Double input indicator
with analogue output
$^1/_8$ DIN - 96 x 48

J3 line

CE

^{c}(UL)^{us} LISTED

Ascon Tecnologic srl
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27029 Vigevano (PV)
Tel.: +39-0381 69 871
**Fax: +39-0381 69 8730**
Sito internet:
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Indirizzo E-Mail:
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**Double input indicator
with analogue output
$1/8$ DIN - 96 x 48**

J3 line $C\epsilon$

C E

NOTES ON ELECTRIC SAFETY AND ELECTROMAGNETIC COMPATIBILITY
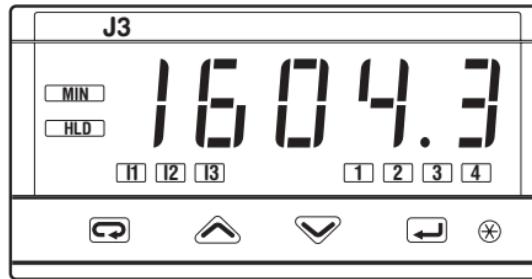
Please, read these instructions carefully before proceeding with the installation of the controller.
Class II instrument, rearl panel mounting.

This indicator has been designed in compliance with:
Regulations on electrical apparatus (appliance, systems and installations) according to the European Community directive 73/23/EEC amended by the European Community directive 93/68/EEC and the Regulations on the essential protection requirements in electrical apparatus EN61010-1 : 93 + A2:95.

Regulations on Electromagnetic Compatibility according to the European Community directive #89/336/EEC, amended by the European Community directive #92/31/EEC, 93/68/EEC, 98/13/EEC and the following regulations:
Regulations on RF emissions
  EN61000-6-3 : 2001   residential environments
  EN61000-6-4 : 2001   industrial environments
Regulation on RF immunity
  EN61000-6-2 : 2001   industrial equipment and system

It is important to understand that it's the responsibility of the installer to ensure compliance with the regulations on safety requirements and EMC.
The device has no user serviceable parts and requires special equipment and specialised engineers. Therefore, a repair cannot be carried out directly by the user. For service or repair, contact the manufacturer or your sales represenattive.

All the information and warnings about safety and electromagnetic compatibility are marked with the ⚠C€ sign, at the side of the note.

TABLE OF CONTENTS
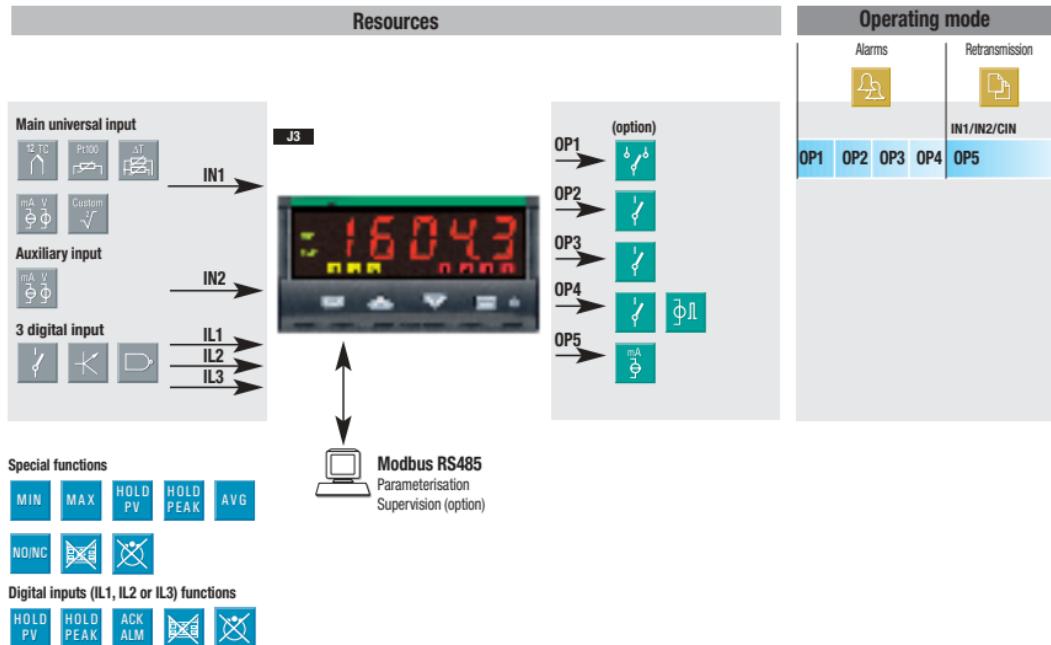
Resources

Main universal input

IN1

Auxiliary input

IN2

3 digital input

IL1
IL2
IL3

J3

(option)

OP1
OP2
OP3
OP4
OP5

Special functions

MIN MAX HOLD PV HOLD PEAK AVG

NO/NC

Digital inputs (IL1, IL2 or IL3) functions

HOLD PV HOLD PEAK ACK ALM

Modbus RS485
Parameterisation
Supervision (option)

Operating mode

	Alarms	Retransmission
		IN1/IN2/CIN
OP1	OP2	OP3	OP4	OP5

1 ▬ INSTALLATION

1.1 GENERAL DESCRIPTION

Installation must only be carried out by qualified personnel.

Before proceeding with the installation of this indicator follow the instructions illustrated in this manual with particular attention to the installation precautions marked with the ⚠️CE symbol, related to the European Community directive on electrical protection and electromagnetic compatibility.

⚠️CE
To prevent hands or metal touching parts that may be electrically live, **the indicators must be installed in an enclosure.**

Mounting clamps

Product code label

Panel surface

IP 20 Terminal block
EN61010 - 1
(IEC1010 - 1)

Sealing front panel gasket

**Front panel
IP65 protection**
EN 650529 (IEC 529)

1.2 DIMENSIONAL DETAILS

96 mm
3.78 in

48 mm
1.89 in

110 mm
4.33 in

10 mm max.
0.39 in max.

10 mm max.
0.39 in max.

1.3 PANEL CUT-OUT

92 +0.8 mm
3.62 +0.031 in

45 +0.6 mm
1.78 +0.023 in

65 mm min.
2.56 in min.

113 mm min.
4.45 in min.
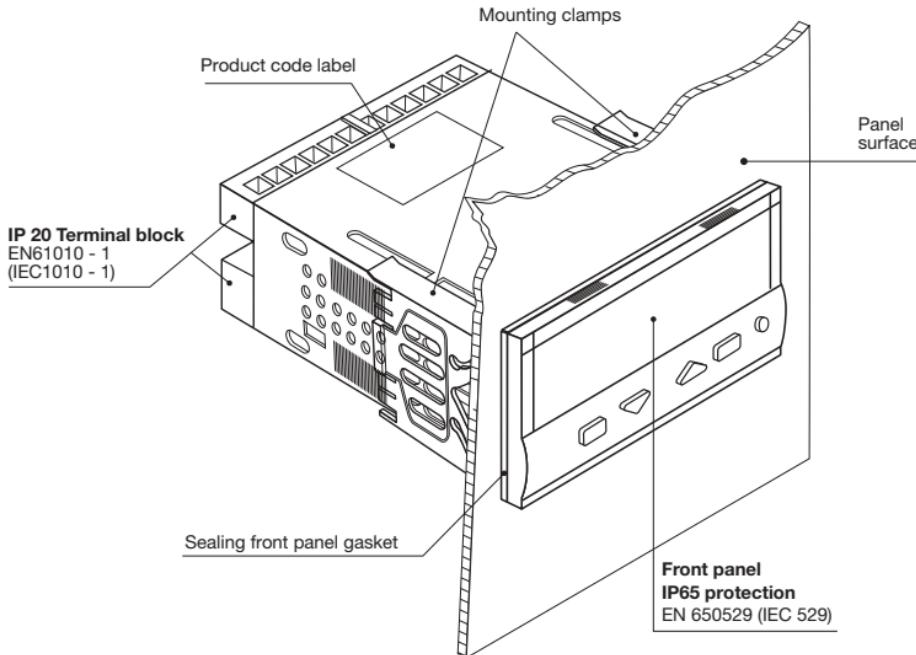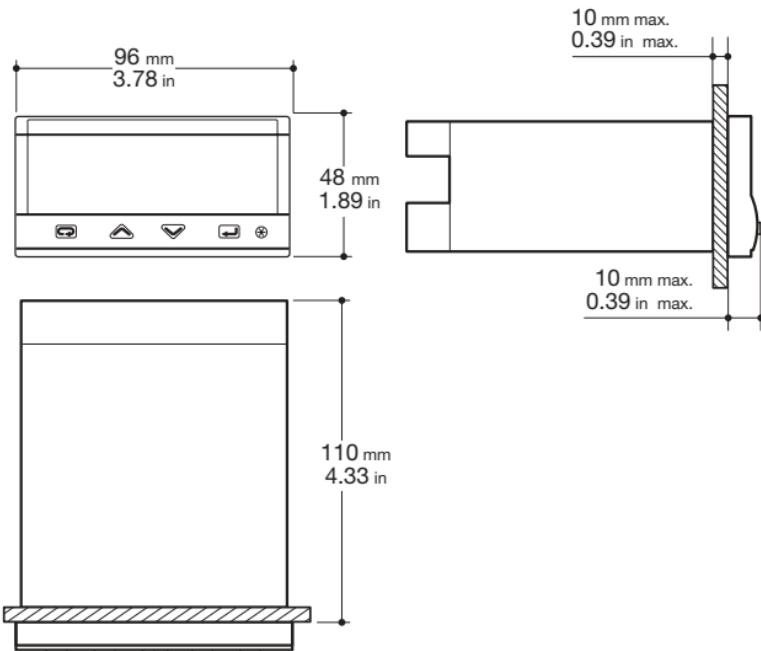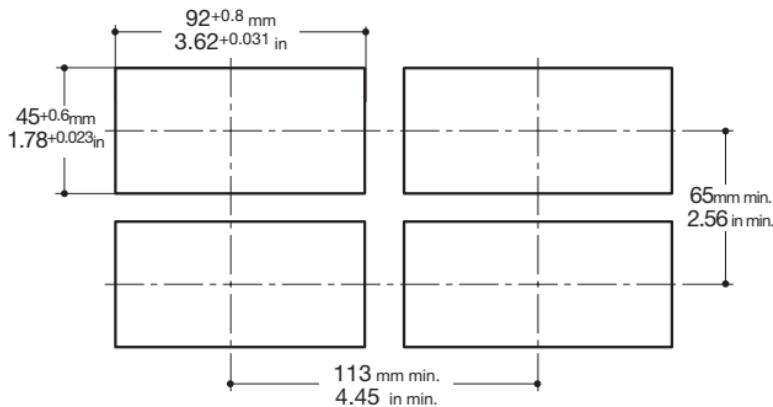
1.4 ENVIRONMENTAL CONDITIONS ⚠CE

