Installation, Wiring and Operation Instructions

UNINTERRUPTIBLE POWER SUPPLY WITH THERMOSTAT FOR REGULUS CTC EcoAir HEAT PUMP

CE

Regulus

EN
v. 1.2

Contents:

Enclosed:

Instruction Manual for UPS PG500

Scope of Supply:

- Backup power source UPS PG500
- UPS THERMOSTAT with Pt1000 sensor
- Power supply transformer 230V/12V
- Wall mount elements
- Auxiliary relay Z-R230/S0

1 Description

UPS THERMOSTAT is designed to protect heat pumps from water circuit freezing during power breakdown. Under current operation when a heat pump is power supplied from the mains (i.e. no power breakdown), the UPS THERMOSTAT acts as a connection between the UPS unit (PG500) and the backup battery, ensuring charging. At the same time, it keeps the relay closed, permitting the controller to have the pump under control. When power breakdown occurs, the UPS THERMOSTAT disconnects from the UPS unit (PG500) in order to prevent the battery discharge.
If the temperature at the thermostat sensor drops below 5°C, the UPS THERMOSTAT connects the battery with the UPS unit (PG500) and the circulation pump is started. The pump is kept running until the sensor temperature rises above 6°C. This prevents the water circuit of the heat pump from freezing.
In this Instruction Manual, the use of a PG500 UPS unit, Z-R230/SO auxiliary relay and a 12V/44Ah backup battery is presumed.

2 Technical data

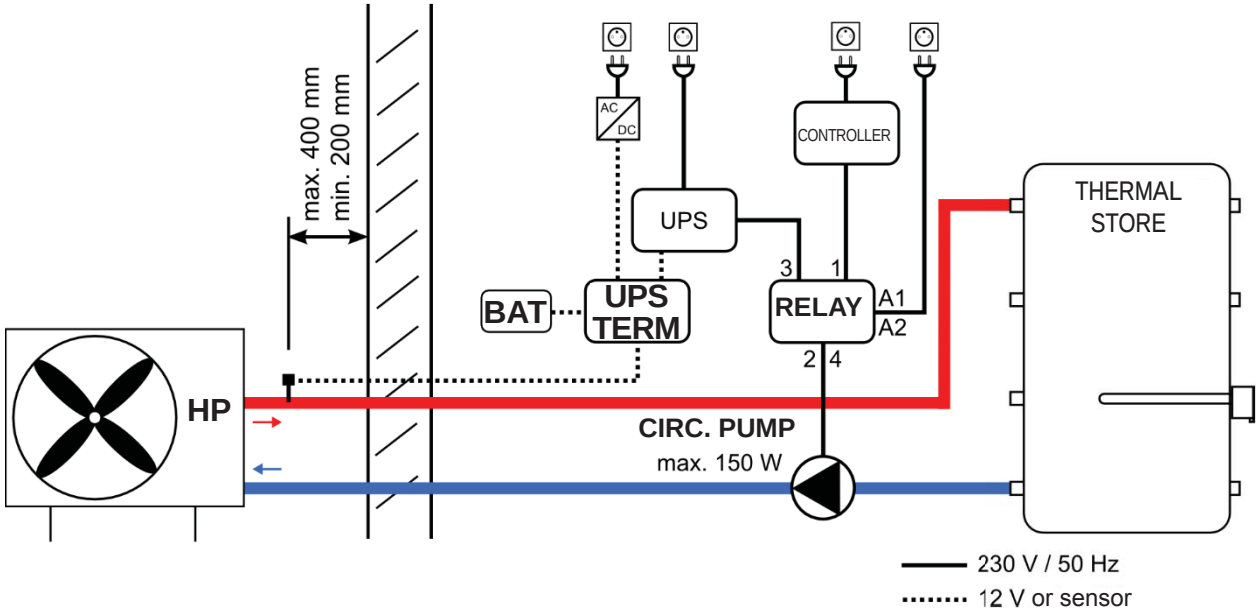
Electric data:	
Voltage	12 V DC +/- 10 %
Electronics consumption (stand-by)	0.08 W
Electronics consumption (on)	1.8 W
Switching current	30A (no fuse)
Power source consumption	0.1 W
El. protection	IP20, SELV
Recommended battery	12 V, 44 Ah capacity
Auxiliary relay:	
Voltage	250 V / 50 Hz
Nominal current	20 A
Permissible ambient conditions:	
Operation temperature	0-40 °C
Transport/storing temperature	0-60 °C
Operation air humidity	max. 85 % RH at 25 °C
Transport/storing air humidity	no moisture condensation permitted
Further specifications and dimensions:	
Case	two-part ABS plastic
Installation position	on a wall
Overall dimensions	125×75×50 mm
Indication	LEDs
Temperature sensors:	
Sensor	Pt 1000 with 2.5m cable
Sensor cable	2×0.75 mm^2, max. permissible length 30m

