

- **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



COMMANDER 250 – the most comprehensive 1/4 DIN controller, straight out of the box

COMMANDER 250

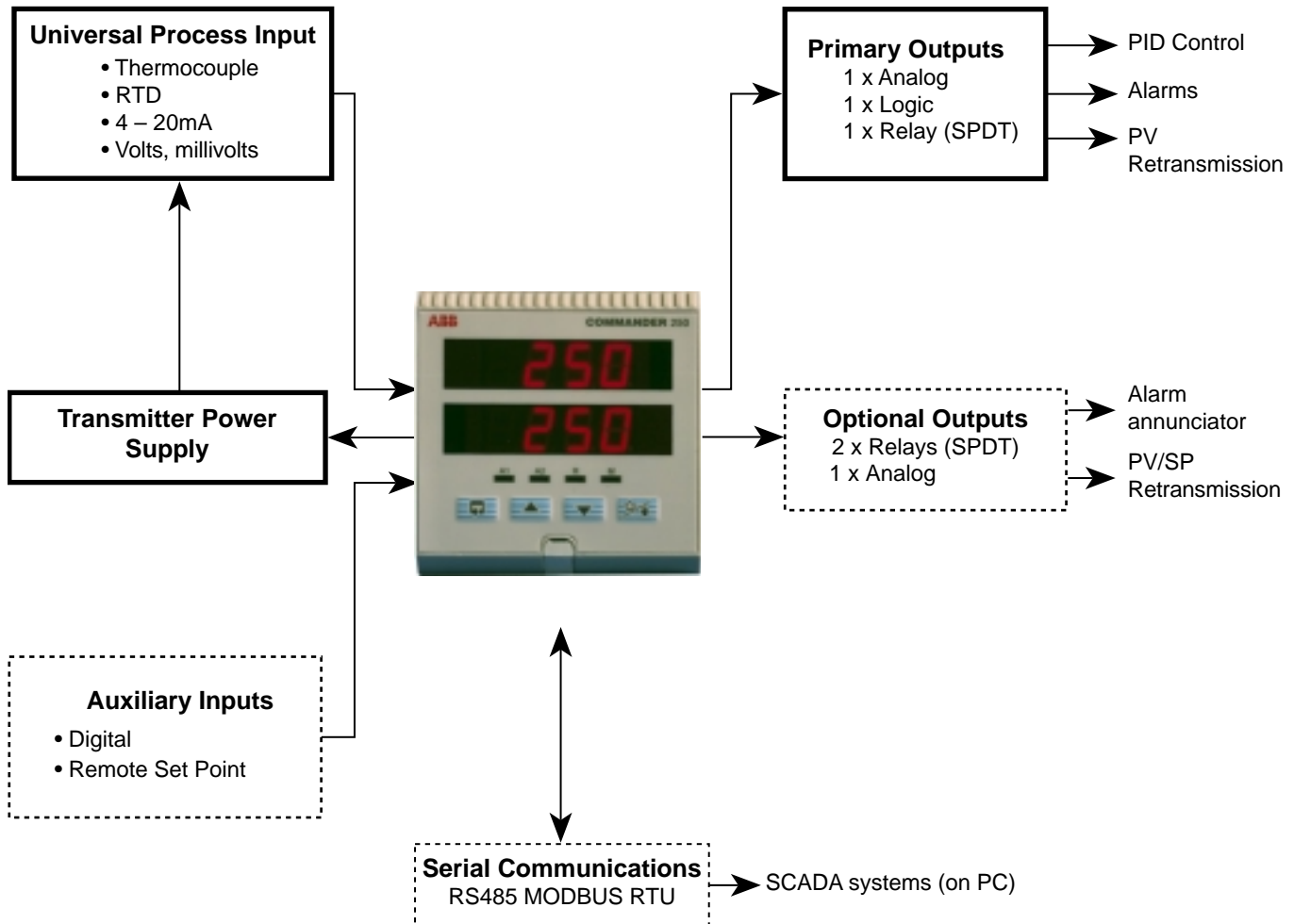
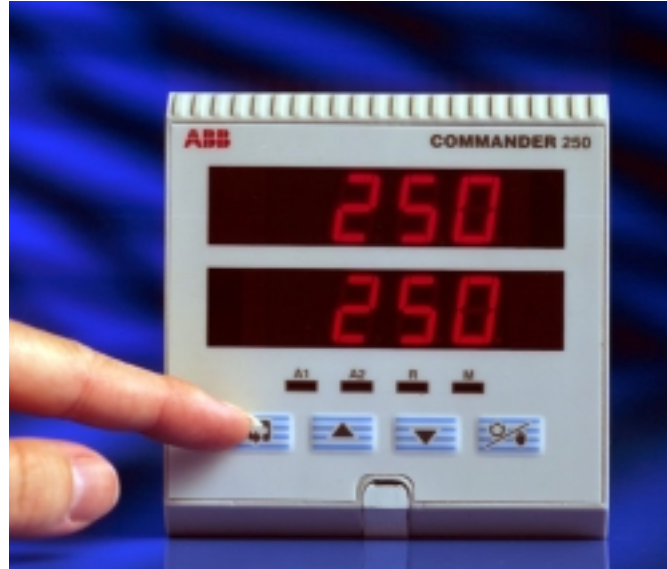
The COMMANDER 250 Process controller is a highly versatile, **single loop controller** in $\frac{1}{4}$ DIN format that has been designed to be exceptionally easy to set up and operate.

