

Specification DataFile

- **Boundless motorized valve controller**
 - no need for slidewire feedback; improves reliability

- **Two sealed 5A control relays**
 - suitable for direct connection to the valve, reducing installation costs

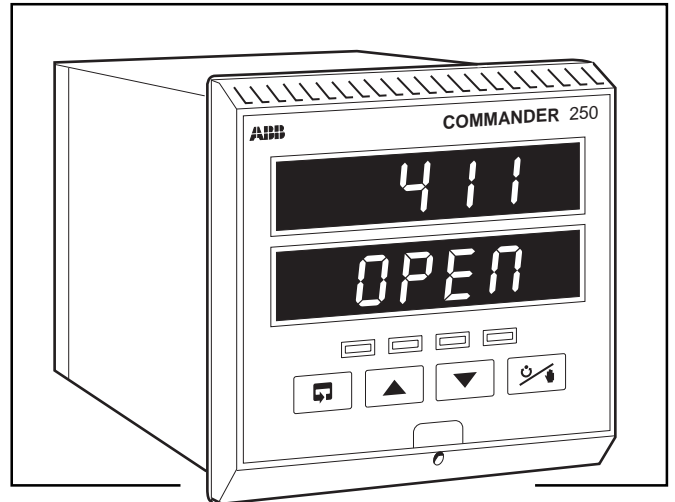
- **Universal process input with integral 2-wire transmitter power supply**
 - direct connection for any process signal

- **Retransmission of process variable**
 - analog output for recorder or datalogger

- **IP66/NEMA4X front face**
 - ideal for use in the harshest environments

- **Quick code, front face or PC configuration**
 - easy operation and commissioning using our Windows™-based software

- **RS485/MODBUS™ serial communication**
 - SCADA, PLC and open systems integration



*COMMANDER V250 –
a dedicated 1/4 DIN controller for
motorized valves*

COMMANDER V250

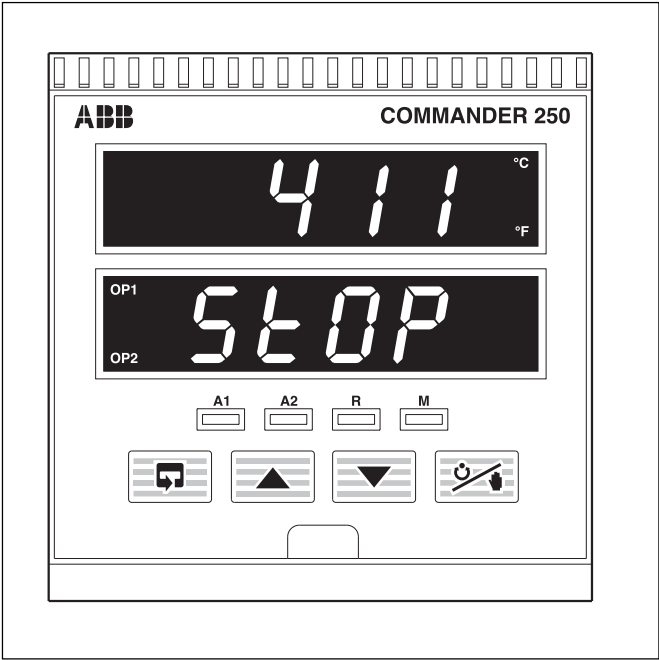
The COMMANDER V250 Valve Position controller is a **dedicated, single loop controller** designed for direct control of motorized valves.

Universal input and **integral transmitter power supply** ensure that the COMMANDER V250 has the capabilities to measure a wide range of process signals such as temperature, pressure, flow and level.

