

# EVK411M Single output digital thermoregulator for general purposes

## GB ENGLISH

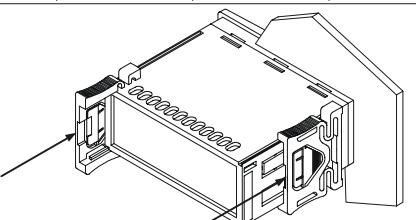
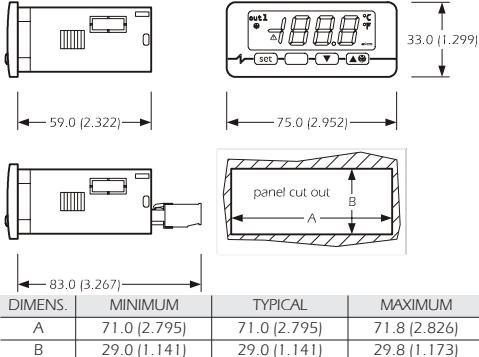
### 1 GETTING STARTED

#### 1.1 Important

Read these instructions carefully before installing and using the instrument and follow all additional information for installation and electrical connection; keep these instructions close to the instrument for future consultations.

#### 1.2 Installing the instrument

Panel mounting, with click brackets (supplied by the builder); dimensions in mm (in).



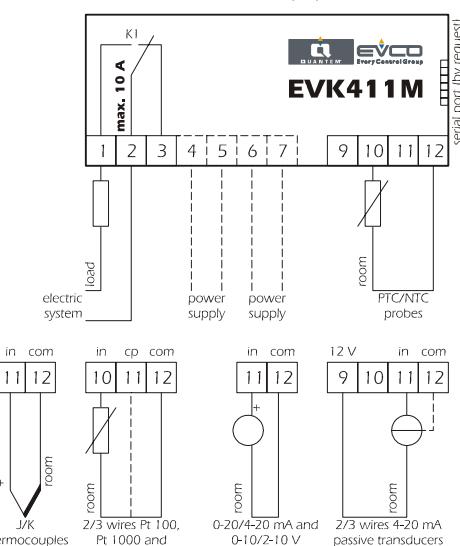
Additional information for installation:

- 59.0 (2.322) is the maximum depth with screw terminal blocks
- 83.0 (3.267) is the maximum depth with extractable terminal blocks
- the panel thickness must not be higher than 8.0 mm (0.314 in)
- working conditions (working temperature, humidity, etc.) must be between the limits indicated in the technical data
- do not install the instrument close to heating sources (heaters, hot air ducts, etc.), devices provided with big magnetos (big speakers, etc.), locations subject to direct sunlight, rain, humidity, dust, mechanical vibrations or bumps
- according to the safety legislation, the protection against electrical parts must be ensured by a correct installation of the instrument; the parts that ensure the protection must be installed so that you can not remove them if not by using a tool.

#### 1.3 Wiring diagram

With reference to the wiring diagram:

- terminals 4 and 5 are available only in the models with power supply 230 VAC and 115 VAC; terminals 6 and 7 are available only in the models with power supply 12 VAC/DC and 12-24 VAC/DC
- the serial port (by request) is the port for the communication with the supervision system (through a serial interface, via TTL, with MODBUS communication protocol) or with the programming key; the port must not be used at the same time for the same purposes.



Additional information for electrical connection:

- do not operate on the terminal blocks with electrical or pneumatic screws
- if the instrument has been moved from a cold location to a warm one, the humidity could condense on the inside; wait about an hour before supplying it

- test the working power supply voltage, working electrical frequency and working electrical power of the instrument; they must correspond with the local power supply
- disconnect the local power supply before servicing the instrument
- provide the thermocouple with a protection able to protect it against contacts with metal parts or use insulated thermocouples
- do not use the instrument as safety device
- for repairs and information on the instrument please contact Quantem-Evco sales network.

#### 2 USER INTERFACE

##### 2.1 Turning on/off the instrument

To turn on the instrument you have to supply it; to turn it off it is enough to cut off the power supply.

##### 2.2 The display

If the instrument is turned on, during the normal operation the display will show the quantity you have set with parameter P5:

- if P5 = 0, the display will show the room temperature
- if P5 = 1, the display will show the working setpoint.

##### 2.3 Showing the room temperature

- make sure the keyboard is not locked and no procedure is running
- press **set** 2 s: the display will show "Pb1"

To quit the procedure:

- press **set** or do not operate 60 s
- press **▲** or **▼** as long as the display shows the quantity you have set with parameter P5 or do not operate 60 s.

##### 2.4 Activating the defrost by hand

- make sure the keyboard is not locked and no procedure is running
- press **▲** 4 s.

If parameter r5 has value 1 (heating action), the defrost functions will not be enabled.

##### 2.5 Locking/unlocking the keyboard

To lock the keyboard:

- make sure no procedure is running
- press **set** and **▼** 2 s: the display will show "Loc" 1 s.

