

*Specification DataFile*

---

- **Single loop PID control with autotune**  
 – easily setup for dependable operation
- **Universal input with 0.1% accuracy**  
 – user programmable for any process signal
- **Analog, relay or logic control output**  
 – full choice to match your application needs
- **5 program, 15 segment Ramp/soak**  
 – with self-seeking set point
- **Alarm relay and retransmission options**  
 – additional outputs for improved process monitoring
- **IP66/NEMA 4X protection and full noise immunity**  
 – reliability in the harshest environments
- **RS485 MODBUS serial communications**  
 – SCADA, PLC and open systems integration



*COMMANDER 200 –  
 the compact 1/4DIN controller  
 with the functions you choose  
 to match your process*

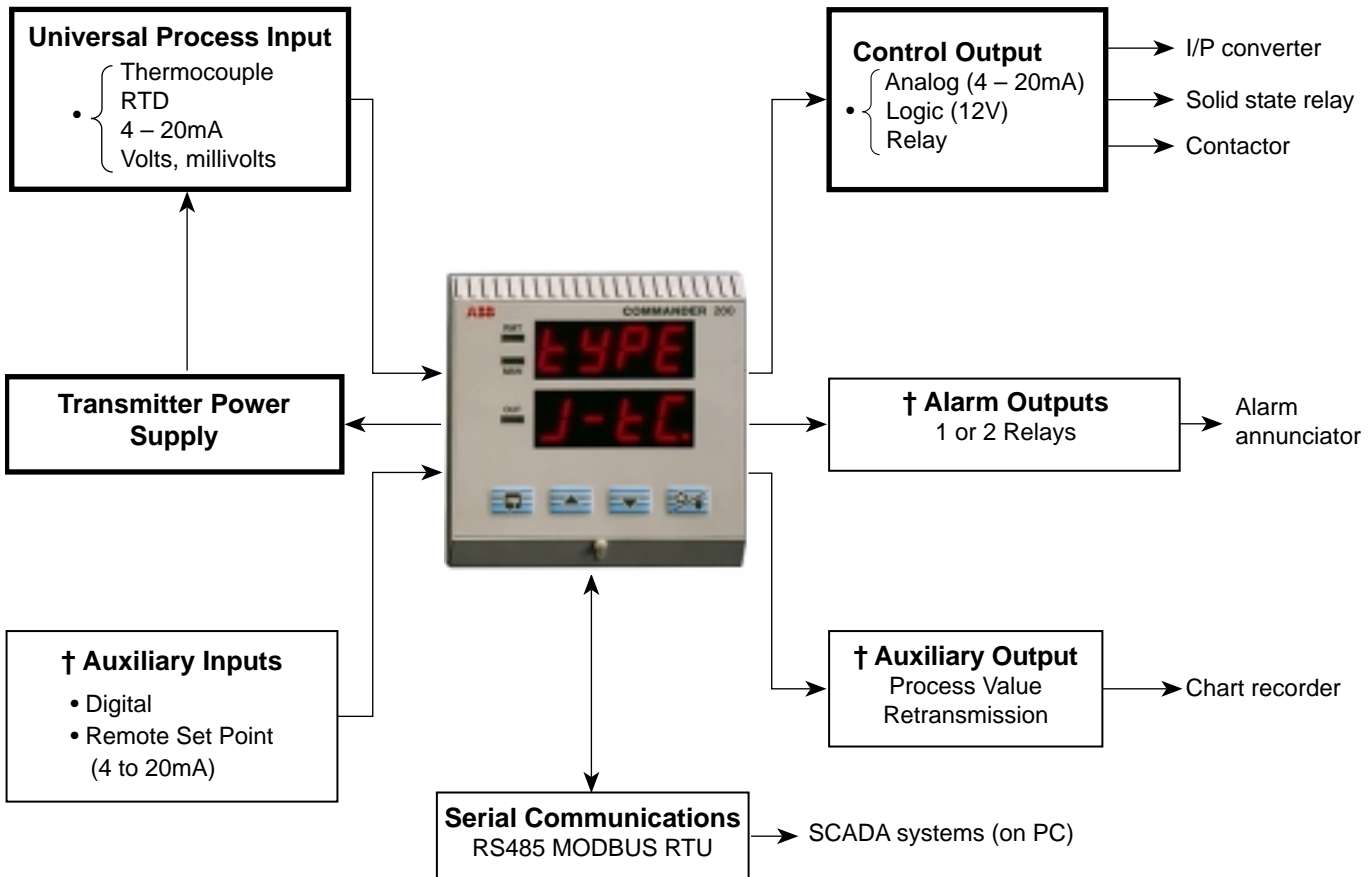
## COMMANDER 200

The COMMANDER 200 is a robust and dependable 1/4 DIN single-loop PID controller. It is designed to display and control any process variable such as temperature, pressure, level or flow.

The **universal process input** is configured by the user to suit the thermocouple, RTD or dc signal from the sensor. The choice of **control output** type, which is specified at the time of order, makes the COMMANDER 200 suitable for a wide range of single loop control applications.

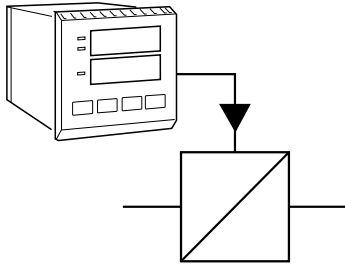
The standard model (C201) incorporates an **autotune** facility for automatic evaluation of the optimum PID values for the application. Advanced versions of the product are available with ramp/soak profiling capability (C202) or flow totalizing facilities (C203).

