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**ASSEMBLY AND INSTALLATION INSTRUCTION FOR CENTRAL HEATING UNIT****TYPE CS1****1. CONSTRUCTION**

Central heating unit CS1 is equipped with a single phase overtemperature cut-out. Loval central heating units comprise the following components: (fig. 1)

Immersion heater UKT 323 or UTT 323 or UKT 623 (2.000 W....10.000 W 230/400 V)  
Terminal box S6, c/w overtemperature cut-out and internal wiring  
Cut-out with necessary installation material  
Stand-off (100 mm, 150 mm, 200 mm) 100 mm as standard.

**2. ASSEMBLY AND INSTALLATION****Mounting of immersion heater**

Mount the immersion heater together with the gasket (1) to the union on the boiler. The thread on the screw-on head must equal to the female thread on the union and the immersed length of the heater must be suitable for the boiler. Position of the immersion heater is not critical. However, it must be completely immersed in water. If the screw-on head of the immersion heater remains inside thermal insulation, sufficiently long stand-off between the head and the terminal box must be used. If stand-off is not needed, continue as described in "Assembly without stand-off".

**Assembly using stand-off**

Fix the long connecting wires (8) to the screw terminals of the heater and fix the studs (9) onto the element head. Now the stand-off (10) can be pulled over the wires and the studs so that free ends of wires come completely through the stand-off. Open the terminal box lid (5) and fix the base of the terminal box (2) onto the stand-off using the clamp ring (3). Remove the screws on the clamp ring and secure the box with the nuts on the studs.

If necessary, the cut-out (4) can be removed to ease the fixing. Push the capillary sensor of the cut-out into the pocket tube of the heater. Fix the free ends of the wires to terminals L2, L2, L3 and N (neutral from star point) of the terminal block.

Bring a wire from the blade terminal 1 of the cut-out to terminal 1 of the terminal block (6). Bring another wire from blade terminal 2 of the cut-out to terminal 2 of the terminal block. Terminal 3 of the cut-out is for a change-over function. E.g. a signal lamp on the control panel can be connected to this terminal to indicate operation of the cut-out. Now install the actual cut-out.

Take care not to loosen the blade connections. The supply wires can now be connected. Strip back the wires of the supply cable so that the earth wire is longer than the live wires. The live wires L1, L2 and L3 are terminated to the corresponding terminals on terminal block and the earth wire to the earth terminal on the base of the terminal box. If neutral wire N is used, it will be terminated to the terminal block. The wires from the control circuit of a contactor are terminated to terminals 1 and 2 of the terminal block. When fixing the lid, make sure that the fixing bracket of the cut-out is securely attached to the grooves on the base of the terminal box.

**Assembly without a stand-off (fig. 1, fig. 2)**

Open the lid (5) of the terminal box and fix the base (2) of the terminal box onto the screw-on head of the heater, using the clamp ring (3). If necessary, the cut-out (4) can be removed to ease the fixing. Push the capillary sensor of the cut-out into the pocket tube of the heater. Fix the free ends of the wires to terminals L2, L2, L3 and N (neutral from star point) of the terminal block. (If the wires supplied with a stand-off are used, they must be shortened). Bring a wire from the blade terminal 1 of the cut-out to terminal 1 of the terminal block (6).

Bring another wire from blade terminal 2 of the cut-out to terminal 2 of the terminal block. Terminal 3 of the cut-out is for a change-over function. E.g. a signal lamp on the control panel can be connected to this terminal to indicate operation of the cut-out. Now install the actual cut-out. Take care not to loosen the blade connections. The supply wires can now be connected. Strip back the wires of the supply cable so that the earth wire is longer than the live wires.

The live wires L1, L2 and L3 are terminated to the corresponding terminals on terminal block and the earth wire to the earth terminal on the base of the terminal box. If neutral wire N is used, it will be terminated to the terminal block. The wires from the control circuit of a contactor are terminated to terminals 1 and 2 of the terminal block. When fixing the lid, make sure that the fixing bracket of the cut-out is securely attached to the grooves on the base of the terminal box.

### Thermal insulation

When installing the central heating unit, make sure that the thermal insulation of the boiler is tightly around the stand-off. This helps to minimize the heat transfer into the terminal box. The actual terminal box and the supply cable must remain outside of thermal insulation.

