Clearscan 12” Diameter Chart Recorders
Clearscan 12” Diameter Chart Recorders

The Clearscan range of recorders are suitable for most industrial applications and can be fitted with up to 3 pens for recording temperature, pressure and flow.

Features
- 1, 2 or 3 pen temperature, pressure & flow recording
- Uses proven and reliable temperature, pressure and differential pressure systems
- Simple installation and maintenance requirement
- Wall, panel, portable or pipe mounting available
- Fully mechanical versions available
- Electrical, battery or mechanical chart drive options
- Large 12 inch diameter chart
- Large choice of temperature, pressure and differential pressure ranges

Case
The Clearscan recorder case is made from high quality zinc coated steel, finished in epoxy powder paint that has a high resistance to weathering, scratches and industrial fumes. The window is high quality acrylic. The case has a lockable front-hinged door, permitting easy access to the chart and pens, and may be either wall, panel or pipe mounted.

Pens
The Clearscan recorders utilise sealed ink capsules with built-in fibre tipped pens which are simple to replace and without any mess. Single pen recorders and the first pen of two and three pen recorders trace in red ink; the second pen of two pen and three pen recorders traces in blue and the third pen of three pen recorders in green. Each recorder is supplied with a spare packet of pens.

Charts
Clearscan Chart Recorders use a 12 inch circular charts which are interchangeable with Barton, Graphic Controls and Bristol charts. The standard chart durations are one revolution every 24 hours or 7 days - other rotations are available. A pen lift is fitted to ease chart changing. Each recorder is supplied with a packet of 100 charts.

Chart Drive Motor
The Clearscan Chart Recorder uses chart drive motors that are available as mains powered, mains powered with battery back-up, mechanical (spring-wound) and battery operated with a wide variety of chart speeds (24 hour and 7 day are standard).

Temperature Systems
The Clearscan chart recorder uses the proven and reliable stainless steel thermal system. These consist of a bourdon tube, stainless steel capillary and a stainless steel bulb. All systems are filled with a non toxic filling.

Pressure Systems
Proven and reliable pressure systems are used to record gauge pressure, vacuum, combined pressure and vacuum, absolute pressure and differential pressure.

Bulb Types

<table>
<thead>
<tr>
<th>Type 301</th>
<th>This bulb is used when no fitting is required. The bulb may be held in place by a bracket or a clip (not supplied by Rototherm).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 302</td>
<td>This bulb has a fitting which slides along the capillary and is tightened into the required position. Bulb length cannot be specified.</td>
</tr>
<tr>
<td>Type 303</td>
<td>The fitting is located on the bulb. When ordering please confirm immersion length “L”.</td>
</tr>
</tbody>
</table>

Internal Features

- Pen Mechanism
- Chart Plate
- Red Pen (first pen)
- Green Pen (second pen)
- Pen Lifter
- Chart Clamp Assembly
- Chart
- Chart Retainer
Specifications

Accuracy
+/-1% FSD

Ambient Temperature
-20ºC to +50ºC

TEMPERATURE SYSTEM
Measuring Element
Thermal bourdon tube temperature compensated.

Capillary
Microbore stainless steel tube with 3mm diameter stainless steel cover (type C1) as standard. Other capillary types are available.

Bulb and Stem
Stainless steel BS970 316. Standard diameter is 12.7mm.

Fittings
Compression gland (adjustable). Stainless steel (1/2" BSP is standard). Other BSP, NPT and API are available on request. (suitable for pressures up to 3.5 bar)

PRESSURE SYSTEM
Measuring Element
Bourdon Tube or pressure capsule, in non ferrous or stainless steel material as applicable

DIFFERENTIAL PRESSURE SYSTEM
Measuring Element
Differential Pressure Unit in 316 stainless steel. Elements in alternative materials to NACE standards are also available. See page 30 for additional information.

Chart Drive Motor
Synchronous electric, battery or mechanical spring wound. 24 hour or 7 day & dual speed rotation. (other rotations on request)

Charts
Disc 300mm (12 inches) diameter. Standard dividing 40, 50, 60, 70 or 80 linear divisions. interchangeable with Barton, Graphic Controls and Bristol charts.

Inking System
Disposable fibre tipped pens.
1 pen : red.
2 pen : red & blue.
3 pen : red, blue and green.

Case
High quality steel finished in 2 pack epoxy powder paint that has a high resistance to weathering, scratches and industrial fumes. The case has a lockable front-hinged door.

Window
Acrylic

Power Supply
200 to 250 volts, 50Hz (60Hz available); 100 to 110 volts, 50Hz (60Hz available);
Battery operated chart drives require 1.5 volt type “AA” cell.

Mounting
Suitable for surface or panel mounting. (Pipe mounting & Portable options are available)

Weight (approx)
Single pen : 9.5 kg (21 lb)
Two pen : 10.0 kg (22 lb)
Three pen : 10.5 kg (23 lb)

The above weights include 3 metres of capillary. For each additional 3 metres add 0.25kg (0.5lb)

Differential Pressure Unit Specification

Pressure Element
AISI 316L 1.4435 stainless steel double welded diaphragm for measuring ranges between 100mbar and 4 bar.
Duratherm (Co Ni Cr Mo alloy) double welded diaphragm for ranges between 6 and 25 bar.

