

INSTALLER'S MANUAL

Heat Pump Water Heaters

Installation Details Warranty



Model Thermann X Hybrid Heat Pump 220 Thermann X Hybrid Heat Pump 300

SPECIAL INFORMATION

- The appliance may be used by children over 8 years of age and persons with reduced physical, sensory or mental capabilities or a lack of experience and expertise, provided that they are supervised or they have been instructed on how to use the appliance safely and have understood the potential risks. Children must never play with the appliance. Children must never clean the appliance or perform user maintenance unless they are supervised.
- Observe all applicable national and regional regulations and instructions.
- Observe the minimum clearances (see chapter "Installation / Preparations / Siting the appliance").
- Observe the requirements concerning the installation room (see "Specification / Data table").
- The appliance is supplied with a flexible power cable without plug. In the case of a permanent connection, the appliance must be able to be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation. Contactors, circuit breakers or fuses can be used for this. This type of isolator must be installed in the fixed electrical installation according to the regulations. For Australia: Ensure that the appliance can be separated from the power supply by a suitable isolator. Contactors, circuit breakers, fuses or general purpose electrical wiring plugs can be used for this. The type of isolator must be installed according to the electrical installation regulations.
- Observe the safety measures to prevent contact with dangerous live currents.
- Observe the MCB/fuse protection required for the appliance (see chapter "Specification / Data table").
- If the power cable is faulty, replace it with a new one. The power cable must only be replaced (for example if damaged) by a qualified contractor.
- The appliance is pressurised. During the heat-up process, expansion water will drip from the safety valve.
- Activate the valves at least every 6 months to prevent them from becoming blocked, e.g. by limescale deposits.
- Drain the appliance as described in "Installation / Maintenance and cleaning / Draining the cylinder".
- A T&P valve or a cold water expansion control valve, or both, must be installed. Observe all applicable national and regional regulations and instructions.
- The maximum pressure in the cold water supply line must be at least 20 % below the lowest response pressure of all installed safety valves. Otherwise a pressure reducing valve is required. If this is the case, install a pressure reducing valve in the cold water supply line. The pressure reducing valve must be set to 540 kPa if a safety valve is installed; otherwise to 700 kPa.
- Fit the drain pipe of the safety valve with a constant downward slope and in a room free from the risk of frost.
- Size the drain pipe so that water can drain off unimpeded when the safety valve is fully opened.
- The safety valve drainage aperture must remain open to atmosphere.



OPERATION

General information

The chapter "Installation" is intended for qualified contractors.



Note Read these instructions carefully before using the appliance and retain them for future reference. Pass on the instructions to a new user if required.

Safety instructions

Structure of safety instructions



KEYWORD Type of risk

Here, possible consequences are listed that may result from failure to observe the safety instructions. Steps to prevent the risk are listed.

Symbols, type of risk

Symbol	Type of risk
$\overline{\mathbb{A}}$	Injury
<u>/</u>	Electrocution
	Burns (burns, scalding)

Keywords

KEYWORD	Meaning
DANGER	Failure to observe this information will result in serious injury or death.
WARNING	Failure to observe this information may result in serious injury or death.
CAUTION	Failure to observe this information may result in non-serious or minor injury.

Other symbols in this documentation

Note

General information is identified by the adjacent symbol.

Read these texts carefully.

Symbol	Meaning
(!)	Material losses (appliance damage, consequential losses and environmental pollution)
	Appliance disposal

This symbol indicates that you have to do something. The action you need to take is described step by step.

Units of measurement

i Note All measurements are given in mm unless stated otherwise.

INSTALLATION

Safety

Only a qualified contractor should carry out installation, commissioning, maintenance and repair of the appliance.

General safety instructions

We guarantee trouble-free function and operational reliability only if original accessories and spare parts intended for the appliance are used.

Instructions, standards and regulations

Note Obse

 $\downarrow I$ Observe all applicable national and regional regulations and instructions.

Take note of the appliance type plate and chapter "Specification".

Appliance description

The heat pump drive unit is located in the upper section of the appliance. The hot water cylinder is located in the lower section of the appliance.

Standard delivery

The following are delivered with the appliance:

- Condensate drain bend
- 2 straight G1 to G 3/4 pipe adaptors
- T&P valve G 1/2
- Reducer from R 3/4 male thread to G 1/2 female thread

Required accessories

Various safety assemblies are available to protect the appliance against impermissible excess pressure and limit the output delivery temperature.

Additional accessories

- Condensate pump (if the condensate cannot be drained off with a naturally occurring fall)

Incorrect use

The following are not permitted:

- Operating the appliance when the casing is open
- Filling the appliance with a refrigerant other than the one detailed in chapter "Specification / Data table"
- Heating liquids other than potable water

Observe the list of requirements regarding the installation room and non-permissible installation sites (see chapter "Installation site").

Preparation

Transport



CAUTION InjuryObserve the weight of the appliance.

► Use suitable transport aids (e.g. sack truck, hand trolley) and enough personnel for transportation.



Material losses

The appliance has a high centre of gravity and low overturning moment.

