



# **Operating Manual**

Multi-functional domestic hot water storage tank MFS 600 S, MFS 830 S, MFS 1000 S

Accessory for heat pumps



www.aitgroup.com



# Contents

| 1    | Abo<br>1.1<br>1.2<br>1.3      | ut this operating manual                                                             | 3<br>3   |
|------|-------------------------------|--------------------------------------------------------------------------------------|----------|
| 2    | Inter                         | nded use                                                                             | 4        |
| 3    | Disc                          | laimer                                                                               | 4        |
| 4    | Safe<br>4.1<br>4.2            | ety<br>Personal protective equipment<br>Residual risks                               | 5        |
| 5    | Con                           | tact                                                                                 | 5        |
| 6    | War                           | ranty / Guarantee                                                                    | 5        |
| 7    | Disp                          | osal                                                                                 | 5        |
| 8    | Mair<br>8.1<br>8.2            | ntenance of the unit<br>Maintenance as required<br>Yearly maintenance                | 5        |
| 9    | Sco                           | oe of delivery                                                                       | 6        |
| 10   | 10.1<br>10.2                  | age, transport, installation Storage Transport to installation location Installation | 6<br>6   |
| 11   | Insta<br>11.1<br>11.2<br>11.3 | Insulate the circulation connection                                                  | 9<br>10  |
| 12   | Insta                         | allating the sensors                                                                 | 11       |
| Tec  | hnic                          | al Data                                                                              | 12       |
| Din  | MFS<br>MFS                    | onal drawings<br>600 S<br>830 S<br>1000 S                                            | 13<br>14 |
| Inst | tallati                       | on plan                                                                              | 16       |
| Нус  | Varia<br>Varia                | c connectionsnt 1nt 2nd hydraulic diagram                                            | 17<br>18 |
|      | _                             |                                                                                      |          |





## 1 About this operating manual

This operating manual is part of the device.

- Before working on or with the device, read the operating manual carefully and follow it for all activities at all times, especially the warnings and safety instructions.
- ► Keep the operating manual to hand at the device and hand over to the new owner if the device changes hands.
- ► If you have any questions or anything is unclear, ask the local partner of the manufacturer or the factory's customer service.
- ▶ Note and follow all reference documents.

## 1.1 Validity

This operating manual exclusively refers to the device identified by the nameplate(→ "Nameplate", page 6).

#### 1.2 Reference documents

The following documents contain additional information to this operating manual:

- Planning & design manual, hydraulic integration
- Operating manual of the heat pump
- Operating manual of the heating and heat pump controller
- Brief description of the heat pump controller

## 1.3 Symbols and markings

#### Identification of warnings

| Symbol    | Meaning                                                                                                          |  |
|-----------|------------------------------------------------------------------------------------------------------------------|--|
| <u></u> ♠ | Safety-relevant information.<br>Warning of physical injuries.                                                    |  |
|           | Safety-relevant information. Warning of physical injuries. Flammable materials / flammable (primary) refrigerant |  |
|           | Safety-relevant information. Warning of physical injuries. Flammable materials / flammable (primary) refrigerant |  |

| Symbol                                                                                                     | ol Meaning                                                                                         |  |  |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--|--|
| Safety-relevant information. Warning of physical injuries. Danger of fatal injury due to electric current. |                                                                                                    |  |  |
| DANGER                                                                                                     | Indicates imminent danger resulting in severe injuries or death.                                   |  |  |
| WARNING                                                                                                    | WARNING Indicates a potentially dangerous situation, which can result in severe injuries or death. |  |  |
| CAUTION                                                                                                    | Indicates a potentially dangerous situation, which can result in moderate or minor injuries.       |  |  |
| IMPORTANT                                                                                                  | Indicates a potentially dangerous situation, which can result in property damage.                  |  |  |

#### Symbols in the document

| Symbol      | Meaning                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------|
| 3°          | Information for qualified personnel                                                                |
| 仓           | Information for the owner/operator                                                                 |
| ✓           | Requirement for action                                                                             |
| •           | Procedural instructions:<br>Single step action prompt                                              |
| 1., 2., 3., | Procedural instructions: Numbered step within a multi-step action prompt. Keep to the given order. |
| i           | Additional information, e.g. a tip on making work easier, information on standards                 |
| <b>→</b>    | Reference to further information elsewhere in the operating manual or in another document          |
| •           | Listing                                                                                            |
|             | Secure connections against twisting                                                                |





#### 2 Intended use

The multi-functional storage tank is designed for household use and may only be used as intended.

This is as a stratified storage tank used in conjunction with heat pumps.

- with buffer area for heating system water
- domestic water heating using the continuous flow principle
- for air/water heat pumps
- brine/water heat pumps
- water/water heat pumps

Can be connected to solar systems and solid fuel boilers.

The unit may be operated only within its technical parameters.

- → "Technical data" overview and "Technical data/Scope of delivery" overview of the operating manual for the heat pump to which the multi-functional storage tank is connected.
- If local regulations apply, observe: laws, standards and directives.

#### 3 Disclaimer

The manufacturer is not liable for losses resulting from any use of the unit which is not its intended use.

The manufacturer's liability also expires:

- if work is carried out on the unit and its components contrary to the instructions in this operating manual.
- if work is improperly carried out on the unit and its components.
- if work is carried out on the unit which is not described in this operating manual, and this work has not been explicitly approved by the manufacturer in writing.
- if the unit or components in the unit have been altered, modified or removed without the explicit written consent of the manufacturer.

