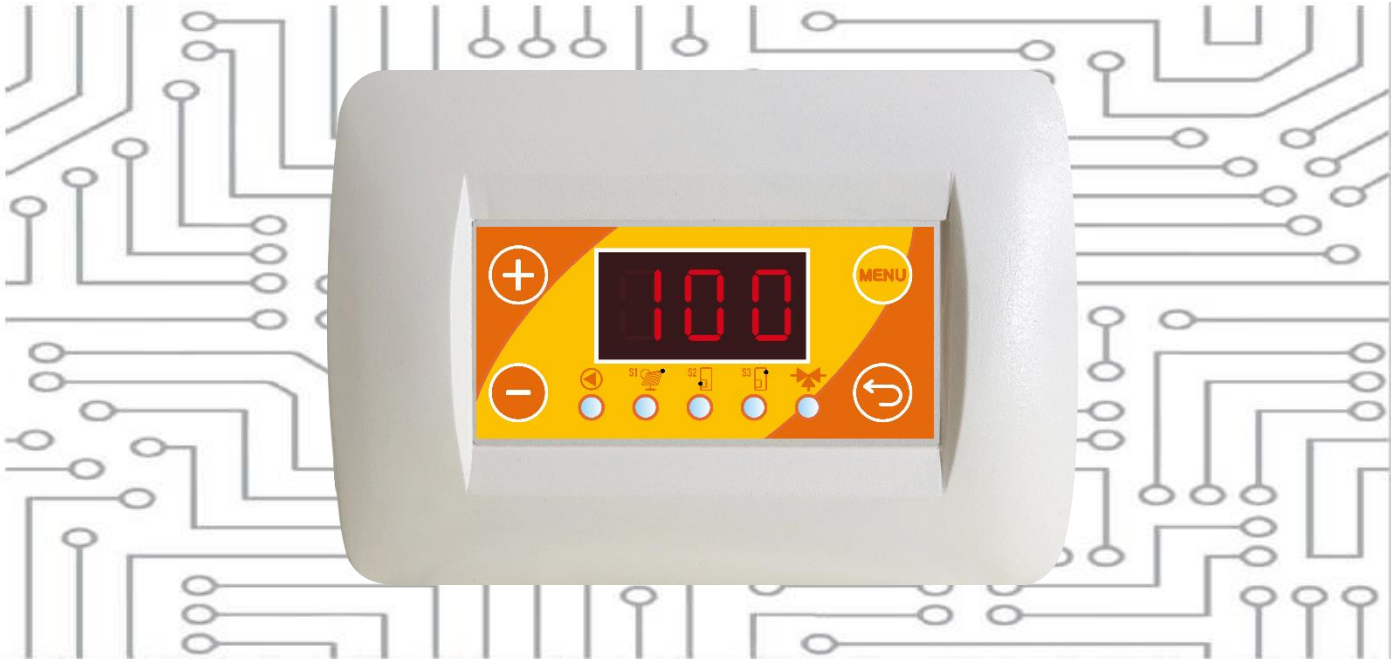


COELSOLAR PWM 3DIN WITH THREE WORKING PROGRAMS



USER MANUAL AND PROGRAMMING INSTRUCTION

Control unit subjected to functionality check.

We declare that the control unit has been functionally testing by an authorized person and must be installed by qualified operators pursuant to the provisions of art. 15 paragraph 9 of Legislative Decree 209/3. COELTE Ltd declines any responsibility for the assembly and use of the control unit according to methods not envisaged by current regulations



