FK 202B
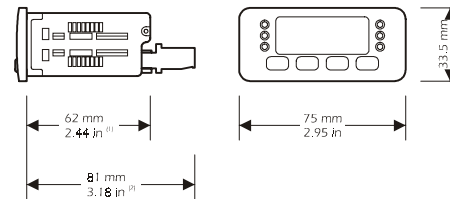
ON-OFF digital controller for static refrigerating units
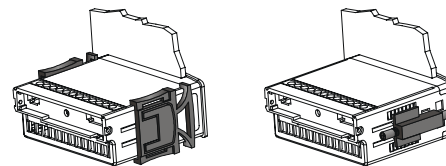
ENGLISH

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).

62 mm
2.44 in [1]

81 mm
3.18 in [2]

75 mm
2.95 in

33.5 mm
1.31 in

(1) maximum depth with screw terminal blocks

(2) maximum depth with extractable terminal blocks.

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
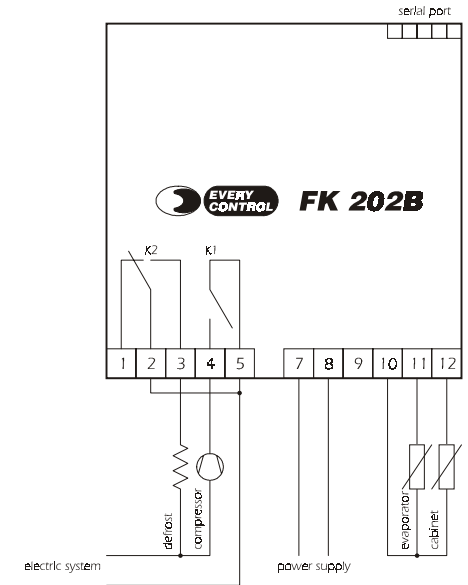
2 OPERATION

2.1 Preliminary information

During the normal operation the instrument shows the cabinet temperature.

2.2 How to silence the buzzer (optional)

If you have to silence the buzzer:

▪ press 🔽

2.3 How to activate the defrost by hand

If you have to activate the defrost by hand:

▪ press 🔼❄ for 4 s

Unless the evaporator temperature is below the defrost end temperature you have set with the parameter d2, the defrost will not be activated.

3 WORKING SETPOINT

3.1 How to set the working setpoint

If you have to modify the working setpoint value:

▪ press set and 🔼❄ or 🔽 [3]

(3) you can set the working setpoint between the limits you have set with the parameters r1 and r2.

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 rO

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
❄	Compressor LED if it is lighted, the compressor will be ON if it flashes, a compressor delay will be running (look at the parameters C0, C1, C2 and C4)
❄❄	Defrost LED if it is lighted, the defrost output will be activated if it flashes: ▪ a defrost delay will be running (look at the parameters C0, C1, C2 and C4) ▪ the dripping will be running (look at the parameter d7)

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
$E0$ cabinet probe alarm	▪ the kind of cabinet probe you have connected is not right ▪ the cabinet probe plays up ▪ the connection instrument-cabinet probe is wrong ▪ the 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 compressor will work in accordance with the parameters C5 and C6 ▪ if the defrost is running, it will immediately end ▪ the defrost will never be activated
$E1$ evaporator probe alarm	▪ the kind of evaporator probe you have connected is not right ▪ the evaporator probe plays up ▪ the connection instrument-evaporator probe is wrong ▪ the evaporator 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 defrost will end by time (parameter d3)

cabinet temperature lower or upper temperature alarm	the cabinet temperature is outside the limit you have set with the parameter A1 or A2	test the temperature close to the probe (look at the parameters A0, A1 and A2)	no effect

The instrument shows the indications above flashing and the buzzer (optional) 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 , 75 x 33.5 x 62 mm (2.95 x 1.31 x 2.44 in) the model with screw terminal blocks.

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) 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) 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: optional.

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

Working range: from -50 to 99 °C (-58 to 210 °F) for PTC probe, from -40 to 99 °C (-40 to 210 °F) for NTC probe.

Setpoint range: from -55 to 99 °C (-55 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.

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

Kind of defrost: electric and hot gas defrost.

Defrost control: defrost interval, defrost end temperature and defrost maximum length (automatic, by hand and remote).

Serial port: TTL with EVCOBUS communication protocol.

