

Electrical Specifications

Code Format: Gray, Binary: 4096 counts max.
BCD: 4000 counts max.

Frequency Response: 125 kbits/sec min.

Output Configuration: Open Collector Sink.
5 to 24 Vdc out. Available with or without a 10 K Ω pull-up resistor.
Open Collector Source.
5 to 24 Vdc out.

Drive Capability: 15 mA Sink or Source max.

Power Requirements: 4.75 to 26.4 Vdc
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

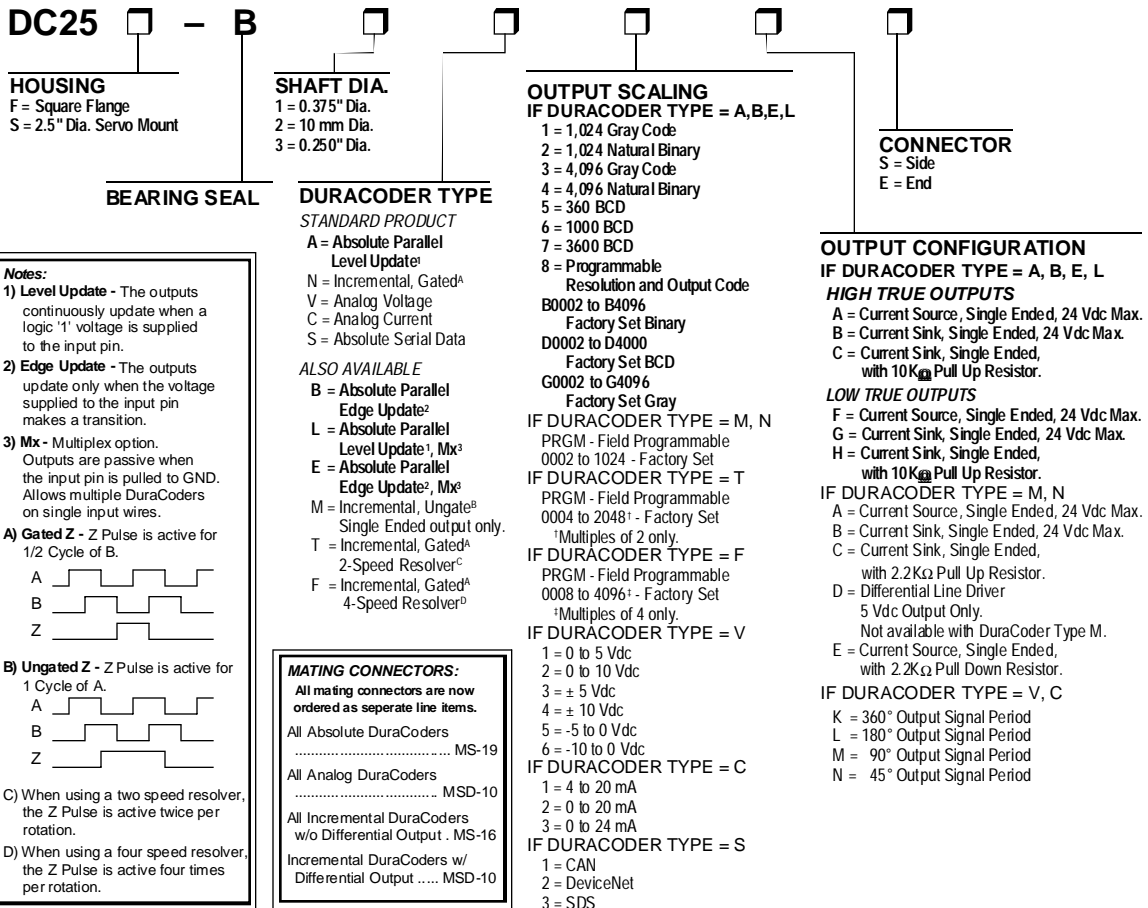
Shaft Diameter: 3/8", 1/4", or 10mm stainless

Shaft Loading: Axial 15 lb, Radial 30 lb

Starting Torque: 1.5 oz.in. @ 25° C

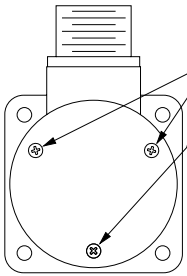
Moment of Inertia: 4 oz-in-sec²

Weight: 1 lb



Setting Programmable Cycles Per Turn

If your DuraCoder has an "8" in the ninth digit of the part number (Output Scaling), use the following procedure to set the counts per turn. The procedure involves removing the back cover, adding or removing jumpers from a header, and putting the cover back on.



