

# ALPHA 15-55 HWR-T

Installation and operating instructions





# ALPHA 15-55 HWR-T

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## English (US)

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## English (US) Installation and operating instructions

## Original installation and operating instructions

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## 1. Limited warranty

Products manufactured by Grundfos Pumps Corporation (Grundfos) are warranted to the original user only to be free of defects in material and workmanship for a period of 36 months from the date code listed on the nameplate of the pump. Grundfos' liability under this warranty shall be limited to repairing or replacing at Grundfos' option, without charge, F.O.B. Grundfos' factory or authorized service station, any product of Grundfos manufacture. Grundfos will not be liable for any costs of removal, installation, transportation, or any other charges that may arise in connection with a warranty claim. Products which are sold, but not manufactured by Grundfos, are subject to the warranty provided by the manufacturer of said products and not by Grundfos' warranty. Grundfos will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with Grundfos' printed installation and operating instructions and accepted codes of good practice. The warranty does not cover normal wear and tear. To obtain service under this warranty, the defective product must be returned to the distributor or dealer of Grundfos' products from which it was purchased together with proof of purchase and installation date, failure date and supporting installation data. Unless otherwise provided, the distributor or dealer will contact Grundfos or an authorized service station for

instructions. Any defective product to be returned to Grundfos or a service station must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Material Authorization must be included if so instructed. Grundfos will not be liable for any incidental or consequential damages, losses, or expenses arising from installation, use, or any other causes. There are no express or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages and some jurisdictions do not allow limitations on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction. Products which are repaired or replaced by Grundfos or authorized service center under the provisions of these limited warranty terms will continue to be covered by Grundfos warranty only through the remainder of the original warranty period set forth by the original purchase date.

## 2. General information

### 2.1 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



#### DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.



#### WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.



#### CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:



#### SIGNAL WORD

##### Description of the hazard

Consequence of ignoring the warning

- Action to avoid the hazard.

## 2.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



Observe these instructions for explosion-proof products.



A blue or gray circle with a white graphical symbol indicates that an action must be taken.



A red or gray circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



If these instructions are not observed, it may result in malfunction or damage to the equipment.



Tips and advice that make the work easier.

## 3. Receiving the product

### 3.1 Inspecting the product



#### CAUTION

##### Crushing of feet

Minor or moderate personal injury  
- Wear safety shoes when handling the product.

- Make sure that the delivered product corresponds to the order.
- Make sure that the supply voltage and frequency correspond to the values stated on the product nameplate.

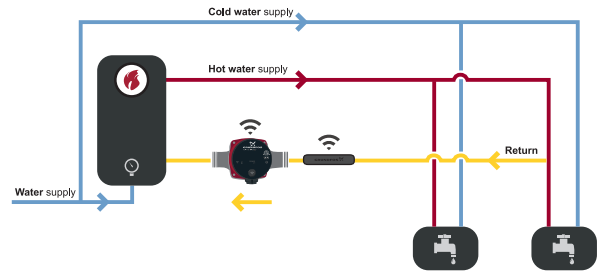
### 3.2 Scope of delivery

The box contains the following items:

Quantity	Description
1	ALPHA HWR-T pump
1	Timer
2	Isolation valve sets
1	Temperature sensor HWR
1	Check valve
1	"Check valve installed" sticker
1	Installation and operating instructions

## 4. Installing the product

### 4.1 Location



TM077506

#### Location of the pump and accessories

The system is intended for indoor use only in areas protected from droplets and splashes.

The maximum ambient temperature at the location of the pump is 104 °F (40 °C).

### 4.2 Tools

The following tools are needed to install the system:

- Hexagon key 4 mm
- Pipe wrench
- Phillips PH1 screwdriver (for temperature sensor screws).

### 4.3 Insulation of the pump housing

Heat loss from the pump can be reduced by insulating the pump housing.



Do not insulate the control box. Do not cover the operating panel.