Universal input and an **integral transmitter power supply** ensure that the COMMANDER 250 has the capabilities to measure a wide range of process signals such as temperature, pressure, flow and level.

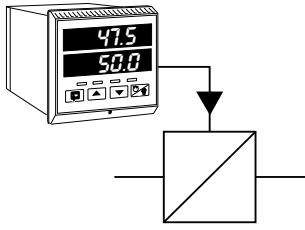
Enhanced performance with **analog, logic and relay control outputs**, all fitted as standard, with the option to add further I/O capabilities such as additional relays, remote set point, analog retransmission and digital input, to suit your application.

The **configuration** of the COMMANDER 250 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 COMMANDER 250 has been designed to control reliably in the harshest of today's industrial environments.



KEY: Standard Option

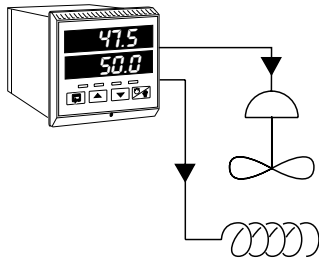


PID Control

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

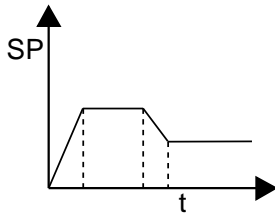
- 4 to 20mA analog output
- Logic 18V time proportioning (to drive solid state relays)
- 5A relay for time proportioning or on/off control

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



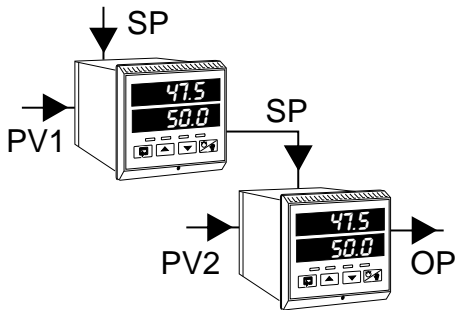
Heat/Cool

Heat/Cool control strategies may be implemented on the standard COMMANDER 250, using a combination of the analog, logic and relay outputs.