Manuale COELsolar
Code: 1630so
Item: 201so

Made by: coelte.net

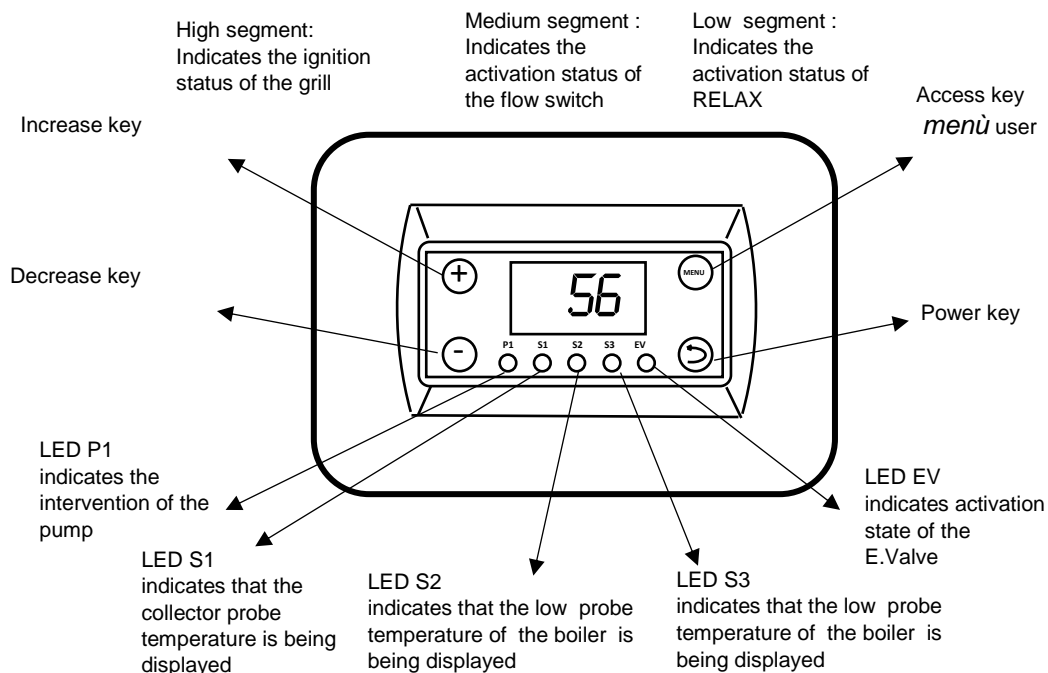
EQUIPMENT DISPOSAL POLICY BY PRIVATE INDIVIDUALS IN THE TERRITORY OF THE EUROPEAN UNION pursuant to article 13 legislative decree 25 July 2005, n.151 "Implementing Directives 2002/95/CE, 2002/96/CE and 2003/108/EC, on the restriction of the use of certain hazardous substances in electric and electronic equipment as well as waste disposal". The crossed-out wheellie-bin symbol (as required by this directive) on the equipment or its packaging, indicates that the end user should segregate the product from other waste at the end-of- life . The user must deliver the equipment that has reached the end of its life to the appropriate collection facilities for electronic and electro-technical waste , or return it to the dealer when purchasing a new equipment of an equivalent type, on a one to one basis. The correct disposal of the equipment for recycling and treatment will help prevent potential negative consequences for the environment and human health and help the re-use and/or recycling of the equipment materials .Illegal dumping of the product by the user involves the application of the administrative sanctions envisaged by current legislation, pursuant to Legislative Decree n. 22/1997 (article 50 and following of the legislative decree n.22/1997)



Enrollment in the EEE Register n° IT19070000011569.

The electronic Control unit COELsolar is characterized by a simple design and provides clear and intuitive controls reading to allow an unprecedented ease of installation and use.

Warning lights and Functions activation



Probes connection

The connection of the probes requires attention in identifying the probe marked by the label SOLAR COLLECTOR PROBE to be connected to terminal 14, corresponding to input S1.

Main Functions

Coelsolar is a device for controlling natural and forced circulation thermal solar systems. The desired program can be selected from a dedicated menu, and the temperatures measured by the probes can be used and controlled according to this.

Programs description

Program	Probes used	Function	Description
1	S1	Suitable for natural circulation systems	Display of the boiler temperature and electro-valve output control
2	S1 S2	Suitable for forced circulation systems	Display of the manifold temperature and differential control of the circulator output Display of the boiler temperature and electro-valve output control
3	S1 S2 S3	Suitable for forced circulation systems	Display of the manifold temperature and differential control of the circulator output in relation to probe S2 located in the lower part of the boiler Display of the temperature in the lower part of the boiler using probe S2 Display of the temperature in the upper part of the boiler using probe S3 and control of the solenoid valve output

Temperature Display

By pressing the + or – keys you can quickly switch to displaying the previous or next probe, the three lights on the synoptic indicate the position of the selected probe.

