AMCI ADVANCED MICRO CONTROLS INC.

Electrical Specifications

Output Precision:	12 bit analog voltage or current
Power up settling time:	20 mSec max.
Voltage Configuration:	0 to 5Vdc, 0 to 10Vdc, ±5Vdc, ±10Vdc, -5 to 0Vdc, -10 to 0Vdc
Current Configuration:	4 to 20mA, 0 to 20mA, 0 to 24mA
Voltage Load Capacity:	2KΩ min.
Current Load Capacity:	Vin ≤15Vdc: 420Ω max.
	Vin = 24Vdc: 800Ω max.
Power Requirements:	4.75 to 26.4Vdc
	1.5W max.

Environmental Specifications

Housing:	NEMA 4 rated
Connector:	MS "R" style
Operating Temp:	-40° C to 85° C
Humidity:	98% RH, noncondensing
Shock:	50g, 11 mSec duration
Vibration:	20g, 5 to 2000 Hz

Mechanical Specifications

Shaft Diameter:	3/8" or 10mm stainless
Shaft Loading:	Axial 15 lb, radial 30 lb
Starting Torque:	1.5 oz.in. @ 25° C
Moment of Inertia:	4 oz-in-sec^2
Weight:	1 lb

DC25 ☐ – B ☐ ☐ ☐ ☐ ☐

HOUSING
F = Square Flange
S = 2.5" Dia. Servo Mount

BEARING SEAL

SHAFT DIA.
1 = 0.375" Dia.
2 = 10 mm Dia.

DURACODER TYPE

STANDARD PRODUCT
A = Absolute Parallel
Level Update[1]
N = Incremental, Gated†
V = Analog Voltage
C = Analog Current
S = Absolute Serial Data

ALSO AVAILABLE
B = Absolute Parallel
Edge Update[2]
L = Absolute Parallel
Level Update[1], Mx[3]
E = Absolute Parallel
Edge Update[2], Mx[3]
M = Incremental, Ungated‡
Single Ended output only.

OUTPUT SCALING
IF DURACODER TYPE = A,B,E,L
1 = 1,024 Gray Code
2 = 1,024 Natural Binary
3 = 4,096 Gray Code
4 = 4,096 Natural Binary
5 = 360 BCD
6 = 1000 BCD
7 = 3600 BCD
8 = Programmable
Resolution and Output Code
B0002 to B4096
Factory Set Binary
D0002 to D4000
Factory Set BCD
G0002 to G4096
Factory Set Gray
IF DURACODER TYPE = M, N
PRGM - Field Programmable
0002 to 1024 - Factory Set
IF DURACODER TYPE = V
1 = 0 to 5 Vdc
2 = 0 to 10 Vdc
3 = ± 5 Vdc
4 = ± 10 Vdc
5 = -5 to 0 Vdc
6 = -10 to 0 Vdc
IF DURACODER TYPE = C
1 = 4 to 20 mA
2 = 0 to 20 mA
3 = 0 to 24 mA
IF DURACODER TYPE = S
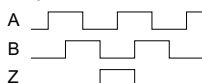1 = CAN
2 = DeviceNet
3 = SDS

CONNECTOR
S = Side
E = End

OUTPUT CONFIGURATION
IF DURACODER TYPE = A, B, E, L
HIGH TRUE OUTPUTS
A = Current Source, Single Ended, 24 Vdc Max.
B = Current Sink, Single Ended, 24 Vdc Max.
C = Current Sink, Single Ended,
with 10KΩ Pull Up Resistor.
LOW TRUE OUTPUTS
F = Current Source, Single Ended, 24 Vdc Max.
G = Current Sink, Single Ended, 24 Vdc Max.
H = Current Sink, Single Ended,
with 10KΩ Pull Up Resistor.
IF DURACODER TYPE = M, N
A = Current Source, Single Ended, 24 Vdc Max.
B = Current Sink, Single Ended, 24 Vdc Max.
C = Current Sink, Single Ended,
with 2.2KΩ Pull Up Resistor.
D = Differential Line Driver
5 Vdc Output Only.
Not available with DuraCoder Type M.
E = Current Source, Single Ended,
with 2.2KΩ Pull Down Resistor.
I**F DURACODER TYPE = V, C**
K = 360° Output Signal Period
L = 180° Output Signal Period
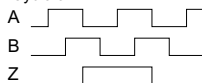**M = 90° Output Signal Period**
N = 45° Output Signal Period

Notes:
1) Level Update - The outputs continuously update when a logic '1' voltage is supplied to the input pin.
2) Edge Update - The outputs update only when the voltage supplied to the input pin makes a transition.
3) Mx - Multiplex option. Outputs are passive when the input pin is pulled to GND. Allows multiple DuraCoders on single input wires.
†) Gated Z - Z Pulse is active for 1/2 Cycle of B.