All versions provide IP66/NEMA 4X water/dust protection on the front face



KEY: Standard Option

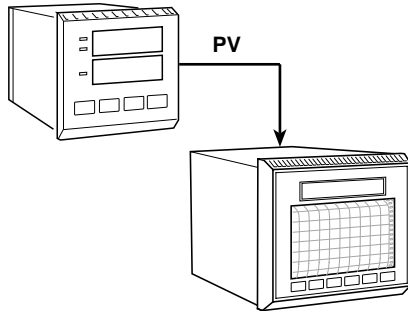
† See I/O option in Ordering Guide page 7



### PID Control

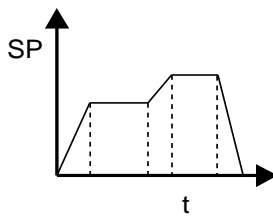
The control output on the COMMANDER 200 is selected at the time of ordering from a choice of three options:

- Relay – 5A time-proportioning for contactor operation
- Logic – 12V d.c. time-proportioning to drive solid state relays (SSRs)
- Analog – 0 to 20mA/4 to 20mA for use with i/p converters and SSRs.



### Process Value Retransmission

The COMMANDER 200 may be fitted with an optional 4 to 20mA auxiliary output for retransmission of process value to a chart recorder.



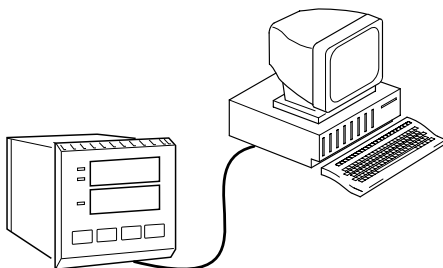
### Ramp/Soak Program Option (C202)

The C202 version of the COMMANDER 200 provides the facility for five user-defined set point profiles with a total of 15 segments. Segment events may be incorporated into the ramp/soak program to allow relays to be activated at predetermined points during the profile.



### Totalizer Option (C203)

The Totalizer version (C203) uses both displays to indicate a totalized value of up to seven digits. Preset values, count direction and reset controls are all user programmable.



### Serial Communications

Fitted with an optional RS485 serial communications board, the COMMANDER 200 can communicate with PLCs and SCADA systems using Modbus protocol.