## 4 Safety

The unit is safe to operate when used for its intended purpose. The construction and design of the unit conform to current state-of-the-art standards, all relevant DIN/VDE regulations and all relevant safety regulations.

The operating manuals supplied with the product are intended for all users of the product.

The operation of the product via the heating and heat pump control and work on the product which is intended for end customers / operators is suitable for all age groups of persons who are able to understand the activities and the resulting consequences and can carry out the necessary activities.

Children and adults who are not experienced in handling the product and do not understand the necessary activities and the resulting consequences must be instructed and, if necessary, supervised by persons experienced in handling the product and who are responsible for safety.

Children must not play with the product.

The product may only be opened by qualified personnel.

All procedural instructions in this operating manual are intended excusively for qualified and skilled personnel.

Only qualified, skilled personnel is able to carry out the work on the unit safety and correctly. Interference by unqualified personnel can cause life-threatening injuries and damage to property.

- Ensure that the personnel is familiar with the local regulations, especially those on safe and hazardaware working.
- Work on the refrigerating circuit may only be carried out by qualified personnel with appropriate qualifications for refrigeration system installation.
- Work on the electrics and electronics may only be carried out by electrical technicians.
- Any other work on the system may only be carried out by qualified personnel (heating installer, plumbing installer).

During the warranty and guarantee period, service work and repairs may only be carried out by personnel authorised by the manufacturer.





#### 4.1 Personal protective equipment

During transport and work on the unit, there is a risk of cuts due to the sharp edges of the unit.

▶ Wear cut-resistant protective gloves.

During transport and work on the unit, there is a risk of foot injuries.

Wear safety shoes.

When working on liquid-conveying lines, there is a risk of injury to the eyes due to leakage of liquids.

Wear safety goggles.

#### 4.2 Residual risks

Injuries caused by high temperatures

▶ Before working on the unit, let it cool down.

#### Safety instructions and warning symbols

Observe the safety instructions and warning symbols on the packaging and on and in the unit.

## 5 Contact

Addresses for purchasing accessories, for servicing or for answers to questions about the unit and this operating manual can be found on the internet and are kept up-to-date.

→ "Contact" in the heat pump operating manual

## 6 Warranty / Guarantee

For warranty and guarantee conditions, please refer to the purchase documents.

ி NOTE

Please contact your dealer about all matters concerning warranties and guarantees.

## 7 Disposal

When decommissioning the unit, always comply with applicable laws, directives and standards concerning recovery, recycling and disposal.

#### 8 Maintenance of the unit

note

We recommend that you sign a maintenance agreement with an accredited heating company.

#### 8.1 Maintenance as required

- ► The components of the heating circuit (valves, expansion vessels, circulating pumps, filters, dirt traps) should be inspected or cleaned as needed, at the very least annually, by qualified personnel (heating or cooling system engineers).
- Check the safety valve (provided by customer) for the hot water tank at regular intervals.

#### 8.2 Yearly maintenance

- ▶ Determine the quality of the heating water by analysis. In the event of deviations from the specifications, take suitable measures without delay.
- ► Check all installed dirt traps for dirt and clean them if necessary.



## 9 Scope of delivery

Multi-functional domestic hot water storage tank



2 insulation shells, Sky jacket, rosettes for connections, circulation connection kit

In extra box:



Circulation connection kit and insulation, 2 hot gas sensors, 4 cable ties

- 1. Check the delivery for outwardly visible signs of damage.
- Check to make sure that the delivery is complete.Report defects or incorrect deliveries immediately.

#### Accessories

#### **IMPORTANT**

Use only original accessories from the manufacturer of the unit.

Select heating elements, between 4.5 to 9 kW depending on the specific system and order as additional items.

| Туре    | MFS 600S | MFS 830 S | MFS 1000S |
|---------|----------|-----------|-----------|
| EHZI 45 | •        | •         | •         |
| EHZ 60  | •        | •         | •         |
| EHZ 75  | •        | •         | •         |
| EHZ 90  | •        | •         | •         |

• : suitable combination, n.g. : not suitable

→ For details of the quantity and positioning of the heating element sockets, refer to the dimensioned drawing of the respective tank.

#### Nameplate

A nameplate is attached to the outside of the unit at the factory.

The nameplate contains the following information at the very top:

- Model, item number
- Serial number

The nameplate also contains an overview of the most important technical data.

## 10 Storage, transport, installation

#### 10.1 Storage

- Store unit protected against:
  - Moisture/damp
  - Frost
  - Dust and dirt

## 10.2 Transport to installation location

9 NOTE

It must be installed in a frost-free room with short pipe lengths to the load. Please also ensure that it is installed on a dry, firm surface able to safely support its weight.

→ "Technical data, weight" overview

To avoid damage during transport, you should transport the storage tank (secured on the wooden pallet) to its final installation location using a lifting truck.

If it is not possible to transport the unit to the final installation location using a lifting truck, you can also transport the unit using a hand truck.



#### WARNING

Several people are required to transport the unit. Do not underestimate the weight of the tank.

→ "Technical data, weight" overview.





#### WARNING

The unit can tip over when being removed from the wooden pallet and during transport with a hand truck or lift truck. This can result in personal injuries and damage.

