



# ISOLATED 4-20 mA TRANSMITTERS

## 500 SERIES FOR DEMANDING APPLICATIONS

- ✓ Isolated to 1500 V rms
- ✓ Two-Wire 4-20 mA Operation
- ✓ 9-50 V Compliance
- ✓ Turndown Ratio to 10:1
- ✓ NMV Protection to 120 Vac
- ✓ -40 to +85°C (-40 to 185°F) Operation
- ✓ Shock Resistance to 55 g
- ✓ NEMA-4X Metal Case
- ✓ Field-Scalable



Custom Scaling Available. Specify input signals corresponding to 4 and 20 mA outputs.



## UNMATCHED ELECTRICAL PERFORMANCE

### Two-wire Operation

Power is obtained directly from the 4-20 mA loop, with no need for separate power input. This simplifies field wiring and eliminates the possibility of noise pickup from power lines.

### Isolation to 1500 V rms (2100 Vp)

This exceptionally high CMV rating from the input to the case or output eliminates the possibility of electrical ground loops between the signal source and the receiver. It also provides a high degree of protection for the receiver against electrical hazards, such as accidental contact between the signal source and an AC power line.

### 9-50 V Compliance


The loop voltage driving the transmitters can be from 9 to 50 V without loss of accuracy. The exceptionally low 9 V limit allows the transmitters to be used with low loop supply voltages, and it maximizes the voltage drop allowed in the current loop for intrinsic safety barriers and load resistance. For example, at the full 20 mA output of the transmitter, a 750 ohm load can be used with a 24 Vdc source and a 150 ohm load can be used with a 12 Vdc source. In either case, there will still be enough voltage left to power the transmitter, namely 9 Vdc.

### 10:1 Turndown Ratio

Turndown ratio is defined as zero suppression divided by span. The exceptionally high 10:1 turndown ratio possible with the 500 Series indicates that wide zero offset can be combined with narrow signal span for closed loop control at high gain. The signal span can also be wide for control of batch operations, where a wide range of signal levels may be encountered over the entire batch cycle.

### High Overvoltage Protection

Overvoltage of 120 Vac may be applied across the input or output leads for 1 minute in case of all models with voltage or thermocouple input. Reverse polarity of 400 Vp may be applied across the output leads indefinitely. These exceptionally high NMV overvoltage ratings provide further protection against possible electrical faults and wiring errors.

NEWPORT PRODUCT INFO	
•	<a href="#">MANUAL (HTML)</a> 500 Series
•	QUICK START
•	<a href="#">MECHANICAL</a>
•	<a href="#">PRICE</a> (501, 502A)
•	<a href="#">PRICE</a> (504, 505, 506)
•	<a href="#">PRICE</a> (508B, 509)
 REQUIRES ADOBE ACROBAT - <a href="#">HELP</a>	

## DESIGNED FOR HARSH ENVIRONMENTS

### Extreme Operating Temperatures

The operating temperature can be from -40°C to +85°C (-40°F to +185°F) while meeting published performance specifications. This allows the 500 Series to be used near furnaces or outdoors in the winter. The exceptionally wide operating temperature range is made possible by a proprietary electrical circuit and by extensive use of computer-graded and computer-matched electrical components.

### Resistant to Shock and Vibration

The shock rating is 55 g, which includes a 6-foot drop onto concrete. This is made possible by a compact die-cast metal case, which is only 74 mm (2.9") in diameter, and by rugged mounting of the electronics. The circuit board assembly is in the shape of a rigid box and is firmly soldered to the top of the transmitter case.

### Waterproof Case

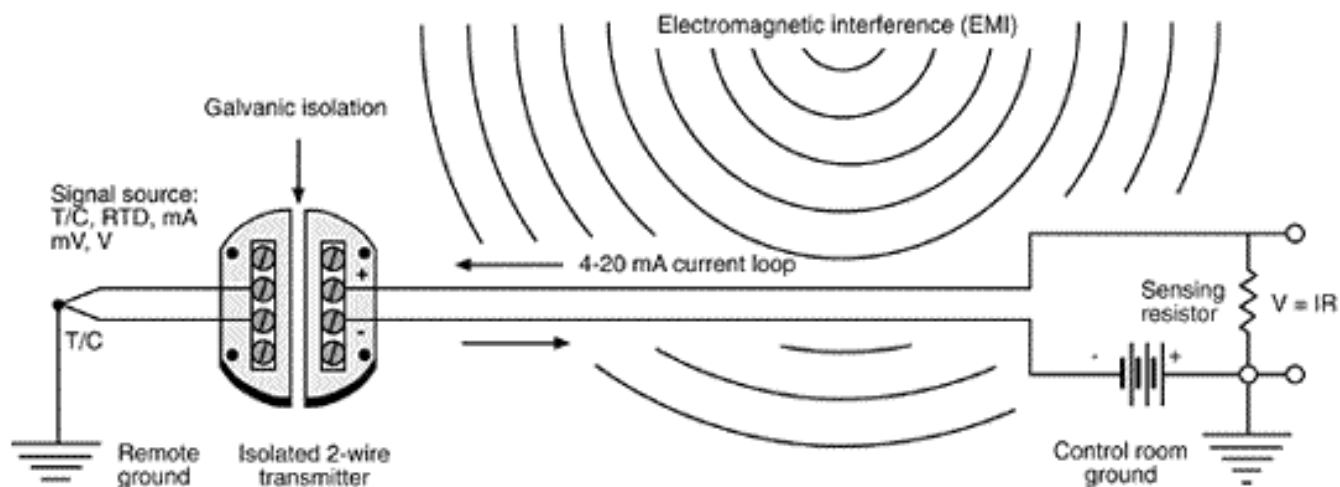
The case is made of die-cast zinc alloy. It is waterproof to 35 kPa (5 PSI) and meets NEMA-4X standards. The top of the case is sealed against the bottom with a fluorosilicone gasket, and the openings in the top of the case for the zero and span adjustment are sealed with fluorosilicone plugs.

### Explosion-proof Housing Options

Three external NEMA-7 explosion-proof and NEMA-4 waterproof enclosures are available as options for use in hazardous locations in Class I, Groups B, C, D; and Class II, Groups E, F, G. Option EPH1 is a single-height, all-metal housing for a single 500-Series transmitter. FM and CENELEC EEx d II C certification is standard. Option EPW2 is a double-height metal enclosure with a glass window for a 500-Series transmitter on the bottom and a 508B loop-powered indicator on top. FM and CENELEC EEx d II C certification is standard. The 508B augments the transmitter with an LCD digital readout scaled in engineering units and only adds a modest 2.5 V drop to the current loop. Option EPW3 is a single-height enclosure for one 508B loop-powered indicator. FM and CENELEC EEx d II C certification is standard.

## EASY TO CALIBRATE AND INSTALL

There is no need to specify different models for different ranges of the same signal type. Zero and span are each set by push-on jumpers for coarse range selection and by a 15-turn precision potentiometer for fine adjustment. The two potentiometers are accessible from outside of the case through openings which are normally sealed by fluorosilicone plugs. To assist in calibration, two test terminals provide a 10 mV/mA output (200 mV full-scale). The scaling procedure is documented in a comprehensive user's manual, which is shipped with every unit.



### Classical Application of a 500 Series 2-Wire Isolated Transmitter

The Transmitter amplifies a low-level voltage signal to 4-20 mA current signal, which is immune to voltage noise pick-up. The voltage detected in the control room is  $V = IR$ , where  $I$  is the loop current and  $R$  is the dropping resistor of the receiving equipment. The isolation provided by the transmitter protects the receiving equipment and eliminates the possibility of ground loops between the remote signal ground and the ground of the control room.