User menu

By pressing the MENU key it is possible to access the user program

MENU	DEFAU LT	RANGE	FUNCTION
Dis*	S1	s1 s2 s3	Set the probe from which you prefer to view the temperature*
Eon	45	20-90	Set the switch-on temperature of the "integration" ev output
Eof	50	20-90	Set the switch-off temperature of the "integration" IV output

Dis* refers to the different possibilities offered by the chosen program to access the visualizations of s1 s2 or s3.

Circulator anti-blocking function.

If the circulator does not restart within the days set in the dab parameter (7 days by default) it activates for the seconds set in the Sab parameter, showing the wording ABL on the display. The function is also active in standby. If there is a voltage drop, causing the ECU to restart, an anti-lock cycle is carried out because it is not possible to know how long the power was off.

Management of the PWM circulator.

The management of the pwm circulator is regulated by 3 technical parameters:

- **SPU** minimum PWM value ;
SPU sets the minimum PWM that can be used during control
EPU=ON When the control activates the circulator, it will start at the PWM value set by SP1 , in this condition, for each further degree of increase in the temperature of the collector with respect to the tank, there is a PWM increase of 10%
Ex: SP1=25% DEL=5°C T.boiler=50°
T.Collector 54° = circulator =off
T.Collector 55° = circulator =on PWM=25%
T.Collector 56° = circulator =on PWM=35 %
T.Collector 57° = circulator =on PWM=45%
- **EPU=OFF** When the control activates the circulator, it will always start at the pwm100% value
CPU operating curve setting;
- CPU= 1 the circulator flow rate increases as the signal decreases PWM read on the output terminals, e.g.:
pwm=0% circulator at maximum, pwm=100% circulator off.
NB to be selected only if circulators designed for application on heating systems are used
CPU = 2 (**default**) the flow rate of the circulator increases with the increase of the PWM signal read on the output terminals, eg: pwm=100% circulator at maximum, pwm=0% circulator stopped.

NOTE: The calculated PWM value is always forced to 100% for the first 10 seconds of circulator activation

Anti-freezing AGE function

To avoid blocking the circulator due to prolonged inactivity, the control unit has a function based on checking the time elapsed without it starting. If the circulator *does not* restart within the days set in the dab parameter (7 days default) it is activated for the seconds set in the Sat parameter (anti-blocking seconds) showing the writing ABL. The function is also active in standby. If there is a voltage drop, causing the ECU to restart, an anti-lock cycle is carried out because it is not possible to know how long the power was off.

AGE Antifreeze function

If it is necessary to prevent the convector liquid from reaching temperatures close to freezing, it is possible to intervene by activating the AGE function (Antifreeze) . The function has the task of activating the circulation pump when the temperature recorded by probe S1 reaches or is lower than the technical menu parameter AGE, the function can be disabled by setting the AGE parameter to 0.

Technical Menu Programming

Access to this menu is recommended only for technical personnel as the control unit may not work properly if programming is not carried out correctly.

The technical menu can be accessed by holding down the menu button (5 seconds).

To move between the menu items press the menu key to advance or the return key to return to the previous item.

MENU	DEFAULT	RANGE	FUNCTION
PRG	3	1-3	SELECTION OF THE REQUIRED SYSTEM PROGRAM
TSC	100	100-150	CHANGE THE SAFETY TEMPERATURE AGAINST SOLAR COLLECTOR OVERTEMPERATURE COLLECTOR
ISc	15	0-20	SAFETY HYSTERESIS COLLECTOR (TSC) NB: ISC = 0 DISABLE COLLECTOR SAFETY
TSb	92	65-150	CHANGE THE VALUE OF THE SAFETY THERMOSTAT AT THE TANK PROBES S2 S3
ISb	5	5-10	SAFETY HYSTERESIS BOYLER
DEL	8	2-20	DIFFERENTIAL DELTA PROBE
ITD	4	2-20	THE HYSTERESIS OF THE DIFFERENTIAL THERMOSTATS CHANGES
TAG	0	0-6	THE ANTIFREEZE THERMOSTAT CHANGES "if sets to 0, the function is excluded
IAG	3	2-20	HYSTERESIS OF ANTIFREEZE THERMOSTAT
DAB	7	1-30	ANTI-LOCKING CIRCULATORS INTERVAL DAYS
SAB	25	0-59	SECONDS DURATION ANTI-LOCKING CIRCULATORS
EPU	ON		PWM CONTROL ENABLING
SPU	25%	0-100%	MINIMUM SETTING % PWM
CPU	2	1-2	CONTROL CURVE PWM
LV2			SEE TECHNICAL MENU SECOND LEVEL
RES			RESET, PRESS THE + KEY, 5 TIMES WHEN THE WRITING On APPEARS, PRESS THE MENU KEY