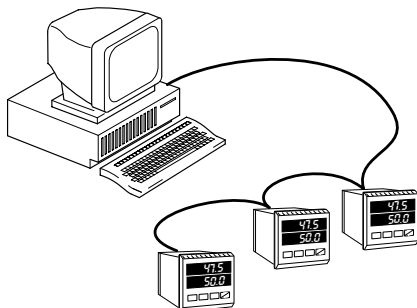
Ramp/Soak Set Point Profiles

The ramp/soak facility available on every COMMANDER 250 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 COMMANDER 250s 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 COMMANDER 250 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 d.c. from input (not isolated from logic output)

Logic output

18V d.c. at 20mA

Min. load 400 Ω

Isolation 500V d.c. from input (not isolated from control output)

Relay output

One relay as standard (SPDT) – 5A @ 115/230V a.c.

Analog Inputs

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

D.C. voltage

Input impedance

mA 100 Ω

mV, V >10M Ω

Linearizer functions

Programmable for standard inputs:

$\sqrt{\quad}$, 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 300 Ω imbalance

Series mode rejection > 60dB 50/60Hz

Transmitter power supply

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

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 a.c.

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 d.c., 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 d.c. from input

Standard Analog Input Ranges

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

RTD	Maximum Range °C	Maximum Range °F	Accuracy (% of reading)
PT100	-200 to 600	-325 to 1100	0.25% or $\pm 0.5^{\circ}\text{C}/0.9^{\circ}\text{F}$

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

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

Notes.

Performance accuracy is not guaranteed below 300°C B, R & S thermocouples or low end sq. root ranges.
 RTD, 3-wire platinum, 100Ω per DIN 43760 standard (IEC751), with range of 0 to 400Ω .
 Min. span below zero Type T $70^{\circ}\text{C}/126^{\circ}\text{F}$
 Type N $105^{\circ}\text{C}/189^{\circ}\text{F}$
 THC standards DIN 43710 IEC 584
 RTD standards DIN 43760 IEC 751

Physical

Size

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

Weight

520g (1.1lb) approx.

Electrical

Voltage

85 to 265V a.c. (50/60Hz)
 24V d.c.

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 $2\mu\text{V}/^{\circ}\text{C}$ ($1\mu\text{V}/^{\circ}\text{F}$)

