

# hmi

high-accuracy  
measurement  
instruments

FICHA TÉCNICA DE PRODUTO

PRODUCT DATASHEET

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**HMI – Automação e Instrumentação, Lda.**

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ABB MEASUREMENT & ANALYTICS | DATA SHEET | DS/C1300-EN REV. S

# C1300

## Advanced circular chart recorder



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## Measurement made easy

C1300 – dependable recording in a rugged, functional instrument

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### High-definition backlit display

- latest LCD panel display technology ensures instrument operation and configuration is as easy as possible

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### Simple-to-configure totalizers

- automatic calculation of the relationship between units of measure and volume flow units

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### Designed to survive

- environmental protection options up to NEMA 4X for the entire recorder, providing reliable operation for wall-, panel- and pipe-mount versions

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### Fully field-upgradeable

- additional options easy to add

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### Configuration backup

- ability to backup and restore configurations from a PC

## C1300

The C1300 is an advanced, programmable circular chart recorder for up to four process signals. The C1300's straightforward operator controls and robust construction make it suitable for a variety of industrial environments. With many features supplied as standard and a powerful range of options, the C1300 is a truly flexible unit that can adapt to match your process requirements.



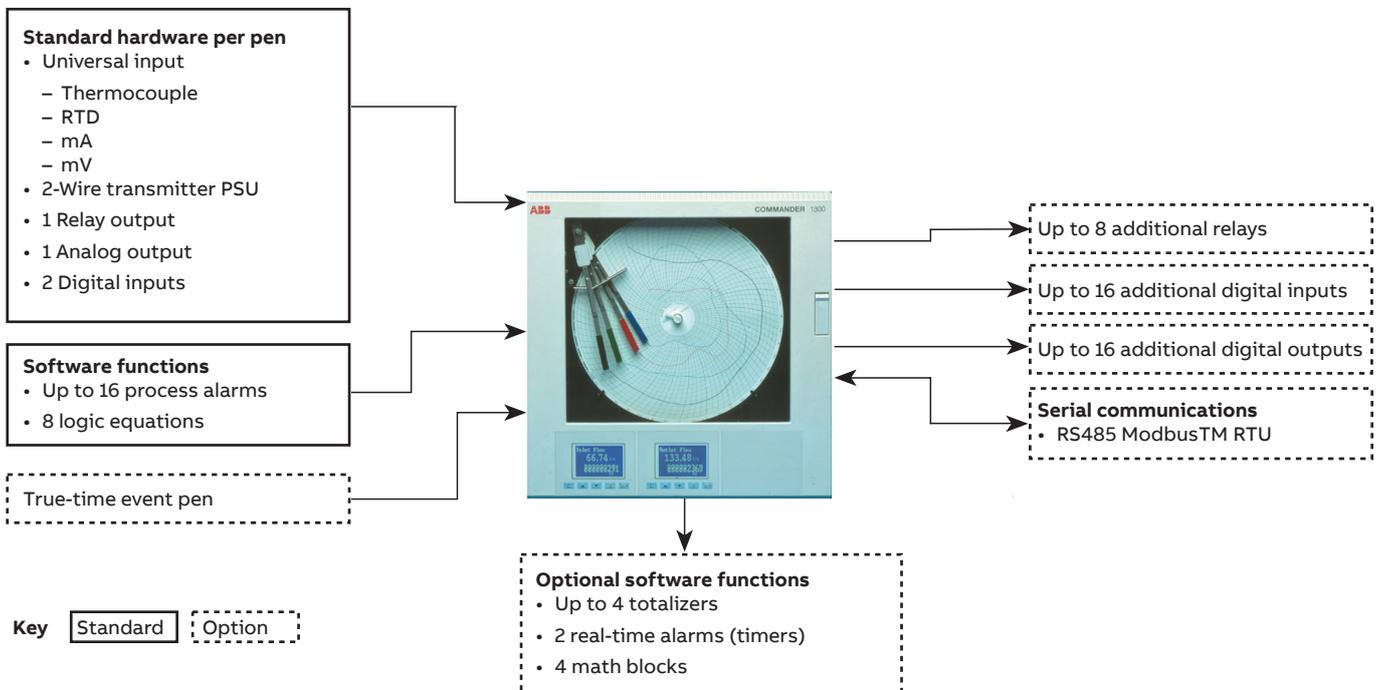
Clear, intuitive display menus

### Comprehensive process information

The C1300 incorporates up to two graphical display panels to keep the operator informed of process status. Each panel is capable of displaying up to eight lines of descriptive text to simplify both configuration and operation of the recorder. The display technology used increases visibility in high ambient light conditions.