8 WORKING SETPOINT AND CONFIGURATION PARAMETERS

8.1 Working setpoint

LABEL	MIN.	MAX.	U.M.	DEF.	WORKING SETPOINT
	r1	r2	°C/°F [4]	0	working setpoint

8.2 First level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	PASSWORD
PA	-55	99	—	0	password

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/1	-55	99	°C/°F [4]	0	cabinet probe calibration (you have to set eight points for adjusting one degree)
/6	-55	99	°C/°F [4]	0	evaporator probe calibration (you have to set eight points for adjusting one degree)

LABEL	MIN.	MAX.	U.M.	DEF.	REGULATOR
r0	1	15	°C/°F [4]	2	hysteresis (differential, it is relative to the working setpoint)

LABEL	MIN.	MAX.	U.M.	DEF.	DEFROST
dA	—	—	°C/°F [4]	—	evaporator temperature showing

8.3 Second level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/0	1	4	—	1	kind of probe (1 = PTC, 2 = reserved, 3 = NTC, 4 = reserved)
/1	-55	99	°C/°F [4]	0	cabinet probe calibration (you have to set eight points for adjusting one degree)
/6	-55	99	°C/°F [4]	0	evaporator 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.	REGULATOR
r0	1	15	°C/°F [4]	2	hysteresis (differential, it is relative to the working setpoint)
r1	-55	r2	°C/°F [4]	-50	minimum value you can assign to the working setpoint
r2	r1	99	°C/°F [4]	50	maximum value you can assign to the working setpoint

LABEL	MIN.	MAX.	U.M.	DEF.	COMPRESSOR PROTECTION
C0	0	240	min	0	minimum delay between you turn the instrument ON and the first compressor activation
C1	0	240	min	5	minimum delay between two compressor activation in succession
C2	0	240	min	3	minimum delay between the compressor gets OFF and the following activation
C4	0	1	—	0	fixed delay since the compressor gets ON and OFF (1 = YES, for 3 s)
C5	1	240	min	10	cycle time for the compressor activation during the cabinet probe alarm
C6	0	100	%	50	percentage of C5 the compressor is ON during the cabinet probe failure

LABEL	MIN.	MAX.	U.M.	DEF.	DEFROST
d0	0	99	h	8	defrost interval [5] (0 = the defrost will never automatically be activated)
d1	0	1	—	0	kind of defrost (0 = electric defrost, 1 = hot gas defrost)
d2	-55	99	°C/°F [4]	2	defrost end temperature (evaporator temperature)
d3	0	240	min	30	defrost maximum length (0 = the defrost will never be activated)
d4	0	1	—	0	defrost activation every time you turn the instrument ON (1 = YES) [5]
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) [6]
d7	0	15	min	2	dripping time
d9	0	1	—	0	compressor protections cleaning at the moment of the defrost activation (it is important if d1 = 1; 1 = YES)
dA	—	—	°C/°F [4]	—	evaporator temperature showing

LABEL	MIN.	MAX.	U.M.	DEF.	ALARMS
A0	1	15	°C/°F [4]	2	hysteresis (differential, it is relative to A1 and A2, it is important if A1 and/or A2 ≠ 0)
A1	-55	0	°C/°F [4]	-10	lower temperature alarm threshold (it is relative to the working setpoint, 0 = it will never be activated)
A2	0	99	°C/°F [4]	10	upper temperature alarm threshold (it is relative to the working setpoint, 0 = it will never be activated)
A3	0	240	min	120	temperature alarm exclusion time since you turn the instrument ON (it is important if A1 and/or A2 ≠ 0)
A6	0	240	min	5	temperature alarm exclusion time (it is important if A1 and/or A2 ≠ 0) [7]
A7	0	240	min	15	temperature alarm exclusion time since the end of the dripping (since the end of d7, it is important if A1 and/or A2 ≠ 0)

LABEL	MIN.	MAX.	U.M.	DEF.	SERIAL NETWORK (EVCOBUS)
L1	1	15	—	1	instrument address
L2	0	7	—	6	instrument group
L4	0	3	—	1	baud rate (0 = 1,200 baud, 1 = 2,400 baud, 2 = 4,800 baud, 3 = 9,600 baud)

[4]   the unit of measure depends on the parameter /8

[5]   unless the evaporator temperature is below the defrost end temperature you have set with the parameter d2, the defrost will not be activated

[6]   if at the moment of the defrost activation the cabinet temperature is below the value "working setpoint + r0", the instrument will not show temperatures above that value; if at the moment of the defrost activation the cabinet temperature is above the value "working setpoint + r0", the instrument will not show the increases of the temperature (if the increase takes place below the value "working setpoint + r0", look at the previous case); the instrument restores the normal operation once the dripping ends and the cabinet temperature falls below the freeze temperature

[7]   if the temperature alarm does not disappear at the end of the time you have set with the parameter A3, it will further be excluded for the time you have set with the parameter A6; if the temperature alarm takes place during the defrost and does not disappear at the end of the time you have set with the parameter A7, it will further be excluded for the time you have set with the parameter A6.