Temperature resistance table for Pt1000 sensors:

°C	0	10	20	30	40	50	60	70	80	90	100
Ω	1000	1039	1077	1116	1155	1194	1232	1270	1308	1347	1385

3 UPS THERMOSTAT connections

Wiring diagram:



Layout principles:

- UPS unit (PG500), UPS THERMOSTAT and battery shall be placed close to one another in such a manner that the prepared length (2m) of 12V cables (2 blue cables and 2 red ones) will be sufficient.
- The sensor shall be placed into a heat pump's heating water sheath. The sheath shall be mounted into the outdoor pipe section, min. 200mm and no more than 400mm from the wall. Should the 2.5m cable be too short, it may be extended up to 30m (cf. Technical data).

4 UPS THERMOSTAT wall installation

Installation

Install the UPS THERMOSTAT in dry rooms only.

1. Unscrew the lid screws and remove them.
2. Put the lid aside. Be careful not to damage the electronics inside.
3. Hold the back plate in the desired position and mark 4 mounting holes. Make sure the selected place is flat and the case will not get distorted after tightening the screws.
4. The enclosed screws and dowels can be used to mount the thermostat on a wall.

5 Electric wiring

All the components shall be wired to the same phase with the same circuit breaker!

Procedure for el. wiring:

1. Make sure the the breaker of the circuit in question is switched off. Verify with an electrical tester that the right circuit breaker is off.
2. Plug the cable with wall plug into the socket on the UPS (PG500) back side. Wire the live wire from UPS (L-UPS) to the auxiliary relay, contact No. 3. Then wire the neutral lead N-UPS to the pump N clamp (see the wiring diagram).

