

## MIC48 With RS 485 link Part number 89422412



- Heating and / or cooling function
- 2 independent alarms
- Load break detection
- 2 setpoint which can be selected remotely
- Manual / automatic power adjustment
- RS 485 / MODBUS-JBUS serial communication option

### Part numbers

Type	Output	Supply voltage
89 422 412 With RS 485 link	Logic	24 V ACDC

### Specifications

#### General characteristics

Supply	100 to 240 VAC, 24 VACDC
Frequency (Hz)	50 / 60
Tolerance	-15 % +10 % Un
Consumption	8 VA max.
Display measurement	red LEDs-4 digits, 7 segment, height 10 mm
Display setpoint	green LEDs-4 digits, 7 segment, height 7,5 mm

#### Control characteristics

Control algorithm	PID with auto-tune and adaptive tune : SMART
Control type	heat or cool heat / cool
Sampling time linear input	250 ms
Sampling time TC and RTD input	500 ms
Proportional band Pb heat or cool	1,0 to 100 % of scale amplitude
Proportional band Pb heat - cool	1,5 to 100 % of scale amplitude
Proportional band Pb Note : if Pb = 0 % discrete action	▪
Hysteresis (during discrete action)	0,1 to 10 % of scale amplitude
Integral time ti Note : if ti > 20 min	20 s to 20 min integral action is inactive
Derivative time td. Note : if td=0	1 s to 10 min derivative action is inactive
Cycle time heating	1 s → 200 s
Cycle time cooling	1 s → 200 s
Heat-cool control Cool proportional band	rC x heat proportional band
Heat-cool control rC : relative gain	0,20 → 1,00
Heat-cool control dead.overlap band	-20 % to + 50 % of the heat proportional band

#### Inputs

Thermocouples J, K, R, S, and N	IEC 584-1
Thermocouples L	DIN 43710
Reference junction	Automatic cold junction compensation : 0 to 50 °C (Thermocouples)
Reference junction drift	0,1 °C / °C
Input impedance (kΩ)	> 1 M Ω
Calibration (IEC 584-1)	▪
Resist. temp. detector 3-wire Pt 100 conforming to DIN 43760	▪
Line resistance	20 Ω max. (Resistance temperature detector)
Input type and standard range TC	L (0/400 °C) (0/1650°F) (0/900 °C) J (0/400 °C) (0/1830°F) (0/1000 °C) K (0/400 °C) (0/2190°F) (0/1200 °C) N (0/1400 °C) (0/2550°F) R (0/1760 °C) (0/3200°F) S (0/1760 °C) (0/3200°F)
Input types and standard range RTD Pt100	(-199,9/400,0 °C) (-199,9/400,0°F) (-200/800 °C) (-330/1470°F)
Measurement range	- 1999 → + 4000
Decimal point	adjustable : - - - - , - - - - , - - - - , - - - -

#### Current transformer input for monitoring the load break

Inputs	50 mAAC
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Measurement range with transformer	10 A → 100 A
Resolution	10 to 20 A : 0.1 A 21 to 100 A : 1 A
Measurement logic threshold	Relay output : NO or NC Logic output : level 1 or 0
Measurement update period	50 ms
Setpoints	- main setpoint : SP - auxiliary setpoint : SP2
Selection input SP/SP2	50 mA AC selection via external N/C type contact

**Output**

Type of output	discontinuous
Action type	can be programmed for heating and/or cooling
Limitation of output power : SOFT-START- heat action	adjustable from 0 to 100 %
Limitation of output power : SOFT-START-heat/cool action	adjustable from -100 to +100 %

**Output specification**

OUT 1 Main output N/O contact	3A 250 V AC resistive (N/C contact is possible via a jumper)
OUT 1 Main output logic	Level 0 : <0,5 V DC Level 1 : 14 V DC±20 % @ 20 mA max 24 V DC±20 % @ 1 mA max
Main output cycle time	1 s → 99 s
OUT 2 Cool output or alarm 1 output	N/O-2A contact, 250 V AC resistive
OUT 3 Load break output and/or alarm 2 output	N/O-2A contact, 250 V AC resistive

