








# Operating manual

## oventrop REGTRONIC PE







Microcontroller-controlled temperature difference controller for solar thermal systems

## Explanation of icons

	Warning! Icon indicates possibility of hazard or error
	Warning: 230 V AC current! Icon indicates danger from high-voltage, life-threatening current.
	List
	Please note!
	Operational advice / special information
	User action / procedure
	Inspection / check

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# 1 Application area / device features

## 1.1 Application area

The REGTRONIC PE controllers are high-performance microprocessor-controlled units for controlling the functions of solar thermal systems. The REGTRONIC PE is the ideal controller for systems with one collector and one storage tank.

The controllers are designed for use in dry areas and for residential, business and commercial applications. If you want to use the unit for other purposes, check applicable statutory regulations before use.

## 1.2 Device features

The REGTRONIC PE generation of controllers is equipped with the following features:

- Intuitive user menus with icons and four control buttons
- Adjustable control values
- RPM control of the solar circuit pump via block modulation or switching control
- Extensive functions for system monitoring, using symbols to indicate errors and faults
- Storage of all values, even during prolonged mains power supply outage
- Various protective functions: system and collector protection, recooling and flow monitoring
- Generous wiring space

### Available accessories:

- Temperature sensor PT1000
- Sensor connection box
- Immersion sleeves

# 2 Safety instructions

- Always ensure that you isolate the device from the mains power supply before starting installation or wiring work on its electrical components. Make sure that you never confuse the SELV (safety extra low voltage) connectors (sensor, flow transmitter) with the 230 V connectors: this will destroy the device. Life-threatening voltages may be present in both the device and the connected sensors.
- Solar power systems can generate high temperatures. There is therefore a risk of burn injuries! Exercise caution when installing the temperature sensors!
- Mount the REGTRONIC PE in a location where it will not be subjected to excessive operating temperatures ( $>50^{\circ}\text{C}$ ) by any external heat sources. For safety reasons, the system should only be operated manually during testing. In this operating mode, the system does not monitor maximum temperatures or sensor functions. Do not operate the system if there is recognisable damage to the controller, cables or the connected pumps and valves.



*You must isolate the control unit from mains power before carrying out any assembly or wiring work. The connection and start-up of the REGTRONIC PE should only be carried out by qualified technical personnel. All work must comply with the applicable safety regulations.*



*The controller must only be installed in dry and non-explosive areas. Mounting the controller on an inflammable surface is prohibited*

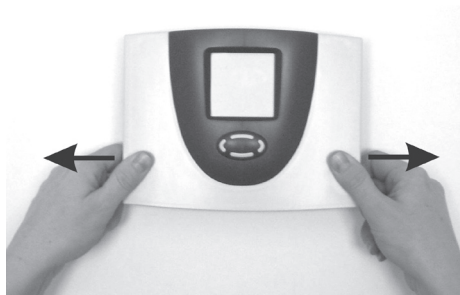


*Prior to switching on or commissioning the device: make sure to close the cover until both sides securely lock into place!*

## 3 Mounting the device

### 3.1 Opening the device

Before opening the device, disconnect mains power and ensure that it cannot be switched back on! The upper part of the housing is locked to the lower part using two latches. Release the housing cover by pulling the sides outwards (see picture) to unlatch it, and then pivot the cover upwards until it “clicks” open



### 3.2 Wall mounting

The device is mounted on the points marked. A drilling template is provided with a device. Insert the “Quick Info” card provided with the device into the corresponding pocket on the back of the device. The “Quick Info” card rapidly familiarises users with the device.

### 3.3 Connections

Bear in mind the following points concerning the 230 V connections:

- If the controller is wired directly into the mains, it must be possible to isolate mains power by using a switch external to the controller.  
The switch is not required if the main power supply is provided via a cable and earthed mains plug.
- The controllers are designed for use with 230 V/50 Hz mains power. Any pumps to be connected must also be rated for use at this voltage!
- All earth leads must be attached to the terminals marked "PE".
- The neutral lead terminals (N) are connected electrically and are not switched
- The switching output (A1) is electronic 230V~ N/O contact. If potential-free contacts are required, the appropriate corresponding accessories are available.



