

- **PID controller with 'one shot' auto-tune**
 - single loop, heat/cool and ramp/soak as standard
- **Quick code, front face or PC configuration**
 - easy commissioning and operation using our Windows™-based software
- **Selectable control outputs to suit application**
 - analog, relay or logic control capabilities as standard
- **Case depth behind panel less than 125mm**
 - reduced installation and panel costs
- **Accurate universal process input with integral transmitter power supply**
 - direct connection for any process signal
- **NEMA4X/IP66 protection and full noise + EMC immunity**
 - reliability in the harshest environments
- **RS485/Modbus serial communications**
 - SCADA, PLC and open systems integration



**C250 – the most comprehensive
1/4 DIN controller,
straight out of the box**

C250

The C250 Process controller is a highly versatile, single loop controller in 1/4 DIN format that has been designed to be exceptionally easy to set up and operate.

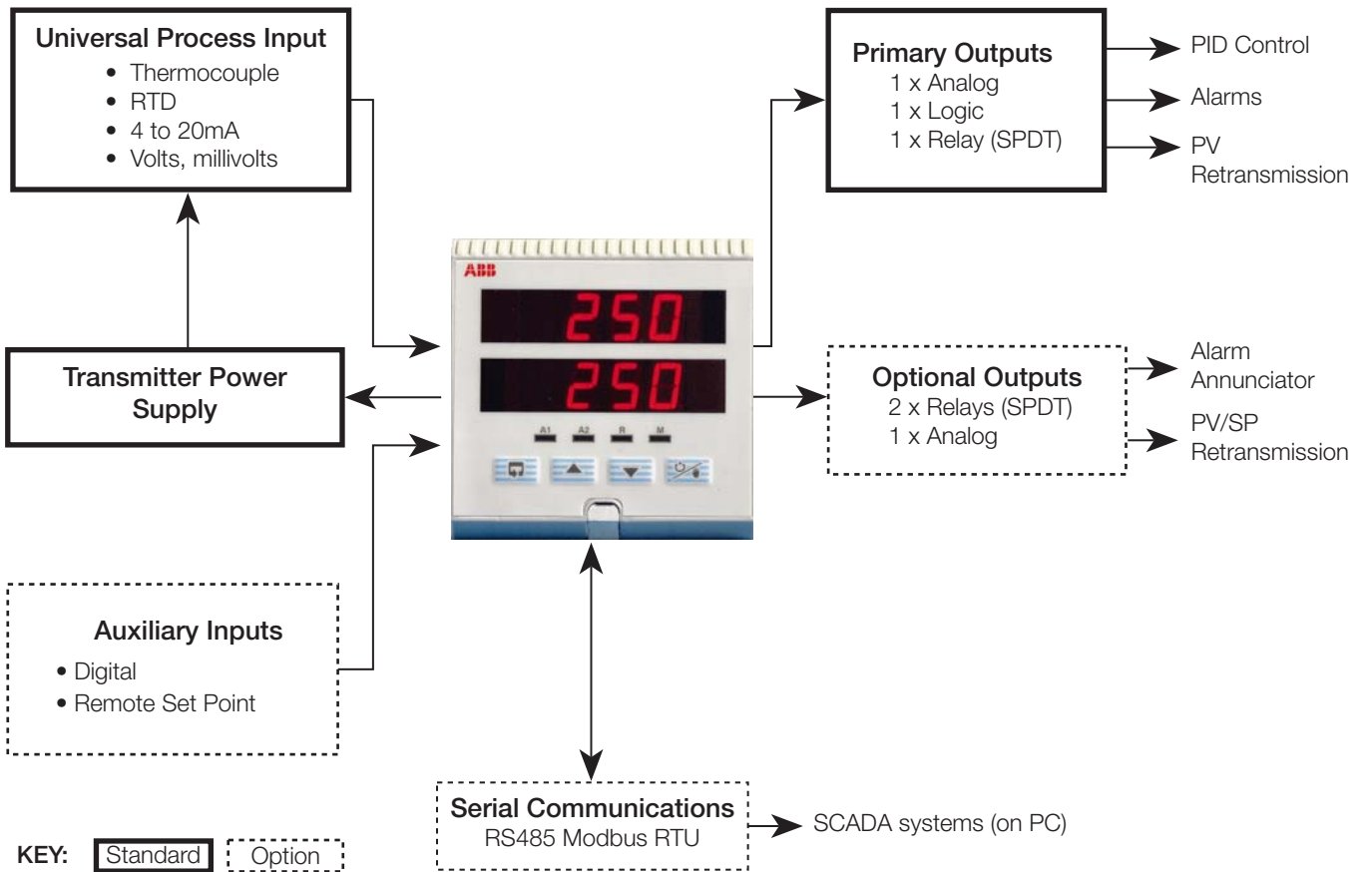
Universal input and an integral transmitter power supply ensure that the C250 has the capabilities to measure a wide range of process signals such as temperature, pressure, flow and level.

