Data Sheet
SS/C310_6

Wall-/Pipe-mount Universal Process Controller

COMMANDER 310

- **IP66/NEMA 4X wall/pipe-mount housing**
  – no need for an instrument panel
- **Single output, Heat/Cool or Motorized Valve control**
  – one controller for every PID control application
- **9 program, 30 segment Ramp/Soak**
  – comprehensive set point profiling capabilities
- **Analog, relay and logic outputs as standard**
  – extensive control output requirements built-in
- **Universal process input with 0.1% accuracy**
  – direct connection of any process signal, simple installation without recalibration
- **RS485 Modbus serial communications**
  – SCADA, PLC and open systems integration

COMMANDER 310 – gives you the control that you need wherever you need it

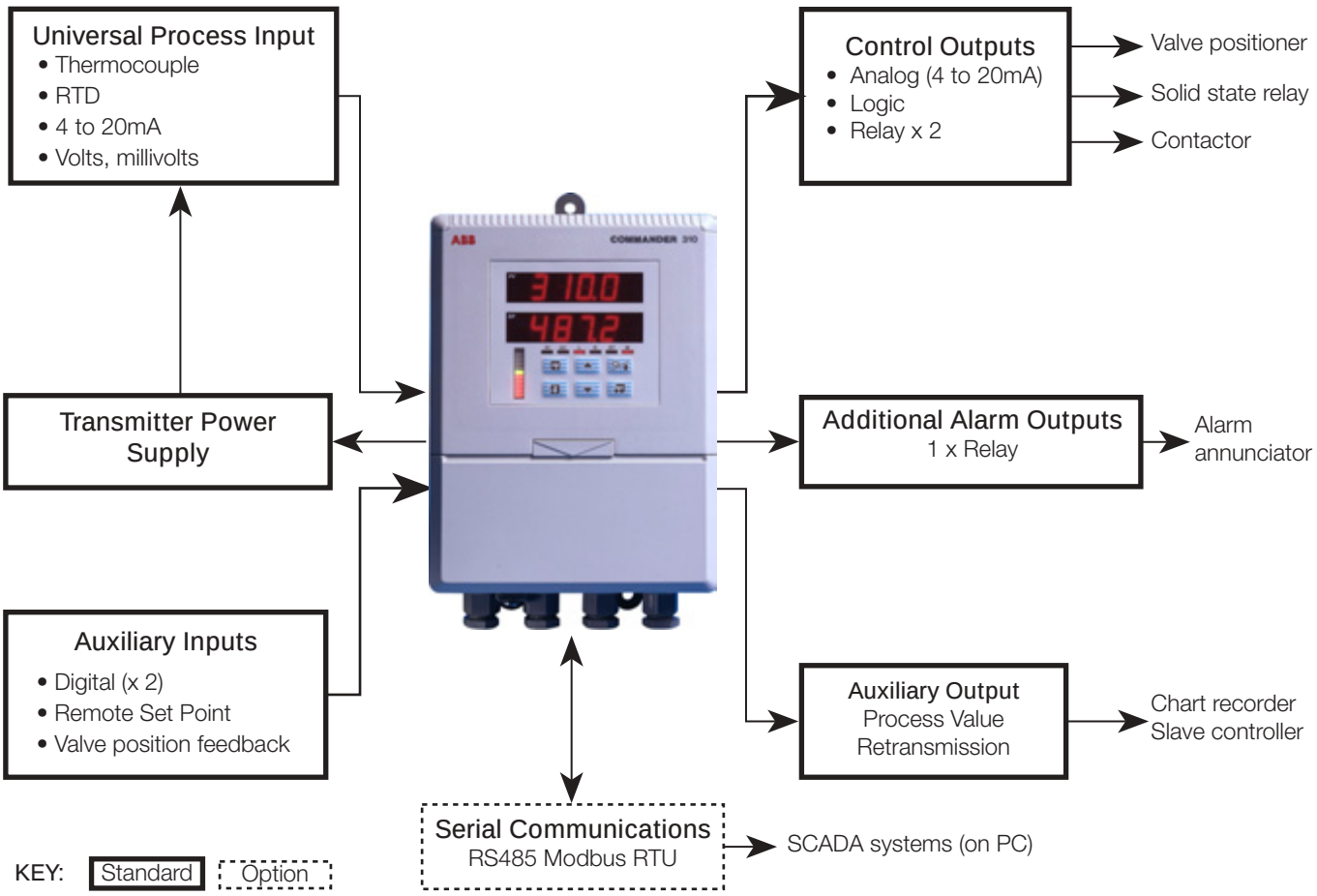
COMMANDER 310

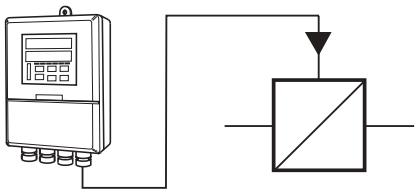
The COMMANDER 310 Wall/pipe-mount Universal Process Controller is a highly versatile single-loop controller packaged in a robust field-mounting housing.

