

# SERIES HS35R

**Dynapar™ brand**

## Heavy Duty Hollowshaft Encoder

### Key Features

- Phased Array Sensor for Reliable Signal Output
- Rugged Design Withstands up to 400g Shock and 20g Vibration
- Unbreakable Code Disc up to 5000PPR
- Heavy Duty Design Rated for IP67
- Customizable Mounting Options including Torque Arm with Optional Grounding Strap



## 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 200 to 300PPR and 1200PPR and above: 90° ±30° electrical; all other resolutions: 90° ±15°  
**Symmetry:**  
 For resolutions 200-300PPR and above: 180° ±25° electrical; all other resolutions: 180° ±18°  
**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. 80 mA max., not including output loads.  
**Outputs:** ET7272, ET7273, 4469, High-Power-Line-Driver  
**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

### MECHANICAL

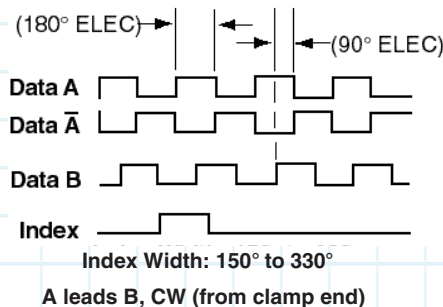
**Shaft Material:** 6061-T6 Aluminum  
**Bore Diameter:** 6mm to 28mm, 1/4" to 1-1/8", electrically isolated  
**Mating Shaft Length:** 1.25", Minimum, 1.60", Recommended  
**Shaft Speed:** 6000 RPM, Maximum (Enclosure Rating is IP64 at speed over 5000 RPM)  
**Starting torque:** 8.0 in-oz. maximum (at 25°C)  
**Running torque:** 5.0 in-oz. maximum (at ambient)  
**Bearings:** ABEC 1  
**Housing and cover:** Powder Coated Aluminum  
**Disc material:** Plastic  
**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)

### DATA AND INDEX

Not all complements shown  
 A-bar shown for reference



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

Note: "MS" type mating connectors and pre-built 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>	□□□□	□	□	□	□	□□
<b>Ordering Information</b>						
<b>HS35R</b> Heavy-Duty Hollowshaft Encoder	<b>0001 0500</b>	<b>0</b> 6mm	<b>0</b> None	<b>0</b> ABZ, 5-26VDC push-pull	<b>0</b> 6 pin	<b>Blank</b> No Option <b>01</b> Reverse Phasing (A leads B, CCW)  Available when Code 5 is 0-2, 6 and 7 and when Code 6 is 0-2 or 5-7 <b>PS</b> LED Output
	<b>0003 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 0600</b>	<b>2</b> 5/16"	<b>2</b> 8.5" C-face tether	<b>2</b> ABZ, 5-26VDC O/C w/2.2kOhm	<b>2</b> 10 pin	
	<b>0012 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 1000</b>	<b>4</b> 3/8"	Not available when Code 5 is D,E,F,G, Q, R	<b>J</b> Same as "1" with Extended temp range	<b>4</b> 10 pin bayonet	
	<b>0032 1024</b>	<b>5</b> 10mm		<b>K</b> Same as "2" with Extended temp range	<b>5</b> 6 pin+mating	
	<b>0050 1200</b>	<b>6</b> 12mm	Available when Code 5 is D,E,F,G, Q, R	Not available when Code 6 is H	<b>6</b> 7 pin+mating	
	<b>0060 1500</b>	<b>7</b> 1/2"			<b>4</b> Differential AB only, 5-26VDC, 5-26VDC out (7272)	
	<b>0100 2000</b>	<b>8</b> 5/8"	<b>4</b> Same as 1 w/cover	<b>5</b> Differential AB only, 5-26VDC in, 5VDC out (7272)	<b>7</b> 10 pin+mating	
	<b>0120 2048</b>	<b>9</b> 15mm	<b>5</b> Same as 3 w/cover	<b>A</b> Differential AB only, 5-26VDC in, 5VDC out (4469)	<b>8</b> 12 pin+mating	
	<b>0200 2400</b>	<b>A</b> 16mm	<b>C</b> Same as A with 56C cover (Single Only)	<b>C</b> Differential AB only, 5-15VDC in, 5-15VDC out (4469)	<b>9</b> 10pin bayonet+mating	
	<b>0240 2500</b>	<b>C</b> 19mm	Not Electrically Isolated	<b>L</b> Same as "4" with Extended temp range	<b>A</b> 0.5m (18") cable	
	<b>0250 3072</b>	<b>D</b> 3/4"			<b>M</b> Same as "5" with Extended temp range	
	<b>0300 4000</b>	<b>E</b> 20mm	Available when Code 5 is D,E,F,G, Q, R	<b>N</b> Same as "4" with Extended temp range	<b>D</b> 2m (72") cable	
	<b>0360 4096</b>	<b>F</b> 7/8"			<b>O</b> Same as "5" with Extended temp range	
<b>5000</b>	<b>G</b> 24mm	<b>7</b> Same as 3 w/dual cover	Not available when Code 6 is 0, 1, 5, 6, or H	<b>F</b> 0.3m (13") cable with 10-pin bulkhead connector and mate		
	<b>H</b> 1"	<b>8</b> Same as 2 w/ 180 C-face cover (single or dual output)		<b>6</b> Differential ABZ, 5-26VDC in, 5VDC out (7272)	<b>G</b> 0.3m (13") cable	
	<b>J</b> 1-1/8"	Not Electrically Isolated	<b>7</b> Differential ABZ, 5-26VDC in, 5-26VDC out (7272)	<b>H</b> 5 pin M12		
	<b>M</b> 14mm			<b>8</b> Differential ABZ, 5-26VDC in, 5VDC out (4469)	<b>J</b> 8 pin M12	
	<b>N</b> 18mm	Not Electrically Isolated	<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>A</b> Rod tether	<b>E</b> Dual isolated outputs, same as "7"			
		<b>B</b> Rod tether with ground strap.	<b>F</b> Dual isolated outputs, same as "8"			
		<b>D</b> Same as B with 56C cover (Single Output)	<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			
			<b>W</b> ABZ, 10-24VDC Line Driver for cable runs up to 500 ft/120m using the Dynapar cable assemblies listed below			

