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OWNER'S MANUAL

LOW-POWER SCREW-IN AND FLANGE-MOUNTED IMMERSION HEATERS

(MAXIMUM 3 PINS)

1 - DESCRIPTION :

These immersion heaters consist of heating elements (maximum 3), which are assembled by being soldered or welded onto a fixing interface by a screw-in plug or a flange which can directly receive a housing. Where the temperature of use is over 110 °C, the terminals are offset and the housing is fitted onto a second threaded support.
The heating elements of each immersion heater are usually identical (power, voltage, length, heating length, shape, material, diameter, surface treatment etc.).

2 - DESCRIPTION AND TECHNICAL SPECIFICATIONS :

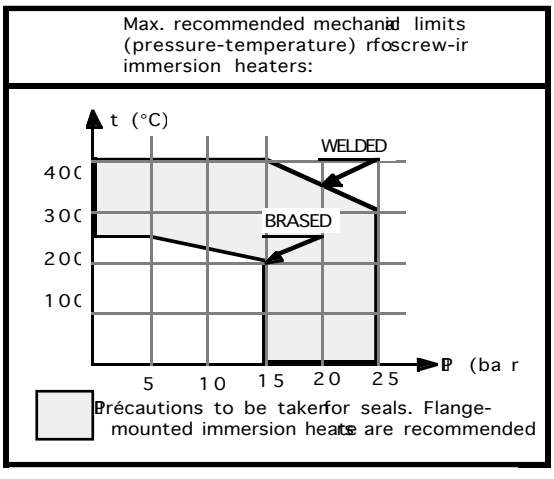
Consult our "low-power screw-in and flange-mounted immersion heaters (maximum 3 pins)" user guide and the relevant drawing (where the appliance has been specially manufactured).

3 - FITTING AND CONNECTION :

3 - 1 - PRIOR TO INSTALLATION :

Check that :

- the materials of which the immersion heater is made and its load (W/cm^2) are compatible with the fluids to be heated, in accordance with the operating conditions, and that there is no risk of galvanic coupling.
- for screw-in immersion heaters:
  - the threaded plug of the immersion heater is compatible with the nominal pressure of your unit:



  - the threading diameter and its pitch are identical to those of the female part (usually a welding ring) into which the immersion heater is screwed.

- For flange-mounted immersion heaters :

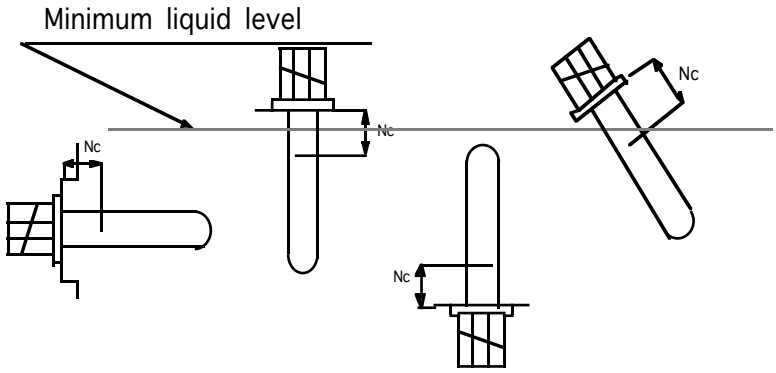
  - the diameter of the flange, the number and diameter of the fixing bolts (and their position diameter) and the supporting surface of the seal are compatible with the mating flange onto which it will be fitted.

  - the immersion heater flange is compatible with the nominal pressure of the installation at the temperature in question (the maximum service pressure must always be below the NP of the flange).

OFFSET B (mm)	TEMPERATURE OF USE up to	MAX. SERVICE PRESSURE (Bar) PER NFE 29005 A 42 CP steel					TEST PRESSURE MSP x 2 : for MSP ≤ 6 Bar
		PN 16	PN 20	PN 25	PN 40	PN 50	
None	110°C	16	17	25	40	47	
60	150°C	14	15	22	36	45	MSP + 6:
	180°C	12	14	21	33	44	pour PSM ≤ 12Ba
	200°C	10	14	20	32	43	
125 if brased	250°C	9	12	17,5	28	41	MSP x 1.5 :
if welded	300°C	7	10	15	24	38	for MSP > 12Bar
245 if welded	350°C		8	12,5	20	37	(MSP = Max.
and Ø 16	400°C		6,5	8,5	14	34	service pressure)

  - it is designed to be fitted in such a way that the heating length (Lc) is always submerged when the power is switched on. Vertical (especially head upwards) or oblique fitting are awkward. It is preferable to fit a device which automatically releases any pockets of gas which may build up, or fit the heater in such a way that this occurs automatically.

