

DeltaSol® BS/4

Differential temperature controller

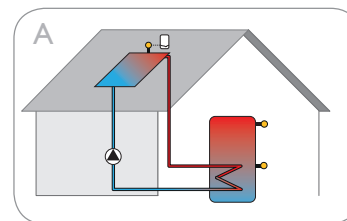
QUICKGUIDE



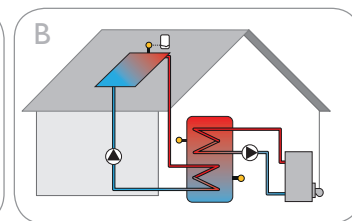
11207431

The cTUVus certification confirms that the controller is certified to UL 60730-1A and CSA E60730.1.

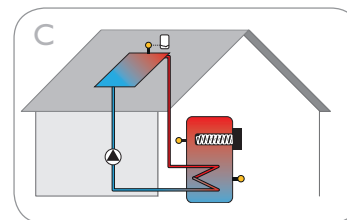
Basic system layouts to choose from:



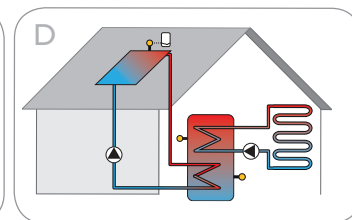
3 sensors, solar collector & solar tank



Solar collector & solar tank, gas booster



Solar collector & solar tank, electric booster (via auxiliary relay HR230)



Solar collector & solar tank, hydronic floor system



General function:



- Button 1 = scrolling forward / increasing adjustment values
- Button 2 = scrolling backward / reducing adjustment values
- Button 3 = selecting channels / confirming adjustments

Accessing adjustment channels:



Press & hold button 1 for approx. 3 s (autom. scrolling to last menu item, followed by adjustable menu)

Changing adjustable parameters:

Operation



adjustment mode

flashing



changing a value

flashing

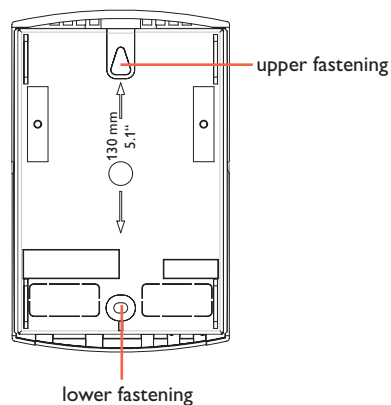
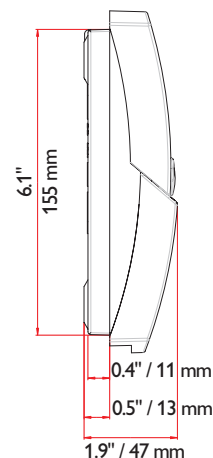
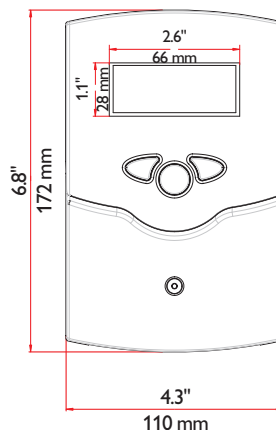


confirming a value

not flashing



to the next parameter



Commissioning:

1. Connect all sensors and actuators (pumps, valves, auxiliary relays) to the controller.
2. Establish the power supply of the controller.
3. During the initialization phase the operating control LED flashes red and green.
4. If failures occur after initialization phase (control lamp flashes, flashing symbols in display), go to the **Troubleshooting** chapter of the controller manual.
5. When the controller is commissioned for the first time or is reset the commissioning menu starts.



Note:

This guide is for demonstration purposes only. Please read the mounting and operating manual carefully before commissioning the controller and pay attention to all safety advice and information. Wrong connection or incorrect use can lead to damages to the device, the heating systems or to persons.

Operating the commissioning menu:

1. Language

Adjust the desired menu language

dE : German

En : English

Fr : French

→ Change to **En**.

2. Unit

Adjust the unit in which temperatures and temperature differences are to be displayed.

→ Change to suit your needs.

3. Time

Adjust the clock time. First of all adjust the hours, then the minutes.

