



netec
Energietechnik

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Handbook Ground-heat pump controller HTR 2-2

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1. Intended Use

The controller HTR 2-1 is designed to control the speed of the circulation pump of a air pre-heating / air precooling system that uses ground heat out of an circulation pipe laying in the ground and filled with an frost-free mixture of water and glycol for heat transportation.

The power modulation of the pump is effected depending on the air temperature, felt by the air temperature sensor. The air temperature sensor is to be hanged into the air channel be- hind the air preheater, so it feels the modulated temperature (not the outer air temperature !). The controller starts the pump and speeds it up - if necessary - if the temperature measured by the sensor is lower than the lower (winter) limit value, or if is higher than the higher (summer) limit value, which are set up in the controller. If the measured air temperatures get higher than the winter limit value or lower than the summer limit value, the controller reduces the pumps power again or stops the pump completely. The precision of the thermal modulation is about 0,5 degree Celsius, if possible by outer conditions. The controller starts the pump also daily once for a short time, to hinder the pump to jam, if not used over a long time.

The HTR2-2 is designed to control a high efficiency pump Type WILO Yonos Para ST 15/7.0 PWM2, that is integrated in Netec pump-group PGR-2. The HTR2-2 is able also to control other high efficiency pumps up to 250 W power, that are controlled with a PWM-signal or with a 0...10-Volt-signal, if the needed settings are changed before and cables are modified. Pumps with higher power then 250 W can only be connected with the signal cable of HTR2-2 bot not directly with the outgoing power-cable of HTR2-2. Such more powerful pumps need to install an separate power-relays between, that takes its power directly from the net and their signal from the outgoing power-cable from HTR2-2.

The controller HTR2-2 cannot be used in combination with standard AC-pumps or in combination with three-phase-pumps or to DC-pumps.

Use the HTR2-2 only for this use. The way of controlling might not be compatible to other use. Use HTR2-2 only together with compatible pumps. Other pumps might be destructed or can run not reliable.

2. Installation

The controller, the brine-to-air heat exchanger and the pump might be installed so near together, that the ready installed electricity- and sensor-cables of HTR2-2 are long enough to connect all without additional wiring.

To fix the HTR2-2 at the wall, use its wall-bracket. To open the wall bracket press the left tab little backwards and move the controller to the right side. To fix it on the bracket later, put it onto and move it little to left side

The temperature sensor is to be installed in the air pipe 20-40 cm behind the brine-to-air exchanger. If exchanger model CWK 300 is used, the sensor is to be installed inside. For this, open its side cover, thread the cable through the foam rubber filling of the top cover and lead it through the Screw eye at the top of the outgoing air pipe, so the metallic end of the sensor cable hangs in the middle of the air stream.

3. Possibly needed settings of HTR2-2, depending on kind of connected pumps

The controller HTR2-2 can control four different types of high efficiency pumps. To do this, Different pre-setting can be necessary. To find the settings menus, can be requested by installers from Netec (mailto: info@sole-ewt.de)

3.1. Combination mit Netec pump group PGR-2 with the pump WILO Yonos Para ST 15/7.0 PWM2

For this combination no settings are needed, because HTR2-2 is pre-set just for this use. The special plugs of the two outgoing cables can be plugged directly into the sockets of the pump. Warning: The controller might be started first, when the brine circulation is filled, because, if the pump runs dry, it will go immediately broken.

3.2. Combination with other WILO high efficiency pumps with PWM2-control signal

(PWM2 = 1780 Hz, rising cam). If such other WILO pumps have compatible sockets to connect the power- and the signal-cable, they might be connected like described in 3.1. If they don't have such sockets, the plugs of the cables must be cut off and the cables must become connected to the pump manually. For this look to the table "Cable-Connections" at the end of manual. Dependent on the hydraulic of the brine system, maybe also an lower or higher minimum pump power level has to be set. For this look to chapter 4.

3.3. Combination with other high-efficiency-pumps with PWM-1 control signal.

(PWM1 = 1780 Hz, sloping cam). Generally look to point 3.2. Additionally it is necessary, to modify in Menu 8 "Mode" the setting from "0" (= PWM2) to "2" (= PWM 1). Dependent on the hydraulic of the brine system, maybe also an lower or higher minimum pump power level has to be setted. For this look to chapter 4.

3.4. Combination with high-efficiency-pumps with 0-10-Volts control signal

With 0-10 volts signal controlled pumps exist in two versions. Type 1 has a rising cam. It is off with 0 volt and runs with max. power with 10 volts. Typ 2 has a sloping cam and is off with 10 Volts and runs with full power with 0 volts. To run such pumps with controller HTR2-2 two settings are needed:

3.4.1. In all 0-10 volt pumps the jumper directly right from the right terminal block on the platine must be moved from the right position "P" (= PWM) to the left position "A" (= 0-10 V).

3.4.2. If 0-10 volt pumps type 1 shall be connected, in the menu 8 "Mode" the setting ist o be changed from "0" (PWM2) to "1" (= 0-10 V type 1). If 0-10 volt pumps type 2 shall be connected, in the menu 8 "Mode" the setting ist o be changed from "0" (PWM2) to "3" (= 0-10 V type 2).

