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
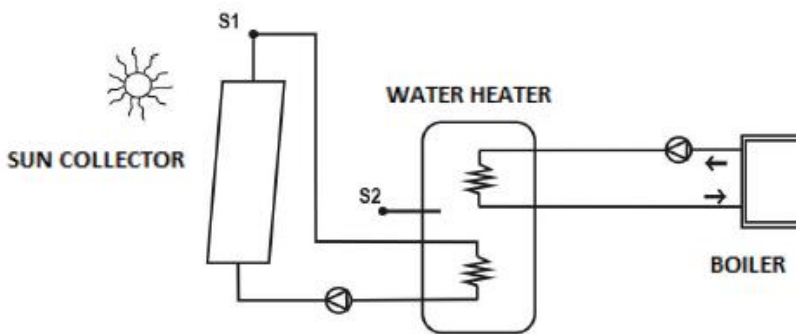
Features and function of device

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 1of circulator is deactivated.
- When S2 < **SPo** then the relay 2 of secondary source (burner – resistance) is activated (connectors 19, 20).
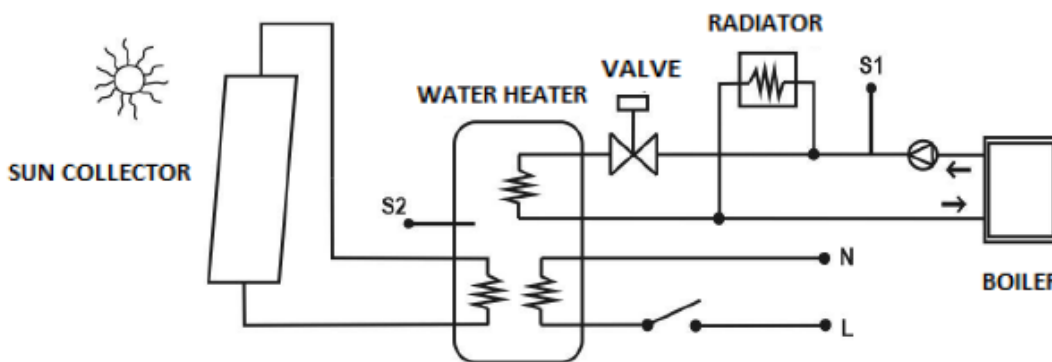
Picture 2 shows the control of valve in burner circuit and the resistance control or boiler control.
- When S1 > **tEC** the valve can be activated when the following condition is satisfied.
- When S1 – S2 > **diE** for time duration bigger than **tHO** time then the relay 1 of valve is activated (connectors 17, 18).
- When S1 – S2 < **did** then the relay 1of 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 2nd temperature
SET	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	SPo	S2 point temperature control of secondary heat source (heat - burner)	10.0	70.0	40.0	°C/°F
2	Cod	code to enter parameter's menu = "**22**"	0	255	0	
3	diF	**differential** operating temperature of **SPo**	0.2	20.0	2.0	°C/°F
4	tEC	S1 temperature where above it the circulator or the valve is activated (connectors 19,21)	0	100	20.0	°C/°F
5	tEF	activation temperature of protection against frost	-10.0	10.0	4.0	°C/°F
6	diE	temperature difference (S1 - S2) which activates the circulator or the valve, always true **diE > did + 0.5**	0.5	25.0	2.0	°C/°F
7	did	temperature difference (S1 - S2) which deactivates the circulator or the valve, always true **did < diE – 0.5**	0.5	25.0	1.5	°C/°F
8	tHO	time duration of the treaty S1 - S2 > diE to activate the circulator or the valve	1	250	1	sec
9	FPE	activation/deactivation parameter of protection against frost. See also parameter No 5, **tEF**	0	1	1	
10	AJ1	**zero adjustment** of temperature sensor 1 (S1)	-10.0	10.0	0.0	°C/°F
11	AJ2	**zero adjustment** of temperature sensor 2 (S2)	-10.0	10.0	0.0	°C/°F
12	Tre	time response of the device to the **CAMIN network**	30	100	30	msec
13	tEd	Selection of the temperature display on the screen where 1 = displays the S1, where 2 = displays the S2. Whenever by pressing ▲ the indication of 2nd temperature sensor is displayed.	1	2	2	-
14	F C	**switch °C/°F** (0=°C, 1=°F) **ATTENTION**: changes between °C/°F do not apply on SPo	0	1	0	°C/°F
15	ALo	temperature activation **lower alarm limit** temperature of the water heater	-50.0	150	4.0	°C/°F
16	AHi	temperature activation **higher alarm limit** temperature of the water heater	-50.0	150	80.0	°C/°F
17	tS	**time delay for refreshing the temperature indication** on screen	0	15	0	sec
18	Add	**address of the device** in the CAMIN network For connecting to Mini Logger adjust **Add = 1**.	0	255	1	-

ALARM TABLE

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

When a malfunction in sensor S1 occurs, then the relay 1 with connectors 17, 18 is activated.
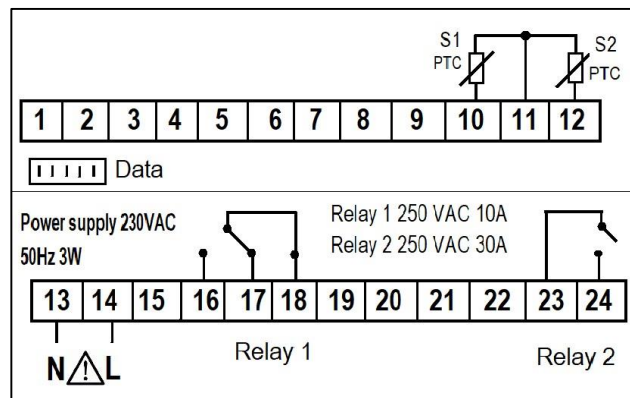
When a malfunction in sensor S2 occurs, then the relay 2 with connectors 19, 20 is deactivated

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 Ω rail
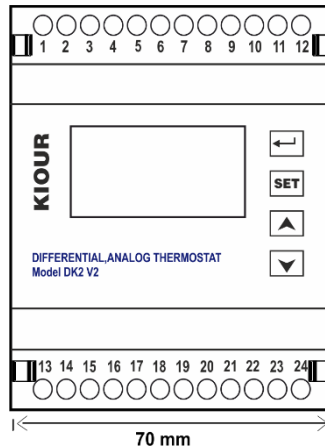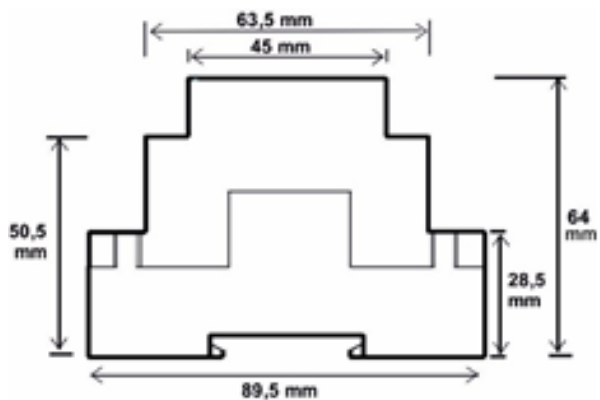Connection with terminal blocks or connectors 6.3mm
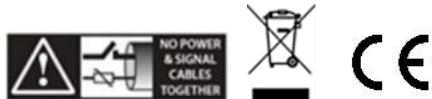Firmware: V2

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.

- **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..