MICROSOL II *plus*
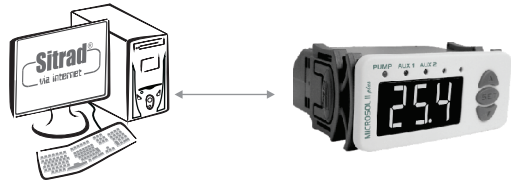
DIFFERENTIAL TEMPERATURE CONTROLLER FOR SOLAR HEATING WITH TWO SOLAR BACKING

Ver.06

1 - DESCRIPTION

Differential temperature controller for automation of solar heating systems, **MICROSOL II *plus*** becomes simple the management of the temperature of the water in the thermal reservoirs and swimming pools, use the solar energy better. It has functions that prevent the water overheating and freezing in the tubings.

It acts in the command of the water circulation pump through the differential of temperature between the solar collectors and the thermal reservoir or swimming pool. It makes use of two solar backing outputs, that can be electric, gas, diesel or also to program the filtering of the swimming pool. Output AUX2 can also be used to program pool filtration or as thermostat for water circulation in the keg so the hot water takes less time to reach the consumption point, thus wasting less water. In addition, it features a real time scheduler that allows programming a weekly schedule with up to four daily events and a clock with internal battery to guarantee its synchronism, even in the energy lack, for a few months.

It is a dedicated instrument that has all its parameters of configuration protected by access code.

2 - APPLICATION

• Solar heating pumped systems

3 - TECHNICAL SPECIFICATIONS

- **Power supply:** Microsol II plus: 115 or 230Vac ± 10% (50/60Hz)
  Microsol II L plus: 12 or 24Vac/dc
- **Control temperature:** Sensor 1: -50 to 200°C / -58 to 392°F
  Sensors 2 and 3: -50 to 105°C / -58 to 221°F
- **Resolution:** 0.1°C between -10 and 100°C and 1°C in the rest of the range
  1°F in all range
- **Dimensions:** 71 x 28 x 71mm
- **Operating temperature:** 0 to 50°C / 32 to 122°F
- **Operating humidity:** 10 to 90% RH (without condensation)
- **Sensors: MICROSOL II *plus*** has three sensors:
  Sensor 1 - Panels (or solar collector) - Metal capsule - Silicone
  Sensor 2 - Pool (or thermal reservoir) - Plastic capsule - PVC
  Sensor 3 - Sensor for control of solar backings - Plastic capsule - PVC
- **Control outputs:** PUMP - Water pump or solenoid - 5(3)A / 250Vac 1/8HP
  It has 2 outputs for solar backing (support system)
  AUX1 - Solar backing 1 - 5(3)A / 250Vac 1/8HP
  AUX2 - Solar backing 2 - 5(3)A / 250Vac 1/8HP

What are solar backing (or support systems)? hey work as backup for the solar heating system on rainy and cold days. Usually they are gas burners, electric heaters, or heat exchangers (heat pump). If the solar heating is not sufficient to heat the water (either from the thermal reservoir and the pool), the solar backings are activated to warm it. Remembering that the SENSOR 3 is responsible for driving the solar backings (support systems). This controller is equipped with an internal circuit, which assures clock synchronization in the event of power outage for a period of 24 hours. However, it should initially be charged for a period of 10 hours or whenever the equipment remains off for a period of over 24 hours.

4 - ADVANCED SETTINGS

IMPORTANT - How to adjust the temperature of the swimming pool or the reservoir?

Hold the `SET` key for 5 seconds until it display `HL2`. This parameter enable to set the desired temperature of the swimming pool or the reservoir.

4.1 - To access the options menu

Press `▽` and `△` simultaneously for two seconds until it appears `SEL`, then releasing it. When appears `Cod` press `SET` (tap) and enter the code (123) through keys `▽` and `△`. To confirm, press the key `SET`. Through the keys `▽` and `△` access the other functions and proceed in the same manner to adjust them. To leave the menu and return to normal operations, press `- - -`(long hit) until `SET` appears.