Remove these three screws to access the header. Use care when removing the cover. End connector DuraCoders have wires from the PC board to the connector.

Fig.1 Back Plate

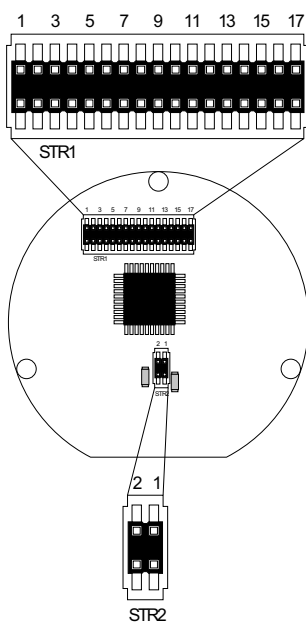


Fig. 2 Header Locations

There are two headers on the DuraCoder. (See figure 2) Change the jumpers on the first 14 pins of the larger header (STR1). Do not change the jumpers on pins 15-17 of STR1 or the two pins of STR2.

The jumpers are notched on one end. Make sure the jumper is placed on the header notched end first. (See figure 3.) Placing these jumper on upside down may damage the metal wipers.

Use the first twelve pins of header STR1 to set the binary number equal to (Counts per Turn) - 1. A jumper across the pins sets a logic 1, Removing the jumper sets a logic 0.

If you don't have a calculator to perform the decimal to binary conversion, use the table below to determine which jumpers should be installed. Start with (Counts per Turn) - 1 and subtract the largest possible number from the table. Place a jumper across the corresponding pins. Continue subtracting the next largest possible number and adding jumpers until you have a remainder of zero.

For example, you want 2790 Counts per Turn. The jumpers must be set to equal 2789.

- 2789 - 2048 = 741 (Jump pins 12)
- 741 - 512 = 229 (Jump pins 10)
- 229 - 128 = 101 (Jump pins 8)
- 101 - 64 = 37 (Jump pins 7)
- 37 - 32 = 5 (Jump pins 6)
- 5 - 4 = 1 (Jump pins 3)
- 1 - 1 = 0 (Jump pins 1)

JMP. #	Weight	JMP. #	Weight
12	2048	6	32
11	1024	5	16
10	512	4	8
9	256	3	4
8	128	2	2
7	64	1	1

Pins 11, 9, 5, 4, 2 have their jumpers removed.

Pins 13 and 14 set the output code. The table below shows how to set the jumpers.

Pin 13	Pin 14	Output Type
ON	ON	Binary Output
ON	OFF	Gray Code Output
OFF	ON	BCD Output
OFF	OFF	

The remaining jumpers are configured at the factory and need not be changed.

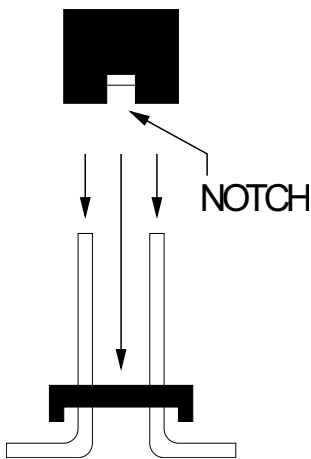
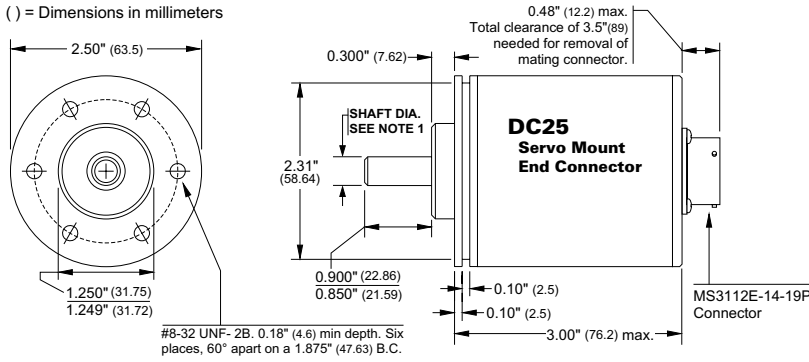


