braude

THERMAL PROCESS EQUIPMENT SPECIALISTS

POLARIS

NEPTUNE Tubular MI Electric Immersion Heater

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

These instructions should be carefully read and understood by all operators before use.
Please verify you have the correct instructions
NOT SUITABLE FOR ATEX AREAS

This Polaris Neptune Immersion heater is manufactured from the finest quality materials and should give trouble free service provided it is installed, operated and maintained in accordance with these instructions.

WARRANTY

The Polaris heater is covered by a 12 month warranty for defects in material supplied or faults in manufacture, providing the heater is installed and used in accordance with the installation, operation and maintenance instructions.

The Warranty does not cover faults or damage occurring as a result of misuse or the effect of outside faults causing damage to the heater.

Any problem should be notified to the manufacturer as soon as it has occurred with details of the date purchased, the invoice number and the serial number of the heater.

Braude will then advise you of the procedure for return or otherwise.

All Braude products are supplied accordance with our terms and conditions of sale available on our website or by request.

Braude do not accept liability for consequential damages that may arise as a result of use of this equipment

IMPORTANT – INSTALLATION MUST BE CARRIED OUT BY A QUALIFIED ELECTRICIAN

Safety is of paramount importance to manufacturers of electric immersion heaters. We endeavor to make our products as safe and foolproof as we possibly can. However, no piece of electrical equipment is 100% safe unless it is protected by an RCD (Residual Current Device) which will provide a rapid (30msec or better) cut off in the event of earth leakage and should be fitted to every installation.

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INSTALLATION

Mounting of heater

The unit is best located near the bottom of the tank, clear of any scale or sludge. Minimum liquid depth above the heater cold junction is 50mm. The junction may be indicated by a steel ring as shown in photo X below or can be established by referring to dimension Z (Table X below)

Failure to observe the minimum solution level will result in the heater becoming overheated and burnt out RENDERING WARRANTY INVALID

The immersion heater can be used in tanks made from plastic, metal and glass so long as no sharp edges can damage the exiting cable from the heater.

