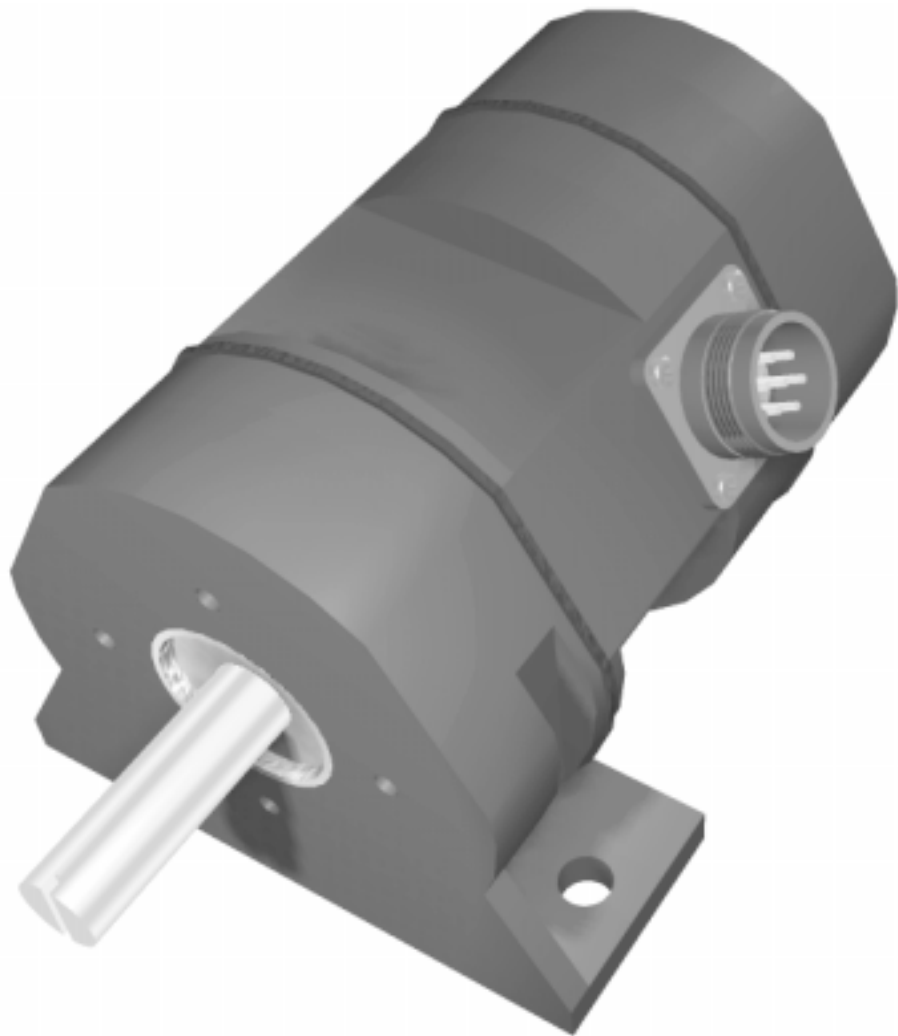


# User Manual

## DC425 NEMA 4X Analog Output Transducers



**AMCI** *ADVANCED  
MICRO CONTROLS INC.*

# DC425 Description

Offering a 4-20 mA output over single or multiple turns, the DC425 Brushless Resolver Transducers are designed for outdoor process control applications such as those found in hydroelectric, water treatment and water purification facilities. The chief consideration when designing the DC425 Transducers was reliable operation in an environment of continuous mechanical shock and vibration, extreme temperature and humidity variations, and exposure to air and liquid-borne contaminants.

Reliability begins with the choice of a brushless resolver as the absolute position feedback device. The brushless resolver is unsurpassed by any other rotary position sensor, such as an optical encoder or brush type resolver, in its ability to withstand the harsh industrial environment.

