



ANASOL 115VAC ANASOL 230VAC

DIFFERENTIAL THERMOSTAT FOR SOLAR
HEATING OR DIGITAL THERMOSTAT

Ver. 04



NEWANASOL04-03T-18632

1. DESCRIPTION

Anasol is a differential thermostat for solar heating with two sensors and one output for controlling a water circulation pump. The controller also has protection functions that prevent water from overheating or freezing in the solar collector. It can also be configured as a digital thermostat with control logic for heating or cooling. The interface used allows the simple display of SAS information, such as: output status (differential or thermostat), operation mode (automatic, manual or off), and sensor temperature.

2. APPLICATIONS

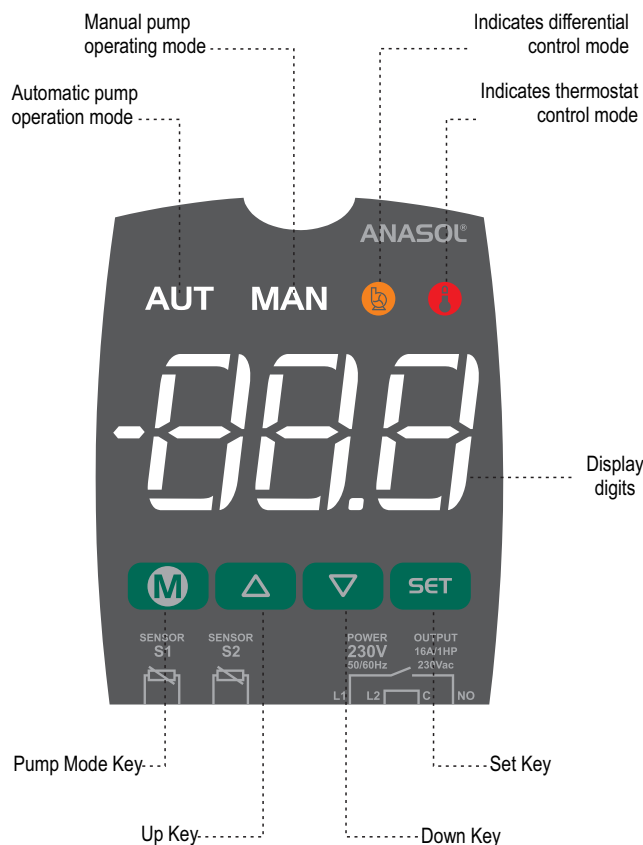
- Solar heating for swimming pool or thermal reservoir;
- Water heaters
- Air-conditioning;

3. TECHNICAL SPECIFICATIONS

Power supply	Anasol 115Vac: 115Vac $\pm 10\%$ (50/60Hz) Anasol 230Vac: 230Vac $\pm 10\%$ (50/60Hz)
Operating temperature	0 to 50°C
Operating humidity	10 a 90% UR (without condensation)
Sensors	Sensor T1: Solar Collector - SB 59 Sensor, white cable, 1m Sensor T2: Thermal Reservoir - SB19 Sensor, grey cable, 2,5m
Control Temperature	Sensor T1: -20 to 200°C Sensor T2: -20 to 105°C
Resolution	0,1°C between -10 and 100°C and 1°C outside that range
Control output	Relay output, max. 1HP at 220Vca ($\frac{1}{2}$ HP at 127Vca) or 16A, resistance at 3500W at 220Vca (1750W at 127Vca)
Product size	77 x 39 x 97mm

4. INDICATION AND SCREEN

4.1 PRESENTATION



4.2 INDICATIONS

AUT - Modo de operação da bomba automático.

MAN - Manual pump operation mode.

Note: Both off - OFF: Pump operating mode off.

- Output on - Differential control mode.

- Output on - Thermostat control mode (heating or cooling).

4.3 KEY MAP

The controller has easy access to features relevant to the user. The controller's operating mode is defined by parameter **[F05]** - Operating Mode. See a table and description below.

4.3.1 DIFFERENTIAL MODE (SOLAR HEATING):

- Short press: changes the pump mode (AUT - MAN - OFF).

- Short press: briefly displays the remaining time (in minutes) of the manual mode timer.

- Short press: changes the temperature display (T1-T2-DIF). After 10 minutes, the preferred indication returns.

SET - Short press: set the pool / reservoir heating temperature.

SET - Long press (4 seconds): access advanced settings.

