DSCT34

Linearized 2- or 3-wire RTD-input Transmitters

DESCRIPTION

Each DSCT34 RTD-input transmitter provides a single channel of RTD-input which is filtered, isolated, amplified, linearized, and converted to a process current output (Figure below). 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.

RTD excitation is provided from the transmitter using a precision current source. The excitation currents are very small (0.26mA max for 100Ω Pt and 120Ω Ni) which minimizes self-heating of the RTD. Linearization is achieved by creating a non-linear transfer function through the module itself. This non-linear transfer function is configured at the factory and is designed to be equal and opposite to the specific RTD non-linearity. Lead compensation is achieved by matching two current paths thus canceling the effects of lead resistance.

The specifications listed are for a 3-wire connection. A 2-wire connection of the RTD to the module is also possible and is achieved by adding a jumper between pin 5 (+EXC) and pin 6 (+IN) on the terminal block and connecting the RTD leads between pin 6 (+IN) and pin 7 (–IN). The 2-wire connection nullifies the lead resistance compensation feature of the module.

Special input and output circuits on the DSCT34 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 ±3% 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

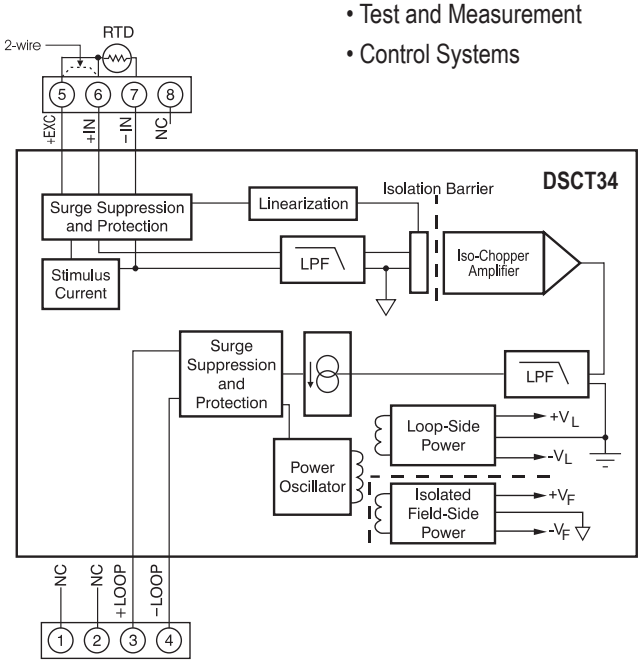
- Interfaces to 100Ω Platinum or 120Ω Nickel RTDs
- Linearizes RTD Signal
- Process Current Output
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input and Output Protected to 240VAC Continuous
- Up to 60V Loop Voltage
- 160dB CMR
- 85dB NMR at 60Hz, 80dB at 50Hz
- ±0.1% Accuracy
- ±0.025% Conformity
- Easily Mounts on Standard DIN-rail
- CSA C/US Certified
- CE Compliant
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- Highly Accurate
- Stable Outputs
- High Repeatability

APPLICATIONS

- Data Acquisition
- Test and Measurement
- Control Systems



DSCT34 Block Diagram - For Module Dimensions and Pinouts, See Page 7-47

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Specifications

Typical* at T_A = +25°C and +24VDC Loop Voltage

Module	DSCT34
Input Range	–200°C to +850°C (100Ω Pt) –80°C to +320°C (120Ω Ni)
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	±3% Zero and Span
Accuracy	See Ordering Information
Conformity	±0.025%
Stability	
Offset	±50ppm/°C
Gain	±100ppm/°C
Sensor Excitation Current	0.260mA
Lead Resistance Effect	±0.02°C/Ω
Noise	
Output, 100kHz	3µArms
Bandwidth, –3dB	3Hz
Response Time, 90% Span	165ms
Output Range	4-20mA
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" (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 conformity, hysteresis, and repeatability.

Ordering Information

Model	Input Range	Accuracy(1)	
100Ω Pt **			
DSCT34-01	–100°C to +100°C (–148°F to +212°F)	±0.1%	±0.2°C
DSCT34-02	0°C to +100°C (+32°F to +212°F)	±0.1%	±0.1°C
DSCT34-03	0°C to +200°C (+32°F to +392°F)	±0.1%	±0.2°C
DSCT34-04	0°C to +600°C (+32°F to +1112°F)	±0.1%	±0.6°C
DSCT34-05	0°C to +400°C (+32°F to +752°F)	±0.1%	±0.4°C
120Ω Ni **			
DSCT34N-01	0°C to +300°C (+32°F to +572°F)	±0.1%	±0.3°C

**RTD Standards

Type	Alpha Coefficient	DIN	JIS	IEC
100Ω Pt 120Ω Ni	0.00385 0.00672	DIN 43760	JIS C 1604-1989	IEC 751

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