

# SERIES HS35R

# Dynapar™ brand

## Sealed Hollowshaft Encoder

### Key Features

- Phased Array Sensor for Reliable Signal Output
- Rugged Design Withstands up to 400g Shock
- Unbreakable Code Disc up to 5000PPR
- Improved Seal Design for Increased Moisture Resistance



## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

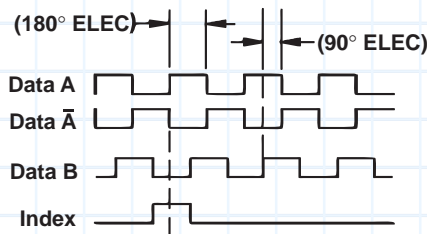
**Code:** Incremental  
**Resolution:** to 5000 PPR (pulses/revolution) See Ordering Information  
**Format:** Two channel quadrature (AB) with optional Index (Z), and complementary outputs  
**Phase Sense:** A leads B for CW shaft rotation viewing the shaft clamp end of the encoder  
**Quadrature Phasing:** For resolutions to 1200 PPR:  $90^\circ \pm 15^\circ$  electrical; For resolutions over 1250 PPR:  $90^\circ \pm 30^\circ$  electrical  
**Symmetry:**  
 For resolutions to 1024PPR:  $180^\circ \pm 18^\circ$  electrical  
 For resolutions over 1024PPR:  $180^\circ \pm 25^\circ$  electrical  
**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

### ELECTRICAL

**Input Power:** 5-26VDC, 5-15VDC. 50 mA max., not including output loads.  
**Outputs:** ET7272, ET7273, 4469  
**Frequency Response:** 125 kHz (data & index)  
**Noise Immunity:** Tested to EN61326-1 EMC  
**Termination:** MS Connector; M12 Connector; cable exit w/seal. See Ordering Information  
**Mating Connector:**  
 6 pin MS, style MS3106A-14S-6S (MCN-N4)  
 7 pin MS, style MS3106A-16S-1S (MCN-N5)  
 10 pin MS, style MS3106A-18-1S (MCN-N6)  
 10 pin Bayonet, MS3116-F12-10S (607545-0001)  
 Cable w/ 5 pin M12 connector, p/n 112859-xxx  
 Cable w/ 8 pin M12 connector, p/n 112860-xxx

### DATA AND INDEX

Not all complements shown  
 A shown for reference



A leads B, CW (from clamp end)

(Reverse Phasing, A leads B for CCW also available: See Code 7 in Ordering Information)

### MECHANICAL

**Shaft Material:** 6061-T6 Aluminum  
**Bore Diameter:** 6mm to 28mm, 1.4" to 1.25", electrically isolated  
**Mating Shaft Length:** 1.25", Minimum, 1.60", Recommended  
**Shaft Speed:** 6000 RPM, Maximum (Enclosure Rating is IP64 at speed over 5000 RPM)  
**Starting torque:** 8.0 in-oz. maximum (at 25°C)  
**Running torque:** 5.0 in-oz. maximum (at ambient)  
**Bearings:** ABEC 1  
**Housing and cover:** Hard Anodized and Powder Coated Aluminum  
**Disc material:** Plastic or metal (unbreakable)  
**Weight:** 1.76lb (28 Oz) Typical

### ENVIRONMENTAL

**Standard Operating Temperature:** -40 to +85°C (0 to +70°C with 4469 line driver, see "Ordering Information"). At shaft speed above 3000 RPM, derate 10°C per 1000 RPM  
**Extended Temperature Range:** -40 to +100°C (See ordering information)  
**Storage temperature:** -40 to +100°C  
**Shock:** 400g, 6mSec  
**Vibration:** 5 to 3000 Hz, 20g  
**Humidity:** 100%  
**Enclosure Rating:** IP67 (IP64 at shaft speed above 5000 RPM)

Note: "MS" type mating connectors and prebuilt cables are rated NEMA 12. "M12" Cable assemblies are rated IP67

**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: Output Format	Code 6: Termination	Code 7: Options
<b>HS35R</b>	□□□□	□	□	□	□	□□