### Simple operation

The clearly-labelled tactile keypad gives direct access for operator adjustments and configuration, without the need to open the recorder's door. Clear text prompts on the digital displays guide the user through the various menus. A password-protected security system prevents unauthorized access to configuration adjustment menus.



## ...C1300

### Advanced totalizer technology

The C1300 features some of the most advanced totalizing features of any recording instrument, giving it the ability to autoconfigure totalizers to specific requirements. For example, it is possible to measure flow in one volumetric unit and totalize in another; the C1300 automatically calculates the relationship between the two volume units and configures this information. No longer is it necessary to deal with unit conversion tables and timebases.

Totalizer control is enhanced further by reset functionality that is set in real-time. If the totalizer is required to reset at midnight every Sunday simply set it to do so. Totalizer logs also eliminate the requirement for the operator to go to the recorder at the same time each day to take readings. The totalizer log contains historical information of the date, time and individual totalizer values; enabling comparison of process volumes directly from the front panel of the recorder.



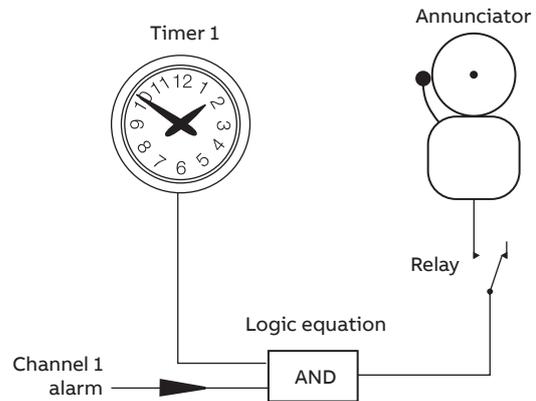
Comprehensive flow totalizer displays

### PC configuration backup

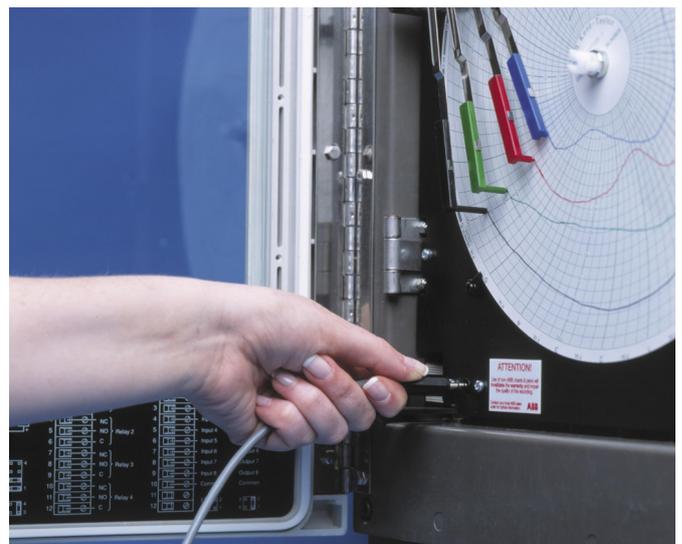
Fitted as standard to every C1300 is a PC Configuration Backup port. Using this port, an instrument's configuration can be both uploaded and downloaded to a PC, enabling a backup of a recorder's configuration to be saved for future use. Configuration time of multiple units with similar configurations is also greatly reduced via use of this feature.

### Timers and clock

The C1300 provides two event timers driven by the recorder's real-time clock. The timers can be configured to operate relays, start/stop the chart or trigger other actions within the recorder; such as allowing alarm annunciation only during night hours.