Conversion from resolver position to 4-20 mA output is accomplished through an integral electronics assembly. This assembly utilizes surface mount technology to improve reliability and offers 1 part in 2048 resolution.

Input to the resolver is through a 5/8" stainless steel shaft and oversized, double row, sealed bearing. The bearing is designed to withstand a 400 lb radial load. Therefore, pulleys or sprockets can be directly connected to the shaft.

Finally, these components are encased in a nickel acetate-sodium dichromate anodized aluminum housing. This is the same NEMA 4X hard coat anodizing process used in marine and military applications.

DC input power and 4-20 mA output connections are made either through gas tube arresters or a sealed MS Connector. Integral MOV's provide additional lightning and static discharge protection on both models.

## Mechanical Specifications

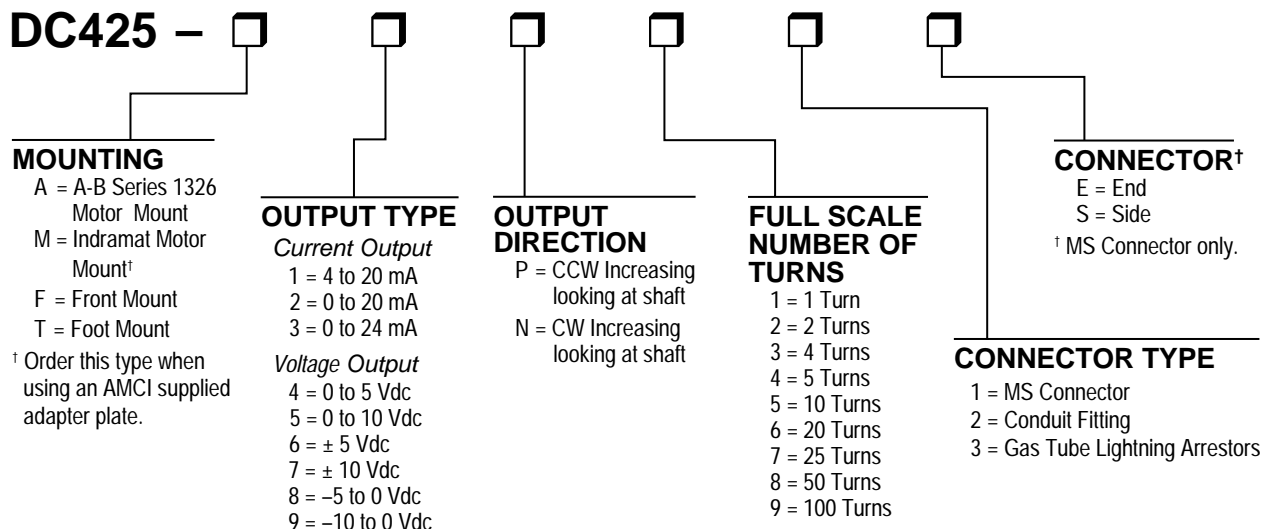
Shaft Diameter .....	5/8"
Shaft Loading .....	Radial: 400 lbs. max. Axial: 200 lbs. max.
Starting Torque .....	8 oz.in. @ 25° C
Moment of Inertia..	20 oz-in-sec <sup>2</sup>
Weight .....	5.5 lbs.

