

DSCA40/41









Analog Voltage Input Signal Conditioners, Wide Bandwidth

Description

Each DSCA40/41 voltage input module provides a single channel of analog input which is filtered, isolated, amplified, and converted to a high level voltage output. Signal filtering is accomplished with a five-pole filter. An anti-aliasing pole is located on the field side of the isolation barrier, and the other four poles are on the system 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.

Module output is either voltage or current. For current output models a dedicated loop supply is provided at terminal 3 (+OUT) with loop return located at terminal 4 (-OUT). The system-side load may be either floating or grounded.

Special input circuits provide protection against accidental connection of powerline voltages up to 240VAC and against transient events as defined by ANSI/ IEEE C37.90.1. Protection circuits are also present on the signal output and power input terminals to guard against transient events and power reversal. Signal and 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 ±5% 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

- · Accepts Millivolt and Voltage Level Signals
- · Industry Standard Output of either 0-10V. ±10V, 0-20mA, or 4-20mA
- · 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- · Input Protected to 240VAC Continuous
- · True 3-Way Isolation
- · Wide Range of Supply Voltage
- 100dB CMR
- · 3 kHz Signal Bandwidth
- ±0.03% Accuracy
- ±0.01% Linearity
- · Easily Mounts on Standard DIN Rail
- · C-UL-US Listed
- · CE and ATEX Compliant

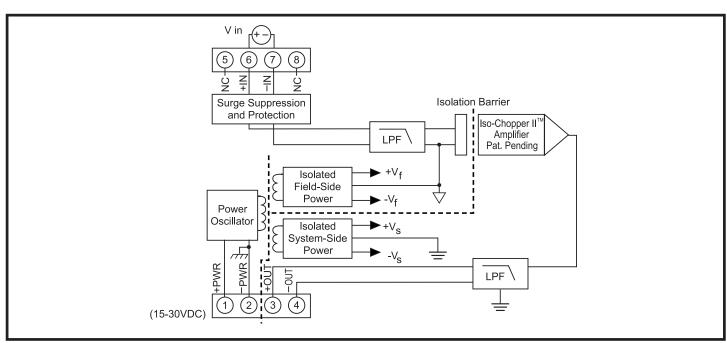


Figure 1: DSCA40/41 Block Diagram



$\textbf{Specifications} \quad \text{Typical at T}_{\text{\tiny A}} \text{=+25}^{\circ}\text{C and +24V supply voltage}$

| Model | DSCA40 | DSCA41 |
|---|--|---|
| Input Range Input Bias Current Input Resistance Normal Power Off Overload Input Protection Continuous Transient | +10mV to +100mV ±0.5nA | ±1V to ±40V ±0.05nA |
| | $50 \mathrm{M}\Omega$ $65 \mathrm{k}\Omega$ $65 \mathrm{k}\Omega$ | $500 k\Omega$ min $500 k\Omega$ min $500 k\Omega$ min |
| | 240Vrms max ANSI/IEEE C37.90.1 | * |
| Output Range Load Resistance (I _{OUT}) Current Limit Output Protection Short to Ground Transient CMV, Input to Output, Input to Power Continuous Transient CMV, Output to Power Continuous CMR (50Hz or 60Hz) | See Ordering Information 600Ω max 8mA (V $_{\rm OUT}$), 30mA (I $_{\rm OUT}$) | * |
| | Continuous ANSI/IEEE C37.90.1 | * |
| | 1500Vrms max ANSI/IEEE C37.90.1 | * |
| | 50VDC max 100dB | * |
| Accuracy ⁽¹⁾ Nonlinearity Adjustability Stability Input Offset Output Offset Zero Suppression Gain Output Noise, 100kHz Bandwidth | ±0.03% Span ±0.01% Span ±5% Zero and Span | * * |
| | $\begin{array}{c} \pm 0.5 \mu \text{V/}^{\circ}\text{C} \\ \pm 6 \text{ppm/}^{\circ}\text{C} \ (\text{V}_{\text{OuT}}), \ \pm 20 \text{ppm/}^{\circ}\text{C} \ (\text{I}_{\text{OuT}}) \\ \pm 50 \text{ppm/}^{\circ}\text{C} \ (\text{V}_{\text{2}})^{2})^{\circ}\text{C} \\ \pm 35 \text{ppm/}^{\circ}\text{C} \\ 750 \mu \text{Vrms} \ (\text{V}_{\text{OuT}}), \ 3 \mu \text{Arms} \ (\text{I}_{\text{OuT}}) \end{array}$ | ±5µV/°C * ±55ppm/°C |
| Bandwidth, -3dB NMR Response Time, 90% Span | 3kHz 100dB/decade above 3kHz 170µs | * * * |
| Power Supply Voltage Current Sensitivity Protection Reverse Polarity Transient | 15 to 30VDC 25mA (V _{out}), 55mA (I _{out}) ±0.0001%/% | * * |
| | Continuous ANSI/IEEE C37.90.1 | * |
| Environmental Operating Temp. Range ATEX Group II, Category 3 Storage Temp. Range Relative Humidity Emissions EN61000-6-4 Radiated, Conducted Immunity EN61000-6-2 RF ESD, EFT, Surge, Voltage Dips | -40°C to +80°C -20°C to +40°C -40°C to +80°C 0 to 95% Noncondensing ISM, Group 1 Class A ISM, Group 1 Performance A ±0.05% Span Error Performance B | * * * * * * * * * |
| Mechanical Dimensions (h)(w)(d) Mounting | 2.95" x 0.89" x 4.13" (75mm x 22.5mm x 105mm) DIN EN 50022 -35x7.5 or -35x15 rail | * |
| NOTES: | | |