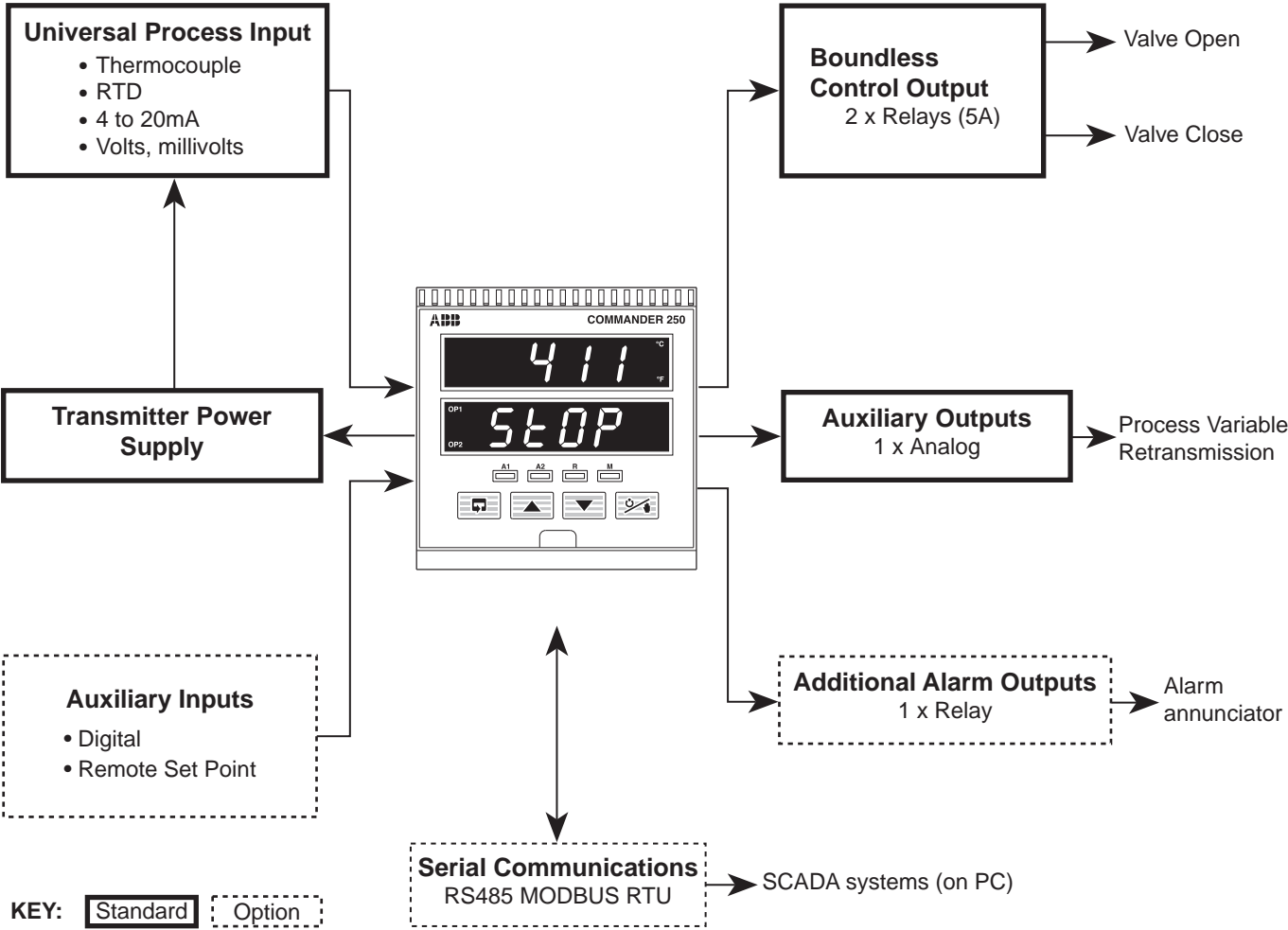
Two 5A relays are fitted as standard for either direct control of the positioner or via intermediate relays plus retransmission of the process variable for connection to a recorder or datalogger. Further i/o capabilities can be added, such as an alarm relay, remote set point and digital input, to suit the application.

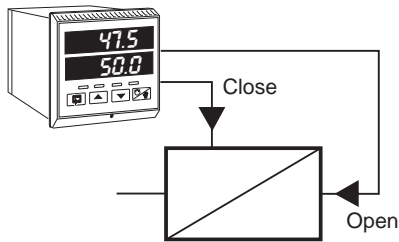
The **configuration** of the COMMANDER V250 is achieved by moving the security switch and entering a simple code from the front panel keys or via our PC configuration package. No passwords, no input links, no complications.