Alarm annunciation enabled during night hours only



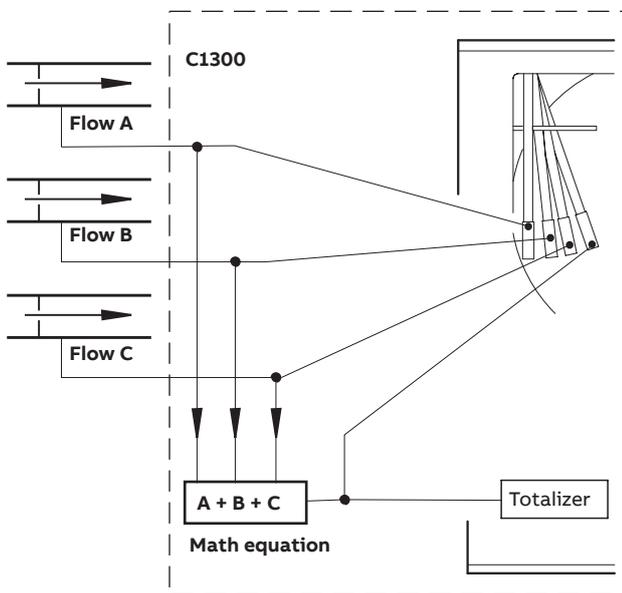
Connecting your PC to the recorder

### Math and logic

Optional math functions, mass flow calculations and RH tables are available, enabling the solving of real process problems, quickly and simply. Math functions include addition, subtraction, multiplication and division.

Logic capability is provided as standard, for interlocking and integration of discrete and continuous functions to address a wide range of process criteria.

Boolean logic functions enable the grouping of alarms to a single 'common-trouble' relay, saving time and money or allowing interlocking to create almost infinite combinations of 'If...Then' scenarios.



Summation of three flows

### Built to meet your needs

The C1300's modular architecture enables a high level of hardware choice.

The standard input/output module supplied with every pen comes complete with a fully isolated universal analog input, a relay output, transmitter power supply, an isolated analog output and two digital inputs.

Further input and output capability is provided by a range of plug-in modules:

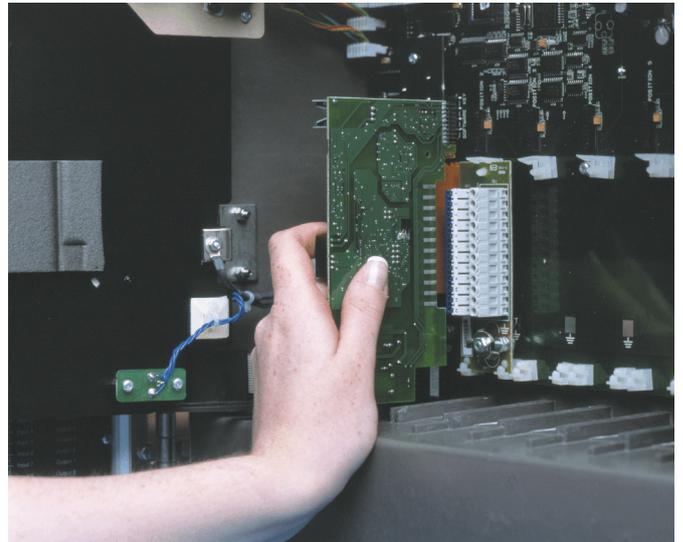
- Four relays – channel alarm outputs
- Eight digital inputs – linked using logic equations
- Eight digital outputs – TTL level alarm outputs
- True-time event pen (Violet) – event pen is additional to standard pens
- Modbus RS485 communications – interfaces with PCs

### Expandable for the future

The C1300 can be upgraded quickly to meet your changing process requirements.

Additional recording channels, math capability or input and output functions can be retrofitted on-site using plug-in modules and easily-fitted pen arms. Input calibration data is stored on each card, enabling quick changes of input modules without the need for recalibration.

Changes to input sensors or recording requirements are accommodated by reconfiguration using the keypad.



