REFRIGERATOR CONTROLLER Model DF-SM V5   KIOUR

ATTENTION

Read carefully these instructions before installing and using this device and keep them for future reference. Attention to installation and electrical wiring. Use this device only as described in this document and never 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

DESCRIPTION

DF-SM 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, fan). 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	
❄	compressor ON
🌀	fan ON
❄❄	defrost ON
-W-	water level resistance - LEVEL ON
⚠	alarm ON
🔧	malfunction ON

Keyboard	
↵	enter/exit the parameter's menu enter parameter's value
SET	enter parameter's value manual defrost
▲ T2	up arrow
▼	down arrow ON/OFF device (check below)

PROGRAMMING THE PARAMETERS

1. Press ↵ to enter the parameter menu.
2. Choose the parameter you want to adjust by pressing ▼ or ▲ T2 and press SET to display its value.
3. Press ▼ or ▲ T2 to change its value and then press ↵ to store the new value.
4. Press ↵ to exit the parameter menu.

⏻ ON/OFF DEVICE

To activate or deactivate the device, press for 3 seconds ▼ .

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 / Accuracy: 0.5°C
Serial Input
Relay compressor 250VAC 30A resistive load 2HP
Relays water level and fan 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
Connections: cable cross section 2.5 mm² for all relays / cable cross section from 0.25 to 1.0 mm² for the sensor and level probe
Connections with terminal blocks 18A using cable with cable cross section up to 2.5 mm² / It is recommended using a torque wrench with maximum torque 0.4Nm

SERIAL INPUT

DF-SM can connect to the key programmer or to the KIOUR CAMIN 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 + ▲ T2 . The device connects to the key and the message "**Eo**" is displayed. By pressing ▲ T2 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.
- 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

ATTENTION: according to safety standards, the device must be properly positioned and protected from any contact with electrical parts. The device must be fastened in such a way that it cannot be removed without the use of tools. Disconnect the main safety switch of the installation before proceeding to any maintenance. Disconnect the power supply of the device before proceeding to any maintenance. Do not place the device near heat sources, equipment containing strong magnets, in areas affected by direct sunlight or rain. Prevent electrostatic discharges and sharp objects from been inserted to the device. Separate signal cables from power supply cables to prevent electromagnetic disorders. Signal cables must never be in the same pipe with the power supply cables. ATTENTION: Read carefully the technical specifications and make sure that the working conditions are appropriate. According to safety standards, the device must be fastened in such a way that it cannot be removed without the use of tools.
Dimensions are in mm. The device is mounted on panel hole with cut 29x71mm and restrained with plastic side brackets.
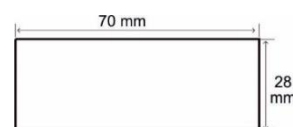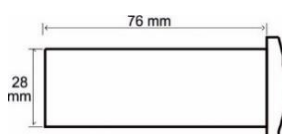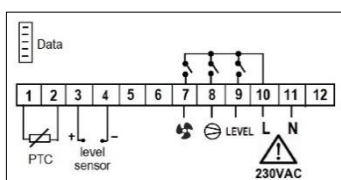
PARAMETER TABLE

| #		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	20	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 fan (**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.

MATCHING THERMOSTAT CONNECTIONS FROM OLD TO NEW VERSION

REF-DF-SM V4.2 (old version)
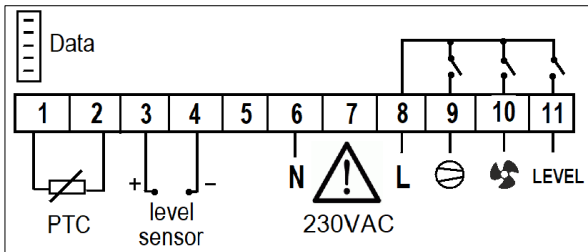
DF-SM V5 (new version)
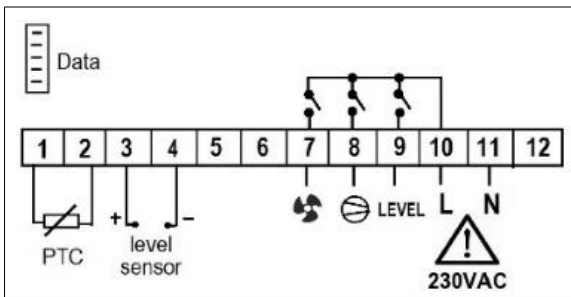
REF-DF-SM V4.2	DF-SM V5
1	1
2	2
3	3
4	4
6 →	11
8 →	10
9 →	8
10 →	7
11 →	9

Made in Greece.

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