# DSCT36

## Potentiometer Input Transmitters

### Description

Each DSCT36 potentiometer input transmitter provides a single channel of potentiometer input which is filtered, isolated, amplified, and converted to a process current output (Figure 1). Signal filtering is accomplished with a five-pole filter, which provides 85dB of normal-mode rejection at 60Hz and 80dB at 50Hz. An anti-aliasing pole is located on the field side of the isolation barrier, and the other four are on the process loop side. After the initial field-side filtering, the input signal is chopped by a proprietary chopper circuit. Isolation is provided by transformer coupling, again using a proprietary technique to suppress transmission of common mode spikes or surges.

Potentiometer excitation is provided from the transmitter using a precision current source. The excitation current is small (less than 0.26mA) which minimizes self-heating of the potentiometer. Lead compensation is achieved by matching two current paths which cancels the effects of lead resistance.

Special input and output circuits on the DSCT36 transmitters provide protection against accidental connection of power-line voltages up to 240VAC and against transient events as defined by ANSI/IEEE C37.90.1. Signal and loop power lines are secured to the module using screw terminals, which are in pluggable terminal blocks for ease of system assembly and reconfiguration.

The modules have excellent stability over time and do not require recalibration, however, zero and span settings are adjustable up to ±10% to accommodate situations where fine-tuning is desired. The adjustments are made using potentiometers located under the front panel label and are non-interactive for ease of use.

### Features

- Interfaces to Potentiometers up to 10kΩ
- Process Current Output
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input and Output Protected to 240VAC Continuous
- Up to 60V Loop Voltage
- 160dB CMR
- 85dB NMR at 60Hz, 80dB at 50Hz
- ±0.03% Accuracy
- ±0.01% Linearity
- Easily Mounts on Standard DIN Rail
- CSA C/US Certified
- CE Compliant