**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)**

- MCN-N4** 6 pin, style MS3106A-14S-6S
- MCN-N5** 7 pin, style MS3106A-16S-1S
- MCN-N6** 10 pin, style MS3106A-18-1S
- 607545-0001** 10 pin bayonet, style MS3116-F12-10S

**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
- 114928-0001** Dual Cover Kit, 180C-face
- 114594-0001** Dual Cover Kit, fan cover
- 116233-0001** Rod Tether only
- 116233-0002** Rod Tether + 56C face cover (single)
- 116233-0004** Rod Tether + grounding strap
- 116233-0005** Rod Tether + grounding strap +56C face cover (single)

# 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/ldx (If Used)		Cable #108615-* 12 Pin CCW (If Used)		Cable #114448-* 10Pin 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	BLK/WHT	—	—
5V Sense	—	—	—	—	—	—	—	—	—	—	11	GRN	—	—

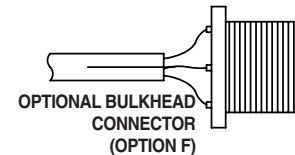
### 5 & 8 Pin M12 Accessory Cables when Code 6 = H or J

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- 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. A	—	—	—	—	3	BRN/WHT
Sig. B	—	—	—	—	5	ORG/WHT
†Sig. Z	—	—	—	—	8	YEL/WHT