4.3.2 THERMOSTAT MODE:

- Short press: changes the output mode (MAN - OFF)

- Long press (4 seconds): changes the output mode (AUT - OFF)

Note: In the automatic mode: short pressing activates the output considering the configured parameters

- Short press: briefly displays the remaining time (in minutes) of the manual mode timer.

SET - Short press: set the thermostat temperature.

SET - Long press (4 seconds): access advanced settings.

5. USER OPERATIONS

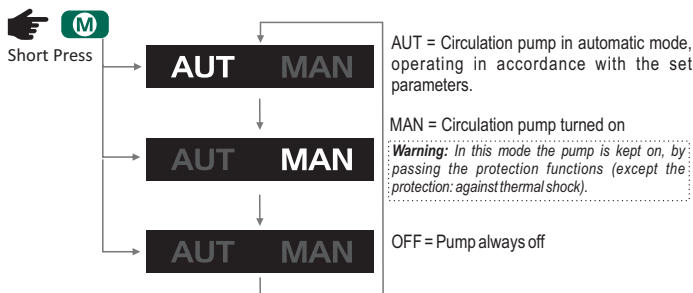
5.1 POOL / RESERVOIR HEATING TEMPERATURE (SENSOR T2) OR THERMOSTAT (SENSOR T1)

Set the comfort temperature (SP) of the pool or thermal reservoir (T2). The water pump will switch off when this temperature is reached, avoiding thermal discomfort. In the thermostat mode, it sets the operating temperature of the thermostat (T1).

To set this parameter, press the **SET** key. Use the or keys to set the value. To confirm, press shortly the **SET** key and the value will be saved in the controller memory. This parameter can be adjusted between the values defined in the advanced configuration **[F09]** - minimum value and **[F10]** - maximum value

5.2 WATER PUMP OPERATING MODE

Using the it is possible to change the operating mode of the water pump. The water circulation pump between the solar collector and the thermal reservoir can operate on three different modes.



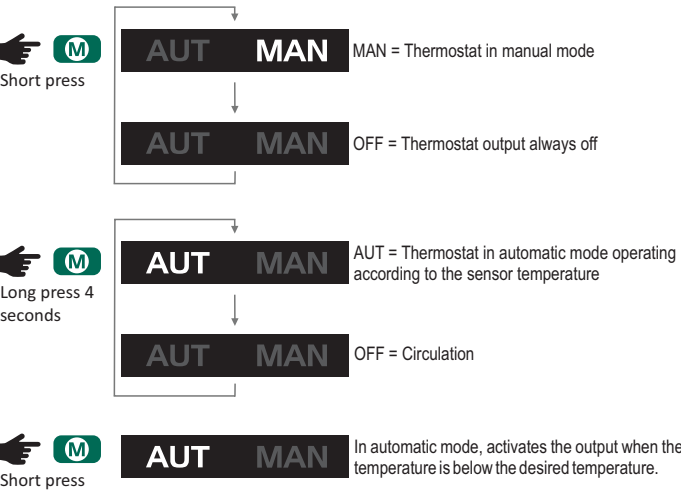
Note*: When the MAN (MANUAL) mode is selected, the pump will operate in this state for the length of time set by the **[F08]** function - The maximum length of time the output will remain on in manual mode. After this, the controller switches to the AUT (AUTOMATIC) mode.

Note*: This operating mode is available when compatible **[F05]** = diF (Differential Solar Heating Mode).

5.3 THERMOSTAT OPERATING MODE

[F06] = [H0E] or [rEE]

Using the [M] key, it is possible to change, the operating mode of the thermostat output. The thermostat can operate in three different modes:



Note¹: When the MAN (MANUAL) mode is selected, the thermostat will operate in this state for the length of time set by the [F08] function - The maximum length of time the output will remain on in manual mode. After this, the controller switches to the OFF mode.

Note²: This operating mode is available when set to [F05] - [H0E] (Heating Thermostat Mode) or F06 - [rEE] (Cooling Thermostat Mode).

6. ADVANCED OPERATIONS FOR INSTALLERS (TECHNICAL USE)

6.1 CHANGING THE CONTROLLER PARAMETERS

Access the settings menu by pressing the [set] key for 4 seconds until [F01] appears, wich corresponds to the first item in the list of functions. Use the [Δ] or [▽] keys to select the desired function. By short pressing the [set] key it is possible to edit its value. Use the [Δ] or [▽] keys to change the value, and when ready, briefly press the [set] key to memorize the set value and return to the function menu. To exit the menu and return to the normal operation (temperature indication) press the [set] key (long press) until [- -] appears.