Modular design enables unit to be upgraded quickly

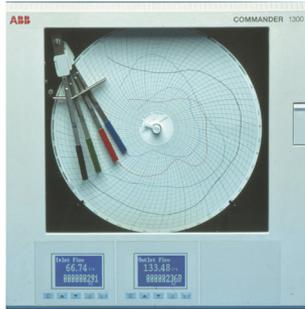
### Modbus RS485 communications

Communications with PCs or PLCs are achieved via the RS485 serial communications link, enabling the C1300 to serve as the front end of plant-wide data acquisition systems. Using Modbus RTU protocol all process inputs and other variables can be read continuously by a host PC running any of a wide range of standard SCADA packages.

## ...C1300

### 4-Pen recording

Available with up to four trending pens, the C1300 enables pen ranges to be configured independently from each other and their corresponding inputs. This enables the pens to be scaled to the best effect and potentially minimizes the requirement for costly multiple-scaled consumables. The C1300 also offers a true-time event-pen facility that ensures that process actions are logged on the same timeline as Pen 1.



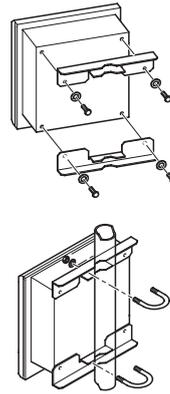
4-pen recorder with two graphical display panels

### Designed to survive

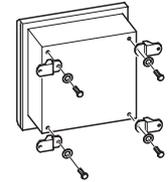
Optional NEMA 4X protection ensures the C1300 can survive in the harshest environments and makes the recorder ideal for use in panels that are hosed down regularly. The tough, acid-resistant case provides NEMA 4X rating for all mounting options.

### Easy to install

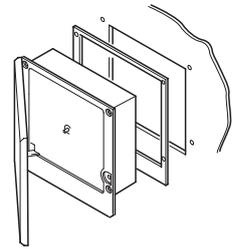
A choice of mounting options enables simple installation of the recorder in a panel, on a wall or on a pipe. Detachable terminal blocks provide trouble-free connection of input and output wiring. Mains isolation can be provided by an optional power switch within the instrument.



Pipe-mounting



Wall-mounting



Panel-mounting

Choice of mounting options

### Summary

- 1, 2, 3 or 4 pens
- 10 in. or 105mm chart size
- Standard I/O with each pen includes:
  - analog input, analog output, transmitter power supply, relay output and 2 digital inputs

## Specification

### Construction

#### Size (H × W × D)

386.8 × 382.0 × 135 mm (15.23 × 15.04 × 5.57 in)

#### Weight

8.2 kg (18 lb)

#### Case material

Glass fiber-filled reinforced polyester

#### Window material

Polycarbonate or glass

#### Door latch

High-compression with optional lock

### Environmental

#### Operational temperature range

0 to 55 °C (32 to 130 °F)

#### Operational humidity range

- 5 to 95 % RH (noncondensing)
- 5 to 80 % RH (chart only)

#### Case sealing

- NEMA 3 (IP54)
- NEMA 4X (IP66) (optional)

### Installation

#### Mounting options

Panel, wall or pipe

#### Terminal type

Screw

#### Wire size (max)

14 AWG (I/O), 12 AWG (power)

### Operation and configuration

#### Programming method

Via front panel keys

#### Security

Password-protected menus

### Safety

#### General safety

EN61010

#### Installation category

II

#### Pollution degree

2

#### Dielectric

- 500 V DC (channel/channel)
- 2k V DC (channel/ground)

#### Memory protection

Nonvolatile FRAM

#### Approvals

- CE
- CSA General Safety (option)
- UL General Safety (option)

### Power supply

#### Voltage

100 to 240 V AC ±10 %

(90 V min. to 264 V AC max.), 50/60 Hz

#### Consumption

<30 VA (typical for full spec. unit)

#### Line interruption

Up to 60 ms

### Process inputs and outputs

#### General

#### Noise rejection

Common mode: >120 dB at 50/60 Hz

Normal (series) mode: >60 dB at 50/60 Hz

#### CJC rejection ratio

<0.05 °C/°C (0.1 °F/°F)

#### Sensor break protection

Upscale or downscale drive

#### Out of range detection

0 to 100 % of engineering span

#### Temperature stability

<0.02 % of reading/°C (0.04 % of reading/°F) or 1 μV/°C

#### Long-term drift

<0.01 % of reading or 10 μV annually

#### Input impedance

- >10 MΩ (mV and V inputs)
- 39 Ω (mA input)