Operating conditions

Altitude up to 2000 m	
Temperature 0…50°C	
%Rh	Relative humidity 5…95 % non-condensing

Special conditions		Suggestions
	Altitude > 2000 m	Use 24Vac supply version
	Temperature >50°C	Use forced air ventilation
%Rh	Humidity > 95 %	Warm up
	Conducting atmosphere	Use filter

Forbidden Conditions 🚫

	Corrosive atmosphere
	Explosive atmosphere

1.5 PANEL MOUNTING [1]

1.5.1 INSERT THE INSTRUMENT

1 Prepare panel cut-out
2 Check-front panel gasket position
**3** Insert the instrument through the cut-out
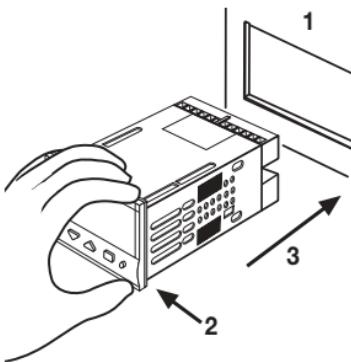
1.5.2 INSTALLATION SECURING

1 Fit the mounting clamps as shown
2 Push the mounting clamps toward the panel surface to secure the instrument
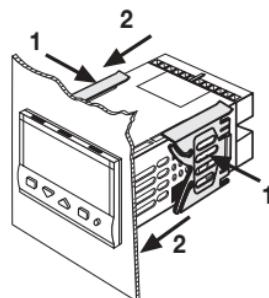
1.5.3 CLAMPS REMOVING

1 Insert the screwdriver in the clips of the clamps
2 Rotate the screwdriver
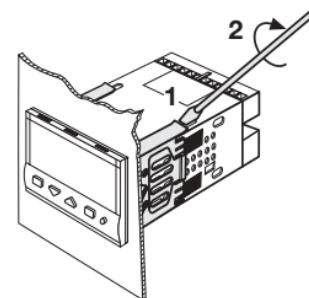
1.5.4 INSTRUMENT UNPLUGGING

1 Push and
2 Pull froward to remove the instrument

Electrostatic discharges can damage the instrument
Before removing the instrument the operator must discharge himself to ground.
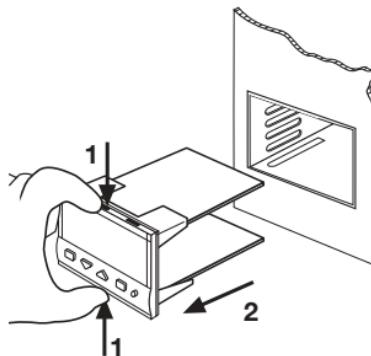
UL note
[1] For Use on a Flat Surface of a Type 2 and Type 3 'raintight' Enclosure.

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2   ELECTRICAL CONNECTIONS

2.1 TERMINAL BLOCK [1]

⊕	28 screw terminals M3		
⊕	Option terminals		
⊕	Tightening torque 0.5 Nm		
▭+	Positive screw-driver PH1		
▭–	Negative screw-driver 0,8 x 4 mm		

Terminals

Pin connector	∅ 1.4 mm 0.055 in max.
Fork-shape AMP 165004	∅ 5.5 mm - 0.21 in
Stripped wire	L 5.5 mm - 0.21 in

Rear terminal cover

5.7 mm
0.22 in

Wire size
1 mm² (18 AWG Solid/Stranded)

UL note
[1] Use 60/70 °C copper (Cu) conductor only.

PRECAUTIONS

Despite the fact that the instrument has been designed to work in harsh and noisy environments (level IV of the industrial standard IEC 801-4), it is recommended following these suggestions.

⚠

All the wiring must comply with the local regulations.

The supply wiring should be routed away from the power cables. Avoid using electromagnetic contactors, power Relays and high power motors nearby.

Avoid power units nearby, especially if controlled in phase angle mode.

Keep the low level sensor input wires away from the power lines and the output wires.

If this is not achievable, use shielded cables on the sensor input, with the shield connected to ground.

2.2 SUGGESTED WIRE ROUTING

A = Supply
B = Outputs
C = Analogue inputs
D = Analogue output
E = Digital I/O and Serial Comms

Conduit for supply and output cables
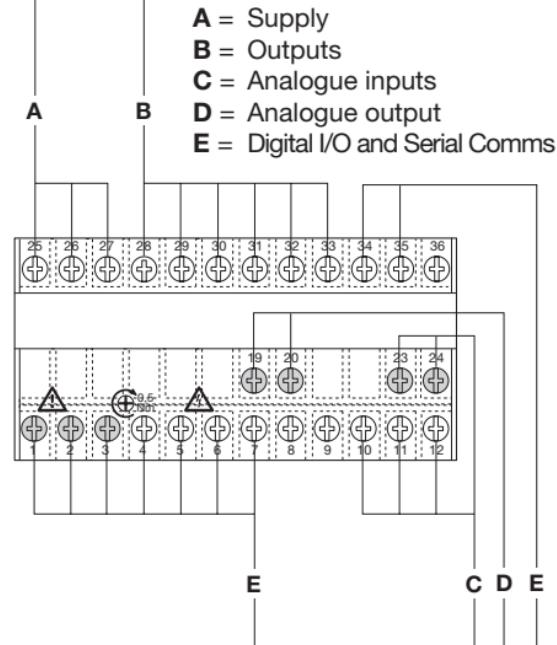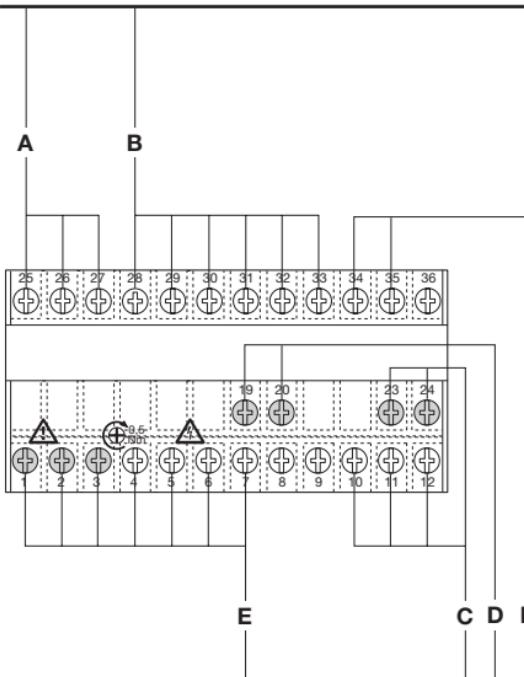
Conduit for low level sensor cables

2.3 EXAMPLE OF WIRING DIAGRAM
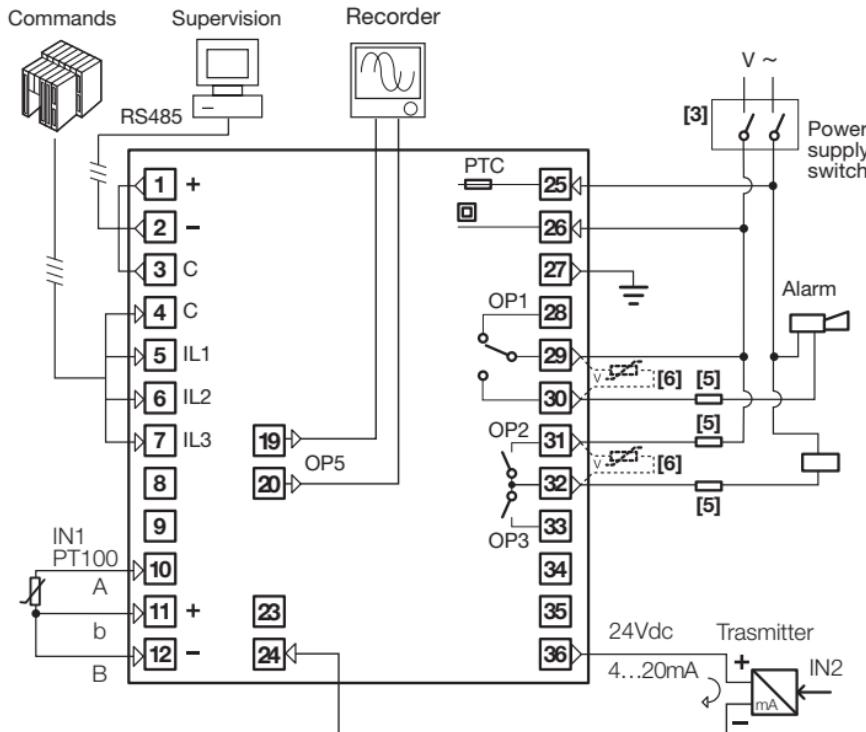
Notes:

1] Make sure that the power supply voltage is the same indicated on the instrument.

2] Switch on the power supply only after all the electrical connections have been completed.

3] In accordance with safety regulations, install a circuit breaker on the instrument power supply line that is clearly identified with that instrument (or group of instruments). The breaker shall be easily accessible by the operator.

4] The instrument is PTC protected. In case of failure it is suggested to return the instrument to the manufacturer for repair.

5] To protect the instruments internal circuits use:
   - 2 AT fuse for Relay outputs (220 Vac);
   - 4 AT fuse for Relay outputs (110 Vac);
   - 1 AacT fuse for Triac outputs.

6] Relay contacts are already protected with varistors.
   Only in case of 24 Vac inductive loads, use model A51-065-30D7 varistors (on request)

2.3.1 POWER SUPPLY ⚠CE

Switching power supply with multiple isolation and internal PTC

- **Standard version:**
  nominal voltage:
  100...240Vac (-15...+10%)
  Frequency 50/60Hz
- **Low Voltage version:**
  Nominal voltage:
  24Vac (-25...+12%)
  Frequency 50/60Hz
  or 24Vdc (-15...+25%)

```
Included PTC
    ⊏══⊐  25⟩ ── L
Supply
▣          26⟩ ── N

           27⟩ ── ⏚
```
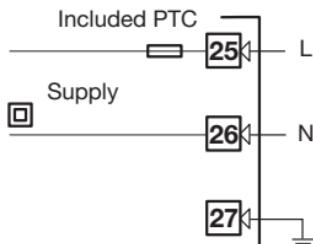
For better protection against noise, it is recommended not to connect the ground clamp provided for civilian installations.