# Specification

## Summary

COMMANDER 200 1/4DIN PID single loop controller

Autotune facility

Fully user configurable

IP66 (NEMA 4X) front face

## Operation

### Display

High-intensity 7-segment, 0.56" (14mm) 2 x 4 digit red LED display

### Configuration

User defined via front panel

## Analog Inputs

### Number

One universal process input  
Optional 4 to 20mA remote set point input

### Input sampling rate

250ms

### Type

#### Process variable input

Universally configurable for  
Thermocouple (THC)  
Resistance thermometer (RTD)  
Millivolt  
Current  
D.C. voltage

#### Remote Set Point Input

4 to 20mA

### Input impedance

Millivolt 10M $\Omega$  minimum  
Volt 10M $\Omega$  minimum  
Current 100 $\Omega$  nominal

### Linearizer functions

Sqrt, THC types B, E, J, K, R, S, T, N or Pt100

## Broken sensor protection

Upscale

## Cold junction compensation

## Temperature Limits

THC/RTD type	°C		°F	
	min.	max.	min.	max.
Per NBS125 & IEC584				
<b>Type B</b>	-18	1800	0	3272
<b>Type E</b>	-100	900	-148	1652
<b>Type J</b>	-100	900	-148	1652
<b>Type K</b>	-100	1300	-148	2372
<b>Type N</b>	-200	1300	-328	2372
<b>Type R &amp; S</b>	-18	1700	0	3092
<b>Type T</b>	-250	300	418	572
<b>RTD per DIN43760 &amp; IEC751</b>	-200	600	-328	1112

### Notes

Performance accuracy is not guaranteed below 400°C (752°F) for types B, R and S thermocouples

RTD, 3-wire platinum, 100 $\Omega$ , with range of 0 to 400 $\Omega$

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	0	150	10
Volts	0	5	0.1
Milliamps	4	20	1

Automatic CJC incorporated as standard

## Input noise rejection

Common mode isolation >140dB at 50/60Hz with 500 $\Omega$  imbalance

Series mode rejection >60dB at 50/60Hz

## Accuracy

Measurement error < $\pm 0.1\%$  of reading or  $\pm 20\mu\text{V}$  (volts, millivolts and current)  
 $\pm 1.0^\circ\text{C}$  ( $\pm 1.8^\circ\text{F}$ ) RTD  
 $\pm 1.5^\circ\text{C}$  ( $\pm 2.7^\circ\text{F}$ ) THC types J, K, E, T, N  
 $\pm 2.0^\circ\text{C}$  ( $\pm 3.6^\circ\text{F}$ ) THC types R, S, B

Display range -999 to +9999

CJC accuracy < $0.05^\circ\text{C}/^\circ\text{C}$  change in ambient temperature

## Process input isolation

500V d.c. (channel to ground)

---

## Transmitter power supply

Isolated 24V d.c. supply for one 2-wire transmitter loop on process variable input

---

## Outputs

### Control output

#### Either

Relay, SPST 5A at 120/240V a.c. normally open or normally closed (On/Off or time-proportioning)

#### Or

Analog, configurable in the range of 4 to 20mA

Max. load 15V (750Ω at 20mA)

Accuracy  $\leq 0.25\%$  of span

#### Or

Logic, (12V) on/off or time proportioning for control of solid state relays.

Max. load 400Ω

### Alarm relays

Up to two additional relays can be used for alarms, ramp/soak or totalizer function

SPST 5A 120/240V a.c. normally open or normally closed dry contact

---

## Options

One option board only can be installed – see ordering guide page 7

### Remote set point input (Ratio/Bias Input)

4 to 20mA d.c. 100Ω nominal input impedance

Scalable in engineering units –999 to 9999

### Digital input

Dry contact or TTL level

### Retransmission (Chart Recorder Output)

Max. load 15V (750Ω at 20mA)

Accuracy  $\leq 0.25\%$  of span

### RS485 four-wire serial communications

Connections – RS485, 2 or 4-wire, 1.2k to 9.6k baud rate

Protocol – MODBUS RTU code option 5

ANSI (slave) code option 4

---

## Ramp/Soak Totalizer

### Profile version (C202)

Max. no. of programs 5

with up to 15 ramp/soak segments per program

### Totalizer version (C203)

7-digit, pre-determined and secure totals

---

---

## Electrical

### Voltage

115V  $\pm 15\%$ , 230V  $\pm 15\%$  (50/60Hz) (link selectable)  
24V a.c.

