

Configurable Multi-input
with time-proportioning
output

XE Series



INSTRUCTION MANUAL

MIU.XE-6/96.12/E

COD. J30-154-1AXE- ING

ASCON spa

GENERAL INDEX

| | | |
|----|---|---------|
| 1 | IDENTIFICATION OF MODEL | page 1 |
| 2 | FUNCTION OF KEYS AND DISPLAYS | page 3 |
| 3 | DIMENSIONS, INSTALLATION | page 6 |
| 4 | ELECTRICAL WIRING | page 8 |
| 5 | Y2 - Y3 AUXILIARY OUTPUTS | page 14 |
| 6 | PASSWORDS | page 17 |
| 7 | PROGRAMMING PROCEDURE (see enclosed leaflet) CONFIGURATION PARAMETERS | |
| 8 | OPERATING DIRECTIONS (see enclosed leaflet) SET POINT AUTO-TUNE | |
| 10 | TECHNICAL DATA | page 18 |

SERIAL COMMUNICATION

(see the instruction manual "SERIAL COMMUNICATION SUPPLEMENT" MIU.-CS/E supplied separately)

1 • IDENTIFICATION OF MODEL

Thank you for choosing an **ASCON** controller

The instruments of the XE series belong to the last generation of microprocessor based controller, are universal, very powerful but simple to use.

They are fitted with AUTO-TUNE, as aid for system start-up, and serial communication for introduction into a distributed control network.

They are complete because all possible variables are always present. Configuration of the instrument permits determination of the operating mode according to the application required.

1.1 Identification of model

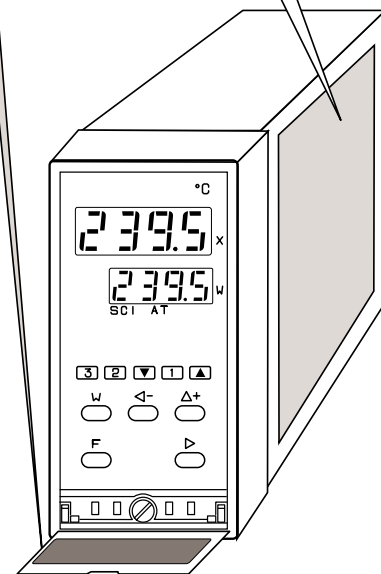
Model code

XE - ABC /

Configuration code

Beginning and end of scale

| | | |
|-------------------------------------|--------------------------------|----------|
| Power supply | | A |
| 100...240 V 50/60 Hz | | 3 |
| 16 ...28 V 50/60 Hz and 20...30 Vdc | | 5 |
| OPTIONS | Serial communication | B |
| | None | 0 |
| | 20mA C.L. Std Ascon protocol | 1 |
| | 20mA C.L. Modbus/Jbus protocol | 2 |
| | Auxiliary output Y3 | C |
| | None | 0 |
| | Fitted | 1 |



1 • IDENTIFICATION OF MODEL

1.2 Configuration code

Model code

Configuration code
DEFG-H / I L

Beginning and end of scale

| | | |
|----------|---|----------------------|
| 1st part | Input X | D |
| | Main output Y1 | E |
| | Auxiliary output Y2 | F |
| 2nd part | Auxiliary output Y3 | H |
| | Beginning and end of scale (for mA and Volt input only) | I L |

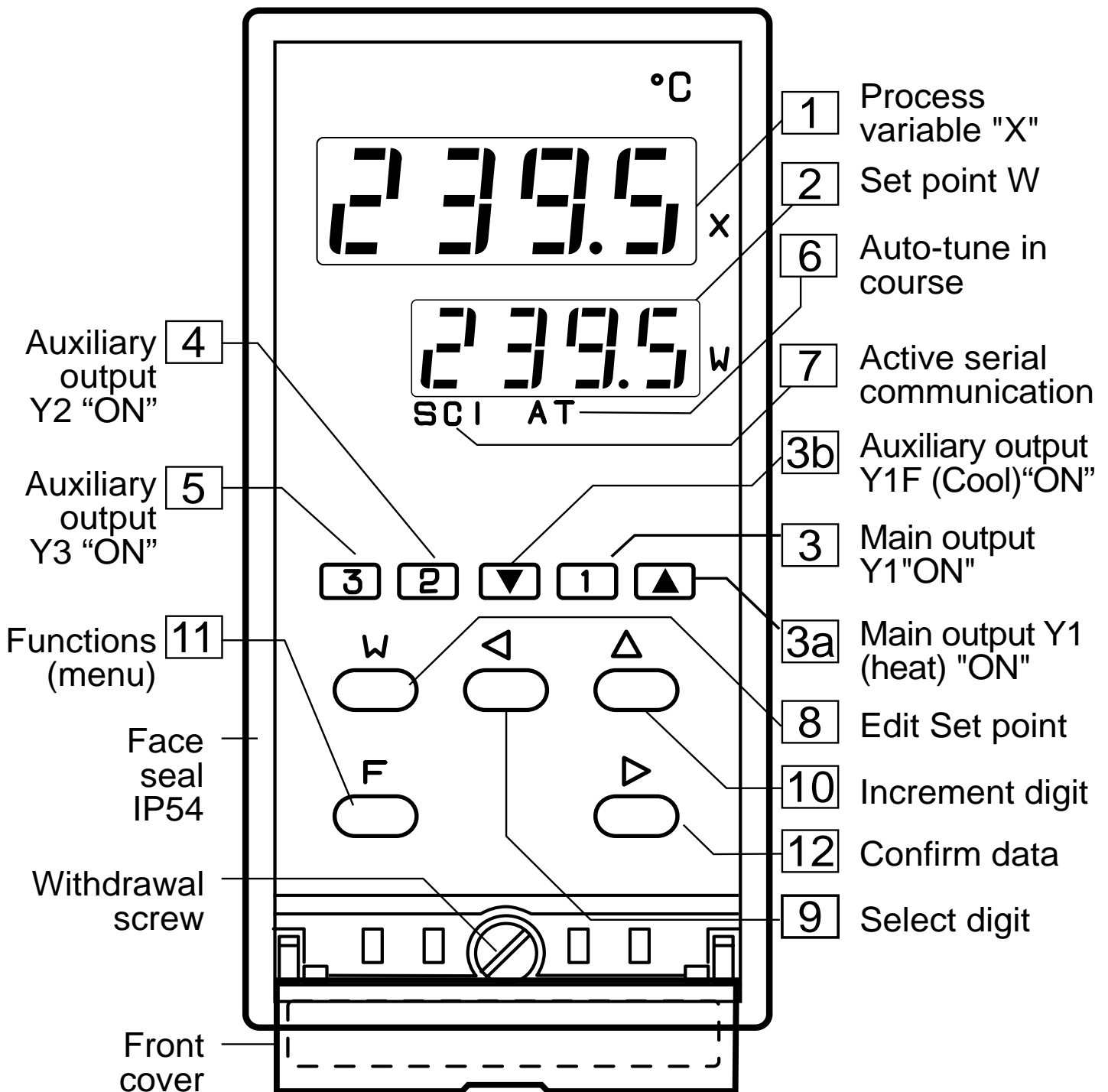
The controller is normally configured in the factory.

