FREEZER CONTROLLER Model FA3F (GB) KIOUR

ATTENTION *Firmware V1.0.0*

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

FA3F is a temperature controller for freezer cabinets with defrost control; room and evaporator temperatures are controlled with NTC/PTC sensors, with a temperature range -50÷+110°C for NTC and -50÷+150°C for PTC; 3 indication digits with resolution 0.5°C and 4 buttons; one digital input for controlling the cabinet's door; 3 relays: compressor 30A 250VAC, fan 10A 250VAC, defrost 10A 250VAC; defrosting may be electric or hot gas, a buzzer in case of an alarm. Smart defrost is also available for power saving and better control of the defrost procedure. The device is mounted on a panel hole and it is restrained with plastic side brackets. Through the serial input it can be connected to a network either through Cloud IoT on the CORTEX platform or through a local computer with the CAMIN program for complete local recording and monitoring of the device.

INDICATIONS AND BUTTONS FUNCTION

Display indications	
❄	compressor ON
🌀	fan ON
❄	defrost ON
⚠	alarm ON
🔧	malfunction ON

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

For more indications regarding the alarms please see the alarm's table at page 4.

ADJUSTING TEMPERATURE – SET POINT

1. Press ↵ to display the first parameter **SPo**.
2. Press SET to display its value. With ▲ T2 or ▼ ⏻ change **SPo** value.
3. Press SET to save the new value. The device is working with the new adjustment.

INDUSTRIAL FACTORY SETTINGS

1. Press ↵ to display **SPo**. Press ▼ ⏻ and the parameter **Cod** is displayed.
2. Press SET to display its value and press ▲ T2 to enter the value **31**. Press SET to store the value to parameter **Cod**.
3. Press ↵ again to exit the parameter menu, 'YES' is displayed on the screen. All appropriate factory settings are now stored in the device.

⏻ ON/OFF DEVICE

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

MANUAL DEFROST

Press for 3 seconds SET to start a manual defrost with duration based on the parameter **dd2**.

*For more information regarding the defrost check the description of parameter **dt6** (parameter No 20 - page 3).*

PROGRAMMING A PARAMETER

***ATTENTION**: to gain full access to the parameter's menu, the 2nd parameter **Cod** must be adjusted to **22** (see parameter table page 2).*

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 SET to store the new value.
4. Press ↵ to exit the parameter menu.

TECHNICAL SPECIFICATIONS

Model **FA3F** power supply: 24VAC/DC 50/60Hz / Maximum power consumption: 3W. Model **FA3FW** switching power supply 100-264VAC 50/60Hz 5W
It is recommended using a power supply safety fuse: 0.5A (not included)
Room and evaporator temperature sensors NTC 10K 1% 25°C IP68 and temperature range -50÷+110°C (-58÷+230°F) (or PTC 1K 25°C with temperature range -50 ÷ +150°C (-58÷+302°F) not included) / Accuracy: ±0.5°C
Alarm buzzer / Serial input with 5pin connector / Digital input door
Compressor relay 30A res. 250VAC normally open contact / Fan and defrost relays 10A res. 250VAC normally open contact / Max current load 16A
Connections: cable cross section 2.5 mm² for all relays / cable cross section from 0.25 to 1.0 mm² for the sensors and door switch
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
Operating temperature: -15÷+55°C / Storage temperature: -20÷+80°C
Dimensions 37x79x81mm / The device is mounted on panel hole 29x71mm and restrained with plastic side brackets / Protection IP65 front
Firmware: V1.0.0

SERIAL INPUT

FA3F connects via serial input to the following options:

- Mobile application for android and iOS, Cloud service and CORTEX platform: connection to the cloud and the CORTEX platform for monitoring - recording and managing the thermostat from your mobile, tablet or any computer, email and mobile notifications in case of an alarm
- CAMIN program: local connection and monitoring - recording and management of the thermostat through the CAMIN program installed on a local computer.