→ Change to local time.

4. System layout

Choose your system (detailed system information on pages 4-7.)

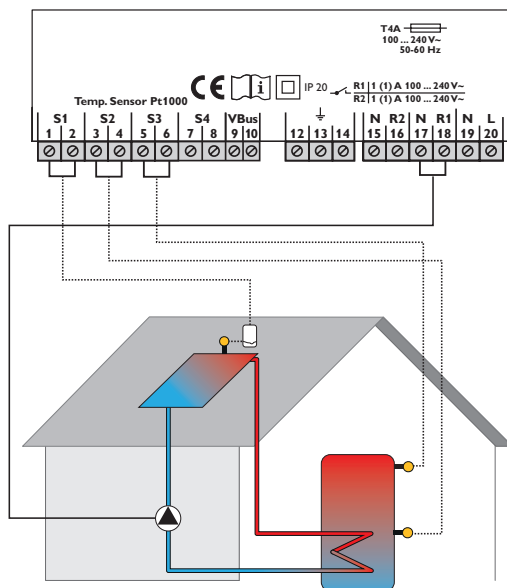
LANG SET
En

UNIT SET
°C

TIME SET
00:00

Arr SET
1

System A – solar system with 1 collector (roof) sensor and up to 2 tank sensors



Sensors and actuators required:

S1 Collector (roof) sensor

S2 Tank sensor; bottom, height of coil

R1 Solar pump/auxiliary relay in case of big pumps

Additional sensors, actuators:

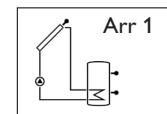
S3 Additional temperature monitoring, e.g. top of tank

4. System Layout

Adjustment range: 1 ... 3

Factory setting: 1

→ Choose **Arr 1**



5. Maximum tank temperature

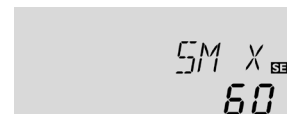
Adjustment range: 4 ... 95

Factory setting: 60 °C

→ Change to suit your needs.

Loading will stop when this temperature is reached at tank sensor (S2).

Factory setting is 60 °C [140 °F] to avoid scald risk or system damage.



6. Minimum pump speed

Adjustment range: 30 ... 100%

Factory setting: 30 °C

→ Change to suit your needs.

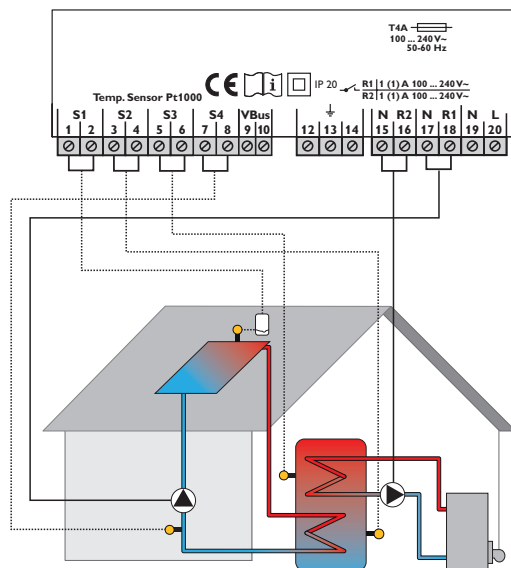
Change to 100 %, if pump speed control is forbidden or not necessary (e. g. auxiliary relay connected to solar pump (R1)).



In order to complete the commissioning menu, press button 3.



System B – solar system with 1 collector (roof) sensor, 2 tank sensors and gas booster



Sensors and actuators required:

- S1 Collector (roof) sensor
- S2 Tank sensor, bottom, height of coil
- S3 Tank sensor, top, height of gas booster coil / inlet
- R1 Solar pump/auxiliary relay in case of big pumps
- R2 Gas booster pump / auxiliary relay for potential-free contact activation of gas booster

Additional sensor:

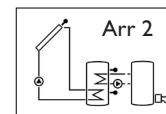
- S4 Additional temperature monitoring, e.g. solar return piping

5. System Layout

Adjustment range: 1 ... 3

Factory setting: 1

→ Choose **Arr 2**



5. Maximum tank temperature

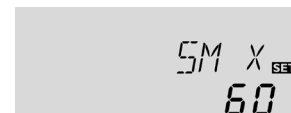
Adjustment range: 4 ... 95

Factory setting: 60 °C

→ Change to suit your needs.

