

# DSCA45

## Frequency Input Signal Conditioners



### Description

Each DSCA45 frequency input module provides a single channel of frequency input which is isolated and converted to a standard analog voltage or current output (Figure 1).

The frequency input signal can be a TTL level or zero-crossing signal. Terminal 7 (-IN) on the field-side terminal block is the “common” or ground connection for input signals. A TTL signal is connected from terminal 6 (+IN) to terminal 7 (-IN), while a zero-crossing signal is connected from terminal 5 (+EXC) to terminal 7 (-IN). Input circuitry for each of the signal types has hysteresis built in. An input signal must cross entirely through the hysteresis region in order to trigger the threshold comparator.

A +5.1V excitation is available for use with magnetic pick-up or contact-closure type sensors. The excitation is available on terminal 8 (-EXC) with return at terminal 7 (-IN).

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 pluggable terminal blocks for ease of system assembly and reconfiguration.

DSCA45 modules have excellent stability over time and do not require recalibration, however, both zero and span settings are adjustable to accommodate situations where fine tuning is desired. The adjustments

### Features

- Accepts Frequency Inputs of 0 to 100kHz
- Industry Standard Output of 0 to +10V, 0 to 20mA, or 4 to 20mA
- ±0.05% Factory Calibrated Accuracy
- Adjustable Zero (±5%) and Span (±5%)
- 1500Vrms Transformer Isolation
- Input Overload Protected to 240VAC Continuous
- 120dB CMR
- ANSI/IEEE C37.90.1 Transient Protection
- Mounts on Standard DIN Rail
- C-UL-US Listed
- CE and ATEX Compliant

are made using potentiometers located under the front panel label and are non-interactive for ease of use.