4.2 - Options

`Cod` Access code entry
`Fun` Advanced configuration functions
`Mod` Events planner operating mode
`Pro` Scheduling in the events planner
`CLo` Adjustment of the clock and the day of the week

4.2.1 - Settings parameters

Fun	Description	CELSIUS				FAHRENHEIT			
		Min	Max	Unit	Standard	Min	Max	Unit	Standard
F01	Indication of the preferential temperature	0	3	-	1	0	3	-	1
F02	Differential for turning on the water circulation pump	1.0	40.0	°C	8.0	1	72	°F	14
F03	Differential for turning off the water circulation pump	1.0	40.0	°C	4.0	1	72	°F	7
F04	Minimum temperature at S1 to switch on the pump	-50.0	200	°C	-50.0	-58	392	°F	-58
F05	Pump switch on delay	0	999	sec.	0	0	999	sec.	0
F06	Negative differential (S1-S2) to switch on the pump to dissipate heat	-40.0	0.0	°C	0.0	-72	0	°F	0
F07	Minimum temperature at S2 to allow activating heat dissipation	0.0	105	°C	105	32	221	°F	221
F08	Antifreeze S1 to switch on the pump	-18	10.0	°C	8.0	-1	50	°F	46
F09	Antifreeze hysteresis	0.1	20.0	°C	5.0	1	36	°F	9
F10	Minimum antifreeze time	0	999	sec.	0	0	999	sec.	0
F11	Overheating temperature S1 to switch off the pump	0.0	200	°C	90.0	32	392	°F	194
F12	Overheating hysteresis to switch on the pump	0.1	20.0	°C	1	1	36	°F	1
F13	Overheating temperature S2 to switch off the pump	0.0	105	°C	105	32	221	°F	221
F14	Overheating hysteresis to switch on the pump (S2)	0.1	20.0	°C	1.0	1	36	°F	1
F15	Solar backing 1 operating mode	0	1	-	0	0	1	-	0

F16	Solar backing 1 temperature setpoint	-50.0	105	°C	35.0	-58	221	°F	95
F17	Solar backing 1 activation hysteresis	0.1	20.0	°C	1.0	1	36	°F	1
F18	Minimum value for solar backing 1 temperature setpoint	-50.0	105	°C	-50.0	-58	221	°F	-58
F19	Maximum value for solar backing 1 temperature setpoint	-50.0	105	°C	105	-58	221	°F	221
F20	Solar backing 1 manual activation time	0	999	min.	0	0	999	min.	0
F21	Solar backing 2 operating mode	0	8	-	1	0	8	-	1
F22	Solar backing 2 temperature setpoint	-50.0	105	°C	30.0	-58	221	°F	86
F23	Solar backing 2 activation hysteresis	0.1	20	°C	1.0	1	36	°F	1
F24	Minimum value for solar backing 2 temperature setpoint	-50.0	105	°C	-50.0	-58	221	°F	-58
F25	Maximum value for solar backing 2 temperature setpoint	-50.0	105	°C	105	-58	221	°F	221
F26	Solar backing 2 manual activation time	0	999	min.	0	0	999	min.	0
F27	Cyclic timer on time	1	999	min.	1	1	999	min.	1
F28	Cyclic timer off time	1	999	min.	1	1	999	min.	1
F29	Event schedule linking mode	0	3	-	0	0	3	-	0
F30	Minimum S1 temperature alarm	-50.0	200	°C	-50.0	-58	392	°F	-58
F31	Maximum S1 temperature alarm	-50.0	200	°C	200	-58	392	°F	392
F32	S1 temperature indication offset	-5.0	5.0	°C	0.0	-9	9	°F	0
F33	S2 temperature indication offset	-5.0	5.0	°C	0.0	-9	9	°F	0
F34	S3 temperature indication offset	-5.0	5.1	°C	0.0	-9	10	°F	0
F35	Water pump activation mode	OFF	Aun	-	Aun	OFF	Aun	-	Aun
F36	RS-485 network address	1	247	-	1	1	247	-	1

4.2.1.1 - Parameters description

F01 Indication of the preferential temperature
It allows the preferential temperature indication to be configured. You may choose between:

- `t-1` Shows the panel temperature (solar collector);
- `t-2` Shows the swimming pool or thermal tank (bath) temperature;
- `t-3` Shows the solar backings temperature (support systems);
- `dIF` Shows the difference (°C) between the solar panel (sensor 1) and the swimming pool or thermal tank (sensor 2).