TM077507

#### Insulating the pump housing

### 4.4 Mechanical installation

#### 4.4.1 Installing the pump

When making pipe connections, follow the pipe manufacturer's recommendations and all code requirements for the pipe material.

#### WARNING



##### Pressurized system

Death or serious personal injury  
- Do not over torque the nuts on the pump housing while tightening.

#### WARNING





##### Hot surface

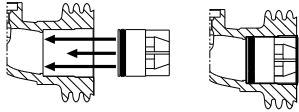
Death or serious personal injury  
- Do not touch a hot pump without protective equipment to avoid burn injuries.

1. Flush the system of debris before installation.
2. Fit the two supplied isolation valves

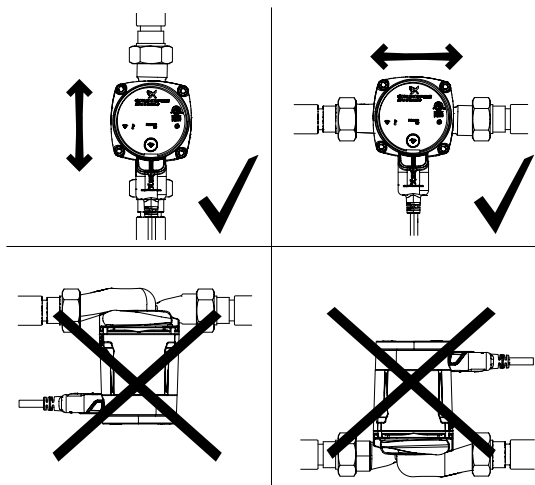
3. Insert the check valve if one is not installed.
4. Refer to the arrows on the pump housing indicating the direction of the liquid flow through the pump.
5. Install the pump with horizontal motor shaft.

 Remember to use the two isolation valves included with the pump.

 The pump must be installed with the proper direction of flow.



Check valve installation



Installation positions

4.4.2 Changing the power head position

**CAUTION**

**Hot surface**

- Minor or moderate personal injury
- Position the pump so that persons cannot accidentally come into contact with hot surfaces.



**WARNING**

**Electric shock**

- Death or serious personal injury
- Switch off the power supply before you start any work on the product. Make sure that the power supply cannot be switched on accidentally.




**WARNING**

**Pressurized system**

- Death or serious personal injury
- Before dismantling the pump, drain the system or close the isolating valve on either side of the pump before you remove the screws. The pumped liquid may be scalding hot and under high pressure.

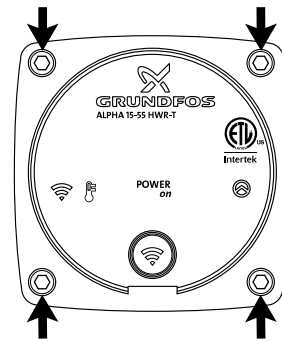


 If you change the position of the pump head, fill the system with the liquid to be pumped or open the isolating valves.

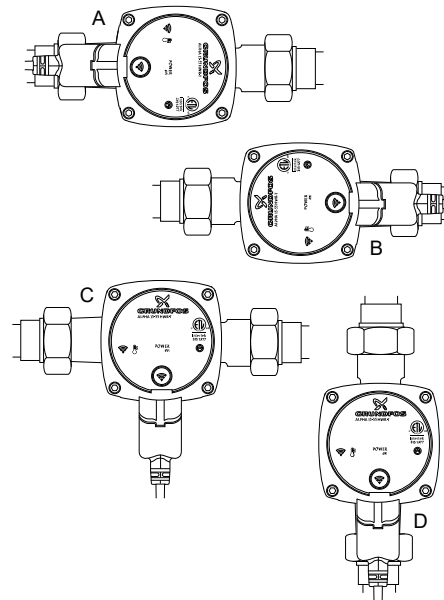
- Any change to the power head orientation should be made before filling the system with liquid.
- You can turn the pump head in steps of 90°. See figure for permissible positions.
- Only use orientations C and D for CSA, enclosure type 2.

