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

Thank you for choosing an **ASCON** controller

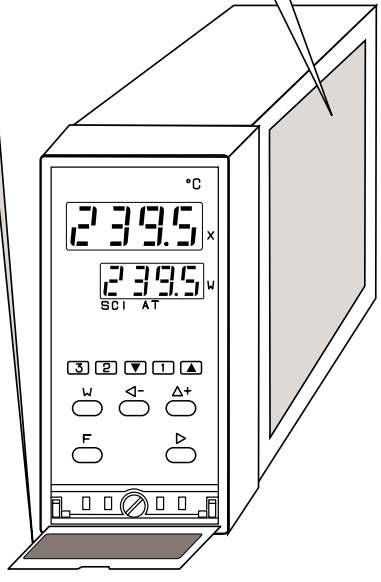
The instruments of the XE series belong to the last generation of microprocessor based controller, are universal, very powerful but simple to use.
They are fitted with AUTO-TUNE, as aid for system start-up, and serial communication for introduction into a distributed control network.
They are complete 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 -A B C /

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

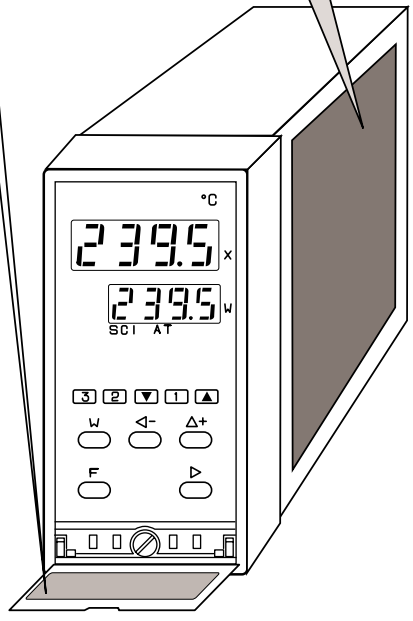
Model code

Configuration code

D E F G – H /

Beginning and end of scale

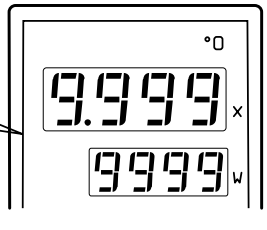
I L



1st part	Input X	D
	Main output Y1	E
		F
	Auxiliary output Y2	G
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.

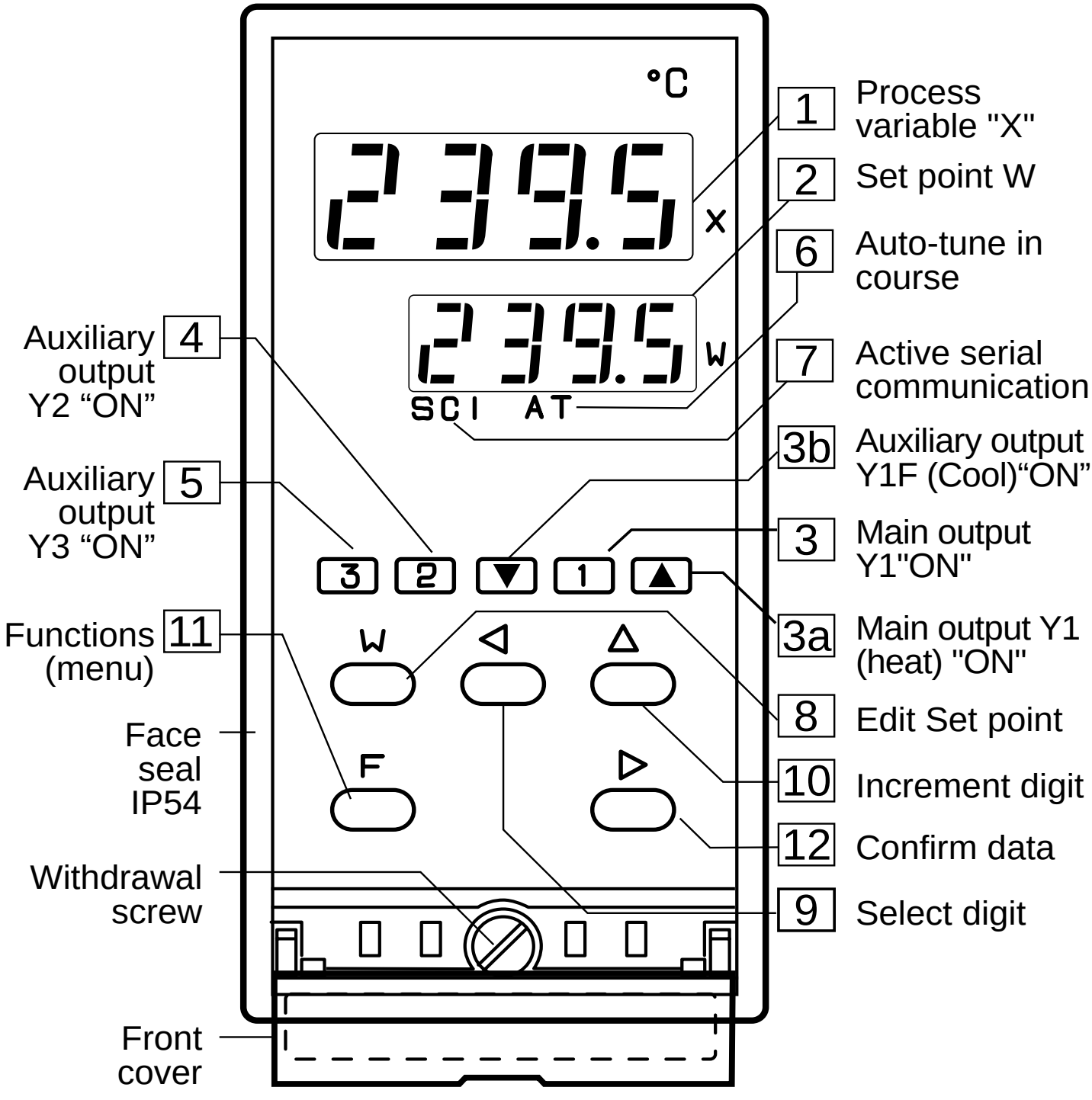
If this appears at the power-up



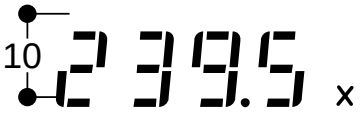
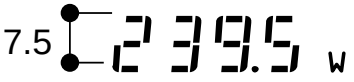
the controller **IS NOT CONFIGURED**