With **IP66/NEMA4X** front panel protection and superior RF immunity as standard the COMMANDER V250 has been designed to control reliably in the harshest of today's industrial environments.



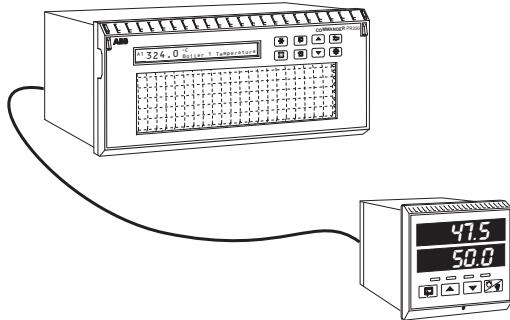
Process Connections





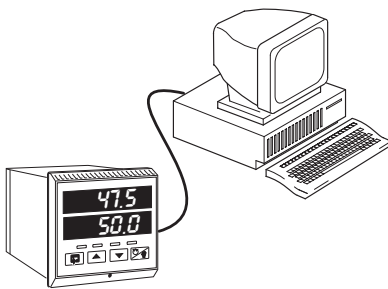
PID Control

Boundless control of an electrically-positioned valve with a travel time between 10 and 5000s using in-built 5A relays. The V250 gives pulsed outputs to the valve which are based on the difference in Process Variable and Set Point. The V250 signals the direction and time of travel to the valve. The controller does not require information on the absolute regulator position but uses the PV inputs as its feedback. The deadband setting prevents the valve from hunting.



Retransmission

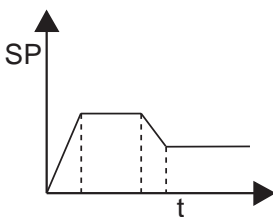
As standard the COMMANDER V250 has a 4 to 20mA retransmission output of the process variable for connection to a chart recorder, datalogger or PLC.



PC Configuration

To make configuration of the COMMANDER V250 quicker and simpler, a Windows-based configuration software package is available. The V250 is supplied with an in-built PC configurator port as standard.

Configurations can be saved and downloaded to other instruments and a printout generated.

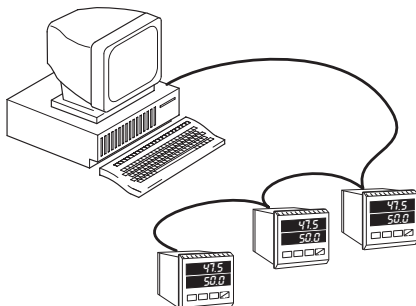


Quick Code Setting

A simple 4-digit code enables all standard parameters to be set from the front face.

Ramp/Soak Set Point Profiles

The ramp/soak facility available on every COMMANDER V250 provides for a single program, four-segment profile. This facility also includes guaranteed ramp/soak, repeat program, skip and reset features.



RS485/MODBUS

Fitted with an optional RS485 serial communication board, the COMMANDER V250 can communicate with PLCs and SCADA systems using the MODBUS protocol.

Specification

Summary

PI, PID single loop, valve position controller

Fully user configurable

NEMA4X/IP66

PC configuration

Operation

Display

High-intensity 7-segment, 2 x 4-digit LED display

Display range –999 to +9999

Display resolution ± 1 digit

Display height 14mm (0.56 in.)

Configuration

User-defined via front panel or via PC configurator

Control Functions

Control types

P+I or P+I+D Boundless

Valve travel time

10 to 5000s

Adjustable deadband (engineering units)

–999 to +9999

Control terms

P = 0.1 to 999.9%

I = 1 to 7200s

D = 0.1 to 999.9s

Set points strategies

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

Standard Build

Relay output

Two relays with arc suppression components included as standard (SPDT) – 5A @ 115/230V a.c.

