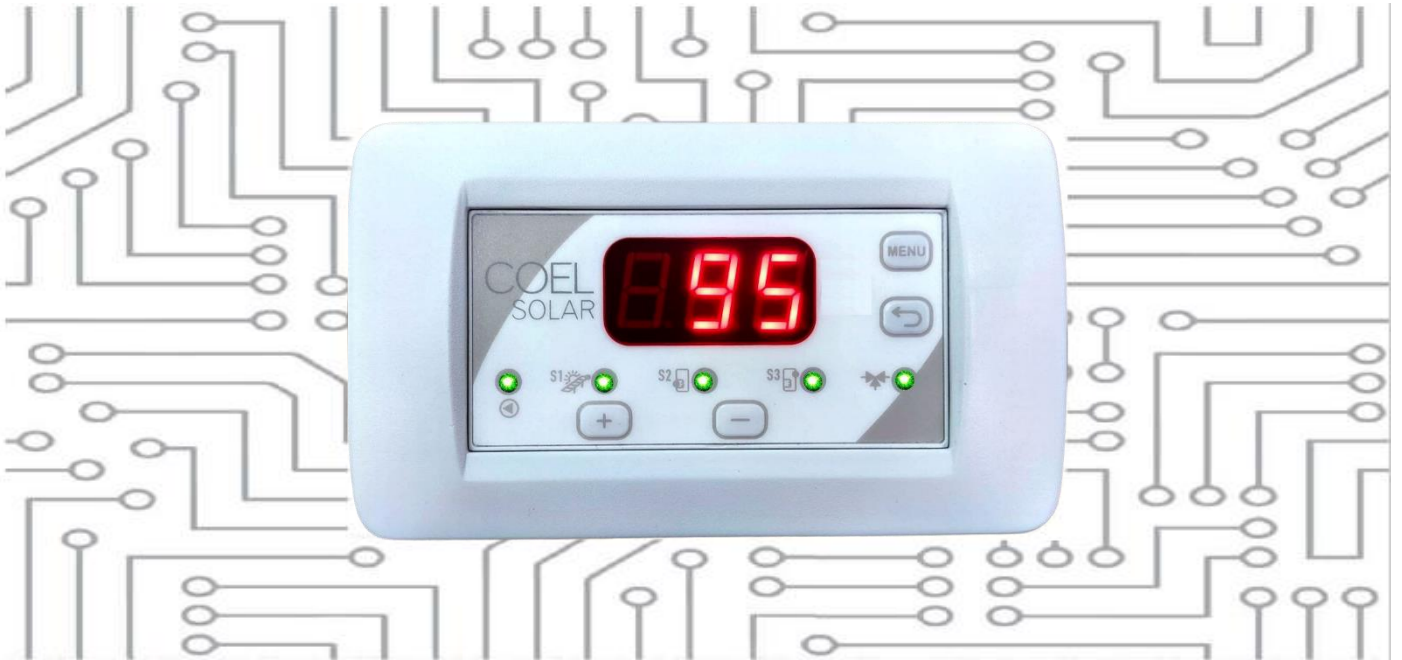


COELSOLAR PWM 4Din WITH THREE WORKING PROGRAMS



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



THERMAL
SOLAR

Manual COELsolar PWM
Code: 1627-SO4D
ITEM : 301B-SOLAR 4D

Made by: coelte.net

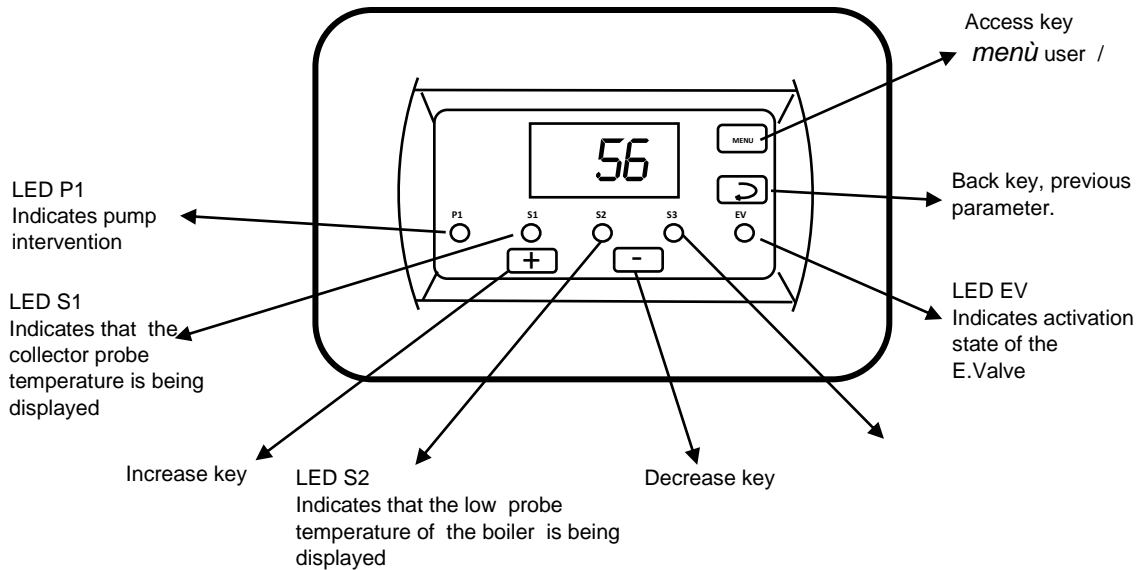
EQUIPMENT DISPOSAL POLICY BY PRIVATE INDIVIDUALS IN THE TERRITORY OF THE EUROPEAN UNION pursuant to article 13 legislative decree 25 July 2005, n.151 "Implementing Directives 2002/95/CE,2002/96/CE and 2003/108/EC, on the restriction of the use of certain hazardous substances in electric and electronic 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 e lights and function 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

Press the menu key to access the TEV parameter setting menu which corresponds to setting the intervention temperature of the solenoid valve thermostat for integration with another DHW generator

Technical Menu

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 (5 seconds) the menu key.

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 (TSC) NB: ISC = 0
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 DISABLES COLLECTOR SAFETY
TSb	92	65-150	BOILER SAFETY THERMOSTAT ADJUSTMENT, PROBES S2 - S3
ISb	5	5-10	SAFETY HYSTERESIS BOILER (TSb)
DEL	8	2-20	DIFFERENTIAL DELTA THERMOSTAT Δ
ITD	4	2-20	HYSTERESIS REGULATION OF THE DIFFERENTIAL THERMOSTATS
TAG	0	0-6	ANTIFREEZE THERMOSTAT ADJUSTMENT "if set to 0 the function is excluded"
IAG	3	2-20	HYSTERESIS THERMOSTAT ANTIFREEZE
DAB	7	1-30	ANTI-BLOCK INTERVAL DAYS CIRCULATORS
SAB	25	0-59	ANTI-BLOCK DURATION CIRCULATORS IN SECONDS
EPU	ON		PWM ENABLING CONTROL
SPU	25%	0-100%	PWM MINIMUM SETTING %
CPU	2	1-2	PWM CURVE CONTROL
