



# ULTIMHEAT

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## HEAT & CONTROLS



# IMMERSION HEATERS

- Air heaters:
- Flow through liquid heaters:

See catalogue No.24

See catalogue No.23

Contact us

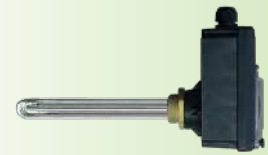


# Summary



Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice

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|                                               |  | 9STB | Immersion heater with 182mm × 130mm × 120mm plastic enclosure. Fittings 1½" and M45×2. With mechanical thermostat or electronic temperature control. With or without manual reset thermostat.                                                                          | P18-P20 |



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|                                                          |  | 9SFT202 and 9SFT502                                                      | Renewable energy 1½" and M45×2 immersion heaters, 12 and 24V power supply, <b>with connection box</b>                                        | P13-P14 |
|                                                          |  | 9SFT400                                                                  | Renewable energy 1¼" immersion heaters, 12 and 24V power supply, <b>without connection box</b>                                               | P15-P16 |
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# **Section 2**

## **Sheathed heating elements for liquids heating**

### **Technical introduction**



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# Technical introduction

## 1- Selecting the right sheath material

There are many different sheath materials available for immersion heaters. The most important factor is the material or fluid that will be in direct contact with the heating element. In many situations, different sheath materials could be used. If the specs allows or calls only for stainless steel, make sure which one is compatible. (Example: 304,304L, 316, 316L or 321; see below). In most cases, it will be possible to use stainless steel, now very popular and cheap, in applications where copper or steel were previously used.

### Main stainless steels used in immersion heaters

| EN        | AISI       | DIN       | Use                                                                                                                                                                                                                  |
|-----------|------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN 1.4301 | AISI 304   | W. 1.4301 | In water or humid environment max. 450°C. Used in food cooking applications. Flanges on immersion heaters are commonly made of 304. It is the less costly of the sheath materials mentioned in this list.            |
| EN 1.4307 | AISI 304L  | W 1.4307  | Same than 304 for humid-corrosive environments. Used for washing machine heating elements. Better corrosion resistance after TIG welding than 304.                                                                   |
| EN 1.4541 | AISI 321   | W. 1.4541 | In water or humid environment max. 550°C. Washing and cooking heating elements.                                                                                                                                      |
| EN 1.4404 | AISI 316L  | W. 1.4404 | Improved resistance to corrosion. For water or corrosive humid environment max. 450°C. For food industry.                                                                                                            |
| EN 1.4435 | AISI 316SL | W. 1.4435 | Equivalent to 316L, with the difference that the higher content of molybdenum ensures elevated mechanical features and resistance to corrosion. In water or corrosive humid environment max. 500°C. Very little use. |
| EN 1.4571 | AISI 316Ti | W. 1.4571 | Equivalent to AISI 321, with the addition of molybdenum besides titanium. For temperatures of 500°C, also in discontinuous service. Very little use.                                                                 |
| EN 1.4876 | Alloy 800  | W. 1.4876 | Also Referred to as Incoloy 800. In water and air with max. temperature of 1050°C.                                                                                                                                   |
| EN 2.4858 | Alloy 825  | W. 2.4858 | Also Referred to as Incoloy 825. In water or highly corrosive environments.                                                                                                                                          |
| EN 1.4847 | Alloy 840  | W. 1.4847 | Also Referred to as Incoloy 840. In air for max. temperature up to 950°C.                                                                                                                                            |
| Ti II     | UNS R50400 | W. 3.7035 | This material is used extensively in immersion heating, sea water piping, reactor vessels. Withstands highly corrosive materials. It is the most costly of the sheath materials mentioned in this list.              |

Additional constraints are given by the ability of different materials to be formed and bent, including in their annealed condition, which imposes different minimum bending radii. E.g. formability 304L and 316L is excellent, while that of titanium is very limited.

The above table is provided for general guidance only. The suitability and completeness through which technical and/or informative characteristics have been supplied in this table have to be analysed carefully by the customer. The customer must carry out all in-depth controls and all necessary tests in order to check the suitability of our product in the final application to which it is to be installed.



# Technical introduction

## 2-Surface load selection

Figures provided in this section are results of tests made in our laboratory. Charts were smoothened by computer, and are given for specified power and for information only.

See also technical section of the catalogue Nr 24 for more information about sheathed element life span.

### General rules.

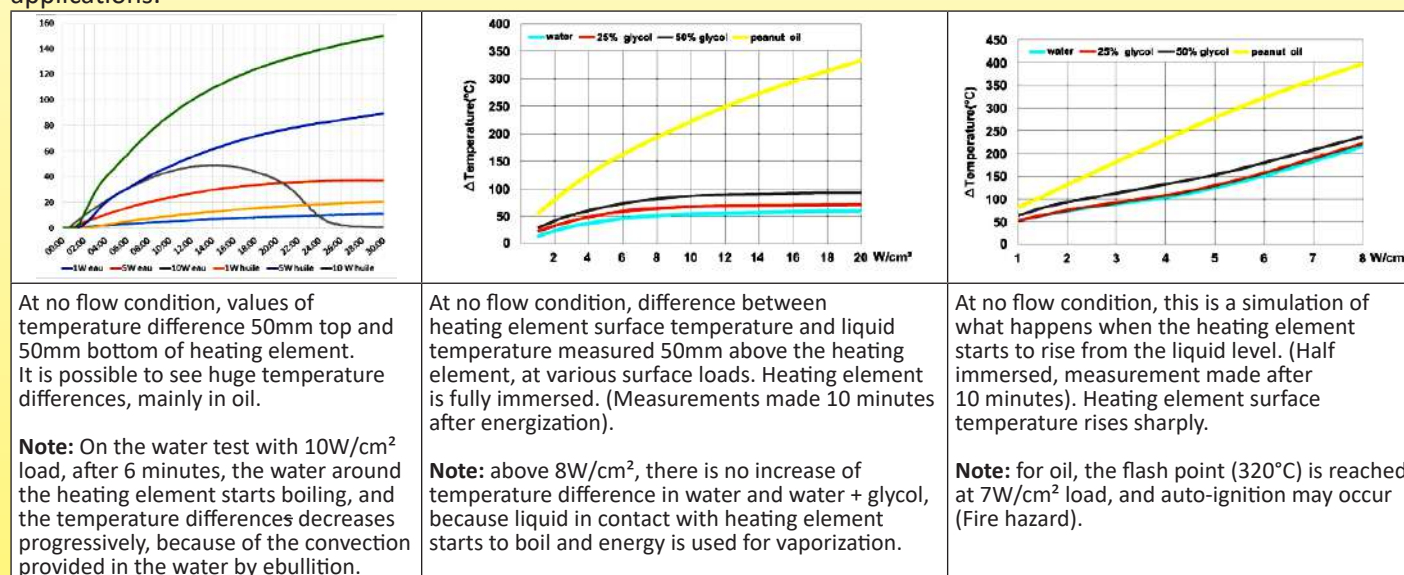
It is recommended to select a surface load which does not produce local boiling of the liquid at the surface of the heating element. This phenomenon, called cavitation, causes rapid wear of the protective sheath of the heating element, decomposition or chemical transformation of the liquid, and the deposit of limestone and contaminants (carbonates, chlorides etc...). In the case of drinking water, these deposition processes are amplified when the water temperature reached 65°C, and for water hardness exceeding 10dH.

The tests below were carried out in usual application configurations, by measuring in several places the surface temperature of the heating elements by miniature thermocouple spot welded to its surface.

It is important to distinguish between static applications where water is not flowing, and where the heat transfer to the liquid is made by heat conduction and natural convection currents, and these where liquid circulates around the heating elements, increasing dramatically the heat exchange.

### Immersion heaters used in tanks or containers without permanent water flow

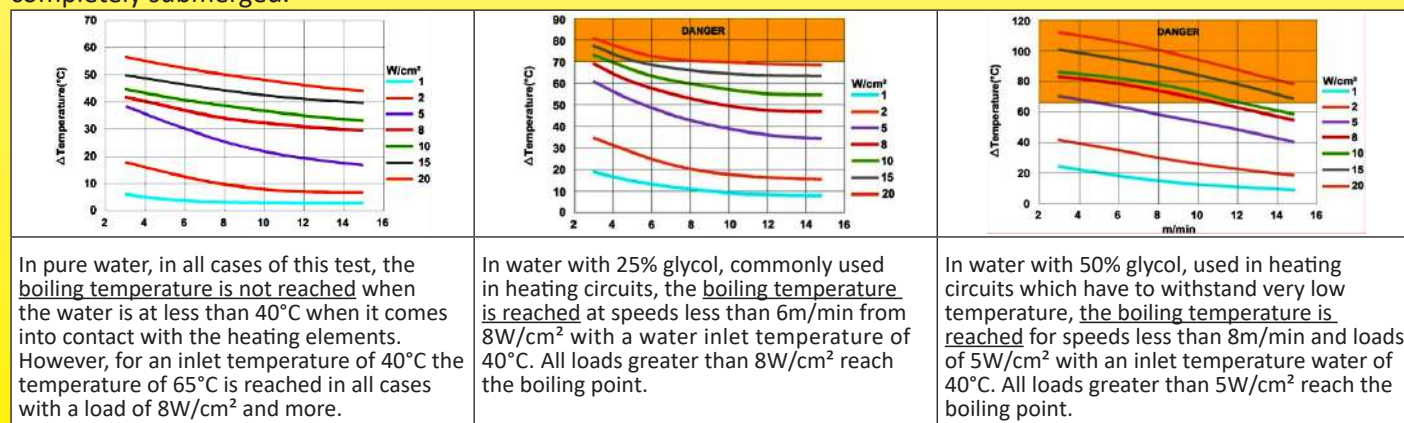
The tests were performed with pure water, 25%, and 50% glycol added water, as they are representative of liquids used in central heating and solar heating circuits, and with peanut oil representative of liquids used in food applications.



### Immersion heaters used in tanks or containers with permanent water flow

In applications with permanent flow, the important parameter is the velocity of the liquid around the heating element. In the graphs below, the speed is given in meters per minute.

The temperature data from these curves is the difference between the surface temperature of the heating element and the fluid temperature, measured 50mm above the heating element. The tests were performed with pure water, and water with glycol addition of 25% and 50%, for the surface load of 1 to 20W/cm². The heating elements are completely submerged.







# Technical introduction

## 3-Selecting the fitting or the flange

**Fitting material:** It is important to consider the immersion heater fitting material, whose corrosion resistance must be compatible with the liquid. Most heaters use a threaded brass fitting, brazed to the heating elements. For applications where the brass is not allowed, a stainless steel fitting, made of 304L or 316L, can be used. It can be brazed with copper alloy or TIG welded for the most difficult cases.

The light flange-mounted immersion heaters, such as that used in washing machines and water heaters, use AISI 304 stamped flanges, cheaper than brass and guaranteeing a better pressure resistance.

Immersion heaters for industrial applications use standard pipe flanges.

### Method of attachment of the heating element to the flange or the fitting:

This attachment must meet various requirements, including: provide a good seal, withstand the temperature of the liquid and the surface temperature of the heating element, provides mechanical retention, corrosion resistance.

| Type                 | Sealing                                                                                | Temperature      | Mechanical retention | Corrosion resistance |
|----------------------|----------------------------------------------------------------------------------------|------------------|----------------------|----------------------|
| Tin soldering        | Good if no mechanical stress or vibrations. Soldering is difficult on stainless steel. | Max 120°C        | Poor to average      | Poor                 |
| Epoxy bonding        | Good if no mechanical stress or vibrations.                                            | Max 80°C         | Poor                 | Good                 |
| Copper alloy brazing | Good, but risks of leakage eventually undetectable in production.                      | Max 300°C        | Superior             | Average              |
| TIG welding          | Superior                                                                               | Max 450°C (304L) | Superior             | Superior             |

### Threads

In Europe there are two common thread types used on immersion heaters fittings.

- Threads according to ISO228-1, also said BSPP or cylindrical gas thread (G),
- 2mm pitch metric thread according ISO965-1, little used, which was the subject of an attempt to standardize in the middle of the 20th century.

The threads are still sometimes described, particularly in France, according to their internal and external diameters.

All these threads are parallel, and therefore requiring a gasket surface to ensure proper sealing. They are mounted on female nozzles, or through wall with a nut.

Selecting a thread diameter is mainly imposed by the minimum possible bending diameter of sheathed elements.

Threads of 1" and below are therefore used on the cartridge heaters.

The main threads are:

| Standard size | ½" (15-21) | ¾" (20-27) | 1" (26-34) | 1¼" (33-42) | 1½" (40-49) | M45x200 | 2" (50-60) | 2½" (66-76) | M77x200 |
|---------------|------------|------------|------------|-------------|-------------|---------|------------|-------------|---------|
| Outside dia   | 21mm       | 26.4mm     | 33.3mm     | 41.9mm      | 47.8mm      | 45mm    | 59.6mm     | 75.2mm      | 77mm    |

### Rotation

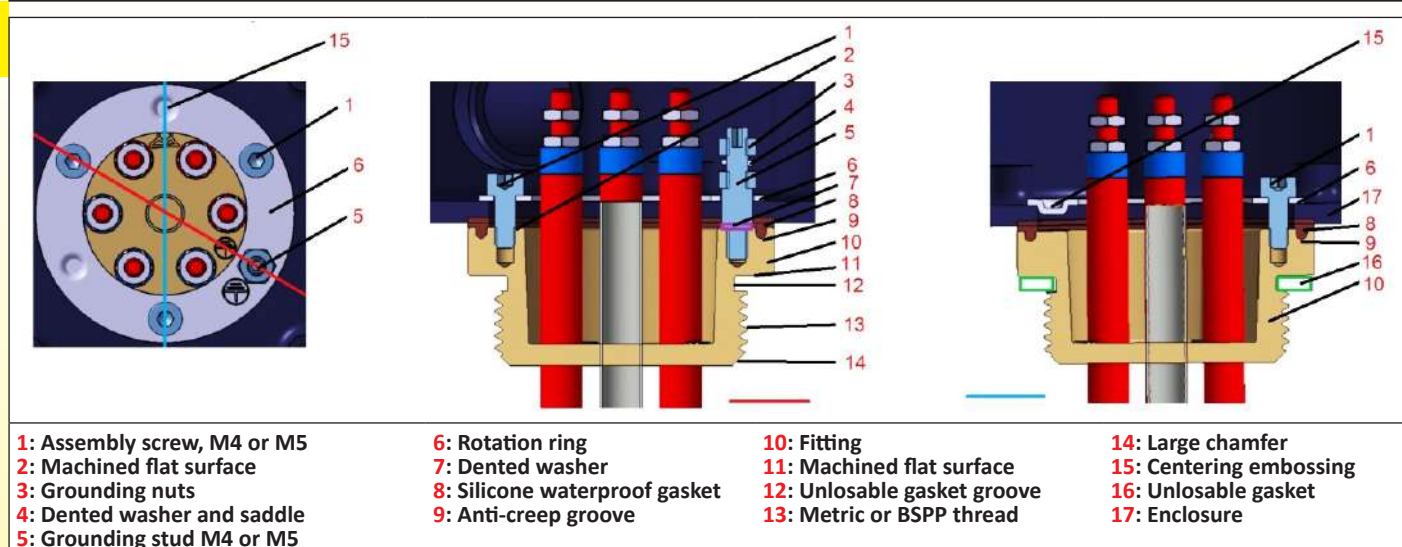
Heaters are often screwed on nozzles welded on the wall of a tank or heater. The seal is obtained by tightening a gasket, it is impossible to predict in advance what will be the position of the fitting and its connection box when tightening will be effective.

Therefore we have designed a technical solution to facilitate the enclosure positioning after fitting tightening.

### The unique design of immersion heater rotating brass fittings used in the products of this catalogue:

- Fit the full range of immersion heater enclosures, starting from the 1¼" fitting.
- Compact size and short length result in reduced weight ( save ±30% compared to double thread fittings).
- Allows a 360° rotation of enclosure.
- Thread clearance for captive gasket.
- Large chamfer facilitating correct assembly.
- Large machined gasket seat.

# Technical introduction



## Assembly on enclosures:

- Through a hole in the enclosure. The enclosure is sandwiched between the fitting and a stamped inner ring. Bumps in the ring provide self-centering. This stamped ring costs only 10% of the conventional threaded inner rings.

## Gasket between fitting and enclosure

- The 4 × 2mm section, 50 Shore silicone gasket with anti-creep rib, absorbs flatness differences, and remains in place during tightening.
- Guaranteed IP65 ingress protection up to 200°C between fitting and enclosure.

## Inner stamped ring

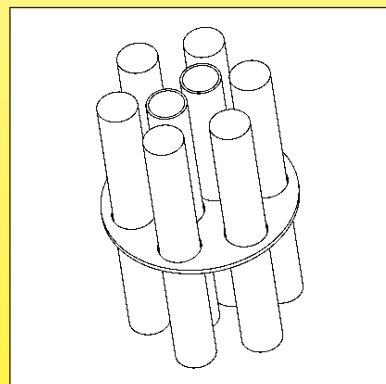
- The clamping with 3 BTR screws at 120° ensures a good pressure distribution and an excellent mechanical strength. These screw positions increase the clearances between the screw heads and live parts of the heating elements
- The recessed hexagonal hole screw heads allow easy and stable entry of hex wrench when adjusting angular position
- Ring made of stainless steel for better durability
- Unalterable stamped earthing logo

## Rohs compliance

According to the Directive 2011/65/ dated June 8, 2011 (Rohs), copper alloys are allowed to have a maximum of 4% by weight of lead as an alloying element. (Provisions of Article 4 and paragraph 1 of Annex II, limit value set by 6c of Annex III)

## Maintaining the tubes

In products having several heating elements and thermowells, it is necessary, from a certain length (typically all 40cms in dia. 8mm; 50cm in 10mm dia.; 60cm in dia. 12mm), to fasten all the tubes in order to prevent them to collide. This is accomplished by one or more grids.



## Non-heating zone, also said cold zone

The non-heating zone is located under the fitting or under the flange. It avoids that the heating elements heat up by thermal conduction the electrical connection ends and the housing. An usual value of this non-heating zone is 50mm (for the immersed portion).





# Technical introduction

## 4-Selecting the Enclosure

### Plastic or aluminum enclosure?

Traditionally immersion heaters enclosures are made of aluminum, as this was the most suitable material in the middle of the 20th century, when the choice of plastic materials was limited to thermosetting resins, Bakelite type. However, the plastic enclosures offer, in addition to a wide variety of moldable shapes, interesting characteristics of electrical insulation, resistance to chemicals and corrosion. They are also generally cheaper because they do not require painted surface protection.

However, they were often criticized for their low mechanical or thermal resistance. The fault is not to the plastic itself, but to the designers of these enclosures, often from Southern Europe, who have often favored the cheapest plastic and the lowest weight of the material, at the detriment of strength and technical requirements.

### Plastic enclosures

A good plastic enclosure must provide a good resistance to corrosion, shock, water ingress, UV, temperature

The choice of the plastic material and thickness will depend on electrical safety, strength, UV resistance for outdoor use, and compliance with European directives Rohs 20220/95/EC and Reach

We have therefore chosen plastics with exceptional environmental resistance characteristics, thermal and electrical. The thicknesses used are defined to meet the impact resistance requirements.

Comparizon of main plastics used in immersion heaters enclosures

| Raw material  | Temperature of deformation under load (ISO 75, method A) | Impact resistance on a 3mm thick plate at 25°C (EN50102) | Resistance loss, after UV test 1000h* (ISO4892-1)    | Flammability (UL94)                       | Mechanical breakage ISO 527/ASTMD638 | GWFI Glow wire test (IEC 60695-2-12) | Comments                                                                                                                                                                                                                                                                                                             |
|---------------|----------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------|-------------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ABS           | 92°C                                                     | 9,4 (IK08)                                               | Bad: 80% mechanical resistance loss after 1000H      | UL94-HB                                   | 50 Mpa                               | 650°C                                | The least expensive material. Poor temperature resistance, very poor insulation and mechanical feature. Not allowed for immersion heater enclosures.                                                                                                                                                                 |
| PS            | 75°C                                                     | 9.8 (IK08)                                               | Medium: 25% mechanical resistance loss after 1000H   | UL94-HB to UL94-HB                        | 23 to 32 Mpa                         | 750 to 960°C                         | Inexpensive material. No temperature resistance, low mechanical strength. Not allowed for immersion heater enclosure.                                                                                                                                                                                                |
| PA66          | 100°C                                                    | 2.9 (IK06)                                               | Medium: 22% mechanical resistance loss after 1000H   | U94-VO                                    | 80 to 85 Mpa                         | 650 to 750°C                         | Good mechanical resistance but low temperature and UV resistance. Low electrical insulation. Non recommended for immersion heater enclosure.                                                                                                                                                                         |
| PC            | 135°C                                                    | 21,2 (IK10)                                              | Good: 11% mechanical resistance loss after 1000H     | UL94-5V                                   | 70 Mpa                               | 850°C                                | Avoid if possible for immersion heater enclosures, due to its average resistance to UV and glow wire flammability. Fiberglass reinforced, with black pigment, however, can be used, as this plastic has a good temperature resistance.                                                                               |
| PC-ABS        | 80°C                                                     | 11,6 (IK09)                                              | Good: 18% mechanical resistance loss after 1000H     | UL94-VO                                   | 60 MPA                               | 960°C                                | Generally suitable for indoor use immersion heater enclosure, if there is no possible high temperature                                                                                                                                                                                                               |
| PC-ABS +20%FG | 120°C                                                    | 9,1 (IK08)                                               | Good: 15% mechanical resistance loss after 1000H     | UL94-VO                                   | 77 MPA                               | 960°C                                | Suitable for immersion housings for indoor and outdoor. Less expensive than glass fiber reinforced PA66. Has a good surface finish.                                                                                                                                                                                  |
| PA66, 20%FG   | 250°C (Peak)<br>120°C (Permanent)                        | IK10 (The most stringent)                                | Excellent: 7% mechanical resistance loss after 1000H | UL94 –VO and UL94-5V (The most stringent) | 150 Mpa                              | 960°C                                | The best technical choice: the highest technical characteristics in temperature, UV, mechanical strength and electrical insulation. However, it is the most expensive material (in the UL94-VO and GWFI 960 types).<br><b>Used on all connection blocks and on most of the plastic enclosures of this catalogue.</b> |

Note on IK Classes: to be IK rated, a material must withstand a shock greater than or equal to the following values: 1 joule = IK06, IK07 = 2 Joules, IK08 = 5 Joules, 10 Joules = IK09, IK10 = 20 Joules. **Therefore, an IK10 box is on average 2 times stronger than IK09, 4 times more than IK08, 10 times more than IK07 and 20 times more than IK06.**

\* UV resistance is improved by the addition of black pigment (black carbon), and it is the main reason for the black color of the boxes intended for outdoor use.



# Technical introduction

## Aluminum enclosures:

These enclosures provide unmatched mechanical and thermal resistance, while remaining relatively mild. Good thermal conductors, they evacuate smoothly the energy received by heating elements conduction. However, they suffer from the following disadvantages:

They are not electrically insulated, and internal wiring must be protected accordingly, and they need to be grounded. They are susceptible to galvanic corrosion in wet conditions, and especially when in contact with metals such as zinc or galvanized steel.

If the surface is not protected, they will also be quickly covered by an oxidized layer.

Therefore, good aluminum housings must be grounded and protected against galvanic corrosion and receive an epoxy paint layer when used outdoors.

## **Our aluminum enclosures were therefore designed to meet these requirements. For this purpose, they have:**

- Stainless steel nuts and screws to prevent galvanic corrosion between the screw and nut.
- Crimped nuts with epoxy seal to prevent galvanic corrosion between nut and aluminum.
- Plastic washers under the heads of the cover screws to prevent galvanic corrosion between the head of the nut and cover.
- They are coated with a baked epoxy paint applied on a sandblasted surface (to improve epoxy bonding to surface) thus providing a durable and reliable protection.

In addition, to reflect the wishes of users, they have in addition the following advantages:

- Captive stainless steel lid screws with dual slots Phillips head.
- These screws are mounted in "Nylstop" locknuts, which prevent their loosening by vibration.
- Two internal grounding threads, equipped with M4 stainless steel screws and washers. The larger models are also equipped with two external grounding threads.
- 3mm and sometimes 4mm wall thickness that permits tapping of threads, for cable glands, caps and other immersion heaters fittings.
- Internal studs on the cover that provides the possibility to mount thermostats with sealed wall crossing axis.
- Internal studs on lower part of enclosures for mounting terminal blocks or accessories that are not secured to the cover.
- Recessed places for labels or name plates that can be riveted or glued, to avoid intentional or unintentional removal.
- Silicone foam cover seal: temperature resistance up to 200°C and good compensation of surface irregularities in the sealing surfaces.

## **Cable and wire outputs on cartridge heaters**

The outputs of wires or cable on cartridge heaters can be protected by silicone filler cap, or by an over-molded PA66 boot. This provides an ingress protection degree higher than IP65.



# Technical introduction

## 5-Selecting temperature control and safety devices

### Selection of types of regulation

Traditionally the immersion heaters, when they are equipped with a temperature control device are using a mechanical thermostat, and its sensor is mounted in a pocket located between the heaters. This is a compact and reliable solution.

It is also possible now, to produce compact immersion heaters with electronic temperature controllers, combined or not with a fail-safe manual reset safety thermostat.

### Comparison of mechanical and electronic control systems that can be incorporated in immersion heaters.

| Device                                                                                                       | Control accuracy and differential                                                                                                                                                    | Ambient temperature                                                                                                                                  | Electrical rating                                                                                                                                                                                                                   | Comments                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Single pole bulb and capillary thermostat</b>                                                             | Set point accuracy: $\pm 3^{\circ}\text{C}$ to $\pm 5^{\circ}\text{C}$ , varies upon temperature ranges.<br>Differential: 2.5 to $4^{\circ}\text{C}$ , vary upon temperature ranges. | $80^{\circ}\text{C}$<br>( temperature ranges up to $60^{\circ}\text{C}$ ) $125^{\circ}\text{C}$<br>(temperature ranges up to $110^{\circ}\text{C}$ ) | 16A 250V<br>(Up to $3 \times 32\text{A } 400\text{V}$ in products with built-in power relay)                                                                                                                                        | Compact, can be mounted in all enclosures above 9ST3. Usually used up to 3000W single phase                                                                                 |
| <b>Single pole bulb and capillary thermostat + manual reset single pole safety thermostat</b>                | Set point accuracy: $\pm 3^{\circ}\text{C}$ to $\pm 5^{\circ}\text{C}$ , varies upon temperature ranges.<br>Differential: 2.5 to $4^{\circ}\text{C}$ , vary upon temperature ranges. | $80^{\circ}\text{C}$<br>( temperature ranges up to $60^{\circ}\text{C}$ ) $125^{\circ}\text{C}$<br>(temperature ranges up to $110^{\circ}\text{C}$ ) | 16A 250V<br>(Up to $3 \times 32\text{A } 400\text{V}$ in products with built-in power relay)                                                                                                                                        | Usually used up to 3000W single phase. Safer solution than a single thermostat. This combination is possible only in enclosures from 9ST6                                   |
| <b>3 pole bulb and capillary thermostat</b>                                                                  | Set point accuracy: $\pm 4^{\circ}\text{C}$ to $\pm 6^{\circ}\text{C}$ , varies upon temperature ranges.<br>Differential: 4 to $6^{\circ}\text{C}$ , vary upon temperature ranges.   | $80^{\circ}\text{C}$<br>( temperature ranges up to $60^{\circ}\text{C}$ ) $125^{\circ}\text{C}$<br>(temperature ranges up to $110^{\circ}\text{C}$ ) | $3 \times 16\text{A } 250\text{V}$<br>$3 \times 16\text{A } 400\text{V}$                                                                                                                                                            | Allows to control 3 phase loads in a compact form. Can be mounted in any enclosure above 9ST4, excluding 9STC.                                                              |
| <b>3 pole bulb and capillary thermostat + 3 pole manual reset safety thermostat</b>                          | Set point accuracy: $\pm 4^{\circ}\text{C}$ to $\pm 6^{\circ}\text{C}$ , varies upon temperature ranges.<br>Differential: 4 to $6^{\circ}\text{C}$ , vary upon temperature ranges.   | $80^{\circ}\text{C}$<br>( temperature ranges up to $60^{\circ}\text{C}$ ) $125^{\circ}\text{C}$<br>(temperature ranges up to $110^{\circ}\text{C}$ ) | $3 \times 16\text{A } 250\text{V}$<br>$3 \times 16\text{A } 400\text{V}$                                                                                                                                                            | Only compatible with 9ST7 boxes                                                                                                                                             |
| <b>Combined device, 3 pole temperature control and manual reset safety thermostat</b>                        | Set point accuracy: $\pm 5^{\circ}\text{C}$ to $\pm 8^{\circ}\text{C}$ , varies upon temperature ranges.<br>Differential: 8 to $12^{\circ}\text{C}$ , vary upon temperature ranges.  | $80^{\circ}\text{C}$<br>( temperature ranges up to $60^{\circ}\text{C}$ ) $125^{\circ}\text{C}$<br>(temperature ranges up to $110^{\circ}\text{C}$ ) | $3 \times 20\text{A } 250\text{V}$<br>$3 \times 16\text{A } 400\text{V}$                                                                                                                                                            | Simple, but huge calibration drift upon ambient temperature. Compatible with 9ST5 enclosure and above (except 9STC)                                                         |
| <b>Electronic temperature controller with digital display</b>                                                | Display $1/10^{\circ}\text{C}$ under $100^{\circ}\text{C}$ . $^{\circ}\text{C}$ display up. Accuracy $\pm 1^{\circ}\text{C}$ . Adjustable differential                               | $60^{\circ}\text{C}$                                                                                                                                 | $1 \times 16\text{A } 250\text{V}$ or $3 \times 16\text{A } 250\text{V}$<br>Up to $3 \times 32\text{A } 400\text{V}$ in products with built-in power relay, or up to $25\text{A } 250\text{V}$ In products using Solid state relay. | Permanent illuminated digital display of the liquid temperature.<br>For on-OFF or PID temperature control upon models.<br>Compatible with 9ST8, 9STB, 9ST9, 9STA enclosures |
| <b>Electronic temperature controller with digital display and manual reset bulb and capillary thermostat</b> | Display $1/10^{\circ}\text{C}$ under $100^{\circ}\text{C}$ . $^{\circ}\text{C}$ display up. Accuracy $\pm 1^{\circ}\text{C}$ . Adjustable differential                               | $60^{\circ}\text{C}$                                                                                                                                 | Up to $3 \times 32\text{A } 400\text{V}$ in products with built-in power relay, or up to $25\text{A } 250\text{V}$ In products using Solid state relay.                                                                             | Permanent illuminated digital display of the liquid temperature.<br>For on-OFF or PID temperature control upon models.<br>Compatible with 9ST8, 9STB, 9ST9, 9STA enclosures |

## Inside or outside setting?

The choice of access to the thermostat setting is dependent on the application.

- An internal access, which requires unscrewing the housing cover screws limits the possibilities of modification by unauthorized persons, and it is possible to seal the cover screws in order to check if someone has accessed this setting
- An access by an external knob is preferred when this adjustment must be changed regularly in the normal working operation of the heater. If needed, accessories like adjustable stops (see last section of this catalog) will allow setting high or low adjustment limits by the user. However, a device with an external knob is more brittle, less protected from impact and has a lower water and dust ingress protection. It is therefore not recommended for outdoor use.
- A Compromise between internal and external access is access under cap. Unscrewing, by means of a screwdriver or of a coin of a M25 cap provides access to a miniature knob on dial. Protection against water or dust ingress, and impact strength are not modified, provided that the cap is correctly reassembled.

## Thermowells (also said « pockets »)

Thermowells are used to place temperature measurement sensors in a liquid-tight tube to sense the temperature of the liquid in which the heater is immersed. The location of the thermowell is important because it determines the accuracy of the measured temperature, and the response time required to measure a temperature change.

A thermowell located in the center of the heater, at a distance of 10 to 20mm of the tubular heating elements, provide a good measure of the average fluid temperature, and will therefore be adapted to a control system.

If a safety thermostat is installed, and if it is intended to measure overheating of the liquid, a similar positioning of the thermowell is great. But if it is intended to detect dry running and avoid the destruction of the item or the risk of fire due to dry running, this thermowell, especially the part where is located measuring element or the thermal fuse, should be very close to the heating elements that come out of the liquid when it goes down.

If, in this case, the heating elements have a high surface load, a copper tube thermowell, better heat conductor than stainless steel, is recommended to reduce the response time. Do not hesitate to contact us.

## Use and installation of thermal cut out (TCO)

The ultimate security in an immersion heater is to use a thermal fuse. Two solutions exist:

- One is to install the wired TCO in a thermowell close to a heating element so that the TCO is triggered if the heater is used when not submerged. This solution allows the change of the fuse during a maintenance operation. This mounting requests 9mm I.D. thermowell (larger than that usually used for thermostats or temperature sensors).
- The second is to embed the TCO in the cold zone of the heating element, but in this case the temperature response time is slower, and this mounting does not permit the change of the TCO when it has triggered. The entire immersion heater must then be replaced.



# Section 3

## References list



Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice





# References list

Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice

| References       | References       | References       | References       | References       | References       |
|------------------|------------------|------------------|------------------|------------------|------------------|
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| 9ST6A5E1030U8240 | 9STCA5EN020V817J | 9STJG5E5010B8130 | 9STND7QV090CL980 | 9STTADU4045VBD5Q | 9SWND8QR01525110  |
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| 9ST6A5E5010VK170 | 9STCA5E5010VK17N | 9STJG5E5030VK440 | 9STND7QV150CMO50 | 9STTADU4A50VKJ0Q | 9SWND8QR045U727N  |
| 9ST6A5E5010V8170 | 9STCA5E5015V813N | 9STJG5E5040U8300 | 9STND7QV150CMO5N | 9STQA5QZ010B8130 | 9SWND8QR060B5190  |
| 9ST6A5E5020V8300 | 9STCA5E5015V824N | 9STJG5E5040U8570 | 9STND7QV180C2810 | 9STQA5QZ010B813N | 9SWND8QR060B7190  |
| 9ST6A5E5020VK170 | 9STCA5E5015VK13N | 9STJG5E5040UK300 | 9STND7QV180C281N | 9STQA5QZ010BK130 | 9SWND8QR060B719N  |
| 9ST6A5E5020VK300 | 9STCA5E5015VK24N | 9STJG5E5040UK570 | 9STND7QV180CM810 | 9STQA5QZ010BK13N | 9SWND8QR090U5270  |
| 9ST6A5E5030V8240 | 9STCA5E5030V8240 | 9STJG5E5060U8440 | 9STND7QV180CM81N | 9STQA5QZ010V8170 | 9SWND8QR090U527N  |
| 9ST6A5E5030V8440 | 9STCA5E5020V830N | 9STJG5E5060U8840 | 9STND7QV210C2950 | 9STQA5QZ010V817N | 9SWND8QR090U7270  |
| 9ST6A5E5030VK240 | 9STCA5E5020VK17N | 9STJG5E5060UK440 | 9STND7QV210C295N | 9STQA5QZ010VK170 | 9SWND8QR090U727N  |
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| 9STCA5EN010V817J | 9STJG5E1040UK300 | 9STND7QV090C1500 | 9STTADT40452BD8Q | 9SWMA8QT0302711N | 9SWMA8QT0302711N  |
| 9STCA5EN010VK17J | 9STJG5E1040UK570 | 9STND7QV090C150N | 9STTADT40452KD8Q | 9SWMA8QT0302711N | 9SWMA8QT0302711N  |
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| 9STCA5EN015VK13J | 9STJG5E1060UK440 | 9STND7QV090CL500 | 9STTADU4040VBD0Q | 9SWMA8QT0302711N | 9SWMA8QT0302711N  |
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Updated 2025/10/11



# Section 4

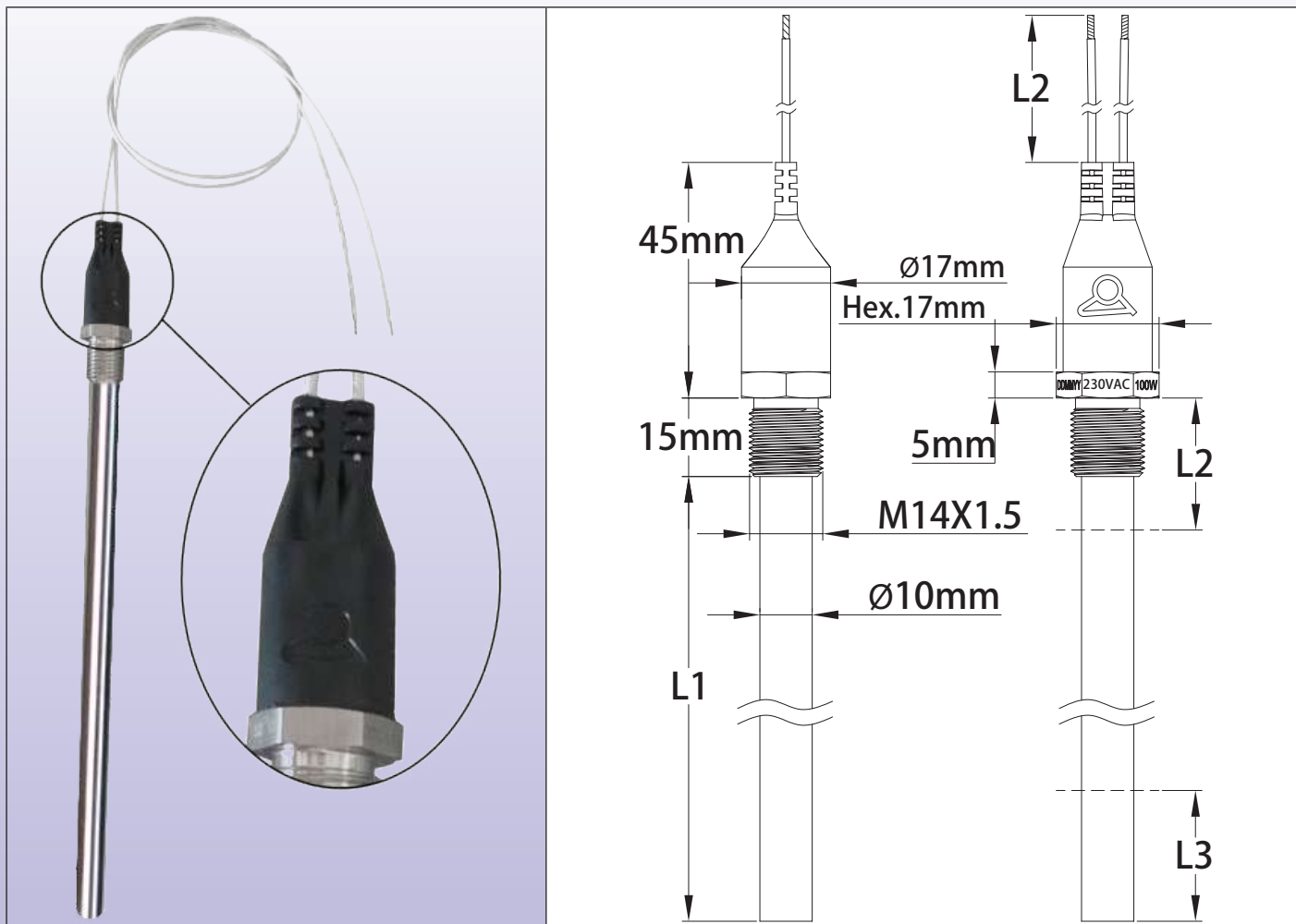
## Cartridge heaters



Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice

# Cartridge heaters

## Cartridge heaters dia. 10mm, with built-in thermostat, M14 × 1.5 thread Type 9T10



**Main applications:** Liquid heating when the space available for the heating element is reduced. E.g. heating oil supply systems, oil filters, sump engines, gearboxes, hydraulic power units. The heater has a built-in thermostat. It is the smaller heating element with built-in thermostat.

- 3 surface load values: 2.5W/cm<sup>2</sup>, 5W/cm<sup>2</sup>, 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heating tube material:** Element diameter 10mm, AISI 304 (AISI 316, AISI 321; Incolloy 800, 825 on request).

**Insulation:** Magnesia compressed by lamination guaranteeing good heat transfer and allows loads up to 20W/cm<sup>2</sup>

**Fitting Material:** TIG welded 304 stainless steel, with gasket seat. Shipped without gasket.

**Thread:** M14×1.5

**Connection:** PVC insulated wires, 300V, 300mm length

**Ingress Protection:** IP65 wires output, carried out by PA66 over-molding.

**Standard lengths (L1):** 215, 315, 415, 515, 615mm

**Not immersed heating zone (L2):** 40mm.

**Non-heating zone receiving the thermostat (L3):** 50mm

**Surface load:** 2.5W/cm<sup>2</sup> (main applications for oils), 5W/cm<sup>2</sup> (water without flow), 10W/cm<sup>2</sup> (circulating water). Other surface loads on request.

**Voltage:** 220-240V single phase, and 24VDC

**Thermostat calibration temperatures:** 50 ±5°C (122±9°F), 70 ±5°C (158±9°F), 90 ±5°C (194±9°F), 100 ±5°C (212±9°F), 110 ±5°C (230±9°F)

**Options on request (MOQ may apply):**

- Other calibration temperature, from 40°C to 150°C (104 to 302°F).
- Types without built-in thermostat
- Lower tolerances on the calibration temperature
- Different wire lengths
- Over-molded cable output
- Tube length up to 1.8m (Maximum power 1700W in 230V and 360W in 24VDC)
- Other thread
- Other voltage

# Cartridge heaters



## Main references in 230V, thermostat set at 50°C±5°C (122±9°F)\*

| Length<br>L1 | 2,5W/cm <sup>2</sup> |                  | 5W/cm <sup>2</sup> |                  | 10W/cm <sup>2</sup> |                  |
|--------------|----------------------|------------------|--------------------|------------------|---------------------|------------------|
|              | Power<br>(W)         | Reference        | Power<br>(W)       | Reference        | Power<br>(W)        | Reference        |
| 215          | 100                  | 9T10215FF010C5V3 | 200                | 9T10215FF020C5V3 | 400                 | 9T10215FF040C5V3 |
| 315          | 180                  | 9T10315FF018C5V3 | 360                | 9T10315FF036C5V3 | 720                 | 9T10315FF072C5V3 |
| 415          | 260                  | 9T10415FF026C5V3 | 520                | 9T10415FF052C5V3 | 1040                | 9T10415FF104C5V3 |
| 515          | 340                  | 9T10515FF034C5V3 | 670                | 9T10515FF067C5V3 | 1350                | 9T10515FF135C5V3 |
| 615          | 420                  | 9T10515FF042C5V3 | 820                | 9T10515FF082C5V3 | 1650                | 9T10515FF165C5V3 |

## Main references in 24VDC, thermostat set at 50°C±5°C (122±9°F)\*

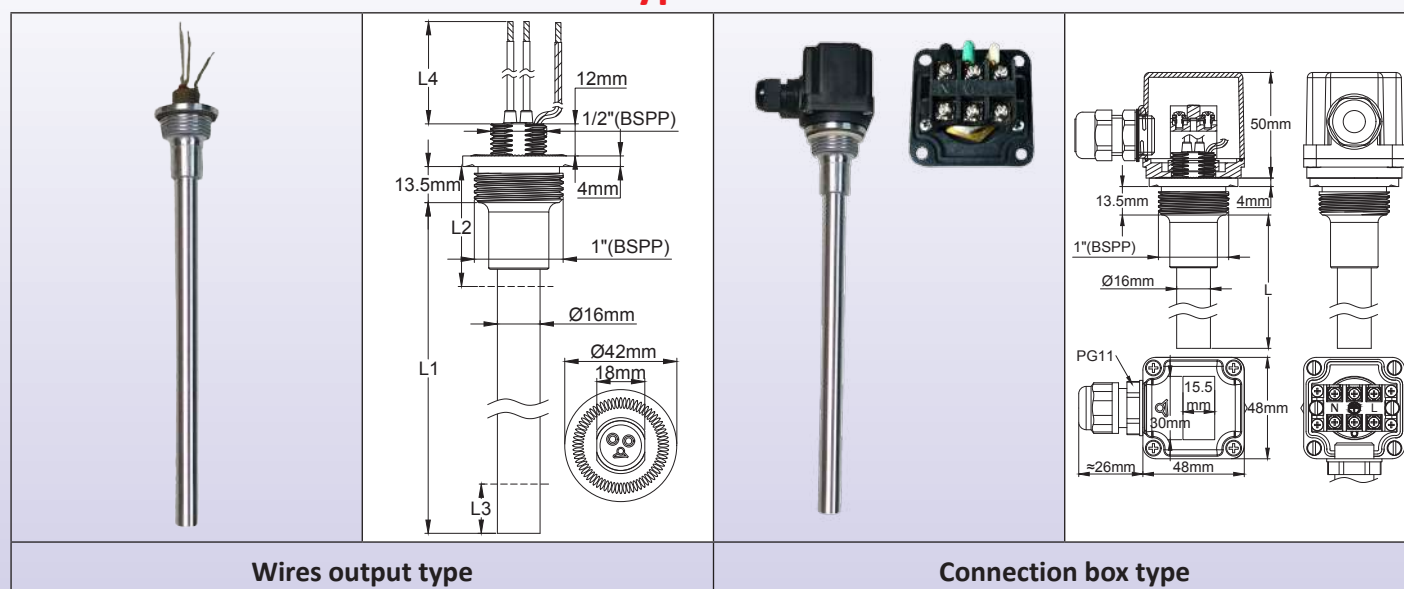
| Length<br>L1 | 2,5W/cm <sup>2</sup> |                  | 5W/cm <sup>2</sup>         |                  |
|--------------|----------------------|------------------|----------------------------|------------------|
|              | Power<br>(W)         | Reference        | Power<br>(W)               | Reference        |
| 215          | 100                  | 9T10215FB010C5V3 | 200                        | 9T10215FB020C5V3 |
| 315          | 180                  | 9T10315FB018C5V3 | 360                        | 9T10315FB036C5V3 |
| 415          | 260                  | 9T10415FB026C5V3 | Higher power not available |                  |

- \*Thermostat set at 70 ±5°C (158±9°F), replace C5 by C7 in the reference
- \*Thermostat set at 90 ±5°C (194±9°F), replace C5 by C9 in the reference
- \*Thermostat set at 100 ±5°C (212±9°F), replace C5 by CA in the reference
- \*Thermostat set at 110 ±5°C (230±9°F), replace C5 by CB in the reference

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# Cartridge heaters

## Cartridge heaters dia. 16mm, with built-in thermostat, 1" BSPP thread Type 9T16



**Main applications:** Heat transfer oil heating on oil filled radiators, and general water or liquids heating when the space available is reduced.

- 3 surface load values: 2.5W/cm<sup>2</sup>, 5W/cm<sup>2</sup>, 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heating tube material:** Element diameter 10mm, AISI 304 (AISI 316, AISI 321; Incolloy 800, 825 on request).

**Insulation:** Magnesia compressed by lamination guaranteeing good heat transfer and allows loads up to 20W/cm<sup>2</sup>

**Fitting Material:** Crimped 304 stainless steel, with gasket seat.

**Thread:** 1" BSPP. This thread allows mounting on standardized central heating radiators. Other side of this fitting is a 1/2" BSPP for enclosure mounting.

**Connection (2 options):**

- 1mm<sup>2</sup>, Silicone insulated wires, 300V, 300mm length, waterproof by silicone potting

- 48 × 48 × 50mm plastic enclosure, PA66 black, PG11 cable gland output. Built in 3 × 2.5mm<sup>2</sup> screws connection block.

**Standard lengths (L1):** 250, 380, 580, 780, 980mm

**Not immersed heating zone (L2):** 50mm.

**Thermostat non-heating zone (L3):** 50mm

**Surface load:** 2, 5W/cm<sup>2</sup> (oils), 5W/cm<sup>2</sup> (heat transfer oils, water without flow), 10W/cm<sup>2</sup> (circulating water). Other surface loads on request.

**Voltage:** 220-240V single phase.

**Thermostat calibration temperatures:** 50 ±5°C (122±9°F), 70 ±5°C (158±9°F), 90 ±5°C (194±9°F), 100 ±5°C (212±9°F), 110 ±5°C (230±9°F)

**Options on request (MOQ may apply):**

- Other calibration temperature, from 40°C to 150°C (104 to 302°F).

