

DIN Rail Mount Configurable Signal Conditioners



DRF Series



- ✓ Voltage, Current, Frequency, Resistance, Potentiometer, Thermocouple, RTD and Load Cell Input Modules
- ✓ Field Configurable Signal Ranges
- ✓ Provides up to 3500 Veff Isolation Between Input and Output and Power (Isolation is Model Specific)
- ✓ Compatible with Standard 35 mm DIN Rail

The DRF series DIN rail signal conditioners are designed to accept a broad range of input signals, such as ac and dc voltage and current, frequency, temperature (thermocouple and RTD), and process transducers, and provide standard process outputs of either 4 to 20 mA, or 0 to 10 Vdc. The DRF series feature a modern housing design, that is easily mounted on standard 35 mm DIN rails. Connections are safely and securely made through pluggable screw terminal connectors, with input and output connections on the opposite sides of the module.

Functionality

The DRF series are designed to maximize functionality. The front door of the housing provides easy access to span and offset potentiometers which may be used to field adjust the input and output signal range.

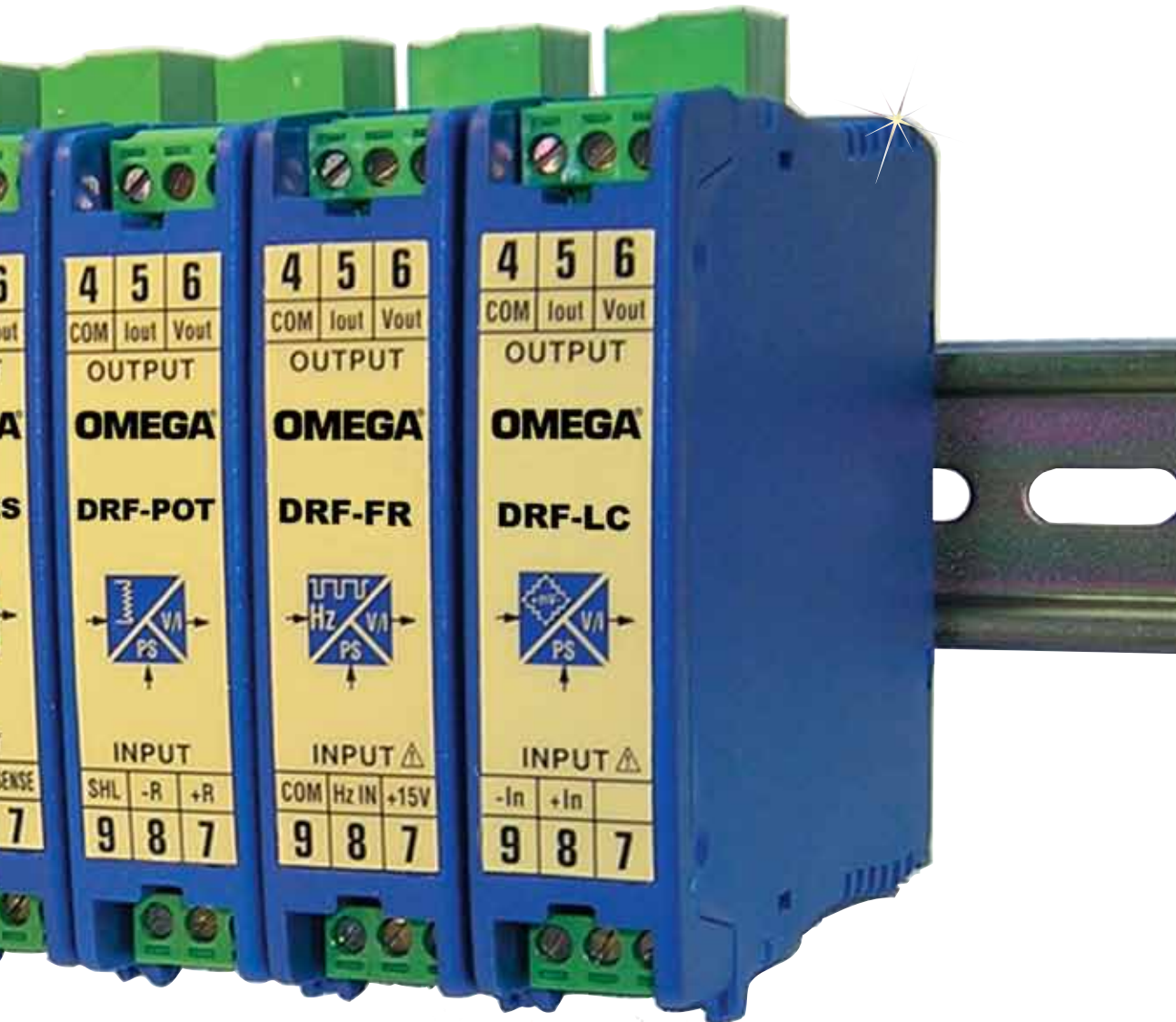
Isolation

The input, output and power circuits are isolated by 3500 volts of galvanic isolation. The isolation protects against potentially damaging voltages from passing through the signal conditioners into connected systems. The isolation also provides improved measurement accuracy by minimizing the effects of ground loops and electrical noise.

Outputs

Each DRF series signal conditioner is available with current and voltage output (only one may be used at a time). Available output types include 4 to 20 mA or 0 to 10 Vdc. Although pre-configured before shipping from the factory, the output may be changed through an internal jumper change.

Standard outputs are linear and proportional to the signal input. Thermocouple input modules feature special circuitry to linearize the output to the actual temperature rather than the non-linear signal produced by thermocouple sensors.