If this appears at the power-up

the controller IS NOT CONFIGURED

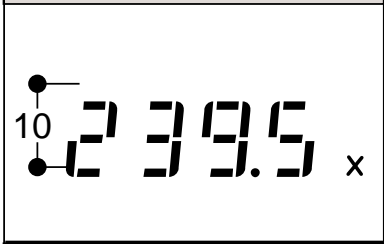


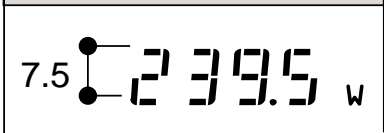
In order to configure the controller, follow the configuration procedure reported in the enclosed leaflet

2 • FUNCTION OF KEYS AND DISPLAYS








2 • FUNCTION OF KEYS AND DISPLAYS

NUMERIC INDICATORS X, W

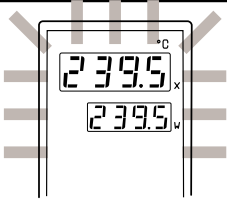
| | |
|---|---|
| <p>1 - Process Variable (X) (green)</p> | <p>The value of measure X is expressed in engineering units.</p> |
|  | <p>If above end of scale </p> <p>If below beginning of scale </p> <ul style="list-style-type: none"> • In programming: displays parameter values • In configuration: displays the values of the 1st part of the configuration code (see enclosed leaflet) |
| <p>2 - Set point W (green)</p> | <p>Displays the operating Set point value</p> |
|  | <ul style="list-style-type: none"> • In programming: displays the parameter codes • In configuration: displays the index values of the 2nd part of the configuration code (see enclosed leaflet) |

LEDS FOR OUTPUT STATE


| | | |
|--|---|---|
| <p>3 - Output Y1 (red)</p> | <p>Lit with output Y1 "ON"</p> | |
| <p></p> | <p>De-activated with continuous or dual action discontinuous output</p> | |
| <p>3a - Output Y1 (heat)</p> | <p>Lit with output Y1 (heat) "ON"</p> | <p>Only for HEAT/COOL time proportional output control</p> |
| <p></p> | | |
| <p>3b - Output Y1F (cool)</p> | <p>Lit with output Y1F (cool) "ON"</p> | |
| <p></p> | | |
| <p>4 - Output Y2 (red)</p> | <p>Lit with output Y2 "ON"</p> | |
| <p></p> | | |
| <p>5 - Output Y3 (red)</p> | <p>Lit with output Y3 "ON" (only with Y3 option)</p> | |
| <p></p> | <p>De-activated with continuous or dual action discontinuous output</p> | |

2 • FUNCTION OF KEYS AND DISPLAYS

LEDS FOR OPERATING STATE

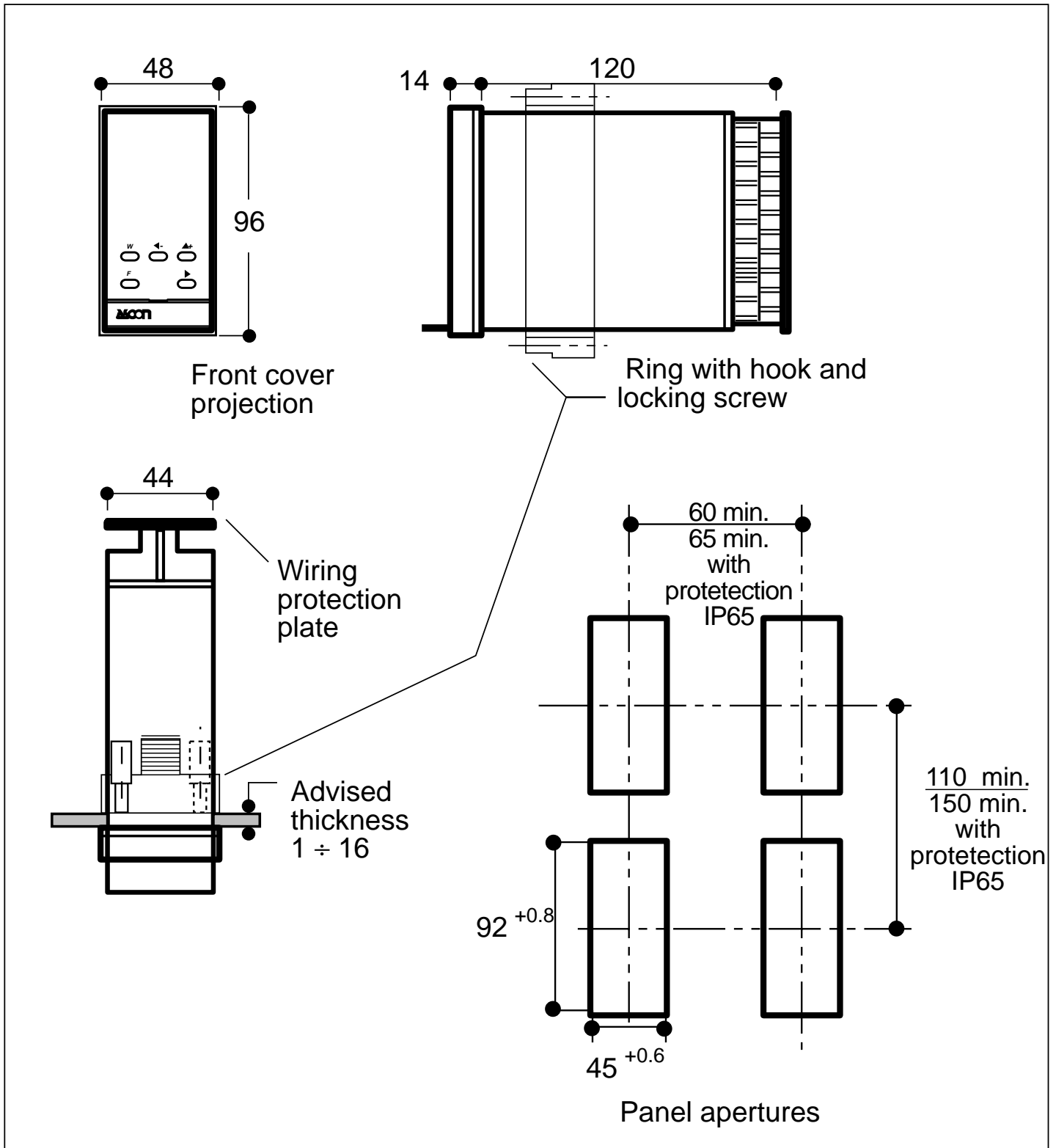
| | | |
|--------------------------|--|---|
| 6 - Auto-Tune (green) | Lit when Auto-Tune or Expert-Tune is in course | |
| <i>AT</i> | | |
| 7 - Serial comm. (green) | Permanently lit when the serial communication is enabled to write. Flashes with signal in transit | |
| <i>SCI</i> | | |
| Loop - Break - Alarm |  | With output Y2 active and configured as Loop Break Alarm, all the front displays are flashing (see p. 14) |

