SERIES HS35

Dynapar™ brand

Sealed Hollowshaft Encoder

Key Features

- **The Original Vector-Duty Hollowshaft Size 35 Encoder**
- **Electrically Isolated Shaft Sizes up to 1.25”**
- **Multitude of Configurations and Accessories Available**
- **Hazardous Location Certification Available**

SPECIFICATIONS

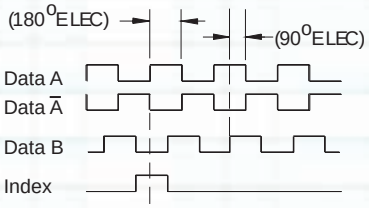
STANDARD OPERATING CHARACTERISTICS

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° ± 22.5° electrical
Symmetry: 180° ± 18° electrical
Index: 180° ± 18° 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 sink 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 EN61326 (Industrial) for Electro Static Discharge, Radio Frequency Interference, Electrical Fast Transients, Conducted and Magnetic Interference

DATA AND INDEX
Not all complements shown.
$\overline{A}$ shown for reference



A Leads B CW

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: ±0.025" (063 mm) radial typical ;
Endplay: ±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:
≤ 5/8" bore: 7.9 x 10^{-4} oz–in–sec^2
> 5/8" bore: 25.6 x 10^{-4} oz–in–sec^2
Weight: 16 oz. max.

ENVIRONMENTAL

Operating Temperature:
Standard: –40 to +70 °C;
Extended: –40 to +100 °C;
≤ 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 Gís for 11 milliseconds duration
Vibration: 5 to 2000 Hz at 20 Gs
Humidity: to 98% without condensation
Enclosure Rating: NEMA4/IP67
Hazardous Location Certification:
Available as Optional Feature. Class I, Division 2, Group A, B, C & D. CSA File No. LR86404

by DYNAPAR™

SERIES HS35

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	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" **P** 1-1/4"	**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, undirectional (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 ($A\bar{A}$ $B\bar{B}$) 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 ($A\bar{A}$ $B\bar{B}$ $Z\bar{Z}$) 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 ($A\bar{A}B\bar{B}Z\bar{Z}$)	**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, 5 V Differential Line Driver out (4469) **6** 5-15V in, 5-15 V Differential Line Driver out (4469) **A** same as **'3'** with extended temp. to 100˚C **B** same as **'4'** with extended 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	**D2** Hazardous Location Certified available when Code 7 is 2 **D3** Same as D2 including adapter for CSA Div. 2, Group F & G Certification (see specifications) ***Note: Requires use of Mating Cable Assembly 114074-XXXX*** available when Code 7 is 0 or 5 and Code 5 is 0-2, or Code 7 is 1, 2, 6, 7: **PS** LED Output Indicator ***Not provided with "Hazardous Location Certified" Option*** **Leave Blank** : No Option

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)
112121-0001 Spare Hub Clamp (Bore size Code 3: 0 - 9)
112121-0002 Spare Hub Clamp (Bore size Code 3: A - H)
110533-0001 Cover Kit, 56C face
110533-0002 Cover Kit, fan cover
110533-0003 Dual Cover Kit, 56C face
110533-0004 Dual Cover Kit, fan cover
114064-0001 Adapter Kit, CSA Division 2, Group F & G, Cert.
114074-XXXX D3 Mating Cable Assembly. "-XXXX" denotes length in feet; example -0010 equals 10 feet.

10 foot Cable Assemblies with MS Connector

108594-0010 6 Pin MS, Cable Assy. For Use with Single Ended Outputs
108595-0010 7 Pin MS, Cable Assy. For Use with Single Ended Outputs
108596-0010 7 Pin MS, Cable Assy. For Use with Differential Line Driver w/o Index Outputs
1400635-0010 10 Pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs
112123-0010 6 Pin MS, Cable Assy. For Use with Differential Line Driver without Index Outputs
108615-0010 12 Pin CCW MS, Cable Assy.

15 foot Cable Assemblies with M12 Connector

112859-0015 5 Pin M12, Cable Assy. For Use with Single Ended Outputs
112860-0015 8 Pin M12, Cable Assy. For Use with Single Ended Outputs
112860-0015 8 Pin M12, Cable Assy. For Use with Differential Line Driver Outputs

Mating Connectors (no cable)

6 pin, style MS3106A-14S-6S (MCN-N4)
7 pin, style MS3106A-16S-1S (MCN-N5)
10 pin, style MS3106A-18-1S (MCN-N6)

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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 Id x		Cable #108596-* 7 Pin Dif Line Drv w/o Id x		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	BRN
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. $\overline{A}$	—	—	C	BRN/WHT	C	BRN/WHT	—	—	H	BRN/WHT	6	BRN/WHT
Sig. $\overline{B}$	—	—	F	ORN/WHT	E	ORN/WHT	—	—	I	ORN/WHT	1	ORN/WHT
Sig. $\overline{Z}$	—	—	—	—	—	—	—	—	J	YEL/WHT	4	YEL/WHT
0V Sense	—	—	—	—	—	—	—	—	—	—	2	GRN
5V Sense	—	—	—	—	—	—	—	—	—	—	11	BLK/WHT

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-* 8Pin 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. $\overline{A}$	–	–	–	–	3	BRN/WHT
Sig. $\overline{B}$	–	–	–	–	5	ORG/WHT
†Sig. $\overline{Z}$	–	–	–	–	8	YEL/WHT

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

***Note:** Standard cable length is 10 feet but may be ordered in any length in 5 foot increment. For example, -0020 is a 20 foot cable.

