

Series HS35 Sealed Hollow Shaft

- Hollow Shaft design eliminates mounting bracket, flexible shaft coupling, and installation labor
- Direct shaft mount eliminates shaft alignment procedures
- Flexible tether minimizes bearing load
- Unbreakable disk
- Robust metal hubshaft
- Electrically isolated and Thermally insulated



Dual Isolated
Outputs Model



Single Output model shown
with LED Output Indicators



MOTOR MOUNT

APPLICATION/INDUSTRY

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.

DESCRIPTION

The Series HS35 Sealed Hollowshaft is equipped with an unbreakable 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.

FEATURES AND BENEFITS

Mechanical and Environmental Features

- Unbreakable 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 to EN50082-2
- Electrically isolated

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental
Resolution: 1 to 2500 PPR (pulses/revolution)
Accuracy: (worst case any edge to any other edge) ± 7.5 arc-min.
Format: Two channel quadrature (AB) with optional Index (Z) and complementary outputs
Phase Sense: A leads B for CW shaft rotation viewing the shaft clamp end of the encoder
Quadrature Phasing: $90^\circ \pm 22.5^\circ$ electrical
Symmetry: $180^\circ \pm 18^\circ$ electrical
Index: $180^\circ \pm 18^\circ$ electrical (gated with B low)
Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

ELECTRICAL

Input Power: (each output)
 4.5 min. to 26 VDC max. at 100 mA max., not including output loads
Outputs:
 7273 Open Collector: 30 VDC max., 40 mA max.
 7272 Push-Pull and Differential Line Driver: 40 mA sink or source
 4469 Differential Line Driver: 100 mA sink or source
Frequency Response: 100 kHz min.
Electrical Protection: Overvoltage, reverse voltage and output short circuit protected
Noise Immunity: Tested to EN50082-2 (Heavy Industrial) for Electro Static Discharge, Radio Frequency Interference, Electrical Fast Transients, Conducted and Magnetic Interference
Mating Connector:
 6 pin, style MS3106A-14S-6S (MCN-N4);
 7 pin, style MS3106A-16S-1S (MCN-N5);
 10 pin, style MS3106A-18-1S (MCN-N6)
 5 pin, style M12: Cable with connector available
 8 pin, style M12: Cable with connector available

MECHANICAL

Bearing Life: 80,000 hours at 3600 RPM; 128,000 hours at 1800 RPM
Shaft Loading: 40 lbs. radial, 30 lbs. axial
Shaft Speed: 3600 RPM max. (*Important: see Operating Temperature derating for >1800 RPM*)
Shaft Bore Tolerance: Nominal $+0.0003"/+0.0005"$ ($+0.008/+0.013$ mm)

Mating Shaft Requirements:

Runout: $\pm 0.025"$ (± 0.63 mm) radial typical;
 Endplay: $\pm 0.050"$ (± 1.27 mm) axial typical;
 Minimum: 1.25" (32 mm) recommended;
 Maximum: 2.0" (51 mm) to fit inside cover;
 Solid shaft recommended; keyway allowed;
 flatted shaft should not be used
Starting Torque: 5.0 oz-in max.
Running Torque: 4.5 oz.-in max.
Moment of Inertia:
 $\leq 5/8"$ bore: 7.9×10^{-4} oz-in-sec²
 $> 5/8"$ bore: 25.6×10^{-4} oz-in-sec²
Weight: 16 oz. max.

ENVIRONMENTAL

Operating Temperature:
 Standard: -40 to $+70$ °C;
 Extended: 0 to $+100$ °C;
 $\leq 5/8"$ bore: Derate 5 °C per 1000 RPM above 1800 RPM;
 $> 5/8"$ bore: Derate 10 °C per 1000 RPM above 1800 RPM.
Storage Temperature: -40 to $+90$ °C
Shock: 50 G's for 11 milliseconds duration
Vibration: 5 to 2000 Hz at 20 G's
Humidity: to 98% without condensation
Enclosure Rating: NEMA4/IP66 (dust proof, washdown)

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ELECTRICAL CONNECTIONS

6, 7 & 10 Pin MS Connectors and Cables - Code 7= 0 to 8, A to G

Connector & mate/accessory cable assembly pin numbers and wire color information is provided here for reference. HS35 models with direct cable exit carry the same color coding as shown for each output configuration.