KEYS

| | | |
|----------------------|---|---|
| 8 - Edit Set Point | To modify Set point |  |
| 9 - Digit selection | | Selects the digit to be modified (see enclosed leaflet) |
| 10 - Increment digit | Increments the value of the flashing digit, from 0 to 9 | |
| 11 - Functions | | Permits access to menu of functions to be programmed |
| 12 - Enter | Enter or Scroll of values and modes of operation | |
| | | Keys for modifying numeric values of any data |
| | | |

3 • DIMENSIONS - INSTALLATION

3.1 - Overall dimensions (in compliance with DIN 43700)

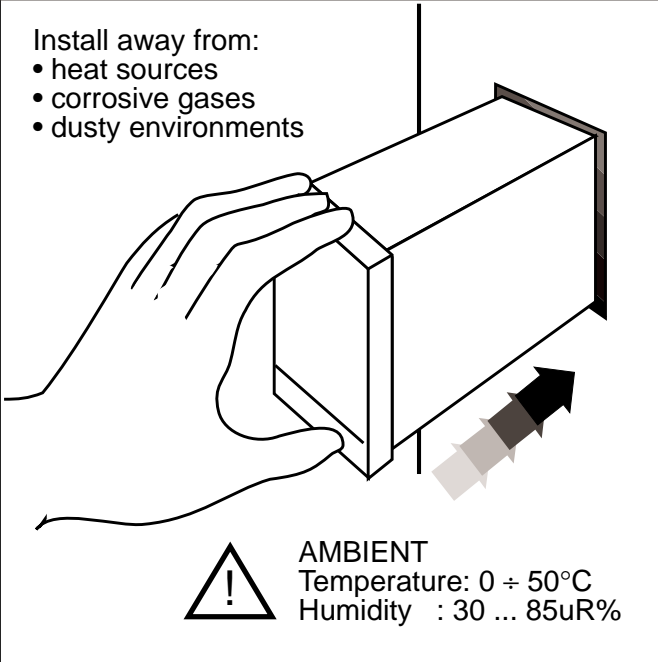


3 • DIMENSIONS - INSTALLATION

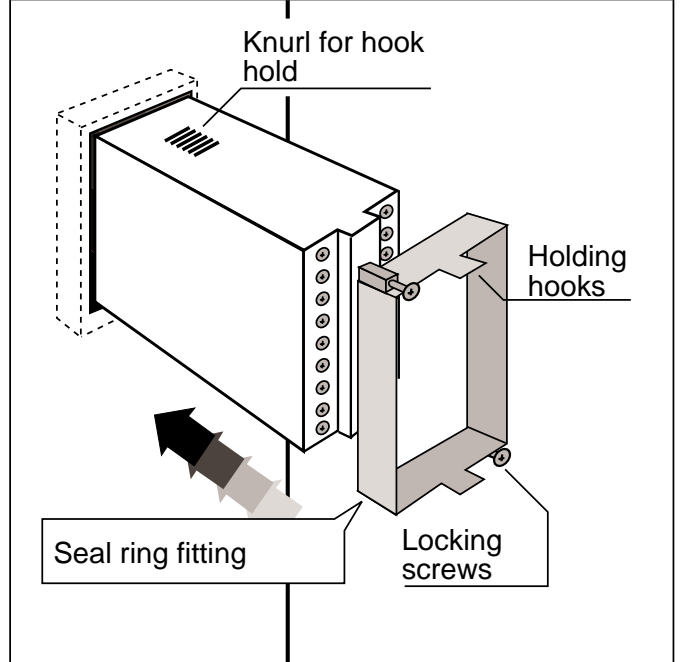
3.2 - Panel installation

A • Panel fitting

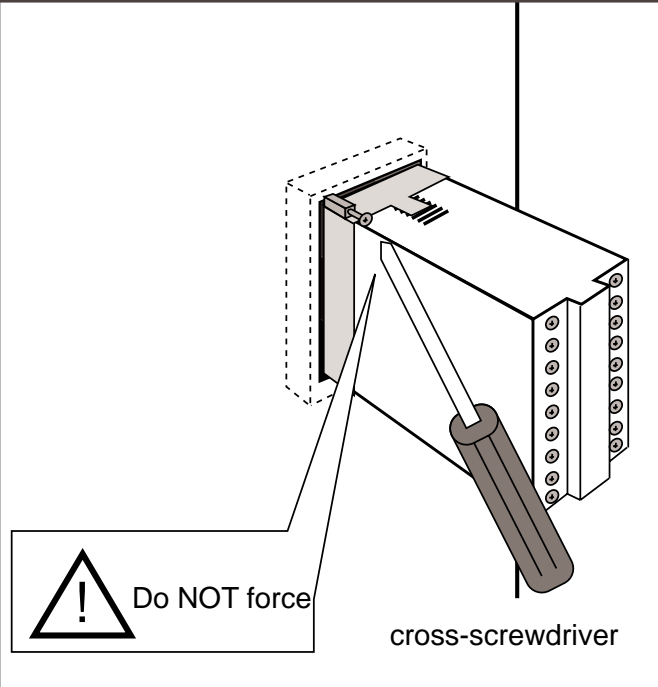
- Install away from:
- heat sources
 - corrosive gases
 - dusty environments



