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CE

OWNER'S MANUAL

CIRCULATING WATER HEATERS

CASING DN 80

TYPE 10705 (UNLAGGED)

TYPE 10745 (LAGGED)

1 - DESCRIPTION :

These heaters comprise the following :

- a painted steel casing with "inlet-outlet" tappings of 2" gas-taper threaded sleeves,
- a Vulcaloy type 1789 immersion heater, specially designed for water heating,
- a casing thermal safety system with a thermostat set at 115 °C,
- lagging (mineral wool) in a jacket of protected sheet metal for the type 10745 models.

2 - TECHNICAL CHARACTERISTICS :

For more details refer to our sales manual "Circulating fluid heaters" and the relevant drawing (in the case of custom-built heaters).

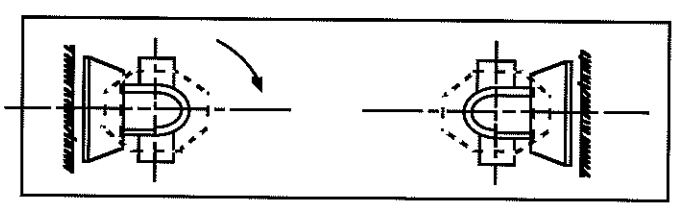
3 - ASSEMBLY AND ELECTRICAL CONNECTIONS :

3 - 1 - BEFORE INSTALLATION : Check that :

- your installation pressure is not higher than the maximum pressure of 10 bars
- the circulation direction of the fluid is correct
- the casing is mounted horizontally : in the special case of vertical mounting, additional precautions should be taken (connection box at the bottom; length of immersion heater less than the nominal length Ln of the casing : refer to our technical department for this special application). The outlet tapping must be vertical and pointing upwards (for outgassing); the fluid inlet must be via the bottom tapping.
- there must be sufficient clearance for dismantling the immersion heater ("racking" side)
- the immersion heater must be well-protected against inclement weather (rain, snow, etc) when fitted outdoors
- the supply voltage must be the same as that specified for the immersion heater (usually indicated on the immersion heater clamp).

3 - 2 - ASSEMBLY :

- Unlagged heaters are delivered with the connection box fitted on the left. This connection box may be positioned to the right by rotating the mounting tabs through 180°C.
  The centre-line of the mounting tabs may be altered if necessary :



Ensure that the heater is completely full, after having bled the entire installation.

4 - 2 - COMMISSIONING :

- Power up the immersion heater. Check immediately that the line current is as specified and adjust the regulating units.

- After it has settled to the nominal working temperature :

- Confirm that any loss of flow below the minimum specified in the heat exchange calculations causes the heater to shut down.

4 - 3 - INSTALLATION SHUTDOWN :

On installation shutdown, the flow of water must be maintained for a few moments after powering down the heater in order to dispel the calories accumulated in the elements.

Under certain conditions, failure to comply with this requirement will result in destruction of the immersion heater and/or its environment, or it may pose a hazard for users.

5 - MAINTENANCE :

After 50 hours of operation :

- Check that all connections are secured tightly.

Every six months :

- As above.

Once a year or more frequently if necessary :

- Dismantle the immersion heater and clean the elements, taking care not to damage them, if sludge or limescale is present (otherwise there is a risk that the service life of the elements may be considerably shortened due to obstruction of the heat exchange with the liquid).

- Drain any sludge that may have built up at the bottom of the heater.

- After re-assembling the immersion heater, follow the commissioning instructions given in Section 4.

6 - WARRANTY :

The warranty must comply with the inter-union agreements of the Electrical Construction industry.

In view of the large series of tests conducted by our quality control department, during manufacture and before handover, the failure probability rate of our equipment is negligible.

We guarantee the compliance of the equipment and any surface coatings, as defined in our documentation.

However, deterioration caused by :

- usage at 10% of the specified nominal voltage,
- wear caused by lack of maintenance, impact and mishandling or inexperience on the part of the user,
- corrosion (including sanitary water) or furring phenomena,

may not be invoked to our detriment, owing to the wide range of parameters that can generate such problems and which are not picked up on inspection.

- Lagged heaters, by design, require floor mounting on a solid base or frame (to provide clearance for the inlet orifice). For wall-mounting : opt for the use of consoles (ref. 6048.01). The centre-line of the mounting tabs is fixed.

- Special precautions must be taken when making hydraulic connections to ensure that the flow cannot be interrupted in any circumstances once the heater is powered up.

  PROVIDE :

  - A flow controller,
  - A safety valve,
  - A heat regulating temperature socket on the outlet tube.
    (We can provide a steel outlet sleeve (ref. 53804.01) which combines the tappings for these 3 functions.
    The 3/8" gas taper threading on the tube can accommodate a glove finger for a thermostat or regulating probe).

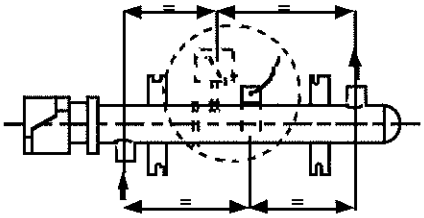
- In the case of circulating water heating in a closed circuit, provide the safety devices specified by law designed to guard against the overpressure phenomena caused by overheating (valve, gas release device, or expansion chamber, etc).

