## DIMENSIONAL DATA

**OVERALL DIMENSIONS AND PANEL CUTOUT**

The dimensions are expressed in millimetres and inches (third-scale drawing).

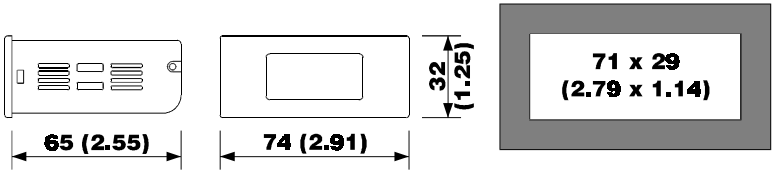


**Fig. 3**
ds3ve.wmf

## INSTALLATION

**WITH THE FIXING SYSTEMS SUGGESTED BY THE BUILDER**

Panel mounting, with the equipped screw (Fig. 4) or spring brackets (Fig. 5) (third-scale drawing).

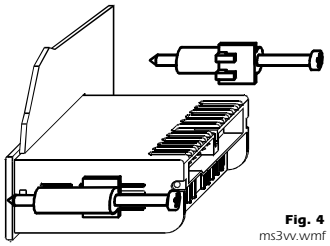

**Fig. 4**
ms3vv.wmf

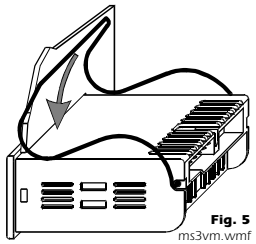

**Fig. 5**
ms3vm.wmf

## ELECTRICAL CONNECTION

**CONNECTIONS TO DERIVE**

Instance of typical application.

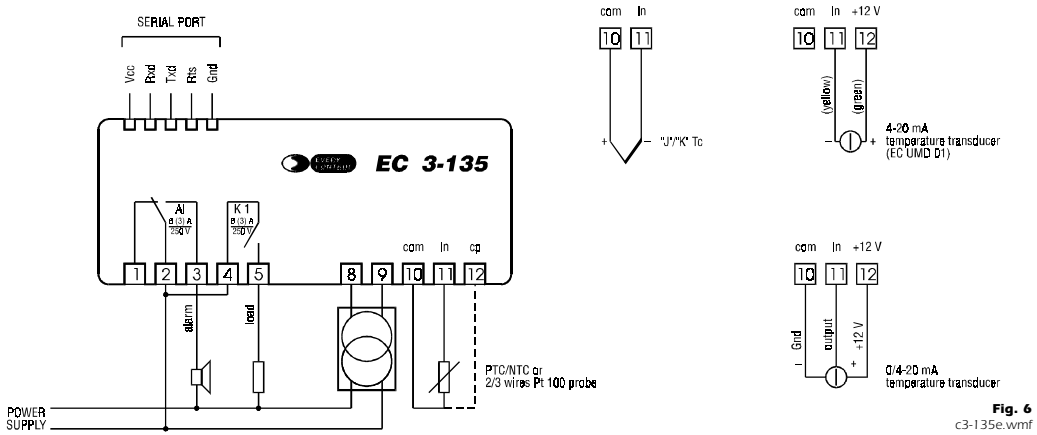


**Fig. 6**
c3-135e.wmf

## BUILDER DATA

**EVERY CONTROL S.r.l.**
Via Mezzaterra 6, 32036 Sedico Belluno ITALY
Phone 0039/0437852468 (a.r.) Fax 0039/043783648
Internet addresses
e-mail: every@worknet.it
http://www.everycontrol.it





# EC 3-135

## ON-OFF single output digital thermoregulator with alarm relay

Operating instructions
Release 1/99 of May the tenth 1999
Code EC 3-135 DOC E000
File 3135e.p65

**IMPORTANT:**

**The use of this new instrument is easy; but for safety reasons, it is important read these instructions carefully before the installation or before the use and follow all additional informations.**

**It is very important keep these instructions with the instrument for future consultations.**

**Fig. 1**
f3-135.wmf

ENGLISH

## GENERAL INFORMATIONS

**WHAT IS THE USE**

EC 3-135 is an ON-OFF single output digital thermoregulator with alarm relay; the alarm output activation is given from every alarm condition.

