

User Guide

DHP-M



The English language is used for the original instructions.
Other languages are a translation of the original instructions.
(Directive 2006/42/EC)

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1 Foreword

Buying a heat pump from Danfoss is an investment in a better future.

A Danfoss heat pump is classed as a renewable energy source, which means that it is considerate of our environment. It is a safe and convenient solution that provides heating, hot water and, in certain cases, cooling for your home at a low cost.

We thank you for the confidence that you have shown in us by buying a heat pump from Danfoss . We hope that you will benefit from it for many, many years to come.

With best wishes**Danfoss heat pumps**

2 Safety precautions

2.1 Symbols in documents

The instructions contain different warning symbols, which, together with text, indicate to the user that there are risks involved with actions to be taken.

The symbols are displayed to the left of the text and three different symbols are used to indicate the degree of danger:

Danger



Indicates an immediate danger that leads to fatal or serious injury if necessary measures are not taken.

Warning



Risk of personal injury!
Indicates a possible danger that can lead to fatal or serious injury if necessary measures are not taken.

Caution



Risk of installation damage.
Indicates a possible hazard that can lead to item damage if necessary measures are not taken.

A fourth symbol is used to give practical information or tips on how to perform a procedure.



Information regarding making the handling of the installation easier or a possible operational technical disadvantage.

2.2 Important information

Warning



The front of the heat pump must only be opened by qualified installers.

Warning

This appliance can be used by children aged 8 years and above, and by persons with reduced physical, sensory or mental capabilities or lack of experience or knowledge, provided that they are supervised or have been instructed in the safe use of the appliance and understand the hazards involved.
Cleaning and user maintenance must not be carried out by children, except under adult supervision.

Warning

Children are not permitted to play with the product.

The system can be considered maintenance-free but certain checks are necessary.
Contact your installer for any service work.

2.3 Installation and maintenance**Warning**

Only qualified installers may install, operate and carry out maintenance and repair work on the heat pump

Warning

Only qualified electricians may modify the electrical installation.

Warning

Only qualified refrigeration technicians may work on the refrigerant circuit

2.4 System modifications

Only qualified installers may carry out modifications on the following components:

- The heat pump unit
- The pipes for the refrigerant, brine and water
- The power supply
- The safety valves

It is not permitted to carry out construction installations that may affect the operational safety of the heat pump.

2.5 Safety valves

Warning



Never block the connection to the safety valves' overflow pipes.

The following safety precautions apply to the hot water circuit's safety valve with corresponding overflow pipe:

- Water expands when it is heated, which means that a small amount of water is released from the system via the overflow pipe.
- The water that exits the overflow pipe can be hot!
Therefore, allow it to flow to a floor drain to prevent any risk of burning yourself.

3 About your heat pump

3.1 Product description

The DHP-M heat pump is a heating system for heating and, if an external water heater is installed (accessory), for hot water production. It has a compressor which is customised for heat pumps. The DHP-M heat pump is equipped with control equipment which is presented in a graphic display. The control equipment is also prepared for monitoring via the internet. Heating is provided to the building via a water-borne heating system. The heat pump supplies as much of the heat demand as possible before auxiliary heating is engaged to assist.

The DHP-M heating unit consists of two basic components:

Heat pump unit

The heat pump consists of:

- Scroll compressor
- Stainless steel heat exchanger
- Circulation pumps for collector system and heating system

Control equipment

The control equipment controls the incoming components of the heating appliance (compressor, circulation pumps, auxiliary heating and exchange valve) and keeps track of when the pump should start and stop, as well as whether it should produce heating for the building or hot water.

The control equipment consists of:

- Colour touch screen and relay module
- Temperature sensors (outdoor, supply line, return line, brine, hot water and hot gas)

3.2 Water heater

The DHP-M heat pump can also produce hot water for an external water heater. The temperature of the water supplied to the water heater is controlled by the start and stop temperature.

