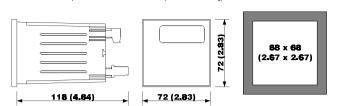
# **DIMENSIONAL DATA**

### OVERALL DIMENSIONS AND PANEL CUTOUT

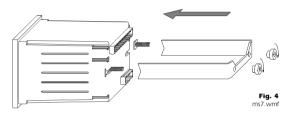
The dimensions are expressed in millimetres and inches (fourth-scale drawing).



# INSTALLATION

## WITH THE FIXING SYSTEM SUGGESTED BY THE BUILDER

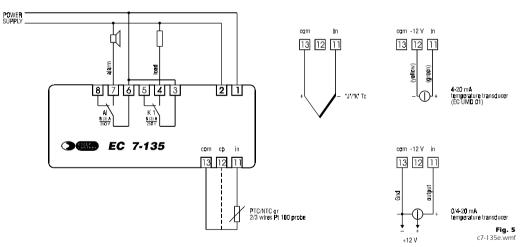
Panel mounting, with the equipped U-bracket (fourth-scale drawing).



# **ELECTRICAL CONNECTION**

CONNECTIONS TO DERIVE





# **BUILDER DATA**

### EVERY CONTROL S.r.I.

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

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ON-OFF single output digital thermoregulator with alarm relay

Operating instructions Release 1/99 of May the eleventh 1999 Code EC 7-135 DOC E000 File 7135e.p65

## IMPORTANT:

Fig. 3

ds7e wmf

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.

# **GENERAL INFORMATIONS**

## WHAT IS THE USE

EC 7-135 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 7-135 is available in the 72 x 72 mm (2.83 x 2.83 in.) case and it is studied for panel mounting with the equipped U-bracket.

# **GETTING STARTED**

## INSTALLATION

EC 7-135 was studied for panel mounting, panel cutout 68 x 68 mm (2.67 x 2.67 in.), with the equipped U-bracket (the overall dimensions and the panel cutout are related in Fig. 3, the fixing system suggested by the builder is related in Fig. 4).

## 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 contention of the instrument
- overheating of the instrument - do not install the instrument near surfaces that can to obstruct the air-grating (carobstruct the air-grating (car-
- pets, 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
- 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.

## ELECTRICAL CONNECTION

EC 7-135 is provided with two extractable screw terminal blocks for cables up to 2.5 mm<sup>2</sup> (0.38 in 7, for the connection to the power supply, measure input and outputs), located on the instrument back panel (the connections to derive are related in Fig. 5 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 1 and 2 are derived to the local power supply, even if the instrument is apparentity 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).



Fig. 1 f7-135.wmf

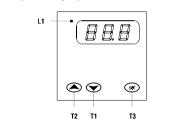
Fig. 2

iu7133 wm

## PRELIMINARY INFORMATIONS

USE

After derived the connections related in Fig. 5, during the normal functioning the instrument displays the temperature read by the probe.



If an alarm should be active the instrument displays the alarm code flashing, the buzzer utters an intermittent beep and the output Al 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 Al status.

EC 7-135 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 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 keen 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  ${\bf T1}$  or  ${\bf T2}$  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 Keen nushed the key T3 (the instrument displays the actual value) and at the same time nush 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 guickly); 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 SETROINT 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 --- 0 leading zeroes displaying /4 0 1 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