A
B
Z

‡) Ungated Z - Z Pulse is active for 1 Cycle of A.

A
B
Z

MATING CONNECTORS:
All mating connectors are now ordered as seperate line items.
All Absolute DuraCoders MS-19
All Analog DuraCoders MSD-10
All Incremental DuraCoders w/o Differential Output . MS-16
Incremental DuraCoders w/ Differential Output MSD-10

Outline Drawings and Connector Pinout

( ) = Dimensions in millimeters

2.50" (63.5)

1.250" (31.75)
1.249" (31.72)

#8-32 UNF- 2B. 0.18" (4.6) min depth. Six places, 60° apart on a 1.875" (47.63) B.C.

0.300" (7.62)

SHAFT DIA. SEE NOTE 1

2.31" (58.64)

DC25 Analog
Servo Mount
End Connector

0.88" (22.4) max.
Total clearance of 3.5"(89) needed for removal of mating connector.

0.900" (22.86)
0.850" (21.59)

0.10" (2.5)
0.10" (2.5)

3.00" (76.2) max.

MS3102E18-1P Connector

( ) = Dimensions in millimeters

1.35" (34.3) max.
Total clearance of 3.5"(89) needed for removal of mating connector.

2.87" (72.9) max.

1.250" (31.75)
1.249" (31.72)

#8-32 UNF-2B. 0.18" (4.6) min. depth. Six places, 60° apart on 1.875" (47.62) B.C.

1.43" sq. (36.3)

MS3102E18-1P Connector

0.300" (7.62)
0.300" (7.62)

SHAFT DIA. SEE NOTE 1

2.31" (58.6)

DC25 Analog
Flange Mount
Side Connector

2.50" (63.5)

0.900" (22.86)
0.850" (21.59)

0.10" (2.5)
0.10" (2.5)

2.70" (68.6) max.

1.032" (26.21) typ.

0.218" (5.54) dia. Four places.

1.032" (26.21) typ.

2.65" (67.3)

1.250" (31.75)
1.249" (31.72)

2.50" (63.5) dia.

2.65" (67.3)

0.88" (22.4) max.
Total clearance of 3.5"(89) needed for removal of mating connector.

0.300" (7.62)

SHAFT DIA. SEE NOTE 1

DC25 Analog
Flange Mount
End Connector

0.900" (22.86)
0.850" (21.59)

.250" (6.35)

2.95" (74.9) max.

MS3102E18-1P Connector

( ) = Dimensions in millimeters

( ) = Dimensions in millimeters

1.35" (34.3) max.
Total clearance of 3.5"(89) needed for removal of mating connector.

2.87" (72.9) max.

2.65" (67.3)

1.250" (31.75)
1.249" (31.72)

1.032" (26.21) typ.

0.218" (5.54) dia. Four places

1.032" (26.21) typ.

2.65" (67.3)

1.43" sq. (36.3)

MS3102E18-1P Connector

0.300" (7.62)

SHAFT DIA. SEE NOTE 1

DC25 Analog
Flange Mount
Side Connector

2.50" (63.5)

0.900" (22.86)
0.850" (21.59)

.250" (6.35)

2.65" (67.3) max.

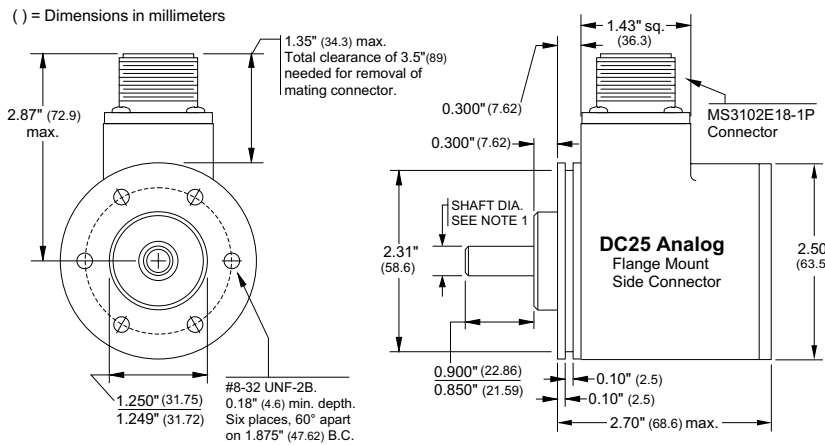
Output Connector
MS3102E18-1P
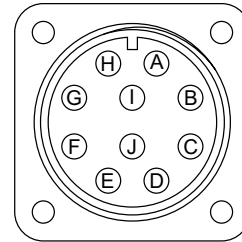
| PIN NO.	FUNCTION
A	NO CONNECTION
B	NO CONNECTION
C	+DC INPUT
D	DIR CONTROL
E	DC RETURN
F	ANALOG OUTPUT
G	NO CONNECTION
H	CASE GROUND
I	DC RETURN
J	NO CONNECTION

