

ELECTRICAL HEATING

08:011-1805

ELECTRICAL WATER HEATERS



Manual

Models 55, 60, 110 and 160



Type 622 and type 644



Type 605



Type 655

Model 55
Type 655 pipe upwards 3 kW
METRO number: 116551003
Plumbing number: 345111260

Model 60
Type 622 3 kW, 5-65°
METRO number: 116221003
Plumbing number: 345121360

Model 60
Type 622 3 kW, 5-88°
METRO number: 116221601
Plumbing number: 345121362

Model 606
Type 622 kW, 5-88°
METRO number 116221005
Plumbing number: 345121370

Model 1103
Type 644 kW, 5-65°
METRO number: 116441003
Plumbing number: 345121560

Model 1103
Type 644 kW, 5-88°
METRO number: 116441601
Plumbing number: 345121562

Model 1109
Type 644 kW, 5-88°
METRO number: 116441006
Plumbing number: 345121580

Model 1603
Type 605 kW, 5-65°
METRO number: 116051003
Plumbing number: 345121760

Model 160
Type 605 3 kW, 5-88°
METRO number: 116051601
Plumbing number: 345121762

Model 160
Type 605 9 kW, 5-88°
METRO number: 116051006
Plumbing number: 345121780

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Transport

Inspect the water heater for damage and missing parts immediately upon receipt. Report any damage or missing parts to the carrier immediately. All shipping is the responsibility of the recipient unless otherwise agreed.

Position

Installation can only be performed by an authorised plumbing installer, and in accordance with the Danish Building Code. Tank and pipes cannot be exposed to freezing. Position the heater close to its water supply and a floor drain. Ensure that there is sufficient room for service and maintenance.

Electric water heaters above model 60 with standard heating elements (3 kW/400V-1kW/230V) can be installed lying on the back plate (except high output 6 and 9 kW). Horizontal installation reduces the effective volume for use by approx. 25 to 30%.

Distance to the floor for wall-mounted models shall be min. 400 mm and distance to ceiling should be min. 200 mm (figure 1).

If suspending a water heater, always use the ceiling-mounting bracket supplied.

Check that the wall can bear the weight of the tank when full of water.

A stand and plate set with adjustable feet is available for models 60 to 160, making it possible to install a water heater on a level, firm surface.

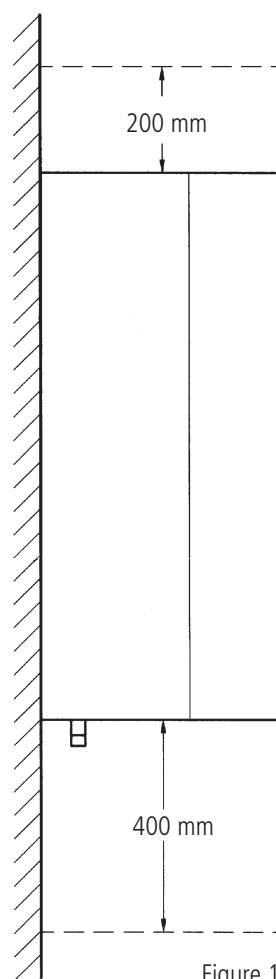
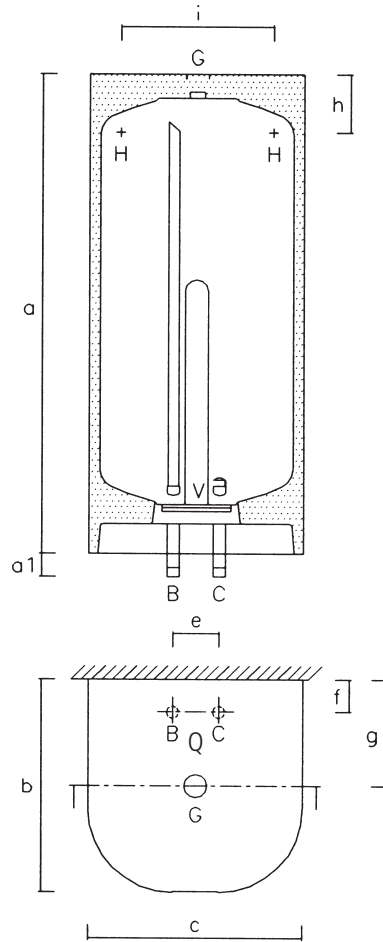