- Types without built-in thermostat

- Lower tolerances on the calibration temperature

- Different wire lengths

- Tube length up to 1.8m (Maximum power 1700W in 230V for models with built in thermostat)

- Other thread

- Other voltage

- Built-in thermal cut-out, inside the threaded section (usual set point temperature 144°C)

### Main references in 230V, thermostat set at 50°C±5°C (122±9°F)\*, wires output

| Length<br>L1 | 2,5W/cm <sup>2</sup> |                  | 5W/cm <sup>2</sup> |                  | 10W/cm <sup>2</sup>                                         |                  |
|--------------|----------------------|------------------|--------------------|------------------|-------------------------------------------------------------|------------------|
|              | Power<br>(W)         | Reference        | Power<br>(W)       | Reference        | Power<br>(W)                                                | Reference        |
| 250          | 190                  | 9T16250FF019B5V3 | 380                | 9T16250FF038B5V3 | 750                                                         | 9T10250FF075B5V3 |
| 380          | 350                  | 9T16380FF035B5V3 | 700                | 9T16380FF070B5V3 | 1400                                                        | 9T10380FF140B5V3 |
| 580          | 600                  | 9T16580FF060B5V3 | 1000               | 9T16600FF100B5V3 | Higher power are only available without built-in thermostat |                  |
| 780          | 850                  | 9T16780FF085B5V3 | 1400               | 9T16850FF140B5V3 |                                                             |                  |
| 980          | 1100                 | 9T16980FF110B5V3 | 1700               | 9T16980FF170B5V3 |                                                             |                  |





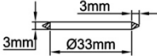
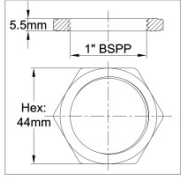
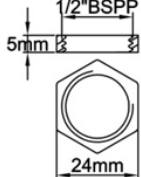
# Cartridge heaters

## Main references in 230V, thermostat set at 50°C±5°C (122±9°F)\*, plastic housing

| Length<br>L1 | 2,5W/cm <sup>2</sup> |                  | 5W/cm <sup>2</sup> |                  | 10W/cm <sup>2</sup>                                         |                  |
|--------------|----------------------|------------------|--------------------|------------------|-------------------------------------------------------------|------------------|
|              | Power<br>(W)         | Reference        | Power<br>(W)       | Reference        | Power<br>(W)                                                | Reference        |
| 250          | 190                  | 9T16250FF019B510 | 380                | 9T16250FF038B510 | 750                                                         | 9T10250FF075B510 |
| 380          | 350                  | 9T16380FF035B510 | 700                | 9T16380FF070B510 | 1400                                                        | 9T10380FF140B510 |
| 580          | 600                  | 9T16580FF060B510 | 1000               | 9T16580FF100B510 | Higher power are only available without built-in thermostat |                  |

- \*Thermostat set at 70 ±5°C (158±9°F), replace B5 by B7 in the reference
- \*Thermostat set at 90 ±5°C (194±9°F), replace B5 by B9 in the reference
- \*Thermostat set at 100 ±5°C (212±9°F), replace B5 by BA in the reference
- \*Thermostat set at 110 ±5°C (230±9°F), replace B5 by BB in the reference

## Accessoires

|                                                                                   |                                                                    |                                                                                   |                                                |                                                                                     |                                                  |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------|
|  | <b>1" High temperature Viton Gasket</b><br>Ref<br>9BBJ03000000005A |  | <b>1" Brass nut</b><br>Ref<br>9BBRA3000ELH047A |  | <b>1/2" Brass nut</b><br>Ref<br>9BBVE2000004003A |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------|

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# **Section 5**

## **Immersion heaters without connection box, stainless steel tubes dia. 8mm**

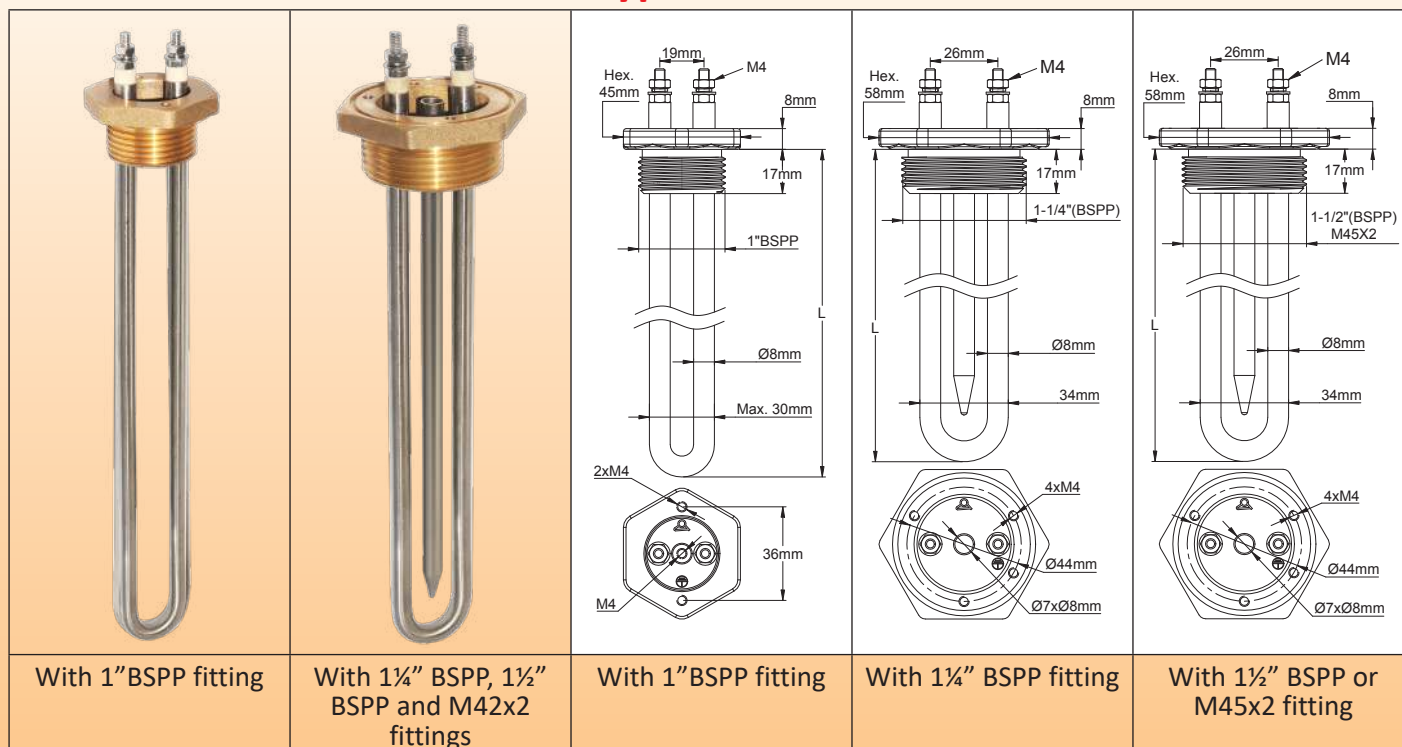


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# Immersion heaters

Immersion heaters with a single hairpin heating element, **brazed brass fitting**, with cylindrical thread 1"BSPP; 1¼" BSPP; 1½" BSPP; M45x2.  
**Type 9RBU1**



**Main applications:** Heating of liquids, hot water circuits, containers and buffer tanks.  
They exist in standard in 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup> (Others available on request). See the technical introduction to select the best surface load.  
Many enclosures for these heaters are available in our catalogue N°11.  
**Heater tube material:** 8mm dia. in AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).  
**Fitting material:** Brass, brazed on tubes. Supplied without gasket and without nut. See accessories below. These fittings have M4 threaded holes for connection box assembly  
**Thread:** 1" BSPP; 1¼" BSPP; 1½" BSPP (ISO 228); M45x2.  
**Thermowell:** Dia. 8x7mm, using the same material than heating elements. (Not available on 1" fittings)  
**Heating elements connections:** Stainless steel M4 screw terminals, nuts and washers  
**Ground connection:** M4 threaded hole  
**Not heating immersed zone:** 50mm including the length inside the fitting.  
**Surface load:** Standard 5 W/cm<sup>2</sup> or 10 W/cm<sup>2</sup>, others values on request.  
**Voltage:** 230-240V single phase (110-115V and 380-400V on request)

## Main references with 1½" fitting\* without pocket \*\*

| Surface load              | 5W/cm <sup>2</sup>  |                  |                  |                  |
|---------------------------|---------------------|------------------|------------------|------------------|
| Power of heating element  | 500w                | 1kW              | 1.5kW            | 2kW              |
| Length L (mm)             | 250                 | 450              | 650              | 850              |
| Reference in Aisi 304     | 9RBU180C05052325    | 9RBU180C10052345 | 9RBU180C15052365 | 9RBU180C20052385 |
| Reference in Incolloy 800 | 9RBU188C05052325    | 9RBU188C10052345 | 9RBU188C15052365 | 9RBU188C20052385 |
| Surface load              | 10W/cm <sup>2</sup> |                  |                  |                  |
| Power of heating element  | 1kW                 | 1.5kW            | 2kW              | 3kW              |
| Length L (mm)             | 250                 | 350              | 450              | 650              |
| Reference in Aisi 304     | 9RBU180C100A2325    | 9RBU180C150A2335 | 9RBU180C200A2345 | 9RBU180C300A2365 |
| Reference in Incolloy 800 | 9RBU188C100A2325    | 9RBU188C150A2335 | 9RBU188C200A2345 | 9RBU188C300A2365 |

\*1" fitting, replace C by A; 1¼" fitting, replace C by B; M45 fitting, replace C by D.

\*\*With pocket, replace U1 by UA (Not available with 1" fitting).

# Immersion heaters



## References of accessories in option

(not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1"               | 1¼"               | 1½"               | M45x200           |
|-----------------------------------------------------------------------------------|---------|------------------|-------------------|-------------------|-------------------|
|                                                                                   | Brass   | 9BBRA3000ELH047A | 9BRRRA3000ELH302A | 9BRRRA3000ELH303A | 9BRRRA3000ELH305A |
|                                                                                   | AISI304 | 9BBRA3000ELH257A | 9BRRRA3000ELH032A | 9BRRRA3000ELH006A | 9BRRRA3000ELH049A |
|                                                                                   | AISI316 | 9BBRA3000ELH258A | 9BRRRA3000ELH202A | 9BRRRA3000ELH203A | 9BRRRA3000ELH205A |

### Gaskets

|  | Thread | 1"               | 1¼"              | 1½" - M45x200    |
|-----------------------------------------------------------------------------------|--------|------------------|------------------|------------------|
|                                                                                   | NBR    | 9BRJO3000ELH210A | 9BRJO3000ELH206A | 9BRJO3000ELH205A |
|                                                                                   | Fiber  | 9BRJO3000ELH209A | 9BRJO3000ELH052A | 9BRJO3000ELH007A |
|                                                                                   | PTFE   | 9BBJO3000000005A | 9BRJO3000ELH032A | 9BRJO3000ELH033A |

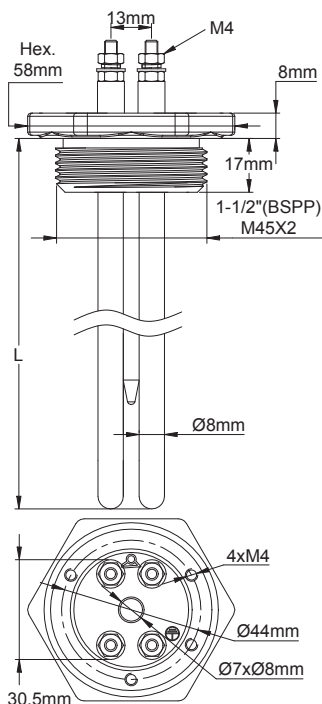
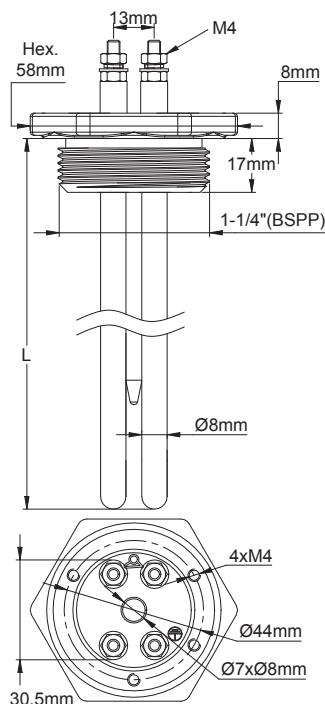
Other accessories and drawings: see last section of this catalogue

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# Immersion heaters

## Immersion heaters with two hairpin heating elements, **brazed brass fitting**, with cylindrical thread 1¼" BSPP; 1½" BSPP; M45x2. **Type 9RBU2**



With 1¼" BSPP, 1½" BSPP and M42x2 fittings

With 1¼" BSPP fitting

With 1½" BSPP or M45x2 fitting

**Main applications:** Heating of liquids, hot water circuits, containers and buffer tanks.

They exist in standard in 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup> (Others available on request). See the technical introduction to select the best surface load.

Many enclosures for these heaters are available in our catalogue N°11.

**Heater tube material:** 8mm dia. in AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Brass, brazed on tubes. Supplied without gasket and without nut. See accessories below. These fittings have M4 threaded holes for connection box assembly

**Thread:** 1¼" BSPP ; 1½" BSPP (ISO 228); M45x2.

**Thermowell:** Dia. 8x7mm, using the same material than heating elements.

**Heating elements connections:** Stainless steel M4 screw terminals, nuts and washers

**Ground connection:** M4 threaded hole

**Not heating immersed zone:** 50mm including the length inside the fitting.

**Surface load:** Standard 5 W/cm<sup>2</sup> or 10 W/cm<sup>2</sup>, others values on request.

**Voltage:** 230-240V single phase (110-115V and 380-400V on request)

### Main references with 1½" fitting\* without pocket \*\*

| Surface load              | 5W/cm <sup>2</sup>  |                  |                  |                  |
|---------------------------|---------------------|------------------|------------------|------------------|
| Total power               | 1Kw                 | 2kW              | 3kW              | 4kW              |
| Length L (mm)             | 250                 | 450              | 650              | 850              |
| Reference in Aisi 304     | 9RBU280C10052325    | 9RBU280C20052345 | 9RBU280C30052365 | 9RBU280C40052385 |
| Reference in Incolloy 800 | 9RBU288C10052325    | 9RBU288C20052345 | 9RBU288C30052365 | 9RBU288C40052385 |
| Surface load              | 10W/cm <sup>2</sup> |                  |                  |                  |
| Total power               | 2kW                 | 3kW              | 4kW              | 6kW              |
| Length L (mm)             | 250                 | 350              | 450              | 650              |
| Reference in Aisi 304     | 9RBU280C200A2325    | 9RBU280C300A2335 | 9RBU280C400A2345 | 9RBU280C600A2365 |
| Reference in Incolloy 800 | 9RBU288C200A2325    | 9RBU288C300A2335 | 9RBU288C400A2345 | 9RBU288C600A2365 |

\*1" fitting not available with 2 heating elements; 1¼" fitting, replace C by B; M45 fitting, replace C by D.

\*\*With pocket, replace U2 by UB.





# Immersion heaters

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1¼"             | 1½"             | M45x200         |
|-----------------------------------------------------------------------------------|---------|-----------------|-----------------|-----------------|
|                                                                                   | Brass   | 9BRR3000ELH302A | 9BRR3000ELH303A | 9BRR3000ELH305A |
|                                                                                   | AISI304 | 9BRR3000ELH032A | 9BRR3000ELH006A | 9BRR3000ELH049A |
|                                                                                   | AISI316 | 9BRR3000ELH202A | 9BRR3000ELH203A | 9BRR3000ELH205A |

### Gaskets

|  | Thread | 1¼"              | 1½" - M45x200    |
|-----------------------------------------------------------------------------------|--------|------------------|------------------|
|                                                                                   | NBR    | 9BRJ03000ELH206A | 9BRJ03000ELH205A |
|                                                                                   | Fiber  | 9BRJ03000ELH052A | 9BRJ03000ELH007A |
|                                                                                   | PTFE   | 9BRJ03000ELH032A | 9BRJ03000ELH033A |

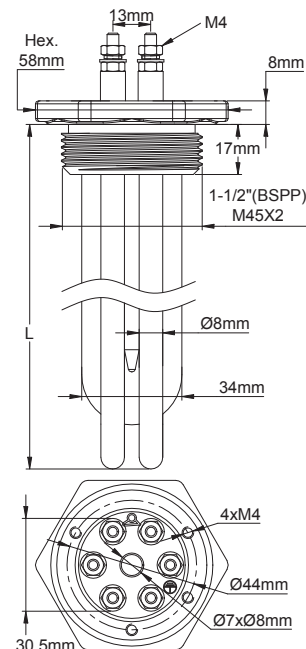
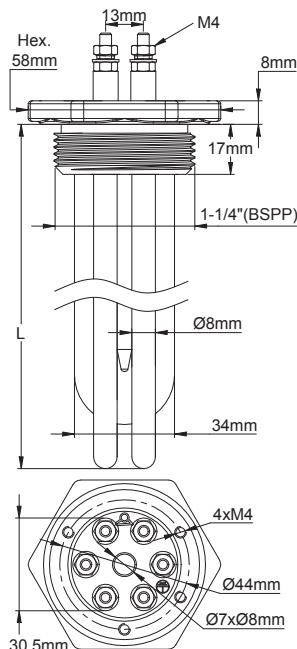
Other accessories and drawings: see last section of this catalogue

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# Immersion heaters

## Immersion heaters with 3 hairpin heating elements, **brazed brass fitting**, with cylindrical thread 1¼" BSPP; 1½" BSPP; M45x2. **Type 9RBU3**



With 1¼" BSPP, 1½" BSPP and M42x2 fittings

With 1¼" BSPP fitting

With 1½" BSPP or M45x2 fitting

**Main applications:** Heating of liquids, hot water circuits, containers and buffer tanks.

They exist in standard in 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup> (Others available on request). See the technical introduction to select the best surface load.

Many enclosures for these heaters are available in our catalogue N°11.

**Heater tube material:** 8mm dia. in AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Brass, brazed on tubes. Supplied without gasket and without nut. See accessories below. These fittings have M4 threaded holes for connection box assembly

**Thread:** 1¼" BSPP ; 1½" BSPP (ISO 228); M45x2.

**Thermowell:** Dia. 8x7mm, using the same material than heating elements.

**Heating elements connections:** Stainless steel M4 screw terminals, nuts and washers

**Ground connection:** M4 threaded hole

**Not heating immersed zone:** 50mm including the length inside the fitting.

**Surface load:** Standard 5 W/cm<sup>2</sup> or 10 W/cm<sup>2</sup>, others values on request.

**Voltage:** 230-240V single phase (110-115V and 380-400V on request)

**Option:** Set of 4 brass jumpers for star-triangle commutation in 3 phases or connection of 3 heating elements in parallel.

### Main references with 1½" fitting\* without pocket \*\*

| Surface load              | 5W/cm <sup>2</sup>  |                  |                  |                  |
|---------------------------|---------------------|------------------|------------------|------------------|
| Total power               | 1.5Kw               | 3kW              | 4.5kW            | 6kW              |
| Length L (mm)             | 250                 | 450              | 650              | 850              |
| Reference in Aisi 304     | 9RBU380C15052325    | 9RBU380C30052345 | 9RBU380C45052365 | 9RBU380C60052385 |
| Reference in Incolloy 800 | 9RBU388C15052325    | 9RBU388C30052345 | 9RBU388C45052365 | 9RBU388C60052385 |
| Surface load              | 10W/cm <sup>2</sup> |                  |                  |                  |
| Total power               | 3kW                 | 4.5kW            | 6kW              | 9kW              |
| Length L (mm)             | 250                 | 350              | 450              | 650              |
| Reference in Aisi 304     | 9RBU380C300A2325    | 9RBU380C450A2335 | 9RBU380C600A2345 | 9RBU380C900A2365 |
| Reference in Incolloy 800 | 9RBU388C300A2325    | 9RBU388C450A2335 | 9RBU388C600A2345 | 9RBU388C900A2365 |

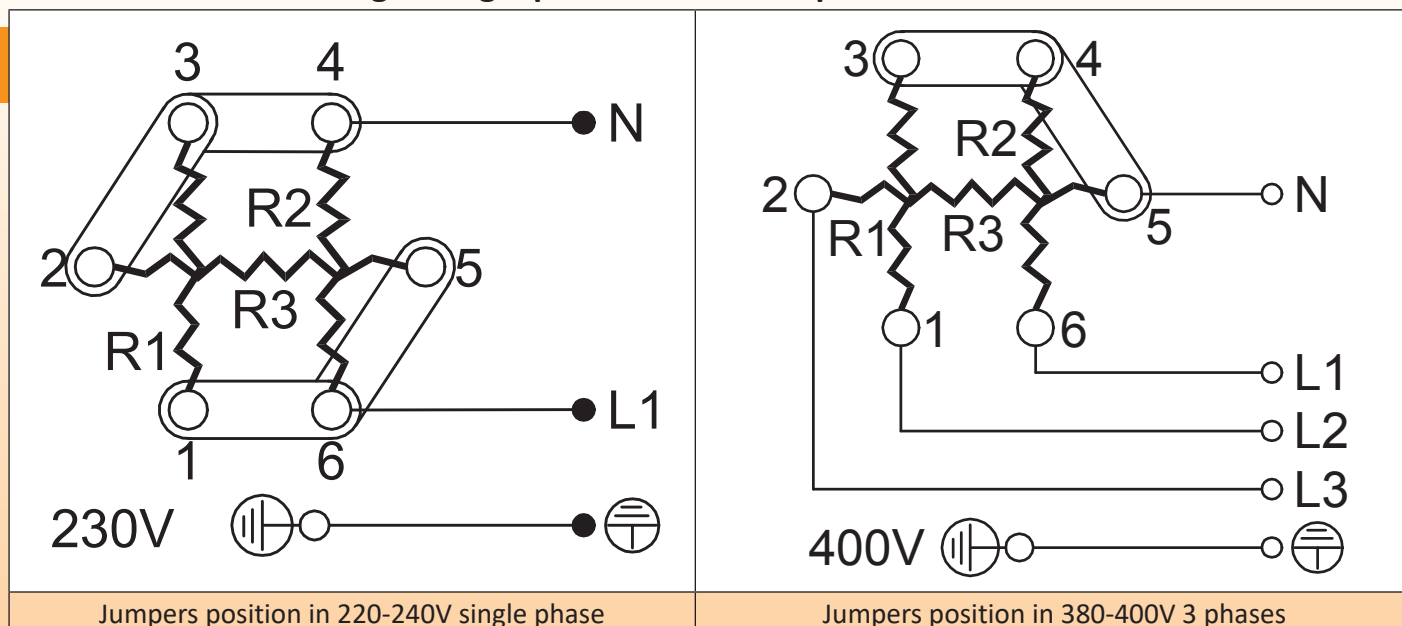
\* 1" fitting not available with 3 heating elements; 1¼" fitting, replace C by B; M45 fitting, replace C by D.

\*\* With pocket, replace U3 by UC.



# Immersion heaters

## Electric Wiring in single phase 230V and 3 phases 400V star connection



### References of accessories in option (not included in the product, must be ordered separately):

#### Nuts

|  | Thread  | 1¼"              | 1½"              | M45x200          |
|------------------------------------------------------------------------------------|---------|------------------|------------------|------------------|
|                                                                                    | Brass   | 9BRRA3000ELH302A | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
|                                                                                    | AISI304 | 9BRRA3000ELH032A | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
|                                                                                    | AISI316 | 9BRRA3000ELH202A | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

#### Gaskets

|  | Thread | 1¼"              | 1½" - M45x200    | Jumpers                                                                               |
|-------------------------------------------------------------------------------------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                                                                                     | NBR    | 9BRJ03000ELH206A | 9BRJ03000ELH205A |  |
|                                                                                     | Fiber  | 9BRJ03000ELH052A | 9BRJ03000ELH007A |                                                                                       |
|                                                                                     | PTFE   | 9BRJ03000ELH032A | 9BRJ03000ELH033A |                                                                                       |
|                                                                                     |        |                  |                  | 9BRCO1SE4ELH001A                                                                      |

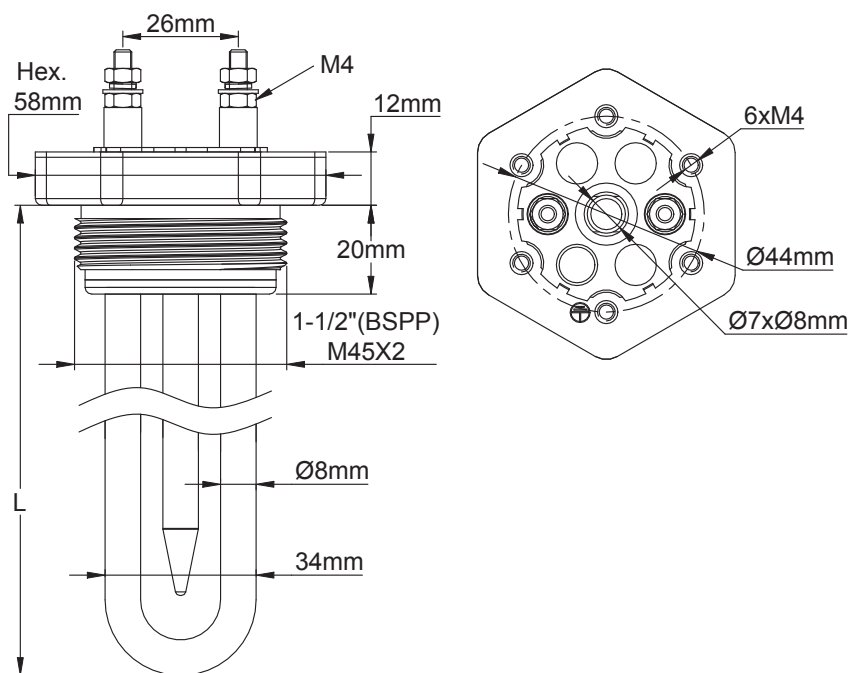
Other accessories and drawings: see last section of this catalogue



# Immersion heaters

Full stainless steel immersion heaters with a single hairpin heating element, TIG welded **stainless steel fitting (Without brazing)**, with cylindrical thread **1½" BSPP; M45x2**.

## Type 9RSU1



With 1½" BSPP and M42x2 fittings

With 1½" BSPP or M45x2 fitting

**Main applications:** These immersion heaters with full stainless steel construction are intended for liquid heating applications in scientific, medical, pharmaceutical or food fields, as well as for applications in corrosive environments. All welds are TIG, without any brazing. Liquids are in contact with stainless steel only

They exist in standard in 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup> (Others available on request). See the technical introduction to select the best surface load.

Many enclosures for these heaters are available in our catalogue N°11.

**Heater tube material:** 8mm dia. in AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Stainless steel, TIG welded to the heating elements. The heated liquid is in contact only with stainless steel. The fitting material is AISI 304 for models with AISI 304, AISI 321 and Incolloy tubes, and AISI 316 for models with AISI316 tubes. Supplied without gasket and without nut. See accessories below. These fittings have M4 threaded holes for connection box assembly

**Thread:** 1½" BSPP (ISO 228); M45x2.

**Thermowell:** Dia. 8x7mm, using the same material than heating elements.

**Heating elements connections:** Stainless steel M4 screw terminals, nuts and washers

**Ground connection:** M4 threaded hole

**Not heating immersed zone:** 50mm including the length inside the fitting.

**Surface load:** Standard 5 W/cm<sup>2</sup> or 10 W/cm<sup>2</sup>, others values on request.

**Voltage:** 230-240V single phase (110-115V and 380-400V on request)

**Option\*\*\*:** On request, the stainless steel fitting can be filled with epoxy resin, which provides incomparable protection against the penetration of moisture into the heating elements, especially when the environment is very humid and the heating elements only operate occasionally and for short periods.

### Main references with 1½" fitting\* in Aisi 304, without pocket \*\*

| Surface load              | 5W/cm <sup>2</sup> |                  |                  |                  |
|---------------------------|--------------------|------------------|------------------|------------------|
| Power of heating element  | 500w               | 1kW              | 1.5kW            | 2kW              |
| Length L (mm)             | 250                | 450              | 650              | 850              |
| Reference in Aisi 304     | 9RSU180C05052325   | 9RSU180C10052345 | 9RSU180C15052365 | 9RSU180C20052385 |
| Reference in Incolloy 800 | 9RSU188C05052325   | 9RSU188C10052345 | 9RSU188C15052365 | 9RSU188C20052385 |



# Immersion heaters

| Surface load              | 10W/cm <sup>2</sup> |                  |                  |                  |
|---------------------------|---------------------|------------------|------------------|------------------|
| Power of heating element  | 1kW                 | 1.5kW            | 2kW              | 3kW              |
| Length L (mm)             | 250                 | 350              | 450              | 650              |
| Reference in Aisi 304     | 9RSU180C100A2325    | 9RSU180C150A2335 | 9RSU180C200A2345 | 9RSU180C300A2365 |
| Reference in Incolloy 800 | 9RSU188C100A2325    | 9RSU188C150A2335 | 9RSU188C200A2345 | 9RSU188C300A2365 |

\* M45 fitting, replace C by D.

\*\* With pocket, replace U1 by UA

\*\*\* Aisi 304 fitting with epoxy filling, replace SU by SV

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1½"              | M45x200          |
|-----------------------------------------------------------------------------------|---------|------------------|------------------|
|                                                                                   | Brass   | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
|                                                                                   | AISI304 | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
|                                                                                   | AISI316 | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

### Gaskets

|  | Thread | 1½" - M45x200    |
|-----------------------------------------------------------------------------------|--------|------------------|
|                                                                                   | NBR    | 9BRJ03000ELH205A |
|                                                                                   | Fiber  | 9BRJ03000ELH007A |
|                                                                                   | PTFE   | 9BRJ03000ELH033A |

Other accessories and drawings: see last section of this catalogue

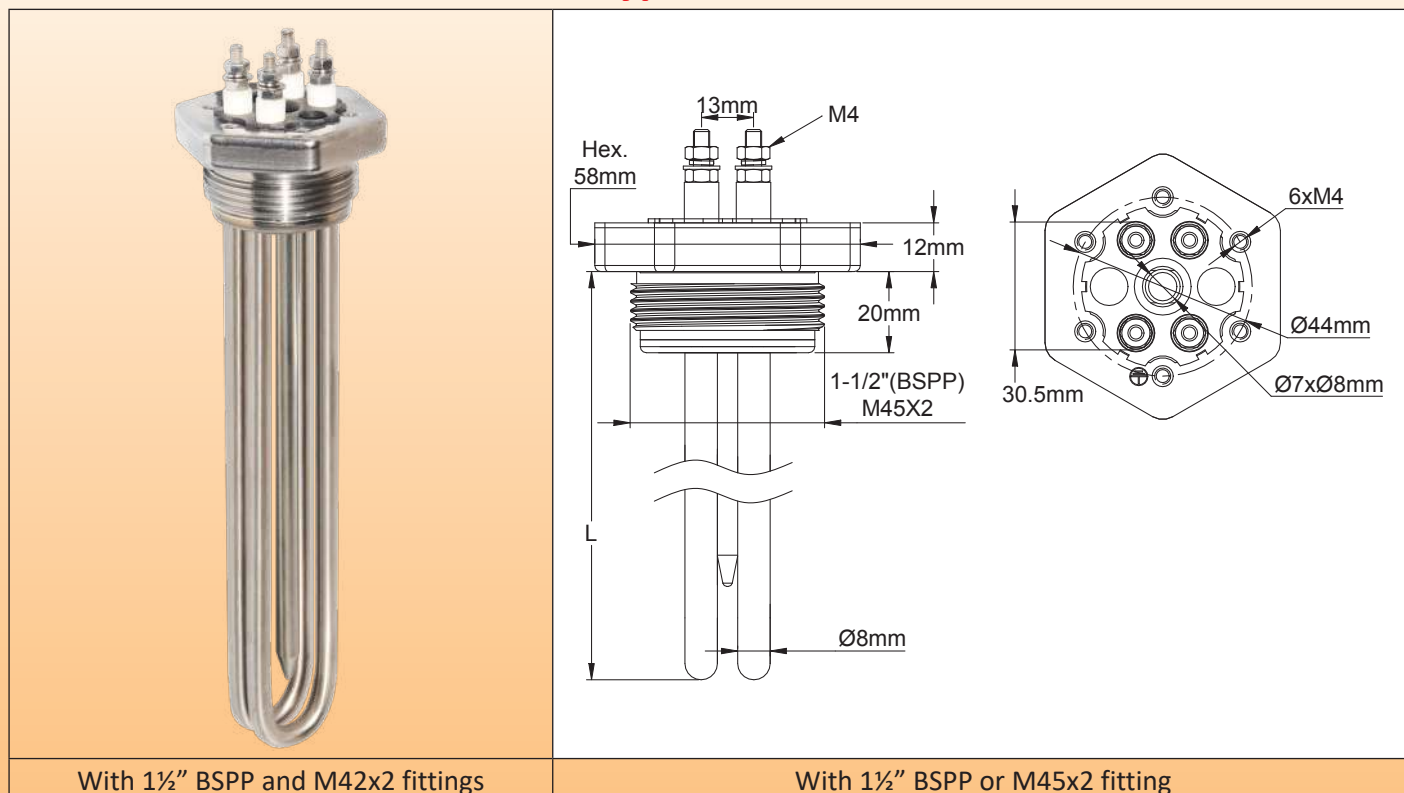
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# Immersion heaters

Full stainless steel immersion heaters with two hairpin heating elements, TIG welded **stainless steel fitting (Without brazing)**, with cylindrical thread **1½" BSPP; M45x2**.

## Type 9RSU2



With 1½" BSPP and M42x2 fittings

With 1½" BSPP or M45x2 fitting

**Main applications:** These immersion heaters with full stainless steel construction are intended for liquid heating applications in scientific, medical, pharmaceutical or food fields, as well as for applications in corrosive environments. All welds are TIG, without any brazing. Liquids are in contact with stainless steel only

They exist in standard in 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup> (Others available on request). See the technical introduction to select the best surface load.

Many enclosures for these heaters are available in our catalogue N°11.

**Heater tube material:** 8mm dia. in AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Stainless steel, TIG welded to the heating elements. The heated liquid is in contact only with stainless steel. The fitting material is AISI 304 for models with AISI 304, AISI 321 and Incolloy tubes, and AISI 316 for models with AISI316 tubes. Supplied without gasket and without nut. See accessories below. These fittings have M4 threaded holes for connection box assembly

**Thread:** 1½" BSPP (ISO 228); M45x2.

**Thermowell:** Dia. 8x7mm, using the same material than heating elements.

**Heating elements connections:** Stainless steel M4 screw terminals, nuts and washers

**Ground connection:** M4 threaded hole

**Not heating immersed zone:** 50mm including the length inside the fitting..

**Surface load:** Standard 5 W/cm<sup>2</sup> or 10 W/cm<sup>2</sup>, others values on request.

**Voltage:** 230-240V single phase (110-115V and 380-400V on request)

**Option\*\*\*:** On request, the stainless steel fitting can be filled with epoxy resin, which provides incomparable protection against the penetration of moisture into the heating elements, especially when the environment is very humid and the heating elements only operate occasionally and for short periods.

### Main references with 1½" fitting\* in Aisi 304, without pocket \*\*

| Surface load              | 5W/cm <sup>2</sup> |                  |                  |                  |
|---------------------------|--------------------|------------------|------------------|------------------|
| Power of heating element  | 10kW               | 2kW              | 3kW              | 4kW              |
| Length L (mm)             | 250                | 450              | 650              | 850              |
| Reference in Aisi 304     | 9RSU280C10052325   | 9RSU280C20052345 | 9RSU280C30052365 | 9RSU280C40052385 |
| Reference in Incolloy 800 | 9RSU288C10052325   | 9RSU288C20052345 | 9RSU288C30052365 | 9RSU288C40052385 |



# Immersion heaters

| Surface load              | 10W/cm <sup>2</sup> |                  |                  |                  |
|---------------------------|---------------------|------------------|------------------|------------------|
| Power of heating element  | 2kW                 | 3kW              | 4kW              | 6kW              |
| Length L (mm)             | 250                 | 350              | 450              | 650              |
| Reference in Aisi 304     | 9RSU280C200A2325    | 9RSU280C300A2335 | 9RSU280C400A2345 | 9RSU280C600A2365 |
| Reference in Incolloy 800 | 9RSU288C200A2325    | 9RSU288C300A2335 | 9RSU288C400A2345 | 9RSU288C600A2365 |

\* M45 fitting, replace C by D.

\*\* With pocket, replace U2 by UB

\*\*\* Aisi 304 fitting with epoxy filling, replace SU by SV

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|                                                                                   |         |                  |                  |
|-----------------------------------------------------------------------------------|---------|------------------|------------------|
|  | Thread  | 1½"              | M45x200          |
|                                                                                   | Brass   | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
|                                                                                   | AISI304 | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
|                                                                                   | AISI316 | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

### Gaskets

|                                                                                   |        |                  |
|-----------------------------------------------------------------------------------|--------|------------------|
|  | Thread | 1½" - M45x200    |
|                                                                                   | NBR    | 9BRJ03000ELH205A |
|                                                                                   | Fiber  | 9BRJ03000ELH007A |
|                                                                                   | PTFE   | 9BRJ03000ELH033A |

Other accessories and drawings: see last section of this catalogue

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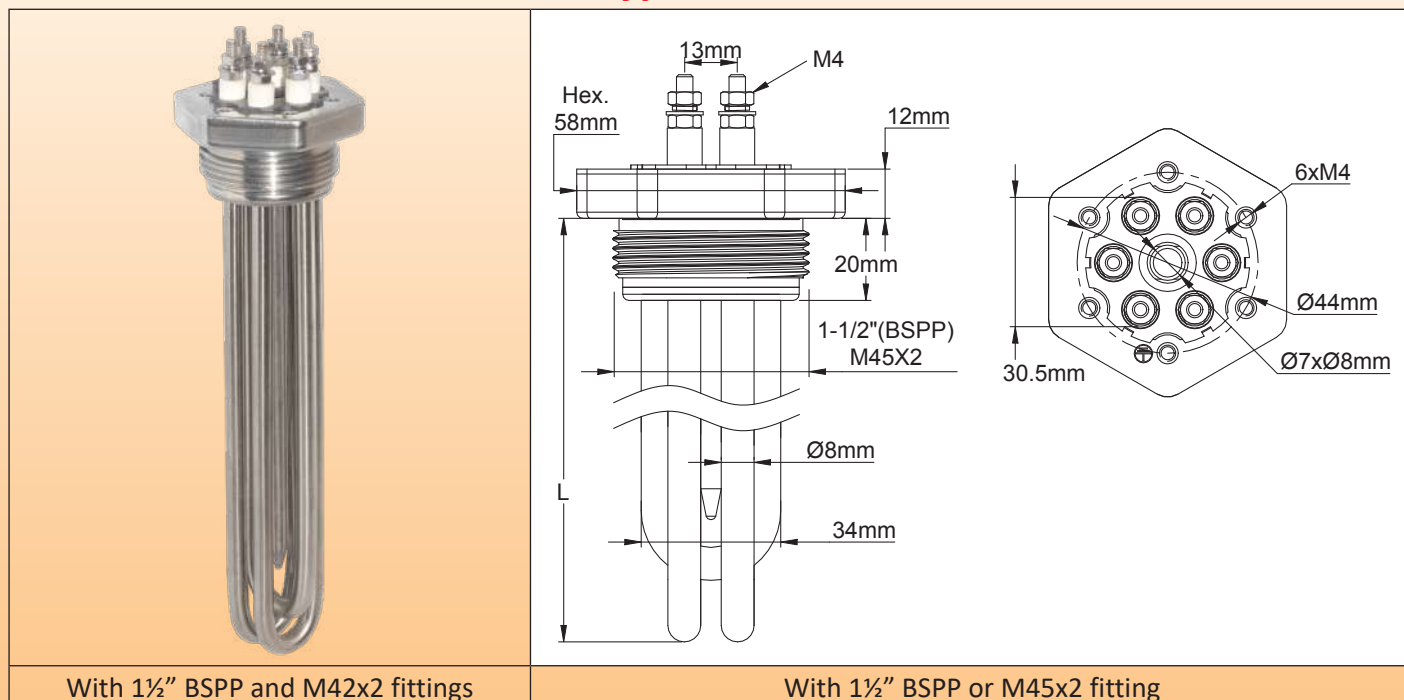




# Immersion heaters

**Full stainless steel immersion heaters with 3 hairpin heating elements, TIG welded **stainless steel fitting (Without brazing)**, with cylindrical thread 1½" BSPP; M45x2.**

## Type 9RSU3



**Main applications:** These immersion heaters with full stainless steel construction are intended for liquid heating applications in scientific, medical, pharmaceutical or food fields, as well as for applications in corrosive environments. All welds are TIG, without any brazing. Liquids are in contact with stainless steel only

They exist in standard in 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup> (Others available on request). See the technical introduction to select the best surface load.

Many enclosures for these heaters are available in our catalogue N°11.

**Heater tube material:** 8mm dia. in AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Stainless steel, TIG welded to the heating elements. The heated liquid is in contact only with stainless steel. **The fitting material is AISI 304 for models with AISI 304, AISI 321 and Incolloy tubes, and AISI 316 for models with AISI316 tubes.** Supplied without gasket and without nut. See accessories below. These fittings have M4 threaded holes for connection box assembly

**Thread:** 1½" BSPP (ISO 228); M45x2.

**Thermowell:** Dia. 8x7mm, using the same material than heating elements.

**Heating elements connections:** Stainless steel M4 screw terminals, nuts and washers

**Ground connection:** M4 threaded hole

**Not heating immersed zone:** 50mm including the length inside the fitting.

**Surface load:** Standard 5 W/cm<sup>2</sup> or 10 W/cm<sup>2</sup>, others values on request.

**Voltage:** 230-240V single phase (110-115V and 380-400V on request)

**Option 1:** Set of 4 brass jumpers for star-triangle commutation in 3 phases or connection of 3 heating elements in parallel.

**Option 2\*\*\*:** On request, the stainless steel fitting can be filled with epoxy resin, which provides incomparable protection against the penetration of moisture into the heating elements, especially when the environment is very humid and the heating elements only operate occasionally and for short periods.

### Main references with 1½" fitting\* in Aisi 304, without pocket \*\*

| Surface load              | 5W/cm <sup>2</sup> |                  |                  |                  |
|---------------------------|--------------------|------------------|------------------|------------------|
| Power of heating element  | 10kW               | 2kW              | 3kW              | 4kW              |
| Length L (mm)             | 250                | 450              | 650              | 850              |
| Reference in Aisi 304     | 9RSU280C10052325   | 9RSU280C20052345 | 9RSU280C30052365 | 9RSU280C40052385 |
| Reference in Incolloy 800 | 9RSU288C10052325   | 9RSU288C20052345 | 9RSU288C30052365 | 9RSU288C40052385 |



# Immersion heaters

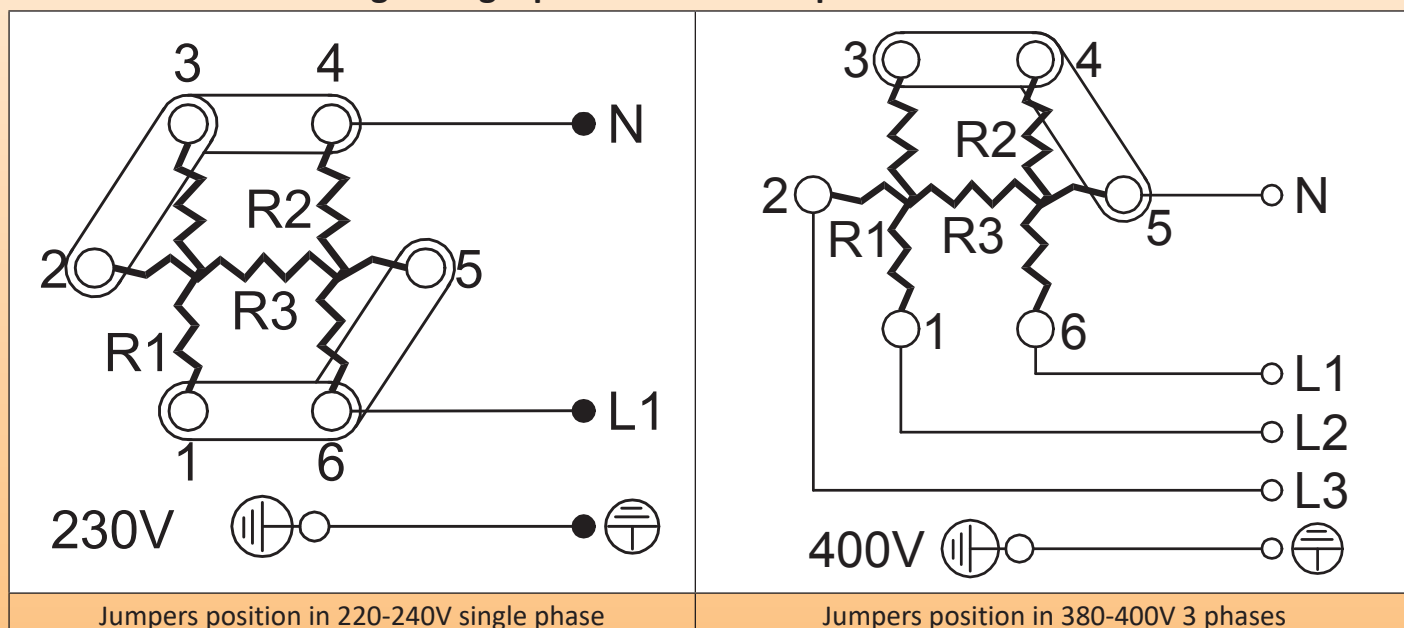
| Surface load              | 10W/cm <sup>2</sup> |                  |                  |                  |
|---------------------------|---------------------|------------------|------------------|------------------|
| Power of heating element  | 2kW                 | 3kW              | 4kW              | 6kW              |
| Length L (mm)             | 250                 | 350              | 450              | 650              |
| Reference in Aisi 304     | 9RSU280C200A2325    | 9RSU280C300A2335 | 9RSU280C400A2345 | 9RSU280C600A2365 |
| Reference in Incolloy 800 | 9RSU288C200A2325    | 9RSU288C300A2335 | 9RSU288C400A2345 | 9RSU288C600A2365 |

\* M45 fitting, replace C by D.

\*\* With pocket, replace U2 by UB

\*\*\* Aisi 304 fitting with epoxy filling, replace SU by SV

## Electric Wiring in single phase 230V and 3 phases 400V star connection



## References of accessories in option

(not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1½"              | M45x200          |
|--|---------|------------------|------------------|
|  | Brass   | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
|  | AISI304 | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
|  | AISI316 | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

### Gaskets

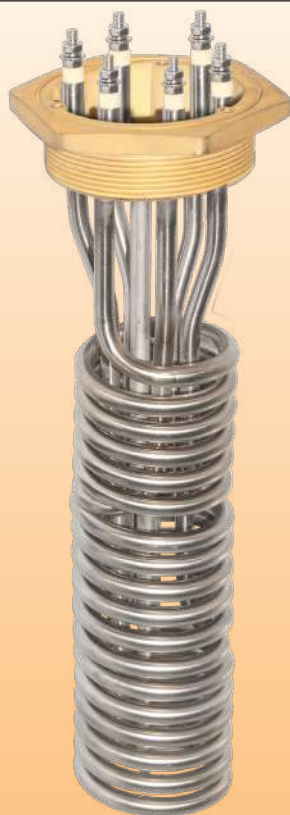
|  | Thread | 1½" - M45x200    | Jumpers          |
|--|--------|------------------|------------------|
|  | NBR    | 9BRJ03000ELH205A |                  |
|  | Fiber  | 9BRJ03000ELH007A |                  |
|  | PTFE   | 9BRJ03000ELH033A |                  |
|  |        |                  | 9BRCO1SE4ELH001A |

Other accessories and drawings: see last section of this catalogue

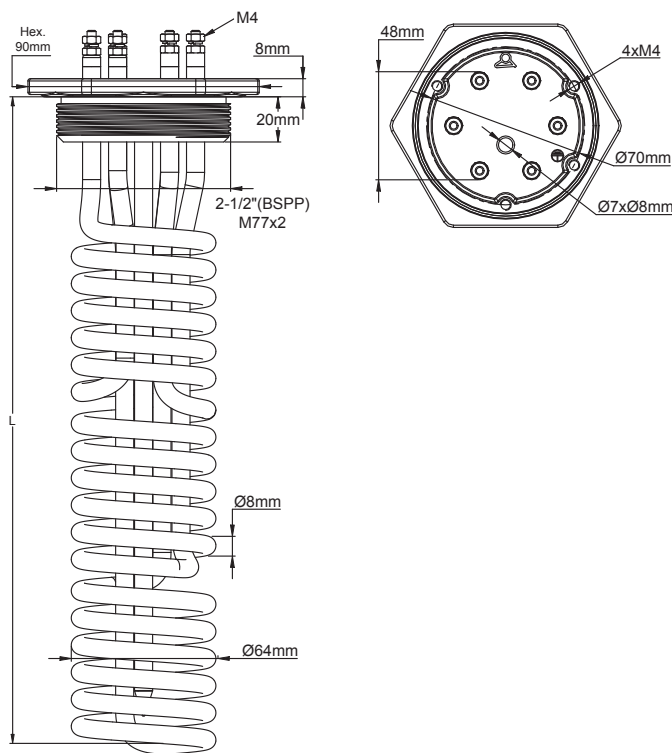


# Immersion heaters

## Ultra-short immersion heaters with 3 helical heating elements, **brass fitting**, available in 2½" and M77 x 2 **Type 9RBW3**



With 2½" BSPP and M77x2 fittings



With 2½" BSPP and M77x2 fittings

**Main applications:** Heating of liquids, hot water circuits, containers and buffer tanks. They provide significant power to heat liquids **when the available depth is limited**.

They exist in standard in 3 types of surface load density: 2W/cm<sup>2</sup>, 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. **The 2W / cm<sup>2</sup> load is recommended for heating viscous products such as oils and fats.** (Others available on request). See the technical introduction to select the best surface load.

Many enclosures for these heaters are available in our catalogue N°11.

**Heater tube material:** 8mm dia. in AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Brass, brazed on tubes. Supplied without gasket and without nut. See accessories below. These fittings have M4 threaded holes for connection box assembly

**Thread:** 2½" BSPP (ISO 228); M77x2.

**Thermowell:** Dia. 7x8mm, using the same material than heating elements.

**Heating elements connections:** Stainless steel M4 screw terminals, nuts and washers

**Ground connection:** M4 threaded hole

**Not heating immersed zone:** 60mm including the length inside the fitting.

**Surface load:** Standard 2W/cm<sup>2</sup>, 5 W/cm<sup>2</sup> or 10 W/cm<sup>2</sup>, others values on request.

**Voltage:** 230-240V single phase (110-115V and 380-400V on request)

**Option:** Set of 4 brass jumpers for star-triangle commutation in 3 phases or connection of 3 heating elements in parallel.

