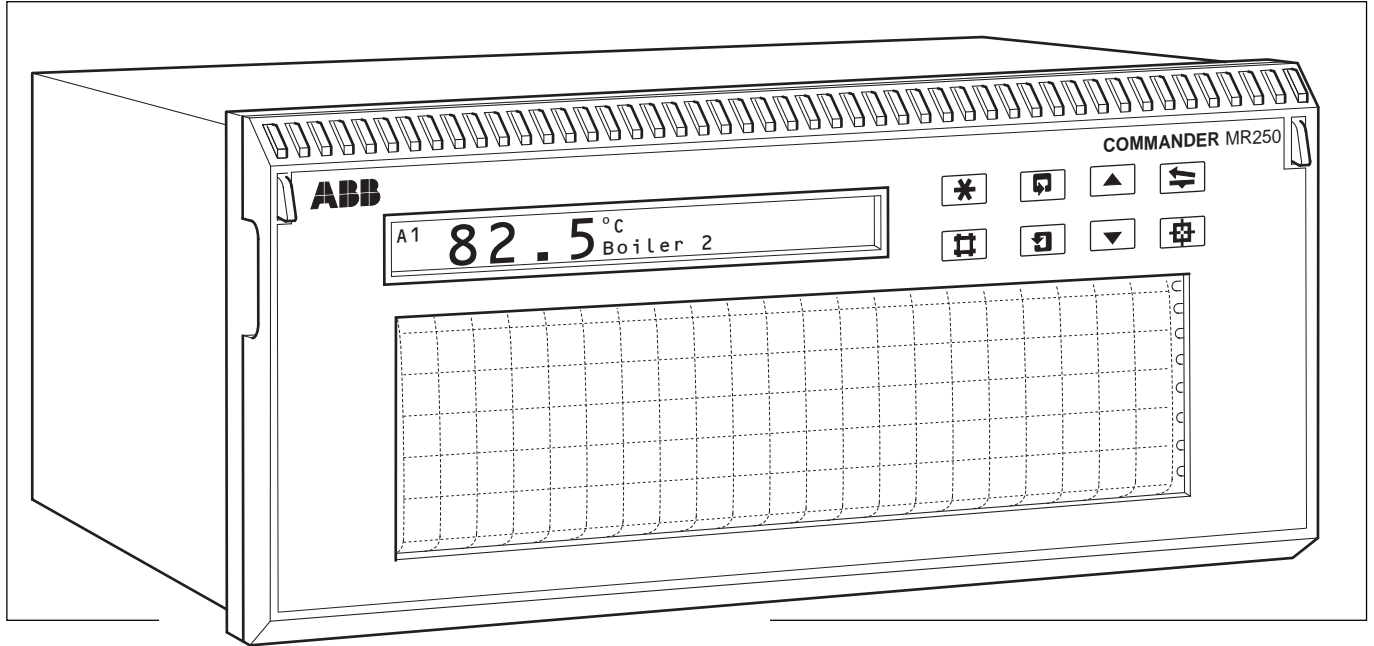


Specification DataFile



COMMANDER MR250

Simplicity and ease of use in a rugged, compact 250mm recorder

- | | |
|--|---|
| <ul style="list-style-type: none"> ■ 12-Channel recording on 250mm Chart
– with individual trace colours ■ Universal process inputs
– accept thermocouples, RTD's, mA, mV & V ■ Clear text annotation on chart
– time, date, scales, speed, alarms and batch | <ul style="list-style-type: none"> ■ High clarity graphics display
– shows process status at a glance ■ Dust- and water-resistant to IP65
– for harsh industrial environments ■ MODBUS® Serial communications
– provide full integration with your control system |
|--|---|
-

COMMANDER MR250

The **COMMANDER MR250** provides accurate and reliable recording of up to 12 process signals on a 250mm wide chart. In-built text printing capabilities give clear annotation on the chart of time, date, scales and other process information.

The clear view of process status from the **LCD display** with the simplicity of chart and pen replacement make the MR250 extremely easy to operate.

The recorder is designed for panel mounting and provides IP65 dust and water protection on the front face, making it suitable for use in harsh environments.