**Description of alarms 1 and 2**

Type of output	direct or reverse
Functions	absolute alarm band alarm deviation alarm
Reset to zero	Manual / automatic
Inhibition	Configuration
Alarm threshold - absolute alarm	absolute value independent from SP
Alarm threshold - band alarm	value relative to SP, adjustable from 0 to 500 °C/°F
Alarm threshold - deviation alarm	value relative to SP, adjustable from -500 °C/°F (negative deviation) to + 500 °C/°F (positive deviation)
Alarm	0.1 to 10 % of scale amplitude

**Serial link**

Type	RS485
Protocol	MODBUS, J.BUS
Address	1 → 255
Number of data bits	8
Transmission speed	600 → 19 200 Bauds
Parity	even, odd, no
Stop bit	1

**Physical details and protection**

Insulation resistance conforming to IEC 348	> 100 MΩ
Insulation voltage according to IEC 348	1500 V
Immunity to interference conforming to IEC 801-4	Level 3
Immunity to interference conforming to IEC 801-2	8000 V
Accuracy	± 0.2 % of the full measurement scale ± 1 digit at an ambient temperature of 25 °C at Un
Operating temperature range (°C)	0 → +50
Storage temperature range (°C)	-20 → +70 °C
Relative humidity (no condensation)	20 → 85 % Rh

**Housing**

Housing material	self-extinguishing UL94 grade VO
Front panel	Polycarbonate membrane
Protection class according to IEC 529 (IEC 70-1)	IP 54
Connection	screw terminals
Weight (g)	250

**Approvals**

UL / CSA	in progress
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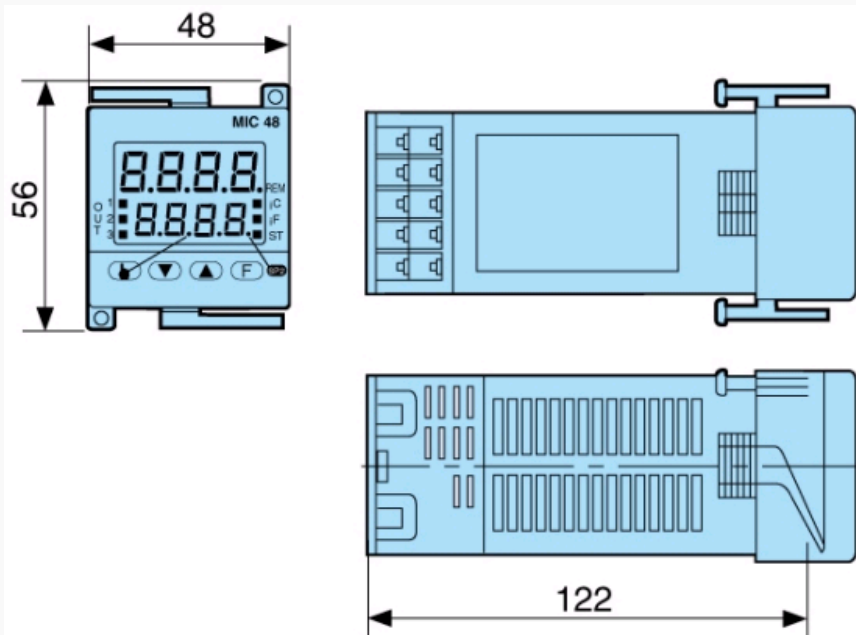
**Protection**

Safe-guard	detects a fault in the equipment caused by external interference and activates automatic reset without modification of the process.
Switch	the configuration and calibration are accessed via an internal switch, can only be accessed when the device is unplugged.