## COMMON SPECIFICATIONS - ALL MODELS

### SIGNAL OUTPUT

**Connection:** 2-wire

**Linear Range:** 4-20 mA

**Maximum Output:** 35 mA

**Voltage Compliance:** 9-50 Vdc

**Power Supply Rejection:** 0.01% of span/volt

### INPUT/OUTPUT PROTECTION

**CMV, Input to Case or Output:** 2100 Vp per HV test, 354 Vp per IEC spacing

**CMR, Input to Case or Output:** 120 dB, DC to 60 Hz

**NMV Across Output Leads:** 120 Vac for 1 min

**Reverse Polarity Across Output Leads:** 400 Vp

### ACCURACY, -40°C to +85°C

**Hysteresis & Repeatability:**  $\pm 0.1\%$  of span 6-month

**Stability Error:**  $\pm 0.2\%$  of zero suppression

**Error Due to 50°C Change in Transmitter Temperature:** **Zero Error:**  $\pm 0.2\%$  of zero suppression **Span Error:**  $\pm 0.2\%$  of span

### ENVIRONMENTAL

**Operating temperature:** -40 to +85°C (-40 to +185°F)

**Storage Temperature:** -55 to +125°C (-67 to +257°F)

**Relative Humidity:** 0 to 100% (sealed case)

**Watertight Proof Pressure:** 35 kPa (5 PSI) **Shock:** 55 g, half sine, 9-13 ms duration

**Vibration:** 1.52 mm (0.06 in) double amplitude, 10-80 Hz cycled

### MECHANICAL

**Case Material:** Zamak® zinc alloy

**Gasket Material:** Fluorosilicone

**Diameter:** 74 mm (2.9 in)

**Height, Including Barriers:** 53 mm (2.1")

**Weight:** 380 g (13 oz)

**Electrical Connection:** #6 screws with wire clamps

**Terminal Protection:** Standard: Screw terminal barriers plus barrier strip cover CPB1 (Optional): Plastic cover for case top (protects T/C screw terminals from air currents)

### NON-COMMON SPECIFICATIONS

**RTD INPUT - MODEL 501****Signal Source:** Pt 100 RTD**Span for 4-20 mA Output:** 100 to 1050°C (180 to 1890°F)**Zero Suppression:** -200 to +750°C (-328 to +1382°F)**Source Connection:** 2- or 3-wire**Excitation Current:** 200  $\mu$ A**Lead Resistance, Max:** 100 ohm**Bandwidth:** DC-60 Hz**OHMS INPUT MODEL 501****Signal Source:** 0-400 ohm**Span for 4-20 mA Output:** 35 to 400 ohm**Zero Suppression:** 0 to 365 ohm**Source Connection:** 2- or 3-wire**Excitation Current:** 200  $\mu$ A**Lead Resistance, Max:** 100 ohm**Bandwidth:** DC-60 Hz**THERMOCOUPLE INPUT MODEL 502A****Span and Zero Suppression:** See input table**Input Resistance (Open T/C Detector Resistance):** 5 M ohm**Bias Current, Max:** 50 nA**NMV Across Input Leads:** 120 Vac for 1 min**NMR Across Input Leads:** 40 dB, 50/60 Hz, 100 mV input**Thermocouple Lead Resistance:** For specified performance: 100 ohm Maximum: 10 kohm**Step Response, Type:** 400 ms**MILLIVOLT INPUT MODEL 504****Span for 4-20 mA Output:** 5 to 100 mV**Zero Suppression:** -30 to +60 mV**Input Resistance:** 100 M ohm**Bias Current, Max:** 50 nA NMV**Across Input Leads:** 120 Vac for 1 min**NMR Across Input Leads:** 40 dB, 50/60 Hz, 100 mV input**Step Response, Type:** 400 ms**MILLIAMP INPUT MODEL 505****Span for 4-20 mA Output:** 5 to 100 mA**Zero Suppression:** -30 to +60 mA**Input Resistance:** 1 ohm**Step Response, Type:** 400 ms**VOLT INPUT MODEL 506****Span for 4-20 mA Output:** 0.5 to 5 V (506-1); 5 to 50 V (506-2)**Zero Suppression:** -3.5 to +6.0 V (506-1); -35 to +60 V (506-2)**Input Resistance:** 1 M ohm Bias Current, Max: 1 nA**NMV Across Input Leads:** 120 Vac for 1 min**NMR Across Input Leads:** 40 dB, 50/60 Hz, 100 mV input**Step Response, Type:** 400 ms**Quick Selection Guide by Input Type**

Model	Signal Type	Zero Suppression* for 4 mA Output	Maximum Signal* for 20 mA Output	Signal Span* for 20 mA Output	Input Impedance
501	RTD Pt 100 Ohms	-200 to +750°C -328 to +1382°F 0 to 365 ohm	+850°C +1562°F 400 ohm	100 to 1050°C 180 to 1890°F 35 to 400 ohm	N/A

<b>502A-J</b>	Type J T/C Iron Costantan	-50 to +660°C -58 to +1220°F	+760°C +1400°F	100 to 810°C 180 to 1458°F	5 Mohm
<b>502A-K</b>	Type K T/C Chromel Alumel	-50 to +1272°C -58 to +2322°F	+1372°C +2502°F	100 to 1422°C 180 to 2560°F	5 Mohm
<b>502A-T</b>	Type T T/C Copper Costantan	-50 to +350°C -58 to +662°F	+400°C +752°F	50 to 450°C 90 to 810°F	5 Mohm
<b>502A-E</b>	Type E T/C Chromel Costantan	-50 to +900°C -58 to +1652°F	+1000°C +1832°F	100 to 1050°C 180 to 1890°F	5 Mohm
<b>504</b>	Millivolts	-30 to +60 mV	+160 mV	5 to 100 mV	100 Mohm
<b>505</b>	Milliamps	-30 to +60 mA	+160 mA	5 to 100 mA	1 ohm
<b>506-1</b>	Low Volts	-3.5 to +6.0 V	+11 V	0.5 to 5 V	1 Mohm
<b>506-2</b>	High Volts	-35 to +60 V	+110 V	5 to 50 V	1 Mohm

\*The signal span shown in column 5 for 4-20 mA output cannot include inputs below the maximum signal in column 4.



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# PROCESS INPUTS SIGNAL CONDITIONER

## DIN RAIL MOUNT



Patented



## DRN-PR / DRX-PR

- ✓ Unipolar/Bipolar 400 mV to 10 Vdc, 0-20 mA dc
- ✓ 11-14-Bit Resolution
- ✓ ±0.1% FS Accuracy
- ✓ 14 Vdc Excitation
- ✓ 1800 Volts Isolation
- ✓ 250 Vac/1 Min. Input Overvoltage Protection (Voltage Input Only)
- ✓ Free Setup and Configuration Software
- ✓ Factory Setup and Configuration Available at No Charge (for DRN Analog Output models)

### NEWPORT PRODUCT INFO

- [MANUAL \(HTML\)](#) - [PDF Version](#) DRN-PR
- [MANUAL \(HTML\)](#) - [PDF Version](#) DRX-PR
- [MECHANICAL](#)
- [PRICE](#)

REQUIRES ADOBE ACROBAT - [HELP](#)



The DRN-PR and DRX-PR signal conditioners provide high accuracy isolated measurement of process signals. For maximum flexibility, the units feature user configurable input types which are fully field scalable. Two models are available, the DRN-PR which provides an analog output that is proportional to the input signal and the DRX-PR which uses a digital RS-485 communication link. Both models can accept unipolar and bipolar signals from 400 mV to 10 Vdc full scale. A 0 to 20 mA current range is also available. The DRN/DRX-PR also contains a 14 Vdc reference voltage which may be used for transducer excitation. The output of DRN-PR can be user set for 0 to 10 V, 4 to 20 mA or 0 to 20 mA. Input scaling and configuration of other operating parameters is accomplished by connecting to a standard RS-232 port of a personal computer and using the DRN-CONFIG, Windows-based setup software. Once configured the settings may be stored in non-volatile memory and the unit disconnected from the PC.

### Factory Setup and Configuration at No Extra Charge

To make your installation even easier, your DRN (Analog Output and RS-232) signal conditioners can be ordered preconfigured by the factory at no extra charge. You select the input types, ranges and output scale and we will program the instruments to your specific requirements in our calibration lab prior to shipment. For custom factory setup and scaling of the DRN model, please specify the “-FS” option.