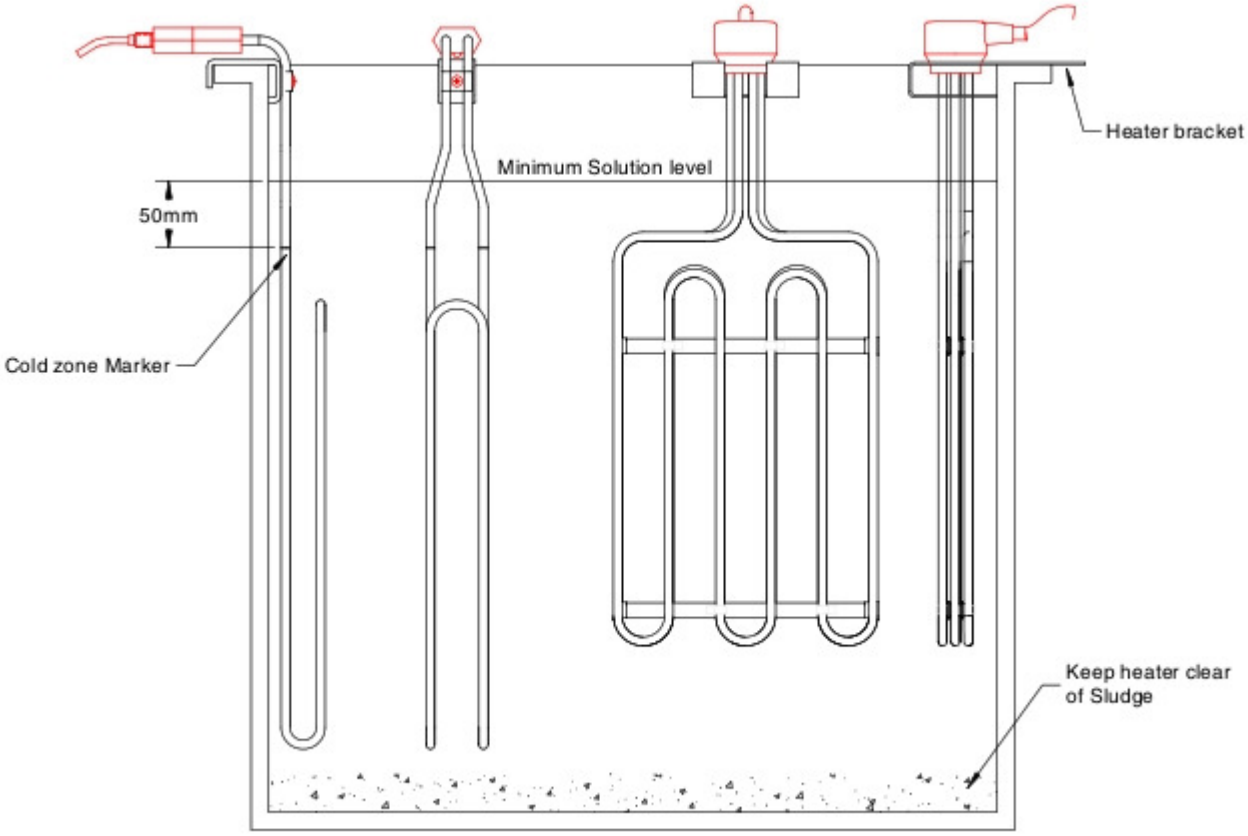


Figure 1: Mounting of Neptune Heaters

The heaters should be mounted vertically with the resin connector at the top. **The resin head should never be immersed in solution**. The heaters should be securely fitted to the tank flange using the brackets provided.

NOTE: The heater should never be switched on when out of solution otherwise overheating and catastrophic damage can occur.

Cold junction position / Markers

The position of the cold junction is defined as dimension Z as shown in the diagrams below. Not all heaters have a physical marker but where they do exist they are represented by a metal ring as shown in the photo 1 below. The solution should be above the cold junction by a least 50mm.

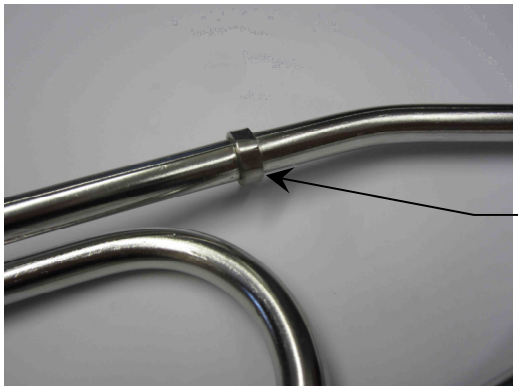
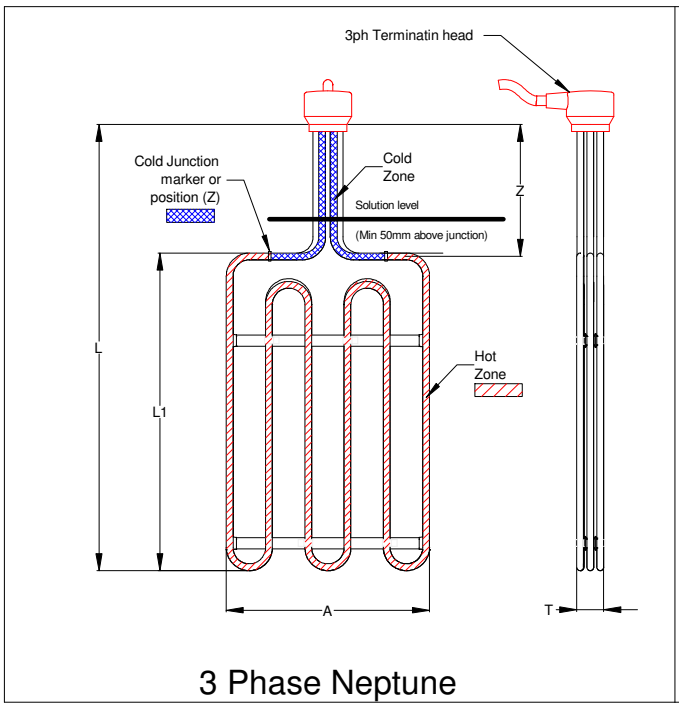
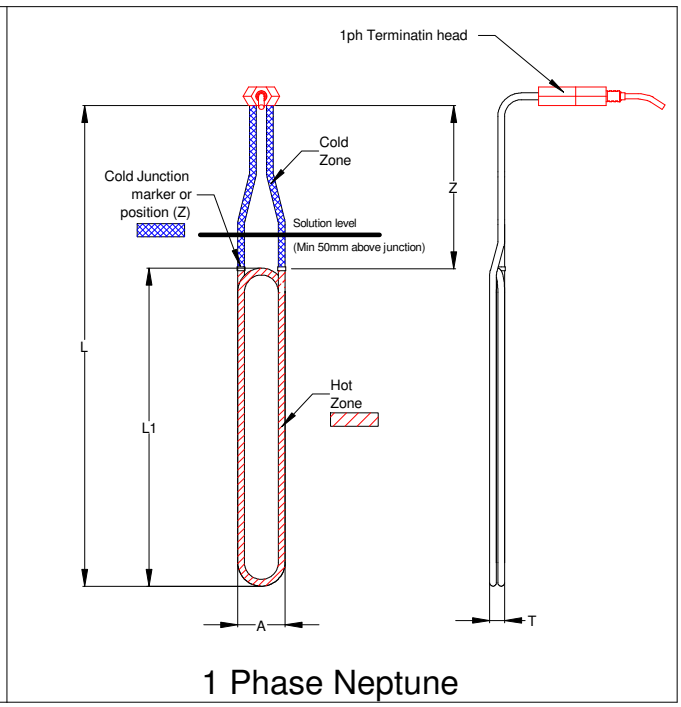