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

2 • FUNCTION OF KEYS AND DISPLAYS

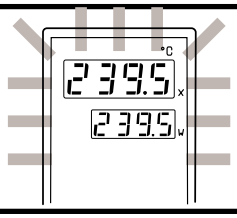


2 • FUNCTION OF KEYS AND DISPLAYS

NUMERIC INDICATORS X, W	
1 -Process Variable (X) (green) 	The value of measure X is expressed in engineering units. If above end of scale 8888 If below beginning of scale 8888 • In programmation: displays parameter values • In configuration: displays the values of the 1st part of the configuration code (see enclosed leaflet)
2 - Set point W (green) 	Displays the operating Set point value • In programmation: 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		
3 - Output Y1 (red) 1	Lit with output Y1 “ON” De-activated with continuous or dual action discontinuous output	
3a - Output Y1 (heat) ▲	Lit with output Y1 (heat) “ON”	**Only for HEAT/COOL time proportional output control**
3b - Output Y1F (cool) ▼	Lit with output Y1F (cool) “ON”	
4 - Output Y2 (red) 2	Lit with output Y2 “ON”	
5 - Output Y3 (red) 3	Lit with output Y3 “ON” (only with Y3 option) De-activated with continuous or dual action discontinuous output	

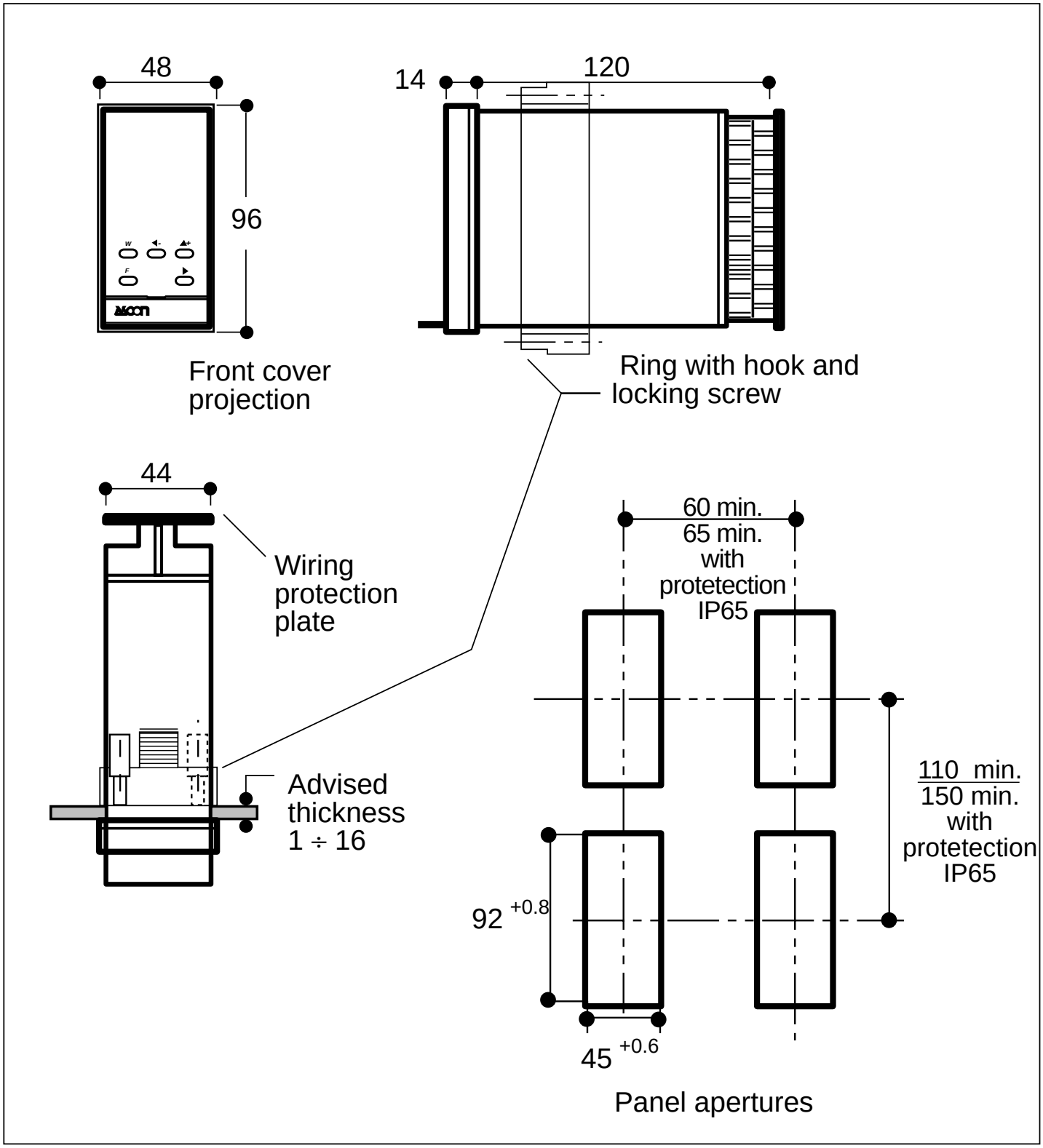
2 • FUNCTION OF KEYS AND DISPLAYS

LEDS FOR OPERATING STATE	
6 - Auto-Tune (green) ***AT***	Lit when Auto-Tune or Expert-Tune is in course
7 - Serial comm. (green) ***SCI***	Permanently lit when the serial communication is enabled to write. Flashes with signal in transit
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 W	To modify Set point	
9 - Digit selection ◁	Selects the digit to be modified (see enclosed leaflet)	**Keys for modifying numeric values of any data**
10 - Increment digit △	Increments the value of the flashing digit, from 0 to 9	
11 - Functions F	Permits access to menu of functions to be programmed	**Keys for data programming and pressing**
12 - Enter ▷	Enter or Scroll of values and modes of operation	