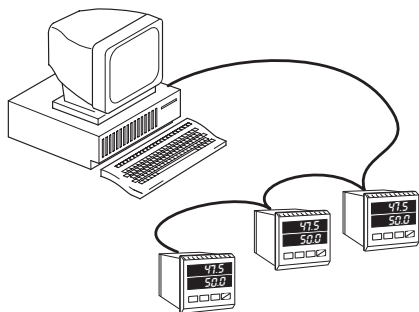
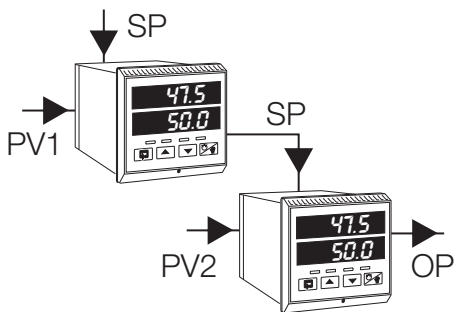
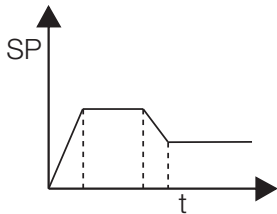
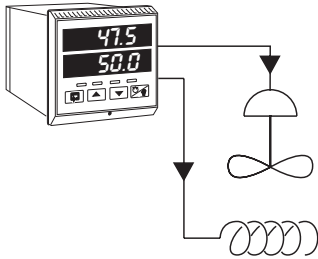
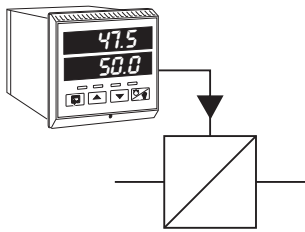
Enhanced performance with analog, logic and relay control outputs, all fitted as standard, with the option to add further I/O capabilities such as additional relays, remote set point, analog retransmission and digital input, to suit your application.

The configuration of the C250 is achieved by moving the security switch and entering a simple code from the front panel keys or via our PC configuration package. No passwords, no input links, no complications.

With NEMA4X/IP66 front panel and superior RF immunity as standard the C250 has been designed to control reliably in the harshest of today's industrial environments.







PID Control

Simple PID control is available using any of the unit's three built-in outputs.

- 4 to 20mA analog output
- Logic 18V time proportioning (to drive solid state relays)
- 5A relay for time proportioning or on/off control

Universal input with direct connection of sensors and built-in transmitter supply. Optional isolated retransmission for input to recorders.

Heat/Cool

Heat/Cool control strategies may be implemented on the standard C250, using a combination of the analog, logic and relay outputs.

Ramp/Soak Set Point Profiles

The ramp/soak facility available on every C250 provides for a single program, four-segment profile. This facility also includes guaranteed ramp/soak, repeat program, skip and reset. An optional digital input can initiate start/stop of the ramp/soak cycle.

Master/Slave and Cascade

Two or more C250s can be used in either a master/slave or cascade configuration, with the addition of the remote set point option to the basic unit.

RS485/Modbus

Fitted with an optional RS485 serial communication board, the C250 can communicate with PLCs and SCADA systems using the Modbus protocol.

Specification

Summary

P, PI, PID single loop controller
Autotune facility
Fully user configurable
NEMA4X/IP66
PC Configuration

Operation

Display

High-intensity 7-segment, 2 x 4-digit red LED display
Display range -999 to +9999
Display resolution ± 1 digit
Display height 12mm (0.43 in.)