- Safeguard the appliance against falling over.
- Only set the appliance down on an even base.

Material losses

The appliance casing is not designed to withstand strong forces. Incorrect handling can lead to material losses of considerable extent.

- Observe the information on the packaging.
- Only remove the packaging shortly before the installation.

Where possible, do not unpack the appliance until it has arrived in the installation room.

For transport and handling leave the appliance in its packaging and on the pallet. This enables brief horizontal transport and provides places to hold on to during transport.

If the appliance has to be unpacked before transportation, we recommend using a hand trolley. Pad the contact surfaces to avoid damaging the appliance. Secure the appliance using a strap. Pad between the strap and the appliance and avoid overtightening the strap. Where stair wells are narrow, you can carry the appliance by the handles on the sack truck or trolley and the foot of the appliance.

Vehicular transport

Material losses

The appliance must generally be stored and transported vertically.

On tarmac, asphalt, bitumen or otherwise paved roads you may transport the appliance horizontally over a maximum distance of 160 km. Strong shocks are not permissible.

→ Material losses

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If transported horizontally, the appliance must always be laid on the shaded side of the box. The appliance must not remain in a horizontal position for more than 24 hours.

If the appliance was transported horizontally, leave it to rest in a vertical position for at least one hour before commissioning.

Observe the information on the packaging.



1 Recessed grips

Transport from vehicle to installation room

The cardboard box has reinforced handholds (recessed grips). You can use these recessed grips, as well as the pallet at the lower end, to carry the appliance into the installation room. Take note of the weight of the appliance and ensure a sufficient number of personnel is available for handling the appliance.

Storage

If it is necessary to store the appliance for a prolonged period before installation, observe the following information:

- Only store the appliance in a vertical position. Never store the appliance horizontally.
- Store the appliance in a location that is dry and largely dust-free.
- Protect the appliance from coming into contact with corrosive substances.
- Ensure the appliance is not subjected to shocks or vibrations.

Installation location

Material losses

Dobserve the following list of requirements regarding the installation site.

- Install the appliance where it will be as little exposed to strong direct wind, extreme rain, sun or snow as possible, but will still be well ventilated. Unhindered air intake and air discharge should be possible. If necessary, protect the appliance against the elements with a canopy, base and deflectors.
- The installation site must be free from flammable, highly combustible gases and substances, as well as high levels of dust.
- The application limits for the heat pump and hot water cylinder must be maintained (see chapter "Specification / Data table").
- The substrate of the installation site must be level and have sufficient load bearing capacity. Take note
 of the weight of the appliance with a full hot water cylinder (see chapter "Specification / Data table").
 A floor with insufficient load bearing capacity is in danger of collapse. If the appliance is not level, there
 may be a risk of appliance damage.
- In the case of indoor installation, the size of the installation room must correspond to the application limits of the appliance (see chapter "Specification / Data table").
- Observe the safety clearances and protection zones.
- Always leave sufficient space to provide access for installation, maintenance and cleaning. Observe the minimum clearances (see "Preparations / Siting the appliance").
- Ensure the operation of other equipment in the installation room is not impaired.
- To keep the water pipe lengths as short as possible, we recommend installing the appliance close to the kitchen or bathrooms.
- To prevent adverse effects from operating noise, never install the appliance close to bedrooms.

Material losses

- Never install or draw off supply air from locations with aggressive atmospheres. This may damage the appliance.
- Check the wider environment around the planned installation location. Check for anything which may have an adverse effect on the installation location or the appliance air supply.

Examples of unacceptable locations		
Atmospheres containing ammonia	Sewage works, pigsties	
Substances which block the evaporator	Air containing oil or grease; dust (cement, flour, etc.) Note: If the air contains hairspray (e.g. in hairdressing salons), the appliance should be operated with shorter maintenance intervals.	
Saline environments	Coastal installations (< 200 m from the coast) can reduce component service life.	
Atmospheres containing chlorine or chloride	Swimming pools, salt works	
Atmospheres containing thermal water		
Areas in proximity to high frequency ma- chines	Inverters for large motors, radar, etc.	

Note

The output data given for this appliance has been determined in accordance with the relevant standard at an intake temperature of 15 °C. Below 15 °C, the efficiency of the appliance decreases.

Note

You can improve the efficiency of the appliance by utilising the waste heat from other appliances to heat the hot water cylinder, e.g. boilers, tumble dryers or freezers.



Sound emissions

The sound emissions are louder on the air intake and air discharge sides of the appliance than on the closed sides.

▶ Never direct the air intake or air discharge towards noise-sensitive rooms of the house, e.g. bedrooms.



Note For details on sounds emissions, see chapter "Specification / Data table".

Siting the appliance

► Carefully undo the cardboard packaging at the clips.



1 Cardboard packaging clips

The appliance is secured to the pallet with metal brackets and screws. The metal brackets are hooked on to the feet underneath the floor plate of the appliance.



