SERIES HS35R

Dynapar™ brand

Heavy Duty Hollowshaft Encoder

IND Industrial Duty

Key Features

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

CE EN 61326-1

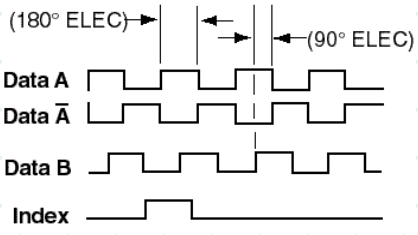
RoHS

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental, Optical
Resolution: 1 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 300 PPR and 1200 PPR and above: 90° ±30° electrical; all other resolutions: 90° ±15°
Symmetry:
For resolutions 200-300 PPR and above1024 PPR:180° ±25° electrical; all other resolutions: 180° ±18°
Index: 150° to 330° A leads B, CW (from clamp end) (Reverse Phasing, A leads B for CCW also available: See Code 7 in Ordering Information)
Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

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



Index Width: 150° to 330°
A leads B, CW (from clamp end)
(Reverse Phasing, A leads B for CCW also available: See Code 7 in Ordering Information)

ELECTRICAL

Input Power: 5-26VDC, 5-15VDC. 80 mA max., not including output loads.
Outputs:
7272 Push-Pull: 40mA, sink or source
7272 Differential Line Driver: 40 mA, sink or source
7273 Open Collector: 40mA, sink max
4469 Differential Line Driver: 100mA, sink or source
High-Power Mosfet Line Driver

Frequency Response: 125 kHz (data & index)
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Reverse polarity, short circuit protected with 7272 or 7273 line drivers only
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, NEMA4 style (MCN-N6N4)
10 pin Bayonet, MS3116-F12-10S (MCN-B1)
12 Pin CCW M23 Connector (MCN-C2)
Cable w/ 5 pin M12 Connector (112859-XXXX)
Cable w/ 8 pin M12 Connector(112860-XXXX)

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

MECHANICAL

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
Shaft Material: 6061-T6 Aluminum
Disc Material: Mylar (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: Up to 98% (non-condensing)
Enclosure Rating: IP67 (IP64 at shaft speed above 5000 RPM)

Dynapar™ brand SERIES HS35R

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
HS35R □□□□	□	□	□	□	□	□□

Ordering Information

Code 1: Model	Code 2: PPR	Code 3: Bore Size	Code 4: Fixing	Code 5: Output Format	Code 6: Termination	Code 7: Options
HS35R Heavy-Duty, Hollowshaft Encoder	**0001** **0500** **0003** **0512** **0010** **0600** **0012** **0900** **0015** **1000** **0032** **1024** **0050** **1200** **0060** **1500** **0100** **2000** **0120** **2048** **0200** **2400** **0240** **2500** **0250** **3072** **0300** **4000** **0360** **4096** **5000**	**0** 6mm **1** 1/4" **2** 5/16" **3** 8mm **4** 3/8" **5** 10mm **6** 12mm **7** 1/2" **8** 5/8" **9** 15mm **A** 16mm **C** 19mm **D** 3/4" **E** 20mm **F** 7/8" **G** 24mm **H** 1" **J** 1-1/8" **M** 14mm **N** 18mm **P** 25mm **R** 28mm Not Electrically Isolated **K** 1-1/4"	**0** None **1** 4.5" C-face tether **2** 8.5" C-face tether **3** Slotted tether (to fit standard AC motor fan cover) Not available when Code 5 is D,E,F,G, Q, R **4** Same as 1 w/cover **5** Same as 3 w/cover **C** Same as A with 56C cover (Single Only) Available when Code 5 is D,E,F,G, Q, R **6** Same as 1 w/dual cover **7** Same as 3 w/dual cover **8** Same as 2 w/ 180 C-face cover (single or dual output) **A** Rod tether **B** Rod tether with ground strap. **D** Same as B with 56C cover (Single Output)	**0** ABZ, 5-26VDC push-pull (7272) **1** ABZ, 5-26VDC O/C (7273) **2** ABZ, 5-26VDC O/C w2.2kOhm (7273) **H** Same as "0" with Extended temp range **J** Same as "1" with Extended temp range **K** Same as "2" with Extended temp range Not available when Code 6 is H **4** Differential AB only, 5-26VDC, 5-26VDC out (7272) **5** Differential AB only, 5-26VDC in, 5VDC out (7272) **A** Differential AB only, 5-26VDC in, 5VDC out (4469) **C** Differential AB only, 5-15VDC in, 5-15VDC out (4469) **L** Same as "4" with Extended temp range **M** Same as "5" with Extended temp range Not available when Code 6 is 0, 1, 5, 6, or H **6** Differential ABZ, 5-26VDC in, 5VDC out (7272) **7** Differential ABZ, 5-26VDC in, 5-26VDC out (7272) **8** Differential ABZ, 5-26VDC in, 5VDC out (4469) **9** Differential ABZ, 5-15VDC in, 5-15VDC out (4469) **D** Dual isolated outputs, same as "6" **E** Dual isolated outputs, same as "7" **F** Dual isolated outputs, same as "8" **G** Dual isolated outputs, same as "9" **N** Same as "6" with Extended temp range **P** Same as "7" with Extended temp range **Q** Same as "D" with Extended temp range **R** Same as "E" with Extended temp range **W** ABZ, 10-24VDC Line Driver for cable runs up to 500 ft/120m using the Dynapar cable assemblies listed below	**0** 6 Pin Connector **1** 7 Pin Connector **2** 10 Pin Connector **3** 12 Pin Connector **4** 10 Pin Bayonet Connector **5** 6 Pin+Mating Connector **6** 7 Pin+Mating Connector **7** 10 Pin+Mating Connector **8** 12 Pin+Mating Connector **9** 10 Pin Bayonet+Mating Connector **A** 0.5m (18") Cable **C** 1m (36") Cable **D** 2m (72") Cable **E** 3m (120") Cable **F** 0.3m (13") Cable with 10-Pin Bulk-head Connector and Mate **G** 0.3m (13") Cable **H** 5 Pin M12 Connector **J** 8 Pin M12 Connector	**Blank** No Option **01** Reverse Phasing (A leads B, CCW) Available when Code 5 is 0-9, A-G and when Code 6 is 0-2 or 5-7 **PS** LED Output