### Please Specify:

- Input Value High & Low
- Output Value High & Low
- Excitation: 10 or 14 Volts dc
- Ratiometric or Non-Ratiometric

**Example:** 0 V = 4 mA, 10 V = 20 mA, Excitation 10 V, Non-Ratiometric

The DRX-PR is a digital signal conditioner which communicates over an RS-485 communication link using either Omega® Serial Protocol or MODBUS Serial Protocol. Up to 32 modules may be connected to a single RS-485 port stretching up to 4,000 ft. Through the use of RS-485 repeaters, additional modules may be used and further transmission distances are achievable.

### Free Active X Controls

Free Active X Controls are provided for the DRN/DRX series Signal Conditioners. This free software makes it easy to integrate the "i Series" with "Active X Containers" such as Microsoft Visual Basic as well as with popular OLE compliant data acquisition, process control, and industrial automation software from OMEGA as well as Wonderware, Intellution, Rockwell Automation, and Object Automation among others.

### SPECIFICATIONS

**Accuracy at 25°C:** ±0.1% FS

**Resolution:** 11 to 14 bit

**Excitation:** 14 VDC @ 25mA

**Power Consumption:** 2 W (84 Ma @ 24 vDC) without excitation (100 mA @ 24 Vdc), 3 W with excitation (125 mA @ 24 Vdc)

**Input Ranges:** Uni/bipolar, 400 mV to 10 Vdc; 0 to 20 mA full

**DRX Output:** 2-wire (half duplex) RS-485

**DRN Output:** 0 to 10 V @ 10 mA max; 0 to 20 mA or 4 to 20 mA, 10 V compliance

**Process Default settings DRN:** Input Range 0-20mA; Output 4-20mA. Excitation 14V (Custom Settings available at no charge.)

**To Order** (Specify Model No.) *Prices Shown in U.S. Dollars*

Model No.	Description	Price
DRX-PR	Digital signal conditioner for strain gages and bridge transducers with RS-485 output	\$275
DRN-PR	Signal conditioner for strain gages and bridge transducers with analog output	\$325
-FS	Factory setup and scaling	FREE

Each unit supplied with complete operator's manual.

**Ordering Example:** DRX-PR digital signal conditioner with RS-485 output for process signals (\$275), plus DRN-PS-750 power supply, 115 Vac input, 24 Vdc output @ 750 mA (\$130), \$275 + 130 = **\$405**.

### ACCESSORIES

Model No.	Description	Price
DRN-RS232-SW DRX-RS485-SW	Configuration Software for DRN Configuration Software for DRX	FREE
DB9-RJ12 DB25-RJ12	DB9 TO RJ12 Connector Adaptor includes 7 ft, DB25 to RJ12 Connector Adaptor RJ12 Cord	\$30
DRN-PS-750	Power supply, 115 Vac input, 24 Vdc output @ 750 mA	\$130
DRN-PS-1000	Switching Power supply, 95-240 Vac input, 24 Vdc output @850mA	\$150
CAT-285	Bi-directional RS-232-RS-485 converter for DRX series	\$148

\*Specify "9" for 9-pin or "25" for 25-pin serial cable.



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# AC VOLTAGE / CURRENT SIGNAL CONDITIONERS

## DIN RAIL MOUNT



## DRN-ACC / ACV & DRX-ACC / ACV

- ✔ Software Selectable Input Ranges  
DRX-ACV: 0-400 mV to 0 to 400 Vac  
DRX-ACC: 0-10 mA to 0-5 A ac
- ✔ 14-Bit Resolution (max)
- ✔ 0.2% FS Accuracy
- ✔ 1800 V Isolation
- ✔ Free Setup and Configuration Software
- ✔ Factory Setup and Configuration Available at No Charge (for DRN Analog Output models)



NEWPORT PRODUCT INFO	
• <a href="#">MANUAL (HTML)</a>	DRN-ACC
• <a href="#">MANUAL (HTML)</a>	DRN-ACV
• <a href="#">MANUAL (HTML)</a> - <a href="#">PDF Version</a>	DRX-ACC
• <a href="#">MANUAL (HTML)</a> - <a href="#">PDF Version</a>	DRX-ACV
• <a href="#">MECHANICAL</a>	
• <a href="#">PRICE</a>	
REQUIRES ADOBE ACROBAT - <a href="#">HELP</a>	

The **DRN/DRX Series** signal conditioners provide high accuracy isolated measurement of ac voltage and current signals. For maximum flexibility, the units feature user configurable input types which are fully field scalable. Four models are available, the DRN-ACV and DRN-ACC accept ac voltage and ac current respectively and provide an analog output which is proportional to the input. The DRX-ACV and DRX-ACC accept ac voltage and ac current respectively and provide a digital RS-485 communication link. The DRN-ACC and DRX-ACV can accept ac currents from 0 to 10 mA to 0 to 5 A ac. The DRX-ACV and DRN-ACV can accept ac voltages from 0 to 400 mV to 0 to 400 Vac.

The output of DRN-ACC and DRN-ACV can be user set for 0 to 10 V, 4 to 20 mA or 0 to 20 mA. Input scaling and configuration of other operating parameters is accomplished by connecting to a standard RS-232 port of a personal computer and using the DRN-RS232-SW, Windows-based setup software. Once configured the settings may be stored in non-volatile memory and the unit disconnected from the PC.

### Factory Setup and Configuration at No Extra Charge

To make your installation even easier, your DRN (Analog Output and RS-232) signal conditioners can be ordered preconfigured by the factory at no extra charge. You select the input types, ranges and output scale and we will program the instruments to your specific requirements in our calibration lab prior to shipment. For custom factory setup and scaling of the DRN model, please specify the “-FS” option.

### Please Specify:

**DRN-ACV:** Input Value High & Low  
Output Value High & Low

**Example:** 0 volts = 4 mA, 400Vac = 20 mA

**DRN-ACC:** Input Value High & Low  
Output Value High & Low

**Example:** 0 A = 4 mA, 5 A = 20 mA



The DRX-ACC and DRX-ACV are digital signal conditioners which communicate over an RS-485 communication link using either Omega® Serial Protocol or MODBUS Serial Protocol. Up to 32 modules may be connected to a single RS-485 port stretching up to 4,000 ft. Through the use of RS-485 repeaters, additional modules may be used and further transmission distances are achievable.

### Free Active X Controls

Free Active X Controls are provided for the DRN/DRX series Signal Conditioners. This free software makes it easy to integrate the "i Series" with "Active X Containers" such as Microsoft Visual Basic as well as with popular OLE compliant data acquisition, process control, and industrial automation software from OMEGA as well as Wonderware, Intellution, Rockwell Automation, and Object Automation among others.

### SPECIFICATIONS

**Accuracy at 25°C:** ±0.2% FS

**Resolution:** 10 to 14 bit

**Power Consumption:** 2.4 W; 100 mA @ 24 Vdc

### MODEL DRX-ACV/DRN-ACV

**Input Ranges:** 0 to 400 mV to 0 to 400 Vac full scale

**Interface:** RS-485; RJ-12 or screw terminal connector

### MODEL DRX-ACC/DRN-ACC

**Input Ranges:** 0 to 10 mA to 0 to 5 A ac full scale

**DRX Output:** 2-wire (half duplex) RS-485

**DRN Output:** 0 to 10V @ 10 mA max; 0 to 20 mA or 4 to 20 mA

**ACV Default settings DRN:** Input 0-400 VAC; Output 4-20 mA (Custom Settings available at no charge.)

**ACC Default settings DRN:** Input 0-5 Amp; Output 4-20 mA (Custom Settings available at no charge.)

**To Order** (Specify Model No.) *Prices Shown in U.S. Dollars*

Model No.	Description	Price
DRX-ACC	Digital signal conditioner with RS-485 output for ac current inputs	\$270
DRX-ACV	Digital signal conditioner with RS-485 output for ac voltage inputs	\$270
DRN-ACC	Signal conditioner with analog output for ac current inputs	\$345
DRN-ACV	Signal conditioner with analog output for ac voltage inputs	\$345
-FS	Factory setup and scaling	FREE

Each unit supplied with complete operator's manual.