If the keyboard is locked, you will not be allowed to:

▪ activate the defrost by hand

- modify the working setpoint with the procedure related in paragraph 4.1 (you also can modify the working setpoint through parameter SP). These operations provoke the visualization of the label "Loc" 1 s.

To unlock the keyboard:

- press **set** and **▼** 2 s: the display will show "UnL" 1 s.

##### 2.6 Silencing the buzzer

- make sure no procedure is running
- press a button (the first pressure of the button does not provoke its usual effect).

#### 3 OPERATION

##### 3.1 Preliminary information

The operation mainly depends on parameter r5.

##### 3.2 Operation with parameter r5 = 0 (cooling action)

- temp.
  - load
  - time
- 
- A graph showing load over time. The load fluctuates around a dashed horizontal line representing the working setpoint. The x-axis is labeled 'time' and the y-axis is labeled 'load'.

##### 3.3 Operation with parameter r5 = 1 (heating action)

- temp.
  - load
  - time
- 
- A graph showing load over time. The load is constant at a low level (representing a defrost cycle) for a period, then rises sharply to a high level (representing full heating) for another period, and then drops back down. The x-axis is labeled 'time' and the y-axis is labeled 'load'.

When the cause that has provoked the alarm disappears, the instrument restores the normal operation.

#### 7 INTERNAL DIAGNOSTICS

##### 7.1 Internal diagnostics

##### CODE MEANING

##### AL1 First temperature alarm

Remedies:

- check the room temperature
- look at parameters A1 and A3

Effects:

- no effect

##### AL2 Second temperature alarm

Remedies:

- check the room temperature
- look at parameters A5 and A7

Effects:

- no effect

When the cause that has provoked the alarm disappears, the instrument restores the normal operation.

#### 4 SETTINGS

##### 4.1 Setting the working setpoint

- make sure the keyboard is not locked and no procedure is running
- press **set** LED **out 1** will flash

- press **▲** or **▼** in 15 s; also look at parameters r1, r2 and r3

- press **set** or do not operate 15 s.

You also can modify the working setpoint through parameter SP.

##### 4.2 Setting configuration parameters

To gain access the procedure:

- make sure no procedure is running
- press **▲** and **▼** 4 s: the display will show "PA"

- press **set**

- press **▲** or **▼** in 15 s to set "-19"

- press **set** or do not operate 15 s

- press **▲** and **▼** 4 s: the display will show "SP"

To select a parameter:

- press **▲** or **▼**

To modify a parameter:

- press **set**

- press **▲** or **▼** in 15 s

- press **set** or do not operate 15 s.

To quit the procedure:

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

##### Switch off/on the power supply of the instrument after the modification of the parameters.

##### 4.3 Restoring the default value of configuration parameters

make sure no procedure is running

- press **▲** and **▼** 4 s: the display will show "PA"

- press **set**

- press **▲** or **▼** in 15 s to set "743"

- press **set** or do not operate 15 s

- press **▲** and **▼** 4 s: the display will show "dEF"

- press **set**

- press **▲** or **▼** in 15 s to set "149"

- press **set** or do not operate 15 s: the display will show "dEF" flashing 4 s, after which the instrument will quit the procedure

▪ switch off/on the power supply of the instrument.

##### Working range:

from -50 to 150 °C (-50 to 300 °F) for PTC probe,

from -40 to 110 °C (-40 to 230 °F) for NTC probe, from -100 to 800 °C

(-140 to 1,450 °F) for J thermocouple, from -100 to 1,300 °C

(-140 to 1,999 °F) for K thermocouple, from -200 to 650 °C

(-320 to 1,200 °F) for 2/3 wires Pt 100 probe, from -80 to 300 °C

(-110 to 570 °F) for 2/3 wires Ni 120 probe.

##### Resolution:

0.1 °C/1 °C/1 °F

##### Digital outputs:

1 relay: I rating: 16 res. A @ 250 VAC (change-over contact).

##### The maximum current allowed on the load is 10 A

##### Serial port:

port for the communication with the supervision system

(through a serial interface, via TTL, with MODBUS communication protocol) or with the programming key; by request.

##### Working temperature:

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

##### Power supply:

230 VAC, 50/60 Hz, 3 VA (approximate); 115 VAC or 12-24 VAC/DC or 12 VAC/DC by request.

##### Frontal protection:

IP 65.

##### Connections:

screw terminal blocks (power supply, input and output), 6 poles connector (serial port; by request); extractable terminal blocks (power supply, input and output) by request.

##### Working temperature:

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

##### Power supply:

230 VAC, 50/60 Hz, 3 VA (approximate); 115 VAC or 12-24 VAC/DC or 12 VAC/DC by request.

##### Frontal protection:

IP 65.