### Power consumption

<10VA

### Power interruption protection

<60ms/<3 cycles, no effect

>60ms/>3 cycles, controlled reset

### Line interference

Meets IEC801 Pt. IV level 3 (>2kV spikes)

### Electrical safety

CE marked instruments meet EU regulations

CSA approved

UL approved

---

## Environmental

### Operating limits

0° to 55°C (32° 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

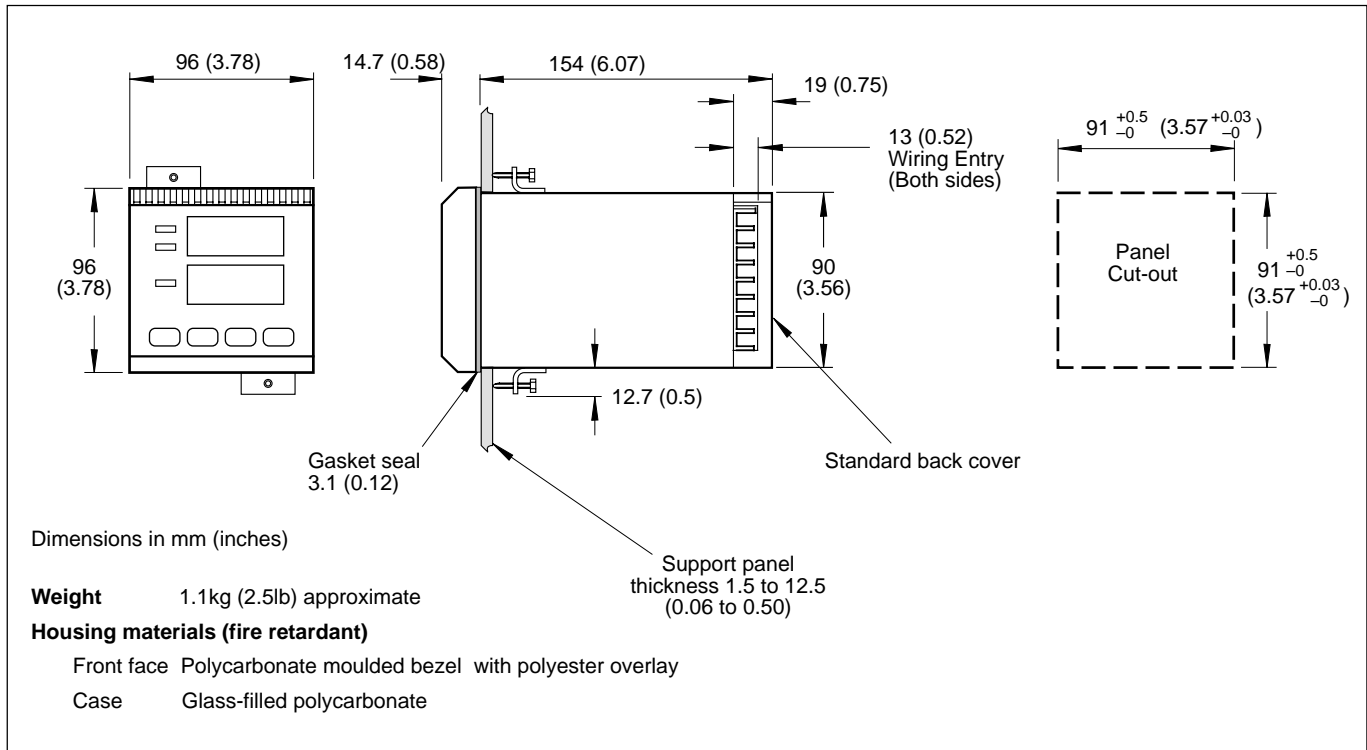
IP66 (NEMA 4X)