#### Analog Inputs

#### Signal types

mV, V, mA, Ω

#### Thermocouple types

B, E, J, K, N, R, S, T

#### Resistance thermometer

Pt 100

#### Other linearizations

$x^{1/2}$ ,  $x^{3/2}$ ,  $x^{5/2}$ , linear

#### Sample interval

250 ms per channel

#### Dielectric

500 V DC channel / channel

#### Digital filter

0 to 60 s (programmable)

#### Engineering range

–999 to 9999

Type	Range low	Range high	Minimum span	Accuracy
mV	0	150	5	±0.1 % reading or 10 μV
V	0	5	0.1	±0.1 % reading or 20 mV
mA	0	50	1	±0.2 % reading or 0.2 μA
Ω (low)	0	750	20	±0.2 % reading or 0.1 Ω
Ω (high)	0	10 k	400	±0.5 % reading or 10 Ω

Analog input performance

## ...Specification

Type	°C		°F		Accuracy (excluding CJC)
	Range low	Range high	Range low	Range high	
B	-18	1800	0	3270	±2 °C (above 200 °C) (3.6 °F above 434 °F)
E	-100	900	-140	1650	±0.5 °C (±0.9 °F)
J	-100	900	-140	1650	±0.5 °C (±0.9 °F)
K	-100	1300	-140	2350	±0.5 °C (±0.9 °F)
N	-200	1300	-325	2350	±0.5 °C (±0.9 °F)
R	-18	1700	0	3000	±1 °C (above 300 °C) (1.8 °F above 572 °F)
S	-18	1700	0	3000	±1 °C (above 200 °C) 1.8 °F above 572 °F)
T	-250	300	-400	550	±0.5 °C (±0.9 °F)
PT100	-200	600	-325	1100	±0.5 °C (±0.9 °F)

Thermocouple performance

### 2-Wire transmitter power supplies

Number

1 per channel

Voltage

24 V DC nominal

Drive

Up to 25mA

Isolation

500 V DC channel-to-channel

### Analog outputs

Type

4 to 20mA

Accuracy

±0.1 %

Maximum load

750 W

Dielectric

500 V DC

### Relay outputs

Type

SPDT

Rating (with non-inductive load)

5A at 115 / 230 V AC

### Digital inputs

Type

TTL or volt-free

Minimum pulse

250 ms

Dielectric

500V DC between modules, no isolation within module

### Digital outputs

Type

5 V TTL

Rating

5 mA per output

Dielectric

500 V DC between modules, no isolation within module

### Serial communications

Connections

RS485, 4-wire

Protocol

Modbus RTU

### Recording system

Pens

Number

1, 2, 3, or 4 (red, green, blue, black)

Response

7 seconds (full scale)

Resolution

0.1% steps

Pen lift

Motor-driven, with optional autodrop

Event Pens

Standard

3-position event recording on any channel

Real time

3-position event recording on the same time line as Pen 1

Chart

Chart size

105 mm or 10 in.

Chart speed

1 to 167 hours or 7 to 32 days per revolution

Rotation accuracy

<0.5% of rotation time

## Graphical display panels

### Displays

#### Number

1 (1 or 2 pens) or 2 (3 or 4 pens)

#### Type

High contrast 128 x 64 STN dot matrix LCD (graphics) module

### Status indicators

Indicate channel number on display

### Alarm indicators

Indicate channel with active alarms

### Panel keys

#### Function

Programming access, increment/decrement, pen lift and menu key

## Alarms and Logic

### Alarms

#### Number

4 per channel

#### Type

High / Low process, fast/slow rate of change, time delay

#### Adjustments

Hysteresis, time delay

### Alarm indicators

Indicate channel with active alarms

### Logic equations

#### Number

4

#### Function

OR, AND

### Inputs

Alarm states, digital inputs, totalizers, logic

### Outputs

Relays, digital outputs, chart stop, alarm acknowledge

## Advanced software functions

### Totalizers

#### Number

Up to 4

#### Size

999,999,999 max.