The MR250 can be configured for a wide range of input types and chart speeds and is ideal for most industrial recording applications.

Application areas include:

- **Heat Treatment**
- **Ceramics Manufacture**
- **Cold Storage**
- **Power Generation**

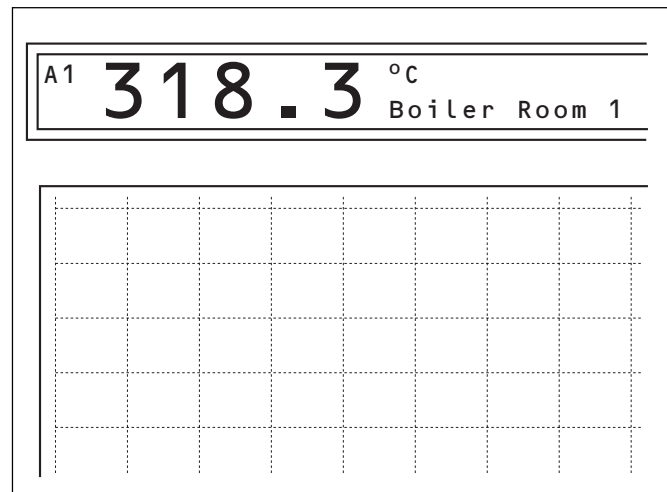
Recording

The COMMANDER MR250's high-speed multi-point printing system updates all 12 traces in 2.2 seconds. This system produces **continuous lines** on the chart for speeds of up to 500mm/hr.

The **printing sequence** is intelligently managed by the recorder's control system to give priority to fast-changing signals, ensuring the most comprehensive process record is traced on the chart.

The MR250 supports full **text printing** to provide detailed annotation on the chart. In addition to the time, date, channel identity and chart speed, the recorder can print scales for each channel, alarm messages and an operator-entered batch name.

The '**Easy-view**' facility enables the user to see the latest recordings at the push of a button.



Operation

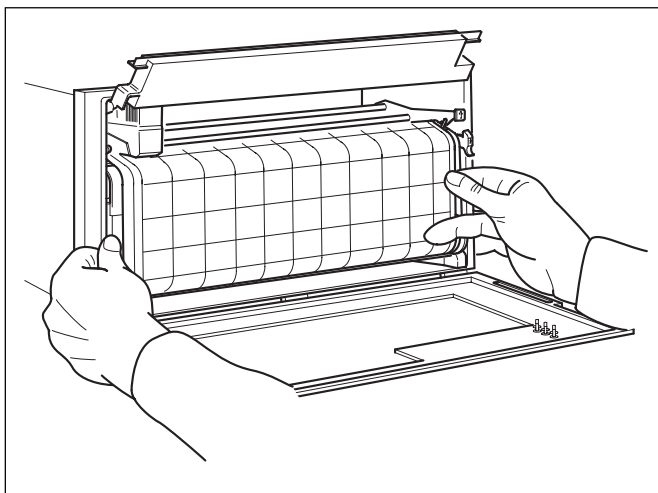
A graphic **LCD display** provides exceptional clarity for day-to-day operation and for configuration.

During normal operation the display cycles through each channel in sequence, showing the measured value, engineering units, description and channel identifier.

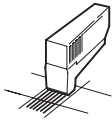
Clear text prompts on the LCD display assist the operator in accessing functions, such as chart reload and alarm acknowledge. Tactile membrane keys on the front of the recorder are used to access these functions. A second, identical keypad is provided inside the recorder for use when the door is open.

Password protection prevents unauthorized access to the recorder's configuration.

Quickly-fitted pen cartridges and an easily-removable chart cassette ensure simple and efficient pen and chart replacement.



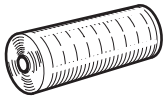
SUMMARY SPECIFICATION



A **6-color print-head** using our patented **Z-trace** printing provides 12 unique traces, all of which are updated every 2.2 seconds.



The recorder prints **time, date and chart speed** automatically at regular intervals. Channel scales and batch identifiers can also be printed on the chart periodically or on demand.