► Take suitable precautions, which prevent the tipping hazard.

Proceed as follows if transport with a lifting truck is not possible:

Remove packaging and insulating material. Remove storage tank from the wooden pallet and bring it to the installation location.

Dispose of the transport and packaging materials properly and under ecological aspects.



Fastening on the wooden pallet

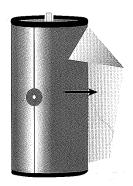
## note

The multi-functional domestic hot water storage tank is delivered with full insulation. If necessary, the insulation (Sky jacket and the 4 insulation shells) can be removed to transport the tank into the basement.

#### **IMPORTANT**

All parts of the insulation must be carefully removed and put aside so that they are not damaged.

1. Remove the protective transport sheeting.



2. Remove the grommets from the connections.



3. Lift off the tank cover.



4. Undo the Sky jacket zip and remove the jacket.





Remove both insulation shells and put them in a safe place.







note Note

Please note that all components must be reassembled in the reverse order.



#### WARNING

Make sure you secure the tank against slipping during transport. Always secure the tank on the hand truck with a ratchet strap.

#### 10.3 Installation

note Note

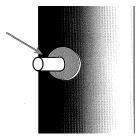
Ensure that the foam insulation is still in the bottom of the storage tank.



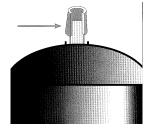
#### **WARNING**

The storage tank must always be tilted by at least 2 people to prevent the risk of it tipping over. Do not tilt the storage tank by more than 20° during this step. Hands and fingers can be crushed when the tank is righted.

- ▶ Do not grip the bottom of the tank.
- Before you re-attach the insulation half-shells, check whether a) the grommets are placed over the pipe sockets and b) the soft foam sleeve is positioned over the top connection.
  - a) Grommets

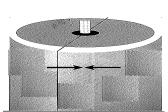


b) Sleeve



2. Re-attach the insulation half-shells to the storage tank.





- 3. Use adhesive tape to fix the insulation half-shells at the top, bottom and in the middle part of the tank.
- 4. Place the Sky jacket around the storage tank so that the punched out holes fit over the sockets. Then close the zip.



#### **IMPORTANT**

The zip must be closed by two people to relieve the strain.

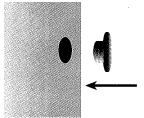




5. Replace the tank cover and push the grommets over the corresponding pipe connections.







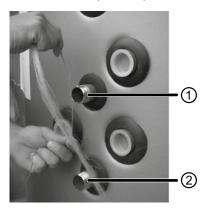
# 11 Installing the hydraulic connections

#### 11.1 Circulation connection kit

**NOTE** 

The connection between the top and bottom heat exchanger must always be installed, even if there is no circulation pipe.

1. Seal the two threads (1 and 2).



2. Screw the tee onto thread 1 and move into the correct position (connection part facing downwards).



3. Seal the thread of the flexible corrugated pipe and screw into the tee.



Screw the 90° elbow onto thread 2 and move into the correct position (elbow must face upwards).



Stretch the flexible corrugated pipe and insert the seal between the elbow and the flexible corrugated pipe.





6. Use the union nut to screw together the flexible corrugated pipe and the elbow.



#### **IMPORTANT**

Tighten the union nut carefully to prevent damage to the seal.

#### 11.2 Insulate the circulation connection

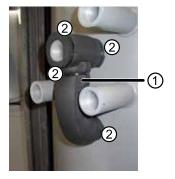
#### A NOTE

The circulation connection is installed outside the shell insulation over the Sky jacket and is then insulated.

1. Push the 110 mm long insulation hose (with pipe cutout) over the thread of the circulation connection.



2. Insulate the remaining piping of the circulation connection with 220 mm long insulation hose (1). Then fix the insulation hoses in 4 places using the cable ties (2).



## 11.3 Hydraulic connections

Note and follow all relevant regulations, standards, guidelines and directives when integrating the multifunctional storage tank in the drinking water and heating network.

Note and follow the relevant DVGW regulations and recommendations and the regulations of the water supply company when connecting to the drinking water.

- ► Integrate the storage tank in the heating system and domestic hot water circuit as shown in the hydraulic diagram.
- → Hydraulic connection

#### **IMPORTANT**

Damage to the copper pipes due to unacceptable loading.

Secure all connections against twisting.

Do not exceed the operating pressures specified on the name plate and in the technical data.

- Install a pressure reducer, if necessary.
- Ensure that the drinking water is of drinking water quality.

#### **IMPORTANT**

The drinking water must meet the following conditions:

| Chloride content        | < 200 mg/l       |
|-------------------------|------------------|
| Sulphate content        | < 250 mg/l       |
| pH value                | 6.5 – 8.5        |
| Electrical conductivity | 130 – 1500 μS/cm |

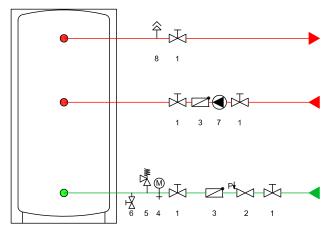
We recommend installing a suitable expansion vessel (not included in delivery) in the hot water circuit. This equalises pressure fluctuations or water shocks in the cold water network and prevents unnecessary loss of water.

Use a safely valve according to the respective relevant standards, guidelines and directives and according to the maximum allowable operating pressures of the storage tank and components.

