



EN

Installation, operation, maintenance and commissioning manual
For installation in hazardous areas

**Industrial immersion heater
D8800**

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1.0 Description of equipment

The immersion heater was designed for heating liquids, gases or solids.

Reference should be made to the general drawing of this item for the intended use:

Drawing no.	Refer to equipment drawing
Electric supply	See electrical diagram
Voltage	See electrical diagram
Ref. number	Same as order number on equipment drawing

The heater consists of a certified increased safety “e” enclosure: Type D-8800 containing:

- Certified electric heating elements (Ex e II).
- Certified Ex e II junction box.
- Certified Ex e II rail mounted terminals and/or copper bars mounted on bus bar supports type Riline made from insulating material and manufactured by Rittal.
- A manually protective rearmable protective device certified
Ex de II C T6 or
Ex e II T 6 or
Ex d (e) II C T 6 or
Ex ia II C.

Optionally the certified equipment mentioned below may be fitted into the junction box; an:

- Ex ia II C T4 temperature transmitter.
- Ex d II C T4 or T5 anti-condensation heater.
- Ex de II C T6 or Ex d II C T6 or Ex e II T6 control device.

Marking hazardous area certification	Ex d e [ia] IIC T6 to T1 Gb – IP 66
alternative	Ex d e IIC T6 to T1 Gb – IP66
Standards IEC/CENELEC	EN-IEC 60079-7, EN-IEC 60079-0, EN-IEC 60079-1 and EN-IEC 60079-11
ATEX group and category	Ex II 2 G
Certificate number	ISSeP 07 ATEX 040X

2.0 Installation instructions

2.1 General

The user must ensure that his employees are fully trained and supervised in the proper working procedures to ensure their safety. The plant must be maintained in a safe condition.

Ensure that the equipment is correctly installed in a suitable location by technically qualified personnel.

Installation must meet the requirements of EN-IEC 60079-14 or equal standards.

2.2 Heater installation

Before unpacking the equipment ensure that all items are available and that all crates / or packages are in good condition and undamaged. Any damages must be reported to the site manager and subsequently to JEVI A/S.

After removing the packing material check all items for damage. If any, report these to the site manager and subsequently to JEVI A/S.

For installation mounting and sealing materials must be used which are suitable for the medium to be heated and the prevailing temperatures that will occur. Please refer to the dimensional drawings for precise data and indications of fitting positions.

1. Open the junction box by unlocking the cover with a special key.
2. Connect the electric power cables to the terminals or bus bar system as indicated on the electrical diagram and connect the earthing provisions on the mounting plate.
3. Connect the protective conductor to the earthing bolt on the outside of the junction box.
4. Follow the instructions that have been provided by the supplier of the cable glands if these are present and/or applicable.
5. Close the cover by using the special key that is supplied with the heater.

IMPORTANT!

- Do not open the junction box when energised.
- During non-operation the unit must be stored dry at a relative humidity <60% and a temperature >15°C.
- If applicable connect and switch on the space heater.
- When dismantled it is advisable to place a silicagel bag inside the junction box.

2.3 Special Conditions

The following conditions for safe use must be taken into consideration as also stipulated in the certificate:

- The setting of the protective device to the temperature limit, ensuring the temperature class, must be made for each apparatus under the responsibility of the manufacturer. The protective device must be sealed, and its setting must not be modified later.
- Intrinsic safety parameters indicated in the certificates should be respected.
- Cable entries will be of a type not less than IP66.

Additional conditions for safe use as described in document with reference 09/CLG/mgl/0/0484 are stated below:

- The temperature classification may be invalidated when heating elements are completely immersed in the inert fluid. It is the responsibility of the manufacturer, installer and / or user, as appropriate, to ensure that an explosive atmosphere does not occur inside the vessel.
- When the heaters are immersed in the inert fluid the values of 'Watt density' are also depending on the process conditions of the system.
- The temperature classification under the above conditions can be the temperature of the inert fluid, the heating element surface temperature or the hottest spot of the package.
- The table of temperature setting in relation with the temperature class of the device in the description is only valid in case of free convection heat transfer.