F02 Differential for turning on the water circulation pump
Allows configuring the temperature difference in degrees between sensor 1 and sensor 2 for **MICROSOL II *plus*** to turn on the water circulation pump.

F03 Differential for turning off the water circulation pump
Allows configuring the temperature difference in degrees between sensor 1 and sensor 2 for **MICROSOL II *plus*** to turn off the water circulation pump.
Exemple:
F02= 8.0
F03= 4.0
When sensor 1 (panel) is at 35°C and sensor 2 (swimming pool or tank) is at 23°C, the difference is 12ºC, thus the circulation pump must be on (35-23 = 12, more than 8). With time the difference between sensor 1 and sensor 2 tends to decrease. Thus when the difference between sensor 1 and sensor 2 reaches 4ºC (function F03), the circulation pump will be turned off (35-31 = 4).
The thermostat panel has an indicator LED "**PUMP**" (upper left). When the LED is on, the pump is on. When the LED "**PUMP**" is off, the pump is off.

F04 Minimum temperature at S1 to switch on the pump
Prevents the pump from being turned on when the temperature of the panel (collector) is below the required temperature, thus preventing warm or cold water from circulating through the system, which would cause higher power consumption. To deactivate this function, just decrement the value until the message `OFF` is displayed.

F05 Pump switch on delay
This function protects the pump from burning out in case of power fault (counts the time in seconds).
Example: When there is a power fault and the power is restored immediately after, **MICROSOL II *plus*** will first count the time programmed in function F05 before activating the circulation pump. This function also helps to reduce the voltage surge that can happen in the protection devices (circuit breakers) when activating many loads at the same time.

F06 Negative differential (S1-S2) to switch on the pump to dissipate heat
If the temperature in the tank or swimming pool is too high, **MICROSOL II *plus*** turns the circulation pump on (even if the water in the panels is cool) to cool the consumption water a little (swimming pool or thermal tank).To deactivate this function, just increase the value until the message `OFF` is displayed.

F07 Minimum temperature at S2 to allow activating heat dissipation
As a safety measure, the user can use this function to configure the minimum temperature at sensor 2 to dissipate heat. To deactivate this function, just increase the value until the message `OFF` is displayed.

F08 Antifreeze S1 to switch on the pump
The technician uses this function to configure a temperature value to prevent the panels from freezing (in cold regions). When sensor 1 reaches the programmed temperature, the circulation pump is turned on. To deactivate this function, just decrement the value until the message `OFF` is displayed.

F09 Antifreeze hysteresis
The temperature difference in sensor 1 (panel) for the antifreeze to be turned off.
Example:
F08= 5.0
F09= 1.0 difWhen sensor 1 measures 5°C (function F08), it will interpret that the temperature is dangerous and can freeze the panels. It activates the circulation pump so that a little warm water from the pool or tank passes through the panels. Thus, after raising 1°C (function F09), the temperature reaches 6ºC and the pump is turned off (5+1=6).

F10 Minimum antifreeze time
This minimum pump on time is a safety measure to ensure that the water can pass through all the panels. This function is frequently used in large installations due to the number of panels required.

F11 **Overheating temperature S1 to switch off the pump**
Allows configuring the temperature for sensor 1 (panels) to turn the pump off to prevent damages in PVC piping by not allowing hot water to circulate.

F12 **Overheating hysteresis to switch on the pump**
Temperature difference to turn the circulation pump on again.
Example: F11= 80°C and F12= 10°C. The circulation pump will be turned off when sensor 1 reaches 80°C. When the temperature drops and reaches 70°C, the circulation pump is turned on again (80 - 10 = 70).

F13 **Overheating temperature S2 to switch off the pump**
Required temperature for the swimming pool. It is the value at which the circulation pump will be turned off.

F14 **Overheating hysteresis to switch on the pump (S2)**
Temperature difference to heat the swimming pool again.
Example:
F13= 28.0 and F14=1.0. This way the swimming pool will be heated until reaching 28°C. After reaching this value the pump will be turned off. When the temperature drops to 27°C the swimming pool will be heated again (28 - 1 = 27).