Figure 1

Diagram

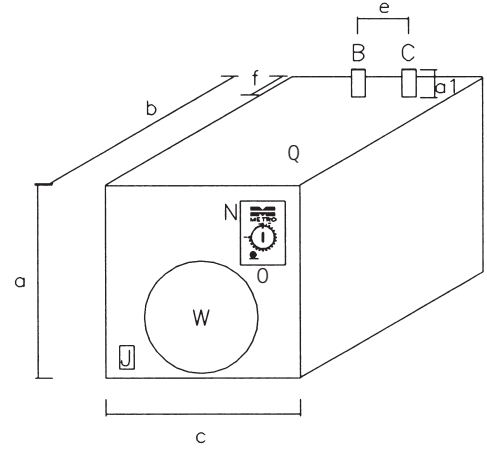
- B Hot water outlet
- C Cold water inlet
- G Connector 3/4" with plug
(e.g. for circulation)
- H Holes in mounting plate
- J Drain spout
- N Control box
- O Indicator light
- Q Electrical connection
- W Removable plate
- I CC measurements for mounting plate

Models 60-110-160 (type 622, 644, 605)



Seen from above

Models 15-30 Type 655)



Dimensioned diagram

All dimensions are in mm.

Type no.	Model	Net weight	Volume (litres)	a	a1	b	c	e	f	h	i
655	55	42	53	460	30	560	460	70	115		
622	60	48	56	875	40	390	390	100	60	175	255
644	110	59	98	1030	40	460	460	100	70	175	255
605	160	76	142	1400	40	460	460	100	70	175	255

Plumbing installation

Note following for installation

- Installations shall comply with the Danish Building Code and all other relevant regulations and provisions, including those for electrical and water installations.
- Check all technical data and information on the type plate.
- Check that all accessories are removed from the packaging.
- Check that there is easy access to the hot water tank. Always install an external shut-off valve for water supply to the heater.
- Flush all water pipes carefully before connection.
- Never expose the heater to water pressure exceeding 1 MPa (10 bar).

Installation can only be performed by an authorised plumbing/electrical installer, and in accordance with the Danish Building Code.

Approvals

VA no. 3.23/19559

Approved by DEMKO

	Hot water tank
Test pressure	13 bar
Operating pressure	10 bar

Energy labels at www.METROTHERM.dk

Risk of corrosion

METRO THERM hot water tanks are made of enamelled steel, and protected by a magnesium anode. If connections and pipes are copper or stainless steel, there can be risk of galvanic corrosion at the point of connection.

The risk can be mitigated by using a PEX pipe adapter between tank and pipe installation.

The water heater is fitted with PEX bushings for cold and hot water supply pipes. These bushings protect the enamel coating and must not be removed.

The water heater must be installed as a pressurised tank with shut-off, non-return and safety valves, e.g. METRO safety device. The safety device must be positioned as shown in figure 2.

Using softened water in a METRO THERM tank

Water softened using salt can be used in a METRO THERM hot water tank. However, we recommend removing the anode before the tank is used, to avoid degradation of the anode. If the anode is degraded, the water can begin to smell, glasses in dishwashers can be stained a milky-white and sulphur hydroxide can form, which cause the tank to begin to sputter.

Do not use demineralised water (double ion exchange), which will rapidly corrode the tank. Demineralised water is also referred to as totally desalinated or deionised water.

