FK 211A

ON-OFF digital controller for static refrigerating units with two compressors

smart guide

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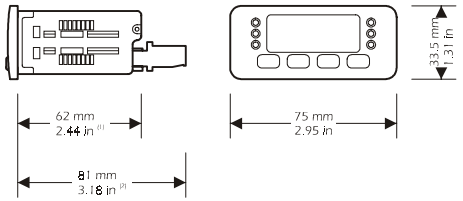
ENGLISH

1 PREPARATIONS

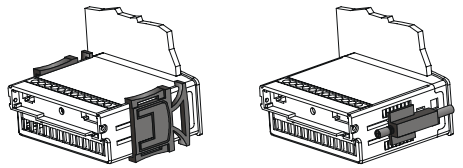
1.1 How to install the instrument

Panel mounting, panel cut out 71 x 29 mm (2.79 x 1.14 in), with click brackets (they are supplied by the builder) or screw brackets (by request).



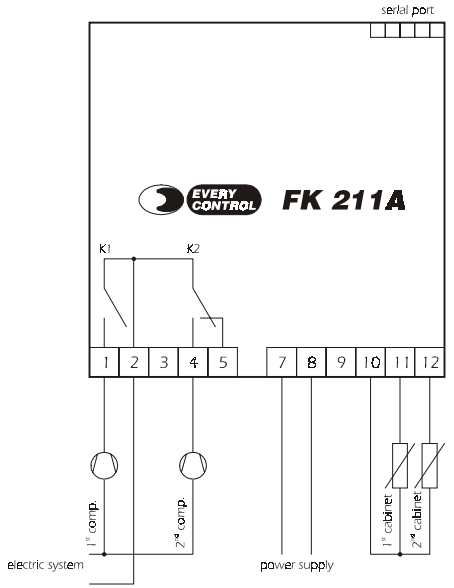
(1) maximum depth with screw terminal blocks (by request)

(2) maximum depth with extractable terminal blocks (standard model).



installation with click brackets (on the left-hand side, they are supplied by the builder) and screw brackets (on the right-hand side, by request); if you are using screw brackets, you have to moderate the clamping torque, in order not to damage the box and screw brackets.

1.2 Electrical connection



2 OPERATION

2.1 Preliminary information

During the normal operation the instrument shows the first cabinet temperature.

2.2 Second cabinet probe showing

If you have to show the second cabinet temperature:

▪ press (↓)

If you have to quit the procedure:

▪ press (↓) or do not operate for 4 s

2.3 How to silence the buzzer

If you have to silence the buzzer:

▪ press (↓)

2.4 How to activate the defrost by hand

If you have to activate the defrost by hand:

▪ press (↑) for 4 s

3 WORKING SETPOINT

3.1 How to set the working setpoint

If you have to modify the first working setpoint value:

- press set and ▲ or ▼ (3)
- do not operate for 2 s

If you have to modify the second working setpoint value:

- release set and press it again during the first working setpoint modification, then …
- press ▲ or ▼ (4)

(3) you can set the first working setpoint between the limits you have set with the parameters r1A and r2A

(4) you can set the second working setpoint between the limits you have set with the parameters r1b and r2b.

4 CONFIGURATION PARAMETERS

4.1 How to set the configuration parameters

Configuration parameters are arranged on two levels.

If you have to gain access the first level:

- press ▲ and ▼ for 4 s: the instrument will show PA

If you have to select a parameter:

- press ▲ or ▼

If you have to modify the value of the parameter:

- press set and ▲ or ▼

If you have to gain access the second level:

- gain access the first level
- press ▲ or ▼ for selecting PA
- press set and ▲ or ▼ for setting "**-19** "
- press ▲ and ▼ for 4 s: the instrument will show r0

If you have to quit the procedure:

- press ▲ and ▼ for 4 s or do not operate for about 60 s.