Configuration

User defined via front panel or PC configurator

Standard Functions

Control types

Programmable for manual, on/off, time proportioning, current proportioning and heat/cool control.

Set points

Local
Remote
4 selectable, fixed value
Ramping set point

Profile controller

Number 4 ramp/soak segments
Features Guaranteed ramp/soak, self seeking set point, program repeat
Controls Run, hold and stop from front panel switches
Run/hold or run/stop from digital input

Alarms

Number Two user-defined
Type High/Low process
High/Low deviation
Loop break alarm

Standard Build

Control output/retransmission

Analog, configurable in the range of 4 to 20mA
Max. load 15V (750 Ω at 20mA)
Accuracy $\leq 0.25\%$ of span
Isolation 500V DC from input (not isolated from logic output)

Logic output

18V DC at 20mA
Min. load 400 Ω
Isolation 500V DC from input (not isolated from control output)

Relay output

One relay as standard (SPDT) 5A @ 115/230V AC, 5A @ 24V DC

...Specification

Analog Input

Number

- One as standard
- One optional 4 to 20mA remote set point input

Input sampling rate

250ms per channel

Type

Universally configurable to provide (Channel 1 only):

- Thermocouple (THC)
- Resistance Thermometer (RTD)
- Millivolt
- Current
- DC voltage

Input impedance

- mA 100Ω
- mV, V >10MΩ

Linearizer functions

- Programmable for standard inputs:
√, THC types B, E, J, K, N, R, S, T or Pt100

Broken sensor protection

- Upscale drive on THC and RTD
- Downscale drive on milliamps and voltage

Cold junction compensation

- Automatic CJC incorporated as standard
- Stability < 0.05°C/°C change in ambient temperature

Input protection

- Common mode isolation >120dB at 50/60Hz with 300Ω imbalance
- Series mode rejection > 60dB 50/60Hz

Transmitter power supply

- 24V, 30mA max. powers one 2-wire transmitter

Standard Analog Input Ranges

Thermocouple	Maximum Range °C	Maximum Range °F	Accuracy (% of reading)
B	-18 to 1800	0 to 3270	0.25% or $\pm 2^{\circ}\text{C}$ (3.6°F) [above 200°C (392°F)] *
E	-100 to 900	-140 to 1650	0.25% or $\pm 0.5^{\circ}\text{C}$ (0.9°F)
J	-100 to 900	-140 to 1650	0.25% or $\pm 0.5^{\circ}\text{C}$ (0.9°F)
K	-100 to 1300	-140 to 2350	0.25% or $\pm 0.5^{\circ}\text{C}$ (0.9°F)
N	-200 to 1300	-325 to 2350	0.25% or $\pm 0.5^{\circ}\text{C}$ (0.9°F)
R	-18 to 1700	0 to 3000	0.25% or $\pm 1.0^{\circ}\text{C}$ (1.8°F) [above 300°C (572°F)] *
S	-18 to 1700	0 to 3000	0.25% or $\pm 0.5^{\circ}\text{C}$ (0.9°F) [above 200°C (392°F)] *
T	-250 to 300	-400 to 550	0.25% or $\pm 0.5^{\circ}\text{C}$ (0.9°F)

* For B, R and S thermocouples, performance accuracy is not guaranteed below value stated

Min. span below zero Type T 70°C (126°F) THC standards DIN 43710
 Type N 105°C (189°F) IEC 584

RTD	Maximum Range °C	Maximum Range °F	Accuracy (% of reading)**
Pt100	-200 to 600	-325 to 1100	0.25% or $\pm 0.5^{\circ}\text{C}$ (0.9°F)

** RTD, 3-wire platinum, 100Ω per DIN 43760 standard (IEC 751), with range of 0 to 400Ω

Linear Inputs	Range	Accuracy (% of reading)
Milliamps	0 to 20mA	0.25% or $\pm 2\mu\text{A}$
Milliamps	4 to 20mA	0.25% or $\pm 2\mu\text{A}$
Volts	0 to 5V	0.25% or $\pm 200\mu\text{V}$
Volts	1 to 5V	0.25% or $\pm 200\mu\text{V}$
Millivolts	0 to 50mV	0.25% or $\pm 20\mu\text{V}$