In factory the instrument gets preset to accept at the measure input PTC/NTC probes or "J"/"K" thermocouples or 2/3 wires Pt 100 probes or 2 and 3 wires 0/4-20 mA temperature transducers (in this last case it is possible to set the reading scale).

Some parameters permit to set the thermoregulator for "cooling" or "heating" functioning, to protect the connected regulation load against overloads due to several starts repeated in a short time, to signal working conditions outside the safety limits.

EC 3-135 is available in the 74 x 32 mm (2.91 x 1.25 in.) case and it is studied for panel mounting with the equipped screw or spring brackets.

## GETTING STARTED

**INSTALLATION**

EC 3-135 was studied for panel mounting, panel cutout 71 x 29 mm (2.79 x 1.14 in.), with the equipped screw or spring brackets (the overall dimensions and the panel cutout are related in Fig. 3, the fixing systems suggested by the builder are related respectively in Fig. 4 and in Fig. 5).

***ADDITIONAL INFORMATIONS***

- *the panel thickness must be included from 1 to 5 mm (0.04 to 0.19 in.)*
- *verify if the using conditions (ambient temperature, humidity, etc.) are within the limits indicated by the builder (see the chapter TECHNICAL DATA)*
- *install the instrument in a location with a suitable ventilation, to avoid the internal overheating of the instrument*
- *do not install the instrument near surfaces that can to obstruct the air-grating (carpets, covers, etc.), heating sources (radiators, hot air ducts, etc.), locations subject to direct sunlight, rain, humidity, excessive dust, mechanical vibrations or bumps, devices with strong magnetos (microwave ovens, big speakers, etc.)*
- *according with the safety norms, the protection against possible contacts with electrical parts and parts protected with functional insulation only must be ensured through a correct installation procedure of the instrument; all parts that ensure the protection must be fixed so that they can not be removed if not with a tool*
- *if not differently specified at the time of order, the instrument will be equipped with screw brackets.*

**ELECTRICAL CONNECTION**

EC 3-135 is provided with two screw terminal blocks for cables up to 2.5 mm² (0.38 in.²), for the connection to the power supply, measure input and outputs) and it is provided with one five poles single line male connector (for the connection to the CLONE configurer/cloner and RICS supervision systems), located on the instrument back panel (the connections to derive are related in Fig. 6 and they are checkable on the polyester label stuck on the instrument case).

***ADDITIONAL INFORMATIONS***

- *if the instrument is brought from a cold to a warm location, the humidity may condense inside the instrument; wait about an hour before supply the instrument*
- *verify if the operating power supply voltage, electrical frequency and power of the instrument correspond to the local power supply (see the chapter TECHNICAL DATA)*
- *do not supply more instruments with the same transformer*
- *if the instrument is installed on a vehicle, its power supply must be derived directly from the battery of the vehicle*
- *give the instrument a protection able to limit the current absorbed in case of failure*
- *the instrument remains connected to the local power supply as long as the terminals 8 and 9 are derived to the local power supply, even if the instrument is apparently turned off*
- *give the probe a protection able to insulate it against possible contacts with metal parts or use insulated probes*
- *give the outputs a protection able to protect them against short circuit and overload*
- *do not try to repair the instrument; for the repairs apply to highly qualified staff*
- *if you have any questions or problems concerning the instrument please consult Every Control (see the chapter BUILDER DATA).*

## USE

**PRELIMINARY INFORMATIONS**

After derived the connections related in Fig. 6, during the normal functioning the instrument displays the temperature read by the probe.