3 • DIMENSIONS - INSTALLATION

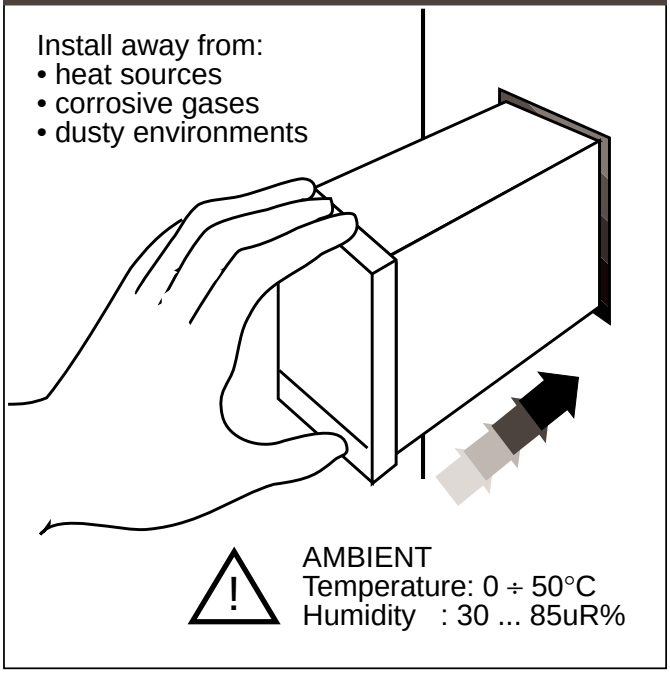
3.1 - Overall dimensions (in compliance with DIN 43700)