#### Output

External counter driver, 'wrap' pulse signal

#### Totalizer log

Max. 21 entries per totalizer

### Math

#### Number of equations

4

#### Type

+, -, x, ÷, low & high select, maximum, minimum, average, mass flow, RH

### Timers

#### Number

2

#### Type

Real-time clock driven event, adjustable duration

#### Output

Relay, digital output, logic equation

## EMC

### Emissions and Immunity

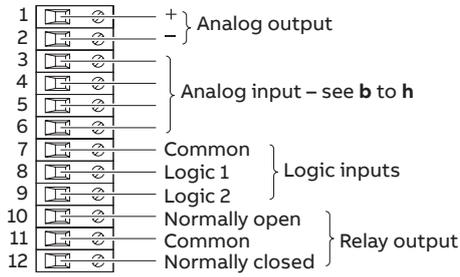
#### Meets requirements of:

- EN50081-2
- EN50082-2
- EN61326 for an industrial environment
- CE Mark

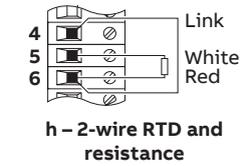
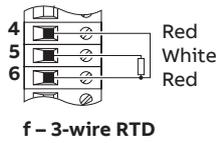
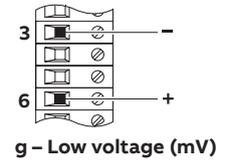
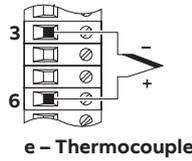
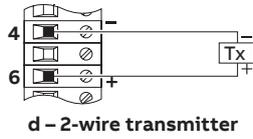
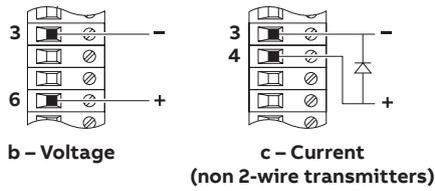
Module type	I/O per module							Max. no. per instrument
	Analog I/P	Analog O/P	Trans. PSU	Relays	Digital I/P	Digital O/P	Comms.	
Standard I/O	1	1	1	1	2			4
4 relays				4				2
8 digital I/P					8			3
8 digital O/P						8		3
RS485 communications							1	1