**Ordering Example:** DRX-ACV digital signal conditioner with RS-485 output for ac voltage inputs (\$270), plus DRN-PS-750 power supply, 115 Vac input, 24 Vdc output @ 750 mA (\$130), \$270 + 130 = **\$400**.

### ACCESSORIES

Model No.	Description	Price
DRN-RS232-SW DRX-RS485-SW	Configuration Software for DRN Configuration Software for DRX	FREE
DB9-RJ12 DB25-RJ12	DB9 TO RJ12 Connector Adaptor includes 7 ft, DB25 to RJ12 Connector Adaptor RJ12 Cord	\$30
DRN-PS-750	Power supply, 115 Vac input, 24 Vdc output @ 750 mA	\$130
DRN-PS-1000	Switching Power supply, 95-240 Vac input, 24 Vdc output @850mA	\$150
CAT-285	Bi-directional RS-232-RS-485 converter for DRX series	\$148

\*Specify "9" for 9-pin or "25" for 25-pin serial cable.





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### Factory Setup and Configuration at No Extra Charge

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### Please Specify:

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- Output Value High & Low
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**Input Ranges:** Uni/bipolar, 400 mV to 10 Vdc; 0 to 20 mA full

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**Process Default settings DRN:** Input Range 0-20mA; Output 4-20mA. Excitation 14V (Custom Settings available at no charge.)

**To Order** (Specify Model No.) *Prices Shown in U.S. Dollars*

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-FS	Factory setup and scaling	FREE

Each unit supplied with complete operator's manual.

**Ordering Example:** DRX-PR digital signal conditioner with RS-485 output for process signals (\$275), plus DRN-PS-750 power supply, 115 Vac input, 24 Vdc output @ 750 mA (\$130), \$275 + 130 = **\$405**.

### ACCESSORIES

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DRN-RS232-SW DRX-RS485-SW	Configuration Software for DRN Configuration Software for DRX	FREE
DB9-RJ12 DB25-RJ12	DB9 TO RJ12 Connector Adaptor includes 7 ft, DB25 to RJ12 Connector Adaptor RJ12 Cord	\$30
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\*Specify "9" for 9-pin or "25" for 25-pin serial cable.



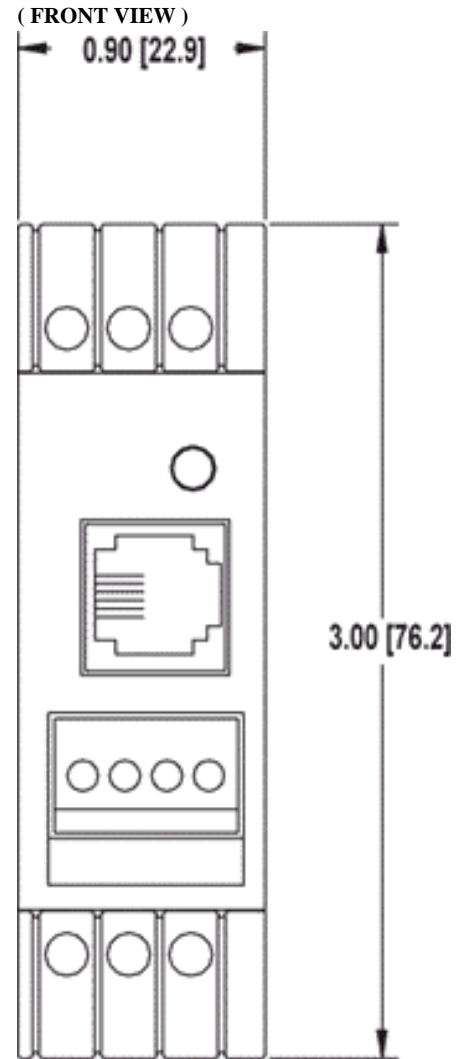
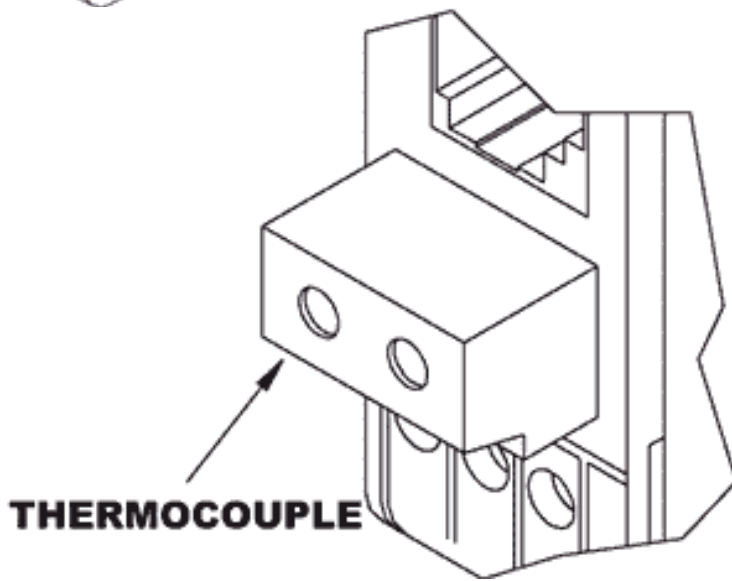
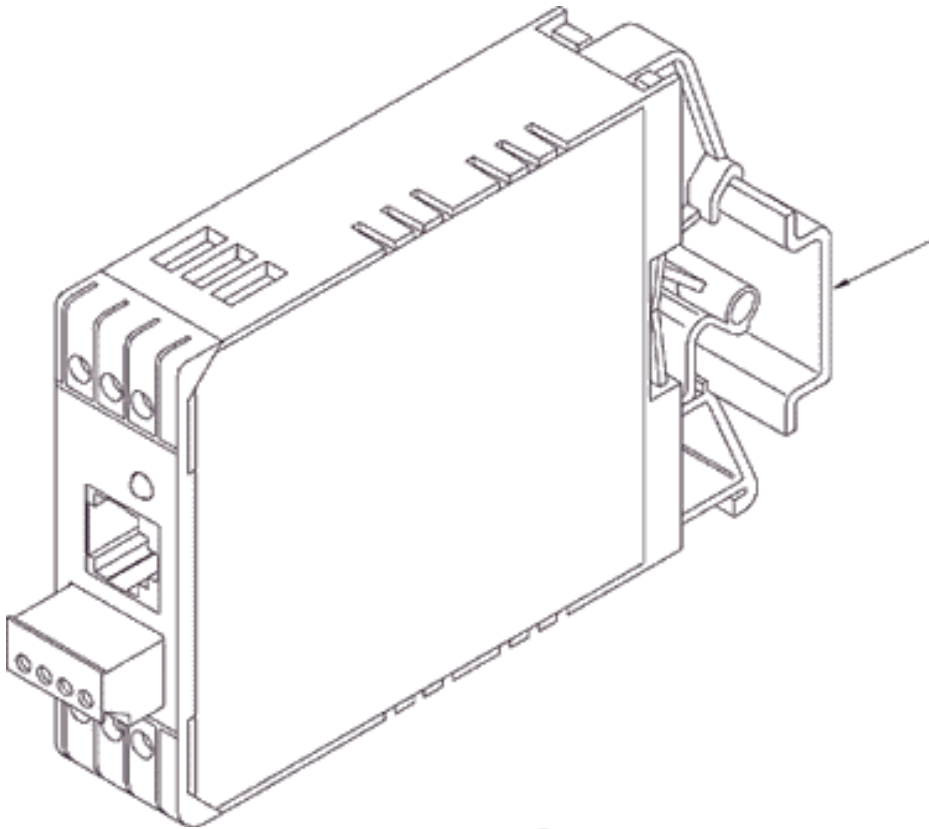
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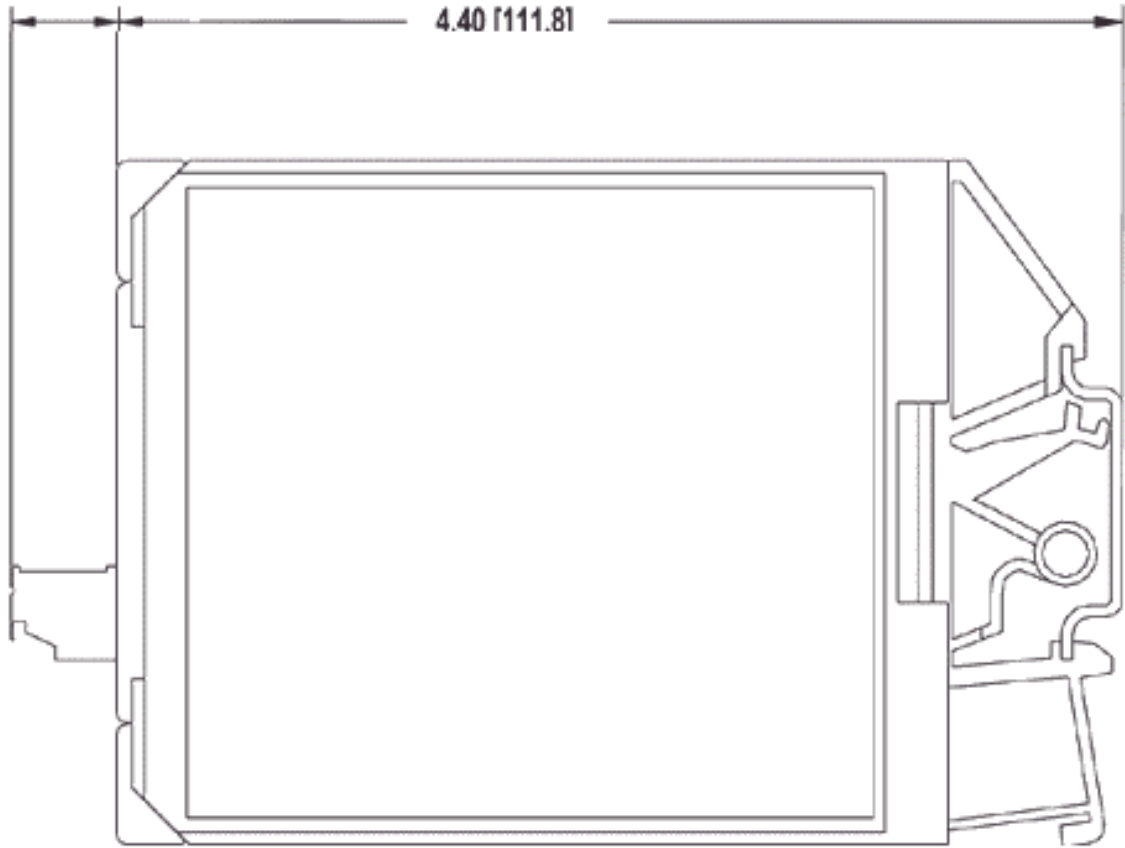
### SIGNAL CONDITIONERS DRN / DRX