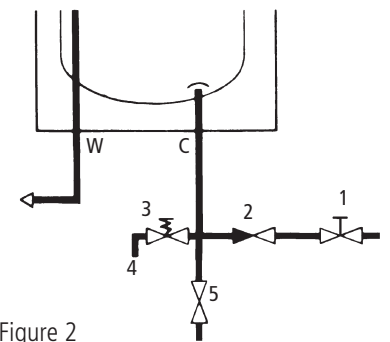


Figure 2

1. Water supply (cold) 3/4" shut-off valve
 2. Non-return valve (integrated)
 3. Safety valve
 4. Overflow 3/4"
 5. Drain tap
- B Hot water out 3/4"
C Cold water in 3/4"

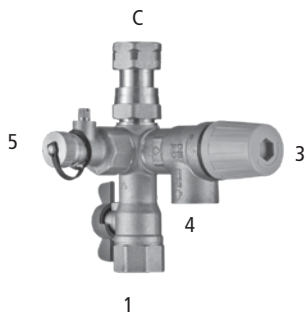


Figure 3

- 1. Water supply (cold) 3/4" shut-off valve
- 3. Safety valve
- 4. Overflow 3/4"
- 5. Drain tap
- C Cold water in 3/4"

Safety device

The safety valve must be mounted on the cold water supply pipe close to the tank, and easily accessible for service and testing. It must be impossible to shut-off the pipe connecting safety valve and tank and the overflow from the safety valve. Diameter min. 3/4" (20 mm.). The overflow outlet must be visible and run to a drain. It must not run outdoors to protect it from freezing. The safety valve must be able release the rated output of the water heater at least. The use of a METRO safety device (figure 3) fulfils this requirement. Because water expands when heated (approx. 2%), the safety valve must drip during heating.

Installing circulation

A plastic plug is fitted in the top plate. Under the plug (in the insulation) is a connector (3/4" internal RG) with a plug (NV 26).'

Forced circulation

We recommend forced circulation with a pump mounted using a circulation kit (supplied as accessory). The circulation kit consists of an enamelled extension pipe to be fitted in the top of the water heater, and a PEX pipe fitted at the bottom (figure 4).

Natural circulation

If connecting the water heater to natural circulation, the hot water outlet must be connected to the top of the tank. The circulation circuit should be connected to the hot water outlet in the base, and the PEX pipe in the hot water outlet shortened to a length of 2/3".

NB:

The customer must be made aware of heat loss from the circulation circuit, and the extra running costs that will incur. Circulation can be controlled by a timer.



Figure 4

Electrical installation

Electrical installation can only be performed by an authorised electrical installer.

The water heater has splashproof IP24 encapsulation and must always be extra-protected in accordance with the LVD directive.

The water heater is fitted with a thermostat, a thermal fuse that can be reconnected, along with an indicator light that comes on when the heating element is activated.

Models 55-160

The water heater is fitted with a thermal fuse to prevent overheating, and that can be reconnected. The fuse can only be reconnected by an authorised electrician. The fuse is located behind a black screw in the control box (figure 5). The thermostat has a working range of 5-65°C or 5-88°C and an on/off function to replace the switch at the mains.

The thermostat and thermal fuse are combined, and mounted in the grey control box on the water heater, along with the indicator light.

Remember that the copper sensor tube from the thermostat and thermal fuse must extend as far from the spade terminal on the heating element as possible.

Electrical heating element – up to 3 kW 3 kW/400 V – 1 kW/230 V

The standard heating element can be connected to 400 V (3 kW) or 230 V (1 kW), see wiring diagram. The water heater is supplied from the factory with a 3-wire cable (with no plug) to be connected to mains electricity. If the cable is damaged, it must be replaced (can be purchased as a spare part).

Electrical heating element 6-9 kW 3 x 400 V

The thermostat must be able to override an external switch (not supplied from factory).

See wiring diagram.

The water heater requires a switch on the mains installation, but not if the external switch provides complete disconnection. The water heater is supplied with a 4-wire cable (brown, blue, black green/yellow, and is 2.5 m²).

The thermostat has a working range of 5-88°C.

Remember! The water heater must be filled with water before connecting electricity.