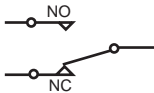
Roll charts with a recording width of 250mm are available with 80, 100, 120, 140 and 150 divisions.



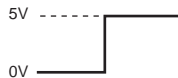
Universal process inputs can be set up for all standard types of thermocouple, RTD, 4 to 20mA and V or mV signals. All 12 inputs are sampled every 1.5 seconds. Transmitter power supplies are available for loop-powered devices.



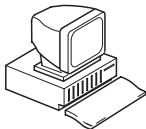
Up to **24 process alarms** can be set up within the recorder. Alarm status can be printed on the chart and the alarms can operate relay outputs or change the chart speed.



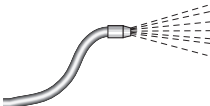
A maximum of **12 relays** can be fitted within the recorder for use as alarm outputs. A single common relay can be set to be triggered by multiple alarms.



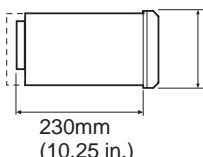
A **digital input** is provided on every Input Module for remote changing of chart speed or alarm acknowledgment.



RS485 2 or 4-wire communications using MODBUS protocol provides a real-time link to SCADA systems or PLCs.



The **IP65** front face and door seals protect panel-mounted recorders against dust and water jets from most cleaning hoses.



Width 327mm (12.87 in.)

With a **panel depth** of only 230mm (9 in.) and weighing less than 6kg (13 lb) the **COMMANDER MR250** is the most compact 250mm recorder available.

Set-up

The COMMANDER MR250 can be easily set up to match your process in either of two ways:

Entry of the correct password via the keyboard on the front of the unit gives access to the recorder's configuration. A simple menu structure with clear text descriptions provides an intuitive approach to the recorder set-up.

The preferred configuration method for multiple COMMANDER MR250 recorders is by means of the COMMANDER Configurator. This Windows-based package provides a simple 'point-and-click' approach to generating a full recorder configuration off-line. The completed configuration can be printed out or saved onto disk before being downloaded to the recorder.

A COMMANDER interface cable is used to provide the connection between the PC's serial port and the configuration port on the recorder.

Cue-and-Review

The COMMANDER MR250's unique Cue-and-Review allows the user to rapidly search any part of the roll chart for process events or alarm occurrence – enabling rapid and accurate analysis of process records.