2nd LEVEL TECHNICAL MENU

The second level of the technical menu is reserved for selecting the type of probe to be used, the types supported are described in the following table:

TYPES	ID TYPE	DESCRIPTION	READING RANGE	RESOLUTION
NTC 10K	0	SELECT TYPE 0 FOR PROBE NTC 10K @25°C K3450	-20 +250 °C	1 °C
NTC 100K	1	SELECT TYPE 1 FOR PROBE NTC 100K OHM @25°C	0 +150 °C	1 °C
PT100	2	SELECT TYPE 2 FOR PROBE PT100	-20 +450 °C	4 °C
PT1000	3	SELECT TYPE 3 FOR PROBE PT100	-20 +450 °C	3 °C

To access the second level menu, you must already be in the technical menu, scroll through the various menu items up to the indication LV2, alternating with this wording, the indication "off" also appears. The + key must be pressed 5 times to make the word "on" appear, at this point press "Menu".

The following items will be displayed:

MENU	DEFAULT	RANGE	FUNCTION
So1	3 (10kntc)	0-3	PROBE TYPE SELECTION FOR OUTPUT 1 TERMINAL 14
So2	0 (10kntc)	0-3	PROBE TYPE SELECTION FOR OUTPUT 2 TERMINAL 15
So3	0 (10kntc)	0-3	PROBE TYPE SELECTION FOR OUTPUT 3 TERMINAL 16
Tu1	--	--	TUNING PROBE 1 *

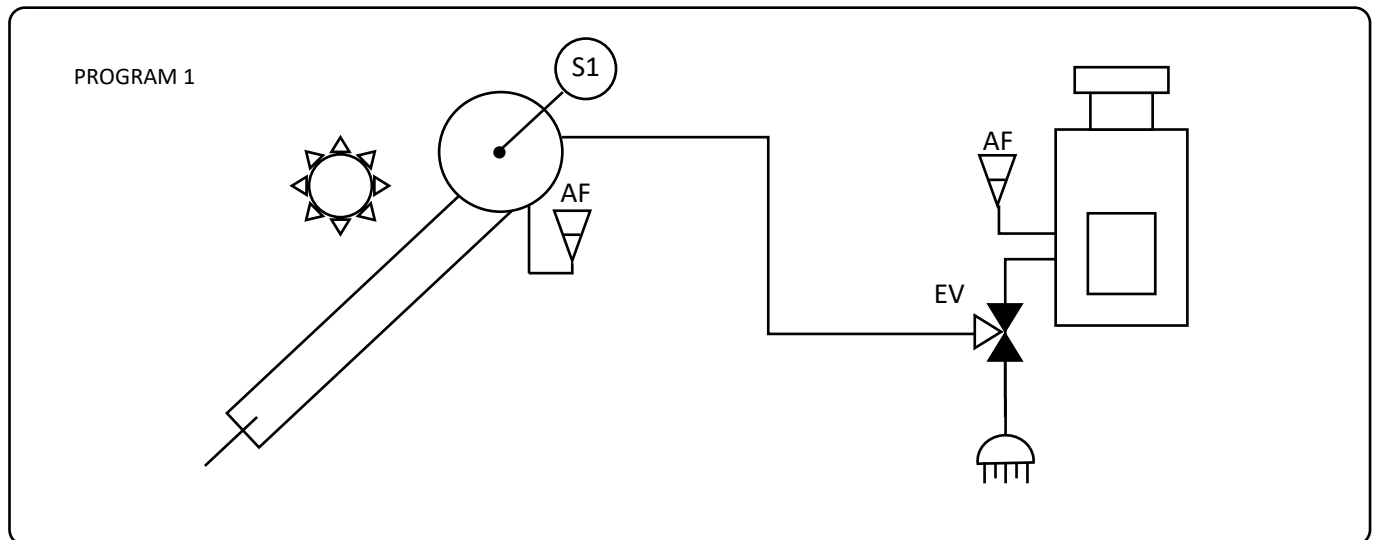
ALARMS The following alarm situations may occur:

ALARM	CAUSE	SCROLLING TEXT DISPLAYED
1	PROBE 1 OPEN OR NOT CONNECTED	PROBE 1 OPEN
2	PROBE 1 IN SHORT CIRCUIT	PROBE 1 IN SHORT CIRCUIT
3	PROBE 2 OPEN OR NOT CONNECTED	PROBE 1 OPEN
4	PROBE 2 IN SHORT CIRCUIT	PROBE 2 IN SHORT CIRCUIT
5	SONDA 3 OPEN OR NOT CONNECTED	PROBE 3 OPEN
6	PROBE 3 IN SHORT CIRCUIT	PROBE 3 IN SHORT CIRCUIT

Terminal Connections

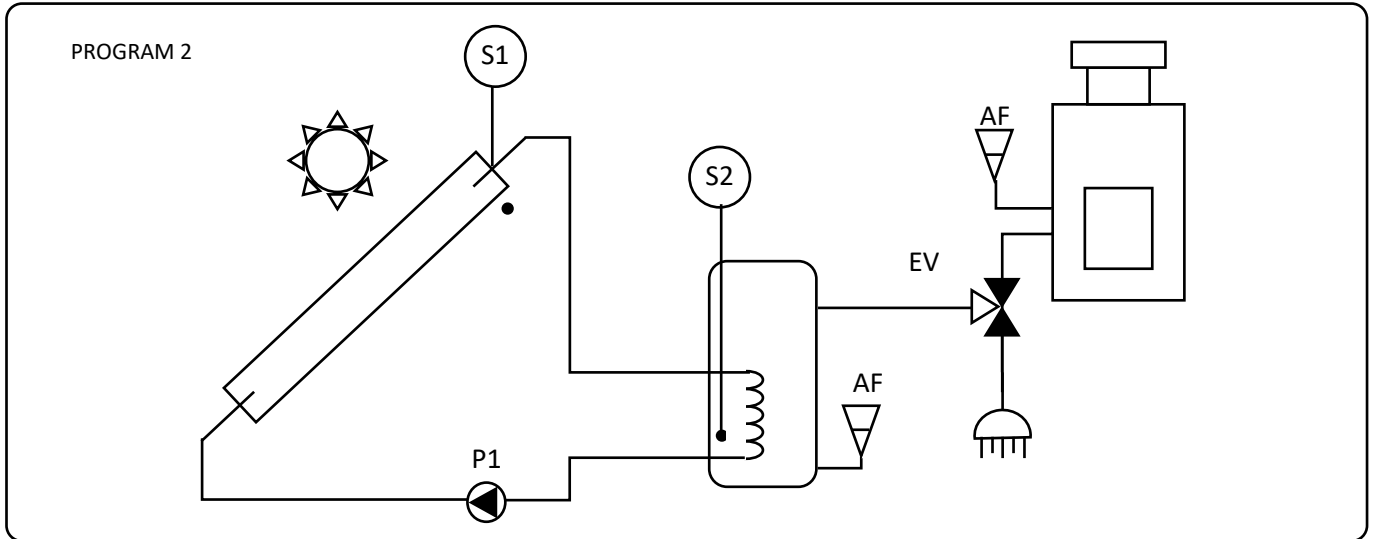
	TERMINAL BOARD	DESCRIPTION
SIGNALS	COM (13)	COMMON WIRES OF INPUTS
	S1 (14)	PROBE 1 COLLECTORS
	S2 (15)	PROBE 2 BOILER DIFFERENTIAL (bottom part)
	S3 (16)	PROBE 3 BOILER TEMPERATURE (top part)
POWER	LINE (6-7)	INPUT POWER SUPPLY 220V
	CIRC (8-9)	220 VOLT OUTPUT
	EVALVE (10-11-12)	CLEAN CONTACT RELAY OUTPUT
PWM	GND (1)	PWM SIGNAL MASS REFERENCE
	PWM (2)	PWM SIGNAL OUTPUT