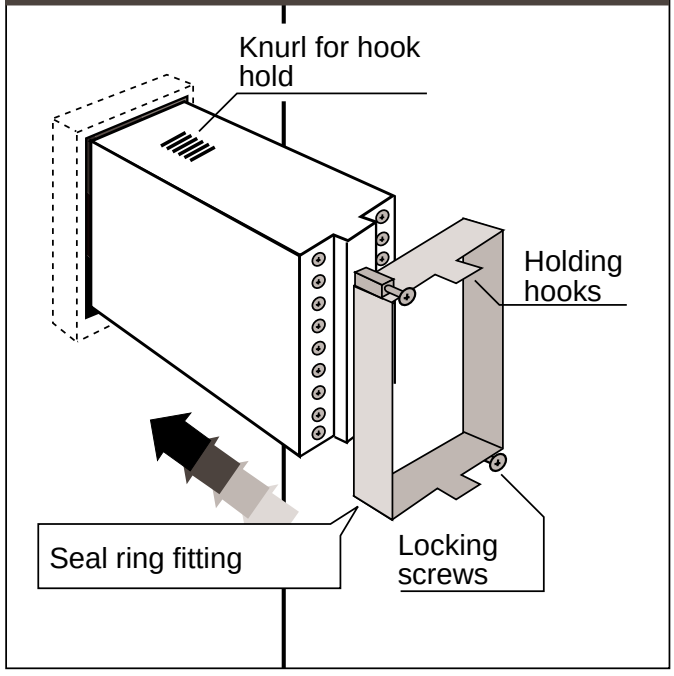
3 • DIMENSIONS - INSTALLATION

3.2 - Panel installation

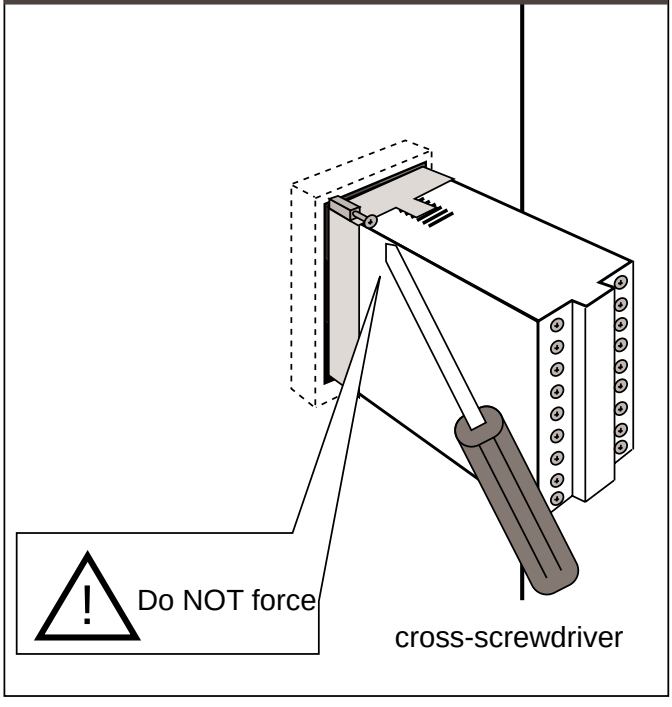
A • Panel fitting



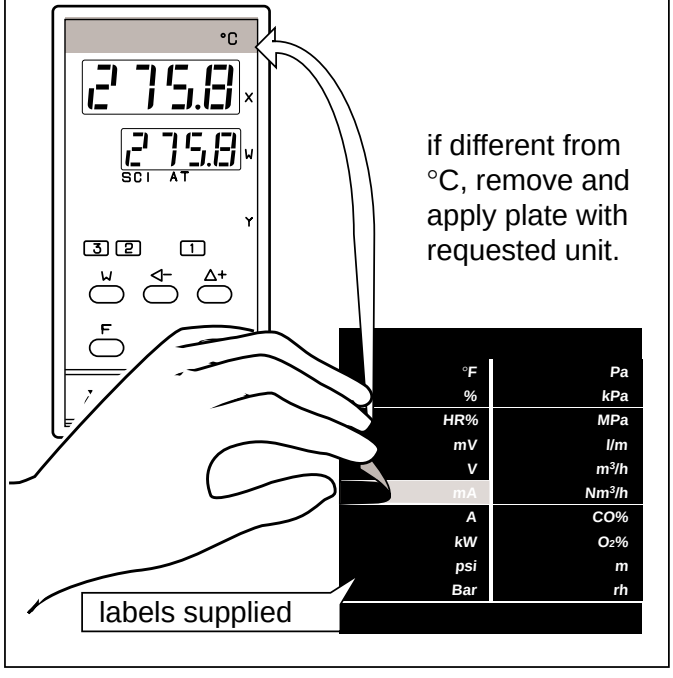
B • Fixing with ring



C • Screw locking



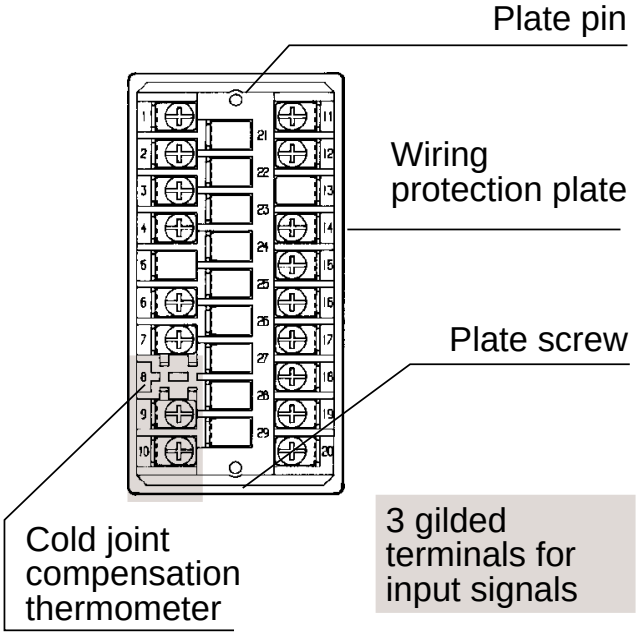
D • Plate for engineering units



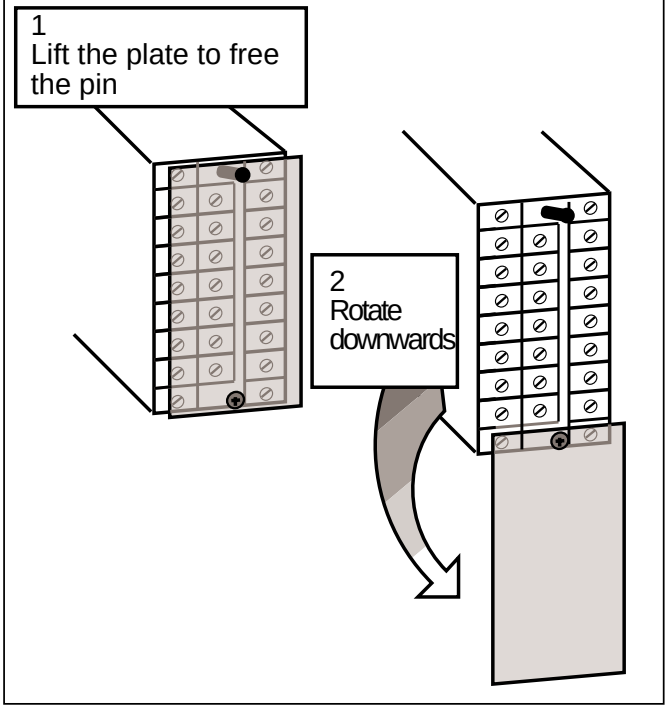
4 • ELECTRICAL WIRING

A • Terminal board

28 screw terminals M3.5



B • Freeing the terminals



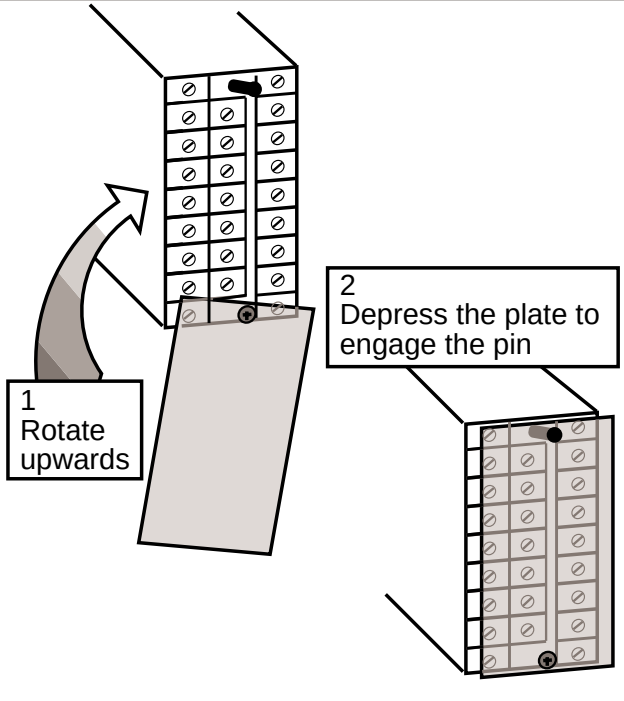
C • Effecting the connections

	Cable section	wires N°
With eyelet terminals max.6.9	0.25 ÷ 2.5 AWG 22 ÷ 14	2
With fork terminals max.6.9		1
With tinned wire 6 ÷ 7		2

7

Preferential

D • Protecting the terminal board



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:

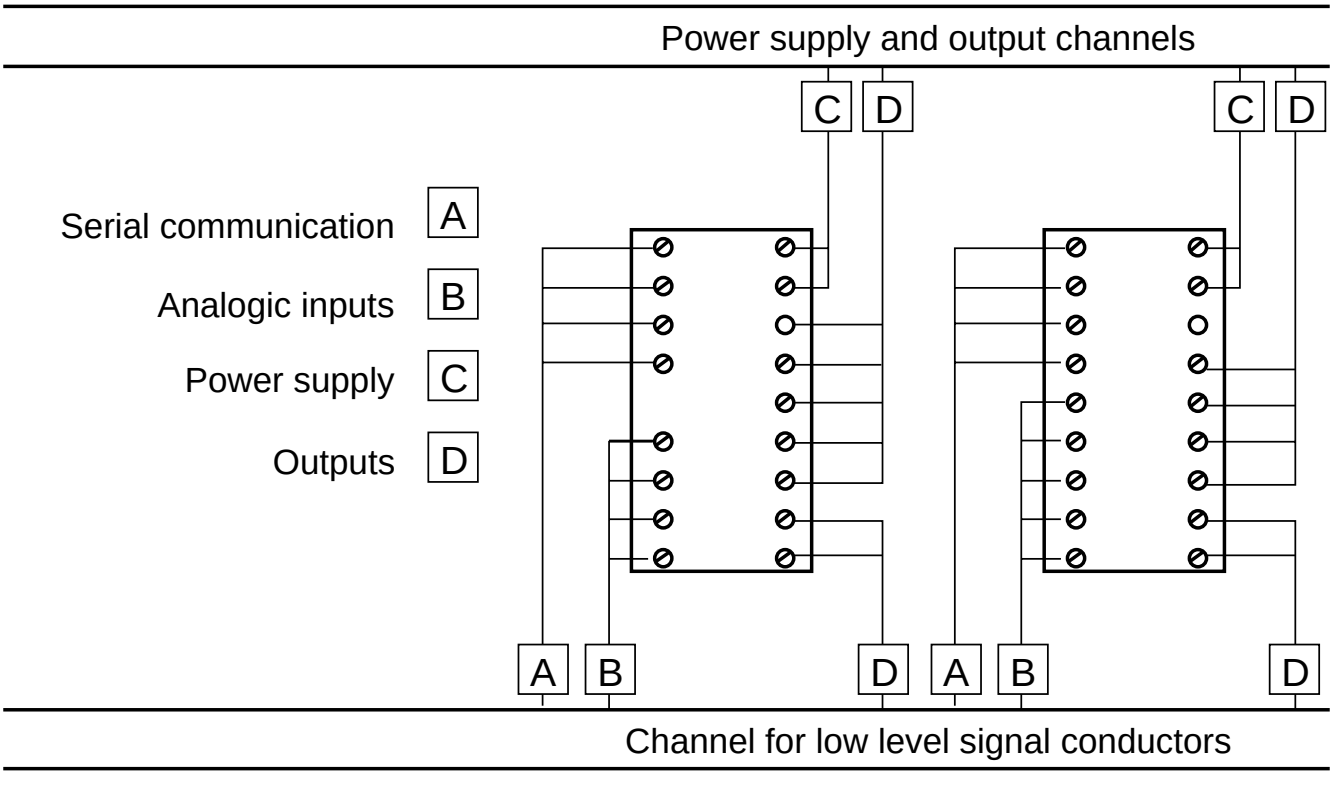
Precautions

Single out supply line from power line

Keep away from teleruptors, electromagnetic contactors and powerful motors

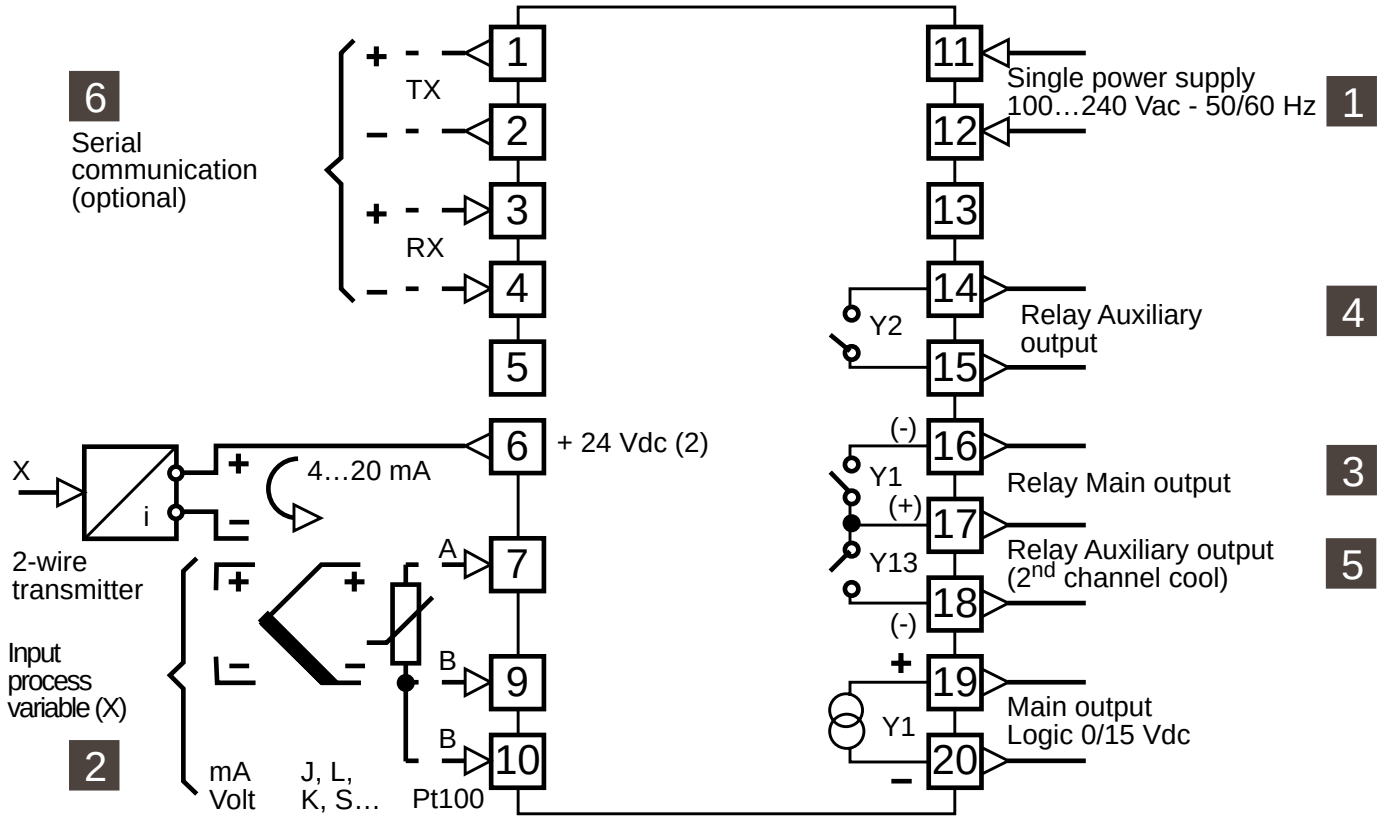
Keep away from power groups, in particular if with phase control