Proceed with changing the power head position as follows:

1. If liquid is present, drain the liquid from the pump or isolate the liquid from the pump.
2. Remove the four socket head cap screws.
3. Turn the pump head to the desired position.
4. Cross-tighten the screws to: 7 ft-lbs torque.



Removing the four socket head cap screws on the pump head



Pump head positions

4.4.3 Installing the temperature sensor



Use thermal compound (heat-conducting grease) between the temperature sensor and the pipe system. Thermal compound is not included.

Use only one temperature sensor per system.

Follow the steps below to install the temperature sensor:

1. Remove the lid of the temperature sensor case.
2. Remove the pull-tab from the end of the AA lithium battery in the sensor case. The temperature sensor will start up.

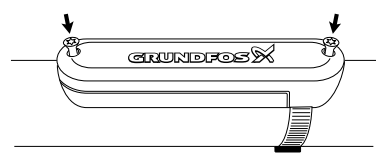
TM072178

TM07508

TM072176

TM077633

3. Mount the temperature sensor on a straight section of pipe. Position the temperature sensor to have the best possible contact with the pipe surface. Apply thermal compound (heat-conducting grease) to the back of the sensor case as shown in figure "Area on the back of the sensor for applying thermal compound". Loosely position the pipe clamp strip around the end of the temperature sensor.
4. Tighten the pipe clamp strip. Keep the clamp on the opposite side of the pipe from the temperature sensor.
  - a. To pair the pump and the temperature sensor, press and hold the connect button on the pump for 2 seconds. The blue connect symbol on the pump will flash. Then press and hold the connect button on the temperature sensor for more than 2 seconds. The internal blue LED of temperature sensor will flash. After successful pairing of the pump and the temperature sensor, the blue light will be on continuously for 5 seconds on both devices. Following the initial pairing, the connect LED on the pump will flash green every 5 seconds. If the pairing fails, the connect symbol on the pump will flash red for 5 seconds. If pairing fails, retry the pairing procedure.
5. Replace the lid of the temperature sensor case.
6. Tighten the two end screws on the temperature sensor case. For best performance, fully tighten the screws but do not over-tighten.



Replacing the lid and and the screws

4.5 Electrical connection

**DANGER**

**Electric shock**

Death or serious personal injury

- All electrical work must be carried out by a qualified electrician in accordance with the latest edition of the National Electric Code and state, local codes and regulations.



**DANGER**

**Electric shock**

Death or serious personal injury

- Switch off the power supply before starting any work on the product. Make sure that the power supply cannot be switched on accidentally.



**DANGER**

**Electric shock**

Death or serious personal injury

- Do not use the pump in swimming pools or marine areas.



**DANGER**

**Electric shock**

Death or serious personal injury

- This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle in accordance with the National Electric Code and any state, local governing codes and regulations.



**WARNING**

**Electric shock**

Death or serious personal injury

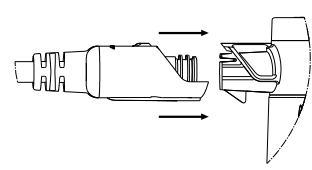
- Use of the product on a circuit equipped with a GFCI can cause improper operation of the GFCI. Consult an electrician and observe all national, state, and local electrical regulations, as applicable.



The motor is protected by the electronics in the control box and requires no external motor protection.

- Confirm that the supply voltage and frequency of the installation site correspond to the values stated on the pump.
- Only use the line cord supplied with the pump to connect the pump to the power supply.
- The **POWER on** symbol indicates that the electrical supply has been switched on.