### 3.4 Temperature sensor connection

The REGTRONIC PE devices use PT1000 precision platinum temperature sensors. Between 2 and 4 sensors will be needed, depending on the functional scope.

**Mounting / wiring the temperature sensors:**

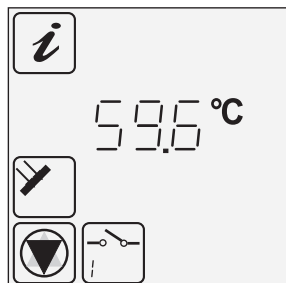
- Mount the sensors on the collector and storage tank. Ensure proper heat transfer, using heat-conductive paste if necessary.
- Cross-sections for cable extensions (shielded):
  - Up to 15 m, 2 x 0.5 mm<sup>2</sup>
  - Up to 50 m, 2 x 0.75 mm<sup>2</sup>
 The shield is connected to earth (PE).
- Temperature sensors are connected according to the system layout. You do not need to observe polarity for the two wires when cabling temperature sensors.
- Sensor cables must be laid separately from 230 V wires.
- Sensor collection boxes equipped with surge protection should be used for collector sensors and cable extensions.



## 4 Short descriptions and device operation

### 4.1 Display layout

During actual operation, **only a selection** of these symbols will be shown – depending on the current menu.



- ◀ Currently active menu
- ◀ Current display assignment
- ◀ Current readings, times or controller states: here 59.6 °C.
- ◀ Measuring point
- ◀ Controller state/messages

#### Display symbols

All possible display symbols are shown below.







## 4.2 Operation

The REGTRONIC PE can be operated simply and easily by using the four control buttons. You can use the control buttons to:

- Access display values
- Make changes to unit settings

The icons on the display let you navigate easily through the various control functions.


**The control buttons have the following functions:**










Control buttons	Function	Description
	"Up" "+"	<ul style="list-style-type: none"> <li>■ Go to menu item above</li> <li>Value modification: increments displayed value by 1; if the button is pressed and held, the value increments continuously</li> </ul>
	"Page left" "Exit" "Cancel"	<ul style="list-style-type: none"> <li>■ Page left in main menu</li> <li>■ Exit a menu</li> <li>■ Exit a menu item</li> <li>■ Cancel a value change without saving it</li> </ul>
	"Access" "Down" "–"	<ul style="list-style-type: none"> <li>■ Access a main menu, Go to menu item below</li> <li>■ Value modification: decrements displayed value by 1; if the button is pressed and held, the value decrements continuously</li> </ul>
	"Page right" "Select" "Confirm"	<ul style="list-style-type: none"> <li>■ Page right in main menu</li> <li>■ Select a menu item</li> <li>■ Confirm a value change and save it</li> </ul>

## 5 Menu structure

### 5.1 "Info" menu







After 60s of inactivity a screensaver showing all measuring points in 2 sec steps will be activated. The screensaver terminates when a button is pressed. The Info menu shows the following readings and yield values:

 The number of values displayed depends on the additional functions activated.

Display e.g.		Meaning	Can be reset
75 °C		Displays current collector temperature	No
min 12 °C		Displays minimum collector temperature. Can be reset to current temperature.	Yes
max 105 °C		Displays maximum collector temperature. Can be reset to current temperature.	Yes
52 °C		Displays current storage tank temperature	No
min 40°C		Displays minimum storage tank temperature. Can be reset to current temperature.	Yes
max 67 °C		Displays maximum storage tank temperature. Can be reset to current temperature.	Yes
25°C		Displays the current temperature - S3	No
1234 h		Operating hours for charging storage tank Can be reset to 0 h	Yes

### 5.2 "Programming" menu

The Programming menu is used to display operating parameters and to change these as required. The preset values generally ensure fault-free system operation.