### Main references with 2½" brass fitting\* without pocket \*\*

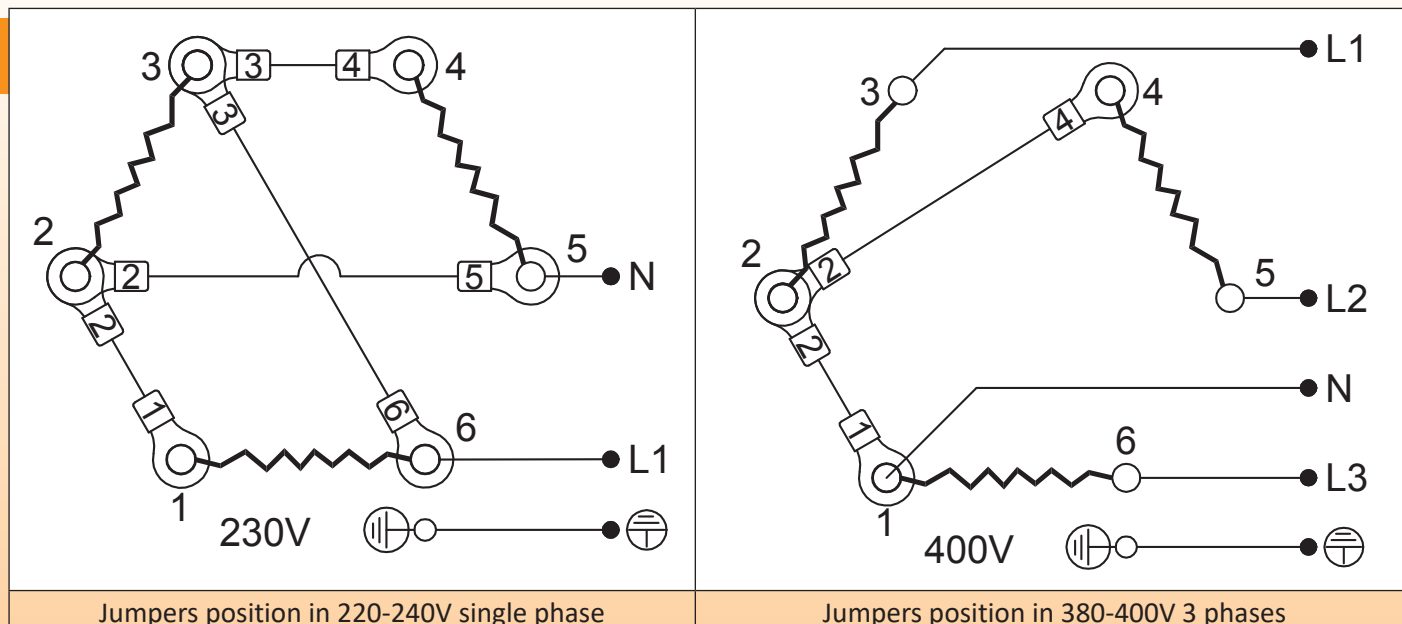
|                                  | 2W/cm <sup>2</sup> | 5W/cm <sup>2</sup> | 10W/cm <sup>2</sup> |
|----------------------------------|--------------------|--------------------|---------------------|
| <b>Total power</b>               | <b>1.8 Kw</b>      | <b>4.5 Kw</b>      | <b>9 Kw</b>         |
| <b>Length L (mm)</b>             | <b>290</b>         | <b>290</b>         | <b>290</b>          |
| <b>Reference in Aisi 304</b>     | 9RBW380H18022329   | 9RBW380H45052329   | 9RBW380H900A2329    |
| <b>Reference in Incolloy 800</b> | 9RBW388H18022329   | 9RBW388H45052329   | 9RBW388H9005A329    |

\*M77 fitting, replace H by G.

\*\*With pocket, replace W3 by WC.

# Immersion heaters

## Electric Wiring in single phase 230V and 3 phases 400V star connection



### References of accessories in option (not included in the product, must be ordered separately):

#### Nuts

|  |         |                 |                 |
|--|---------|-----------------|-----------------|
|  | Thread  | 2½"             | M77x2           |
|  | Brass   | 9BRR3000ELH314A | 9BRR3000ELH306A |
|  | AISI304 | 9BRR3000ELH142A | 9BRR3000ELH150A |
|  | AISI316 | 9BRR3000ELH214A | 9BRR3000ELH206A |

#### Gaskets

|  |        |                  |
|--|--------|------------------|
|  | Thread | 2½" - M77x2      |
|  | NBR    | 9BRJ03000ELH201A |
|  | Fiber  | 9BRJ03000ELH030A |
|  | PTFE   | 9BRJ03000ELH036A |

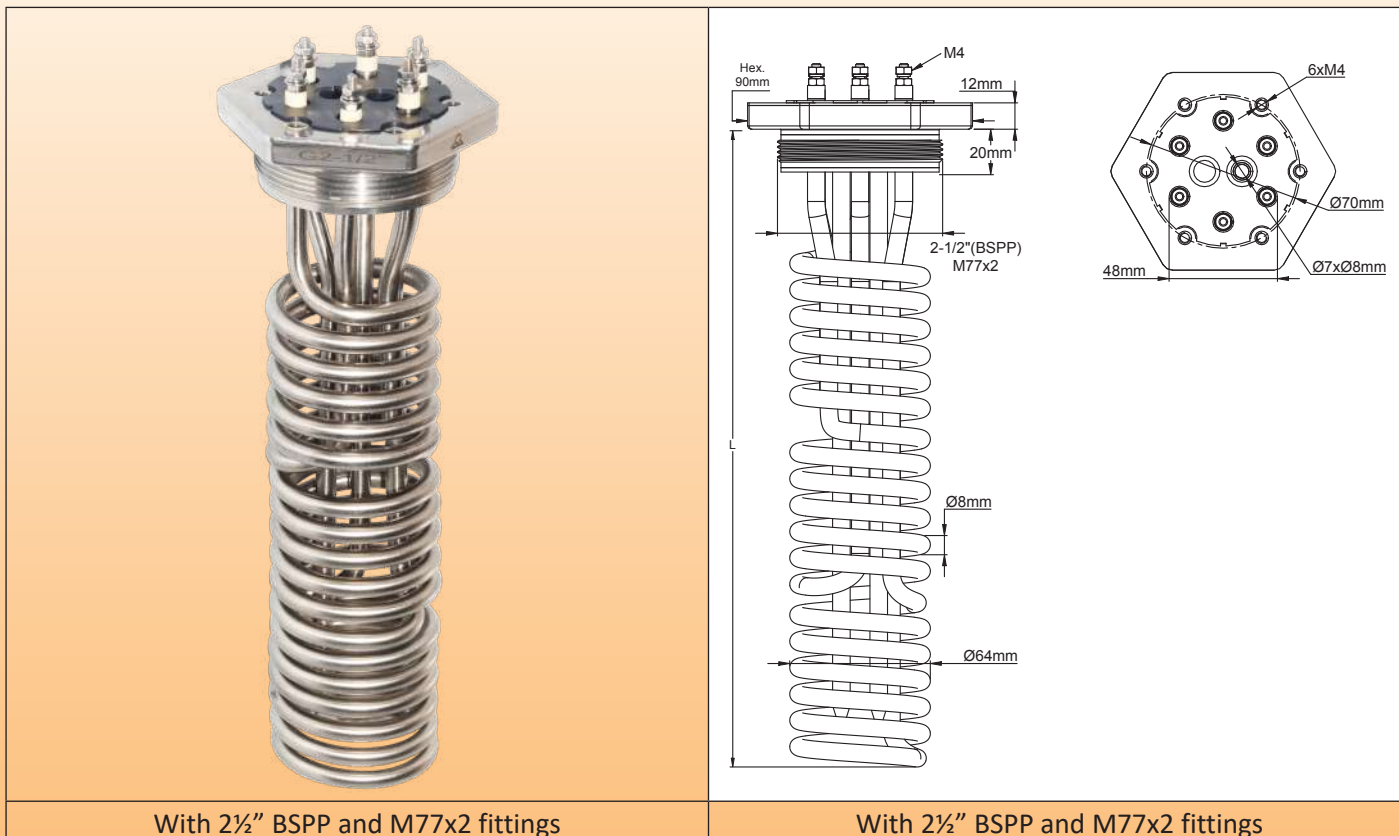
#### 2.5mm<sup>2</sup> Jumpers

|                  |
|------------------|
|                  |
| 9BRDS1SE4ELH001A |

Other accessories and drawings: see last section of this catalogue

# Immersion heaters

**Full stainless steel ultra-short immersion heaters with 3 helical heating elements, TIG welded stainless steel fitting (Without brazing), with cylindrical thread 2½" and M77 x 2**  
**Type 9RSW3**



**Main applications:** Heating of liquids, hot water circuits, containers and buffer tanks. They provide significant power to heat liquids **when the available depth is limited**. They exist in standard in 3 types of surface load density: 2W/cm<sup>2</sup>, 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. **The 2W/cm<sup>2</sup> load is recommended for heating viscous products such as oils and fats.** (Others available on request). See the technical introduction to select the best surface load.

Many enclosures for these heaters are available in our catalogue N°11.

**Heater tube material:** 8mm dia. in AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Brass, brazed on tubes. Supplied without gasket and without nut. See accessories below. These fittings have M4 threaded holes for connection box assembly

**Thread:** 2½" BSP (ISO 228); M77x2.

**Thermowell:** Dia. 8x7mm, using the same material than heating elements.

**Heating elements connections:** Stainless steel M4 screw terminals, nuts and washers

**Ground connection:** M4 threaded hole

**Not heating immersed zone:** 60mm including the length inside the fitting.

**Surface load:** Standard 2W/cm<sup>2</sup>, 5 W/cm<sup>2</sup> or 10 W/cm<sup>2</sup>, others values on request.

**Voltage:** 230-240V single phase (110-115V and 380-400V on request)

**Option:** Set of 4 brass jumpers for star-triangle commutation in 3 phases or connection of 3 heating elements in parallel.

## Main references with 2½" brass fitting\* without pocket \*\*

|                                  | 2W/cm <sup>2</sup> | 5W/cm <sup>2</sup> | 10W/cm <sup>2</sup> |
|----------------------------------|--------------------|--------------------|---------------------|
| <b>Total power</b>               | <b>1.8 Kw</b>      | <b>4.5 Kw</b>      | <b>9 Kw</b>         |
| <b>Length L (mm)</b>             | <b>290</b>         | <b>290</b>         | <b>290</b>          |
| <b>Reference in Aisi 304</b>     | 9RBW380H18022329   | 9RBW380H45052329   | 9RBW380H900A2329    |
| <b>Reference in Incolloy 800</b> | 9RBW388H18022329   | 9RBW388H45052329   | 9RBW388H9005A329    |

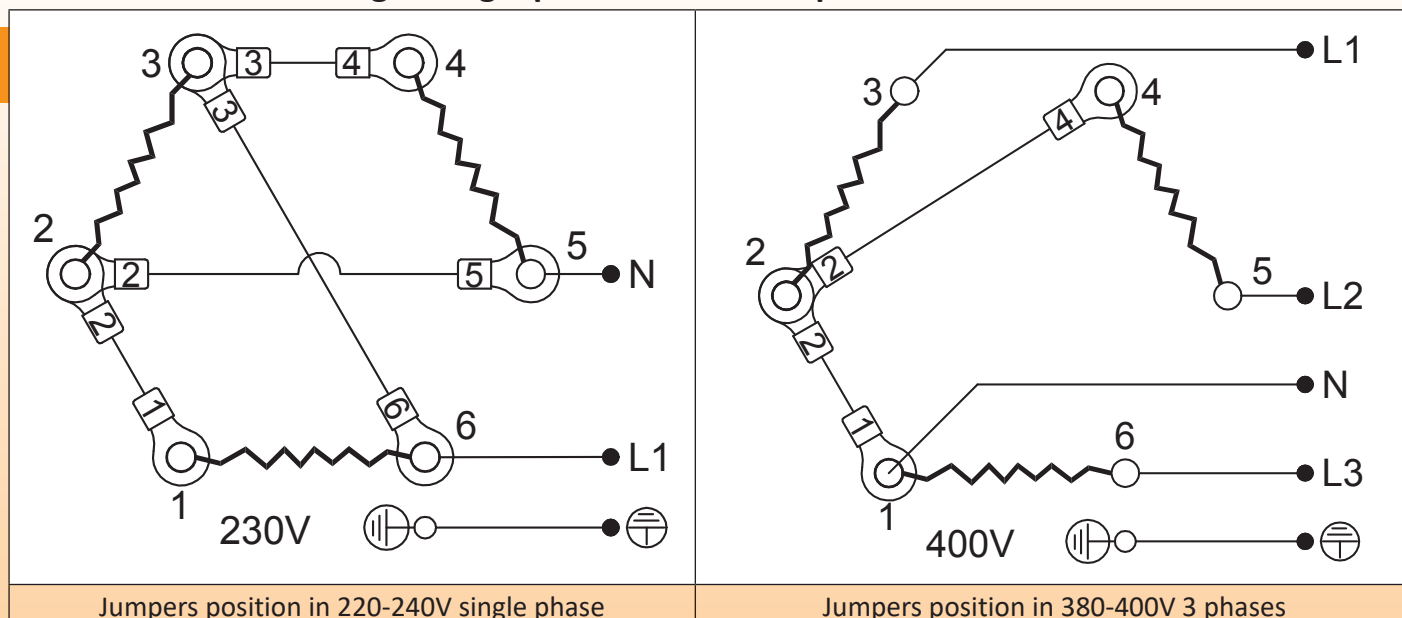
\*M77 fitting, replace H by G.

\*\*With pocket, replace W3 by WC.



# Immersion heaters

## Electric Wiring in single phase 230V and 3 phases 400V star connection



### References of accessories in option (not included in the product, must be ordered separately):

#### Nuts

|  | Thread  | 2½"              | M77x2            |
|--|---------|------------------|------------------|
|  | Brass   | 9BRRA3000ELH314A | 9BRRA3000ELH306A |
|  | AISI304 | 9BRRA3000ELH142A | 9BRRA3000ELH150A |
|  | AISI316 | 9BRRA3000ELH214A | 9BRRA3000ELH206A |

#### Gaskets

|  | Thread | 2½" - M77x2      |
|--|--------|------------------|
|  | NBR    | 9BRJ03000ELH201A |
|  | Fiber  | 9BRJ03000ELH030A |
|  | PTFE   | 9BRJ03000ELH036A |

#### 2.5mm<sup>2</sup> Jumpers

|                  |
|------------------|
|                  |
| 9BRDS1SE4ELH001A |

Other accessories and drawings: see last section of this catalogue



# **Section 6**

## **Immersion heaters with plastic connection box**



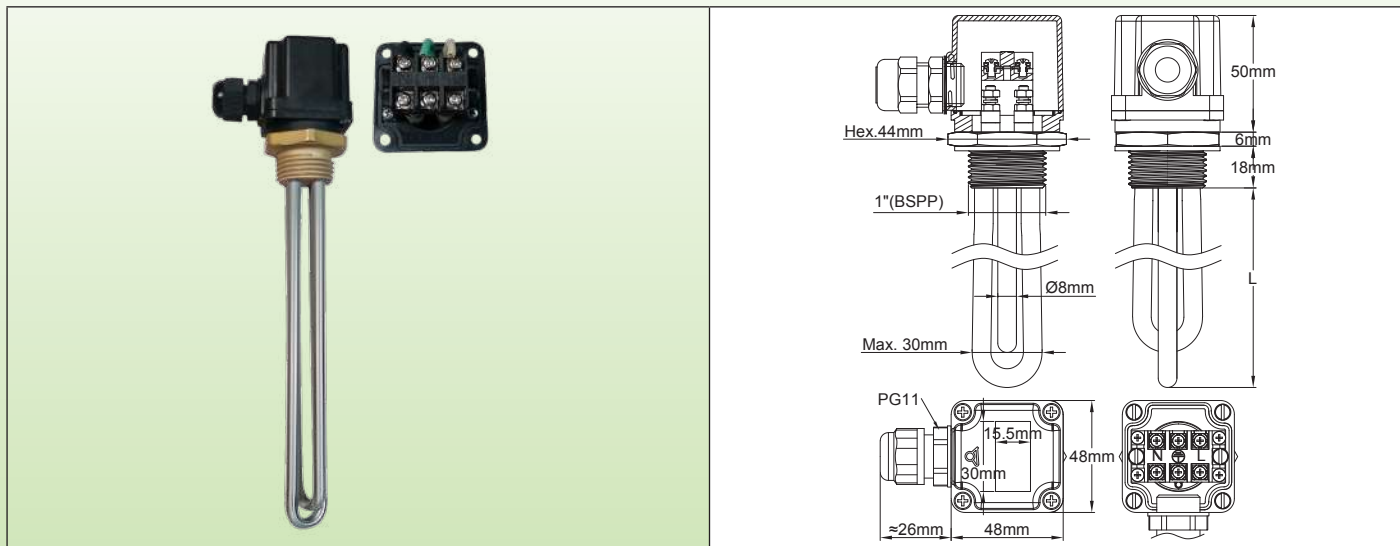


Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice



# Immersion heaters with plastic connection box

## Immersion heaters with 48 × 48 × 50mm PA66 connection box and 1" BSPP thread Type 9ST1



**Main applications:** liquid heating, hot water circuits, containers and buffer tanks.

It has 2 heating elements dia. 8mm, 230V, connected in parallel. Serial connection of these elements allows using them in 115V.

These immersion heaters are the smallest with a connection box.

They have been designed with a built-in connection block for easier wiring. Their small size does not allow having a thermostat inside.

They exist in:

- 5 standard power levels: 500W; 1kW; 1.5kW; 2kW; 3kW

- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, non-swiveling, brazed on tubes. (AISI 304 or AISI 316, TIG welded or brazed models are available on request). Supplied without gasket and without nut. See accessories below.

**Thread:** 1" BSPP (ISO 228).

**Enclosure:** 48 × 48 × 50mm, black PA66 fiber glass reinforced.

**Ingress protection class:** IP54.

**Cable gland:** PG11, PA66. Nickel-plated brass on request.

**Thermowell:** not available on these types.

**Heating elements connections:** Built-in plastic connection block, 3 screw terminals, 2.5mm<sup>2</sup>.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, others values on request.

**Voltage:** 220-240V single phase (parallel wiring) or 115V (serial wiring)

**Option:** Only one heating element.

### Main references

|                        | 5W/cm <sup>2</sup> |                  |                  | 10W/cm <sup>2</sup> |                  |                  |
|------------------------|--------------------|------------------|------------------|---------------------|------------------|------------------|
| Power                  | 500w               | 1kW              | 1.5kW            | 1kW                 | 2kW              | 3kW              |
| Length (mm)            | 135                | 240              | 340              | 135                 | 240              | 340              |
| AISI 304 Reference     | 9ST1A310005B8130   | 9ST1A310010B8240 | 9ST1A310015B8340 | 9ST1A310010B8130    | 9ST1A310020B8240 | 9ST1A310030B8340 |
| Incolloy 800 reference | 9ST1A310005BK130   | 9ST1A310010BK240 | 9ST1A310015BK340 | 9ST1A310010BK130    | 9ST1A310020BK240 | 9ST1A310030BK340 |

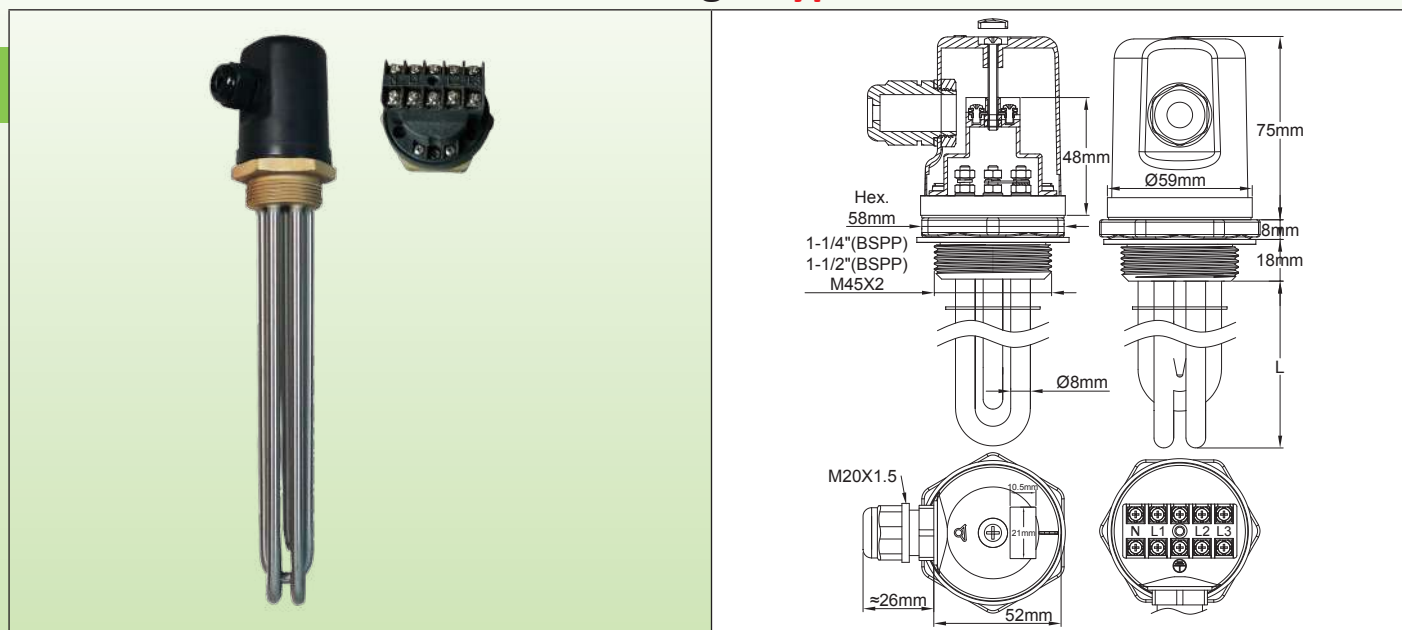
### References of accessories in option (not included in the product, must be ordered separately):

|  | 1" Nuts  |                  |  | Gaskets |                  |
|--|----------|------------------|--|---------|------------------|
|  | Brass    | 9BBRA3000ELH047A |  | NBR     | 9BRJO3000ELH210A |
|  | AISI 304 | 9BBRA3000ELH257A |  | Fiber   | 9BRJO3000ELH209A |
|  | AISI 316 | 9BBRA3000ELH258A |  | Viton   | 9BBJO3000000005A |

Other accessories and drawings: see last section of this catalogue

# Immersion heaters with plastic connection box

Immersion heater with round enclosure, dia. 58 × 75mm. 1¼", 1½", M45x2 fittings. **Type 9ST2**



**Main applications:** liquid heating, hot water circuits, containers and buffer tanks.

These immersion heaters are the smallest with connection box and 3 heating elements. They have been designed with a built-in connection block for easier wiring. Their small size does not allow having a thermostat inside.

They exist in:

- 5 standard power levels: 1kW - 1,5kW - 2kW - 3kW - 4kW.
- 3 types of standard fittings: 1¼", 1½" and M45x2.
- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 3 heating elements dia. 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Brass, not swiveling, brazed on tubes. (AISI 304 or AISI 316, TIG welded, or brazed, models are available on request). Supplied without gasket and without nut. See accessories below.

**Thread:** 1¼", 1½" BSPP (ISO 228) and Metric thread M45x2.

**Enclosure:** dia. 58mm × 75mm, black PA66 fiber glass reinforced, with gasket. Opening by center M4 screw without access to end user.

**Ingress protection class:** IP54.

**Cable gland:** M20, PA66. Nickel-plated brass on request.

**Thermowell:** On request.

**Heating element connections:** Terminals with stainless steel screw, nut and stainless steel washer. Switching straps for single phase/ 3 phases.

Heating elements are connected on a built-in 5 ways connection block, for wires up to 2.5mm<sup>2</sup>.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, other values on request.

**Voltage:** 220-240V single phase or three phases 380-400V (Star connection with neutral)

**Variants on request:**

- Only one or only 2 heating elements.
- M45x2 brass fitting.

## Electric Wiring





# Immersion heaters with plastic connection box

## Main references

### 5W/cm<sup>2</sup>, 1½" \* brass fitting

| Power                     | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              |
|---------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)               | 170              | 240              | 300              | 440              | 570              |
| Reference in AISI 304     | 9ST2A5E0010U8170 | 9ST2A5E0015U8240 | 9ST2A5E0020U8300 | 9ST2A5E0030U8440 | 9ST2A5E0040U8570 |
| Reference in Incolloy 800 | 9ST2A5E0010UK170 | 9ST2A5E0015UK240 | 9ST2A5E0020UK300 | 9ST2A5E0030UK440 | 9ST2A5E0040UK570 |

### 10W/cm<sup>2</sup>, 1½" \* brass fitting

| Power                     | 1kW**            | 1.5kW            | 2kW              | 3kW              | 4kW              |
|---------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)               | 135              | 135              | 170              | 240              | 300              |
| Reference in AISI 304     | 9ST2A5E0010BK130 | 9ST2A5E0015U8130 | 9ST2A5E0020U8170 | 9ST2A5E0030U8240 | 9ST2A5E0040U8300 |
| Reference in Incolloy 800 | 9ST2A5E0010UK130 | 9ST2A5E0015UK130 | 9ST2A5E0020UK170 | 9ST2A5E0030UK240 | 9ST2A5E0040UK300 |

\* 1¼" brass fitting instead of 1½", replace A5 by A4 in the reference. M45x2 brass fitting instead of 1½", replace A5 by A9 in the reference.

\*\* This model has only 2 heating elements.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1¼"              | 1½"              | M45x200          |
|------------------------------------------------------------------------------------|---------|------------------|------------------|------------------|
|                                                                                    | Brass   | 9BRRA3000ELH302A | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
|                                                                                    | AISI304 | 9BRRA3000ELH032A | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
|                                                                                    | AISI316 | 9BRRA3000ELH202A | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

### Gaskets

|  | Thread | 1¼"              | 1½" - M45x200    |
|-------------------------------------------------------------------------------------|--------|------------------|------------------|
|                                                                                     | NBR    | 9BRJ03000ELH206A | 9BRJ03000ELH205A |
|                                                                                     | Fiber  | 9BRJ03000ELH052A | 9BRJ03000ELH007A |
|                                                                                     | PTFE   | 9BRJ03000ELH032A | 9BRJ03000ELH033A |

Other accessories and drawings: see last section of this catalogue

# Immersion heaters with plastic connection box

Immersion heater with dia. 100mm × 100mm plastic enclosure. 1¼" to 2" fittings. **With or without thermostat.**  
**Type 9ST6**

|  |                    |                                                                          |                                                                                            |
|--|--------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|  |                    |                                                                          |                                                                                            |
|  |                    |                                                                          |                                                                                            |
|  |                    |                                                                          |                                                                                            |
|  | Without thermostat | Single pole and 3 pole thermostats with outside knob adjustment (Option) | Single pole and 3 pole thermostats with inside knob adjustment, M25 cap access. (standard) |

**Main applications:** liquid heating, hot water circuits, containers and buffer tanks.

These heaters can be fitted with the same equipment than the 9ST5 type, (thermostats, limiters, pilot lights etc..), but their plastic enclosure is more convenient for corrosive surrounding.

They exist in:

- 6 standard power levels: 1kW - 2kW - 3kW - 4kW - 6kW- 8kW.

- 4 types of standard fittings: 1¼"; 1½"; M45x2; 2".

- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request). 10mm dia. heating elements on model with 2" fitting.

**Fitting material:** brass, swiveling on housing, brazed on tubes. (AISI 304 or AISI 316, TIG welded, or brazed, models are available on request). Supplied without gasket and without nut. See accessories below.

**Thread:** 1¼" ; 1½" BSPP (ISO 228); M45x2; 2".

**Enclosure:** Dia. 100mm × 100mm, black PA66 fiberglass reinforced. Silicone foam gasket. Stainless steel cover screws with locking nuts

**Adjustment range:** 30-90°C (85-195°F)

**Ingress protection class:** Water and dust: IP65; shock resistance: IK 8 (with metal cable glands and M25 metal plug).

**Cable glands:** M20, PA66. Nickel-plated brass on request.

**Thermowell:** In standard one thermowell in AISI304, dia.8 × 7mm, 135mm length.

**Electrical connections:** tubular heater terminals with stainless steel screw, nut and stainless steel washer. Switching straps on 3 phases models.

Models with thermostats have a built in connection block, 3 × 2.5mm<sup>2</sup> for single phase units and 5 × 2.5mm<sup>2</sup> for 3 phases units. One more M4 grounding terminal available.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, other values on request.

**Voltage:** 220-240V single phase or three phases 380-400V (Star connection with neutral).

**Standard options:**

- Thermostat knob accessible under the cover by a M25 removable plug, adjustable from 30°C to 90°C (85-195°F). 230V single phase thermostat for power up to 3kW. 3 phases thermostat for 4kW, 6kW and 8kW models.

**Variants on request:**

- 4-40°C (40-105°F), 0-60°C (32-140°F), or 30-110°C (86-230°F) thermostat.
- Additional cable gland output for electronic control sensor.
- Thermostat with external knob.
- One or two pilot lights and a power cord.



# Immersion heaters with plastic connection box

## Electric Wiring

|                                               |                                                        |                                           |                                                |
|-----------------------------------------------|--------------------------------------------------------|-------------------------------------------|------------------------------------------------|
|                                               |                                                        |                                           |                                                |
| 220-240V single phase<br>(Without thermostat) | 220-240V single phase<br>(With single pole thermostat) | 380-400V 3 phases<br>(without thermostat) | 380-400V 3 phases<br>(with 3 poles thermostat) |

## Main references

**5W/cm<sup>2</sup>, 1½" brass fitting, without thermostat.**

| Heating element dia.   | 8mm              |                  |                  |                  |                  |                  | 10mm (2" only) |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------|
| Power                  | 1kW              | 2kW              | 3kW              | 4kW              | 6kW              | 8kW              |                |
| Length (mm)            | 170              | 300              | 440              | 570              | 840              |                  | 880            |
| AISI 304 Reference     | 9ST6A5E1010U8170 | 9ST6A5E1020U8300 | 9ST6A5E1030U8440 | 9ST6A5E1040U8570 | 9ST6A5E1060U8840 | 9ST6A6E1080U1880 |                |
| Incolloy 800 reference | 9ST6A5E1010UK170 | 9ST6A5E1020UK300 | 9ST6A5E1030UK440 | 9ST6A5E1040UK570 | 9ST6A5E1060UK840 | 9ST6A6E1000UL880 |                |

**10W/cm<sup>2</sup>, 1½" brass fitting, without thermostat.**

| Heating element dia.   | 8mm              |                  |                  |                  |                  |                  | 10mm (2" only) |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------|
| Power                  | 1kW**            | 2kW              | 3kW              | 4kW              | 6kW              | 8kW              |                |
| Length (mm)            | 135              | 170              | 240              | 300              | 440              | 450              |                |
| AISI 304 Reference     | 9ST6A5E1010B8130 | 9ST6A5E1020U8170 | 9ST6A5E1030U8240 | 9ST6A5E1040U8300 | 9ST6A5E1060U8440 | 9ST6A6E1080U1450 |                |
| Incolloy 800 reference | 9ST6A5E1010BK130 | 9ST6A5E1020UK170 | 9ST6A5E1030UK240 | 9ST6A5E1040UK300 | 9ST6A5E1060UK440 | 9ST6A6E1000UL450 |                |

**5W/cm<sup>2</sup>, 1½" brass fitting, with 30-90°C (85-195°F) thermostat, adjustable under M25 cap (single phase up to 3kW, 3 phases for 4kW, 6kW and 8kW models)**

| Heating element dia.   | 8mm              |                  |                  |                  |                  |                  | 10mm (2" only) |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------|
| Power                  | 1kW              | 2kW              | 3kW              | 4kW              | 6kW              | 8kW              |                |
| Length (mm)            | 170              | 300              | 440              | 570              | 840              | 880              |                |
| AISI 304 Reference     | 9ST6A5ES010V8170 | 9ST6A5ES020V8300 | 9ST6A5ES030V8440 | 9ST6A5ES040U8570 | 9ST6A5ES060U8840 | 9ST6A6ES080U1880 |                |
| Incolloy 800 reference | 9ST6A5ES010VK170 | 9ST6A5ES020VK300 | 9ST6A5ES030VK440 | 9ST6A5ES040UK570 | 9ST6A5ES060UK840 | 9ST6A6ES000UL880 |                |

**10W/cm<sup>2</sup>, 1½" brass fitting, with 30-90°C (85-195°F) thermostat adjustable under M25 cap (single phase up to 3kW, 3 phases for 4kW, 6kW and 8kW models)**

| Heating element dia.   | 8mm              |                  |                  |                  |                  |                  | 10mm (2" only) |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------|
| Power                  | 1kW**            | 2kW              | 3kW              | 4kW              | 6kW              | 8kW              |                |
| Length (mm)            | 135              | 170              | 240              | 300              | 440              | 450              |                |
| AISI 304 Reference     | 9ST6A5ES010B8130 | 9ST6A5ES020V8170 | 9ST6A5ES030V8240 | 9ST6A5ES040U8300 | 9ST6A5ES060U8440 | 9ST6A6ES080U1450 |                |
| Incolloy 800 reference | 9ST6A5ES010BK130 | 9ST6A5ES020VK170 | 9ST6A5ES030VK240 | 9ST6A5ES040UK300 | 9ST6A5ES060UK440 | 9ST6A6ES000UL450 |                |

\* 1½" brass fitting instead of 1½", replace A5 by A4 in the reference. M45x2 brass fitting instead of 1½", replace A5 by A9 in the reference.

\*\* This model has only 2 heating elements.

**References of accessories in option (not included in the product, must be ordered separately):**

### Nuts

|  | Thread  | 1½"              | 1½"              | M45x200          | 2"               |
|--|---------|------------------|------------------|------------------|------------------|
|  | Brass   | 9BRRA3000ELH302A | 9BRRA3000ELH303A | 9BRRA3000ELH305A | 9BRRA3000ELH304A |
|  | AISI304 | 9BRRA3000ELH032A | 9BRRA3000ELH006A | 9BRRA3000ELH049A | 9BRRA3000ELH348A |
|  | AISI316 | 9BRRA3000ELH202A | 9BRRA3000ELH203A | 9BRRA3000ELH205A | 9BRRA3000ELH204A |

### Gaskets

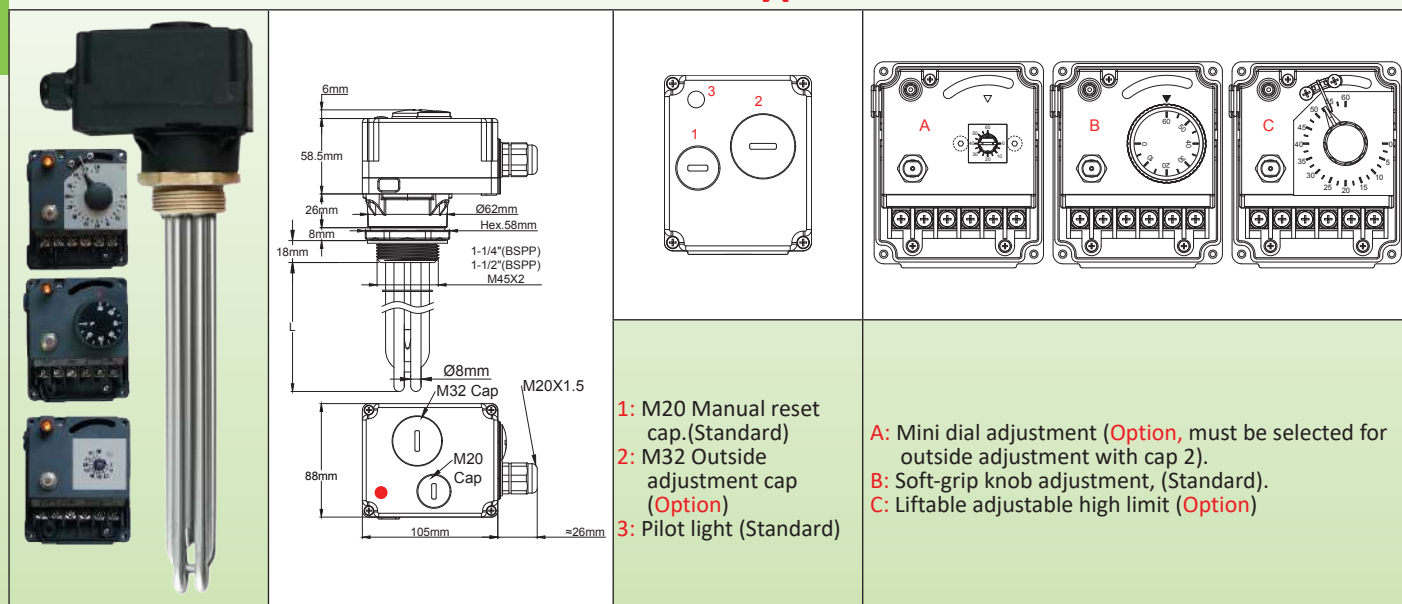
|  | Thread | 1½"              | 1½" - M45x200    | 2"               |
|--|--------|------------------|------------------|------------------|
|  | NBR    | 9BRJ03000ELH206A | 9BRJ03000ELH205A | 9BRJ03000ELH203A |
|  | Fiber  | 9BRJ03000ELH052A | 9BRJ03000ELH007A | 9BRJ03000ELH028A |
|  | PTFE   | 9BRJ03000ELH032A | 9BRJ03000ELH033A | 9BRJ03000ELH034A |

Other accessories and drawings: see last section of this catalogue



# Immersion heaters with plastic connection box

**Immersion heater with 105mm × 88mm × 58.5mm plastic enclosure. 1½", M45x2 fittings. With control thermostat and manual reset thermostat. Type 9STC**



**Main applications:** liquid heating, hot water circuits, containers and buffer tanks.

These heaters are specifically designed for domestic and commercial hot water tanks, as well as auxiliary heating systems of solar energy buffer tanks, and auxiliary heaters for heat pumps.

The housing is offset by 30mm for tank thermal insulation.

They exist in:

- 5 standard power levels: 1kW – 1.5kW - 2kW - 3kW - 3.5kW

- 2 types of standard fittings: 1½", M45x2

- 2 types of surface load density: 5W/cm² and 10W/cm². See technical introduction to optimize the surface load.

The 5W/cm² surface load can meet the recommendations of the "NFC Performance" Standard, Class C (LCIE 103-14), for storage water heaters.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, swiveling on housing, brazed on tubes. Supplied without gasket and without nut. See accessories below.

**Thread:** 1½" BSPP (ISO 228), and metric thread M45x2.

**Enclosure:** IP54, 105 × 88 × 84.5mm, (Cap, accessories and cable gland not included), black PA66, fiber glass reinforced.

Product including an adjustable temperature control thermostat and a fixed setting high limit manual reset thermostat. Manual reset has access from outside, by removing a screwed cap.

**Electrical input:** One M20 cable gland in PA66. A second hole for M20 cable gland is closed by a cap.

**Temperature Adjustment:** Inside, with °C printed knob. (°F printed knobs available in option)

**Thermowell:** One thermowell in AISI304, dia.10mm

**Standard set point adjustment ranges:**

- 30-90°C (85-195°F) with manual reset at 100°C (212°F)

- 0-60°C (32-140°F with manual reset at 80°C (176°F)

**Electrical connections:**

- Power supply (Neutral, Line, Ground), on 6mm² screw terminals.

- Immersion heater: 3 wires, FEP 180°C insulated, 2.5mm², equipped with ring terminals, length 50mm on the immersion heater connection side, for direct connection on heating elements M4 terminals. (Neutral wire is blue color)

- Pilot light: can be connected by a strap on power supply, or on control thermostat output, or on safety thermostat output.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm² or 10W/cm², other values on request.

**Voltage:** 220-240V single phase only.

**Standard options:**

- Thermostat knob accessible under the cover by a M32 removable cap.

**Variants on request:**

- 4-40°C (40-105°F), 30-110°C (85-230°F) thermostats.

- Liftable adjustable high end adjustment on control thermostat.

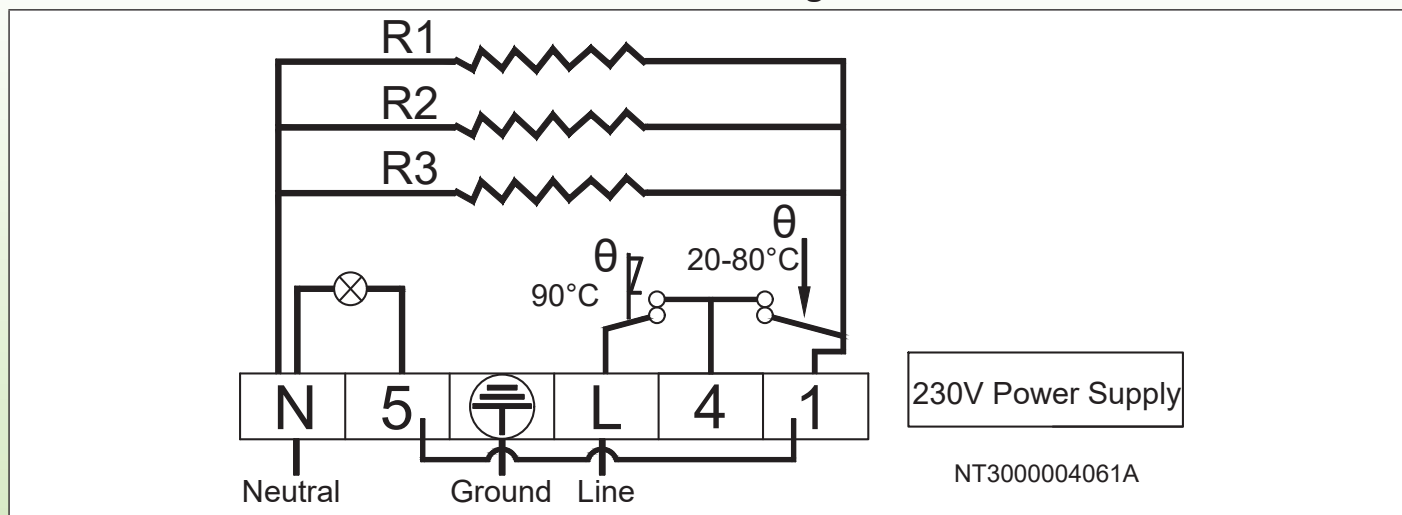
- TIG welded fitting.





# Immersion heaters with plastic connection box

## Electric Wiring



## Main references

**5W/cm<sup>2</sup>, 1½" brass fitting, with 0-60°C (30-140°F) adjustable thermostat. Manual reset at 80°C (176°F)**

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 3,5kW            |
|------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 500              |
| AISI 304 Reference     | 9STCA5EN010V817J | 9STCA5EN015V824J | 9STCA5EN020V830J | 9STCA5EN030V844J | 9STCA5EN035V850J |
| Incolloy 800 reference | 9STCA5EN010VK17J | 9STCA5EN015VK24J | 9STCA5EN020VK30J | 9STCA5EN030VK44J | 9STCA5EN035VK50J |

**10W/cm<sup>2</sup>, 1½" brass fitting, with 0-60°C (30-140°F) adjustable thermostat. Manual reset at 80°C (176°F)**

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 3,5kW            |
|------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 270              |
| AISI 304 Reference     | 9STCA5EN010B813J | 9STCA5EN015V813J | 9STCA5EN020V817J | 9STCA5EN030V824J | 9STCA5EN035V827J |
| Incolloy 800 reference | 9STCA5EN010BK13J | 9STCA5EN015VK13J | 9STCA5EN020VK17J | 9STCA5EN030VK24J | 9STCA5EN035VK27J |

**5W/cm<sup>2</sup>, 1½" brass fitting, with 30-90°C (85-195°F) adjustable thermostat. Manual reset at 100°C (212°F)**

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 3,5kW            |
|------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 500              |
| AISI 304 Reference     | 9STCA5ES010V817N | 9STCA5ES015V824N | 9STCA5ES020V830N | 9STCA5ES030V844N | 9STCA5ES035V850N |
| Incolloy 800 reference | 9STCA5ES010VK17N | 9STCA5ES015VK24N | 9STCA5ES020VK30N | 9STCA5ES030VK44N | 9STCA5ES035VK50N |

**10W/cm<sup>2</sup>, 1½" brass fitting, with 30-90°C (85-195°F) adjustable thermostat. Manual reset at 100°C (212°F)**

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 3,5kW            |
|------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 270              |
| AISI 304 Reference     | 9STCA5ES010B813N | 9STCA5ES015V813N | 9STCA5ES020V817N | 9STCA5ES030V824N | 9STCA5ES035V827N |
| Incolloy 800 reference | 9STCA5ES010BK13N | 9STCA5ES015VK13N | 9STCA5ES020VK17N | 9STCA5ES030VK24N | 9STCA5ES035VK27N |

\* M45x2 brass fitting instead of 1½", replace A5 by A9 in the reference.

\*\* This model has only 2 heating elements.

## References of accessories in option

(not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1½"              | M45x200          |
|--|---------|------------------|------------------|
|  | Brass   | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
|  | AISI304 | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
|  | AISI316 | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

### Gaskets

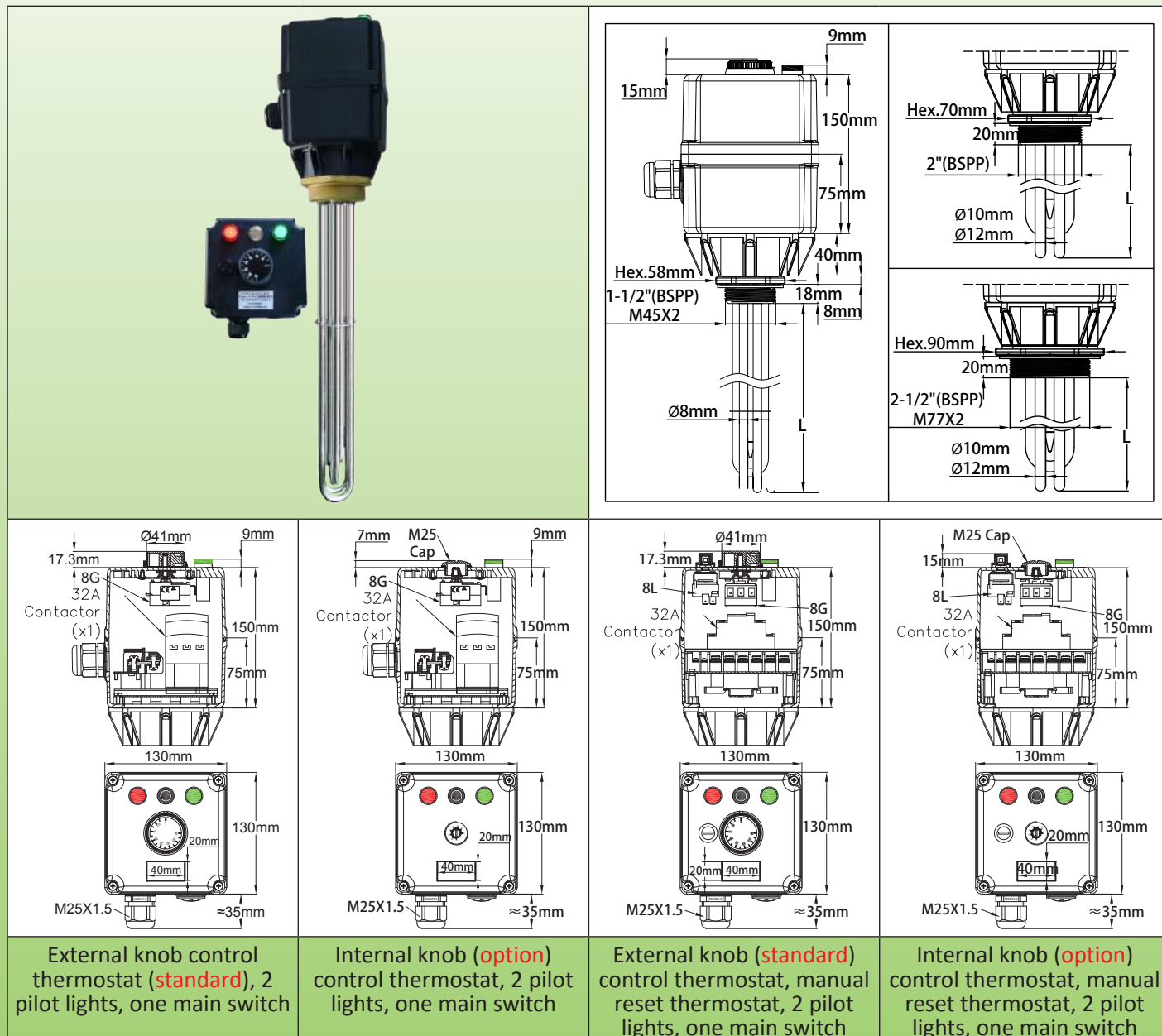
|  | Thread | 1½" - M45x200    |
|--|--------|------------------|
|  | NBR    | 9BRJ03000ELH205A |
|  | Fiber  | 9BRJ03000ELH007A |
|  | PTFE   | 9BRJ03000ELH033A |

Other accessories and drawings: see last section of this catalogue

# Immersion heaters with plastic connection box

Immersion heater with 130mm × 130mm × 190mm plastic enclosure. Fittings from 1½" to M77x2. With control thermostat. With or without and manual reset. Power up to 21kW with one built-in power relay. Heating elements dia. 8, 10 and 12mm.

## Type 9STM



**Main applications:** Industrial liquid heating, hot water circuits, containers and buffer tanks.

These immersion heaters are designed for medium power applications, requesting power relays. They are fitted with one relay, 3 pole, 32A res. They have in standard two pilot lights and one main switch.

They are intended for indoor use.

These enclosures have a 40mm offset to go through tank thermal insulation.

They exist in:

- 6 standard power levels: 4kW; 6kW; 8kW; 10kW; 12kW; 14kW. (on request, it is possible to reach 21kW with dia.12mm heating elements)

- 2 types of standard fittings with dia. 8mm heating elements: 1½"; M45x2.

- 3 types of standard fittings with dia. 10mm heating elements: 2", 2½"; M77x2

- 2 types of surface load density: 5W/cm² and 10W/cm². See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. or 10mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, swiveling on housing, brazed on tubes. (AISI 304 or AISI 316, TIG welded, or brazed, models are



# Immersion heaters with plastic connection box

available on request). Supplied without gasket and without nut. See accessories below.

**Thread:** 1½" BSPP (ISO 228), and metric thread M45x2 (dia. 8 heating elements), and 2", 2½", M77x2 (dia. 10mm heating elements ).

**Enclosure:** 130mm × 130mm, 150mm height, black PA66 fiberglass reinforced. Silicone foam gasket. Stainless steel cover screws with locking nuts.

**Ingress protection class:** Water and dust: IP54; shock resistance: IK 8 (with metal cable glands and M25 metal plug).

**Temperature control:** by 30-90°C (85-195°F) bulb and capillary thermostat, with outside knob access. Thermostat shaft has a waterproof gasket. Other temperature ranges available. See options hereunder.

**Cable gland:** M25, PA66. Mounted on a removable board for easier wiring access. A second hole for M25 cable gland is available, closed by a screwed cap.

**Thermowell:** one thermowell in AISI304, dia.10mm, for M45 and 1½" fittings, 2 thermowells for larger sizes.

**Heating elements connections:** terminals with stainless steel screw, nut and stainless steel washer.

Designed for applications in three-phase with neutral, however, these devices are equipped with straps for switching to single-phase supply. This change must be made by the professional technical staff able to calculate and observe the maximum permissible intensities on power relays.

**Power supply connection:**

- on built in connection block, 6 × 10mm<sup>2</sup> for power connection and 2 × 2.5mm<sup>2</sup> for optional external remote control

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, others values on request.