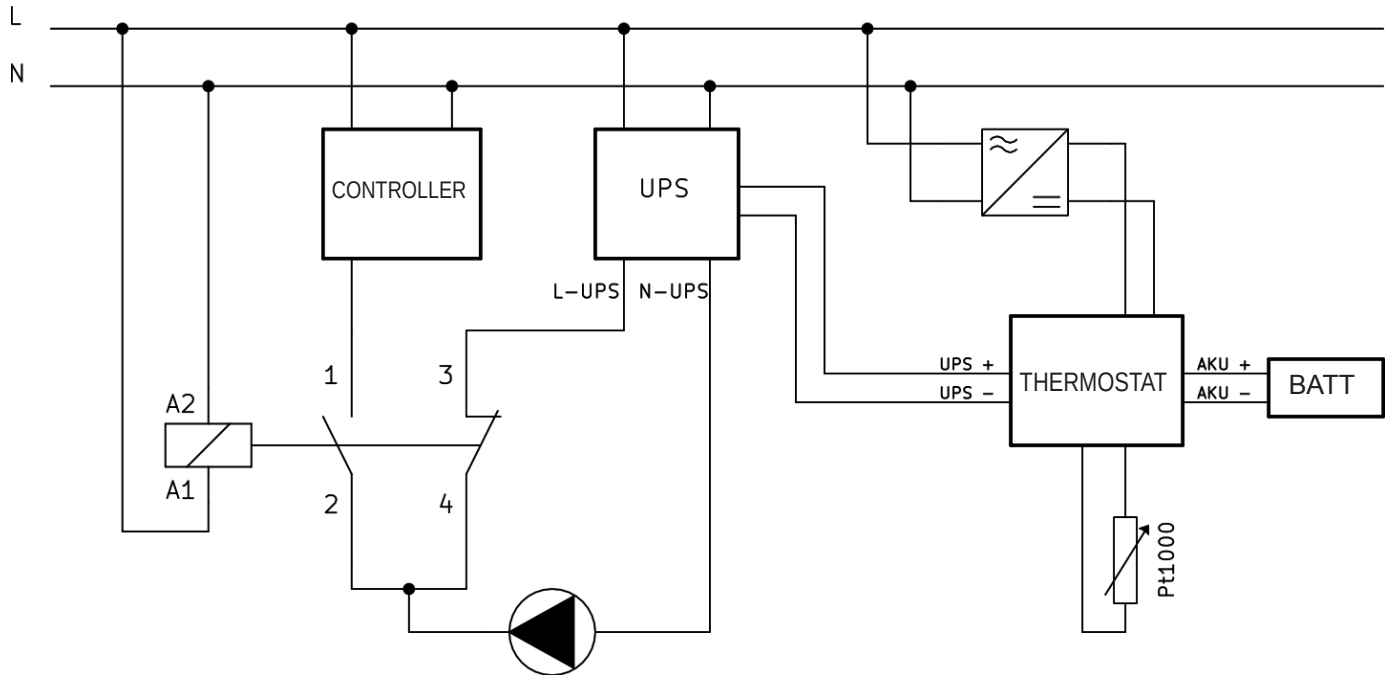
ATTENTION! The neutral wire from UPS (N-UPS) and the mains neutral wire (N) must not be connected!

3. Connect the heat pump controller outlet designed for a circulation pump to the auxiliary relay, contact No. 1.
4. Wire the live and neutral conductors from the 230V mains to the auxiliary relay contacts A1 and A2.

ATTENTION! This shall be the same phase as THERMOSTAT and UPS are wired to.

5. Plug the 230V/12V power supply transformer into one of these two sockets. Then connect the transformer terminal into the socket at the bottom of the UPS THERMOSTAT. The power supply transformer is intended only to check for the presence of the mains. Its power consumption is negligible (cf. Technical data).
6. Wire the UPS THERMOSTAT with UPS (PG500) using the red and blue cables. Marking "UPS+" and "UPS-". Mind the polarity!
7. Connect the contacts No. 2 and 4 of the auxiliary relay using a jumper and wire them to the live (L) pump clamp. The jumper shall be of the same diameter as the pump L wire.
8. Only after having connected the previously mentioned components, connect the battery to the UPS THERMOSTAT. Marking "UPS+" and "UPS-". Mind the polarity!
9. As the last step, connect the UPS (the power supply cable is included in its supply) into a 230V/50Hz wall socket.

Wiring diagram:



6 Temperature sensor connection

The sensor shall be placed into a heat pump's heating water sheath. The sheath shall be mounted into the outdoor pipe section, min. 200 mm and no more than 400 mm from the wall.

The sheath shall be located downstream the heat pump – see the layout diagram.

If the unit cannot be placed in such a way that the supplied 2.5 m cable is enough, the cable may be extended. The max. permitted sensor cable length is 30 m. The lead cross section is 0.75 sqmm. No contact resistance may be present in the sensor leads.

Temperature sensor cable shall be routed separately from mains voltage cables!

7 Description of operation

Under current operation (i.e. no power breakdown), the heat pump controller switches the outlet for the circulation pump power supply. The auxiliary relay is wired to this outlet. It is permanently closed as long as electric tension is present in the network. The power supply transformer is connected to the same outlet, being intended just to detect the presence of the mains for the UPS THERMOSTAT.

In this situation, the UPS battery is being charged permanently. The pump follows the commands from the controller. The **green** LEDs on the THERMOSTAT and UPS are lit.