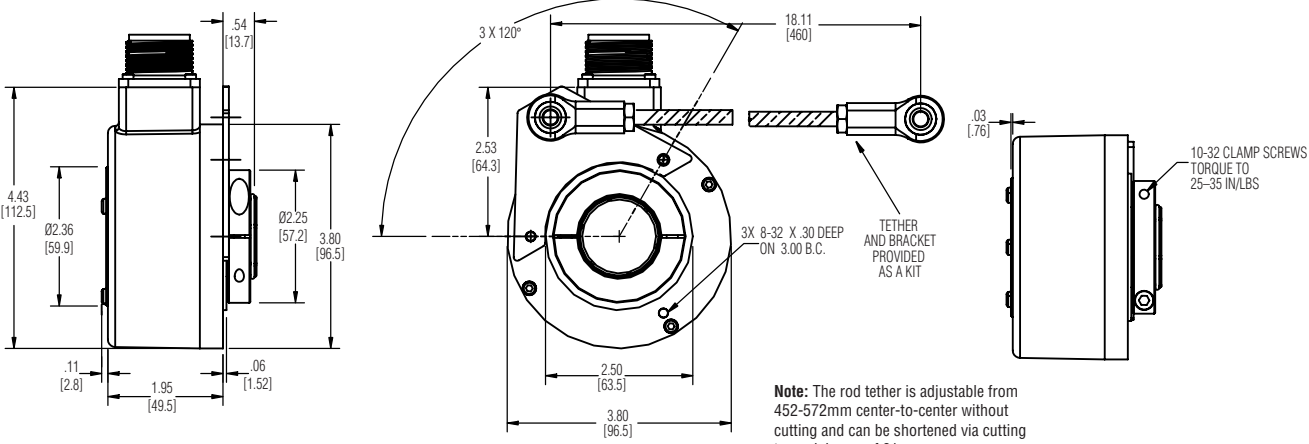
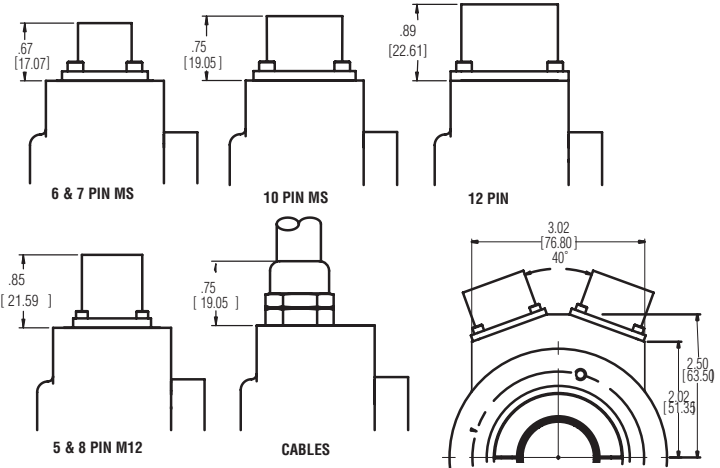
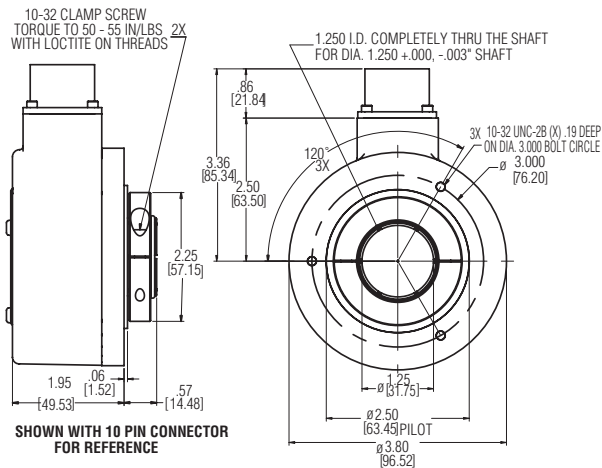
† Index not provided on all models. See ordering information

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



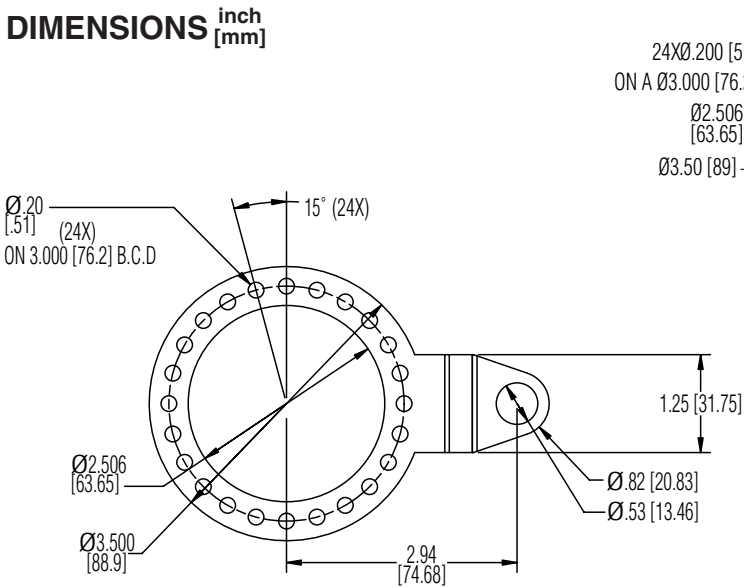
- \* 1) Note: Standard cable length is 10 feet but may be ordered in any length in 5 foot increment. For example, -0020 is a 20 foot cable.
- 2) "MS" type mating connectors and prebuilt cables are rated NEMA 12. "M12" Cable assemblies are rated IP67
- 3) For watertight applications, use NEMA4 10 pin cable & connector 109209-XXXX.
- † Only with cable option A thru G.