Option module types

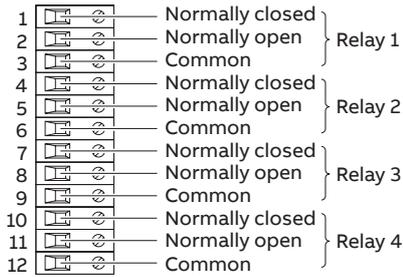
# Electrical connections



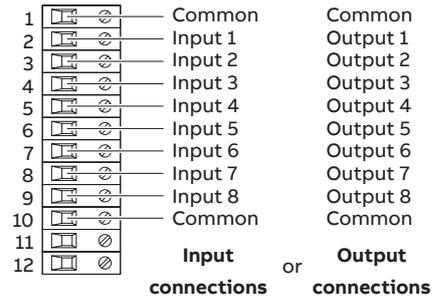
Summary of connections



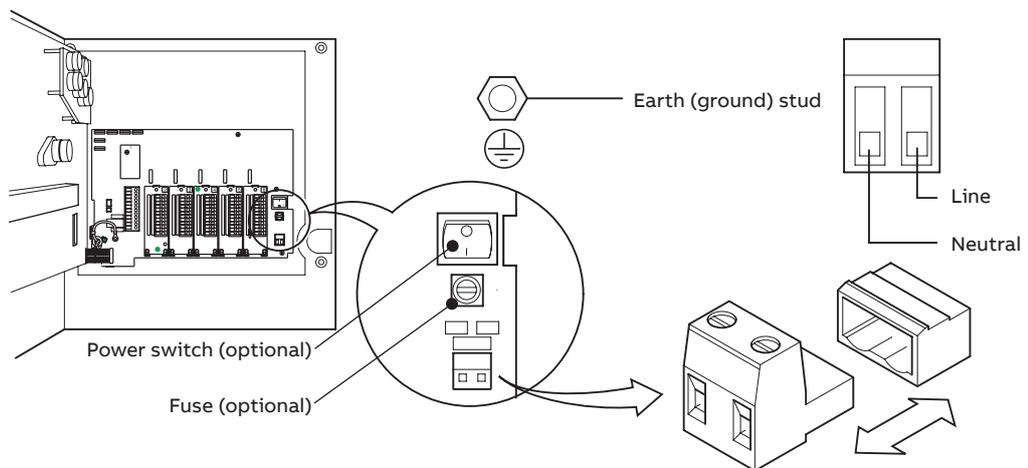
## Standard input/output modules



4-relay output module



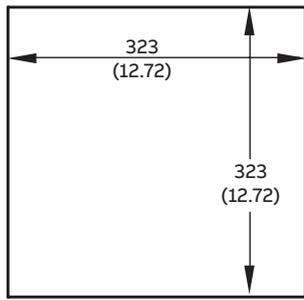
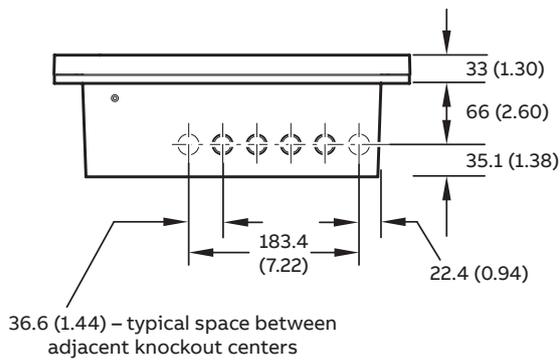
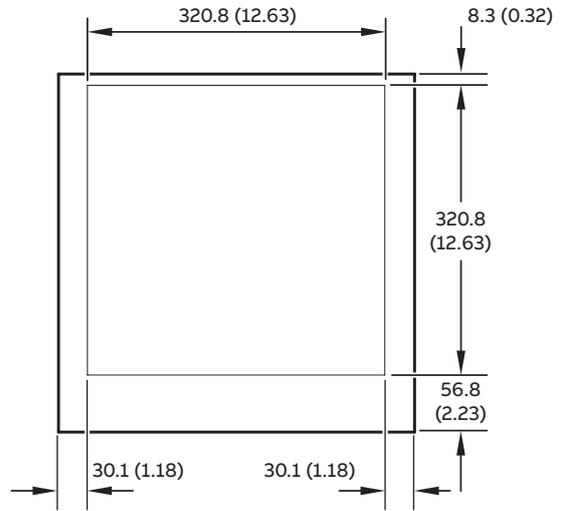
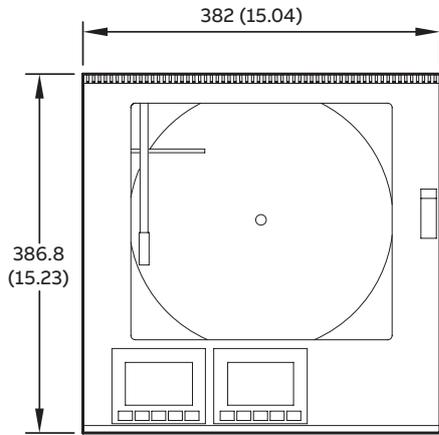
Digital input / output module



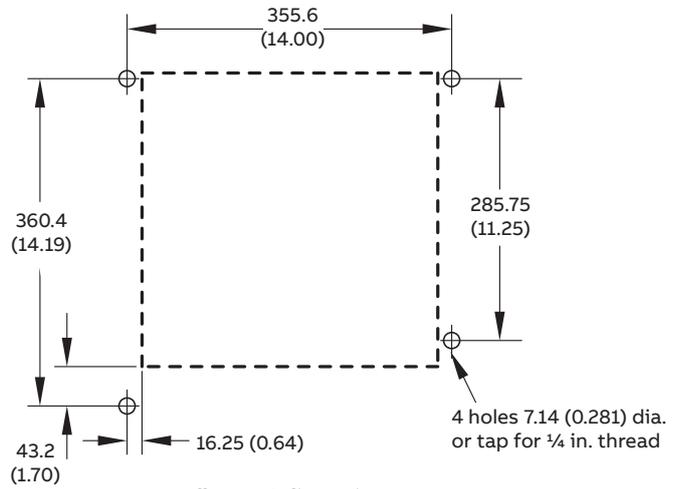
Power supply connections

## Overall dimensions

Dimensions in mm (in.)