Advised conductor course

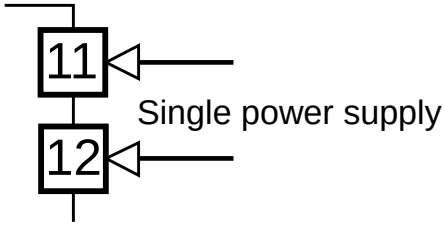


4 • ELECTRICAL WIRING

Wiring diagram



1 • Single power supply



"Switching" type

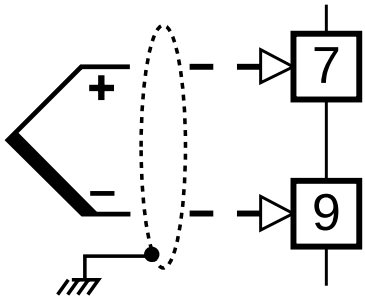
- Standard: 100 a 240Vac -15% +10%
- for low tension: 24Vac -15% +10%
  24Vdc ±15%

Absorbed power 4VA

4 • ELECTRICAL WIRING

2 • Process Variable (X)

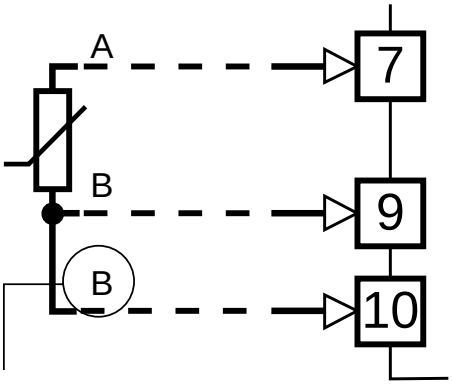
A - For thermocouples J-L-K-S-R



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

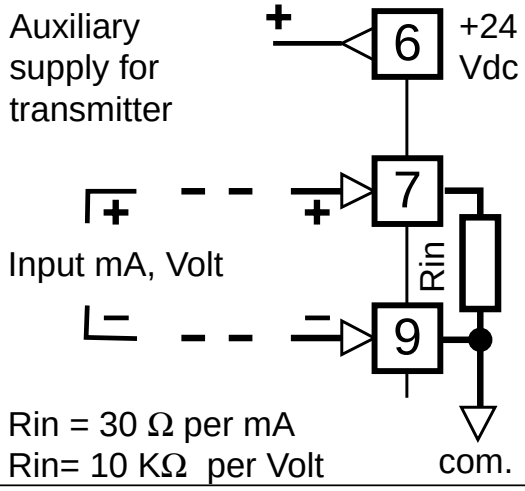


for 3-wire connection only
Line: max. 20 Ω per wire

- 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.)

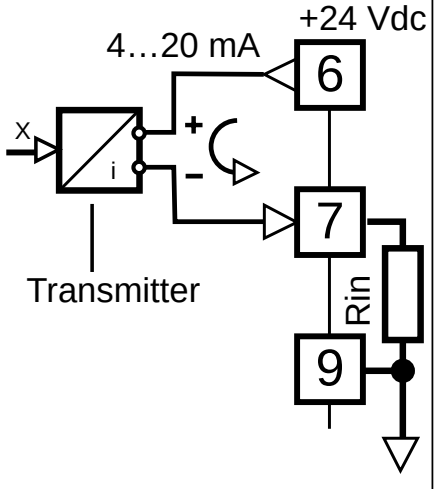
Note:
with a 15 m. probe to controller distance and a 1.5 sq.mm. section cable, the error is about 1°C.