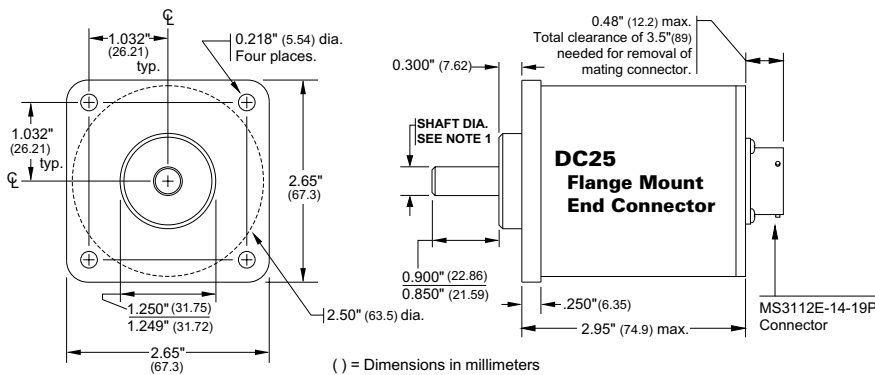
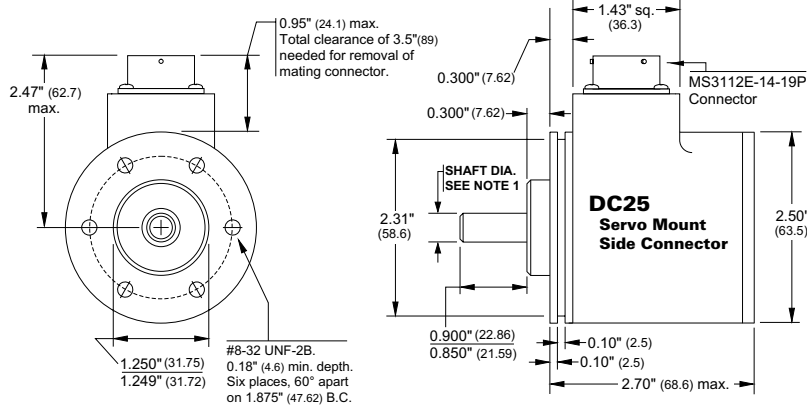
Fig. 3 Jumper Orientation

Outline Drawings

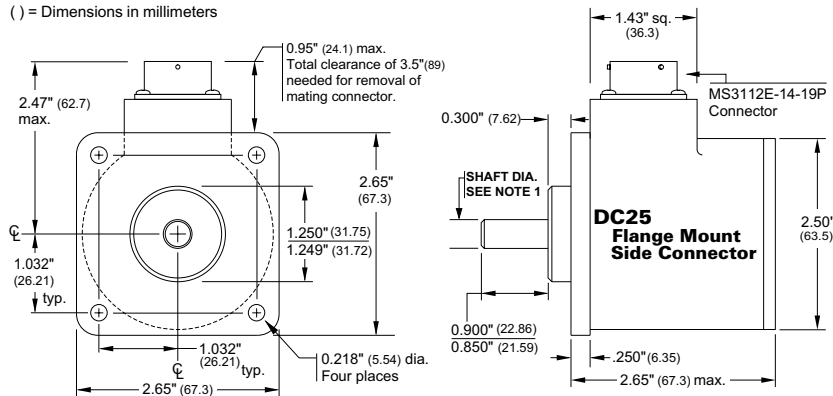
() = Dimensions in millimeters



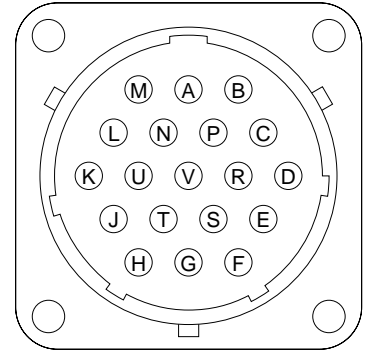
() = Dimensions in millimeters



() = Dimensions in millimeters



Connector Pin Designations MS3112E14-19P



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"