Ordering Information

| Model | Input Range | Output Range [†] |
|-----------|------------------|---------------------------|
| DSCA40-01 | -10mV to +10mV | 1 |
| DSCA40-02 | -50mV to +50mV | 1 |
| DSCA40-03 | -100mV to +100mV | 1 |
| DSCA40-04 | -10mV to +10mV | 2, 3, 4 |
| DSCA40-05 | -50mV to +50mV | 2, 3, 4 |
| DSCA40-06 | -100mV to +100mV | 2, 3, 4 |
| DSCA40-07 | 0 to +10mV | 2, 3, 4 |
| DSCA40-08 | 0 to 50mV | 2, 3, 4 |
| DSCA40-09 | 0 to +100mV | 2, 3, 4 |
| DSCA41-01 | -1V to +1V | 1 |
| DSCA41-02 | -5V to +5V | 1 |
| DSCA41-03 | -10V to +10V | 1 |
| DSCA41-04 | -1V to +1V | 2, 3, 4 |
| DSCA41-05 | -5V to +5V | 2, 3, 4 |
| DSCA41-06 | -10V to +10V | 2, 3, 4 |
| DSCA41-07 | -20V to +20V | 1 |
| DSCA41-08 | -20V to +20V | 2, 3, 4 |
| DSCA41-09 | -40V to +40V | 1 |
| DSCA41-10 | -40V to +40V | 2, 3, 4 |
| DSCA41-11 | 0 to +1V | 2, 3, 4 |
| DSCA41-12 | 0 to +5V | 2, 3, 4 |
| DSCA41-13 | 0 to +10V | 2, 3, 4 |
| DSCA41-14 | 0 to +20V | 2, 3, 4 |
| DSCA41-15 | 0 to +40V | 2, 3, 4 |

†Output Ranges Available

| Output Range | Part No. Suffix | Example |
|---------------|-----------------|------------|
| 110V to +10V | NONE | DSCA40-01 |
| 2. 0V to +10V | NONE | DSCA40-04 |
| 3. 4 to 20mA | C | DSCA40-04C |
| 4. 0 to 20mA | E | DSCA40-04E |

NOTES:

Installation Notes:

- 1.) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B, C, D, or Non-Hazardous Locations Only.
- 2.) Warning Explosion Hazard Substitution of Components May Impair Suitability for Class I, Division 2.
- 3.) Warning Explosion Hazard Do Not Disconnect Equipment Unless Power Has Been Switched Off or The Area is Known to be Non-Hazardous.

^{*} Same specification as DSCA40.

⁽¹⁾ Includes nonlinearity, hysteresis and repeatability.
(2) V_z is the nominal input voltage that results in 0V or 0mA output.