†Note: Index not provided on all models. See ordering information

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

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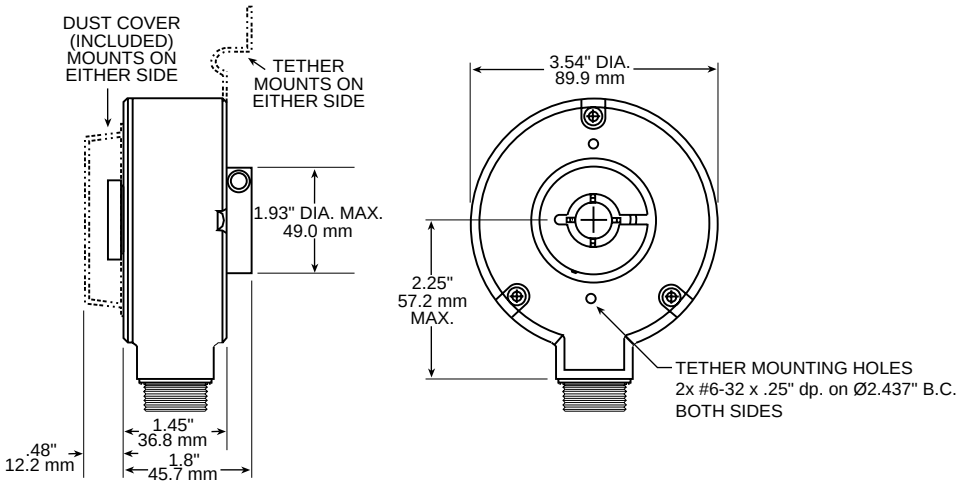
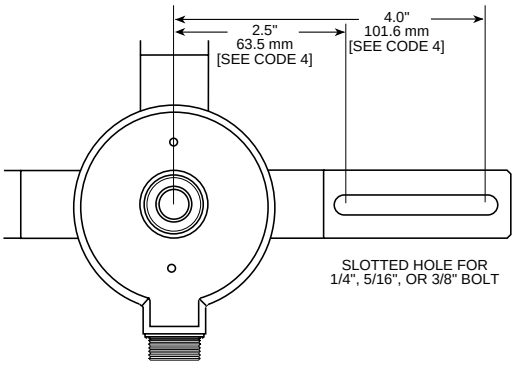
SERIES HS35

DIMENSIONS

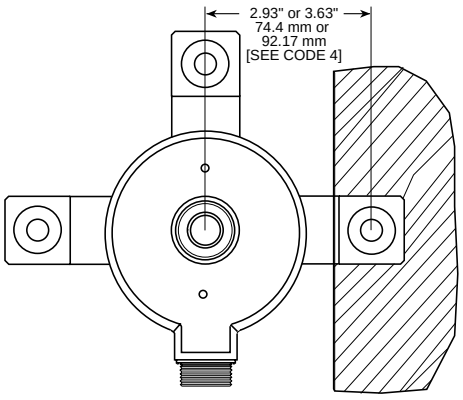


Code 4: Fixing

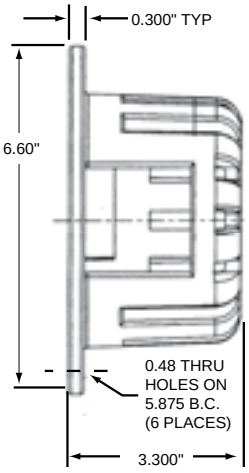
3
Fan Cover Motor Mount



1, 3
Machine Mount

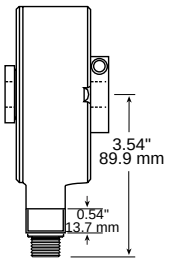


4, 5, 6, 7
Cover Option

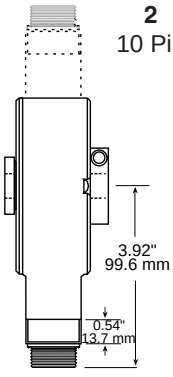


Code 7: Termination

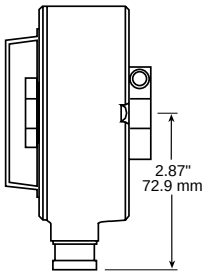
0, 1
6 & 7 Pin MS



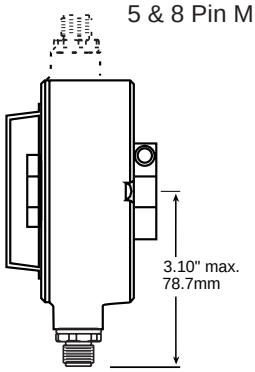
2
10 Pin MS



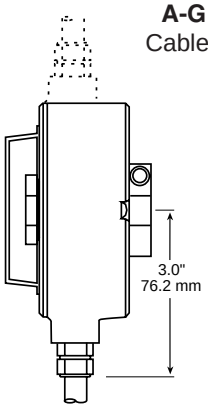
3
12 Pin MS



H, J
5 & 8 Pin M12



A-G
Cables



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