



- **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



**C310 – gives you the control that  
you need wherever you need it**



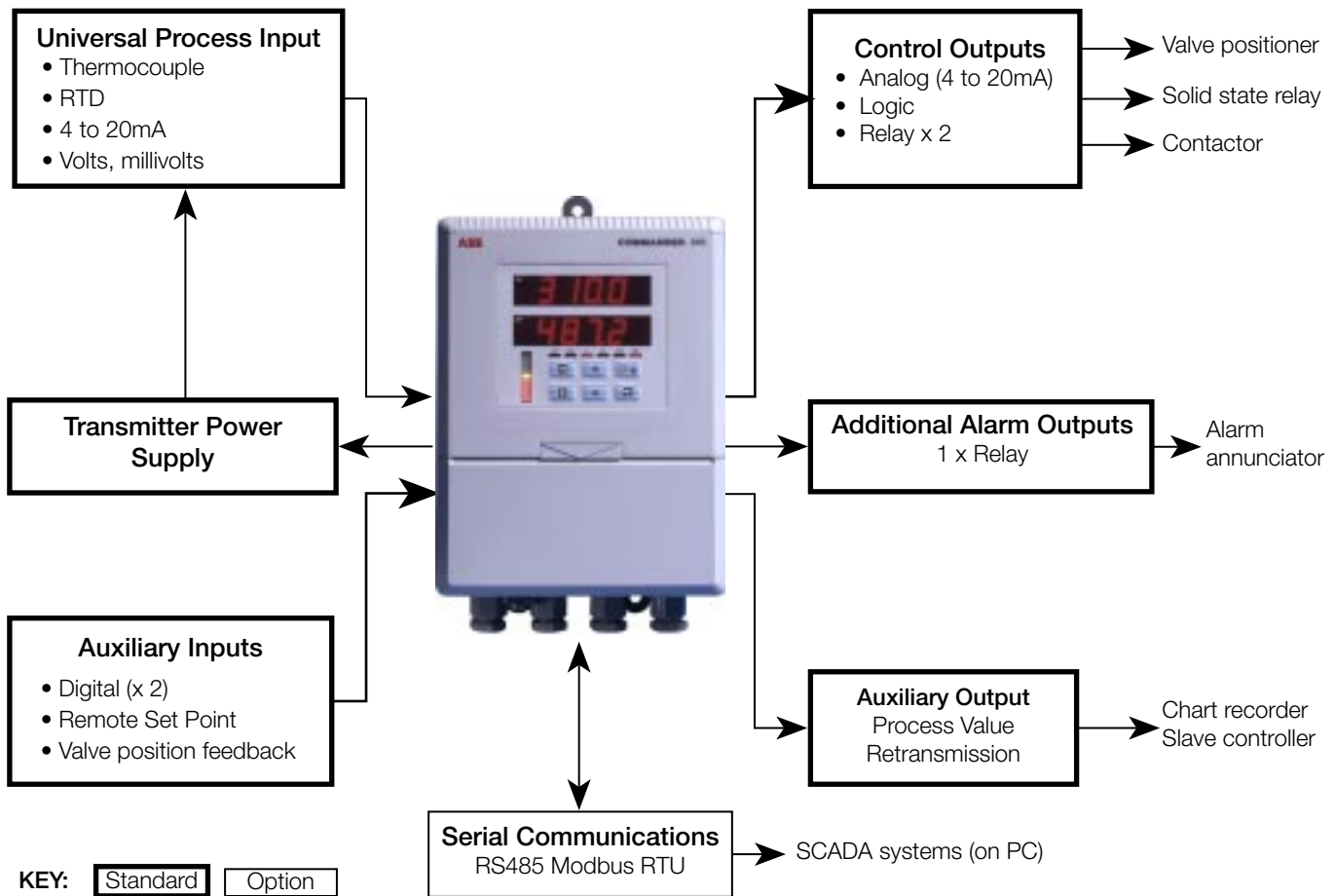
**C310**

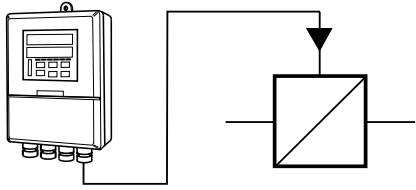
The C310 Wall/pipe-mount Universal Process Controller is a highly versatile single-loop controller packaged in a robust field-mounting housing.

No need to fit an expensive instrument panel when installing or upgrading process equipment. The C310 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.

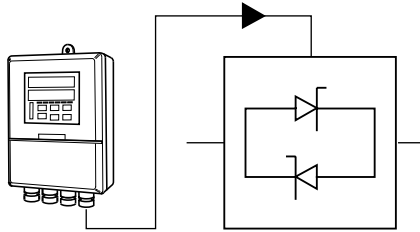
With IP66/NEMA4X water/dust protection the C310 can be mounted right next to your process, no matter how harsh the environment.





