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Libretto istruzioni
centralina

Instruction manual
electronic control panel

Gebrauchsanleitungen
Elektronische Steuerung

Libro de instrucciones
centralita electrónica

Mode d'emploi
Panneau électronique

Руковоество по эксплуатации
электронной панели

MIR90

1. FRONT PANEL CONTROLS

SET : *SET POINT display*: By pressing and releasing this key the set point is displayed.
SET POINT change: By pressing the key for 3s the set point value is displayed and the set point change mode is entered: the SET led blinks. In order to change the value use the and keys.
Then, the new value can be stored either by pressing the "SET" key (the instrument restores temperature display) or by waiting the programming exit timeout (15s).

UP : In the programming mode or in the "Function Menu" it browses the parameter codes or increases the value of the variable displayed. Keep pressed for a faster change.
Manual defrost: by pressing it for 5s the defrost cycle will start.

DOWN : In programming mode or in "Function Menu" it browses the parameter codes or decreases the value of the variable displayed. Keep pressed for a faster change.

LIGHT : It switches on and off the light.

ON/OFF : It activates and deactivates the card stand-by.

KEY COMBINATIONS

+ If the keys are pressed and released, the probe values are displayed.

+ When pressed for 3s, the Pr1 or PR2 parameter Menu is entered.

+ Programming end and room temperature display once again.

USE OF LEDS

A series of light points on keyboard is used to monitor the loads controlled by the instrument. Each LED function is described in the following table:

LED	MODE	FUNCTION
	ON	Compressor enabled
	BLINKING	Anti-short cycle delay enabled
	ON	Fan enabled
	BLINKING	Drain enabled
	ON	Defrost enabled
	BLINKING	Drain time in progress
	ON	• ALARM signal • In "Pr2" indicates the parameter is also present in "Pr1"
	ON	Auxiliary exit ON
	BLINKING	The set point is displayed and it is modifiable
	ON	The set point is displayed
	ON	The instrument is on standby

2. PROGRAMMING OF THE PARAMETERS

The parameters that control the electronic control panel working are divided into 2 different levels. The parameters more used lie at the first level (Pr1), whereas at the second one (Pr2) there those which need to be changed very rarely.

ACCESS PROCEDURE TO "**Pr1**"

1 Press the keys + for 3s: the code of the first parameter will be displayed.
2 To run trough the menu use the or keys.
3 To select the function desired press the key .

ACCESS PROCEDURE TO "**Pr2**"

To enter the parameters of the Pr2 level it necessary to write a password.

1 Enter the Pr1 user Menu.
2 Select through ▲ or ▼ the Pr2 label and press SET.
3 Use the ▲ or ▼ buttons to program the correct number on the blinking digit.
4 Confirm this number by pushing SET : this digit will stop blinking, the chosen number will still be displayed and the following digit will blink.
5 Repeat operations 3 and 4 for the other digits.
6 If the password is correct, the "Pr2" is entered by pressing SET on the last digit, otherwise the password input process restarts from the beginning.

If no key is pressed within 15 seconds, the instrument displays the cold room temperature again.

Turn to the supplier for the **PASSWORD**.

N.B.: each parameter in "Pr2" can be removed or put into "Pr1" (user level) by pressing the SET + ▼ keys. When you are in "Pr2" and a parameter is present in "Pr1", the LED is lit up.

CHANGE OF THE PARAMETER VALUE

Each parameter is identified by a special alphanumeric code.
To change the parameter value operate as follows:
1 Enter the parameter mode (Pr1 or Pr2).
2 Browse the parameter list using ▲ or ▼ until the required parameter is displayed.
3 Press the SET key to display its value.
4 Use ▲ or ▼ to change its value.
5 Press SET to store the new value and to pass to the following parameter.

Exit: Press SET + ▲ when a label is displayed, or wait 15s without pressing any key.

N.B.: The set value is stored, even when the parameter change procedure is left without pressing the SET key.

3. LIST OF PARAMETERS

HY **Differential**: (0,1÷25,5°C; 1÷25°F) Intervention differential for set point, always positive. The compressor Cuts IN when the temperature reaches the Set Point Plus + Hy value. The Compressor Cuts OUT when the temperature reaches again the set point value.

LS **Minimum set point**: (-50°C÷SET; -58°F÷SET) Sets the minimum acceptable value for the set point.

US **Maximum set point**: (SET÷110°C; SET÷230°F) Sets the maximum acceptable value for the set point.

OdS **Output activation delay at start-up**: (0÷255min) At start-up the activation of any load is hindered for the programmed time.

AC **Anti-short cycle delay**: (0÷30 min) minimum interval between the compressor stop and the following restart.