  - if fitted onto a connection piece, the non-heating length (Nc) must be slightly longer than the collar of the connection piece.



- the O-ring is in place and is compatible with the substance being heated, at the relevant temperature of use.

- the supply voltage corresponds to the voltage for which the immersion heater is designed (the specific load of the pins is stated on the six faces of the plug).

3 - 2 - **FITTING :**

- Where possible, fit it horizontally :
  in this case, for A dimensions >1000 mm, installation and removal will be facilitated by putting in place a guide or supporting cradle, designed so as not to damage the cladding. This support will also compensate for the overhang of the heating elements.

- For screw-in immersion heaters:

  - usually a screw-in immersion heater is fitted to a welding ring (which we can supply as an option for diameters 45 and 77 at a pitch of 200).

  - to prevent deformation of the ring whilst it is being welded to the tank (or the collar), we suggest that you fit a solid plug (available as an option for diameters 45 and 77, pitch 200) inside the ring during the operation.

- Do not overlook the circuit side seal at the time of fitting and check its position when tightening; this task will be easier if you use one of our tightening spanners, supplied as an option, for screw-in immersion heaters.

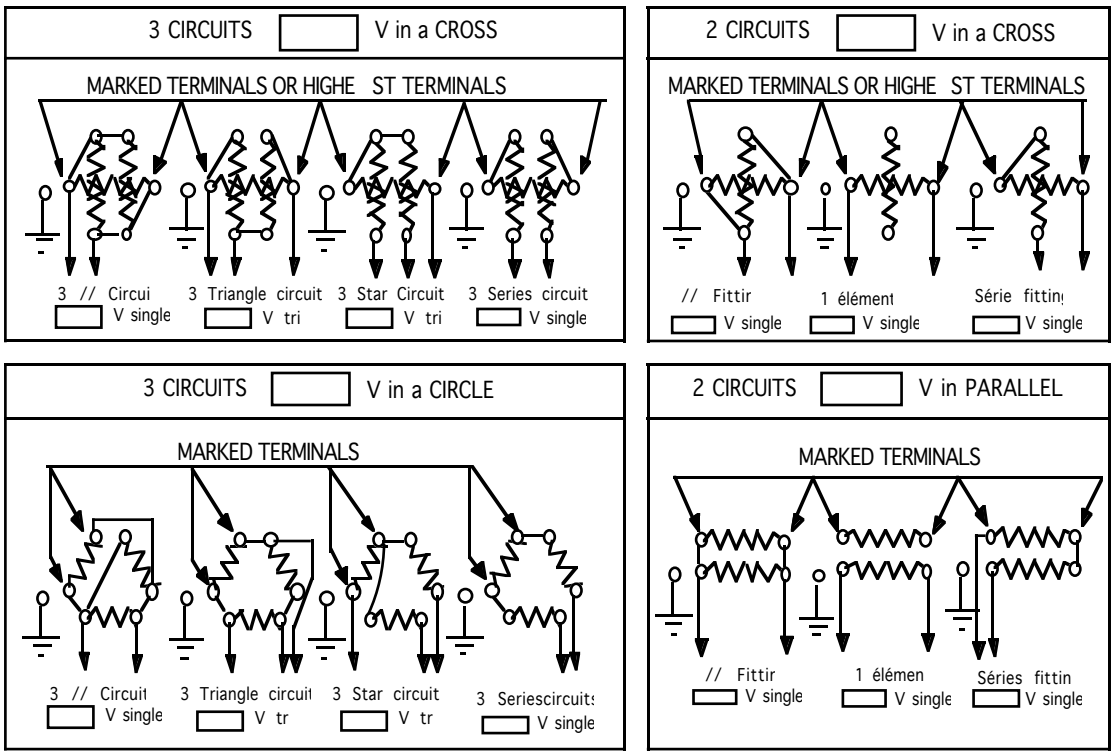
- The same goes for the housing seal applied to the fixing interface, on the terminal side.

- If the tank is lagged, leave room around the housing for air to circulate freely. In the case of immersion heaters with an offset housing, leave exposed the entire part located between the immersion heater attachment and the housing (do not lag this under any circumstances).

- As the orientation of the housing can be adjusted, position the stuffing box towards the bottom.

