

**DESCRIPTION**

Differential thermostat **DK2** has application in systems which can heat the water with solar collector and boiler. The thermostat has two PTC sensors with decimal resolution and has two outputs to relays. There are also abilities to activate frost protection and to activate operation's time delay of circulator – valve

**Features and function of device**

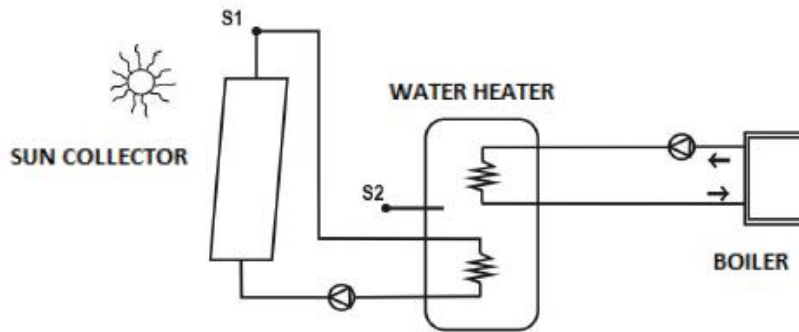
Picture 1 shows the control of circulator to collector and the control of burner – boiler.

- When  $S1 > tEC$  the circulator can be activated when the following condition is satisfied.
- When  $S1 - S2 > diE$  for time duration bigger than  $tHO$  time then the relay 1 of circulator is activated (connectors 17, 18).
- When  $S1 - S2 < did$  then the relay 1 of circulator is deactivated.
- When  $S2 < SPo$  then the relay 2 of secondary source (burner – resistance) is activated (connectors 19, 20).

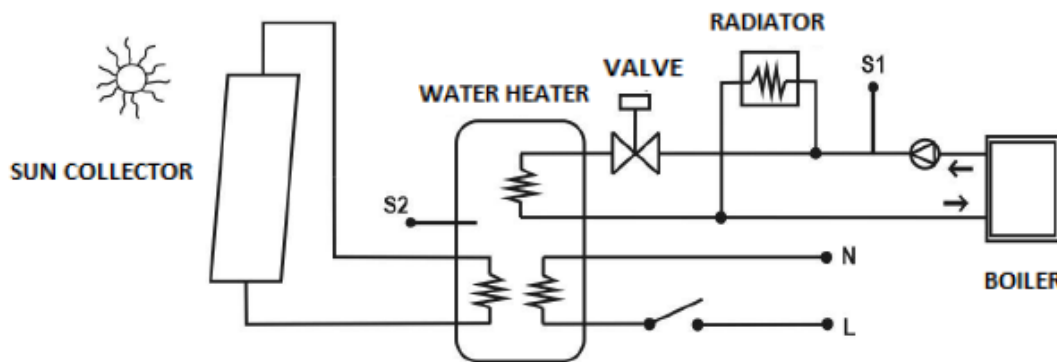
Picture 2 shows the control of valve in burner circuit and the resistance control or boiler control.

- When  $S1 > tEC$  the valve can be activated when the following condition is satisfied.
- When  $S1 - S2 > diE$  for time duration bigger than  $tHO$  time then the relay 1 of valve is activated (connectors 17, 18).
- When  $S1 - S2 < did$  then the relay 1 of valve is deactivated.
- When  $S2 < SPo$  then the relay 2 of secondary source (burner – resistance) is activated (connectors 19, 20).

By pressing ▲ the value of the second temperature is displayed.



PICTURE 1



PICTURE 2

**INDICATIONS AND BUTTONS**

Indications	
	resistance ON
	circulator ON
	PTC malfunction

button	functions
	enter
	down arrow
	up arrow display 2 <sup>nd</sup> temperature
<b>SET</b>	set

## PROGRAMMING THE PARAMETERS

By pressing [←], we enter the parameter's menu.

The first parameter **SPo** is displayed and with arrows [▲], [▼] we scroll into the parameters as they appear in the following parameter's table.

By pressing [SET] the value of the parameter is displayed and with the arrows [▲], [▼] we change the value.

By pressing [←] we confirm the new value and the parameter's name is displayed.

By pressing [SET] we cancel the new value and the parameter's name is displayed.