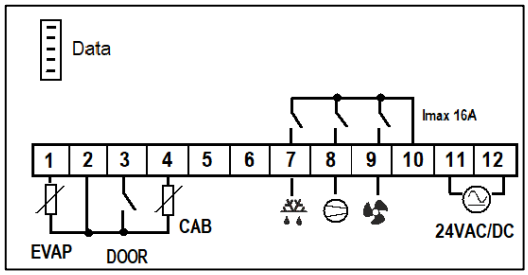
SMART DEFROST

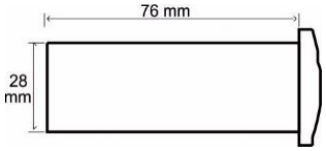
Smart defrost operates in parallel and independently from the conventional defrost. Both defrost modes can operate at the same time based on the respective settings. By enabling smart defrost, it is recommended to adjust conventional defrost to operate in safe mode - for example once every 48 hours: parameter dFr = 48. If smart defrost is not executed, then the conventional defrost will start after 48 hours from the last successful defrost. Each time a smart defrost is executed, the timer of the conventional defrost is renewed.
Smart defrost is activated from parameter dSE = 1.
It is recommended during the start-up of the temperature controller, to execute a smart defrost cycle, parameter dSb = 1.

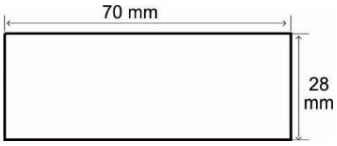
ELECTRICAL DIAGRAM - DIMENSIONS

***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'S TABLE

No		description	min	max	FA3F	UOM
1	**SPo**	SET POINT: room temperature setting	LSP	HSP	-21.0	°C/°F
2	**Cod**	Enter password Cod = 22 and press (▼) to access all parameters menu	0	255	0	-
ANALOG INPUTS - TEMPERATURE						
3	**diF**	Differential of room temperature SPo (thermostat delay)	0.1	25.5	3.0	°C/°F
4	**LSP**	Lower setting limit of SPo	-50.0	+110	-21.0	°C/°F
5	**HSP**	Maximum setting limit of SPo	-50.0	+110	-10.0	°C/°F
6	**dEC**	Temperature indication as integer or decimal, where 0 = integer / 1 = decimal	0	1	1 = decimal	-
7	**SEn**	*Sensor type NTC/PTC* 0 = PTC / 1 = NTC	0	1	1=NTC	-
8	**SE1**	Room sensor offset	-10.0	+10.0	0.0	°C/°F
9	**SE2**	Evaporator sensor offset	-10.0	+10.0	0.0	°C/°F
10	**tdS**	Delay in displaying the actual room temperature on the screen when the door opens	0	255	0	minutes
11	**oS2**	*Evaporator's sensor operation* 0 = OFF sensor 1 = ON sensor When the sensor is OFF, by pressing (T2) it is displayed "---". For more information regarding the defrost without the evaporator's sensor, check parameters dE5, dt6 and Fd3.	0	1	1= ON	-
12	**C_F**	Temperature measurement unit: toggling between °C/°F does not adjust the SPo automatically, it must be changed by the user : 0 = °C / 1 = °F	0	1	0=°C	°C/°F
ALARMS						
13	**ALo**	Low room temperature	-50.0	+110	-25.0	°C/°F
14	**AHi**	High room temperature	-50.0	+110	0.0	°C/°F
15	**At2**	*Time delay in activating "AHi", "ALo" and the buzzer among them.* *This setting does not apply to sensor failure and door alarm.* -1 = OFF buzzer 0 = immediately buzzer is ON 1 to 120 min = delay in alarm and buzzer activation	-01	120	20	minutes
16	**AF1**	*Alarm setting* 0 = automatic OFF, where the alarm stops once the cause of the alarm disappears. 1 = manual OFF, where the alarm indication remains even if the cause of the alarm disappears and it's cleared only by pressing (▼).	0	1	0 = auto	-