Medium	air oil water
rC relative gain	1,00 0,80 0,40
Cycle time cooling	10 s 4 s 2 s

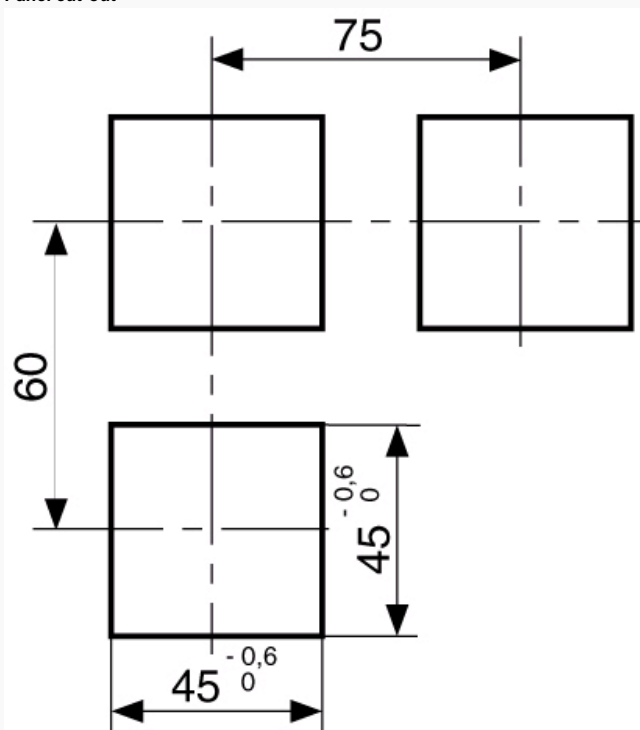
## Dimensions (mm)