Loading will stop when this temperature is reached at tank sensor (S2).

Factory setting is 60 °C [140 °F] to avoid scald risk or system damage.



6. Minimum pump speed

Adjustment range: 30 ... 100%

Factory setting: 30 °C

→ Change to suit your needs.

Change to 100 %, if pump speed control is forbidden or not necessary (e. g. auxiliary relay connected to solar pump (R1)).



In order to complete the commissioning menu, press button 3.

Further adjustments can be carried out in the adjustment menu.

Press and hold button 1 for approx. 3 s to enter the adjustment menu. Use Button 1 to scroll to the parameter you wish to adjust.



7. AfterHeating (backup heating)

Adjustment range 0.0 ... 95.0 °C

[30.0 ... 200.0 °F]

Factory setting 40.0 °C

→ Change to suit your needs.



Switch-on temperature for the backup heating. R2 (gas booster) is activated, if the temperature at S3 falls below AH O. For this system, AH O should be lower than AH F.

8. AH F AfterHeating (backup heating)

Adjustment range 0.0 ... 95.0 °C

[30.0 ... 200.0 °F]

Factory setting 45.0 °C

Switch-off temperature for the backup heating. R2 (gas booster) is deactivated, if the temperature at S3 exceeds AH F.



9. Time frame

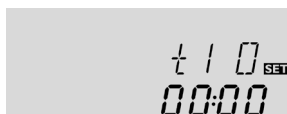
Three time frames can be adjusted for the backup heating.

t1 O, t2 O, t3 O

Thermostat switch-on time

Adjustment range: 00:00 ... 23:45

Factory setting: 00:00



t1 F, t2 F, t3 F

Thermostat switch-off time

Adjustment range: 00:00 ... 23:45

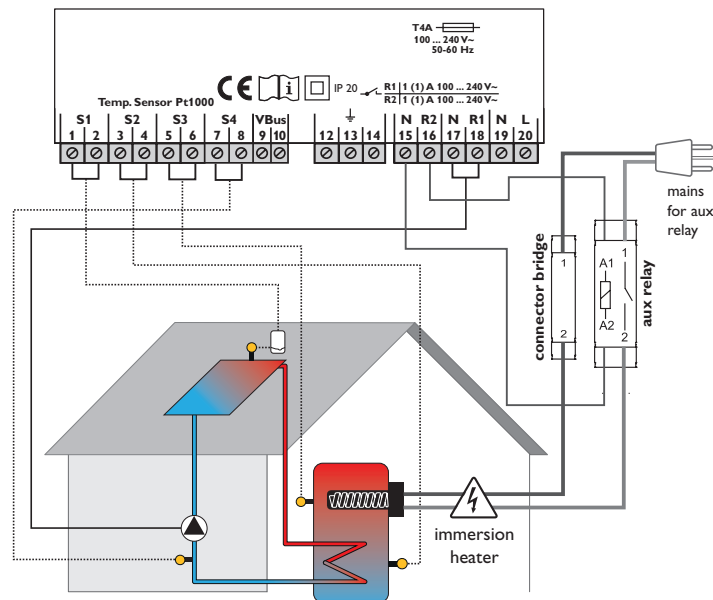
Factory setting: 00:00



If switch-on times and switch-off times are equal (e. g. factory setting 00:00), the time frames are not activated - backup heating is active all the time!