**Voltage:** three phases 380-400V (Star connection with neutral). Single pole 230V is possible.

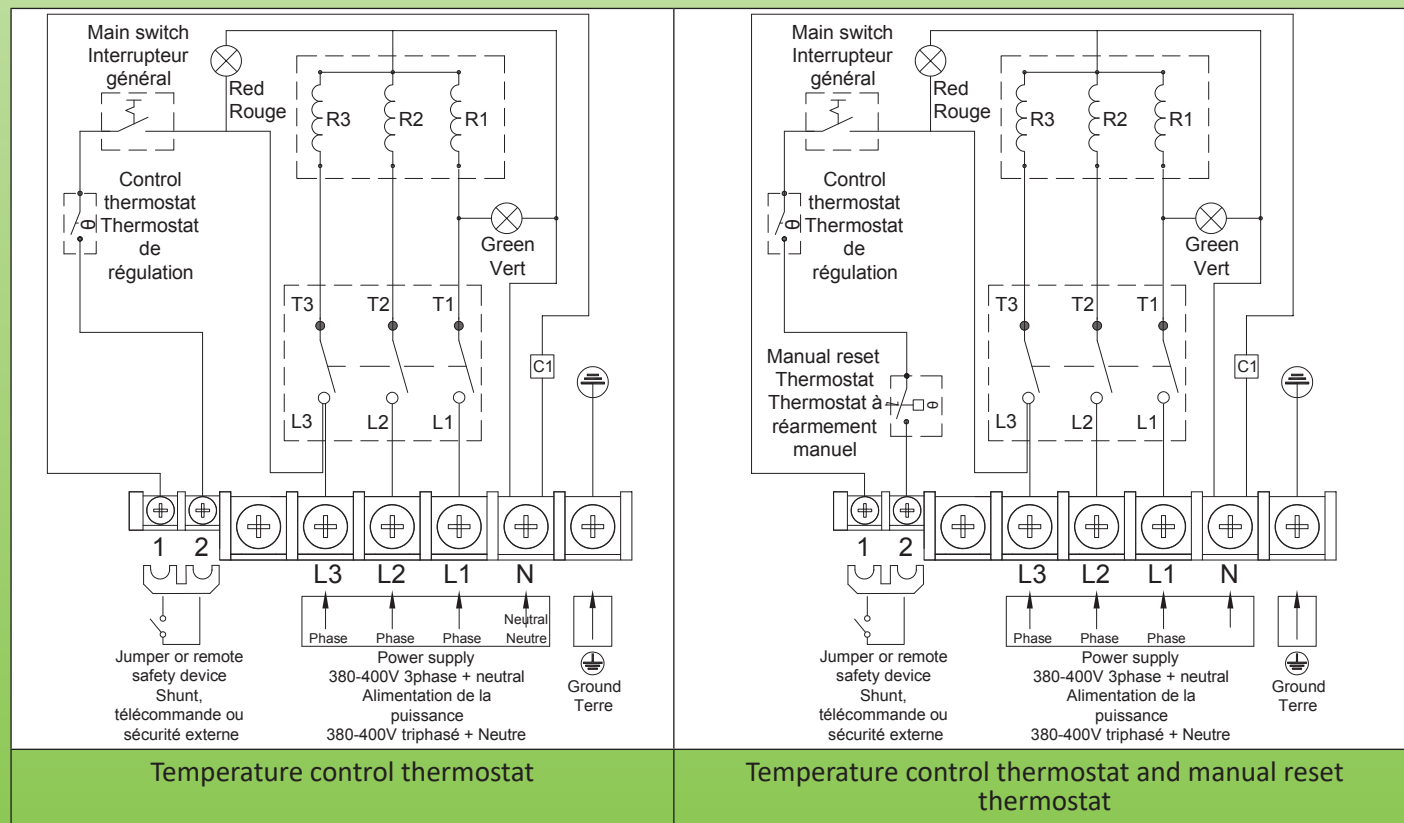
**Standard equipment:**

- Manual reset thermostat, reset access by M25 screwed cap, preset at 100°C (212°F).
- Main power switch.
- Large size (dia. 16mm) LED pilot lights. Green illuminated when heating is on. Red illuminated when manual reset is triggered.

**Variants on request:**

- Thermostat knob accessible under the cover by a M25 removable plug (on request).
- 4-40°C, 0-60°C or 30-110°C thermostats. Higher range on request.
- 4-40°C (40-105°F) temperature range with manual reset at 60°C (140°F).
- 0-60°C (32-140°F) temperature range with manual reset at 80°C (176°F).
- 30-110°C (85-230°F) temperature range with manual reset at 130°C (266°F).
- Thermal cut out located inside immersion heater pocket.
- 400V power supply without neutral: consult us.

## Electric Wiring





# Immersion heaters with plastic connection box

## Main references

**5W/cm<sup>2</sup>, with 30-90°C (85-195°F) thermostat, external knob, without manual reset.**

|                        | 1½" brass fitting, dia. 8mm heating elements |                  |                  | 2½" brass fitting, dia. 10mm heating elements |                  |
|------------------------|----------------------------------------------|------------------|------------------|-----------------------------------------------|------------------|
| Power                  | 4kW                                          | 6kW              | 8kW              | 10kW                                          | 12kW             |
| Length (mm)            | 570                                          | 840              | 1100             | 1100                                          | 1300             |
| AISI 304 Reference     | 9STMA5QT040U8570                             | 9STMA5QT060U8840 | 9STMA5QT080U8J00 | 9STMA7QT100U1K00                              | 9STMA7QT120U1M00 |
| Incolloy 800 reference | 9STMA5QT040UK570                             | 9STMA5QT060UK840 | 9STMA5QT080UKJ00 | 9STMA7QT100ULK00                              | 9STMA7QT120ULM00 |

**10W/cm<sup>2</sup>, with 30-90°C (85-195°F) thermostat, external knob, without manual reset.**

|                        | 1½" brass fitting, dia. 8mm heating elements |                  |                  | 2½" brass fitting, dia. 10mm heating elements |                  |
|------------------------|----------------------------------------------|------------------|------------------|-----------------------------------------------|------------------|
| Power                  | 4kW                                          | 6kW              | 8kW              | 10kW                                          | 12kW             |
| Length (mm)            | 300                                          | 440              | 570              | 540                                           | 660              |
| AISI 304 Reference     | 9STMA5QT040U8300                             | 9STMA5QT060U8440 | 9STMA5QT080U8570 | 9STMA7QT100U1540                              | 9STMA7QT120U1660 |
| Incolloy 800 reference | 9STMA5QT040UK300                             | 9STMA5QT060UK440 | 9STMA5QT080UK570 | 9STMA7QT100UL540                              | 9STMA7QT120UL660 |

**5W/cm<sup>2</sup>, with 30-90°C (85-195°F) adjustable thermostat, external knob. Manual reset at 100°C (212°F)**

| Threads and heating elements diameters | 1½" brass fitting, dia. 8mm heating elements |                  |                  | 2½" brass fitting, dia. 10mm heating elements |                  |
|----------------------------------------|----------------------------------------------|------------------|------------------|-----------------------------------------------|------------------|
| Power                                  | 4kW                                          | 6kW              | 8kW              | 10kW                                          | 12kW             |
| Length (mm)                            | 570                                          | 840              | 1100             | 1100                                          | 1300             |
| AISI 304 Reference                     | 9STMA5QT040U857N                             | 9STMA5QT060U884N | 9STMA5QT080U8J0N | 9STMA7QT100U1K0N                              | 9STMA7QT120U1M0N |
| Incolloy 800 reference                 | 9STMA5QT040UK57N                             | 9STMA5QT060UK84N | 9STMA5QT080UKJ0N | 9STMA7QT100ULK0N                              | 9STMA7QT120ULM0N |

**10W/cm<sup>2</sup>, with 30-90°C (85-195°F) adjustable thermostat, external knob. Manual reset at 100°C (212°F)**

| Threads and heating elements diameters | 1½" brass fitting, dia. 8mm heating elements |                  |                  | 2½" brass fitting, dia. 10mm heating elements |                  |                  |
|----------------------------------------|----------------------------------------------|------------------|------------------|-----------------------------------------------|------------------|------------------|
| Power                                  | 4kW                                          | 6kW              | 8kW              | 10kW                                          | 12kW             | 14kW             |
| Length (mm)                            | 300                                          | 440              | 570              | 540                                           | 660              | 770              |
| AISI 304 Reference                     | 9STMA5QT040U830N                             | 9STMA5QT060U844N | 9STMA5QT080U857N | 9STMA7QT100U154N                              | 9STMA7QT120U166N | 9STMA7QT120U177N |
| Incolloy 800 reference                 | 9STMA5QT040UK30N                             | 9STMA5QT060UK44N | 9STMA5QT080UK57N | 9STMA7QT100UL54N                              | 9STMA7QT120UL66N | 9STMA7QT120UL77N |

\* In dia. 8mm: M45x2 brass fitting instead of 1½", replace A5 by A9 in the reference.

\*\* In dia. 10mm: 2" brass fitting instead of 2½", replace A7 by A6 in the reference. M77x2 brass fitting instead of 2½", replace A7 by A8 in the reference.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread   | 1½"              | M45x2            | 2"               | 2½"              | M77x2            |
|-------------------------------------------------------------------------------------|----------|------------------|------------------|------------------|------------------|------------------|
|                                                                                     | Brass    | 9BRRA3000ELH303A | 9BRRA3000ELH305A | 9BRRA3000ELH304A | 9BRRA3000ELH314A | 9BRRA3000ELH306A |
|                                                                                     | Inox 304 | 9BRRA3000ELH006A | 9BRRA3000ELH049A | 9BRRA3000ELH348A | 9BRRA3000ELH142A | 9BRRA3000ELH150A |
|                                                                                     | Inox 316 | 9BRRA3000ELH203A | 9BRRA3000ELH205A | 9BRRA3000ELH204A | 9BRRA3000ELH214A | 9BRRA3000ELH206A |

### Gaskets

|  | Thread | 1½" - M45x200    | 2"               | 2½" - M77x2      |
|-------------------------------------------------------------------------------------|--------|------------------|------------------|------------------|
|                                                                                     | NBR    | 9BRJ03000ELH205A | 9BRJ03000ELH203A | 9BRJ03000ELH201A |
|                                                                                     | Fiber  | 9BRJ03000ELH007A | 9BRJ03000ELH028A | 9BRJ03000ELH030A |
|                                                                                     | PTFE   | 9BRJ03000ELH033A | 9BRJ03000ELH034A | 9BRJ03000ELH036A |

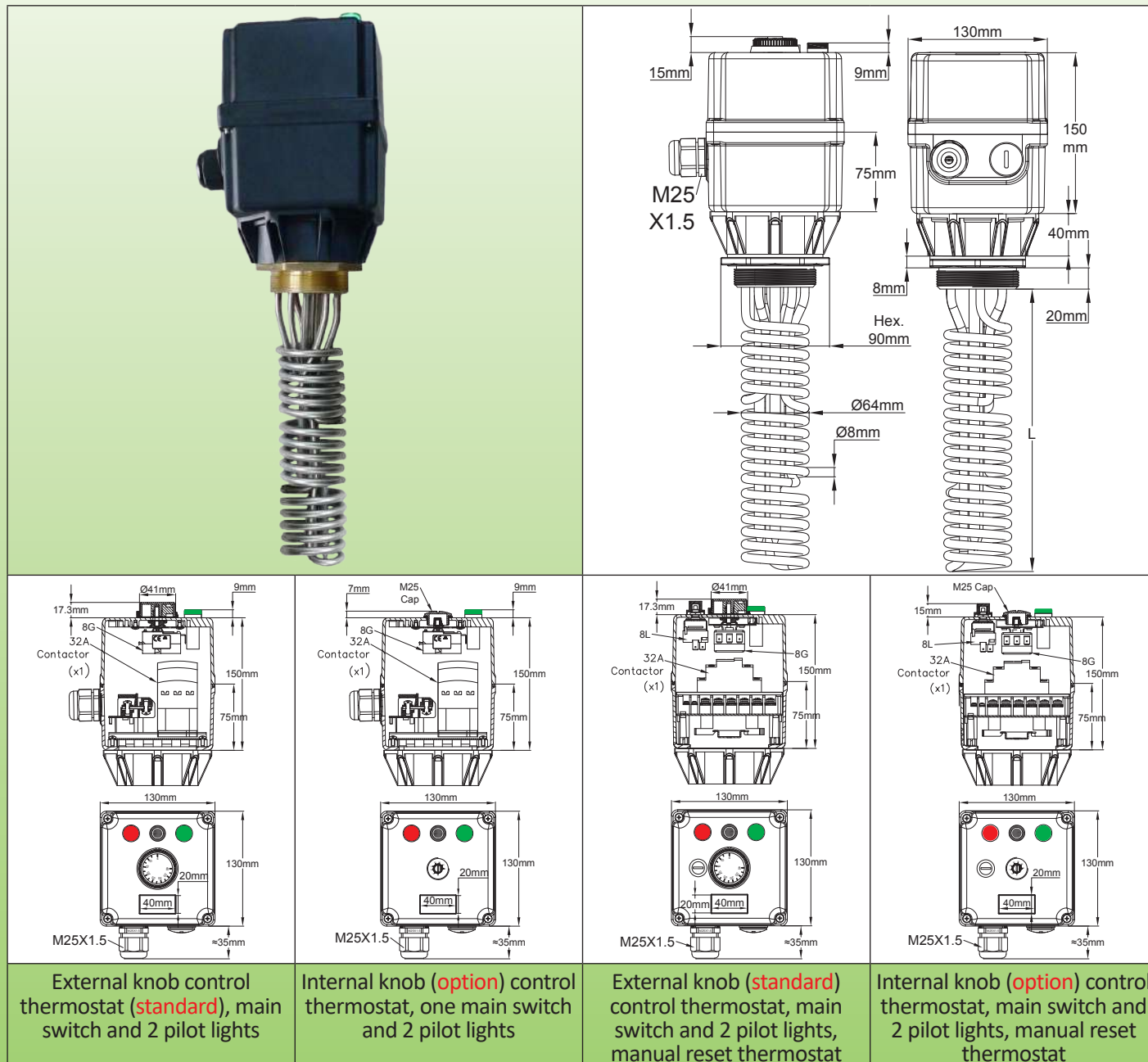
Other accessories and drawings: see last section of this catalogue.



# Immersion heaters with plastic connection box

**Extra short** Immersion heater with 130mm × 130mm × 190mm plastic enclosure. M77x2 or 2½" fittings. With control thermostat. With or without manual reset thermostat. Power up to **9kW** with one built-in power relay. Coiled Heating elements dia. 8mm.

## Type 9SWM



**Main applications:** Industrial liquid heating, hot water circuits, containers and buffer tanks, in applications where the heating elements immersed length must be as short as possible.

They can be fitted with one or two. They have in standard one 32A res relay, 3 pole, two pilot lights and one main switch. They are intended for indoor use.

These enclosures have a 40mm offset to go through tank thermal insulation.

- 5 standard power levels: 1,5kW; 3kW; 4,5kW; 6kW; 9kW. On request, it is possible to reach 21kW by increasing the L length).

- 2 types of standard fittings: 2½"; M77x2.

- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, swiveling on housing, brazed on tubes. Supplied without gasket and without nut. See accessories below.



# Immersion heaters with plastic connection box

**Thread:** 2½", or M77x2

**Enclosure:** 130mm × 130mm, 150mm height, black PA66 fiberglass reinforced. Silicone foam gasket. Stainless steel cover screws with locking nuts.

**Ingress protection class:** Water and dust: IP54; shock resistance: IK 8 (with metal cable glands and M25 metal plug).

**Temperature control:** by 30-90°C (85-195°F) bulb and capillary thermostat, with outside knob access. Thermostat shaft has a waterproof gasket. Other temperature ranges available. See options hereunder.

**Cable gland:** M25, PA66. Mounted on a removable board for easier wiring access. A second hole for M25 cable gland is available, closed by a screwed cap.

**Thermowell:** two thermowells in AISI304, dia.10mm × 8.4mm.

**Heating elements connections:** terminals with stainless steel screw, nut and stainless steel washer.

Three-phase models are equipped with straps for switching to single-phase supply. This change must be made by the professional technical staff able to calculate and observe the maximum permissible rating on power relay.

**Power supply connection:** on built in connection block, 6 × 10mm<sup>2</sup> for power connection and 2 × 2.5mm<sup>2</sup> for remote safety device or remote control.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, other values on request.

**Voltage:** Single pole 230V or three phases 380-400V (Star connection with neutral).

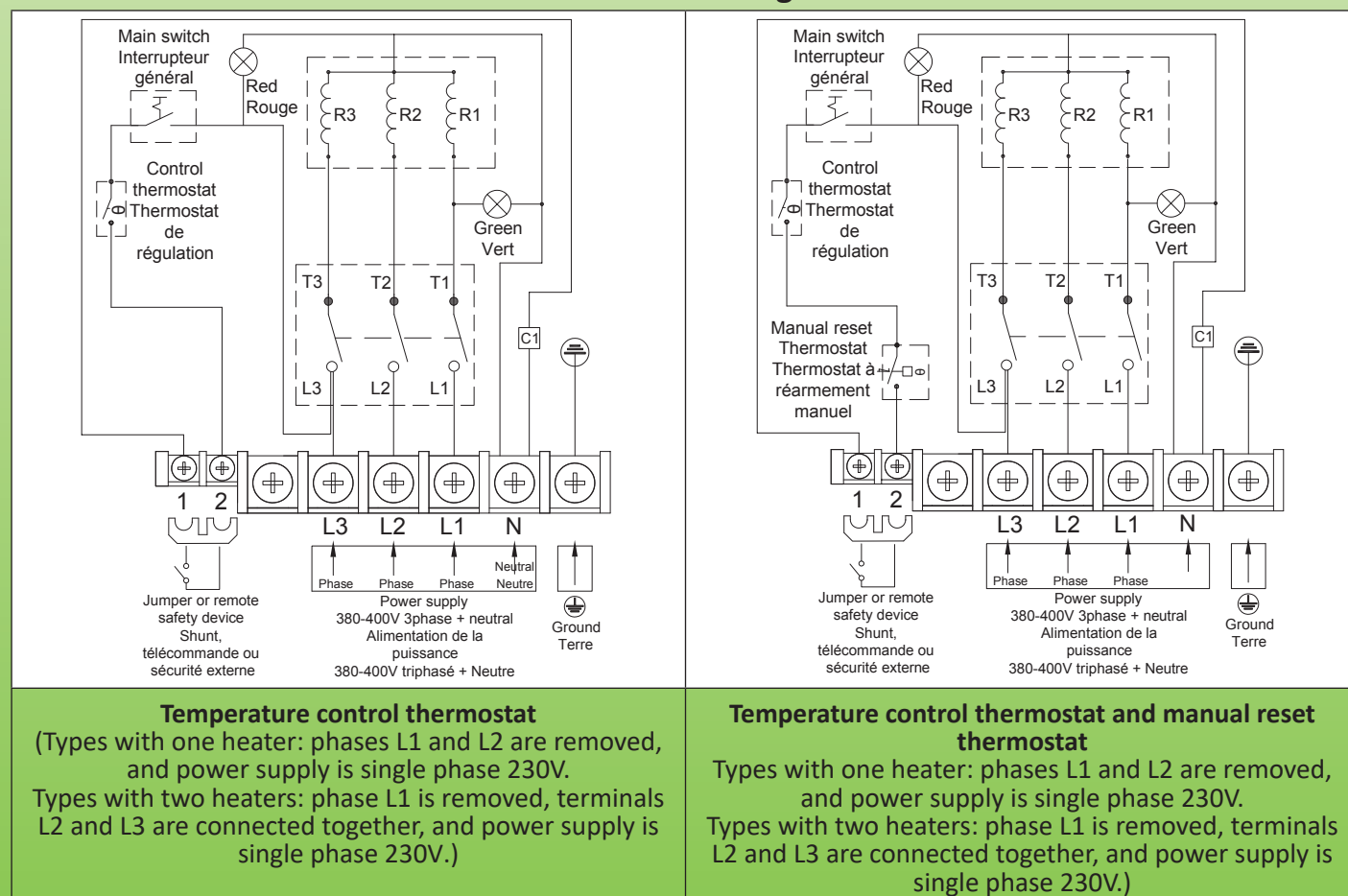
**Standard equipment:**

- Thermostat with outside knob.
- Main power switch.
- Large size (dia. 16mm) green and red LED pilot lights.
- On models with manual reset: reset access by M25 screwed cap, preset at 100°C (212°F).

**Variants on request:**

- Thermostat adjustment access under the screwed M25 cap.
- Thermostat without limiter, ranges 4-40°C (40-105°F), 0-60°C (30-140°F) or 30-110°C (85-230°F) Higher range on request.
- 4-40°C (40-105°F) temperature range with manual reset at 60°C (140°F)
- 0-60°C (32-140°F) temperature range with manual reset at 80°C (176°F)
- 30-110°C (85-230°F) temperature range with manual reset at 130°C (266°F)
- Thermal cut out (TCO) located inside immersion heater pocket.
- 400V power supply without neutral: consult us.

## Electric Wiring





# Immersion heaters with plastic connection box

## Main references

With 30-90°C (85-195°F) thermostat, external knob \*\*, without manual reset. M77x2 fitting\*

|                          | 5W/cm <sup>2</sup> |                    |                    | 10W/cm <sup>2</sup> |                    |                    |
|--------------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
|                          | 1 heating element  | 2 heating elements | 3 heating elements | 1 heating element   | 2 heating elements | 3 heating elements |
| L (mm)                   | 110                | 188                | 265                | 110                 | 188                | 265                |
| Power (Watt)             | 1500               | 3000               | 4500               | 3000                | 6000               | 9000               |
| References, AISI 304     | 9SWMA8QT01525110   | 9SWMA8QT030B5190   | 9SWMA8QT045U5270   | 9SWMA8QT03025110    | 9SWMA8QT060B5190   | 9SWMA8QT090U5270   |
| References, Incolloy 800 | 9SWMA8QT01527110   | 9SWMA8QT030B7190   | 9SWMA8QT045U7270   | 9SWMA8QT03027110    | 9SWMA8QT060B7190   | 9SWMA8QT090U7270   |

With 30-90°C (85-195°F) adjustable thermostat, external knob \*\*, M77x2 fitting\*, Manual reset at 100°C (212°F)

|                          | 5W/cm <sup>2</sup> |                    |                    | 10W/cm <sup>2</sup> |                    |                    |
|--------------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
|                          | 1 heating element  | 2 heating elements | 3 heating elements | 1 heating element   | 2 heating elements | 3 heating elements |
| L (mm)                   | 110                | 188                | 265                | 110                 | 188                | 265                |
| Power (Watt)             | 1500               | 3000               | 4500               | 3000                | 6000               | 9000               |
| References, AISI 304     | 9SWMA8QT0152511N   | 9SWMA8QT030B519N   | 9SWMA8QT045U527N   | 9SWMA8QT0302511N    | 9SWMA8QT060B519N   | 9SWMA8QT090U527N   |
| References, Incolloy 800 | 9SWMA8QT0152711N   | 9SWMA8QT030B719N   | 9SWMA8QT045U727N   | 9SWMA8QT0302711N    | 9SWMA8QT060B719N   | 9SWMA8QT090U727N   |

\* 2½" brass fitting instead of M77x2, replace A8 by A7 in the reference

\*\* Option with thermostat inside set point adjustment, replace QT by QR in the reference

## References of accessories in option (Not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 2½"              | M77x2            |
|------------------------------------------------------------------------------------|---------|------------------|------------------|
|                                                                                    | Brass   | 9BRRA3000ELH314A | 9BRRA3000ELH306A |
|                                                                                    | AISI304 | 9BRRA3000ELH142A | 9BRRA3000ELH150A |
|                                                                                    | AISI316 | 9BRRA3000ELH214A | 9BRRA3000ELH206A |

### Gaskets

|  | Thread | 2½" - M77x2      |
|-------------------------------------------------------------------------------------|--------|------------------|
|                                                                                     | NBR    | 9BRJ03000ELH201A |
|                                                                                     | Fiber  | 9BRJ03000ELH030A |
|                                                                                     | PTFE   | 9BRJ03000ELH036A |

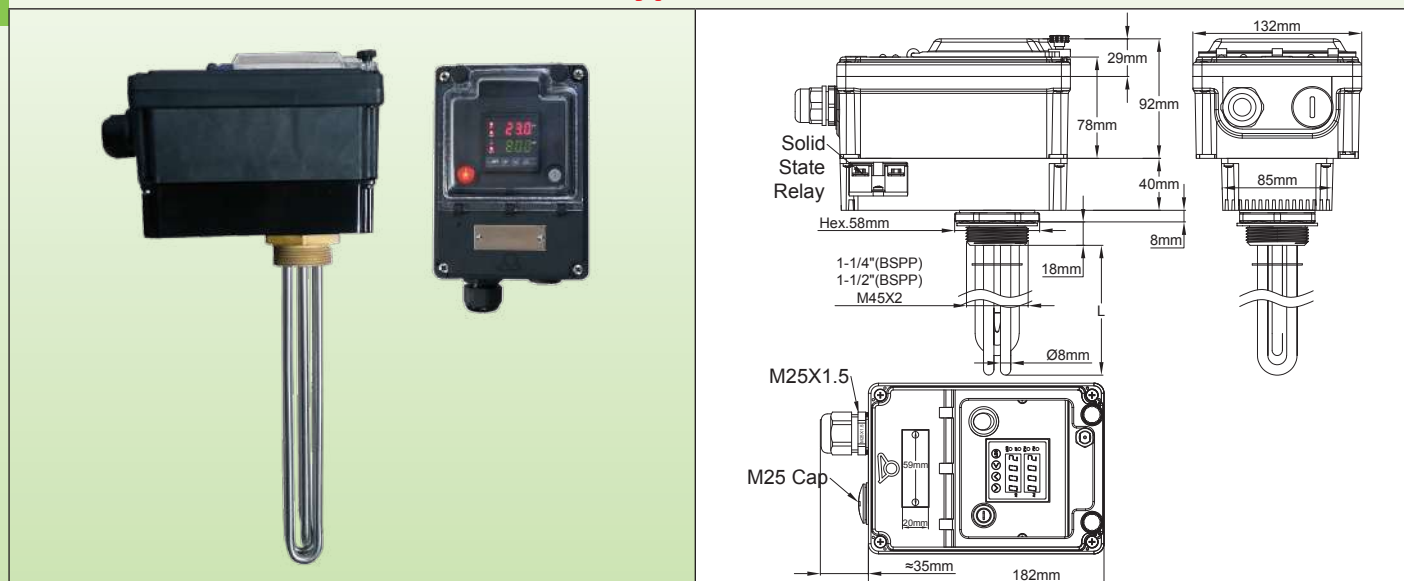
Other accessories and drawings: see last section of this catalogue.



# Immersion heaters with plastic connection box

**Immersion heaters with 182mm × 130mm × 132mm plastic enclosure. Fittings 1¼", 1½", M45x2. With electronic PID temperature control, with or without manual reset thermostat. Built-in cooled SSR.**

## Type 9STQ



**Main applications:** Liquid heating, hot water circuits, containers and buffer tanks.

These products have been engineered for precision liquid heating. The initial setting of the PID controller, however, is intended for a professional. The best results are obtained in stirred tanks.

They exist in:

- 5 standard power levels: 1kW; 1,5kW; 2kW; 3kW; 4kW
- 2 types of standard fittings: 1½" and M45x2
- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Brass, swiveling on housing, brazed on tubes. (AISI 304 or AISI 316, TIG welded, or brazed, models are available on request). Supplied without gasket and without nut. See accessories below.

**Thread:** 1¼" or 1½" BSPP (ISO 228). Metric thread M45x2 available on request.

### Temperature control:

- Electronic temperature controller with double digital display of temperature set point and measured value. This microprocessor controller uses Fuzzy Logic technology. It reaches a predetermined set point more quickly, with minimal overshoot during the disturbances related to the rise or external load. It regulates with PID action, whose setting is simplified by the auto-tune function that automatically adjusts the parameters P, I and D (A clear User Manual is supplied). If the temperature sensor is broken, the output power is cut off and the error is displayed.
- Temperature display Accuracy: 0.2% of full scale.
- Temperature sensor: Pt100
- Display is configurable in degree or tenth of a degree.
- The two high or low alarm outputs can be set over the entire range of adjustment and have an adjustable differential.

**Enclosure:** Extremely robust, in thick PA66, designed for outdoor installation, IP65 and IK10. It also includes:

- A fuse to protect internal circuits.
- An illuminated on- off switch
- A polycarbonate transparent window allowing access to the settings. This window can be secured with seals. This case also includes a separate lid, with independent seals, providing access to electrical connections
- On the rear side is located an aluminum housing with cooling fins for a built in 25A SSR.

In models with failsafe manual reset limiter, reset can be accessed after opening the window.

**Cable glands:** Located on a removable mounting board, providing easier access for connections, fitted with one M25, PA66, and one more hole for M25, closed by a plastic cap.

**Thermowell:** In standard, one thermowell in AISI304, dia. 10mm, 135mm length.

### Electric connections:

- Built-in terminal block, with 5 terminals 6mm<sup>2</sup> and 5 terminals 2.5mm<sup>2</sup>.

This terminal block is provided with a strap between terminals 1 and 2. By removing this strap, it is possible to connect an additional safety device, a remote control, or a timer.

- Auxiliary high alarm and low alarm contacts (3A 250V max.)

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.



# Immersion heaters with plastic connection box

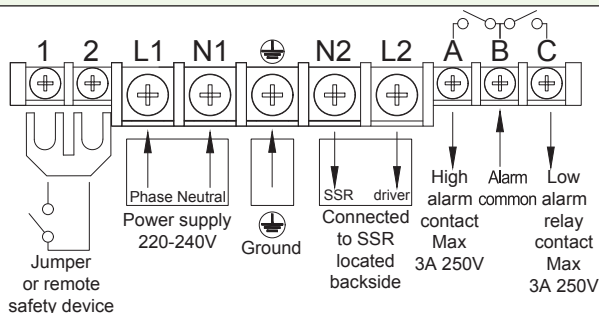
**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, other values on request.

**Voltage:** 220-240V single phase only.

**Standard options:**

Manual reset limiter, preset at: 60°C, 80°C, 100°C, 110°C, 130°C. (140°F, 176°F, 212°F, 230°F, 266°F).

## Wiring diagram



## Main references

**55W/cm<sup>2</sup>; 1½"\*\*\* brass fitting, without manual reset thermostat.**

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 570              |
| AISI 304 Reference     | 9STQA5QZ010V8170 | 9STQA5QZ015V8240 | 9STQA5QZ020V8300 | 9STQA5QZ030V8440 | 9STQA5QZ040V8570 |
| Incolloy 800 reference | 9STQA5QZ010VK170 | 9STQA5QZ015VK240 | 9STQA5QZ020VK300 | 9STQA5QZ030VK440 | 9STQA5QZ040VK570 |

**10W/cm<sup>2</sup>; 1½"\*\*\* brass fitting, without manual reset thermostat.**

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 4kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 300              |
| AISI 304 Reference     | 9STQA5QZ010B8130 | 9STQA5QZ015V8130 | 9STQA5QZ020V8170 | 9STQA5QZ030V8240 | 9STQA5QZ040V8300 |
| Incolloy 800 reference | 9STQA5QZ010BK130 | 9STQA5QZ015VK130 | 9STQA5QZ020VK170 | 9STQA5QZ030VK240 | 9STQA5QZ040VK300 |

**5W/cm<sup>2</sup>; 1½"\*\*\* brass fitting, with manual reset thermostat set at 100°C (212°F)\*\***

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 570              |
| AISI 304 Reference     | 9STQA5QZ010V817N | 9STQA5QZ015V824N | 9STQA5QZ020V830N | 9STQA5QZ030V844N | 9STQA5QZ040V857N |
| Incolloy 800 reference | 9STQA5QZ010VK17N | 9STQA5QZ015VK24N | 9STQA5QZ015VK30N | 9STQA5QZ030VK44N | 9STQA5QZ040VK57N |

**10W/cm<sup>2</sup>; 1½"\*\*\* brass fitting, with manual reset thermostat set at 100°C (212°F)\*\***

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 300              |
| AISI 304 Reference     | 9STQA5QZ010B813N | 9STQA5QZ015V813N | 9STQA5QZ020V817N | 9STQA5QZ030V824N | 9STQA5QZ040V830N |
| Incolloy 800 reference | 9STQA5QZ010BK13N | 9STQA5QZ015VK13N | 9STQA5QZ020VK17N | 9STQA5QZ030VK24N | 9STQA5QZ040VK30N |

\* M45x2 brass fitting instead of 1½", replace A5 by A9 in the reference.

\*\* Manual reset thermostat set at 60°C, 80°C, 110°C, 130°C. (140°F, 176°F, 230°F, 266°F), replace the last character N by E, J, Q, U.

## References of accessories in option

(not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1½"              | M45x200          |
|--|---------|------------------|------------------|
|  | Brass   | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
|  | AISI304 | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
|  | AISI316 | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

### Gaskets

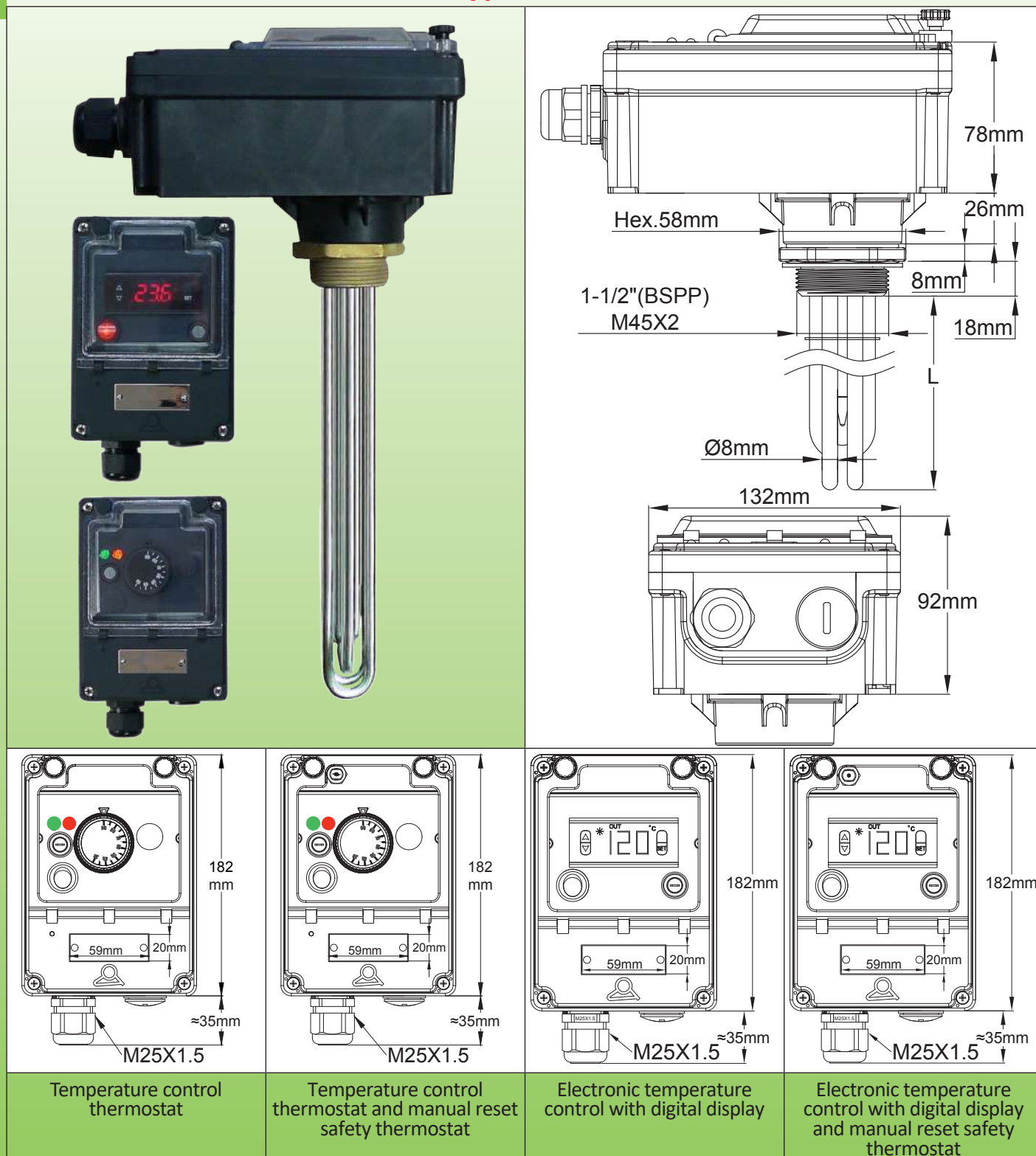
|  | Thread | 1½" - M45x200    |
|--|--------|------------------|
|  | NBR    | 9BRJ03000ELH205A |
|  | Fiber  | 9BRJ03000ELH007A |
|  | PTFE   | 9BRJ03000ELH033A |

Other accessories and drawings: see last section of this catalogue

# Immersion heaters with plastic connection box

Immersion heaters with 182mm × 130mm × 120mm plastic enclosure.  
Fittings 1½", M45x2. With mechanical thermostat or electronic  
temperature control. With or without manual reset thermostat.

## Type 9STB



**Main applications:** Liquid heating, hot water circuits, containers and buffer tanks.

This series is intended for high-end low-power devices, single phase. It combines a modern aesthetic, a waterproof plastic housing, shock resistant, and settings viewing through a transparent window in polycarbonate. It is available with thermostat control or with an easy-to-use electronic controller, both of them with or without safety limiter.



# Immersion heaters with plastic connection box

They exist in:

- 4 standard power levels: 1kW; 1,5kW; 2kW; 3kW.
- 2 types of standard fittings: 1½" and M45x2.
- 2 types of surface load density: 5W/cm² and 10W/cm². See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, swiveling on housing, brazed on tubes. (AISI 304 or AISI 316, TIG welded, or brazed, models are available on request). Supplied without gasket and without nut. See accessories below.

**Thread:** 1¼" or 1 ½" BSPP (ISO 228). Metric thread M45x2 available on request.

**Temperature control, 2 types available:**

1/ Electronic temperature controller with permanent digital display of temperature measured value.

- Temperature display Accuracy: ±1°C (±2°F) ± one digit.
- Temperature range 0 to 120°C (-32+250°F).
- Temperature sensor: NTC
- Display is configurable in degree or tenth of a degree.
- On-off temperature control action (relay output).
- Adjustable differential.
- If the temperature sensor is broken, the output power is cut off and the error is displayed.

2/ Mechanical thermostat, temperature range 30-90°C (85-195°F).

**Enclosure:** extremely robust, in thick PA66, designed for outdoor installation, IP65 and IK10. It also includes:

- A fuse to protect internal circuits (only in electronic version).
- An on- off switch (Built on thermostat shaft on thermostat version).
- A polycarbonate transparent window allowing access to the settings. This window can be secured with seals. This case also includes a separate lid, with independent seals, providing access to electrical connections.

In models with failsafe manual reset limiter, reset can be accessed after opening the window.

**Cable glands:** Located on a removable mounting board, providing easier access for connections, fitted with one M25, PA66, and one more hole for M25, closed by a plastic cap.

**Thermowell:** in standard two thermowells in AISI304, dia.8 × 7mm, 135mm length.

**Electric connections:**

Made on a built-in terminal block, with 5 terminals 6mm² and 5 terminals 2.5mm².

This terminal block is provided with a strap between terminals 1 and 2. By removing this strap, it is possible to connect an additional safety device, a remote control, or a timer.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm² or 10W/cm², other values on request.

**Voltage:** 220-240V single phase only.

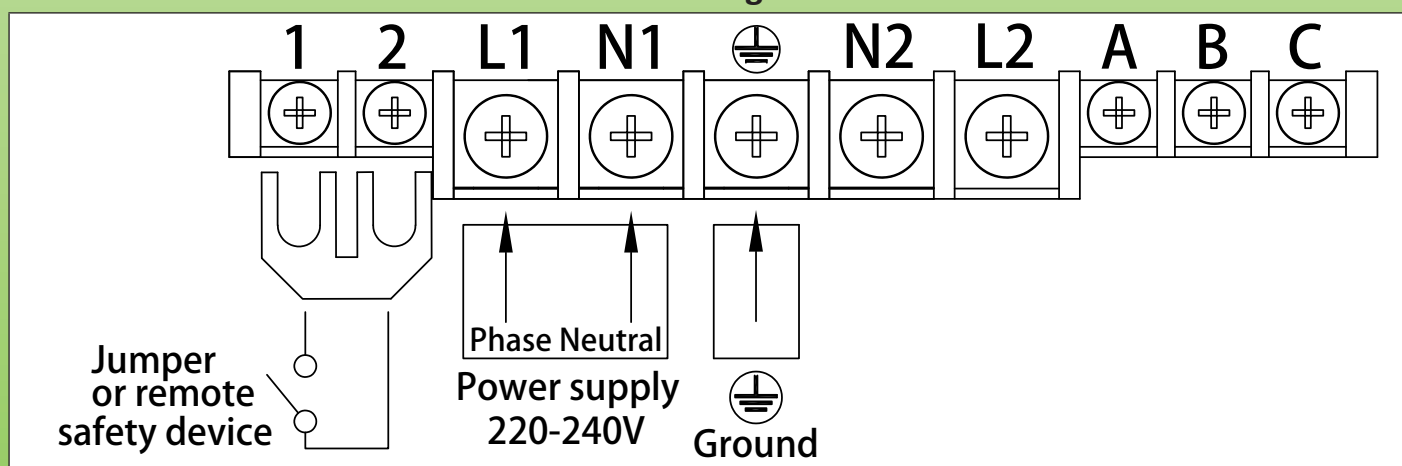
**Standard options:**

Manual reset limiter, preset at: 60°C, 80°C, 100°C, 110°C, 130°C. (140°F, 176°F, 212°F, 230°F, 266°F).

**Variants on request:**

- 30-110°C adjustable thermostat (85-230°F).
- Thermal cut out inside a thermowell.

## Wiring



## Main references with 30-90°C (85-195°F) adjustable thermostat\*

5W/cm²; 1½"\*\*\* brass fitting, without manual reset thermostat.

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              |
|------------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              |
| AISI 304 Reference     | 9STBA5HV010V8170 | 9STBA5HV015V8240 | 9STBA5HV020V8300 | 9STBA5HV030V8440 |
| Incolloy 800 reference | 9STBA5HV010VK170 | 9STBA5HV015VK240 | 9STBA5HV020VK300 | 9STBA5HV030VK440 |



# Immersion heaters with plastic connection box

**10W/cm<sup>2</sup>, 1½"\*\*\* brass fitting, without manual reset thermostat.**

| Power                  | 1kW***           | 1.5kW            | 2kW              | 3kW              |
|------------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              |
| AISI 304 Reference     | 9STBA5HV010B8130 | 9STBA5HV015V8130 | 9STBA5HV020V8170 | 9STBA5HV030V8240 |
| Incolloy 800 reference | 9STBA5HV010BK130 | 9STBA5HV015VK130 | 9STBA5HV020VK170 | 9STBA5HV030VK240 |

**5W/cm<sup>2</sup>, 1½"\*\*\* brass fitting, with manual reset thermostat set at 100°C (212°F)\*\*\*\***

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              |
|------------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              |
| AISI 304 Reference     | 9STBA5HV010V817N | 9STBA5HV015V824N | 9STBA5HV020V830N | 9STBA5HV030V844N |
| Incolloy 800 reference | 9STBA5HV010VK17N | 9STBA5HV015VK24N | 9STBA5HV015VK30N | 9STBA5HV030VK44N |

**10W/cm<sup>2</sup>, 1½"\*\*\* brass fitting, with manual reset thermostat set at 100°C (212°F)\*\*\*\***

| Power                  | 1kW***           | 1.5kW            | 2kW              | 3kW              |
|------------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              |
| AISI 304 Reference     | 9STBA5HV010B813N | 9STBA5HV015V813N | 9STBA5HV020V817N | 9STBA5HV030V824N |
| Incolloy 800 reference | 9STBA5HV010BK13N | 9STBA5HV015VK13N | 9STBA5HV020VK17N | 9STBA5HV030VK24N |

\* Type with electronic temperature control: replace HV by HY in the reference.

\*\* M45x2 brass fitting instead of 1½", replace A5 by A9 in the reference.

\*\*\*: only two heating elements.

\*\*\*\* Manual reset thermostat set at 60°C, 80°C, 110°C, 130°C. (140°F, 176°F, 230°F, 266°F), replace the last character N by E, J, Q, U.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1½"             | M45x200         |
|------------------------------------------------------------------------------------|---------|-----------------|-----------------|
|                                                                                    | Brass   | 9BRR3000ELH303A | 9BRR3000ELH305A |
|                                                                                    | AISI304 | 9BRR3000ELH006A | 9BRR3000ELH049A |
|                                                                                    | AISI316 | 9BRR3000ELH203A | 9BRR3000ELH205A |

### Gaskets

|  | Thread | 1½" - M45x200    |
|-------------------------------------------------------------------------------------|--------|------------------|
|                                                                                     | NBR    | 9BRJ03000ELH205A |
|                                                                                     | Fiber  | 9BRJ03000ELH007A |
|                                                                                     | PTFE   | 9BRJ03000ELH033A |

Other accessories and drawings: see last section of this catalogue



# Section 7

## Immersion heaters with aluminum connection box



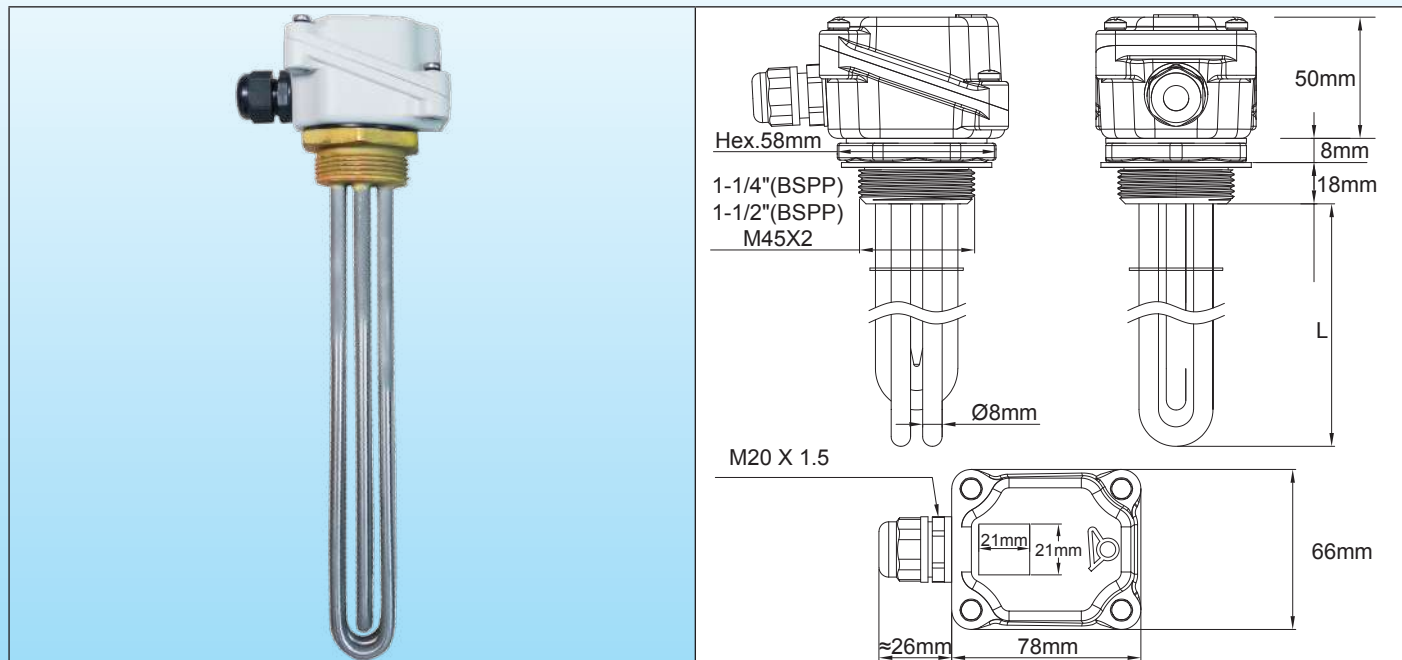


Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice



# Immersion heaters with aluminum connection box

Immersion heater with 78mm × 66mm × 50mm aluminum enclosure.  
1¼", 1½", M45x2 fittings.  
**Type 9ST3**



**Main applications:** liquid heating, hot water circuits, containers and buffer tanks.

These immersions heaters are the smallest with 3 heating elements and aluminum enclosure. There is not enough room inside for thermostat.

They do not have a built-in connection block.

They exist in:

- 6 standard power levels: 1kW – 1.5kW - 2kW - 3kW - 4kW - 6kW.
- 3 types of standard fittings: 1¼", 1½" and M45x2
- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, swiveling on housing, brazed on tubes. (AISI 304 or AISI 316, TIG welded, or brazed, models are available on request). Supplied without gasket and without nut. See accessories below.

**Thread:** 1¼", 1½" BSPP (ISO 228) and metric thread M45x2.

**Enclosure:** 78 × 66 × 50mm, die-cast aluminum, 3mm wall thickness. Silicone foam gasket. Stainless steel cover screws with locking nuts, 2 inner earth terminals M4; Gray epoxy paint RAL7035. Protected against galvanic corrosion.

**Ingress protection class:** Water and dust: IP65; shock resistance: IK 10 (with metal cable gland).

**Cable glands:** M20, PA66. Nickel-plated brass on request.

**Thermowell:** On request.

**Heating elements connections:** terminals with stainless steel screw, nut and stainless steel washer. Switching straps on 3 phases models.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, others values on request.

**Voltage:** 220-240V single phase or three phases 380-400V (Star connection with neutral).

**Variants on request:** TCO inside dia. 10mm pocket, at center of heating elements. (MOQ apply).

## Electric Wiring



Straps position in 220-240V single phase

Straps position in 380-400V 3 phases

# Immersion heaters with aluminum connection box



## Main references

5W/cm<sup>2</sup>, 1½" \* brass fitting.

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 570              | 840              |
| AISI 304 Reference     | 9ST3G5E0010U8170 | 9ST3G5E0015U8240 | 9ST3G5E0020U8300 | 9ST3G5E0030U8440 | 9ST3G5E0040U8570 | 9ST3G5E0060U8840 |
| Incolloy 800 reference | 9ST3G5E0010UK170 | 9ST3G5E0015UK240 | 9ST3G5E0020UK300 | 9ST3G5E0030UK440 | 9ST3G5E0040UK570 | 9ST3G5E0060UK840 |

10W/cm<sup>2</sup>, 1½" \* brass fitting.

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 300              | 440              |
| AISI 304 Reference     | 9ST3G5E0010B8130 | 9ST3G5E0015U8130 | 9ST3G5E0020U8170 | 9ST3G5E0030U8240 | 9ST3G5E0040U8300 | 9ST3G5E0060U8440 |
| Incolloy 800 reference | 9ST3G5E0010BK130 | 9ST3G5E0015UK130 | 9ST3G5E0020UK170 | 9ST3G5E0030UK240 | 9ST3G5E0040UK300 | 9ST3G5E0060UK440 |

\* 1¼" brass fitting instead of 1½", replace G5 by G4 in the reference. M45x2 brass fitting instead of 1½", replace G5 by G9 in the reference.