2.3.2 MAIN UNIVERSAL INPUT (IN1)   ⚠CE

A L-J-K-S-R-T-B-N-E-W thermocouple type
- Connect the wires with the polarity as shown
- Always use compensation cable of the correct type for the thermocouple used
- The shield, if present, must be connected to a proper ground.

Wire resistance
150Ω max.
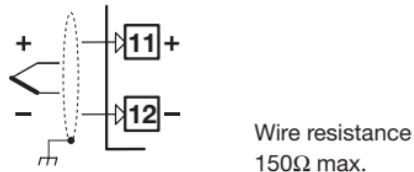
B For Pt100 resistance thermometer
- If a 3 wires system is used, always use cables of the same diameter (1mm² min.) (line 20 Ω/lead maximum resistance)
- When using a 2 wire system, always use cables of the same size (1.5mm² min.) and put a jumper between terminals 11 and 12


For 3 wires only.
Maximum line
resistance: 20Ω/line
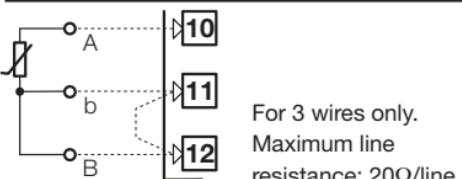
C For ∆T (2x RTD Pt100) Special
⚠ When the distance between the indicator and the sensor is 15 m using a cable of 1.5 mm² size, produces an error on the measure of 1°C (1°F).

**R1 + R2 must be <320Ω**

Use wires of the same
length and 1.5 mm²
size.
Maximum line
resistance: 20Ω/line

D For mA, mV

Rj >10MΩ.
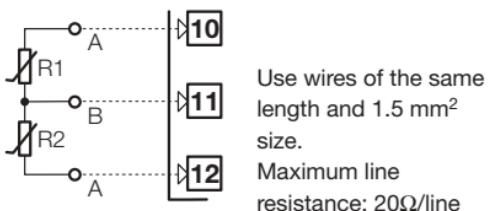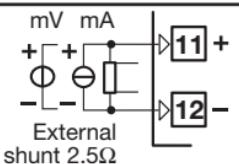
D1 With 2 wire transmitter
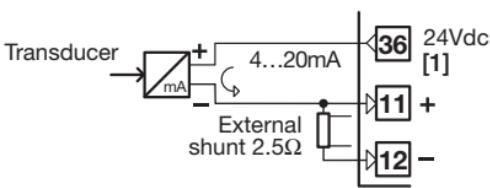
D2 With 3 wire transmitter
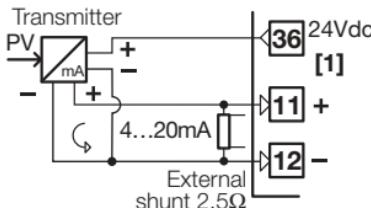
Note:

[1] Auxiliary power supply for external transmitter 24Vdc ±20% /30mA max. with no short circuit protection

2.3.3 AUXILIARY INPUT (IN2) (OPTION) ⚠CE

For mA and V

Current 0/4…20mA
Input resistance = 30Ω
Voltage:1…5V, 0…5V, 0…10V
Input resistence = 300kΩ
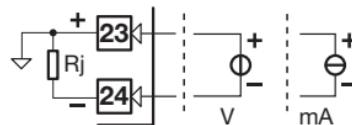
2.3.4 DIGITAL INPUT ⚠CE

• The input is active when the logic state is ON, corresponding to the contact closed
• The input is inactive when the logic state is OFF, corresponding to the contact open
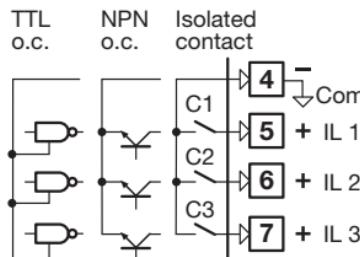
2.3.4 OP1 - OP2 - OP3 - OP4 OUTPUTS (OPTION) ⚠CE

OP1	SPDT relay output
OP2 - OP3	SPST-NO relay outputs
OP4	SSR drive or SPST-NO relay output
OP5	Retransmission analogue output

OP1 relay output:
• SPDT relay,
2A/250Vac for resistive load, fuse 2AT at 250Vac, (4A/120Vac, fuse 4AT at 120Vac).

OP2 - OP3 relay outputs
• SPST N.O. relay,
2A/250Vac for resistive load, fuse 2AT at 250Vac, (4A/120Vac, fuse 4AT at 120Vac).

OP4 not isolated SSR drive output
• 0…5Vdc, ±20%, 30 mA max..

OP4 Relay output
• SPST relay N.O.,
2A/250Vac for resistive load, fuse 2AT at 250Vac (4A/120Vac, fuse 4AT at 120Vac).

OP5 isolated analogue output
• 0/4…20mA, 750Ω/15V max..

2.3.5 ALARM OUTPUTS

OP1 output

NC 28
C 29
NO 30

Fuse
[1]
[1]
Fuse
Load
oVac o
Load

OP2, OP3 Outputs

OP2 31
32
OP3 33

Fuse
[1]
oVac o
[1]
Fuse
AL1 load
AL2 load

OP4 output

OP4 31
32

[2]
34
OP4
35

Fuse
[1]
Coil of the
load contactor
Load
SSR drive
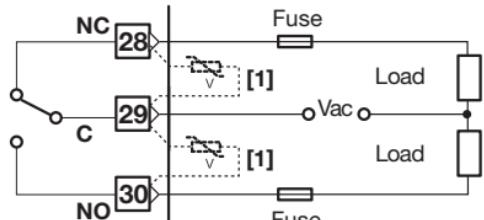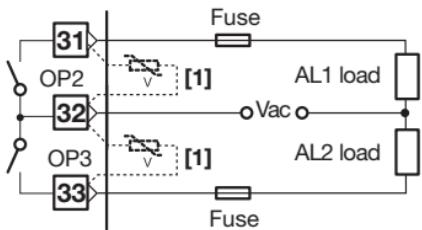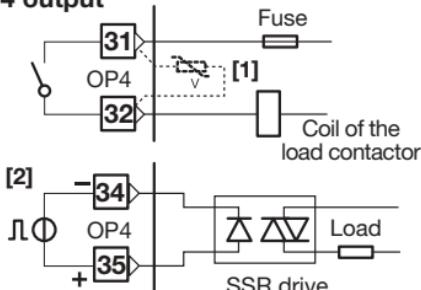
Notes:

[1] Varistor for inductive load 24Vac only;

**[2]** When basic product code $\boxed{B}$ = 9, OP4 (terminals 34, 35) is a Relay output.

2.3.6 OP5 ANALOGUE CONTROL OUTPUT (OPTION)

+ 19
mA⊖ OP5 Load
− 20

For control of IN1 or IN2 retransmission
- Galvanic isolation 500Vac/1 min.
- 0/4…20mA, (750Ω or 15Vdc max.)

2.3.7 SERIAL COMMUNICATIONS (OPTION)

1 +
2 −
3 C
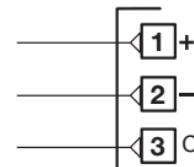
- Galvanic isolation 500Vac/1 min.
- Compliance to the EIA RS485 standard for Modbus/Jbus
- Setting dip switches
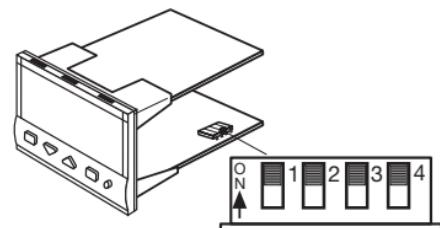
⚠ Please, read:
"gamma**due**® and delta**due**® indicator series serial communication and configuration software" technical manual

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3   PRODUCT CODING

The complete code is shown on the instrument label.

The information about product coding is accessible from the front panel by means of the procedure described in section 5.2 page 34.

Configuration code (software)   **O** **P** **Q** **R**

        I **L** **M** **N**
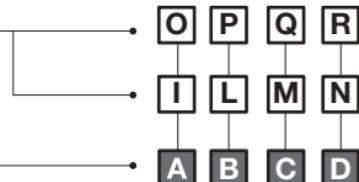
Basic product code (hardware)   **A** **B** **C** **D**

Instrument label

```
P/N       : J3-3150-0000
CONF   :
S/N       : A0A-0450/2210
V~(L-N) : 100÷240V 50/60 Hz - 4W
```

CE
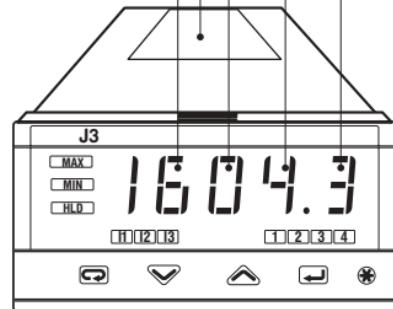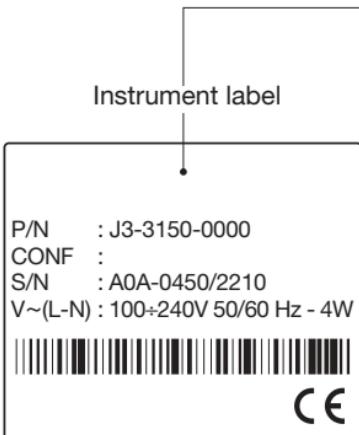
3.1 MODEL CODE

The product code indicates the specific hardware configuration of the instrument that can be modified by authorised personel only.