4.5.1 Connecting the line cord

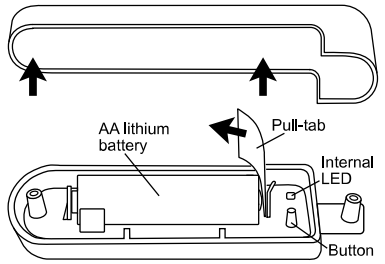


Inserting the line cord plug into the pump (side view)

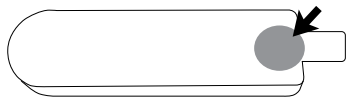
To connect the line cord with the pump:



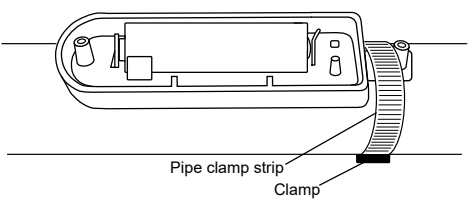
Removing the screws from the lid



Removing the lid and the pull-tab



Area on the back of the sensor for applying thermal compound



Positioning the clamp

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TM072158

TM072157

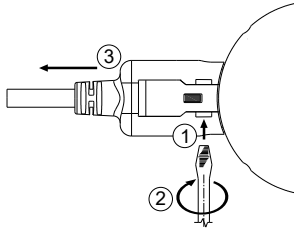
TM072161

TM072160

TM072125

1. Align the line cord plug with the pump.
2. Insert the line cord plug into the pump as shown on the side view above.
3. Push the line cord plug into the pump.

**4.5.2 Removing the line cord**



*Removing the line cord plug from the pump (bottom view)*

To remove the line cord from the pump:

1. Insert a 1/8 inch flat blade screwdriver into the slot.
2. Twist the screwdriver.
3. Pull the cord to remove it.

**5. Starting up the product**

**5.1 Venting the system**

**WARNING**

**Hot water**

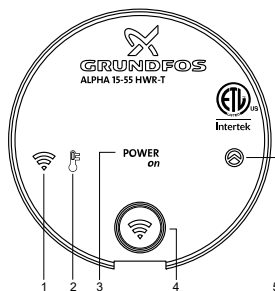


- Death or serious personal injury
- If the hot water temperature is too high, it can cause severe burns or scalding.
  - To prevent burns or scalding, make sure the temperature of the hot water source is controlled before you vent the system.

To vent the system:

1. Turn on the water supply to the hot water source.
2. Make sure that there are no leaks in any of the connections.
3. Turn on the tap or faucet furthest from the hot water source until there is a steady stream of water with no evidence of air in the system.

**5.2 Starting the pump**



*ALPHA 15-55 HWR-T display*

Pos.	Description
1	"Connect" LED
2	"Temperature sensor" LED
3	"Power ON" LED
4	Pairing button
5	"Pump operation" LED

1. Connect the line cord to the power supply to start the pump.
2. The pump will run for up to 10 minutes and then stop. If the water heater system is tankless, check that the heater turns on when connecting the power supply to the pump.
3. The green **POWER on** LED on the pump display will be lit when the power is on.

**6. Product introduction**

**6.1 Product description**



*ALPHA 15-55 HWR-T pump, and temperature sensor*

The ALPHA HWR-T system is a temperature-controlled hot water recirculation system for use in domestic hot water applications.

**6.2 Accessories**



One temperature sensor is either included or may be purchased as an accessory.



*Temperature Sensor HWR*

**6.3 Intended use**

The ALPHA 15-55 HWR-T system is intended for domestic hot-water recirculation with a dedicated return line.



## 6.4 Pumped liquids

### CAUTION



#### Chemical hazard

- Minor or moderate personal injury
- Do not use the pump for flammable liquids, such as diesel or gasoline.

### WARNING



#### Biological hazard

- Death or serious personal injury
- In domestic hot water systems, the temperature of the pumped liquid must always be above 122 °F (50 °C) due to the risk of legionella.

### WARNING



#### Biological hazard

- Death or serious personal injury
- In domestic hot water systems, the pump is permanently connected to the main water supply. Therefore, do not connect the pump by a hose.