By pressing [←] we exit parameter's menu.

**Parameters Table**

No		Description	Min	Max	Def	UOM
1	<b>SPo</b>	S2 point temperature control of secondary heat source (heat - burner)	10.0	70.0	40.0	°C/°F
2	<b>Cod</b>	code to enter parameter's menu = "22"	0	255	0	
3	<b>diF</b>	<b>differential</b> operating temperature of <b>SPo</b>	0.2	20.0	2.0	°C/°F
4	<b>tEC</b>	S1 temperature where above it the circulator or the valve is activated (connectors 19,21)	0	100	20.0	°C/°F
5	<b>tEF</b>	activation temperature of protection against frost	-10.0	10.0	4.0	°C/°F
6	<b>diE</b>	temperature difference (S1 - S2) which activates the circulator or the valve, always true <b>diE &gt; did + 0.5</b>	0.5	25.0	2.0	°C/°F
7	<b>did</b>	temperature difference (S1 - S2) which deactivates the circulator or the valve, always true <b>did &lt; diE - 0.5</b>	0.5	25.0	1.5	°C/°F
8	<b>tHO</b>	time duration of the treaty S1 - S2 > diE to activate the circulator or the valve	1	250	1	sec
9	<b>FPE</b>	activation/deactivation parameter of protection against frost	0	1	1	
10	<b>AJ1</b>	<b>zero adjustment</b> of temperature sensor 1 (S1)	-10.0	10.0	0.0	°C/°F
11	<b>AJ2</b>	<b>zero adjustment</b> of temperature sensor 2 (S2)	-10.0	10.0	0.0	°C/°F
12	<b>Tre</b>	time response of the device to the <b>CAMIN network</b>	30	100	30	msec
13	<b>tEd</b>	Selection of the temperature display on the screen where 1 = displays the S1, where 2 = displays the S2. Whenever by pressing ▲ the indication of 2 <sup>nd</sup> temperature sensor is displayed.	1	2	2	-
14	<b>F C</b>	<b>switch °C/°F</b> (0=°C, 1=°F) <b>ATTENTION:</b> changes between °C/°F do not apply on SPo	0	1	0	°C/°F
15	<b>ALo</b>	temperature activation <b>lower alarm limit</b> temperature of the water heater	-50.0	150	4.0	°C/°F
16	<b>AHi</b>	temperature activation <b>higher alarm limit</b> temperature of the water heater	-50.0	150	80.0	°C/°F
17	<b>tS</b>	<b>time delay for refreshing the temperature indication</b> on screen	0	15	0	sec
18	<b>Add</b>	<b>address of the device</b> in the CAMIN network For connecting to Mini Logger adjust <b>Add = 1</b> .	0	255	1	-

**ALARM TABLE**

1	<b>LF1</b>	sensor's 1 (S1) malfunction
2	<b>LF2</b>	sensor's 2 (S2) malfunction
3	<b>ALo</b>	low temperature of water heater
4	<b>AHi</b>	high temperature of water heater

When a malfunction in sensor S1 occurs, then the relay 1 with connectors 17, 18 is activated.

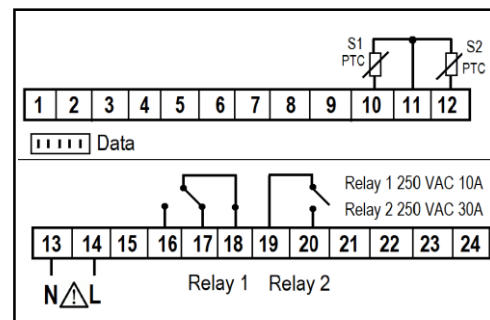
When a malfunction in sensor S2 occurs, then the relay 2 with connectors 19, 20 is deactivated

**The alarms are automatically deactivated when the cause of the alarm disappears**

## TECHNICAL SPECIFICATION

Power supply: 230VAC 50/60Hz  
 Maximum power consumption: 3W  
 It is recommended using a power supply safety fuse 0.5A (not included)  
 Two PTC temperature sensors  
 Accuracy: 1°C  
 Resolution: 0.1°C  
 Serial Input  
 Relay1 250VAC 10A  
 Relay2 250VAC 30A  
 Operating temperature: -15÷+55°C  
 Storage temperature: -20÷+80°C  
 The device is mounted in  $\Omega$  rail  
 Connection with terminal blocks or connectors 6.3mm  
 Firmware: V2