Pin D: Dir Control - This pin controls which direction the shaft must turn to increment the position data. With this pin open circuit, position data increases with CCW rotation (looking at the shaft). Connecting this pin to Pin I, (DC Return), forces the position to increase with CW rotation (looking at the shaft).

NOTES:

1) This pin should never be connected to Pin C (+DC Input).

2) Connection to Pin I (DC Return) must be done at the DC25 Connector. Do not connect at the other end of the cable.
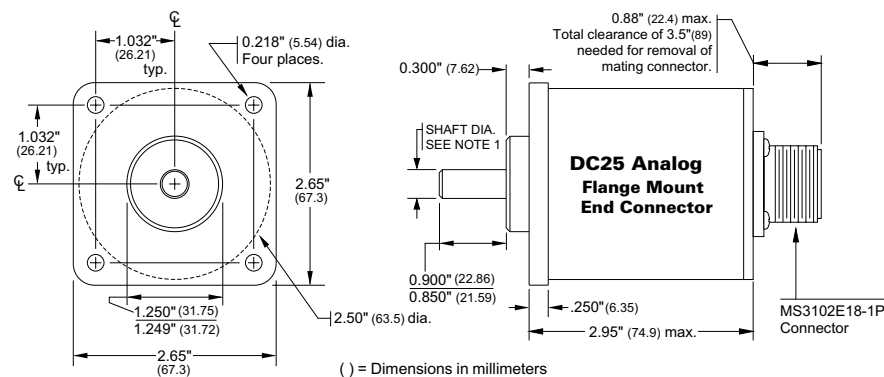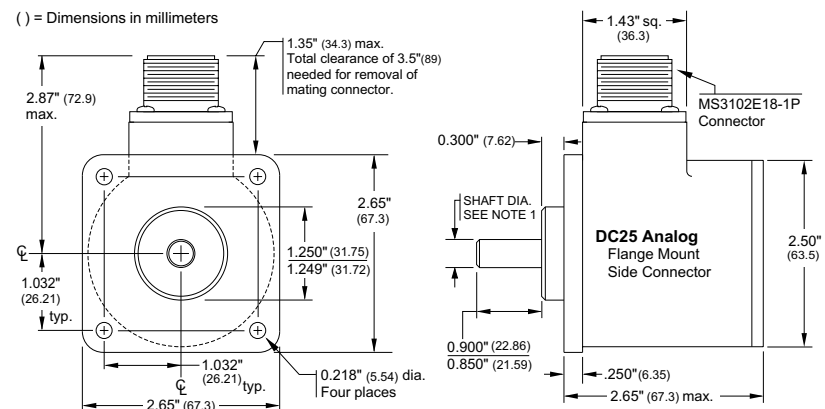
NOTE 1

If Shaft Diameter Digit = 1: *(0.375" Nominal)*
     Max. Dia. = 0.3747", Min. Dia. = 0.3744"

If Shaft Diameter Digit = 2: *(10 mm Nominal)*
     Max. Dia. = 9.993mm, Min. Dia. = 9.985mm

If Shaft Diameter Digit = 3: *(0.250" Nominal)*
     Max. Dia. = 0.2497", Min. Dia. = 0.2492"

Output Load Calculations

Voltage Output DuraCoder:

A voltage output DuraCoder can drive an output load of 2 KΩ or greater.