SPECIFICATIONS (Common to all Models)

Power: 24 Vdc $\pm 10\%$, 230 Vac $\pm 10\%$ 50/60 Hz, 115 Vac $\pm 10\%$ 50/60 Hz

Power Consumption: <3.8 VA

Output: 4 to 20 mA and 0 to 10 Vdc

Maximum Voltage Output: 11 Vdc approx.

Minimum Voltage Output: -1 Vdc approx.

Minimum Load Resistance (Voltage): ≥ 1 K Ω

Maximum Current Output: 22 mA approx.

Maximum Current Output: -1.5 mA approx.

Maximum Load Resistance (current): $\leq 400\Omega$

Accuracy: <0.2% or <0.3% depending on model

Linearity: <0.1% or <0.2% depending on model

Thermal Drift: <150 ppm/ $^{\circ}$ C or 250 ppm/ $^{\circ}$ C typical depending on model

Response Time: 70 mS (Process and DC input models); 250 mS (Temperature and AC input models)

Isolation*:

Input to Output: 3500 Veff

Power to Input: 3500 Veff

Power to Output: 3500 Veff (for AC powered models), 1K Veff (for dc powered models)

Electrical Connections: Plug-in screw terminals

Protection: IP-30

MECHANICAL DIMENSIONS

Weight:

(DC Powered): 120 g (4.2 oz)

(AC Powered): 200 g (7 oz)

Dimensions:

(DC Powered Models): 110 H x 22.5 W x 93 mm D (4.3 x 0.9 x 3.7")

(AC Powered Models):

110 H x 37 W x 93 mm D (4.3 x 1.46 x 3.7")

Operating Temperature: 0 to 60 $^{\circ}$ C (32 to 140 $^{\circ}$ F)

Storage Temperature: -20 to 70 $^{\circ}$ C (-4 to 158 $^{\circ}$ F)

*Tested True RMS, 60 sec. leak <1 mA

Frequency Input Signal Conditioner

DRF-FR



- ✓ NPN, PNP, NAMUR, Voltage Pulse, Voltage AC (up to 200 Vac)
- ✓ Frequency Signals from 10 Hz up to 50 KHz
- ✓ Accuracy 0.2%
- ✓ Excitation Voltage 15 Vdc (20 mA) or 9V2 for NAMUR
- ✓ Galvanic Isolation between Input, Output and Power

The DRF-FR signal conditioner accepts a frequency input and provides an isolated 0 to 10 Vdc or 4 to 20 mA output. Models are available with three different power options, 24 Vdc, 120 Vac and 240 Vac.

The DRF-FR are ideally suited for industrial applications. All models mount on a standard 35mm DIN rail and provide galvanic isolation between input, output and power up to 3500 Veff (model specific). Module response time is 250 ms or less.

Specifications

Signal Type: NPN, PNP, NAMUR, Voltage Pulse, AC up to 200 Vac (2 ranges < 24 Vac and < 200 Vac)

Accuracy: <0.2% full scale

Linearity: <0.1% full scale

Thermal Drift: 250 ppm/°C typical (max <200ppm/°C)

RESPONSE TIME

0 to 100 Hz: <300 mS (90% of signal)

0 to 500 Hz: <250 mS (90% of signal)

0 to 5 KHz: <200 mS (90% of signal)

0 to 50 KHz: <150 mS (90% of signal)

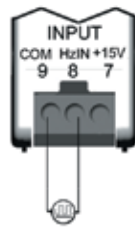
IMPEDANCE

Voltage Input: (<24 Vac Range): 100 K

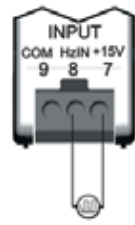
(<200 Vac Range): 1 M

PNP and NPN Input: 10 K Ω

NAMUR Input: 1 K Ω



Externally Powered Sensor



NAMUR or PNP Sensor Powered from the DRF-FR Signal Conditioner

DRF-FR-115VAC-1KHZ-4/20, shown larger than actual size.



Input Range Table

Range Code	Range
20HZ	0 to 20 Hz
40HZ	0 to 40 Hz
60HZ	0 to 60 Hz
100HZ	0 to 100 Hz
200HZ	0 to 200 Hz
300HZ	0 to 300 Hz
500HZ	0 to 500 Hz
1KHZ	0 to 1 KHz
2KHZ	0 to 2 KHz
3KHZ	0 to 3 KHz
5KHZ	0 to 5 KHz
10KHZ	0 to 10 KHz
20KHZ	0 to 20 KHz
30KHZ	0 to 30 KHz
50KHZ	0 to 50 KHz

OVER RANGE PROTECTION

Voltage Input;
 (<24 Vac Range): 75V
 (<200V ac Range): 300V
PNP and NPN Input: 35V
NAMUR Input: Always powered by 9V2

* Custom ranges may be obtained by adjusting on-board zero and span potentiometers. The minimum span is 10 Hz.

To Order Visit omega.com/dr_f_series for Pricing and Details

Model No.	Description
DRF-FR-(*)-(**)-(***)	Signal conditioner for frequency input

* Specify power, "24Vdc" for 24 Vdc power, "115Vac" for 115 Vac power or "230Vac" for 230 Vac power

** Specify range code from the Input Range Table

*** Specify output, "4/20" for 4 to 20 mA output or "0/10" for 0 to 10 Vdc output

Ordering Example: DRF-FR-115VAC-1KHZ-4/20, signal conditioner for frequency input with a 0 to 1000 Hz input range, 4 to 20 mA output and 115 Vac power.