F15 **Solar backing 1 operating mode**
The user can use this function to configure whether the auxiliary systems will be independent from each other. The modes are:
- **0** Solar backing 1 working independently of the support 2
- **1** Solar backing 1 deactivated when the solar backing 2 is activated

If programmed to 1, this function allows turning off the gas support system (connected to support 1) and turning on support 2 (electric heater) automatically. The support systems will never work together.

F16 **Solar backing 1 temperature setpoint**
Temperature to turn off the solar backing 1.

F17 **Solar backing 1 activation hysteresis**
Temperature difference to turn on the solar backing 1.
Exemple: F16= 30.0 and F17=1.0
The solar backing turns on at 29° C and turns off at 30º C (30 - 1 = 29)
It should be noted that the first support system is linked to an event schedule (acts in accordance with user-defined times for up to four daily events). Therefore the times must be programmed for this support to work properly.

F18 **Minimum value for solar backing 1 temperature setpoint**

F19 **Maximum value for solar backing 1 temperature setpoint**
Functions F18 and F19 are only limits to configure F16 (setpoint temperature for support 1). They are used to block the setpoint if an out-of-range value is wrongly programmed.

F20 **Solar backing 1 manual activation time**
If the user activates the solar backing 1 manually, **MICROSOL II** *plus* will count the time configured in this functions and then return to automatic mode.

F21 **Solar backing 2 operating mode**
The user can chose the operation mode for solar backing 2.
- **0** Cooling thermostat
- **1** Heating thermostat
- **2** Cooling thermostat linked to the event schedule
- **3** Heating thermostat linked to the event schedule
- **4** Cyclic timer with initial state "ON"
- **5** Cyclic timer with initial state "ON" linked to the event schedule
- **6** Cooling thermostat for heat dissipation to reduce any excess temperature in the water tank.
- **7** Heating thermostat of the water line
- **8** Heating thermostat of the water line linked to the event schedule

When the thermostat mode is selected for the water line heating, the supports are controlled by different sensors. Support 2 is controlled by sensor 3 while support 1 continues to be controlled by sensor 2. For this, sensor 3 must be enabled in F34. In the other thermostat functions, both supports are controlled by the same sensor. If sensor 3 is disabled (F34=OFF), both supports are controlled by sensor 2, or else they are controlled by sensor 3, if it is enabled.

F22 **Solar backing 2 temperature setpoint**
Temperature desired for the pool (or thermal reservoir), as well as the function F13.

F23 **Solar backing 2 activation hysteresis**
Temperature difference to turn on the solar backing 2 heating again.
Exemple: F22= 30.0 and F23=1.0
The auxiliary system turns on at 29ºC and turns off at 30ºC (30 - 1 = 29)
This example is valid only if function F21 is configured to 1.

F24 **Minimum value for solar backing 2 temperature setpoint**
F25 **Maximum value for solar backing 2 temperature setpoint**
Functions F24 and F25 are only limits to configure F22 (setpoint temperature for solar backing 2). They are used to block the setpoint if an out-of-range value is wrongly programmed.

F26 **Solar backing 2 manual activation time**
If the user activates the support 2 manually, **MICROSOL II** *plus* will count the time configured in this function and then return to automatic mode.

F27 **Cyclic timer on time**
F28 **Cyclic timer off time**
Functions F27 and F28 work when the user configures the solar backing 2 to filter the swimming pool. Then Microsol will cycle (on time and off time) the filter system.
If function F21 is programmed to 4 or 5, the solar backing 2 will cycle in accordance with the times programmed in F27 (on time) and F28 (off time).

F29 **Event schedule linking mode**
This function allows the user to configure whether the auxiliary system 2 must work in conjunction with auxiliary system 1 or not.
If support 2 is programmed as linked to the schedule of support 1 (F21=2 or F21=3), this function will inform for which events (times) the support systems must be activated.

0 Aux 1 linked to events 1, 2, 3 and 4	**2** Aux 1 linked to events 1 and 2
Aux 2 linked to events 1, 2, 3 and 4	Aux 2 linked to events 3 and 4
1 Aux 1 linked to event 1	**3** Aux 1 linked to events 1, 2 and 3
Aux 2 linked to events 2, 3 and 4	Aux 2 linked to event 4

F30 **Minimum S1 temperature alarm**
Minimum solar panel temperature to activate the alarm.