Screw with access to the thermal fuse.

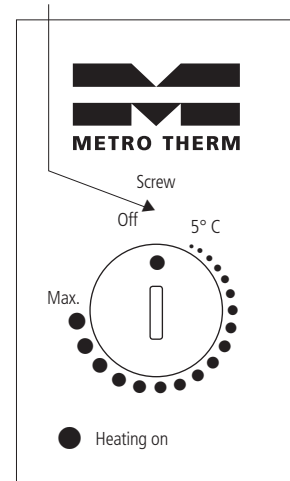


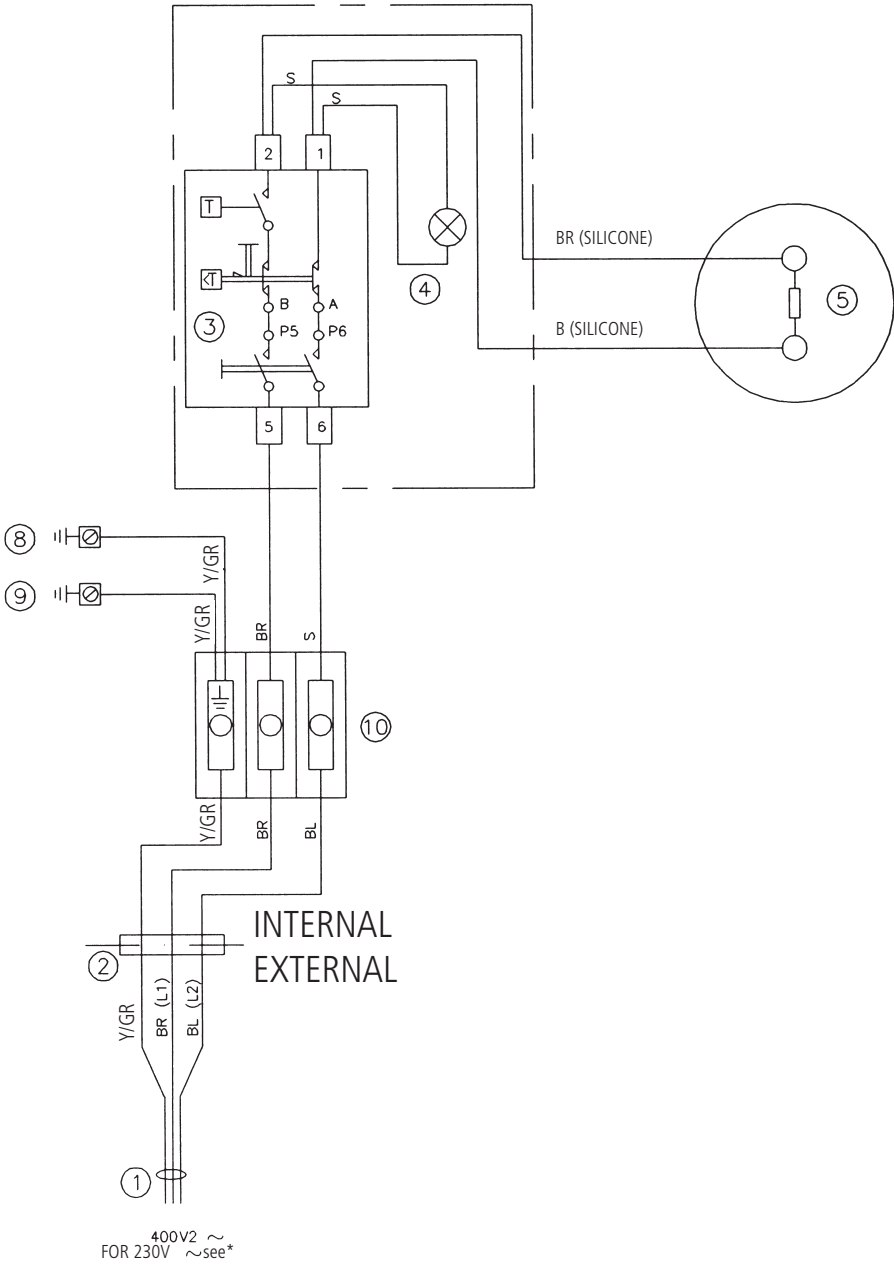
Figure 5

Wiring diagram 3 kW (1 kW) Type 622, 644, 605 and 655

1. Connection to mains electricity
2. Cable penetration with strain relief
3. On/off switch, thermal fuse (110°C) and thermostat (65 or 88°C)