4 Control system

The heat pump has an integrated control system which automatically calculates the heat demand in the building to ensure that the correct amount of heat is produced and emitted when necessary.

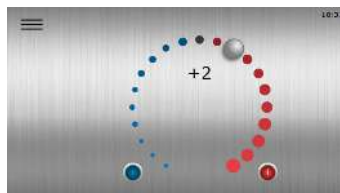
A touch screen is connected to the control system.

The display is used for:

- making settings such as:
 - setting heating
 - adjusting the heat curve
- displaying operating data such as:
 - operating time
 - current values of sensors

4.1 Display description

Start screen



The screen which appears when the system is switched on.

Here you can also carry out comfort adjustment:

1. Drag clockwise or anticlockwise to raise or lower the offset. Each point represents an increase/decrease of 1°C
2. Alternatively, press + / -

Menu screen



This screen appears when you have pressed on the start screen.

5 Settings and adjustments

A qualified installer sets the heat pump's basic settings upon installation. The adjustments that may be made by the installer/user are described below.



Never change control unit settings unless you are aware of what effects the changes may have.
Make a note of the default setting.

5.1 Activate functions



Functions must be enabled before they can be activated and used.

Below is an example where the Heating function is activated. Other functions are activated in a similar way.

1. Press in the upper left corner of the Start screen.
2. Press .
3. Continue with to the menu page to set heating.
4. Press to activate the heating function.
5. Press to return to the Menu screen.

5.2 Selecting operating mode



The heat pump has a starting time of about 5 - 10 minutes.
The delay does not apply to the auxiliary operating mode.

Set the heat pump to the desired operating mode in the menu:

1. Press on the Start screen to open the Menu screen.
2. Press . A new window opens.
3. Press the appropriate symbol for the desired operating mode.

Symbol	Description
	Operating mode Off . All functions off.
	Operating mode Standby . All internal functions off. System pump and other external functions are on.
	Operating mode On . All activated functions are on. In this operating mode, functions selected in Settings can be switched on or off. Press > to switch functions on/off. See the example in the table below.



The list below shows examples of pre-selected functions.
Functions must be enabled in Settings before they can be activated and used.

Symbol	Description
	Operating mode Heat production . Only if the compressor is in operation. Press to activate.
	Operating mode Hot tap water . Only hot water production is permitted. Press to activate.
	Operating mode Auxiliary heater . Only heat production. Press to activate.

5.3 Adjusting the indoor temperature

The heat curve is a graph that compares the outdoor temperature with the supply temperature. The colder the outdoor temperature is, the more heat is supplied to the heating system. The heat curve is adjusted during installation. It must however be re-adjusted later to obtain a pleasant indoor temperature in all weather conditions.

For an explanation of the factory pre-set heat curve, see *Symbol description* below.

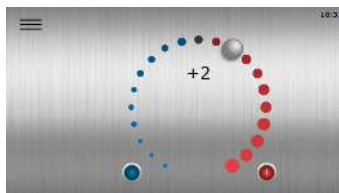
At an outdoor temperature of 0°C the supply temperature should be 40°C. Note that this is only a benchmark. There are radiator systems, floor heating systems and other types of heating system which require either lower or higher temperatures.

At outdoor temperatures below 0°C, supply line water hotter than 40°C is supplied to the radiators. Supply line water colder than 40°C is supplied if the outdoor temperature is above 0°C.

A correctly set heat curve reduces the need for maintenance, as well as making operation more energy-efficient.

The indoor temperature is adjusted by changing the heat curve of the heat pump. This curve is the control system's tool for calculating the correct supply temperature of water for the heating system.

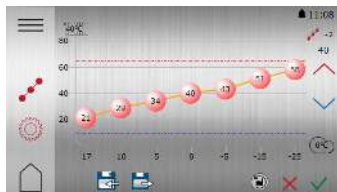
Comfort adjustment



Comfort adjustment involves moving the whole curve upwards or downwards.

