

FK 402A

ON-OFF single output digital thermoregulator with alarm relay

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EVERY CONTROL S.r.l.

This Company belongs to **EVCO group**

Via Mezzaterra 6, 32036 Sedico Belluno ITALY

Phone 0039-0437-852468 • Fax 0039-0437-83648

info@everycontrol.it • www.everycontrol.it

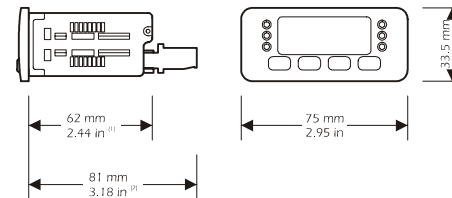
ENGLISH

smart guide

1 PREPARATIONS

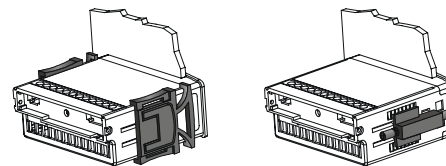
1.1 How to install the instrument

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.

2 OPERATION

2.1 Preliminary information

During the normal operation the instrument shows the room temperature.

The alarm relay will be activated during the normal operation and it will be deactivated during an alarm condition ⁽³⁾.

⁽³⁾ if the parameter uP has value 1, the alarm relay will be deactivated during the normal operation and it will be activated during an alarm condition.

2.2 How to silence the buzzer

If you have to silence the buzzer:

▪ press

3 WORKING SETPOINT

3.1 How to set the working setpoint

If you have to modify the working setpoint value:

▪ press

▪ press or within 2 s ⁽⁴⁾ ⁽⁵⁾

▪ press

⁽⁴⁾ you can set the working setpoint between the limits you have set with the parameters rA1 and rA2

⁽⁵⁾ unless the parameter rA5 has value 0, you can not modify the working setpoint.

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 ⁽⁶⁾; the instrument will show *PR*

If you have to select a parameter:

▪ press or

If you have to modify the value of the parameter:

▪ press

▪ press or within 2 s ⁽⁷⁾










▪ press

If you have to gain access the second level:


▪ gain access the first level

▪ press or for selecting *PR*

▪ press

- press  or  within 2 s  for setting “-19”
- press 
- press  and  for 4 s : the instrument will show  

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	Load LED if it is lighted, the load will be ON if it flashes, a load delay will be running (look at the parameters CA0, CA1, CA2 and CA4)
°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

INDICAT.	MEANING
---	you can not modify the working setpoint (look at the parameter rA5)

6 ALARMS

6.1 Alarms

CODE	REASONS	REMEDIES	EFFECTS
E2	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	<ul style="list-style-type: none"> you can not gain access the setting procedures all outputs will be forced OFF
E0	the kind of room probe you have connected is not right	<ul style="list-style-type: none"> look at the parameter /0 test the integrity of the probe 	<ul style="list-style-type: none"> the load will be forced to the status you have set with the parameter CA3