\*\* This model has only 2 heating elements.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1¼"             | 1½"             | M45x200         |
|------------------------------------------------------------------------------------|---------|-----------------|-----------------|-----------------|
|                                                                                    | Brass   | 9BRR3000ELH302A | 9BRR3000ELH303A | 9BRR3000ELH305A |
|                                                                                    | AISI304 | 9BRR3000ELH032A | 9BRR3000ELH006A | 9BRR3000ELH049A |
|                                                                                    | AISI316 | 9BRR3000ELH202A | 9BRR3000ELH203A | 9BRR3000ELH205A |

### Gaskets

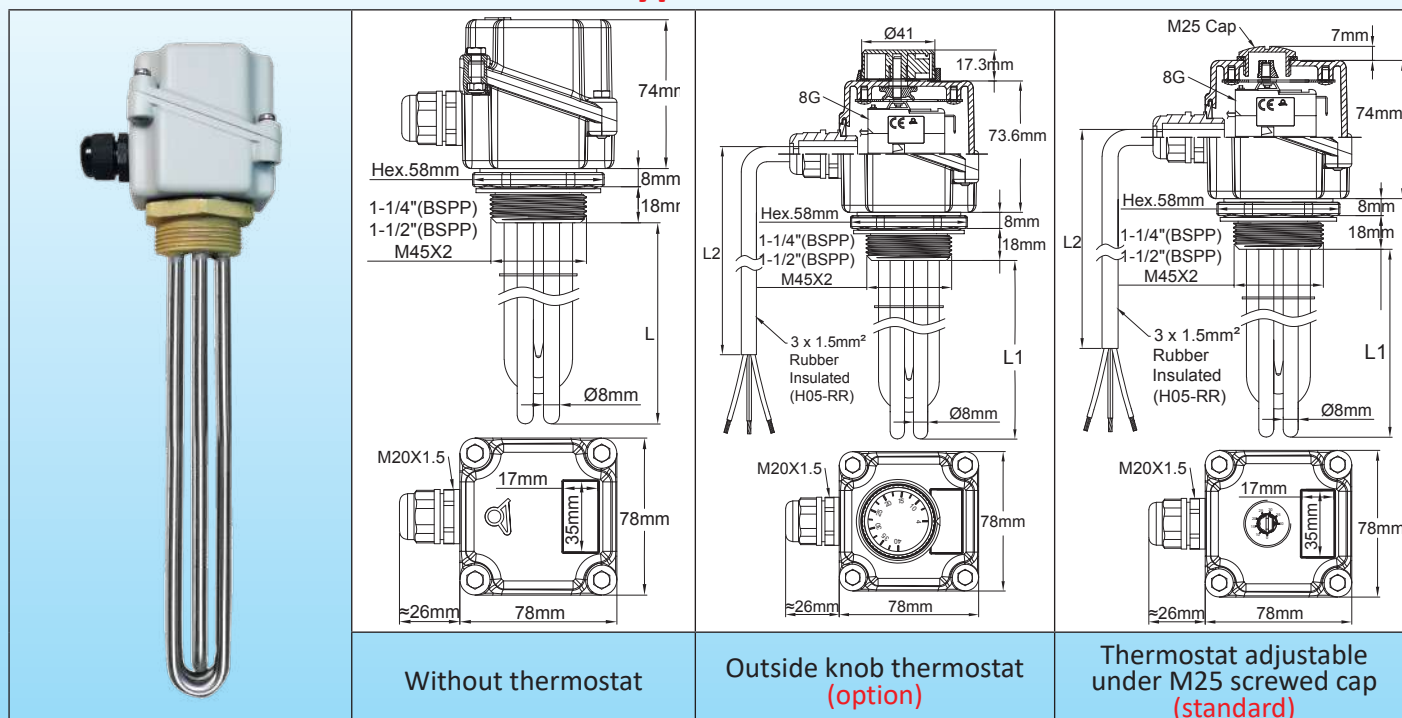
|  | Thread | 1¼"              | 1½" - M45x200    |
|-------------------------------------------------------------------------------------|--------|------------------|------------------|
|                                                                                     | NBR    | 9BRJ03000ELH206A | 9BRJ03000ELH205A |
|                                                                                     | Fiber  | 9BRJ03000ELH052A | 9BRJ03000ELH007A |
|                                                                                     | PTFE   | 9BRJ03000ELH032A | 9BRJ03000ELH033A |

Other accessories and drawings: see last section of this catalogue



# Immersion heaters with aluminum connection box

**Immersion heater with 78mm × 78mm × 74mm aluminum enclosure.  
1¼", 1½", M45x2 fittings. With or without thermostat.  
Type 9ST4**



**Main applications:** liquid heating, hot water circuits, containers and buffer tanks.

**These heaters are the smallest size with aluminum enclosure that can receive an adjustable thermostat. But there is not enough room inside to add a connection block. Therefore, models with thermostats are supplied wired with a 2 meters long rubber insulated cable, 3 × 1.5mm<sup>2</sup>.**

They exist in:

- 6 standard power levels: 1kW – 1.5kW - 2kW - 3kW - 4kW - 6kW.

- (4 and 6kW version does not exist with thermostat).

- 3 types of standard fittings: 1¼", 1½" and M45x2.

- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** Brass, swiveling on housing, brazed on tubes. (AISI 304 or AISI 316, TIG welded, or brazed, models are available on request). Supplied without gasket and without nut. See accessories below.

**Thread:** 1¼", 1½" BSPP (ISO 228) and metric thread M45x2 available on request.

**Enclosure:** 78 × 78 × 74mm, die-cast aluminum, 3mm wall thickness. Silicone foam gasket. Stainless steel cover screws with locking nuts, 2 inner earth terminals M4; Gray epoxy paint RAL7035. Protected against galvanic corrosion.

**Ingress protection class:** Water and dust: IP65; shock resistance: IK 10 (with metal cable glands and M25 metal plug).

**Cable glands:** M20, PA66. Nickel-plated brass on request.

**Thermowell:** They are supplied in standard with one thermowell in AISI304, dia.8 × 7mm, 135mm length, also included on heaters. Supplied without thermostat.

**Heating element connections:** Terminals with stainless steel screw, nut and stainless steel washer. Switching straps on 3 phases models.

**Models with thermostats are made with a wired-in power cord, length 2m.**

**Temperature control:** Models with thermostats can be set from 30 to 90°C (85-195°F). Thermostat knob access is under a M25 cap. External knob on request. Other temperature ranges on request. Models with thermostat are made only in single phase and for power up to 3kW only.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, other values on request.

**Voltage:** 220-240V single phase or three phases 380-400V (Star connection with neutral). 3 phases version cannot be made with a thermostat.

Variants on request:

- One or 2 heating elements only.

- 4-40°C (40-105°F), 0-60°C (32-140°F), or 30-110°C (86-230°F) thermostat.

- Manual reset thermostat.

- One or two pilot lights.

# Immersion heaters with aluminum connection box



## Electric Wiring

|                                                               |                                                                        |                                                           |
|---------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------|
|                                                               |                                                                        |                                                           |
| Straps position in 220-240V single phase (Without thermostat) | Straps position in 220-240V single phase (With single pole thermostat) | Straps position in 380-400V 3 phases (without thermostat) |

## Main references

5W/cm<sup>2</sup>, 1½" brass fitting, **without thermostat.**

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 570              | 840              |
| AISI 304 Reference     | 9ST4G5E1010U8170 | 9ST4G5E1015U8240 | 9ST4G5E1020U8300 | 9ST4G5E1030U8440 | 9ST4G5E1040U8570 | 9ST4G5E1060U8840 |
| Incolloy 800 reference | 9ST4G5E1010UK170 | 9ST4G5E1015UK240 | 9ST4G5E1020UK300 | 9ST4G5E1030UK440 | 9ST4G5E1040UK570 | 9ST4G5E1060UK840 |

10W/cm<sup>2</sup>, 1½" brass fitting, **without thermostat.**

| Power                  | 1kW***           | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 300              | 440              |
| AISI 304 Reference     | 9ST4G5E1010B8130 | 9ST4G5E1015U8130 | 9ST4G5E1020U8170 | 9ST4G5E1030U8240 | 9ST4G5E1040U8300 | 9ST4G5E1060U8440 |
| Incolloy 800 reference | 9ST4G5E1010BK130 | 9ST4G5E1015UK130 | 9ST4G5E1020UK170 | 9ST4G5E1030UK240 | 9ST4G5E1040UK300 | 9ST4G5E1060UK440 |

5W/cm<sup>2</sup>, 1½" brass fitting, **with 30-90°C (85-195°F) thermostat, adjustment under M25 cap**

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW                           | 6kW |
|------------------------|------------------|------------------|------------------|------------------|-------------------------------|-----|
| Length (mm)            | 170              | 240              | 300              | 440              | Not available with thermostat |     |
| AISI 304 Reference     | 9ST4G5NS010V8170 | 9ST4G5NS015V8240 | 9ST4G5NS020V8300 | 9ST4G5NS030V8440 |                               |     |
| Incolloy 800 reference | 9ST4G5NS010VK170 | 9ST4G5NS015VK240 | 9ST4G5NS020VK300 | 9ST4G5NS030VK440 |                               |     |

10W/cm<sup>2</sup>, 1½" brass fitting, **with 30-90°C (85-195°F) thermostat, adjustment under M25 cap**

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 4kW                           | 6kW |
|------------------------|------------------|------------------|------------------|------------------|-------------------------------|-----|
| Length (mm)            | 135              | 135              | 170              | 240              | Not available with thermostat |     |
| AISI 304 Reference     | 9ST4G5NS010B8130 | 9ST4G5NS015V8130 | 9ST4G5NS020V8170 | 9ST4G5NS030V8240 |                               |     |
| Incolloy 800 reference | 9ST4G5NS010BK130 | 9ST4G5NS015VK130 | 9ST4G5NS020VK170 | 9ST4G5NS030VK240 |                               |     |

\* 1½" brass fitting instead of 1½", replace G5 by G4 in the reference. M45x2 brass fitting instead of 1½", replace G5 by G9 in the reference.

\*\* This model has only 2 heating elements.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1½"             | 1½"             | M45x200         |
|--|---------|-----------------|-----------------|-----------------|
|  | Brass   | 9BRR3000ELH302A | 9BRR3000ELH303A | 9BRR3000ELH305A |
|  | AISI304 | 9BRR3000ELH032A | 9BRR3000ELH006A | 9BRR3000ELH049A |
|  | AISI316 | 9BRR3000ELH020A | 9BRR3000ELH020A | 9BRR3000ELH020A |

### Gaskets

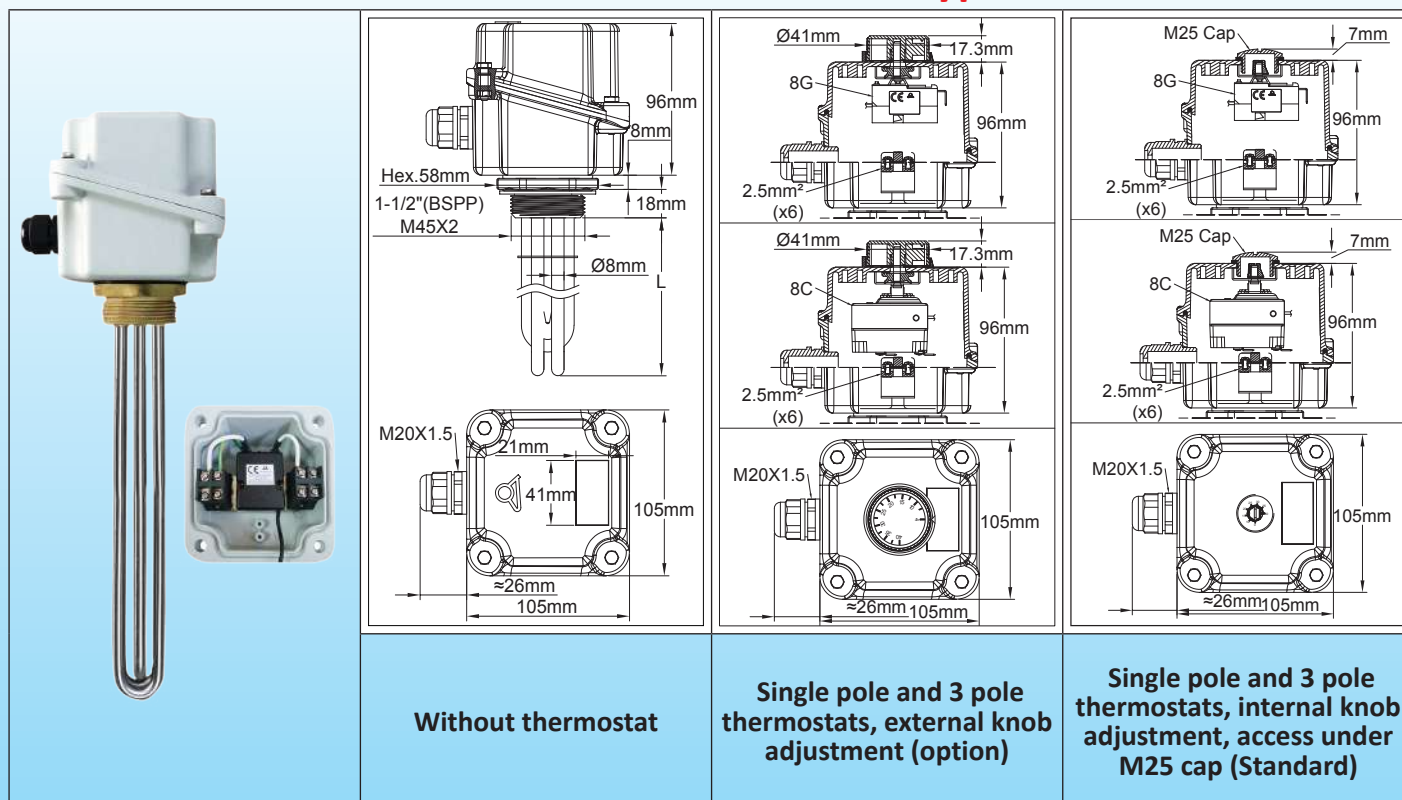
|  | Thread | 1½"              | 1½" - M45x200    |
|--|--------|------------------|------------------|
|  | NBR    | 9BRJ03000ELH206A | 9BRJ03000ELH205A |
|  | Fiber  | 9BRJ03000ELH052A | 9BRJ03000ELH007A |
|  | PTFE   | 9BRJ03000ELH032A | 9BRJ03000ELH033A |

Other accessories and drawings: see last section of this catalogue.



# Immersion heaters with aluminum connection box

## Standard immersion heater with aluminum enclosure, 105 × 105 × 96mm, with and without thermostat. Type 9ST5



**Main applications:** liquid heating, hot water circuits, containers and buffer tanks.

These heaters with that box size are the most used because they can receive many accessories such as thermostats, limiters, pilot lights etc., with a relatively small footprint.

They exist in:

- 6 standard power levels: 1kW – 1.5kW - 2kW - 3kW - 4kW - 6kW.

- 3 types of standard fittings: 1½"; 1½"; M45x2.

- 2 types of surface load density: 5W/cm² and 10W/cm². See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, swiveling on housing, brazed on tubes. (AISI 304 or AISI 316, TIG welded, or brazed, models are available on request). Supplied without gasket and without nut. See accessories below.

**Thread:** 1½"; 1½" BSP (ISO 228); M45x2.

**Temperature control:** single pole or 3 pole thermostat, 30-90°C (85-195°F). Other temperature ranges in option.

**Enclosure:** 105 × 105 × 96mm, die-cast aluminum, 3mm wall thickness. Silicone foam gasket. Stainless steel cover screws with locking nuts, 2 inner earth terminals M4; Gray epoxy paint RAL7035. Protected against galvanic corrosion.

**Ingress protection class:** Water and dust: IP65; shock resistance: IK 10 (with metal cable glands and M25 metal plug).

**Cable glands:** M20, PA66. Nickel-plated brass on request.

**Thermowell:** in standard on thermowell in AISI304, dia. 8 × 7mm, also for models supplied without thermostat.

**Electrical connections:** tubular heater terminals with stainless steel screw, nut and stainless steel washer. Switching straps on 3 phases models.

Models with thermostats have a built-in connection block, 3 × 2.5mm² for single phase units and 5 × 2.5mm² for 3 phases units. One more M4 grounding terminal available.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm² or 10W/cm², other values on request.

**Voltage:** 220-240V single phase or three phases 380-400V (Star connection with neutral).

**Standard options:**

- 230V single phase thermostat for power up to 3kW. 3 phases thermostat for 4kW and 6kW models.

**Variants on request:**

- External thermostat knob, with waterproof shaft gasket.

- 4-40°C (40-105°F), 0-60°C (32-140°F), or 30-110°C (86-230°F) thermostat.

- Additional cable gland output for electronic control sensor.

- It is possible to deliver these devices with one or two pilot lights and a power cord.

- These heaters can be assembled with fittings having threads up to 2½" or M77x200, and 10mm dia. heating tubes.

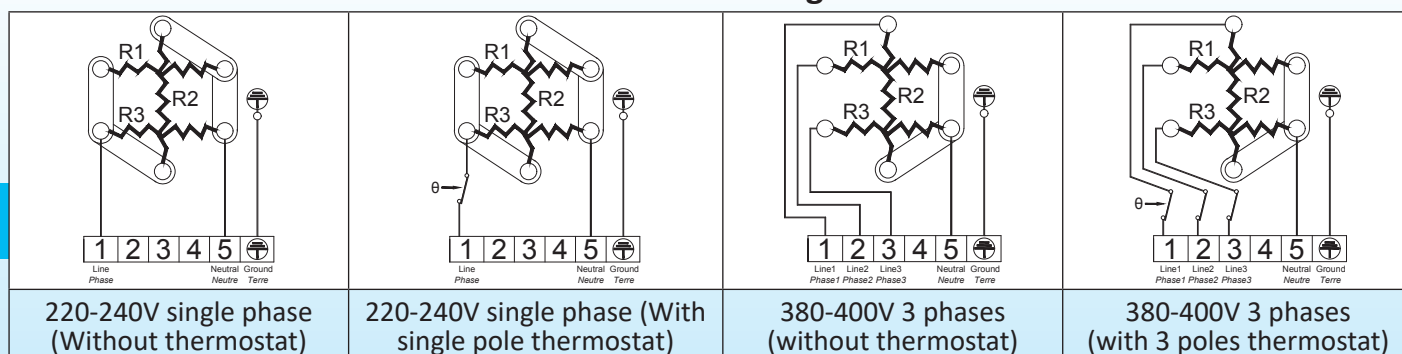
Contact us for feasibility.



# Immersion heaters with aluminum connection box



## Electric Wiring



## Main references

5W/cm<sup>2</sup>; 1½" \*\* brass fitting, without thermostat.

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 570              | 840              |
| AISI 304 Reference     | 9ST5G5E1010U8170 | 9ST5G5E1015U8240 | 9ST5G5E1020U8300 | 9ST5G5E1030U8440 | 9ST5G5E1040U8570 | 9ST5G5E1060U8840 |
| Incolloy 800 reference | 9ST5G5E1010UK170 | 9ST5G5E1015UK240 | 9ST5G5E1020UK300 | 9ST5G5E1030UK440 | 9ST5G5E1040UK570 | 9ST5G5E1060UK840 |

10W/cm<sup>2</sup>, 1½" \* brass fitting, without thermostat.

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 300              | 440              |
| AISI 304 Reference     | 9ST5G5E1010B8130 | 9ST5G5E1015U8130 | 9ST5G5E1020U8170 | 9ST5G5E1030U8240 | 9ST5G5E1040U8300 | 9ST5G5E1060U8440 |
| Incolloy 800 reference | 9ST5G5E1010BK130 | 9ST5G5E1015UK130 | 9ST5G5E1020UK170 | 9ST5G5E1030UK240 | 9ST5G5E1040UK300 | 9ST5G5E1060UK440 |

5W/cm<sup>2</sup>, 1½" \* brass fitting, with 30-90°C (86-195°F) thermostat, adjustment under M25 cap (single phase up to 3kW, 3 phases for 4kW and 6kW models)

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 570              | 840              |
| AISI 304 Reference     | 9ST5G5ES010V8170 | 9ST5G5ES015V8240 | 9ST5G5ES020V8300 | 9ST5G5ES030V8440 | 9ST5G5ES040U8570 | 9ST5G5ES060U8840 |
| Incolloy 800 reference | 9ST5G5ES010VK170 | 9ST5G5ES015VK240 | 9ST5G5ES015VK300 | 9ST5G5ES030VK440 | 9ST5G5ES040UK570 | 9ST5G5ES060UK840 |

10W/cm<sup>2</sup>, 1½" \* brass fitting, with 30-90°C (86-195°F) thermostat, adjustment under M25 cap (single phase up to 3kW, 3 phases for 4kW and 6kW models)

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 300              | 440              |
| AISI 304 Reference     | 9ST5G5ES010B8130 | 9ST5G5ES015V8130 | 9ST5G5ES020V8170 | 9ST5G5ES030V8240 | 9ST5G5ES040U8300 | 9ST5G5ES060U8440 |
| Incolloy 800 reference | 9ST5G5ES010BK130 | 9ST5G5ES015VK130 | 9ST5G5ES020VK170 | 9ST5G5ES030VK240 | 9ST5G5ES040UK300 | 9ST5G5ES060UK440 |

\* 1½" brass fitting instead of 1½", replace G5 by G4 in the reference. M45x2 brass fitting instead of 1½", replace G5 by G9 in the reference.

\*\* This model has only 2 heating elements.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

| Thread  | 1½"              | 1½"              | M45x200          |
|---------|------------------|------------------|------------------|
| Brass   | 9BRRA3000ELH302A | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
| AISI304 | 9BRRA3000ELH032A | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
| AISI316 | 9BRRA3000ELH202A | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

### Gaskets

| Thread | 1½"              | 1½" - M45x200    |
|--------|------------------|------------------|
| NBR    | 9BRJ03000ELH206A | 9BRJ03000ELH205A |
| Fiber  | 9BRJ03000ELH052A | 9BRJ03000ELH007A |
| PTFE   | 9BRJ03000ELH032A | 9BRJ03000ELH033A |

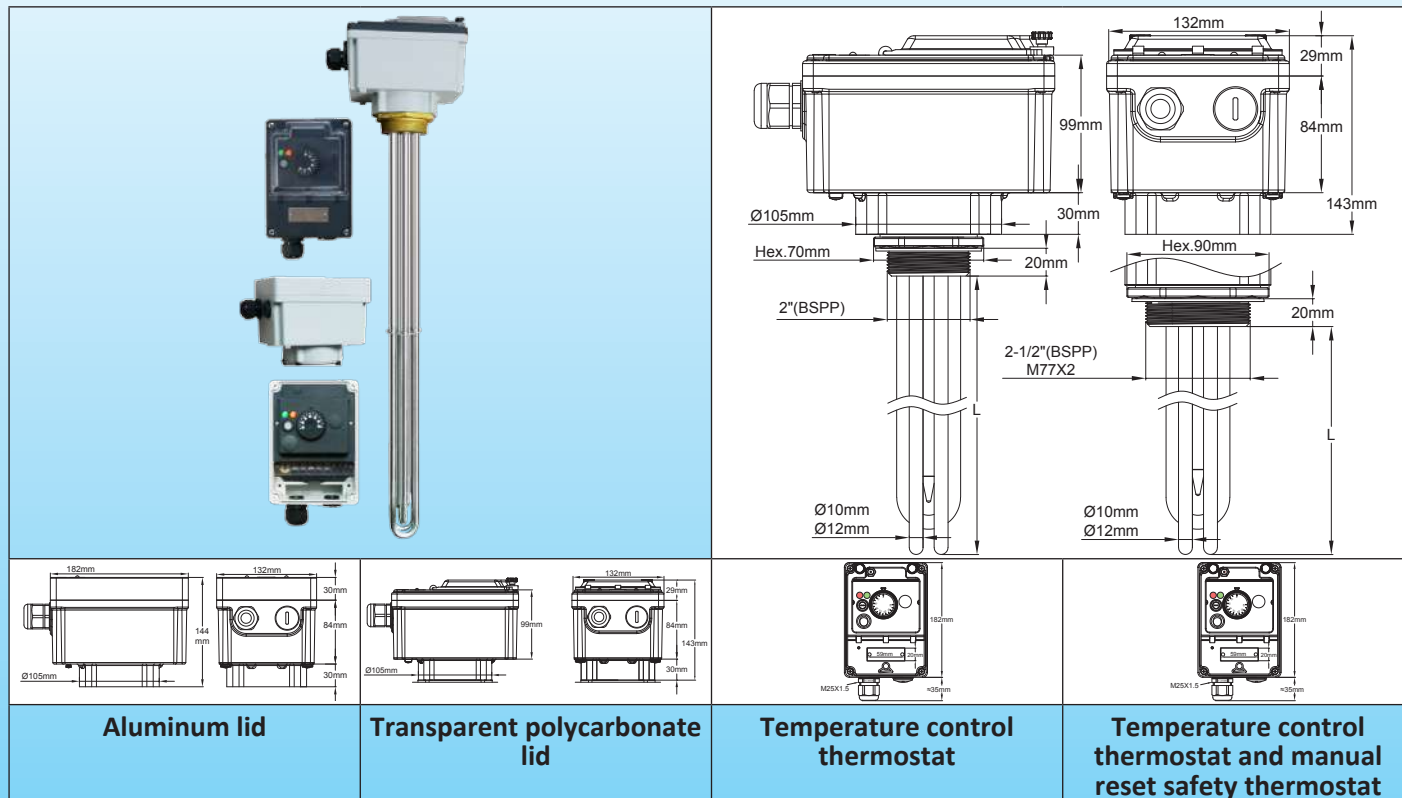
Other accessories and drawings: see last section of this catalogue.



# Immersion heaters with aluminum connection box

Immersion heaters with 182mm × 130mm × 144mm aluminum and plastic enclosure. Fittings from 2" to M77x2. With mechanical thermostat. With or without manual reset thermostat. Power up to 21kW with built-in power relay. Heating elements dia. 10 and 12mm.

## Type 9STP



**Main applications:** Industrial liquid heating, hot water circuits, containers and buffer tanks.

These heaters with aluminum enclosure are designed for industrial applications of medium power in three-phase, which require the use of contactors. They can receive one power relay, 3 poles 32A resistive. They exist only with thermostat temperature control. The enclosure lid may be transparent polycarbonate or aluminum.

They are equipped with a device that allows adjusting the enclosure position after tightening of the fitting.

They can be made in:

- 6 standard power levels: 6kW; 9kW; 12kW; 15kW; 18kW; 21kW.
- 3 types of standard fittings with dia. 10mm heating elements: 2", 2½" and M77x2
- 2 types of standard fittings with dia. 12mm heating elements: 2½"; M77x2
- 2 types of surface load density: 5W/cm² and 10W/cm². See technical introduction to optimize the surface load.

**Heater tube material:** 3 heating elements, dia.10mm or 12mm, AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, swiveling on housing, brazed on tubes. Supplied without gasket and without nut. See accessories below.

**Thread:**

- Dia. 10mm heating elements: 2", 2½" and M77x2
- Dia. 12mm heating elements: 2½"; M77x2

**Temperature control:**

Mechanical thermostat, temperature range 30-90°C (85-195°F). Other ranges available.

**Enclosure:** Extremely robust, die-cast aluminum, 3mm wall thickness. Silicone foam gasket. Stainless steel cover screws with locking nuts. Gray epoxy paint RAL7035. Protected against galvanic corrosion. Designed for outdoor installation, IP65 and IK10. It also includes:

- A fuse to protect internal circuits
- An illuminated on- off switch
- A pilot light for power supply and a pilot light for power output.

There are 2 models of covers:

- **PA66 lid**, with a polycarbonate transparent window allowing access to the settings. This window can be secured with seals. This case also includes a separate lid, with independent seals, providing access to electrical connections. In models with failsafe manual reset limiter, reset can be accessed after opening the window.



# Immersion heaters with aluminum connection box

- **Aluminum lid.** This model provides access to settings only after removing the cover. It is convenient for industrial applications that do not request frequent changes in settings.

**Cable glands:** One M25, PA66, and one more hole for M25, closed by a plastic cap.

**Thermowell:** in standard two thermowells in AISI304, dia.8 × 7mm.

**Electric connections:**

Made on a built-in terminal block, with 6 terminals 10mm<sup>2</sup> and 2 terminals 2.5mm<sup>2</sup>.

This terminal block is provided with a strap between terminals 1 and 2. By removing this strap, it is possible to connect an additional safety device, a remote control, or a timer.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, other values on request.

**Voltage:** 380-400V, three phases with neutral only.

**Standard options:**

Plastic cover with transparent polycarbonate window.

Aluminum cover.

**Variants on request:**

- 4-40°C (40-105°F) adjustable thermostat, manual reset at 60°C (140°F).

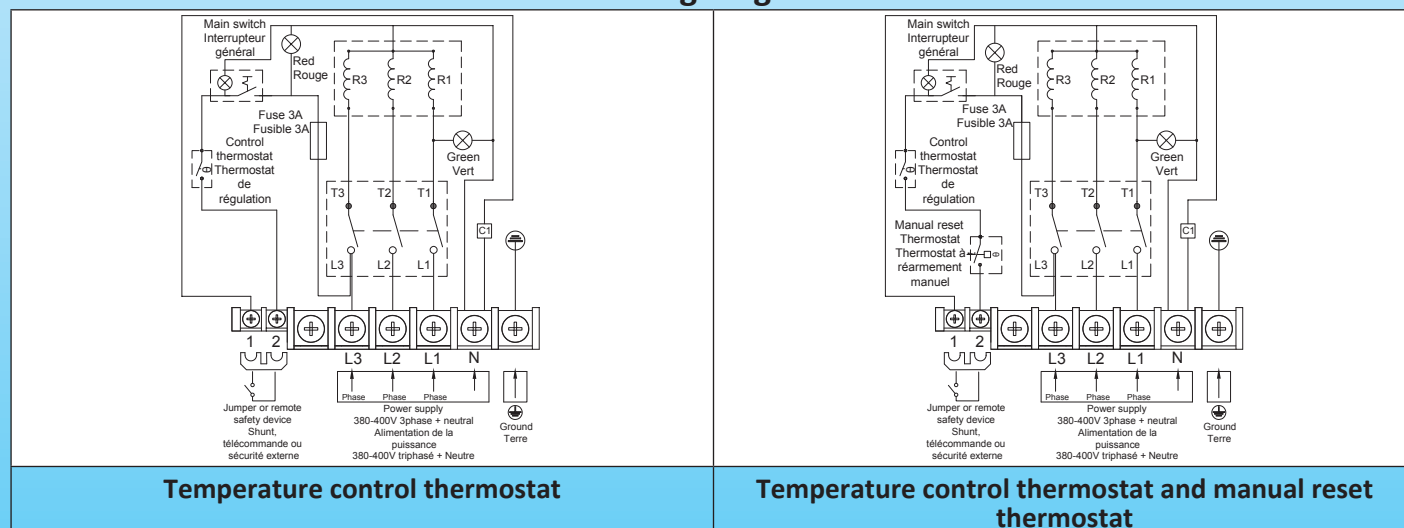
- 0-60°C (32-140°F), adjustable thermostat, manual reset at 80°C (176°F).

- 30-110°C (85-230°F) adjustable thermostat, manual reset at 130°C (266°F).

- Thermal cut out inside a thermowell.

It is also possible to produce models with digital electronic control. Ask our commercial department.

## Wiring diagram



## Main references with transparent polycarbonate window\*

5W/cm<sup>2</sup>; 2½"\*\*\* brass fitting, without manual reset thermostat.

| Heating element diameter | Dia. 10mm heating elements |                  | Dia. 12mm heating elements |                  |
|--------------------------|----------------------------|------------------|----------------------------|------------------|
| Power                    | 6kW                        | 9kW              | 12kW                       | 15kW             |
| Length (mm)              | 660                        | 980              | 1100                       | 1350             |
| AISI 304 Reference       | 9STPD7QV060C1660           | 9STPD7QV090C1980 | 9STPD7QV120C2K00           | 9STPD7QV150C2O50 |
| Incolloy 800 reference   | 9STPD7QV060CL660           | 9STPD7QV090CL980 | 9STPD7QV120CMK00           | 9STPD7QV150CMO50 |

10W/cm<sup>2</sup>, 2½"\*\*\* brass fitting, without manual reset thermostat.

| Heating element diameter | Dia. 10mm heating elements |                  |                  | Dia. 12mm heating elements |                  |                  |
|--------------------------|----------------------------|------------------|------------------|----------------------------|------------------|------------------|
| Power                    | 6kW                        | 9kW              | 12kW             | 15kW                       | 18kW             | 21kW             |
| Length (mm)              | 350                        | 500              | 650              | 680                        | 810              | 950              |
| AISI 304 Reference       | 9STPD7QV060C1350           | 9STPD7QV090C1500 | 9STPD7QV120C1650 | 9STPD7QV150C2680           | 9STPD7QV180C2810 | 9STPD7QV210C2950 |
| Incolloy 800 reference   | 9STPD7QV060CL350           | 9STPD7QV090CL500 | 9STPD7QV120CL650 | 9STPD7QV150CM680           | 9STPD7QV180CM810 | 9STPD7QV210CM950 |

5W/cm<sup>2</sup>, 2½"\*\*\* brass fitting, with manual reset thermostat set at 100°C (212°F)\*\*\*

| Heating element diameter | Dia. 10mm heating elements |                  | Dia. 12mm heating elements |                  |
|--------------------------|----------------------------|------------------|----------------------------|------------------|
| Power                    | 6kW                        | 9kW              | 12kW                       | 15kW             |
| Length (mm)              | 660                        | 980              | 1100                       | 1350             |
| AISI 304 Reference       | 9STPD7QV060C166N           | 9STPD7QV090C198N | 9STPD7QV120C2K0N           | 9STPD7QV150C2O5N |
| Incolloy 800 reference   | 9STPD7QV060CL66N           | 9STPD7QV090CL98N | 9STPD7QV120CMK00           | 9STPD7QV150CMO5N |



# Immersion heaters with aluminum connection box

**10W/cm<sup>2</sup>, 2½" \* brass fitting, with manual reset thermostat set at 100°C (212°F) \*\***

| Heating element diameter | Dia. 10mm heating elements |                  |                  | Dia. 12mm heating elements |                  |                  |
|--------------------------|----------------------------|------------------|------------------|----------------------------|------------------|------------------|
| Power                    | 6kW                        | 9kW              | 12kW             | 15kW                       | 18kW             | 21kW             |
| Length (mm)              | 350                        | 500              | 650              | 680                        | 810              | 950              |
| AISI 304 Reference       | 9STPD7QV060C135N           | 9STPD7QV090C150N | 9STPD7QV120C165N | 9STPD7QV150C268N           | 9STPD7QV180C281N | 9STPD7QV210C295N |
| Incolloy 800 reference   | 9STPD7QV060CL35N           | 9STPD7QV090CL50N | 9STPD7QV120CL65N | 9STPD7QV150CM68N           | 9STPD7QV180CM81N | 9STPD7QV210CM95N |

\* For plain aluminum cover, replace TPD by TPG in the reference.

\*\* 2" brass fitting instead of 2½", replace D7 by D6 in the reference. (Only possible on dia. 10mm heating elements)

M77x2 brass fitting instead of 2½", replace D7 by D8 in the reference. (Possible on dia. 10mm and dia. 12mm heating elements).

\*\*\* Manual reset thermostat set at 60°C, 80°C, 110°C, 130°C. (140°F, 176°F, 230°F, 266°F), replace the last character N by E, J, Q, U.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 2"               | 2½"              | M77x2            |
|-----------------------------------------------------------------------------------|---------|------------------|------------------|------------------|
|                                                                                   | Brass   | 9BRRA3000ELH304A | 9BRRA3000ELH314A | 9BRRA3000ELH306A |
|                                                                                   | AISI304 | 9BRRA3000ELH348A | 9BRRA3000ELH142A | 9BRRA3000ELH150A |
|                                                                                   | AISI316 | 9BRRA3000ELH204A | 9BRRA3000ELH214A | 9BRRA3000ELH206A |

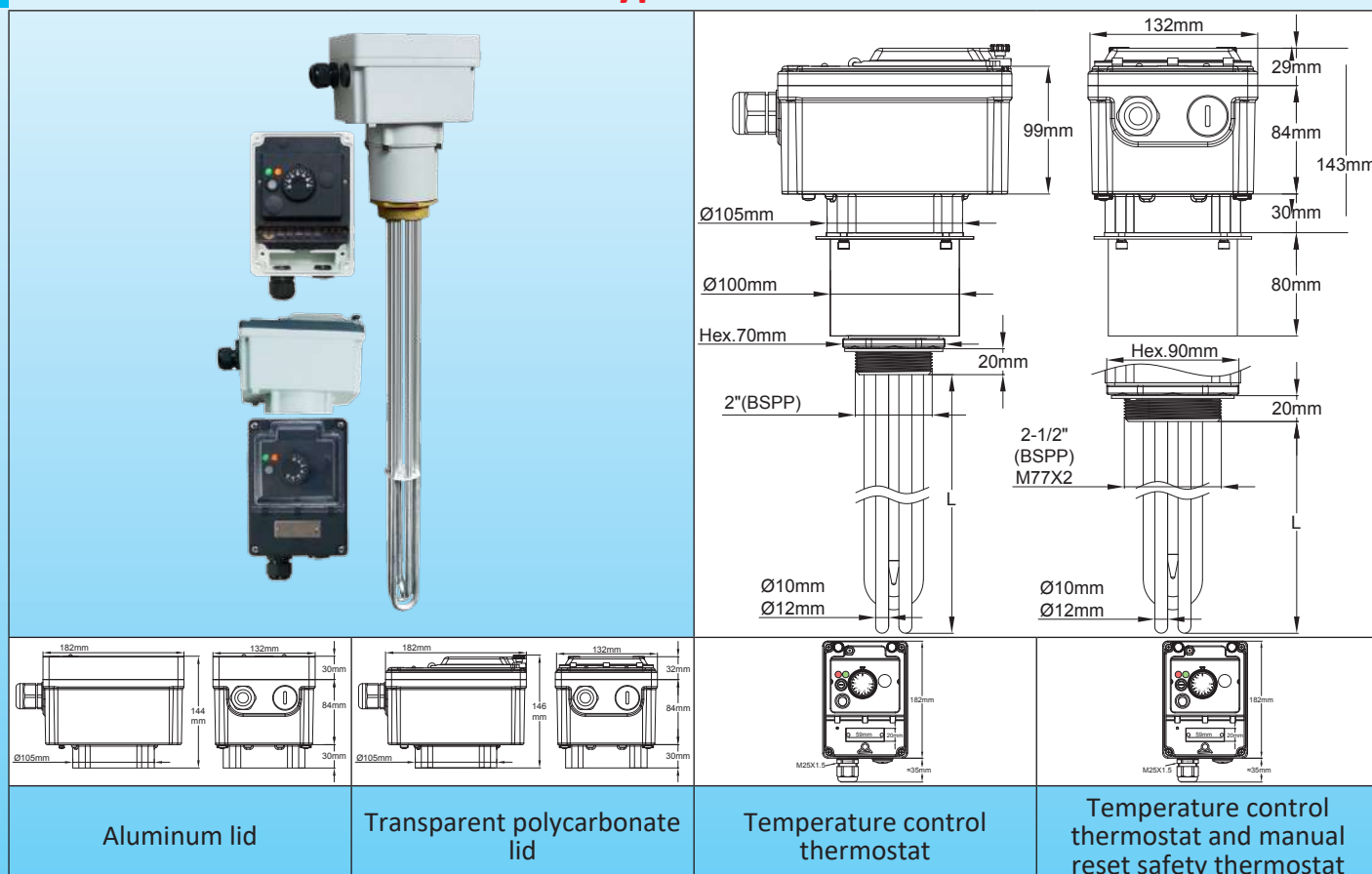
### Gaskets

|  | Thread | 2"               | 2½" - M77x2      |
|-----------------------------------------------------------------------------------|--------|------------------|------------------|
|                                                                                   | NBR    | 9BRJ03000ELH203A | 9BRJ03000ELH201A |
|                                                                                   | Fiber  | 9BRJ03000ELH028A | 9BRJ03000ELH030A |
|                                                                                   | PTFE   | 9BRJ03000ELH034A | 9BRJ03000ELH036A |

# Immersion heaters with aluminum connection box

Immersion heaters with 182mm × 130mm × 224mm aluminum and plastic enclosure, or full aluminum enclosure, with 80mm offset. Fittings from 2" to M77x2. With mechanical thermostat. With or without manual reset thermostat. Power up to 21kW with built-in power relay. Heating elements dia. 10 and 12mm.

## Type 9STN



**Main applications:** Industrial liquid heating, hot water circuits, containers and buffer tanks.

These heaters with aluminum enclosure are designed for industrial applications of medium power in three-phase, which require the use of contactors. They can receive one power relay, 3 poles 32A resistive. They exist only with thermostat temperature control. The enclosure lid may be transparent polycarbonate or aluminum. They are equipped with a device that allows adjusting the enclosure position after tightening of the fitting.

The enclosure has a 80mm offset to go through thick thermal insulation.

They can be made in:

- 6 standard power levels: 6kW; 9kW; 12kW; 15kW; 18kW; 21kW.
- 3 types of standard fittings with dia. 10mm heating elements: 2", 2½" and M77x2
- 2 types of standard fittings with dia. 12mm heating elements: 2½"; M77x2
- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 3 heating elements, dia.10mm or 12mm, AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, swiveling on housing, brazed on tubes. Supplied without gasket and without nut. See accessories below.

**Thread:**

- Dia. 10mm heating elements: 2", 2½" and M77x2
- Dia. 12mm heating elements: 2½"; M77x2

**Temperature control:**

Mechanical thermostat, temperature range 30-90°C (85-195°F). Other ranges available.

**Enclosure:** Extremely robust, die-cast aluminum, 3mm wall thickness. Silicone foam gasket. Stainless steel cover screws with locking nuts. Gray epoxy paint RAL7035. Protected against galvanic corrosion. Designed for outdoor installation, IP65 and IK10. It also includes:





# Immersion heaters with aluminum connection box

- A fuse to protect internal circuits
- An illuminated on- off switch
- A pilot light for power supply and a pilot light for power output.

There are 2 models of covers:

- **A PA66 cover** with a polycarbonate transparent window allowing access to the settings. This window can be secured with seals. This case also includes a separate lid, with independent seals, providing access to electrical connections. In models with failsafe manual reset limiter, reset can be accessed after opening the window.

- **An aluminum cover.** This model provides access to settings only after removing the cover. It is convenient for industrial applications that do not request frequent changes in settings.

**Cable glands:** One M25, PA66, and one more hole for M25, closed by a plastic cap.

**Thermowell:** in standard two thermowells in AISI304, dia.8 × 7mm.

**Electric connections:**

Built-in terminal block, with 6 terminals 10mm<sup>2</sup> and 2 terminals 2.5mm<sup>2</sup>.

This terminal block is provided with a strap between terminals 1 and 2. By removing this strap, it is possible to connect an additional safety device, a remote control, or a timer.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** Standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, other values on request.

**Voltage:** 380-400V, three phases with neutral only.

**Standard options:**

Plastic cover with transparent polycarbonate window.

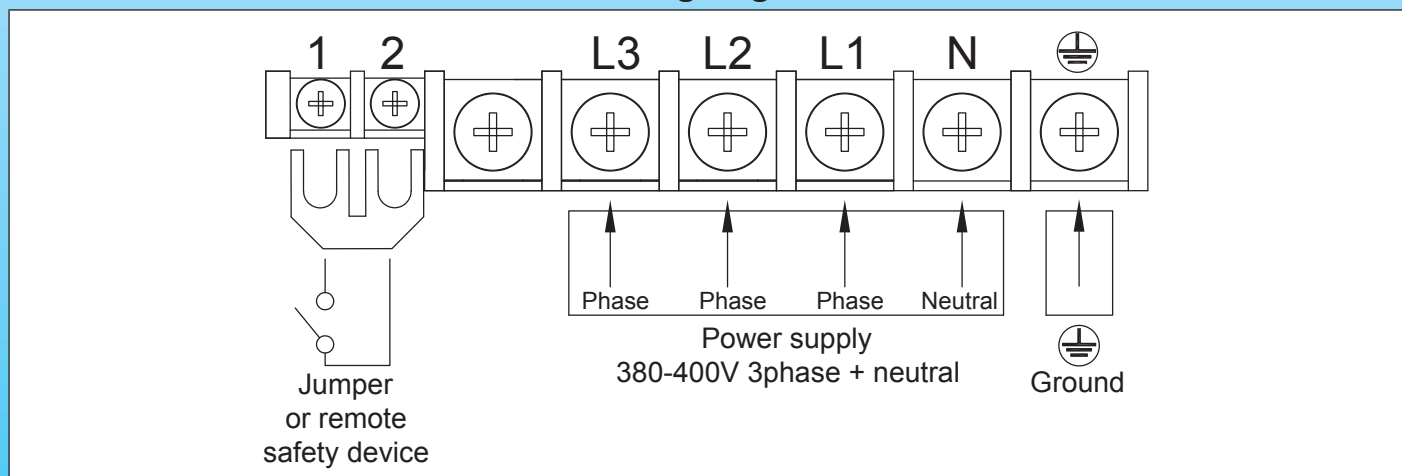
Aluminum cover.

**Variants on request:**

- 4-40°C (40-105°F) adjustable thermostat, manual reset at 60°C (140°F).
- 0-60°C (32-140°F), adjustable thermostat, manual reset at 80°C (176°F).
- 30-110°C (85-230°F) adjustable thermostat, manual reset at 130°C (266°F).
- Thermal cut out inside a thermowell.

It is also possible to produce models with digital electronic control. Ask our commercial department.

## Wiring diagram



## Main references with transparent polycarbonate window\*

5W/cm<sup>2</sup>; 2½"\*\*\* brass fitting, without manual reset thermostat.

| Heating element diameter | Dia. 10mm heating elements |                  | Dia. 12mm heating elements |                  |
|--------------------------|----------------------------|------------------|----------------------------|------------------|
| Power                    | 6kW                        | 9kW              | 12kW                       | 15kW             |
| Length (mm)              | 660                        | 980              | 1100                       | 1350             |
| AISI 304 Reference       | 9STND7QV060C1660           | 9STND7QV090C1980 | 9STND7QV120C2K00           | 9STND7QV150C2O50 |
| Incolloy 800 reference   | 9STND7QV060CL660           | 9STND7QV090CL980 | 9STND7QV120CMK00           | 9STND7QV150CMO50 |

10W/cm<sup>2</sup>, 2½"\*\*\* brass fitting, without manual reset thermostat.

| Heating element diameter | Dia. 10mm heating elements |                  |                  | Dia. 12mm heating elements |                  |                  |
|--------------------------|----------------------------|------------------|------------------|----------------------------|------------------|------------------|
| Power                    | 6kW                        | 9kW              | 12kW             | 15kW                       | 18kW             | 21kW             |
| Length (mm)              | 350                        | 500              | 650              | 680                        | 810              | 950              |
| AISI 304 Reference       | 9STND7QV060C1350           | 9STND7QV090C1500 | 9STND7QV120C1650 | 9STND7QV150C2680           | 9STND7QV180C2810 | 9STND7QV210C2950 |
| Incolloy 800 reference   | 9STND7QV060CL350           | 9STND7QV090CL500 | 9STND7QV120CL650 | 9STND7QV150CM680           | 9STND7QV180CM810 | 9STND7QV210CM950 |





# Immersion heaters with aluminum connection box

**5W/cm<sup>2</sup>, 2½" brass fitting, with manual reset thermostat set at 100°C (212°F)\*\***

| Heating element diameter | Dia. 10mm heating elements |                  | Dia. 12mm heating elements |                  |
|--------------------------|----------------------------|------------------|----------------------------|------------------|
| Power                    | 6kW                        | 9kW              | 12kW                       | 15kW             |
| Length (mm)              | 660                        | 980              | 1100                       | 1350             |
| AISI 304 Reference       | 9STND7QV060C166N           | 9STND7QV090C198N | 9STND7QV120C2K0N           | 9STND7QV150C2O5N |
| Incolloy 800 reference   | 9STND7QV060CL66N           | 9STND7QV090CL98N | 9STND7QV120CMK00           | 9STND7QV150CMO5N |

**10W/cm<sup>2</sup>, 2½" brass fitting, with manual reset thermostat set at 100°C (212°F)\*\***

| Heating element diameter | Dia. 10mm heating elements |                  |                  | Dia. 12mm heating elements |                  |                  |
|--------------------------|----------------------------|------------------|------------------|----------------------------|------------------|------------------|
| Power                    | 6kW                        | 9kW              | 12kW             | 15kW                       | 18kW             | 21kW             |
| Length (mm)              | 350                        | 500              | 650              | 680                        | 810              | 950              |
| AISI 304 Reference       | 9STND7QV060C135N           | 9STND7QV090C150N | 9STND7QV120C165N | 9STND7QV150C268N           | 9STND7QV180C281N | 9STND7QV210C295N |
| Incolloy 800 reference   | 9STND7QV060CL35N           | 9STND7QV090CL50N | 9STND7QV120CL65N | 9STND7QV150CM68N           | 9STND7QV180CM81N | 9STND7QV210CM95N |

\* For plain aluminum cover, replace TND by TNG in the reference.

\*\* 2" brass fitting instead of 2½", replace D7 by D6 in the reference. (Only possible on dia. 10mm heating elements)

M77x2 brass fitting instead of 2½", replace D7 by D8 in the reference. (Possible on dia. 10mm and dia. 12mm heating elements).

