# KIOUR Type REF-FR Model REF-FR-SPIT

## Electronic digital refrigerator controller (Compact) with ON-OFF function, level water control, dfrost control (valve or resistance), fan, ON-OFF relay and buzzer ALARM. Range -45 -+150 °C/°F.

Electronic controller **REF-FR** is a device composed of two parts, *REF-FR-SB* and *REF-FR-SP*. Designed for the refrigerator's control, it is ideal for ventilated refrigerator rooms of low temperatures with dfrost control. It is provided with 5 relays: compressor (30 A, 2 HP), fan (5A), valve or resistance (12A), level control (5A), ON-OFF relay and a buzzer ALARM.

It controls two temperatures with its two sensors in range of -45 - +150 °C/°F, while it has an **Off state,** in which all relays are off and **OFF** is displayed. Also it is provided with one input for level control (Patent No.1004976) and one input for open door. If the door opens the fan stops. After four minutes the compressor also stops and the ALARM of the open door is displayed, while the buzzer is ON.

### MANAGING THE UNIT

↵ : By pressing ↵ the parameter's menu is displayed.
**df** : By pressing **df** for five minutes, a dfrost cycle is forced.
**T2** : By pressing **T2**, the temperature of the evaporator is displayed.
▼ : By pressing ▼ for 1 sec, the setup °C or °F is displayed.
**RESET** : By pressing **RESET**, the display of the ALARM and the buzzer stops.
⏻ : By pressing ⏻ for 3 sec, the state changes from **OFF to ON** or from **ON to OFF**.

### MANAGING THE PARAMETERS

**1.** By pressing ↵, the first parameter SPo (Set Point) is displayed and with the arrow buttons we can see the other parameters as they appear in the table below.
**2.** By pressing **SET**, we can see the value of the parameter and with the arrow buttons we can change the value. We confirm the new value with the enter (↵), while the name of the parameter is displayed. If we press **SET**, we cancel the new value and the name of the parameter is displayed.
**3.** To exit the parameters, we press ↵.
*NOTE: For security reasons, we can't see all the parameters. To access them all, we enter the value 22 to the **Cod** parameter.*

### OPTICAL SIGNS - ALARMS

**ALo** : Low temperature of room
**AHi** : High temperature of room
**LF1** : Malfunction of the room's sensor
**LF2** : Malfunction of the evaporator's sensor
**dor** : Open door. If the door remains open for 4 minutes, the compressor stops, an ALARM is displayed and the buzzer is ON.

### SERIAL INPUT

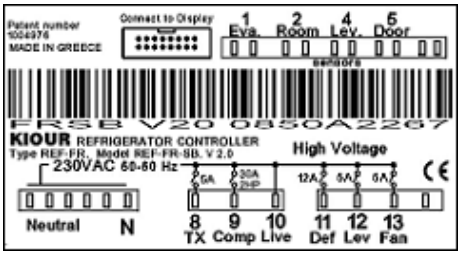
Via serial input the instrument is connected to the memory backup (key) or to a network.
1. *Memory backup (key):* With the key we save the setup of the parameters. We connect the key to the instrument and:
   a. By pressing SET and the UP button, the instrument connects to the key and the message **Eo** is displayed.
   b. By pressing UP button, the instrument reads the parameters from the key and the message **ro = read O.K.** or **rF = read Fail** is displayed.
   b. By pressing DOWN button the instrument writes the parameters to the key and the messages **Yo = Write o.K.** or **YF = Write Fail** is displayed**.** The key can be connected to various types of instruments. If you try to read the parameters of a different instrument, a message **rF = read Fail** is displayed.
   At all instruments and at any time we can perform the write operation. After 10 sec, the key is disconnected automatically.
**2.** *Connect to network:* The device can be connected to the **CAMIN** net (RS485 Modbus protocol) though an interface, NET-IN-1. **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.

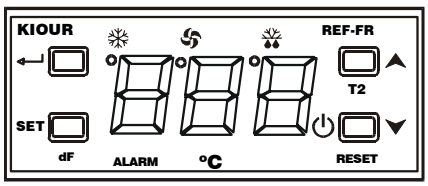
### TECHNICAL SPECIFICATIONS

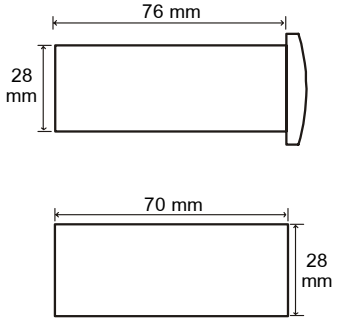
- Power supply: 12 VAC/DC
- Accuracy: 0.5 % ±1 digit
- Connection: TAB 6,3 mm (DIN46247)
- Security power supply: 0.5 A
- *REF-FR-SP* is mounted thought panel hole, while *REF-FR-SB* is mounted to the machine
- Relay 250 VAC 30 A Resistive Load 2 HP
- Relay 250 VAC 5 A Resistive Load
- Two relays 250VAC 5 A Resistive Load
- Operating temperature: -10 - 60°C
- Storage temperature: -20 - +80°C
- Maximum power consumption: 3 Watt
- Connection for two sensors

**ATTENTION**: It is necessary to prevent electrostatic discharges at the ventilation openings. Also prevent insertion of pointed elements.