Ordering Information						
<b>HS35R</b> Industrial-duty, hollowshaft encoder	<b>0001</b>	<b>0500</b>	<b>0</b> 6mm	<b>0</b> None	<b>0</b> ABZ, 5-26VDC push-pull	<b>0</b> 6 pin
	<b>0003</b>	<b>0512</b>	<b>1</b> 1/4"	<b>1</b> 4.5" C-face tether	<b>1</b> ABZ, 5-26VDC O/C	<b>1</b> 7 pin
	<b>0010</b>	<b>0600</b>	<b>2</b> 5/16"	<b>2</b> 8.5" C-face tether	<b>2</b> ABZ, 5-26VDC O/C w2.2kOhm	<b>2</b> 10 pin
	<b>0012</b>	<b>0900</b>	<b>3</b> 8mm	<b>3</b> Slotted tether (to fit standard AC motor fan cover)	<b>H</b> Same as "0" with Extended temp range	<b>3</b> 12 pin
	<b>0015</b>	<b>1000</b>	<b>4</b> 3/8"		<b>J</b> Same as "1" with Extended temp range	<b>4</b> 10 pin bayonet
	<b>0032</b>	<b>1024</b>	<b>5</b> 10mm		<b>K</b> Same as "2" with Extended temp range	<b>5</b> 6 pin+mating
	<b>0050</b>	<b>1200</b>	<b>6</b> 12mm			<b>6</b> 7 pin+mating
	<b>0060</b>	<b>1500</b>	<b>7</b> 1/2"		Not available when Code 6 is H	<b>7</b> 10 pin+mating
	<b>0100</b>	<b>2000</b>	<b>8</b> 5/8"	Not available when Code 5 is D,E,F,G, Q, R	<b>4</b> Differential AB only, 5-26VDC, 5-26VDC out (7272)	<b>8</b> 12 pin+mating
	<b>0120</b>	<b>2048</b>	<b>A</b> 16mm	<b>4</b> Same as 1 w/cover	<b>5</b> Differential AB only, 5-26VDC in, 5VDC out (7272)	<b>9</b> 10pin bayonet+mating
<b>0200</b>	<b>2400</b>	<b>C</b> 19mm	<b>5</b> Same as 3 w/cover	<b>A</b> Differential AB only, 5-26VDC in, 5VDC out (4469)	<b>A</b> 0.5m (18") cable	
<b>0240</b>	<b>2500</b>	<b>D</b> 3/4"		<b>C</b> Differential AB only, 5-15VDC in, 5-15VDC out (4469)	<b>C</b> 1m (36") cable	
<b>0250</b>	<b>3072</b>	<b>E</b> 20mm		<b>L</b> Same as "4" with Extended temp range	<b>D</b> 2m (72") cable	
<b>0300</b>	<b>4000</b>	<b>F</b> 7/8"	Not available when Code 5 is 0 through C or H through P	<b>M</b> Same as "5" with Extended temp range	<b>E</b> 3m (120") cable	
<b>0360</b>	<b>4096</b>	<b>G</b> 24mm			<b>F</b> 0.3m (13") cable with 10 pin connector and mate	
	<b>5000</b>	<b>H</b> 1"		Not available when Code 6 is 0, 1, 5, 6, or H	<b>G</b> 0.3m (13") cable	
		<b>J</b> 1-1/8"	<b>6</b> Same as 1 w/dual cover	<b>6</b> Differential ABZ, 5-26VDC in, 5VDC out (7272)	<b>H</b> 5 pin M12	
		<b>K</b> 1-1/4"	<b>7</b> Same as 3 w/dual cover	<b>7</b> Differential ABZ, 5-26VDC in, 5-26VDC out (7272)	<b>J</b> 8 pin M12	
		<b>M</b> 14mm		<b>8</b> Differential ABZ, 5-26VDC in, 5VDC out (4469)		
		<b>N</b> 18mm		<b>9</b> Differential ABZ, 5-15VDC in, 5-15VDC out (4469)		
		<b>P</b> 25mm		<b>D</b> Dual isolated outputs, same as "6"		
		<b>R</b> 28mm		<b>E</b> Dual isolated outputs, same as "7"		
				<b>F</b> Dual isolated outputs, same as "8"		
				<b>G</b> Dual isolated outputs, same as "9"		
				<b>N</b> Same as "6" with Extended temp range		
				<b>P</b> Same as "7" with Extended temp range		
				<b>Q</b> Same as "D" with Extended temp range		
				<b>R</b> Same as "E" with Extended temp range		

**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
- 112123-0010** 6 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
- 114448-0010** 10 Bayonet, Cable Assy. For Use with Differential Line Driver with Index Outputs
- 109209-0010** NEMA4 10 pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs

**10 foot Cable Assemblies with M23 Connector**

- 108615-0010** 12 M23, Cable Assy. For Use with Differential Line Driver with Index Outputs, CCW

**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)
- 10 pin bayonet, style MS3116-F12-10S (607545-0001)

**Accessory Kits:**

- 114573-0001** Tether Kit, 4.5" C-face single point with 3/8" bolt
- 114574-0001** Tether Kit, Slotted with T-bolts for standard AC motor fan covers
- 114575-0001** Tether Kit, 8.5" C-face single point with 1/2" bolt
- 114591-0001** Cover Kit, 56C face
- 114592-0001** Cover Kit, fan cover
- 114593-0001** Dual Cover Kit, 56C face
- 114594-0001** Dual Cover Kit, fan cover

# SERIES HS35R

## ELECTRICAL CONNECTIONS

### 6, 7 & 10 Pin MS Connectors and Cables - Code 6 = 0 to 9, A to G

Connector & mate/accessory cable assembly pin numbers and wire color information is provided here for reference. 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- or 109209- (NEMA4) 10 Pin Dif Line Drv w/Id x (If Used)		Cable #108615-* 12 Pin CCW (If Used)		Cable #114448-* 10 Pin Bayonet	
	Pin	Wire Color	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	A	BRN
Sig. B	D	ORN	D	ORN	B	ORN	B	ORN	B	ORN	8	ORN	B	ORN
Sig. Z	C	YEL	—	—	—	—	C	YEL	C	YEL	3	YEL	C	YEL
Power +V	B	RED	B	RED	D	RED	D	RED	D	RED	12	RED	D	RED
N/C	F	—	—	—	—	—	E	—	E	—	7	—	E	—
Com	A	BLK	A	BLK	F	BLK	F	BLK	F	BLK	10	BLK	F	BLK
Case	—	—	—	—	G	GRN	G	GRN	G	GRN	9	—	G	GRN
Sig. A	—	—	C	BRN/WHT	C	BRN/WHT	—	—	H	BRN/WHT	6	BRN/WHT	H	BRN/WHT
Sig. B	—	—	F	ORN/WHT	E	ORN/WHT	—	—	I	ORN/WHT	1	ORN/WHT	J	ORN/WHT
Sig. Z	—	—	—	—	—	—	—	—	J	YEL/WHT	4	YEL/WHT	K	YEL/WHT
OV Sense	—	—	—	—	—	—	—	—	—	2	GRN	—	—	—
5V Sense	—	—	—	—	—	—	—	—	—	11	BLK/WHT	—	—	—

