

Technical Bulletin

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Manufactured by:

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The Dynapar brand Series HS35 Sealed Hollowshaft encoder is designed for easy installation on motor or machine shafts. Its hollowshaft design eliminates the need for a flexible shaft coupling, mounting bracket, flower pot, or flange adapter. This not only reduces the installation depth, but also lowers total cost.

The Series HS35 Sealed Hollowshaft is equipped with an unbreakable metal disk that meets the demands of the most severe shock and vibration generating processes. Its floating shaft mount and spring tether eliminate bearing loads and flexible shaft couplings to eliminate wear and maintenance.

Series HS35 has complete electrical protection from overvoltage, reverse voltage, and output short circuits. In addition, the Series HS35 is not only electrically & thermally isolated, but also environmentally sealed with shaft seals at both ends.

Mechanical and Environmental Features

- Unbreakable, metal code disk
- Flexible mounting
- Eliminated bearing loads
- Shaft seals at both ends of hollowshaft
- Sealed connector or cable exit
- Insulated from motor housing/shaft temperatures to 125°C

Electrical Features

- Overvoltage, reverse voltage, & output short circuit protection
- Noise immunity in excess of IEC801 level 3
- Electrically isolated

SPECIFICATIONS

Electrical

Code: Incremental

Pulses per Revolution: 1 to 2048

Phasing Sense: A leads B for CW rotation viewing split collar (shaft) clamp

Quadrature Phasing: 90° ± 22.5°

Symmetry: 180° ± 18°

Index: 180° ± 18° (gated with B channel low) physical index aligned with marks on body

Input Power Requirements:

Open Collector: 5 to 26 VDC at 100 mA max.; Push-Pull and Differential Line Driver: 5 to 26 VDC at 100 mA max.

Output Signals:

Open Collector: 30 VDC max., 40 mA sink at 0.5 VDC max.; Push-Pull and Line Driver: 40 mA sink/source

Frequency Response:

100 kHz Data and Index

Noise Immunity: Tested to IEC801 level 3 for Electro Static Discharge, Radio Frequency Interference, and Electrical Fast Transients

Mechanical

Weight: 16 oz.

Starting Torque at 25°C: 5.0 in-oz max.

Running Torque at 25°C: 4.5 in-oz max.

Moment of Inertia:

Up to 5/8" bore: 7.9 x 10⁻⁴ in-oz sec.²;
Over 5/8" bore: 25.6 x 10⁻⁴ in-oz sec.²

Shaft Speed: Up to 5/8" bore: 3600 RPM max.; Over 5/8" bore: 1800 RPM max.

Hub Dia. Tolerance:

+0.0003"/0.0005" (+.008/.013 mm)

Mating Shaft Length:

1.25" (32 mm) min. recommended
2.0" (50.8 mm) max. inside cover
Solid shaft preferred; keyway allowed; flattened shaft should not be used

Mating Shaft Runout:

±0.025" (±0.63 mm) typ.

Mating Shaft Endplay:

±0.050" (±1.27 mm) typ.

Bearing Life: 80K hours @ 3600 RPM;
128K hours @ 1800 RPM

Environmental

Operating Temperature: -40 to +70°C (std. temp. models); 0 to +100°C (high temp. models); derate 5°C/1000 RPM above 1800 RPM

Storage Temperature: -40 to +90°C

Shock: 50 G's at 11 msec duration

Vibration: 2.5 G's at 5 to 2000 Hz

Relative Humidity: 98% non-condensing

Enclosure Rating: NEMA4 / IP66

Electrical Connections

Encoder Function	Cable #108594-* 6 Pin Single Ended		Cable #108596-* 7 Pin Dif Line Drv w/o Idx		Cable #108595-* 7 Pin (If Used)		Cable #1400635-* 10 Pin (If Used)		Cable #108615-* 12 Pin CCW (If Used)	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
Sig. A	E	BRN	A	BRN	A	BRN	A	BRN	5	BRN
Sig. B	D	ORN	B	ORN	B	ORN	B	ORN	8	ORN
Sig. Z	C	YEL	—	—	C	YEL	C	YEL	3	YEL
Power +V	B	RED	D	RED	D	RED	D	RED	12	RED
N/C	F	—	—	—	E	—	E	—	7	—
Com	A	BLK	F	BLK	F	BLK	F	BLK	10	BLK
Case	—	—	G	GRN	G	GRN	G	GRN	9	—
Sig. A	—	—	C	BRN/WHT	—	—	H	BRN/WHT	6	BRN/WHT
Sig. B	—	—	E	ORN/WHT	—	—	I	ORN/WHT	1	ORN/WHT
Sig. Z	—	—	—	—	—	—	J	YEL/WHT	4	YEL/WHT
0V Sense	—	—	—	—	—	—	—	—	2	GRN
5V Sense	—	—	—	—	—	—	—	—	11	BLK/WHT

*Mating connector/cable assembly wire color information is provided here for reference.