Logic output

18V d.c. at 20mA

Min. load 400 Ω

PV retransmission

Analog, configurable in the range of 4 to 20mA

Max. load 15V (750 Ω at 20mA)

Accuracy $\leq 0.25\%$ of span

Analog Inputs

Number

One standard process variable

One optional remote set point input

Input sampling rate

250ms per channel

Type

Universally configurable

Channel 1: Thermocouple (THC)

Resistance Thermometer (RTD)

Millivolt

Current

D.C. voltage

Channel 2: 4 to 20mA

Input impedance

mA 100 Ω

mV, V >10M Ω

Linearizer functions

Programmable for standard inputs:

$\sqrt{}$, 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

Optional I/O specification

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

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 (1.1 lb) 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), case rear IP20

EMC

Emissions

Meets requirements of EN50081-2

Immunity

Meets requirements of EN50082-2

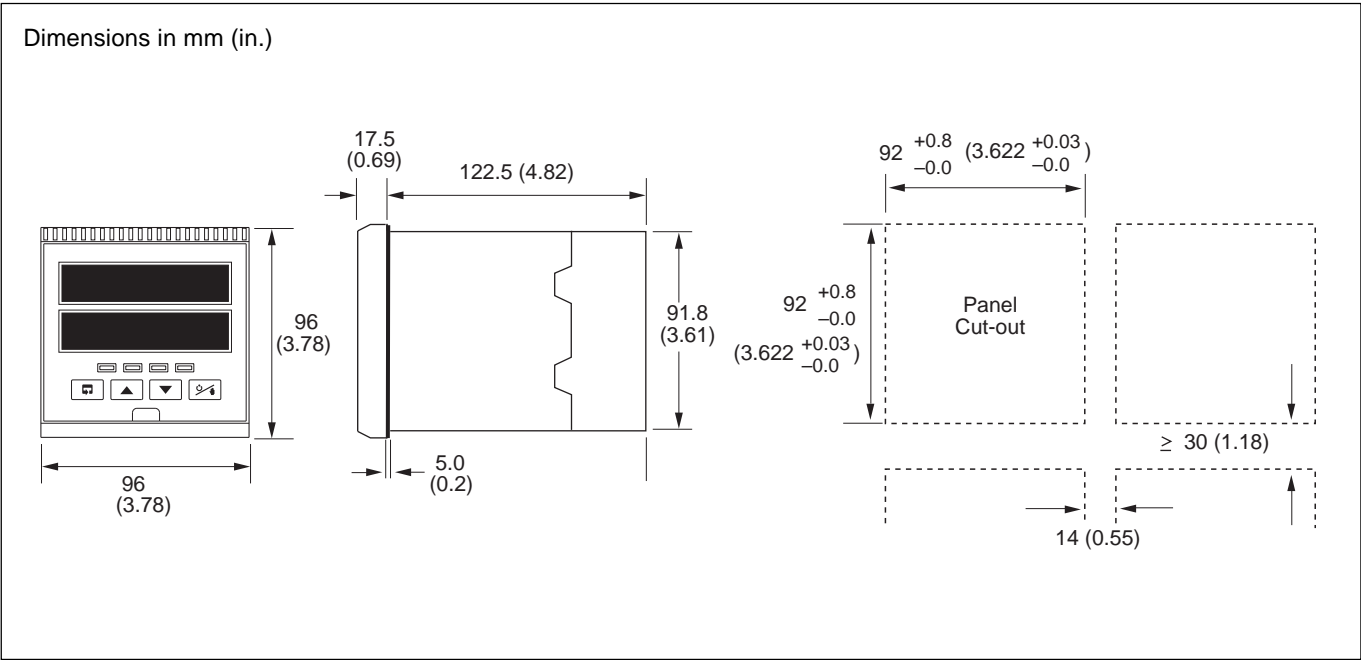
Design and manufacturing standards

