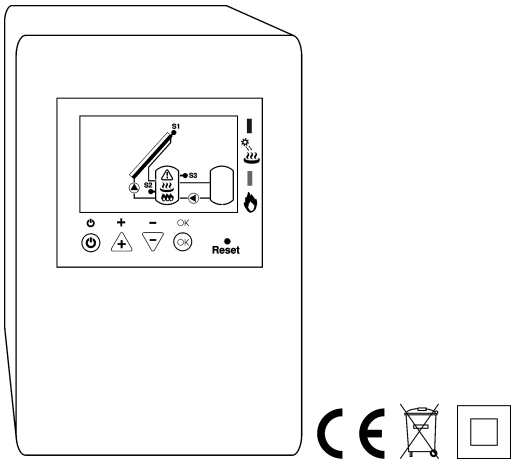
EUROSTER 813

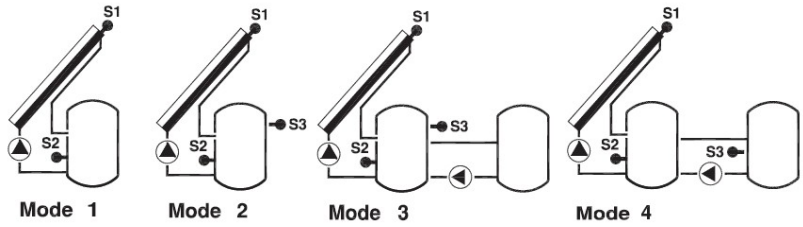


INTRODUCTION

The Euroster 813 is a din-rail mount Solar controller for a domestic water heating system. It is designed to be used as differential temperature controller to control a solar collector and maximum 2 storage tanks subject to the chosen operating mode.

The controller is able to control an auxiliary heating (boiler or electric) elements to provide supplementary heat. Users can program the required time schedule to automatically start-stop the auxiliary heating.

The unit provides 4 operating modes for users to choose from. A preventive measure is build-in to prevent error from occurrence whilst in selecting the required operating mode. Graphic of each required mode that will be shown on the LCD of the unit,as below.



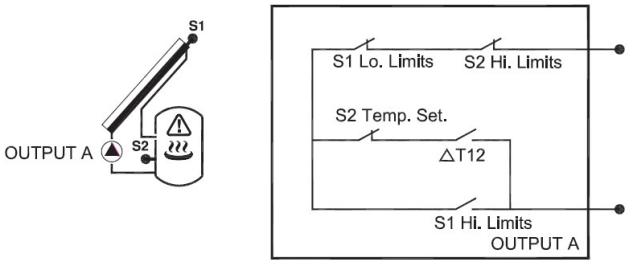
Graphic descriptions to operation logic in each of 4 operating modes:

 Normally Closed (before setpoint/limitation)

 Normally Opened (before setpoint/limitation)

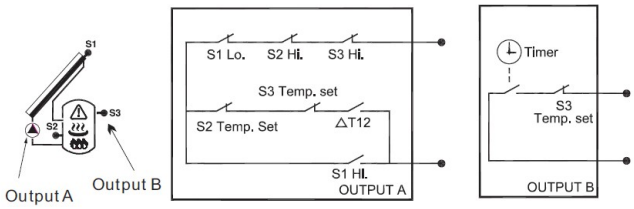
Mode-1: 2 sensor operation with 1 storage tank

S1 - Solar collector temperature sensor
S2 - Lower storage tank temperature sensor



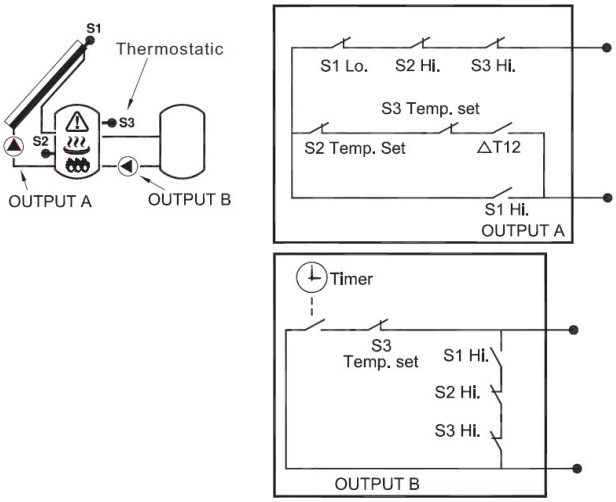
Mode-2: 3 sensor operation with auxiliary heater