progra rA3	immabl 0	e estab	lished v	with the	e parameter rA1. "cooling" or "heating" functioning
	-	-		-	g, as indicated:
0 =	"coolii	ng" fun	ctioning	J	ga
1 =			ctioning		
rA4	O	1 the kir		0	kind of hysteresis (kind of differential)
n esta 0 =		netrica		Steresis	s (kind of differential), as indicated:
1 =		etrical.			
rA5	0	1		0	locking of the working setpoint modification
lt esta ∩ =					lification of the working setpoint, as indicated: modified
1 =					t be modified as long as the parameter rA5 gets set to 0.
LABEL	MIN.	MAX.	U.M.	ST.	OUTPUT K 1 PROTECTION
CAO	0	999	SEC.	0	disabling time to the output activation from the instru- ment start
It esta start. CA1	n	the tin 999	sec.	disables	s the output activation from the moment of the instrument
				-	disabling time to the output activation from the previous activation as the output activation from the moment of the previous
	activa n		sec.		
				-	disabling time to the output activation from the previous deactivation as the output activation from the moment of the previous
output	deacti				
CA3	0	1		0	output status during a probe failure alarm
lt esta cated: 0 =					he output gets forced during a probe failure alarm, as indi-
1 =	during			e alarm	the output gets forced to the status OFF the output gets forced to the status ON.
CA4	0	1		0	disabling time to the output activation and deactivation
lt esta 0 =	blishes inactiv		sable th	ne outpu	ut activation and deactivation for a fixed time, as indicated:
1 =			tivation	and de	activation get disabled for 3 sec.
	. MIN.		U.M.		TEMPERATURE ALARM REGULATOR ASSOCIATED TO THE FIRST TEMPERATURE ALARM
AAO	(*)	+99	U.M. °C	ST. (*)	TEMPERATURE ALARM REGULATOR ASSOCIATED TO THE FIRST TEMPERATURE ALARM hysteresis (differential)
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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 K1 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 CAO, CA1, CA2 and CA4).

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

## 

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 Al gets activated.

If the instrument displays the indication "EO" 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 Al gets activated

If the instrument displays the indication "EOC" flashing and the buzzer utters an intermittent been (cold junction/third wire failure alarm) it means that if the instrument is preset to accent at the measure input ".I"/"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 Al gets activated.

If the instrument displays the indication "AI 1" flashing alternated to the temperature read by the probe and the buzzer utters an intermittent been (first temperature alarm) it means that the temperature read by the probe is outside the limit established with the parameter AA1 (see the parameters AAO, 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 Al 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 (PPO), self-extinguishing. 72 x 72 x 118 mm (2 83 x 2 83 x 4 64 in ) with terminal Size: blocks Installation panel mounting, panel cutout 68 x 68 mm (2.67 x 2.67 in.). with the equipped LI-bracket IP 54 Type of protection Connections: extractable screw terminal blocks with pitch 5.08 mm (0.2 in., power supply and outputs) and with pitch 7.5 mm (0.29 in., measure input) for cables up to 2.5 mm<sup>2</sup> (0.38 in.2) from 0 to +60 °C (+32 to +140 °F, 10 ... 90 % of not con-Ambient temperature: densing relative humidity) 230 Vac or 115 Vac or 24 Vac or 12-24 Vac/dc or Power supply: 12 Vac/dc, 50/60 Hz, 2 VA Insulation class: Ш Alarm buzzer: incorporated. 1 configurable, hardware depending, for PTC/NTC probes Measure innuts: or "J"/"K" thermocouples or 2/3 wires Pt 100 probes or 2 and 3 wires 0/4-20 mA temperature transducers (Bi 56 Ohm); at terminal 12 -13.5 V (±20 %) are available to supply the transducer. from -50 to +150 °C (-58 to +302 °F) for PTC probe, from Working range: -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 °E) 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 two change-over contact 8 (3) A @ 250 Vac relays for regu-Outnuts: lation load and alarms management

# **HOW TO ORDER**

CODING SYST

CODING SYSTEM	
Instrument name:	EC 7-135.
Desired measure input:	P (for PTC/NTC probes), J (for "J"/"K" thermocouples), C (for 2/3 wires Pt 100 probes), I (for 2 and 3 wires 0/4-20 mA temperature transducers).
Desired power supply:	220 (230 Vac) 115 (115 Vac) A24 (24 Vac) 024 (12-24 Vac/dc) 012 (12 Vac/dc).
Options:	custom configuration, temperature display in °F, green LED display, SSR outputs, serial port.