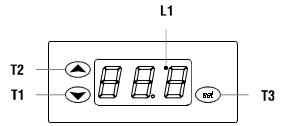


**Fig. 2**
iu3133.wmf

If an alarm should be active the instrument displays the alarm code flashing, the buzzer utters an intermittent beep and the output AI gets activated as long as the cause that has given it does not disappear (see the chapter SIGNALS AND ALARMS); pressure on the key **T1** during an alarm permits to silence the buzzer but does not modify the output AI status.

EC 3-135 is provided with one working setpoint and with some configuration parameters that get stored in a non volatile memory and that permit to set the instrument according with one's requirements (see the chapter CONFIGURABILITY).

The output K 1 is associated to the working setpoint, it remains activated continuously as long as the temperature read by the probe reaches the working setpoint and when it rises above (if the output was set for "cooling" functioning) or it falls below (if the output was set for "heating" functioning) the working setpoint of the hysteresis value (differential) the output gets reactivated.

**WORKING SETPOINT SETTING (WORKING TEMPERATURE)**

To modify the working setpoint value keep pushed the key **T3** (the instrument displays the actual value) and at the same time push and release over and over the key **T1** or **T2** as long as the instrument displays the desired value (keeping pushed the key **T1** or **T2** the value gets decreased or increased more quickly): after the modification release the key **T3** last; during the pressure of the key **T3** the LED **L1** flashes quickly to indicate that a working setpoint setting procedure is running (to the release of the key **T3** the instrument automatically turns out from the working setpoint setting procedure).

***ADDITIONAL INFORMATIONS***

- *for the whole period of a corrupted memory data alarm the access to the working setpoint setting procedure is refused*
- *the working setpoint is programmable within the limits established with the parameters rA1 and rA2*
- *if the parameter rA5 has value 1 the working setpoint can not be modified as long as the parameter rA5 gets set to 0*
- *the working setpoint value gets stored in a non volatile memory even if a lack of power supply happens.*

**CONFIGURATION PARAMETERS SETTING**

Configuration parameters are arranged on two levels, to protect the most tricky settings against undesirable violations and they are arranged in families that can be recognized through the initial letter of the label.

To gain access to the first level keep pushed at the same time for four seconds at least the keys **T1** and **T2** (passed four seconds the instrument displays the label **PA**).

To select a parameter of the first level push and release over and over the key **T1** or **T2** as long as the instrument displays the label of the desired parameter.

To modify the parameter value keep pushed the key **T3** (the instrument displays the actual value) and at the same time push and release over and over the key **T1** or **T2** as long as the instrument displays the desired value (keeping pushed the key **T1** or **T2** the value gets decreased or increased more quickly); after the modification release the key **T3** last (to the release of the key **T3** the instrument displays the label of the parameter again).

To gain access to the second level enter inside the first level and select the label **PA**.

Keep pushed the key **T3** (the instrument displays the actual value) and at the same time push and release over and over the key **T1** or **T2** as long as the instrument displays -19 (keeping pushed the key **T1** or **T2** the value gets decreased or increased more quickly): after the modification release the key **T3** last (to the release of the key **T3** the instrument displays the label **PA** again); keep pushed at the same time for four seconds at least the keys **T1** and **T2** (passed four seconds the instrument displays the first parameter of the second level).

To select a parameter of the second level push and release over and over the key **T1** or **T2** as long as the instrument displays the label of the desired parameter.

To modify the parameter value keep pushed the key **T3** (the instrument displays the actual value) and at the same time push and release over and over the key **T1** or **T2** as long as the instrument displays the desired value (keeping pushed the key **T1** or **T2** the value gets decreased or increased more quickly); after the modification release the key **T3** last (to the release of the key **T3** the instrument displays the label of the parameter again).

To turn out from the configuration parameters setting procedure keep pushed at the same time for four seconds at least the keys **T1** and **T2** or do not operate with the keys for fifty seconds at least (time-out exit).