S1 - Solar collector temperature sensor
S2 - Lower storage tank temperature sensor
S3 - Thermostatic sensor



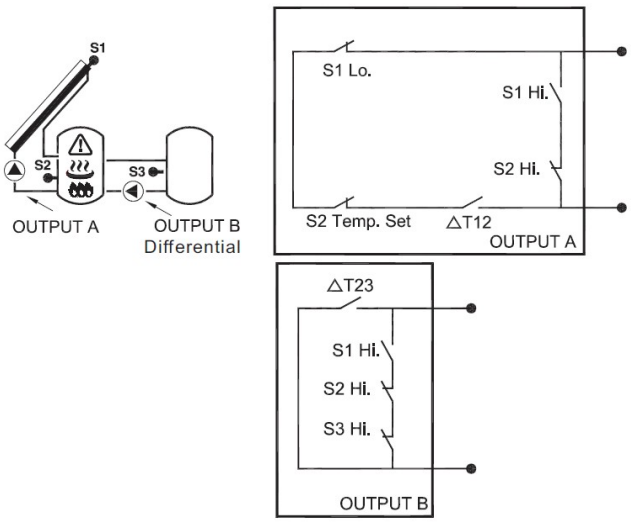
Mode-3: 3 sensor operation with auxiliary boiler

S1 - Solar collector temperature sensor
S2 - Lower storage tank temperature sensor
S3 - Thermostatic sensor