The safety drain of the safety valve must lead into the drain via a funnel siphon in accordance with the applicable standards and regulations.



#### Domestic hot water connection diagram to DIN 1988



- 1 Shut-off valve
- 2 Pressure reducing valve
- 3 Check valve
- 4 Pressure gauge and test valve
- 5 Safety valve
- 6 Emptying valve
- 7 Circulation pump
- 8 Vent valve

#### note Note

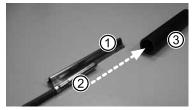
This diagram does not take into account any scalding protection.

## 12 Installating the sensors

Always use the sensor springs included in the scope of delivery when installing the sensors (domestic hot water sensor and return temperature sensor).

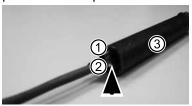


 Position the sensor on the outside of the sensor spring.



- 1 Sensor spring
- 2 Sensor
- 3 Sensor pocket (is already installed in the tank)

2. Push the sensor and sensor spring together into the respective sensor pocket.



- 3. Push in the sensor up to the end of the sensor pocket.
- → For position of the sensor pocket, see dimensioned drawing

#### note Note

Always install the sensor springs, to ensure optimum temperature transfer. Take care not to damage the insulation of the sensor cable.

- 4. Connect the sensors to the heating and heat pump controller according to the specifications in the terminal diagram.
- → Terminal diagram of the respective unit type.

#### A NOTE

Refer to the instruction manual for the heating and heat pump regulator for the regulator settings required for parallel tank. Refer to the terminal diagram of the respective heat pump type for details of the circulating pump connections and, if installed, the switching valve for domestic hot water.



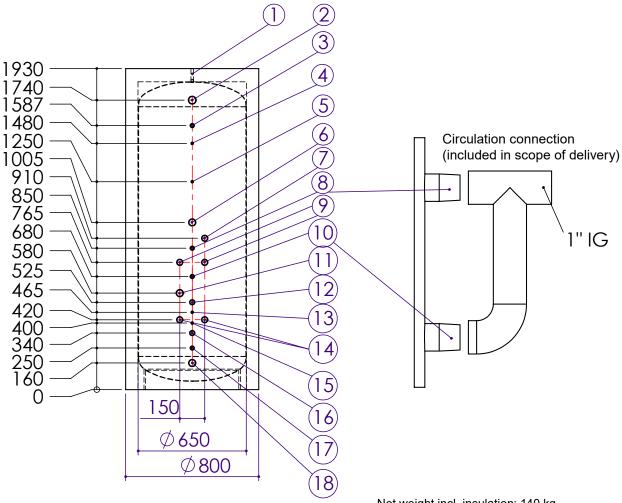
## **Technical Data**

| Tank name                                                                      |            | MFS 600S      | MFS 830S      | MFS 1000S     |
|--------------------------------------------------------------------------------|------------|---------------|---------------|---------------|
| Multi-functional domestic hot water tank                                       | • yes - no | •             | •             | •             |
| Energy efficiency class according to ErP                                       |            | _             | _             | _             |
| Standing loss according to ErP (at 65°C)                                       | W          | 111           | 124           | 135           |
| Total tank volume according to ErP                                             | I          | 552           | 826           | 903           |
| Operating temperature minimum   maximum                                        | °C         | 7   95        | 7   95        | 7   95        |
| Maximum allowable heating water flow rate                                      | m³/h       | 5             | 5             | 5             |
| Corrosion protection according to                                              |            | DIN 4753      | DIN 4753      | DIN 4753      |
| Enamelled surface                                                              | • yes — no | _             | _             | _             |
| Heating water reservoir                                                        |            |               |               |               |
| Capacity                                                                       | I          | 504           | 769           | 830           |
| Max. operating pressure                                                        | bar        | 3             | 3             | 3             |
| Test pressure                                                                  | bar        | 4,5           | 4,5           | 4,5           |
| Operating temperature minimum   maximum                                        | °C         | <b>-   95</b> | <b>-   95</b> | <b>-   95</b> |
| Maximum heating output of the heat pump at heat source max.                    | kW         | _             | _             | _             |
| Solar heat exchanger                                                           |            |               |               |               |
| Capacity                                                                       | l          | 8             | 11            | 17            |
| Pressure loss   flow rate                                                      | bar   l/h  | -   -         | -   -         | -   -         |
| Max. operating pressure                                                        | bar        | 10            | 10            | 10            |
| Test pressure                                                                  | bar        | 15            | 15            | 15            |
| Operating temperature minimum   maximum                                        | °C         | 95            | 95            | 95            |
| Domestic hot water heat exchanger                                              |            |               |               |               |
| Capacity                                                                       | <u> </u>   | 40            | 46            | 56            |
| Pressure loss   flow rate                                                      | bar   I/h  | -   -         | -   -         | -   -         |
| Max. operating pressure                                                        | bar        | 6             | 6             | 6             |
| Test pressure                                                                  | bar        | 12            | 12            | 12            |
| Operating temperature minimum   maximum                                        | °C         | <b>-   95</b> | <b>-   95</b> | <b>-   95</b> |
| Material                                                                       |            | 1.4404 (V4A)  | 1.4404 (V4A)  | 1.4404 (V4A)  |
| Available quantity of domestic hot water                                       |            |               |               |               |
| at heat pump flow temperature                                                  | °C         | 55            | 55            | 55            |
| Heat pump flow on charging                                                     | m³/h       | 3             | 3             | 3             |
| 10 l/min drawn off at 45°C                                                     |            | 200           | 210           | 210           |
| 20 l/min drawn off at 45°C                                                     |            | 170           | 180           | 180           |
| 10 l/min drawn off at 38°C                                                     |            | 220           | 240           | 240           |
| 20 I/min drawn off at 38°C                                                     | I          | 200           | 220           | 220           |
| Installation location                                                          | 20         | 7105          | 7105          | 7.105         |
| Room temperature minimum   maximum                                             | °C         | 7   35        | 7   35        | 7   35        |
| Relative humidity maximum (non-condensing)                                     | %          | 65            | 65            | 65            |
| General unit data                                                              |            |               |               |               |
| Tests                                                                          |            | SVGW / SEV    | SVGW / SEV    | SVGW / SEV    |
| Insulation                                                                     |            |               |               |               |
| Material: Rigid foam   soft foam                                               | • yes — no | •   -         | •   -         | •   -         |
| Insulation thickness                                                           | mm         | 72,5          | 95            | 95            |
| as per DIN 4753                                                                | • yes – no | •   -         | •   -         | •   -         |
| Sheet metal jacket ı Foil jacket                                               | • yes — no | _   •         | _   •         | _   •         |
| *) for further details see dimensional drawing   Manufacturer: ait deutschland |            | 813605        | 813606        | 813607        |