Current Output DuraCoder:

The maximum load that can be driven by a current output DuraCoder depends upon the power supply voltage applied to +DC Input (Pin C). For input voltages up to 15Vdc the maximum load is 420Ω For input voltages above 15Vdc the maximum load is:

$$R_{LOAD_{MAX}} = \frac{(+DC\ Input - 5)}{Maximum\ Output\ Current}$$

Maximum Output Current = 0.020A or 0.024A

Wiring Diagram
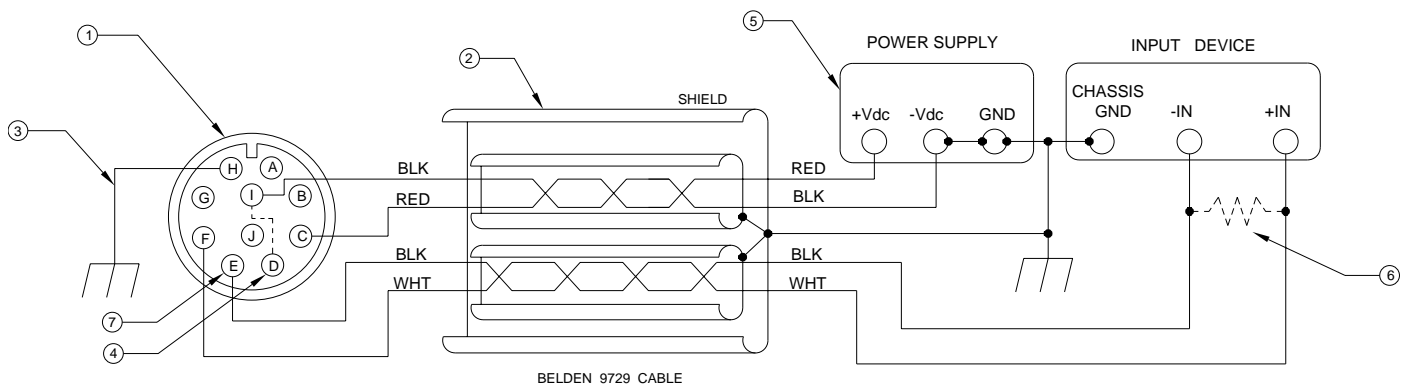
BELDEN 9729 CABLE

1) Connector Type: MS3016A18-1S (AMCI Part# MSD-10).

2) Use two, twisted, individually shielded pairs. Cable Type Belden 9729 or equivalent such as Manhattan M39249.

3) The DuraCoder 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 H must be connected to an Earth Ground point as close as possible to the DuraCoder. Do Not connect PIN H to the cable shields. This can form a ground loop that may affect the operation of the DuraCoder.

4) Units are shipped for CCW increasing output. (Looking at shaft.) For CW increasing output, Jumper PIN D to PIN I at the connector.

5) Use a regulated power supply with voltage output in the range of 7 to 24Vdc. If cable length is less than 30 feet, a power supply of 5 to 24Vdc can be used.

6) For DuraCoder type DCx-xxVxxxx (Voltage Output) the input device impedence must be greater than 2KΩ If the input device impedence exceeds 10KΩ, consider installing a 10KΩ resistor in parallel with the input terminals.

7) PIN E and PIN I are internally connected for DuraCoder S/N 24094 and above. For S/N below 24094 connect PIN E to PIN I at the DuraCoder connector.

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

Important User Information

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.

UNDER NO CIRCUMSTANCES WILL ADVANCED MICRO CONTROLS, INC. BE RESPONSIBLE OR LIABLE FOR ANY DAMAGES OR LOSSES, INCLUDING INDIRECT OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM THE USE OF ANY INFORMATION CONTAINED WITHIN THIS MANUAL, OR THE USE OF ANY PRODUCTS OR SERVICES REFERENCED HEREIN.

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.

® DuraCoder is a registered trademark of AMCI. AMCI is a registered trademark, and the AMCI logo is a trademark of Advanced Micro Controls, Inc.

Standard Warranty

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 eighteen months. 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 eighteen months 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

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

24 Hour technical support is available on this product. If you have internet access, start at our website, *www.amci.com*. Product documentation and FAQ's are available on the site that answer most common questions.

If you require additional technical support, call (860) 583-7271. Your call will be answered by the factory during regular business hours, Monday through Friday, 8AM - 5PM EST. During non-business hours an automated system will ask you to enter the telephone number you can be reached at. Please remember to include your area code. The system will page an engineer on call. Please have your product model number and a description of the problem ready before you call.

Revision History

This manual, 940-0D023 replaces 940-0D022 Its first issue date was 04/05/2005. It improves the outline drawings, updates warranty information, and includes website tech support information.

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