



### **Read all these instructions before installation.**

#### **General information**

This product must be installed by an authorised installer. The installer must be qualified to undertake electrical work and to work on pipes.

Before connection, the person in charge must ascertain which regulations apply to the district heating installation.

MAXI is a unit or substation designed to heat hot service water and/or space heating water for buildings, by means of district heating.

See the information supplied with the delivery documentation for an explanation of how the district heating substation works and how it should be connected.

Connecting the district heating substation, electric power, pipework and safety equipment incorrectly may result in a major hazard and is not allowed.

This manual and other delivery documentation must be kept accessible close to the district heating substation throughout its life.

If the unit is subsequently added to or modified, the documentation must also be updated.

The owner of the building must be instructed in the operation, setting and care of the unit.

It is particularly important to provide information about the safety systems and about hazards that may arise in relation to the high pressure and temperature of the district heating water.

#### **Arrival inspection**

Remove the transport packaging and check that the product has not been damaged in transit and that the delivered unit agrees with the specifications.

#### **Lifting and handling**

When lifting the unit, take great care to avoid subjecting pipes and heat exchangers to stresses that might affect their strength.

Use lifting eyes if provided, and a pallet lifter where possible. Note: Lifting objects as heavy as a MAXI is a very hazardous operation.

Check the weight of the unit before lifting it, and use equipment capable of handling the weight. The weight including packaging is stated on the shipping paperwork.

If the unit needs to be dismantled to move it to the installation site, carefully mark all pipes and electrical connections so that no mistakes are made during re-assembly.

#### **Installation space**

The Maxi must be installed in a space where the air temperature is between 0 and +40°C, and where the humidity is lower than the dewpoint. See also the IP class of the electrical equipment supplied, in the respective manuals or product data sheets.

Set up the unit so that the installation work can be done easily and efficiently. It is important to have access to the entire unit for subsequent inspection and servicing.

The unit has adjustable feet to compensate for minor irregularities in the floor.

If the floor is very uneven, it must be made smooth before the unit is installed.

Safety valves release water to protect the installation. The area should therefore have a floor drain or some other means of draining away the discharged water.

The unit must not be installed in such a way that water from safety valves or any other leakage that might occur cannot be drained away.

#### **Approvals**

The MAXI has been manufactured and inspected in accordance with applicable directives, i.e. the Machine Directive (MD), the Pressure Equipment Directive (PED) and the Low-Voltage Directive (LVD).

See the identification plate of the unit and the *Declaration of Conformity* for marking and further details of regulations invoked.

### **Safety regulations**

#### Equipment to prevent excess pressure

On its secondary sides, the district heating centre requires safety equipment to prevent excess pressure, which must protect the installation in accordance with the current CE regulations.

- Before the unit goes into service it must be protected with non-closable safety valves on each secondary circuit.
- These safety valves must protect both the unit's own components, such as heat exchanger, and the components and pipes of the heated system, against excessive pressure.

If these safety valves are not included in the consignment, they must be retro-fitted to the unit.

#### Electrical safety

A permanent installation must always include a lockable all-pole safety switch on the supply.

This safety switch may be included in the consignment. If not, it must be installed in the permanent installation.

All electric power to the unit must be switched off before any work is done on the electrical installation.

#### Take-up of expansion of heating water

An expansion vessel that can handle the entire volume expansion of the space heating system must be connected at the time of installation. The expansion vessel is not normally included in the consignment, but it must be installed before the system goes into service.

#### Temperature safety

Cetetherm Maxi is designed to manage all possible temperature that can result, when connected to a district heating network. See sign data.

If a MAXI is connected to a building that does not manage temperature that can be the result of leaking control valves, power failure etc.

- some additional components and functions for preventing this must be added.

If these functions are not included in the delivery, they must be added during installation. The level of safety needed, functions to provide that must be regarded during installation.

#### When working on the unit

Make sure that all valves are closed in the circuit to be worked on. The unit normally contains water at such a high pressure and sometimes at such a high temperature that steam may be formed.

NOTE: It may take a long time after closing the valves before work can begin without risk of scalding.

When welding or soldering on or close to the unit, combustible parts such as thermal insulation or electrical cables must be moved out of the way.

When certain materials are heated, there is a risk of fire or toxic gases.

### **Installation**

#### Pipework

All pipes are marked so that they can be connected correctly. Connecting them incorrectly is dangerous.

To avoid the risk of scalding, discharge pipes from safety valves and drain cocks must be installed so that water is directed downwards and close to the floor.

Connecting pipes must be fixed in such a way that forces and movement from the pipework are not transferred to the unit.

If strainers are not supplied with the unit, they must be obtained and fitted to the primary side and to each secondary side.

It may be necessary to fit additional drain cocks and air bleed valves at the lowest and highest points of the pipework. These must be fitted with plugs to prevent scalding if they are opened accidentally.

#### Pipework insulation

District heating pipes and space heating pipes may sometimes reach temperatures at which scalding may result if they are touched.

These pipes must be insulated at the time of installation.

Other pipes should be insulated to prevent heat loss (hot water and hot water circulation pipes) or air humidity condensation (cold water pipes).

Condensation dripping on to steel pipes may eventually cause corrosion.

