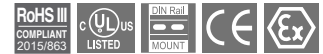


## DSCA39



### Current-output Signal Conditioners

#### DESCRIPTION

Each DSCA39 current-output module provides a single channel of analog output. The input signal is buffered, isolated, filtered, and converted to a unipolar or bipolar current output (Figure below). Signal filtering is accomplished with a five-pole filter which provides 100dB per decade of attenuation above 1kHz. An anti-aliasing pole is located on the system side of the isolation barrier, and the other four poles are on the field side. After the initial system-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.

Special output circuits provide protection against accidental connection of power-line voltages up to 240VAC and against transient events as defined by ANSI/IEEE C37.90.1. Protection circuits are also present on the signal input 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  $\pm 5\%$  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

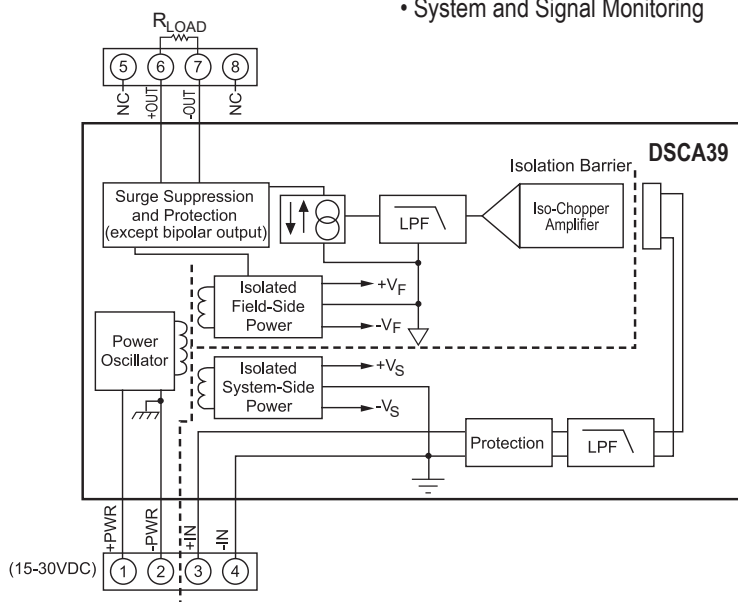
- Accepts High-level Voltage Input
- Provides 4-20mA, 0-20mA, or  $\pm 20$ mA Output
- ANSI/IEEE C37.90.1 Transient Protection
- 1500Vrms Transformer Isolation
- $\pm 0.03\%$  Accuracy
- $\pm 0.01\%$  Linearity
- Output Protected to 240VAC Continuous
- True 3-way Isolation
- Wide Supply Voltage Range
- 100dB CMR
- Easily Mounts on Standard DIN-rail
- UL/cUL Listed
- CE and ATEX Compliant
- Manufactured per RoHS III Directive 2015/863

#### BENEFITS

- Protects User Equipment from Lightning and Heavy Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair
- Reduces EMC Concerns
- Signal Filtering in Noisy Environments
- Simplifies Sensor Interface and Signal Conditioning Design
- Provides Isolation of External Sensors
- Breaks Ground Loops

#### APPLICATIONS

- Analog Signal Filtering
- Industrial Process Control
- Test and Measurement
- System and Signal Monitoring
- Temperature Measurement
- Torque Measurement
- Civil Engineering
- Geotechnical Monitoring



DSCA39 Block Diagram - [For Module Dimensions and Pinouts, See Page 4-35](#)