### WARNING



#### Hot water

- Death or serious personal injury
- If the hot water temperature is too high, it can cause severe burns or scalding.
  - Ensure that the temperature of the hot water source is not high enough to cause burns or scalding.

### CAUTION



#### Corrosive substance

- Minor or moderate personal injury
- Do not use the pump for aggressive liquids such as acids or seawater.

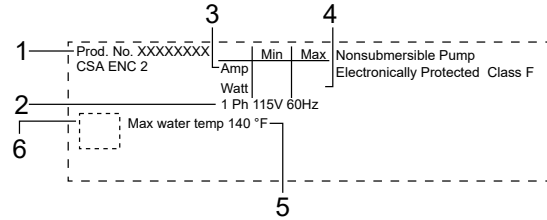
The pump is suited for domestic hot water.

Maximum hardness	14 °dH
Maximum potable water temperature	140 °F (60 °C)

For water with a higher degree of hardness, contact Grundfos.

## 6.5 Identification

### 6.5.1 Nameplate



TM077632

Nameplate

Pos.	Description
1	Product number
2	Voltage [V]
<b>Rated current [A]:</b>	
3	Min.: Minimum current [A] Max.: Maximum current [A]
<b>Input power [W]:</b>	
4	Min.: Minimum power [W] Max.: Maximum power [W]
5	Maximum liquid temperature [°F]
6	FCC and IC ID

## 6.6 Approvals for ALPHA 15-55 HWR-T

### Approval marks



TM073285

TM076608



TM073284

### FCC sections

#### Section 15.19 (a) 3

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### Section 15.21

Any changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

**Section 15.105 (b)**



This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines and RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 8 in (20 cm) or more away from person's body.

**Canadian ISED information**

These devices (ALPHA 15-55 HWR-T, Temperature sensor HWR) contain license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions: (1) this device may not cause interference, (2) this device must accept any interference, including interference that may cause undesired operation of the device. Innovation, Science and Economic Development Canada ICES-003 Compliance Label: CAN ICES-3(B)/NMB-3(B).

These devices (ALPHA 15-55 HWR-T, Temperature sensor HWR) comply with Industry Canada RSS-247 and license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

**7. Control functions**

The pump operation is controlled by temperature measured at the wireless temperature sensor mounted on the hot water return line. When the pump has mains connected it starts to circulate hot water. During the first minutes of operation, up to 5 minutes, it learns the system temperature,  $T_{sys}$ . On the basis of the system temperature, the pump calculates the start and stop temperature:

$$T_{stop} = T_{sys} - 5 \text{ }^{\circ}\text{F (maximum: 110 }^{\circ}\text{F)}$$

$$T_{start} = T_{sys} - 16 \text{ }^{\circ}\text{F}$$

Example 1:

if  $T_{sys} = 110 \text{ }^{\circ}\text{F}$  (maximum: 115  $^{\circ}\text{F}$ ) then

$$T_{stop} = 105 \text{ }^{\circ}\text{F}$$

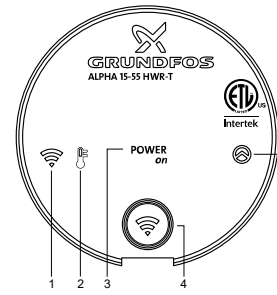
$$T_{start} = 102 \text{ }^{\circ}\text{F}$$

Every 12 hours or at each power cycle the pump performs the above sequence to calibrate and flush the system.

If system temperature,  $T_{sys}$ , is below 85  $^{\circ}\text{F}$  the pump operates with 5 minutes on and 15 minutes off cycles and  $T_{start}$  and  $T_{stop}$  is omitted.

If the temperature sensor is not paired or connected to the pump the pump operates with 5 minutes on and 15 minutes off cycles and can be used during commissioning etc.