Wetted parts in 316 stainless steel and Monel 400 to NACE standards are also available.

Ranges
Standard ranges for pressure values between 25 mbar and 25 bar

Maximum Static Pressure
Maximum static pressure 200 bar

Connections
AISI 316L stainless steel; 1/4" NPT female is standard - other connections available include 1/" BSP male and 1/2" NPT male

Differential Cell Gaskets
Nitrile rubber (NBR); FPM (Viton®) on request.
Viton® is a registered trademark of DuPont Dow Elastomers

TTI Instruments
TOTAL TEMPERATURE INSTRUMENTATION INCORPORATED
Clearscan 12” Diameter Chart Recorders

- **Dimensions**

Dimensions for Clearscan 12” chart recorder - wall or panel mounting

Dimensions for Clearscan 12” chart recorder - 2” pipe / post mounting

Dimensions for Clearscan 12” chart recorder - fitted with Differential Pressure Unit

All dimensions are in mm. Drawings are for illustration purposes only.
Ordering Information

When ordering, please specify the following:

For all recorder types
- Model Number
- Mounting - wall / panel / portable or pipe mounting
- Chart Drive Motor Type - electrical, mechanical or battery
- Chart Rotation

For instruments recording Temperature
- Temperature Range
- Bulb type - 301, 302 or 303 (see page 27 for more details)
- Capillary type - plain or armoured stainless steel
- Capillary Length - 3 metres is standard
- Compression fitting size
- Bulb immersion length “L” (see page 27 for more details)

For instruments recording Pressure
- Pressure Range
- Process Connection Size
- Element / Connection Material - Non Ferrous or Stainless Steel

For instruments fitted with Differential Pressure Unit
- Differential Pressure Range
- Housing and Bellows Material - Stainless Steel is standard
- Maximum Static Pressure

### Standard Temperature Ranges

<table>
<thead>
<tr>
<th>Range</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40 to +40°C</td>
<td>0 to 160°C</td>
</tr>
<tr>
<td>-30 to +30°C</td>
<td>0 to 200°C</td>
</tr>
<tr>
<td>-30 to +50°C</td>
<td>0 to 300°C</td>
</tr>
<tr>
<td>-25 to +25°C</td>
<td>0 to 400°C</td>
</tr>
<tr>
<td>-25 to +30°C</td>
<td>20 to 120°C</td>
</tr>
<tr>
<td>0 to 40°C</td>
<td>50 to 150°C</td>
</tr>
<tr>
<td>0 to 50°C</td>
<td>50 to 250°C</td>
</tr>
<tr>
<td>0 to 60°C</td>
<td>100 to 400°C</td>
</tr>
<tr>
<td>0 to 100°C</td>
<td>100 to 500°C</td>
</tr>
<tr>
<td>0 to 120°C</td>
<td></td>
</tr>
</tbody>
</table>

### Standard Pressure Ranges

<table>
<thead>
<tr>
<th>Standard Range</th>
<th>Sensing Element Type</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 15 psi</td>
<td>Bellows</td>
<td>Beryllium Copper</td>
</tr>
<tr>
<td>0 to 1 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 2 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 4 bar</td>
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<tr>
<td>0 to 6 bar</td>
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<tr>
<td>0 to 10 bar</td>
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<tr>
<td>0 to 16 bar</td>
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<tr>
<td>0 to 25 bar</td>
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<tr>
<td>0 to 40 bar</td>
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<tr>
<td>0 to 60 bar</td>
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<tr>
<td>0 to 100 bar</td>
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<tr>
<td>0 to 160 bar</td>
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<td>0 to 250 bar</td>
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<tr>
<td>0 to 300 bar</td>
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<td>0 to 400 bar</td>
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<tr>
<td>0 to 600 bar</td>
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<tr>
<td>0 to 1000 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 1200 bar</td>
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<td></td>
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<tr>
<td>0 to 1600 bar</td>
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</tbody>
</table>

*Bourdon Tube* or *Phosphor Bronze*

Calibration in other units of pressure are available.

### Models

- **Clearscan CST100**  - Single Pen Temperature Recorder
- **Clearscan CST200**  - Two Pen Temperature Recorder
- **Clearscan CST300**  - Three Pen Temperature Recorder
- **Clearscan CSP100**  - Single Pen Pressure Recorder
- **Clearscan CSP200**  - Two Pen Pressure Recorder
- **Clearscan CSP300**  - Three Pen Pressure Recorder
- **Clearscan CSTP200** - Two Pen Temperature & Pressure Recorder
- **Clearscan CSTP300** - Three Pen Temperature & Pressure Recorder
- **Clearscan CSF100**  - Single Pen Differential Pressure Recorder
- **Clearscan CSF100**  - Two Pen Differential Pressure Recorder

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Total Temperature Instrumentation, Inc
P.O. Box 1073, 8 Leroy Road, Williston, VT 05495 USA

Telephone: 1-800-884-4967  Facsimile: 1-802-863-1193  E-mail: sales@ttiglobal.com  Web site: www.ttiglobal.com

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