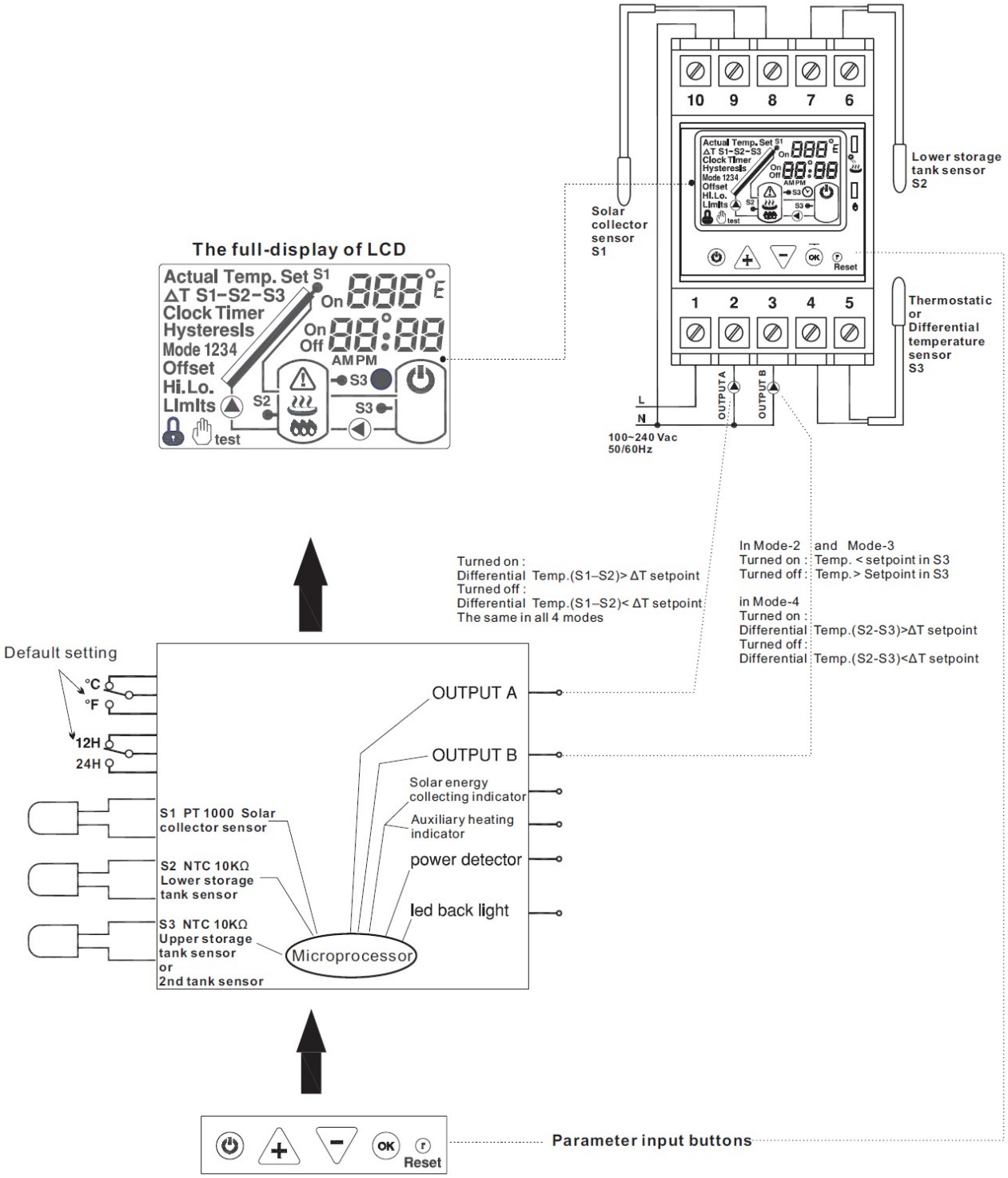


Mode-4: 3 sensor operation with 2 storage tanks

S1 - Solar collector temperature sensor
S2 - Lower storage tank temperature sensor
S3 - Differential temperature sensor



The control-logic of Euroster 813 explained in the graphic descriptions



1. Operating voltage : 100 ~ 240 V AC 50/60 Hz
2. Output rating : (Solar collector circulation Pump) Output A - Volt output, 7 Amp \ 250 V AC (Auxiliary heating) Output B-Volt output, 16Amp\250V AC
3. Power consumption:4VA
4. Clock format : 12H/24H by preset. Default setting 24H
5. °C/°F : By preset. Default setting °C (build-in Protective functions)
6. Anti-seizing protection : Automatic operation, the Output A will be turned on for 5 seconds everyday at midnight 12:00 (00:00) when the night temperature is below 15°C.

7. Overheating protection: Automatic operation, when this protection is activated, backlight and will be synchronous flashing on the LCD.

Overheating in the solar collector

In operating mode-1/2/3
Output A will be turned on when S1 temperature >= S1 Hi temp. limits. setpoint and S2 temperature <= S2 (Hi temp. limits. Setpoint -2°C)
Output A will be turned off when S1 temperature <= (S1 Hi temp. limits. Setpoint -5°C) and S2 <= S2 Hi temp. limits. setpoint

In operating mode-4
Output A&B will be turned on when S1 temperature >= S1 Hi temp. limits setpoint and S2 temperature <= (S2 Hi temp. Limits Setpoint -2°C)
Output A&B will be turned off when S1 temperature <= (S1 Hi temp. limits. setpoint -5°C) and S2 temperature <= (S2 Hi temp. Limits. setpoint-2°c)

Overheating in the storage tank

In operating mode1/2/3
Output A will be turned on when S2 temperature >= S2 Hi temp. limits setpoint and S1 temperature <= (S1 Hi temp. limits. setpoint -5°C)
Output A will be turned off when S2 temperature <= (S2 Hi temp. limits. setpoint -2°C) and S1 temperature <= S1 Hi temp. limits. setpoint

In operating mode-4
Output A&B will be turned on when S2 temperature >= S2 Hi temp. limits. setpoint and S1 temperature <= (S1 Hi temp. limits. setpoint -5°C)
Output A&B will be turned off when S2 temperature <= (S2 Hi temp. limits. setpoint -2°C) and S1 temperature <= S1 Hi temp. limits. setpoint

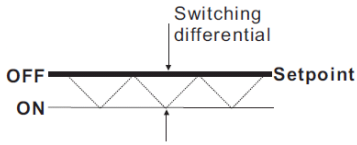
8. Anti-frost protection : Active when the unit is ON (in operation)
Output A will be turned on for 1 minute in every hour when S1 temperature = 5°C.
Output A will be permanent turned on when S1 temperature = 2°C, until S1 > 5°C.
Enable(ON) or disable(OFF) this function is selectable. Default setting : OFF

(Set/adjust all the setpoints in the S1,S2andS3)