Display e.g.		Meaning	Value range	Typical setting	Current setting
max 65 °C		Storage tank: Maximum permissible temperature	15–95°C	65°C	
dT max 7K		Storage tank: Switch-on difference	3–40K	7K	
dT min 3K		Storage tank: Switch-off difference	2–35K	3K	
min 100	 	Set minimum pump capacity using RPM control: 100% = RPM control off	30%–100%	100%	






Settings and changes in this menu must only be carried out by a specialist technician. Incorrect settings can damage or adversely affect the function of the solar power system.

### 5.3 "Manual operation" menu

Automatic operation is switched off during manual operation. The solar pump can be manually switched on and off for servicing and test purposes.

Automatic operation is reactivated after exiting the menu or after 8 hours have passed.

Display 	Meaning	Value range
 	Manual switching on/off of solar pump	0 = Off 1 = On



Settings and changes in this menu must only be carried out by a specialist technician. Incorrect settings can damage or adversely affect the function of the solar power system.

### 5.4 "Basic Setup" menu

The System Settings menu displays all additional functions. Settings must only be changed by a specialist technician. Settings may only be adjusted in the menu:

a) within one minute of the device being switched on;

or

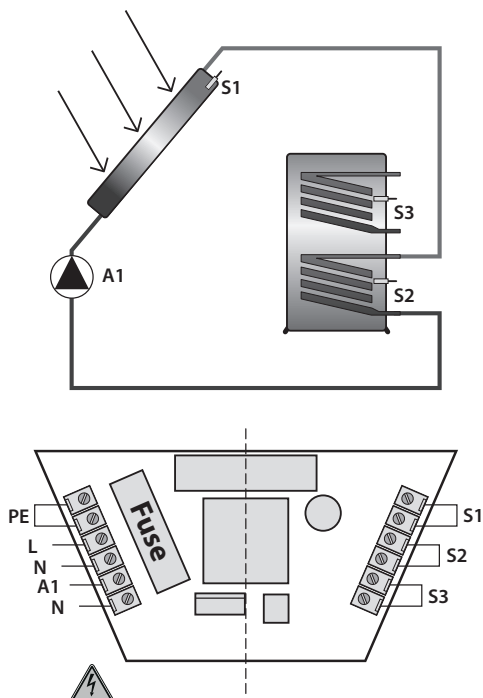
b) by simultaneously pressing the buttons: 

Display Line	Value	Meaning	Value range	Factory setting	Current setting
0	0	Collector protection function	0 = Off 1 = On	0 = Off	
1	120 °C	Collector protection function	110–150°C	120°C	
2	0	Recooling function (only if the collector protection is on)	0 = Off 1 = On	0 = Off	
3	40°C	Recooling temperature for storage tank	30–90°C	40°C	



## 6 System diagram

1 collector, 1 storage tank



### 230V connections

L	Mains phase
N	Neutral conductor - mains and outputs
A1	Solar circuit pump supply voltage (switching output 1)

### Sensor connections

S1	Collector sensor
S2	Lower storage tank
S3	General temp. measuring point




## Controller functions

### 7.1 General controller functions

The controller compares the temperatures of the various measuring points and charges the storage tank optimally. If the collector temperature exceeds the storage tank temperature, the solar circuit pump is switched on. Monitoring and protective functions ensure safe system operation.

#### 7.1.1 RPM control

The output A1 can be operated using an RPM control.

„Programming“ menu 				
Display		Meaning	Value range	Typical setting
<b>min</b> <b>100</b>	 	Set the minimum pump capacity using the RPM control 100% = RPM control off	30% – 100%	100%

### 7.2 Protective functions

The controller is equipped with the following protective functions.

#### 7.2.1 Collector protection

If the storage tank has reached the set maximum temperature and the collector temperature exceeds the set collector protection temperature (line 1), the solar circuit pump is switched on. The solar circuit pump is switched off once the collector temperature is 10K below the maximum value.

In this case, the storage tank is charged up to 95°C regardless of the set maximum temperature.