		Configuration	
Line	Basic	Accessories	1st part 2nd part
Model: J 3	A B C D - E F G 0	/	I L M N - O P Q R

Line	J 3

Power supply	**A**
100...240Vac (-15...+10%)	3
24Vac (-25...+12%) or 24Vdc (-15....+25%)	5

Outputs OP1 - OP2 - OP3 - OP4	**B**
None	0
Relay - Relay - Relay - SSR Drive	1
Relay - Relay - / - /	7
Relay - Relay - Relay - Relay	9

Serial Communications	**C**
None	0
RS485 Modbus/Jbus SLAVE	5

Options	**D**
None	0
Analog output for signal retransmission	1
Second input port IN2	2
Analog output + Second input port IN2	5

User manual	**F**
Italian/English (std)	0
French/English	1
German/English	2
Spanish/English	3

| **Front panel colour**	**G**
Dark (std)	0
Beige	1

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3.2 CONFIGURATION CODING

A 4+4 index code follows the model of the indicator.
The code has to be set to configure the indicator
**(see chapter 3.1 page 15)**

⚠

If, when the indicator is powered up for the first time, the display shows the message:
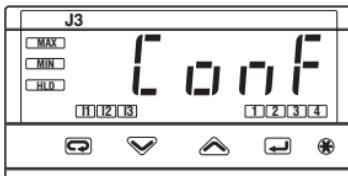

it means that the indicator has not yet been configured.

The indicator remains in standby until the configuration code is set correctly (pag. 24).

Index 　I L M N

1st part
of configuration code
`0320`
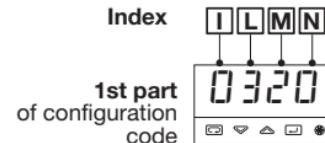
E.g. Enter the code `0320` to choose:
- T/C type J input with range 0...600°C;
- Change the display color to red when an alarm is active;
- Peak hold disbled.

Index 　O P Q R

2nd part
of configuration code
`2301`
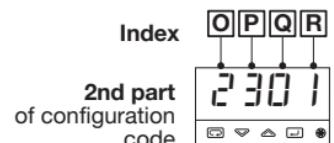
E.g. Enter the code `2301` to choose:
- AL1 absolute, active high;
- AL2 absolute, active low;
- AL3 disabled;
- Sensor break alarm.

Input type and range			I	L
TR Pt100 IEC751	-99.9…300.0 °C	-99.9…572.0 °F	0	0
TR Pt100 IEC751	-200…600 °C	-328…1112 °F	0	1
TC L Fe-Const DIN43710	0…600 °C	32…1112 °F	0	2
TC J Fe-Cu45% Ni IEC584	0…600 °C	32…1112 °F	0	3
TC T Cu-CuNi	-200 …400 °C	-328…752 °F	0	4
TC K Chromel-Alumel IEC584	0…1200 °C	32…2192 °F	0	5
TC S Pt10%Rh-Pt IEC584	0…1600 °C	32…2912 °F	0	6
TC R Pt13%Rh-Pt IEC584	0…1600 °C	32…2912 °F	0	7
TC B Pt30%Rh Pt6%Rh IEC584	0…1800 °C	32…3272 °F	0	8
TC N Nicrhosil-Nisil IEC584	0…1200 °C	32…2192 °F	0	9
TC E Ni10%Cr-CuNi IEC584	0…600 °C	32…1112 °F	1	0
TC Ni-NiMo18%	0…1100 °C	32…2012 °F	1	1
TC W3%Re-W25%Re	0…2000 °C	32…3632 °F	1	2
TC W5%Re-W26%Re	0…2000 °C	32…3632 °F	1	3
Dc input 0…50mV linear	Engineering and units		1	4
Dc input 10…50mV linear	Engineering and units		1	5
Custom input and range **[1]**			1	6

[1] For instance, other thermocouples types, ∆T (with 2 PT 100), custom linearisation etc.

Display mode	M
Green	0
Red	1
Red when alarm 1 (AL1) active	2
Red when at least 1 alarm is active (alarm OR)	3
Alternate between IN1, IN2 and CIN value	4
Manual forced display of IN1, IN2, CIN, Lo, Hi and Unit value	5

Hold of the peak values	N
Disabled	0
Shows the max. value (HI peak) for a programmable period of time	1
Shows the min. value (LO peak) for a programmable period of time	2

Alarm type and function		O AL1	P AL2	Q AL3	R AL4
Non-active				0	
Sensor break alarm				1	
Absolute	Active High			2	
	Active Low			3	
Deviation	Active High			4	
	Active Low			5	
Band	Active Out			6	
	Active In			7	
Rate alarm (AL1 only)		8		-	

4   OPERATIONS   4.1.1 KEY FUNCTIONS AND DISPLAY IN OPERATOR MODE

Display mode of the Peak values

MAX or MIN LEDs will be lit when the display shows a minimum or a maximum value. HLD LED will be lit when tha value displayed is locked by the HOLD command. HOLD and PEAK commands stop the measurement procedure, while the PEAK VALUES HOLD command returns to the normal operation after a programmed period of time (HLdtn parameter).

IN1 input value [1]

In engineering units

Over range   Under range

Digital input status LEDs (yellows)

I 1 - IL1 active
I 2 - IL2 active
I 3 - IL3 active

Menu access

Min. and Max. values display

Alarm status LEDs (reds)

1	AL1 ON
2	AL2 ON
3	AL3 ON
4	AL4 ON

Alarm acknowledge

**Entry key for selection and value setting confirmation**
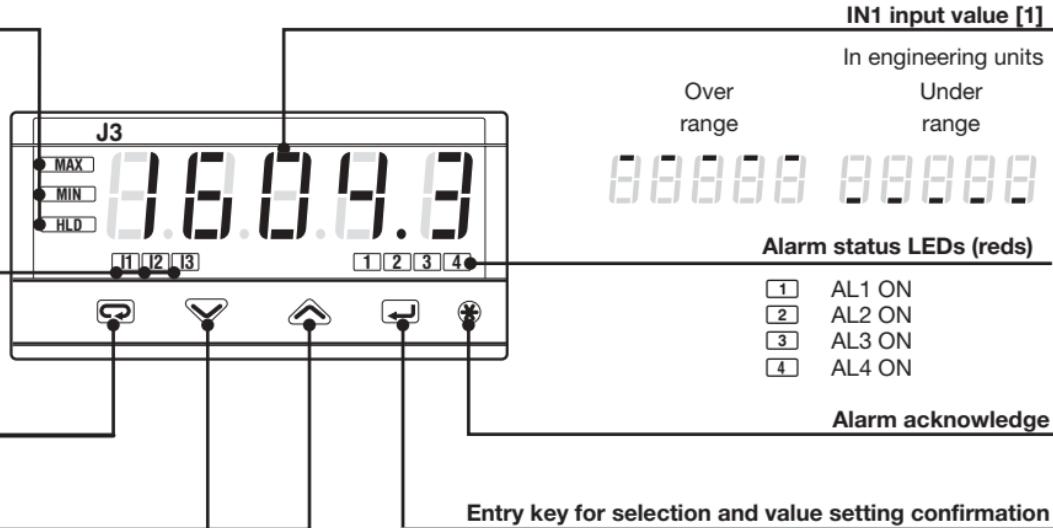
Note:
[1] The color of the dislplay is set through field M of the Configuration Code (page 17).

4.1.2 KEY FUNCTIONS AND DISPLAY IN PROGRAMMING MODE

⚠

The parameter setting procedure has a timeout. If no keys are pressed for at least 30 seconds, the indicator switches back, automatically, to the operator mode.

After having selected the parameter or the code, press △ and ▽ to display or modify the value (see page 25).

The value is entered when the next parameter is selected, by pressing the ⏎ key.

Until the △ or ▽ are pressed or, if you wait for 30 seconds, the parameter value is not inserted.

Pressing the ⟳ key, the next group of parameters is presented on the display.

Parameter Code/Value

Back to previous parameter

Access to the menu for:
Parameter setting
Configuration

Value modification

Entry key for selection and value setting confirmation
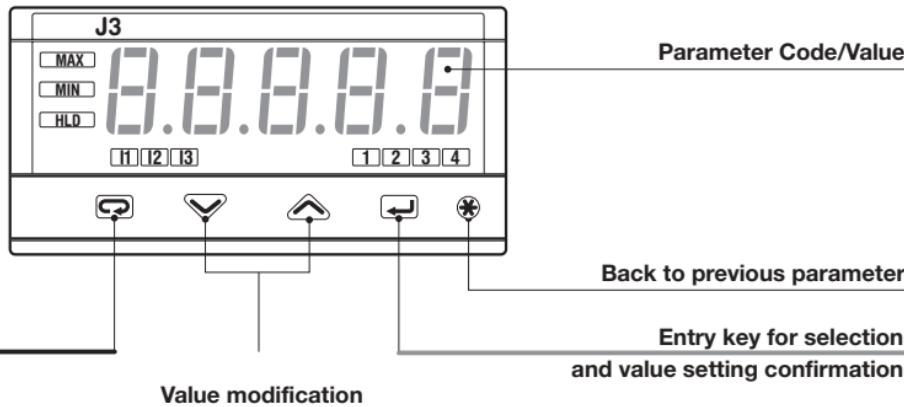
4.2 PARAMETER SETTING

4.2.1 NUMERIC ENTRY

(i.e. how to the modify a threshold value from 275.0 to 240.0)

Pressing ⌃ or ⌄ momentarily changes the value by 1 unit every push.

Continued pressing of ⌃ or ⌄ changes the value, at a rate that doubles every second. Releasing the button decreases the rate of change.

In any case value stops changing the max./min. value has reached limit set for the parameter.

Access the alarm threshold menu

Select the AL 1 threshold

Threshold value of AL1 alarm

Decrease

Increase

Threshold entry
Press the ⏎ key to store the new value in the instrument

Operator mode
Displays the value of the selected input
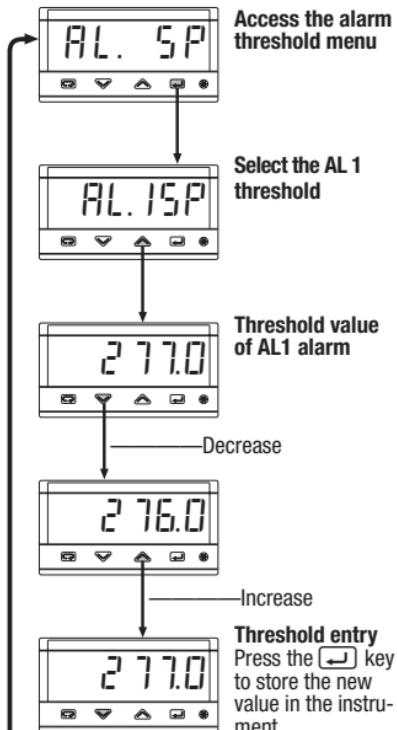
4.2.2 MNEMONIC CODES SETTING

(e.g. configuration see page 30)

Press the ⌃ or ⌄ to display the next or previous mnemonic for the selected parameter.