4. Indicator light – comes on when the thermostat opens up for heat
5. Pipe heating elements
8. Terminal, earth wire (tank)
9. Terminal, earth wire (cabinet)
10. Terminal block on baseplate

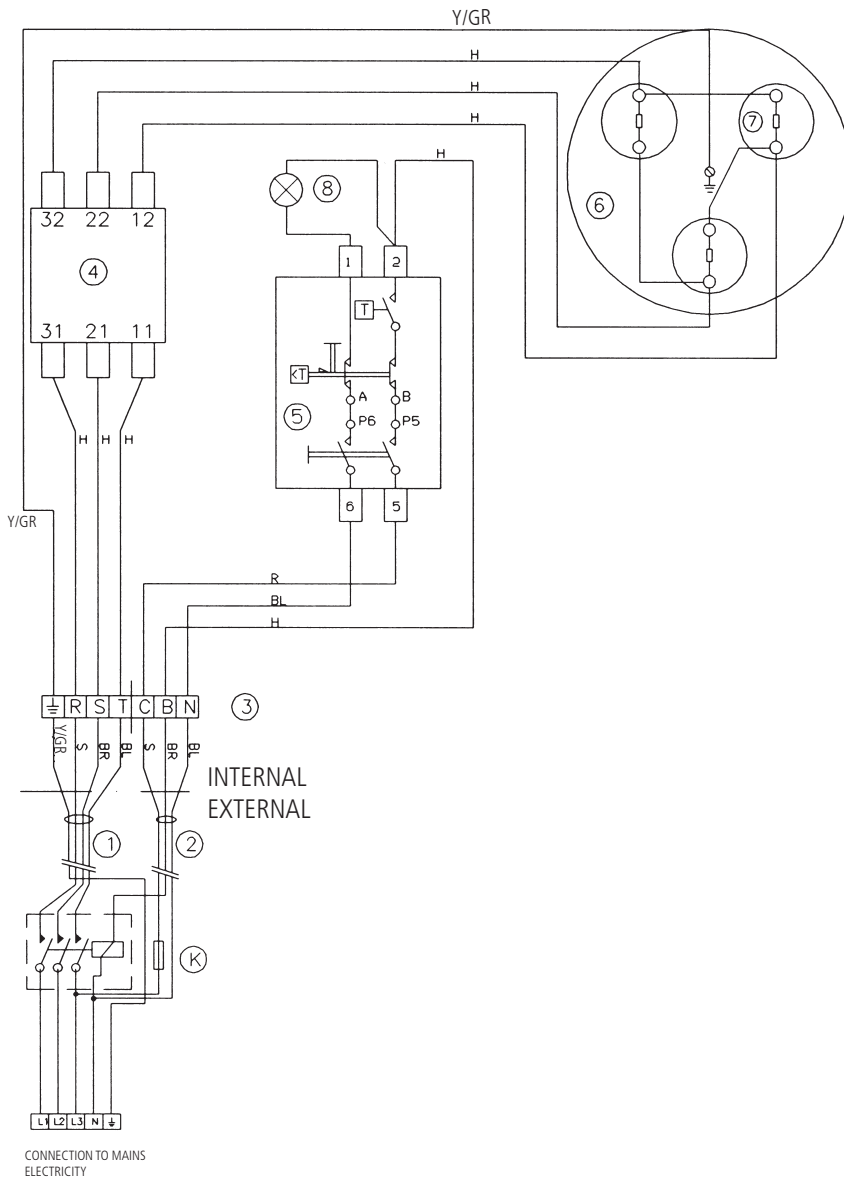
* When connected to 230V~ blue wire must be connected to neutral