Parameter t# O / t# F	Full name	Adjustment range	Factory setting	Description
	Time frames	00:00 – 07:00		Backup heating NOT active
		t1 O = 07:00	t1 F = 09:00	Backup heating active
		09:00 – 11:00		Backup heating NOT active
		t2 O = 11:00	t2 F = 12:00	Backup heating active
		12:00 – 18:00		Backup heating NOT active
		t3 O = 18:00	t3 F = 19:00	Backup heating active
		19:00 – 24:00		Backup heating NOT active

System C – simple solar system with 1 collector (roof) sensor; 2 tank sensors and electric booster (via HR230 auxiliary relay)



Sensors and actuators required:

- S1** Collector (roof) sensor
- S2** Tank sensor, bottom, height of coil
- S3** Tank sensor, top, height of electric booster inlet
- R1** Solar pump/auxiliary relay in case of big pumps
- R2** Electric booster (via HR230 auxiliary relay)

Additional sensor:

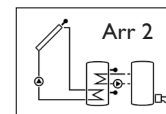
- S4** Additional temperature monitoring, e.g. solar return piping

6. System Layout

Adjustment range: 1 ... 3

Factory setting: 1

→ Choose **Arr 2**



5. Maximum tank temperature

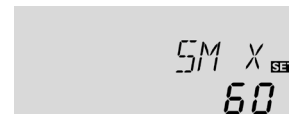
Adjustment range: 4 ... 95

Factory setting: 60 °C

→ Change to suit your needs.

Loading will stop when this temperature is reached at tank sensor (S2).

Factory setting is 60 °C [140 °F] to avoid scald risk or system damage.



6. Minimum pump speed

Adjustment range: 30 ... 100%

Factory setting: 30 °C

→ Change to suit your needs.

Change to 100 %, if pump speed control is forbidden or not necessary (e.g. auxiliary relay connected to solar pump (R1)).



In order to complete the commissioning menu, press button 3.

Further adjustments can be carried out in the adjustment menu.

Press and hold button 1 for approx. 3 s to enter the adjustment menu. Use Button 1 to scroll to the parameter you wish to adjust.



7. AfterHeating (backup heating)

Adjustment range 0.0 ... 95.0 °C

[30.0 ... 200.0 °F]

Factory setting 40.0 °C

→ Change to suit your needs.



Switch-on temperature for the backup heating. R2 (gas booster) is activated, if the temperature at S3 falls below AH O. For this system, AH O should be lower than AH F.

8. AH F AfterHeating (backup heating)
Adjustment range 0.0 ... 95.0 °C
[30.0 ... 200.0 °F]
Factory setting 45.0 °C

Switch-off temperature for the backup heating. R2 (gas booster) is deactivated, if the temperature at S3 exceeds AH F.

9. Time frame

Three time frames can be adjusted for the backup heating.

t1 O, t2 O, t3 O
Thermostat switch-on time
Adjustment range: 00:00 ... 23:45
Factory setting: 00:00

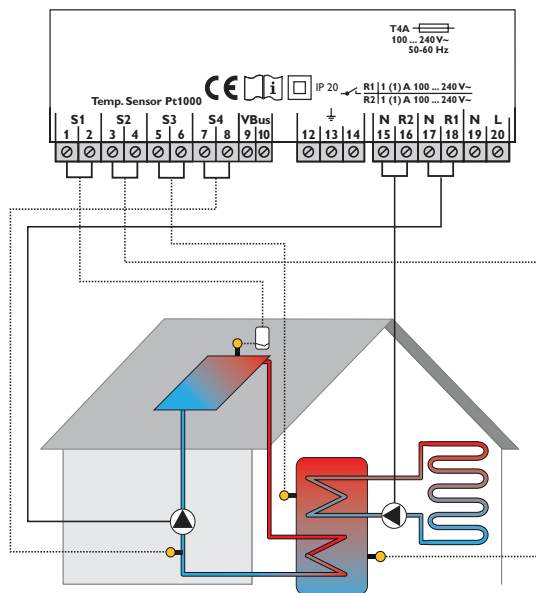
t1 F, t2 F, t3 F
Thermostat switch-off time
Adjustment range: 00:00 ... 23:45
Factory setting: 00:00

If switch-on times and switch-off times are equal (e. g. factory setting 00:00), the time frames are not activated - backup heating is active all the time!