MIC 48



## Dimensions (mm)

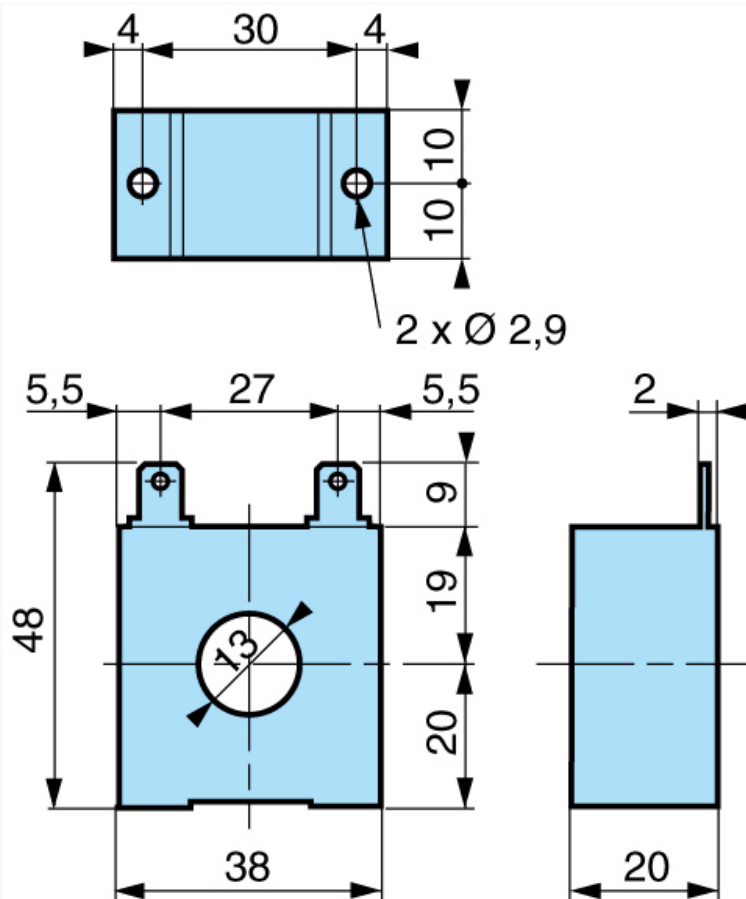
Panel cut-out



Découpe panneau

## Dimensions (mm)

Dimensions

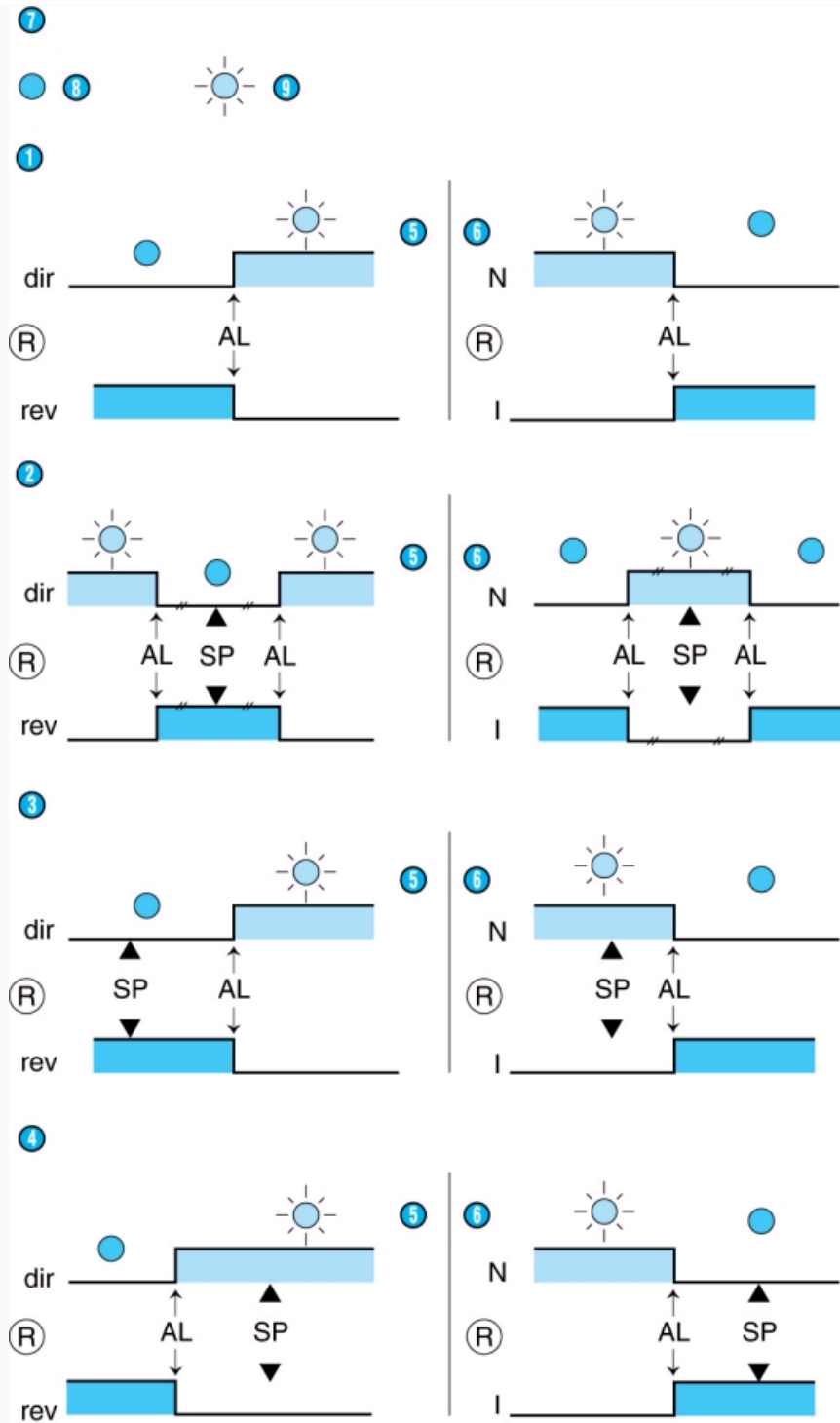


Transformateur d'intensité

#### Curves

Modes de fonctionnement

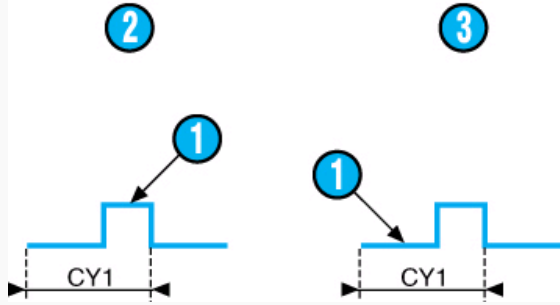
Résumé des différentes configurations



N°	Legend
1	Absolute alarm
2	Band alarm
3	Positive deviation alarm
4	Negative deviation alarm
5	High
6	Low
7	Output display LED
8	LED off
9	LED on