## Environmental Specifications

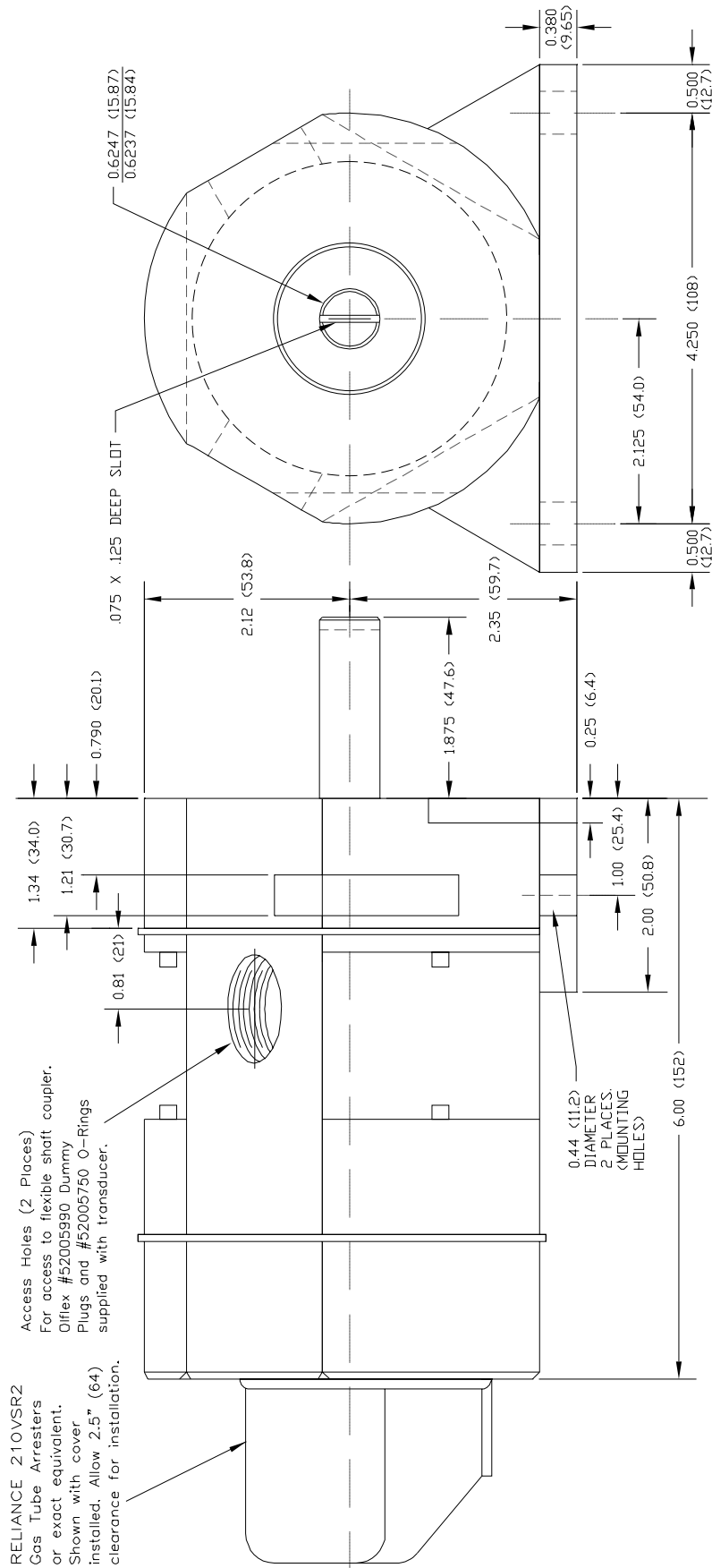
Operating Temp .....	-40 to 85° C
Shock .....	200 g's for 11 mSec.
Vibration .....	5 to 2000 Hz @ 20 g's
Enclosure .....	NEMA 4X When properly installed.