Continued pressing of ⌃ or ⌄ will display further mnemonics at a rate of one mnemonic every 0.5 s. The mnemonic displayed at the time the next parameter is selected is the one stored in the parameter.

Engineering Units

Degree Centigrade

Degree Fahrenheit

Degree Centigrade

Degree Fahrenheit

No unit defined

Ph
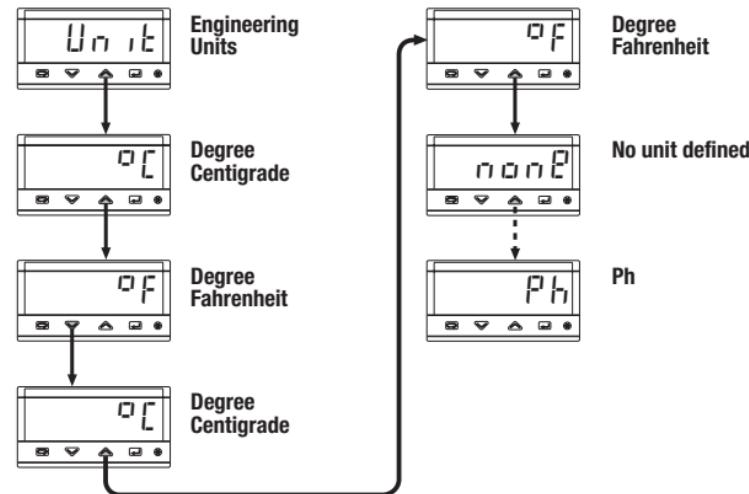
4.3 PARAMETERISATION - MAIN MENU

Operator mode

Direct access to the parameter (only if $CodE$ <5000)

Password Entry

Only if $CodE$ value ≥5000

Must be equal to the value of the parameter $CodE$

Back to the operator mode

OK

NO   YES

Back to the operator mode

$AL. SP$ → **Alarm set [1]** (page 21)

$nEas$ → **Measure set-up [1]** (page 22)

$AL.Par$ → **Alarm parameter setting [1]** (pag. 23)

$ConF$ → **Instrument configuration** (page 24)
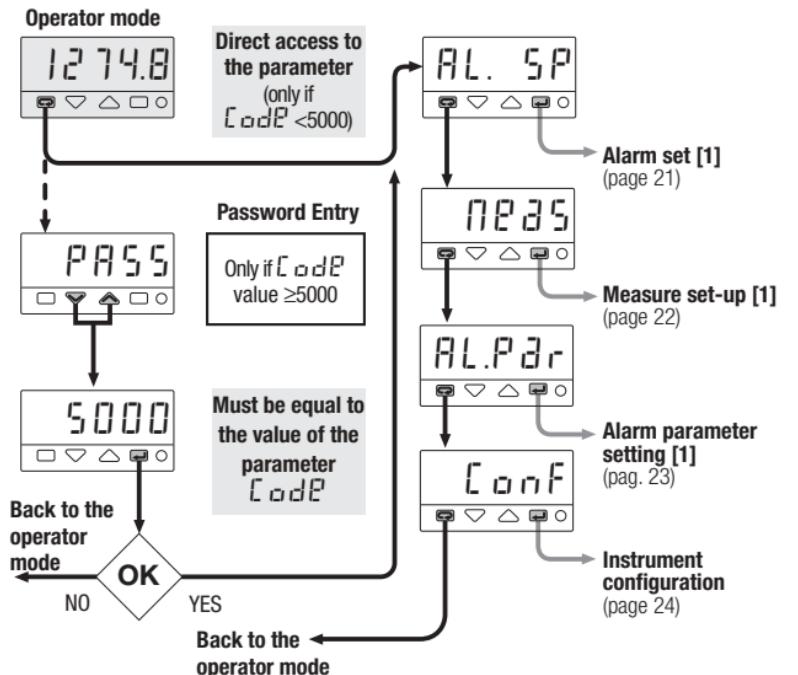
Note:
[1] The menu apears only if at least one of the alarms has been configured (except for the sensor break alarm).

4.3.1 ALARM SET

$AL SP$ — **Alarm threshold menu**

$AL.1SP$ — **AL1 alarm threshold**

$AL.1hY$ — **AL1 hysteresis**

$AL.2SP$ — **AL2 alarm threshold**

$AL.2hY$ — **AL2 hysteresis**

$AL.3SP$ — **AL3 alarm threshold**

$AL.3hY$ — **AL3 hysteresis**

$AL.4SP$ — **AL4 alarm threshold**

$AL.4hY$ — **AL4 hysteresis**

$AL.rEF$ — **Alarm internal reference value** (engineering unit)

Back to $AL.1SP$
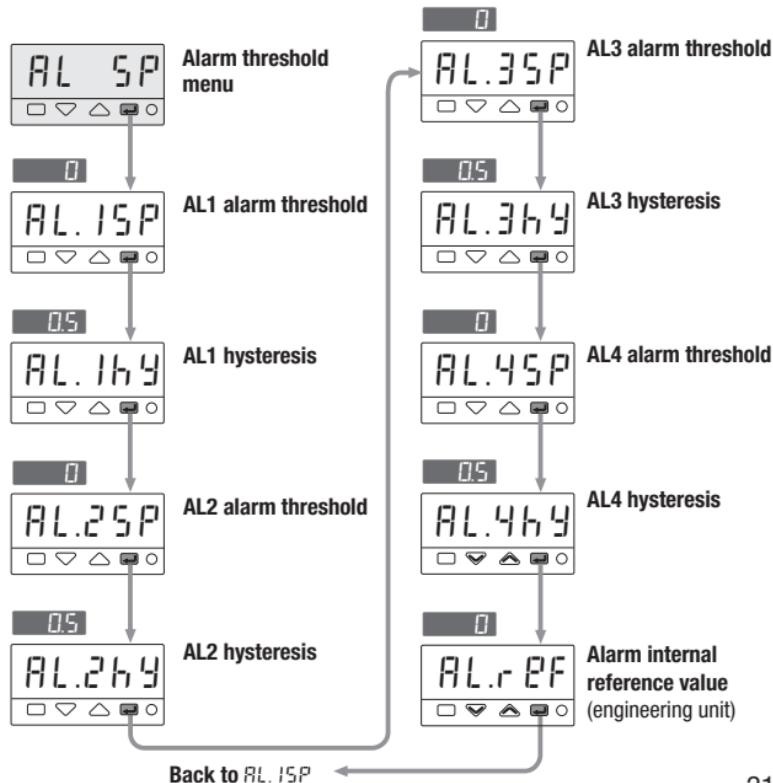
4.3.2 PARAMETERISATION - MEASURE MENU

Display	Label	Description
`NEAS`	**Measure setting menu**	
`20` `HLd.tN`	**Measure hold time**	`0...9999`
`In 1` `C in.SL`	**Conditioning the measure**	Available operations page 27
`0-5` `in.2St`	**IN2 Input type**	Input types available page 27
`0` `in.2Lo`	**IN2 low limit**	`- 9999...32000`
`10000` `in.2H i`	**IN2 HIGH limit**	`- 9999...32000`
`0` `in.2dd`	**IN2 decimal point position**	`0...3`
`0` `in.2Cn`	**IN2 square root**	`nonE/SQrt` (page 27)
`0` `Cut 2`	**IN2 square root cut-off**	`0...9.999` (page 28)
`0` `t.F iL2`	**IN 2 filter time constant**	`OFF/ 1...30`s
`0` `in.2Sh`	**IN2 input shift**	`- 1000... 1000`
`0` `C in.Lo`	**Conditioned measure (Cin) low limit**	`- 9999...32000`
`10000` `C in.H i`	**Conditioned measure (Cin) HIGH limit**	`- 9999...32000`
`0` `C in.dd`	**Conditioned measure (Cin) decimal point position**	`0...3`
`5` `t iNE.S`	**Alternate display period (Cin active)**	`5...20`s
`nonE` `AO.Src`	**Analogue output source**	`nonE/ In 1/ C in/ In2`
`0-20` `AO.tYP`	**Analogue output type**	`0 - 2/4 - 20`
`0` `AO.Lo`	**Analogue output low limit**	`- 9999...32000`
`10000` `AO.H i`	**Analogue output HIGH limit**	`- 9999...32000`
`0` `dEF.Sh`	**Default displayed parameter**	`In 1/ In2/C in /Lo/H i /Un it`

Back to `HLd.tN`

4.3.3 PARAMETERISATION - ALARMS PARAMETERSIATION MENU

ALP3r — Alarms parameterisation menu
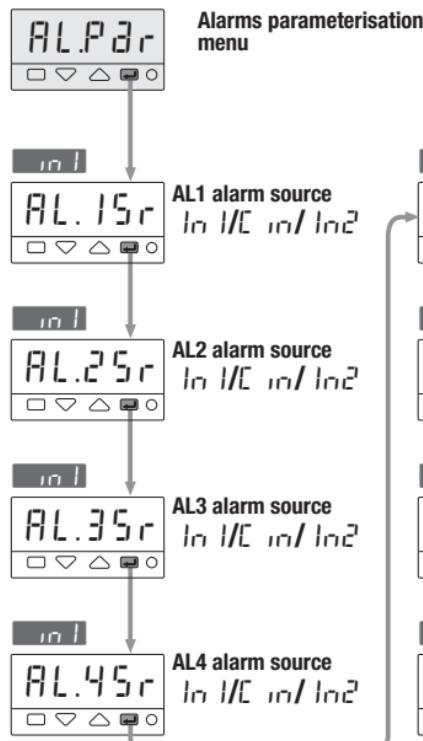
Note:
[1] Only those alarms that are configured different than zero are shown during the parameterisation phase (fields **O** **P** **Q** **R** page 17).

