100mm Process Indicator Recorder

CR100

- One or two pen continuous line 100mm recorder
  - universal input for thermocouple, RTD, mV, mA and V

- Clear, 5-digit LED display
  - high visibility, wide viewing angle

- Two (5A) alarm relays as standard
  - allocated to individual channels or common to both

- Isolated analog retransmission
  - easy connection to management system

- Two digital inputs
  - chart start/stop, change chart speed or remote alarm acknowledge

- Configuration from front fascia or via PC
  - simple configuration setup and storage procedure

- Transmitter power supply
  - power each loop from the standard unit, no extras needed

- IP65/NEMA3 protection
  - reliability in the harshest environments

CR100
- combination of a high resolution process indicator and a compact chart recorder
The CR100 is a one or two pen continuous-line 100mm strip chart recorder with a number of features included as standard:

- Two alarm relays
- Isolated analog retransmission
- Two digital inputs
- Transmitter power supply.

These inbuilt features make the CR100 an extremely versatile chart recorder.

It has a bright, 5-digit LED display giving clear indication of the process. Configuration using the front keys is very easy. The CR100 can also be configured using the PC Configuration software increasing the flexibility and reducing setup time.

With a IP65/NEMA3 front fascia the CR100 is suitable for use in harsh industrial environments.

### Process Connections

**Isolated Universal Process Input**
- Thermocouple
- RTD
- 4 to 20mA
- Volts, Millivolts
- Tx Power Supply

**Optional**
- Two Relays
- Analog Retransmission

**2 Digital Inputs**

**Standard**

**Optional**

**PC Configuration**

**Single Pen**

**Two Pen**

**Roll Chart or Fanfold Chart**

**5-digit LED display**
Clear Display and Simple Controls
Process values and alarm messages are shown on the high-resolution 5-digit LED display which has been designed for maximum visibility. On the two-pen version the display toggles between input one and input two.

Beneath the display are 6 keys (increment, decrement, scroll, multifunction, pen lift and chart speed selection) that are used to operate and configure the recorder.

The instrument is equipped with four user-defined alarms, each with its own LED which is lit when an alarm condition exists.

Extras Built-in as Standard
To meet the majority of process needs, two relays are included in the standard build. These can be allocated as one per channel, both on one channel or common to both channels.

Further flexibility is provided by an analog retransmission signal and two digital inputs. The digital inputs can be used for remote acknowledgement of alarms, starting and stopping the chart or for changing the chart speed.

All this as standard makes the CR100 an extremely versatile recorder.

Isolated Universal Analog Inputs
Both of the analog inputs are universal, galvanically isolated and accept direct connection from all standard thermocouple, RTD, mA, mV and voltage sources.

Using the PC Configuration software, non-standard ranges as low as 5mV are also possible.

The recorder also has a 2-wire transmitter power supply suitable for powering each loop.
**Easy Setup**
The CR100 can be configured in one of two ways:

**Front face keys**
The front face keys are used to configure the instrument via a security code protected configuration menu.

**PC Configurator**
The standard equipment PC configurator port is used to connect a PC equipped with the Windows™-based PC Configurator software making setup a point-and-click operation. Settings can also be saved on the PC and copied to other recorders making setup of multiple instruments quick and simple.

**Rugged Enclosure Design**
The case has been designed to withstand operation in harsh industrial environments with IP65/NEMA3 front face protection as standard. This makes the instrument ideal for use in food applications and hosedown areas.
Applications

**Temperature Monitoring**
The compact design of the CR100 makes it ideal as a local temperature monitor and alarm.

Inbuilt CJ compensation enables the direct connection of all standard thermocouples. For precision measurement Pt100 resistance thermometers can be connected directly via the universal input, thus ensuring low installation costs.

The clear LED display provides highly visible indication and numbered alarm LEDs provide instant process status verification.

**Environmental/Laboratory Monitoring**
The unbroken line on the chart provided by the CR100 is ideal for continuous gas or liquid environmental applications.

Other uses include batch monitoring of laboratory tests, or test chambers, to verify the test results and the provision of alarm signals to indicate if a test exceeds preset limits.

**Discharge Monitoring**
With universal inputs the CR100 provides the opportunity for local monitoring and alarms for the measurement of parameters such as level, flow and pH.

The retransmission also provides the ability to retransmit this signal to a process monitor so readings can be integrated into a plant data acquisition scheme.

**Indicating Recorder**
Ideal for small units or operator panels providing clear, high resolution digital indication of process variables.