## Electrical Specifications

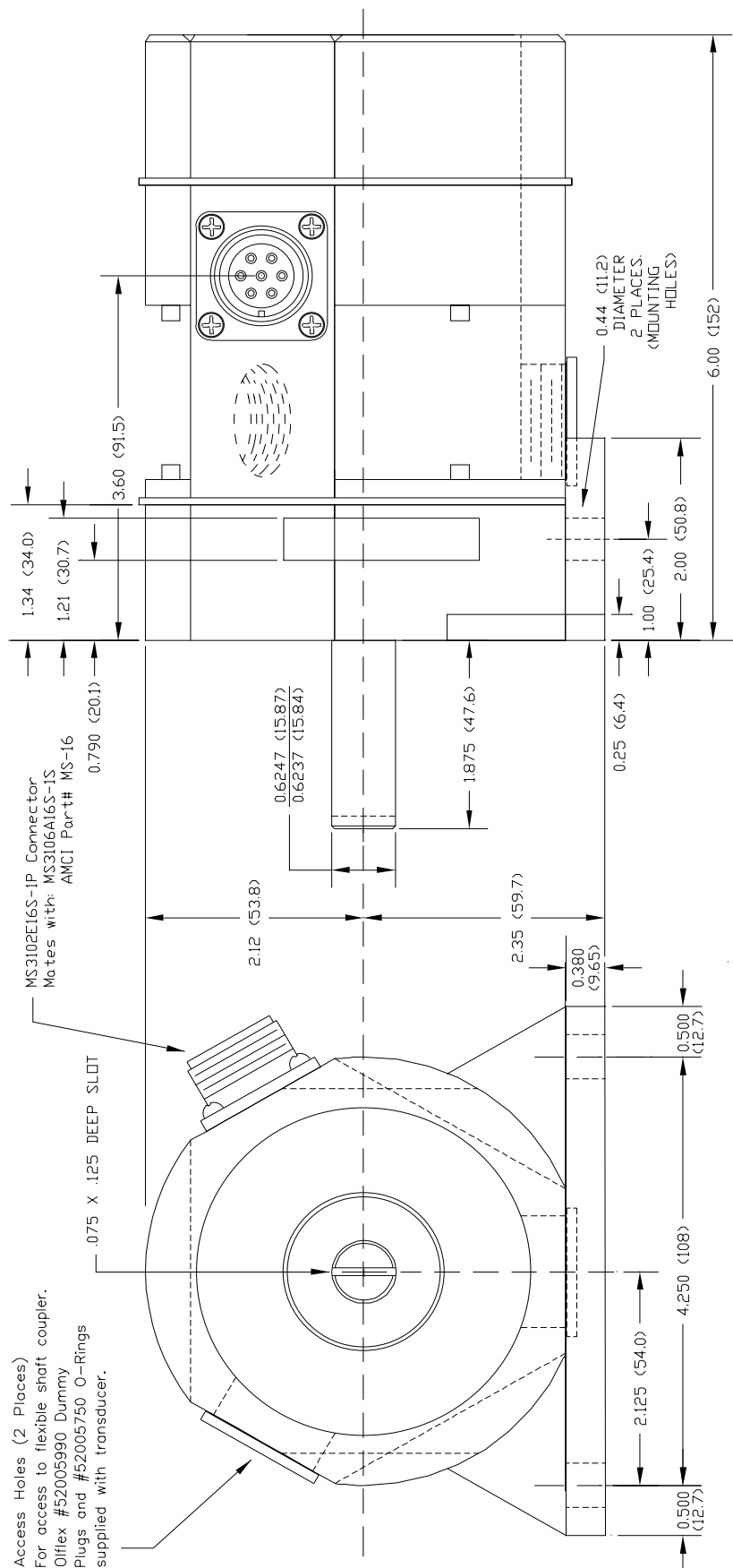
Input Voltage .....	18 to 30 Vdc 24 Vdc optimal
Input Power .....	3.75W max.
Current Output .....	4 to 20 mA 12 bit resolution per turn. 16 bit resolution max.
Current Load .....	650Ω max. @ 18Vdc input. 950Ω max. @ 24Vdc input. 1,250Ω max. @ 30 Vdc input.
Voltage Output .....	0 to 10 Vdc 12 bit resolution per turn. 16 bit resolution max.
Voltage Load .....	2KΩ minimum



