

## Installation, Operating and Maintenance Instructions for

Jola immersion probes

TSR/.../..Variant /Ex-M  I M2 Ex ia I Mb

or

TSR/.../..Variant /Ex-0G  II 1 G Ex ia IIC T3 or T4 or T5 or T6 Ga

or

TSR/.../..Variant /Ex-0G  II 2/1 G Ex ia IIC T3 or T4 or T5 or T6 Ga/Gb

or

TSR/.../..Variant /Ex-1G  II 2 G Ex ia IIC T3 or T4 or T5 or T6 Gb

or

NTR/.../..Variant /Ex-M  I M2 Ex ia I Mb

or

NTR/.../..Variant /Ex-0G  II 1 G Ex ia IIC T3 or T4 or T5 or T6 Ga

or

NTR/.../..Variant /Ex-0G  II 2/1 G Ex ia IIC T3 or T4 or T5 or T6 Ga/Gb

or

NTR/.../..Variant /Ex-1G  II 2 G Ex ia IIC T3 or 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!**

**Jola Spezialschalter GmbH & Co. KG  
Klostergartenstr. 11 • 67466 Lambrecht (Germany)  
Tel. +49 6325 188-01 • Fax +49 6325 6396  
contact@jola-info.de • www.jola-info.de**

## 1. Area of application

The immersion probes

JOLA  
D-67466 Lambrecht

**CE 0080**

TSR/.../..Variant . /Ex-M  I M2 Ex ia I Mb  
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(serial number)  
(production year)

Tamb : - 20°C (optionally - 40°C)  
to + 60°C or to + 75°C or to + 110°C or to + 125°C  
INERIS 03ATEX0163X

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:**

**TSR or NTR/.../..Variant . /Ex-M  I M2.**

- ◆ **under atmospheric pressure (between 0.8 bar and 1.1 bar) in above-ground areas which could be at risk due to a potentially explosive atmosphere:**

**TSR or NTR/.../..Variant . /Ex-0G  II 1 G:  
in zone 0, 1 or 2;**

**TSR or NTR/.../Variant . /Ex-0G  II 2/1 G:**  
terminal box or cable entry placed in zone 1 or 2,  
probe tube placed in zone 0, 1 or 2;

**TSR or NTR/.../Variant . /Ex-1G  II 2 G:**  
in zone 1 or 2;

♦ **under a pressure of max. 10 bar, but only under a hydraulic pressure and when the application is not concerned from the pressure equipment directive 2014/68/EU,**  
in above-ground areas which could be at risk due to a potentially explosive atmosphere:

**TSR or NTR/.../Variant .P/Ex-0G  II 1 G:**  
in zone 0, 1 or 2;

**TSR or NTR/.../Variant .P/Ex-0G  II 2/1 G:**  
terminal box or cable entry placed in zone 1 or 2,  
probe tube placed in zone 0, 1 or 2;

**TSR or NTR/.../Variant .P/Ex-1G  II 2 G:**  
in zone 1 or 2.

The immersion probe **TSR or NTR/.../Variant . /Ex-** with **1 built-in reed contact** 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 immersion probe **TSR or NTR/.../Variant . /Ex-** with **2 built-in reed contacts** serves 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 use of an immersion probe **TSR or NTR/.../Variant . /Ex-** with more than 2 built-in reed contacts allows you to perform more complex switching tasks (e.g. overflow protection, high-level alarm, pump ON, pump OFF, low-level alarm, run-dry protection etc.).

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The immersion probes with straight probe tube are designed **for mounting from above**.

The immersion probes with angled probe tube are designed **for mounting from the side**.

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If there is a risk of any kind that **adhesive residues or solid particles** might impair the function of the immersion probes, then the probes are not suitable for the application in question.

All the technical parameters of the immersion probe 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 immersion probe(s) may not be installed, connected and started up.