## MFS 600 S

# Dimensional drawing

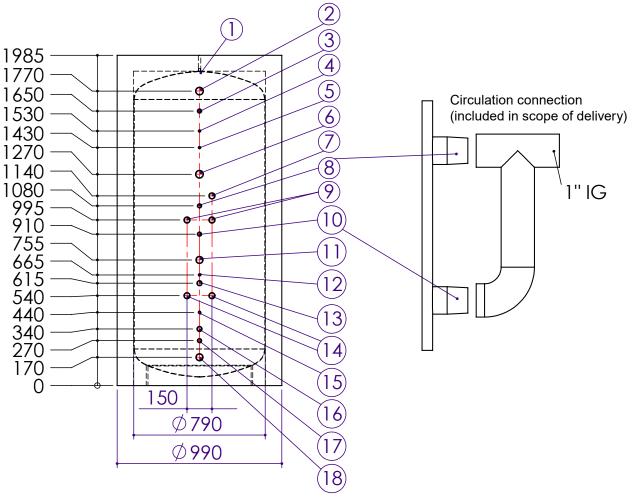


Keys: UK819328 All dimensions in mm. Net weight incl. insulation: 140 kg Tilting dimension without insulation: 1900 Domestic hot water exchanger: 7.5 m<sup>2</sup> Solar heat exchanger: 1.5 m<sup>2</sup>

| 1  | Ventilation                                                                                  | ½" IG               |
|----|----------------------------------------------------------------------------------------------|---------------------|
| 2  | Flow of second heat generator                                                                | 1½" IG              |
| 3  | Domestic hot water withdrawal                                                                | 1" AG               |
| 4  | Sensor pocket (domestic hot water sensor)                                                    | Ø 13 x 75           |
| 5  | Sensor pocket                                                                                | Ø 13 x 75           |
| 6  | Heating element, hot water (max. 9kW)                                                        | 1½" IG              |
| 7  | Domestic hot water return heat pump                                                          | 1¼" IG              |
| 8  | Circulation bottom connection kit                                                            | 1" AG               |
| 9  | Heating circuit flow   heat pump, heating and domestic hot water flow (both can be replaced) | 11⁄4" IG   11⁄4" IG |
| 10 | Circulation bottom connection kit                                                            | 1" AG               |
| 11 | Heating element, heating (max. 9kW)                                                          | 1½" IG              |
| 12 | Sensor pocket (return temperature sensor)                                                    | 1" IG               |
| 13 | Solar exchanger flow                                                                         | Ø 13 x 75           |
| 14 | Return heating circuit   return flow, heat pump (both can be replaced)                       | 1¼" IG   1¼" IG     |
| 15 | Sensor pocket (Solar)                                                                        | Ø 13x75             |
| 16 | Cold water inlet                                                                             | 1" AG               |
| 17 | Sensor exchanger return                                                                      | 1" IG               |
| 18 | Return of second heat generator (draining)                                                   | 1½" IG              |



# Dimensional drawing



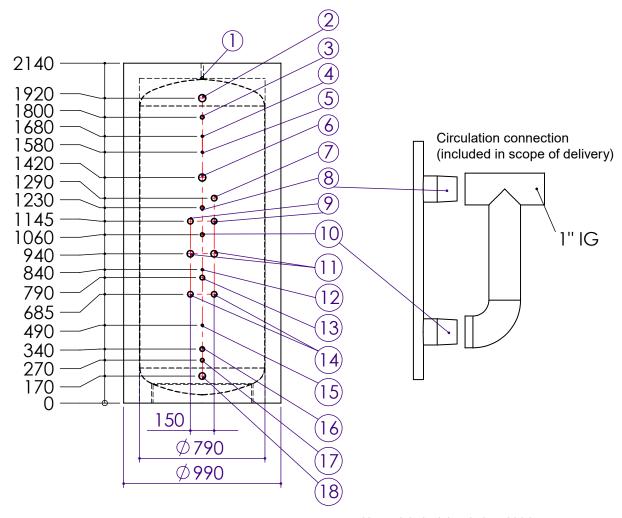
Keys: UK819214c All dimensions in mm. Net weight incl. insulation: 200 kg Tilting dimension without insulation: 1990 Domestic hot water exchanger: 8.7 m<sup>2</sup> Solar heat exchanger: 2.2 m<sup>2</sup>

