

# CTS-420 Series – Position Transmitter System



- 4-20mA 2-wire current loop operation
- Linear stroke ranges from 0.25 to 10 inches
- Rotary version 0 to 90°
- Wide operating temperature range
- Compact size
- Remote sensor operation up to 35 ft [10m]
- MS style hermetic connector on the sensors
- Rugged splash-proof electronics housing (optional)

## DESCRIPTION

The **CTS-420 Series** is a 2-wire current loop position transmitter system especially suited to measurements in process industries. Each system consists of either an HCI Series LVDT linear position sensor or an R36AS RVDT rotary position sensor, along with an electronics module which provides a 4-20mA current loop output.

The CTS-420 operates on an unregulated 10 to 36VDC supply voltage. The electronics module provides the position sensor with the required AC voltage excitation voltage and converts the AC voltage output into a smooth 4-20mA signal. The zero and span adjustment potentiometers, as well as the sensor and loop supply connection terminals, are all conveniently located on the front panel for easy installation and calibration.

The HCI LVDT is constructed of stainless steel and is hermetically sealed. Like in most of our LVDTs, the HCI windings are vacuum impregnated with a specially formulated, high temperature, flexible resin, and the coil assembly is potted inside its housing with a two-component epoxy. This provides excellent protection against hostile environments such as high vibration and shock. Both the LVDT and the RVDT sensors feature an integral welded-on electrical hermetic connector.

The CTS-420 is ideal for applications where the sensor must be remotely located from the electronics (up to 35 feet away) due to environmental or space considerations. In addition, inductance and capacitance levels are well below the levels set for intrinsic safety requirements.

Also see our other 4-20mA position transmitter models; **PTS-420** (rugged housing, IP-65 LVDT), **HCT** (2-wire LVDT transmitter), **GCT** (heavy-duty gage head), and **RVIT 15-120i** (Rotary Variable Inductance Transmitter).

Measurement Specialties, Inc. (NASDAQ MEAS) offers many other types of sensors and signal conditioners. Data sheets can be downloaded from our web site at: <http://www.meas-spec.com/datasheets.aspx>

*Measurement Specialties acquired Schaevitz Sensors and the **Schaevitz™** trademark in 2000.*

## FEATURES

- 4-20mA 2-wire current loop operation
- Linear or rotary position sensing
- Zero and span adjustable
- Hermetically sealed (LVDT only)
- Imperial or metric threaded core (LVDT)
- Cable assembly up to 35ft. (optional)

## APPLICATIONS

- Process industry
- Remote, oil field valve position monitoring
- Ship-board turbine throttle position control
- Paper mill head box position
- Rolling mill roller gap feedback
- Damper control on fossil fuel power plants

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## PERFORMANCE SPECIFICATIONS

| ELECTRICAL SPECIFICATIONS              |                                                           |              |              |              |              |               |              |
|----------------------------------------|-----------------------------------------------------------|--------------|--------------|--------------|--------------|---------------|--------------|
| Parameter                              | CTS-420 250                                               | CTS-420 500  | CTS 420-1000 | CTS-420 2000 | CTS-420 4000 | CTS-420 10000 | CTS-420 0-90 |
| Measurement range                      | 0.250 [6.35]                                              | 0.500 [12.7] | 1.0 [25.4]   | 2.0 [50.8]   | 4.0 [101.6]  | 10.0 [254]    | 0 to 90°     |
| Non-linearity, max.                    | ±0.5% of FR                                               |              |              | ±1.5% of FR  |              |               |              |
| Temperature coefficient of sensitivity | ±0.02%/°F [±0.036%/°C]                                    |              |              |              |              |               |              |
| Loop supply voltage                    | 10 to 36VDC                                               |              |              |              |              |               |              |
| Output                                 | 4 to 20mA                                                 |              |              |              |              |               |              |
| Output at null position                | 12mA (null position is defined as the mid-range position) |              |              |              |              |               |              |
| Max loop resistance                    | 595 ohms @ 24VDC (see loop resistance chart below)        |              |              |              |              |               |              |
| Stability                              | 0.05% of FSO after 30 minutes warm up                     |              |              |              |              |               |              |
| Frequency response                     | 100Hz @ -3db                                              |              |              |              |              |               |              |
| Controls                               | Zero and span potentiometers, 10 turns                    |              |              |              |              |               |              |

| ENVIRONMENTAL AND MATERIAL SPECIFICATIONS  |                                                                      |
|--------------------------------------------|----------------------------------------------------------------------|
| Operating temperature range (LVDT/RVDT)    | -67°F to +300°F [-55°C to +150°C]                                    |
| Operating temperature (Electronics module) | -40°F to +200°F [-40°C to +95°C]                                     |
| Housing material (LVDT/RVDT)               | AISI 400 Series stainless steel                                      |
| Electrical connections (LVDT/RVDT)         | 6-pin MS type connector (MIL-C-5015)                                 |
| IEC 60529 rating (LVDT)                    | IP68 to 1,000 PSI [70 bars] with use of proper mating connector plug |