AL.15r — AL1 alarm source `In 1/IC in/ In2`

AL.25r — AL2 alarm source `In 1/IC in/ In2`

AL.35r — AL3 alarm source `In 1/IC in/ In2`

AL.45r — AL4 alarm source `In 1/IC in/ In2`

AL.1OP — AL1 alarm output `nonE/OP 1 /OP2/OP3/OP4`

AL.2OP — AL2 alarm output `nonE/OP 1 /OP2/OP3/OP4`

AL.3OP — AL alarm output `nonE/OP 1 /OP2/OP3/OP4`

AL.4OP — AL4 alarm output `nonE/OP 1 /OP2/OP3/OP4`

OP.1a — AL1 alarm action `d ir /r EU`

OP.2a — AL2 alarm action `d ir /r EU`

OP.3a — AL3 alarm action `d ir /r EU`

OP.4a — AL4 alarm action `d ir /r EU`

AL.1Lb — AL1 alarm Latching/Blocking `nonE/LEch /bLoc/LEbL / 1SA/ 1S.bL`

AL.2Lb — AL2 alarm Latching/Blocking[1] `nonE/LEch /bLoc/LEbL / 1SA/ 1S.bL`

AL.3Lb — AL3 alarm Latching/Blocking[1] `nonE/LEch /bLoc/LEbL / 1SA/ 1S.bL`

AL.4Lb — AL4 alarm Latching/Blocking[1] `nonE/LEch /bLoc/LEbL / 1SA/ 1S.bLL`

ALM.Sr — Alarm reference source `int/ in2`

Back to AL.15r

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4.3.5 CONFIGURATION MENU

When an unconfigured indicator is powered up for the first time, the display shows:

See chapters 3, 3.1 and 3.2 starting from page 14.

Configuration menu

Password Entry

Must be equal to the value of the parameter `Code`

Back to the operator menu

NO ← **OK** → Yes

`Con 1` Entering digits
I - L - M - N of the configuration code
(chapter 3.2 pages 15, 16)

`Con2` Entering digits
O - P - Q - R of the configuration code
(chapter 3.2 pages 15, 16)

`IL 1` IL1 digital input function (see table 1)

`IL 2` IL2 digital input function (see table 1)

`IL 3` IL3 digital input function (see table 1)

`Unit` Engineering units (see table 2)

LINEAR SCALE ONLY

`in.1dd` N° of decimals 0...3

`in.1Lo` Low range -9999...32000 (min. 100 digit)

`in.1H1` High range -9999...32000 (min. 100 digit)

`in.1Cn` IN1 square root nonE/SQrt

`Cut1` IN1 Cut off square root 0...9999 (engineering units)

24

Filter time constant
$tFiL1$ OFF/1...30s

Input shift
$In.15h$ OFF/-60...60 digit

SERIAL COM. OPTION (if installed)

$U.buS$ **Communications protocol** $Nbu5 / Jbu5$

$Prot$

9600 **Baud rate** $1200/2400$ $4800/9600$

$bdud$

1 **Serial comms address** $1...247$

$Addr$

33

$CodE$

Password (password) $0...9999$ factory default 33

Back to the $Con.1$ parameter

Table 1 - Digital input functions

$IL1$		$IL2$	$IL3$
Value	Description	Value	Description
$nonE$	Not used	$HcPH$	Positive peak enable
$EEY.1$	Keypad lock		
$OP.bL$	Outputs lock	$HcPL$	Negative peak (valley) enable
AcE	Alarm acknowledge	$HEPH$	Positive peaks sustained display
$r.HL$	Max. and min. reset	$HEPL$	Negative peaks sustained display
$HoLd$	Measure Hold	$F.diS$	Display a different parameter

Table 2 - Engineering units

$uniE$			
Value	Description	Value	Description
$°C$	Centigrade degrees	A	Ampere
$°F$	Fahrenheit degrees	bar	Bar
$nonE$	none	PSI	PSI
nU	mV	rh	Rh
U	Volt	PH	pH
nA	mA		

Note:

[1] Cut off the square root of the input value enables the user to round to zero a result that is too low to be important.

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4.4 PARAMETERS DESCRIPTION

For ease of operation of the indicator, its parameters have been organised in groups (menu), according to their functionality area.

4.4.1 ALARM THRESHOLD MENU

OP1, OP2, OP3 and OP4 outputs can be used as alarms.
It is possible to configure up to 4 alarms: AL1, AL2, AL3 and AL4 (page 22) selecting for each of them:

- type and perating condition of the alarm (page 31);
- the functionality of the alarm acknowledgement (latching) $\boxed{Ltch}$ (page 31);
- the blocking function is activated on start up $\boxed{bLoc}$ (page 31);
- Sensor break function (page 31);
- Rate alarm (only for AL1 referred to IN1).

$\boxed{AL.1SP}$ **AL1 alarm threshold**

$\boxed{AL.2SP}$ **AL2 alarm threshold**

$\boxed{AL.3SP}$ **AL3 alarm threshold**

$\boxed{AL.4SP}$ **AL4 alarm threshold**

Parameters to set the threshold of AL1, AL2, AL3 and AL4 alarms.

The range of the alarm threshold corresponds to the whole span.

When an alarm occurs, the display will shows the red LEDs $\boxed{1}$, $\boxed{2}$, $\boxed{3}$ and $\boxed{4}$ respectively ON and, when configured, with a change of the display colour.

$\boxed{AL.1hy}$ **AL1 alarm hysteresis**

$\boxed{AL.2hy}$ **AL1 alarm hysteresis**

$\boxed{AL.3hy}$ **AL1 alarm hysteresis**

$\boxed{AL.4hy}$ **AL1 alarm hysteresis**

Hysteresis of the threshold of AL1, AL2, Al3 and AL4 alarms. It is specified as a % of the full scale.

4.4.2 MEASURES MANAGEMENT MENU

The entries present in thi menu allow the user to configure:
- the secondary input IN2;
- if a conditioning operation must be applied to the measurement;
- if a conditioning operation must be applied to the analogue output.

$\boxed{HL\ d.t\ \Pi}$ **Measure hold time**

This parameter allows the configuration of the period of time a peak value must be sustained on the display.
Setting range: 5...9999 s.

$\boxed{C\ in.5L}$ **Measure conditioning**

The Cin.SL parameter selects the type of operation that must be applied to input 1 (IN1) from the secondary input (IN2); the result is the conditioned input ($C\ in$).
In the table that follows are listed the possible conditioning operations:

Id	Description
$in\ 1$	Cin = IN1
$in2$	Cin = IN2
$5u\Pi$	Cin = IN1 + IN2
$5ub$	Cin = IN1 - IN2
$8u9$	Cin = (IN1 + IN2)/2
$H\ i9$	Cin = MAX (IN1, IN2)
LoU	Cin = Min (IN1, IN2)
ΠuL	Cin = IN1 * IN2
$rt\ io$	Cin = IN1/IN2

$\boxed{in.25t}$ **IN2 input type**

The parameter defines the range of the secondary input (IN2).

Value	Description
$0 - 5$	0...5 V
$1 - 5$	1...5 V
$0 - 10$	0...10 V
$0 - 20$	0...20 mA
$4 - 20$	4...20 mA

$\boxed{in.2dd}$ **Number of decimals IN2 input**

$\boxed{in.2L\ o}$ **Low range IN2 input**

$\boxed{in.2H\ i}$ **High range IN2 input**

These parameters define the limits an the number of decimals to be displayed for the secondary input (IN2).

$\boxed{in.2C\ n}$ **IN2 measure square root**

Parameter to enable the calculation of the square root of the IN2 measure ($59rt$ = enabled, $non\mathcal{E}$ = disabled)

$\boxed{CUt\ 2}$ **Cut-off square root result**

This parameter allows the user to round to zero those results that are not meaningful.
Setting range: 0...9999.
Default value: 0.

$\boxed{\text{t.F iL 2}}$ **Input 2 filter time constant**

Time constant, in seconds, of the RC input filter applied to the PV input.

When this parameter is set to OFF the filter is bypassed.

Filter response
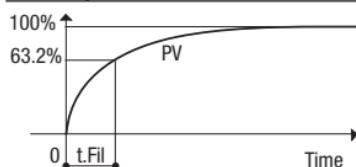
$\boxed{\text{in.2 5h}}$ **Secondary input (IN2) shift**

This value is added to the measured input 2 value. Its effect is to shift the whole IN2 scale of up to ± 60 digits.

Default value: 0.

$\boxed{\text{C in.dd}}$ **Number of decimals for Cin value**

$\boxed{\text{C in.L o}}$ **Low range for conditioned value**

$\boxed{\text{C in.H i}}$ **High range for conditioned value**

These parameters define the range and the number of decimals to be displayed for the conditioned measure (C in).

$\boxed{\text{t inE.5}}$ **Alternate display period (Cin active)**

Parameter to set the displaying time of an alternate measure when the conditioned input is active (C in).

Setting range: 5...20 s.
Default value: 5 s.

$\boxed{\text{A0.5r c}}$ **Analog output source**

Selects the variable to be put on the analog output.

Values: None,
In1,
Cin,
In2.

$\boxed{\text{A0.t 4P}}$ **Analogue output type**

Selects the type of signal retransmitted by the analogue output.

Values: 0... 20 mA,
4... 20 mA.

Default value: 0...20mA.

$\boxed{\text{A0.L o}}$ **Analogue output low range**

$\boxed{\text{A0.H i}}$ **Analogue output high range**

Range of the analogue output.

Values:
$AoLo$: -9999...32000
$AoHY$: -9999...32000

Default value:
$AoLo$: 0
$AoHY$: 10000

$\boxed{\text{dEF.5h}}$ **Default displayed variable**

Defines the name of the variable that is displayed by default when in manual forced display mode (field $\boxed{\text{M}}$ set to 5).

Value	Description
In 1	Input 1
In 2	Input 2
C in	Conditioned input
L o	Minimum stored value
H i	Maximum stored value
Un it	Selected engineering unit

Valore di default: In1

4.4.2 ALARM PARAMETERS CONFIGURATION MENU

The entries of this menu alow the user to configure the functioning parameters of alarms AL1, AL2, AL3 and AL4.

| $RL.15r$ | **AL1 alarm source** |

| $RL.25r$ | **AL2 alarm source** |

| $RL.35r$ | **AL3 alarm source** |

| $RL.45r$ | **AL4 alarm source** |

Sets, for each alarm, the signal source to be considered.
Values: IN1, Cin; IN2.
Default value: IN1

| $RL.10P$ | **AL1 alarm output** |

| $RL.20P$ | **AL2 alarm output** |

| $RL.30P$ | **AL3 alarm output** |

| $RL.40P$ | **AL4 alarm output** |

These parameters connect each alarm to the output port to be activated when an alarm condition occurs.
Values: none, OP1, OP2, OP3, OP4.
Default values: AL1: OP1
                AL2: OP2,
                AL3: none
                AL4: none.

| $OP.1d$ | **Output OP1 action** |

| $OP.2d$ | **Output OP2 action** |

| $OP.3d$ | **Output OP3 action** |

| $OP.4d$ | **Output OP4 action** |

Sets the type of action of the output port.
Values: direct (relay-coil activated in alarm condition), reverse (relay-coil not activated when in alarm condition).
Default values: direct.

| $RL.1Lb$ | **AL1, AL2, AL3, AL4 latching** |

| $RL.2Lb$ | **and blocking function** |

| $RL.3Lb$ | |

| $RL.4Lb$ | |

For each alarm it is possible to select one of the following functions:
- $nonE$ none;
- $LtcH$ acknowledge;
- $bLoc$ blocking;
- $Lt.bL$ latching + blocking
- ISA ISA acknowledge sequence
- $IS.bL$ ISA acknowledge sequence + blocking

`L t c h` **ALARM ACKNOWLEDGE FUNCTION**

Once an alarm occurs, it is indicated on the display until it is acknowledged. To acknowledge an alarm press the ⊛ key.