\*\*\* Manual reset thermostat set at 60°C, 80°C, 110°C, 130°C. (140°F, 176°F, 230°F, 266°F), replace the last character N by E, J, Q, U.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 2"               | 2½"              | M77x2            |
|-----------------------------------------------------------------------------------|---------|------------------|------------------|------------------|
|                                                                                   | Brass   | 9BRRA3000ELH304A | 9BRRA3000ELH314A | 9BRRA3000ELH306A |
|                                                                                   | AISI304 | 9BRRA3000ELH348A | 9BRRA3000ELH142A | 9BRRA3000ELH150A |
|                                                                                   | AISI316 | 9BRRA3000ELH204A | 9BRRA3000ELH214A | 9BRRA3000ELH206A |

### Gaskets

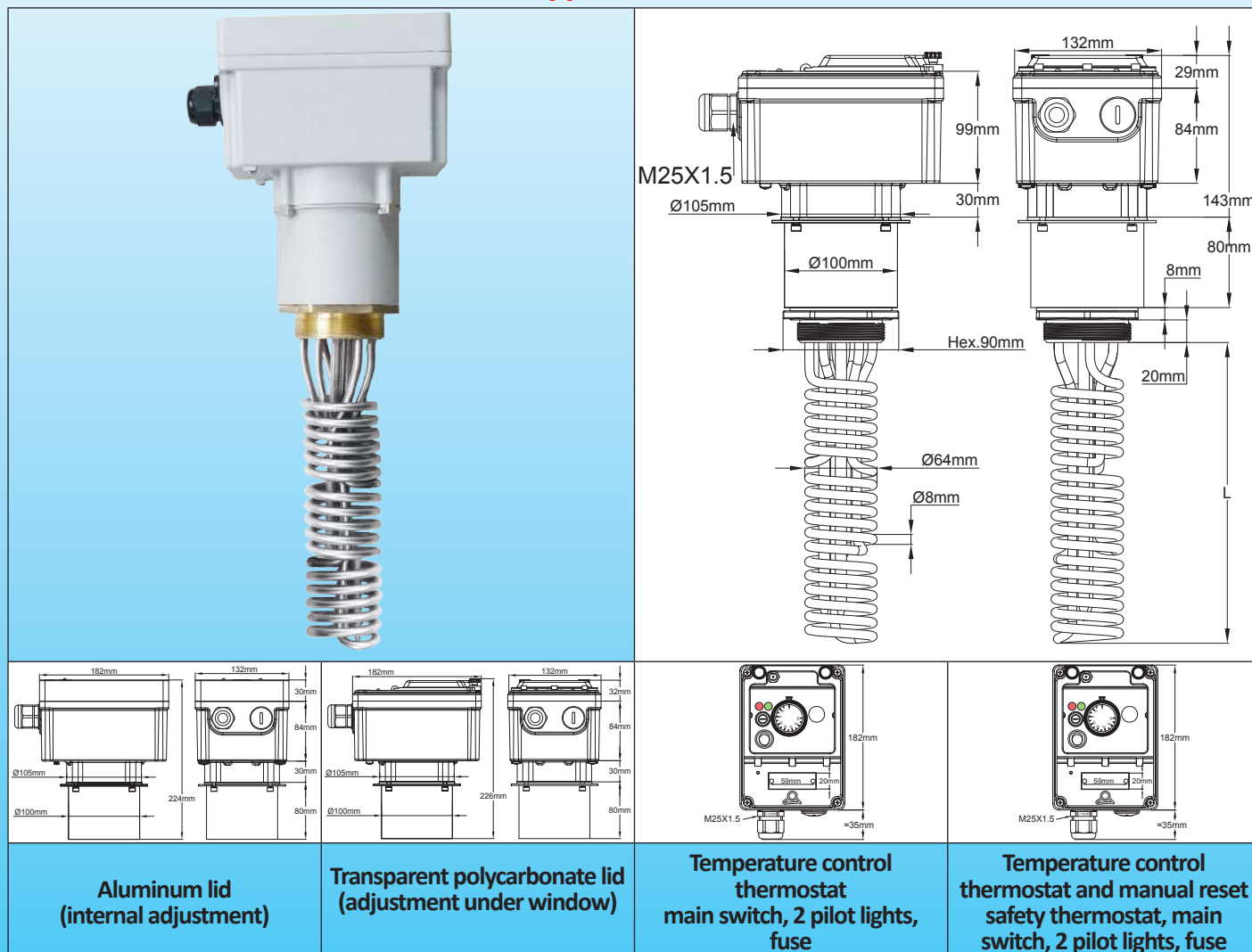
|  | Thread | 2"               | 2½"- M77x2       |
|-------------------------------------------------------------------------------------|--------|------------------|------------------|
|                                                                                     | NBR    | 9BRJ03000ELH203A | 9BRJ03000ELH201A |
|                                                                                     | Fiber  | 9BRJ03000ELH028A | 9BRJ03000ELH030A |
|                                                                                     | PTFE   | 9BRJ03000ELH034A | 9BRJ03000ELH036A |



# Immersion heaters with aluminum connection box

**Extra short** immersion heaters with 182mm × 130mm × 224mm aluminum-plastic of full aluminum enclosure, with 80mm offset. 2½" and M77x2 fittings. With mechanical thermostat. With or without manual reset thermostat. Power up to 9kw with built-in power relay. Coiled heating elements dia. 8mm.

## Types 9SWN



**Main applications:** Industrial liquid heating, hot water circuits, containers and buffer tanks, in applications where the heating elements immersed length must be as short as possible.

These heaters with aluminum enclosure are designed for industrial applications of medium power in three-phase, which require the use of contactor. They can receive one power relay, 3 poles 32A resistive. They exist only with thermostat temperature control. The enclosure lid may be transparent polycarbonate or aluminum. They are equipped with a device that allows adjusting the enclosure position after tightening of the fitting.

The enclosure has a 80mm offset to go through thick thermal insulation.

- 5 standard power levels: 1.5kW; 3kW; 4.5kW; 6kW; 9kW. On request, it is possible to reach 21kW by increasing the L length)

- 2 types of standard fittings: 2½"; M77x2.

- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 3 heating elements, dia.10mm or 12mm, AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** brass, swiveling on housing, brazed on tubes. Supplied without gasket and without nut. See accessories below.

**Thread:** 2½", or M77x2.

**Temperature control:** Mechanical thermostat, temperature range 30-90°C (85-195°F). Other ranges available.

**Enclosure:** Extremely robust, die-cast aluminum, 3mm wall thickness. Silicone foam gasket. Stainless steel cover screws with locking nuts. Gray epoxy paint RAL7035. Protected against galvanic corrosion. Designed for outdoor



# Immersion heaters with aluminum connection box

installation, IP65 and IK10. It also includes:

- A fuse to protect internal circuits.
- An illuminated on- off switch.
- A pilot light for power supply and a pilot light for power output.

There are 2 models of covers:

- A **PA66 cover** with a polycarbonate transparent window allowing access to the settings. This window can be secured with seals. This case also includes a separate lid, with independent seals, providing access to electrical connections. In models with failsafe manual reset limiter, reset can be accessed after opening the window.
- An **aluminum cover**. This model provides access to settings only after removing the cover. It is convenient for industrial applications that do not request frequent changes in settings.

**Cable glands:** One M25, PA66, and one more hole for M25, closed by a plastic cap.

**Thermowell:** two thermowells in AISI304, dia.10mm × 8.4mm.

**Heating elements connections:** terminals with stainless steel screw, nut and stainless steel washer.

Three-phase models are equipped with straps for switching to single-phase supply. This change must be made by the professional technical staff able to calculate and observe the maximum permissible rating on power relay.

Power supply connection: on built-in connection block, 6 × 10mm<sup>2</sup> for power connection and 2 × 2.5mm<sup>2</sup> for remote safety device or remote control.

**Not heating immersed zone:** 50mm.

**Surface load:** Standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, other values on request.

**Voltage:** Single pole 230V or three phases 380-400V (Star connection with neutral).

**Standard equipment:**

- Thermostat with knob access under the lid.
- Main power switch, with access under the lid.
- Green and red pilot lights, with access under the lid.
- On models with manual reset: preset at 100°C (212°F). Reset access under the lid.

**Standard options:**

Plastic cover with transparent polycarbonate window.

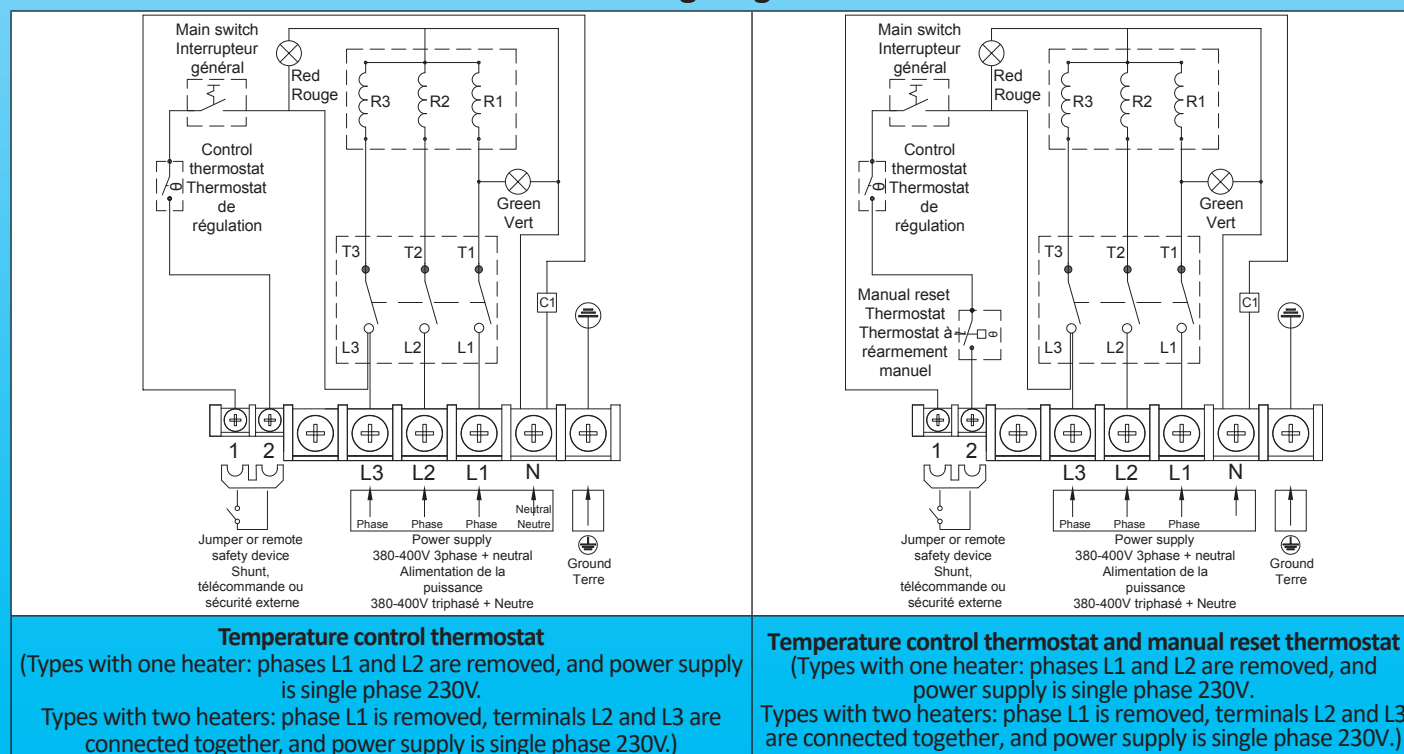
Aluminum cover.

**Variants on request:**

- Thermostat without limiter, ranges 4-40°C (40-105°F), 0-60°C (30-140°F) or 30-110°C (85-230°F) Higher range on request.
- 4-40°C (40-105°F) adjustable thermostat, manual reset at 60°C (140°F).
- 0-60°C (32-140°F), adjustable thermostat, manual reset at 80°C (176°F).
- 30-110°C (85-230°F) adjustable thermostat, manual reset at 130°C (266°F).
- Thermal cut out (TCO) inside a thermowell.

It is also possible to produce models with digital electronic control or/and without the 70mm extension. Ask our commercial department.

## Wiring diagram





# Immersion heaters with aluminum connection box

## Main references with transparent polycarbonate window\*

With 30-90°C (85-195°F) thermostat, without manual reset. M77x2 fitting\*\*

|                          | 5W/cm <sup>2</sup> |                    |                    | 10W/cm <sup>2</sup> |                    |                    |
|--------------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
|                          | 1 heating element  | 2 heating elements | 3 heating elements | 1 heating element   | 2 heating elements | 3 heating elements |
| L (mm)                   | 110                | 188                | 265                | 110                 | 188                | 265                |
| Power (Watt)             | 1500               | 3000               | 4500               | 3000                | 6000               | 9000               |
| References, AISI 304     | 9SWND8QR01525110   | 9SWND8QR030B5190   | 9SWND8QR045U5270   | 9SWND8QR03025110    | 9SWND8QR060B5190   | 9SWND8QR090U5270   |
| References, Incolloy 800 | 9SWND8QR01527110   | 9SWND8QR030B7190   | 9SWND8QR045U7270   | 9SWND8QR03027110    | 9SWND8QR060B7190   | 9SWND8QR090U7270   |

With 30-90°C (85-195°F) adjustable thermostat. Manual reset at 100°C (212°F), M77 × 2 fitting\*\*.

|                          | 5W/cm <sup>2</sup> |                    |                    | 10W/cm <sup>2</sup> |                    |                    |
|--------------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
|                          | 1 heating element  | 2 heating elements | 3 heating elements | 1 heating element   | 2 heating elements | 3 heating elements |
| L (mm)                   | 110                | 188                | 265                | 110                 | 188                | 265                |
| Power (Watt)             | 1500               | 3000               | 4500               | 3000                | 6000               | 9000               |
| References, AISI 304     | 9SWND8QR0152511N   | 9SWND8QR030B519N   | 9SWND8QR045U527N   | 9SWND8QR0302511N    | 9SWND8QR060B519N   | 9SWND8QR090U527N   |
| References, Incolloy 800 | 9SWND8QR0152711N   | 9SWND8QR030B719N   | 9SWND8QR045U727N   | 9SWND8QR0302711N    | 9SWND8QR060B719N   | 9SWND8QR090U727N   |

\* For plain aluminum cover, replace 9SWND by 9SWNG in the reference.

\*\* 2½" brass fitting instead of M77x2, replace D8 by D7 in the reference.

## References of accessories in option (Not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 2½"              | M77x2            |
|------------------------------------------------------------------------------------|---------|------------------|------------------|
|                                                                                    | Brass   | 9BRRA3000ELH314A | 9BRRA3000ELH306A |
|                                                                                    | AISI304 | 9BRRA3000ELH142A | 9BRRA3000ELH150A |
|                                                                                    | AISI316 | 9BRRA3000ELH214A | 9BRRA3000ELH206A |

### Gaskets

|  | Thread | 2½" - M77x2      |
|-------------------------------------------------------------------------------------|--------|------------------|
|                                                                                     | NBR    | 9BRJ03000ELH201A |
|                                                                                     | Fiber  | 9BRJ03000ELH030A |
|                                                                                     | PTFE   | 9BRJ03000ELH036A |

Other accessories and drawings: see last section of this catalogue.

# Immersion heaters with aluminum connection box



Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice



# Section 8

## Full stainless steel immersion heaters

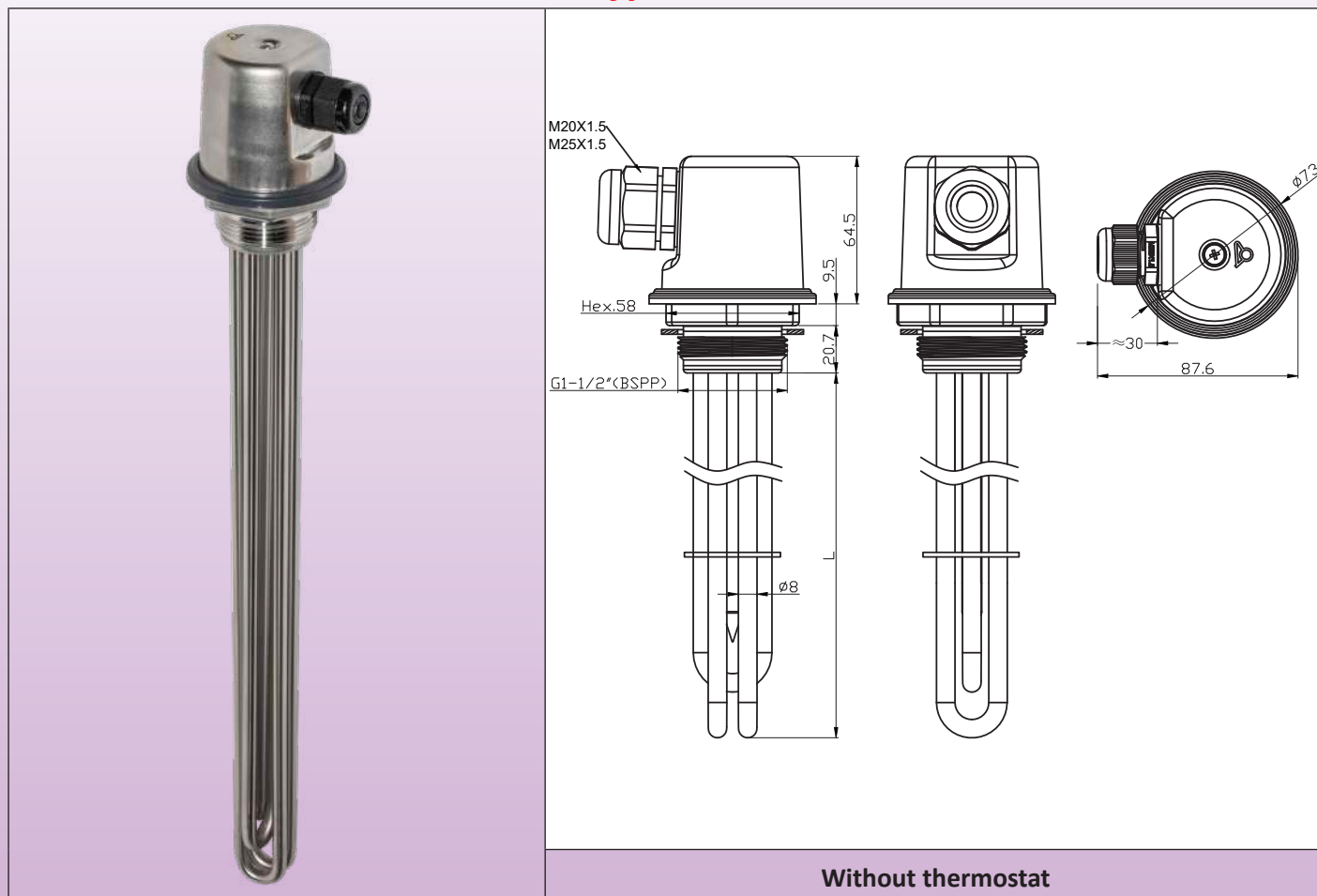




Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice

# Full stainless steel immersion heaters

**Full stainless steel immersion heater, without brazing,  
dia.73mm x 64.5mm stainless steel enclosure. Stainless steel 1½" fitting.  
Without thermostat.  
Type 9STI**



Without thermostat

**Main applications:** liquid heating, hot water circuits, containers and buffer tanks.

These all stainless steel construction immersion heaters, are intended for scientific, medical, or corrosive environments. All welding are TIG, without brazing alloys. Connection boxes and fitting are achievable in 304 or 316 stainless steel.

They exist in:

- 6 standard power levels: 1 kW – 1.5 kW - 2 kW - 3 kW - 4 kW - 6 kW.
- 2 types of fittings: 1½" ( or M45x2, non standard option)
- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** AISI 304 or AISI 316, TIG welded, swiveling on housing. Supplied without gasket and without nut. See accessories below.

**Thread:** 1½" BSPP (ISO 228)

**Enclosure:** Ø73mm x 64.5 mm, 304 or 316 stainless steel enclosure, 1mm wall thickness. Silicone gasket. Stainless steel cover screws, 2 internal earth terminals M4;

**Ingress protection class:** Water and dust: IP65; shock resistance: IK 10 (with metal cable glands)

**Cable glands:** M25, PA66. M20 or Nickel-plated brass or stainless steel on request.

**Thermowell:** in standard on thermowell in AISI304, dia.8 x 7 mm.

**Electrical connections:** Heating elements terminals are epoxy potted for better humidity resistance. Wiring is made on a 6 x 2.5mm<sup>2</sup> built-in connection block. Two M4 grounding terminals.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5 W/cm<sup>2</sup> or 10 W/cm<sup>2</sup>, other values on request.

**Voltage:** 220-240V single phase or three phases 380-400V (Star connection with neutral)

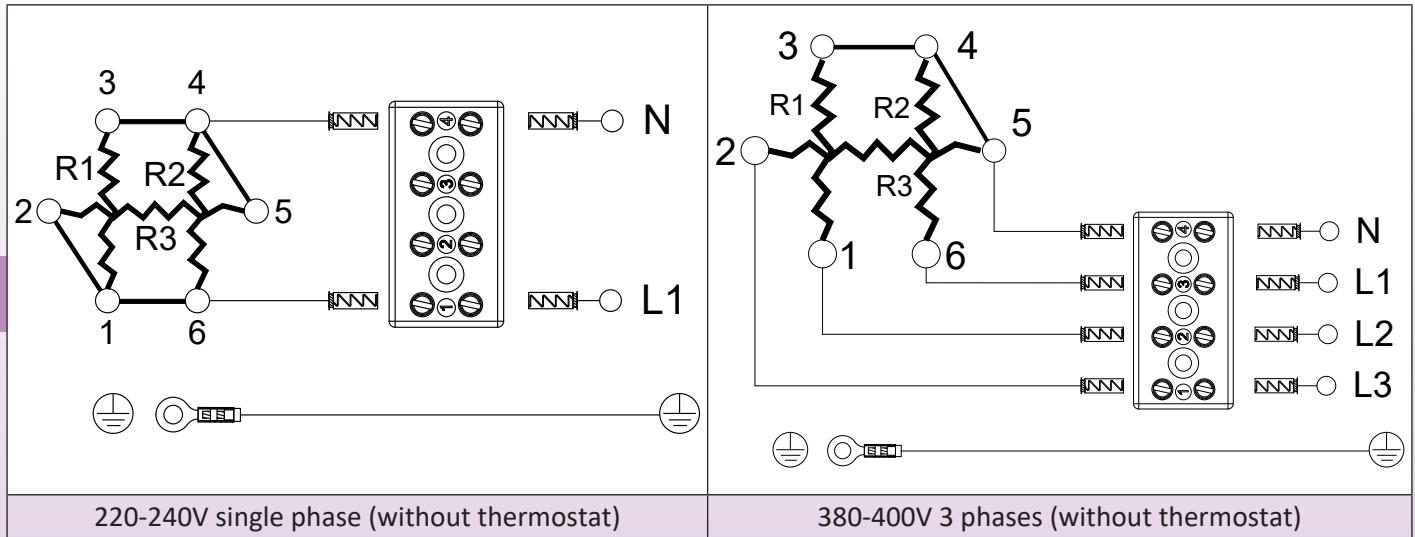
**Variants on request:**

- It is possible to deliver these devices with one or two pilot lights and a power cord.

# Full stainless steel immersion heaters



## Electric Wiring



## Main references with enclosure and fitting in 304 stainless steel\*

5W/cm<sup>2</sup>; **without thermostat.**

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 570              | 840              |
| AISI 304 Reference     | 9STI2DE0010C2A70 | 9STI2DE0015C2B40 | 9STI2DE0020C2C00 | 9STI2DE0030C2D40 | 9STI2DE0040C2E70 | 9STI2DE0060C2H40 |
| Incolloy 800 reference | 9STI2DE0010CKA70 | 9STI2DE0015CKB40 | 9STI2DE0020CKC00 | 9STI2DE0030CKD40 | 9STI2DE0040CKE70 | 9STI2DE0060CKH40 |

10W/cm<sup>2</sup>; **without thermostat.**

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 300              | 440              |
| AISI 304 Reference     | 9STI2DE0010C2A30 | 9STI2DE0015C2A30 | 9STI2DE0020C2A70 | 9STI2DE0030C2B40 | 9STI2DE0040C2C00 | 9STI2DE0060C2D40 |
| Incolloy 800 reference | 9STI2DE0010CKA30 | 9STI2DE0015CKA30 | 9STI2DE0020CKA70 | 9STI2DE0030CKB40 | 9STI2DE0040CKC00 | 9STI2DE0060CKD40 |

\* References in 316 stainless steel on request

\*\* This model has only 2 heating elements.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1½"              | 1½"              | M45x200          |
|-------------------------------------------------------------------------------------|---------|------------------|------------------|------------------|
|                                                                                     | Brass   | 9BRRA3000ELH302A | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
|                                                                                     | AISI304 | 9BRRA3000ELH032A | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
|                                                                                     | AISI316 | 9BRRA3000ELH202A | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

### Gaskets

|  | Thread | 1½"              | 1½" - M45x200    |
|-------------------------------------------------------------------------------------|--------|------------------|------------------|
|                                                                                     | NBR    | 9BRJ03000ELH206A | 9BRJ03000ELH205A |
|                                                                                     | Fiber  | 9BRJ03000ELH052A | 9BRJ03000ELH007A |
|                                                                                     | PTFE   | 9BRJ03000ELH032A | 9BRJ03000ELH033A |

### Bracket

|                                                                                     |         |               |
|-------------------------------------------------------------------------------------|---------|---------------|
|  | AISI304 | AE1000004146D |
|-------------------------------------------------------------------------------------|---------|---------------|

Other accessories and drawings: see last section of this catalogue

Updated 2025/09/26

# Full stainless steel immersion heaters

**Full stainless steel immersion heater, without brazing, 105mm × 105mm × 100mm stainless steel enclosure. Stainless steel 1½" fitting. With or without thermostat. Type 9STJ**

|  |                    |  |                                                                                                    |  |
|--|--------------------|--|----------------------------------------------------------------------------------------------------|--|
|  |                    |  |                                                                                                    |  |
|  |                    |  |                                                                                                    |  |
|  |                    |  |                                                                                                    |  |
|  | Without thermostat |  | Single pole and 3 pole thermostats, external knob adjustment (option)                              |  |
|  |                    |  | Single pole and 3 pole thermostats, internal knob adjustment, access under silicone cap (Standard) |  |

**Main applications:** liquid heating, hot water circuits, containers and buffer tanks.

**These all stainless steel construction immersion heaters, are intended for scientific, medical, or corrosive environments. All welding are TIG, without brazing alloys. They are achievable in 304 or 316 stainless steel.**

They exist in:

- 6 standard power levels: 1kW – 1.5kW - 2kW - 3kW - 4kW - 6kW.

- 2 types of fittings: 1½" or M45x2

- 2 types of surface load density: 5W/cm<sup>2</sup> and 10W/cm<sup>2</sup>. See technical introduction to optimize the surface load.

**Heater tube material:** 8mm dia. AISI 304 or Incolloy 800 (AISI 316; AISI 321; Incolloy 825 on request).

**Fitting material:** AISI 304 or AISI 316, TIG welded, swiveling on housing. Supplied without gasket and without nut. See accessories below.

**Thread:** 1½" BSPP (ISO 228)

**Temperature control:** single pole or 3 pole thermostat, 30-90°C (85-195°F). Other temperature ranges in option.

**Enclosure:** 105 × 105 × 100mm, 304 or 316 stainless steel enclosure, 1mm wall thickness. Silicone gasket. Stainless steel cover screws, 2 internal earth terminals M4;

**Ingress protection class:** Water and dust: IP65; shock resistance: IK 10 (with metal cable glands and M25 metal plug).

**Cable glands:** M25, PA66. Nickel-plated brass or stainless steel on request.

**Thermowell:** in standard on thermowell in AISI304, dia.8 × 7mm, also for models supplied without thermostat.

**Electrical connections:** tubular heater terminals with stainless steel screw, nut and stainless steel washer. Switching straps on 3 phases models.

Models with thermostats have a 6 × 2.5mm<sup>2</sup> built-in connection block. Two M4 grounding terminals.

**Support grid:** 1 grid AISI 304 for lengths from 400 to 600mm, 2 grids above.

**Not heating immersed zone:** 50mm.

**Surface load:** standard 5W/cm<sup>2</sup> or 10W/cm<sup>2</sup>, other values on request.

**Voltage:** 220-240V single phase or three phases 380-400V (Star connection with neutral)

**Standard options:**

- 230V single phase thermostat for power up to 3kW. 3 phases thermostat for 4kW and 6kW models.

**Variants on request:**

- External thermostat knob, with waterproof shaft gasket.

- 4-40°C (40-105°F), 0-60°C (32-140°F), or 30-110°C (86-230°F) thermostat.

- It is possible to deliver these devices with one or two pilot lights and a power cord.



# Full stainless steel immersion heaters

## Electric Wiring

|                                               |                                                        |                                           |                                                |
|-----------------------------------------------|--------------------------------------------------------|-------------------------------------------|------------------------------------------------|
|                                               |                                                        |                                           |                                                |
| 220-240V single phase<br>(Without thermostat) | 220-240V single phase<br>(With single pole thermostat) | 380-400V 3 phases<br>(without thermostat) | 380-400V 3 phases<br>(with 3 poles thermostat) |

## Main references with enclosure and fitting in 304 stainless steel\*

5W/cm<sup>2</sup>; **without thermostat.**

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 570              | 840              |
| AISI 304 Reference     | 9STJG5E1010U8170 | 9STJG5E1015U8240 | 9STJG5E1020U8300 | 9STJG5E1030U8440 | 9STJG5E1040U8570 | 9STJG5E1060U8840 |
| Incolloy 800 reference | 9STJG5E1010UK170 | 9STJG5E1015UK240 | 9STJG5E1020UK300 | 9STJG5E1030UK440 | 9STJG5E1040UK570 | 9STJG5E1060UK840 |

10W/cm<sup>2</sup>; **without thermostat.**

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 300              | 440              |
| AISI 304 Reference     | 9STJG5E1010B8130 | 9STJG5E1015U8130 | 9STJG5E1020U8170 | 9STJG5E1030U8240 | 9STJG5E1040U8300 | 9STJG5E1060U8440 |
| Incolloy 800 reference | 9STJG5E1010BK130 | 9STJG5E1015UK130 | 9STJG5E1020UK170 | 9STJG5E1030UK240 | 9STJG5E1040UK300 | 9STJG5E1060UK440 |

5W/cm<sup>2</sup>, **with 30-90°C (89-195°F) thermostat, adjustment under silicone grommet** (single phase up to 3kW, 3 phases for 4kW and 6kW models)

| Power                  | 1kW              | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 170              | 240              | 300              | 440              | 570              | 840              |
| AISI 304 Reference     | 9STJG5ES010V8170 | 9STJG5ES015V8240 | 9STJG5ES020V8300 | 9STJG5ES030V8440 | 9STJG5ES040U8570 | 9STJG5ES060U8840 |
| Incolloy 800 reference | 9STJG5ES010VK170 | 9STJG5ES015VK240 | 9STJG5ES015VK300 | 9STJG5ES030VK440 | 9STJG5ES040UK570 | 9STJG5ES060UK840 |

10W/cm<sup>2</sup>; **with 30-90°C (89-195°F) thermostat, adjustment under silicone grommet** (single phase up to 3kW, 3 phases for 4kW and 6kW models)

| Power                  | 1kW**            | 1.5kW            | 2kW              | 3kW              | 4kW              | 6kW              |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Length (mm)            | 135              | 135              | 170              | 240              | 300              | 440              |
| AISI 304 Reference     | 9STJG5ES010B8130 | 9STJG5ES015V8130 | 9STJG5ES020V8170 | 9STJG5ES030V8240 | 9STJG5ES040U8300 | 9STJG5ES060U8440 |
| Incolloy 800 reference | 9STJG5ES010BK130 | 9STJG5ES015VK130 | 9STJG5ES020VK170 | 9STJG5ES030VK240 | 9STJG5ES040UK300 | 9STJG5ES060UK440 |

\* References in 316 stainless steel on request

\*\* This model has only 2 heating elements.

## References of accessories in option (not included in the product, must be ordered separately):

### Nuts

|  | Thread  | 1 1/4"           | 1 1/2"           | M45x200          |
|--|---------|------------------|------------------|------------------|
|  | Brass   | 9BRRA3000ELH302A | 9BRRA3000ELH303A | 9BRRA3000ELH305A |
|  | AISI304 | 9BRRA3000ELH032A | 9BRRA3000ELH006A | 9BRRA3000ELH049A |
|  | AISI316 | 9BRRA3000ELH202A | 9BRRA3000ELH203A | 9BRRA3000ELH205A |

### Gaskets

|  | Thread | 1 1/4"           | 1 1/2" - M45x200 |
|--|--------|------------------|------------------|
|  | NBR    | 9BRJ03000ELH206A | 9BRJ03000ELH205A |
|  | Fiber  | 9BRJ03000ELH052A | 9BRJ03000ELH007A |
|  | PTFE   | 9BRJ03000ELH032A | 9BRJ03000ELH033A |

Other accessories and drawings: see last section of this catalogue



# Section 9

## Low voltage renewable energy immersion heaters





Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice



## Renewable energy immersion heaters

### Renewable energy 1½" and M45x2 immersion heaters, 12 and 24V power supply with 230V auxiliary heating element, **without connection box**

| Main Voltage | Low voltage Power          | Auxiliary voltage | Auxiliary power     | Enclosure | Threads            | Type                      |
|--------------|----------------------------|-------------------|---------------------|-----------|--------------------|---------------------------|
| 12V, 24V     | 2 × 150W<br>or<br>2 × 300W | 230V              | 700W<br>or<br>1500W | Without   | 1½"<br>or<br>M45x2 | 9SFN200<br>and<br>9SFN500 |

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| <p>2 × 150W 12V + 1 × 700W 230V</p> | <p>2 × 300W 12V + 1 × 1500W 230V</p> |
|-------------------------------------|--------------------------------------|

**Main application:** direct use of low voltage electricity produced by wind turbines or photovoltaic solar panels, for heating liquids, domestic hot water circuits, hot water tanks. These immersion heaters make it possible to use the surplus energy produced, and not used by domestic lighting needs or small electrical appliances. They can also be used in addition to domestic hot water tanks, limiting the need for electricity from the distribution network.

**Heater tube material:** dia. 8mm heating elements in AISI 304 (AISI 316; AISI 321; Incolloy 800 or Incolloy 840 on request).

**Fitting material:** Brass, brazed on tubes. Supplied with one fiber gasket but without nut. See accessories below.

**Thread:** 1½" BSPP (ISO 228) and metric thread M45x2

**Thermowell:** Includes one stainless steel thermowell 7mm ID.

**Heating elements connections:** Terminals with M4 stainless steel screw, nut and stainless steel washer. Supplied with brass straps for switching the two low voltage heaters from 12V to 24V. (Changing their connection from parallel to serial).

Low voltage heating elements are identified by a red sleeve. 230V heating elements are identified by a black sleeve.

**Not heating immersed zone:** 50mm.

**Surface load:** see drawings

**Voltage:** 12 or 24V DC or AC and single phase 230V for models with auxiliary power heater

**Attention:** Switching by a thermostatic device the heating elements in low voltage must be made by device designed for low voltage use, and withstanding the important intensity of these circuits. Similarly, the section of the power cables must be adapted.

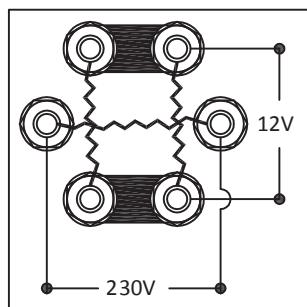


# Renewable energy immersion heaters

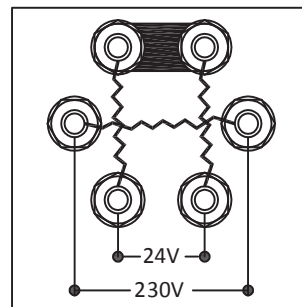
## Intensity flowing in low voltage heating circuits

| Voltage | Power |       |      |
|---------|-------|-------|------|
|         | 150W  | 300W  | 600W |
| 12V     | 12.5A | 25A   | 50A  |
| 24V     | 6.2A  | 12.5A | 25A  |

## Electric Wiring



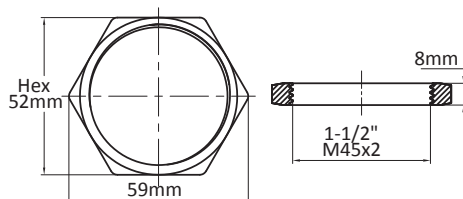
Straps position in 12V



Straps position in 24V

## Main references

| Fitting thread                           | 1½" BSPP                        |                                  | M45 × 2                         |                                  |
|------------------------------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|
| Power                                    | 2 × 150W 12V<br>+ 1 × 700W 230V | 2 × 300W 12V<br>+ 1 × 1500W 230V | 2 × 150W 12V<br>+ 1 × 700W 230V | 2 × 300W 12V<br>+ 1 × 1500W 230V |
| Length (mm)                              | 170                             | 300                              | 170                             | 300                              |
| Surface load of 12/24V heating elements  | 3W/cm <sup>2</sup>              | 6W/cm <sup>2</sup>               | 3W/cm <sup>2</sup>              | 6W/cm <sup>2</sup>               |
| Surface load of the 230V heating element | 10W/cm <sup>2</sup>             | 10W/cm <sup>2</sup>              | 10W/cm <sup>2</sup>             | 10W/cm <sup>2</sup>              |
| Reference in AISI 304                    | 9SFN200152307217                | 9SFN200302615230                 | 9SFN500152307217                | 9SFN500302615217                 |
| Reference in Incolloy 800                | 9SFN200152307K17                | 9SFN200302615K30                 | 9SFN200152307K30                | 9SFN500302615K30                 |



## References of Brass Nuts

|         |               |
|---------|---------------|
| 1½"     | 66NLC11280H52 |
| M45 × 2 | 66NLM45280H52 |



## Renewable energy immersion heaters

### Renewable energy 1½" and M45x2 immersion heaters, 12 and 24V power supply with 230V auxiliary heating element, with connection box

| Main Voltage | Low voltage Power          | Auxiliary voltage | Auxiliary Power     | Enclosure | Threads            | Type                      |
|--------------|----------------------------|-------------------|---------------------|-----------|--------------------|---------------------------|
| 12V, 24V     | 2 × 150W<br>or<br>2 × 300W | 230V              | 700W<br>or<br>1500W | With      | 1½"<br>or<br>M45x2 | 9SFN202<br>and<br>9SFN502 |

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| <p>2 × 150W 12V + 1 × 700W 230V</p> | <p>2 × 300W 12V + 1 × 1500W 230V</p> |
|-------------------------------------|--------------------------------------|

**Main application:** direct use of low voltage electricity produced by wind turbines or photovoltaic solar panels, for heating liquids, domestic hot water circuits, hot water tanks. These immersion heaters make it possible to use the surplus energy produced, and not used by domestic lighting needs or small electrical appliances. They can also be used in addition to domestic hot water tanks, limiting the need for electricity from the distribution network.

**Heater tube material:** dia. 8mm heating elements in AISI 304 (AISI 316; AISI 321; Incolloy 800 or Incolloy 840 on request).

**Fitting material:** Brass, brazed on tubes. Supplied with one fiber gasket but without nut. See accessories below.

**Thread:** 1½" BSPP (ISO 228) and metric thread M45x2

**Enclosure:** dia. 58mm × 75mm, black PA66 fiber glass reinforced, with gasket. Opening by center M4 screw without access to end user. (When the screw cap is pushed in, it is impossible to remove the cover)

**Ingress protection class:** IP66.

**Cable gland:** M20, PA66.

**Thermowell:** Includes one stainless steel thermowell 7mm ID.

**Heating elements connections:** Terminals with M4 stainless steel screw, nut and stainless steel washer. Supplied with brass straps for switching the two low voltage heaters from 12V to 24V. (Changing their connection from parallel to serial).

Low voltage heating elements are identified by a red sleeve. 230V heating elements are identified by a black sleeve.

**Not heating immersed zone:** 50mm.

**Surface load:** see drawings

**Voltage:** 12 or 24V DC or AC and single phase 230V for models with auxiliary power heater

**Attention:** Switching by a thermostatic device the heating elements in low voltage must be made by device designed for low voltage use, and withstanding the important intensity of these circuits. Similarly, the section of the power cables must be adapted.

# Renewable energy immersion heaters

## Intensity flowing in low voltage heating circuits

| Voltage | Power |       |      |
|---------|-------|-------|------|
|         | 150W  | 300W  | 600W |
| 12V     | 12.5A | 25A   | 50A  |
| 24V     | 6.2A  | 12.5A | 25A  |

## Electric Wiring

|                        |                        |
|------------------------|------------------------|
|                        |                        |
| Straps position in 12V | Straps position in 24V |

## Main references

| Fitting thread                           | 1½" BSPP                        |                                  | M45 × 2                         |                                  |
|------------------------------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|
| Power                                    | 2 × 150W 12V<br>+ 1 × 700W 230V | 2 × 300W 12V<br>+ 1 × 1500W 230V | 2 × 150W 12V<br>+ 1 × 700W 230V | 2 × 300W 12V<br>+ 1 × 1500W 230V |
| Length (mm)                              | 170                             | 300                              | 170                             | 300                              |
| Surface load of 12/24V heating elements  | 3W/cm <sup>2</sup>              | 6W/cm <sup>2</sup>               | 3W/cm <sup>2</sup>              | 6W/cm <sup>2</sup>               |
| Surface load of the 230V heating element | 10W/cm <sup>2</sup>             | 10W/cm <sup>2</sup>              | 10W/cm <sup>2</sup>             | 10W/cm <sup>2</sup>              |
| Reference in AISI 304                    | 9SFN202152307217                | 9SFN202302615230                 | 9SFN502152307217                | 9SFN502302615217                 |
| Reference in Incolloy 800                | 9SFN202152307K17                | 9SFN202302615K30                 | 9SFN202152307K30                | 9SFN502302615K30                 |

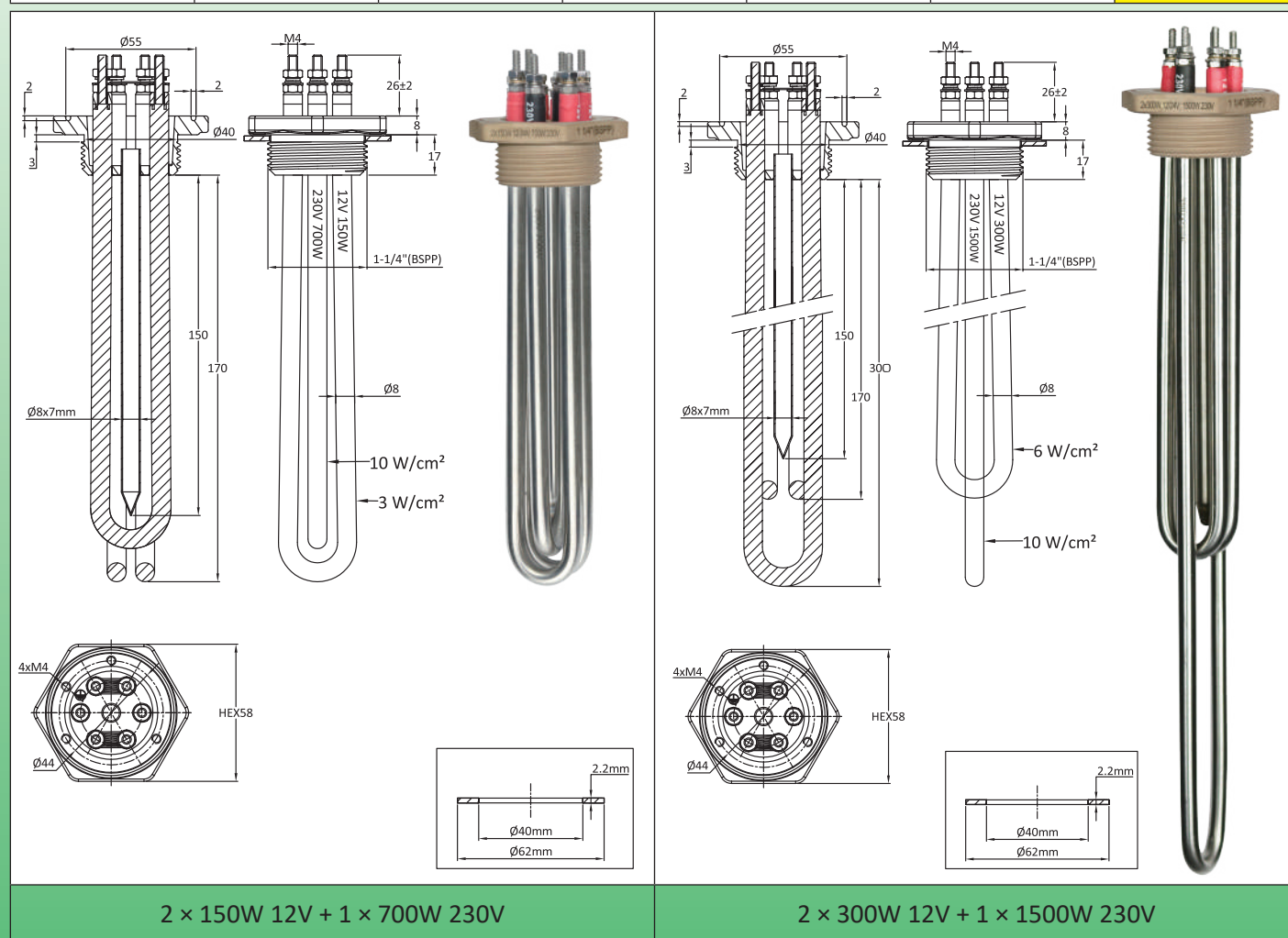
|  | References of Brass Nuts |               |
|--|--------------------------|---------------|
|  | 1½"                      | 66NLC11280H52 |
|  | M45 × 2                  | 66NLM45280H52 |



## Renewable energy immersion heaters

### Renewable energy 1½" immersion heaters, 12 and 24V power supply with 230V auxiliary heating element, **without connection box**

| Main Voltage | Low voltage Power          | Auxiliary voltage | Auxiliary power     | Enclosure | Threads | Type    |
|--------------|----------------------------|-------------------|---------------------|-----------|---------|---------|
| 12V, 24V     | 2 × 150W<br>or<br>2 × 300W | 230V              | 700W<br>or<br>1500W | Without   | 1½"     | 9SFN400 |



**Main application:** **direct use of low voltage electricity** produced by wind turbines or photovoltaic solar panels, for heating liquids, domestic hot water circuits, hot water tanks. These immersion heaters make it possible to use the surplus energy produced, and not used by domestic lighting needs or small electrical appliances. They can also be used in addition to domestic hot water tanks, limiting the need for electricity from the distribution network.

**Heater tube material:** dia. 8mm heating elements in AISI 304 (AISI 316; AISI 321; Incolloy 800 or Incolloy 840 on request).

**Fitting material:** Brass, brazed on tubes. Supplied with one fiber gasket but without nut. See accessories below.

**Thread:** 1½" BSPP (ISO 228)

**Thermowell:** Includes one stainless steel thermowell 7mm ID.

**Heating elements connections:** Terminals with M4 stainless steel screw, nut and stainless steel washer. Supplied with brass straps for switching the two low voltage heaters from 12V to 24V. (Changing their connection from parallel to serial).

Low voltage heating elements are identified by a **red** sleeve. 230V heating elements are identified by a black sleeve.

**Not heating immersed zone:** 50mm.

**Surface load:** see drawings

**Voltage:** 12 or 24V **DC or AC** and single phase 230V for models with auxiliary power heater

**Attention:** Switching by a thermostatic device the heating elements in low voltage must be made by device **designed for low voltage use**, and withstanding the important intensity of these circuits. Similarly, the section of the power





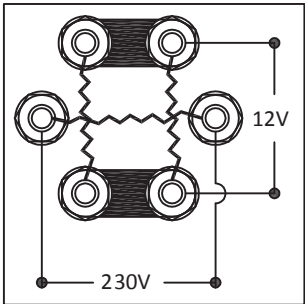
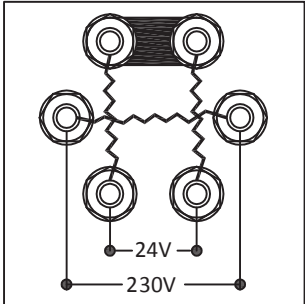
# Renewable energy immersion heaters

cables must be adapted.

## Intensity flowing in low voltage heating circuits

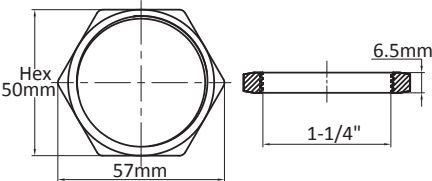
| Voltage | Power |       |      |
|---------|-------|-------|------|
|         | 150W  | 300W  | 600W |
| 12V     | 12.5A | 25A   | 50A  |
| 24V     | 6.2A  | 12.5A | 25A  |

## Electric Wiring

|                                                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |
| Straps position in 12V                                                            | Straps position in 24V                                                              |

## Main references in 1 1/4" BSPP

| Power                                    | 2 x 150W 12V<br>+ 1 x 700W 230V | 2 x 300W 12V<br>+ 1 x 1500W 230V |
|------------------------------------------|---------------------------------|----------------------------------|
| Length (mm)                              | 170                             | 300                              |
| Surface load of 12/24V heating elements  | 3W/cm <sup>2</sup>              | 6W/cm <sup>2</sup>               |
| Surface load of the 230V heating element | 10W/cm <sup>2</sup>             | 10W/cm <sup>2</sup>              |
| Reference in AISI 304                    | 9SFN400152307217                | 9SFN400302615230                 |
| Reference in Incolloy 800                | 9SFN400152307K17                | 9SFN400302615K30                 |

|   | References of Brass Nut |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|
|                                                                                                                                                                         | 1 1/4"                  | 66NLC11465H50 |



## Renewable energy immersion heaters

### Renewable energy 1¼" immersion heaters, 12 and 24V power supply with 230V auxiliary heating element, with connection box

| Main Voltage | Low voltage Power          | Auxiliary voltage | Auxiliary power     | Enclosure | Threads | Type    |
|--------------|----------------------------|-------------------|---------------------|-----------|---------|---------|
| 12V, 24V     | 2 × 150W<br>or<br>2 × 300W | 230V              | 700W<br>or<br>1500W | With      | 1¼"     | 9SFN402 |

|                              |                               |
|------------------------------|-------------------------------|
|                              |                               |
| 2 × 150W 12V + 1 × 700W 230V | 2 × 300W 12V + 1 × 1500W 230V |

**Main application:** direct use of low voltage electricity produced by wind turbines or photovoltaic solar panels, for heating liquids, domestic hot water circuits, hot water tanks. These immersion heaters make it possible to use the surplus energy produced, and not used by domestic lighting needs or small electrical appliances. They can also be used in addition to domestic hot water tanks, limiting the need for electricity from the distribution network.

**Heater tube material:** dia. 8mm heating elements in AISI 304 (AISI 316; AISI 321; Incolloy 800 or Incolloy 840 on request).