The cost-effective price of the CR100 allows individual indication, with sensitivity down to $10 \mu V$ or $0.2^\circ C (0.11^\circ F)$, and a secure hard copy record for traceability of the process.
## Specification

### Summary
- 1 or 2 continuous lines
- 100mm wide roll or fanfold chart
- Fully user-programmable
- IP65/NEMA3 protection

### Recording
**Measuring channels**
- 1 or 2

**Colors**
- Single continuous line, Red
- Two continuous lines, Pen 1 – Red, Pen 2 – Green

**Chart**
- 7.5 m fanfold or 15m roll
- Quick-load cassette
- Standard chart graduation 50 divisions

**Chart speed**
- Configurable in 1mm steps between 1mm and 1500mm/hr
- Logic or switch selectable at two configured speeds

**Pen response time**
- 4s, 10 to 90%, typical

### Operation
**Display**
- High intensity 5-digit LED display (14mm high)

**Configuration**
- User-defined via front panel or Windows-based PC configurator

**Alarms**
- Number: 4 user-defined
- Types: High/Low process, High/Low latch
- Hysteresis: Programmable level

**Accuracy**
**Pen**
- Resolution: 0.2% of span

**Display**
- Display range: –9999 to +99999
- Display resolution: ±1 digit

## Digital Inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>2</td>
</tr>
<tr>
<td>Type</td>
<td>Volt-free contacts</td>
</tr>
<tr>
<td>Minimum pulse</td>
<td>250ms</td>
</tr>
</tbody>
</table>

## Outputs

### Retransmission
- Analog configuration in the range of 4 to 20mA
  - Max. load: 15V (750Ω at 20mA)
  - Accuracy: ±0.25% of span
  - Isolation: 500V DC from inputs
  - Assignable to any one analog input

### Relay Outputs
- 2 relays (SPDT), 5A at 115/230V AC
- Assignable to alarms

## Physical

**Size**
- 144mm (5.67 in.) x 144mm (5.67 in.)
- x 230mm (9.05 in.) depth behind panel

**Weight**
- 3.3kg (7 lbs) approx.

**Panel cut-out**
- 138mm (5.43 in.) x 138mm (5.43 in.)

**Case material**
- Sheet steel case, stove enamel painted

**Door material**
- Glass-filled polycarbonate

**Window material**
- Polycarbonate

## Electrical

**Power supply**
- 85 to 265V 50/60Hz

**Power consumption**
- 36W max.

**Electrical safety**
- EN61010-1
- CE marked instruments meet EU regulations
- CSA (optional)

**Electrical connections**
- Screw terminals
Environmental
Operating limits
0 to 50°C (32 to 122°F)
95% RH non-condensing
80% RH for chart
Temperature stability
0.02% of reading or 2μV/°C whichever is the greater
Protection
Front face IP65 NEMA3
Rear of instrument IP20
Line interruption
<80ms loss, no effect
>80ms loss, auto reset and restart

EMC
Emissions and Immunity
Meets requirements of IEC 61326 for an Industrial Environment
Design and manufacturing standards
Designed to meet CSA requirements
CE mark

Analog Inputs
Number
1 or 2 isolated analog inputs
Input sampling rate
250ms
Input Type
Universally configurable to provide:
- Thermocouple (THC)*
- Resistance thermometer (RTD)
- Millivolt
- Current
- DC voltage
*2nd input can be THC, but only if 1st input also THC
Linearizer functions
Programmable for: Square root
THC types B, E, J, K, N, R, S, T or Pt100
Filter time Adjustable up to 60s
Broken sensor protection
Upscale drive on THC and RTD
Downscale drive on mA and voltage
Cold junction compensation (CJC)
Automatic CJC incorporated as standard
Accuracy <0.05° C/°C change in ambient
Input impedance
mA 100Ω
mV, V >10MΩ
Transmitter power supplies
Two isolated supplies 25mA max. each
Input isolation
Analog channel-to-channel isolation 500V DC
Input to ground 700V DC
Common mode >120dB at 50/60Hz with 300Ω imbalance resistance
Series mode >60dB at 50/60Hz
3-lead RTD
Max. lead resistance 10Ω
### Standard Analog Input Ranges

<table>
<thead>
<tr>
<th>Thermocouple</th>
<th>Maximum Range °C</th>
<th>Maximum Range °F</th>
<th>Accuracy (% of reading)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>−18 to 1800</td>
<td>0 to 3270</td>
<td>0.25% or ±2°C (above 200°C)</td>
</tr>
<tr>
<td>E</td>
<td>−100 to 900</td>
<td>−140 to 1650</td>
<td>0.25% or ±0.5°C</td>
</tr>
<tr>
<td>J</td>
<td>−100 to 900</td>
<td>−140 to 1650</td>
<td>0.25% or ±0.5°C</td>
</tr>
<tr>
<td>K</td>
<td>−100 to 1300</td>
<td>−140 to 2350</td>
<td>0.25% or ±0.5°C</td>
</tr>
<tr>
<td>N</td>
<td>−200 to 1300</td>
<td>−325 to 2350</td>
<td>0.25% or ±0.5°C</td>
</tr>
<tr>
<td>R</td>
<td>−18 to 1700</td>
<td>0 to 3000</td>
<td>0.25% or ±1.0°C (above 300°C)</td>
</tr>
<tr>
<td>S</td>
<td>−18 to 1700</td>
<td>0 to 3000</td>
<td>0.25% or ±0.5°C</td>
</tr>
<tr>
<td>T</td>
<td>−250 to 300</td>
<td>−400 to 550</td>
<td>0.25% or ±0.5°C</td>
</tr>
</tbody>
</table>