No need to fit an expensive instrument panel when installing or upgrading process equipment. The COMMANDER 310 can be rapidly commissioned by simply fixing it to any flat surface or pipe and making the electrical connections via the cable entry glands on the underside of the unit.

The instrument has extensive control and i/o capabilities fitted as standard, allowing it to be rapidly configured for almost any application.

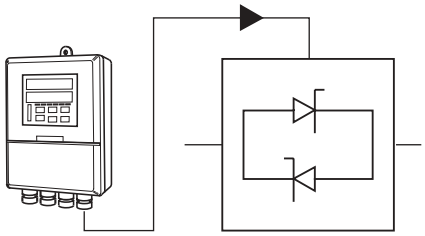
With IP66/NEMA4X water/dust protection the COMMANDER 310 can be mounted right next to your process, no matter how harsh the environment.





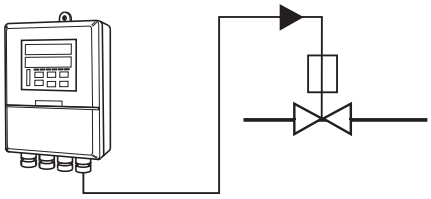
PID Control

The COMMANDER 310's isolated analog output provides the standard control output to I/P converters, thyristors etc. Alternatively, built-in relays can be used to generate a time-proportioning control output.



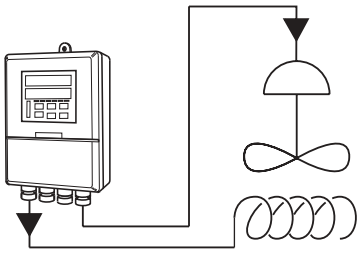
Solid State Relay SSR

A 12V time-proportioning logic output on the standard C310 can be used to drive solid state relays (SSRs).



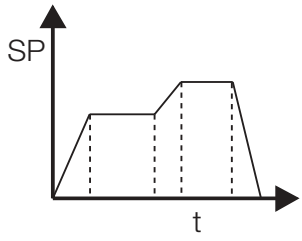
Valve Position

The COMMANDER 310 is fitted with twin relays and a valve-position input for closed-loop control of a motorized valve. 'Boundless' control (without position feedback) and analog control (using 4 to 20mA output) are also available in the standard unit.



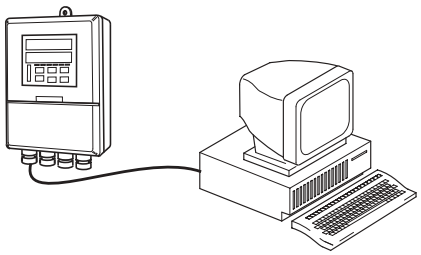
Heat/Cool

Heat/cool control strategies may be implemented on the standard COMMANDER 310, using a combination of the analog control output and one relay.



Ramp/Soak Set Point Profiles

The standard ramp/soak facility provides 30 segments, freely assignable amongst 9 programs. A Segment Event function enables relays to be switched on or off at predetermined points within the program.



Serial Communications

Not only does the COMMANDER 310 provide clear process information in the field, it can also communicate plant data to control rooms via an RS485 link, using Modbus protocol.

Specification

Summary

COMMANDER 310 Wall-/Pipe-mount Universal Controller

P, PI, PID single loop controller

Autotune facility

Fully user configurable

IP66 (NEMA 4X) front face and housing

Operation

Display

High-intensity 7-segment, 0.56 in. (14mm), 2 x 6 red LED display

Configuration

User defined via front panel

Analog Inputs

Number

Three universal process inputs

Type

Universally configurable for:

Channels 1 & 2 (Process Variable & Remote Set Point)	–	Thermocouple (THC) Resistance thermometer (RTD) Millivolt Current DC voltage Resistance
Channel 3 (Actuator Position Feedback)	–	DC voltage Current Resistance

Input sampling rate

160ms per channel

Millivolts/THC	>10MΩ
Voltage	500kΩ
Current	10Ω

Linearizer functions

Programmable for input channels 1 and 2

Sqrt, $X^{3/2}$, $X^{5/2}$ THC types B, E, J, K, R, S, T, L, N or Pt100

Broken sensor protection

Programmable Up/Downscale or None

Cold junction compensation

Automatic CJC incorporated as standard

Temperature limits

THC/RTD type Per NBS125 & IEC584	°C			°F		
	min.	max.	min. span	min.	max.	min. span
Type B	–18	1800	710	0	3272	1278
Type E	–100	900	45	–148	1652	81
Type J	–100	900	50	–148	1652	90
Type K	–100	1300	65	–148	2372	117
Type L	–100	900	50	–148	1652	90
Type N	–200	1300	90	–328	2372	162
Type R & S	–18	1700	320	0	3092	576
Type T	–250	300	60	418	572	108
RTD per DIN43760 & IEC751	–200	600	25	–328	1112	45

Notes.