### To note on electrical installation

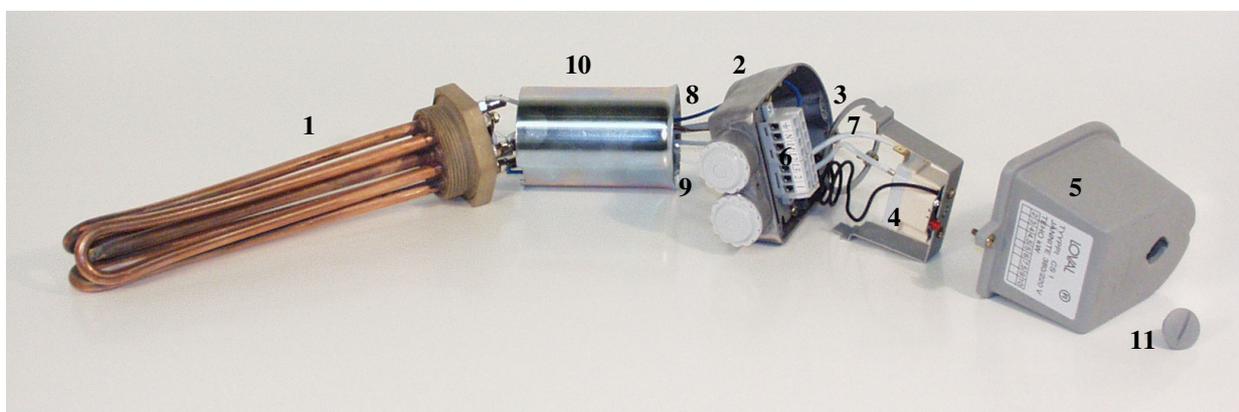
The alternative wattages are marked on the rating label of the central heating unit. Upon installation, the power of the immersion heater must be marked on this label. Supply cable must be suitable for the power. When a sufficiently high stand-off is used, plastic shielded cable (MMJ) can be used. If no stand-off is used, the thermal rating of the supply cable must be minimum 170 °C.

There must be a switch on the heating unit that disconnects all phases of the unit from the mains supply.

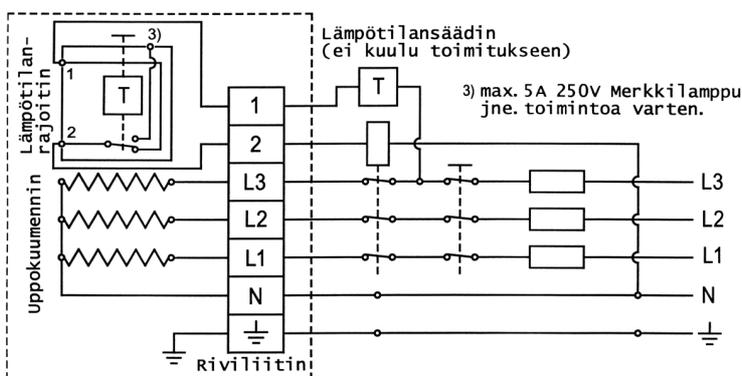
There must be a thermostat in the unit that meets with the following requirements:

- When set to the maximum value, it must maintain the liquid temperature below the set point of the cut-off. In addition to the set points, also the differentials of both the cut-off and the thermostat must be taken into account. The operating ranges must not overlap.
- The thermostat must be located on the same level or above the heating element the operation of which it controls. The so called boiler thermostat in the central heating boiler must not be connected to control the central heating unit.

FIGURE 1. CENTRAL HEATING UNIT CS1



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|---------------------|-------------------------|-------------------------|------------|------------------------|
| 1. Immersion heater | 2. Base of box          | 3. Clamp ring           | 4. Cut-off | 5. Lid of terminal box |
| 6. Terminal block   | 7. Terminal block wires | 8. Terminal screw wires | 9. Studs   |                        |
| 10. Stand-off       | 11. Reset cap           |                         |            |                        |



Terminal block

Thermostat (not included in delivery)

3) max. 5A 250 V for signal lamp etc.

FIGURE 2. WIRING DIAGRAM OF CENTRAL HEATING UNIT TYPE CS1