

# Clearscan 12" Diameter Chart Recorders

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**TTI Instruments**  
TOTAL TEMPERATURE INSTRUMENTATION INCORPORATED

# 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

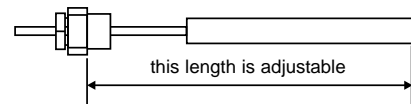
### Type 301

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).



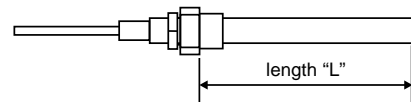
### Type 302

This bulb has a fitting which slides along the capillary and is tightened into the required position. Bulb length cannot be specified.

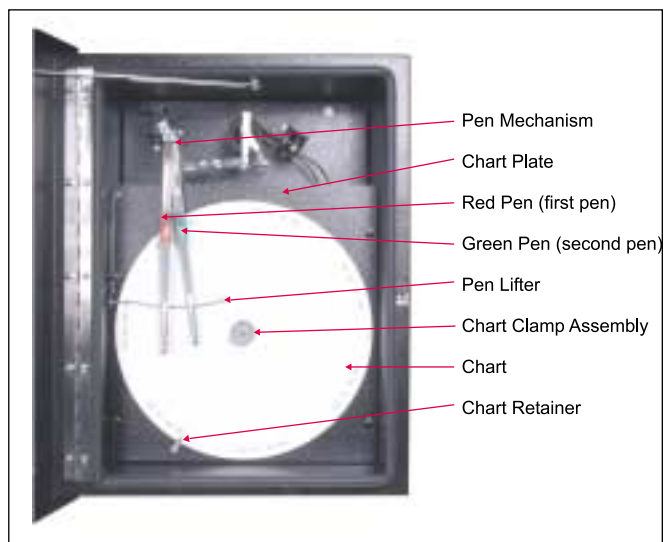


### Type 303

The fitting is located on the bulb. When ordering please confirm immersion length "L".



## ■ Internal Features



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## ■ Specifications

### Accuracy

+/-1% FSD

### Ambient Temperature

-20°C to +50°C

### 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.

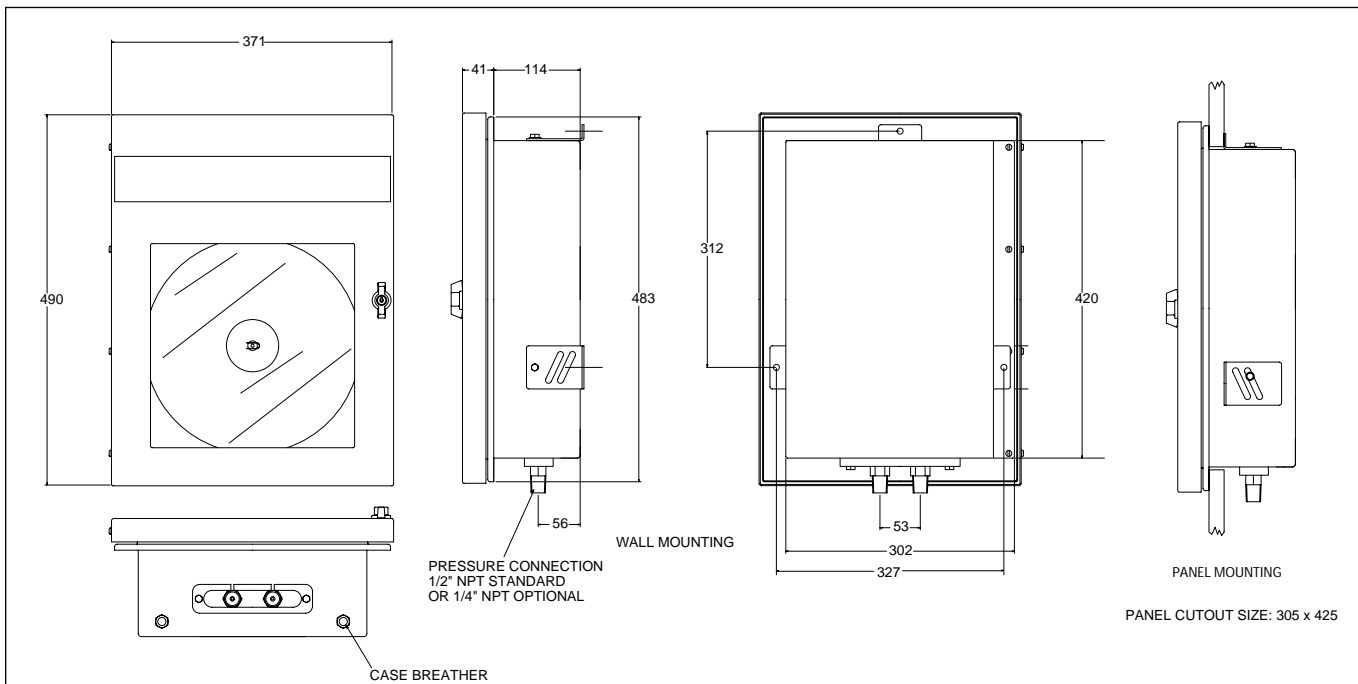
*Viton® is a registered trademark of DuPont Dow Elastomers*