3.0 Operating instructions

Before initial start-up of the heater, it should be checked whether:

1. The heater has been properly installed and, if necessary, a leakage test was performed.
2. The electrical connection was performed in accordance with the relevant rules and regulations.
3. The protective conductor (PE) has been connected and, if necessary, the external earth connection between housing and ground has been effected, e.g. for avoiding electrostatic discharge.
4. Monitoring systems have been actuated e.g. "Dry Run Protection", "Flow Monitoring" or "Overheat Protection".
5. The medium to be heated is in accordance with the heater design.
6. At the cable entries no temperature exceeding 70°C is admitted.

IMPORTANT!

- *Before switching the heater on, check whether the heater elements and temperature sensors are fully immersed and/or that the rated process flow is running.*
- *The construction materials used were chosen in accordance with the operating conditions specified.*
- *Should the heater be operated with another media or temperature than specified, all warranty will be revoked.*

4.0 Maintenance instructions

According to EN-IEC 60079-17:

If correctly connected to the electrical mains and control system, the heater (immersion heater) will be maintenance free.

However, we advise you to do the following after one year of operation:

1. Check the ceramic insulators on the elements for damage.
2. Check the insulation resistance of the heating elements.
Connect the Megger to an earth bolt and one of the phases L1, L2 or L3. If the measured value is less than 2 Mega ohm, each heating element must be checked separately. Minimum value is 2 Mega ohm at 1000 volts.

IMPORTANT!

If the insulation resistance has changed because of improper or prolonged storage, it is recommended to:

- a) *open the junction box in a dry area and let the element connections dry out using a hot air blower. (note: air < 80°C).*
 - b) *run the heater at a lower voltage until all moisture is evaporated and the insulation resistance has reached its desired value.*
3. Clean the element surface:
Withdraw the heater bundle from the vessel. Salt crystals, carbon or calcium layers must be removed from the sheath of the heating elements by means of a non-metal tool, e.g. wood.
 4. Ensure that terminations are securely connected to the terminals or bus bars. Heating element connections are to be tightened with a maximum torque of 5 Nm.
 5. Check the functioning of the space heater in the junction box (if there is one incorporated). The space heater is fitted with an integrated thermostat situated inside the connection cable, which is factory set to frost guard temperatures. The space heater is maintenance free. Should the heater not function, it must be replaced.

5.0 Start-up / commissioning

According to EN-IEC 60079-17.

Before the initial start-up of the heater, the following must be checked:

1. The heater was correctly installed (horizontal) and if necessary, a leakage test was performed.
2. The protective conductor (PE) was connected and, if necessary, the external connection between housing and ground was effected, e.g. for avoiding electrostatic discharging (earthing boss on supports of the heater vessel).
3. The earthing connection (if applicable) between heater vessel and immersion heater was effected and properly secured.
4. The electrical connections were performed in accordance with the relevant regulations and wiring schematics.
5. The immersion heater was properly installed, and all studs and nuts are properly tightened.
6. All electrical connections between control panel and heater are correctly installed e.g. power cable, temperature transmitter.

5.1 Filling-up and increasing the pressure

1. Vent the heater to allow the remaining air to escape from the vessel.
2. If the medium to be heated is in accordance with the heater design e.g. flow, pressure. If this is not the case, it is strictly prohibited to energise the heating elements.
3. Pressurise the system.
4. Check for leakage in the entire system.

5.2 Before energising the heating elements

1. Check the supply voltage.
Check the control voltage.
Voltages are mentioned on the wiring diagrams of this equipment.
2. Check whether the monitoring system has been actuated e.g. 'Overheat Protection' (PT100 or thermocouple sensor fixed to an element sheath).
3. Check setting of temperature controller for 'Overheat Protection' (Temperature setting is stated on the wiring diagram)
4. Check setting of temperature controller for medium temperature.
5. Energise the heater elements for approx. 2 minutes and monitor the element skin temperature on the temperature controller.
If element skin temperature is not responding, shut down the system and check instrumentation and wiring.
6. Run the system on working conditions, e.g. pressure, flow and temperature. Wait until the system has reached the stable temperature and set the overheat protection controller at a level that will cause the heater to trip. If the heater does not switch off, shut down the system and check for errors.

5.3 Shutting down the heater

1. De-energise the heater before shutting down the flow.
2. Re-tighten the stud bolts after the heater has cooled down.