1. On the start screen, press on the point marked.
2. Drag clockwise or anticlockwise to raise or lower the offset. Each point represents an increase/decrease of 1°C.

Adjusting the heat curve



1. Press  on the Start screen to open the Menu screen.
2. Press .
3. Press  if the Heat curve is not shown.
4. There are two ways of adjusting the heat curve:
 - Press  or  to adjust the entire curve.
 - Or:**
 - individual points can be moved separately either :
 - by pressing one of the individual points on the curve and dragging the point upwards or downwards to the desired radiator temperature
 - **or** by pressing / marking one of the points on the curve and pressing  and  to the desired radiator temperature.
5. Confirm the new selection by pressing .

Heating settings

In Heating settings, you can set heat stop and min/max supply temperature.

Heat stop is at which outdoor temperature the heat production is shut off.



1. Press  on the Start screen to open the Menu screen.
2. Press .
3. Press  if the Heat settings window is not shown.
4. Make the desired changes.
5. Confirm settings by pressing .

Symbol description

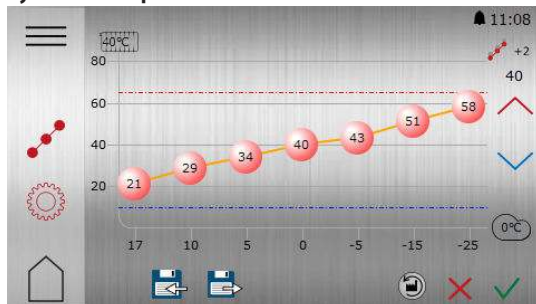


Fig. 1: The figure shows the standard curve 40

Symbol	description
	Shows when the curve is comfort-adjusted. The digit shows how much.
	Shows that the heat curve window is inactive. Press on the symbol to open heat curve settings.
	Shows that the heat curve window is active. This window is the default window.
	Shows that the heating settings window is inactive. Press on the symbol to open heating settings.
	Shows that the heating settings window is active.
	Shows the current outdoor temperature.
	Shows the current supply temperature.
	Press to download and upload a previously saved setting.
	Press to save the current setting. NB The setting must first be confirmed by pressing
	Press to reset to factory settings.
	Press to move individual points or the whole curve upwards.
	Press to move individual points or the whole curve downwards.

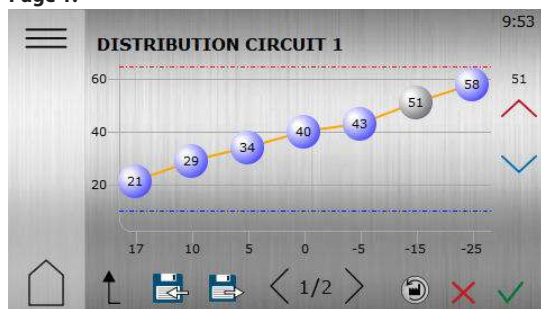
5.4 Distribution circuits

Distribution circuit 1 is available from factory. Distribution circuits 2-5 require an expansion module, EM-1, separately sold as accessory.

Up to 5 distribution circuits can be active simultaneously.

Example of settings for distribution circuit 1:

1. Press in the upper left corner of the Start screen
2. Press
3. Press the text **Mix valves**.
4. Press text for desired distribution circuit.
Each distribution circuit has 2 pages of settings.
5. **Page 1:**



Settings for supply temperature at different outdoor temperatures.

NOTE! The distribution circuit settings must not exceed the values set in the main heat curve. The temperature can be adjusted in two ways:

- Press or to adjust the entire curve.
- Press and drag individual curve points:
 - Press one of the individual points on the curve and drag the point upwards or downwards to the desired temperature
 - **OR** press / mark one of the points on the curve and press and to the desired temperature.

If a value which lies outside the main heat curve is set, this is shown by a change of colour. See 51 in the curve above.

Confirm the settings with .