***ADDITIONAL INFORMATIONS***

- *for the whole period of a corrupted memory data alarm the access to the configuration parameters setting procedure is refused*
- *the modification of a parameter value which unit of measure is the hour or the minute or the second has not immediate effect; to obtain this effect it must not be executed during the course of the value*
- *the configuration parameters values get stored in a non volatile memory even if a lack of power supply happens.*

# CONFIGURABILITY

**WORKING SETPOINT**

| LABEL | MIN. | MAX. | U.M. | ST. | WORKING SETPOINT |
|---|---|---|---|---|---|
| | **rA1** | **rA2** | **°C** | **0** | **working setpoint** |

It establishes the temperature associated to the output K 1.

**CONFIGURATION PARAMETERS**

| LABEL | MIN. | MAX. | U.M. | ST. | PASSWORD |
|---|---|---|---|---|---|
| **PA** | **-90** | **100** | **---** | **0** | **password (§)** |

It is the password that permits to gain access to the second level.

| LABEL | MIN. | MAX. | U.M. | ST. | MEASURE INPUT |
|---|---|---|---|---|---|
| **/0** | **01** | **31** | **---** | **(*)** | **kind of probe** |

It establishes the kind of probe that the instrument must recognize to its measure input, as indicated:

01 = PTC probe
03 = NTC probe
10 = "J" thermocouple
11 = "K" thermocouple
20 = 3 wires Pt 100 probe
21 = 2 wires Pt 100 probe
30 = 2 and 3 wires 4-20 mA temperature transducer
31 = 2 and 3 wires 0-20 mA temperature transducer.

| | | | | | |
|---|---|---|---|---|---|
| **/1** | **-9** | **+10** | **°C** | **0** | **calibration (§)** |

It establishes a threshold to add algebraically to the signal coming from the measure input (for instance to correct the signal).

| | | | | | |
|---|---|---|---|---|---|
| **/2** | **0** | **6** | **---** | **3** | **digital filter** |

It establishes a time constant to apply to the signal coming from the measure input, as indicated:

0 = 0 sec.
1 = 0.4 sec.
2 = 1.2 sec.
3 = 3.0 sec.
4 = 8.0 sec.
5 = 19.8 sec.
6 = 48.0 sec.

| | | | | | |
|---|---|---|---|---|---|
| **/4** | **0** | **1** | **---** | **0** | **leading zeroes displaying** |

It establishes if to display the leading zeroes, as indicated:

0 = the leading zeroes get not displayed
1 = the leading zeroes get displayed.

| | | | | | |
|---|---|---|---|---|---|
| **/5** | **0** | **1** | **---** | **1** | **decimal point** |

It establishes the resolution with which the temperature gets displayed, as indicated:

0 = the temperature gets displayed with the resolution of the unit of measure
1 = the temperature gets displayed with the resolution of 1/10 of the unit of measure.

| | | | | | |
|---|---|---|---|---|---|
| **/6** | **-99** | **+999** | **points** | **-20** | **lower end of scale for 0/4-20 mA input (it coincides with the minimum calibration value of the transducer)** |

It establishes the lower end of scale for 0/4-20 mA input and it must coincide with the minimum calibration value of the transducer.

| | | | | | |
|---|---|---|---|---|---|
| **/7** | **-99** | **+999** | **points** | **+80** | **upper end of scale for 0/4-20 mA input (it coincides with the maximum calibration value of the transducer)** |

It establishes the upper end of scale for 0/4-20 mA input and it must coincide with the maximum calibration value of the transducer.

| LABEL | MIN. | MAX. | U.M. | ST. | ON-OFF TEMPERATURE REGULATOR ASSOCIATED TO THE WORKING SETPOINT AND TO THE OUTPUT K 1 |
|---|---|---|---|---|---|
| **rA0** | **-99** | **+99** | **°C** | **(*)** | **hysteresis (differential) (§)** |

It establishes the hysteresis (differential) relative to the working setpoint.

| | | | | | |
|---|---|---|---|---|---|
| **rA1** | **-99** | **+999** | **°C** | **(*)** | **minimum working setpoint programmable** |