Photo 1



3 Phase Neptune



1 Phase Neptune

Heater (Kw)	Cold Zone (Z)mm	
	Stainless steel	Titanium
0.5	250	250
1.0	250	250
1.5	250	250
2.0	300	300
3.0	300	300
4.0	300	300

Other Kw and materials available on request

ELECTRICAL CONNECTIONS

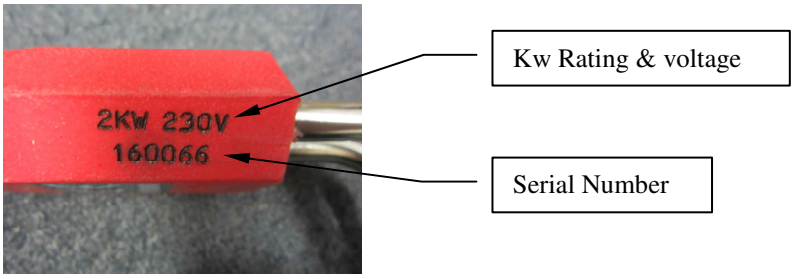
A heater should always be used in conjunction with temperature and also level control. Braude have a range of controllers suitable for use with the Neptune heater. Please contact us for advice.

SAFETY

Safety is of paramount importance to manufacturers of electric immersion heaters. We endeavor to make our products as safe and foolproof as we possibly can. However, no piece of electrical equipment is 100% safe unless it is protected by an RCD (Residual Current Device) which will provide a rapid (30msec or better) cut off in the event of earth leakage and should be fitted to every installation.

Before making electrical connections:

- Ensure that the heater is suitable for use on the available supply. Details will be found stamped on the resin termination head



- An earth is provided as an integral part of the NEPTUNE heater. It is essential that this is satisfactorily connected.
- It is also essential that a Residual Current Device (RCD) is incorporated in the circuit.
- Ensure that the terminal box is mounted high above the liquid level away from splash and humid conditions. The heater supply lead is provided with bare conductor ends which can be either directly wired into your supply control panel OR have a suitable industrial plug fitted in accordance with the ratings shown in table 1 below.
- Where the heater is to be directly wired into a control panel there shall be a disconnection incorporated in the fixed wiring.

CURRENT RATINGS

Electrical circuits should be protected by suitable fuses or circuit breakers. The table below gives nominal line currents, to assist in selecting a suitable fuse or circuit breaker and plugs for attachment to the heater.

Nominal Rating (kW)	230V Single Phase	Single phase plug rating	400V Three Phase (per phase)	Three phase Plug rating
0.50	2.2A	230v, 16A, 50-60Hz		
1.00	4.3A	230v, 16A, 50-60Hz		
1.50	6.5A	230v, 16A, 50-60Hz	2.2A	400v, 16A, 50-60Hz
2.00	8.7A	230v, 16A, 50-60Hz		
3.00	13.0A	230v, 16A, 50-60Hz	4.3A	400v, 16A, 50-60Hz
4.00	17.4A	230v, 32A, 50-60Hz		
4.50	19.6A	230v, 32A, 50-60Hz	6.5A	400v, 16A, 50-60Hz
6.00	26.1A	230v, 63A, 50-60Hz	8.7A	400v, 16A, 50-60Hz
9.00	39.1A	230v, 63A, 50-60Hz	13.0A	400v, 32A, 50-60Hz
12.00			17.4A	400v, 32A, 50-60Hz