During power failure the auxiliary relay contact will switch to power supply from the UPS. Then, these conditions may occur:

- If the piping has not cooled down yet, no LEDs are lit on the THERMOSTAT/UPS.
- As soon as the outdoor piping cools down below +5°C, the **yellow** LED is lit on the THERMOSTAT (temperature drop). At the same time, the **green** LED is lit (circulation pump running). The UPS is power supplied from the battery, the **yellow** LED is lit.

Hot water from the thermal store will warm up the piping and the THERMOSTAT will turn off the circulation pump until the next temperature drop. The piping is being heated for 1-3 minutes (depending on its length and the circulation pump used).

- Once the battery is flat, the UPS will not run any more (UPS LED is not lit), and if the piping temperature drops below +5°C, then the **yellow** and **green** LEDs are lit. In this case it is recommended to drain water from the outdoor piping. If the frost persisted for a longer time, the heat pump piping and condenser might freeze up.

If both the LEDs are lit on the THERMOSTAT and none on the UPS – drain the water!

8 Operation overview

The meaning of indication LEDs:

- **green - circulation pump running**
- **yellow - outdoor piping temperature below +5 °C**
- **red - sensor defect**

Detailed description of all the states:

Sensor	Mains	Temperat.	Circ. pump	Thermostat	UPS	Description
Sensor OK	Operation	Řízeno regulací		○○✹ green	○○✹ green	Battery charging. Pump switches by controller commands.
	Power failure	>5 °C	0	○○○	○○○	Ready. Waiting for temperature drop at the outdoor pipe.
		<5 °C	I	○✹✹ yellow green	○✹○ yellow	Antifrost one-off circulating the fluid. The circulation pump is fed from the battery.
		<5 °C	0	○✹✹ yellow green	○○○	**NO PROTECTION - DRAIN PIPES!**

Sensor	Mains	Sensor condition	Circ. pump	Thermostat	**UPS**	Description
Sensor defect	Operation	Sensor disconnected	Controlled by HP controller	✹○✹ red green	○○✹ green	Battery charging. Circulation pump switched on and off by HP controller.
	Power failure		I	✹○✹ red green	○✹○ yellow	The circulation pump is running, fed from the battery.
	Operation	Sensor shortcut	Controlled by HP controller	✹✹✹ red yellow green	○○✹ green	Battery charging. Circulation pump switched on and off by HP controller.
	Power failure		I	✹✹✹ red yellow green	○✹○ yellow	The circulation pump is running, fed from the battery.

9 Overview of possible faults and troubleshooting

FAULT DESCRIPTION	CAUSE	TROUBLESHOOTING
Green LED is not lit on the THERMOSTAT but the socket is energized.	The 230/12V power supply transformer is not connected.	Check the transformer for outgoing voltage and a proper position of the terminal in the unit.
	The battery is not connected or completely discharged.	Check the battery connection, replace the battery.

10. Maintenance

Maintenance consists of checking the charging function.
Before a heating season starts, check the condition of the battery.

IMPORTANT INFORMATION ON DISPOSAL IN COMPLIANCE WITH THE EUROPEAN DIRECTIVE 2002/96/ES

Do not dispose of this product as unsorted municipal waste. Please dispose of this product by returning it to the point of sale or to your local municipal collection point for recycling.
Respecting these rules will help to preserve, protect and improve the quality of the environment, protect human health and utilize natural resources prudently and rationally.
The crossed out wheeled bin with marking bar, printed ether in the Manual or on the product itself, identifies that the product must be disposed of at a recycling collection site.

WEEE number: 02771/07-ECZ

WARRANTY CERTIFICATE

REGULUS UPS THERMOSTAT

WARRANTY CONDITIONS

1. The warranty period is 24 months from the date of purchase.
2. When claiming warranty, this Warranty Certificate must be submitted together with the purchase receipt.
3. The warranty is valid only when the technical conditions set by the Manufacturer are maintained.
4. The warranty does not cover defects caused by tampering, improper handling, using the product to other purposes than designed for, installing the appliance in unsuitable environment, or by a natural disaster.
5. Your claim will be dealt with by your seller at the address shown.

Date of Purchase:.....

Rubber stamp print and signature of the seller:

06/2015

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