#### DIN RAIL MOUNT (32mm or 35mm)



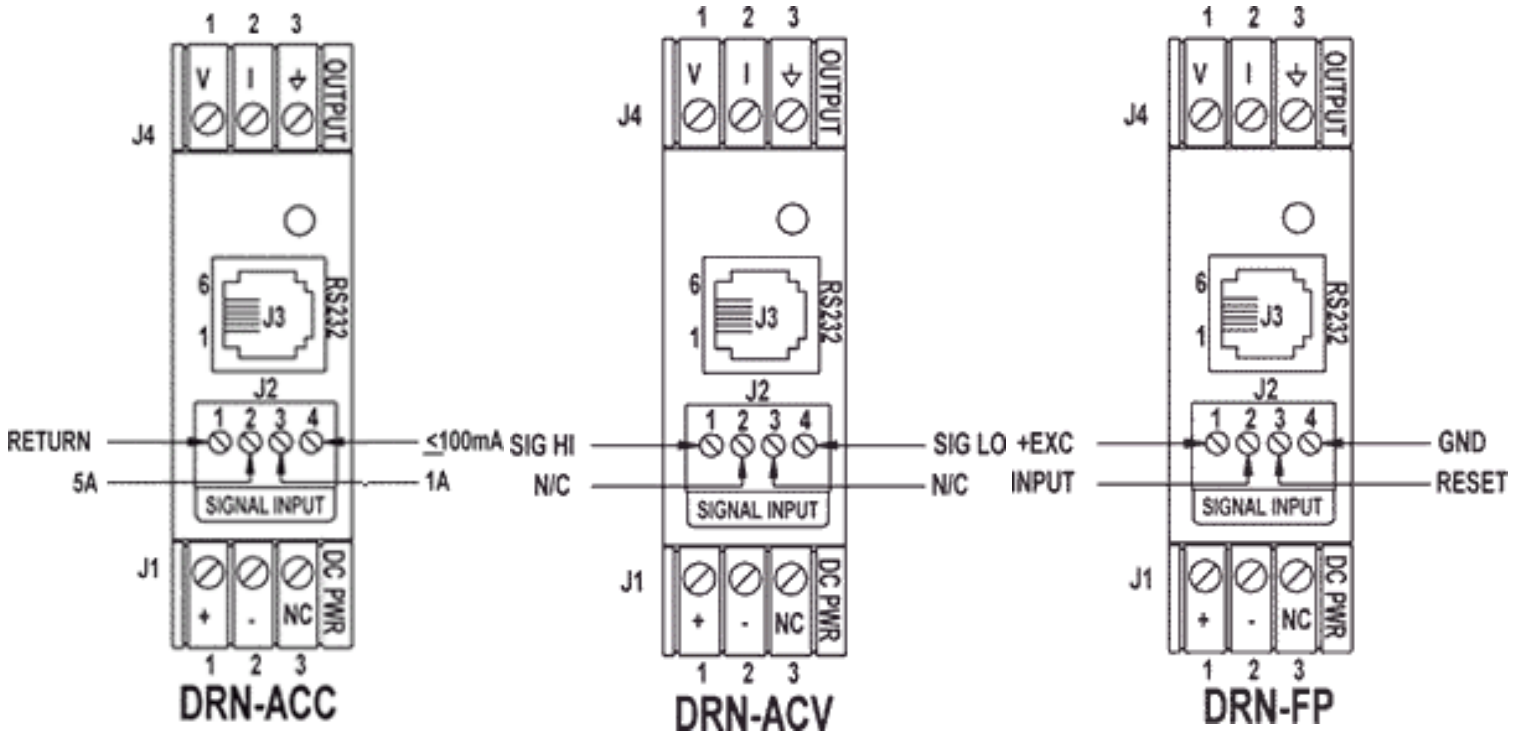
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4.40 [111.81]

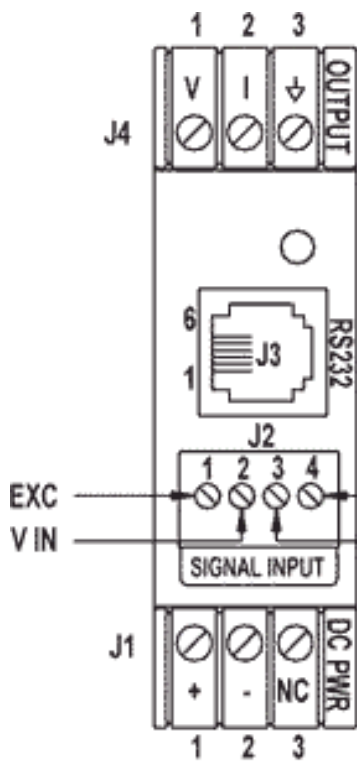


(SIDE VIEW)