9. Set/adjust the "Hi. Temp. Limits." (the overheating protection temperature setpoint)
S1 : Setting range from 60°C to 190°C. Default setting 120°C
S2 : Setting range from 0°C to 100°C. Default setting 95°C
10. Set/adjust the "Lo Temp. Limits" (the lowest temperature protection setpoint). Only in the S1
Output A will be shut off when temperature at S1 is lower than "Lo Temp. Limits" Setting range from 10°C to40°C. Default setting 15°C
11. ΔT S1-S2 (Turn ON or OFF the solar collector circulation pump to the differential setpoints)
ON :The minimum required temperature difference between S1 temperature at Solar panel and S2 temperature at the lower of storage tank which is for turning ON Output A.
Setting range:3~20°C, default setting 10°C

OFF:The minimum required temperature difference between S1 temperature at Solar panel and S2 temperature at the lower of storage tank which is for turning OFF Output A to avoid reverse circulation.
Setting range:1~18°C, default setting 3 °C
12. ΔT S2-S3 (Turn ON or OFF the Circulation pump to the differential setpoints) Effects in operating mode-4 only
ON:The minimum required temperature difference between S2 temperature at the lower of 1st storage tank and S3 temperature at the lower of 2nd storage tank which is for turning ON Output B. Setting range:3~20°C, default setting 10°C
OFF:The minimum required temperature difference between S2 temperature at the lower of 1st storage tank and S3 temperature at the lower of 2nd storage tank which is turning OFF Output B. Setting range:1~18°C, default setting 3°C
13. Set/adjust the temperature setpoints at S2&S3 and their Switching differential (Hysteresis)

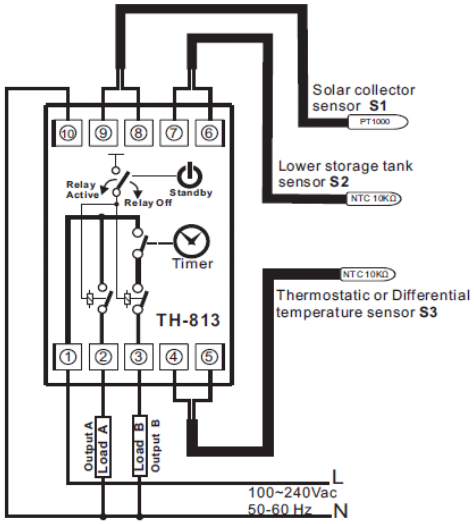
These setpoints will provide this unit with the thermostatic operation to automatically maintain the water in the storage tanks at the required temperature.
The setpoint at S2 controls the ON/OFF in Output A.
The setpoint at S3 controls the ON/OFF in Output B.
S2 : Setting range from 10°C to 100°C. Default setting 60°C
S2 : Switching differential : Setting range from 1°C to 20°C. Default setting 2°C
S3 : Setting range from 10°C to 100°C. Default setting 60°C
S3 : Switching differential : Setting range from 1°C to 20°C.
Default setting 10°C, in mode-2 and mode-3
Default setting 2°C, in mode-4



14. TIMER function
Active only in the operating mode -2 or 3, ON/OFF controls to the time setpoints in the Output B (S3). For solar collector systems with auxiliary heating. Enable or disable this function is selectable. When the TIMER function is enabled, 2 ON-OFF(program-periods) /Day provided, program-resolution : 10 minutes. Default setting : OFF
15. Temperature sensor cable
Collector sensor S1 --- PT1000, 1KΩ at 0°C, Temp. Coefficient 3.9x10 / °C. Resistance variable rate 0.3851Ω/°C. Temperature display range -40~ + 250°C/-40~482°F, Accuracy ±0.5 °C/1.0 °F. Cable length:2meters,thermal-resisitve PTFE shielding
Tank sensor S2 --- NTC, 10KΩ at 25°C.
Temperature display range -10 ~ +110 °C/-14 ~ 230°F
Accuracy ±0.5 °C /1.0 °F. Cable length : 2 meters , thermal-resistive PTFE shielding.
Tank sensor (thermostatic) S3---NTC, 10KΩ at25°C.
Temperature display range -10 ~ +110 °C /-14 ~ 230°F. Accuracy ±0.5 °C /1.0 °F. Cable length : 2 meters, thermal-resistive PTFE shielding.
16. Temperature sensor's calibration : Offset (The same Offset range in all 3 sensors)
Range : -10°C ~ + 10°C,default setting 0°C
17. Build-in Rechargeable battery for retaining the settings and the time during power outages
18. Stand-By mode
Manually turn the unit ON/OFF (Output A & B can be turned-on/shut-off manually)
19. Key-lock function
Lock out of all the buttons on the front control-panel, prevents the settings from being tampered with.
20. Anti-Legionella function
Effective only in S3. used for control the auxiliary heating.(Control of Output B).
This function will operate manually only, when it is in operation, Output B will be turned on to heat up the water. When the water temperature reaches the setpoint, Output B will continue to operate for a duration of (1080- (12x Anti-legionella temperature setpoint)) Seconds. After, the unit will resume its normal operation.
Anti-legionella temperature setpoint: Setting range from 60°C to 90°C. Default setting 70°C
21. Blue backlit LCD, auto mode 10 seconds
22. Dimensions:52.5Wx85.0Hx60.0Dmm. 35 mm Din-rail