6.2 TABLE OF PARAMETERS

FUN	DESCRIPTION	MIN	MAX	UNIT	DEFAULT
[F01]	Difference (T1-T2) required to switch on the pump	1.0	40.0	°C	8.0
[F02]	Difference (T1-T2) required to switch off the pump	1.0	40.0	°C	4.0
[F03]	Defrost temperatura (T1) required to switch on the pump	Off (-19)	10.0	°C	8.0
[F04]	Overheating temperature (T1) required to switch off the pump	0.0	200	°C	90.0
[F05]	Vacuum tube function	[OFF]	[EUB]	-	[OFF]
[F06]	Operating mode	[dIF]	[rEE]	-	[dIF]
[F07]	Temperature control hysteresis	0.1	20.0	°C	1.0
[F08]	Maximum time for the output to be on in manual mode	Off (0)	720	min.	360
[F09]	Minimum set value allowed for the desired temperature (SP)	-20.0	F10	°C	-20.0
[F10]	Maximum set value allowed for the desired temperature (SP)	F09	105	°C	105
[F11]	T1 sensor indication offset	-20.0	20.0	°C	0.0
[F12]	T2 sensor indication offset	-20.0	20.0	°C	0.0

6.3 DESCRIPTION OF PARAMETERS

F01 - Differential (T1-T2) to switch on the pump:

It allows configuring the temperature difference between the solar collector and the pool/thermal reservoir to switch on the circulation pump. As the solar collectors receive energy, the temperature at sensor T1 increases, and when this temperature is a set value over the temperature of sensor T2, the pump is switched on and the heated water circulates and is stored in the pool/reservoir.

F02 - Differential (T1-T2) to switch off the pump:

It allows configuring the temperature difference between the solar collector and the thermal reservoir to switch off the circulation pump. With the pump on, the temperature difference between the collector and the reservoir (T1-T2) tends to decrease. When this value drops to a set value, the pump is switched off, stopping the circulation of water.

F03-Defrost temperature (T1) required to switch on the pump:

When the temperature of the collectors (T1) is too low (e.g. winter nights), the pump is turned on, depending on the set temperature of this parameters, to prevent water from freezing in the solar collector and damaging it. The hysteresis of this control is fixed and set at 2.0°C. The minimum pump on time is fixed and set at 2 minutes, to ensure that the water will pass through all the collectors. Even if the T1 sensor temperature exceeds the defrost temperature (parameter [F03]), the controller obeys the minimum (fixed) time. To disable the defrost function, change he setting to the minimum until OFF is displayed.

F04-Overheating temperature (T1) required to switch off the pump:

When the temperature in the collectors (T1) is above the value set in this parameter, the pump is turned off in order to prevent the overheated water from circulating through the pipes and damaging them, if PVC pipes are used, for example. The hysteresis of this control is fixed and set at 2.0°C.

F05 - Vacuum tube function:

[OFF]: Vacuum tube function disabled;
[EUP]: Vacuum tube function for swimming pool;
[EUB]: Vacuum tube function for bath.

If the [EUP] function is enabled, the controller activates the vacuum tube mode with parameters set for pool. If the [EUB] function is enabled, the controller activates the vacuum tube mode with parameters set for bath. These parameters determine the pump on period and time, in addition to the minimum collector temperature (T1) and the maximum differential (T1-T2), corresponding to the thermal shock protection to activate the function. There are some models of vacuum tube collectors where it is not possible to directly measure the collector temperature, as they do not take readings from immersion sensors. To accurately measure the water temperature at the outlet of the collector, a minimum amount of water must be flowing. For this, the solar circuit must activate the pump at regular intervals so that the water heated in the collector passes over the T1 sensor. When the vacuum tube function is enabled, thermal shock protection is activated, which prevents the pump being switched on when the temperature of the collector is much greater than the reservoir.
Note: the controller prioritizes the protection settings (overheating), and if they are engaged, ignores the vacuum tube function.

F06 - Operating mode:

Allows configuring the operating mode of the controller as differential control (solar heating) or thermostat for heating or cooling. When configured as differential, sensor T1 is used in the collector and sensor T2 for the reservoir. When configured as a thermostat, only the T1 sensor is used.

[dIF]: Differential mode;
[H0E]: Thermostat heating mode;
[rEE]: Thermostat cooling mode.