#### Flushing

Before the system goes into service, every circuit must be flushed to remove any debris or contaminants in the system. Among other things, contaminants in the water are harmful to the heat exchanger and this may result in a higher return temperature.

### Pressure testing

Before the installation goes into service, it must be pressure-tested in accordance with local or national regulations.

According to the PED Directive, the test pressure must be at least 1.43 times the design pressure for the respective circuit.

For certain materials and temperature levels, a higher factor applies.

See the identification plate data for suitable test pressures (PT) for the unit.

Before circuits with safety valves are pressure-tested, the safety valves must be removed and replaced with plugs.

DO NOT plug the outlets of installed safety valves for pressure testing  
- This may damage the valves.

When pressure testing is complete, refit the safety valves and check for leaks.

### Filling

Before filling the system with water, re-tighten all joints in the unit that are fitted with a gasket.

To fill, open the incoming cold water supply and fill the service water circuit.

Then fill the heating circuits by opening the respective filling valve.

Observe the pressure in the heating circuits during filling, to ensure that the maximum pressure is not exceeded. After filling, carefully close manual filling valves.

Unless there is a strainer on the return line, the primary (district heating) side should be filled by opening the supply first.

If the unit is filled via a return line that has no strainer, debris may enter the unit and lodge in control valves, for instance. This might result in incorrect operation or leakage.

### Sealing leaks in gasket joints

If a bolted or flanged joint with a gasket is leaking, de-pressurise the circuit before tightening the joint. This is because there is

water between the gasket and the mating surfaces. Continuing to tighten the joint with the system under pressure will deform the gasket and it will have to be replaced to stop the leakage.

### Bleeding

Air is bled from heating circuits in the customary way. Depending on the equipment level and system type of the unit, repeated bleeding may be necessary in the initial period after starting.

### Electrical connection

The MAXI can be supplied with or without electrical connection, and also without a control centre, for connection to control equipment already on site.

Electrical connection and installation work done when the unit is installed must undergo appropriate safety and function testing.

Electrical connection done at the factory conforms to the rules for CE marking and has undergone electrical safety and function testing to the extent possible for the degree of completion of the unit.

In some cases, a ready-wired unit may be supplied fitted with a plug so that the unit can be started before a qualified electrician carries out the permanent installation.

A ready-wired unit is supplied with a socket to connect an outside sensor, to be installed on the coldest side of the building, normally the north side,  $\geq 2$  metres above ground.

## **Adjustment, settings**

### Pump, hot water circulation flow

The Maxi can be supplied with a pump for hot water circulation. The purpose of this pump is to ensure that the temperature of the water in the circulation pipe of the building is at least 50 °C on returning to the substation.

If the temperature is lower, bacterial growth may occur and there may be a longer wait for hot service water at each draw-off point.

Adjust the flow so that the temperature of the returned water is about 50 °C, which is about 5 degrees lower than the water in the hot water flow pipe.

The flow rate can be adjusted by changing the pump setting or with a balancing valve.

### Pumps and flows to the heating system

The Maxi can be supplied with a circulation pump for one or more space heating circuits. Each heating circuit should be adjusted in order to extract the required performance from the substation. Make sure water quality is in accordance with VDI 2035 or similar norm, to prevent damage to pumps and/ or other equipment in the circuit.

A high return temperature and high flow rates on the primary side may result in excessive energy cost.

### Control equipment

Check that the available primary differential pressure agrees with the design values of the unit.

The control equipment must be set for the relevant operating case, so that the control system can operate optimally and so that maximum comfort, and sufficient safety is achieved.

See separate documentation from the supplier of the control equipment.

Temperature "hunting" may result in control valves, actuators and heat exchangers having to be replaced prematurely.

When commissioning hot water systems, make sure that no-one draws hot water until the temperature level has stabilised around the recommended figure of about 55 °C. – Risk of scalding!

### **Modification of the unit**

The MAXI has been marked and documented by Cetetherm in the configuration in which it left the factory.

Any modification or extension requires a documented assessment of compliance with the directives and regulations applicable at the time of the change.

### **Dismantling and recycling**

Maxi consists primarily of metals, steel, stainless steel, brass and copper in different amounts, depending on the size of the unit and the type of system.

When the time comes to dispose of the unit, some of these can be separated and recycled.

Non-metallic parts and components must be disposed of in the correct manner in accordance with local or national regulations.

### Technical data - MAXI

#### Sign data

- Type designation
- Manufacturing no.
- Order no.
- Unit
  - design temperature TS
  - design pressure PS
  - test pressure PT
- Year of manufacture/week of pressure test
- Design data of heat exchanger, such as
  - capacity, kW
  - temperatures, - flow, - pressure drop
  - volume in litres per side
- Relief pressure of any safety valves supplied
- Electric power supply, single- or three-phase
- Fluid group 2 according to PED
- CE marking if applicable
- Manufacturer

The identification plate is affixed on the unit, and a copy is provided with the delivery documentation.

#### Weight

The weight of the unit is stated in the shipping document.

#### Sound level

The sound level from a Maxi does not exceed 70 dB(A) at 1.6 metres above the floor, at 1 metre.

#### **Appendices** (depending on version)

- Flowchart, description
- Operating instructions
- Declaration of conformity as per directives
- Electrical diagram
- Product data sheets for included components