It establishes the minimum working setpoint programmable; the instrument automatically verifies if the value established with the parameter rA1 is below the maximum working setpoint programmable established with the parameter rA2.

| | | | | | |
|---|---|---|---|---|---|
| **rA2** | **-99** | **+999** | **°C** | **(*)** | **maximum working setpoint programmable** |

It establishes the maximum working setpoint programmable; the instrument automatically verifies if the value established with the parameter rA2 is above the minimum working setpoint programmable established with the parameter rA1.

| | | | | | |
|---|---|---|---|---|---|
| **rA3** | **0** | **1** | **---** | **1** | **"cooling" or "heating" functioning** |

It establishes the output functioning, as indicated:

0 = "cooling" functioning
1 = "heating" functioning.

| | | | | | |
|---|---|---|---|---|---|
| **rA4** | **0** | **1** | **---** | **0** | **kind of hysteresis (kind of differential)** |

It establishes the kind of hysteresis (kind of differential), as indicated:

0 = asymmetrical
1 = symmetrical.

| | | | | | |
|---|---|---|---|---|---|
| **rA5** | **0** | **1** | **---** | **0** | **locking of the working setpoint modification** |

It establishes if to prevent the modification of the working setpoint, as indicated:

0 = the working setpoint can be modified
1 = the working setpoint can not be modified as long as the parameter rA5 gets set to 0.

| LABEL | MIN. | MAX. | U.M. | ST. | OUTPUT K 1 PROTECTION |
|---|---|---|---|---|---|
| **CA0** | **0** | **999** | **sec.** | **0** | **disabling time to the output activation from the instrument start** |

It establishes the time that disables the output activation from the moment of the instrument start.

| | | | | | |
|---|---|---|---|---|---|
| **CA1** | **0** | **999** | **sec.** | **0** | **disabling time to the output activation from the previous activation** |

It establishes the time that disables the output activation from the moment of the previous output activation.

| | | | | | |
|---|---|---|---|---|---|
| **CA2** | **0** | **999** | **sec.** | **0** | **disabling time to the output activation from the previous deactivation** |

It establishes the time that disables the output activation from the moment of the previous output deactivation.

| | | | | | |
|---|---|---|---|---|---|
| **CA3** | **0** | **1** | **---** | **0** | **output status during a probe failure alarm** |

It establishes the status to which the output gets forced during a probe failure alarm, as indicated:

0 = during a probe failure alarm the output gets forced to the status OFF
1 = during a probe failure alarm the output gets forced to the status ON.

| | | | | | |
|---|---|---|---|---|---|
| **CA4** | **0** | **1** | **---** | **0** | **disabling time to the output activation and deactivation** |

It establishes if to disable the output activation and deactivation for a fixed time, as indicated:

0 = inactive
1 = the output activation and deactivation get disabled for 3 sec.

| LABEL | MIN. | MAX. | U.M. | ST. | TEMPERATURE ALARM REGULATOR ASSOCIATED TO THE FIRST TEMPERATURE ALARM |
|---|---|---|---|---|---|
| **AA0** | **(*)** | **+99** | **°C** | **(*)** | **hysteresis (differential)** |

It establishes the hysteresis (differential) relative to the parameter AA1.

| | | | | | |
|---|---|---|---|---|---|
| **AA1** | **-99** | **+999** | **°C** | **0** | **alarm setpoint** |

It establishes the temperature to which the temperature alarm gets activated according with the modality established with the parameter AA4.

| | | | | | |
|---|---|---|---|---|---|
| **AA3** | **0** | **999** | **min.** | **0** | **disabling time to the alarm activation from the instrument start** |

It establishes the time that disables the temperature alarm activation from the moment of the instrument start.

| | | | | | |
|---|---|---|---|---|---|
| **AA4** | **1** | **7** | **---** | **1** | **kind of alarm** |

It establishes the kind of temperature alarm that the instrument must manage, as indicated:

1 = the temperature alarm never gets 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 recomputation and reenabling
7 = upper temperature alarm relative to the working setpoint with automatic recomputation and reenabling.