Con **Compressor ON time with faulty probe**: (0÷255min) time during which the compressor is active in case of faulty probe. With "Con=0" the compressor is always OFF. N.B.: If "Con"=0 e "CoF"=0 the compressor is OFF.

CoF **Compressor OFF time with faulty probe**: (0÷255min) time during which the compressor is off in case of faulty probe. With "CoF=0" the compressor is always active.

CF **Temperature measurement unit**: **°C** = Celsius; **°F** = Fahrenheit.

tdF **Defrost type**: **rE** = by heaters (Compressor OFF). **rt** = time defrost with temperature control. The defrost duration is equal to the Mdf value, and during this time, the heaters are controlled by a thermostat so that the dtE temperature value is kept in the evaporator. **in** = by hot gas (Compressor ON).

EdF **Defrost mode**: **in** = the defrost takes place only during fixed time intervals set by the idF parameters.
sd = Smart Defrost. The idF defrost interval time is counted only at compressor ON.

dtE **Defrost termination temperature**: (-50,0÷110,0°C; -58÷230°F) sets the temperature measured by the evaporator probe, which causes the end of defrost.

IdF **Interval between defrost cycles**: (1÷120 hours) determines the time interval between the beginning of two defrost cycles.

MdF **Maximum defrost duration**: (0÷255min) When P2P = n (evaporator probe not present) sets the defrost duration, when P2P = y (evaporator probe present) it sets the maximum length of time for defrost.

dFd **Temperature displayed during defrost**: **rt** = real temperature; **it** = defrost start temperature; **Set** = set point; **dEF** = "dEF" label; **dEG** = "dEg" label.

dAd **MAX display delay after defrost**: (0÷255min): Sets the maximum time between the end of the defrost and the restarting of the real room temperature display.

Fdt **Drain time**: (0÷60min) Time interval between reaching defrost termination temperature and the restoring of the control normal operation.

FnC **Fans operating mode**: **C-n**: runs with compressor/OFF during defrost; **C-y**: runs with compressor/ON during defrost; **O-n**: continuous mode/OFF during defrost; **O-y**: continuous mode/ON during defrost.

Fnd **Fan activation delay after defrost**: (0÷255min) time interval between the defrost termination and the restoring of the fan normal operation.

FSt **Fan stop temperature**: (-50÷110°C; -58÷230°F) If the temperature detected by evaporator probe is higher than "FSt" the fans stop. It is used to let air cold enough in the cold room.

ALC **Set point alarm configuration**: (rE= depends on the set point; Ab= absolute) determines if temperature alarms concern the setpoint or if alarms are referred to absolute temperatures.

ALU **Maximum temperature alarm**: (If ALC = rE: 0÷50°C ;0÷90°F. If ALC = Ab: ALL÷110°C; ALL÷230°F) when this temperature is reached the alarm is enabled after the ALd delay time.

ALL **Minimum temperature alarm**: (If ALC = rE: 0÷50°C ;0÷90°F. If ALC = Ab: ALU÷-50°C; ALU÷-58°F) when this temperature is reached the alarm is enabled after the ALd delay time.

AFH **Alarm and fan Set differential**: (0,1 ÷ 25,5 °C; 1÷25°F). It indicates the differential for the fan and temperature alarm regulation.

ALd **Temperature alarm delay**: (0÷255 min) time interval between the detection of an temperature alarm condition and the alarm signalling.

dAo **Temperature alarm delay at start-up**: (from 0min÷23h 50min) time interval between the detection of the temperature alarm condition after instrument power on and the alarm signalling.

EdA **Temperature alarm delay at defrost end**: (0÷255min) time interval between the detection of the temperature alarm condition at the end of the defrost and the alarm signalling.

dot **Door opening alarm override**: (0÷255min) It is the time that determines the alarm override duration after door closing.

doA **Open door alarm delay**: (0÷255min) time interval between the detection of the open door alarm condition and the alarm signalling.

tbA **Buzzer and alarm relay switching off**: n = Buzzer and relay are independent; y = Buzzer and relay are switched off through the same key.

nPS **Maximum number of pressure switch trippings**: (0÷15) It establishes how many time the pressure switch has to trip in the interval times set at the "did" parameter in order to cause the alarm signalling.

ot **Thermostat probe calibration**: (-12÷12°C; -21÷21°F) allows to calibrate the thermostat probe.

oE **Evaporator probe calibration**: (-12÷12°C; -21÷21°F) allows to calibrate the evaporator probe.

P2P **Presence of the Probe 2**: n: probe not present, time defrost. y: probe present, temperature controlled defrost.

odc **Opened door control**: It determines the compressor and fan state at open door: **no** = Fans and compressor operate normally; **Fan** = Fans OFF; **CPr** = Compressor OFF; **F_C** = Compressor and fans OFF.

did **Digital input alarm delay**: (0÷255 min.) When the digital input is set as pressure switch input, it determines the interval time during which the pressure switch has to trip a "nps" number of time to cause an alarm signalling.