### Notes:

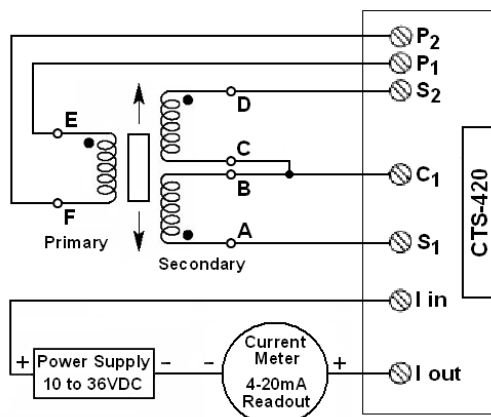
All values are nominal unless otherwise noted

Dimensions are in inch [mm] unless otherwise noted

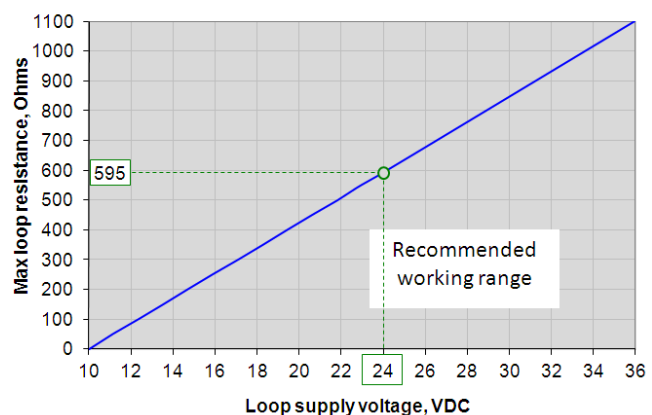
FR: Full Range is the range, end to end; FR=S for a 0 to S range

FSO (Full Scale Output): Largest absolute value of the outputs measured at the ends of the range

## WIRING SCHEMATIC & LOOP RESISTANCE



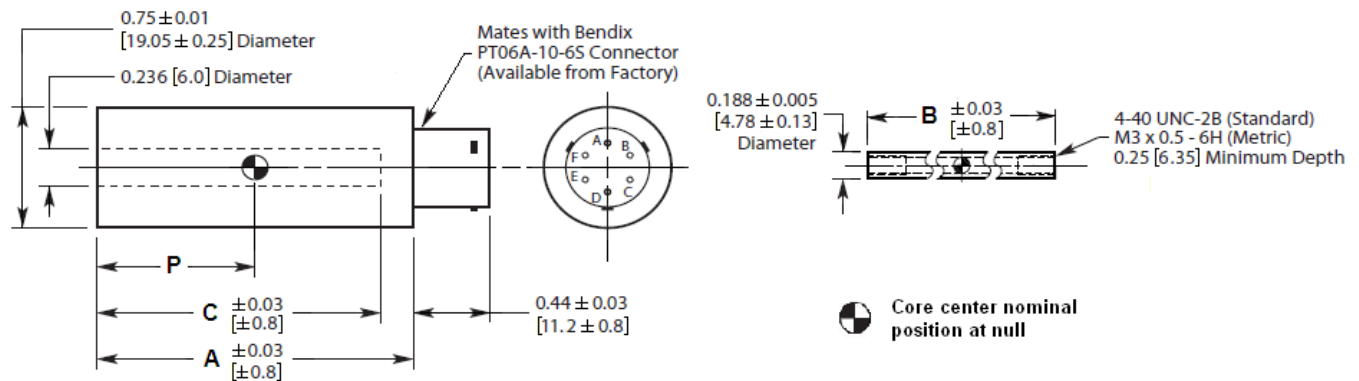
A through F: Connector pin assignments



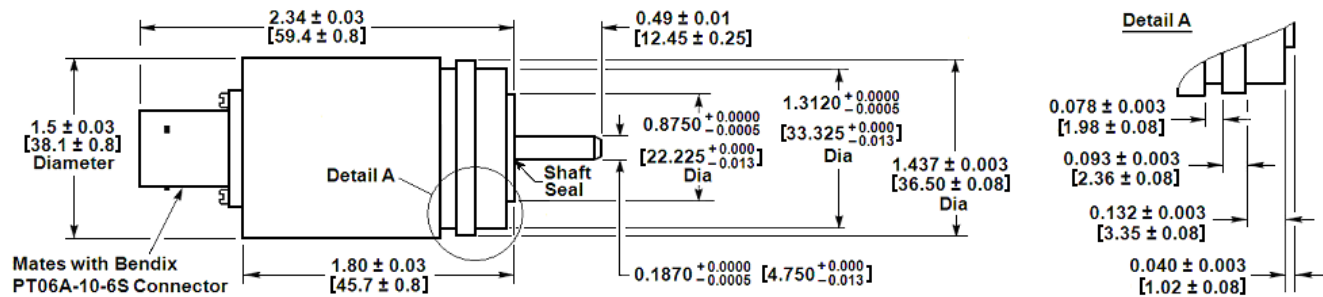
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## MECHANICAL SPECIFICATIONS – LVDT, HCI SERIES