Dependent on the hydraulic of the brine system, maybe also an lower or higher minimum pump power level has to be set. For this look into chapter 4.

4. Setting of Minimum Pump Power

A modification of minimum pump power is not necessary, if the controller HTR2-2 is used in combination with Netec pump group PGR2 to supply a brine-to-air exchanger system with not more than 300 m brine pipes length. If used in larger systems a modification of minimum pumps power might be needed to guarantee a safe starting of brine flow. This setting is done in menu 9 (MinPWM). Here values between 0 und 255 can be set. The Netec pre-setting is an value of 41, that runs well with the pump WILO Yonos Para ST 15/7.0 PWM2. If a 10-10-volts pump type WILO Stratos Para 15/1-7 T2 is connected, a value of 54 is running fine. What other values in other combinations may be helpful, should be discussed with the hydraulic or pumps planner.

5. Menus and Setting of individually wanted values

The HTR2-2 has a LC-Display and 3 buttons to operate. After first start some seconds are needed, before the display shows the menu. Open visible are 6 menu-sides, between and inside them you can move with the **+button and the -button**.

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HTR2-2	V 1.00

Start-Menu: This is shown only a short moment, after controller is connected firstly to the electricity.

Temp	16.4 °C
Pump	0.0 %

Menu Temp and Pump: shows the measured temperature of outgoing air and the actual pumps power in percent. Values can be between 0 and 100 %. The speed of flashing of the green LED signalizes the speed of the pump.

2: Winter-Min	
°C	<0001.0>

Menu 2: Winter-Min: here the wanted minimal outgoing air temp in winter is set. Don't set higher values then needed for keeping frost free, because a warmer preheating of air reduce the efficiency of the later heat recovery unit of the ventilation unit.

3: Summer-Max	
°C	<+0025.0>

Menu 3: Summer-Max: here the wanted maximal outgoing air temp in summer is set. Usually no lower values then 24°C can be set,

4: 0-100 % = Test	
200=auto	<0200.0>

Menu 4: Mode: here can be set, if the pump shall run automatically dependent on MIN- and MAX temperatures (value = 200) or with a constant power (values 0 - 100%).

5: Sprache	0=E
1=D 2=F	<001>

Menu 5: Language: here you can choose the displays language 0=English, 1=German and 2=French

Additional Menus

If a pressure control sensor is installed in the brine pipe and if this sensor is connected with the controller HTR2-2 and if minimum pressure is below, in the menu will be shown the text "Pressure low. Pump off" and an acustical alarm is given.

There exist 7 more menus, that are only accessible for instructed installers. In these additional menus more settings can be done. These additional settings concern the in points 3 and 4 mentioned settings for other pumps, the minimal run-time and not-run-time of the pump and the slope of the pumps powering-curve

How to modify settings:

The controller HTR2-2 is presetted, that it begins to preheat in winter, if outgoing air temp is lower then +1°C (WINTER-MIN) and that it begins to pre-cool in summer, if outgoing air temp is higher then +24°C (SUMMER-MAX). These values can be modified

Move with buttons (+) and (-) the cursor into the wanted menu and onto the wanted number or sign. The button (+) jumps sometimes from menu to mehu, the button (-) jumps only from

number to number. If arrived on the wanted number, press SET and keep pressed and press additionally (+) or (-) to modify this value. If wanted value is shown, put away both fingers and press only SET for two seconds, until "storing" is shown.

The setting of Summer-MAX-Wert cannot be reduced to lower value then +24°C with the Netec-presettings. This is a security against too large condense water outflow, that can make problems at following components too. This blocking can be opened, if in menu 4 the value is set to 248. Netec is not liable for any consequences of lower settings of this value.

6. Security informtion

The controller is to be used only together with pumps with 230 Volts and max. 250 Watts. It's body may only be opened from authorized personal. Before opening it must be disconnected from the mains.

7. Behavior at fault

The electronics of the controller can be irritated or damaged by over- or under-voltage, caused by flash of powerful machines starting nearby. In consequence unrealistic temperature values can be shown on the display. If this happens, disconnect from electricity net, wait a minute and connect again. Mostly such re-booting helps. If not, disconnect and contact producer Netec (info@sole-ewt.de).

8. Konformity

The controller HTR2-2 fulfills all demands, needed for the CE-Sign.



9. Disposal

The controller contains recyclables. Please don't throw it away, if defect, but give it to a recycling-organization. Information about this gives your local administration.

Left Clamp block (from left to right)

Clamp 1	PE	Electric supply (yellow-green)
Clamp 2	N	Electric supply (blue)
Clamp 3	L	Electric supply (brown/black)
Clamp 4	L	Power to pump (brown/black)
Clamp 5	N	Power to Pump (blue)
Clamp 6	PE	Power to pump (yellow-green)

Right Clamp block (from left to right):

Clamp 1	Signal	PWM or 0-10V (brown)
Clamp 2	Mass	PWM or 0-10V (blue)
Clamp 3	Plus	Pressure sensor (yellow, conn. with Clamp 4)
Clamp 4	Mass	Pressure sensor (yellow, conn. with Clamp 3)
Clamp 5	Plus	Temperature sensor (white)
Clamp 6	Mass	Temperature sensor (brown)