Square Root Input	Range	Accuracy (% of reading)***
Milliamps	4 to 20mA	0.25% or $\pm 2\mu\text{A}$

*** Below input of 4.64mA (20% flow) the input is linear

...Specification

Options

One option board can be installed from:

- Type 1 One relay
- Type 2 Two relays + one digital input + remote set point
- Type 3 One relay + one digital input + remote set point + Modbus serial communications
- Type 4 One relay + one digital input + remote set point + retransmission

Relay output

SPDT 5A @ 115/230V AC

Digital input

Type Volt-free
Minimum pulse 250ms

Modbus serial communications

Connections RS422/485, 2- or 4-wire
Speed 2.4k or 9.6k baud rate
Protocol Modbus RTU slave

Remote Set Point Input

4 to 20 mA DC, 100 Ω nominal input impedance
Preset to process variable engineering units

Auxiliary Analog Output

Analog, configurable in the range of 4 to 20mA
Max. load 15V (750 Ω at 20mA)
Isolation 500V DC from input

Physical

Size

96 wide x 96 high x 122.5mm
(3.78 in. wide x 3.78 in. high x 4.82 in. deep)

Weight

520g (1.1 lb) approx.

Electrical

Voltage

85 to 265V AC (50/60Hz)
24V DC

Power consumption

<6VA

Power interruption protection

<60ms/<3 cycles, no effect
>60ms/>3 cycles, instrument returns to operation after a controlled reset

Environmental

Operating limits

0 to 55°C (32 to 131°F)
5 to 95%RH non-condensing

Temperature stability

<0.02% of reading or 2 μ V/°C (1 μ V/°F)