LED	1	0-1	ENABLE WI-FI CONNECTION STATUS LED
LV2			SEE SECOND LEVEL TECHNICAL MENU
RES			FACTORY RESET, PRESS THE + KEY 5 TIMES, WHEN THE WORDS On APPEARS, PRESS 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	0 450 °C	4 °C
PT1000	3	SELECT TYPE 3 FOR PROBE PT100	0 450 °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	0 (10kntc)	0-3	PROBE TYPE SELECTION FOR OUTPUT 1 TERMINAL BOARD 14
So2	0 (10kntc)	0-3	PROBE TYPE SELECTION FOR OUTPUT 2 TERMINAL BOARD 15
So3	0 (10kntc)	0-3	PROBE TYPE SELECTION FOR OUTPUT 3 TERMINAL BOARD 16
Tu1	--	--	TUNING PROBE 1 *

*The Tu1 parameter is useful for fine-tuning any possible degree of inaccuracy in the reading of probe S1.

Thermostat output Solenoid valve

All programs provide for the possibility of using a relay output with clean contacts to allow connection of an integration solenoid valve with other sources of domestic hot water.

In program 1 the control takes place by reading from probe S1, in program 2 the reading takes place from probe S2 and in program 3 it takes place by reading from probe S3.

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.

Circulator anti-blocking 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.

Factory reset

To restore the control unit to the factory values, it is necessary to reach the RES item in the technical menu, press the + key 5 times, the wording ON will appear, at this point press menu. The control unit will display the scrolling message "Eseguito" to confirm the operation. Attention: all previously entered data will be cancelled, including wifi association data.

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

Management of the PWM circulator.