Front face

IP66 (NEMA4X), rear IP20

EMC

Emissions

Meets requirements of EN50081-2

Immunity

Meets requirements of EN50082-2

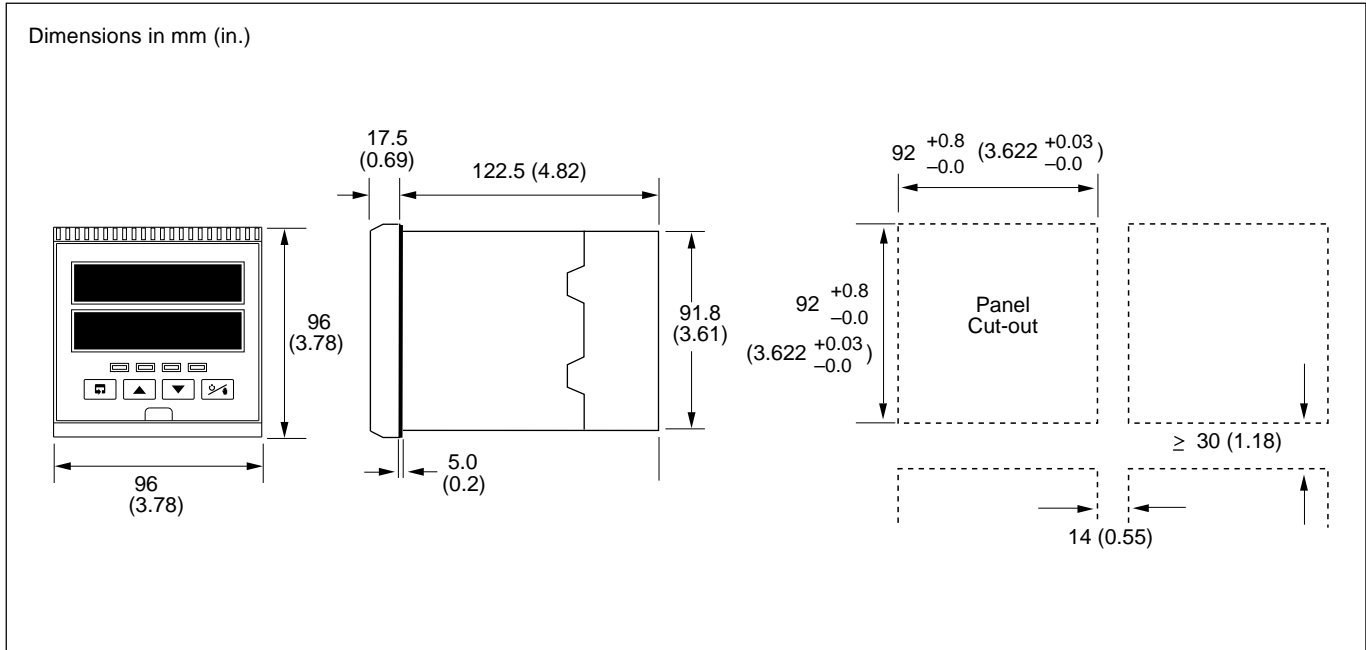
Design and manufacturing standards

Designed to meet CSA requirements
 CE Mark

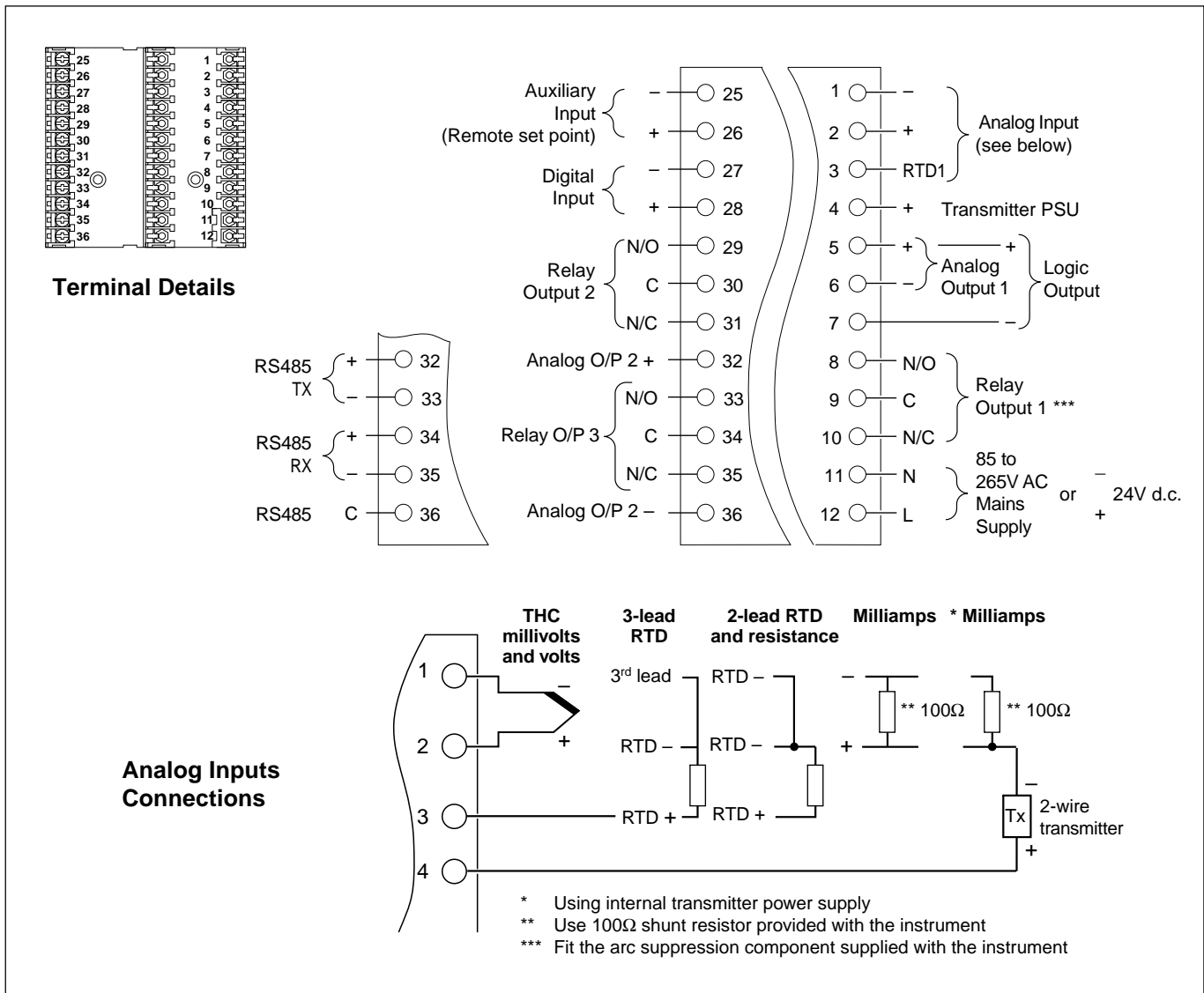
Electrical safety

EN61010-1

Overall Dimensions



Electrical Connections

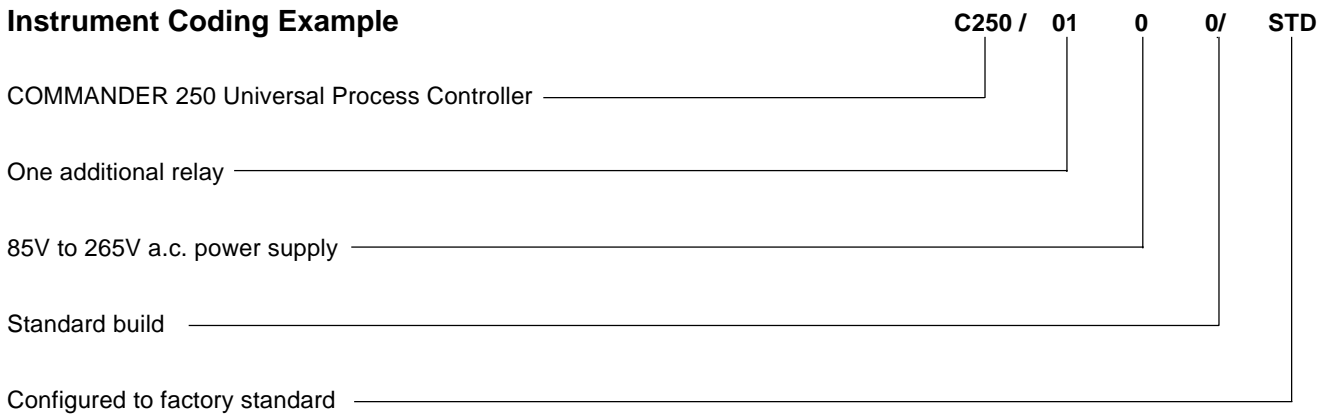


Ordering Guide

COMMANDER 250 Process Controller*	C250 /	X X	X	X	/	X X X X
Option Board						
None		0 0				
One additional relay		0 1				
Two additional relays + one digital input + remote set point 4 to 20mA		0 2				
One additional relay + one digital input + remote set point + RS485/MODBUS		0 3				
One relay + one digital input + remote set point + retransmission		0 4				
Power Supply						
85V to 265V a.c.				0		
24V d.c.				1		
Build						
ABB Standard				0		
CSA approval (pending)				1		
UL approval (pending)				2		
Programming/Special Features						
Configured to factory standard						S T D
Configured to customer detail						C U S
Agreed special features						S P X X

* As standard the COMMANDER 250 is fitted with one relay, analog output, logic output Universal input and transmitter power supply

Instrument Coding Example



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