| 1                          | Ventilation                                                                                                                                                                                         | 1/2" IG                                        |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 2                          | Flow of second heat generator                                                                                                                                                                       | 1½" IG                                         |
| 3                          | Domestic hot water withdrawal                                                                                                                                                                       | 1" AG                                          |
| 4                          | Sensor pocket (domestic hot water sensor)                                                                                                                                                           | Ø 13 x 100                                     |
| 5                          | Sensor pocket                                                                                                                                                                                       | Ø 13 x 100                                     |
| 6                          | Heating element, hot water (max. 9kW)                                                                                                                                                               | 1½" IG                                         |
| 7                          | Domestic hot water return heat pump                                                                                                                                                                 | 11⁄4" IG                                       |
| 8                          | Circulation bottom connection kit                                                                                                                                                                   | 1" AG                                          |
| 9                          | Heating circuit flow   heat pump, heating and domestic hot water flow (both can be replaced)                                                                                                        | 1¼" IG   1¼" IG                                |
|                            |                                                                                                                                                                                                     | =                                              |
| _10                        | Circulation bottom connection kit                                                                                                                                                                   | 1" AG                                          |
| 10                         | Heating element, heating (max. 9kW)                                                                                                                                                                 | 1" AG<br>1½" IG                                |
|                            |                                                                                                                                                                                                     |                                                |
| 11                         | Heating element, heating (max. 9kW)                                                                                                                                                                 | 1½" IG                                         |
| 11                         | Heating element, heating (max. 9kW)  Sensor pocket (return temperature sensor)                                                                                                                      | 1½" IG<br>Ø 13x100                             |
| 11<br>12<br>13             | Heating element, heating (max. 9kW)  Sensor pocket (return temperature sensor)  Solar exchanger flow  Return heating circuit   return flow, heat pump                                               | 1½" IG<br>Ø 13x100<br>1" IG                    |
| 11<br>12<br>13<br>14       | Heating element, heating (max. 9kW)  Sensor pocket (return temperature sensor)  Solar exchanger flow  Return heating circuit   return flow, heat pump (both can be replaced)                        | 1½" IG<br>Ø 13x100<br>1" IG<br>1¼" IG   1¼" IG |
| 11<br>12<br>13<br>14<br>15 | Heating element, heating (max. 9kW)  Sensor pocket (return temperature sensor)  Solar exchanger flow  Return heating circuit   return flow, heat pump (both can be replaced)  Sensor pocket (Solar) | 1½" IG<br>Ø 13x100<br>1" IG<br>1¼" IG   1¼" IG |



## MFS 1000 S

# Dimensional drawing



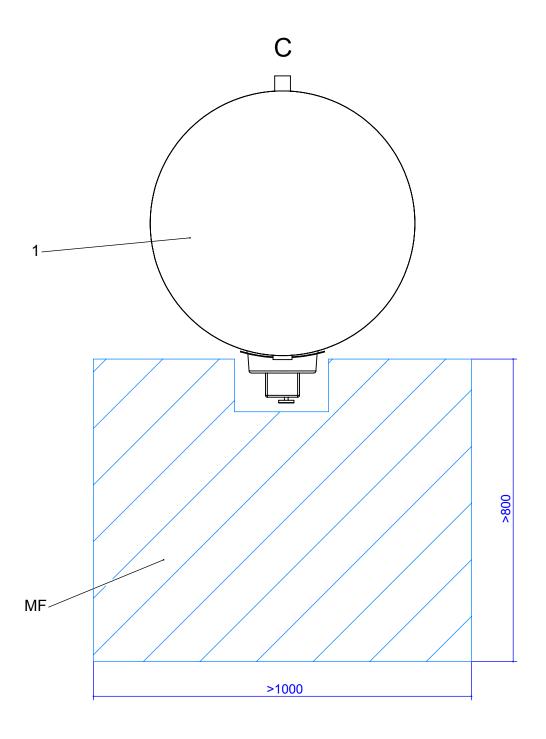
Keys: UK819312b All dimensions in mm. Net weight incl. insulation: 230 kg Tilting dimension without insulation: 2090 Domestic hot water exchanger: 10.9 m<sup>2</sup>