- 1 Metal bracket fixing screw
- ▶ Remove the fixing screws of the metal brackets from the pallet.
- Push the metal brackets a little towards the cylinder centre to unhook them from the appliance feet.
- ▶ Pull the metal brackets out from underneath the appliance.

Material losses

i Take note of the appliance's weight and centre of gravity.

- Slightly tip the appliance and carefully roll the appliance off the pallet.
- Position the appliance in the final installation site.



Material losses

The appliance must be positioned vertically to avoid damage.

- The feet under the floor plate of the appliance are height-adjustable.
- ► Level the appliance horizontally using the height-adjustable feet.



Minimum clearances

Maintain the minimum clearances.



Installation



WARNING Injury

Incorrect installation can lead to serious injury or material losses. Before any work, ensure sufficient clearances for the installation. Handle sharp-edged components carefully.

Water connection



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Material losses

Carry out all water connection and installation work in accordance with regulations.

Material losses

The corrosion protection provided by the anode can only be guaranteed when the electrical conductivity of the domestic hot water is within the limits stated in the chapter "Specification / Data table".



The following material combinations are approved for metal pipework installations:

Cold water inlet	hot water outlet
Copper pipe	Copper pipe
Steel pipe	Steel pipe or copper pipe

Thoroughly flush the pipework before connecting the appliance. Foreign bodies, such as abraded plastic or metal, rust, sand or sealant can impair the operational reliability of the appliance.



Material losses

To protect the connections against corrosion the water connection must be made with flat gaskets. The use of hemp on connections is not permissible.

Install the hot water outlet line and the cold water inlet line (see chapter "Specification / Dimensions and connections").

Hot water circulation

A hot water circulation is not allowed.

Safety equipment

A T&P valve or a cold water expansion control valve must be installed. Observe the applicable local and regional regulations.

T&P valve (850 kPa)



1 T&P valve

- 2 Reducer from R 3/4 male thread to Rp 1/2 female thread
- ► If specified, install a type-tested T&P valve with reducer, using the corresponding connection on the appliance.

The response pressure of the valve must be below or equal to the permissible operating pressure of the hot water cylinder. The valve protects the appliance against impermissible pressure or temperature rises. The diameter of the cold water supply line must be no greater than the diameter of the valve.

Ensure that the expansion water escaping from the valve can drip into a drain, e.g. a funnel, tundish.

Ensure the drain cannot be shut off.

- ▶ Size the drain pipe so that water can drain off unimpeded when the safety valve is fully opened.
- Ensure that the drain hose of the safety valve is open to atmosphere.
- Fit the safety valve drain pipe with a constant downward slope and in a location free from the risk of frost.

Cold water expansion control valve (700 kPa)

▶ If specified, install a type-tested 700 kPa expansion control valve in the cold water supply line.

The safety valve protects the appliance against impermissible excess pressure. The diameter of the cold water supply line must be no greater than the diameter of the safety valve.

Ensure that the expansion water escaping from the safety valve can drip into a drain, e.g. a tank or funnel.

Ensure the drain cannot be shut off.

- ▶ Size the drain pipe so that water can drain off unimpeded when the safety valve is fully opened.
- ▶ Ensure that the safety valve drain pipe is open to atmosphere.
- Fit the drain pipe of the safety valve with a constant downward slope and in a room free from the risk of frost.

Pressure reducing valve

The maximum pressure in the cold water supply line must be at least 20 % below the lowest response pressure of all installed safety valves. Otherwise a pressure reducing valve is required. If this is the case, install a pressure reducing valve in the cold water supply line. The pressure reducing valve must be set to 540 kPa if a safety valve is installed; otherwise to 700 kPa.

Drain valve

▶ Install a suitable drain valve at the lowest point in the cold water supply line.

Thermal insulation

- Insulate the hot water line and valves against heat loss and to improve energy efficiency in accordance with locally applicable regulations.
- ▶ Insulate the cold water supply line to prevent condensate forming.

Hot water outlet



WARNING Burns

The water in the hot water cylinder can be heated to temperatures in excess of 60 °C. There is a risk of scalding at outlet temperatures in excess of 43 °C.

- In Australia and New Zealand, observe regulations in accordance with AS/NZS3500.4:
- Install a temperature limiter in all systems intended for personal hygiene, e.g. tempering valve, thermostatic mixing valve.

Condensate drain

Install a condensate drain hose to drain off the condensate that is created.

- Connect the condensate drain bend included in the standard delivery to the condensate drain connection.
- Connect a condensate drain hose to the condensate drain bend.

Material losses

Ensure condensate cannot back up.

- Use a condensate drain hose with a diameter greater than the diameter of the condensate drain bend.
- Ensure the condensate drain hose is not kinked.
- ▶ Route the condensate drain hose with a continuous fall.
- The condensate drain must be open to atmosphere.

▶ Use a suitable condensate pump if there is insufficient fall. Take the building characteristics into account.

Condensate pan heater

Material losses

If the temperature at the installation site could continuously (1 - 2 days) fall below freezing, install a condensate pan heater. The condensate pan heater is not part of the standard delivery.

When the compressor is running, install a load-dependent relay to switch on the condensate pan heater after a delay. The condensate pan heater must have an external power supply.