#### 7.2.2 Recooling (Holiday function)

The collector protection function is only effective if the storage tank temperature is below the temperature limit (95°). During a holiday period, for example, the storage tank must therefore be discharged at night to the set recooling temperature.

Warning: do not activate this function at the same time as backup heating!




*Settings and changes in this menu must only be carried out by a specialist technician. Incorrect settings can damage or adversely affect the function of the solar power system.*

"Basic Setup" menu 				
Display		Meaning	Value range	Factory setting
Line	Value			
<b>0</b>	<b>0</b>	Switches on or off the collector protection function	0 = Off 1 = On	0 = Off
<b>1</b>	<b>120 °C</b>	Temperature at which the collector protection function is activated	110–150°C	120°C
<b>2</b>	<b>0</b>	Switches on or off the recooling function (only if the collector protection is on)	0 = Off 1 = On	0 = Off
<b>3</b>	<b>40 °C</b>	Temperature to which the storage tank is recoolled once the collector protection function is activated	30–90°C	40°C


### 7.2.3 System protection

To protect system components, the solar circuit pump is switched off if the collector temperature exceeds the collector protection temperature (see 7.2.2) by 10 K.  
If the temperature drops below this temperature, the controller once again resumes normal operation.  
This function is always activated.

## 8 System monitoring




The occurrence of errors is generally indicated by a flashing  symbol.

### 8.1 Sensor monitoring

The connected sensors and sensor cables are monitored for interruptions and short-circuits. Errors are indicated by the  symbol. The source of the error can be found by paging up or down in the Info menu.

### 8.2 Flow monitoring

The controllers are programmed so as to display a message if the flow is interrupted, e.g. via pump fault or vapour in the system. However, this notification does not switch off the pump.










"Basic Setup" menu 	
Display	Meaning
 + 	No circulation in the solar circuit

## 9 Troubleshooting

In principle, all system errors can be placed in one of two categories:

- Faults that the controller can detect automatically and for which error messages can be shown
- Faults that cannot be reported by the controller

### 9.1 Faults with error messages

Error displayed on-screen	Possible causes	Action to take
	<ul style="list-style-type: none"> <li>■ Disruption to sensor cable</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Check cable</li> </ul>
	<ul style="list-style-type: none"> <li>■ Sensor defective</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Check sensor resistance, replace sensor if necessary</li> </ul>
 <b>flashing</b>		
	<ul style="list-style-type: none"> <li>■ Short-circuit in sensor cable</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Check cable</li> </ul>
 <b>flashing</b>	<ul style="list-style-type: none"> <li>■ Sensor defective</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Check sensor resistance, replace if necessary</li> </ul>
<b>Circulation fault: no flow-through</b>	<ul style="list-style-type: none"> <li>■ Fault in pump connection</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Check cabling</li> </ul>
	<ul style="list-style-type: none"> <li>■ Pump defective</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Replace pump</li> </ul>
	<ul style="list-style-type: none"> <li>■ Air in the system</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Vent system</li> </ul>
 + 	<ul style="list-style-type: none"> <li>■ Flow meter defective</li> </ul>	<ul style="list-style-type: none"> <li>🔧 If visible, check whether the flywheel of the meter moves when the system is running</li> </ul>
<b>Also displayed with energy yield measurement:</b>		
	<ul style="list-style-type: none"> <li>■ Connection to flow meter defective</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Check cable</li> </ul>
	<ul style="list-style-type: none"> <li>■ Disruption to sensor cable</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Check cable</li> </ul>
	<ul style="list-style-type: none"> <li>■ Sensor defective</li> </ul>	<ul style="list-style-type: none"> <li>🔧 Check sensor resistance, replace sensor if necessary</li> </ul>

## 9.2 Faults without error messages

For faults and malfunctions that cannot be displayed, you can use the following table to identify them, plus evaluate the possible causes and sources of such errors. If you cannot rectify the fault by using the description below, you will need to contact your supplier or installer.