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

SPU minimum PWM value

SP1 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 respect to the tank, there is a PWM increase of 10%

Ex: SPU=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%

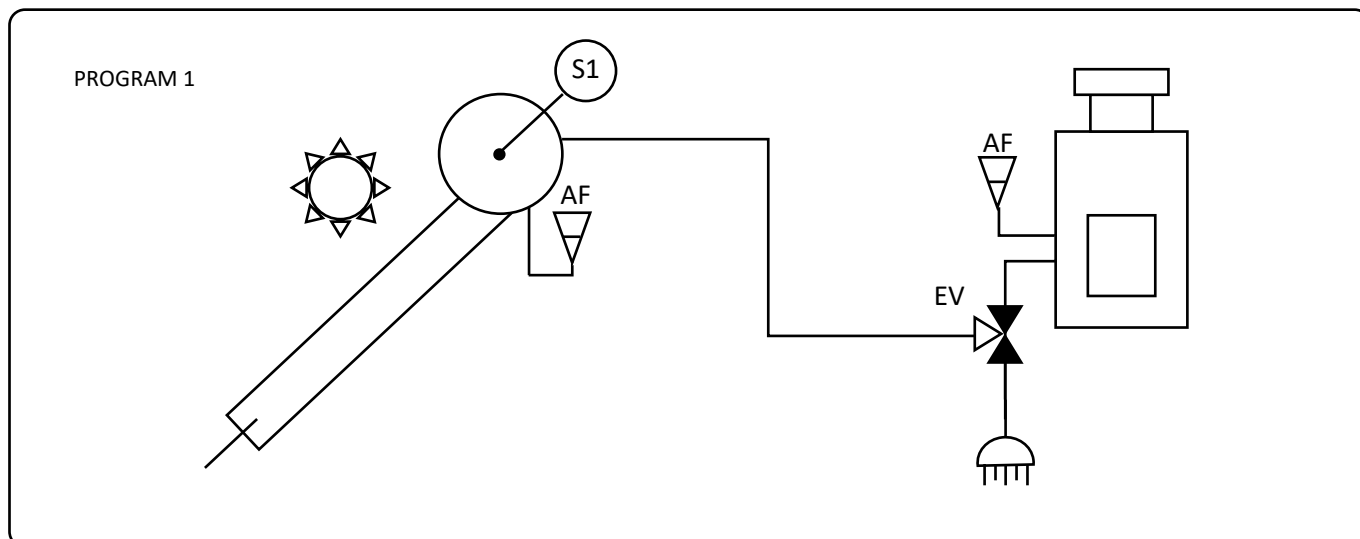
- **EPU=OFF** When the control activates the circulator, it will always start at the pwm100% value
- **CPU operating curve setting**
 - CPU= 1 the circulator flow rate increases as the signal decreases PWM read on the output terminals, e.g.: pwm=0% circulator at maximum, pwm=100% circulator off. NB to be selected only if circulators designed for application on heating systems are used
 - CP1= 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

Terminal Board Connections

SIGNALS	TERMINAL BOARD	DESCRIPTION
	COM (13)	COMMON WIRES OF The INPUTS
	S1 (14)	PROBE 1 COLLECTORS
	S2 (15)	PROBE 2 BOILER DIFFERENTIAL (bottom part)
	S3 (16)	PROBE 3 BOILER TEMPERATURE (top part)
POWER	LINEA (1-2)	INPUT POWER SUPPLY 220V
	CIRC (3-4)	220 VOLT OUTPUT
	EVALVE (5-6-7)	CLEAN CONTACT RELAY OUTPUT
PWM	PWM(8)	PWM SIGNAL OUTPUT
	GND(9)	PWM SIGNAL MASS REFERENCE