Curves

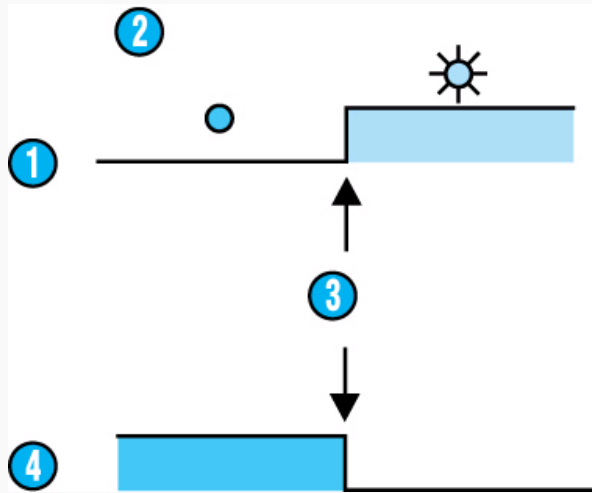
Description of the load break monitoring alarm



Operating mode The measurement is executed on each cycle CY1 of the main output OUT 1

N°	Legend
1	measurement
2	OUT 1 N/O type
3	OUT 1 N/C type

Curves

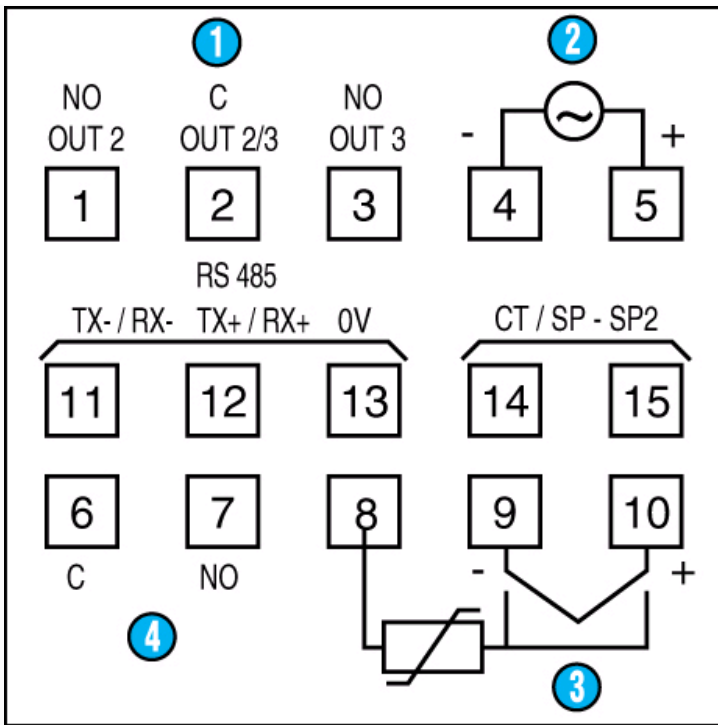


Behaviour of output OUT 3

N°	Legend
1	Dir
2	Low level alarm
3	Threshold in A
4	Rev

Connections

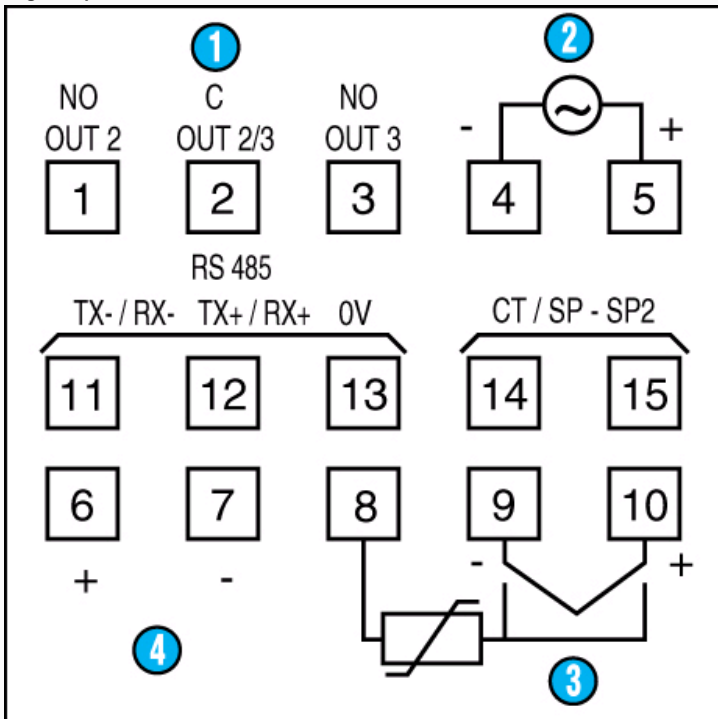
Relay output



N°	Legend
1	250 V AC / 2 A resistive
2	Power supply
3	Linear
4	Main output 250 V AC / 3 A resistive