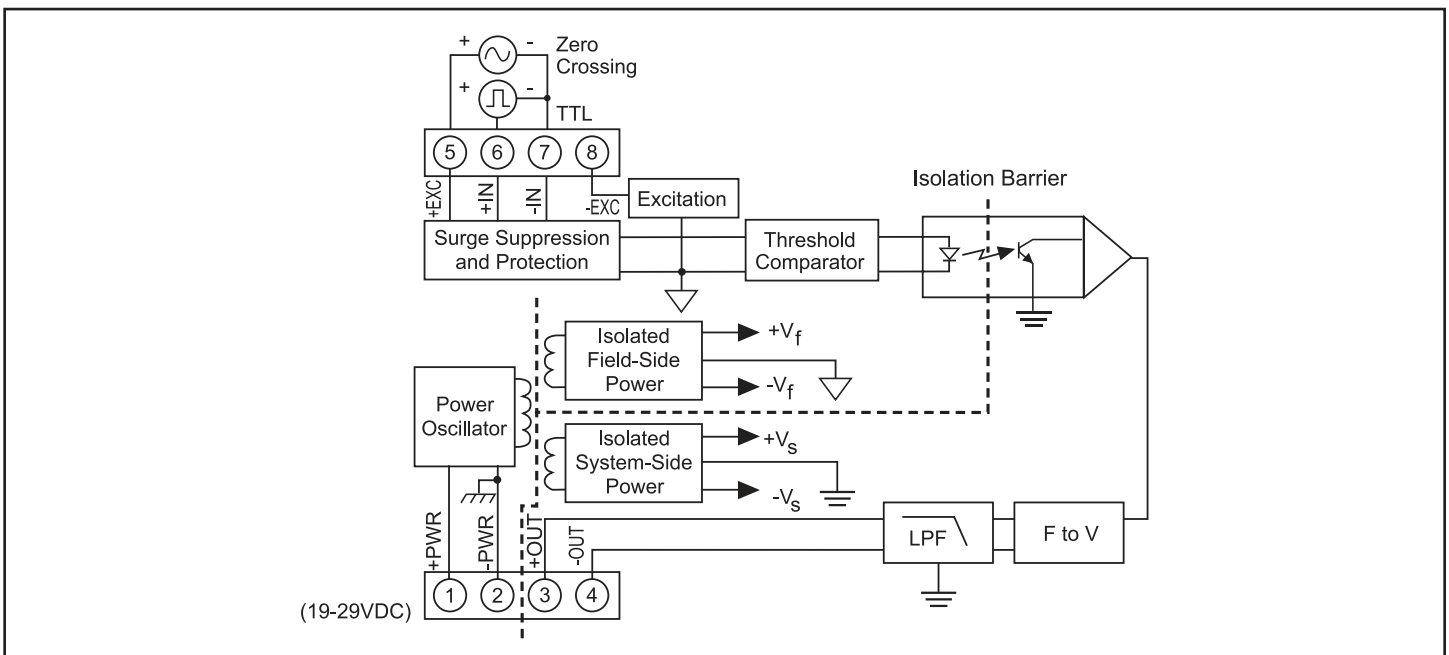


Figure 1: DSCA45 Block Diagram

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

| Module                              | DSCA45   |
|-------------------------------------|--|
| Input                               |  |
| Range                               | 0 to 100kHz max                                    |
| Threshold                           | Zero Crossing                                      |
| Minimum Input                       | 60mVp-p  |
| Maximum Input                       | 350Vp-p  |
| Minimum Pulse Width                 | 4µs  |
| TTL Input Low                       | 0.8V max   |
| TTL Input High                      | 2.4V min   |
| Hysteresis                          |  |
| Zero Crossing                       | 40mV   |
| TTL                                 | 1.5V   |
| Resistance                          | 100kΩ  |
| Protection                          |  |
| Continuous                          | 240Vrms max  |
| Transient                           | ANSI/IEEE C37.90.1                                 |
| Output Range                        | See Ordering Information                           |
| Adjustability                       | ±5% Zero & Span                                    |
| Load Resistance (I <sub>OUT</sub> ) | 600Ω max.  |
| Current Limit                       | 8mA (V <sub>OUT</sub> ), 30mA (I <sub>OUT</sub> )  |
| Output Protection                   |  |
| Short to Ground                     | Continuous   |
| Transient                           | ANSI/IEEE C37.90.1                                 |
| Ripple                              | ± .20% Span at input ± % Span                      |
| Accuracy <sup>(1)</sup>             | ±0.05% Span  |
| vs. Temperature                     | ±40ppm/°C (Zero & Span)                            |
| Linearity                           | ±0.02% Span  |
| Isolation (Common Mode)             |  |
| Input to Output, Input to Power     |  |
| Continuous                          | 1500Vrms max                                       |
| Transient                           | ANSI/IEEE C37.90.1                                 |
| Output to Power                     |  |
| Continuous                          | 50VDC max  |
| Rejection (50-60Hz Common Mode)     | 120dB  |
| Response Time (0 to 90%)            |  |
| DSCA45-01, -02, -03                 | 310ms, 175ms, 50ms                                 |
| DSCA45-04, -05, -06                 | 30ms, 30ms, 15ms                                   |
| DSCA45-07, -08                      | 15ms, 1.5ms  |
| Field Excitation                    | +5.1V ±5% at 8mA max                               |
| Power Supply                        |  |
| Voltage                             | 19 to 29VDC  |
| Current                             | 60mA (V <sub>OUT</sub> ), 80mA (I <sub>OUT</sub> ) |
| Sensitivity                         | ±0.0002% %   |
| Protection                          |  |
| Reverse Polarity                    | Continuous   |
| Transient                           | ANSI/IEEE C37.90.1                                 |
| Mechanical Dimensions               | 2.95" x 0.89" x 4.13"                              |
| (h)(w)(d)                           | (75mm x 22.5mm x 105mm)                            |
| Mounting                            | DIN EN50022 -35x7.5 or -35x15 rail                 |
| Environmental                       |  |
| Operating Temp. Range               | -40°C to +80°C                                     |
| Storage Temp. Range                 | -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    | Output Range† |
|-----------|----------------|---------------|
| DSCA45-01 | 0Hz to 500Hz   | 2, 3, 4       |
| DSCA45-02 | 0kHz to 1kHz   | 2, 3, 4       |
| DSCA45-03 | 0kHz to 2.5kHz | 2, 3, 4       |
| DSCA45-04 | 0kHz to 5kHz   | 2, 3, 4       |
| DSCA45-05 | 0kHz to 10kHz  | 2, 3, 4       |
| DSCA45-06 | 0kHz to 25kHz  | 2, 3, 4       |
| DSCA45-07 | 0kHz to 50kHz  | 2, 3, 4       |
| DSCA45-08 | 0kHz to 100kHz | 2, 3, 4       |

**†Output Ranges Available**

| Output Range    | Part No. Suffix | Example    |
|-----------------|-----------------|------------|
| 1. -10V to +10V | NONE            | N/A        |
| 2. 0V to +10V   | NONE            | DSCA45-01  |
| 3. 4 to 20mA    | C               | DSCA45-01C |
| 4. 0 to 20mA    | E               | DSCA45-01E |

**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.