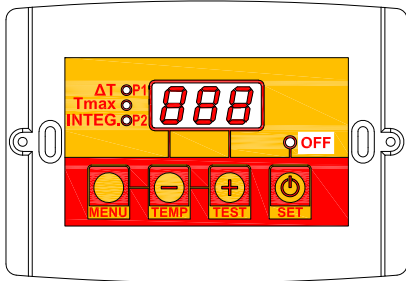


## ELECTRONIC CONTROL UNIT FOR FORCED CIRCULATION SOLAR SYSTEMS

### OPERATING INSTRUCTIONS



**SUPPLY VOLTAGE:** 230 Vac - 50 Hz  
**POWER CONSUMPTION:** 2 W  
**DIMENSIONS:** 120 x 80 x 50 (mm)

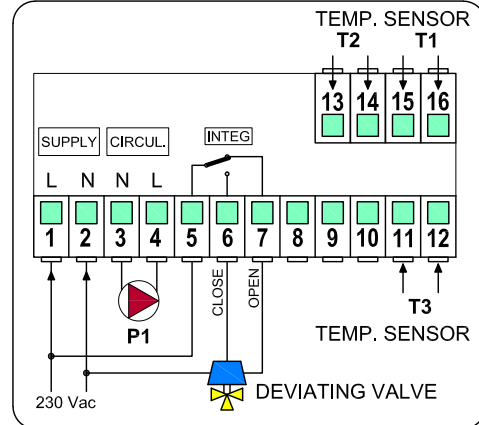
### Mod. CS2CF in-box type Mod. CS4CF wall type

#### Functioning leds

- ΔT** ◦ P1 Solar circuit circulator
- T max** ◦ Max storage temperature
- INTEG** ◦ Integration

The **electronic unit CS2(4)CF** is designed to control forced circulation solar systems with storage tanks. Its large versatility permits a wide range of configurations of the plants. The display shows the temperature detected by the sensors and led lights show connected devices and signal failures.

### ELECTRICAL BOARD





INPUTS	T1	Temp. Sensor in solar panel	Temperature Range -50 + 250 °C	Type NTC 100 kΩ at 25 °C		
	T2, T3	Temp. Sensor in storage tank	Temperature Range -50 + 100 °C	Type NTC 100 kΩ at 25 °C		
	LINEA IN	Supply voltage 230 Vac				
OUTPUTS	POMPA	With control unit ON, 230 Vac ( 5 A max )		3 (N)	4 (L)	
	INTEG	Additional heating source	Free potential terminals ( 5 A max, 230 V )	5 (COM)	6 (NC)	7 (NO)

The electronic control unit is produced according to the standards EN 60730-1 50081-1 e EN 60730-1 A1 50081-2.

## FUNCTION OF ELECTRONIC CONTROL UNIT CS2CF / CS4CF

### 1. ON/OFF

Push for some seconds  button to switch ON / OFF the controller  
- The state OFF is signaled with the lighting of led  OFF

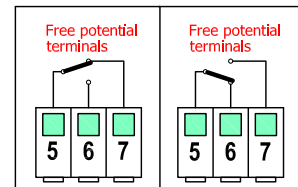
Pushing TEMP button shows in sequence temperature sensors current values.

No dash on the display = sensor T1; one dash high = sensor T2; one dash low = sensor T3.

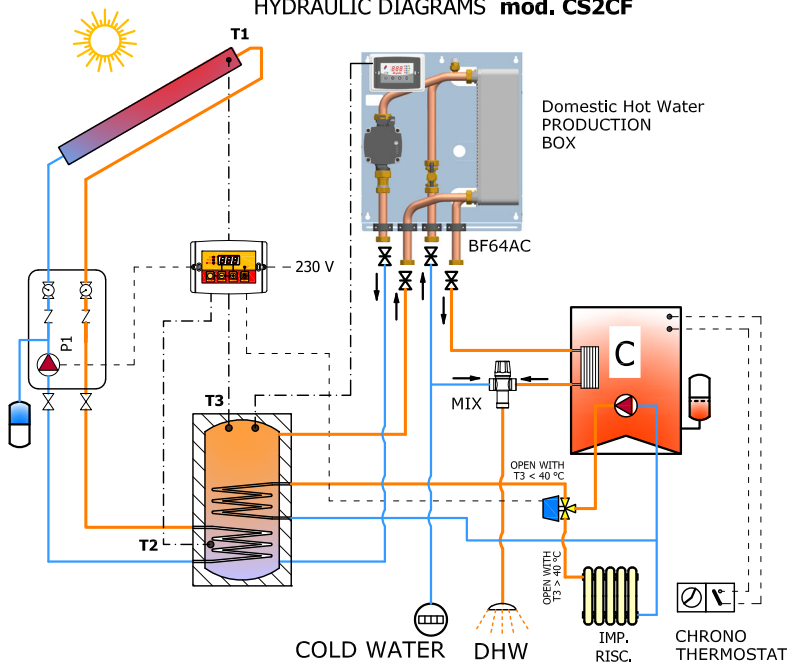
Led on means circulator on or max temperature alarm.

With MENU' button it's possible to see in sequence the values of the 3 thermostats as set in factory (ΔT 5 °C / Tmax 70 °C / Integ 40 °C).

**T3 < 40 °C** (with integration)    **T3 > 40 °C** (without integration)



### HYDRAULIC DIAGRAMS mod. CS2CF



▶ **Circulator P1 in the solar circuit is ON only when T1 - T2 ≥ 5 °C**

▶ **T3 controls the integration. There is integration only when T3 ≤ 40 °C**

▶ **If T3 > 70 °C the Tmax led is ON and the circulator P1 is OFF.**

**T1** Panel temperature sensor: it must be placed in the suitable casing in the panel.

**T2** Storage tank temperature sensor: it must be placed in the lower part of the tank, near the heat exchanger of the solar system.