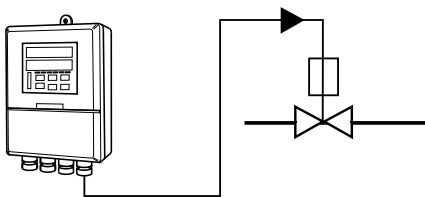
### PID Control

The C310'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.



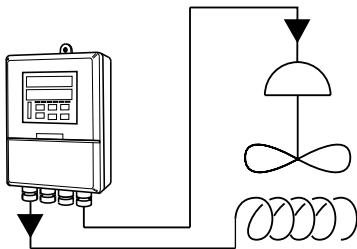
### Solid State Relay SSR

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



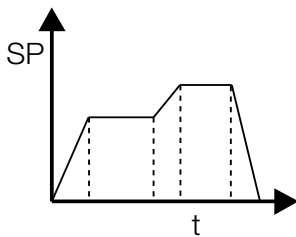
### Valve Position

The C310 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.



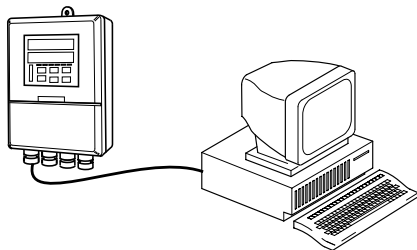
### Heat/Cool

Heat/cool control strategies may be implemented on the standard C310, 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 C310 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

C310 Wall-/Pipe-mount Universal Controller P, PI, PID single loop controller Autotune facility Fully user configurable IP66 (NEMA 4X) front face and housing
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### 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 – Thermocouple (THC)
- (Process Variable & Remote Set Point) Resistance thermometer (RTD)
- Millivolt
- Current
- DC voltage
- Resistance
- Channel 3 – DC voltage
- (Actuator Position Feedback) 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<sup>3/2</sup>, X<sup>5/2</sup> 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:

<b>Analog</b>	in the range of 0 to 20mA
Max. load	15V (750Ω at 20mA)
Accuracy	≤0.1% of span
Isolation	1kV AC
<b>Logic</b>	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