**7.1 Pump display**



LED symbols and buttons on the pump display

Pos.	Description
1	Connect LED
2	Temperature sensor LED
3	POWER on LED
4	Pairing button
5	Pump operation LED

Pump display symbol	Status	Explanation
POWER on	Green	The LED lights green when the pump is powered on.
Connect	Flashing blue	The LED flashes blue when the pump is ready for pairing with the temperature sensor. The symbol flashes blue when the paired temperature sensor is disconnected.
	Blue	The LED lights blue for 5 seconds when pairing is successful between the pump and the temperature sensor.
	Flashing green	The LED light flashes green every 5 seconds when the pump and the temperature sensor are paired
Connect	Flashing red	The LED flashes red for 5 seconds when pairing has failed with the temperature sensor.
Pump operation	Green	The LED lights green when the pump circulates water during normal operation and is connected to the temperature sensor.
	Yellow	The LED lights yellow when the pump has timed out. The pump does not circulate water.
	Red	The pump is in an alarm state (see fault finding section).
Temperature sensor	Red	The LED lights red when the battery level in the temperature sensor is at a critically low level (see fault finding section). Replace the battery in the temperature sensor.

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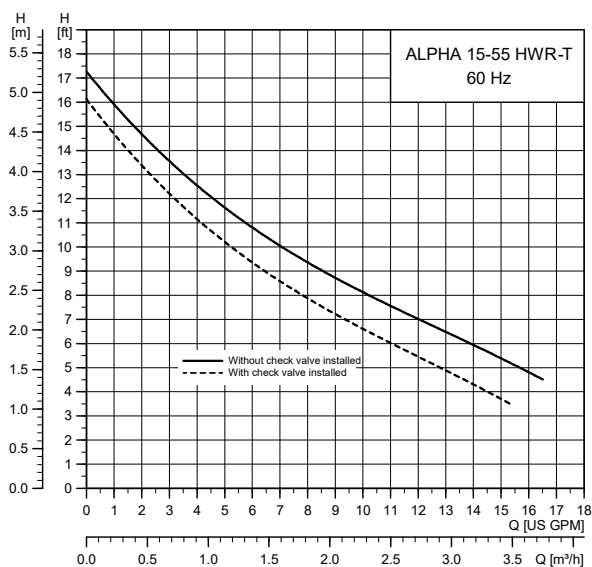
## 7.2 Temperature sensor display

The LED is located on the temperature sensor beneath the lid. You must remove the lid in order to pair the temperature sensor with the pump.

Status	Explanation
Flashing blue	The LED flashes blue when the temperature sensor is ready for pairing with the pump.
Blue	The LED lights blue for 5 seconds when pairing between the temperature sensor and the pump has succeeded.
Flashing red	The LED flashes red for 5 seconds when pairing between the temperature sensor and the pump has failed. Restart of the installation procedure is recommended.

## 7.3 Performance curve

The pump runs at constant speed and consequently on a constant curve. The pump is set on the maximum curve under all operating conditions.



Performance curve, ALPHA 15-55 HWR-T

## 8. Servicing the product

### 8.1 Product maintenance

The ALPHA HWR-T pump is maintenance-free.

If the pump is damaged, for example with fractures or dents, replace the pump.

#### 8.1.1 Battery replacement

### WARNING

#### Biological hazard

Death or serious personal injury



- Keep batteries out of reach of small children, the elderly, and pets. Batteries can cause permanent injury if ingested or placed in the nose, mouth, or ears.
- Immediate emergency room treatment is required for anyone who ingests a battery. In addition, in the US, consult the 24-hour National Battery Ingestion Hotline at 800-498-8666 for assistance.

### CAUTION

#### Corrosive substance

Moderate to minor personal injury and risk of property damage



- The temperature sensor must be replaced if battery leakage occurs.

### CAUTION

#### Flammable material

Minor or moderate personal injury



- Do not attempt to recharge non-rechargeable batteries.



To clean the temperature sensor, wipe it with a clean, damp cloth.

Ensure that disposal of old batteries is in accordance with local regulations. Recycle old batteries where possible.