Y/GR= yellow/green
BR = brown
BL = blue
B = black



Electrical installation

Wiring diagram 6-9 kW Type 644, 605 and 605



1. Connection to mains electricity
2. Pilot current to switches
NB: K: Switches and fuses on mains installations are not supplied by the factory.
3. Terminal block (behind cover on baseplate)
4. 3-pin thermal fuse 110°C
5. Thermostat 88°C
6. Flange pipe $\varnothing 200$
7. 47 mm steatite heating element:
6 kW= 3 x 2 kW
9 kW= 3 x 3 kW
8. Indicator light (on when heating)

INTERNAL WIRING:

Pilot current circuit is 0.75 m². Other wires are 2.5 m² silicone wires.

- G/GR = yellow/green
BR = brown
R: = Red
BL = blue
B = black
H: = White

User Guide

Read this manual carefully before installation and using the water heater.

Safety regulations

Installation, first activation and maintenance of this product can only be performed by an authorised plumber/electrician, who will be responsible for observance of the relevant standards and installation regulations. We cannot be held liable for damage or injury caused by failing to observe the safety regulations.

Risk of flooding and freezing

If the water heater is mounted in a holiday home, or a house which is uninhabited for long periods, we recommend draining the entire water installation to damage caused by freezing. If there is no risk of freezing, shutting-off the water supply at the mains cock will be sufficient.

Setting temperature on type 622, 644, 605 and 655

The water heater is fitted with a grey control box. Set the desired water temperature using the thermostat dial. The thermostat will then control heating of the water to the desired temperature. See figure 7 for thermostat scale markings.

The indicator light (Heating on, figure 6) comes on when electricity is connected and the heating element is activated.

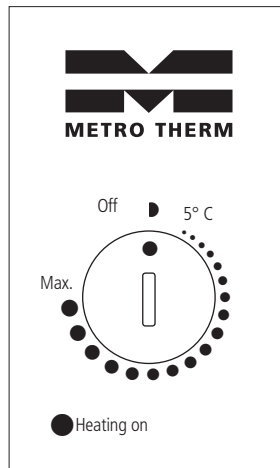


Figure 6

Heating times 10-50°C (minutes)

Type	1 kW	3kW	6kW	9 kW
622	167	56	28	-
644	307	102	-	34
605	447	149	-	50
655	154	51	-	-

Setting the thermostat

Relationship between thermostat scale and desired tank temperature. Set as a time on a clock face. All values are indicative.

Setting	min.	13.00	15.00	18.00	19.00	20.00	max.
5-65°	5	10	25	35	45	55	65°C
5-88°	5	20	35	45	65	75	88°C

Figure 7

NB:

Pipes and fittings near the water heater can reach temperatures over 60°C.

The water heater is fitted with a thermal fuse that will cut-out in the event of overheating.

The fuse can only be reconnected by an authorised electrician.

Disposal

Ensure disposal of the product in the most eco-friendly manner. Private owners must comply with local municipal rules for disposal of domestic waste.

Maintenance

External cleaning

The tank can only be cleaned with a damp cloth. Window or glass cleaner can be used, but not scouring cream/powder or solvents. Always read the instructions on the cleaning product.

Safety valve

Always inspect the safety valve at least twice annually. The plumbing installer can show you how. When testing, water should flow out of the valve.

Limescale removal guide

Limescale removal can only be performed by an authorised installer. Always replace the gasket. Never re-use the old gasket.