C • Continuous, mA, Volt

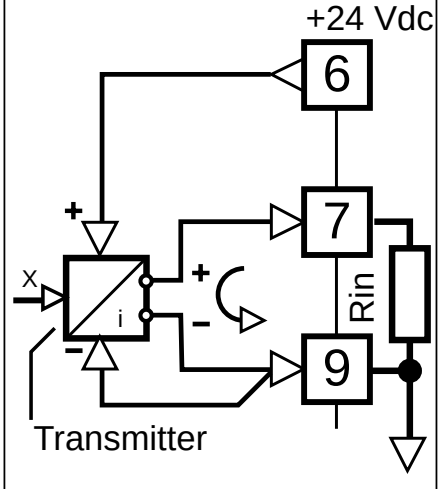


Rin = 30 Ω per mA
Rin= 10 KΩ per Volt

For 2-wire transmitter



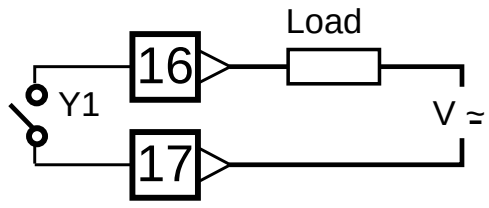
For 3 or 4-wire transmitter



4 • ELECTRICAL WIRING

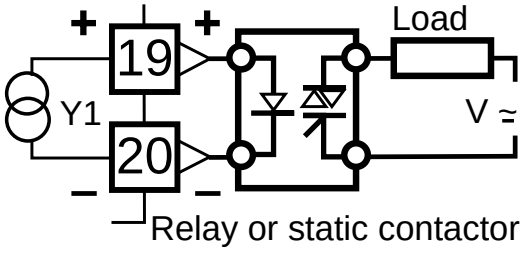
3 • Main output Y1

A • Relay Single Action



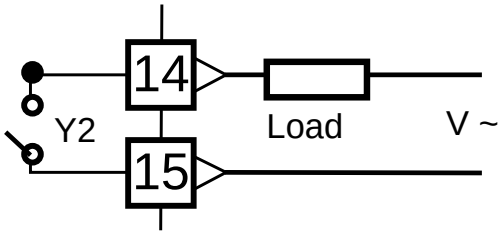
NO contact, capacity 3A/250Vac Load for resistive loads (transition 2 x 10^5 min. at 3A/250Vac)

B • Logic Single Action



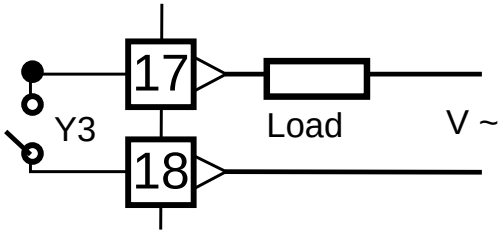
Output 0/15Vdc
(20mA max.)
galvanically isolated

4 • Auxiliary output Y2 (see pag.14)



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

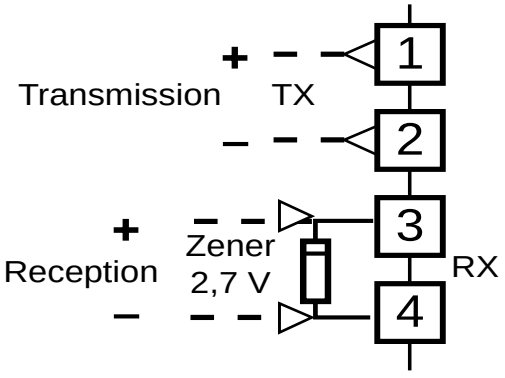
5 • Auxiliary output Y3 (option)



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

4 • ELECTRICAL WIRING

6 • Serial communication (option)

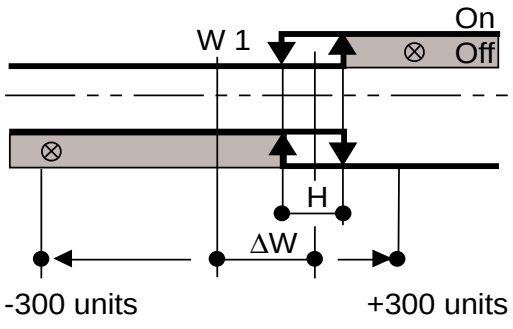
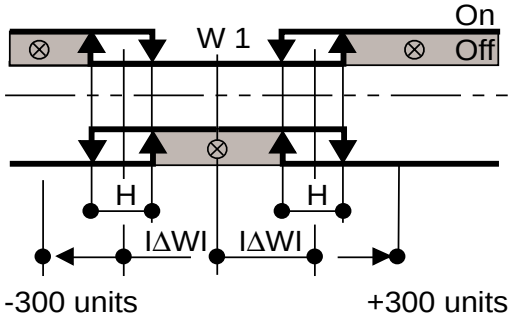
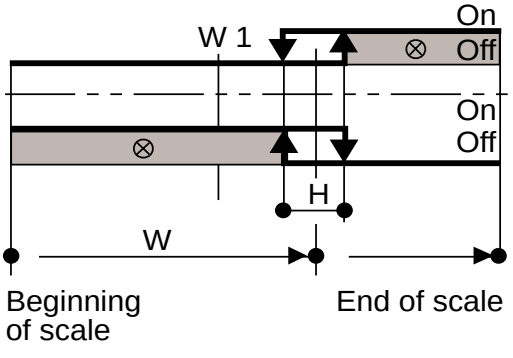


Note
Zener 2,7 V Only for 20mA C.L.

Interface 20mA C.L. passive and galvanically isolated

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

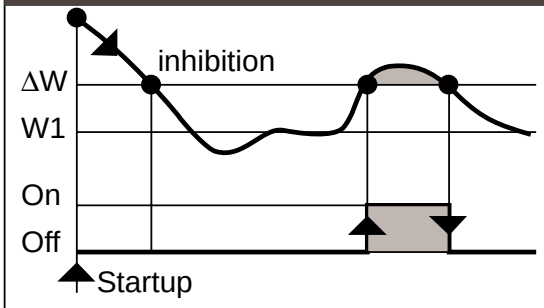
5 • Y2 - Y3 AUXILIARY OUTPUTS

Deviation  	Active high (above) Active low (under)	Set point ΔW (1) -0...300 units compared to W1
Band  	Active Out (above) Active In (under)	Set point IΔWI (1) -0...300 units compared to W1
Independent  	Active high (above) Active low (under)	Set point (1): from beginning to end of scale

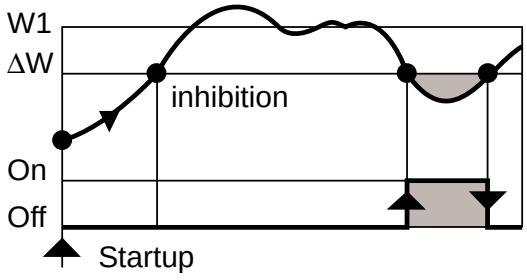
(1)- The Set point of Y2 and Y3 is not limited by the limits of the main Set point W1, but only by the scale span.