## DIMENSIONS inch [mm]

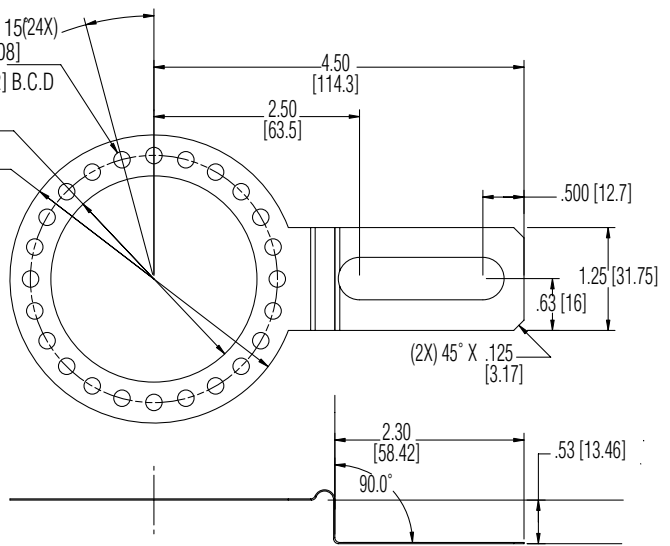
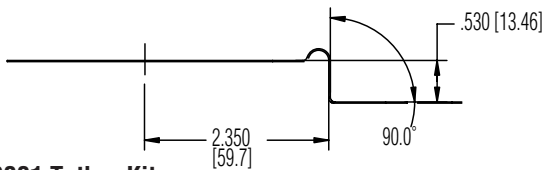


SHOWN WITH TORQUE ARM

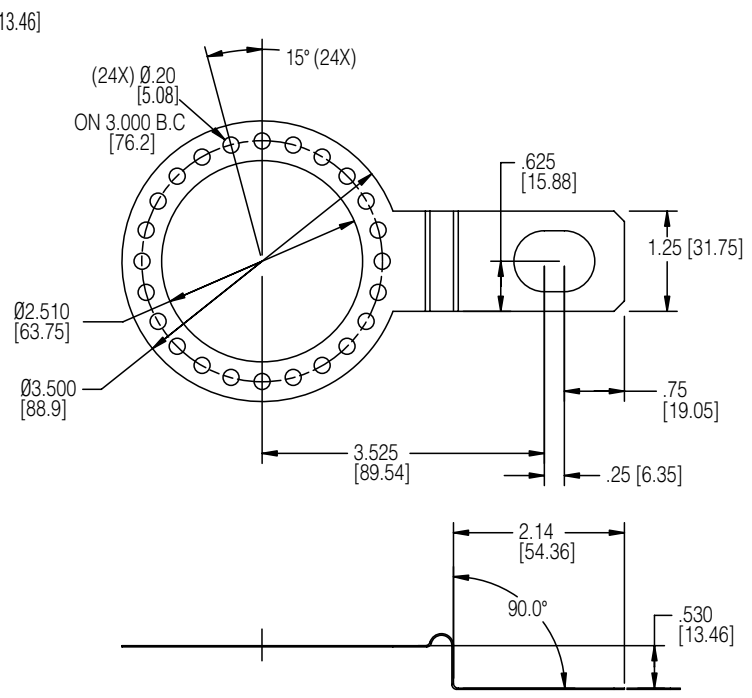
**DIMENSIONS** inch [mm]



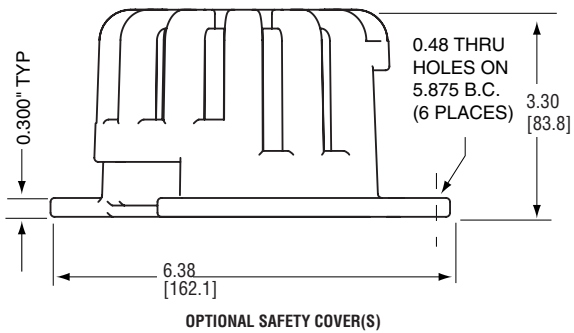
**114573-0001 Tether Kit**



**114574-0001 Slotted Tether Kit**



**114575-0001 Tether Kit**



**OPTIONAL SAFETY COVER(S)**