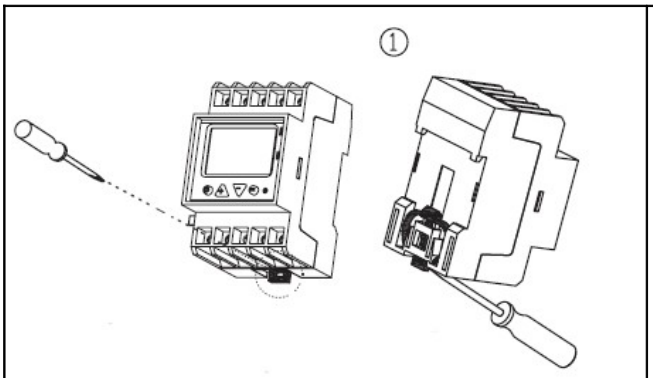
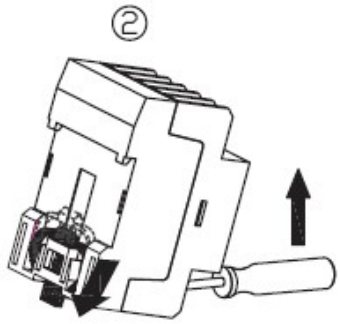
Remove battery insulation before wiring

Wiring

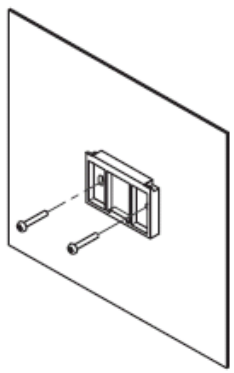
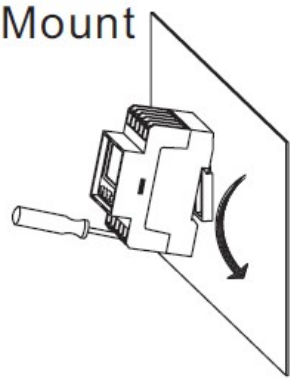
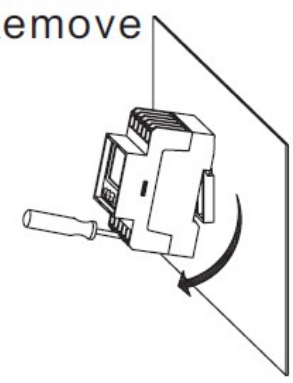


Mount the unit on rail or wall

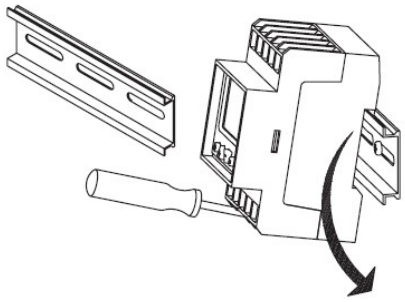
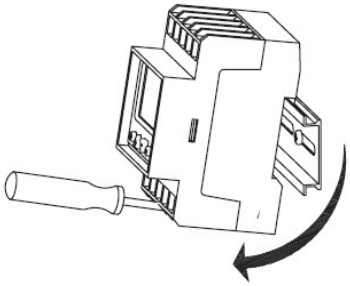
The retractor on the back of the plastic housing is for clamping the unit on the Wall or Rail. Follow the graphic description below when mounting the unit.

	
Insert a Flat-head screw-driver in the position as shown above.	Tilt the screw-driver to the direction as shown above to push down the retractor.