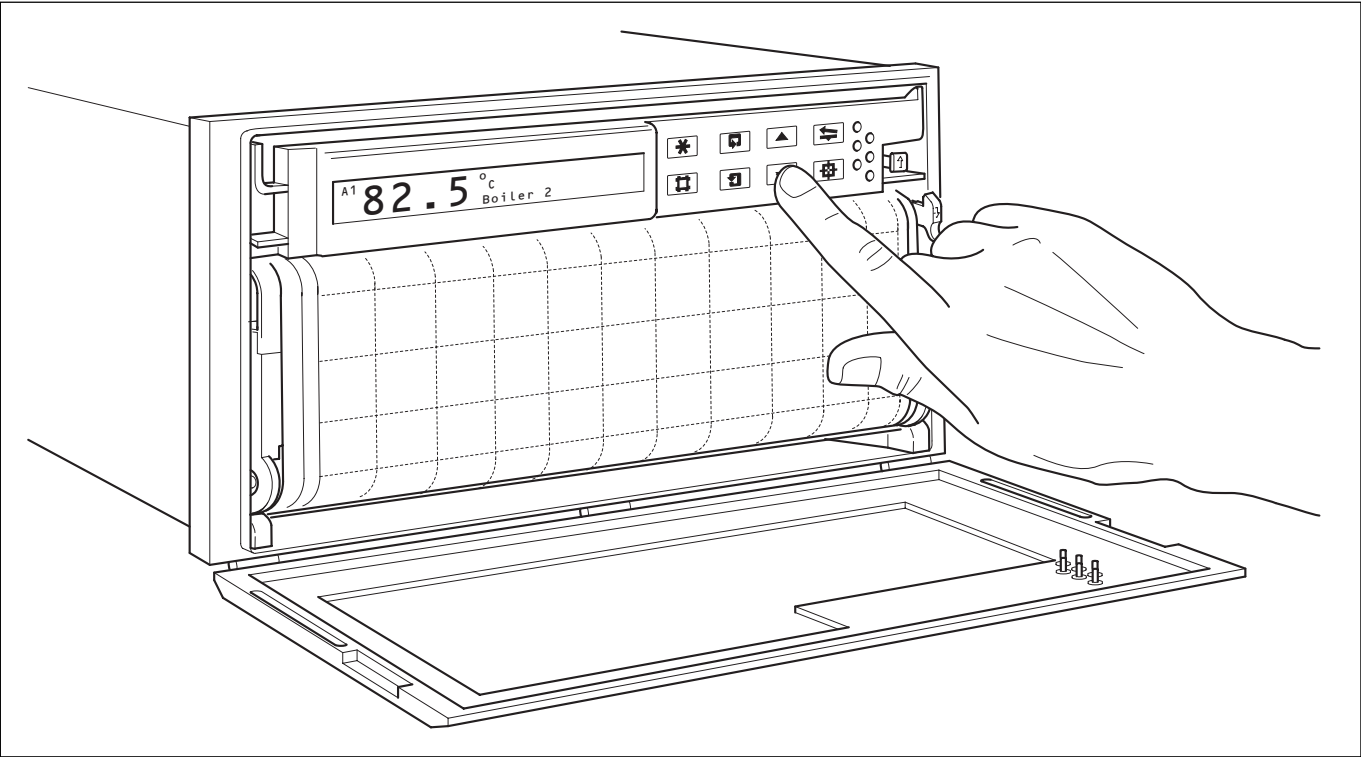
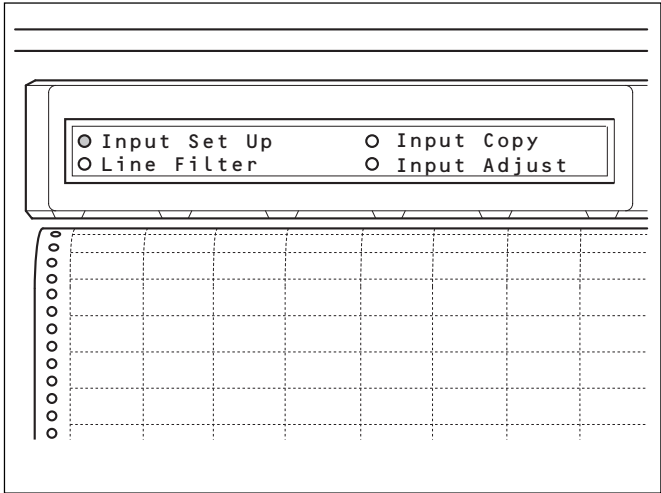
Option Modules

All recorders are fitted with at least one universal input module for analog process signals plus a transmitter power supply for up to two 2-wire transmitters.

The capabilities of your recorder can be extended further by the addition of option modules. Each recorder can support up to 2 input modules plus 3 option modules.

I/O Options

Type	Standard	Option
Universal Inputs	3, 6, 9 or 12	
Relays	0	12
Transmitter Power Supply (loops)	2	12
Serial Communications	X	✓



PERFORMANCE SPECIFICATIONS

CHART

Traces

Up to 12

Colors

Channel 1 to 6 Magenta, Red, Black, Green, Blue and Brown

Channel 7 to 12 Bi-color, Z-traces

Pen Life

3 months typically (at 20mm/hr with normal scale printing)

Chart

25m Roll chart

Quick-load cassette

Standard chart graduation: 100 divisions

80, 120, 140, 150 divisions also available

Chart Speed

1mm to 1500mm/hr

Remote speed change

Trace Response

2.2s for print-out of 12 traces

1.5s for print-out of 6 traces

Trace Resolution

0.2mm

Text Messages

1 operator message for batch identification (20-character)

24 alarm messages (20 characters)