- Disconnect electricity supply at the mains, and shut off water supply at the shut-off valve.
- Drain the tank.
- Remove bottom cover to access the heating element. This is a ceramic heating element placed in an immersion pipe in the bottom flange (flange pipe).
- Disconnect wires on the heating element, carefully extract the capillary pipes from the small immersion cover.
- Remove the flange. The gasket may need to be cut free from the tank. Use a thin-bladed knife. The flange pipe can be difficult to get through the opening if heavily scaled with lime or other deposits. Ease it carefully out, as aggressive handling of the enamelled parts can cause damage, which can later lead to corrosion.
- Remove loose limescale. Loosen limescale caked on the element by tapping gently, e.g. with a piece of wood.
- Rinse out remaining limescale from tank.
- Replace the flange with a new gasket and spacer ring on the outside of the bolts (figure 8). Tighten the bolts in diagonal cross-sequence to 15 to 17 Nm.
- Fill with water and check for leaks by pressure-testing at water pressure of 10 bar.
- Replace the capillary pipes and wires. Regardless of model, the capillary pipes to the thermostat and thermal fuse respectively must always be fitted with the sensor for the fuse the furthest in the immersion cover.

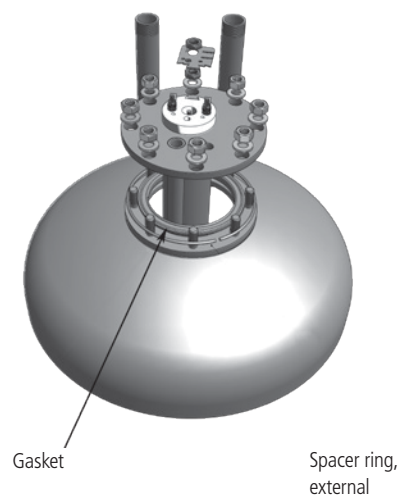


Figure 8

IMPORTANT! Check that the capillary pipes fit before touching conductive parts.

Important for high-output tanks

6 or 9 kW water heaters are fitted with an 88°C thermostat and often installed where water consumption is high. Depending on water hardness, temperature and consumption, it may be necessary to remove limescale every 6 months or more to avoid damaging the product. The plumbing installer can advise on the required interval. In the event of neglect, the guarantee will lapse.

Checking/replacing the anode

Must be performed by an authorised plumbing/electrical installer. The tank is fitted with a magnesium anode that can be inspected. It is fitted in the bottom flange, and can be inspected by removing the connection to the tank and inserting a multimeter (see figure 9). If the anode current reading is greater than 0.3 mA, the mass of the anode is sufficient to protect the tank. If the reading is less than 0.3 mA, the anode should be replaced. To do so, drain the tank and remove the flange pipe (figure 10).

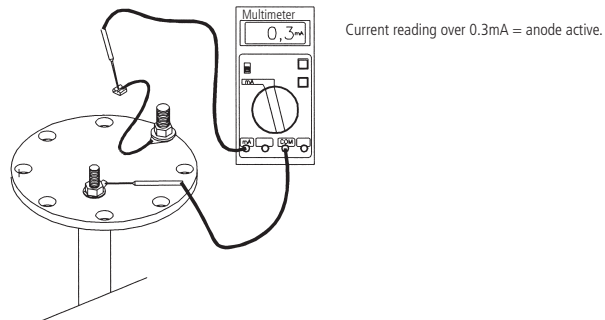


Figure 9

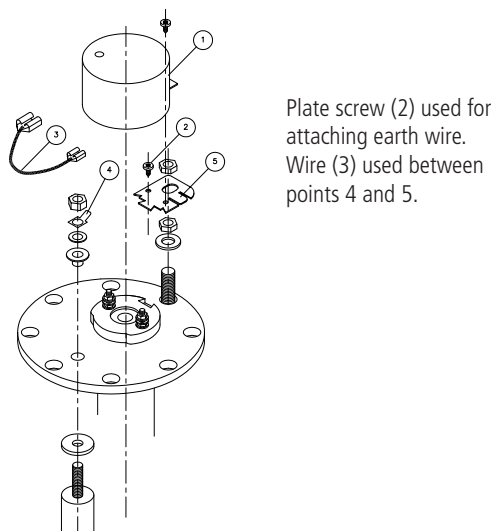


Plate screw (2) used for attaching earth wire.
Wire (3) used between points 4 and 5.