5 SIGNALS

5.1 Signals

LED	MEANING
out 1	First compressor LED if it is lighted, the first compressor will be ON if it flashes, a first compressor delay will be running (look at the parameters C0A, C1A, C2A and C4A)
out 2	Second compressor LED if it is lighted, the second compressor will be ON if it flashes, a second compressor delay will be running (look at the parameters C0b, C1b, C2b and C4b)
❄	Defrost LED if it is lighted, the defrost will be running
°F	Fahrenheit degree LED if it is lighted, the unit of measure of the temperature showed by the instrument is Fahrenheit degree
°C	Celsius degree LED if it is lighted, the unit of measure of the temperature showed by the instrument is Celsius degree

6 ALARMS

6.1 Alarms

CODE	REASONS	REMEDIES	EFFECTS
E2 corrupted memory data	there is the corruption of the configuration data of the memory of the instrument	switch off the power supply of the instrument: unless the alarm disappears, you will have to change the instrument	▪ you can not gain access the setting procedures ▪ all outputs will be forced OFF
E0 first cabinet probe alarm	▪ the kind of first cabinet probe you have connected is not right ▪ the first cabinet probe plays up ▪ the connection instrument-first cabinet probe is wrong	▪ look at the parameter /0 ▪ test the integrity of the probe ▪ test the instrument-probe connection	▪ the first compressor will be forced to the status you have set with the parameter C3A ▪ if the defrost is running, it will immediately end ▪ the defrost will never be activated

A7b	0	15	h	2	second temperature alarm exclusion time since the end of the defrost (since the end of d3, it is important if A1b and/or A2b ≠ 0)

LABEL	MIN.	MAX.	U.M.	DEF.	DEFROST
d0	0	99	h	8	defrost interval (0 = the defrost will never automatically be activated)
d3	0	99	min	30	defrost length (0 = the defrost will never be activated) (6)
d4	0	1	—	0	defrost activation every time you turn the instrument ON (1 = YES)
d5	0	99	min	0	delay between you turn the instrument ON and the defrost activation (it is important if d4 = 1)
d6	0	1	—	1	freeze of the temperature showed by the instrument during the defrost (1 = YES) (7)

LABEL	MIN.	MAX.	U.M.	DEF.	SERIAL NETWORK (EVCOBUS)
L1	1	15	—	1	instrument address
L2	0	7	—	0	instrument group
L4	0	3	—	1	baud rate (0 = 1,200 baud, 1 = 2,400 baud, 2 = 4,800 baud, 3 = 9,600 baud)

(5) the unit of measure depends on the parameter /8

(6) if the parameter r3A and/or the parameter r3b have value 1, you have to set the parameter d3 with value 0

(7) if at the moment of the defrost activation the first cabinet temperature is below the value "first working setpoint + r0A" , the instrument will not show temperatures above that value; if at the moment of the defrost activation the first cabinet temperature is above the value "first working setpoint + r0A" , the instrument will not show the increases of the temperature (if the increase takes place below the value "first working setpoint + r0A" , look at the previous case); the instrument restores the normal operation once the defrost ends and the first cabinet temperature falls below the freeze temperature.

	▪ the first cabinet temperature is outside the limits allowed by the working range of the instrument	▪ test the temperature close to the probe (it has to be between the limits allowed by the working range)	
E1 second cabinet probe alarm	▪ the kind of second cabinet probe you have connected is not right ▪ the second cabinet probe plays up ▪ the connection instrument-second cabinet probe is wrong ▪ the second cabinet temperature is outside the limits allowed by the working range of the instrument	▪ look at the parameter /0 ▪ test the integrity of the probe ▪ test the instrument-probe connection ▪ test the temperature close to the probe (it has to be between the limits allowed by the working range)	▪ the second compressor will be forced to the status you have set with the parameter C3b ▪ if the defrost is running, it will immediately end ▪ the defrost will never be activated
AL1 first lower or upper temperature alarm	the first room temperature is outside the limit you have set with the parameter A1A or A2A	test the temperature close to the first probe (look at the parameters A0A, A1A and A2A)	no effects
AL2 first lower or upper temperature alarm	the second room temperature is outside the limit you have set with the parameter A1b or A2b	test the temperature close to the second probe (look at the parameters A0b, A1b and A2b)	no effects

The instrument shows the indications above alternated with the first cabinet temperature, except the indication "**E2**" (it flashes) and "**E0**" (it is alternated with the indication "**- - -**") and the buzzer utters an intermittent beep.