IMPORTANT ENCODER INSTALLATION INFORMATION

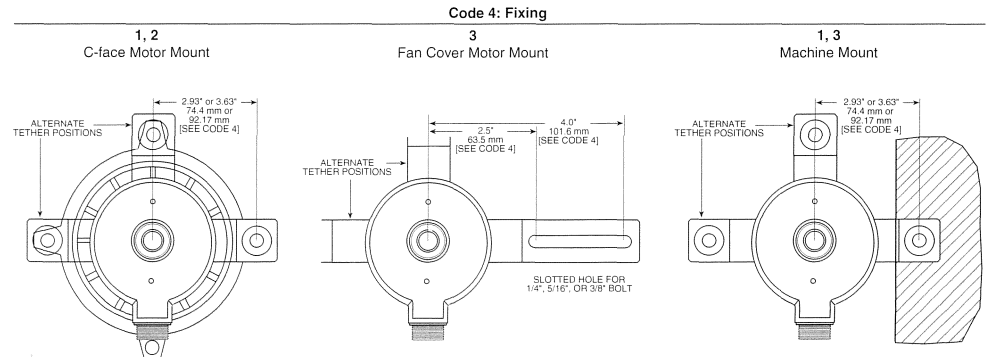
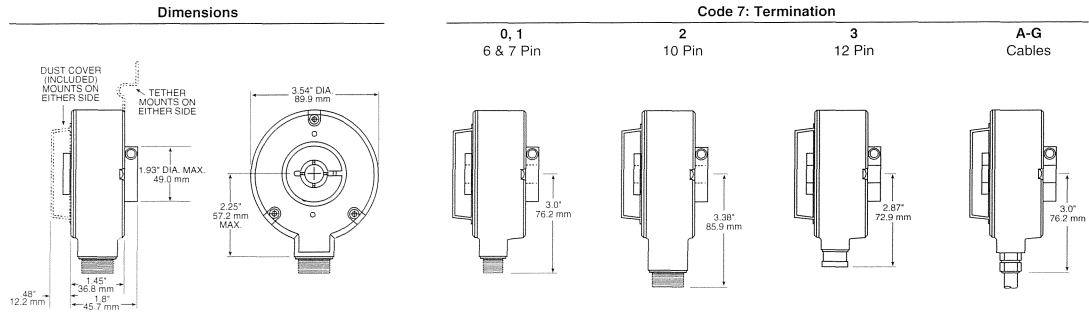
Mounting the Encoder: The encoder's integral flexible mount eliminates the need for an external coupling device. The encoder should be mounted such that its shaft receptacle is in close as possible alignment with the axis of the driving machine or motor shaft.

CAUTION: Defeating or restricting the flexure of the integral mount will cause failure of the encoder's or driving shaft's bearings.

Important Wiring Instructions: Use of shielded cable is recommended for all encoder installations. The shield should be connected to signal-ground at the receiving device only. **Connecting the shield at both ends can cause grounding problems that degrade system performance.** If possible, run the encoder cable through a dedicated conduit (not shared with other wiring). Use of conduit will protect the cable from physical damage and provide a degree of electrical isolation. Do not run the cable in close proximity to other conductors that carry current to heavy loads such as motors, motor starters, contactors, solenoids, etc. This practice can induce electrical transients in the encoder cable, potentially interfering with reliable data transmission.

Refer to Electrical Connections table for wiring information. To avoid possible damage, do not connect or disconnect the encoder connector or wiring while power is applied to the system.

CAUTION: Unused encoder signal wires must be individually insulated and under no circumstances be in contact with ground, voltage sources, or other signal lines.



Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR	Code 3: Bore Size	Code 4: Fixing	Code 5: Format	Code 6: Output	Code 7: Termination	
HS35	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HS35 Size 35 heavy-duty, sealed hollowshaft encoder	0001 0003 0010 0012 0050 0060 0100 0120 0240 0250 0300 0360	0500 0512 0600 0900 1000 1024 1200 1270 1500 1800 2000 2048	0 6 mm 1 1/4" 2 5/16" 3 8 mm 4 3/8" 5 10 mm 6 12 mm 7 1/2" 8 5/8" 9 15 mm A 16 mm B 19 mm C 3/4" D 20 mm E 7/8" F 24 mm G 1" H 1-1/8"	0 None - customer supplied 1 Clearance hole for 3/8" bolt on 5.88" dia. bolt circle (to fit 4-1/2" NEMA C-face) 2 Clearance hole for 1/2" bolt on 7.25" dia. bolt circle (to fit 8-1/2" NEMA C-face) 3 Slotted hole for bolt on 2.5" to 4.0" radius (to fit standard AC motor fan cover slots)	0 single ended, unidirectional (A) 1 single ended, bidirectional (AB) 2 single ended, bidirectional with index (ABZ) Available when Code 6 is 3, 4, A or B: 3 differential, bidirectional (AA BB) Available when Code 6 is 3, 4, A or B, and Code 7 is 2, 3 or 7 - G: 4 differential, bidirectional with index (AABBZZ)	0 5-26V in, 5-26V open collector out 1 5-26V in, 5-26V open collector out w/ 2.2kΩ pullups 2 5-26V in, 5-26V push-pull out Available when Code 5 is 3 or 4: 3 5-26V in, 5V line driver out 4 5-26V in, 5-26V line driver out A same as '3' with high temp. to 100°C B same as '4' with high temp. to 100°C	0 6 pin connector 1 7 pin connector 2 10 pin connector 3 12 pin connector 5 6 pin connector, plus mating connector 6 7 pin connector, plus mating connector 7 10 pin connector, plus mating connector 8 12 pin connector, plus mating connector A 18" (.5m) cable B 36" (1m) cable C 72" (2m) cable D 10' (3m) cable F 13' (.3m) cable with 10 pin connector plus mating connector G 13' (.3m) cable

109473-0001	Tether kit (clearance hole for 3/8" bolt on 5.88" dia. bolt circle)
109473-0002	Tether kit (clearance hole for 1/2" bolt on 7.25" dia. bolt circle)
109473-0003	Tether kit (slotted hole for bolt on 2.5" to 4.0" radius)