Performance accuracy is not guaranteed below 400°C (752°F) for types B, R and S thermocouples
RTD, 3-wire platinum, 100Ω, with range of 0 to 400Ω

Min. span below zero Type T 70°C (126°F)
Type N 105°C (189°F)

Electrical limits

Input type	Min. value	Max. value	Min. span
Millivolts	–2000	2000	2.5
Volts	–20	20	0.25
Milliamps	–100	100	0.25
Resistance	0	8000	10

Input noise rejection

Common mode rejection	>140dB at 50/60Hz with 500Ω imbalance
Series mode rejection	>60dB at 50/60Hz

Accuracy

Measurement error	<±0.1% of reading or ±5µV
Linearizer	Typically ±0.1°C (±0.2°F)
Display range	–9999 to +9999
CJC accuracy	<0.05°C/°C change in ambient

Transmitter power supply

24V 30mA max. powers one loop, fitted as standard

Outputs

Control output

Configurable as either:

Analog	in the range of 0 to 20mA
Max. load	15V (750Ω at 20mA)
Accuracy	≤0.1% of span
Isolation	1kV AC
Logic	12V DC (SSR drive)
Max. load	400Ω
Isolation	1kV AC

Retransmission

0 to 20mA configurable for process variable, set point or position feedback values

Max. load	15V (750Ω at 20mA)
Accuracy	≤0.1% of span

Relay outputs

Three relays, configurable for time proportioning control, valve drive or alarms.

SPDT 5A 120/240V AC normally open or normally closed

Option

Serial communications

Connections	–	RS485, 4-wire, 1.2k to 9.6k baud rate
Protocol	–	Modbus RTU

Electrical

Voltage

115V ±15% or 230V ±15% 50/60Hz (link selectable)

Power consumption

<10VA

Power interruption protection

<60ms/<3 cycles, no effect

>60ms/>3 cycles, controlled reset

Line interference

Meets IEC 801 Pt IV level 3 (>2kV spikes)

Environmental

Operating limits

–10° to 55°C (14° to 131°F), 0 to 95%RH non-condensing

Temperature stability

<0.02% of reading or 1µV/°C (0.5µV/°F)

Housing dust/water protection

IP66 (NEMA 4X)