Table 1
Nominal running current in each line when cold

SINGLE PHASE CONNECTION

See Figure 4 and connecting instructions on the supply lead

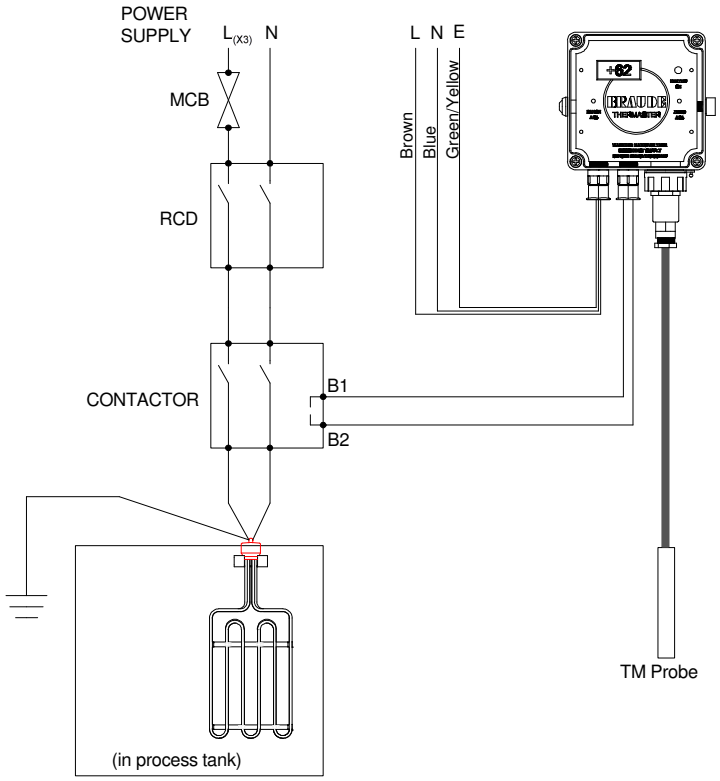


Fig 4

THREE PHASE CONNECTIONS

Three phase units are connected as shown on Figure 5. If a 3 live and earth mains electrical supply is being used with no neutral, the blue (star-point) lead of the NEPTUNE should be insulated and left unconnected. Three single phase heaters of equal rating can be connected to three phase supply. See Fig.6. Users and operators must ensure that the individual heater's voltage ratings are not exceeded

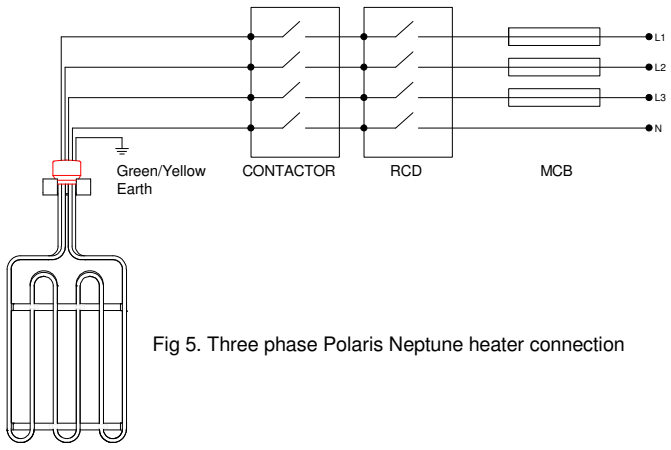


Fig 5. Three phase Polaris Neptune heater connection

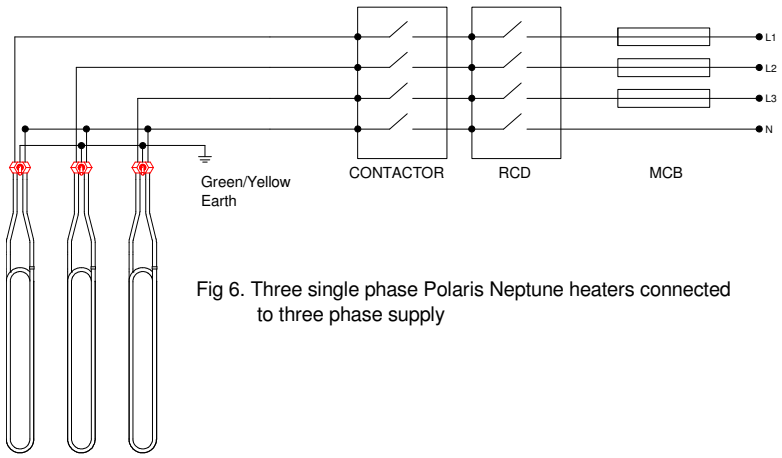


Fig 6. Three single phase Polaris Neptune heaters connected to three phase supply