**Fitting material:** Brass, brazed on tubes. Supplied with one fiber gasket but without nut. See accessories below.

**Thread:** 1¼" BSPP (ISO 228)

**Enclosure:** dia. 58mm × 75mm, black PA66 fiber glass reinforced, with gasket. Opening by center M4 screw without access to end user. (When the screw cap is pushed in, it is impossible to remove the cover)

**Ingress protection class:** IP66.

**Cable gland:** M20, PA66.

**Thermowell:** Includes one stainless steel thermowell 7mm ID.

**Heating elements connections:** Terminals with M4 stainless steel screw, nut and stainless steel washer. Supplied with brass straps for switching the two low voltage heaters from 12V to 24V. (Changing their connection from parallel to serial).

Low voltage heating elements are identified by a red sleeve. 230V heating elements are identified by a black sleeve.

**Not heating immersed zone:** 50mm.

**Surface load:** see drawings

**Voltage:** 12 or 24V DC or AC and single phase 230V for models with auxiliary power heater

**Attention:** Switching by a thermostatic device the heating elements in low voltage must be made by device designed for low voltage use, and withstanding the important intensity of these circuits. Similarly, the section of the power cables must be adapted.

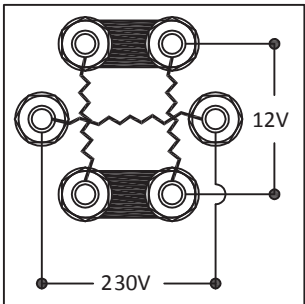
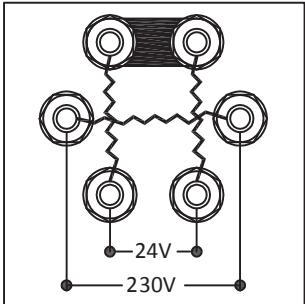


# Renewable energy immersion heaters

## Intensity flowing in low voltage heating circuits

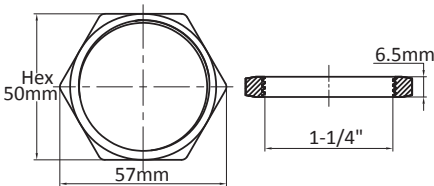
| Voltage | Power |       |      |
|---------|-------|-------|------|
|         | 150W  | 300W  | 600W |
| 12V     | 12.5A | 25A   | 50A  |
| 24V     | 6.2A  | 12.5A | 25A  |

## Electric Wiring

|                                                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |
| Straps position in 12V                                                            | Straps position in 24V                                                              |

## Main references in 1 1/4" BSPP

| Power                                    | 2 x 150W 12V<br>+ 1 x 700W 230V | 2 x 300W 12V<br>+ 1 x 1500W 230V |
|------------------------------------------|---------------------------------|----------------------------------|
| Length (mm)                              | 170                             | 300                              |
| Surface load of 12/24V heating elements  | 3W/cm <sup>2</sup>              | 6W/cm <sup>2</sup>               |
| Surface load of the 230V heating element | 10W/cm <sup>2</sup>             | 10W/cm <sup>2</sup>              |
| Reference in AISI 304                    | 9SFN402152307217                | 9SFN402302615230                 |
| Reference in Incolloy 800                | 9SFN402152307K17                | 9SFN402302615K30                 |

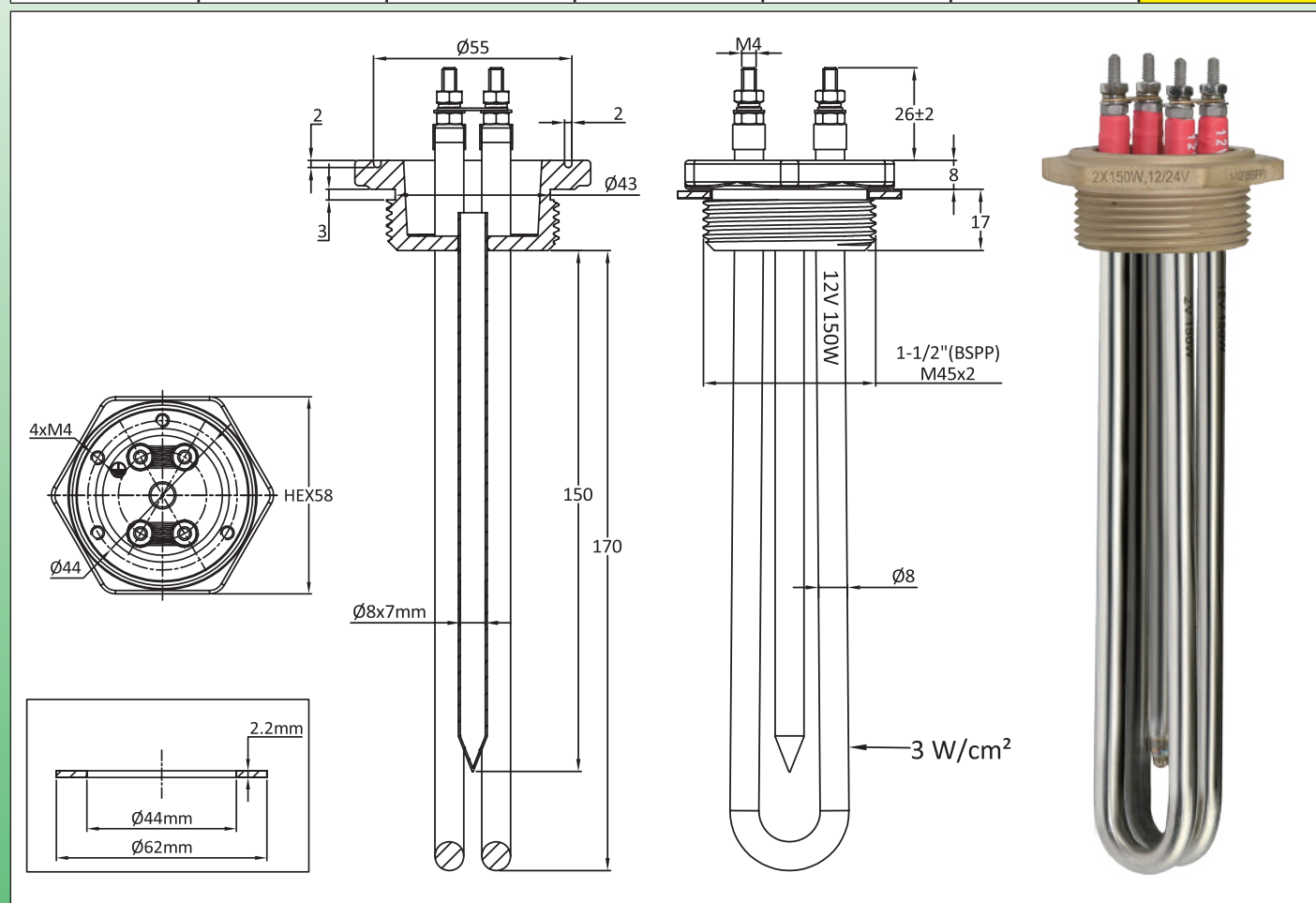
|   | References of Brass Nut |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|
|                                                                                                                                                                         | 1 1/4"                  | 66NLC11465H50 |



## Renewable energy immersion heaters

### Renewable energy 1½" and M45x2 immersion heaters, 12 and 24V power supply, without connection box

| Main Voltage | Low voltage Power          | Auxiliary voltage | Auxiliary power | Enclosure | Threads            | Type                      |
|--------------|----------------------------|-------------------|-----------------|-----------|--------------------|---------------------------|
| 12V, 24V     | 2 × 150W<br>or<br>2 × 300W | Without           | Without         | Without   | 1½"<br>or<br>M45x2 | 9SFT200<br>and<br>9SFT500 |



**Main application:** direct use of low voltage electricity produced by wind turbines or photovoltaic solar panels, for heating liquids, domestic hot water circuits, hot water tanks. These immersion heaters make it possible to use the surplus energy produced, and not used by domestic lighting needs or small electrical appliances. They can also be used in addition to domestic hot water tanks, limiting the need for electricity from the distribution network.

**Heater tube material:** dia. 8mm heating elements in AISI 304 (AISI 316; AISI 321; Incolloy 800 or Incolloy 840 on request).

**Fitting material:** Brass, brazed on tubes. Supplied with one fiber gasket but without nut. See accessories below.

**Thread:** 1½" BSPP (ISO 228) and metric thread M45x2

**Thermowell:** Includes one stainless steel thermowell 7mm ID.

**Heating elements connections:** Terminals with M4 stainless steel screw, nut and stainless steel washer. Supplied with brass straps for switching the two low voltage heaters from 12V to 24V. (Changing their connection from parallel to serial).

**Not heating immersed zone:** 50mm.

**Surface load:** see drawings

**Voltage:** 12 or 24V DC or AC.

**Attention:** Switching by a thermostatic device the heating elements in low voltage must be made by device designed for low voltage use, and withstanding the important intensity of these circuits. Similarly, the section of the power cables must be adapted.

# Renewable energy immersion heaters

## Intensity flowing in low voltage heating circuits

| Voltage | Power |       |      |
|---------|-------|-------|------|
|         | 150W  | 300W  | 600W |
| 12V     | 12.5A | 25A   | 50A  |
| 24V     | 6.2A  | 12.5A | 25A  |

## Electric Wiring

|                        |                        |
|------------------------|------------------------|
|                        |                        |
| Straps position in 12V | Straps position in 24V |

## Main references

| Fitting thread                          | 1½" BSPP           |                    | M45 × 2            |                    |
|-----------------------------------------|--------------------|--------------------|--------------------|--------------------|
| Power                                   | 2 × 150W 12V       | 2 × 300W 12V       | 2 × 150W 12V       | 2 × 300W 12V       |
| Length (mm)                             | 170                | 170                | 170                | 170                |
| Surface load of 12/24V heating elements | 3W/cm <sup>2</sup> | 6W/cm <sup>2</sup> | 3W/cm <sup>2</sup> | 6W/cm <sup>2</sup> |
| Reference in AISI 304                   | 9SFT200152300217   | 9SFT200302600217   | 9SFT500152300217   | 9SFT500302600217   |
| Reference in Incolloy 800               | 9SFT200152300K17   | 9SFT200302600K17   | 9SFT500152300K17   | 9SFT500302600K17   |

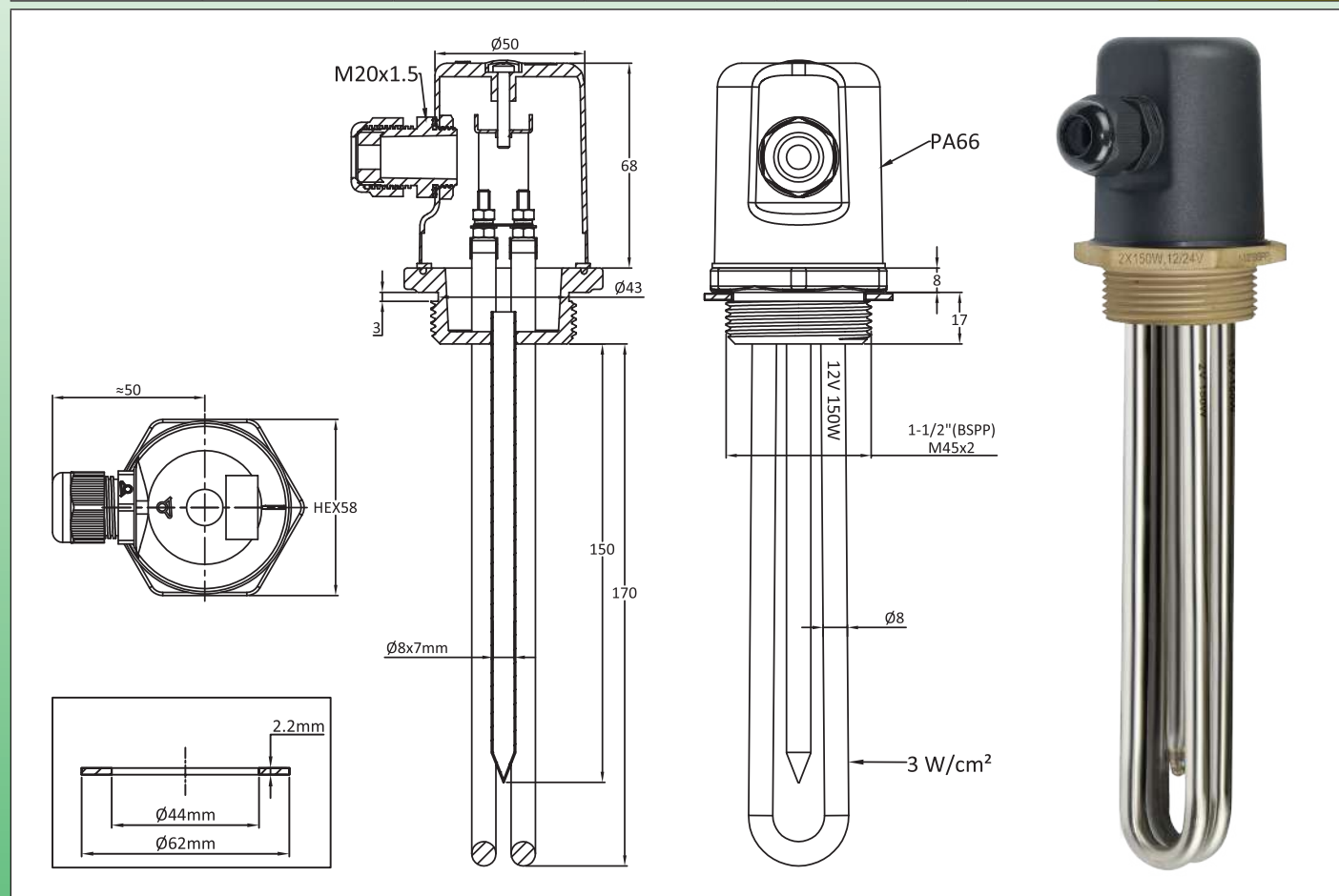
|  | References of Brass Nuts |               |
|--|--------------------------|---------------|
|  | 1½"                      | 66NLC11280H52 |
|  | M45 × 2                  | 66NLM45280H52 |



## Renewable energy immersion heaters

### Renewable energy 1½" and M45x2 immersion heaters, 12 and 24V power supply, with connection box

| Main Voltage | Low voltage Power          | Auxiliary voltage | Auxiliary power | Enclosure | Threads            | Type                      |
|--------------|----------------------------|-------------------|-----------------|-----------|--------------------|---------------------------|
| 12V, 24V     | 2 × 150W<br>or<br>2 × 300W | Without           | Without         | With      | 1½"<br>or<br>M45x2 | 9SFT202<br>and<br>9SFT502 |



**Main application:** direct use of low voltage electricity produced by wind turbines or photovoltaic solar panels, for heating liquids, domestic hot water circuits, hot water tanks. These immersion heaters make it possible to use the surplus energy produced, and not used by domestic lighting needs or small electrical appliances. They can also be used in addition to domestic hot water tanks, limiting the need for electricity from the distribution network.

**Heater tube material:** dia. 8mm heating elements in AISI 304 (AISI 316; AISI 321; Incolloy 800 or Incolloy 840 on request).

**Fitting material:** Brass, brazed on tubes. Supplied with one fiber gasket but without nut. See accessories below.

**Thread:** 1½" BSPP (ISO 228) and metric thread M45x2

**Enclosure:** dia. 58mm × 75mm, black PA66 fiber glass reinforced, with gasket. Opening by center M4 screw without access to end user. (When the screw cap is pushed in, it is impossible to remove the cover)

**Ingress protection class:** IP66.

**Cable gland:** M20, PA66.

**Thermowell:** Includes one stainless steel thermowell 7mm ID.

**Heating elements connections:** Terminals with M4 stainless steel screw, nut and stainless steel washer. Supplied with brass straps for switching the two low voltage heaters from 12V to 24V. (Changing their connection from parallel to serial).

**Not heating immersed zone:** 50mm.

**Surface load:** see drawings

**Voltage:** 12 or 24V DC or AC.

**Attention:** Switching by a thermostatic device the heating elements in low voltage must be made by device designed for low voltage use, and withstanding the important intensity of these circuits. Similarly, the section of the power cables must be adapted.



# Renewable energy immersion heaters

## Intensity flowing in low voltage heating circuits

| Voltage | Power |       |      |
|---------|-------|-------|------|
|         | 150W  | 300W  | 600W |
| 12V     | 12.5A | 25A   | 50A  |
| 24V     | 6.2A  | 12.5A | 25A  |

## Electric Wiring

|                        |                        |
|------------------------|------------------------|
|                        |                        |
| Straps position in 12V | Straps position in 24V |

## Main references

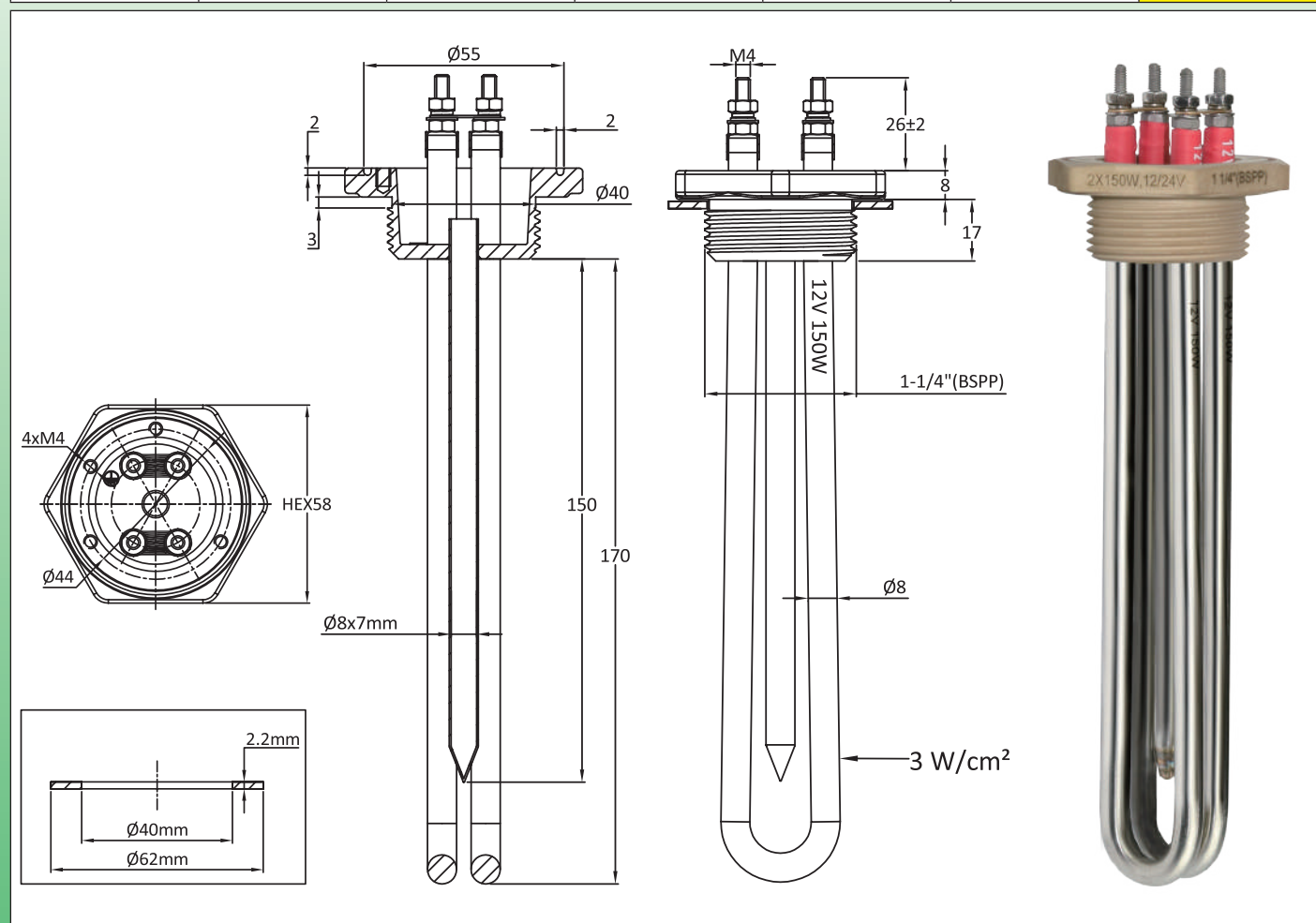
| Fitting thread                          | 1½" BSPP           |                    | M45 × 2            |                    |
|-----------------------------------------|--------------------|--------------------|--------------------|--------------------|
| Power                                   | 2 × 150W 12V       | 2 × 300W 12V       | 2 × 150W 12V       | 2 × 300W 12V       |
| Length (mm)                             | 170                | 300                | 170                | 300                |
| Surface load of 12/24V heating elements | 3W/cm <sup>2</sup> | 6W/cm <sup>2</sup> | 3W/cm <sup>2</sup> | 6W/cm <sup>2</sup> |
| Reference in AISI 304                   | 9SFT202152300217   | 9SFT202302600217   | 9SFT502152300217   | 9SFT502302600217   |
| Reference in Incolloy 800               | 9SFT202152300K17   | 9SFT202302600K17   | 9SFT502152300K17   | 9SFT502302600K17   |

|  | References of Brass Nuts |               |
|--|--------------------------|---------------|
|  | 1½"                      | 66NLC11280H52 |
|  | M45 × 2                  | 66NLM45280H52 |

## Renewable energy immersion heaters

### Renewable energy 1 1/4" immersion heaters, 12 and 24V power supply, without connection box

| Main Voltage | Low voltage Power          | Auxiliary voltage | Auxiliary power | Enclosure | Threads | Type    |
|--------------|----------------------------|-------------------|-----------------|-----------|---------|---------|
| 12V, 24V     | 2 × 150W<br>or<br>2 × 300W | Without           | Without         | Without   | 1 1/4"  | 9SFT400 |



**Main application:** direct use of low voltage electricity produced by wind turbines or photovoltaic solar panels, for heating liquids, domestic hot water circuits, hot water tanks. These immersion heaters make it possible to use the surplus energy produced, and not used by domestic lighting needs or small electrical appliances. They can also be used in addition to domestic hot water tanks, limiting the need for electricity from the distribution network.

**Heater tube material:** dia. 8mm heating elements in AISI 304 (AISI 316; AISI 321; Incolloy 800 or Incolloy 840 on request).

**Fitting material:** Brass, brazed on tubes. Supplied with one fiber gasket but without nut. See accessories below.

**Thread:** 1 1/4" BSPP (ISO 228)

**Thermowell:** Includes one stainless steel thermowell 7mm ID.

**Heating elements connections:** Terminals with M4 stainless steel screw, nut and stainless steel washer. Supplied with brass straps for switching the two low voltage heaters from 12V to 24V. (Changing their connection from parallel to serial).

**Not heating immersed zone:** 50mm.

**Surface load:** see drawings

**Voltage:** 12 or 24V DC or AC.

**Attention:** Switching by a thermostatic device the heating elements in low voltage must be made by device designed for low voltage use, and withstanding the important intensity of these circuits. Similarly, the section of the power cables must be adapted.

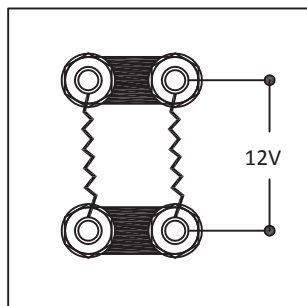


# Renewable energy immersion heaters

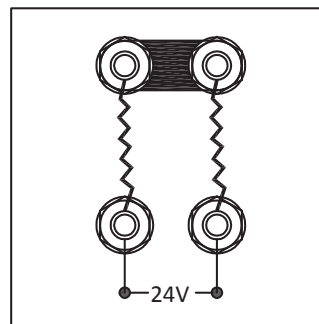
## Intensity flowing in low voltage heating circuits

| Voltage | Power |       |      |
|---------|-------|-------|------|
|         | 150W  | 300W  | 600W |
| 12V     | 12.5A | 25A   | 50A  |
| 24V     | 6.2A  | 12.5A | 25A  |

## Electric Wiring



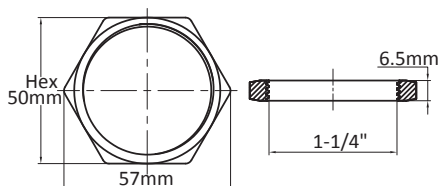
Straps position in 12V



Straps position in 24V

## Main references in 1¼" BSPP

| Power                                   | 2 × 150W 12V       | 2 × 300W 12V       |
|-----------------------------------------|--------------------|--------------------|
| Length (mm)                             | 170                | 170                |
| Surface load of 12/24V heating elements | 3W/cm <sup>2</sup> | 6W/cm <sup>2</sup> |
| Reference in AISI 304                   | 9SFT400152307217   | 9SFT400302615217   |
| Reference in Incolloy 800               | 9SFT400152307K17   | 9SFT400302615K17   |



## References of Brass Nut

1¼"

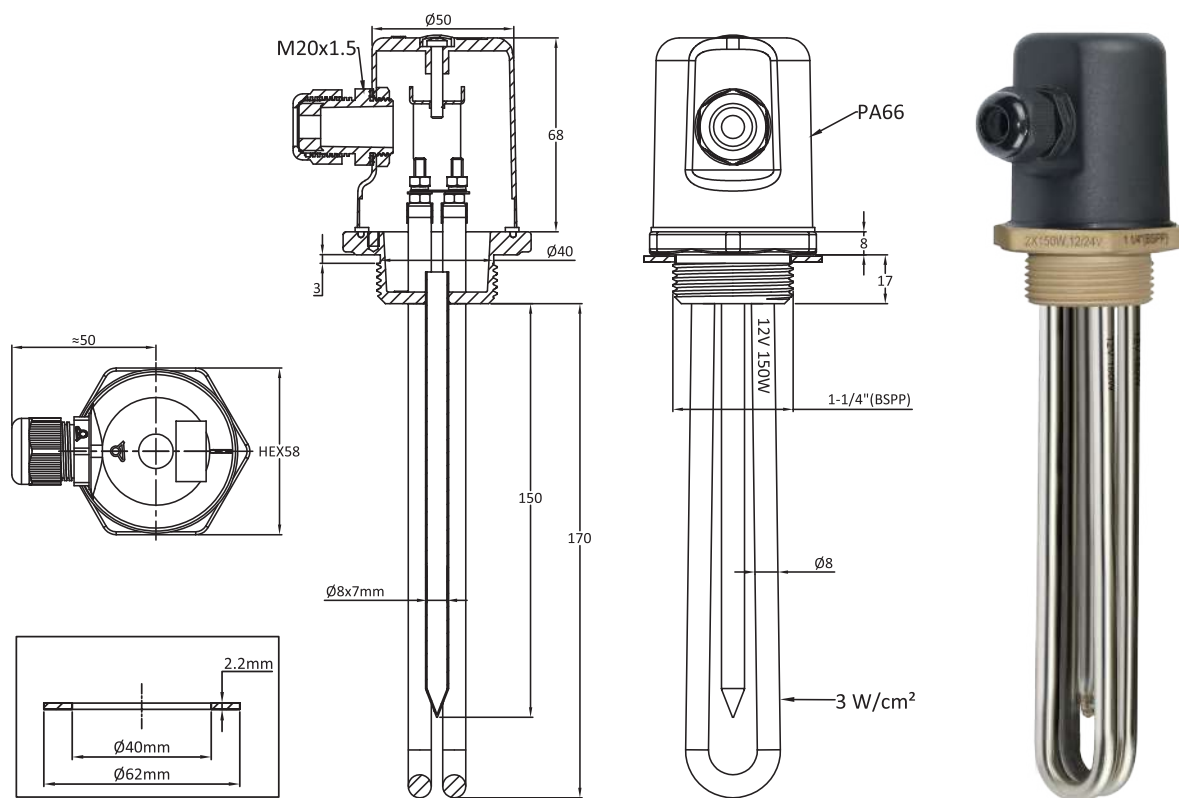
66NLC11465H50



## Renewable energy immersion heaters

### Renewable energy 1¼" immersion heaters, 12 and 24V power supply, with connection box

| Main Voltage | Low voltage Power          | Auxiliary voltage | Auxiliary power | Enclosure | Threads | Type    |
|--------------|----------------------------|-------------------|-----------------|-----------|---------|---------|
| 12V, 24V     | 2 × 150W<br>or<br>2 × 300W | Without           | Without         | With      | 1¼"     | 9SFT402 |



**Main application:** direct use of low voltage electricity produced by wind turbines or photovoltaic solar panels, for heating liquids, domestic hot water circuits, hot water tanks. These immersion heaters make it possible to use the surplus energy produced, and not used by domestic lighting needs or small electrical appliances. They can also be used in addition to domestic hot water tanks, limiting the need for electricity from the distribution network.

**Heater tube material:** dia. 8mm heating elements in AISI 304 (AISI 316; AISI 321; Incolloy 800 or Incolloy 840 on request).

**Fitting material:** Brass, brazed on tubes. Supplied with one fiber gasket but without nut. See accessories below.

**Thread:** 1¼" BSPP (ISO 228)

**Enclosure:** dia. 58mm × 75mm, black PA66 fiber glass reinforced, with gasket. Opening by center M4 screw without access to end user. (When the screw cap is pushed in, it is impossible to remove the cover)

**Ingress protection class:** IP66.

**Cable gland:** M20, PA66.

**Thermowell:** Includes one stainless steel thermowell 7mm ID.

**Heating elements connections:** Terminals with M4 stainless steel screw, nut and stainless steel washer. Supplied with brass straps for switching the two low voltage heaters from 12V to 24V. (Changing their connection from parallel to serial).

**Not heating immersed zone:** 50mm.

**Surface load:** see drawings

**Voltage:** 12 or 24V DC or AC.

Attention: Switching by a thermostatic device the heating elements in low voltage must be made by device designed for low voltage use, and withstanding the important intensity of these circuits. Similarly, the section of the power cables must be adapted.

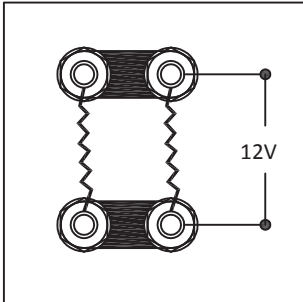
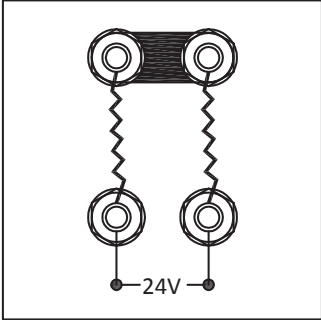


# Renewable energy immersion heaters

## Intensity flowing in low voltage heating circuits

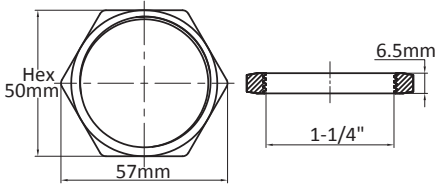
| Voltage | Power |       |      |
|---------|-------|-------|------|
|         | 150W  | 300W  | 600W |
| 12V     | 12.5A | 25A   | 50A  |
| 24V     | 6.2A  | 12.5A | 25A  |

## Electric Wiring

|                                                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |
| Straps position in 12V                                                            | Straps position in 24V                                                              |

## Main references in 1¼" BSPP

| Power                                   | 2 × 150W 12V       | 2 × 300W 12V       |
|-----------------------------------------|--------------------|--------------------|
| Length (mm)                             | 170                | 170                |
| Surface load of 12/24V heating elements | 3W/cm <sup>2</sup> | 6W/cm <sup>2</sup> |
| Reference in AISI 304                   | 9SFT402152307217   | 9SFT402302615217   |
| Reference in Incolloy 800               | 9SFT402152307K17   | 9SFT402302615K17   |

|   | References of Brass Nut |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|
|                                                                                                                                                                         | 1¼"                     | 66NLC11465H50 |



# **Section 10**

## **Usual immersion heaters connection boxes for thermostats**





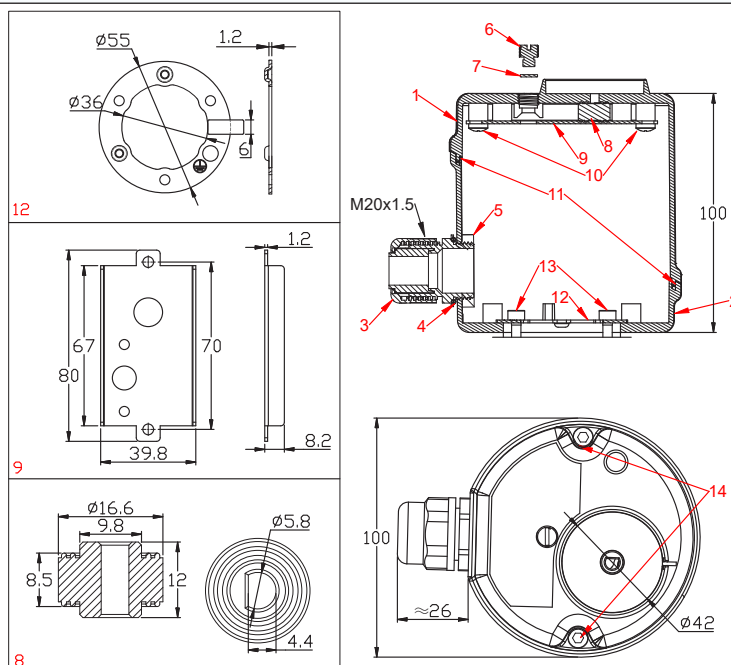
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## Usual immersion heaters connection boxes for thermostats

### Standard immersion heater PA66 enclosure for 8I three phases thermostat

Compatible with JPCI three-pole combined temperature control and fail safe manual reset limiters thermostats type 8I and similar models.



- 1: PA66 upper lid with recess for dia. 41mm standard knob
- 2: PA66 lower lid
- 3: M20 Pa66 cable gland
- 4: Cable gland gasket
- 5: Cable gland nut
- 6: Manual reset M9 x 1 protection cap in PA66
- 7: Manual reset protection cap gasket in silicone
- 8: Adjustment shaft waterproof gasket in silicone
- 9: 3 poles combination thermostat (type 8I) mounting board in stainless steel
- 10: M4 x 5 mounting board screws in stainless steel
- 11: PA66 enclosure lid gasket
- 12: Immersion heater 180° rotation ring, in stainless steel
- 13: M4 x 12 rotation ring screws in stainless steel (hollow hexagonal head)
- 14: M5 x 30 unlosable lid screws in stainless steel (x2)

### Main features

- Heavy-duty fiber glass reinforced PA66 housing, IK10 impact resistance, IP65 waterproofing, 115°C temperature resistance, excellent UV resistance.
- For indoor or outdoor use.
- Quick thermostat mounting without the need for drilling or adaptation.
- Compatible with immersion heaters designed to receive a rotation ring for easy orientation after screwing onto the tank.
- As an option, can receive a pilot light and a screw terminal block.
- Available off the shelf

### Part number:

Y3065001120T0U5E00

Updated 2025/02/12

Contact us

[www.ultimheat.com](http://www.ultimheat.com)

Cat22-4-10-3



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# **Section 11**

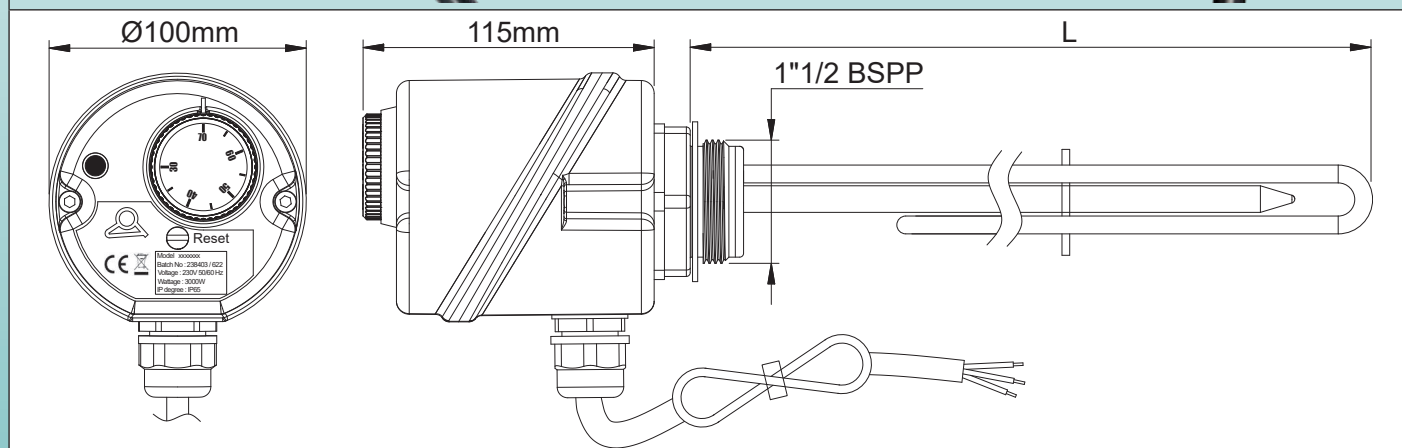
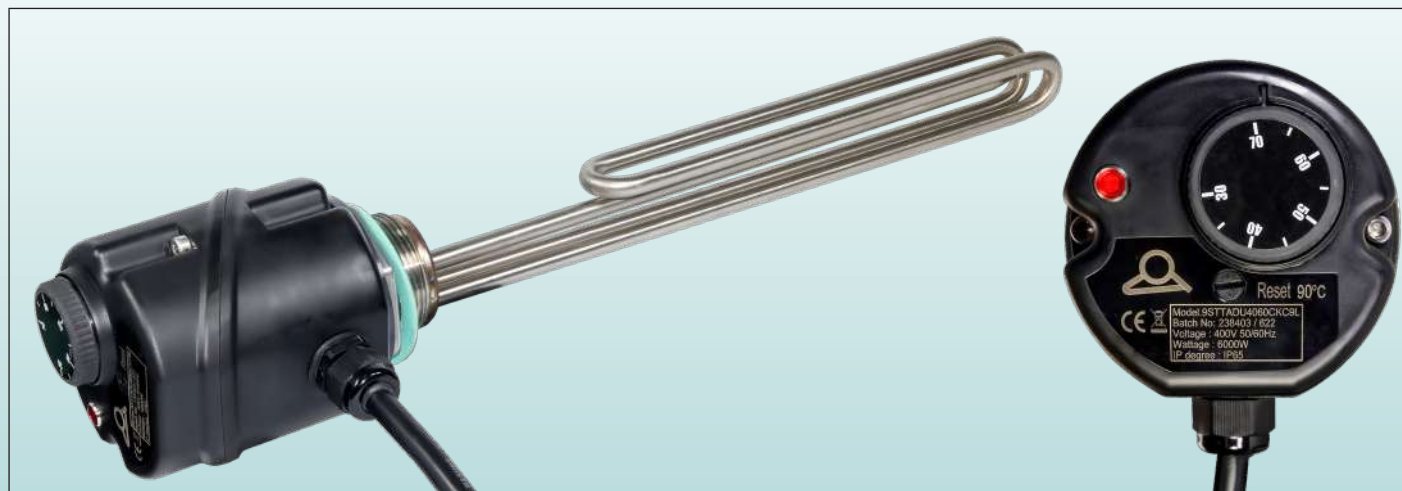
## **Usual single phase or 3 phases immersion heaters**



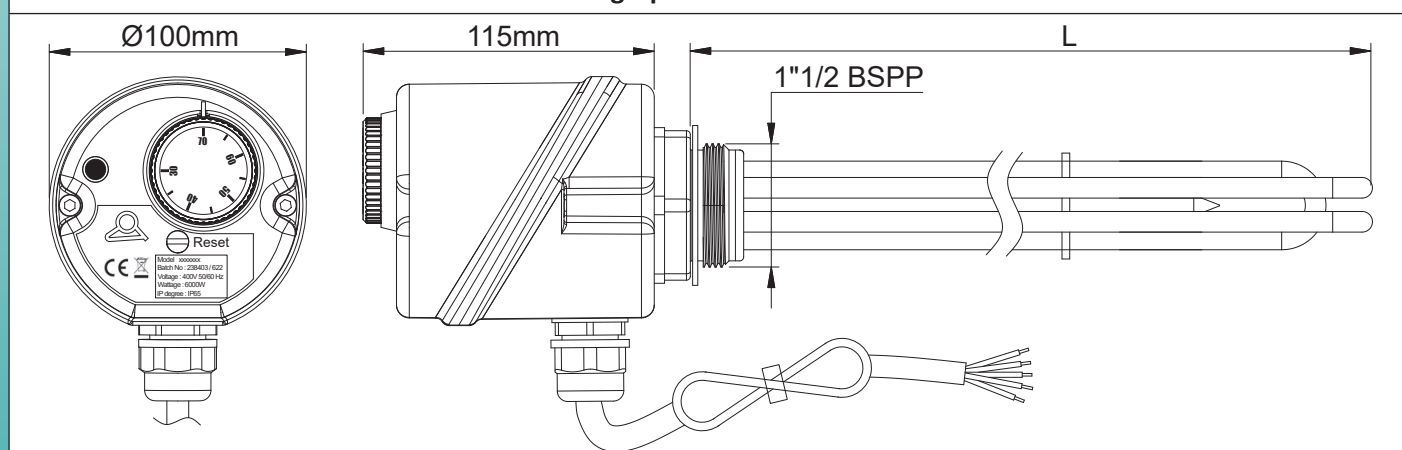
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## Usual single phase or 3 phases immersion heaters

With temperature control with 1½" threaded fitting and thermostats  
**TYPE 9STTAD**



Single pole 230V heater



3 Poles 400V heater

### Main technical features

- **Fully integrated manufacturing:** the entire production process is managed in-house, from complete thermostat manufacturing to the production of heating elements and their housing. This includes accessories molding, stamping, TIG and laser welding, laser marking, elastomeric gaskets compression production. Each stage is rigorously inspected to ensure the highest quality standards.
- Built-in thermostat with waterproof external control knob in a modern soft-grip design, made of polycarbonate. Standard print in °C.
- Indoor or outdoor use.





# Usual single phase or 3 phases immersion heaters

## Thermostat, safety and electric connection features

- Multi-pole thermostat adjustment range: 30-70°C.
- Multi-pole fixed limiter setting with manual reset: 90°C. The reset button is protected by a waterproof screw cap.
- Waterproof red pilot light indicating power on.
- Electrical output via cable gland, and connection via 2.5mm<sup>2</sup> HO5VVF PVC cord, 2 meters long, with 3, 4, or 5 conductors depending on the model.
- Power supply: 230V  $\pm 10\%$  50/60Hz (single-phase model) or 400V  $\pm 10\%$  50/60Hz (three-phase models)

## Mechanical fixing and housing features

- PA66 housing with the highest impact resistance class: IK10 (EN62262); IP65 (IEC 60529) and IP69K sealing (withstands high-pressure washing with water at 80°C according to DIN 40050). Ambient temperature rating of 115°C, excellent UV resistance. These characteristics are confirmed by laboratory tests.
- Captive stainless steel screws
- Features an internal rotation ring for easy rotation up to 180° after screwing onto the tank.

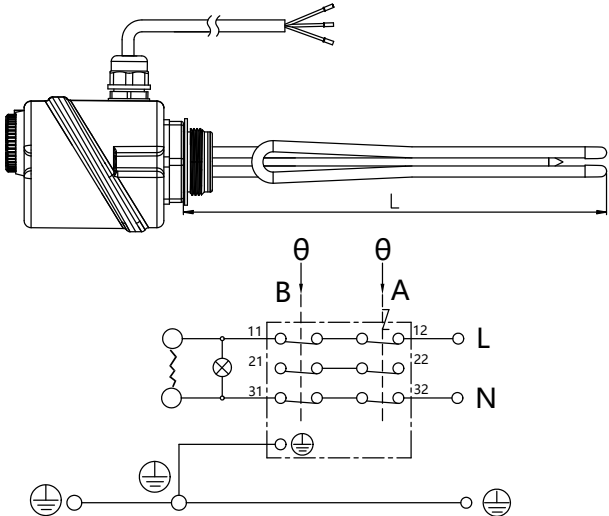
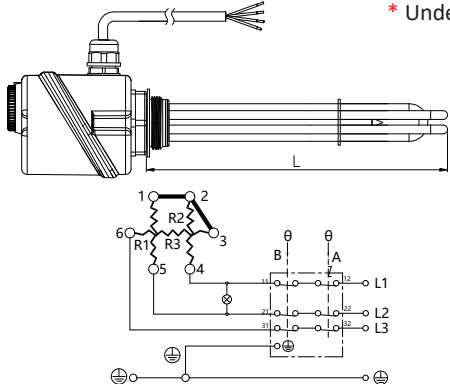
## Heating element features

- 304 stainless steel fitting with G 1½" cylindrical thread (ISO 228/1), asbestos-free fiber flat gasket provided for tank mounting.
- The heating elements are TIG-welded to the fitting without filler metal, ensuring genuine corrosion resistance.
- UL and VDE-certified 8mm diameter shielded heating elements in 304 or 316 stainless steel, but also, upon request, in Incoloy 800, 825, or titanium (MOQ apply).
- Packaging in individual cartons including a user and installation manual.

### Options:

- Logo customization via laser marking (MOQ apply)
- Internal set point adjustment.
- Thermostat temperature ranges and safety limiter temperature
- Delivery without power cord but with internal terminal block or faston 6,3 × 0,8mm
- Knob printed in °F
- Delta star switching connection block by screws.

## Part numbers

| Single phase with only one 230V heating element                                     |                  |             |           |        | 3 phases with 3 heating elements 400V                                                |                  |             |           |        |
|-------------------------------------------------------------------------------------|------------------|-------------|-----------|--------|--------------------------------------------------------------------------------------|------------------|-------------|-----------|--------|
| INCOLOY 800                                                                         | AISI-316L        | Voltage (V) | Power (W) | L (mm) | INCOLOY 800                                                                          | AISI-316L        | Voltage (V) | Power (W) | L (mm) |
| 9STTADT40152KC2Q                                                                    | 9STTADT40152BC2Q | 230         | 1500      | 320    | 9STTADU4030VKC0Q                                                                     | 9STTADU4030VBC0Q | 400         | 3000      | 300    |
| 9STTADT40202KC2Q                                                                    | 9STTADT40202BC2Q | 230         | 2000      | 320    | 9STTADU4040VKD0Q                                                                     | 9STTADU4040VBD0Q | 400         | 4000      | 400    |
| 9STTADT40222KC2Q                                                                    | 9STTADT40222BC2Q | 230         | 2200      | 320    | 9STTADU4045VKD5Q                                                                     | 9STTADU4045VBD5Q | 400         | 4500      | 450    |
| 9STTADT40252KC2Q                                                                    | 9STTADT40252BC2Q | 230         | 2500      | 320    | 9STTADU4050VKE0Q                                                                     | 9STTADU4050VBE0Q | 400         | 5000      | 500    |
| 9STTADT40302KC2Q                                                                    | 9STTADT40302BC2Q | 230         | 3000      | 320    | 9STTADU4055VKE5Q                                                                     | 9STTADU4055VBE5Q | 400         | 5500      | 550    |
| 9STTADT40452KD8Q                                                                    | 9STTADT40452BD8Q | 230         | 4500      | 480    | 9STTADU4060VKF0Q                                                                     | 9STTADU4060VBF0Q | 400         | 6000      | 600    |
|  |                  |             |           |        | 9STTADU4075VKG0Q                                                                     | 9STTADU4075VBG0Q | 400         | 7500      | 700    |
|                                                                                     |                  |             |           |        | 9STTADU4090VKG0Q                                                                     | 9STTADU4090VBG0Q | 400         | 9000      | 700    |
|                                                                                     |                  |             |           |        | 9STTADU4A20VKH5Q                                                                     | 9STTADU4A20VBH5Q | 400         | 12000*    | 850    |
|                                                                                     |                  |             |           |        | 9STTADU4A50VKJ0Q                                                                     | 9STTADU4A50VBJ0Q | 400         | 15000*    | 1000   |
|                                                                                     |                  |             |           |        |  |                  |             |           |        |

\* Under conditions

Updated 2025/04/07



# **Section 12**

## **Accessories for immersion heaters**

### **Fittings and gaskets, connection blocks**

### **Thermostats**

### **TCO**

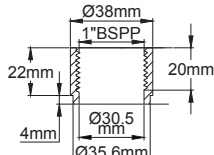
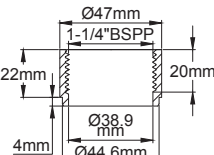
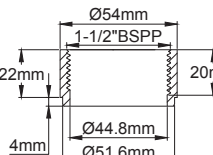
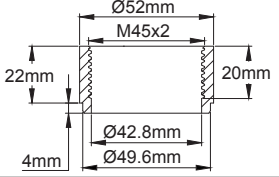
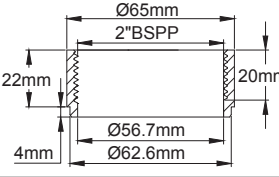
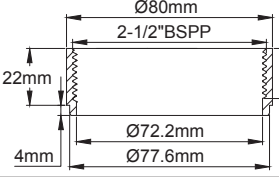
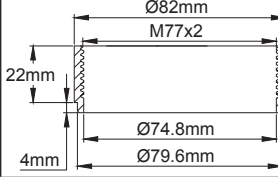


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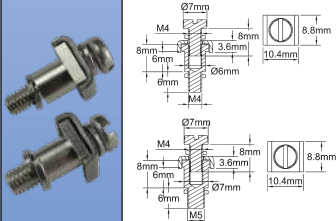
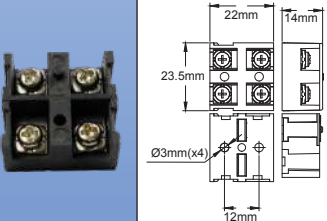
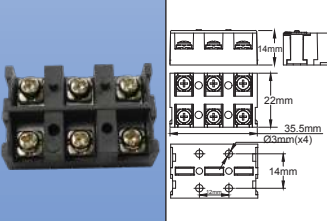
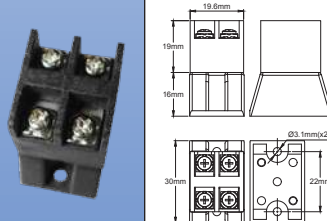
## Accessories for immersion heaters.