Solar heat exchanger: 3.1 m<sup>2</sup>

| 1  | Ventilation                                                                                  | ½" IG           |
|----|----------------------------------------------------------------------------------------------|-----------------|
| 2  | Flow of second heat generator                                                                | 1½" IG          |
| 3  | Domestic hot water withdrawal                                                                | 1" AG           |
| 4  | Sensor pocket (domestic hot water sensor)                                                    | Ø 13 x 100      |
| 5  | Sensor pocket                                                                                | Ø 13 x 100      |
| 6  | Heating element, hot water (max. 9kW)                                                        | 1½" IG          |
| 7  | Domestic hot water return heat pump                                                          | 1¼" IG          |
| 8  | Circulation bottom connection kit                                                            | 1" AG           |
| 9  | Heating circuit flow   heat pump, heating and domestic hot water flow (both can be replaced) | 1¼" IG   1¼" IG |
| 10 | Circulation bottom connection kit                                                            | 1" AG           |
| 11 | Heating element, heating (max. 9kW)                                                          | 1½" IG          |
| 12 | Sensor pocket (return temperature sensor)                                                    | Ø 13 x 100      |
| 13 | Solar exchanger flow                                                                         | 1" IG           |
| 14 | Return heating circuit   return flow, heat pump (both can be replaced)                       | 1¼" IG   1¼" IG |
| 15 | Sensor pocket (Solar)                                                                        | Ø 13 x 100      |
| 16 | Sensor exchanger return                                                                      | 1" IG           |
| 17 | Cold water inlet                                                                             | 1" AG           |
| 18 | Return of second heat generator (draining)                                                   | 1½" IG          |



Installation plan MFS ...



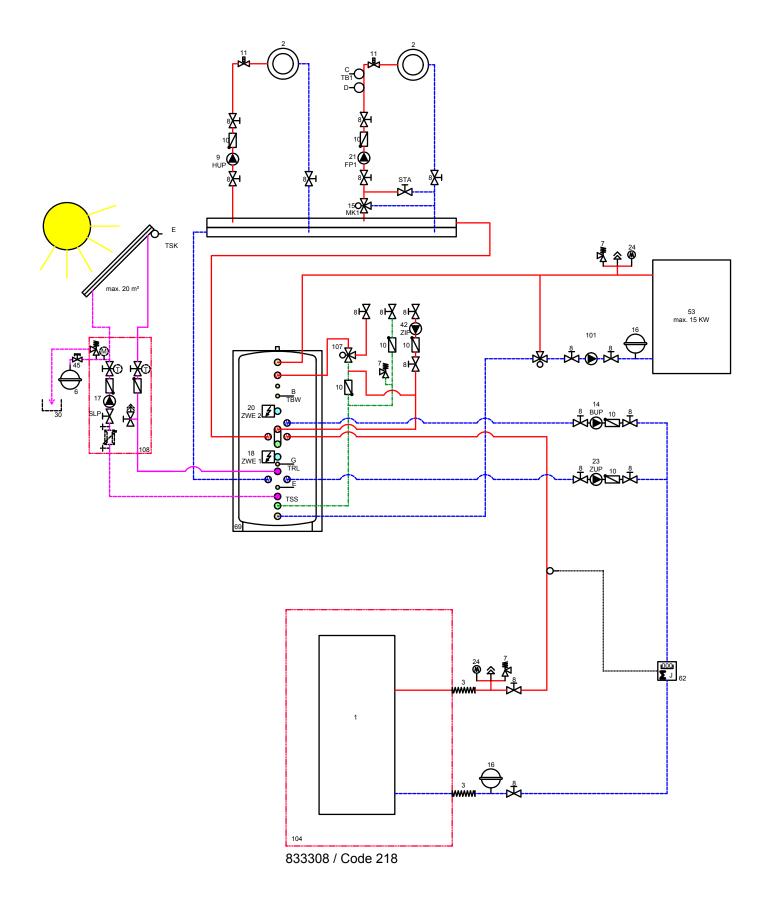
Keys: UK819397 All dimensions in mm.

| 1  | Storage tank                                          |
|----|-------------------------------------------------------|
| С  | Top view                                              |
| MF | Minimum area to ensure ability to operate and service |



