulences or heavy wave movements of the liquid to be monitored.

5. Additional conditions for safe operation of the float switches

The temperature application range of the float side of the electrical float switch is between -20°C and + 60°C. The operating temperatures must always be within this range.
The temperature application range of the float side of the pneumatic float switch is between 0°C and + 40°C. The operating temperatures must always be within this range.

The ambient temperature at the terminal box of the electrical float switch must always be between -20°C and + 60°C.
The ambient temperature at the terminal box of the pneumatic float switch must always be between 0°C and + 40°C.

Before using the float switch, you must ensure that the materials used in the float switch are sufficiently chemically and mechanically resistant to the liquids to be monitored (parts coming into contact with the liquid) and all external influences (all other parts).

In case of doubt, consult a suitably trained expert prior to use. Do not use the product before these questions have been fully clarified.

6. Installation, connection and start-up, general regulations

Installation, connection and start-up of the float switch may only be performed by suitably qualified specialist personnel in line with all the information material and documentation supplied with the float switch 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 float switch SM/..../..../../Ex-.. must always comply with the standard EN 60 079-14 resp. the replacing standard.

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

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.

7. Installation

Mounting of the float switch which operates in horizontal orientation:

Float switch supplied **without** mounting flange:

First remove the splint on the float shaft and remove the float by unscrewing it. Insert the gasket and screw the screw-in nipple of the float switch into the tank sleeve G1 or into the G1 hole of the corresponding mounting flange, then correctly position the terminal box in such a way that the label marked "TOP" points upwards and the cable entry points downwards. To this end, it is necessary to slightly loosen – but not remove! – the two screws in the connecting piece between terminal box and screw-in nipple and to re-tighten them after the necessary adjustment has been made. Then carefully screw the float back on again and secure it in place using the splint.
When choosing the gasket, make sure that it is a gasket of size G1 which is sufficiently resistant to the liquids to be monitored.
The gasket supplied by Jola is a standard gasket which may not be suitable for all liquids.

Float switch supplied **with** mounting flange:

Fasten the float switch to a suitable counterflange using its connection flange. It can be fastened using the stud bolts in the counterflange and suitable nuts or using suitable bolts and nuts. Secure the nuts using suitable measures that are appropriate for the application in question.
Tighten the nuts evenly and firmly.
It may be necessary to unscrew the cover of the terminal box in order to fasten the bolts or nuts. In this event, take care to ensure that no moisture or dirt is allowed to get inside the terminal box.
When choosing the gasket, make sure that it suits the dimensions of the flange and that it is sufficiently resistant to the liquids to be monitored.
The gasket supplied by Jola is a standard gasket which may not be suitable for all liquids.

The float switch must be mounted and fixed in place in horizontal orientation.

Mounting of the float switch which operates in vertical orientation:

Float switch supplied **without** mounting flange:

First remove the splint on the float shaft and remove the float by unscrewing it. Insert the gasket and screw the screw-in nipple of the float switch into the tank sleeve G1 or into the G1 hole of the corresponding mounting flange. Then carefully screw the float back on again and secure it in place using the splint.
When choosing the gasket, make sure that it is a gasket of size G1 which is sufficiently resistant to the liquids to be monitored.

The gasket supplied by Jola is a standard gasket which may not be suitable for all liquids.

Float switch supplied **with** mounting flange:

Fasten the float switch to a suitable counterflange using its connection flange. It can be fastened using the stud bolts in the counterflange and suitable nuts or using suitable bolts and nuts. Secure the nuts using suitable measures that are appropriate for the application in question.
Tighten the nuts evenly and firmly.

When choosing the gasket, make sure that it suits the dimensions of the flange and that it is sufficiently resistant to the liquids to be monitored.
The gasket supplied by Jola is a standard gasket which may not be suitable for all liquids.

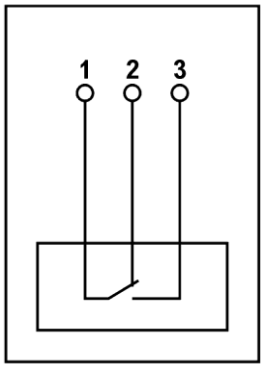
The float switch must be mounted and fixed in place in vertical orientation.

8. Connection of the electrical float switch

The float switches must be connected **by qualified specialist personnel**.

If intrinsically safe contact protection relays are used, connect the float switches in line with the instructions contained in the corresponding production description for the contact protection relay

Connect the changeover contact of the electrical float switch as shown in the circuit diagram below:



Connection to the potential equalization system:

To avoid the danger coming from the static electricity, potential equalization is necessary with the float switch SM/..../..../../Ex-..:

Connect the external earth connection terminals on the screw-in nipple and, if present, on the flange of the unit to the potential equalization system.

Connection to the potential equalization system is essential for safe operation and must never be neglected.

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.

It is important to ensure that the cable used suits the gasket insert of the cable entry and permits optimum sealing, as a non-matching cable will negatively affect the IP protection.

After inserting the corresponding cable, fasten the movable part of the cable entry (but do not use unnecessary force) in order to achieve the required IP protection level.

9. Connection of the pneumatic float switch

The float switches must be connected **by qualified specialist personnel**.

The pneumatic float switch must be connected to both air connection pieces using an anti-static (electrically conductive) air hose with a diameter of 4 mm.
The pneumatic input and the pneumatic output are identified by a corresponding label on the terminal box of the float switch.

Connection to the potential equalization system:

To avoid the danger coming from the static electricity, potential equalization is necessary with the float switch SM/..../..../../Ex-..:

Connect the external earth connection terminals on the screw-in nipple and, if present, on the flange of the unit to the potential equalization system.

Connection to the potential equalization system is essential for safe operation and must never be neglected.

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.

10. Start-up

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

In the case of the electrical float switch, you must in particular check once again that the corresponding, admissible intrinsically safe circuit is connected to the connection terminals of the changeover contact of the float switch, as defined in no. 2.

In the case of the pneumatic float switch, you must in particular check once again that the corresponding, admissible compressed air or the corresponding admissible compressed gas is connected to the pneumatic connections of the float switch, as defined in no. 3.

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 applies to the electrical float switch: after performing the corresponding checks, close the cover of the terminal box of the electrical float switch and tighten the 4 cover screws evenly and firmly but without applying unnecessary force.

The float switch may then be started up.

11. Maintenance

The float switch is maintenance-free when used in low-viscosity, non-adhesive liquids that are free of solids.

To rule out any risks, however, the float 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 float 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.

12. Repair

All alterations and repairs to the float switch must be performed by the manufacturer's suitably qualified specialist personnel. Under no circumstances may other individuals or companies perform unauthorised alterations or repairs.

13. 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.