### 304L\* fitting for tank. Can be brazed or TIG welded

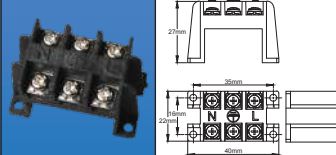
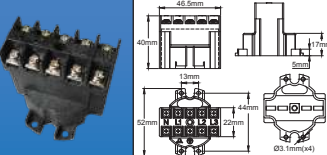
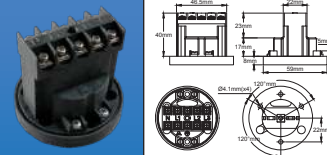
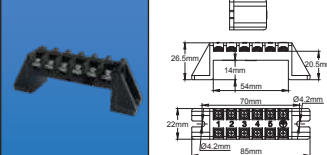
|                                                                                   |                                                                                   |                                                                                    |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  | 1"                                                                                | 1 1/4"                                                                             | 1 1/2"                                                                              |
|                                                                                   |  |  |  |
|                                                                                   | 9BBRA3000ELH259A                                                                  | 9BBRA3000ELH144A                                                                   | 9BBRA3000ELH140A                                                                    |
| M45x2                                                                             | 2"                                                                                | 2 1/2"                                                                             | M77x2                                                                               |
|  |  |  |  |
| 9BBRA3000ELH145A                                                                  | 9BBRA3000ELH146A                                                                  | 9BBRA3000ELH147A                                                                   | 9BBRA3000ELH148A                                                                    |

\* Made on order only. Can also be made in 316L.

### Connectors and terminals blocks for immersion heaters

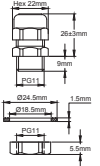
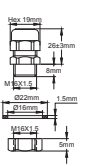
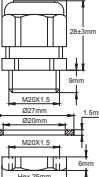
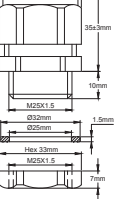
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|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Ground terminals. To screw on M4 or M5 threads on enclosures or fittings.                                                                                     | Small footprint standard connection blocks, PA66, 2.5mm <sup>2</sup>               |                                                                                     |                                                                                      |
|                                                                             |  |  |  |
| M4 terminal. For use with 1 1/2" and M45 stainless steel fittings and 1 1/4", 1 1/2", M45, 2" brass fittings<br>M5: For use with 2 1/2" and M77 brass fitting | Black PA66 connection block, 2 x 2.5mm <sup>2</sup> , backside mounting screws.    | Black PA66 connection block, 3 x 2.5mm <sup>2</sup> , backside mounting screws.     | Black PA66 connection block, 2 x 2.5mm <sup>2</sup> , 35mm raised bracket mounting.  |
| References                                                                                                                                                    | Reference                                                                          | Reference                                                                           | Reference                                                                            |
| M4: 9BBSI10COELH010A<br>M5: 9BBSI10COELH011A                                                                                                                  | BE2E2000000CP000                                                                   | BE3E3000000FP000                                                                    | BE2E2000000HP000                                                                     |

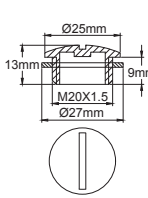
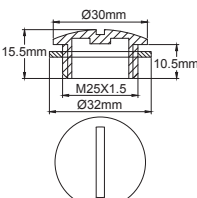
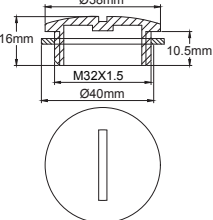
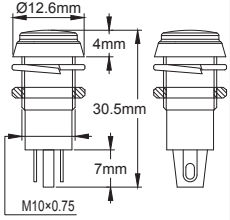
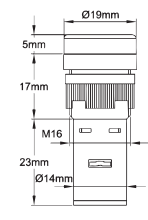
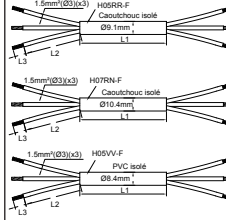
### Raised connection terminal blocks, PA66, 2.5mm<sup>2</sup>. Are mounted above the heating element outputs.

|                                                                                                                   |                                                                                                                                                |                                                                                                                                                                                                             |                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                |                                                             |                                                                                                                         |                                                                                                                                |
| Black PA66 connection block, 3 x 2.5mm <sup>2</sup> . 27mm raised bracket mounting, for products with 1" fitting. | Black PA66 connection block, 5 x 2.5mm <sup>2</sup> . 40mm raised bracket mounting. For use on products with 1 1/4" ; 1 1/2" ; M45x2 fittings. | Black PA66 connection block, 5 x 2.5mm <sup>2</sup> . 48mm raised bracket mounting ; with adapter for use on all enclosures, plastic or aluminum, with rotation ring, and 1 1/4" ; 1 1/2" ; M45x2 fittings. | This 6 way elevated terminal block can be positioned above tubular heater terminals, and it fits inside 105 x 105mm square aluminum and stainless steel housing and also inside the 100mm diameter plastic housing. |
| Reference                                                                                                         | Reference                                                                                                                                      | Reference                                                                                                                                                                                                   | Reference                                                                                                                                                                                                           |
| BE3E3000000JP000                                                                                                  | BE5E5000000KP000                                                                                                                               | BE5E5000000LP000                                                                                                                                                                                            | BE6E6000000MP000                                                                                                                                                                                                    |

# Immersion heaters

## Cable glands. Black PA66 and nickel plated brass. Ingress protection IP66

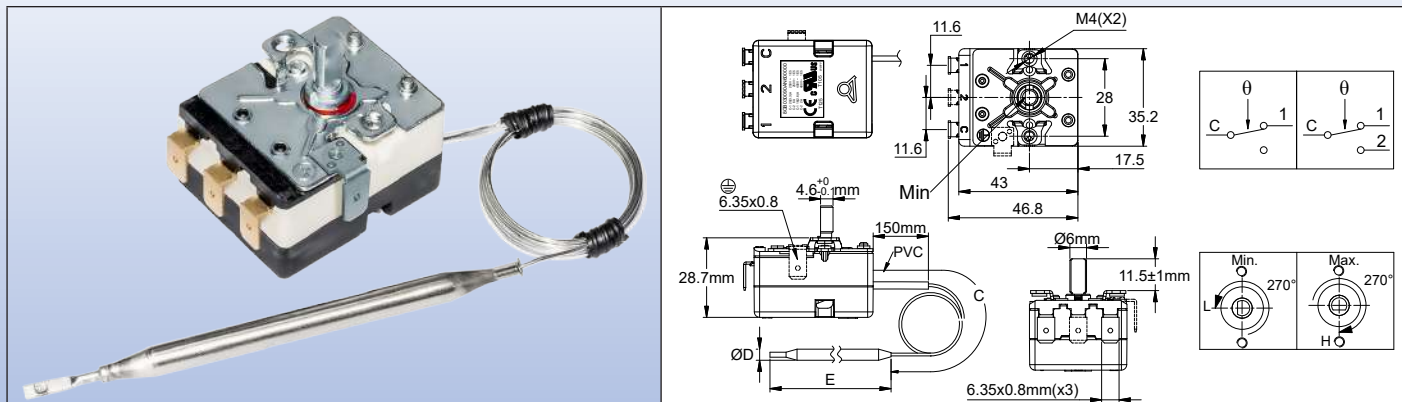
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|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                       |  |  |  |  |  |  |  |
| PG11 cable gland, used only on the smallest enclosure of the range. For cables for 5 to 10mm dia. With gasket and nut. |                                                                                   | M16 cable gland, for cables from 5 to 10mm dia. With gasket and nut.              |                                                                                   | M20 cable gland, for cables from 7.5 to 14mm dia. With gasket and nut.            |                                                                                     | M25 cable gland, for cables from 13 to 18mm dia. With gasket and nut.               |                                                                                     |
| <b>References</b>                                                                                                      |                                                                                   | <b>References</b>                                                                 |                                                                                   | <b>References</b>                                                                 |                                                                                     | <b>References</b>                                                                   |                                                                                     |
| PA66                                                                                                                   | 6YTPEP11C050100                                                                   | PA66                                                                              | 6YTPEM16C050100                                                                   | PA66                                                                              | 6YTPEM20C075140                                                                     | PA66                                                                                | 6YTPEM25C130180                                                                     |
| Nickel plated brass                                                                                                    | 6YTPEP11L050100                                                                   | Nickel plated brass                                                               | 6YTPEL16L050100                                                                   | Nickel plated brass                                                               | 6YTPEM20L075140                                                                     | Nickel plated brass                                                                 | 6YTPEM25L130180                                                                     |

| Cable gland caps, black PA66 and nickel plated brass                               |            |                                                                                    |            |                                                                                    |            | Pilot lights (230V)                                                                 |              |                                                                                      |              | Various                                                                                                 |  |
|------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------------------------------------------------|--|
|  |            |  |            |  |            |  |              |  |              |                     |  |
| M20 cap with gasket                                                                |            | M25 cap with gasket                                                                |            | M32 cap with gasket                                                                |            | Dia. 12mm, 10mm drill (Neon)                                                        |              | Dia. 19mm, 16mm drill (LED)                                                          |              | Electrical cords                                                                                        |  |
| References                                                                         |            | References                                                                         |            | References                                                                         |            | References                                                                          |              | References                                                                           |              | References upon request, depends of lengths L1, L2, L3 and insulation style (H05RR-F, H07RN-F, H05VV-F) |  |
| PA66                                                                               | 6YTPEM20B  | PA66                                                                               | 6YTPEM25B  | PA66                                                                               | 6YTPEM32B  | Red                                                                                 | 6YL10230RF00 | Red                                                                                  | 6YL16230RF00 |                                                                                                         |  |
| Nickel plated brass                                                                | 6YTPEM20PB | Nickel plated brass                                                                | 6YTPEM25PB | Nickel plated brass                                                                | 6YTPEM32PB | Green                                                                               | 6YL10230VF00 | Green                                                                                | 6YL16230VF00 |                                                                                                         |  |



# Immersion heaters

## 20A 250V Single pole control thermostat Type 8G



### Technical features

**Housing dimensions:** 43 × 35 × 29mm (without terminals)

**Bulb and capillary:** Stainless steel, with 100mm long PVC sleeve on the capillary. Capillary minimum bending radius is 5mm. No capillary sleeve for temperature ranges above 400°C (750°F). 8mm bulbs are in copper.

**Temperature sensing element:** Oil filled bulb and capillary.

**Caution:** Temperature ranges above 400°C (750°F) are filled with sodium-potassium eutectic. In case of breakage of the bulb or capillary, this liquid may self-ignite at room temperature in the presence of water or moisture.

**Terminals:** 6.35 × 0.8 quick connect terminals, 90° bended. Straight terminals or terminals with M4 screws also available on request. (MOQ apply). Terminal positions and alignment allow the use of a connector with flat or bended terminals.

**Adjustment:** Dia. 6mm shaft with 4.6mm flat, length 11.5mm. Other lengths, screw driver adjustment or fixed setting available on request.

**Mounting:** Front bracket with 2 × M4 threads, 28mm distance.

**Grounding:** 6.35 × 0.8 QC terminal on mounting bracket.

**Contact:** SPDT

**Electrical rating:**

**When the rated voltage is 250V~:**

- Open on temperature rise contact (C-1): 20(3.3)A 250V~, 50-60Hz
- Close on temperature rise contact (C-2): 6A 250V~, 50 ~60Hz

**When the rated voltage is 400V~:**

- Open on temperature rise contact (C-1): 16(2.6)A 400V~, 50-60Hz
- Close on temperature rise contact (C-2): 2A 400V~, 50 ~60Hz

**Electrical life:** 100, 000 cycles

**Max ambient temperature on body:** 85°C(185°F)

**Acceptable degree of pollution:** 2

### Main references used in immersion heaters

| Reference        | Temperature range<br>°C (°F) | Capillary<br>length(C, mm) | Bulb diameter<br>(D, mm)         | Bulb length<br>(E, mm) | Differential<br>°C (°F) | Max temperature<br>on bulb °C (°F) |
|------------------|------------------------------|----------------------------|----------------------------------|------------------------|-------------------------|------------------------------------|
| 8GB-35035AO60001 | -35+35°C (-31+95°F)          | 1500                       | 6                                | 139±5                  | 4±2°C (7.2±3.6°F)       | 65°C (149°F)                       |
| 8GB-35035AA60001 | -35+35°C (-31+95°F)          | 250                        | 6                                | 139±5                  | 4±2°C (7.2±3.6°F)       | 65°C (149°F)                       |
| 8GB-10040AO60001 | -10+40°C (14-104°F)          | 1500                       | 6                                | 175±5                  | 3±2°C (5.4±3.6°F)       | 70°C (158°F)                       |
| 8GB-10040AA60001 | -10+40°C (14-104°F)          | 250                        | 6                                | 175±5                  | 3±2°C (5.4±3.6°F)       | 70°C (158°F)                       |
| 8GB004040IA30000 | 4-40°C (39.2-104°F)          | 250                        | Pig tail style,<br>dia.30mm coil | 55±10                  | 4±2°C (7.2±3.6°F)       | 70°C (158°F)                       |
| 8GB004040AA80001 | 4-40°C (39.2-104°F)          | 250                        | 8                                | 86±5                   | 4±2°C (7.2±3.6°F)       | 70°C (158°F)                       |
| 8GB004040AO60001 | 4-40°C (39.2-104°F)          | 1500                       | 6                                | 135±5                  | 4±2°C (7.2±3.6°F)       | 70°C (158°F)                       |
| 8GB004040AA60001 | 4-40°C (39.2-104°F)          | 250                        | 6                                | 135±5                  | 4±2°C (7.2±3.6°F)       | 70°C (158°F)                       |
| 8GB000060AO60001 | 0-60°C (32-140°F)            | 1500                       | 6                                | 155±5                  | 3±2°C (5.4±3.6°F)       | 90°C (194°F)                       |
| 8GB000060AA80001 | 0-60°C (32- 140°F)           | 250                        | 8 copper                         | 97±5                   | 3±2°C (5.4±3.6°F)       | 90°C (194°F)                       |
| 8GB000090AO60001 | 0-90°C (32-194°F)            | 1500                       | 6                                | 85±5                   | 5±2°C (9±3.6°F)         | 120°C (248°F)                      |
| 8GB030090AO60001 | 30-90°C (86-194°F)           | 1500                       | 6                                | 122±5                  | 4±3°C (7.2±5.4°F)       | 120°C (248°F)                      |
| 8GB030090AA80001 | 30-90°C (86-194°F)           | 250                        | 8 copper                         | 79±5                   | 4±3°C (7.2±5.4°F)       | 120°C (248°F)                      |
| 8GB030110AO60001 | 30-110°C (86-230°F)          | 1500                       | 6                                | 101±5                  | 5±3°C (9±5.4°F)         | 140°C (284°F)                      |
| 8GB030110AA80001 | 30-110°C (86-230°F)          | 250                        | 8 copper                         | 68±5                   | 5±3°C (9±5.4°F)         | 140°C (284°F)                      |

Updated 2026/07/08

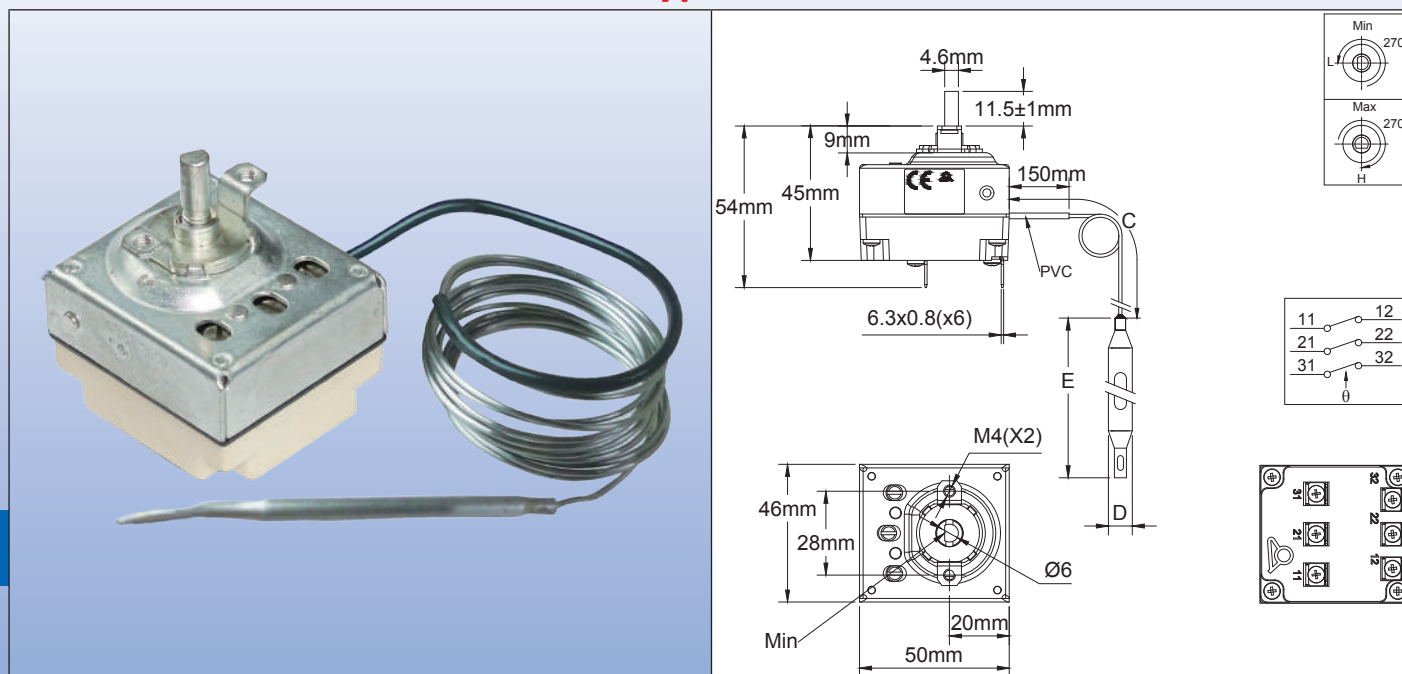
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Cat22-4-12-5

# Immersion heaters

## 3 pole control thermostats Type 8C



### Technical features

**Housing dimensions:** 46 × 50 × 45mm (without terminals.)

**Bulb and capillary:** Stainless steel, capillary length 250mm or 1500mm, 150mm long PVC sleeve on capillary. Capillary minimum bending radius 5mm.

**Temperature sensing element:** Liquid filled bulb and capillary.

**Terminals:** 6.35 × 0.8 quick connect terminals.

**Adjustment:** Dia. 6mm shaft with 4.6mm flat, (other lengths or fixed setting available on request).

**Mounting:** Front bracket with 2 × M4 threads, 28mm distance.

**Rating:** 3 × 16A(4) 250VAC, 10A 400VAC

**Contacts:** 3 × ST with snap action contact, 3PDT available on request.

**Max ambient temperature:** 85°C(185°F)

**Acceptable degree of pollution for use in 250V:** 3

**Acceptable degree of pollution for use in 400V:** 2

### Main references used in immersion heaters

| Reference        | Temperature range<br>(°C/ °F) | Capillary<br>length (mm) | Bulb<br>diameter<br>(mm) | Bulb length<br>(mm) | Differential<br>(°C/ °F) | Max<br>temperature<br>on bulb (°C/ °F) |
|------------------|-------------------------------|--------------------------|--------------------------|---------------------|--------------------------|----------------------------------------|
| 8CB-35035AO60001 | -35+35°C (-30+95°F)           | 1500                     | 6                        | 95                  | 4±2°C/ 7±3.6°F           | 50°C/ 122°F                            |
| 8CB-35035AA60001 | -35+35°C (-30+95°F)           | 250                      | 6                        | 95                  | 4±2°C/ 7±3.6°F           | 50°C/ 122°F                            |
| 8CB004040AO60001 | 4-40°C (40-105°F)             | 1500                     | 6                        | 160                 | 4±2°C/ 7±3.6°F           | 50°C/ 122°F                            |
| 8CB004040AA60001 | 4-40°C (40-105°F)             | 250                      | 6                        | 160                 | 4±2°C/ 7±3.6°F           | 50°C/ 122°F                            |
| 8CB030090AO60001 | 30-90°C (85-195°F)            | 1500                     | 6                        | 86                  | 6±3°C/ 10.8±5.4°F        | 110°C/ 230°F                           |
| 8CB030110AO60001 | 30-110°C (85-230°F)           | 1500                     | 6                        | 70                  | 6±3°C/ 10.8±5.4°F        | 130°C/ 266°F                           |

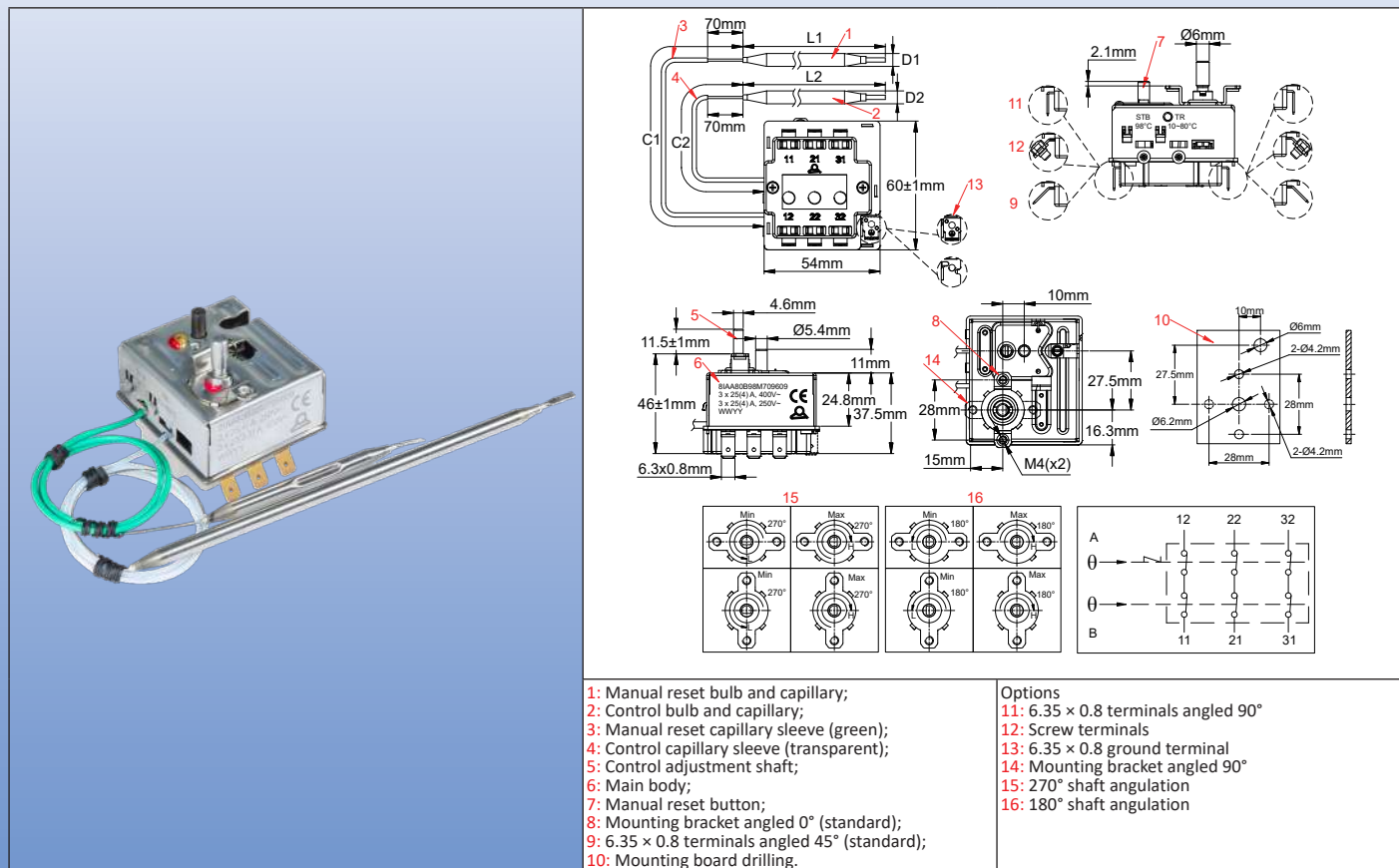


# Immersion heaters

## Three poles combination control thermostats, 25(4)A 250VAC, 25(4)A 400VAC with 3 poles fail safe manual reset limiter

### Type 8I

#### Dimensions



#### Applications

3 pole temperature control and 3 pole cut off on hot water tanks, including flat tanks, electric radiators, electro-thermal heating equipment and immersion heaters.

#### Main technical features

**Housing dimensions:** 60 × 54 × 46mm (Without adjusting shaft, terminals, bulbs and capillaries).

**Bulb and capillary:** Stainless steel, capillary length 250, 750, or 870mm, full length PVC sleeve on capillary up to 70mm of the bulb. PVC sleeve is transparent on the temperature control diastat and green on fail-safe safety diastat.

The bulb diameter of the safety diastat is usually 1mm smaller than that of the temperature control diastat to allow them to be mounted one behind the other in the same pocket. For the same reason, the capillary of the safety diastat is shorter than that of the temperature control diastat.

Capillary minimum bending radius: 5mm.

**Temperature sensing element:** Liquid filled bulbs and capillaries.

**Terminals:** 6.35 × 0.8 quick connect terminals. M4 screws also available on request.

**Adjustment of temperature control set point:** Dia. 6mm shaft with 4.6mm flat, shaft length 11.5mm. Other lengths or fixed setting available on request.

The temperature control shaft is available with 180 or 270° mechanical angulation.

**Manual reset:** Fail-safe, sealed fixed setting, front access reset button. Set point value of manual reset is usually 25°C above the maximum adjustment value of the temperature control set point. Other values are possible, **provided that tolerances between both set point don't allow over crossing.**

To know more about standard tolerances on manual reset set point, see 85 thermostat catalogue pages.

**Mounting:** Bracket with 2 M4 holes at 28mm distance, centered around the adjustment shaft. Exists in 2 positions, at 0° and 90°

**Rating:** 3 × 25(4)A 400VAC, 3 × 25(4)A 250VAC.

**Contacts:** 3 normally closed contacts, snap action, with simultaneous opening and closing.

**Max ambient temperature on body:** 85°C(185°F).

**Acceptable degree of pollution for use in 250V:** 3

**Acceptable degree of pollution for use in 400V:** 2



# Immersion heaters

**Main references with 45° bended QC terminals, 270° angulation, 11.5mm shaft length, mounting bracket angled at 0° \***

| References with 6 × 6.35 terminals bended at 45° | References with six M4 screw terminals | Manual reset Calibration temperature (°C/°F) | Control temperature range (°C/°F) | Capillaries length (C1, C2, mm) ** | Bulb diameters (D1, D2, mm) | Bulb length (L1, L2, mm) | Max temperature on bulbs L1 and L2 °C (°F) |
|--------------------------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------|------------------------------------|-----------------------------|--------------------------|--------------------------------------------|
| 8IAA70B90M009E04                                 | 8IAA70B90M009E0S                       | 90+0/-8°C<br>(194+0/-14.4°F)                 | 10-70°C<br>(50-158°F)             | 900                                | Ø5, Ø 6                     | 80, 85                   | L1: 140°C (284°F)<br>L2: 170°C (338°F)     |
| 8IAA70B90M005E04                                 | 8IAA70B90M005E0S                       |                                              |                                   | 500                                |                             |                          |                                            |
| 8IAA70B90M002E04                                 | 8IAA70B90M002E0S                       |                                              |                                   | 250                                |                             |                          |                                            |
| 8IAC70B90M009E04                                 | 8IAC70B90M009E0S                       | 90+0/-8°C<br>(194+0/-14.4°F)                 | 30-70°C<br>(86-158°F)             | 900                                | Ø5, Ø 6                     | 80, 140                  | L1: 120°C (248°F)<br>L2: 130°C (266°F)     |
| 8IAC70B90M005E04                                 | 8IAC70B90M005E0S                       |                                              |                                   | 500                                |                             |                          |                                            |
| 8IAC70B90M002E04                                 | 8IAC70B90M002E0S                       |                                              |                                   | 250                                |                             |                          |                                            |
| 8IA075B98M009E04                                 | 8IA075B98M009E0S                       | 98+0/-8°C<br>(208+0/-14.4°F)                 | 0-75°C<br>(32-167°F)              | 900                                | Ø5, Ø 6                     | 80, 130                  | L1: 140°C (284°F)<br>L2: 170°C (338°F)     |
| 8IA075B98M005E04                                 | 8IA075B98M005E0S                       |                                              |                                   | 500                                |                             |                          |                                            |
| 8IA075B98M002E04                                 | 8IA075B98M002E0S                       |                                              |                                   | 250                                |                             |                          |                                            |
| 8IAA80BK0M009E04                                 | 8IAA80BK0M009E0S                       | 110+0/-8°C<br>(230+0/-14.4°F)                | 10-80°C<br>(50-176°F)             | 900                                | Ø5, Ø 6                     | 80, 120                  | L1: 140°C (284°F)<br>L2: 170°C (338°F)     |
| 8IAA80BK0M005E04                                 | 8IAA80BK0M005E0S                       |                                              |                                   | 500                                |                             |                          |                                            |
| 8IAA80BK0M002E04                                 | 8IAA80BK0M002E0S                       |                                              |                                   | 250                                |                             |                          |                                            |
| 8IAC85BK0M009E04                                 | 8IAC85BK0M009E0S                       | 110+0/-10°C<br>(230+0/-18°F)                 | 30-85°C<br>(86-185°F)             | 900                                | Ø5, Ø 6                     | 80, 80                   | L1: 140°C (284°F)<br>L2: 170°C (338°F)     |
| 8IAC85BK0M005E04                                 | 8IAC85BK0M005E0S                       |                                              |                                   | 500                                |                             |                          |                                            |
| 8IAC85BK0M002E04                                 | 8IAC85BK0M002E0S                       |                                              |                                   | 250                                |                             |                          |                                            |

\* Ask to get specific data sheet for products with different bending of 6.35 terminals, 180° angulation, a mounting bracket angled at 90° or different length of adjustment shaft.

\*\* In standard, manual reset capillary is shorter than temperature control. Ask specific data sheet if 2 identical lengths are requested. Temperature control maximum set point is 450°C and maximum manual reset set point is 500°C. Ask for specific data sheets. Some high temperature ranges are not available with fail safe action.

## Standard knobs printing\*

| 10 - 70°C on 270°  | 10 - 70°C on 180°  | 10 - 80°C on 270°  | 10 - 80°C on 180°  | 30 - 85°C on 270°  | 30 - 85°C on 180°  | 30 - 70°C on 210°    |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|
|                    |                    |                    |                    |                    |                    |                      |
| 66MZ0060100702FB   | 66MZ006010070AFB   | 66MZ0060100802FB   | 66MZ006010080AFB   | 66MZ0060300852FB   | 66MZ006030085AFB   | 66MZ0060300701FW     |
| 50 - 158°F on 270° | 50 - 158°F on 180° | 50 - 176°F on 270° | 50 - 176°F on 180° | 86 - 185°C on 270° | 86 - 185°C on 180° | 33.8 - 158°F on 210° |
|                    |                    |                    |                    |                    |                    |                      |
| 66MZ0060501582FY   | 66MZ006050158AFY   | 66MZ0060501762FY   | 66MZ006050176AFY   | 66MZ0060861852FY   | 66MZ006086185AFY   | 66MZ0060351551FX     |

\* Be careful in selecting knob model in accessories, the knob diameter and bezel must let free access to the reset button (see the 27.5mm dimension on drawing)

# Immersion heaters

**SPNC manual reset high limit, fixed or adjustable set point, fail-safe, 20A.**

## Type 8L

### Dimensions

| T85 types                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>8L0: M10 mounting, T85</b><br/> <b>8L3: M10 mounting, T150</b></p> <p>1: Reset button cap<br/>                 2: Reset button<br/>                 3: Capillary sleeving<br/>                 4: Ground terminal (option)</p> | <p><b>8L1: 2 x M4 screws mounting, T85</b><br/> <b>8L4: 2 x M4 screws mounting, T150</b></p> <p>1: Reset button cap<br/>                 2: Reset button<br/>                 3: Capillary sleeving<br/>                 4: Ground terminal (option)<br/>                 5: 2xM4 mounting bracket</p> | <p><b>8L2: 2 x M4 screws mounting and mini adjustment dial, T85</b><br/> <b>8L5: 2 x M4 screws mounting and mini adjustment dial, T150</b></p> <p>1: Reset button cap<br/>                 2: Reset button<br/>                 3: Capillary sleeving<br/>                 4: Ground terminal (option)<br/>                 5: 2xM4 mounting bracket<br/>                 6: Mini adjustment dial</p> |

### Technical features

**Applications:** Protection against the overheating of the heaters due to an abnormal rise of the liquid temperature due to a flow failure. The mounting of the bulbs can be made inside standard dia. 8.5mm pockets, or in an additional thermowell added on request.

Through wall fittings on capillary are also available. The thermostat body can be installed in a protective cover of the heating elements outputs, or remotely in a separate control cabinet. They are resettable after tripping, but prior full audit of the circuit is essential to find the cause of overheating and correct it before restarting.



# Immersion heaters

**Housing dimensions:** 24.7 × 33 × 26mm (without terminals and reset). These thermostats exist in two ambient temperature resistance classes: T85 (cheapest) or T150

**Bulb and capillary:** Stainless steel, capillary length 250mm to 1500mm, 100mm long PVC sleeve on capillary. Capillary minimum bending radius 5mm.

**Temperature sensing element:** Liquid filled bulb and capillary.

**Terminals:** 6.35 × 0.8 quick connect terminals (M4 screws also available on request). Terminals can be vertical, horizontal or bended at 45°

**Adjustment:** Fixed setting, sealed or adjustable by mini dial

**Manual reset:** Fail-safe, front access reset button

**Fail-safe contact action by low temperature:** Temperatures under -10°C (14°F) will trigger the manual reset.

**Mounting:** Front bushing with M10 × 1 thread, Maximum recommended tightening torque of M10x1 nut: 1N.m (with 3.5mm thickness nut)

**Rating:** 20(4)A 250V/16 (4)A 400VAC

**Contacts:** SPNC snap action contact

**Max ambient temperature on body:** 85°C (185°F).

**Acceptable degree of pollution for use in 250V:** 3

**Acceptable degree of pollution for use in 400V:** 3

## Main references in T85 \*\*\* with 750mm capillary\* and vertical 6.35mm terminals\*\*

| References, M10 mounting | References, 2 × M4 bracket mounting | References, 2 × M4 bracket mounting and mini dial | Calibration temperature (°C/°F) | Bulb diameter (D, mm) | Bulb length (E, mm) | Max temperature on bulb (°C/°F) |
|--------------------------|-------------------------------------|---------------------------------------------------|---------------------------------|-----------------------|---------------------|---------------------------------|
| 8L0070105AG60000         | 8L1070105AG60000                    | 8L2070105AG60000                                  | 70 +0/-8°C (158 +0/-14.4°F)     | 6                     | 77                  | 105°C/221°F                     |
| 8L0080105AG60000         | 8L1080105AG60000                    | 8L2080105AG60000                                  | 80 +0/-8°C (176 +0/-14.4°F)     | 6                     | 77                  | 105°C/221°F                     |
| 8L0090115AG60000         | 8L1090115AG60000                    | 8L2090115AG60000                                  | 90 +0/-8°C (194 +0/-14.4°F)     | 6                     | 77                  | 115°C/239°F                     |
| 8L0100120AG60000         | 8L1100120AG60000                    | 8L2100120AG60000                                  | 100 +0/-8°C (212 +0/-14.4°F)    | 6                     | 77                  | 120°C/248°F                     |
| 8L0110135AG60000         | 8L1110135AG60000                    | 8L2110135AG60000                                  | 110 +0/-8°C (230 +0/-14.4°F)    | 6                     | 77                  | 135°C/275°F                     |
| 8L0120145AG60000         | 8L1120145AG60000                    | 8L2120145AG60000                                  | 120 +0/-8°C (248 +0/-14.4°F)    | 6                     | 77                  | 145°C/293°F                     |
| 8L0130155AG60000         | 8L1130155AG60000                    | 8L2130155AG60000                                  | 130 +0/-8°C (266 +0/-14.4°F)    | 6                     | 74                  | 155°C/311°F                     |
| 8L0150175AG60000         | 8L1150175AG60000                    | 8L2150175AG60000                                  | 150 +0/-8°C (302 +0/-14.4°F)    | 6                     | 74                  | 175°C/347°F                     |
| 8L0170195AG50000         | 8L1170195AG50000                    | 8L2170195AG50000                                  | 170 +0/-10°C (338 +0/-18°F)     | 5                     | 70                  | 195°C/383°F                     |
| 8L0190215AG50000         | 8L1190215AG50000                    | 8L2190215AG50000                                  | 190 +0/-10°C (374 +0/-18°F)     | 5                     | 70                  | 215°C/419°F                     |
| 8L0210235AG40000         | 8L1210235AG40000                    | 8L2210235AG40000                                  | 210 +0/-12°C (410 +0/-22°F)     | 4                     | 65                  | 235°C/455°F                     |
| 8L0230255AG40000         | 8L1230255AG40000                    | 8L2230255AG40000                                  | 230 +0/-12°C (446 +0/-22°F)     | 4                     | 65                  | 255°C/490°F                     |

\* Capillary 250mm: replace G by A in the reference; Capillary 1m: replace G by J in the reference; Capillary 1.5m: replace G by O in the reference.

\*\* Horizontal 6.35 terminals, replace 0000 by 2000 in the reference; 45° bended 6.35 terminals, replace 0000 by 1000 in the reference. Screw terminals, ask for data sheet.

\*\*\* Ground terminal option: replace 0000 at the end of references by 0G00

\*\*\*\* T150 types, replace 8L0 by 8L3, 8L1 by 8L4, 8L2 by 8L5.

Set point temperature up to 500°C can be made, without fail safe action for calibration higher than 400°C. Ask for specific data sheet.

## Accessories (Must be ordered separately, shipped assembled on capillary)

|  |  |                                                                                                        |                  |
|--|--|--------------------------------------------------------------------------------------------------------|------------------|
|  |  | Nickel plated brass capillary fitting for use on liquids up to 130°C<br>(Capillary gasket in NBR)      | 66RL41LS30000000 |
|  |  | Nickel plated brass capillary fitting for use on liquids up to 230°C<br>(Capillary gasket in FKM)      | 66RL41LS20000000 |
|  |  | Stainless steel 304 capillary fitting for use on liquids up to 130°C<br>(Capillary gasket in NBR)      | 66RIMEPM9X1041C7 |
|  |  | Stainless steel 304 capillary fitting for use on liquids up to 230°C<br>(Capillary gasket in FKM)      | 66RIMEPM9X1041C8 |
|  |  | Stainless steel 304 capillary fitting for use on liquids up to 500°C<br>(Capillary gasket in graphite) | 66RIMEVM9X1041C9 |

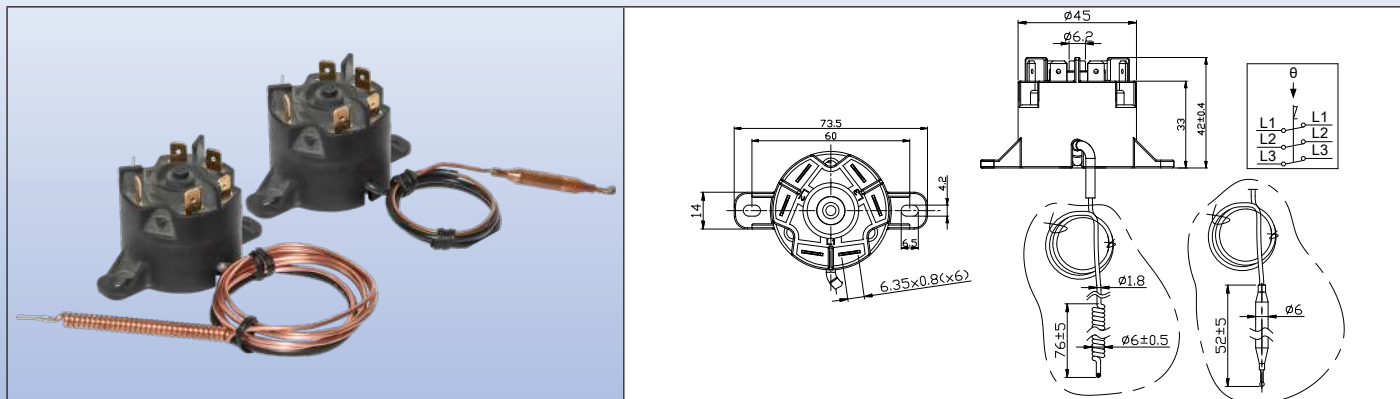
Updated 2026/05/15





# Immersion heaters

## 3 poles manual reset high limit, fail safe, 25A 250V, 20A 400V, rear mounting Type 82



### Technical features

**Applications:** Protection against the overheating of the heaters due to an abnormal rise of the liquid temperature due to a flow failure. The mounting of the bulbs can be made inside standard dia. 8.5mm pockets, or in an additional thermowell added on request. The thermostat body can be installed in a protective cover of the heating elements outputs, or remotely in a separate control cabinet. They are resettable after tripping, but prior full audit of the circuit is essential to find the cause of overheating and correct it before restarting.

**Housing dimensions:** dia. 45 x 42 mm

**Capillary:** copper, capillary length 250mm or 900 mm, 150 mm long PVC sleeve on capillary. Capillary minimum bending radius 5 mm.

For technical reasons, we do not recommend to use capillary length longer than 900 mm.

**Bulb or helicoid capillary:** copper, dia. 6 mm

**Temperature sensing element:** Liquid-filled thermostatic assembly whose boiling causes tripping of the contact. Therefore, unlike liquid filled systems, these thermostats are little sensitive to atmospheric pressure.

**Terminals:** 6.35 x 0.8 quick connect terminals

**Adjustment:** factory fixed setting available between 50°C and 212°C

**Mounting:** Backside legs, 2 M4 screws, holes distance 60 mm

**Manual reset:** fail safe action, center button

**Rating:** 3 x 25A 250VAC, 3 x 20A 400VAC, resistive (6000 cycles), UL, CUL, CE (T85).

**Contacts:** three poles, open on temperature rise (snap action contact), double break.

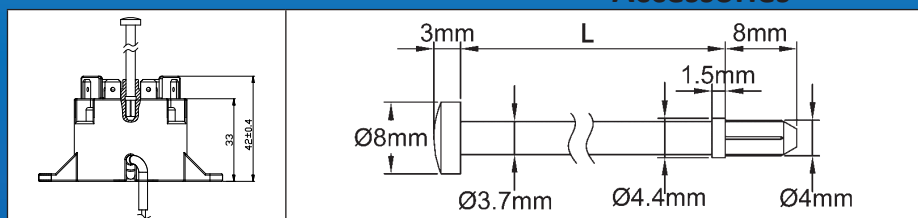
**Max ambient temperature on head:** 150°C (302°F).

### Main references with helicoid bulb

| Reference        | Calibration Temperature (°C/ °F) | Minimum resettable temperature (°C/ °F) | Capillary length (C, mm) | Bulb diameter (D, mm) | Bulb length (L, mm) | Max temperature on bulb (°C/ °F) |
|------------------|----------------------------------|-----------------------------------------|--------------------------|-----------------------|---------------------|----------------------------------|
| 820060090AI610F1 | 60±5°C/140±9°F                   | 20°C/68°F                               | 900                      | 6                     | 50                  | 90°C/ 194°F                      |
| 820060090AI610F1 | 60±5°C/140±9°F                   | 20°C/68°F                               | 250                      | 6                     | 50                  | 90°C/ 194°F                      |
| 820070100AI610F1 | 70±5°C/158±9°F                   | 30°C/86°F                               | 900                      | 6                     | 50                  | 100°C/ 212°F                     |
| 820080110AI610F1 | 80±5°C/176±9°F                   | 40°C/104°F                              | 900                      | 6                     | 50                  | 110°C/ 230°F                     |
| 820090120AI610F1 | 90±5°C/194±9°F                   | 50°C/122°F                              | 900                      | 6                     | 50                  | 120°C/ 248°F                     |
| 820110140AI610F1 | 110±5°C/230±9°F                  | 70°C/158°F                              | 900                      | 6                     | 50                  | 140°C/ 284°F                     |
| 820130160AI610F1 | 130±6°C/266±11°F                 | 90°C/194°F                              | 900                      | 6                     | 60*                 | 160°C/ 320°F                     |
| 820150180AI610F1 | 150±7°C/302±13°F                 | 110°C/230°F                             | 900                      | 6                     | 60*                 | 180°C/ 356°F                     |
| 820170200AI610F1 | 170±7°C/338±13°F                 | 130°C/266°F                             | 900                      | 6                     | 60*                 | 200°C/ 392°F                     |

- Maximum manual reset set point is 212°C ±12°C. Ask for specific data sheets

### Accessories



Long distance manual reset rods

| L   | Reference |
|-----|-----------|
| 114 | 664CLR114 |
| 30  | 664CLR030 |

Other lenght on request

Updated 2026/03/27

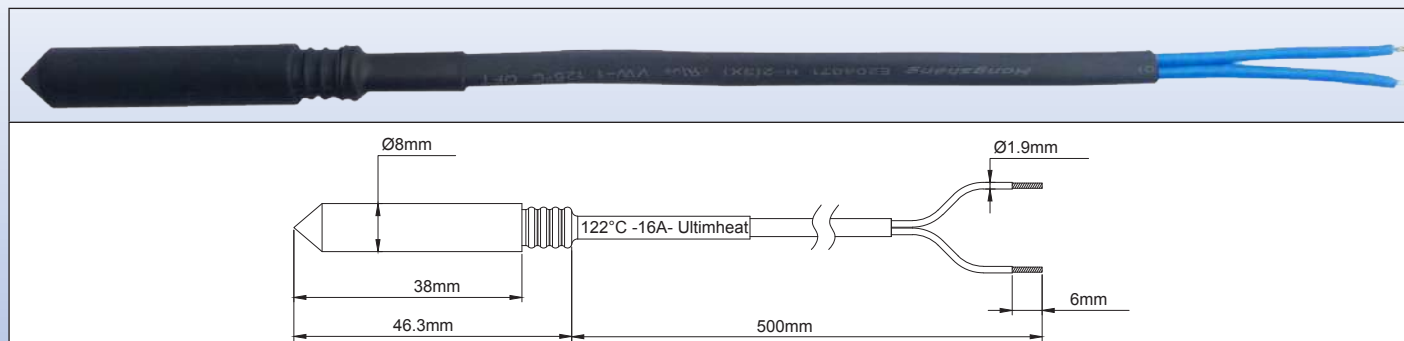
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Cat22-4-12-11

# Immersion heaters

## Wired thermal fuses, for insertion into 8.5mm I.D. thermowells Type 5MA 3-F



**Applications:** protection against overheating of equipment and heating elements.

**Fusible pellet:** organic compound.

**Mechanism:** movable pellet actuated of a spring released by the fusion of the pellet.

**Protection:** by electrical insulation silicone boot, dia. 8mm.

**Nominal current rating :** 16A 250V.

The nominal current rating is the maximum current the fuse can carry without opening or deteriorate when subjected to a temperature known as the «holding temperature» (Th) for a limited time.

**Holding temperature (Th):** the fuse must not open or be destroyed when subjected to a temperature equal to Th-6°C for a period of 168 hours under nominal voltage and current.

**Rated functioning temperature (Tf):** It is the opening temperature of the fuse in a calibration oven, when subjected to a current less than 10 mA, when temperature rises at a speed of 0.5 to 1°C/min. The opening temperature must not be lower than Tf-10°C or above Tf under these conditions. This is the operating temperature Tf which is printed on the fuse and the protective sheath external of the leads.

**Maximum temperature (Tm):** it is the maximum temperature withstood by the fuse after opening without losing its insulating and mechanical properties.

**This feature is critical in immersion heater applications, to determine the right position of the TCO to avoid its destruction and re-energization of the electrical circuit by high temperature overshoot.**

**Insulation voltage between open contacts:** ≥ 500V.

**Insulation resistance between open contacts:** ≥ 0.2 MΩ @ 500V.

**Lead lengths:** 500mm.

**Leads:** FEP 300V primary insulation, 1mm<sup>2</sup> gauge (AWG18), in a polyolefin sheath.

**In red:** standard temperatures available from stock.

### Main references

| Reference        | Rated functioning temperature °C/ °F (Tf) | Holding temperature °C/ °F (Th) | Maximum temperature °C/ °F (Tm) |
|------------------|-------------------------------------------|---------------------------------|---------------------------------|
| 5MA3SPF070F18500 | 73°C/ 163.4°F                             | 45°C/ 113°F                     | 115°C/ 239°F                    |
| 5MA3SPF077F18500 | 79°C/ 174.2°F                             | 52°C/ 125.6°F                   | 125°C/ 257°F                    |
| 5MA3SPF084F18500 | 85°C/ 185°F                               | 57°C/ 134.6°F                   | 125°C/ 257°F                    |
| 5MA3SPF091F18500 | 94°C/ 201.2°F                             | 66°C/ 150.8°F                   | 140°C/ 284°F                    |
| 5MA3SPF096F18500 | 99°C/ 210.2°F                             | 71°C/ 159.8°F                   | 140°C/ 284°F                    |
| 5MA3SPF106F18500 | 108°C/ 226.4°F                            | 77°C/ 170.6°F                   | 145°C/ 293°F                    |
| 5MA3SPF109F18500 | 113°C/ 235.4°F                            | 84°C/ 183.2°F                   | 150°C/ 302°F                    |
| 5MA3SPF121F18500 | 122°C/ 251.6°F                            | 94°C/ 201.2°F                   | 175°C/ 347°F                    |
| 5MA3SPF129F18500 | 133°C/ 271.4°F                            | 101°C/ 213.8°F                  | 175°C/ 347°F                    |
| 5MA3SPF139F18500 | 142°C/ 287.6°F                            | 114°C/ 237.2°F                  | 185°C/ 365°F                    |
| 5MA3SPF152F18500 | 157°C/ 314.6°F                            | 127°C/ 260.6°F                  | 195°C/ 383°F                    |
| 5MA3SPF165F18500 | 167°C/ 332.6°F                            | 130°C/ 266°F                    | 205°C/ 401°F                    |
| 5MA3SPF169F18500 | 172°C/ 341.6°F                            | 145°C/ 293°F                    | 215°C/ 419°F                    |
| 5MA3SPF182F18500 | 184°C/ 363.2°F                            | 156°C/ 312.8°F                  | 225°C/ 437°F                    |
| 5MA3SPF188F18500 | 192°C/ 377.6°F                            | 164°C/ 327.2°F                  | 245°C/ 473°F                    |
| 5MA3SPF216F18500 | 216°C/ 420.8°F                            | 189°C/ 372.2°F                  | 280°C/ 536°F                    |
| 5MA3SPF227F18500 | 227°C/ 440.6°F                            | 190°C/ 374°F                    | 295°C/ 563°F                    |
| 5MA3SPF240F18500 | 240°C/ 464°F                              | 190°C/ 374°F                    | 305°C/ 581°F                    |







# ULTIMHEAT

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## HEAT & CONTROLS



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# IMMERSION HEATERS