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

Min. span below zero | Type T 70°C (160°F) | THC standards | DIN 43710 IEC 584
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Type N 100°C (180°F)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RTD</th>
<th>Maximum Range °C</th>
<th>Maximum Range °F</th>
<th>Accuracy (% of reading)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100</td>
<td>−200 to 600</td>
<td>−325 to 1100</td>
<td>0.25% or ±0.5°C</td>
</tr>
</tbody>
</table>

** RTD, 3-wire platinum, 100Ω per DIN43760 standard (IEC751), with range of 0 to 400Ω

### Linear Inputs

<table>
<thead>
<tr>
<th>Linear Inputs</th>
<th>Range</th>
<th>Accuracy (% of reading)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milliamps</td>
<td>0 to 20</td>
<td>0.25% or ±2μA</td>
</tr>
<tr>
<td>Milliamps</td>
<td>4 to 20</td>
<td>0.25% or ±2μA</td>
</tr>
<tr>
<td>Volts</td>
<td>0 to 5</td>
<td>0.25% or ±2mV</td>
</tr>
<tr>
<td>Volts</td>
<td>1 to 5</td>
<td>0.25% or ±2mV</td>
</tr>
<tr>
<td>Millivolts</td>
<td>0 to 50</td>
<td>0.25% or ±20μV</td>
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</table>

### Square Root Input

<table>
<thead>
<tr>
<th>Linear Inputs</th>
<th>Range</th>
<th>Accuracy (% of reading)***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milliamps</td>
<td>4 to 20</td>
<td>0.25% or ±2μA</td>
</tr>
</tbody>
</table>

*** Below input of 4.64mA (20% flow) the input is linear
Overall Dimensions

Dimensions in mm (in.)

Electrical Connections

Terminal blocks viewed from rear of case

Relay 1

Relay 2

Fuse (1A anti-surge)

Line

Neutral
### Ordering Information

<table>
<thead>
<tr>
<th>CR100 100mm Process Indicator Recorder</th>
<th>CR10</th>
<th>X/</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
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<td>CSA approval (pending)</td>
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<td><strong>Door</strong></td>
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<td><strong>Chart Drive</strong></td>
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<td>Roll chart</td>
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<td>Fan-fold chart</td>
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<tr>
<td><strong>Power Supply</strong></td>
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<tr>
<td>85 to 265V AC</td>
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<td></td>
<td>1</td>
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<tr>
<td><strong>Programming/Special Features</strong></td>
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<tr>
<td>Configured to factory standard</td>
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<tr>
<td>Configured to customer requirements</td>
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<tr>
<td>Special features</td>
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</tbody>
</table>

### Accessories

PC Configurator kit (part no. C100/0700)
### Standard Chart Selection

<table>
<thead>
<tr>
<th>Range</th>
<th>Roll Chart Part No.</th>
<th>Fanfold Chart Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>International</td>
<td>North America</td>
</tr>
<tr>
<td>−50/50</td>
<td>P100L/7477G</td>
<td>KPC100-1110</td>
</tr>
<tr>
<td>0/14</td>
<td>P100L/17463G</td>
<td>KPC100-1047</td>
</tr>
<tr>
<td>0/50</td>
<td>P100L/7401G</td>
<td>KPC100-1032</td>
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<tr>
<td>0/100</td>
<td>P100L/7400G</td>
<td>KPC100-1037</td>
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<tr>
<td>0/150</td>
<td>P100L/7414G</td>
<td>KPC100-1039</td>
</tr>
<tr>
<td>0/200</td>
<td>P100L/7420G</td>
<td>KPC100-1040</td>
</tr>
<tr>
<td>0/500</td>
<td>P100L/7010G</td>
<td>KPC100-1043</td>
</tr>
<tr>
<td>0/800</td>
<td>P100L/17446G</td>
<td>KPC100-1045</td>
</tr>
<tr>
<td>0/1000</td>
<td>P100L/7476G</td>
<td>KPC100-1072</td>
</tr>
</tbody>
</table>

*Supplied as standard

**Note.** Other ranges may be available on request.

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