F31 **Maximum S1 temperature alarm**
Maximum solar panel temperature to activate the alarm.
This alarm is visual, shown in the display of **MICROSOL II** *plus* as the message **AH1**.

F32 **S1 temperature indication offset**
This function allows adjusting (or correcting) any deviation in the reading of sensor 1 caused by an increase (splice) in the sensor cable or occasional replacement, only if required.

F33 **S2 temperature indication offset**
This function allows adjusting (or correcting) any deviation in the reading of sensor 2 caused by an increase (splice) in the sensor cable or occasional replacement, only if required.

F34 **S3 temperature indication offset**
This function allows adjusting (or correcting) any deviation in the reading of sensor 3 caused by an increase (splice) in the sensor cable or occasional replacement, only if required.
To disable the temperature sensor for the solar backing systems (sensor 3), access this function in the advanced function menu. Then press the key ▲ successively until the message **OFF** is displayed. Press **SET** to confirm. After sensor 3 is disabled, solar backing 1 and 2 will be controlled by sensor 2 (tank/swimming pool).
If the activation of the water pump is linked to sensor 3 and this sensor is disabled, the controller will automatically unlink them.

F35 **Water pump activation mode**
It allows to set the operation mode of the water circulation pump, the options are:
- **OFF** Water pump always OFF
- **On** Water pump always ON
- **Aun** Circulation pump operating in automatic mode and not linked to sensor 3.
  With this mode the pump is activated only by the temperature differential (S1-S2).
- **AuA** Circulation pump operating in automatic mode and linked to sensor 3. With this mode the pump is activated by the temperature differential and when the temperature at sensor 1 is higher than that at sensor 3.

F36 **RS-485 network address**
Equipment's network address for communicating with SITRAD® software.
Note: it is not allowed to have more than one device with the same address in a network.

4.2.2 - Events schedule operating mode
In this option, you can choose how the events planner will operate.
- **1b1** **Weekly programming** - In this mode, the instrument can configure up to 4 events for every day of the week.
- **2t6** **Programming for business days** - In this mode, the instrument keeps the events the same for business days (Monday through Friday), and allows the programming of different events for Saturday and Sunday.
- **1t7** **Daily programming** - In this mode, the instrument keeps the events the same for all of the days of the week.

4.2.3 - Programming of the events schedule
In this option, you can enter the values for the time periods for each event. The entry of the data depends on the operating mode configured. You can configure up to four events for each day. For each event, the start and end time are configured through the options **On1** **OF1** up to **On4** **OF4**, where:
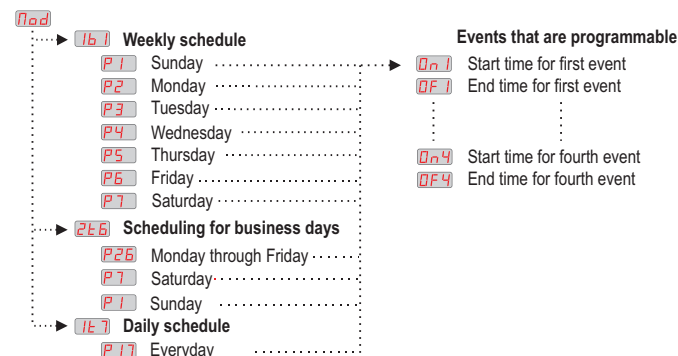
On1 Start time for the first event
OF1 End time for the first event

On4 Start time for the 4º event
OF4 End time for the 4º event

If you do not need to use the four events, you can configure it to be deactivated, and all you have to do is increase the off time (**OF1** for example) until the **OFF** indication appears. It is also possible to configure an event to overlap that it begins in one day and it finishes in the other, and for that you should increase the off time until the option **Cro** appears and adjust an event for the next day to start at 00h and 00min. According to the operating mode configured, the following scheduling possibilities may be presented.