##### Connections:

## 9 WORKING SETPOINTS AND CONFIGURATION PARAMETERS

## 9.1 Working setpoints

	MIN.	MAX.	U.M.	DEF	WORKING SETPOINTS
r1	r2	°C/F (1)	0.0		working setpoint

## 9.2 Configuration parameters

PARAM	MIN.	MAX.	U.M.	DEF	WORKING SETPOINTS
SP	r1	r2	°C/F (1)	0.0	working setpoint

PARAM	MIN.	MAX.	U.M.	DEF	MEASURE INPUTS
CA1	-25.0	25.0	°C/F (1)	0.0	room probe offset

P0	0	13	---	2	kind of probe 0 = PTC 1 = NTC 2 = J 3 = K 4 = 3 wires Pt 100 5 = 2 wires Pt 100 6 = 3 wires Pt 1000 7 = 2 wires Pt 1000 8 = 4-20 mA 9 = 0-20 mA 10 = 2-10 V 11 = 0-10 V 12 = 3 wires Ni 120 13 = 2 wires Ni 120
					tipo di sonda 0 = PTC 1 = NTC 2 = J 3 = K 4 = Pt 100 3 fili 5 = Pt 100 2 fili 6 = Pt 1000 3 fili 7 = Pt 1000 2 fili 8 = 4-20 mA 9 = 0-20 mA 10 = 2-10 V 11 = 0-10 V 12 = Ni 120 3 fili 13 = Ni 120 2 fili

P1	0	1	---	1	if P0 = 0 ... 7 or 12 ... 13, decimal point Celsius degree 1 = YES if P0 = 8 ... 11, decimal point position 0 = no decimal point 1 = on the digit of ten
					se P0 = 0 ... 7 o 12 ... 13, punto decimale grado Celsius 1 = SI se P0 = 8 ... 11, posizione del punto decimale 0 = nessun punto decimale 1 = sul digit delle decine

P2	0	2	---	0	unit of measure temperature [influential only on LED Celsius degree and on LED Fahrenheit if P0 = 8 ... 11] (2) (3) 0 = °C 1 = °F 2 = LED Celsius degree and LED Fahrenheit degree will remain turned off
					unità di misura temperatura [influenza solo sul LED grado Celsius e sul LED grado Fahrenheit se P0 = 8 ... 11] (2) (3) 0 = °C 1 = °F 2 = il LED grado Celsius e il LED grado Fahrenheit rimarranno spenti

P3	-199.0	199.0	points	-20.0	minimum value of the range of the transducer
					valore minimo della taratura del trasduttore

P4	-199.0	199.0	points	80.0	maximum value of the range of the transducer
					valore massimo della taratura del trasduttore

P5	0	1	---	0	quantità da mostrare durante la normale funzionamento
					0 = room temperature 1 = working setpoint

PARAM	MIN.	MAX.	U.M.	DEF	MAIN REGULATOR
r0	0.1	99.0	°C/F (1)	2.0	working setpoint differential

r1	-199.0	r2	°C/F (1)	0.0	minimum working setpoint
					massimo setpoint di lavoro

r2	r1	[4]	°C/F (1)	350.0	maximum working setpoint
					blocco della modifica del setpoint di lavoro (con la procedura indicata nel paragrafo 4.1)

r3	0	1	---	0	locking the working setpoint modification (with the procedure related in paragraph 4.1)
					1 = YES

r5	0	1	---	[5]	cooling or heating action
					0 = cooling

PARAM	MIN.	MAX.	U.M.	DEF	LOAD PROTECTIONS
C1	0	240	min	0	minimum time between two activations in succession of the load; also load delay since the end of the room probe error (6)

C2	0	240	min	0	minimum time the load remains turned off; also load delay since you turn on the instrument
					durata minima dello spegnimento del carico; anche ritardo carico dall'accensione dello strumento

C3	0	240	s	0	minimum time the load remains turned on
					durata minima dell'accensione del carico

C4	0	240	min	10	time the load remains turned off during the room probe error; also look at C5
					durata dello spegnimento del carico durante l'errore sonda ambiente; si veda anche C5

C5	0	240	min	10	time the load remains turned on during the room probe error; also look at C4
					durata dell'accensione del carico durante l'errore sonda ambiente; si veda anche C4

PARAM	MIN.	MAX.	U.M.	DEF	DEFROST (7)
d0	0	99	h	8	defrost interval (8)

					0 = the defrost at intervals will never be activated
					0 = defrosteamento a intervalli non verrà mai attivato

d3	0	99	min	0	defrost duration
					0 = lo sbrinamento non verrà mai attivato

d4	0	1	---	0	defrost when you turn on the instrument
					1 = YES

d5	0	99	min	0	defrost delay when you turn on the instrument (only if d4 = 1)
					ritardo sbrinamento dall'accensione dello strumento (solo se d4 = 1)

d6	0	1	---	1	temperature shown during the defrost
					0 = room temperature

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