F07 - Temperature control hysteresis:

Allows configuring the hysteresis temperature for both differential control and thermostat mode. Through this function it is possible to set a temperature range within which the output will remain off.
For example: If set SP = 30.0 and [F07] = 1.0, heating of the pool/thermal reservoir will be turned off when the temperature of the T2 sensor reaches 30.0°C, and will only switch on again to heat up, when it falls below 29.0°C (30.0-1.0 = 29.0).

F08 -Maximum time for the output to be on in manual mode:

It is the length of time that the pump or thermostat output will remain on in manual mode. After this period, the controller in differential operation mode switches to AUT (automatic) mode, and in thermostat mode it switches OFF.
Note: In differential operating mode, if this parameter is set to OFF, it does not switch the pump on. In thermostat operating mode, if this parameter is set to OFF, the output will activate until reaching the desired temperature (SP), after this period, the controller will switch to OFF mode.

F09 - Minimum set value allowed for the desired temperature (SP):

F10 - Maximum set value allowed for the desired temperature (SP):
These parameters serve as lower and upper limits for setting the SP parameter (desired temperature in the pool/thermal reservoir or thermostat). They are used to block the temperature adjustment in order to restrict inappropriate configuration, for example. A high value can keep the thermostat output on for a long time, increasing energy consumption.

F11 - T1 sensor indication offset:

F12 -T2 sensor indication offset

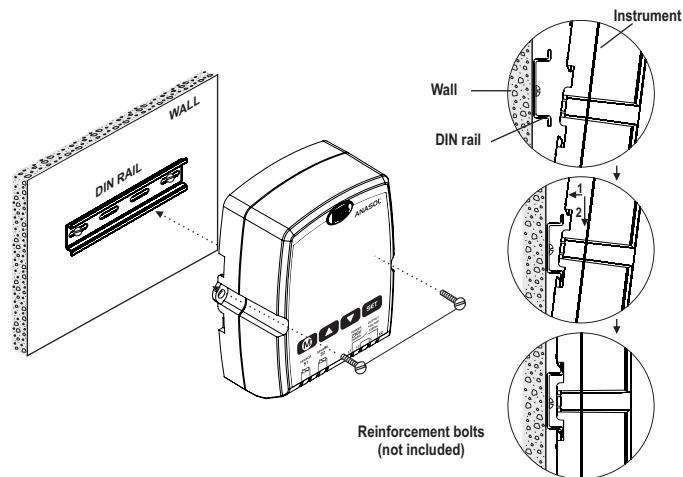
It allows compensating for possible deviations in the reading of sensors T1 (collector or thermostat) and T2 (reservoir), due to a sensor being replaced or change in cable length.

7. SIGNALS

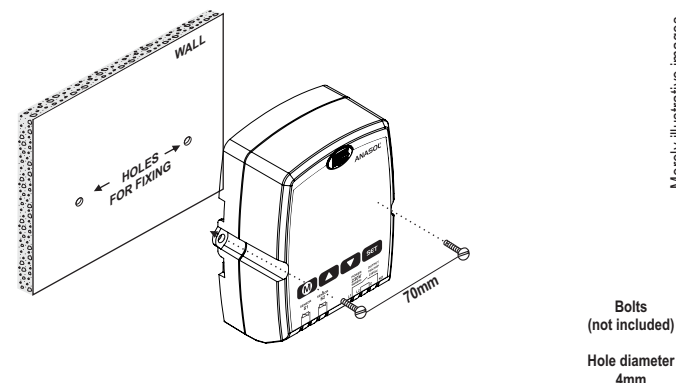
Er 1	Reason: Sensor 1 disconnected or outside the specified range. Action: Check sensor connections and operation.
Er 2	Reason: Sensor 1 disconnected or outside the specified range. Action: Check sensor connections and operation.
ICE	Reason: Sensor 1 temperature below the temperature set in [F03]. Antifreeze protection.
Ht 1	Reason: Sensor 1 temperature above the temperature set in [F04]. Overheating protection.
PPP	Actions: Contact the technician responsible for the installation.
ECL	Actions: Contact the technician responsible for the installation.