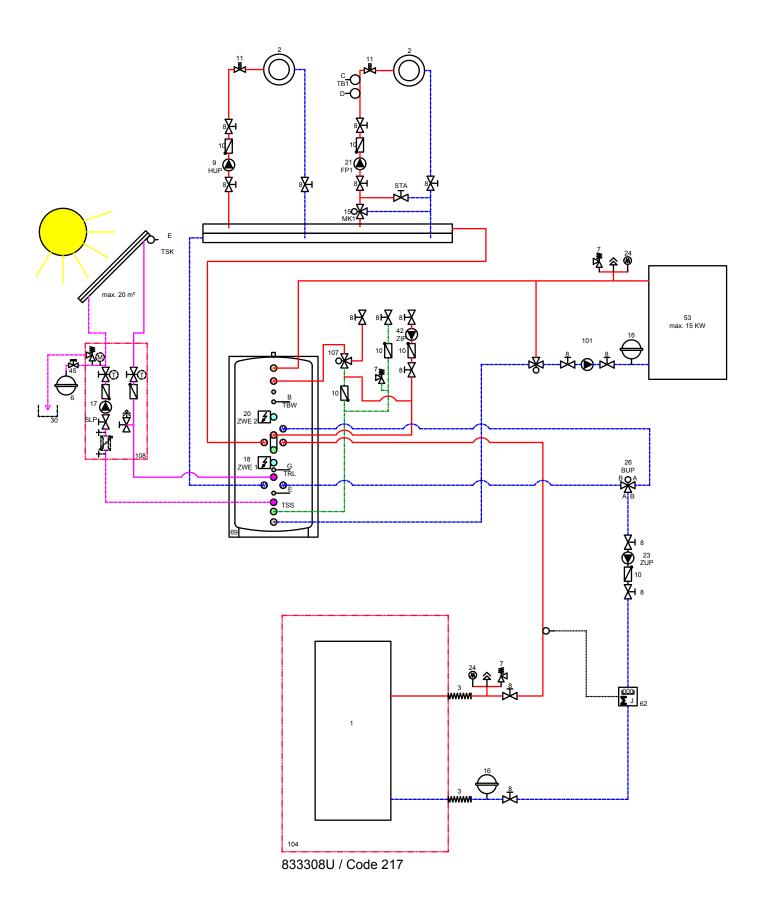
# Variant 1

# Hydraulic connection MFS





# Hydraulic connection MFS





| 140304                    | External sensor  Domestic hot water sensor Feedwater sensor mixer circuits 1 Floor the persure limiter Sensor external return Line pressure regulator valve Sensor return (hydraulic module, dual) Motor valve Split heat pump outdoor unit Split heat pump indoor unit Circulation pump Switching valve Connection 2nd heat generator Outdoor temperature sensor Return temperature sensor Return temperature sensor Flow temperature sensor Flow temperature sensor Flow temperature limiter Flow temperature | BT19 Temperature sensor immersion heater BT24 Temperature sensor 2nd heat generator Comfort board / Expansion board:  15 Mixer circuit three-way mixer (MK2-3 discharge) 17 Temperature difference regulator 19 Mixer circuit four-way mixer (MK2-charge) 21 Mixer circuit four-way mixer (MK2-charge) 22 Swimming pool circulating pump (FP2-3) 22 Swimming pool circulating pump 44 Three-way mixer valve (cooling function MK2) 47 Changeover valve swimming bath preparation(B = normally open) 60 Changeover valve solar circuit(B = normally open) 61 Changeover valve solar circuit(B = normally open) 62 Heat meter (optional) 63 Changeover valve solar circuit(B = normally open) 64 Cooling circulation pump 70 Solar seperation module 71 TES/E 71 Sensor, temperature difference control (low temperature) 72 TSS/E 73 Sensor, temperature difference control (high temperature) 74 TEE/F 75 Sensor external energy source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           | 1A/A<br>1BW/B<br>1B1/C<br>0<br>1RL/G<br>STA<br>112<br>82<br>82<br>82<br>83<br>84<br>113<br>811<br>811<br>812<br>813<br>814<br>811<br>811<br>811<br>811<br>811<br>811<br>811<br>811<br>811                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | BT19<br>BT24<br>Comfort bos<br>15<br>17<br>17<br>17<br>18<br>22<br>44<br>44<br>47<br>60<br>62<br>63<br>63<br>64<br>70<br>TB2-3/C<br>TSS/E<br>TSS/E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                           | Seperation tank Gas- or oil-boiler Wood boiler Hot water cylinder Brine perssure switch Swimming pool heat exchanger Geothermal heat exchanger Ventilation system Plate heat exchanger Cooling cylinder Cooling cylinder Compact distributor Fancoils Solar/ service water cylinder Solar/ service water cylinder Solar/ service water cylinder Buffer tank wall mounted Pipe lead-in Ventower Scope of delivery, hydraulic tower, dual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Fresh water station Scope of supply water/water booster Accessories water/water booster optional Room thermostat for cooling (optional) Controls supplied by customer Dew-point monifor (optional) Room thermostat for reference space in packing list Supply heat pump Cooling circuit module box removeable for installation Specific glycole mixture Scald protection / thermostatic mixer valve Solar pump assembly Overflow valve must be closed Packing list hydraulic tower Mounting for additional heating element Minimum distance to thermal decoupling of the mixing valve                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                           | 55<br>56<br>57<br>58<br>58<br>58<br>58<br>58<br>58<br>58<br>58<br>58<br>58<br>58<br>58<br>58                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 7 7 7 7 8 7 100<br>100<br>100<br>100<br>100<br>100<br>100<br>110<br>110<br>110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Legend hydraulic diagramm | Heat pump Underfloor heating / radiators Vibration isolation Sylomer strip machine underlay Closure and drainage Expansion vessel packing list Safety valve Closure Heating circulation pump Non return valve/ one way valve Individual room regulation Overflow valve Steamight insulation Service water circulation pump Mixer circuit three-way mixer (MK1 discharge) Expansion vessel supplied by customer Heating rod (fheating) Mixer circuit four-way mixer (MK1 charge) Heating rod (sway) Mixer circulation pump (FP1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Feed circulating pump (reconnect the integrated circulating pump in the heat pump)  Manifuld Heating circulation pump Switching valve (heating/service water)(B = normally open) Heating element Brine circulation pump Dirt-tay fur brine mix Wall breakthrough Inter pipe Brine manifuld Ground collector Ground sinkies Ground |
| Legend                    | - 2 & 4 & 0 C & 0 0 1 1 2 £ 4 £ £ £ 6 8 6 0 1 1 2 £ 7 £ 7 £ 8 £ 6 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 23 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

# Important notice!

These hydraulic diagrams are schematic representations and are for assistance only. They do not relieve of the obligation to carry out appropriate planning! They do not include all necessary shut-off valves, ventilator fittings or safety devices. These must be incorporated in accordance with the standards and regulations applicable to the respective installation. All country-specific standards, laws and regulations must be observed! The tubes have to be dimensioned according to the nominal volume flow of the heat pump resp. the free pressing of the integrated circulating pump. For detailed information and advice please contact our local sales partner!

an ideal tomorrow



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