### 5 & 8 Pin M12 Accessory Cables when Code 6 = H or J

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

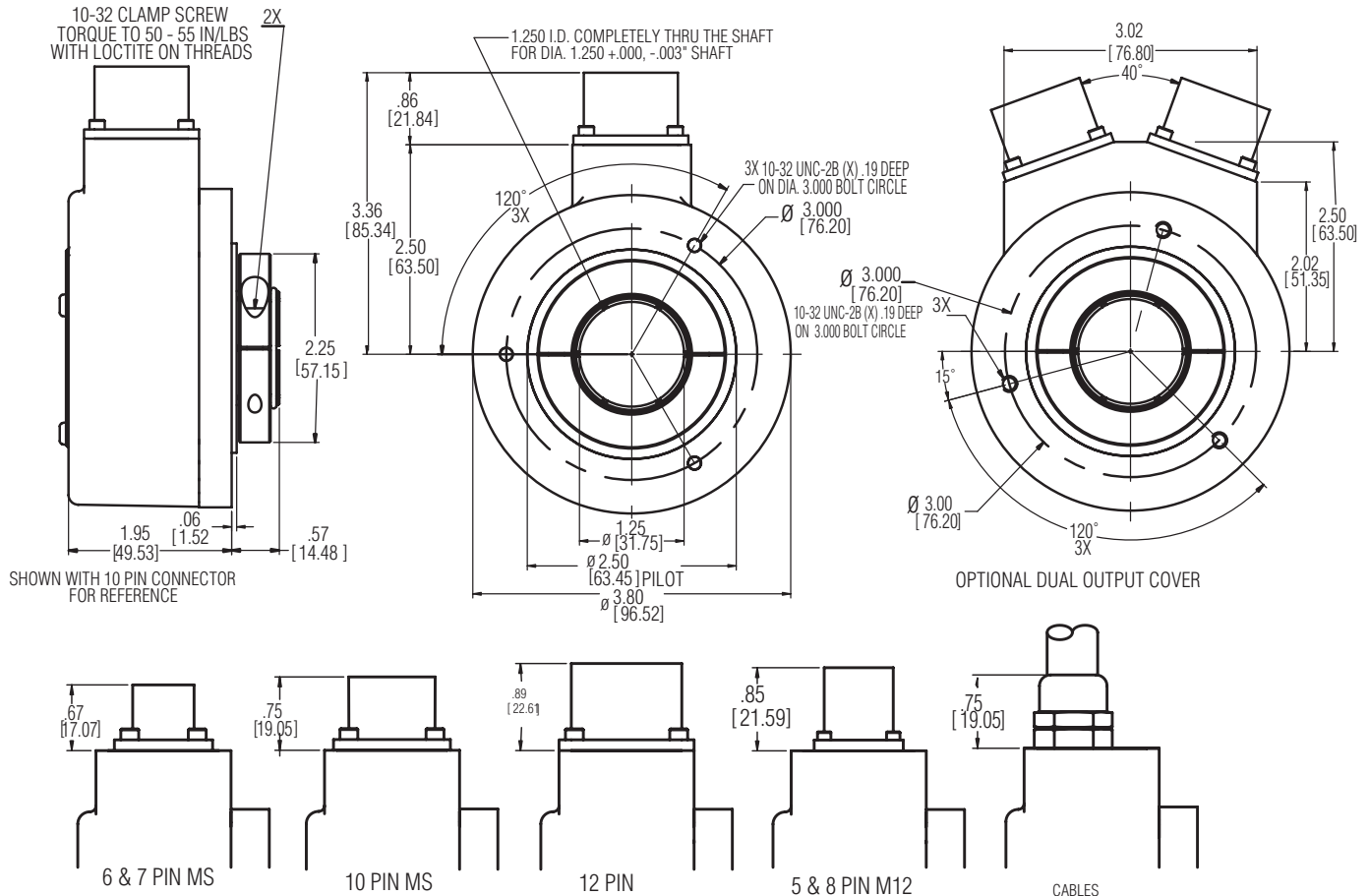
Encoder Function	Cable # 112859- 5 Pin Single Ended		Cable # 112860- 8 Pin Single Ended		Cable # 112860- 8 Pin Differential	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
Sig. A	4	BLK	1	BRN	1	BRN
Sig. B	2	WHT	4	ORG	4	ORG
†Sig. Z	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
Com	3	BLU	7	BLK	7	BLK
Sig.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

† Index not provided on all models. See ordering information

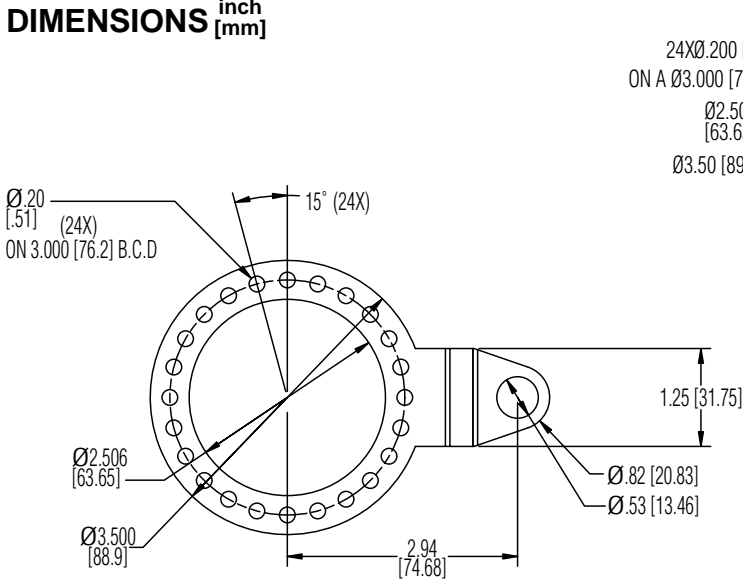
**Cable Configuration:** PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum

- \* 1) 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.
- 2) "MS" type mating connectors and prebuilt cables are rated NEMA 12. "M12" Cable assemblies are rated IP67
- 3) For watertight applications, use NEMA4 10 pin cable & connector 109209-XXXX.