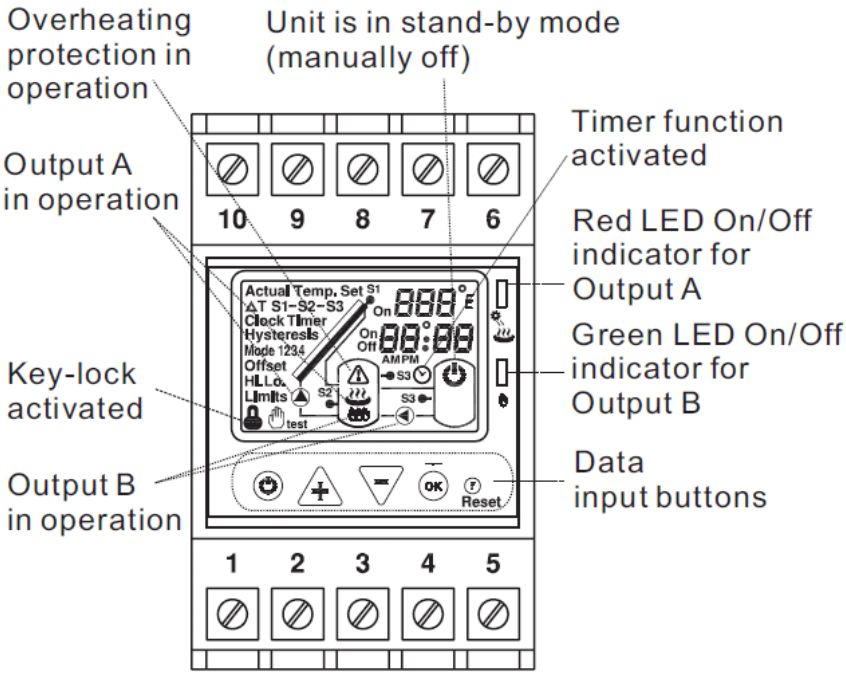
Mount/Remove the unit in surface-mount

		
Mount the provided surface-mountbracket on the wall.	Align the top of back plastic housing with the top of the bracket. Push down the retractor and mount.	Push down the retractor to remove the unit off the bracket.

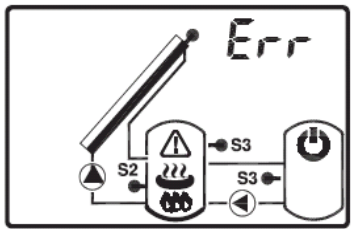
Mount/Remove the unit in din-rail mountl

	
Align the top of the back plastic housing with the top of the Din-rail. Push down the retractor and mount.	Push down the retractor to remove the unit off the din-rail.

Product description



Set\Adjust internal settings



We suggest that you read the specification thoroughly before starting to set/adjust the unit.

This unit has preventive measures to avoid errors whilst in selecting the required operating mode.

When the error occurs, "Err" will be shown on LCD.

If this situation occurs, either press "reset" or press ⊕ and ⊖ together for 5 seconds to restart setting/adjusting.

Press "reset" prior to starting to set/adjust for first time use.

⚠ In the setting/adjusting procedure, if no data is input after 1 minute, this unit will automatic retain the settings and start to operate. Users may use this when just making adjustments in the internal settings.

Press ⊕ and ⊖ together for 5 seconds to start setting/adjusting

A. Set/Adjust the Clock

1. Press + or − to set the correct Hour of the day
2. Press (OK) to set the Minutes.
3. Press + or − to set the correct minutes
4. Press OK to set/adjust next setting.

B. Anti-frost protection A-F
(refer to the page of Specification Item-8 for a detailed description)

1. Press + or − to choose Enable (ON) or Disable(OFF) this function.

C. Set/Adjust the required operating mode
This unit provides 4 operating modes, we suggest that you read the "Introduction" thoroughly in this Instructions before choosing.

1. Press + or − to choose the required mode
2. Press OK to go to the next setting.

C1 - Hi Limits S1 (Refer to the page of Specification Item-7 & 9 for a detailed description)

1. Press + or − to choose the required setpoint
2. Press OK to go to the next setting.

C-2 Lo Limits S1 (Refer to the page of Specification Item-10 for a detailed description)

1. Press or to choose the required setpoint
2. Press to go to the next setting.

C-3 Hi Limits S2 (Refer to the page of **Specification** Item-7 & 9 for a detailed description)

1. Press + or − to choose the required setpoint.
2. Press OK to go to the next setting.

D. ΔT S1-S2 ON and OFF setpoints
(Refer to the page of Specification Item-11 for a detailed description)

1. Press + or − to choose the required setpoint
2. Press OK to go to the next setting.
3. Press + or − to choose the required setpoint.
4. Press OK to go to the next setting.