## CONNECTIONS

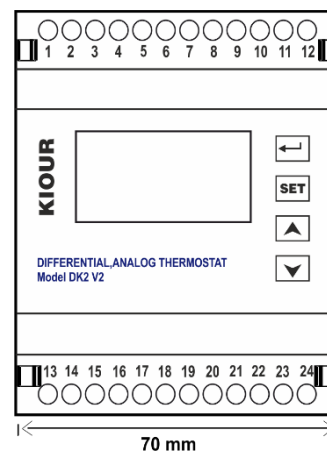
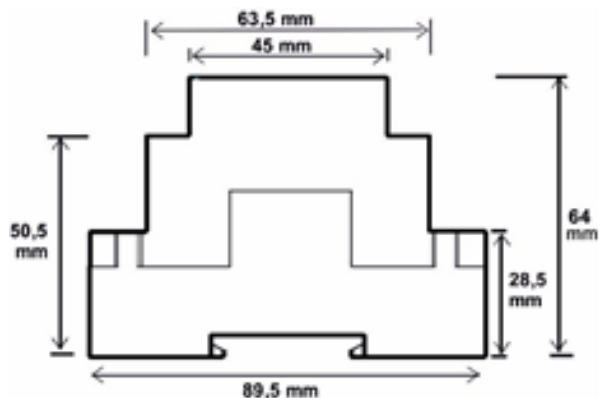


## SERIAL INPUT

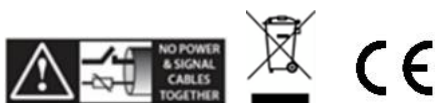
DK2 can connect to the **key programmer** or the data logger **Mini Logger** or the **CAMIN** network.

- **Key programmer:** controller's parameter values can be saved or retrieved from the programming key. Connect the programming key to the controller and by pressing [SET] and [▲] the device connects with the key and the message **Eo** is displayed. By pressing [▲] the device reads the parameters from the key and the message **ro = read O.K.** or **rF = read Fail** is displayed. By pressing [▼] the device writes the parameters to the key and the message **Yo = Write O.K.** or **YF = Write Fail** is displayed. In case of failure (**rF** or **YF**) reenter the key to the serial input and repeat the procedure from the beginning. The key can connect to all **KIOUR** devices. If you try to read the parameters of a different device, message **rF** is displayed. At any time we can perform the aforesaid operation. After 10 sec the key is disconnected.
- **Data logger Mini Logger:** the controller can connect to the data logger and save its temperatures based on selected minutes, its status and alarms to a microSD memory card. It connects to the controller via a cable and the parameter **Add = 1** must be adjusted.
- **CAMIN PC network:** the controller can connect to **CAMIN** network (RS485, modbus protocol) through an interface **NET-INS-485**. **CAMIN** is an application designed to collect information, watch and fully control a net of devices. The maximum length of the net can be 1000 meters.

## DIMENSIONS



Made in Greece.



**ATTENTION** according to safety standards, the device must be properly positioned and protected from any contact with electrical parts. All parts that provide protection must be fastened in such a way that they cannot be removed without the use of tools. **ATTENTION:** disconnect the power supply of the device before proceeding to any kind of maintenance. **ATTENTION:** do not place the device near heat sources, equipment containing strong magnets, in areas affected by direct sunlight or rain. **ATTENTION:** prevent electrostatic discharges at the side slots of the device and sharp objects from been inserted. **ATTENTION:** separate the signal's cables from the power supply's cables to prevent electromagnetic disorders. Signal cables must never be in the same pipe with the power supply cables. **Use the device only as described in this document, not to use itself as a security device. The device must be disposed of in accordance with local standards for the collection of electrical and electronic equipment. Read and keep these instructions.** The device is under two year's guarantee of good operation. The guarantee is valid only if the manual instructions have been applied. The control and service of the device must be done by an authorized technician. The guarantee covers only the replacement or the service of the device.

**KIOUR** preserves the right to adjust its products without further notice..