8. INSTALLATION

8.1 MOUNTING ON A DIN RAIL

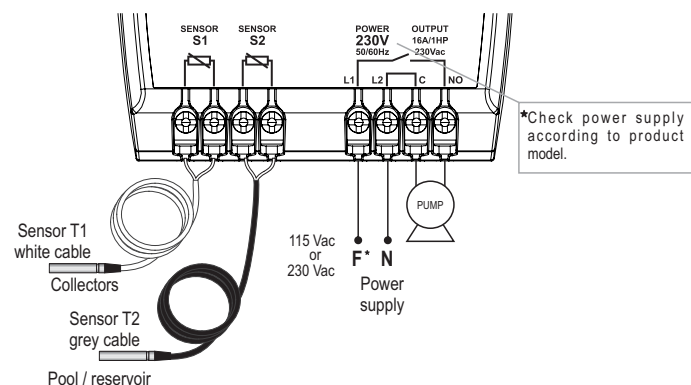


8.2 BOLT FASTENING (OVER)

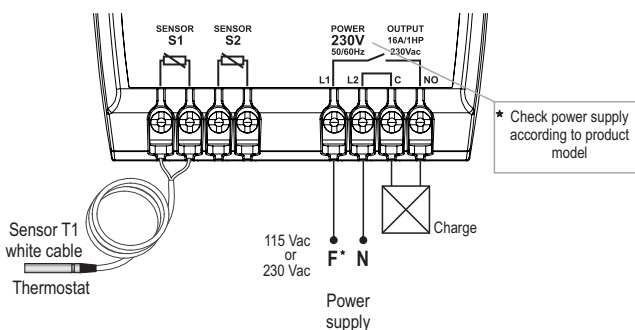


8.3 ELECTRICAL CONNECTIONS

8.3.1 Differential Mode (Solar Heating)



8.3.2 Thermostat mode



IMPORTANT

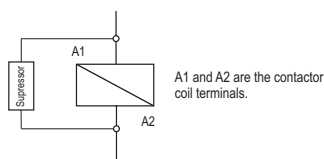
As instructed by standard NBR 5410:

1: Install surge protectors on the power supply.

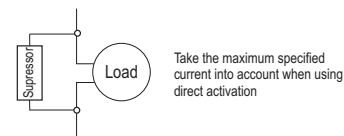
2: Sensor and computer signal cables can be together, however not in the same cable chute of power supply and load cables.

3: Install transient suppressors (RC filter) in parallel to the loads, as a way to increase the working life of the relays.

Wiring diagram for suppressors in the contactors



Wiring diagram for suppressors on direct loads



ENVIRONMENTAL INFORMATION

PACKAGING:

Full Gauge products use packaging made from entirely recycled materials. Please dispose of it through specialized recyclers.

PRODUCTO:

The components used in Full Gauge controllers can be recycled and reused if they are dismantled by specialists.

DISPOSAL:

Do not burn or throw away controllers in the domestic waste, once they have reached the end of their working life. Observe the existing legislation in your region regarding the disposal of electronic waste. If you have any questions, contact Full Gauge Controls.

WARRANTY - FULL GAUGE CONTROLS

Products manufactured by Full Gauge Controls, from May 2005, have a warranty period of 02 (two) years direct from the factory and 01 (one) year from accredited retailers, starting from the consignment date on the sales invoice. After this year, the warranty will continue to be honored for purchases from retailers if the device is sent directly to Full Gauge Controls. This period is valid in Brazil. Other countries provide a guarantee for 2 years. The products are guaranteed in the event of a manufacturing fault that makes them unsuitable or inappropriate for the uses to which they were intended. The warranty is limited to the maintenance of devices manufactured by Full Gauge Controls, regardless of any other form of costs, such as any indemnity due to damage caused to other equipment.

WARRANTY EXCEPTIONS

The Warranty does not cover transport and/or insurance costs for sending products believed to have defects or to have malfunctioned to Technical Support. The following events are also not covered: natural wear of parts, external damage caused by falls or improper packing of products.

LOSS OF WARRANTY

The product will automatically no longer be covered if:

- The instructions for use and assembly contained in the technical description and installation procedures listed in the NBR5410 standard are not observed;
- It is subjected to conditions beyond the limits specified in its technical description;
- If it is breached or repaired by a person who is not part of Full Gauge Controls technical team;
- The damage which has taken place was the result of a fall, blow or impact, water damage, electrical surge or atmospheric discharge.

USING THE WARRANTY

To take advantage of the warranty, the customer must send the product properly packed, together with the corresponding purchase invoice, to Full Gauge Controls. The delivery cost for the product is borne by the client. You will also need to send as much information as possible regarding the defect that has been detected, thus making it possible to streamline the analysis, testing and servicing.

These processes and any eventual maintenance of the product will only be carried out by Full Gauge Controls Technical Support, at the Company's head office - Rua Júlio de Castilhos, 250 - Zip Code 92120-030 - Canoas - Rio Grande do Sul - Brazil.

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