**T3** Storage tank temperature sensor: it must be placed in the higher part of the tank.

### ICE FUNCTION

If the function is enabled (P06=1), when the temperature in the solar panel (T1) is lower than A03, the circulator P1 turns ON for **t 05** (seconds) and OFF for **t 06** (minutes), until T1 is higher than A03.

### TEST FUNCTION

Pushing the button TEST ⊕ for 5 seconds at least, the circulator P1 turns on for 30 seconds. Pushing again the same button for 5 seconds, the circulator stays on for a longer time **t 08** (minutes); this is useful to fill the system. With a short pushing, the function is disabled.

### WARNING

- Do not match power cables with sensor cables.
- Connect power supply line to a two-pole switch according to current regulations.
- The installation and the electric wiring must be made by a qualified operator according to current regulations.
- Before make electric connections, **be sure that power supply has been switched off.**

### CABLES

It's possible to extend the cables of the sensors up to **15 m**, with a standard cable (2 x 0.50 mm<sup>2</sup>).

### TEMPERATURE SENSORS

The sensors measure the temperature of the fluid in the solar panel and in the storage tank.

N° 1 temperature sensor **T1** cod.SP100N (in the solar panel).

Cap in Stainless steel, cable in silicone, grey color

NTC 100 kΩ ± 3 % at 25 °C

Temperature range: -50 ÷ 250 °C (Measured: 0 ÷ 180 °C)

Response time: 6 s



N° 2 temperature sensors **T2, T3** cod.SA100N (in the storage tank).

Cap in brass, cable in PVC, color green

NTC 100 kΩ ± 3 % at 25 °C

Temperature range: -50 ÷ 100 °C (Measured: 0 ÷ 99 °C)

Response time: 6 s

### SIGNAL FAILURES OR ALARMS

Blinking messages:

- Lo:** sensor T1 - out of range to the low temperature (under 0 °C) **(Sensor broken)**
- Hi:** sensor T1 - out of range to the high temperature (over 190 °C) **(Sensor in short circuit)**
- Lo:** sensor T2 - out of range to the low temperature (under 0 °C) **(Sensor broken)**
- Hi:** sensor T2 - out of range to the high temperature (over 110 °C) **(Sensor in short circuit)**
- Lo:** sensor T3 - out of range to the low temperature (under 0 °C) **(Sensor broken)**
- Hi:** sensor T3 - out of range to the high temperature (over 110 °C) **(Sensor in short circuit)**

In case of overcoming of the safety temperature set for each sensor, a message **Sic** is shown alternately to temperature value.

In case of lowering of the temperature T1 of the solar panel, below the minum value set A03, a message **ICE** is shown alternately to temperature value.

### MAIN MENU

Clicking the button ⊕ (MENU) it is possible to read the values set for the Thermostats - the associated led blinks

To modify a value, choose the wanted thermostat to set and:

- with the button ⊕ SET pushed, push the button ⊕ to increase
- with the button ⊖ SET pushed, push the button ⊖ to decrease

To exit and memorize wait about 5 seconds or browse all the thermostats with the ⊕ (MENU) button

MAIN MENU	SYMBOL	LED	MIN	DEFAULT	MAX	TYPICAL VALUES
Differential thermostat	A31	ΔT (**)	3	5	30	5
Max. tank temperature thermostat	A26	T max	20	70	99	70
Integration - additional source thermostat	A25	INTEG	20	40	90	40

(\*\*) ΔT = T1-T2  
T max = T3 max allowed  
INTEG = free potential terminals for additional heating source

**INSTALLER MENU** (the admission to this menu is only for INSTALLERS or EXPERT PERSONNEL, because modified parameters could make the product not fit for the applications)

To enter the MENU push together buttons ⊖ (TEMP) and ⊕ (TEST) for about 5 seconds

To browse the parameters push ⊕ (MENU)

To visualize the parameter value push button ⊖ (SET)

To modify the value push buttons ⊕ or ⊖ together with button ⊖ (SET)

To see the list of the parameters and memorize push button ⊖ (SET)

To exit and memorize wait about 5 seconds

INSTALLER MENU PARAMETERS	SYMBOL	MIN	DEFAULT	MAX
Solar panel safety temperature (°C)	A02 (T1Sic)	60	120	180
Storage tank safety temperature (°C)	A17 (T2Sic)	60	95	99
Storage tank safety temperature (°C)	A27 (T3Sic)	40	95	99
Solar panel protection temperature (°C)	A04 (T1Pro)	60	140	180
Hysteresis of safety temperatures (°C)	i 10 (iSic)	1	2	15
Hysteresis of protection temperature (°C)	i 04 (iPro)	1	5	30
Hysteresis of differential temperature (°C)	i 31 (iΔ12)	1	2	15
Hysteresis of thermostat T3 (°C)	i 26 (iT3)	1	2	15
Hysteresis of integration thermostat (°C)	i 25 (iT3-min)	1	2	15
ICE Function	P06 (ICE)	0 (off)	0 (off)	1 (on)
Thermostat ICE on T1 (°C)	A03 (T1ICE)	2	3	5
P1 ON time with ICE (sec)	t 05 (timer)	5	10	60
P1 OFF time with ICE (min)	t 06 (timer)	1	20	60
P1 Test time (sec)	t 07 (timer)	5	30	60
P1 filling system time (min)	t 08 (timer)	5	60	255

