REFRIGERATOR CONTROLLER Model REF-DF-SM Version 4.2 KIOUR

DESCRIPTION

REF-DF-SM Version 4.2 is a compact controller for refrigerator's control with defrost. Via one **PTC** sensor, it controls room's temperatures with temperature range -19÷+99°C (-2÷+210°F). It has defrost control and three relays (compressor, water level, ON-OFF). Also it has an OFF state, in which all relays are OFF and it has one input for level control and one input for open door. The controller has a serial input and can connect to the **KIOUR CAMIN** modbus network for full monitoring and data logging of the device.

INDICATIONS AND BUTTON OPERATIONS

Indications	
❄	relay ON
❄	deFrost ON

button	Operations		
	pressed once	pressed more than 3 sec	pressed together
↵	SET POINT indication confirm new value	-	-
▼⏻	indicates temperature sensors °C/°F	ON/OFF controller	enter parameter's menu
▲	-	-	
SET df	cancel new value	start manual deFrost	

PROGRAMMING THE PARAMETERS

By pressing at the same time [**SET**] and [▲], [▼] we access the parameters menu.
The first parameter "**SP"** is displayed and with [▲], [▼] we scroll into the parameters with the order they appear to parameters table below .
By pressing [**SET**] the value of the parameter is displayed and with the [▲], [▼] we change the value.
By pressing [↵] we **confirm** the new value and the name of the parameter is displayed.
By pressing [**SET**] we **cancel** the new value and the name of the parameter is displayed.
By pressing [↵] we **exit** the parameters menu.

⏻ SWITCHING ON/OFF THE DEVICE

By pressing [▼] more than 3 sec. we **switch ON or OFF** the device.

TECHNICAL SPECIFICATIONS

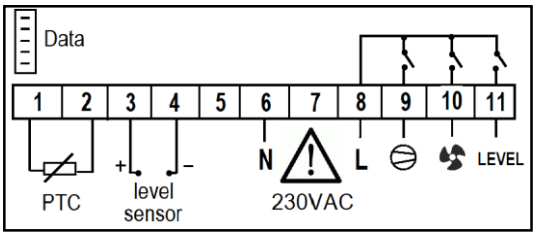
Power supply: 230VAC 50/60Hz / Maximum power consumption: 3W
It is recommended to use a power supply safety switch: fuse 0,5A (not included)
Cabinet's temperature sensor PTC 1K 25°C / Ακρίβεια: 0.5°C
Serial Input
Relay compressor 250VAC 30A resistive load 2HP
Relay water level and relay ON/OFF 250VAC 10A
Operating temperature: -15÷+55°C / Storage temperature: -20÷+80°C
The device is mounted through panel hole 29x71mm and is restrained with two plastic side brackets / Connection with terminal connectors 6.3mm

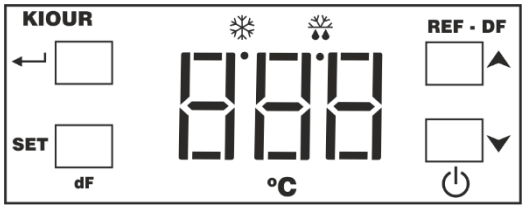
SERIAL INPUT

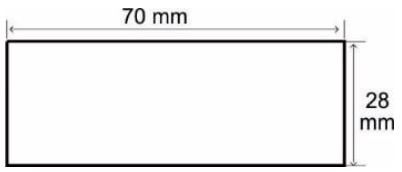
REF-DF-SM can connect to the **key programmer** or to the data logger **Mini Logger** or to the **KIOUR CAMIN** network or to any **modbus network**.

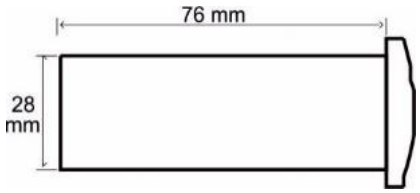
- **Key programmer:** controller's parameter values can be saved or retrieved from the programming key. Plug in the programming key to the controller and press at the same time [**SET**]+[▲]. The device connects to the key and the message "**Eo**" is displayed. By pressing [▲] the device downloads the parameters from the key and the message "**ro**" = read O.K. or "**rF**" = read Fail is displayed. By pressing [▼] the device uploads 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 10sec the key is disconnected.
- **Data logger Mini Logger:** the controller is connected to the data logger via cable and by programming the parameter **Add = 1**. Automatically, based on selected minutes, the data logger writes to a microSD memory card the controller's temperatures, status and alarms.
- **CAMIN network:** the controller can connect to the **CAMIN** network via an interface **NET-INS-485**. **CAMIN** is an PC software application designed to collect information, watch and fully control a net of **KIOUR** devices while sending SMS and email in case of an alarm. The maximum length of the net can be 1000 meters.

CONNECTIONS - DIMENSIONS









PARAMETER TABLE

#		description	min	max	DF-SM	UOM
1	**SP**	SET POINT: temperature control of the cabinet	SL	SH	0	°C/°F
2	**SL**	**minimum** temperature limit of SP	-18	+80	-2	°C/°F
3	**SH**	**maximum** temperature limit of SP	0	99	8	°C/°F
4	**di**	**differential relay function**	1	50	3	°C/°F
5	**Cr**	minimum **pause time** of the compressor	0	4	0	min
6	**CF**	In case of **sensor's malfunction (F1)**, the compressor operates as follows: **0 =** 40% ON compressor's operation (3min ON, 4min OFF), **1 =** compressor is ON continuously.	0	1	0	-
7	**dF**	frequency of defrosts per 24h, where: **0 =** the **deFrost** is deactivated and for ex. if put **dF=6** →24h / 6 = 4h, which means every 4 hours the defrost starts	0	12	4	hours
8	**dT**	**maximum duration of deFrost (automatic and manual)**	1	90	18	min
9	**dL**	**temperature limit of deFrost**: above this temperature the automatic defrost stops. The **manual defrost** does not stop according to **"dL"** temperature limit.	1	70	10	°C/°F
10	**do**	type of deFrost: compressor OFF (not programmable)	-	-	-	-
11	**dr**	**dripping time.** After the defrost, the compressor remains OFF according to dripping time.	0	10	0	min
12	**td**	during defrost the indication **"dF"** is displayed, with **0 =** the room's temperature is displayed during defrost.	0	99	20	min
13	**AJ**	**zero adjustment** of the sensor	-9	+10	0	°C/°F
14	**tS**	**refresh delay** of temperature indication at display.	0	20	0	sec
15	**FC**	**switch °C/°F** (0=°C, 1=°F) **ATTENTION**: changes between °C/°F do not apply on SPo	0	1	0	°C/°F
16	**Br**	baud rate (9600mbps)	-	-	-	-
17	**tr**	time response of the device to the **CAMIN network**	5	100	20	msec
18	**FF**	operation mode of relay ON-OFF (**1=**ON continuously, **0=**ON when compressor is ON)	0	1	1	-
19	**Ad**	**address of the device** in the network.	0	250	2	-

ALARM TABLE

1	**F1**	cabinet sensor malfunction
The alarms are automatically deactivated when the cause of the alarm disappears.		

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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.

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