Parameter t# O / t# F	Full name	Adjustment range	Factory setting	Description
	Time frames	00:00 – 07:00		Backup heating NOT active
		t1 O = 07:00	t1 F = 09:00	Backup heating active
		09:00 – 11:00		Backup heating NOT active
		t2 O = 11:00	t2 F = 12:00	Backup heating active
		12:00 – 18:00		Backup heating NOT active
		t3 O = 18:00	t3 F = 19:00	Backup heating active
		19:00 – 24:00		Backup heating NOT active

System D – simple solar system with 1 collector (roof) sensor; 2 tank sensors and hydronic floor system



Sensors and actuators required:

- S1** Collector (roof) sensor
- S2** Tank sensor, bottom, height of coil
- S3** Tank sensor, top, height of floor system outlet
- R1** Solar pump / auxiliary relay in case of big pumps
- R2** Hydronic floor system circulating pump

Additional sensor:

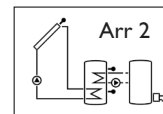
- S4** Additional temperature monitoring, e.g. solar return piping

7. System Layout

Adjustment range: 1 ... 3

Factory setting: 1

→ Choose **Arr 2**



5. Maximum tank temperature

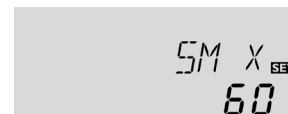
Adjustment range: 4 ... 95

Factory setting: 60 °C

→ Change to suit your needs.

Loading will stop when this temperature is reached at tank sensor (S2).

Factory setting is 60 °C [140 °F] to avoid scald risk or system damage.



6. Minimum pump speed

Adjustment range: 30 ... 100%

Factory setting: 30 °C

→ Change to suit your needs.

Change to 100 %, if pump speed control is forbidden or not necessary (e. g. auxiliary relay connected to solar pump (R1)).



In order to complete the commissioning menu, press button 3.

Further adjustments can be carried out in the adjustment menu.

Press and hold button 1 for approx. 3 s to enter the adjustment menu. Use Button 1 to scroll to the parameter you wish to adjust.



7. AfterHeating (backup heating)

Adjustment range 0.0 ... 95.0 °C

[30.0 ... 200.0 °F]

Factory setting 40.0 °C

→ Change to suit your needs.



Switch-on temperature for the backup heating. R2 (gas booster) is activated, if the temperature at S3 falls below AH O. For this system, AH O should be higher than AH F.

8. AH F AfterHeating (backup heating)

Adjustment range 0.0 ... 95.0 °C

[30.0 ... 200.0 °F]

Factory setting 45.0 °C

Switch-off temperature for the backup heating. R2 (gas booster) is deactivated, if the temperature at S3 exceeds AH F.



9. Time frame

Three time frames can be adjusted for the backup heating.