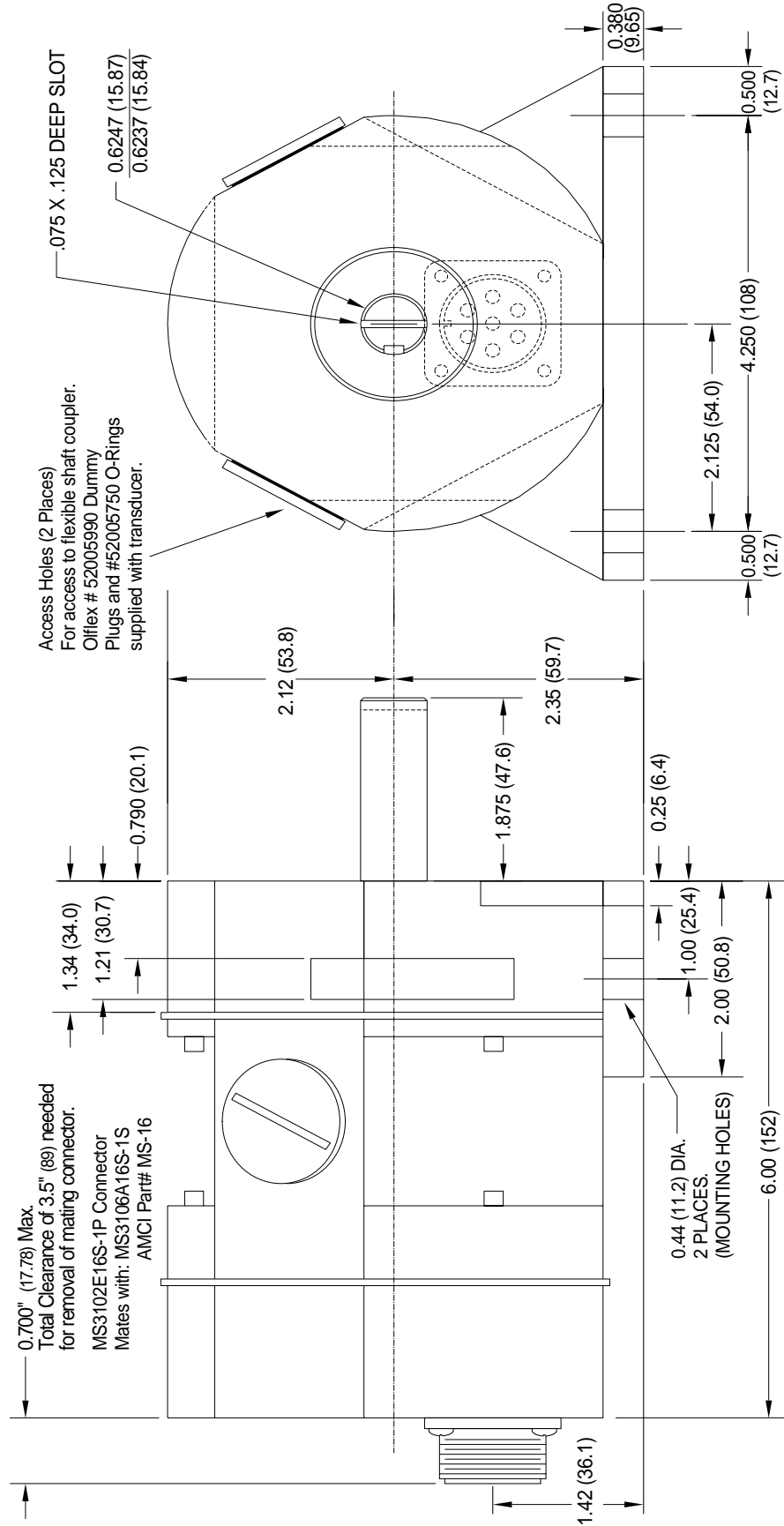
# Outline Drawing - Gas Tube Arrester Type