Panel cut-out size



Wall-mount dimensions

## Ordering Information

<b>C1300 advanced circular chart recorder</b>	<b>131</b>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	XXX	OPT	
<b>Pens</b>																			
One pen (red)	1																		
Two pens (red, green)	2																		
Three pens (red, green, blue)	3																		
Four pens (red, green, blue, black)	4																		
<b>Chart type</b>																			
Standard (ER/C)			J																
KPC 105 PX and PXR type charts			K																
Chessell Brand charts			C																
<b>Electrical code</b>																			
Standard				A															
CSA approved				C															
UL approved				U															
Dual approval				D															
<b>Software options</b>																			
None					0														
1 totalizer, math and timers					1														
2 totalizer, math and timers					2														
3 totalizer, math and timers					3														
4 totalizer, math and timers					4														
<b>Environmental protection</b>																			
IP54 & NEMA3						0													
IP66 & NEMA4X						N													
<b>Door color</b>																			
ABB standard							0												
<b>Window material</b>																			
Glass												G							
Polycarbonate												P							
<b>Door lock</b>																			
No lock																		0	
Lock fitted																		L	
<b>Power supply</b>																			
100 to 240V AC ±10% (90V min. to 264V) max.																		1	
100 to 240V AC ±10% (90V min. to 264V) max. with on/off switch																		2	
<b>I/O modules</b>																			
Module position 2 / channel 2 input*		0	1																
Module position 3 / channel 3 input*		0	1																
Module position 4 / channel 4 input*		0	1	3	4	5	6												
Module position 5		0	3	4	5	8													
Module position 6		0	4	5	8														
<b>Special settings</b>																			
Company standard																		STD	
Custom configuration (customer to complete and supply C1300 custom configuration sheet – INF08/030)																		CUS	
Special																		SXX	
Engineered configuration (customer to supply configuration details required)																		ENG	
Calibration certificate **																		C1	
<b>Printed instruction manual</b>																			
English																		M5	

\* On 2, 3 or 4 pen instruments, a standard I/O module is always fitted in the corresponding module position (enter '0' in the corresponding order code field).

\*\* When a calibration certificate is ordered it is performed according to the specified configuration type:  
 CUS/ENG – Inputs and outputs calibrated according to the customer supplied configuration details and ranges.  
 STD – Inputs and outputs calibrated according to the instrument factory standard configuration and ranges.

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## Standard accessories

(supplied with each recorder)

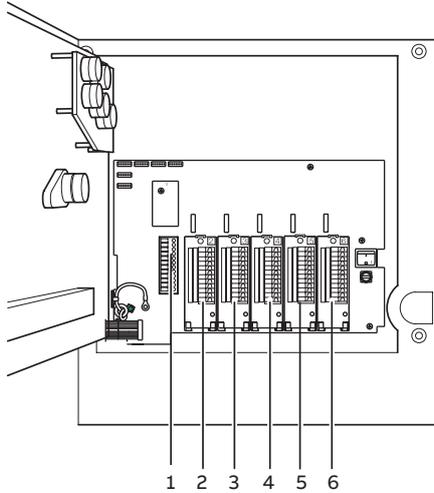
- Set of pens
- Wall-mount kit

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## Optional accessories

Part No.	Description
C100/0051	PC configuration backup cable
C1900/1713	Pipe-mount kit
ENG/REC	After-sales engineered configuration service

## Module identification



### Module positions

- 0 No module fitted / pen input channel
- 1 Standard input / output
- 3 Four relays
- 4 Eight digital inputs
- 5 Eight digital outputs
- 6 True-time event pen – violet (additional to standard pens)
- 8 Modbus RS485 communications

### Key to module types

## Acknowledgements and trademarks

Modbus™ is a trademark of Modicon, Inc.

Sales



Service



Software





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	Actuators and Positioners		Analytical Instruments
	Device Management, Fieldbus and Wireless		Flow Measurement
	Force Measurement		Level Measurement
	Natural Gas Measurement		Pressure Measurement
	Recorders and Controllers		Temperature Measurement

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