INSTRUCTIONS FOR INSTALLING THE THERMOSTAT ON UNLAGGED HEATERS :

In order that the safety thermostat can function efficiently :

- It must always be positionned as indicated below. Check this position especially if the fixing lugs have had their position changed when the installer has positioned the assembly :

Thermostat positioned at the center of the casing



- Put some thermal lubricant on the surface of the thrmostat probe set at 115 °C or on the adjustable thermostat bulb.
- Insulate around the fixed thermostat or around the bulb of adjustable thermostat.

Lagging : When the temperature exceeds 60 °C, lagging must be fitted. Never lag the immersion heater connection box.

3 - 3 - ELECTRICAL CONNECTIONS :

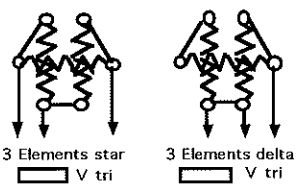
3 - 3 - 1 - THREE-PHASE voltage :

- THREE-PHASE electrical connection of the VULCALOY immersion heater is extremely simple and fast, eliminating the risk of a wiring error. In effect, The "STAR-DELTA" coupler enables a Star or Delta configuration to be achieved simply by turning it round.

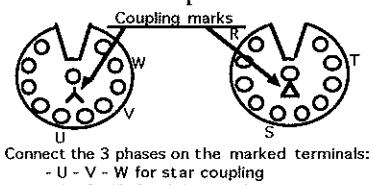
  The coupler is provided with a discriminating device (polarizer) which allows only one type of setting : on the visible side of the Coupler when fitted, a symbol is displayed showing the type of coupling :

  Y for Star and Δ for Delta.

  The three terminals to be connected are clearly identified on the coupler :



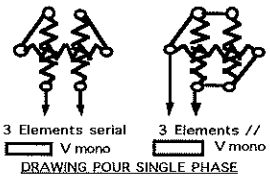
CONNECTIONS OF THE COUPLER



UTILISATION OF THE COUPLEUR

3 - 3 - 2 - SINGLE-PHASE voltage :

Remove the "STAR-DELTA" coupler and configure as shown below :



DRAWING POUR SINGLE PHASE

IMPORTANT COMMENTS :

- The immersion heater clamp shows :
  - the nominal power of the immersion heater which is equal to three times the power of a pin when energized by the nominal voltage
  - the voltage in the form : xxx/yyy :
    where xxx is the nominal voltage of each pin
    where yyy is the three-phase star coupling voltage
    (hence yyy = $3^{1/3}$.xxx)
    With high power values (usually above 24 kW), the voltage is in the form xxx V 3-PHASE, which requires a Delta coupling to obtain the nominal power.
- Remember that, in order to calculate the resultant power, it varies with the square of the voltage : see the table below for examples of standardized immersion heaters :

POSSIBLES POWERS AND LOADS ACCORDING COUPLING RING POSITION FOR STANDARDIZED VULCALOY

W/Cm2 / kW — Nominals powers and voltage (kW et v)	230/400 V TRI									400 V TRI		
	3	4,5	6	9	12	15	18	21	24	30	36	45
COUPLING // 230 V MONO	12 / 3	12 / 4,5	12 / 6	12 / 9	12 / 12	12 / 15	12 / 18	12 / 21	12 / 24	4 / 10	4 / 12	4 / 15
COUPLING // 400 V MONO	FORBIDDEN									12 / 30	12 / 36	12 / 45
COUPLING SERIAL 230 V MONO	1,3 / 0,33	1,3 / 0,5	1,3 / 0,67	1,3 / 1	1,3 / 1,3	1,3 / 1,67	1,3 / 2	1,3 / 2,3	1,3 / 2,66	0,4 / 1,1	0,4 / 1,32	0,4 / 1,65
COUPLING SERIAL 400 V MONO	4 / 1	4 / 1,5	4 / 2	4 / 3	4 / 4	4 / 5	4 / 6	4 / 7	4 / 8	1,3 / 3,3	1,3 / 4	1,3 / 5

Dissipated power in kW and load in W/Cm2

WARNING : HIGT INTENSITY

RECOMMENDATIONS :

- Firmly connect the earth terminal at the centre of the coupler to the installation earth point.
- Check that the connections to the heater elements are tight.
- When choosing the connecting cable, ensure that the temperature in the connection box may be approximately 20 to 50 °C above the temperature of the outside air.

3 - 3 - 3 - SAFETY SYSTEM :

- The safety thermostat (breaking capacity 2 A - 400 V) must irreversibly cut off the electrical power supply to the heater if a fault develops.
- It is highly advisable to fit a thermostat or temperature regulator that is quite separate from the safety device, since the latter must irreversibly cut off the electrical power supply if overheating is detected.

4 - **COMMISSIONING PROCEDURE**

4 - 1 - PRECAUTIONS TO BE TAKEN BEFORE COMMISSIONING :

The immersion heater must not in any circumstances be powered up without the minimum design flow rate (the installation of a flow controller is strongly recommended and an outgassing device is often essential).