OPERATION

Graphics display – backlit LCD

Characters 10.4mm high – process variables
5.1mm high – text

Display of Process Variable

Display range –9999 to +9999

Languages

User configurable for English, French or German

Switches

Sealed tactile membrane – duplicate keypads on door and inside case

ANALOG INPUTS

Number

3, 6, 9 or 12, Standard Analog Inputs

Input Sampling Rate

125ms per channel – 12 channels in 1.5s

Type

Universally Configurable for:

Thermocouple (THC)

Resistance thermometer (RTD)

Millivolt, Current, Voltage, Resistance

Linearizer Functions

$\sqrt{\quad}$, $x^{3/2}$, $x^{5/2}$

THC types B, E, J, K, R, S, T, L, N

Pt100 (IEC751)

Broken Sensor Detection

Programmable to drive UP/DOWN scale

RTD short/open circuit detection

Cold Junction Compensation

Automatic CJC incorporated as standard

< 0.05°C per °C/change in ambient

Input impedance

Current 10Ω

Voltage 500kΩ

mV & THC >10MΩ

Input

Channel to channel dielectric strength 12V d.c.

Channel to ground 500V d.c.

Common Mode Rejection

> 120dB at 50/60Hz with 300Ω imbalance resistance

Series Mode Rejection

> 60dB at 50/60Hz

Temperature Stability

0.02% of reading/°C or 2μV/°C (whichever is greater)

Long Term Drift

< 0.01% of reading or ±5μV annually

Filtering

Off, 5 to 60s digital filter

2-wire Transmitter Power Supply

45mA max. (2 loops), fitted as standard.

Additional loops can be powered from optional TXPSU modules

ALARMS

24 high/low process alarms with programmable level and time hysteresis

4 real-time events with programmable on-time and duration

ELECTRICAL

Power supply

85 to 265V 50/60Hz

24V dc ±4V (optional)

Line interruption

<80ms loss, no effect

>80ms loss, auto-reset and restart

Power consumption

35VA max

Electrical safety

EN61010-1, IEC348

CSA (optional)

Electrical connections

Screw terminals

OPTION MODULES

3 or 6 Relay Output Module

Universally assignable to any alarm signal
 Relay type Single pole changeover
 Voltage 250V a.c. 30V d.c.
 Current 5A a.c. 5A d.c.
 Loading (non-inductive) 1250VA 150W
Note. The total load for all relays within the instrument must not exceed 36A.

2-wire Transmitter Power Supply Module

Two isolated 24V outputs (45mA each)
 Each output capable of driving 2 loops

RS485 Serial Communication (MODBUS) Module

EIA communications standard RS485 (2 or 4-wire)
 Protocol MODBUS rtu (slave)
 Baud rate User selectable up to 9600
 Isolation 500V from rest of instrument

PHYSICAL

Size

326.8mm (12.87in.) x 147mm (5.78in.)
 x 230mm (9.00in.) (depth behind panel)

Weight

< 6kg (13lbs.)

Panel cut-out

303mm (11.92in.) x 138mm (5.43in.)

Case material:

Stainless steel, painted

Door material

Glass-filled polyarylamide

Window material

Polycarbonate

Keyboard material

Polyester

INPUT RANGES AND ACCURACY

Input Ranges

Input Type	Min. Value	Max. Value	Min. Span	Accuracy (% of reading)
Millivolts	−2000	2000	2.5	±0.1% or ±10μV
Volts	−20	20	0.25	±0.2% or ±2mV
Milliamps	−100	100	0.25	±0.2% or ±2μA
Resistance	0	8000	10	±0.2% or ±0.08Ω

ENVIRONMENTAL

Operating limits

0 to 50°C (32° to 122°F),
 Electronics < 95%RH (non-condensing)
 Chart < 80%RH (non-condensing)

Storage temperature limits

−20°C to 80°C

Dust/Water Protection

Front face IP65
 Rear of instrument IP20

Electromagnetic Compatibility

EN50081-2, EN50082-2
 CE marked

Vibration

Designed to meet IEC68

Thermocouple and RTD Ranges and Accuracy

THC/RTD Type	°C				°F			
	Min.	Max.	Min. Span	Accuracy	Min.	Max.	Min. Span	Accuracy
Type B	−18	1800	710	±2.0*	0	3272	1278	±3.6*
Type E	−100	900	45	±0.5	−148	1652	81	±0.9
Type J	−100	900	50	±0.5	−148	1652	90	±0.9
Type K	−100	1300	65	±0.5	−148	2372	117	±0.9
Type L	−100	900	50	±0.5	−148	1652	90	±0.9
Type N	−200	1300	90	±0.5	−328	2372	162	±0.9
Type R & S	−18	1700	320	±0.1*	0	3092	576	±1.8*
Type T	−250	300	60	±0.5	−418	572	108	±0.9

* For thermocouple types B, R and S performance accuracy cannot be guaranteed below 300°C (572°F).