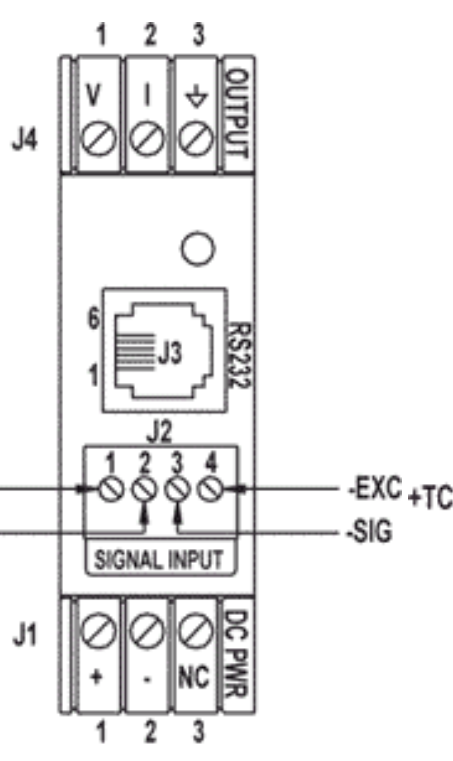
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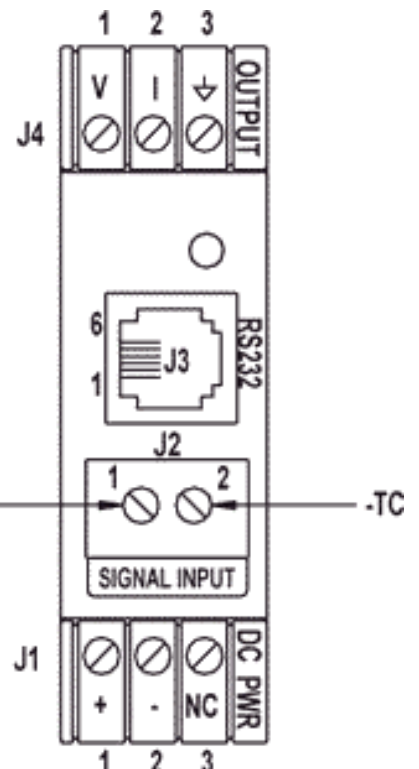




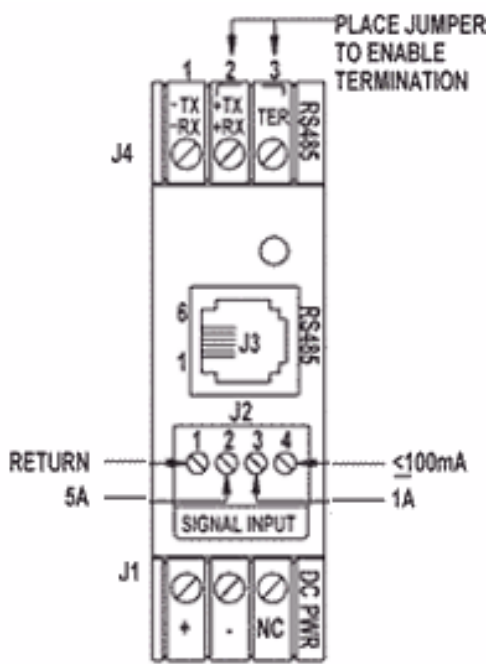
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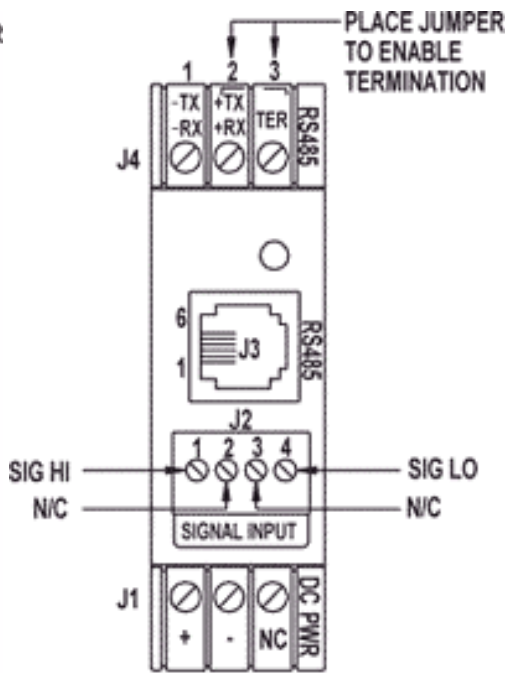
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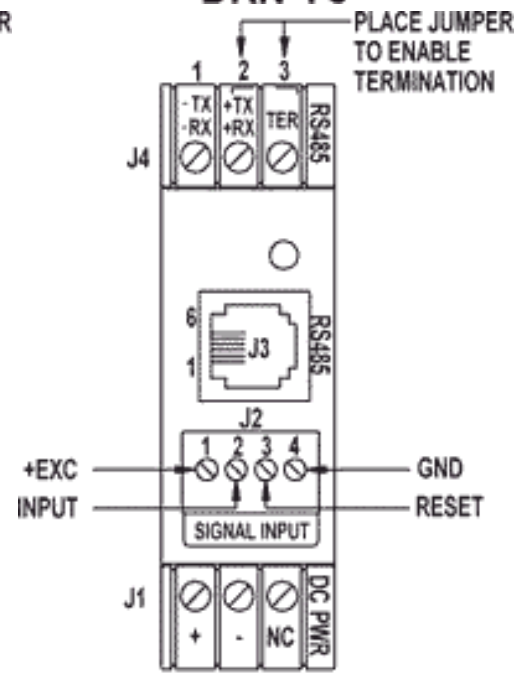
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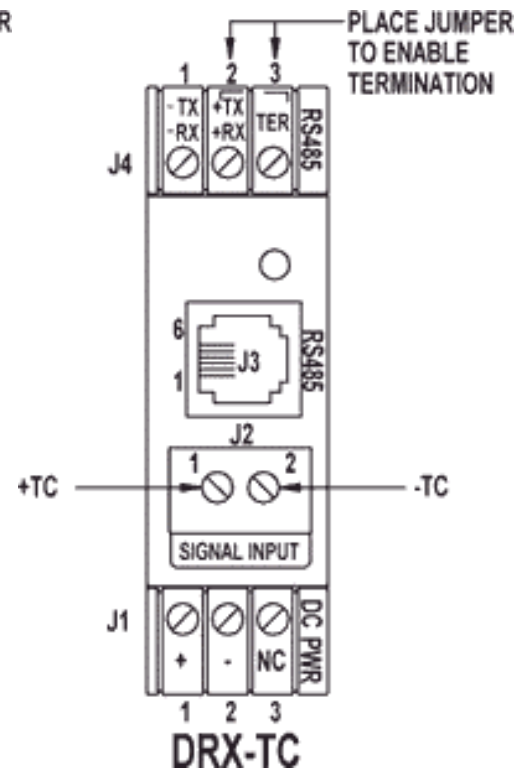
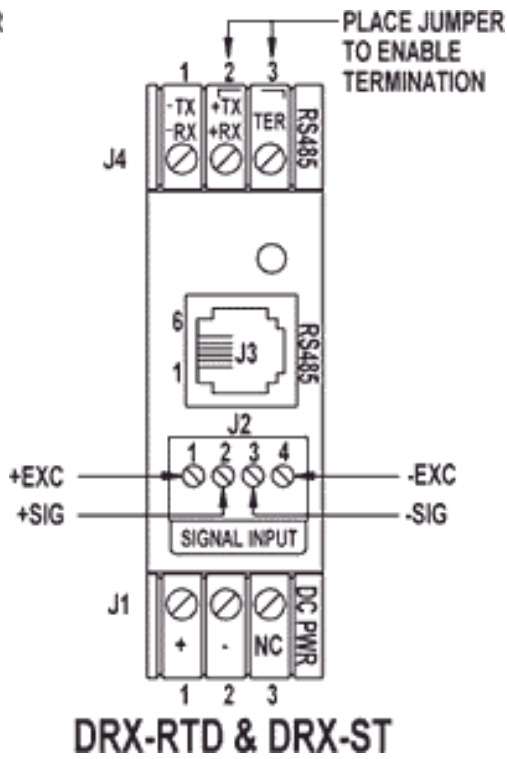
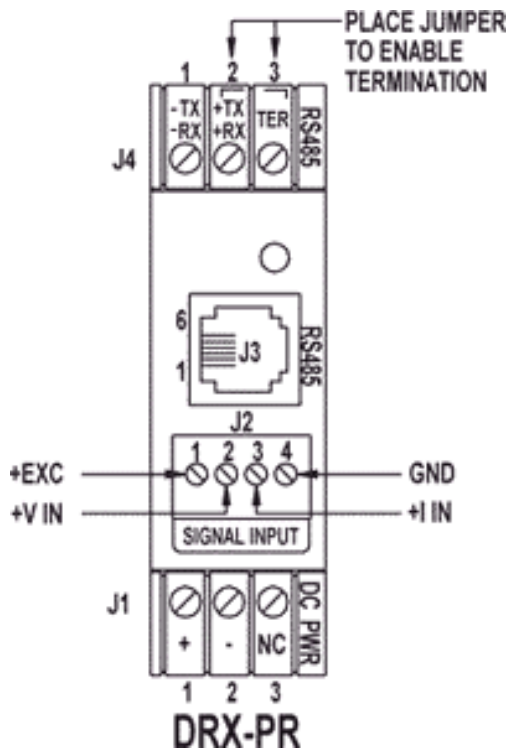
**DRX-ACC**