LdE ***Light switching off delay after door closing***: *(0÷255s) It settles the light switching on after the door closing.*

Adr **Serial address RS485**: (1÷247) It allows to identify the instrument when it is inserted into a control or monitoring system like the XJ500.

rEL **Release software**: (reading only).

Ptb **Parameter table**: (reading only) Through it , it is possible to look up the list of the parameters set in the factory.

4. DIGITAL INPUTS

The **MIR90** electronic control panel has two digital inputs (clean contact). The first digital input acts as door microswitch and the second one as pressure switch.

INPUT 1: **DOOR MICROSWITCH**

It signals to the device the cold room door opening. When the door is opened, the compressor and the fans work according to the "odc" parameter value.
After the time interval programmed at the dOA parameter, the opened door alarm is activated and on the display the "dA" message appears. The alarm reset is automatic as soon as the digital input is deactivated. The temperature alarms are off when the door is opened and after its closing for the time interval set at the "dot" parameter.
The LIGHT output is active at the door opening and during the "Lde" interval time after its closing.

INPUT 2: **PRESSURE SWITCH**

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If during the time interval programmed at the "did" parameter, the pressure switch trips a number of times equal to those set at the "nPS" parameter the alarm is actuated. The "PAL" message is displayed, the compressor stops and the regulation is suspended. To restore the normal functioning, switch off the instrument or put it on Standby through the ON/OFF key.

5. TTL SERIAL LINE

Thanks to the TTL serial line, the MIR90 can connect to a monitoring and supervising system by an external TTL/RS485 module. The communication protocol is the ModBUS-RTU.

6. ALARM SIGNALS

Message - Mode		***Cause***	***Outputs***
"EE"	**Flashing**	Data failure	Alarm output ON; Other outputs unchanged
"P1"	**Flashing**	Thermostat probe failure;	Alarm output ON; Compressor output according to parameters "Con" and "CoF"
"P2"	**Alternating with room temperature**	Evaporator probe failure;	Alarm output ON; Other outputs unchanged, Time controlled end defrost
"HA"	**Alternating with room temperature**	Maximum temperature alarm	Alarm output ON; Other outputs unchanged
"LA"	**Alternating with room temperature**	Minimum temperature alarm	Alarm output ON; Other outputs unchanged
"dA"	**Alternating with room temperature**	Open door alarm	Alarm output ON; Outlets according to the parameter "odc"
"PAL"	**Alternating with room temperature**	Pressure switch alarm	Alarm output ON; All outputs OFF
"noL"	**Fixed or lighting**	Comunication alarm keyboard – mainboard	All the outlets OFF

!!! ***All the signals different from the ones specified in this manual indicate a serious damage to the electronic control panel.***

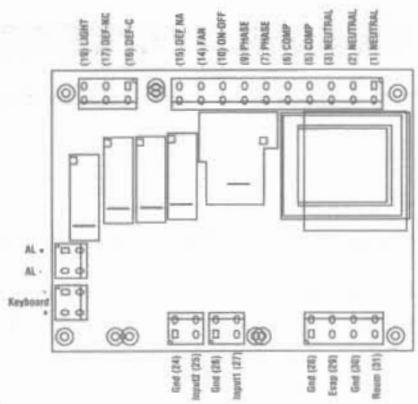
7. ALARM OUTPUT

When an alarm condition occurs, the alarm signal is displayed till this condition does not disappears. It is possible to inhibit the alarm output deactivation by setting the "tbA" parameter at "n"; in this case the alarm output remains active till the alarm condition lasts.

ALARM RECOVERY

Probe alarm "P1" starts 30 seconds after the fault in the related probe; it stops automatically 30 seconds after the probe restarts normal operation. Check connections before replacing the probe.
The ***"HA"*** and ***"LA"*** **temperature alarms** automatically stop as soon as the thermostat temperature returns to normal values, at defrost starting or at door opening.
The **"dA" open door alarm** stops automatically at the door closing.
The **"PAL" pressure switch alarm** can be restarted manually, by switching off the instrument or by putting it on Standby.