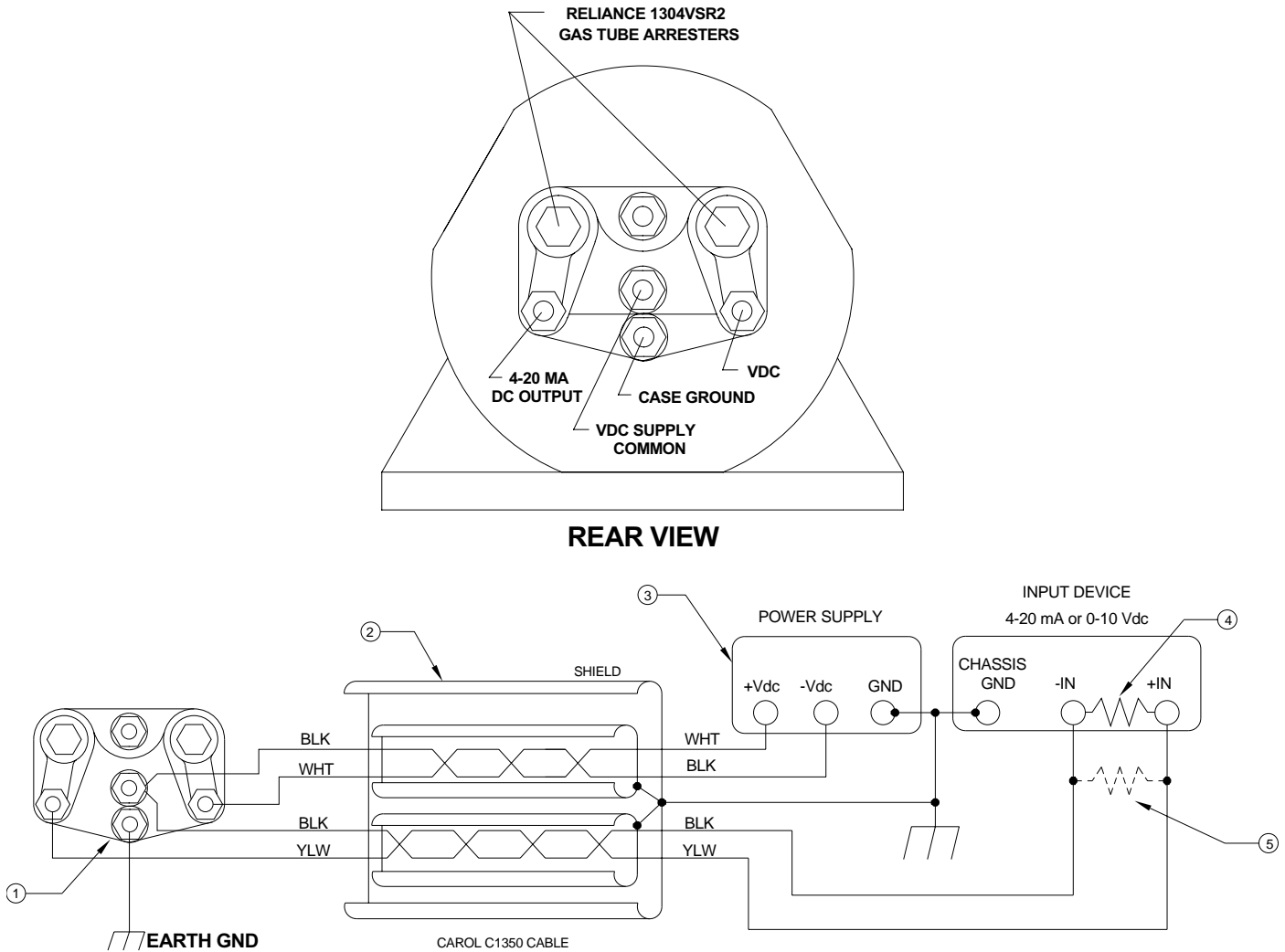
# Outline Drawing - Side MS Connector Type