**DRX-ACV**



**DRX-FP**

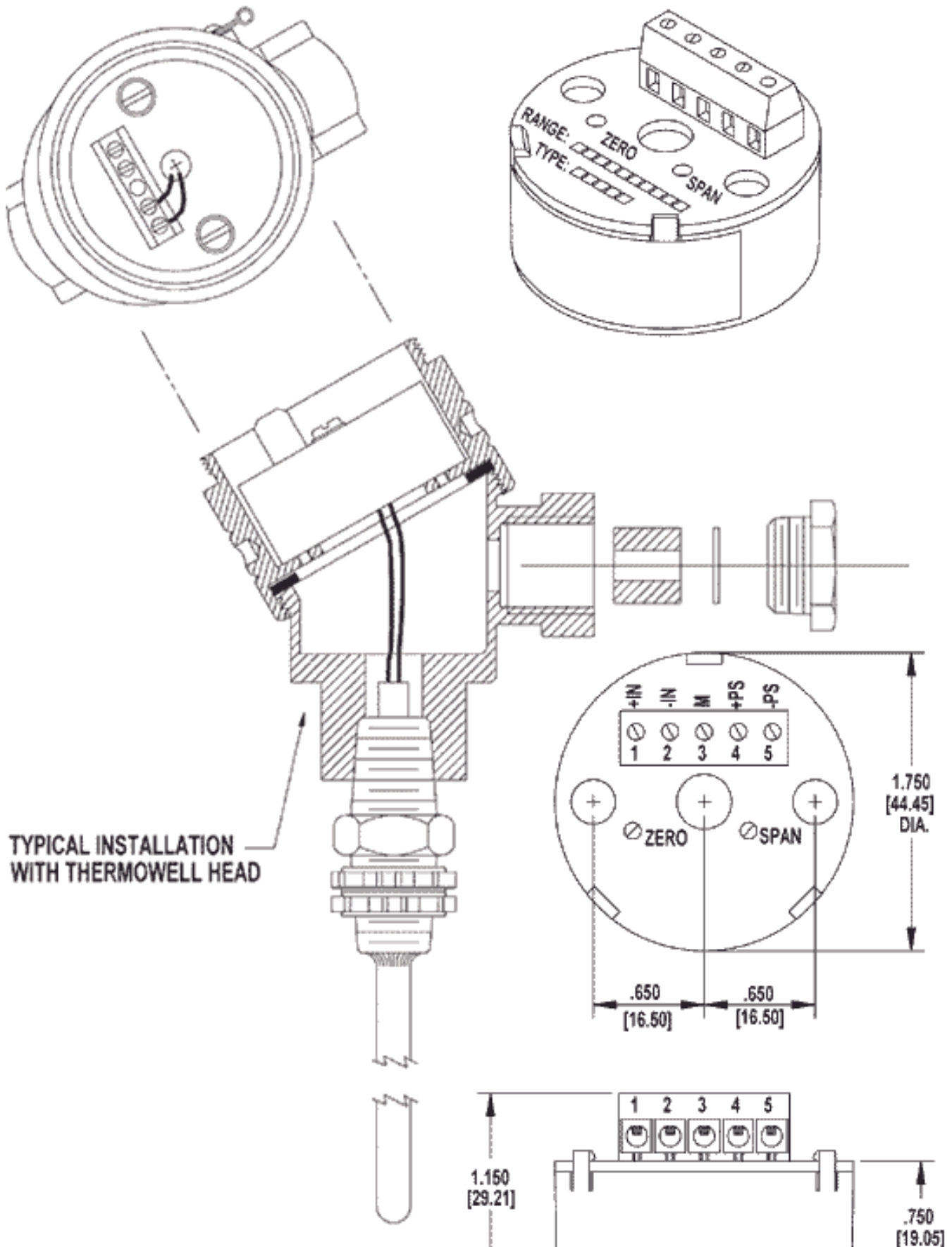


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**THERMOWELL HEAD TRANSMITTER MTX**