Mod
▶ **1b1** **Weekly schedule** | **Events that are programmable**
- **P1** Sunday ▶ **On1** Start time for first event
- **P2** Monday | **OF1** End time for first event
- **P3** Tuesday
- **P4** Wednesday
- **P5** Thursday | **On4** Start time for fourth event
- **P6** Friday | **OF4** End time for fourth event
- **P7** Saturday

▶ **2t6** **Scheduling for business days**
- **P26** Monday through Friday
- **P7** Saturday
- **P1** Sunday

▶ **1t7** **Daily schedule**
- **P17** Everyday

4.2.4 - Adjustment of the current time and day of the week
Press the key ▲ until the message **CLo** appears in the visor.
Hit key **SET**. The settings will appear in the following order:

HOURS ➡ MINUTES ➡ DAY OF THE WEEK

Ex.: 12h43min - Friday
- **12h** Hours
- **43'** Minutes
- **6** Day of the week

NOTE: Should the controller remain off for more than 24 hours, the message **CLo** will flash on the display, indicating that the clock is no longer programmed, a function of the discharge circuit internal. In this case, simply adjust the controller clock. If this happens, the controller should remain powered on for 10 hours so that the internal circuit fully recharges.

5 - FACILITATED ACCESS MENU

5.1 - Solar backing 1 manual activation

Keep pressing the key ▽ for 5 seconds until the message `AA1` appears in the display. Then release the key to activate or deactivate manually the solar backing 1 output. The operation of turning on or off will be confirmed by the messages `On` or `OFF` respectively.
To disable the manual activation just configure the function F20 to `000`.

5.2 - Solar backing 2 manual activation

Keep pressing the key △ for 5 seconds until the message `AA2` appears in the display. Then release the key to activate or deactivate manually the solar backing 2 output. The operation of turning on or off will be confirmed by the messages `On` or `OFF` respectively.
To disable the manual activation just configure the function F26 to `000`.

5.3 - Solar backing 1 desired temperature (setpoint)

Keep pressing the key ▽ for 10 seconds until the message `SP1` appears in the display. Then release the key to set the temperature setpoint of solar backing 1, confirm with the key `SET`.

5.4 - Solar backing 2 desired temperature (setpoint)

Keep pressing the key △ for 10 seconds until the message `SP2` appears in the display. Then release the key to set the temperature setpoint of solar backing 2, confirm with the key `SET`.

5.5 - Setting the overheating temperature 2

Keep pressing the key `SET` for 5 seconds until the message `HE2` appears in the display.
Then release the key to set the overheating temperature for sensor 2.
This shortcut is used when **MICROSOL II** *plus* is installed for swimming pool heating control. In this case, the function adjusts the maximum temperature of the swimming pool for comfort.

5.6 - Setting the water pump activation mode

Keep pressing the key `SET` for 10 seconds until the message `PAP` appears in the display.
Then release the key to adjust the water pump activation mode. The options are:

`OFF` Water pump always OFF
`On` Water pump always ON
`Aun` Circulation pump operating in automatic mode and not linked to sensor 3. With this mode the pump is activated only by the temperature differential (S1-S2).
`AuA` Circulation pump operating in automatic mode and linked to sensor 3. With this mode the pump is activated by the temperature differential and when the temperature at sensor 1 is higher than that at sensor 3.

6 - QUICK VIEW

6.1 - View other temperatures

To switch between the temperature views for sensor 1, sensor 2, sensor 3 or temperature difference between sensors 1 and 2 (differential temperature), press ▽ til the desired temperature is displayed.

`t-1` Sensor 1 temperature
`t-2` Sensor 2 temperature
`t-3` Sensor 3 temperature
`d.iF` Differential temperature (S1-S2)

The selected temperature will be displayed for 15 seconds and then the default indication returns (as per `F01` parameter setting).

6.2 - Visualize the current time

Quickly pressing the key `SET`, you can visualize the time set in the controller, the current time will be shown, followed by the minutes and then the day of the week.

Ex.: 12h43min - Friday
`12h` Hours
`43'` Minutes
`6` Day of the week

6.3 - View maximum and minimum temperatures

Pressing the △ key enables viewing the maximum and minimum temperature for each sensor, as well as the maximum and minimum temperature differentials. Upon pressing the key △ (short touch) the message `t-1` will be displayed to indicate sensor 1 temperature and then its maximum and minimum temperatures will be displayed, then the temperatures for sensor 2 (`t-2`), sensor 3 (`t-3`), and differential (`d.iF`) will be displayed in sequence.
If the key △ is pressed during the visualization, the values will be reset and the message `-St` will be displayed.