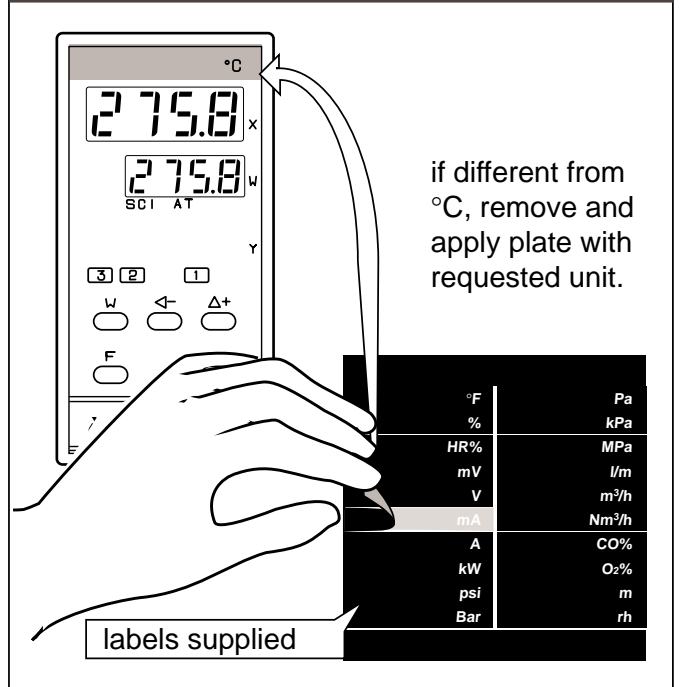
B • Fixing with ring



C • Screw locking



D • Plate for engineering units



4 • ELECTRICAL WIRING

A • Terminal board

28 screw terminals M3.5

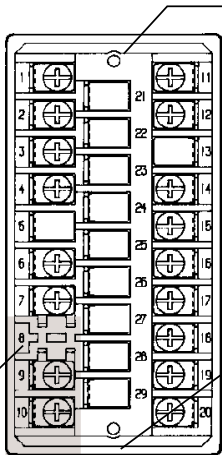
Plate pin

Wiring protection plate

Plate screw

Cold joint compensation thermometer

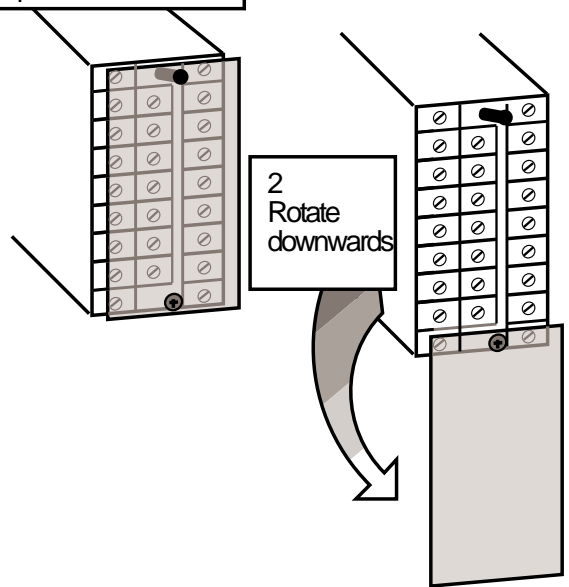
3 gilded terminals for input signals



B • Freeing the terminals

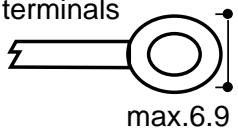
1 Lift the plate to free the pin

2 Rotate downwards

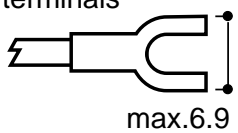


C • Effecting the connections

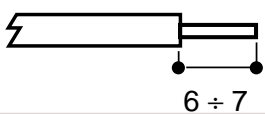
With eyelet terminals



With fork terminals



With tinned wire



Preferential

Cable section

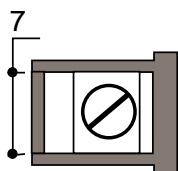
wires N°

0.25 ÷ 2.5 AWG
22 ÷ 14

2

1

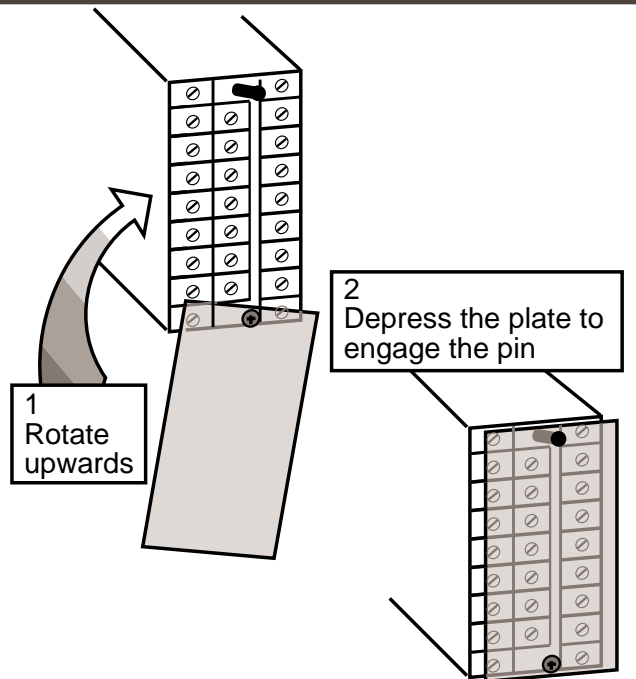
2



D • Protecting the terminal board

1 Rotate upwards

2 Depress the plate to engage the pin



4 • ELECTRICAL WIRING

Although this controller is designed to resist the heaviest disturbances present in industrial environments (level IV of standard (IEC 801-4), it is advised to keep to the following precautions:

Precautions



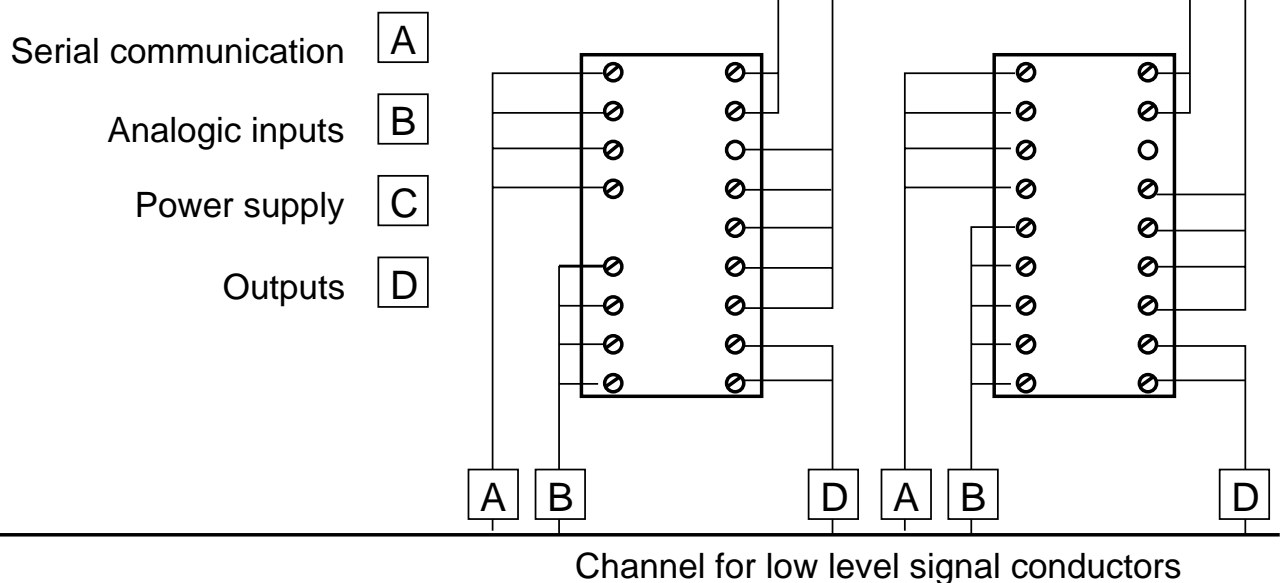
Single out supply line from power line

Keep away from teleruptors, electromagnetic contactors and powerful motors

Keep away from power groups, in particular if with phase control

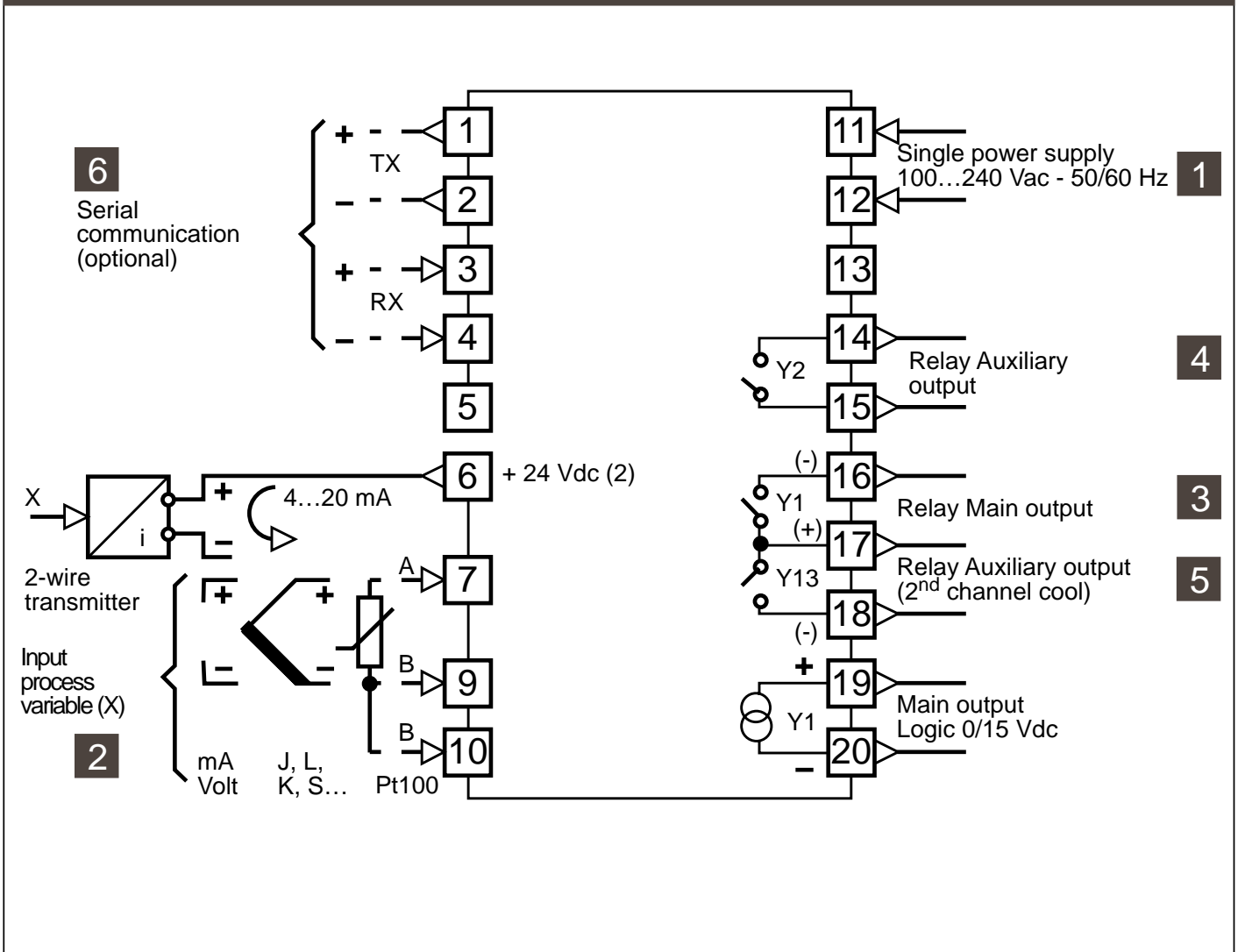
Advised conductor course

Power supply and output channels

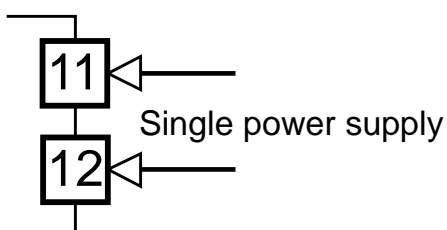


4 • ELECTRICAL WIRING

Wiring diagram



1 • Single power supply



“Switching” type

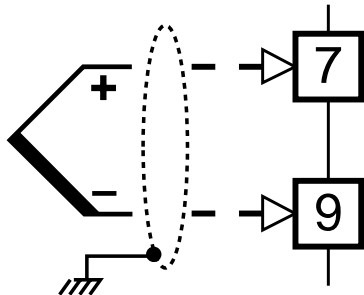
- Standard: 100 a 240Vac -15% +10%
- for low tension: 24Vac -15% +10%
- 24Vdc ±15%

Absorbed power 4VA

4 • ELECTRICAL WIRING

2 • Process Variable (X)

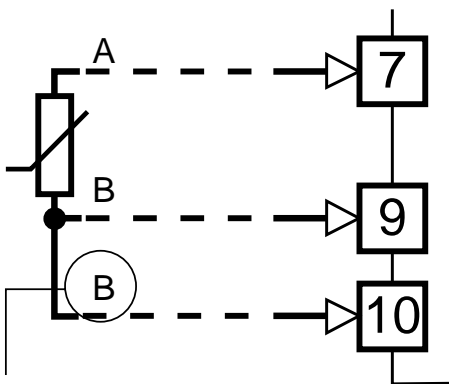
A - For thermocouples J-L-K-S-R



Line: max. 150 Ω

- Respect polarities
- For eventual extensions, use a compensated cable suitable for the type of thermocouple used
- The eventual shield must be well earthed at only one end