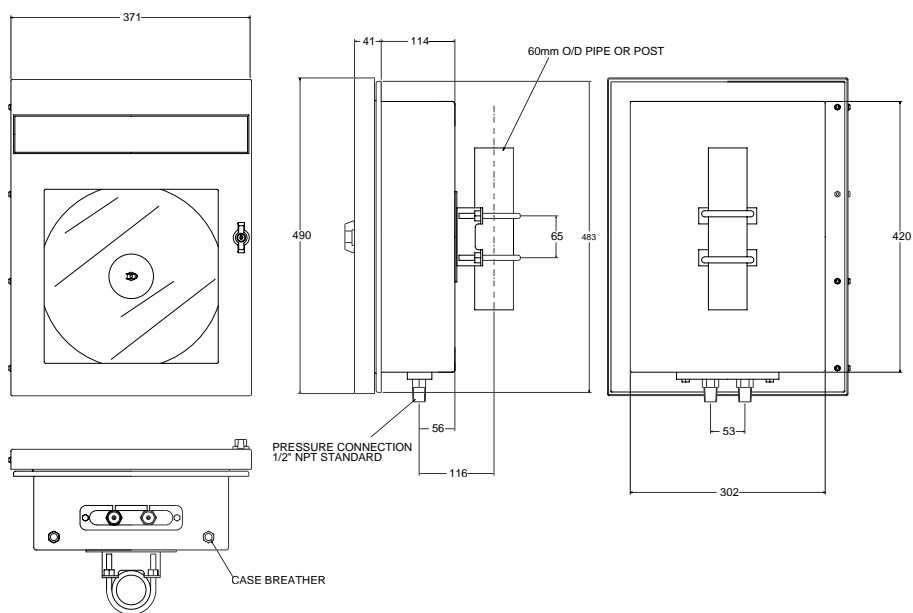
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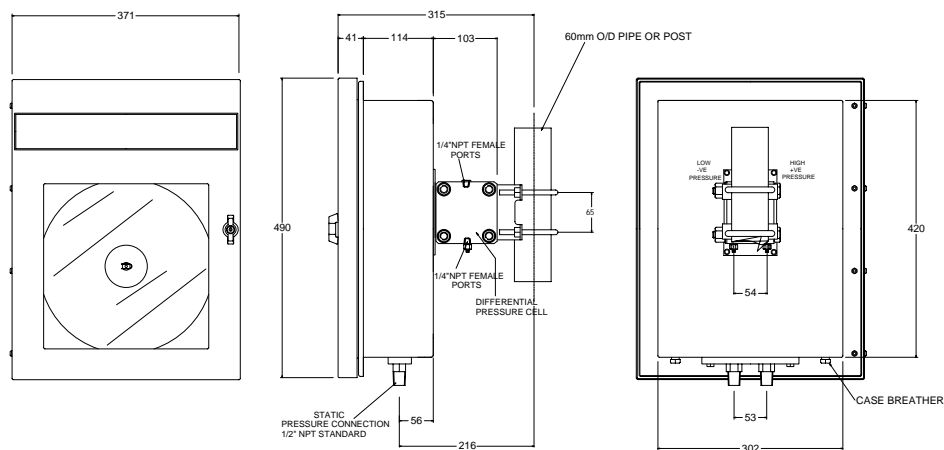
## ■ Dimensions



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

## ■ Standard Temperature Ranges

Range	Range
-40 to +40°C	0 to 160°C
-30 to +30°C	0 to 200°C
-30 to +50°C	0 to 300°C
-25 to +25°C	0 to 400°C
-25 to +30°C	20 to 120°C
0 to 40°C	50 to 150°C
0 to 50°C	50 to 250°C
0 to 60°C	100 to 400°C
0 to 100°C	100 to 500°C
0 to 120°C	

## ■ Standard Pressure Ranges

Standard Range	Sensing Element Type	Material
3 - 15 psi 0 to 1 bar 0 to 1.6 bar 0 to 2 bar	Bellows	Beryllium Copper
0 to 2.5 bar 0 to 4 bar 0 to 6 bar 0 to 10 bar 0 to 16 bar 0 to 25 bar 0 to 40 bar 0 to 60 bar 0 to 100 bar	Bourdon Tube	Phosphor Bronze or Stainless Steel
0 to 160 bar 0 to 250 bar 0 to 300 bar 0 to 400 bar 0 to 600 bar 0 to 1000 bar 0 to 1200 bar 0 to 1600 bar	Bourdon Tube	Stainless Steel

*Calibration in other units of pressure are available.*

## ■ 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

## ■ 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

## Total Temperature Instrumentation, Inc

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