E. ΔT S2-S3 ON and OFF setpoints
(Refer to the page of Specification Item-12 for a detailed description)

1. **Press** + or − **to choose the required** setpoint.
2. Press OK to go to the next setting.
3. Press + or − to choose the required setpoint.
4. Press OK to go to the next setting.
   (Effects in operating mode-4 only)

F. Set/Adjust Operation setpoint and Hysteresis (Switching differential) in S2
(Thermostatic in Output A. Refer to the page of Specification Item-13 for a detailed description)

1. Press + or − to choose the required setpoint.
2. Press OK to go to the Hysteresis setpoint
3. Press + or − to choose the required Hysteresis setpoint.
4. Press OK to go to the next setting

G. Set/Adjust Operation setpoint and Hysteresis (Switching differential) in S3
(Thermostatic in Output B. Refer to the page of Specification Item-13 for a detailed description)

1. Press ⊕ or ⊖ to choose the required S3 point
2. Press OK to go to the Hysteresis setpoint.
3. Press ⊕ or ⊖ to choose the required hysteresis setpoint
4. Press OK to go to the next setting.
   (Effects in operating mode-2/ 3/ 4 only)

H. Offset – Temperature sensor's calibration (Refer to the page of specification Item-15/16 for a detailed description)

1. Press ⊕ or ⊖ to choose the required temperature calibration value in S1.
2. Press OK for the calibration in S2.
3. Press ⊕ or ⊖ to choose the required value.
4. Press OK for the calibration in S3
5. Press ⊕ or ⊖ to choose the required value.
6. Press OK to set the next setting
   (Calibration in S3 effects in operating mode-2 / 3 / 4 only)

I. Timer function

(Refer to the page of introduction and the page of Specification Item-14 for a detailed description, 2 program-periods are provided in this unit)

For setting the Timer, press and hold ⊕ for fast forward press and hold ⊖ for fast backward

1. Press ⏻ to enable the Timer function and to choose the required ON/OFF time in each program.
2. Press ⊕ or ⊖ to choose the time for P-1 ON
3. Press OK to set the P-1 OFF time
4. Press ⊕ or ⊖ to choose.
5. Press OK to set the P-2 ON time
6. Press ⊕ or ⊖ to choose.
7. Press OK to set the P-2 OFF time.
8. Press ⊕ or ⊖ to choose.
   (Timer function activates in Mode-2 or 3 only)
9. Press OK to go to the next setting

All internal settings are now completed, press OK to start operation.

When this unit is in operation, press ⊕ or ⊖ to check the temperature of each temperature sensor.

Stand-by mode

1. Press ⏻.
2. A Flashing „YES" will show on the LCD.
3. Press ⏻ again.
4. This unit is now manually turned off.

Remark:

When this unit was manually turned off, the build-in protective function will be automatically activated.

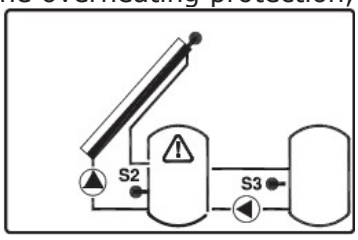
⚠ Refer to the page of Specification Item-6 Anti-seizing protection for the details.

When this unit is operating in stand-by mode, pressing the ⏻ button will resume its operation.

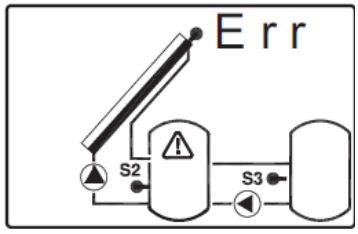
Remark:

Under two situations the backlight on the LCD will be flashing to alert users;

1. When this unit is in operating the overheating protection, it will display on the LCD;



2. If any of the temperature sensor is not properly connected or has been damaged, it will display on the LCD;

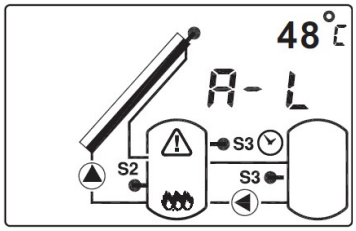


Also the symbol of on the LCD will be synchronously in flashing.
Immediate contact service persons if this situation has occurred.