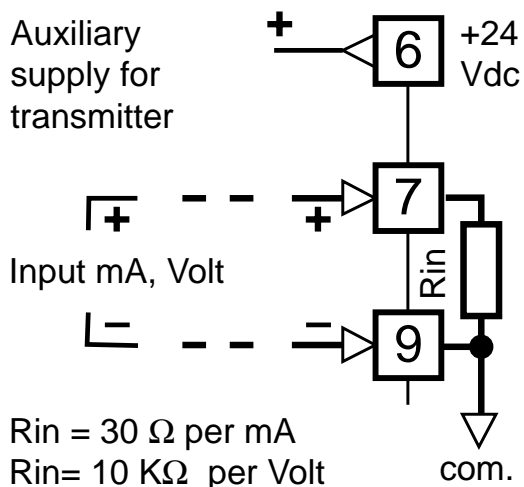
B - For RTD Pt100



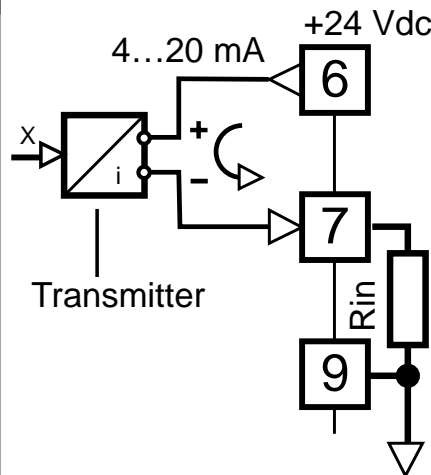
for 3-wire connection only
Line: max. 20 Ω per wire

- For 3-wire connection, use cables of same section (min. 1 sq.mm)
 - For 2-wire connection, use cables of adequate section (min. 1.5 sq.mm.)
- Note:
with a 15 m. probe to controller distance and a 1.5 sq.mm. section cable, the error is about 1°C.

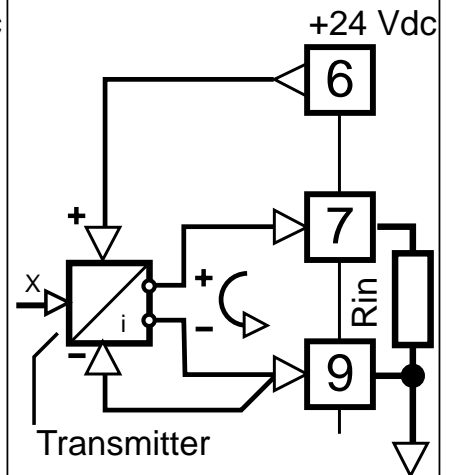
C • Continuous, mA, Volt



For 2-wire transmitter



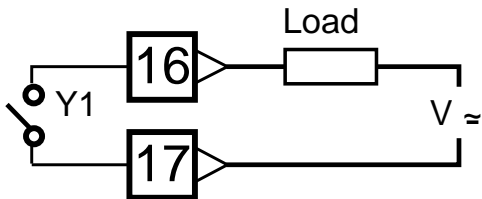
For 3 or 4-wire transmitter



4 • ELECTRICAL WIRING

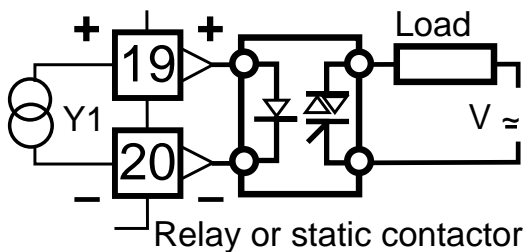
3 • Main output Y1

A • Relay Single Action



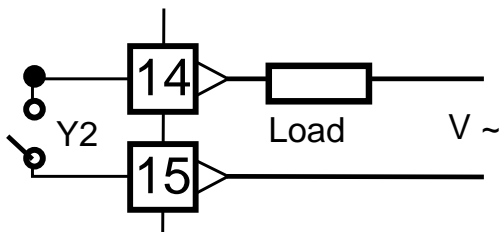
NO contact, capacity 3A/250Vac Load for resistive loads (transition 2×10^5 min. at 3A/250Vac)

B • Logic Single Action



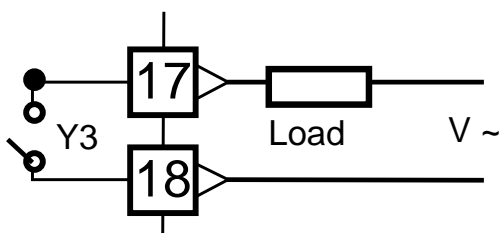
Output 0/15Vdc (20mA max.) galvanically isolated

4 • Auxiliary output Y2 (see pag.14)



NO contact, capacity 3A/250Vac Load for resistive loads (transition 2×10^5 min. at 3A/250Vac)

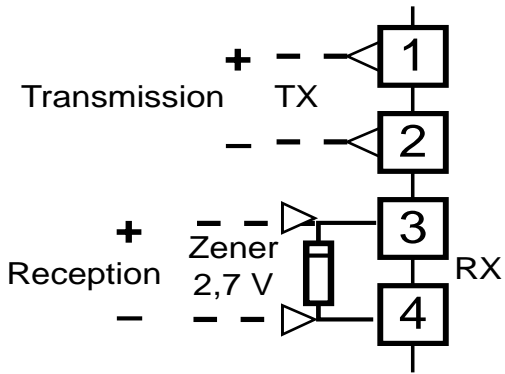
5 • Auxiliary output Y3 (option)



NO contact, capacity 3A/250Vac Load for resistive loads (transition 2×10^5 min. at 3A/250Vac)

4 • ELECTRICAL WIRING

6 • Serial communication (option)



Note
Zener 2,7 V Only for 20mA C.L.

Interface 20mA C.L. passive and galvanically isolated

Consult Directions for use “SERIAL COMMUNICATION SUPPLEMENT MIU.-CS/E” supplied separately.

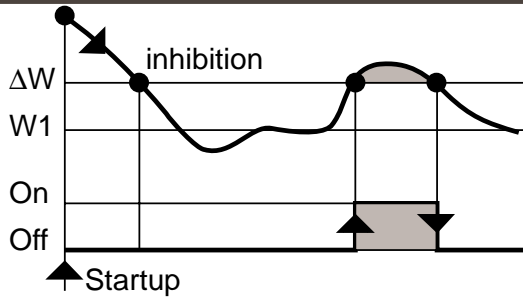
5 • Y2 - Y3 AUXILIARY OUTPUTS

| Deviation | | | |
|---|---|--|--|
| <p>The diagram shows two horizontal bars representing output ranges. The top bar is labeled 'On' and 'Off' with a circled 'X' at the right end. It has a setpoint 'W 1' and a range from '-300 units' to '+300 units'. The bottom bar is labeled 'On' and 'Off' with a circled 'X' at the left end. It has a setpoint 'H' and a range from '-300 units' to '+300 units'. A horizontal double-headed arrow between the two bars is labeled 'ΔW'.</p> | <p>Active high (above)</p> <p>Active low (under)</p> | <p>Set point ΔW (1) -0...300 units compared to W1</p> | |
| Band | <p>The diagram shows two horizontal bars. The top bar is labeled 'On' and 'Off' with a circled 'X' at the right end. It has a setpoint 'W 1' and a range from '-300 units' to '+300 units'. The bottom bar is labeled 'On' and 'Off' with a circled 'X' at the left end. It has a setpoint 'H' and a range from '-300 units' to '+300 units'. A horizontal double-headed arrow between the two bars is labeled 'IΔWI'.</p> | <p>Active Out (above)</p> <p>Active In (under)</p> | <p>Set point $I\Delta WI$ (1) -0...300 units compared to W1</p> |
| Independent | <p>The diagram shows two horizontal bars. The top bar is labeled 'On' and 'Off' with a circled 'X' at the right end. It has a setpoint 'W 1' and a range from 'Beginning of scale' to 'End of scale'. The bottom bar is labeled 'On' and 'Off' with a circled 'X' at the left end. It has a setpoint 'H' and a range from 'Beginning of scale' to 'End of scale'. A horizontal double-headed arrow between the two bars is labeled 'W'.</p> | <p>Active high (above)</p> <p>Active low (under)</p> | <p>Set point (1): from beginning to end of scale</p> |

(1)- The Set point of Y2 and Y3 is not limited by the limits of the main Set point W1, but only by the scale span.