Electrical connection

WARNING Electrocution

The appliance is supplied with a flexible power cable without plug. In the case of a permanent connection, the appliance must be able to be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation. Contactors, circuit breakers or fuses can be used for this. This type of isolator must be installed in the fixed electrical installation according to the regulations. For Australia: Ensure that the appliance can be separated from the power supply by a suitable isolator. Contactors, circuit breakers, fuses or general purpose electrical wiring plugs can be used for this. The type of isolator must be installed according to the electrical installation regulations.

WARNING Electrocution

Carry out all electrical connection and installation work in accordance with national and regional regulations.





WARNING Electrocution

<u>A Ensure that the appliance is earthed.</u>
WARNING Electrocution Observe the safety measures to prevent contact with dangerous live currents.
WARNING Electrocution Coming into contact with live components presents a threat to life. Disconnect the appliance from the power supply before carrying out work inside the appliance. Prevent the power supply from being switched on while you are working on the system.
WARNING Electrocution Insufficient earthing can lead to electrocution. Ensure the appliance is earthed according to locally applicable requirements.
WARNING Electrocution If the power cable is faulty, replace it with a new one. The power cable must only be replaced (for ex- ample if damaged) by a qualified contractor.
I Material losses The specified voltage must match the mains voltage. Observe the type plate.
Material losses Observe the MCB/fuse protection required for the appliance (see chapter "Specification / Data table").

Material losses

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Never connect the appliance to the power supply before the hot water cylinder is filled.

The appliance is supplied with a flexible connecting cable without plug.

- ▶ If the connecting cable is not long enough, you may detach from the appliance and replace with a longer suitable cable, or extend connection as permitted by regional and national regulations (eg. use of a junction box).
- When routing the new connecting cable, ensure that it is waterproof as it passes through the existing cable grommet. Connect the cable properly inside the appliance.

Standard connection (without external signal transmitter)



ΒU Blue

GNYE Green/yellow

Separate power supply to the impressed current anode

At the factory, the appliance is fitted with rechargeable batteries that ensure the power supply to the impressed current anode in the case of a power failure. If regular interruptions to the power supply are not anticipated, the rechargeable batteries will require no maintenance.

Every three years, a qualified contractor must replace the batteries for the impressed current anode in the following cases:

- The impressed current anode is not separately connected to a continuous power supply and a switching contact regularly interrupts the power supply to the appliance.
- The security of supply is inadequate.

Failure to observe this point puts the appliance at risk of damage.

The need to replace the batteries can be avoided by connecting the impressed current anode separately to a continuous power supply. This continues to protect the hot water cylinder against corrosion if the rest of the appliance is switched off, e.g. by a controlled power supply.

▶ Remove the appliance cover (see chapter "Cleaning and maintenance / Removing the appliance cover").



- 1 Strain relief
- 2 Terminal XO
- ▶ Prepare the cables in such a way that each cable terminates with a wire ferrule.
- ▶ Push the cables through one of the cable entries in the appliance casing.
- ▶ Route leads through the strain relief.
- ▶ Remove the jumper which leads from X0/N to X0/2 in the delivered condition.
- ▶ Remove the jumper which leads from X0/L to X0/1 in the delivered condition.



- A Power supply provided by power supply utility or energy management system for switching the load (compressor)
- B Power supply to impressed current anode and PCB
- BN Brown
- BU Blue
- GNYE Green/yellow

► Connect the cables for the separate impressed current anode power supply to X0/1 and X0/2.

∧ Material losses

The power supply to the impressed current anode must be continuously ensured.

Connection with external signal transmitter

Note

This type of connection must only be carried out by a qualified electrician.

Note

The appliance has a second, higher set temperature which is preset at the factory. This is activated in the event of an external switching signal. Set temperature 2 takes priority over the standard set temperature while there is an external switching signal.

An external signal transmitter for switching a separate set hot water temperature (set temperature 2) can be connected to terminal X3/1-2. In the delivered condition, terminal X3/1-2 is not assigned. If this terminal is connected at the voltage stated in the specification (see "Permissible voltage range, external signal transmitter") (L to X3/1, N to X3/2), the appliance activates set temperature 2.

Following a one-off activation (signal is present for at least 1 minute), set temperature 2 applies for at least 20 minutes. Set temperature 2 is ranked higher than set temperature 1. When the relevant set hot water temperature has been reached, the compressor switches off and remains off for a minimum idle time of 20 minutes.



The following diagram illustrates the connections by means of a sample signal sequence from an external signal transmitter.

Example:

Water temperature	°C	62
Set temperature 1	°C	61
Set temperature 2	°C	65



- A External signal
- B Compressor
- 1 20 min. minimum runtime, set temperature 2
- 2 20 min. minimum compressor idle time
 > Remove the appliance cover (see chapter "Cleaning and maintenance⁺/ Removing the appliance cover").