### RF protection

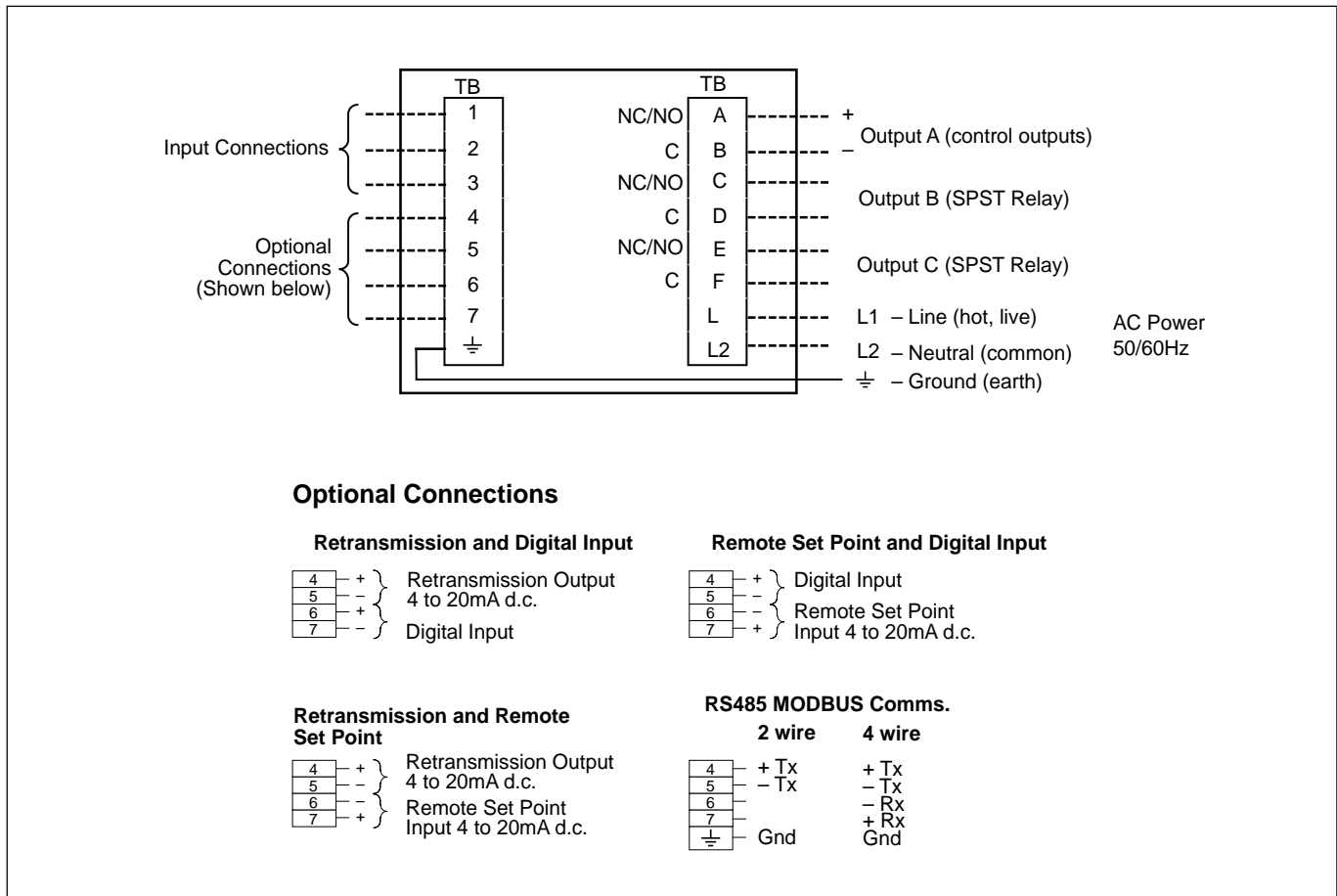
Meets IEC 801 Pt. III level 3

---

## Dimensions



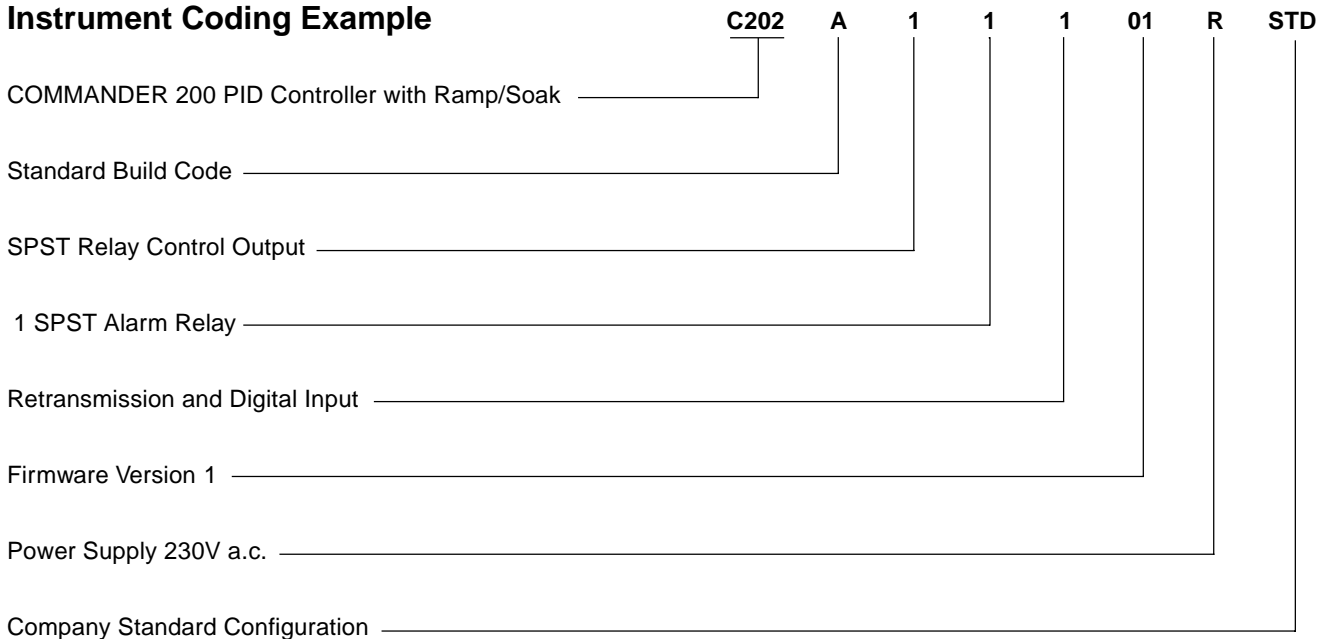
## Wiring Connections



## Ordering Guide

COMMANDER 200 Controller		C20	X	X	X	X	X	0	1	X	X	X	X	
PID Controller			1											
PID Controller with Ramp/Soak			2											
PID Controller with Totalizer			3											
<b>Build</b>	Standard			A										
	CSA Approved			B										
	UL Approved			C										
<b>Control Output</b>	SPST Relay				1									
	Logic				2									
	Analog (4–20mA)				3									
<b>Alarm Relays</b>	None					0								
	1 SPST Relay					1								
	2 SPST Relays					2								
<b>I/O Options</b>	None						0							
	Retransmission and digital input						1							
	Remote set point and digital input						2							
	Retransmission and remote set point						3							
	RS485 Serial Communications (ANSI)						4							
	RS485 Serial Communications (MODBUS)						5							
<b>Firmware Version</b>	Version 1							0	1					
<b>Power Supply</b>	115V a.c. (excl. USA)										P			
	115V a.c. (USA only)										U			
	230V a.c.										R			
	24V a.c.										T			
<b>Configuration</b>	Company Standard											S	T	D
	Customer Setting											C	U	S
	Special											S	X	X

## Instrument Coding Example





The Company's policy is one of continuous product improvement and the right is reserved to modify the information contained herein without notice.  
© ABB 1998 (4.98)

---

**ABB Instrumentation Ltd**  
Howard Road  
St. Neots, Cambs.  
England, PE19 3EU  
Tel: +44 (0)1480-475-321  
Fax: +44 (0)1480-217-948

**ABB Automation Inc  
Instrumentation Division**  
125 E. County Line Road  
Warminster, PA 18974 USA  
Tel: +1 215-674-6000  
Fax: +1 215-674-7183

**ABB Instrumentation**  
22016 Lenno  
Como  
Italy  
Tel: +39 (0)344-58111  
Fax: +39 (0)344-58278