t1 O, t2 O, t3 O

Thermostat switch-on time

Adjustment range: 00:00 ... 23:45

Factory setting: 00:00



t1 F, t2 F, t3 F

Thermostat switch-off time

Adjustment range: 00:00 ... 23:45

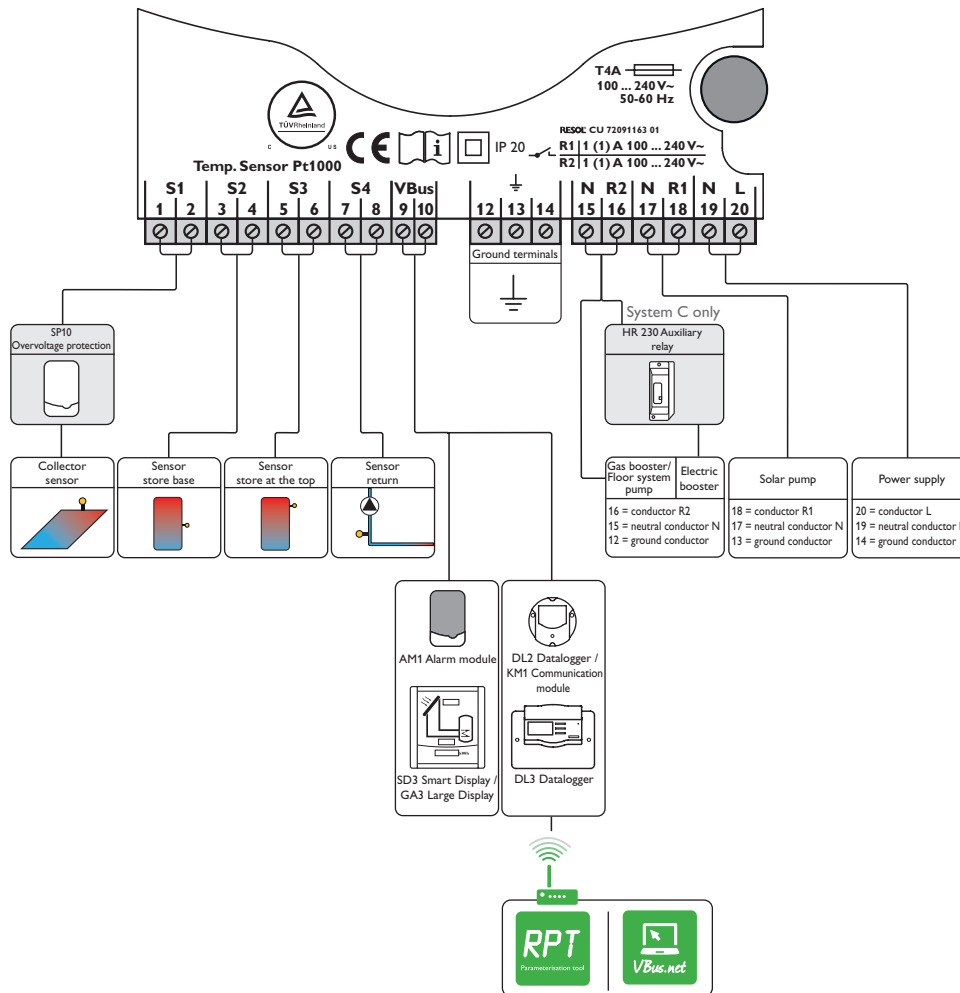
Factory setting: 00:00



If switch-on times and switch-off times are equal (e. g. factory setting 00:00), the time frames are not activated - backup heating is active all the time!

Parameter t# O / t# F	Full name	Adjustment range	Factory setting	Description
	Time frames	00:00 – 07:00		Backup heating NOT active
		t1 O = 07:00	t1 F = 09:00	Backup heating active
		09:00 – 11:00		Backup heating NOT active
		t2 O = 11:00	t2 F = 12:00	Backup heating active
		12:00 – 18:00		Backup heating NOT active
		t3 O = 18:00	t3 F = 19:00	Backup heating active
		19:00 – 24:00		Backup heating NOT active

Exemplary figure for illustrating the connection possibilities



RESOL SP10

Overvoltage protection device SP10 should be used in order to protect the susceptible temperature sensors in or at the collector against induced overvoltages.



RESOL HR230

Auxiliary relay for separation of different electric circuits.



RESOL GA3 Large Display

Large Display module with 3 displays for collector and tank temperatures as well as for heat quantity, incl. power supply.



RESOL SD3 Smart Display

Display module for the living area with 3 displays for collector and tank temperature as well as for heat quantity.



RESOL DL2 Datalogger

Datalogger incl. RESOL Service CD, SD card and LAN cable, power supply adapter and VBus® cable pre-connected.



RESOL DL3 Datalogger

Datalogger incl. RESOL Service CD, SD card, power supply adapter, LAN and VBus® cable.



RESOL Moisture-proof housing

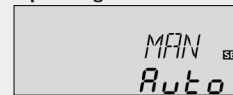
Moisture-proof housing for controller installation outdoors or in highly humid locations (without controller).



RESOL AM1

Alarm module for signaling system failures.

Operating mode



For control and service work, the operating mode of the controller can be manually adjusted. Press and hold button 1 for approx. 3 s to enter the adjustment menu. Use Button 1 to scroll to the parameter MAN1, MAN2.

The following adjustments can be made:

• MAN1/MAN2

Operating mode

OFF : relay off Δ (flashing) + ☞

Auto : relay in automatic operation

ON : relay on Δ (flashing) + ☞ + ⓘ / Ⓜ



Note:

Always adjust the operating mode back to "Auto" when the control and service work is completed. Normal operation is not possible in manual mode.

RESOL – Elektronische Regelungen GmbH

Heiskampstraße 10
45527 Hattingen / Germany

Tel.: +49 (0) 23 24 / 96 48 - 0

Fax: +49 (0) 23 24 / 96 48 - 755

www.resol.com

info@resol.com