- 1 Strain relief
- 2 Terminal X3
- ▶ Prepare the cables in such a way that each cable terminates with a wire ferrule.
- ▶ Push the cables through one of the cable entries in the appliance casing.
- ▶ Route leads through the strain relief.
- Connect the cables to X3.

Example 1: Power supply utility signal with its own phase



- BU Blue
- GNYE Green/yellow

Example 2: Photovoltaic signal via on-site relay and phase routed out of the appliance

Note The r

- The relay in the inverter must meet the following requirements:
- Potential-free relay (240 V AC / 24 V DC, 1 A) with N/O contact
- Adherence to safety regulations and standards for safety extra low voltage
- The switching output must be programmed so that the relay contact closes or opens if certain limits (inverter output level) are exceeded or undershot.
- If necessary, check with the inverter manufacturer whether the product meets the stated criteria.



BN Brown

BU Blue GNYE Green/yellow

The inverter power feed is usually located at a central distribution point (e.g. in the main distribution board).

Assembling the appliance

Note Refit

Refit the appliance cover after completing your work. See chapter "Maintenance and cleaning / Fitting the appliance cover".

Commissioning

Initial start-up

$ \cap $	No

Note Fill the hot water cylinder before switching on the power supply to the appliance. The appliance is equipped with boil-dry protection to prevent operation if the hot water cylinder is not completely full of water.



Following an interruption of the power supply, compressor operation remains blocked for at least one minute while the appliance initialises.

If the compressor subsequently fails to start, it may be blocked by additional safety devices (motor overload relay, high pressure switch). This block can last between 1 and 10 minutes.

Filling the hot water cylinder

Fill the hot water cylinder and vent the pipework by following the procedure below:

- Close the drain valve.
- ▶ Open all hot water draw-off points and the shut-off valve in the cold water supply.
- Close the hot water draw-off points as soon as water starts to emerge from them.
- Check the safety valve by leaving it open until water runs out.



Settings / function check

In the delivered condition, the appliance is set to a hot water temperature of > 61 °C.

► Switch the mains power ON.

Note

Following an interruption of the power supply, compressor operation remains blocked for at least one minute while the appliance initialises.

If the compressor subsequently fails to start, it may be blocked by additional safety devices (motor overload relay, high pressure switch). This block can last between 1 and 10 minutes.

- ► Check the appliance function.
- Check the function of the safety assembly.

Appliance handover

▶ Explain the appliance function to users and familiarise them with its operation.

Example: The appliance is in "element boost" mode. The element boost heater switches off temporarily when the temperature in the upper section of the cylinder reaches 67 °C during heat-up. The heat pump has not yet heated the lower section to 65 °C and the "element boost heating" function has therefore not yet finished. The "element boost heater" symbol is displayed until element boost heating has finished.

- ▶ Make users aware of potential dangers, especially the risk of scalding.
- ▶ Make users aware of critical environmental factors and requirements concerning the installation site.
- ▶ Inform users that water may drip from the safety valve during the heat-up process.
- Please note that the appliance is not protected against frost and corrosion when it is disconnected from the power supply. At the factory, the appliance is fitted with rechargeable batteries that ensure the power supply to the impressed current anode in the case of a power failure. The batteries must be replaced by a qualified contractor every three years, if the power supply is regularly interrupted by a switching contact or the security of supply is inadequate. We recommend a maintenance contract for replacing the batteries.
- ▶ Hand over these operating and installation instructions to users for safekeeping.

Recommissioning

Note

Following an interruption of the power supply, compressor operation remains blocked for at least one minute while the appliance initialises.

If the compressor subsequently fails to start, it may be blocked by additional safety devices (motor overload relay, high pressure switch). This block can last between 1 and 10 minutes.

If the appliance is switched off due to an interruption to the power supply, no specific measures for restarting are required once the power supply has been restored.

Appliance shutdown

Material losses

If you disconnect the appliance from the power supply, it is no longer protected against frost or corrosion.

Only disconnect the appliance from the power supply for longer periods if you are also draining the hot water cylinder. See chapter "Maintenance[†]/ Draining the appliance".

The appliance can only be switched off by interrupting the power supply.

Disconnect the appliance from the power supply at the MCB/fuse in the domestic distribution board or by unplugging from a general purpose outlet.

Troubleshooting

WARNING Electrocution

Troubleshooting must only be carried out by a qualified contractor. Prior to all work on the appliance, isolate it from the power supply.



Material losses

If you disconnect the appliance from the power supply, it is no longer protected against frost or corrosion.

- Only disconnect the appliance from the power supply for longer periods if you are also draining the hot water cylinder.
- For work inside the appliance, remove the appliance cover (see chapter "Cleaning and maintenance / Removing the appliance cover").
- If necessary, remove the upper section of the casing jacket (see chapter "Maintenance and cleaning[†]/ Removing the casing ring").

Note

Note Refit the casing ring after completing the work. See chapter "Maintenance and cleaning†/ Fitting the casing ring").

Note

Following an interruption of the power supply, compressor operation remains blocked for at least one minute while the appliance initialises.

If the compressor subsequently fails to start, it may be blocked by additional safety devices (motor overload relay, high pressure switch). This block can last between 1 and 10 minutes.