		In any case, by pressing the buzzer stops and turns on to state that the cause of the alarm still exists. Muting the alarm buzzer by pressing once is valid until all alarms disappear.				
17	**bOF**	*Buzzer operation* 0 = OFF / 1 = ON	0	1	1=ON	-
DIGITAL INPUT – DOOR SWITCH						
18	**dLd**	*Door switch operation* 0=OFF / 1=NC (normally close contact) / 2=NO (normally open contact) If cabinet's door is open during defrost (electrical or hot-gas) for more than timer tdo, then defrost relay turns OFF and resumes once door is closed. Defrost duration based on timer dd2 stops counting as long as the door is open and resumes once it closes.	0	1	1= NC	-
19	**tdo**	*Time delay in activating the door alarm once the door opens*. Once the door closes, the compressor is activated and the alarm turns off.	0	250	0	minutes
20	**tor**	*Override timer of the open door while the compressor is ON* 0 = deactivated Once open door alarm is activated, timer **tor** starts counting, where the door is overridden and the compressor continues to operate. Door alarm is still activated as long as the door is open.	0	250	0	minutes
DEFROST						
21	**dt6**	*Type of defrost* 0 = electrical: compressor OFF, resistance ON 1 = hot gas: compressor ON, resistance ON - - - - - - - - - - - - *Defrost with the evaporator's temperature sensor ON* Automatic or manual defrost ends either with time adjusted from the parameter dd2 or with defrost end temperature dE5, whatever comes first. Automatic or manual defrost does not start if the evaporator temperature is greater than the defrost end temperature dE5. *Defrost with the evaporator's temperature sensor OFF* Defrost end temperature is the room temperature. Automatic defrost ends either with time adjusted from the parameter dd2, or with defrost end temperature dE5, whatever comes first. Manual defrost starts regardless of the room's temperature and ends after time adjusted in parameter dd2 elapses.	0	1	0 = electrical	-
22	**dFr**	*Time between two successive defrost, where dFr = 0, defrost is deactivated.*	0	100	6	hours
23	**dd2**	Defrost duration (manual and automatic)	1	120	30	minutes
24	**dE5**	*Defrost end temperature – evaporator temperature - sensor EVAP T2* In case of deactivated evaporator sensor, defrost end temperature is the room temperature. In case of evaporator's sensor malfunction (LF2), there is no check of defrost end temperature and defrosting is completed after timer adjusted in parameter dd2 elapses.	0.0	100	30.0	°C/°F
25	**dP3**	*Dripping time, where the compressor is OFF after defrost.* The fan starts based on the parameters Fd3 and Fd4.	0	15	2	minutes
26	**dY4**	*Display indication during defrost* -2 = SPo + diF value is displayed when room temperature is greater than SPo + diF -1 = "dFr" is displayed when room temperature is greater than SPo + diF 0 = room temperature is displayed 1 to 40 minutes = "dFr" is displayed from 1 to 40 minutes from the initiation of defrost	-1	40	-1	minutes
27	**dt5**	*Time delay in restraining indication "dFr" (parameter dY4=-1) or indication SET POINT + diF (parameter dY4=-2) on screen after defrost ends* Indication "dFr" disappears once room's temperature is smaller than SET POINT + diF.	0	150	0	minutes
SMART DEFROST – more details at page 2						
28	**dSE**	*Smart defrost function* 0 = OFF 1 = ON	0	1	0	-
29	**dSb**	*A defrost cycle is executed once the device starts-up* 0 = OFF 1 = ON	0	1	1	-
30	**dS2**	Minimum time between two successive smart defrosts	1	255	60	minutes
31	**dS1**	Time constant: a steady increase in the constant, delays more the start of the smart defrost and increases the ice on the evaporator	1	20	3	minutes
32	**dSt**	Temperature constant: a steady increase in the constant, delays more the start of the smart defrost and increases the ice on the evaporator	0.5	3.0	1.0	°C/°F
COMPRESSOR						
33	**Co1**	Compressor's minimum time ON	0	15	0	minutes
34	**CP2**	Compressor's minimum time OFF	0	15	3	minutes
35	**CF3**	*Compressor's operation in case of room's sensor malfunction LF1* -1 = compressor OFF 0 = compressor ON while defrost starts based on timer dFr and ends based on timer dd2 or defrost end temperature dE5, whichever comes first. 1 to 150 min = compressor time ON while defrost starts based on timer dFr and ends based on timer dd2 or defrost end temperature dE5, whichever comes first.	-1	15	3	minutes
36	**CF4**	*Compressor time OFF in case of room's sensor malfunction*	1	150	3	minutes
FAN						
37	**Ft2**	*Evaporator's fan operation* -3 = the fan operates based on the set point Fo1 and a steady differential 2°C: if the evaporator's temperature is over Fo1 temperature, the fan is always oFF. If the evaporator's temperature is lower than Fo1 - 2°C, the fan is always ON. -2 = continuously ON for evaporator's temperature smaller than temperature Fo1	-2	15	-1= ON continuously	minutes