Connector Pinout

Absolute Output Electrical Connections Output Connector: MS3112E14-19P

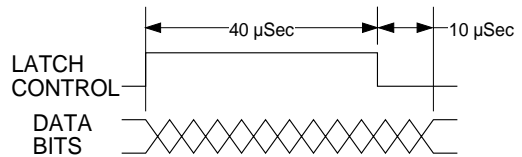
PIN NO.	FUNCTION		
	GRAY CODE	NATURAL BINARY	BCD (8421)
A	G(0)	2 ⁰	1
B	G(1)	2 ¹	2
C	G(2)	2 ²	4
D	G(3)	2 ³	8
E	G(4)	2 ⁴	10
F	G(5)	2 ⁵	20
G	G(6)	2 ⁶	40
H	G(7)	2 ⁷	80
J	G(8)	2 ⁸	100
K	G(9)	2 ⁹	200
L	G(10)	2 ¹⁰	400
M	G(11)	2 ¹¹	800
N	Not Used	Not Used	1000
P	Not Used	Not Used	2000
R	Direction	Direction	Direction
S	Case GND	Case GND	Case GND
T	DC Return	DC Return	DC Return
U	Latch Control	Latch Control	Latch Control
V	+DC Input	+DC Input	+DC Input

Pin R: Direction - 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 T, (DC Return), forces the position to increase with CW rotation (looking at the shaft).

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

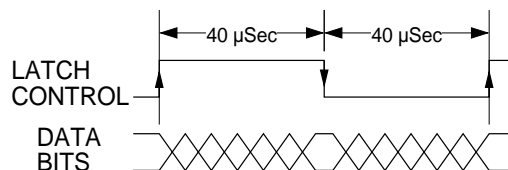
Pin U: Latch Control - This pin controls how often the outputs update and should be used to freeze the outputs before the output data is read. The input is configured at the factory to be either level or edge sensitive.

Level Sensitive - A Logic 1 voltage on this pin will update the outputs within 40 μ Sec. The output data will then update continuously every 8 μ Sec. A Logic 0 voltage will freeze the output data within 10 μ Sec. If this input is low when power is applied to the DuraCoder, the outputs will be all low until the first positive transition.



Edge Sensitive - A 0 \rightarrow 1 or 1 \rightarrow 0 transition on this pin will update the outputs within 40 μ Sec. The outputs will then freeze until another valid transition. Therefore, the transitions must be a minimum of 40 μ Sec apart. (12.5 kHz maximum at 50% duty cycle.)

All of the outputs will be in a zero state on power up and will remain in this state until the first transition occurs. Position output will not be valid until this transition.



Input Logic 1: 3Vdc to +DC Input or Open Circuit.

Input Logic 0: 0 to 1 Vdc.

NOTE: If you choose not to use this input, leave it floating or connect it to +DC Input. Connecting it to DC Return will freeze the outputs.

Output Specifications

Source Output Configuration

Output Options A, F

Max. Leakage Current: 5 μ A
Max. ON State Current: 15 mA
Max. ON State Resistance: 100 Ω (1.5Vdc drop
across driver @ 15mA)

Output Option A

High True Output: Driver turns on for logic 1
Driver turns off for logic 0

Output Option F

Low True Output: Driver turns off for logic 1
Driver turns on for logic 0

Sink Output Configuration

Output Options B, C, G, H

Max. Leakage Current: 5 μ A
Max. ON State Current: 15 mA
Max. ON State Resistance: 100 Ω (1.5Vdc drop
across driver @ 15mA)

Output Option B

High True Output: Driver turns off for logic 1
Driver turns on for logic 0

Output Option C

High True Output: Driver turns off for logic 1
*Output pulled high with
10K Ω pull-up resistor.*
Driver turns on for logic 0

Output Option G

Low True Output: Driver turns on for logic 1
Driver turns off for logic 0

Output Option H

Low True Output: Driver turns on for logic 1
Driver turns off for logic 0
*Output pulled high with
10K Ω pull-up resistor.*

Notes

- 1) Use an overall shielded cable to connect the DuraCoder to your electronics. The exact cable will depend on the number of conductors needed and will vary from application to application. The shield of the cable must be connected as close as possible to the power supply earth ground. **DO NOT** connect both ends of the shield to earth ground. This can form a ground loop that may affect the operation of the DuraCoder.
- 2) 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 S must be connected to an Earth Ground point as close as possible to the DuraCoder. **DO NOT** connect PIN S to the cable shields. This can form a ground loop that may affect the operation of the DuraCoder.
- 3) Use a regulated power supply with its voltage output in the range of 7 to 24Vdc. If the cable length is less than 30 feet, a power supply of 5 to 24Vdc can be used.



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.

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Returns Policy

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Revision History

This manual, 940-0D041 replaces 940-0D040. Its first issue date was 04/04/2005. It improves the outline drawings and adds powerup information on the latch control input.

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