▶ See chapter "Troubleshooting" in the Owner's Guide.

Fault display in the programming unit

The "service/fault" symbol on the appliance programming unit indicates the occurrence of a fault when it illuminates or flashes. If the symbol is still illuminated or flashing after 12 hours, please contact the service department.

A permanently illuminated "service/fault" symbol indicates that a fault has occurred, but the heat pump is still heating. A flashing "service/fault" symbol indicates that a fault has occurred and the heat pump is no longer heating.

"Service/ fault" symbol	Possible causes of fault	Note	Remedy
illumi- nated	The integral sensor is faulty.	If the integral sensor is faulty, it is set to the value of the cylinder top sensor, and amount of mixed water is calculated using this value. The appliance contin- ues to deliver heat.	Contact the service department.
	The cylinder top sensor is faulty.	The appliance continues to deliver heat.	Contact the service department.
	Hot gas temperature sensor faulty	The appliance limits the set tempera- ture to 50 °C.	Contact the service department.
	Impressed current anode short circuit or faulty protective anode	If the impressed current anode is faulty, the appliance is not protected against corrosion.	Contact the service department.
	No communication between con- troller and programming unit.	The controller carries on running independently.	Contact the service department.
	After 70 minutes of defrosting, the evaporator temperature has not yet reached 3 °C. The com- pressor is not working.	If the fault is continuously displayed, an air intake temperature outside the ap- plication limits may be the cause.	The fault is cleared automatically once the evaporator temperature rises to 3 °C.
flashes	The cylinder top sensor and the integral sensor are faulty. The appliance no longer delivers heat.	The appliance does not permit emer- gency heating mode.	Contact the service department.
	Air intake temperature sensor faulty		Contact the service department. Activate emergency heating mode.
	Evaporator temperature sensor faulty		Contact the service department. Activate emergency heating mode.
	The anode current is interrupted. The appliance does not heat up.	The appliance does not permit emer- gency heating mode.	Check the impressed current anode and the wiring.



"Service/ fault" symbol	Possible causes of fault	Note	Remedy
	The appliance is locked out due to being switched off frequently for safety reasons (high pressure).	The safety pressure limiter has re- sponded 5 times in 5†hours.	Contact the service department. The appli- ance can only be unlocked with a service pro- gramming unit. Activate emergency heating mode.
	The appliance has ascertained that the hot water cylinder has not been heated for 13 hours, de- spite there being a demand.	The compressor is permanently locked out.	Check whether there is excessively high, con- tinuous hot water draw-off or if a hot water circulation line is installed. Check whether there is a fault in the refrigerant circuit. Con- tact the service department. Activate emer- gency heating mode. In the case of this fault, the result of carrying out a reset by interrupt- ing the power supply is that emergency heat- ing mode can only be activated again after 13 hours.
	Evaporator temperature < -20 °C; air flow rate too low	The compressor is permanently locked out.	Check whether the fan is faulty. Check whether the evaporator is contaminated. Check wheth- er the air intake or air discharge is blocked. The compressor can only be unlocked by means of a reset carried out by interrupting the power supply. Check whether there is an air flow rate after carrying out the reset by in- terrupting the power supply.

As a qualified contractor you can bypass the compressor lockout time and reset several faults. Switch the power supply OFF and back ON again via the fuse/MCB in the domestic distribution board.

If the "service/fault" symbol is flashing, you can continue to use the appliance temporarily by activating emergency heating mode. Press and hold the "Rapid heat-up" button for two seconds. See chapter "Operation / 'Rapid heat-up' button / Emergency heating mode".

There are some cases in which emergency heating mode cannot be activated. For example, if the hot water cylinder is empty or temperature sensors are faulty, the appliance locks out the electric emergency/booster heater.

Resetting the safety pressure limiter

The safety pressure limiter responds if the pressure in the refrigerant circuit exceeds the permissible maximum value. If the safety pressure limiter responds 5 times in 5 hours, compressor operation is blocked.

- ▶ Eliminate the cause of the increased pressure in the refrigerant circuit.
- ▶ Wait approx. 5-15 minutes for the appliance to equalise the pressure.

The appliance can only be unlocked with a service programming unit.

Resetting the high limit safety cut-out

If the hot water cylinder is overheated, the high limit safety cut-out switches off the electric emergency/ booster heater to protect the appliance.



- 1 Reset button for high limit safety cut-out
- Once the cause of the fault has been removed, press the reset button of the high limit safety cut-out on the rod thermostat. To do so, remove the appliance cover.

Thermann Installer's Manual Heat Pump Water Heaters

Motor overload relay

The motor overload relay will shut down the compressor in the event of excessive thermal load. Remove the cause.

After a short cooling period, the motor overload relay will restart the compressor automatically.

Maintenance

4

WARNING Electrocution

Prior to all work on the appliance, isolate it from the power supply.

Removing the appliance cover



- ▶ Undo the screw (Torx) that attaches the cover to the appliance.
- ▶ Push the cover upwards.