**Specifications** Typical\* at T<sub>A</sub> = +25°C and +24VDC Supply Voltage

| Module                                   | DSCA39-01, -02, -03, -04                         | DSCA39-05  | DSCA39-07  |
|--|--|--|--|
| Output Range                             | 4-20mA or 0-20mA                                 | 0-20mA   | ±20mA  |
| Over Range Capability                    | 10%  | 10%  | 5%   |
| Output Compliance Voltage (Open Circuit) | 22VDC  | 22VDC  | ±15VDC   |
| Load Resistance Range                    | 0 to 750Ω  | 0 to 750Ω  | 0 to 500Ω  |
| Output Protection                        |  |  |  |
| Continuous                               | 240Vrms (max)                                    | 240Vrms (max)                                    | 240Vrms (max)                                    |
| Transient                                | ANSI/IEEE C37.90.1                               | ANSI/IEEE C37.90.1                               | ANSI/IEEE C37.90.1                               |
| Input Range                              | ±10V or 0V to +10V                               | 0-20mA   | ±10V   |
| Input Resistance                         |  |  |  |
| Normal                                   | 2MΩ  | <100Ω  | 2MΩ  |
| Power Off                                | 2MΩ  | <100Ω  | 2MΩ  |
| Overload                                 | 2MΩ  | 65kΩ   | 2MΩ  |
| Input Protection                         |  |  |  |
| Continuous                               | ±35V (max)                                       | 75mA   | ±35V (max)                                       |
| Transient                                | ANSI/IEEE C37.90.1                               | ANSI/IEEE C37.90.1                               | ANSI/IEEE C37.90.1                               |
| CMV, Output to Input, Output to Power    |  |  |  |
| Continuous                               | 1500Vrms (max)                                   | 1500Vrms (max)                                   | 1500Vrms (max)                                   |
| Transient                                | ANSI/IEEE C37.90.1                               | ANSI/IEEE C37.90.1                               | ANSI/IEEE C37.90.1                               |
| CMV, Input to Power                      |  |  |  |
| Continuous                               | 50VDC (max)                                      | 50VDC (max)                                      | 50VDC (max)                                      |
| CMR (50Hz or 60Hz)                       | 110dB  | 110dB  | 110dB  |
| Accuracy <sup>(1)</sup>                  | ±0.03% Span                                      | ±0.03% Span                                      | ±0.05%   |
| Linearity                                | ±0.01% Span                                      | ±0.01% Span                                      | ±0.01% Span                                      |
| Adjustability                            | ±5% Zero and Span                                | ±5% Zero and Span                                | ±5% Zero and Span                                |
| Stability                                |  |  |  |
| Offset                                   | ±20ppm/°C  | ±20ppm/°C  | ±20ppm/°C  |
| Gain                                     | ±40ppm/°C  | ±50ppm/°C  | ±40ppm/°C  |
| Output Noise, 100kHz Bandwidth           | 4μArms   | 4μArms   | 4μArms   |
| Bandwidth, -3dB                          | 1kHz   | 1kHz   | 1kHz   |
| NMR                                      | 100dB per Decade Above 1kHz                      | 100dB per Decade Above 1kHz                      | 100dB per Decade Above 1kHz                      |
| Response Time, 90% Span                  | 475μs  | 475μs  | 475μs  |
| Power Supply                             |  |  |  |
| Voltage                                  | 15 to 30VDC                                      | 15 to 30VDC                                      | 19 to 29VDC                                      |
| Current                                  | 65mA   | 65mA   | 65mA   |
| Sensitivity                              | ±0.0003%/%                                       | ±0.0003%/%                                       | ±0.0003%/%                                       |
| Protection                               |  |  |  |
| Reverse Polarity                         | Continuous                                       | Continuous                                       | Continuous                                       |
| Transient                                | ANSI/IEEE C37.90.1                               | ANSI/IEEE C37.90.1                               | ANSI/IEEE C37.90.1                               |
| Mechanical Dimensions (h)x(w)x(d)        | 2.95" x 0.89" x 4.13"<br>(75mm x 22.5mm x 105mm) | 2.95" x 0.89" x 4.13"<br>(75mm x 22.5mm x 105mm) | 2.95" x 0.89" x 4.13"<br>(75mm x 22.5mm x 105mm) |
| Mounting                                 | DIN EN 50022<br>35x7.5 or 35x15 Rail             | DIN EN 50022<br>35x7.5 or 35x15 Rail             | DIN EN 50022<br>35x7.5 or 35x15 Rail             |
| Environmental                            |  |  |  |
| Operating Temperature Range              | -40°C to +80°C                                   | -40°C to +80°C                                   | -40°C to +80°C                                   |
| Storage Temperature Range                | -40°C to +80°C                                   | -40°C to +80°C                                   | -40°C to +80°C                                   |
| Relative Humidity                        | 0 to 95% Noncondensing                           | 0 to 95% Noncondensing                           | 0 to 95% Noncondensing                           |
| Emissions EN61000-6-4                    | ISM, Group 1                                     | ISM, Group 1                                     | ISM, Group 1                                     |
| Radiated, Conducted                      | Class A  | Class A  | Class A  |
| Immunity EN61000-6-2                     | ISM, Group 1                                     | ISM, Group 1                                     | ISM, Group 1                                     |
| RF                                       | Performance A ±0.5% Span Error                   | Performance A ±0.5% Span Error                   | Performance A ±0.5% Span Error                   |
| ESD, EFT                                 | Performance B                                    | Performance B                                    | 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  | Output Range |
|-----------|--------------|--------------|
| DSCA39-01 | 0V to +10V   | 4-20mA       |
| DSCA39-02 | -10V to +10V | 4-20mA       |
| DSCA39-03 | 0V to +10V   | 0-20mA       |
| DSCA39-04 | -10V to +10V | 0-20mA       |
| DSCA39-05 | 0mA to 20mA  | 0-20mA       |
| DSCA39-07 | -10V to +10V | ±20mA        |

**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.
- 4.) The Power to These Devices Shall Be Limited by an Over-current Protection Device, UL Certified Fuse (JDYX/JDYX2) Rated 6A Max.