	11-12-13 : Serial link
	14-15 : Input 50 mA AC (Current transformer connected for load break monitoring or selection of 2 <sup>nd</sup> setpoint)

**Connections**

**Logic output**

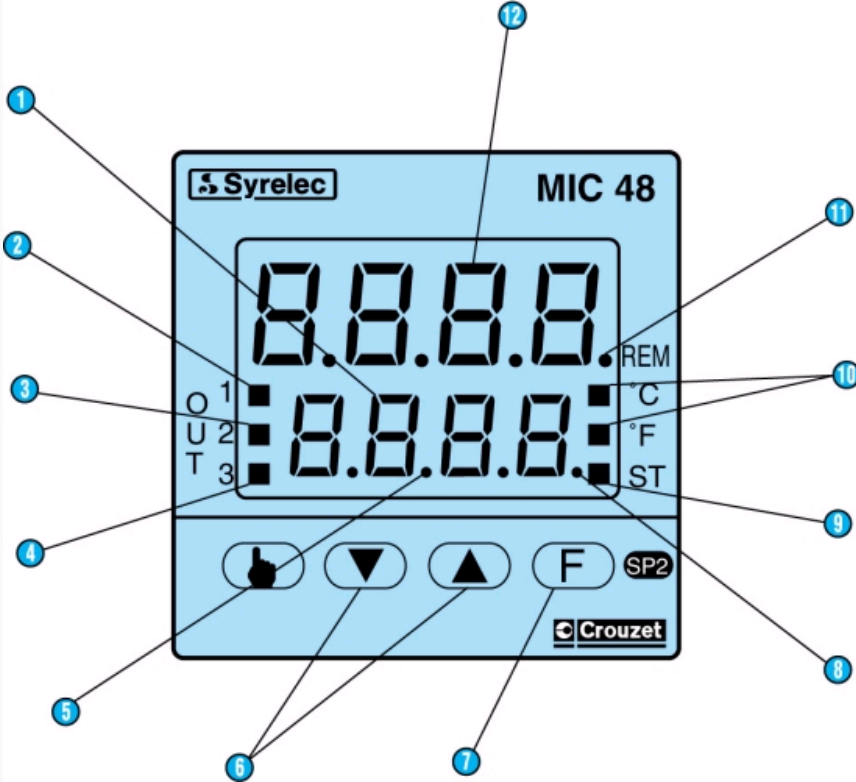


N°	Legend
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1	250 V AC / 2 A resistive
2	Power supply
3	Linear
4	Main output 0-24 V DC / 200 mA max
	11-12-13 : Serial link
	14-15 : Input 50 mA AC (Current transformer connected for load break monitoring or selection of 2 <sup>nd</sup> setpoint)