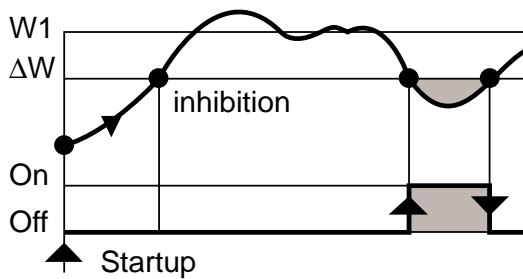
5 • Y2 - Y3 AUXILIARY OUTPUTS

Deviation with startup inhibition



Active high
(above)

Set point ΔW (1)
-300...+300 units
compared to W1



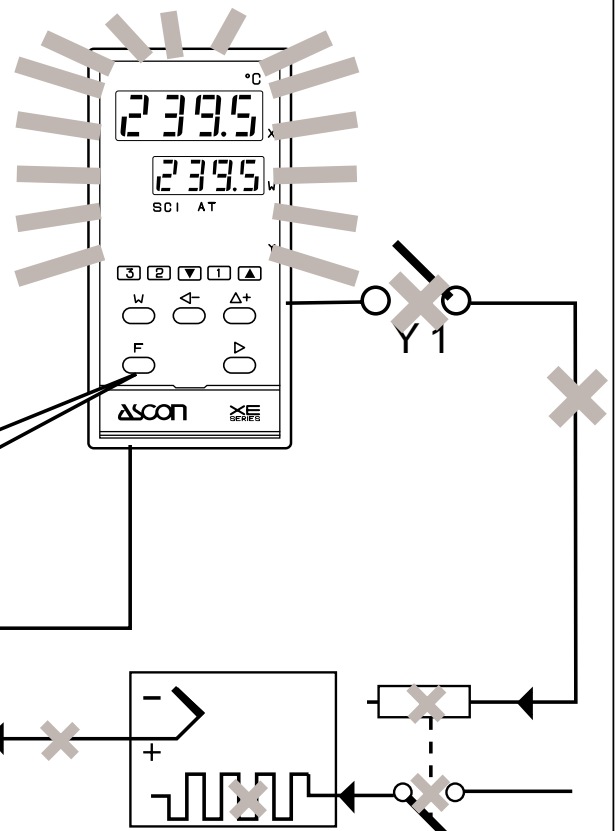
Active low
(below)

“Loop-Break-Alarm” LBA (control loop defect/interruption)

Any interruption in the connections or any anomaly in the operation of one of the control loop components, will cause the output Y2 to be energized after a few minutes and the whole front display will be flashing.

The alarm state will stop when the anomaly causing it stops or

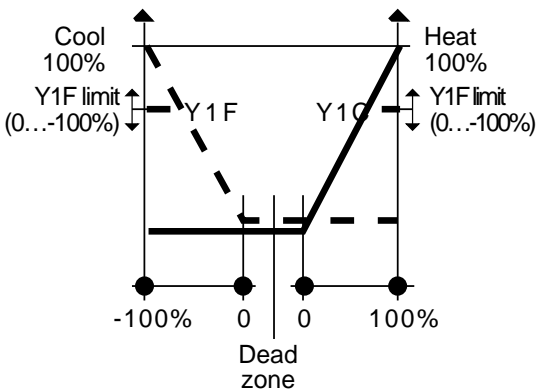
depressing any key for silencing it.



**With ON-OFF
action "LBA"
feature is not available**

5 • Y2 - Y3 AUXILIARY OUTPUTS

Double time programmable intervention (Heat - Cool) (Y3)



Where is Y1F → Y3 = Cool outputs

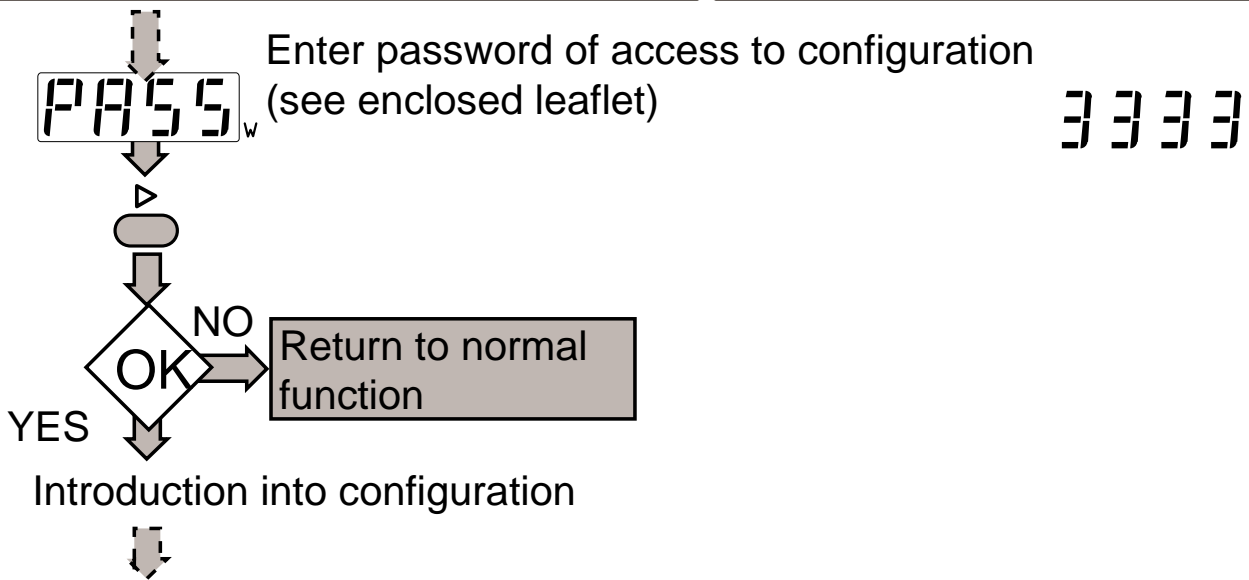
Where is Y1C → Y1 = Heat outputs

Only for models with option Y3 is possible to have a double action regulation (for instance Heat - Cool). Output Y3 with index H=9, is available as cool output. Proportional band, cycle time, and maximum output are settable separately for Heat and Cool.