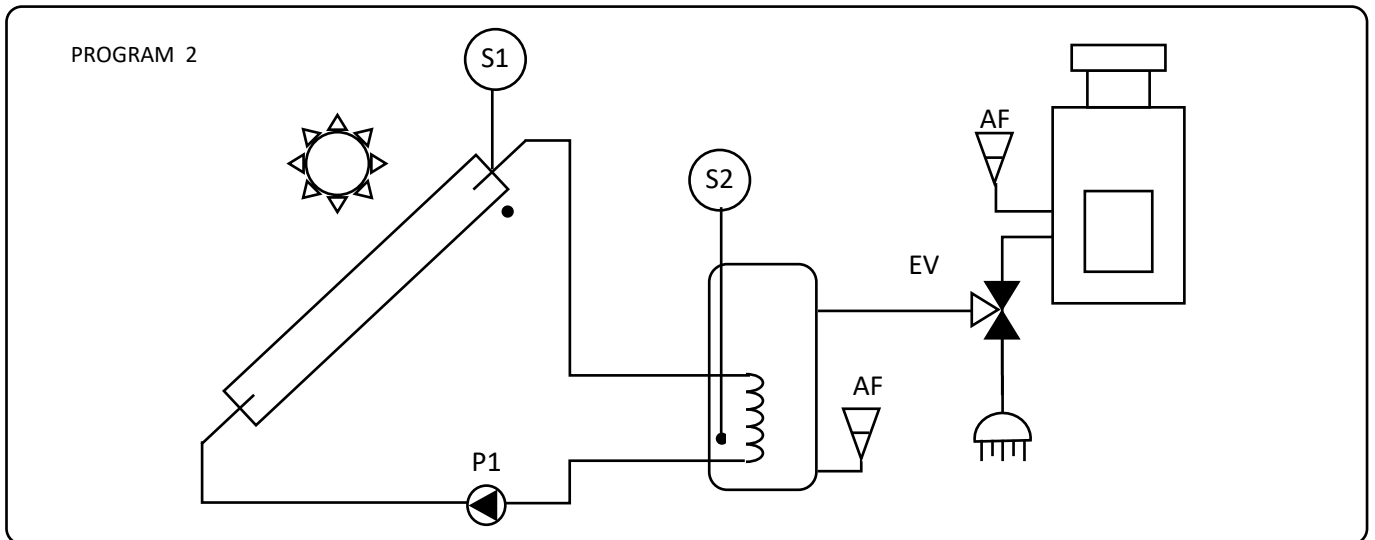
Program 1



TERMINAL BOARD	NAME	CONNECTIONS			
1-2	Line 220 volts				
3-4	NOT USED				
5-6-7	Integration relay clean contacts (Solenoid valve)				
8-9	NOT USED				
10	Common probes input				
10-11	PROBE INPUT 1				
10-12	INPUT NOT USED				
10-13	INPUT NOT USED				
PARAMETERS					
DISPLAY	LED	DESCRIPTION	DEFAULT	RANGE	UNIT'
DIS	S1	TEMPERATURE DISPLAY PROBE 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