5 • Y2 - Y3 AUXILIARY OUTPUTS

Deviation with startup inhibition



Active high (above)



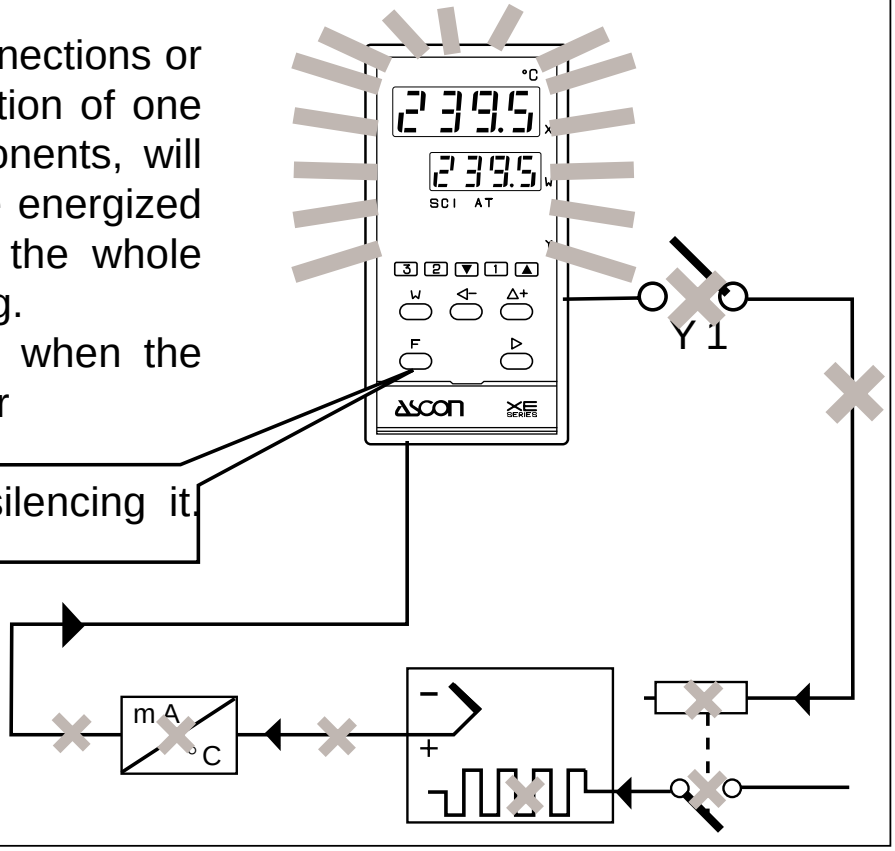
Active low (below)

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

"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

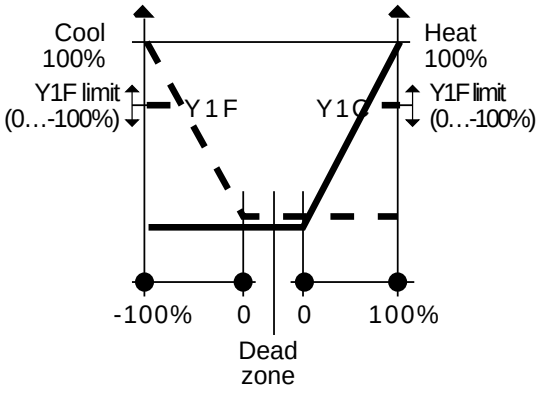
depressing any key for silencing it.



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

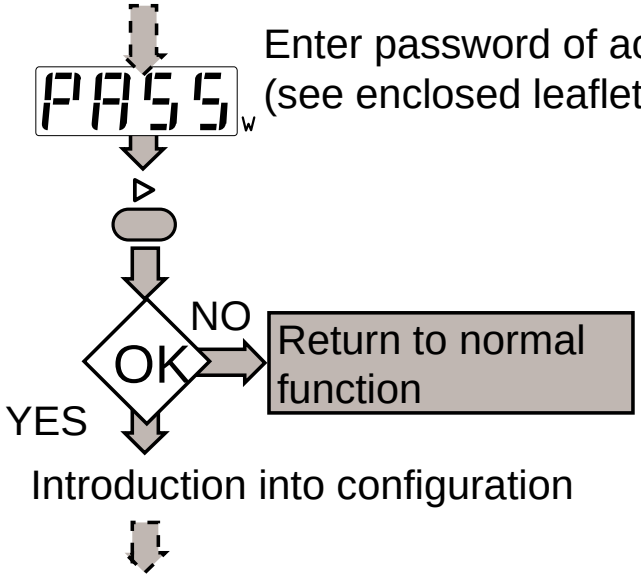
Where is Y1C →Y1 = Heat outputs

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.

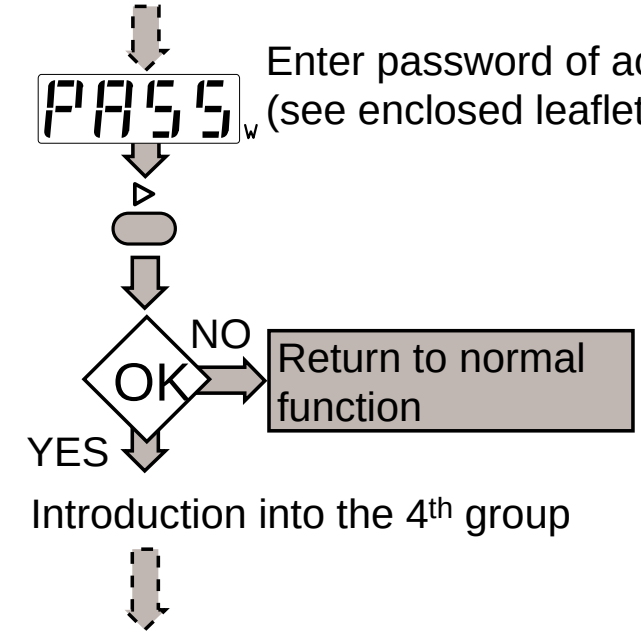
6 • PASSWORDS

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 △) -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.

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