# Outline Drawing - End MS Connector Type



# Gas Tube Arrestor Wiring

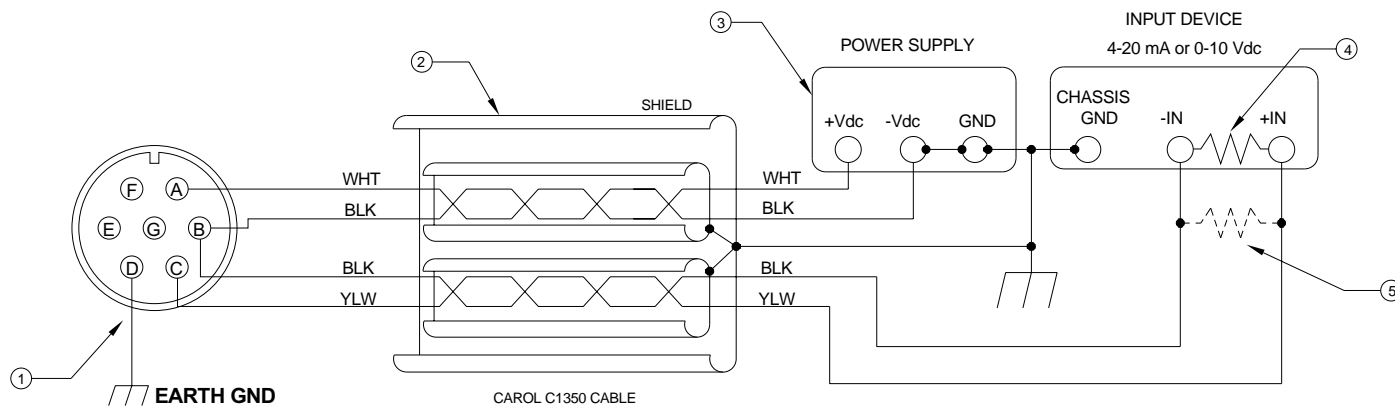
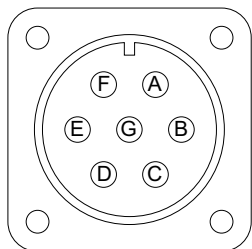


- 1) a. In order for the gas tube arrestors to work properly, you must run a heavy gauge drain wire from the [Case GND] terminal to an earth ground point at the DC425. A braided cable is the preferred drain wire.  
 b. Because of the gas tube arrestors, the [VDC COM] and [Case GND] terminals are tied together at the DC425.
- 2) Use two, twisted, individually shielded pairs. Cable Type CAROL C1350 or equivalent such as: Belden 9328, Alpha 2242C, or Manhattan M39351.
- 3) a. Use a isolated, regulated power supply with voltage output in the range of 18 to 30Vdc.  
 b. The power supply output must be isolated from earth ground to avoid possible ground loops between the supply and the DC425.
- 4) a. For voltage output DC425's, the input device impedance must be greater than 2K $\Omega$ .  
 b. For current output DC425's, the input device impedance cannot exceed  $(V_{DC} - 5) / 0.020A$ . This value varies from 650 $\Omega$  when  $V_{DC} = 18V_{DC}$  to 1250 $\Omega$  when  $V_{DC} = 30V_{DC}$ .
- 5) For voltage output DC425's, consider installing a 10K $\Omega$  resistor in parallel with the input terminals if the input device impedance exceeds 10K $\Omega$ .