| LABEL | MIN. | MAX. | U.M. | ST. | TEMPERATURE ALARM REGULATOR ASSOCIATED TO THE SECOND TEMPERATURE ALARM |
|---|---|---|---|---|---|
| **Ab0** | **(*)** | **+99** | **°C** | **(*)** | **hysteresis (differential)** |

It has the same significance of the parameter AA0.

| | | | | | |
|---|---|---|---|---|---|
| **Ab1** | **-99** | **+999** | **°C** | **0** | **alarm setpoint** |

It has the same significance of the parameter AA1.

| | | | | | |
|---|---|---|---|---|---|
| **Ab3** | **0** | **999** | **min.** | **0** | **disabling time to the alarm activation from the instrument start** |

It has the same significance of the parameter AA3.

| | | | | | |
|---|---|---|---|---|---|
| **Ab4** | **1** | **7** | **---** | **1** | **kind of alarm** |

It has the same significance of the parameter AA4.

| LABEL | MIN. | MAX. | U.M. | ST. | CONNECTION IN A SERIAL NETWORK WITH EVCOBUS PROTOCOL COMMUNICATION |
|---|---|---|---|---|---|
| **L1** | **1** | **15** | **---** | **1** | **instrument address** |

It establishes the address to which the instrument (slave) answers when it is connected to a serial network with EVCOBUS protocol communication managed from a master (for instance a Personal Computer).

| | | | | | |
|---|---|---|---|---|---|
| **L2** | **0** | **7** | **---** | **0** | **instrument group** |

It establishes the group to which the instrument (slave) answers when it is connected to a serial network with EVCOBUS protocol communication managed from a master (for instance a Personal Computer).

***ADDITIONAL INFORMATIONS***

- *the symbol (§) indicates that the parameter is of the first level*
- *the symbol (*) indicates that the value depends from the measure input presetting requested*
- *if the instrument is preset to accept at the measure input "J"/"K" thermocouples the parameter /5 does not exist*
- *if the instrument is not preset to accept at the measure input 2 and 3 wires 0/4-20 mA temperature transducers the parameters /6 and /7 do not exist.*



# SIGNALS AND ALARMS

**SIGNALS**

If the LED **L1** is turned ON it means that the output K 1 is activated.

If the LED **L1** flashes it means that a count of a disabling time to the output K 1 activation is running (see the parameters CA0, CA1, CA2 and CA4).

If the instrument displays the indication "═" it means that the working setpoint can not be modified (see the parameters rA5).

**ALARMS**

If the instrument displays the indication "**E2**" flashing and the buzzer utters an intermittent beep (**corrupted memory data alarm**) it means that there is a corruption of the configuration data in the memory (turn OFF and turn ON again the instrument: if to the turning ON again the alarm does not disappear the instrument must be replaced); during this alarm the access to the working setpoint setting and the configuration parameters setting procedures is refused, the output K 1 gets forced to the status OFF and the output AI gets activated.

If the instrument displays the indication "**E0**" flashing and the buzzer utters an intermittent beep (**probe failure alarm**) it means that: the kind of connected probe is not proper (see the parameter /0), the probe is faulty (verify the probe integrity), there is a mistake in the instrument-probe connection (verify the instrument-probe connection integrity), the temperature read by the probe is outside the limits permitted by the probe in use (verify that the temperature near the probe be inside the limits permitted by the probe); during this alarm the output K 1 gets forced to the status established with the parameter CA3 and the output AI gets activated.

If the instrument displays the indication "**E0C**" flashing and the buzzer utters an intermittent beep (**cold junction/third wire failure alarm**) it means that, if the instrument is preset to accept at the measure input "J"/"K" thermocouples there is a mistake in the cold junction adjustment circuit (the instrument must be replaced), if the instrument is preset to accept at the measure input 2/3 wires Pt 100 probes and it is set to recognize to its measure input 3 wires Pt 100 probes the third wire of the probe is not connected (verify the instrument-probe connection integrity); during this alarm the output K 1 gets forced to the status established with the parameter CA3 and the output AI gets activated.