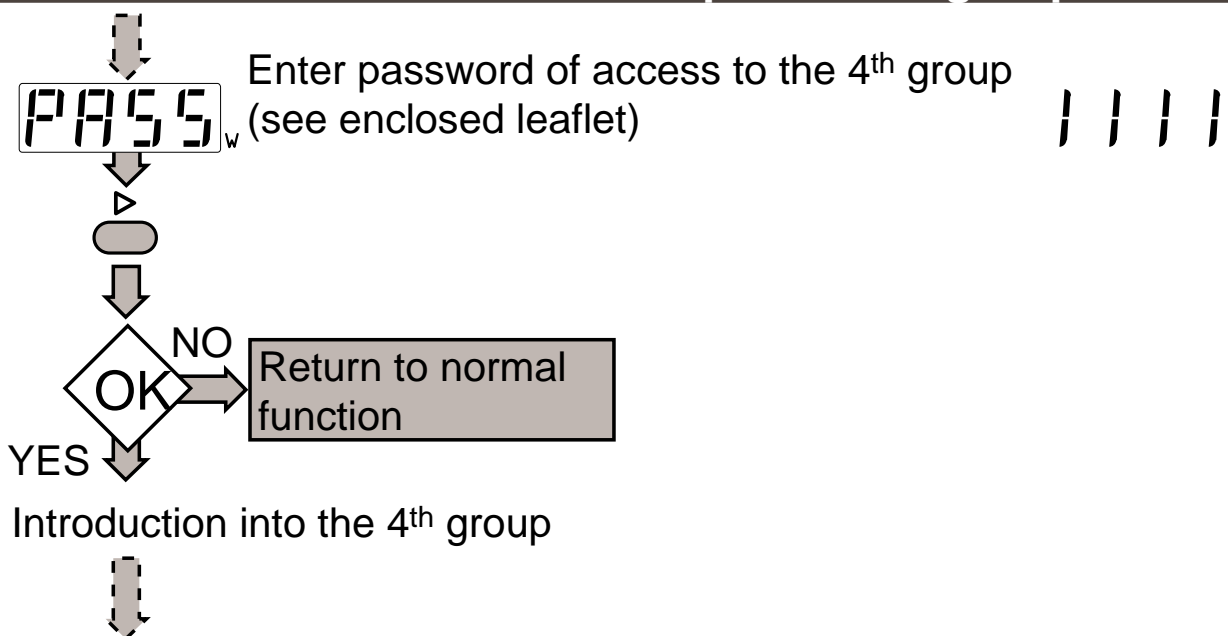
6 • PASSWORDS

In order to prevent tampering or inadvertent alterations of the configuration or of some important parameters at the programming stage, 2 passwords have to be entered.

6.1 Password of access to configuration 3333



6.2 Password of access to the 4th parameter group 1111



10 • TECHNICAL DATA

| | | | |
|---|---|---|-------------------------------|
| Accuracy (a25°C amb.) | 0.2% ± 1 digit (for input with RTD Pt100 and thermocouples) | | |
| | 0.1% ± 1 digit (for input in current and voltage) | | |
| Process Variable "X" (configurable) | RTD Pt100 | Pt100 (IEC 751) | |
| | Thermocouples | J-K-S-R (IEC 584), L (DIN 43710) | |
| | Direct current | 4..20mA, 0..20mA, Ri 30Ω | With configurable scale field |
| | Direct voltage | 0..1Vdc, 0..10Vdc, Ri 10KΩ | |
| Set point | 1 Local | | |
| | Distinct ascent and descent gradient slope | 0.1...120.0% scale/min. or step gradient | |
| | Higher and lower limit | from beginning to end of scale | |
| Control mode | Algorithm | PID, PI, PD, P or On - Off | |
| | Proportional band (P) | 0,5..1000% | |
| | Integral action time (I) | 0.1..100min., excludable | |
| | Derivative action time (D) | 0.01..10min., excludable | |
| | Cycling time | 1..200 sec. | |
| | Hysteresis | 0.1..10% (for on-off control) | |
| | Dead zone | 0..10% for dual action (heat-cool) control | |
| Auto - Tune | For automatic parameter adjustment (One shot) | | |
| Main output Y1 | Discontinuous with direct or reverse action | | |
| | Relay with dual action | 2 contacts NO, 3A/250Vac, 2x10 ⁵ transitions | |
| | Logic | 0.15 Vdc, 20mA max. (for static relays) | galvanically isolated |
| | Maximum output | 10..100% (1st channel \triangle) -10.. -100% (2nd channel ∇) | |

10 • TECHNICAL DATA

| | | | | |
|---|---|---|---|--|
| Auxiliary outputs Y2 - Y3 (configurable) | Relay | 2 contacts NO, 3A/250Vac, 2x10 ⁵ transitions | | |
| | Action mode | active high (above the set point) active low (below the set point) | | |
| | Hysteresis | 0,1..10% | | |
| | Type of Set point | deviation | ± 300 digit (with or without inhibited startup) | |
| | | band | 0..300 digit | |
| | | independent | from beginning to end of scale | |
| Special functions | Loop-Break-Alarm (signal of control loop defect) | | | |
| | Double action regulation "Heat - Cool" (only with Y3 option) | | | |
| Serial communication (option) | Interface 20mA C.L. passive and galvanically isolated For other data, see manual MIU.-CS/E | | | |
| Protections | Access to parameters | On three levels for: modification, indication only, no access | | |
| | Immunity to disturbances | level IV, standard IEC 801-4 | | |
| | All significant data are stored in a non-volatile memory | | | |
| Single power supply | Standard model | 100..240V, 48..63Hz, -15% + 10% | | |
| | Low voltage model | 24V, 48..63Hz, -15% + 10% or 24Vdc ± 15% | | |
| | Absorbed power | about 4VA | | |
| Auxiliary power supply | 24Vdc ± 10%, 20mA max. for 2-wire or 3 or 4-wire transmitter | | | |
| General features | Isolation group | C according to VDE 0110 | | |
| | Climatic group | KWF according to DIN 40040 | | |
| | Ambient temperature | 0...50°C., humidity 35...85HR% | | |
| | Protection | Front:IP54 standard (IP65 with Kit AXIP65- 1) Cover: IP30, terminal board IP20 | | |
| | Material | Self-extinguishing UL94V1 | | |
| | Weight | about 350 g. | | |
| | Dimensions | 48 x 96, depth 120mm, according to DIN 43700 | | |

GUARANTEE

The equipment is guaranteed free from manufacturing defects for 1 year after installation, for a maximum of 18 months after delivery.

Faults caused by use other than that described in these operating instructions are excluded from the guarantee.

ASCON spa

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Fax (0039 - 2) 3504243 - Telex 322451 ASCON I