RF protection

Meets IEC 801 Pt. III level 3

EMC

Emissions

Meets requirements of EN50081-2

Immunity

Meets requirements of EN50082-2

Design and Manufacturing Standards

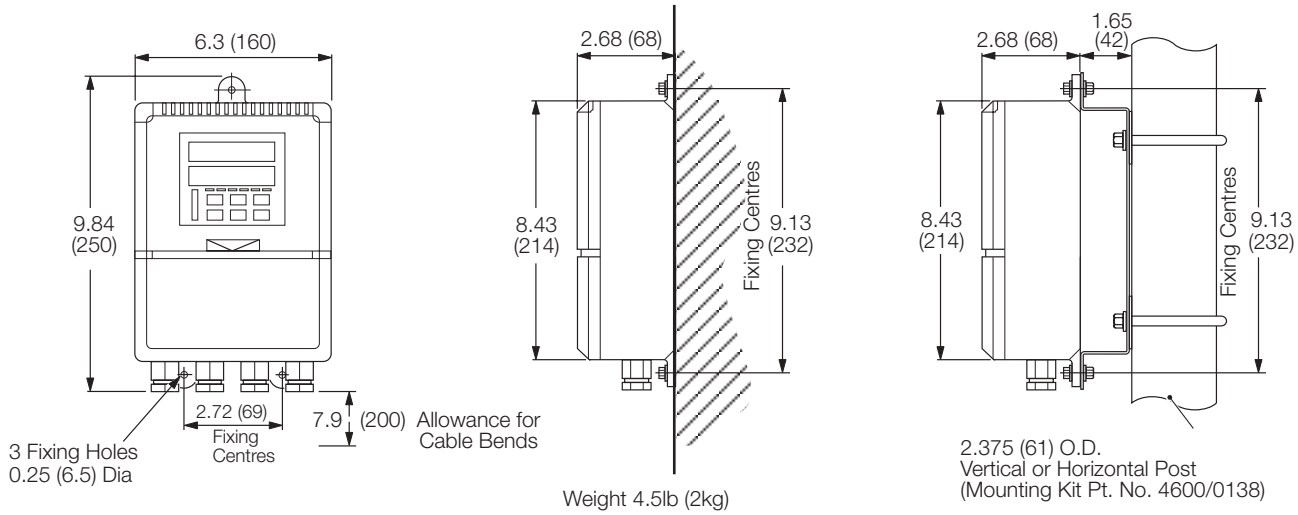
CE

CSA

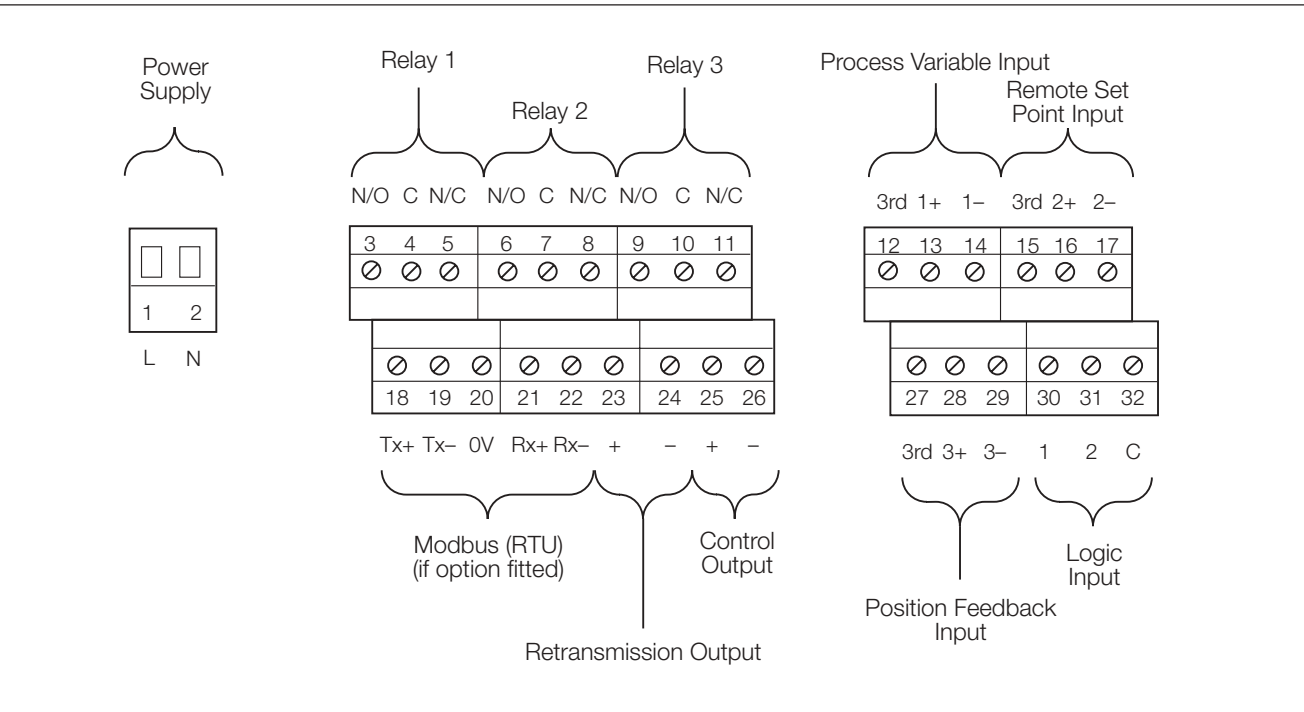
CSA/FM Class 1 Div.2 Hazardous Area

Dimensions

Dimensions in ins. (mm)



Electrical Connections



Ordering Information

COMMANDER 310 Wall-/Pipe-mount Universal Process Controller	C310 /X	X	X	X /	XXXX
Option Board					
None		0 0			
RS485 Modbus Communications		0 1			
Power Supply					
115V AC (NPT fitted with blanking plugs)			1		
230V AC (M20 fitted with cable glands)			2		
115V AC (M20 fitted with cable glands)			4		
230V AC (NPT fitted with blanking plugs)			5		
Build					
Standard				0	
CSA approved (pending)				1	
CSA/FM Cl.1 Div. 2				3	
Programming/Special Features					
Configured to factory standard					STD
Configured to customer detail					CUS
Agreed special features					SPXX

Instrument Coding Example **C310 / 01 1 1 / STD**

COMMANDER 310 Controller

RS485 Modbus Communications

115V AC

CSA approved

Factory standard configuration

ABB has Sales & Customer Support expertise in over 100 countries worldwide

www.abb.com

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