#### 8.1.1.1 Replacing battery for temperature sensor

The temperature sensor uses AA 3.6 V lithium-thionyl batteries. To change the battery in the temperature sensor, follow steps below:

1. Remove the lid of the temperature sensor.
2. Remove the old battery.
3. Insert the new battery.
4. Replace the lid of the temperature sensor.

TM077509

## 9. Fault finding the product

### 9.1 Fault finding table

**Fault: The pump does not start.**

Status	Cause	Remedy
The <b>POWER on</b> LED on the pump operating panel is green. The <b>Pump Operation</b> LED is red.	The pump is not connected to the power supply.	Make sure the power supply is switched on. Check if external protection has tripped.
	The pump is in alarm state.	Make sure the cables and connections are free from defects and connected securely.
	If the <b>Pump operation</b> LED on the pump operating panel is yellow, the pump has timed out.	Contact your local Grundfos representative.
The <b>POWER on</b> LED on the pump operating panel is green, but the pump does not start.		Wait until the yellow <b>Pump operation</b> LED turns off. The pump restarts when the timed out period is over.

**Fault: The "Connect" LED is flashing blue continuously.**

Status	Cause	Remedy
The <b>Connect</b> LED on the pump operating panel is flashing blue. The temperature sensor has been disconnected from the pump.	The temperature sensor is out of range.	Ensure the temperature sensor is in proximity to the pump.
	The temperature sensor batteries need replacing.	Replace the batteries in the temperature sensor.
	The temperature sensor is not working.	Replace the temperature sensor. Follow the pairing procedure for the new temperature sensor.

**Fault: There is noise in the hydraulic system.**

Status	Cause	Remedy
There are no indicators lit on the pump or accessories.	Air in the system.	Open a faucet or tap to let trapped air escape.

**Fault: There is noise in the circulator pump.**

Status	Cause	Remedy
There are no indicators lit on the pump or accessories.	Air is trapped in the pump.	Open a faucet or tap to let trapped air escape.
	No liquid.	Ensure there is liquid in the hot-water supply source.

## 10. Technical data

### 10.1 Operating conditions

Supply voltage	
- Pump	1 x 115 V, +10 % / -10 %, 60 Hz
Motor protection	The pump requires no external motor protection.
Enclosure class	Indoor use only, IP42. CSA enclosure type 2.
Insulation class	F
Relative humidity	Maximum 95 %
Max. outlet pressure	150 psi (10.34 bar)
Sound pressure level	43 dB (A)
Ambient temperature	34 to 104 °F (1 to 40 °C)

#### Inlet pressure

Liquid temperature	Min. inlet pressure
167 °F (75 °C)	0.75 psi (0.05 bar)
194 °F (90 °C)	4.06 psi (0.28 bar)
230 °F (110 °C)	15.7 psi (1.08 bar)

#### Liquid temperature

36 °F (2 °C) to 230 °F (110 °C)



In domestic hot water systems, keep the liquid temperature below 149 °F (65 °C) to eliminate the risk of lime precipitation.

To avoid condensation in the control box and stator, the liquid temperature must always be higher than the ambient temperature.

Ambient temperature [°F (°C)]	Min. liquid temperature [°F (°C)]	Max. liquid temperature [°F (°C)]
34 (1)	36 (2)	230 (110)
50 (10)	50 (10)	230 (110)
68 (20)	68 (20)	230 (110)
86 (30)	86 (30)	230 (110)
95 (35)	95 (35)	194 (90)
104 (40)	104 (40)	158 (70)

#### Approximate power usage

Minimum	2 W
Maximum	45 W

## 11. Disposing of the product

### CAUTION

#### Magnetic field



Minor or moderate personal injury

- Persons with pacemakers dismantling this product must exercise care when handling the magnetic materials embedded in the rotor.

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service center.

See also end-of-life information at [www.grundfos.com/product-recycling](http://www.grundfos.com/product-recycling).

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**Revision Info**

Last revised on 12-11-2020

99984088 112020

ECM: 1301041