RTD	−200	600	25	±0.5**	−328	1112	45	±0.9**
-----	------	-----	----	--------	------	------	----	--------

** For temperatures between 300° and 600°C (572° and 1112°F) accuracy is ±1.0° (±1.8°).

Ordering Guide

COMMANDER MR250 Recorder		MR250 /	XXS /	X00	/ X	X	X	/ X	X	X	XX
Number of Traces and Input Channels	3	0 3									
	6	0 6									
	9	0 9									
	12	1 2									
Build	Basic		B								
	CSA (pending)		C								
	UL (pending)		U								
Option Module E	None			0							
	3 relays			3							
	6 relays			6							
	Transmitter power supply			T							
Option Module F	None			0							
	3 relays			3							
	6 relays			6							
	Transmitter power supply			T							
Option Module G	None						0				
	MODBUS serial comms.						S				
	Transmitter power supply						T				
Case Type	Standard							1			
	Standard + Terminal cover							2			
Chart Type	Roll chart								1		
Power Supply	85V to 265V a.c.									2	
	24V a.c./d.c.									3	
Configuration	Custom – complete Configuration Details, below Standard										CM ST

Configuration Details

For instrument configuration please complete this form and return it with your order.

Channel	Input Type	Linearization Type	THC and Pt100			mA, mV, V and Resistance				
			Linearizer Range			Range		Display		
			Units	Zero	Span	Zero	Span	Zero	Span	Units
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
ST	mA	None				4	20	0	1000	
e.g. 1	mA	None	–	–	–	4	20	0	100	bar
e.g. 2	THC	R	°C	0	1400	–	–	–	–	

Default configuration as ST above.

Electrical Connections

Note. Refer to instrument code for module positions

Instrument viewed from rear

A	B		E	F	G	H
---	---	--	---	---	---	---

H
Power Supply

1	⊗	L	Line	
2	⊗	N	Neutral	AC
3	⊗	E	Earth	
4	⊗	+	+	DC
5	⊗	-	-	
6	⊗			
7	⊗	+24V	+	2-wire Transmitter
8	⊗	0V	-	DC Power

A, B
Analog Input Connector

⊗	1	+	Analog I/P 1
⊗	2	-	
⊗	3		3rd lead RTD
⊗	4	+	Analog I/P 2
⊗	5	-	
⊗	6		3rd lead RTD
⊗	7	+	Analog I/P 3
⊗	8	-	
⊗	9		3rd lead RTD
⊗	10	+	Analog I/P 4
⊗	11	-	
⊗	12		3rd lead RTD
⊗	13	+	Analog I/P 5
⊗	14	-	
⊗	15		3rd lead RTD
⊗	16	+	Analog I/P 6
⊗	17	-	
⊗	18		3rd lead RTD
⊗	19		Logic I/P
⊗	20		0V

E, F
Relay Output

⊗	1	NC	Relay 1
⊗	2	NO	
⊗	3	C	Relay 2
⊗	4	NC	
⊗	5	NO	Relay 3
⊗	6	C	
⊗	7	NC	Relay 4
⊗	8	NO	
⊗	9	C	Relay 5
⊗	10	NC	
⊗	11	NO	Relay 6
⊗	12	C	
⊗	13	NC	Relay 7
⊗	14	NO	
⊗	15	C	Relay 8
⊗	16	NC	
⊗	17	NO	Relay 9
⊗	18	C	
⊗	19	NC	Relay 10
⊗	20	NO	