Designed to meet CSA requirements
CE Mark

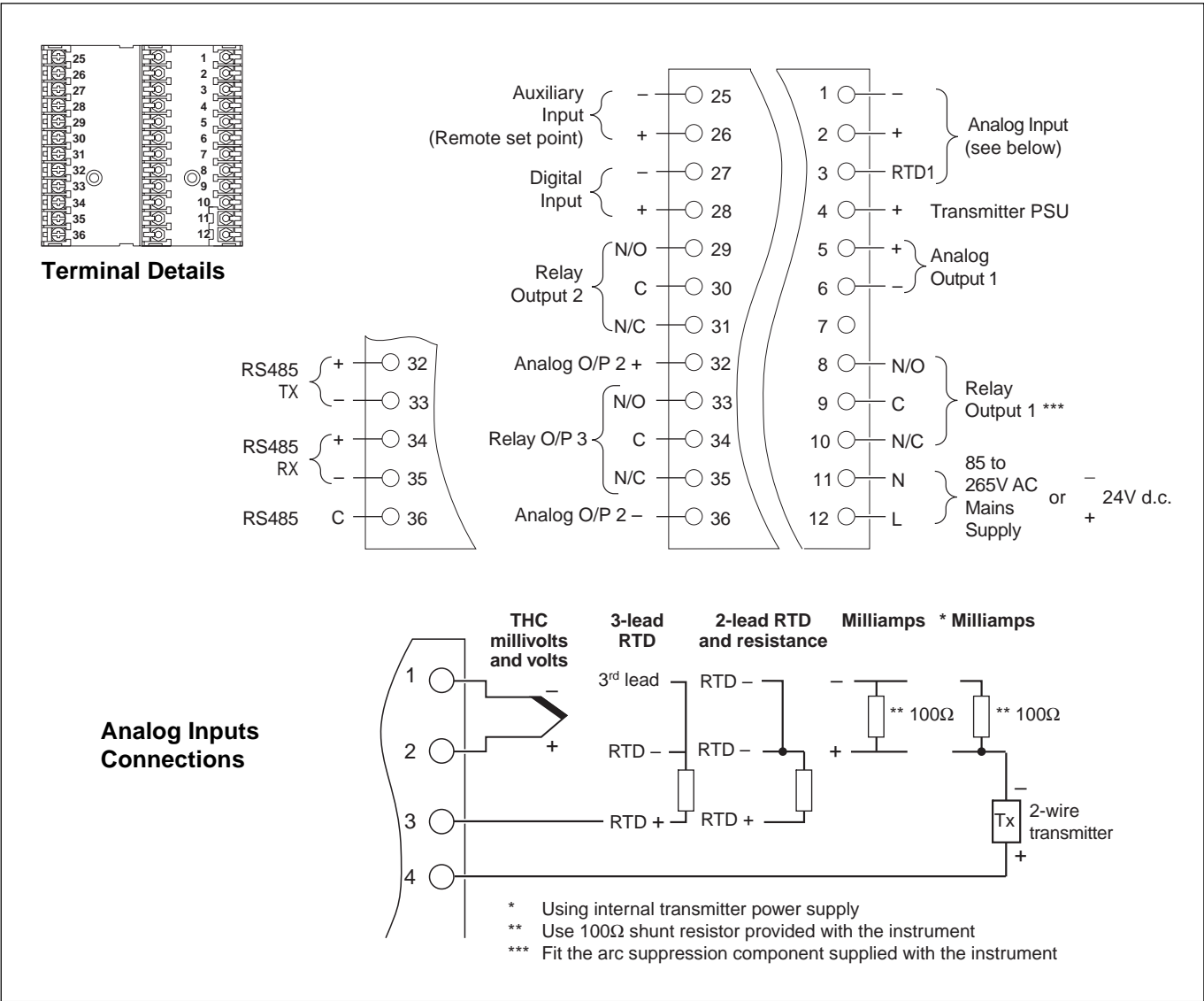
Electrical safety

EN61010

Dimensions



Electrical Connections



Ordering Guide

COMMANDER V250 Motorized Valve Controller				V250 /	X	X	X	X	/	X	X	X	X
Options													
Standard *					0	1							
One additional alarm relay + one digital input + remote set point 4 to 20mA					0	2							
One digital input + remote set point + RS485/MODBUS					0	3							
Power Supply													
85V to 265V a.c.							0						
24V d.c.							1						
Build													
ABB Standard								0					
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 all COMMANDER V250 Controllers are fitted with 2 relays (open/close) and 4 to 20mA retransmission.

Instrument Coding Example

	V250 /	01	0	0/	STD
COMMANDER V250 Valve Position Controller					
Two relays + retransmission					
85V to 265V a.c. power supply					
Standard build					
Configured to factory standard					

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