## 2. Preconditions for safe use

- ◆ **Maximum values for each reed contact in the immersion probes TSR or NTR/Variant . /Ex-.**

Contact type	Type designation of immersion probe	Li	Ci
Make contact or break contact	TSR/.D/.. /Variant . /Ex-.	3 $\mu$ H	0.6 nF
	NTR/.D/.. /Variant . /Ex-.	3 $\mu$ H	0.6 nF
	TSR/.W/.. /Variant . /Ex-.	6 $\mu$ H	1.2 nF
	NTR/.W/.. /Variant . /Ex-.	6 $\mu$ H	1.2 nF
Changeover contact	TSR/.D/.. /Variant . /Ex-.	4.5 $\mu$ H	0.9 nF
	NTR/.D/.. /Variant . /Ex-.	4.5 $\mu$ H	0.9 nF
	TSR/.W/.. /Variant . /Ex-.	9 $\mu$ H	1.8 nF
	NTR/.W/.. /Variant . /Ex-.	9 $\mu$ H	1.8 nF

Please note: The values Li and Ci of the above table correspond to a maximum length of the immersion tube of the TSR or NTR/.D/... of 3 m respectively of the immersion tube of the TSR or NTR/.W/... of 6 m.

- ◆ **Special requirements/conditions for the safe use of the immersion probe TSR or NTR/Variant Ex-.**

To ensure safe operation, power supply to the immersion probe TSR or NTR/.../Variant . /Ex- 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.

More than one reed contact of an immersion probe TSR or NTR/.../Variant . /Ex- can be connected to the same voltage source.

Always observe all the restrictions specified with regard to the voltage source.

**The output parameters of the voltage source must be equivalent to or lower than the input parameters of the units as defined below.**

**Maximum input parameters for each make or break reed contact of the immersion probe TSR or NTR/Variant . /Ex-. which has to be used under atmospheric pressure (between 0.8 bar and 1.1 bar):**

Variant	Ui	Ii	Pi	Li	Ci
Variant 0	42 V	0.5 A	-	1 μH/m probe tube	200 pF/m probe tube
Variant 1	42 V	0.25 A	0.5 W		
Variant 2	30 V	0.5 A	0.5 W		
Variant 3	30 V	0.25 A	0.5 W		

**Maximum input parameters for each changeover reed contact of the immersion probe TSR or NTR/Variant Ex-. which has to be used under atmospheric pressure (between 0.8 bar and 1.1 bar):**

Variant	Ui	Ii	Pi	Li	Ci
Variant 0	30 V	0.5 A	-	1.5 μH/m probe tube	300 pF/m probe tube
Variant 1	30 V	0.25 A	0.5 W		
Variant 2	30 V	0.5 A	0.5 W		
Variant 3	30 V	0.25 A	0.5 W		

**Maximum input parameters for each make or break reed contact of the immersion probe TSR or NTR/.../Variant .P/Ex-. which can be used under a pressure of max. 10 bar, but only under a hydraulic pressure and when the application is not concerned from the pressure equipment directive 2014/68/EU:**

Ui	Ii	Li	Ci
12 V	0.033 A	1 μH/m probe tube	200 pF/m probe tube

**Maximum input parameters for each changeover reed contact of the immersion probe TSR or NTR/.../Variant .P/Ex-. which can be used under a pressure of max. 10 bar, but only under a hydraulic pressure and when the application is not concerned from the pressure equipment directive 2014/68/EU:**

Ui	Ii	Li	Ci
12 V	0.033 A	1.5 μH/m probe tube	300 pF/m probe tube

### 3. Additional conditions for safe operation

The temperature application range for the probe tube and the float of the immersion probes is

- for the types Ex ia IIC T6: between - 20°C (optionally - 40°C) and + 60°C,
- for the types Ex ia IIC T5: between - 20°C (optionally - 40°C) and + 75°C,
- for the types Ex ia IIC T4: between - 20°C (optionally - 40°C) and + 60°C,
- for the types Ex ia IIC T3: between - 20°C (optionally - 40°C) and + 125°C.

The operating temperatures must always be within this range.

If the immersion probe is equipped to be able to work under the - 40°C condition, the applicability of - 40°C will be marked on the name plate of the immersion probe.

In the case that the immersion probe is equipped with a terminal box made of plastic, the ambient temperature at the terminal box of the immersion probe must always be between - 20°C (optionally - 40°C) and + 60°C.

The ambient temperatures must always be within this range.

If the immersion probe is equipped to be able to work under the - 40°C condition, the applicability of - 40°C will be marked on the name plate of the immersion probe.