Anti-legionella function

This function activates only in systems equipped with auxiliary heating devices (mode-2 or 3). Refer to the page of Specification Item-20 for a detailed description

1. Press and hold OK for 5 seconds.
2. Press + or - to set the required temperature setpoint for this Hygienic function.
3. Press OK to start to operate this function

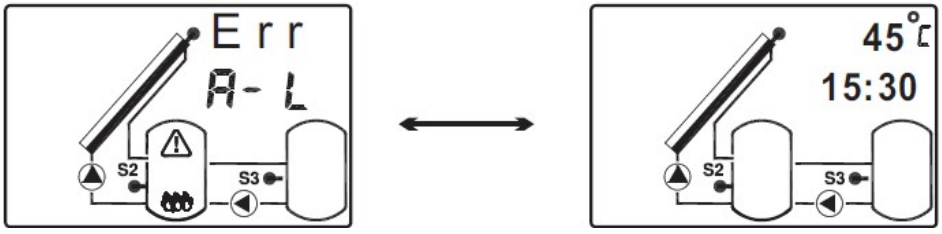


When this unit is operating the anti-legionella function, the LCD will show A-L and the S3 temperature.

Press OK again will stop the operation.

This unit will automatic resume its normal operation after the anti-legionella function.

If the temperature at S3 could not reach the required A-L setpoint after this function has been in operation for one hour, the backlight will be flashing to alert users that the anti-legionella function has failed to operate.
The display on the LCD will alternately show



Press OK to stop this A-L operation and immediately contact service personnel When this situation has occurred.

Test mode

Check if both Output A and B are in good condition and ready to start operation. (In mode-1, Output A only)

1. Press and hold OK, then press +.
2. Slow flashing Output A (◀) will be shown on the LCD.
3. Press + to turn on Output A.
4. If Output A is in good condition, a fast flashing (◀) will be shown on the LCD and the red LED on the top right corner of panel will be turned on.
   (Unit may be damaged if above situation did not occur)
5. Press − to turn off the test on Output A.
6. Press OK to test Output B.
7. Slow flashing Output B (◀ or S3 in mode-2) will be shown on the LCD.
8. Press + to turn on Output B.
9. If Output B is in good condition, a fast flashing (◀) will be shown on the LCD and the green LED on the top right corner of panel will be turned on. (Unit may be damaged if above situation did not occur)
10. Press − to turn off the test on Output B.
11. After test, press and hold OK and then press + to start operation.

Resume default settings

Press 🔒 and OK together. „dEL" will be shown on the top right of the LCD. All default settings will be resumed, the time will however be retained.

Reset

Press "Reset" , the previous settings will be retained, however the time setting will be erased.

Key-lock function 🔒

(Refer to the page of Specification Item-19 for a detailed description)

Press − and OK together. 🔒 will be shown on the bottom left of the LCD. Any data input through the buttons on the panel is now invalid.

When the unit is in Key-lock mode, press − and OK together to release the Key-lock.

ELECTRONIC WASTE MANAGEMENT INFORMATION

We made every effort to get as a long controller lifetime as possible. However, the device is subject to natural tear and wear. We ask you to have a controller that will not meet your requirements any more brought in to an electronic waste management facility. Electronic waste is collected free of charge by local distributors of electronic equipment.

Inappropriate management of electronic waste may lead to an unnecessary environment pollution.

Cardboard boxes should be disposed of at a paper recycling facility.

GUARANTEE CERTIFICATE

EUROSTER 813

Warranty terms:

1. Warranty is valid for 24 months from the controller sale date.
2. Claimed controller together with this warranty certificate must be supplied to the seller.
3. Warranty claims shall be processed within 14 business days from the date the manufacturer has received the claimed device.
4. Controller may be repaired exclusively by the manufacturer or by other party clearly authorized by the manufacturer.
5. Warranty becomes invalidated in case of any mechanical damage, incorrect operation and/or making any repairs by unauthorized persons.
6. This consumer warranty does not exclude, restrict nor suspend any right of the Buyer ensuing if the product would not meet any of the sale contract terms.

…….....

sale date serial number/date of manufacture signature/stamp

Business entity that issued this warranty certificate:
P.H.P.U. AS Agnieszka Szymańska-Kaczyńska, Chumiętki 4, 63-840 Krobia, Poland