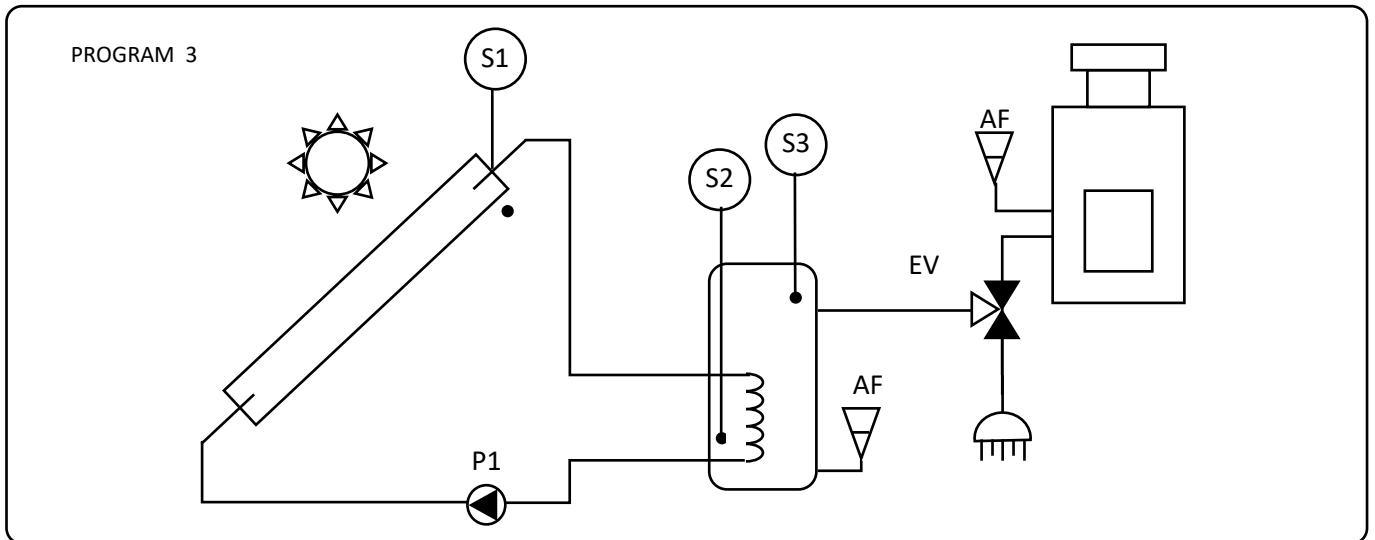
Program 2



TERMINAL BOARD	NAME	CONNECTIONS			
1-2	Line 220 volts				
3-4	Circulator power output				
5-6-7	Integration relay clean contacts (Solenoid valve)				
8-9	Pwm Signal Output				
10	Probes common input				
10-11	PROBE INPUT 1				
10-12	PROBE INPUT 2				
10-13	INPUT NOT USED				
PARAMETERS					
DISPLAY	LED	DESCRIPTION	DEFAULT	RANGE	UNIT
DIS	S1-S2	TEMPERATURE DISPLAY REFERENCE TO SELECTED PROBE			
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
DEL		PROBE DIFFERENTIAL DELTA (TECHNICAL MENU)	2	2-20	°C
Tsb		TANK SAFETY TEMPERATURE (technical menu)	90	65-150	
TSC		MANIFOLD SAFETY TEMPERATURE (technical menu)	130	100-150	°C

OPERATING PRINCIPLE		
IF the condition is true the correspondent output STATE LOGIC OUTPUT is activated	LOGIC STATE	OUTPUT
IF (S1 >= TSC)	OVERTEMP_S1	
IF (S2 >= TSB)	OVERTEMP_S2	
IF ((S1 >25) E (S1 >= (S2+DEL))AND (OVERTEMP_S2=OFF) E (OVERTEMP_S1=OFF)))		P1
IF THE EON PARAMETER IS higher 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

Program 3



TERMINAL BOARD	NAME	CONNECTIONS			
1-2	Line 220 volts				
3-4	Circulator power output				
5-6-7	Integration relay clean contacts (Solenoid valve)				
8-9	Pwm Signal Output				
10	Probes common input				
10-11	PROBE INPUT 1				
10-12	PROBE INPUT 2				
10-13	PROBE INPUT 3				
PARAMETERS					
DISPLAY	LED	DESCRIPTION	DEFAULT	RANGE	UNIT
DIS	S1-S2-S3	TEMPERATURE DISPLAY REFERENCE TO SELECTED PROBE			
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
DEL		PROBE DIFFERENTIAL DELTA (TECHNICAL MENU)	2	2-20	°C
TSb		TANK SAFETY TEMPERATURE (technical menu)	70	65-150	
TSC		MANIFOLD SAFETY TEMPERATURE (technical menu)	130	100-150	°C

Operating Principle		LOGIC STATE	OUTPUT
IF the condition is true the correspondent output STATE LOGIC OUTPUT is activated			
IF (S1 >= TSC)		OVERTEMP_S1	
IF (S2 >= TSB)		OVERTEMP_S2	
IF ((S1 >25) E (S1 >= (S2+DEL))AND (OVERTEMP_S2=OFF) E (OVERTEMP_S1=OFF)))			P1
IF THE EON PARAMETER IS higher 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 guide for pwm control signal connection

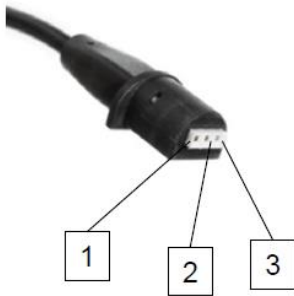
GRUNDFOS ALPHA



Spina Mini Superseal

Invece su un altro tipo

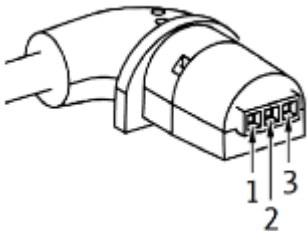
WILO YONOS PARA



Conductors	Colour	Terminal Board Coelte
<u>Signal input</u>	<u>Brown</u>	<u>Terminal board PWM</u>
<u>Signal reference</u>	<u>Blu</u>	<u>terminal board GND</u>
<u>Signal output</u>	<u>black</u>	<u>not used</u>

Conductors	Colour	Terminal Board Coelte
<u>Signal input</u>	<u>Brown</u>	<u>Terminal board PWM</u>
<u>Signal reference</u>	<u>Blue or Grey</u>	<u>terminal board GND</u>
<u>Signal output</u>	<u>black</u>	<u>not used</u>

WILO PARA iPW



Conductors	Colour	Terminal Board Coelte
<u>Signal input</u>	<u>Brown</u>	<u>Terminal board PWM</u>
<u>Signal reference</u>	<u>Blue or Grey</u>	<u>terminal board GND</u>
<u>Signal output</u>	<u>black</u>	<u>not used</u>