7 TECHNICAL DATA

7.1 Technical data

Box: self-extinguishing grey.

Size: 75 x 33.5 x 81 mm (2.95 x 1.31 x 3.18 in) the model with extractable terminal blocks (standard model), 75 x 33.5 x 62 mm (2.95 x 1.31 x 2.44 in) the model with screw terminal blocks (by request).

Installation: panel mounting, panel cut out 71 x 29 mm (2.79 x 1.14 in), with click brackets (they are supplied by the builder) or screw brackets (by request).

Frontal protection: IP 65.

Connections: extractable terminal blocks with pitch 5 mm (0.19 in, standard model) for cables up to 2.5 mm² (0.38 sq in, power supply, inputs and outputs) or screw terminal blocks with pitch 5 mm (0.19 in, by request) for cables up to 2.5 mm² (0.38 sq in, power supply, inputs and outputs), 5 poles single line male connector with pitch 2.5 mm (0.09 in, serial port).

Ambient temperature: from 0 to 55 °C (32 to 131 °F; 10 ... 90% of relative humidity without condensate).

Power supply: 12 Vac/dc, 50/60 Hz, 1.5 VA (standard model) or 12-24 Vac/dc, 50/60 Hz, 1.5 VA (by request).

Alarm buzzer: included.

Measure inputs: 2 (first cabinet and second cabinet probe) for PTC or NTC probes.

Working range: from -50 to 150 °C (-58 to 302 °F) for PTC probe, from -40 to 110 °C (-40 to 230 °F) for NTC probe.

Setpoint range: from -99 to 99 °C (-99 to 99 °F).

Resolution: 1 °F with unit of measure in Fahrenheit, 1 °C with unit of measure in Celsius.

Display: one red LED 3-digit display 13.2 mm (0.51 in) high, output status indicators, defrost status indicator, temperature unit of measure indicators.

Outputs: 2 relays: one 10 A @ 250 Vac relay for one ½ HP @ 230 Vac compressor control (NO contact) and one 8 A @ 250 Vac relay for one ½ HP @ 230 Vac compressor control (change-over contact).

Kind of defrost: stopping the compressor.

Defrost control: defrost interval and defrost length (automatic and by hand).

Serial port: TTL with EVCOBUS communication protocol (for the configurer/cloner system CLONE and supervision system RICS).

8 WORKING SETPOINT AND CONFIGURATION PARAMETERS

8.1 Working setpoint

LABEL	MIN.	MAX.	U.M.	DEF.	WORKING SETPOINT
	r1A	r2A	°C/°F [5]	0	first working setpoint
	r1b	r2b	°C/°F [5]	0	second working setpoint

8.2 First level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	PASSWORD
PA	-99	99	—	0	password

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/1A	-99	99	°C/°F [5]	0	first cabinet probe calibration (you have to set eight points for adjusting one degree)
/1b	-99	99	°C/°F [5]	0	second cabinet probe calibration (you have to set eight points for adjusting one degree)

LABEL	MIN.	MAX.	U.M.	DEF.	FIRST REGULATOR
r0A	1	15	°C/°F [5]	2	hysteresis (differential, it is relative to the first working setpoint)

LABEL	MIN.	MAX.	U.M.	DEF.	SECOND REGULATOR
r0b	1	15	°C/°F [5]	2	hysteresis (differential, it is relative to the second working setpoint)