<ul style="list-style-type: none"> the room probe plays up the connection instrument-room probe is wrong the room temperature is outside the limits allowed by the working range of the instrument 	<ul style="list-style-type: none"> test the instrument-probe connection test the temperature close to the probe (it has to be between the limits allowed by the working range) 	<ul style="list-style-type: none"> the alarm relay will be activated/deactivated (look at the parameter uP)
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E0C	<ul style="list-style-type: none"> if the instrument has been preset for working with “J”, “K” or “S” thermocouples, there will be a defect in the cold joint compensation circuit if the instrument has been preset for working with 2 or 3 wires Pt 100 or Ni 120 probes, the third wire of the probe will not be connected 	<ul style="list-style-type: none"> in the first case, switch off the power supply of the instrument: unless the alarm disappears, you will have to change the instrument in the second case, test the instrument-probe connection 	<ul style="list-style-type: none"> the load will be forced to the status you have set with the parameter CA3 the alarm relay will be activated/deactivated (look at the parameter uP)
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AL1	the room temperature first is outside the limit you have set with the parameter AA1	test the temperature close to the probe (look at the parameters AA0, AA1 and AA4)	the alarm relay will be activated/deactivated (look at the parameter uP)
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AL2	the room temperature second is outside the limit you have set with the parameter Ab1	test the temperature close to the probe (look at the parameters Ab0, Ab1 and Ab4)	the alarm relay will be activated/deactivated (look at the parameter uP)
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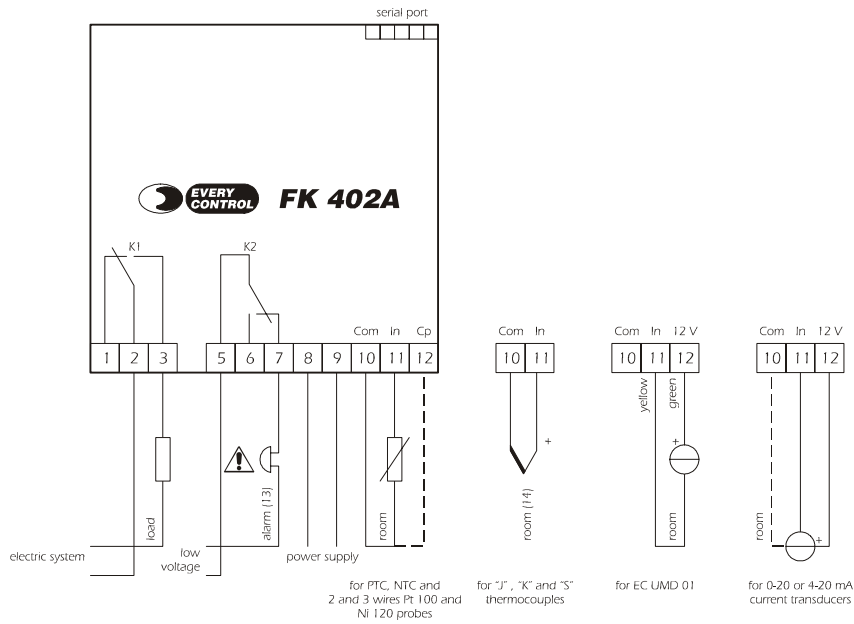
The instrument shows the indications above alternated with the room temperature, except the indications “E2”, “E0” and “E0C” (they flash) and the buzzer utters an intermittent beep.

(11) unless the instrument has been preset for working with 0-20 or 4-20 mA current transducers, the parameter will not be showed

(12) if the instrument has been preset for working with 0-20 or 4-20 mA current transducers, the parameter will not be important.

9 ELECTRICAL CONNECTION

9.1 Electrical connection



(13) use a low voltage load

(14) provide the probe with a protection able to protect it against contacts with metal parts or use insulated probes.

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

Alarm buzzer: included.

Measure inputs: 1 (room probe), depending on the model, for PTC or NTC probes, "J", "K" or "S" thermocouples, 2 or 3 wires Pt 100 or Ni 120 probes, 0-20 or 4-20 mA current transducers.

At terminal 12 there are 12 V you can use in order to supply the transducer.

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, from 0 to 700 °C (32 to 999 °F) for "J" thermocouple, from 0 to 999 °C (32 to 999 °F) for "K" thermocouple, from 0 to 999 °C (32 to 999 °F) for "S" thermocouple, from -50 to 600 °C (-58 to 999 °F) for 2 or 3 wires Pt 100 probe, from -80 to 260 °C (-99 to 500 °F) for 2 or 3 wires Ni 120 probe.

Setpoint range: from -99 to 999 °C (-99 to 999 °F).

Resolution: 1 °F with unit of measure in Fahrenheit, 0.1 °C (except the instruments preset for working with "J", "K" or "S" thermocouples) or 1 °C with unit of measure in Celsius.

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

Outputs: 2 relays: one 10 A @ 250 Vac relay for load control (change-over contact) and one 8 A @ 250 Vac relay for alarms control.

Serial port: TTL with EVCOBUS communication protocol (for the configurator/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
rA1	rA2	°C/°F ⁽⁶⁾	0.0	working setpoint	

8.2 First level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	PASSWORD
PA	-90	100	—	0	password

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/1	-50	50.0	°C/°F ⁽⁶⁾	0.0	room probe calibration

LABEL	MIN.	MAX.	U.M.	DEF.	REGULATOR
rA0	-99	99.9	°C/°F ⁽⁶⁾	-0.2	hysteresis (differential, it is relative to the working setpoint); look at rA4 as well ⁽⁷⁾

8.3 Second level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/0	01	41	—	⁽⁸⁾	kind of probe (01 = PTC, 03 = NTC, 10 = "J" Tc, 11 = "K" Tc, 12 = "S" Tc, 20 = 3 wires Pt 100, 21 = 2 wires Pt 100, 30 = 4-20 mA, 31 = 0-20 mA, 40 = 3 wires Ni 120, 41 = 2 wires Ni 120)
/1	-50	50.0	°C/°F ⁽⁶⁾	0.0	room probe calibration
/5	0	1	—	1	temperature resolution (0 = 1 degree, 1 = 0.1 degrees) ⁽⁹⁾ ⁽¹⁰⁾
/6	-99	999	points	-20	minimum value of the range of the transducer ⁽¹¹⁾
/7	-99	999	points	80	maximum value of the range of the transducer ⁽¹¹⁾
/8	0	1	—	1	temperature unit of measure (0 = Fahrenheit degree, 1 = Celsius degree) ⁽¹²⁾