In the case that the immersion probe is equipped with a terminal box made of metal or with a metallic interface unit instead of a terminal box (in the case of the models with free connecting cable), the ambient temperature at the terminal box or the interface unit of the immersion probe must always be

- for the types Ex ia IIC T6: between - 20°C (optionally - 40°C) and + 60°C,
- for the types Ex ia IIC T5: between - 20°C (optionally - 40°C) and + 75°C,
- for the types Ex ia IIC T4: between - 20°C (optionally - 40°C) and + 60°C,
- for the types Ex ia IIC T3: between - 20°C (optionally - 40°C) and + 125°C.

The ambient temperatures must always be within this range.

If the immersion probe is equipped to be able to work under the - 40°C condition, the applicability of - 40°C will be marked on the name plate of the immersion probe.

Before using the immersion probe TSR or NTR/.../..Variant . /Ex-..., you must ensure that the materials used in the screw-in nipple or mounting flange, the probe tube, the float and the collars or the terminal box are sufficiently chemically and mechanically resistant to the liquid to be monitored and/or 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.

### 4. Installation, connection, start-up and maintenance, general regulations

Installation, connection, start-up and maintenance of the immersion probes 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 immersion probe(s) TSR or NTR/.../..Variant . /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.

## 5. Installation of the immersion probes TSR or NTR/.../..Variant . /Ex-.

When mounting the immersion probes TSR or NTR/.../..Variant . /Ex-, follow the instructions in the small brochure "Mechanical installation of TSR immersion probes".

**In order to avoid electrostatic charges, it is essential that the magnet of the float is always situated in the upper part of the float. This position allows a permanent inclination of the float and creates consequently a direct contact between immersion tube and float.**

**The float side carrying the magnet is marked by the label "TOP" or a marking "O" on the float.**

**In case the label should be lost and the marking "O" not anymore be present on the float, the float side carrying the magnet can easily be recognized by means of a little metallic object (e.g. metallic paper clip, little screw driver etc.).**

## 6. Connection

Connect the **contacts of the immersion probes TSR or NTR/.../..Variant . /Ex-** as shown in the supplied circuit diagram.

**If intrinsically safe contact protection relays are used, connect the contacts in line with the instructions contained in the production description of the contact protection relay.**

**To avoid the danger coming from the static electricity, potential equalization is necessary with the immersion probes **TSR or NTR/.../..Variant.../Ex-**. Connect the earth connection terminal on the screw-in nipple or 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.

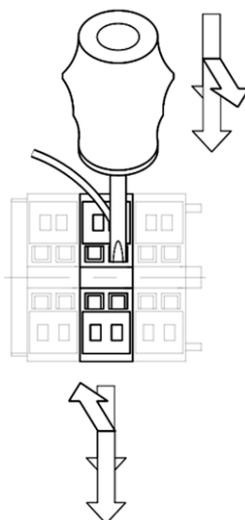
**In potentially explosive atmospheres with gas hazards, the entire installation set-up must always comply with the standard EN 60 079-14 resp. the replacing standard.**

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In the case of an immersion probe equipped with a terminal box, it is important to ensure that the **cable suits the gasket insert of the cable entry of the terminal box and permits correct sealing, as a non-matching cable will negatively affect the IP protection.**

**After inserting the cable, fasten the movable part of the cable entry (but do not use unnecessary force) in order to achieve the required IP protection level IP 65.**

Connect the cable itself as shown below:



Push a screwdriver into the opening as shown in the drawing. Open the relevant terminal by pushing the screwdriver down towards the centre of the terminal block using a lever action.

## 7. Start-up

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

**In particular, you must check once again that the unit/units is (are) also connected to the corresponding, admissible intrinsically safe circuit(s).**

**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.**

In the case of an immersion probe equipped with a terminal box: After performing the corresponding checks, close the cover of the terminal box and tighten the 4 cover screws evenly and firmly but without applying unnecessary force.

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

## 8. Maintenance

The immersion probes TSR or NTR/.../..Variant . /Ex-. are maintenance-free when used in low-viscosity, non-adhesive liquids that are free of solids and do not attack the component materials.

**To rule out any risks, however, the immersion probe 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 immersion probe 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.**

## 9. Repair

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

## 10. 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.