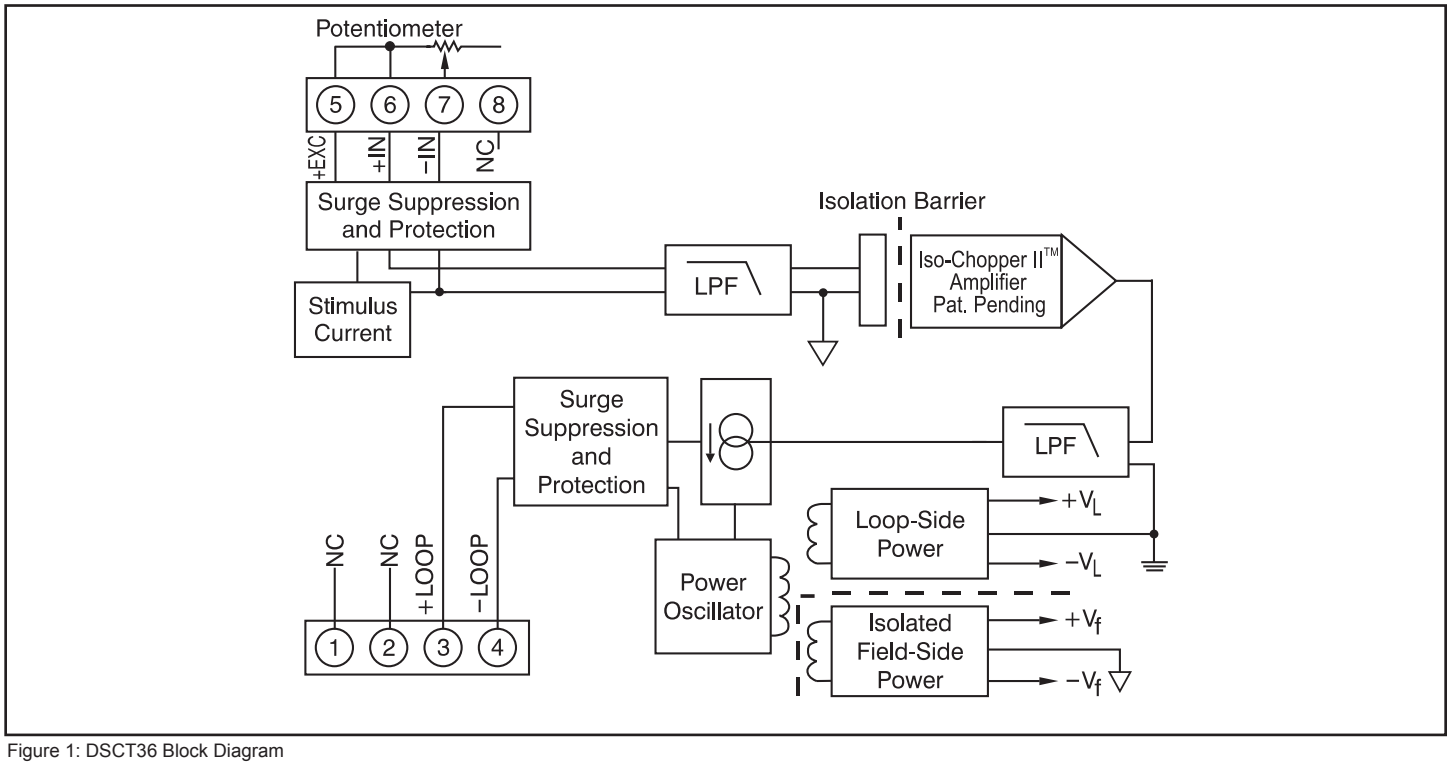


Figure 1: DSCT36 Block Diagram

## Specifications

Typical* at $T_A$ = +25°C and +24VDC loop voltage

| Module | DSCT36 |
|---|---|
| Input Range | 0Ω to 10kΩ |
| Input Resistance | |
| Normal | 50MΩ |
| Power Off | 66kΩ |
| Overload | 66kΩ |
| Input Protection | |
| Continuous | 240Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| CMV, Input to Output | |
| Continuous | 1500Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| CMR (50Hz or 60Hz) | 160dB |
| NMR | 85dB at 60Hz, 80dB at 50Hz |
| Adjustability | ±10% Zero and Span |
| Accuracy(1) | ±0.03% |
| Conformity | ±0.01% |
| Stability | |
| Offset | ±50ppm/°C |
| Gain | ±100ppm/°C |
| Sensor Excitation Current | 0.26mA; 100Ω, 500Ω Sensor<br>0.13mA; 1kΩ Sensor<br>0.065mA; 10kΩ Sensor |
| Lead Resistance Effect | ±0.01Ω/Ω; 100Ω, 500Ω, 1kΩ Sensor<br>±0.02Ω/Ω; 10kΩ Sensor |
| Noise | |
| Output, 100kHz | 3µArms |
| Bandwidth, –3dB | 3Hz |
| Response Time, 90% Span | 165ms |
| Output Range | 4mA to 20mA |
| Output Limits | |
| Under-range | 3mA |
| Over-range | 29mA |
| Output Protection | |
| Reverse Polarity | Continuous |
| Over-voltage | 240Vrms Continuous |
| Transient | ANSI/IEEE C37.90.1 |
| Loop Supply Voltage | 10.8V to 60V |
| Loop Supply Sensitivity | ±0.0005%/V |
| Turn-On Delay | 400ms |
| Mechanical Dimensions (h)(w)(d) | 2.95" x 0.89" x 4.13"<br>(75mm x 22.5mm x 105mm) |
| Mounting | DIN EN 50022 -35x7.5 or -35x15 rail |
| Environmental | |
| Operating Temperature | –40°C to +80°C |
| Storage Temperature | –40°C to +80°C |
| Relative Humidity | 0 to 95% Noncondensing |
| Emissions, EN61000-6-4 | ISM, Group 1 |
| Radiated, Conducted | Class A |
| Immunity EN61000-6-2 | ISM, Group 1 |
| RF | Performance A ±0.5% Span Error |
| ESD, EFT | Performance B |

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Includes linearity, hysteresis and repeatability.

## Ordering Information

| Model | Input Range |
|---|---|
| DSCT36-01 | 0 to 100Ω |
| DSCT36-02 | 0 to 500Ω |
| DSCT36-03 | 0 to 1kΩ |
| DSCT36-04 | 0 to 10kΩ |