**Applications**

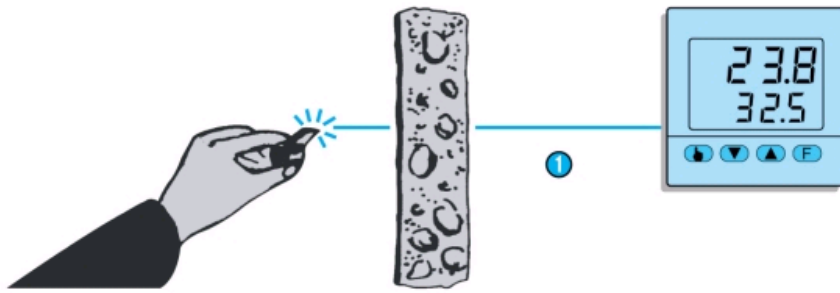
**Display**



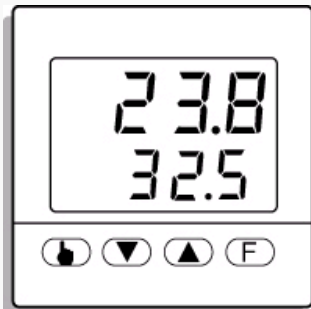
N°	Legend
1	Lower display : - setpoint - output power - heating element consumption (in amps) - abbreviation of the parameter selected during programming
2	Main output status LED, lit when the output is active.
3	Cool output or alarm 1 output status LED, lit when the output is active
4	Load break alarm output and/or alarm output 2 status LED, lit when the output is active
5	Manual/automatic operation. The LED flashes when the controller is in manual mode
6	Parameter modification and direct access to the setpoint
7	Parameter selection and validation in configuration and parameter definition modes. This key is also used to display the output power and the heating element consumption
8	SP2 LED flashes slowly when control occurs at setpoint SP2. SP2 LED flashes rapidly when the setpoint value is programmed via the RS485 serial link
9	LED indicating the SMART function
10	When the sensor input is connected to a thermocouple or a Pt100, the LED corresponding to the selected unit of measurement is lit
11	REM LED on when the controller is communicating via the RS485 serial link
12	Upper display : -measurement -parameter values during programming

**Applications**

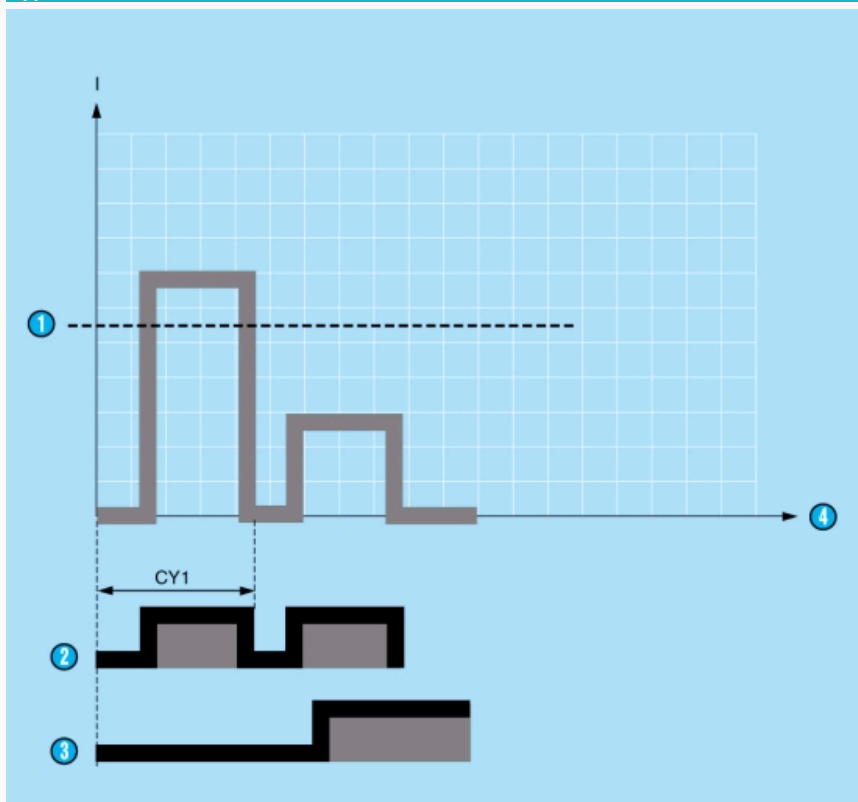




Applications



Applications



Applications