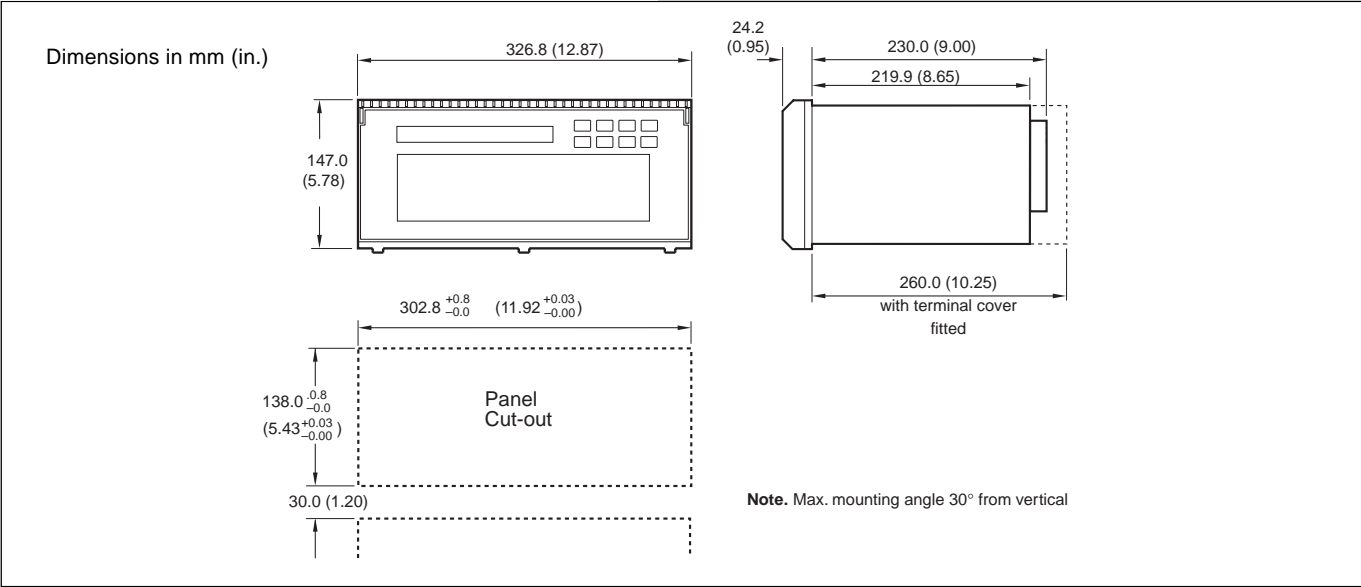
E, F, G
Transmitter DC Power Supply

⊗	1	+	24V
⊗	2	-	
⊗	3		24V
⊗	4	-	
⊗	5		24V
⊗	6	+	
⊗	7	-	24V
⊗	8	+	
⊗	9	-	24V
⊗	10		
⊗	11		24V
⊗	12	-	
⊗	13		24V
⊗	14	+	
⊗	15	-	24V
⊗	16		
⊗	17		24V
⊗	18	+	
⊗	19	-	24V
⊗	20		

G
RS 485 Comms

⊗	1	-	TX 4-wire
⊗	2	+	
⊗	3	-	TX 4-wire
⊗	4	+	
⊗	5	+	TX/RX 2-wire & RX 4-wire
⊗	6	-	
⊗	7	+	TX/RX 2-wire & RX 4-wire
⊗	8	-	
⊗	9	+	Common
⊗	10	-	
⊗	11		Common
⊗	12		
⊗	13		Common
⊗	14		
⊗	15		Common
⊗	16		
⊗	17		Common
⊗	18		
⊗	19		Common
⊗	20		

Overall Dimensions



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 Kent-Taylor Ltd. St. Neots Cambs. England, PE19 3EU Tel: +44 (0) 1480 475321 Fax: +44 (0) 1480 217948	ABB Instrumentation Inc. PO Box 20550, Rochester New York 14602-0550 USA Tel: +1 716 292 6050 Fax: +1 716 273 6207	ABB Kent-Taylor SpA 22016 Lenno Como Italy Tel: +39 (0) 344 58111 Fax: +39 (0) 344 56278
---	--	--