RCD Rating

Always consult a qualified electrician when installing RCD & MCB.
RCD should have a trip sensitivity of 30mA and be TYPE AC
Single phase heaters should be attached to 2 pole RCD and three phase to 4 pole RCD

MCB Rating

MCB used should be TYPE B (resistive loads)
Single phase heaters should be attached to 1 pole MCB and three phase to 3 pole MCB

RECOMMENDED RCD/MCB RATINGS						
	SINGLE PHASE HEATERS			THREE PHASE HEATERS		
	RCD / MCB RATING 230V			RCD / MCB RATING 400V		
Nominal Heater Rating (kW)	Nominal Heater 230V Single Phase current (A)	RCD Current rating (A)	MCB Current rating (A)	400V Three Phase (per phase)	RCD Current rating (A)	MCB Current rating (A)
0.50	2.2A	25	6			
1.00	4.3A	25	6			
1.50	6.5A	25	10	2.2A	25	6
2.00	8.7A	25	16			
3.00	13.0A	25	16	4.3A	25	6
4.00	17.4A	40	25			
4.50	19.6A	40	25	6.5A	25	10
6.00	26.1A	40	40	8.7A	25	16
9.00	39.1A	63	50	13.0A	25	20
12.00				17.4A	40	25

TABLE 2: RCD / MCB RATINGS

OPERATION

The NEPTUNE is suited for use in most solutions at temperatures up to 100^{0}C. The heater is available in a variety of different materials to suit your application. To confirm compatibility refer to the chemical supplier to check the suitability of the material. Braude do not accept responsibility for incorrect selection of materials.

ALWAYS ENSURE THAT THE SOLUTION LEVEL COMPLETELY COVERS THE HEATER TO LEVELS INDICATED IN FIG. 1.

Although the heater is of robust construction, care should be taken to prevent impact damage on the element.

MAINTENANCE

The POLARIS NEPTUNE heater is manufactured from robust materials and requires minimum maintenance. In order to obtain maximum performance from the heater the following procedures must be observed.

Examine the heater periodically. Certain solutions may tend to build a deposit or film on the heater element over a period of time. This must not be allowed to build up unchecked as heat transfer efficiency will suffer and premature failure of the element will occur. The level and time it takes for deposits to build up on the heater element is dependent on individual operating conditions and therefore the user will have to establish a maintenance period based on observation.

The supply lead is an integral part of the heater and therefore the heater should be returned to Braude if it becomes damaged in anyway.
Check there are no foreign bodies or material embedded in the tube.

REMOVAL, CLEANING AND STORAGE OF HEATER.

CAUTION The operator must exercise care when removing the heaters from tanks where corrosive solutions are in use. Make sure the heaters are fully drained and avoid 'carry over' of solution. Operators should be protected against acid spillage and splash by wearing suitable protective clothing.

- Before removal or draining the tank, ensure that the heater has been unplugged or disconnected from the supply and allowed to cool down for at least 15 minutes. Remove the heater and rinse thoroughly in clean water. DO NOT TOUCH the heated section of the heater, or place it on combustible surfaces until it is fully cooled.

- To remove deposits immerse the heater in a suitable cleaner until it is free from deposits. Rinse thoroughly in clean water.

- Heavy deposits may require the units to be left in a solution overnight but the heater rod should not be cleaned in an aggressive solution that is incompatible with the materials. Aggressive solutions should not be used to clean the resin head or the lead.

- If the heater is to be stored after cleaning, guard against possible seepage of corrosive liquid due to inadequate draining.

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SAFETY - IMPORTANT	
DO NOT	Switch on power unless you have checked for correct supply voltage.
DO NOT	Use the heater unless the 'SAFE LEVEL INDICATOR' is fully immersed.
DO NOT	Examine, move, tamper or remove the heater from the tank unless the power is unplugged / disconnected from the supply and allowed to cool off for at least 15 minutes.
DO NOT	Attempt to dismantle and tamper with the heater since irreparable damage may occur and invalidate the guarantee.
DO NOT	Allow sharp objects or other items likely to cause damage to come into contact with electrical elements. This is essential whether the heater power is switched on or not.
DO NOT	Attempt to repair a damaged heater.