Program1



TERMINAL	NAME	CONNECTIONS			
1-2	NOT used				
3-4-5	NOT used				
6-7	Line 220 volts				
8-9	NOT used				
10-11-12	Integration relay clean contacts (Solenoid valve)				
13-14	COLLECTOR probe input				
13-15	NOT used				
13-16	NOT used				
PARAMETERS					
DISPLAY	LED	DESCRIPTION	DEFAULT	RANGE	UNIT
DIS	S1	TEMPERATURE DISPLAY PROBE 1	1	1	--
EON	EV	The switch-on temperature of the ev output is set	45	20-90	°C
EOF	EV	The switch-off temperature of the ev output is set	43	20-90	°C
OPERATING PRINCIPLE					
IF THE EON PARAMETER is greater than EOF					
IF (S1>=EON)					EV= on
IF (S1<= EOF)					EV= off
IF THE EON PARAMETER IS lower than EOF					
IF (S1<=EON)					EV= on
IF (S1>= EOF)					EV= off

Program 2

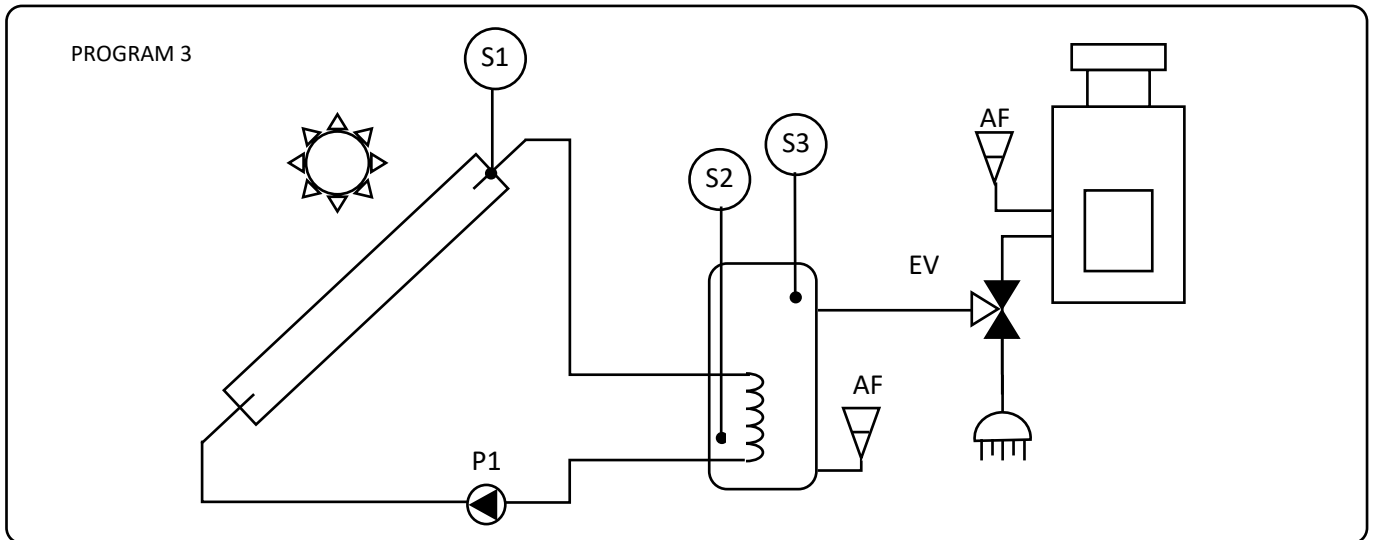


TERMINAL	NAME	CONNECTIONS
1-2	Pwm signal output	
3-4-5	NOT used	
6-7	Line 220 volt	
8-9	Circulator power output	
10-11-12	Integration relay clean contacts	
13-14	COLLECTOR probe input	
13-15	BOYLER PROBE INPUT	
13-16	NOT used	