- Where heating is circulating within a closed circuit, fit the safety devices provided for by law, which are intended to prevent overpressure in the event of overheating (valve, degasser, expansion vessel etc.)

3 - 3 - **ELECTRICAL CONNECTION :**



- To prevent any risk of error, check the position of the circuits (in a cross-arrangement, in a circle or in parallel), prior to coupling in accordance with the above diagram, and the voltage for each pin and the network voltage (for immersion heaters with a diameter M 77 x 200 and 2" GAS, and for flange-mounted immersion heaters, we can supply specially designed coupling connector blocks as an option).

- Connect the earth terminal to the installation earth.

- Ensure that the connections to the heating elements are tightened (max. torque 0.8 mkg on threaded terminals).

- When choosing a connecting cable, take into account the fact that the temperature within the housing may be around 20 to 50 °C higher than the external atmosphere.

- We strongly recommend that you install a safety thermostat or regulator, which is separate from the main regulation device, and which irreversibly cuts off the electrical supply where overheating is detected.

- For connecting the safety device (option) of the flange imersion heater, be careful to use the right type of connection cable (the type differs depending on weither the probe is a plate type probe or a type J or K thermocouple.

- Avoid fitting power supply cable in the same sheath as the connection wire of the (low voltage) safety device.

NOTE : The safety system must not under any circumstances be used as temperature regulation system. Abnormally hight temperatures should irreversibly cut off the power supply, thus necessitating checking before manual resetting.

4 - COMMISSIONING PROCEDURE :

4 - 1 - PRECAUTIONS TO BE TAKEN PRIOR TO COMMISSIONING :

Heating liquid by natural convection:

The immersion heater must not under any circumstances be switched on without the heating section being completely submerged (it is strongly recommended that a level-monitoring device is fitted; a degasser or a manual bleed is necessary).

The safety thermostat or regulator or the safety device (option) of the flange immersion heater have been set at a reference temperature value which is slightly higher than the temperature of use.

Heating liquid or gas by forced convection:

The immersion heater must not under any circumstances be commissioned unless the minimum calculated flow rate is guaranteed (it is strongly recommended that a flow rate monitoring device is fitted; a degasser is often essential for liquids).Check that the full heating length is swept by the fluid.

The safety thermostat or regulator or the safety device (option) of the flange immersion heater have been set at a reference temperature value which is slightly higher than the presumed triggering temperature.

4 - 2 - COMMISSIONING :

- Switch on the immersion heater. Check immediately that the on-line intensity conforms to that for which it is designed, and set the regulation devices.

- After stabilisation at the nominal temperature of use:

  - manually cut off the safety thermostat (or regulator) and set it approximately 10∞C above this value, without exceeding the vaporisation temperature of the fluid at the pressure in question.

  - where heating liquid or gas by forced convection, make sure that any reduction in flow rate below the minimum provided for by the heat exchange calculations automatically brings heating to a halt.

4 - 3 - SWITCHING OFF THE INSTALLATION (forced convection) :

Where heating liquid and especially gas by forced convection, it is necessary, when switching off the installation, to maintain the fluid flow rate for a minimum period of 3 minutes after the immersion heater has been switched off, to evacuate the calories accumulated within the heating elements.

Under certain conditions, failure to follow this instruction can result in the destruction of the immersion heater and/or its environment, and even present a danger to the users.

5 - MAINTENANCE :

After 50 hours operating:

- Check that all connections are tight.

Every six months :

- Same operation as in the previous paragraph.

At least once every year, and more frequently if required:

- Where heating liquid, dismantle the immersion heater and clean the heating elements, without damaging them, if sludge or limescale have built up on them (there is a risk that these will considerably shorten the service life of heating elements by obstructing heat exchange with the liquid).

- Remove any sludge which may have formed towards the bottom of the tank (or the preheater).

- After the immersion heater has been reassembled, follow the commissioning instructions in § 4.

6 - GUARANTEE :

The guarantee conforms to inter-union electrical construction agreements and our general terms and conditions of sale.

In view of the large number of tests conducted by our quality control department during the course of manufacture, and prior to the appliance being supplied, the probability of our equipment being defective is minute.

We guarantee that materials and surface treatments supplied will be in conformity with the definition given in our documents.

On the other hand, we cannot be held liable for any deterioration caused by:

- using the appliance above 10% over the nominal voltage intended,

- wear and tear caused by lack of maintenance, impacts, rough handling or inexperience on the part of the user,

- phenomena of corrosion (including in mains water) or boiler scale deposits.

on account of the variety of parameters which can cause these, and which are beyond our control.