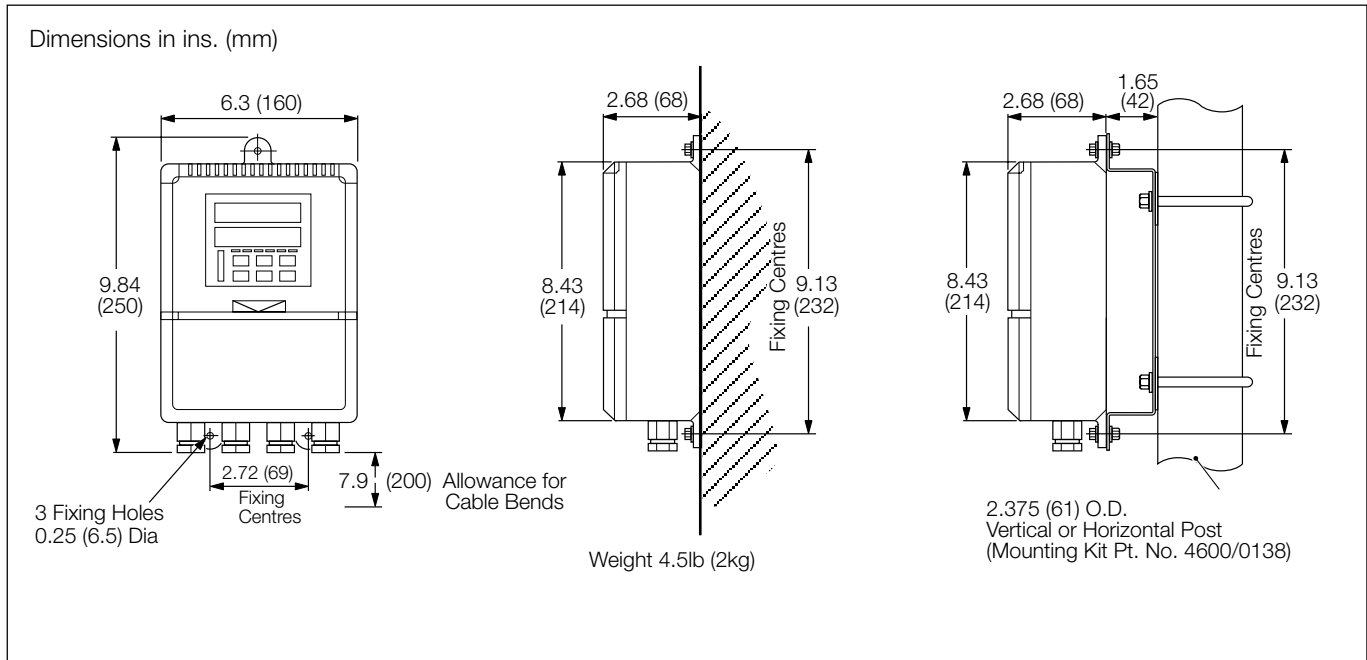
### Design and Manufacturing Standards

CE

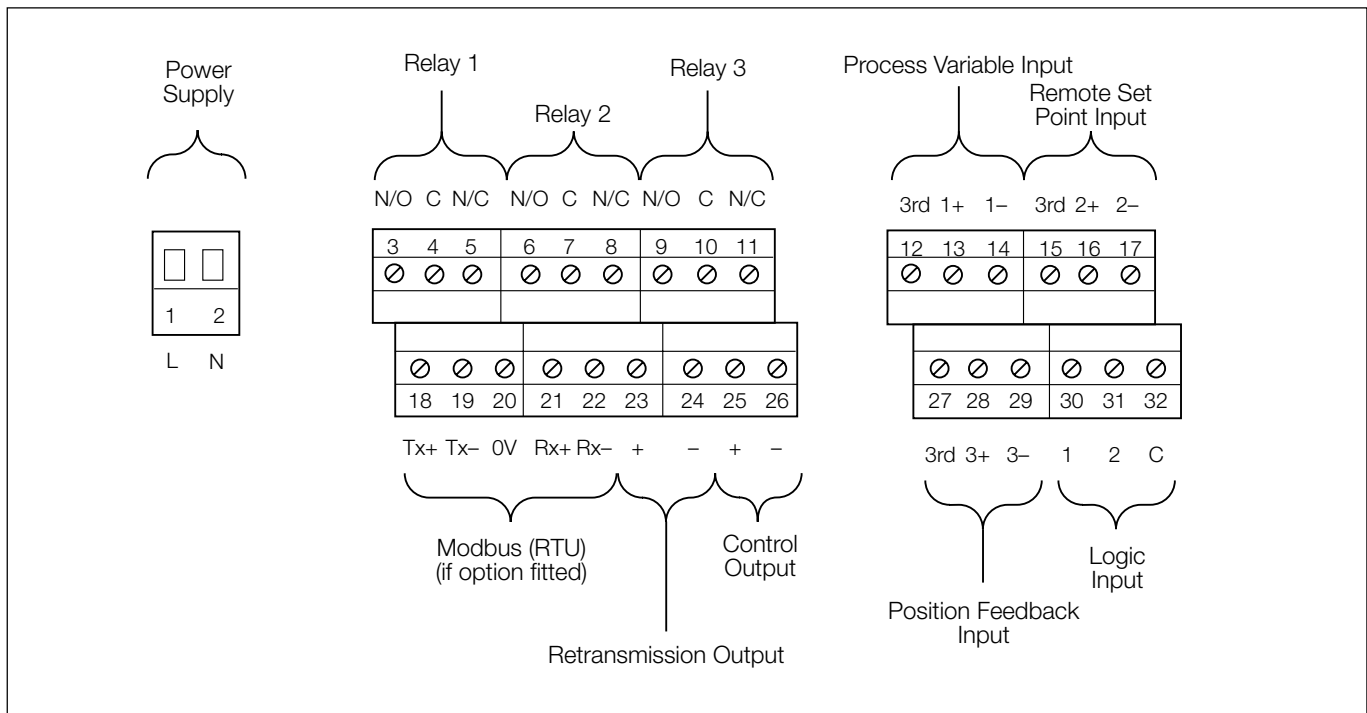
CSA

CSA/FM Class 1 Div.2 Hazardous Area

## Dimensions



## Electrical Connections

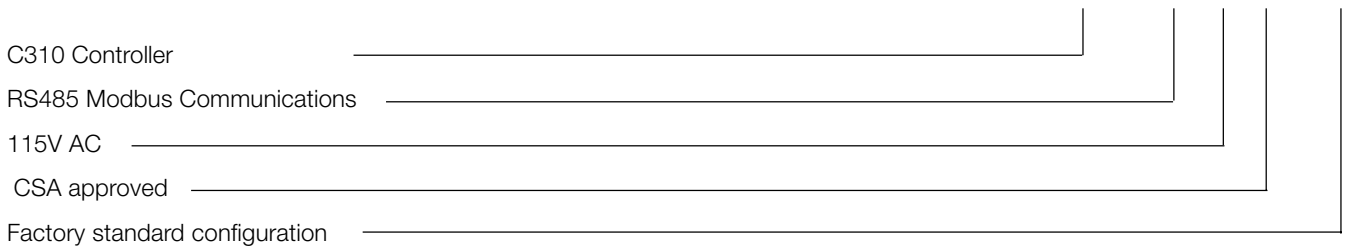


**Ordering Guide**

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

**Instrument Coding Example**

**C310 / 01 1 1 / STD**



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