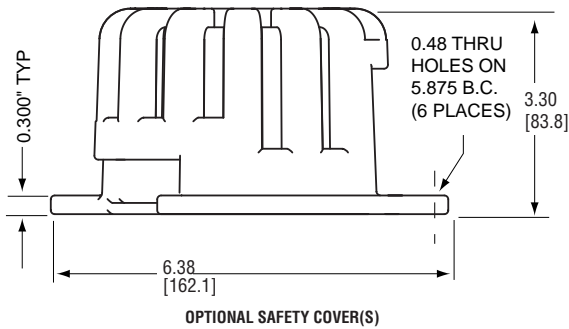
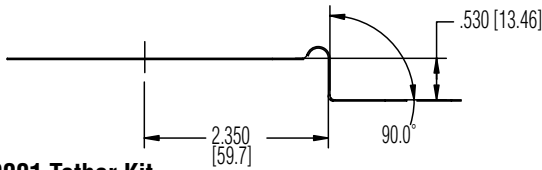
## DIMENSIONS [inch /mm]



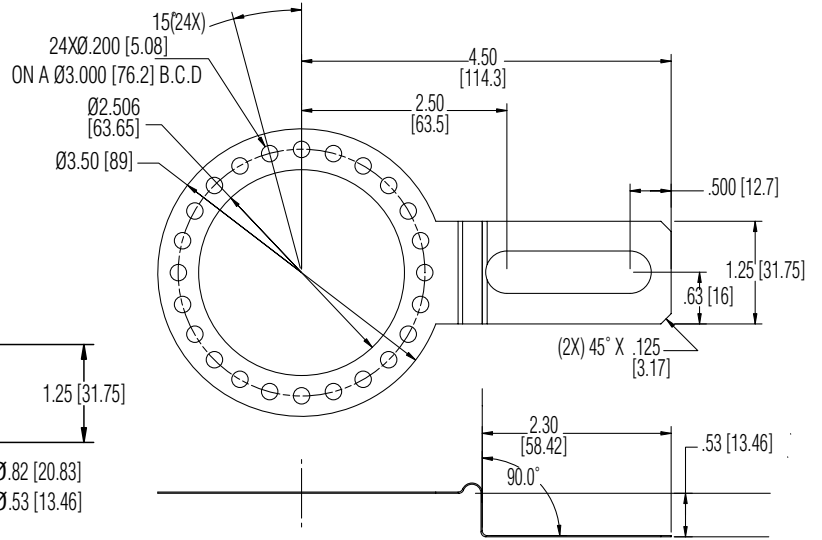
**DIMENSIONS** <sup>inch</sup> [mm]



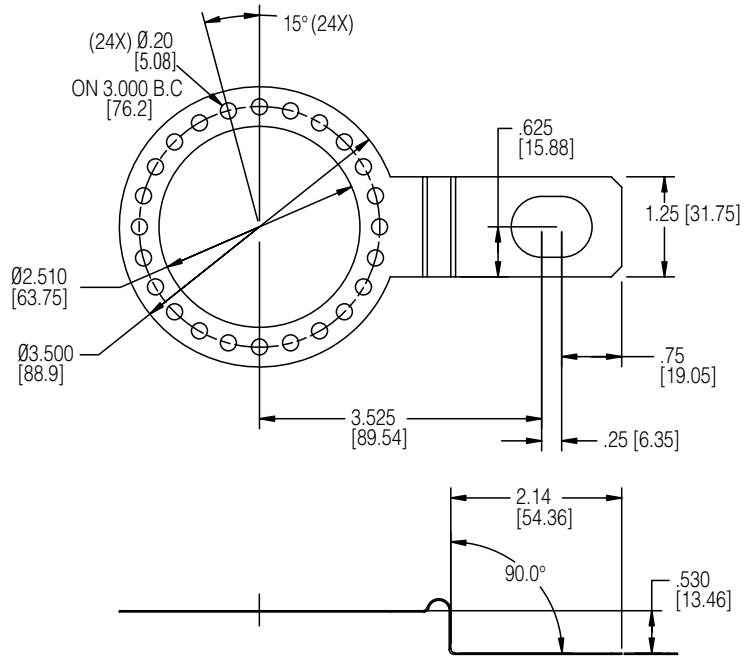
**114573-0001 Tether Kit**



OPTIONAL SAFETY COVER(S)



**114574-0001 Slotted Tether Kit**



**114575-0001 Tether Kit**

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