6. **Page 2:**
Settings for max/min supply temperature.
NOTE! The distribution circuit settings must not exceed the values set in the main heat curve.
Confirm the settings with .

5.5 Operating data

Check applicable sensors described in the table below. The sensors can be found in the sub-menu Operating data 

Select Operating data on the Menu screen:

1. Press  on the Start screen to open the Menu screen.
2. Press Operating data 
3. Select sensor on the different menu pages.

Sensor	Explanation
Outdoor	Shows the temperature on the outdoor sensor.
Calculated demand	Shows heating surplus or heating deficit in the heating system. Minus value indicates heating deficit.
System supply line	Shows the temperature on the system supply line.
Desired system supply line	Shows the current system requirement value.
Hot water	Shows the temperature of the hot water sensor, if hot water production is permitted.
Condenser out	Shows temperature of outgoing radiator temperature from heat pump.
Condenser in	Shows temperature of incoming radiator temperature to heat pump.
Brine in	Shows the current temperature of brine in to the heat pump.
Brine out	Shows the current temperature of brine out from the heat pump.
Compressor run time	Shows the number of hours that the compressor has been in operation.
Tap water run time	Shows the number of hours that has been used for hot water production.
External heater run time	Shows the number of hours that the external heater has been activated.

Version information

On page 3 in the Operating data, version information about the control system software is shown. This information is useful when contacting support.

6 Default settings in the control unit

The left column in the table below shows the parameters that can be adjusted by the user.

The middle column shows the factory settings.

The right column shows the settings made by the installer when the heat pump was installed

Parameter	Factory setting	Any customer-specific settings
Heat curve	40°C	
Operating mode	Off	
Min desired system supply temp.	10°C	
Max desired system supply temp.	55°C	
Heat stop	17°C	

7 Regular checks

7.1 Alarms

There are three types of alarm:

- Class A: Stops the heat pump. The alarm must be acknowledged.
- Class B: Does **not** stop the heat pump. The alarm must be acknowledged.
- Class C: Does **not** stop the heat pump. The alarm is self-acknowledging.

If an event triggers a class A or B alarm, the display shows a continuous red light.

Press the screen, and the following window will appear:

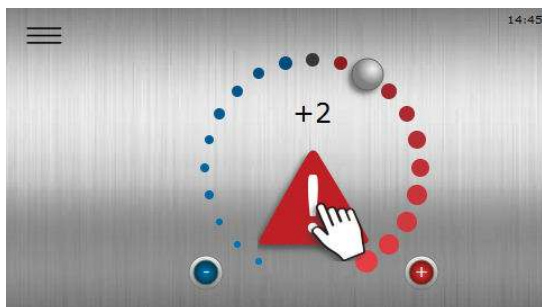


Fig. 2: Start screen with alarm

Press  A new window opens, showing the alarm which has been triggered.



Fig. 3: Alarm example

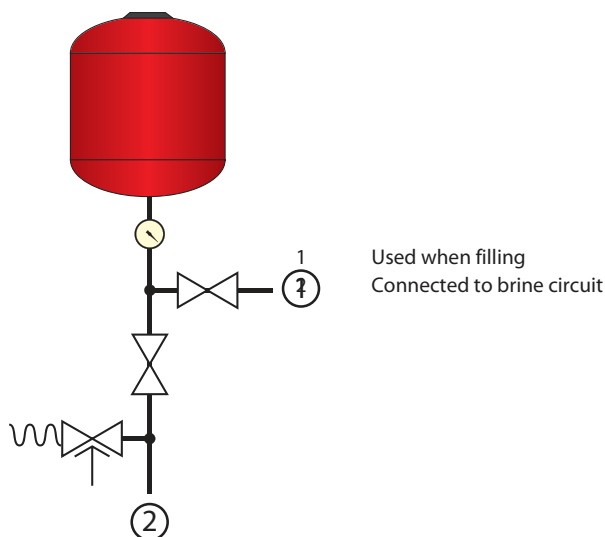
Acknowledging alarms

Press  to reset all alarms.