# MS Connector Wiring

## Output Connector MS3102E16S-1P

PIN NO.	FUNCTION
A	+V <sub>DC</sub> INPUT
B	V <sub>DC</sub> COMMON
C	ANALOG OUTPUT
D	CASE GROUND
E	NO CONNECTION
F	NO CONNECTION
G	NO CONNECTION



- 1) The DC425 case must be connected to Earth Ground. This is usually accomplished through its mounting. If not properly grounded through its mounting, a wire from PIN D must be connected to an Earth Ground point as close as possible to the DuraCoder. Do Not connect PIN D to the cable shields. This can form a ground loop that may affect the operation of the DC425.
- 2) Use two, twisted, individually shielded pairs. Cable Type CAROL C1350 or equivalent such as: Belden 9328, Alpha 2242C, or Manhattan M39351.
- 3)
  - a. Use a regulated power supply with voltage output in the range of 18 to 30Vdc.
  - b. The power supply output common [V<sub>CD</sub> COM] should be connected to earth ground at the power supply.
- 4)
  - a. For voltage output DC425's, the input device impedance must be greater than 2K $\Omega$
  - b. For current output DC425's, the input device impedance cannot exceed  $(V_{DC} - 5) / 0.020A$ . This value varies from 650 $\Omega$  when V<sub>DC</sub> = 18V<sub>DC</sub> to 1250 $\Omega$  when V<sub>DC</sub> = 30V<sub>DC</sub>.
- 5) For voltage output DC425's, consider installing a 10K $\Omega$  resistor in parallel with the input terminals if the input device impedance exceeds 10K $\Omega$



### WARNING

**DO NOT** connect or disconnect the DC425 from its MS connector while power is applied. Under limited circumstances, damage to the DC425 may result.

## ***Important User Information***

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The products and application data described in this manual are useful in a wide variety of different applications. Therefore, the user and others responsible for applying these products described herein are responsible for determining the acceptability for each application. While efforts have been made to provide accurate information within this manual, AMCI assumes no responsibility for the application or the completeness of the information contained herein.

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No patent liability is assumed by AMCI, with respect to use of information, circuits, equipment, or software described in this manual.

The information contained within this manual is subject to change without notice.

## ***Standard Warranty***

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ADVANCED MICRO CONTROLS, INC. warrants that all equipment manufactured by it will be free from defects, under normal use, in materials and workmanship for a period of [1] year. Within this warranty period, AMCI shall, at its option, repair or replace, free of charge, any equipment covered by this warranty which is returned, shipping charges prepaid, within one year from date of invoice, and which upon examination proves to be defective in material or workmanship and not caused by accident, misuse, neglect, alteration, improper installation or improper testing.

The provisions of the "STANDARD WARRANTY" are the sole obligations of AMCI and excludes all other warranties expressed or implied. In no event shall AMCI be liable for incidental or consequential damages or for delay in performance of this warranty.

## ***Returns Policy***

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All equipment being returned to AMCI for repair or replacement, regardless of warranty status, must have a Return Merchandise Authorization number issued by AMCI. Call (860) 585-1254 with the model number and serial number (if applicable) along with a description of the problem. A "RMA" number will be issued. Equipment must be shipped to AMCI with transportation charges prepaid. Title and risk of loss or damage remains with the customer until shipment is received by AMCI.

## ***24 Hour Technical Support Number***

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24 Hour technical support is available on this product.

For technical support, call (860) 583-7271. During regular business hours, (Monday - Friday, 8AM - 5PM EST), your call will be answered by the factory. At all other times an automated system will answer your call and ask you to enter the telephone number that you can be reached at. The system will then page an AMCI engineer on call. Please have the product model and serial numbers as well as a description of the problem available before you call.

## ***Revision History***

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This manual, 940-0D030, replaces LMDC42517. It was first released 10/20/97. The revision adds the MS end connector drawing.

LMDC42517 updated wiring diagrams and output resolution specifications.

LMDC425C6 documented changes to the part numbering system.

LMDC42586 was the first revision of the manual.

AMCI manuals are constantly evolving entities. If you notice any errors or would like to comment on the contents of this manual please call or fax AMCI Technical Documentation. Tel. (860) 585-1254 Fax. (860) 584-1973