Front face

IP66 (NEMA4X), rear IP20

EMC

Emissions and Immunity

Meets requirements of IEC 61326 for an Industrial Environment

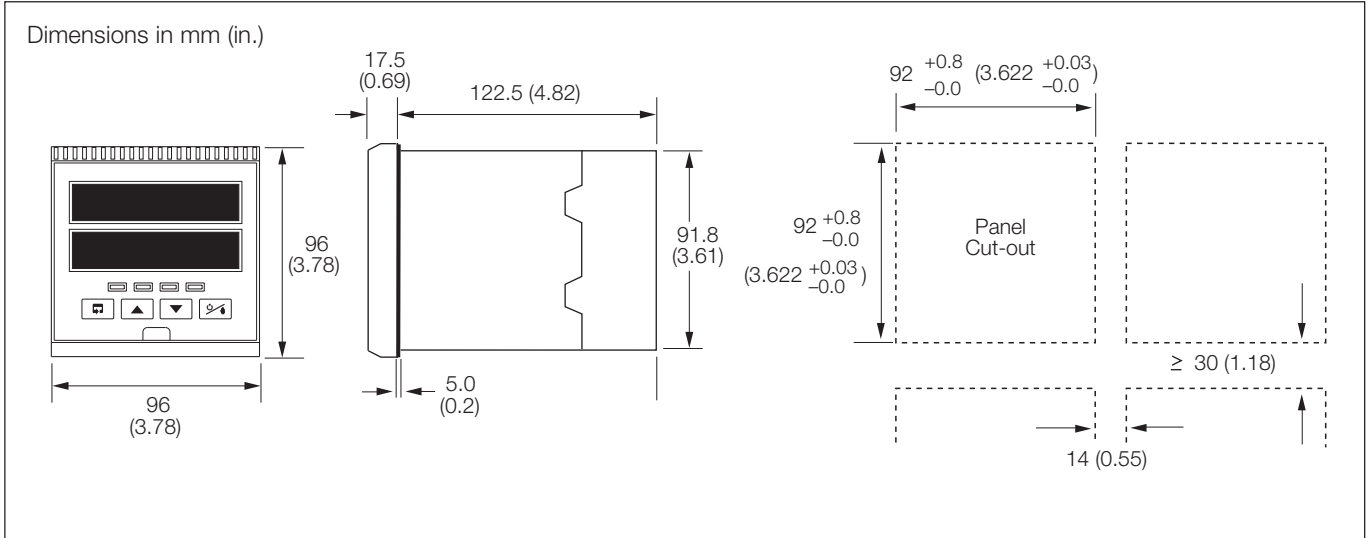
Design and manufacturing standards

CE Mark

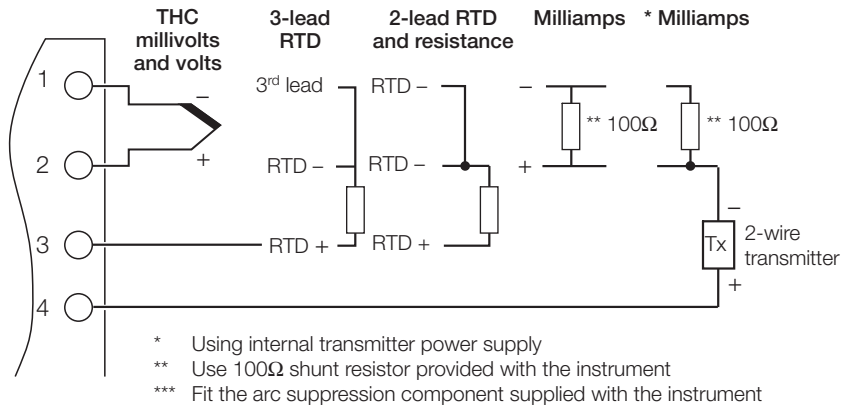
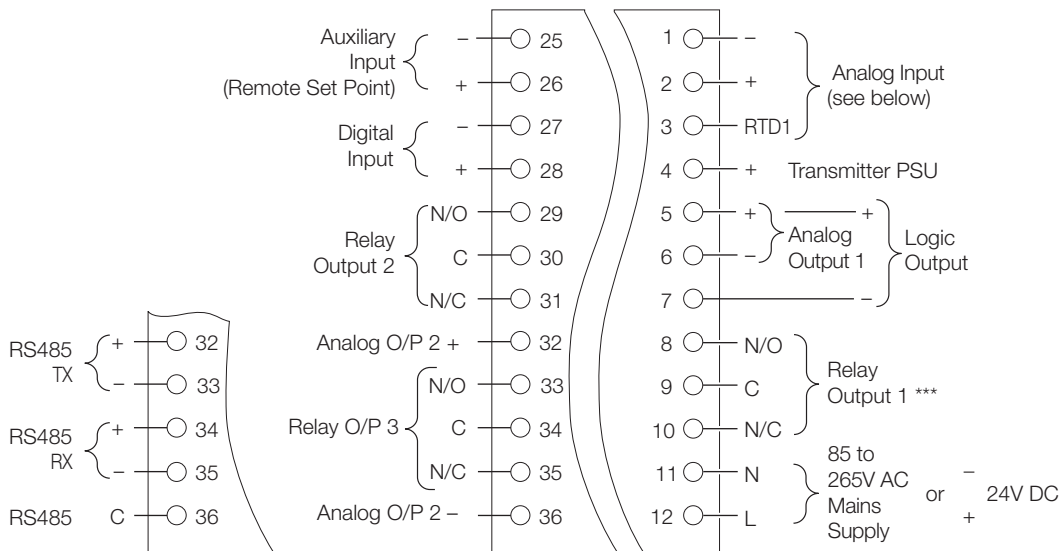
Safety standards

EN61010 – 1
UL 310 – 1
FM 3810

Overall Dimensions



Electrical Connections



Ordering Information

C250 1/4 DIN Process Controller*	C250 /	X X	X	X /	X X X X
Option Board					
None		0 0			
1 additional relay		0 1			
2 additional relays + 1 digital input + remote set point 4 to 20mA		0 2			
1 additional relay + 1 digital input + remote set point + RS485/Modbus		0 3			
1 relay + 1 digital input + remote set point + retransmission		0 4			
Power Supply					
85V to 265V AC			0		
24V DC			1		
Build					
ABB Standard			0		
CSA approval (pending)			1		
UL approval			2		
FM approval			4		
Programming/Special Features					
Configured to factory standard					S T D
Configured to customer requirements					C U S
Special features					S P X X

* As standard the C250 is fitted with one relay, analog output, logic output, universal input and transmitter power supply

Accessories

PC Configurator Kit (part no. C100/0700)

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