7.2 Checking the brine circuit pressure

The brine circuit must be filled with the correct amount of fluid; otherwise the installation may become damaged. Ensure that the system has the necessary pressure, but not above the maximum pressure of 6 bar.

For filling brine, see the commissioning guide.



7.3 Check the water level in the heating circuit

The system pressure of the installation must be checked at least twice per year. Ensure that the heating system has the necessary pressure, but max 6 bar.

You can use normal tap water when topping up the heating system. In certain exceptional cases the water quality may be unsuitable for filling the heating system (corrosive or calciferous water). In case of doubt, contact your installer.

Do not use any additives for treatment of the water in the heating system!

7.4 Checking safety valves

The safety valves for the installation must be checked at least four times a year to prevent lime deposits clogging the mechanism.

The safety valve of the water tank protects the enclosed heater against over pressure. It is mounted on the cold water inlet line. If the safety valve is not checked regularly, there is a risk that the water tank may sustain damage. It is quite normal for the safety valve to let out small amounts of water when the water tank is being charged, especially if a lot of hot water was used previously.

The safety valves can be checked by turning the cap a quarter of a turn clockwise until water comes out of the overflow pipe. If a safety valve does not work properly, it must be replaced. Contact your installer.

The opening pressure of the safety valves is not adjustable.

7.5 In the event of leakage

In the event of leakage in the hot water pipes between the heat pump and water taps, close the shut-off valve on the cold water inlet immediately. Then contact your installer.

In the event of leakage in the brine circuit, turn off the heat pump and call your installer immediately.

7.6 Cleaning the filters for the heating and brine circuits



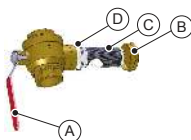
The heat pump must be switched off at the main switch before cleaning can be started.



The filter must be cleaned twice a year after installation. The interval can be extended if there is evidence that cleaning twice a year is not necessary.



Have a cloth at hand when opening the filter cover as a small amount of water usually escapes.



A	Shut-off tap
B	Cover
C	Filter
D	O-ring

Clean the filter as follows:

1. Switch off the heat pump.
2. For the brine circuit filter - remove the insulation around the filler cock.
3. Turn the shut-off tap (A) to the closed position.
4. Unscrew the cover (B) and remove it.
5. Remove the filter.
6. Rinse the filter (C).
7. Reinstall the filter.
8. Check that the O-ring (D) on the cover is not damaged.
9. Screw the cover back into place.
10. Turn the shut-off tap to the open position.
11. For the brine circuit filter - reinstall the insulation around the filler cock.
12. Start the heat pump.

8 Checklist

Location

- ☐ Surface adjustment
- ☐ Drainage

Pipe installation, hot and cold side

- ☐ Pipe connections in accordance with the diagram
- ☐ Flexible hoses
- ☐ Expansion and bleed vessel
- ☐ Filter, hot and cold side
- ☐ Pipe insulation
- ☐ Open radiator valves
- ☐ Leak test, hot and cold side

Electrical Installation

- ☐ Circuit breaker
- ☐ Fuse
- ☐ Positioning of the outdoor sensor

Commissioning

- ☐ Bleeding, hot and cold side
- ☐ Settings control system
- ☐ Manual test components
- ☐ Manual test different operating conditions
- ☐ Noise check
- ☐ Function test safety valves
- ☐ Function test mixer valve
- ☐ Trimming the heating system

Customer information

- ☐ Contents of this manual
- ☐ Safety precautions
- ☐ Controller, function
- ☐ Settings and adjustments
- ☐ Regular checks
- ☐ Reference to service requirement
- ☐ Warranties and insurances

9 Installation carried out by:

Piping installation

- Date:

- Company:

- Name:

- Tel. No:

Electrical Installation

- Date:

- Company:

- Name:

- Tel. No:

System adjustment

- Date:

- Company:

- Name:

- Tel. No:

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