- ► Carefully remove the cover.
- Undo the plug-in connection in the electrical cable that runs to the battery pack on the back of the fascia.
- Carefully lift away the appliance cover and undo the earth cable that runs from the appliance control panel to the cover.

Note

Refit the appliance cover after completing your work. See chapter "Maintenance and cleaning / Fitting the appliance cover".

Removing the casing ring

Note

If you require more space to work inside the appliance, you can remove the casing ring on the upper section of the appliance.





1 Fixing screws on casing ring

The casing ring is fastened with screws.

- ▶ Undo the fixing screws on the casing ring.
- Remove the condensate drain bend and pipe collar of the drain. Turn anti-clockwise to undo them.



Material losses

Inside the appliance, an earth cable is connected to the casing ring. Undo the earth cable in order to be able to remove the casing ring.



The casing ring overlaps along the joint. A tab on one end clips into the recess at the other end of the casing ring.

▶ Ease the casing ring apart, until it can be removed or slid downwards.

Note

Note Refit the casing ring after completing the work. See chapter "Maintenance and cleaning / Fitting the casing ring").

Cleaning the evaporator

WARNING Injury

The evaporator consists of numerous sharp-edged fins.

▶ Be careful when cleaning the evaporator and wear protective clothing, especially safety gloves.

In order to maintain the appliance performance as best as possible, check and clean the appliance evaporator as often as necessary.

- ▶ Undo the screw that fastens the appliance cover to the top of the fascia.
- ▶ Remove the fascia and the appliance cover.
- Carefully clean the evaporator fins. Only use water and a soft brush for this. Never use acidic or alkaline cleaning agents.

Draining the cylinder



WARNING Burns

Hot water may escape when you drain the appliance.

To drain the hot water cylinder, e.g. when shutting the appliance down, proceed as follows.

- ▶ Isolate the appliance from the power supply.
- ► Close the shut-off valve in the cold water inlet line.

The hot water cylinder is drained via the cold water supply line.

- Open the drain valve installed in the cold water supply line (see chapter "Water connection"). If no drain valve has been installed, undo the cold water supply line at the "Cold water inlet" connection.
- ▶ To vent the system, undo the hot water line connected to the "hot water outlet" connection.

Some residual water will remain in the bottom of the hot water cylinder.

Descaling the electric emergency/booster heater

Only descale the flange of the emergency/booster heater after disassembly. Never treat the inside of the hot water cylinder or the impressed current anode with descaling agents. The electric emergency/booster heater is screwed into the hot water cylinder of the appliance at a central point at the top.



1 Electric emergency/booster heater with protective anode

Valves

Regularly check the valves in the system (safety valve, pressure reducing valve, drain valve) to ensure the operational reliability of the appliance. The amount of limescale deposits depends on the local water quality.

- Check all valves in the system and remove limescale deposits.
- ▶ Replace the valves if necessary.
- Check the function of the valves.

Condensate drain

▶ Check whether the condensate drain is clear of obstructions. Remove contaminants.

Replacing the power cable

WARNING Electrocution The power cable must only be replaced (for example if damaged) by a qualified contractor.



Fitting the casing ring

WARNING Electrocution

Reconnect the earth cable to the casing ring.



- ▶ Fit the upper casing ring. The casing ring overlaps along the joint. A tab on one end clips into the recess at the other end of the casing ring.
- Secure the casing ring with screws.
- ▶ Fit the pipe collar of the condensate drain and the condensate drain bend.

Protective anode and battery change

The appliance is equipped with a maintenance-free impressed current anode that protects the cylinder from corrosion when it is connected to the power supply. At the factory, the appliance is fitted with rechargeable batteries that ensure the power supply to the impressed current anode in the case of a power failure. The power supply to the appliance must not be interrupted for more than 16 hours.

If the power supply is regularly interrupted by a switching contact or the security of supply is inadequate, the rechargeable batteries of the impressed current anode must be replaced every three years. Neglecting to do this puts the appliance at risk of damage. If regular interruptions in the power supply are not anticipated and there is security of supply, no maintenance of the batteries is required and the appliance is maintenance-free in this regard.

Material losses

Never use batteries that cannot be recharged. Only NiMH rechargeable batteries are permissible. Batteries may be damaged in the appliance. Without a power supply, the impressed current anode and the cylinder would not be protected against corrosion.

The rechargeable batteries are secured at the back of the fascia.



- ▶ Undo the screw securing the fascia.
- Carefully remove the fascia so that the cables running from the batteries to the impressed current anode in the appliance are not pulled out.



1 Plug-in connection

▶ Undo the plug-in connection by pressing the connection lock on both sides.



- 1 Battery compartment
- ▶ Pull the battery compartment down to remove it from the retainer.
- Open the battery compartment using a screwdriver.
- ▶ Replace the batteries (NiMH, type AAA, \geq 800 mAh).

Material losses

Ensure that the batteries are inserted correctly and the right way round, otherwise there will be no corrosion protection in the event of interruptions in the power supply.

- Close the battery compartment using a screwdriver.
- ▶ Push the battery compartment into the retainer.
- ▶ Reconnect it to the appliance with the plug-in connection.