8. CONNECTIONS



Password = 321

9. PARAMETER DEFAULT VALUES

Label	Description	Range	level	defrost by AIR H-A	defrost by HOT GAS M-N	defrost by HOT GAS B-K	defrost by HEATERS M-N	defrost by HEATERS B-K
REGULATION								
Set	Set point	LS ÷ US	Pr 1	–	–	–	–	–
HY	Differential SET (principal)	0,1 ÷ 25,5 °C/°F	Pr 1	2	2	2	2	2
LS	Minimum set point	-50,0 °C/°F ÷ Set	Pr 1	5	-5	-25	-5	-25
US	Maximum set point	Set ÷ 110,0 °C/°F	Pr 1	15	5	-18	5	-18
OdS	Output activation delay at start-up	0 ÷ 255 min	Pr 1	0	0	0	0	0
AC	Anti-short cycle delay	0 ÷ 30 min	Pr 2	2	2	2	2	2
Con	Compressor ON time with faulty probe	0 ÷ 255 min	Pr 2	0	0	0	0	0
CoF	Compressor OFF time with faulty probe	0 ÷ 255 min	Pr 2	0	0	0	0	0
PROBES AND DISPLAYS								
CF	Display Celsius/Fahrenheit	°C ÷ °F	Pr 2	°C	°C	°C	°C	°C
DEFROST								
tdF	Defrost type	rE, rt, in	Pr 1	rE	In	In	rE	rE
EdF	Defrost mode: hour, interval, Smart-def	in ÷ Sd	Pr 2	Sd	Sd	Sd	Sd	Sd
dtE	Defrost termination temperature	-50,0 ÷ +110,0 °C/°F	Pr 1	110	20	20	30	30
IdF	Defrost Interval	1 ÷ 120 h	Pr 1	3	3	3	3	3
MdF	Maximum defrost duration	0 ÷ 255 min	Pr 1	20	20	20	30	30
dFd	Display during defrost	rt, it, Set, dEF, dEG	Pr 2	rt	rt	rt	rt	rt
dAd	Temperature display delay after defrost	0 ÷ 255 min	Pr 2	0	0	0	0	0
Fdt	Drain time	0 ÷ 60 min	Pr 1	0	2	2	2	2
FANS								
FnC	Fans operating mode	C_n, C_y, O_n, O_y	Pr 1	O_y	O_n	O_n	O_n	O_n
Fnd	Fan activation delay after defrost	0 ÷ 255 min	Pr 1	0	3	3	3	3
FSt	Fan stop temperature	-50,0 ÷ +110,0 °C/°F	Pr 1	40	40	40	40	40
ALARMS								
ALC	Alarm configuration: relative / absolute	rE ÷ Ab	Pr 2	rE	rE	rE	rE	rE
ALU	Maximum temperature alarm	-50,0 ÷ +110,0 °C/°F	Pr 2	5	5	5	5	5
ALL	Minimum temperature alarm	-50,0 ÷ +110,0 °C/°F	Pr 2	5	5	5	5	5
AFH	Alarm and fan set differential	0,1 ÷ 25,5 °C; 1 ÷ 25 °F	Pr 2	2	2	2	2	2
ALd	Temperature alarm delay (normal operating)	0 ÷ 255 min	Pr 2	0	0	0	0	0
dAo	Temperature alarm delay at start-up	0 ÷ 24 h	Pr 1	3	3	4	3	4
EdA	Temperature alarm delay at defrost end	0 ÷ 255 min	Pr 2	60	60	60	60	60
dot	Door opening alarm override	0 ÷ 255 min	Pr 2	60	60	60	60	60
doA	Open door alarm delay	0 ÷ 255 min	Pr 2	10	10	10	10	10
tbA	Alarm relay switching off	n ÷ y	Pr 2	y	y	y	y	y
nPS	No. of pressure switch trippings (did time)	0 ÷ 15	Pr 2	10	10	10	10	10
ANALOG INPUTS								
ot	Probe 1 calibration	-12,0 ÷ +12,0 °C/°F	Pr 2	0	0	0	0	0
oE	Probe 2 calibration	-12,0 ÷ +12,0 °C/°F	Pr 2	0	0	0	0	0
P2P	Probe 2 presence	n ÷ y	Pr 1	n	y	y	y	y
DIGITAL INPUTS								
odc	Open door control: fans and compressor	no, Fan, CPr, F_C	Pr 2	F_C	F_C	F_C	F_C	F_C
did	Digital input 1 counting interval time	0 ÷ 255 min	Pr 2	60	60	60	60	60
LdE	Light switching off delay after deactivation	0 ÷ 255 min	Pr 2	0	0	0	0	0
OTHER								
Adr	Address 1 RS485	0 ÷ 247	Pr 1	1	1	1	1	1
rEL	Firmware release code (reading only)	–	Pr 2	–	–	–	–	–
Ptb	Parameter table	–	Pr 2	–	–	–	–	–

10. GENERAL DESCRIPTION

The **MIR90** electronic control panel has two inputs for probes which control the cold room temperature and the defrost. It has also two free digital inputs not to be supplied that act as door microswitch and pressure switch. The alarm conditions are signalled by an output of 0-12V/20mA.