OUTLINE & MOUNTING

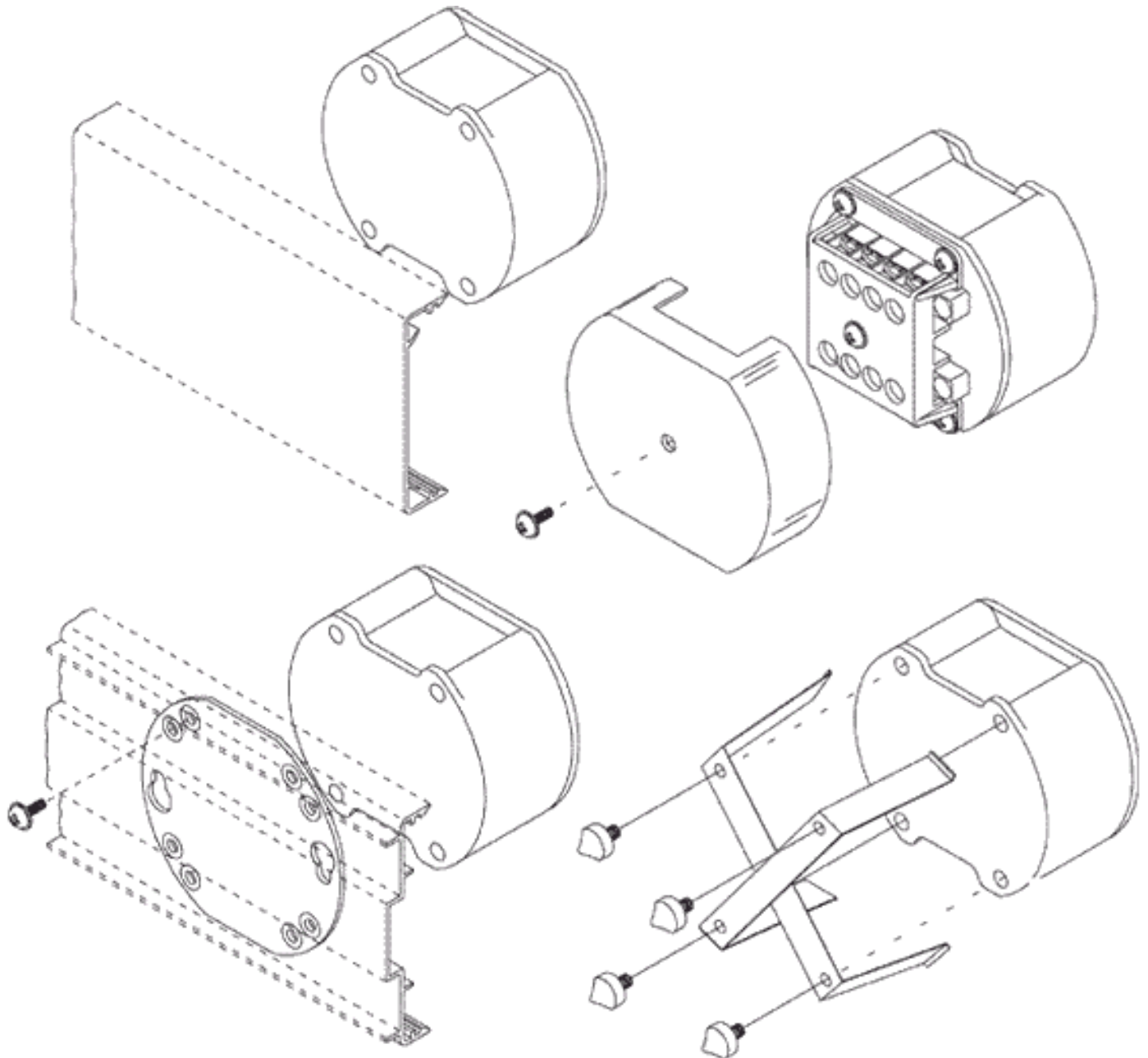


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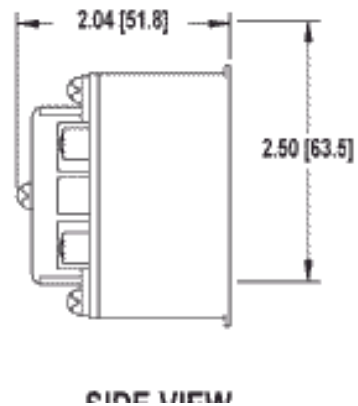
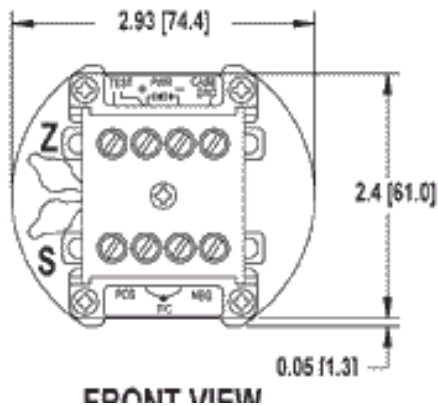
CALL 714-540-4914

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### LOOP TRANSMITTERS INDICATORS

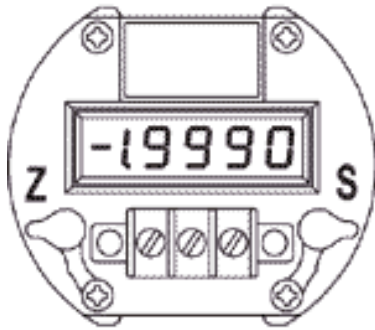


NOTES: DIMENSIONS ARE IN INCHES WITH MILLIMETERS IN [ ].

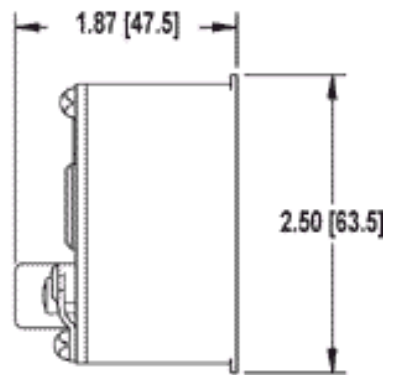
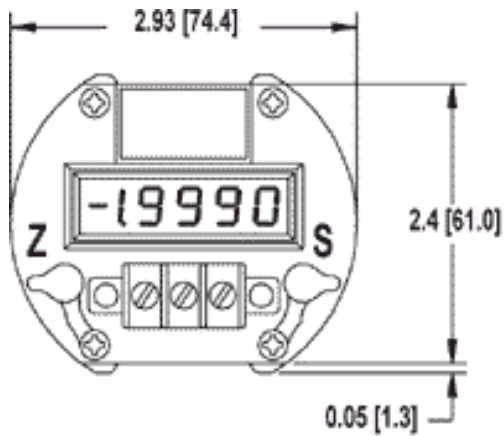
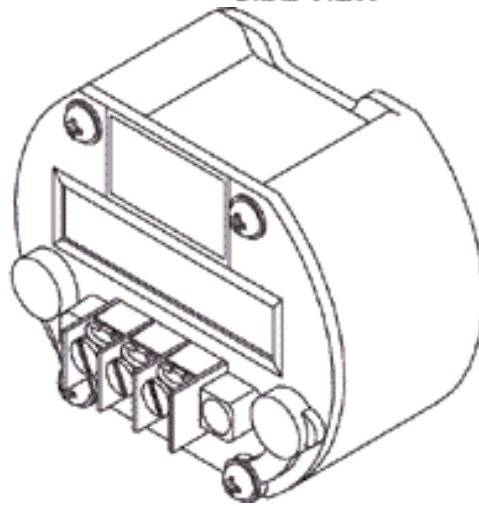




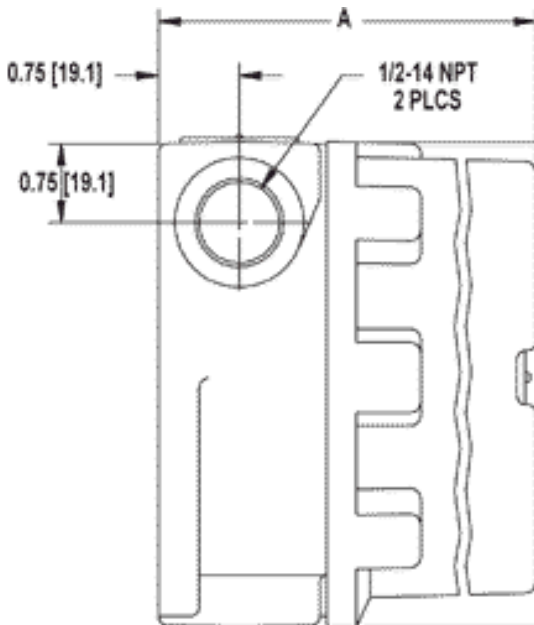
FRONT VIEW



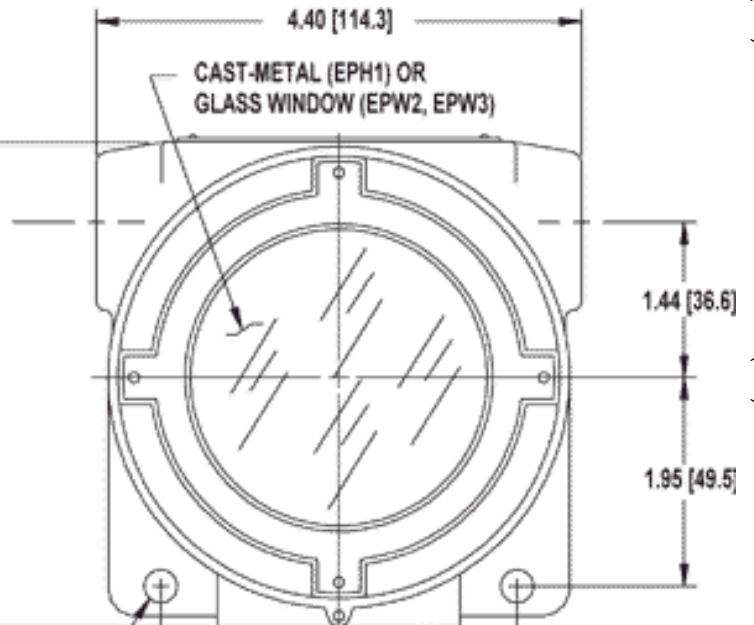
SIDE VIEW



FRONT VIEW



SIDE VIEW



SIDE VIEW

EARTH STUD

F 0.31 [7.9]  
2 HOLES

FRONT VIEW

NOTES: DIMENSIONS ARE IN INCHES  $\pm 0.01$   
WITH MILLIMETERS IN [ ]  $\pm 0.25$