Figure 10

Troubleshooting

The table below can help identify and remedy any problems. If a problem cannot be remedied using the table, contact an authorised plumbing/electrical installer.

Fault	Cause	Action
No water flow	Water supply cut off (hot or cold water pipe).	Check ballcock is open. Check ballcock on the safety device is open.
Reduced hot water	Water capacity in tank used up.	Wait 30 mins before trying again.
No hot water	Thermostat set too low	Switch to a higher setting.
	No current to heating element.	Check relay board and fuses.
	Thermal fuse cut-out.	Reconnect*
	Heating element burnt out.	Replace*
No current to tank	Disconnected relay board	Switch on relay board.
	Fuse blown.	Replace fuse.
	Thermal fuse cut-out.	Reconnect*
Water too hot	Thermostat set too high.	Switch to lower setting.
	Thermostat faulty.	Replace control box*
Water too cold	Thermostat set too low.	Switch to a higher setting.

* can only be performed by an authorised installer.

Guarantee terms

Dear customer

METRO THERM manufacture and supply carefully-checked quality products that require authorisation to install and service. As such, all liability for dimensioning, delivery, installation and commissioning lies with the installer, and you should therefore contact authorised plumbing and electrical installers for installation, use and warranty claims.

In the event of material or manufacturing faults, a number of provisions apply to guarantee and repair, which are specified below:

Guarantee cover is contingent on the following:

- The product is covered by guarantee up to 24 months from documented installation or purchase date in accordance with the Sale of Goods Act
- For tanks: METRO THERM provides an additional 3-year guarantee against corrosion penetration of the internal tank. In the event of corrosion from the inside, METRO THERM will undertake repair or replacement at no charge of the tank at its factory.
- For heat pumps: METRO THERM provides an additional 3-year guarantee against internal functional faults. In the event of faults on the inside, METRO THERM will undertake repair at no charge.
- The product must be positioned where service can be performed without difficulty. If the product is very difficult to access, METRO THERM cannot be held liable for any extra expense incurred. We refer to DS 439 Sections 5.1 and 5.2.
- The product must be installed according to BR Section 8.4.2.3 (1).
- When repairs are performed on the spot, the factory will supply new replacement parts when repair is agreed.

The above provisions apply ONLY if the following are fulfilled:

- The installer has contacted METRO THERM before commencing repair or replacement, and written agreement has been reached on the extent of repair.
- The installer has stated manufacturing number when contacting METRO THERM.
- The installer has sent a copy of the invoice for purchase or installation and the faulty product item to METRO THERM after replacement/repair.

What the guarantee does NOT cover:

- Compensation for anything other than the above, or for personal injury caused by any faults regarding the product.
- If the product has been connected at any temperature, Voltage or pressure other than specified on the type plate.
- If damage is caused by freezing, lightning or dry-boiling, or as a result of limescale or excess pressure.
- If repair or other physical intervention has been made on the product other than specified.
- Limescale deposits on the heat exchanger and high-output tank, as limescale is often due to incorrect settings or use.
- Damage caused by leaking water and hidden water installations.
- Damage caused during transport. The latter shall be reported to the carrier.
- Higher or extra costs for repair or replacement performed at weekends, on public holidays or outside normal working hours. Neither are travelling expenses covered. Using a local installer is therefore recommended.

All current guarantee provisions can be read at www.METROTHERM.dk.

Manufacturing number:

Set-up and instruction given by installer: (name)

Signature:

Date:

Updated March 2016

Declaration of compliance

The declaration of compliance is available on our website at: www.METROTHERM.dk – This product is VA-approved.

Get a 1-year extended guarantee on your METRO product

We offer a one-year extended guarantee on your METRO product when you register the product, entering where and when it was installed and by which company.



1. Go to <http://FQR.dk> or scan the QR code
2. Enter product and installation details
3. You will receive a mail confirming the extended guarantee.



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