After this operation, the alarm shuts off only when the alarm condition is no longer present.

`b L o c` **START-UP DISABLING**

Ramp down
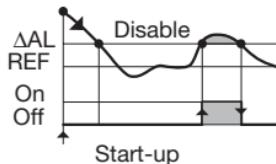
Ramp up
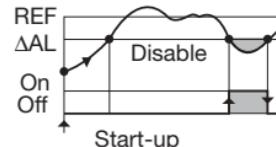
ΔAL Threshold = REF ± range

`1 5 A` **"ISA A" ALARM RESET SEQUENCE**

The alarm intervention activates both the visual alarm (the alarm LED on the display) and the audible alarm (the OP output used to activate for example a buzzer or a siren). When the operator acknowledges the alarm, the status of the two alarms differs if the alarm condition has been removed or not. In the table that follows the visual and audible alarm status are pointed out for each condition.

| Status | Status changes | | | | Visual alarm (alarm LED) | Audible alarm (OP output) |
| | Input variable | | Reset (ACK) | | | |
	Normal condition	Alarm condition	Reset not done	Reset done		
No alarm active	No status changes	Go to status: **Alarm not acnowledged**			OFF	OFF
Alarm not acnowledged			No status changes	Go to status: **Acnowledged alarm**	Flashing	Active
Acnowledged alarm	Go to status: **No alarm active**	No status changes			Steady ON	OFF

`A L N.S r` **Alarm reference source**

This parameter allows the user to select the reference value to be used for the alarms.

Valid values: Int/In2

Default: Int (as set in `A L r E F`)

4.4.3 CONFIGURATION MENU

$\boxed{\mathsf{C\,o\,n\,F}}$ **1st part of the configuration code**

Fields $\boxed{I}$ and $\boxed{L}$ allow the selection of type and range of the primary input (IN1 page 16).

Field $\boxed{M}$ allows the selection of the function mode of the display (page 17).

Field $\boxed{N}$ selects if and how the peak values are to be hold (or not) on the display.

$\boxed{\mathsf{C\,o\,n\,2}}$ **2nd part of the configuration code**

Fields $\boxed{O}\boxed{P}\boxed{Q}$ and $\boxed{R}$ select alarm type and function (page 17).

SENSOR BREAK ALARM FUNCTION

During the configuration phase (page 17) set fields $\boxed{O}$, $\boxed{P}$, $\boxed{Q}$, $\boxed{R}$, to value 1. When the PV overcomes the sensor range limits, the sensor break alarm intervention is immediate. **When the alarm is no longer present, the alarm stops.**

ABSOLUTE ALARM

During the configuration phase (page 17) set fields $\boxed{O}$, $\boxed{P}$, $\boxed{Q}$, $\boxed{R}$, to value 2 (actve high) or 3 (active low).
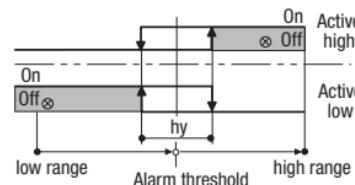
DEVIATION ALARM

During the configuration phase (page 17) set fileds $\boxed{O}$, $\boxed{P}$, $\boxed{Q}$, $\boxed{R}$, to value 4 (active high) or 5 (active low).

BAND ALARM

During the configuration phase (page 17) set fileds $\boxed{O}$, $\boxed{P}$, $\boxed{Q}$, $\boxed{R}$, to value 5 (active in) or 6 (active out).
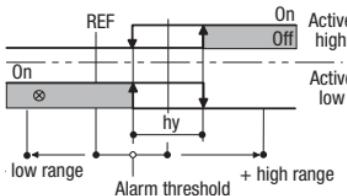
AL1 RATE ALARM FUNCTION

During the configuration phase (page 17) set fileds $\boxed{O}$, to value 8. When the changing rate of the PV connected to the alarm is higher than the specified threshold, AL1 is actvated.

The changing rate can be set within the limits: 0.1... 5.0 digit/s.

The alarm wil be activated in 1 second if the changin rate is higher than 1 digit/s. At lower rates the alarm activation time increases to up to 6 seconds for a limit change rate of 0.1 digit/s.

`IL 1`	**IL1 digital input function**
`IL 2`	**IL2 digital input function**
`IL 3`	**IL3 digital input function**

A function is assigned, through the configuration procedure to each IL1, IL2 and IL3 digital input (see the parameters setting at table. 1 at page 31).

The configured function is activated when the digital input (free voltage contact or open collector output) is in the ON state (closed). It is deactivated by setting the input to the OFF state (open).

The activation of the function through the digital input has the highest priority than through the keypad or through the serial communications.

Function	Parameter Value	Performed operation —●╱●— Off	Performed operation —●╱●— On	Notes
None	`nonE`	–	–	Not used
Keypad lock	`EEY.1`	Unlocked	Locked	Also with the keypad locked the commands from digital inputs and serial communications are still operating
Outputs lock	`OP.bL`	Normal operation	Outputs lock	Closing the contact causes the setting to the logical status 0 of the output ports. The retransmission analogue output is forced to the low limit (0 or 4 mA)
Alarm acknowledge	`Ac E`	Normal operation	Alarm acknowledge	Closing the contact causes the acknowledgement of the active alarms
Max. and min. reset	`r. HL`	Normal operation	Max., min. reset	Closing the contact causes the reset of the stored maximum and minimum value
Measure hold	`HoLd`	Normal operation	Measure held locked	Closing the contact locks the measurement of the IN1 input. In accordance, all the values directly connected to IN1 measure are locked.
Positive peak hold enable	`Hc PH`	Normal operation	Shows the max. value read	The display shows the maximum value read all the time the contact is closed. The number displayed changes in case of higher max. values
Negative peak hold enable (valley)	`Hc PL`	Normal operation	Shows the min. value read	The display shows the minimum value read all the time the contact is closed. The number displayed changes in case of lower min. values
Positive peaks sustained display	`HE PH`	Normal operation	Max. value + normal operation	The display shows, for a programmable period of time (`HL dE n`), the max. value read, then returns to normal operation
Negative peaks sustained display	`HE PL`	Normal operation	Min. value + normal operation	The display shows, for a programmable period of time (`HL dE n`), the min. value read, then returns to normal operation
Display a different parameter	`Fd iS`	Normal operation	Alternate display	For all the period the contact is closed the display shows the value of the variable set with the `dEF.Sh` parameter

$Un it$	**Engineering units**

This parameter allows the user to view the process in the desired engineering units. When the instrument senses temperature, this parameter allows the convertion between Farenheit (°F) and centigrade (°C). All the engineering units available are listed at page 25 table 2.

LINEAR SCALES PARAMETERS

The parameters that follow are displayed only when, during the configuration phase, a linear input has been selected for IN1 (fileds I and L at page 16).

$in.Idd$	**IN1 Input number of decimals**
$in.IL o$	**IN1 input low range**
$in.IH i$	**IN1 input high range**

These parameters allow the user to set the operating range and the number of decimal point to be displayed for the primary (IN1) input.

$in.I.C n$	**IN1 measure square root**

Parameter to enable the calculation of the square root of the IN1 measure ($Sqrt$ = enabled, $nonE$ = disabled)

$CUt 1$	**Cut-off square root result**

This parameter allows the user to round to zero those results that are not meaningful.
Setting range: 0...9999.
Default value: 0.

SERIAL COMMUNICATIONS PARAMETERS (OPTIONAL)

The parameters that follow are displayed only when the optional communications board is installed in the instrument.

$Prot$	**Comunications protocol**
$baud$	**Baud rate**
$Addr$	**Instrument serial address**

Values:
Protocol: Modbus/Jbus.
Baud rate: 200/2400/4800/9600 baud.
Instrument serial address: 1...247
Default values:
Protocol: Jbus.
Baud rate: 9600 baud.
Instrument serial address: 1

SAFETY PARAMETERS

$CodE$	**Access code**

This parameter allows the user to change the factory default password ($CodE = 33$).
If $CodE$ is set to 0 (zero), the access to the instrument is opern (no password needed).
If $0 < CodE ≤ 5000$ only the $ConF$ menu is protected.
Codes higher than 5000 ($5000 ≤ CodE < 10000$), protect all the 3 main menus of the instrument.

5 DISPLAYS

5.1 DISPLAYING THE PROCESS VARIABLES

Operator mode

1 6 0 4 . 3

in1 → **IN1 reading** 1 6 0 4 . 3

in2 → **IN2 reading** 0

C in → **Conditioned measure value** 1 6 0 4 . 3

Lo → **Minimum value read** 8 5 4 . 0

H i → **Maximum value read** 1 6 0 5 . 0

Unit → **Engineering units** (table 2 page 25) → °C → **Back to IN1**
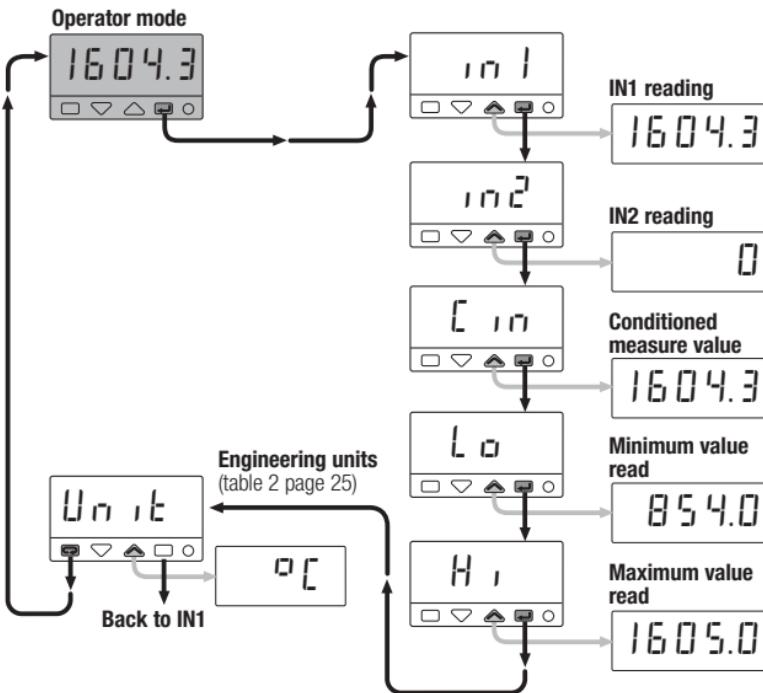
5.2 DISPLAYING THE CONFIGURATION CODES