### CONNECTION DIAGRAMS - DIMENSIONS



| REF-FR-SM | | |
|---|---|---|
| A/A | **PARAMETERS - DESCRIPTION** | |
| 1 | **Spo** | Set Point temperature control room, **Values: LSP to HSP** |
| 2 | **Alo** | Alarm of low temperature room, **Values: -45 - +20 °C** |
| 3 | **Ahi** | Alarm of high temperature room, **Values: 0 - +60 °C** |
| 4 | **dr1** | Repeat time of dfrost, **Value: 1 - 100 hours** |
| 5 | **Cod** | Code Number**.** The number **22** permits scrolling into the other parameters |
| 6 | **diF** | Differential working temperature of compressor, **Value: 1 - +20 °C** |
| 7 | **dd2** | dfrost duration, **0 - 120 min,** in which 0 means that dfrost is OFF |
| 8 | **dP3** | Dripping time, **0 - 15 min** and compressor's time pause after the dfrost |
| 9 | **dY4** | ***Display Operation at dfrost***<br>**dY4 = -1** : If the temperature of the room is greater than **SPo+dif, dFr** is displayed<br>**dY4 = 0** : Temperature is displayed continually<br>**dY4 = 1-40 min** : **dFr** is displayed from the beginning of the dfrost, until time expires |
| 10 | **dE5** | Temperature of dfrost: **1 - +70 °C.** Sensor's malfunction of the evaporator doesn't make temperature control and dfrost finishes from expire of time. |
| 11 | **dt6** | dfrost's working mode, **Values 0 and 1. 0 = Electrical:** Compressor OFF, Resistance ON<br>**1 = Hot GAS:** Compressor ON, Resistance ON. |
| 12 | **AF1** | **Alarm's working mode. Values 0 and 1. 0=Auto, 1=Manual**. At the **auto set up (0)** the disappearance of the ALARM stops the buzzer etc. At the **manual set up (1)**, the disappearance of the ALARM does not stop the buzzer and the indication of the ALARM is displayed. In any case by pressing the down button we stop the buzzer and the indication of ALARM but the flashing line of the display of the hundreds indicates that there is still an ALARM. The RESET is valid until the disappearance of the last ALARM. |
| 13 | **At2** | **At2 = -1** : The alarms of the room's temperature do not activate the buzzer<br>**At2 = 0** : The alarms of the room's temperature activate the buzzer immediately<br>**At2 = 1 - 120 min** : The alarms of the room's temperature are activated after the time of the parameter's value expires. The ALARMS of the sensor's fault and of the open door are activated immediately. |
| 14 | **Fo1** | Below this evaporator's temperature, the Fan is activated after the dfrost, **Values: -50 - +50 °C/°F** |
| 15 | **Ft2** | ***Normal working of FAN***<br>**Ft2 = -1** : The fan works continually.<br>**Ft2 = 0** : The fan starts and stops at the same time with the compressor.<br>**Ft2 = 1-15 min** : The fan operates at the same time with the compressor and stops after specific time, indicated by the parameter's value. |
| 16 | **Fd3** | ***Fan working mode at dfrost***<br>**Fd3 = 0** : During the dfrost, the Fan is OFF. It turns ON after the compressor is ON and if the temperature of the evaporator is lower than the parameter's value, **Fo1**<br>**Fd3 = 1** : The fan is ON if the evaporator's temperature is lower than **Fo1**<br>**Fd3 = 2** : The fan is ON in both types of dfrost (ELE - GAS) |
| 17 | **Co1** | Minimum working time of the compressor, **Values: 0 - 15 min** |
| 18 | **CP2** | Minimum stop time of the compressor, **Values: 0 - 15 min** |
| 19 | **CF3** | ***Working mode of the compressor with a room's sensor malfunction***<br>**CF3 = -1** : The compressor stops working.<br>**CF3 = 0** : The compressor is always ON. The dfrost works according to time.<br>**CF3 = 1-150 min** : The compressor works with fixed times, **ON and OFF,** that are defined from the parameters **CF3 and CF4.** The dfrost, also, works according to time. |
| 20 | **CF4** | ***Working mode of the compressor with a room's sensor malfunction***<br>**CF4 = 1-150 min.** Stop time of the compressor. |
| 21 | **SE1** | Zero adjustment of sensor No 1. (Room), **Values: -20 - +20 °C/°F** |
| 22 | **SE2** | Zero adjustment of sensor No 2. (Evaporator), **Values: -20 - +20 °C/°F** |
| 23 | **SEr** | Doesn't work |
| 24 | **LSP** | Lower limit temperature of SET POINT, **Values: -50 - +100 °C/°F** |
| 25 | **HSP** | Maximum limit temperature of SET POINT, **Values: -50 - +100 °C/°F** |
| 26 | **C_F** | 0 = **°C**<br>1 = **°F**<br>**ATTENTION!** The changes between **°C** and **°F** do not change the value of the parameters. (ex. SET POINT 10 **°C** is 10 **°F** ) |
| 27 | **br** | Baud Rate |
| 28 | **trE** | **t**ime **r**espond: the respond time of the instrument, **Values in mSec with default 20 mSec** |
| 29 | **Add** | Address of instrument at the network operation, **Values: 1 - 255** |

Guarantee of good operation: Two (2) years.
**Guarantee terms.** The guarantee is valid if the operating instructions are followed.
The **repairing** and the **service** of the instrument must be done by an authorized technician.
The guarantee covers only the repairing or the replacement of the instrument.