8.3 Second level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/0	1	3	—	1	kind of probe (1 = PTC, 3 = NTC)
/1A	-99	99	°C/°F [5]	0	first cabinet probe calibration (you have to set eight points for adjusting one degree)
/1b	-99	99	°C/°F [5]	0	second cabinet probe calibration (you have to set eight points for adjusting one degree)
/8	0	1	—	1	temperature unit of measure (0 = Fahrenheit degree, 1 = Celsius degree)

LABEL	MIN.	MAX.	U.M.	DEF.	FIRST REGULATOR
r0A	1	15	°C/°F [5]	2	hysteresis (differential, it is relative to the first working setpoint)
r1A	-99	r2A	°C/°F [5]	-50	minimum value you can assign to the first working setpoint
r2A	r1A	99	°C/°F [5]	50	maximum value you can assign to the first working setpoint
r3A	0	1	—	0	cooling or heating action (0 = cooling action)

LABEL	MIN.	MAX.	U.M.	DEF.	FIRST COMPRESSOR PROTECTION
C0A	0	15	min	0	minimum delay between you turn the instrument ON and the first activation of the first compressor
C1A	0	15	min	5	minimum delay between two activation of the first compressor in succession
C2A	0	15	min	3	minimum delay between the first compressor gets OFF and the following activation
C3A	0	1	—	0	first compressor status during the first cabinet probe alarm (0 = it will be forced OFF, 1 = it will be forced ON)
C4A	0	1	—	0	fixed delay since the first compressor gets ON and OFF (1 = YES, for 3 s)

LABEL	MIN.	MAX.	U.M.	DEF.	FIRST ALARM (first cabinet temperature)
A0A	1	15	°C/°F [5]	2	hysteresis (differential, it is relative to A1A and A2A, it is important if A1A and/or A2A ≠ 0)
A1A	-99	0	°C/°F [5]	-10	lower first temperature alarm threshold (it is relative to the first working setpoint, 0 = it will never be activated)
A2A	0	99	°C/°F [5]	10	upper first temperature alarm threshold (it is relative to the first working setpoint, 0 = it will never be activated)
A3A	0	15	h	2	first temperature alarm exclusion time since you turn the instrument ON (it is important if A1A and/or A2A ≠ 0)
A7A	0	15	h	2	first temperature alarm exclusion time since the end of the defrost (since the end of d3, it is important if A1A and/or A2A ≠ 0)

LABEL	MIN.	MAX.	U.M.	DEF.	SECOND REGULATOR
r0b	1	15	°C/°F [5]	2	hysteresis (differential, it is relative to the second working setpoint)
r1b	-99	r2A	°C/°F [5]	-50	minimum value you can assign to the second working setpoint
r2b	r1A	99	°C/°F [5]	50	maximum value you can assign to the second working setpoint
r3b	0	1	—	1	cooling or heating action (0 = cooling action)

LABEL	MIN.	MAX.	U.M.	DEF.	SECOND COMPRESSOR PROTECTION
C0b	0	15	min	0	minimum delay between you turn the instrument ON and the first activation of the second compressor
C1b	0	15	min	0	minimum delay between two activation of the second compressor in succession
C2b	0	15	min	0	minimum delay between the second compressor gets OFF and the following activation
C3b	0	1	—	0	second compressor status during the second cabinet probe alarm (0 = it will be forced OFF, 1 = it will be forced ON)
C4b	0	1	—	0	fixed delay since the second compressor gets ON and OFF (1 = YES, for 3 s)

LABEL	MIN.	MAX.	U.M.	DEF.	SECOND ALARM (second cabinet temperature)
A0b	1	15	°C/°F [5]	2	hysteresis (differential, it is relative to A1b and A2b, it is important if A1b and/or A2b ≠ 0)
A1b	-99	0	°C/°F [5]	-10	lower second temperature alarm threshold (it is relative to the second working setpoint, 0 = it will never be activated)
A2b	0	99	°C/°F [5]	10	upper second temperature alarm threshold (it is relative to the second working setpoint, 0 = it will never be activated)
A3b	0	15	h	2	second temperature alarm exclusion time since you turn the instrument ON (it is important if A1b and/or A2b ≠ 0)