Encoder Function	Cable #108594-* 6 Pin Single Ended		Cable #112123-* 6 Pin Dif Line Drv w/o ldx		Cable #108596-* 7 Pin Dif Line Drv w/o ldx		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	Pin	Wire Color
	Sig. A	E	BRN	E	BRN	A	BRN	A	BRN	A	BRN	5
Sig. B	D	ORN	D	ORN	B	ORN	B	ORN	B	ORN	8	ORN
Sig. Z	C	YEL	—	—	—	—	C	YEL	C	YEL	3	YEL
Power +V	B	RED	B	RED	D	RED	D	RED	D	RED	12	RED
N/C	F	—	—	—	—	—	E	—	E	—	7	—
Com	A	BLK	A	BLK	F	BLK	F	BLK	F	BLK	10	BLK
Case	—	—	—	—	G	GRN	G	GRN	G	GRN	9	—
Sig. \bar{A}	—	—	C	BRN/WHT	C	BRN/WHT	—	—	H	BRN/WHT	6	BRN/WHT
Sig. \bar{B}	—	—	F	ORN/WHT	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

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5 & 8 Pin M12 Accessory Cables when Code 7= H or J

Connector pin numbers and cable assembly wire color information is provided here for reference.

Encoder Function	Cable # 112859- 5 Pin Single Ended		Cable # 112860- 8 Pin Single Ended		Cable # 112860- 8 Pin Differential	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
Sig. A	4	BLK	1	BRN	1	BRN
Sig. B	2	WHT	4	ORG	4	ORG
*Sig. Z	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
Com	3	BLU	7	BLK	7	BLK
Sig. \bar{A}	—	—	—	—	3	BRN/WHT
Sig. \bar{B}	—	—	—	—	5	ORG/WHT
*Sig. \bar{Z}	—	—	—	—	8	YEL/WHT

* Index not provided on all models. See ordering information

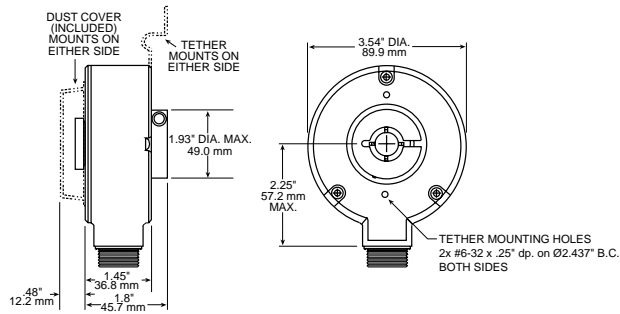
Cable Configuration: PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum

See "Accessories" Section for Connectors and Cable Assemblies Ordering Information

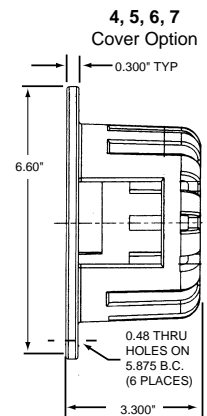
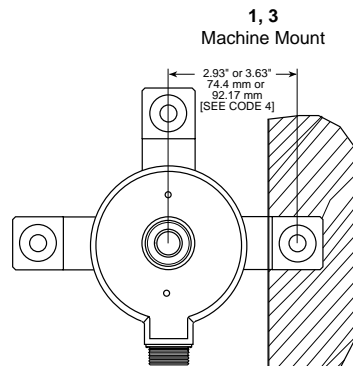
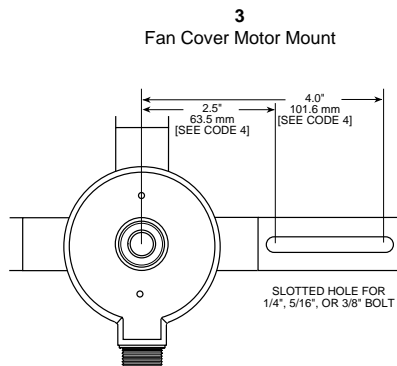
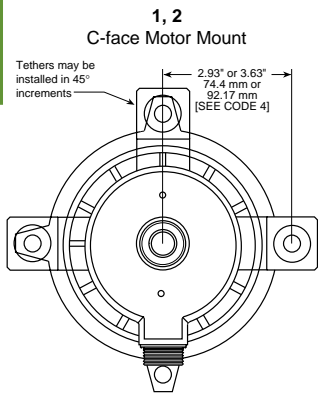
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DIMENSIONS