Fitting the appliance cover

WARNING Electrocution

Reconnect the earth cable to the appliance cover.

- ▶ Place the cover back on the appliance.
- Connect the cable linking the batteries with the internal control unit to the back of the fascia.
- ▶ Replace the fascia.
- ▶ Secure the appliance cover and the fascia with the screw at the top of the control fascia.



Specification

Dimensions and connections

Thermann Hybrid 220



b01 Entry electrical cables		
c01 Cold water inlet	Male thread	G 1
c06 Hot water outlet	Male thread	G 1
c13 T&P valve	Female thread	Rp 3/4
d45 Condensate drain	Male thread	G 3/4
g01 Air intake		
g02 Air discharge		
i43 Cover for manufacturing aperture		

Thermann Hybrid 300



		Thermann Hybrid 300
b01 Entry electrical cables		
c01 Cold water inlet	Male thread	G
c06 Hot water outlet	Male thread	G
c13 T&P valve	Female thread	Rp 3/4
d45 Condensate drain	Male thread	G 3/4
g01 Air intake		
g02 Air discharge		
i43 Cover for manufacturing aperture		



Wiring diagram



Thermann Installer's Manual

Heat Pump Water Heaters

- Electronic assembly (control unit) A1
- A2 Electronic assembly (programming unit)
- Α3 Electronic assembly (electrical corrosion protection)
- C1 Capacitor
- C2 Battery pack
- Heating element E1
- F1 High limit safety cut-out TSR
- F2 Motor overload relay M1
- F3 High pressure switch
- F4 Fuse
- F5 Fuse, power supply, rechargeable battery
- Impressed current anode G1
- M1 Compressor
- M2 Fan
- N1 Thermostat TSR
- R1 Resistor
- S1 DIP switch (operating mode)
- S2 **DIP** switch
- T1 Temperature sensor, cylinder top/integral
- Τ2 Temperature sensor, hot gas
- т3 Т4 Temperature sensor, air intake
- Temperature sensor, evaporator
- V1 Solenoid valve (live in heating mode)
- V2 Solenoid valve (live in defrost mode)
- ХŌ Mains terminal
- X1 Terminal
- X3 Terminal
- Χ4 Terminal, battery pack

Data table

		Thermann Hybrid 220	Thermann Hybrid 300
		238383	238384
Hydraulic data			
Nominal capacity		220	302
Application limits			
Hot water temperature with heat pump	°C	61	61
Max. hot water temperature with heat pump	°C	65	65
Max. hot water temperature with emergency/booster heater	°C	63	63
Min./max. application limits of heat source for heat pump operation	°C	-5/+42	-5/+42
Min./max. application limits for cylinder ambient temperature	°C	-5/+55	-5/+55
Min. installation room floor area	m²	6	6
Min. installation room volume	m³	13	13
Maximum permissible operating pressure, cold water/hot water	MPa	0.85	0.85
Min./max. conductivity, drinking water	µS/cm	100-1500	100-1500
Small-scale Technology Certificates (Australia)			
ACOP (AS/NZS 4234 climate zone 2)		3.94	3.58
Heating output			
Average heating output (EN 16147 / A15)	kW	1.64	1.65
Power consumption			
Average heat pump power consumption (EN 16147 / A15)	kW	0.55	0.55
Max. heat pump power consumption (excl. start-up)	kW	0.65	0.65
Electrical data			
Rated voltage	V	230	230
Power supply		1/N/PE 220-240 V 50/60 Hz	1/N/PE 220-240 V 50/60 Hz
Permissible voltage range, external signal transmitter		~ 220-240V 50/60Hz	~ 220-240V 50/60Hz
Max. operating current	<u> </u>	9.70	9.70
Max. starting current	A	23.44	23.44
MCB/fuse rating	<u> </u>	C16	C16
Sound emissions			
Sound power level (EN 12102)	dB(A)	60	60
Average sound pressure level at 1 m distance, free field	dB(A)	45	45



		Thermann Hybrid 220	Thermann Hybrid 300
Versions			
IP rating		IP24	IP24
Refrigerant		R134a	R134a
Refrigerant charge	kg	0.85	0.85
Global warming potential of the refrigerant (GWP100)		1430	1430
CO ₂ equivalent (CO ₂ e)	t	1216	1216
Power cable length approx.	mm	2000	2000
Dimensions			
Height	mm	1545	1913
Diameter	mm	690	690
Height when tilted	mm	1692	2034
Height when tilted incl. packaging	mm	1895	2230
Packing unit dimensions height/width/depth	mm	1740/740/740	2100/740/740
Weight			
Weight, empty	kg	120	135
Connections			
Condensate connection		G 3/4	G 3/4
Safety valve connection		Rp 3/4	Rp 3/4
Water connection		G 1	G 1
Values			
Type of anode		Maintenance-free impressed	Maintenance-free impressed
		current anode	current anode
Air flow rate	m³/h	550	550

The output data refers to new appliances with clean heat exchangers.