7 - SIGNALING

`Er1` Sensor 1 (solar panel) disconnected or temperature out of range (-50° C or + 200° C), also check if the sensor is connected to **MICROSOL II** *plus* terminals 3 and 4.
`Er2` Sensor 2 (tank or swimming pool) disconnected or temperature out of range (-50° C or + 105° C), also check if the sensor is connected to **MICROSOL II** *plus* terminals 4 and 5.
`Er3` Sensor 3 (solar backing/support systems) disconnected or temperature out of range (-50° C or + 105° C), also check if the sensor is connected to **MICROSOL II** *plus* terminals 4 and 6.
`Er4` If there is a problem with sensor 1 or sensor 2 and function `F01` is with `d.iF` value, then the message `Er4` will be displayed, giving an alarm to indicate that it is unable to calculate the differential between sensor 1 and sensor 2.
`ICE` Indicates that **MICROSOL II** *plus* is activating the antifreeze system. The alarm indication terminates when the normal operation resumes.
`HE1` Sensor 1 has identified panel (collector) overheating
`HE2` Sensor 2 has identified swimming pool (thermal tank) overheating
`PPP` Some parameter is invalid
`On` Circulation pump activated in manual mode
`OFF` Circulation pump turned off in manual mode
`AH1` Sensor 1 (panel) temperature too high
`ALO` Sensor 1 (panel) temperature low
`CLo` Alternating with the temperature, clock deprogrammed
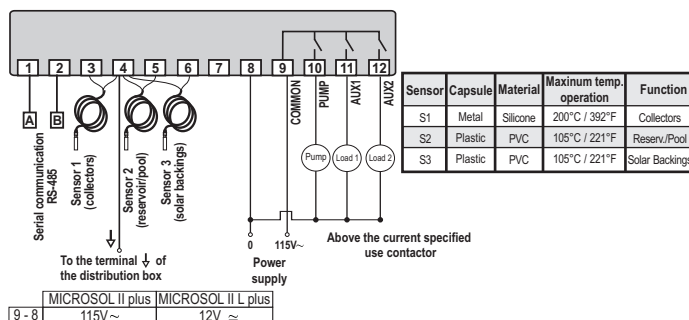`AA2` Auxiliary system 2 activation alarm

8 - UNIT SELECTION (°C / °F)

To define the unit that the system will use to operate, enter into the functions menu `Cod` using the access code "231" and confirm it by hitting key `SET`. The indication `Uni` will appear, press ▽ or △ to choose between: `°C` or `°F` and confirm with key `SET`. After selecting the unit the `FAC` message will appear, and the instrument will return to the function `Cod`. Whenever the unit is altered, the parameters relating to the temperature must be reconfigured, since they assume "standard" values.

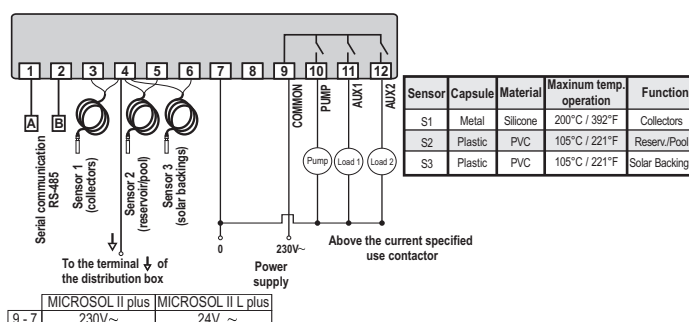# 9 - ENABLE / DISABLE THE FACILITATED ACCESS FUNCTIONS

To deactivate or reactivate the functions of facilitated acces (item 5) just press the ▽ and △ keys simultaneously for 10 seconds until the message `On` (on) or `OFF` (off) on display.