LABEL	MIN.	MAX.	U.M.	DEF.	REGULATOR
rA0	-99	99.9	°C/°F ⁽⁶⁾	-0.2	hysteresis (differential, it is relative to the working setpoint); look at rA4 as well ⁽⁷⁾
rA1	-99	rA2	°C/°F ⁽⁶⁾	⁽⁸⁾	minimum value you can assign to the working setpoint
rA2	rA1	999	°C/°F ⁽⁶⁾	⁽⁸⁾	maximum value you can assign to the working setpoint
rA3	0	1	—	1	cooling or heating action (0 = cooling action)
rA4	0	1	—	0	kind of hysteresis (0 = asymmetrical, 1 = symmetrical)
rA5	0	1	—	0	working setpoint modification lock-out (1 = YES)

LABEL	MIN.	MAX.	U.M.	DEF.	LOAD PROTECTION
CA0	0	999	s	0	minimum delay between you turn the instrument ON and the first load activation
CA1	0	999	s	0	minimum delay between two load activation in succession
CA2	0	999	s	0	minimum delay between the load gets OFF and the following activation
CA3	0	1	—	0	load status during the room probe alarm (0 = it will be forced OFF, 1 = it will be forced ON)
CA4	0	1	—	0	fixed delay since the load gets ON and OFF (1 = YES, for 3 s)

LABEL	MIN.	MAX.	U.M.	DEF.	FIRST ALARM
AA0	0.1	999	°C/°F ⁽⁶⁾	0.1	hysteresis (differential, it is relative to AA1, it is important if AA4 ≠ 1)
AA1	-99	999	°C/°F ⁽⁶⁾	0.0	first temperature alarm threshold (it is important if AA4 ≠ 1); look at AA4 as well
AA3	0	999	min	0	first temperature alarm exclusion time since you turn the instrument ON (it is important if AA4 ≠ 1)
AA4	1	7	—	1	kind of temperature alarm (1 = it will never be activated, 2 = absolute lower temperature alarm, 3 = absolute upper temperature alarm, 4 = lower temperature alarm relative to the working setpoint, 5 = upper temperature alarm relative to the working setpoint, 6 = lower temperature alarm relative to the working setpoint with automatic calculation and enabling, 7 = upper temperature alarm relative to the working setpoint with automatic calculation and enabling)

LABEL	MIN.	MAX.	U.M.	DEF.	SECOND ALARM
Ab0	0.1	999	°C/°F ⁽⁶⁾	0.1	hysteresis (differential, it is relative to Ab1, it is important if Ab4 ≠ 1)
Ab1	-99	999	°C/°F ⁽⁶⁾	0.0	second temperature alarm threshold (it is important if Ab4 ≠ 1); look at Ab4 as well
Ab3	0	999	min	0	second temperature alarm exclusion time since you turn the instrument ON (it is important if Ab4 ≠ 1)
Ab4	1	7	—	1	kind of temperature alarm (1 = it will never be activated, 2 = absolute lower temperature alarm, 3 = absolute upper temperature alarm, 4 = lower temperature alarm relative to the working setpoint, 5 = upper temperature alarm relative to the working setpoint, 6 = lower temperature alarm relative to the working setpoint with automatic calculation and enabling, 7 = upper temperature alarm relative to the working setpoint with automatic calculation and enabling)

LABEL	MIN.	MAX.	U.M.	DEF.	ALARM RELAY OPERATION
uP	0	1	—	0	alarm relay operation (0 = the alarm relay will be activated during the normal operation and it will be deactivated during an alarm condition, 1 = the alarm relay will be deactivated during the normal operation and it will be activated during an alarm condition)

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)

⁽⁶⁾ the unit of measure depends on the parameter /8

⁽⁷⁾ if the parameter rA3 has value 0, you have to set the parameter rA0 with positive sign; if the parameter rA3 has value 1, you have to set the parameter rA0 with negative sign

⁽⁸⁾ the value depends on the kind of measure input the instrument has been preset

⁽⁹⁾ if the instrument has been preset for working with "J", "K" or "S" thermocouples, the parameter will not be showed

⁽¹⁰⁾ unless the parameter /8 has value 1, the parameter will not be showed