*Important: any faults involving the 230 V AC mains power supply must only be rectified by a technician!*

Error display	Possible causes	Action to take
<b>No display possible</b>  	■ 230 V mains power supply unavailable	🔧 Switch on or connect up control unit 🔧 Check fuses for building power supply
	■ Fuse inside unit defective	🔧 Check fuse*, replace if necessary with new 2A (T) fuse. 🔧 Check 230 V components for short-circuits
	■ Unit defective	🔧 Contact your supplier
<b>Pump is not switched on</b>	■ Unit is in manual operation mode	🔧 Exit "Manual Operation".
	■ Switch-on condition not yet achieved.	🔧 Wait until switch-on condition achieved
<b>"Pump" icon turns, but pump is not on</b>  	■ Disruption to pump connection.	🔧 Check cable to pump
	■ Pump has seized up.	🔧 Ensure pump can run smoothly
	■ No voltage at output.	🔧 Contact your supplier.
<b>Temperature display fluctuates strongly at short intervals</b>	■ Sensor cabling has been laid near to 230 V cables	🔧 Reposition sensor cabling, shield sensor leads
	■ Long sensor cables extended using unshielded leads	🔧 Shield sensor leads
	■ Unit defective	🔧 Contact your supplier

## 10 REGTRONIC PE Specifications

Casing	
Material	100% recyclable ABS casing for wall mounting
Dimensions (L x W x H) in mm, weight	175 x 134 x 56; approx. 360 g
Protection class	IP20 according to DIN 40050, IEC 529, VDE 0470, EN 60529
Electrical specifications	
Supply voltage	AC 230 V/50 Hz, -10 – +15%
Radio interference class	N (as defined by VDE 0875)
Max. cable cross-section, 230 V connections	2.5 mm <sup>2</sup> fine-/single-wire
Temperature sensor	PT1000, 1 kΩ at 0 °C
Measuring range	- 30 °C .. +250 °C
Test voltage	4 kV 1 min according to EN 60730/DIN, VDE 0631, IEC 60664/IEC
Output Voltage	230V~
Power - switching output	1A / approx. 230VA for cos φ = 0,7-1,0
Fuse protection	Fine-wire fuses 5 x 20mm, 2A/T (2 amperes, delayed-action fuse)
Miscellaneous	
Operating temperature	0 – 50°C
Storage temperature	-10 – +65°C
Humidity	max. 60 %

## 11 Resistance table PT1000

Temperature sensors can be checked for proper function by using an ohmmeter and consulting the following temperature resistance table:

Temperature in °C	Resistance in Ohm	Temperature in °C	Resistance in Ohm
-30	882	60	1232
-20	921	70	1271
-10	960	80	1309
0	1000	90	1347
10	1039	100	1385
20	1077	120	1461
30	1116	140	1535
40	1155	200	1758
50	1194		

## 12 Declaration of conformity

We, Prozeda GmbH, hereby declare our sole responsibility for ensuring that the SOLAREG Type 1332 product complies with the following directives:

DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC

Law on the electromagnetic compatibility of equipment (EMC) of 26 February 2008

DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 December 2006 on the approximation of the laws of the Member States concerning electrical equipment for use within certain voltage limits

DIN EN 61326-1, VDE 0843-20-1:2006-10 Electrical measurement, control and laboratory use - EMC requirements - Part 1: General requirements (IEC 61326-1:2005); German version EN 61326 -1:2006

DIN EN 61326-2-2, VDE 0843-20-2-2:2006-10 Electrical measurement, control and laboratory use - EMC requirements - Part 2-2: Particular requirements - Test, operating conditions and performance requirements for portable test, measurement and monitoring equipment for use in low voltage power supply systems (IEC 61326-2-2:2005); German version EN 61326-2-2:2006

DIN EN 60730-1, VDE 0631 Part1:2009:06 -1 Automatic electrical control devices for household and similar use - Part 1: General requirements (IEC 60730-1:1999, modified + A1:2003, modified + A2:2007, modified); German version EN 60730-1:2000 + A1:2004 + A12:2003 + A13:2004 + A14:2005 + A16:2007 + A2:2008