		-1 = continuously ON 0 = parallel operation to the compressor 1÷15 min = parallel operation with the compressor and when the compressor is OFF, the fan stops after the selected minutes				
38	**Fo1**	*Evaporator's temperature controlling the fan operation during defrost and normal operation.* If the evaporator's sensor is OFF, the parameter does not operate. For more information check the parameters Ft2, Fd3 and Fd4.	-50.0	+100	-2.0	°C/°F
39	**Fd3**	*Evaporator's fan operation during defrost the with evaporator's sensor ON (parameter oS2 = 1)* 0 = OFF and starts with the compressor if the evaporator's temperature is smaller than Fo1. In case of parameter Ft2 = -3, the evaporator's fan starts with the compressor and as long as the evaporator's temperature is lower than Fo1 - 2°C. 1 = ON when the evaporator's temperature is smaller than Fo1 2 = always ON in both types of defrost (electrical / hot gas) If the evaporator's sensor is OFF (parameter oS2 = 0), the fan is OFF during defrost and starts after timer Fd4 elapses.	0	2	0	-
40	**Fd4**	*Time delay in activating the fan after defrost ends* and only if the evaporator's temperature is smaller than temperature Fo1 (check parameter Fd3).	0	255	0	minutes
NETWORK - GENERAL SETTINGS						
41	**tPE**	*Unique product number – no access*	-	-	229	-
42	**Add**	Device address on network	0	255	1	-
43	**trE**	Response time of the device on network	5	100	40	msec
44	**bAU**	*Baud rate: 0 = 2400 / 1 = 4800 / 2 = 9600 / 3 = 19200*	0	3	3	-
45	**Pro**	*Cabinet's program (factory settings) is displayed – no access*	-	-	31	-
46	**SrU**	*Room service*: after the end of the selected time, 'SrU' is displayed and informs that the room needs service. The thermostat continues to operate normally and its functions are not suspended. -1 = disabled function 0 to 150 weeks = remaining time to activate the 'SrU' room service notification. The countdown starts once a new value is stored. Whenever we enter the parameter, the remaining time until the activation of 'SrU' notification is displayed. To deactivate the notification, insert SrU = -1.	-1	150	-1	weeks
47	**UEr**	*Firmware version – no access*	-	-	1.X.X	-

ALARM'S TABLE

1	**LF1**	Room sensor malfunction
2	**LF2**	Evaporator sensor malfunction
3	**ALo**	Low room temperature
4	**AHi**	High room temperature
5	**dor**	Open door alarm (when the cabinet's door opens, the fan stops)
6	**SrU**	room service notification: timer has elapsed and the cabinet needs a service (see parameter 46, SrU)
7	**EEr**	Error in memory RAM: re-enter the SPo (see ADJUSTING TEMPERATURE – SET POINT page 1)
The alarms are automatically deactivated once the cause of the alarm disappears.		

REVISION HISTORY

PDF Version	Date	Comments
1.0.0	31/7/2023	added new parameters **tor** No.21 and **bOF** No.17, parameter **tAd** merged to parameter **tdo** No.19, changes to parameter **bAU** and new pcb with switch tact buttons

Made in Greece.

The device is under two year's guarantee. 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 PC implements a Quality Management System according to EN ISO 9001:2015 Standard with registration number 01013192. KIOUR preserves the right to adjust its products without further notice.