PARAMETERS					
DISPLAY	LED	DESCRIPTION	DEFAULT	RANGE	UNIT
DIS	S1-S2	TEMPERATURE DISPLAY REFERENCE TO SELECTED PROBE	1	1-2	--
EON	EV	The switch-on temperature of the ev output is set	45	20-90	°C
EOF	EV	The switch-off temperature of the ev output is set ev	43	20-90	°C
DEL		DIFFERENTIAL DELTA PROBE (TECHNICAL MENU)	2	2-20	°C
Tsb		SAFETY BOILER TEMPERATURE (TECHNICAL MENU)	90	65-150	
TSC		SAFETY COLLECTOR TEMPERATURE (TECHNICAL MENU)	130	100-150	°C

OPERATING PRINCIPLE		
SE	LOGIC STATE	OUTPUT
IF (S1 >= TSC)	OVERTEMP_S1	
IF (S2 >= TSI)	OVERTEMP_S2	
IF ((S1 >25) E (S1 >= (S2+DEL)) AND (OVERTEMP_S2=OFF) E (OVERTEMP_S1=OFF)))		P1
IF THE EON PARAMETER is greater than EOF		
IF (S2>=EON)		EV= on
IF (S2<= EOF)		EV= off
IF THE EON PARAMETER IS lower than EOF		
IF (S2<=EON)		EV= on
IF (S2>= EOF)		EV= off

Program3



TERMINAL	NAME	CONNECTIONS
1-2	Output pwm signal	
3-4-5	NOT used	
6-7	Line 220 volt	
8-9	Circulator power output	
10-11-12	Integration relay clean contacts	
13-14	COLLECTOR PROBE INPUT	
13-15	BOILER PROBE INPUT bottom	
13-16	BOILER PROBE INPUT top	

PARAMETER					
DISPLAY	LED	DESCRIPTION	DEFAULT	RANGE	UNIT
DIS	S1-S2-S3	TEMPERATURE DISPLAY REFERENCE TO SELECTED PROBE	1	1-3	--
EON	EV	The switch-on temperature of the ev output is set	45	20-90	°C
EOF	EV	The switch-off temperature of the ev output is set ev	43	20-90	°C
DEL		DEFFERENTIAL DELTA PROBE (TECHNICAL MENU)	2	2-20	°C
TSb		SAFETY BOILER TEMPERATURE (TECHNICAL MENU)	70	65-150	
TSC		SAFETY COLLECTOR TEMPERATURE (TECHNICAL MENU)	130	100-150	°C

OPERATING PRINCIPLE		
IF the condition is true the corresponding output is activated	LOGIC STATE	OUTPUT
IF(S1 >= TSC)	OVERTEMP_S1	
IF (S2 >= TSB)	OVERTEMP_S2	
IF ((S1 >25) E (S1 >= (S2+DEL)) E (OVERTEMP_S2=OFF) E (OVERTEMP_S1=OFF)))		P1
IF THE EON PARAMETER is greater than EOF		
IF (S3>=EON)		EV= on
IF (S3<= EOF)		EV= off
IF THE EON PARAMETER IS lower than EOF		
IF (S3<=EON)		EV= on
IF (S3>= EOF)		EV= off

How to locate conductors for the control signal pwm

GRUNDFOS ALPHA

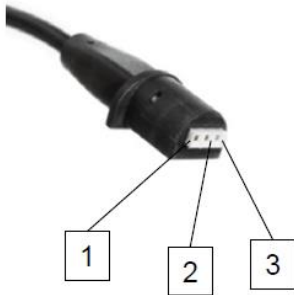


Spina Mini Superseal

Invece su un altro tipo

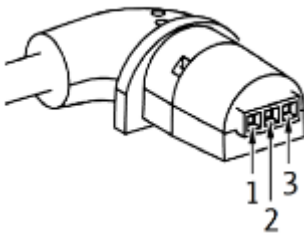
Conductors	Colour	Terminal Board Coelte
Signal input	Brown	terminal board PWM
Signal reference	Blue	terminal board GND
Signal output	Black	not used

WILO YONOS PARA



Conductors	Colour	Terminal Board Coelte
Signal input	Brown	terminal board PWM
Signal reference	Blue or Grey	terminal board GND
Signal output	Black	not used

WILO PARA iPWM



Conductors	Colour	Terminal Board Coelte
Signal input	Brown	terminal board PWM
Signal reference	Blue or Grey	terminal board GND
Signal output	Black	not used