10 - WIRING DIAGRAM

10.1 - Wiring diagram for 115Vac
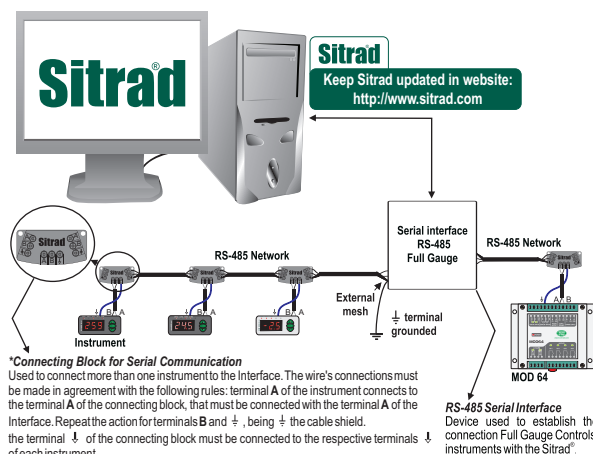

Sensor	Capsule	Material	Maximum temp. operation	Function
S1	Metal	Silicone	200°C / 392°F	Collectors
S2	Plastic	PVC	105°C / 221°F	Reserv./Pool
S3	Plastic	PVC	105°C / 221°F	Solar Backings

	MICROSOL II plus	MICROSOL II L plus
9 - 8	115V ~	12V ≃

10.2 - Wiring diagram for 230Vac

Sensor	Capsule	Material	Maximum temp. operation	Function
S1	Metal	Silicone	200°C / 392°F	Collectors
S2	Plastic	PVC	105°C / 221°F	Reserv./Pool
S3	Plastic	PVC	105°C / 221°F	Solar Backings

	MICROSOL II plus	MICROSOL II L plus
9 - 7	230V ~	24V ≃

Note: The sensor cable length can be increased by the user until 200 meters using PP 2 x 24 AWG cable.

11 - INTEGRATING CONTROLLERS, RS-485 SERIAL INTERFACE AND COMPUTER

Sitrad

Keep Sitrad updated in website: http://www.sitrad.com

Serial interface RS-485 Full Gauge

RS-485 Network

External mesh

⏚ terminal grounded

Instrument

MOD 64

RS-485 Serial Interface
Device used to establish the connection Full Gauge Controls' instruments with the Sitrad®.

*Connecting Block for Serial Communication
Used to connect more than one instrument to the Interface. The wire's connections must be made in agreement with the following rules: terminal **A** of the instrument connects to the terminal **A** of the connecting block, that must be connected with the terminal **A** of the Interface. Repeat the action for terminals **B** and ⏚ , being ⏚ the cable shield.
the terminal ⏚ of the connecting block must be connected to the respective terminals ⏚ of each instrument.
*Sold Separately

IMPORTANT
According to the chapters of norm IEC 60364:
1: Install protector against overvoltage on the power supply.
2: Sensor cables and signal cables of the computer may be joined, but not in the same electric conduit through which the electric input and the activation of the loads run.
3: Install transient suppressors (RC filters) parallel to the loads as to increase the product life of the relays.

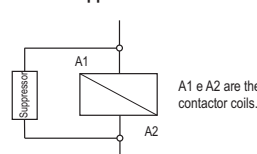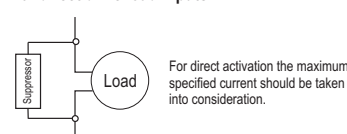**Contact suppressor connection diagram**

A1 e A2 are the contactor coils.

Diagram for suppressor installation for direct drive load inputs

For direct activation the maximum specified current should be taken into consideration.

Suppressors on offer from Full Gauge Controls

ENVIRONMENTAL INFORMATION

Package:
The packages material are 100% recyclable. Just dispose it through specialized recyclers.

Products:
The electro components of Full Gauge controllers can be recycled or reused if it is disassembled for specialized companies.

Disposal:
Do not burn or throw in domestic garbage the controllers which have reached the end-of-life. Observe the respectively law in your region concerning the environmental responsible manner of dispose its devices. In case of any doubts, contact Full Gauge controls for assistance.

PROTECTIVE VINYL:
This adhesive vinyl (included inside the packing) protects the instruments against water drippings, as in commercial refrigerators, for example. Do the application after finishing the electrical connections.

Remove the protective paper and apply the vinyl on the entire superior part of the device, folding the flaps as indicated by the arrows.

Dimension of the clipping for setting of the instrument in panel

29 mm

72 mm