Operator mode

1 6 0 4 . 3

in1 → **IN1 reading** 1 6 0 4 . 3

Hard → **Hardware code** 3 9 5 5

Con1 → **1st part of configuration index** 2 3 2 0

Con2 → **2nd part of configuration index** 0 3 0 1

rEL → **Software release #** 0 3 0
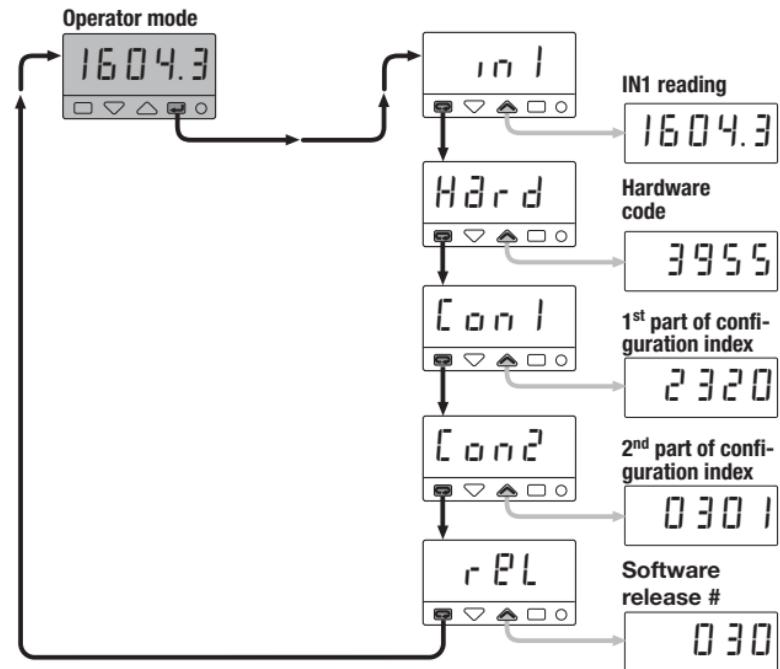
6 COMMANDS COMMANDS TO THE INDICATOR AND OPERATING PROCEDURE

The commands can be entered in 3 ways:

6.1 KEYPAD
see page 36

- Keypad lock
- Outputs lock

6.2 DIGITAL INPUTS
see page 33
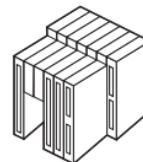
6.3 SERIAL COMMUNICATIONS
see the manual on this topic

6.1 KEYPAD COMMANDS

6.1.1 KEYPAD LOCK

To lock/unlock the keypad press and hold the keys ⟳ and ↵ simultaneously for 2 seconds. To confirm the keypad lock/unlock the display flashes once.

The keypad lock/unlock can also be achieved over serial communications.

⚠ The keypad lock is retained in the event of power failure.

Operator mode
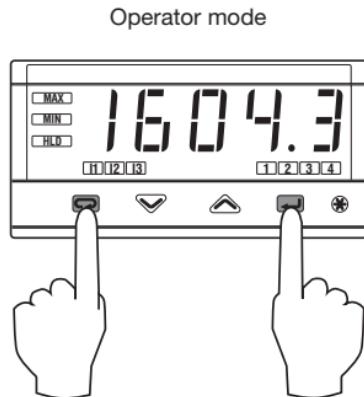
Press simultaneously for 2 seconds

6.1.2 OUTPUTS LOCK

The outputs are switched to the OFF status by pressing and holding the keys ⟳ and ▽ simultaneously for 2 seconds. To confirm the outputs lock/unlock the display flashes once. To unlock the outputs press the keys simultaneously again.

The outputs lock/unlock can also be achieved over serial communications.

⚠ The outputs lock is retained in the event of power failure.

Operator mode
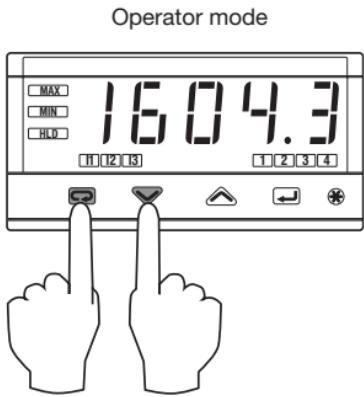
Press simultaneously for 2 seconds

7 TECHNICAL SPECIFICATIONS

Features (at 25°C environmental temp.)	Description				
Total configurability	From keypad or serial communication the user selects: input type, type/functionality and display mode of the alarms				
IN1 Input (see pages 11,12 and 16)	Common characteristics	A/D converter with resolution of 50,000 points Update measurement time: 0.2 seconds Sampling time: 0.5 seconds Input bias: -60…+ 60 digit Input filter: 1…30 seconds (0 = disabled)			
	Accuracy	0.25% ±1 digits for temperature sensors 0.1% ±1 digits (for mV and mA)		Between 100…240 Vac the error is minimal	
	Resistance thermometer (for ∆T: R1+R2 must be <320Ω)	Pt100Ω at 0°C (IEC 751) °C/°F selectable	2 or 3 wire connection Burnout (with any combination)	Max. wire resist.: 20Ω max. (3 wires) Input drift: 0.35°C/10° Env. Temp. <0.35°C/10Ω Wire Res.	
	Thermocouple	L, J, T, K, S, R, B, N, E, W3, W5 (IEC 584) Rj >10MΩ, °C/°F selectable	Internal cold junction compensation with NTC Error 1°C/20°C ±0.5°C Burnout	Line: 150Ω max. Input drift: <2µV/°C Env. Temp. <5µV/10Ω Wire resistance	
	DC input current (with 2.5Ω external shunt)	0… 20mA, 4... 20mA, Rj >10MΩ	Engineering units Conf. decimal point position Init. Scale -999…9999 Full Scale -999…9999 (min. range of 100 digits)	Input drift: <0.1%/20°C Env. Temp.	
	DC input voltage	0…50mV, 10...50mV, Rj >10MΩ			
IN2 secondary input (option)	DC input current	0… 20mA, 4... 20mA, Rj = 30Ω	Accuracy: 0.1%, sampling time: 1.5 s Update measurement time: 0.7 s		
	DC input voltage	0...5V, 1…5V, 1...10V, Rj = 300kΩ			
Digital inputs (3) (not isolated)	Closing an external contact is possible to:	Lock the keypad, lock the output, acknowledge alarms, reset min./max. stored values, Hold the measure, Hold/sustained display of positive/negative peaks, force the display of a different parameter			

Features (at 25°C environmental temp.)	Description				
OP1 outputs	SPDT relay, 2A/250Vac (4A/120Vac) for resistive load				
OP2- OP3 outputs	SPST Relay N.O., 2A/250Vac (4A/120Vac) for resistive load				
OP4 outputs	Logic not isolated: 0/5Vdc, ±10% 30mA max. - SPST Relay N.O., 2A/250Vac (4A/120Vac) for resistive load				
OP5 analogue output (option)	For retransmission of: IN1 IN2 Conditioned measure (Cin)	Galvanic isolation: 500 Vac/1 min Resolution 12bit (0.025%) Accuracy: 0.1 %		In current: 0/4…20mA 750Ω/15V max.	
AL1 - AL2 - AL3 - AL4 alarms	Hysteresis 0.1…10.0% c.s.				
	Action	Active high	Action type	Changing rate threshold	0.1...5.0 digit/s
				Deviation threshold	±range
		Active low		Band threshold	0…range
				Absolute threshold	whole range
		Special functions	Sensor break		
			Acknowledge (latching), activation inhibit (blocking), OR function, ISA-A acknowledge sequence		

Features (at 25°C environmental temp.)	Description		
Serial comm. (option)	RS485 isolated, Modbus/Jbus protocol, 1200, 2400, 4800, 9600 bit/s, 3 wires		
Auxiliary Supply	+24Vdc ±20% 30mA max. - for external transmitter supply		
Operational Safety	Measure input	Detection of out of range, short circuit or sensor break with automatic activation of the safety strategies and alerts on display	
	Outputs	Safety value: -100…100%	
	Parameters	Parameter and configuration data are stored in a non-volatile memory for an unlimited time	
	Access protection	Password to access the configuration and parameter data, keypad lock, outputs lock	
General characteristics	Power supply (PTC protected)	100...240Vac (-15...+10%) 50/60 Hz or 24Vac (-25...+12%), 50/60 Hz and 24Vdc (-15...+25%)	Power consumption 4W max.
	Safety	Compliance to EN61010-1 (IEC 1010 – 1), installation class 2 (2.5kV) pollution class 2, **instrument class II**	
	Electromagnetic compatibility	Compliance to the CE standards (see page 2)	
	UL and cUL Approvals	File 176452	
	Protection EN60529 (IEC 529)	IP65 front panel	
	Dimensions	$^1/_8$ DIN - 96 x 48, depth 110 mm, weight 250 g approx.	

■■■ **WARRANTY**

We warrant that the products will be free from defects in material and workmanship for 18 months from the date of delivery.
The warranty above shall not apply for any failure caused by the use of the product not in accordance with the instructions contained in this manual.

■ ICONS TABLE

Main universal input	
Thermocouple	
RTD (Pt100)	
Delta Temp (2x RTD)	
mA and mV	
Custom	
Frequency	
Auxiliary input	
Current transformer	
mA Remote setpoint	
Volt Remote setpoint	
Feedback potentiometer	

Digital input	
Isolated contact	
NPN open collector	
TTL open collector	
Setpoint	
Local	
Stand-by	
Keypad lock	
Outputs lock	
Start-up function	
Timer function	
Memorized	
Remote	
Setpoint programmer	

Digital input connected functions	
Auto/Manual	
Run, Hold, Reset and program selection	
PV hold	
Setpoint slopes inhibition	
Output	
SPST Relay	
Triac	
SPDT Relay	
mA	
mA mV	
Logic	