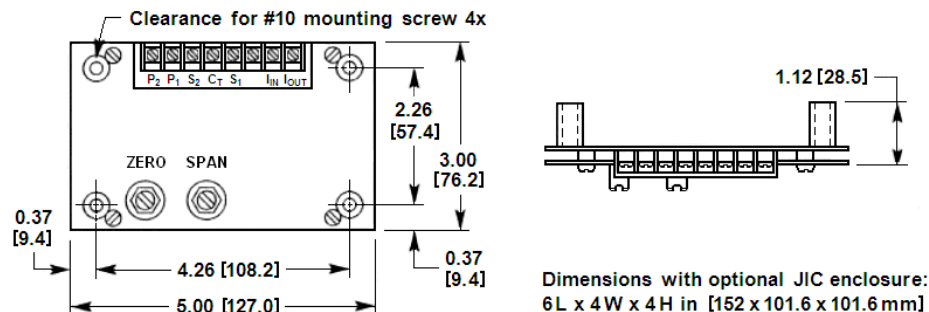
| Parameter                  | CTS-420 250 | CTS-420 500 | CTS-420 1000 | CTS-420 2000 | CTS-420 4000  | CTS-420 10000 |
|----------------------------|-------------|-------------|--------------|--------------|---------------|---------------|
| Main body length "A"       | 2.50 [63.5] | 3.84 [97.5] | 5.03 [127.8] | 7.29 [185.2] | 10.68 [271.3] | 19.7 [500.4]  |
| Core length "B"            | 1.10 [27.9] | 1.80 [45.7] | 3.00 [76.2]  | 3.80 [96.5]  | 5.00 [127.0]  | 6.2 [157.5]   |
| Center of core at null "P" | 0.96 [24.4] | 1.52 [38.6] | 2.23 [56.6]  | 3.32 [84.3]  | 5.05 [128.3]  | 9.53 [242.1]  |
| Bore depth "C"             | 1.91 [48.5] | 3.25 [82.5] | 4.46 [113.3] | 6.72 [170.7] | 10.2 [259.1]  | 19.12 [485.6] |
| Body weight, oz [g]        | 1.73 [49]   | 2.58 [73]   | 2.93 [83]    | 5.22 [148]   | 5.64 [160]    | 10.30 [292]   |
| Core weight, oz [g]        | 0.11 [3]    | 0.14 [4]    | 0.28 [8]     | 0.39 [11]    | 0.46 [13]     | 0.49 [14]     |



## MECHANICAL SPECIFICATIONS – RVDT, MODEL R36AS



## MECHANICAL SPECIFICATIONS – ELECTRONICS MODULE



Dimensions are in inch [mm]

# CTS-420 Series – Position Transmitter System

## ORDERING INFORMATION

| Description                                                | Model           | Part Number  |
|------------------------------------------------------------|-----------------|--------------|
| Transmitter system with 0.25 inch stroke LVDT              | CTS-420 250     | 02291277-000 |
| Transmitter system with 0.50 inch stroke LVDT              | CTS-420 500     | 02291278-000 |
| Transmitter system with 1 inch stroke LVDT                 | CTS-420 1000    | 02291279-000 |
| Transmitter system with 2 inch stroke LVDT                 | CTS-420 2000    | 02291280-000 |
| Transmitter system with 4 inch stroke LVDT                 | CTS-420 4000    | 02291281-000 |
| Transmitter system with 10 inch stroke LVDT                | CTS-420 10000   | 02291282-000 |
| Transmitter system with 0 to 90° range RVDT                | CTS-420 0-90    | 02291283-000 |
| <b>OPTIONS</b>                                             |                 |              |
| Metric threaded core (M3 x 0.5 – 6H) LVDT                  |                 | XXXXXXXX-006 |
| Guided core LVDT                                           |                 | XXXXXXXX-010 |
| Metric threaded, guide core                                |                 | XXXXXXXX-016 |
| <b>ACCESSORIES</b>                                         |                 |              |
| Mounting block for LVDTs                                   |                 | 04560950-000 |
| R-Flex Multipurpose Coupling Kit for RVDT                  |                 | 66530072-000 |
| Mating connector kit for LVDT or RVDT                      | PT06A-10-6S(SR) | 62101011-000 |
| LVDT/RVDT to CTS 420 cable, PT06A-10-6S to Stripped/Tinned | (1)             | 04290417-000 |
| JIC electronics enclosure                                  |                 | 61403006-000 |
| CTS Electronics module only (without LVDT or RVDT)         |                 | 04290398-000 |

(1) Cables are shielded, 10 foot long, and are rated 80°C [176°F] operating. Consult factory for other lengths.

Refer to our "[Accessories for LVDTs](#)" data sheet for our LVDT signal conditioning instrumentation and other accessories.  
Refer to our "[RVDT and RVIT Accessories](#)" data sheet for other accessories.

## TECHNICAL CONTACT INFORMATION

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