If the instrument displays the indication "**AL1**" flashing alternated to the temperature read by the probe and the buzzer utters an intermittent beep (**first temperature alarm**) it means that the temperature read by the probe is outside the limit established with the parameter AA1 (see the parameters AA0, AA1 and AA4); during this alarm the output AI gets activated.

If the instrument displays the indication "**AL2**" flashing alternated to the temperature read by the probe and the buzzer utters an intermittent beep (**second temperature alarm**) it means that the temperature read by the probe is outside the limit established with the parameter Ab1 (see the parameters Ab0, Ab1 and Ab4); during this alarm the output AI gets activated.

If the instrument displays the indication "**999**" flashing (**end of scale display**) it means that the temperature read by the probe is outside the working range permitted by the instrument (verify that the temperature near the probe be inside the limits permitted by the instrument); inactive.

***ADDITIONAL INFORMATIONS***

- *the alarm codes are related in order of precedence.*

# TECHNICAL DATA

**TECHNICAL DATA**

| | |
|---|---|
| **Case:** | plastic black (PC-ABS), self-extinguishing. |
| **Size:** | 74 x 32 x 65 mm (2.91 x 1.25 x 2.55 in.). |
| **Installation:** | panel mounting, panel cutout 71 x 29 mm (2.79 x 1.14 in.), with the equipped screw or spring brackets. |
| **Type of protection:** | IP 54. |
| **Connections:** | screw terminal blocks with pitch 5 mm (0.19 in., power supply, measure input and outputs) for cables up to 2.5 mm² (0.38 in.²), five poles single line male connector with pitch 5.08 mm (0.2 in., serial port). |
| **Ambient temperature:** | from 0 to +60 °C (+32 to +140 °F, 10 ... 90 % of not condensing relative humidity). |
| **Power supply:** | 12 Vac/dc or 12-24 Vac/dc, 50/60 Hz, 1.5 VA. |
| **Insulation class:** | II. |
| **Alarm buzzer:** | incorporated. |
| **Measure inputs:** | 1 configurable, hardware depending, for PTC/NTC probes or "J"/"K" thermocouples or 2/3 wires Pt 100 probes or 2 and 3 wires 0/4-20 mA temperature transducers (Ri 56 Ohm); at terminal 12 +12 V (+30 %, -20 %) are available 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 -99 to +700 °C (-99 to +999 °F) for "J" thermocouple, from -99 to +999 °C (-99 to +999 °F) for "K" thermocouple, from -99 to +600 °C (-99 to +999 °F) for 2/3 wires Pt 100 probes, configurable for 2 and 3 wires 0/4-20 mA temperature transducers. |
| **Setting range:** | from -99 to +999 °C (-99 to +999 °F). |
| **Resolution:** | configurable for 0.1 (except the instruments preset to accept at the measure input "J"/"K" thermocouples) or 1 °C (1 °F). |
| **Display:** | 3-digit display 12.5 mm (0.49 in.) high red LED display with automatic decimal point and minus sign, regulation output status indicator. |
| **Outputs:** | two 6 (3) A @ 250 Vac relays for regulation load (NO contact) and alarms (change-over contact) management. |
| **Serial port:** | TTL with EVCOBUS protocol communication, for the connection to the CLONE configurer/cloner and RICS supervision systems. |

# HOW TO ORDER

**CODING SYSTEM**

| | |
|---|---|
| **Instrument name:** | EC 3-135. |
| **Desired measure input:** | P (for PTC/NTC probes),<br>J (for "J"/"K" thermocouples),<br>C (for 2/3 wires Pt 100 probes),<br>I (for 2 and 3 wires 0/4-20 mA temperature transducers). |
| **Desired power supply:** | 012 (12 Vac/dc),<br>024 (12-24 Vac/dc). |
| **Options:** | custom configuration, temperature display in °F, green LED display, SSR outputs. |