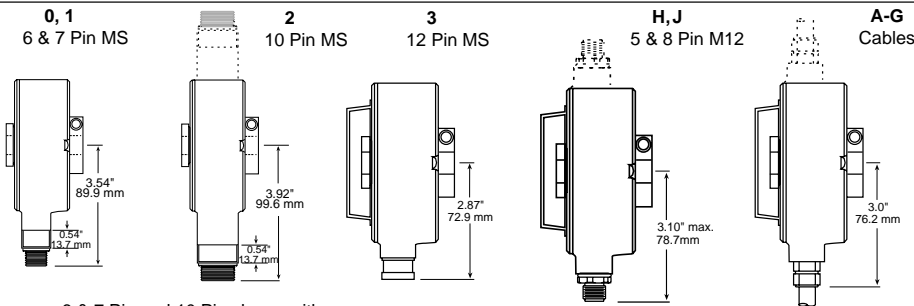
Dimensions



Code 4: Fixing



Code 7: Termination



6 & 7 Pin and 10 Pin shown with LED Output Indicator Option - Code 8: PS

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ORDERING INFORMATION

Code 1: Model	Code 2: PPR	Code 3: Bore Size	Code 4: Fixing	Code 5: Format	Code 6: Output	Code 7: Termination	Code 8: Options	
HS35	□□□□	□	□	□	□	□	□□	
Ordering Information								
HS35 Size 35 heavy-duty, sealed hollowshaft encoder	0001 0500 0003 0512 0010 0600 0012 0900 0050 1000 0060 1024 0064 1200 0100 1270 0120 1500 0240 1800 0250 2000 0300 2048 0360 2400 2500	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) Available when Code 5 is 0-4: 4 Same as '1', w/ cover kit 5 Same as '3', w/ cover kit Available when Code 5 is 5: 6 Same as '1' w/ dual cover kit 7 Same as '3' w/ dual cover kit	0 single ended, unidirectional (A) 1 single ended, bidirectional (AB) 2 single ended, bidirectional with index (ABZ) available when Code 6 is 3, 4, 5, 6, A or B: 3 differential, bidirectional (AĀ BĀ BĪ) available when Code 6 is 3, 4, 5, 6, A or B and Code 7 is 2, 3, or 7 thru G, J: 4 differential, bidirectional with index (AĀ BĀ ZĪ ZĪ) available when Code 6 is 3, 4, 5, 6, A or B, and Code 7 is 2, 7, A thru G, J: 5 Dual isolated differential, bi-directional w/index (AĀBĪZĪ)	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, 4 or 5: 3 5-26V in, 5V line driver out (7272) 4 5-26V in, 5-26V line driver out (7272) 5 5-26V in, 5V Differential Line Driver out (4469) 6 5-15V in, 5-15V Differential Line Driver out (4469) 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 J 8 Pin M12 Connector available when Code 5 is 0 thru 2 H 5 Pin M12 Connector	available when Code 7 is 0 - 2 or 5 - 7: PS LED Output Indicator	
109473-0001	Tether kit (clearance hole for 3/8" bolt on 5.88" dia. bolt circle)			110533-0001 Cover Kit, 56C face				
109473-0002	Tether kit (clearance hole for 1/2" bolt on 7.25" dia. bolt circle)			110533-0002 Cover Kit, fan cover				
109473-0003	Tether kit (slotted hole for bolt on 2.5" to 4.0" radius)			110533-0003 Dual Cover Kit, 56C face				
112121-0001	Spare Hub Clamp (Bore size Code 3: 0 - 9)			110533-0004 Dual Cover Kit, fan cover				
112121-0002	Spare Hub Clamp (Bore size Code 3: A - H)							

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