Cable Assemblies with MS Connector*

108594-XXXX 6 Pin MS, Cable Assy. For Use with Single Ended Outputs
112123-XXXX 6 Pin MS, Cable Assy. For Use with Differential Line Driver w/o Index Outputs
108595-XXXX 7 Pin MS, Cable Assy. For Use with Single Ended Outputs
108596-XXXX 7 Pin MS, Cable Assy. For Use with Differential Line Driver w/o Index Outputs
1400635-XXXX 10 Pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs
114448-XXXX 10 Bayonet, Cable Assy. For Use with Differential Line Driver with Index Outputs
109209-XXXX NEMA4 10 pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs

Cable Assemblies with M23 Connector*

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

Cable Assemblies with M12 Connector*

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

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

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
MCN-N6N4 10 pin, NEMA4 style
MCN-B1 10 pin bayonet, style MS3116-F12-10S
MCN-C2 12 Pin CCW M23 Connector

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, 56 C-Face
114592-0001 Cover Kit, Fan Cover
114593-0001 Dual Cover Kit, 56 C-Face
114928-0001 Dual Cover Kit, 180 C-Face
114594-0001 Dual Cover Kit, Fan Cover
116233-0001 Rod Tether Only
116233-0002 Rod Tether + 56 C-Face Cover (Single)
116233-0004 Rod Tether + Grounding Strap
116233-0005 Rod Tether + Grounding Strap + 56 C-Face Cover (Single)

SERIES HS35R

by DYNAPAR™

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-XXXX 6 Pin Single Ended		Cable #112123-XXXX 6 Pin Dif Line Drv w/o Index		Cable #108596-XXXX 7 Pin Dif Line Drv w/o Index		Cable #108595-XXXX 7 Pin (If Used)		**Cable #109209-XXXX or 1400635XXXX 10 Pin Differential Line Driver w/ Index		Cable #114448-XXXX 10 Pin Bayonet		Cable #108615-XXXX 12 Pin CCW		Cable Exit with Seal
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Wire Color
Sig. A	E	BRN	E	BRN	A	BRN	A	BRN	A	BRN	A	BRN	5	BRN	BRN
Sig. B	D	ORN	D	ORN	B	ORN	B	ORN	B	ORN	B	ORN	8	ORN	ORN
Sig. Z*	C	YEL	—	—	—	—	C	YEL	C	YEL	C	YEL	3	YEL	YEL
Power +V	B	RED	B	RED	D	RED	D	RED	D	RED	D	RED	12	RED	RED
N/C	F	—	—	—	—	—	E	—	E	—	E	—	7	—	—
Com	A	BLK	A	BLK	F	BLK	F	BLK	F	BLK	F	BLK	10	BLK	BLK
Case	—	—	—	—	G	GRN	G	GRN	G	GRN	G	GRN	9	—	GRN
Sig. $\overline{A}$	—	—	C	BRN/WHT	C	BRN/WHT	—	—	H	BRN/WHT	H	BRN/WHT	6	BRN/WHT	BRN/WHT
Sig. $\overline{B}$	—	—	F	ORN/WHT	E	ORN/WHT	—	—	I	ORN/WHT	J	ORN/WHT	1	ORN/WHT	ORN/WHT
Sig. $\overline{Z}$*	—	—	—	—	—	—	—	—	J	YEL/WHT	K	YEL/WHT	4	YEL/WHT	YEL/WHT
0V Sense	—	—	—	—	—	—	—	—	—	—	—	—	2	BLK/WHT	—
+V 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.

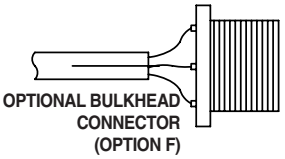
Encoder Function	Cable # 112859-XXXX 5 Pin Single Ended		Cable # 112860-XXXX 8 Pin Single Ended		Cable # 112860-XXXX 8 Pin Differential	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
Sig.A	4	BLK	1	BRN	1	BRN
Sig.B	2	WHT	4	ORG	4	ORG
Sig. Z*	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
Com	3	BLU	7	BLK	7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

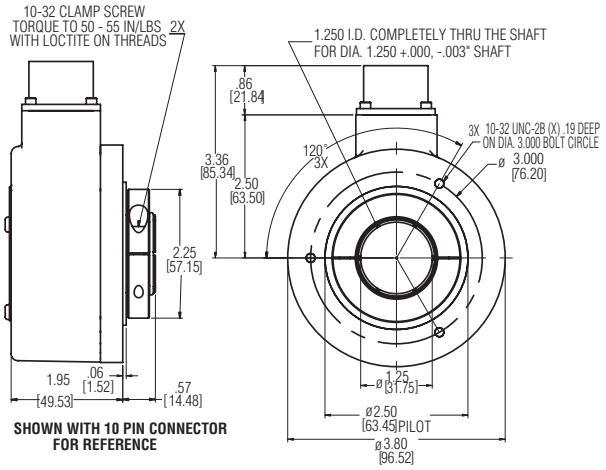
1) Cable Configuration (**Table 1**): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 24 AWG (output signals), plus 2 twisted pairs 22 AWG (input power)
2) Cable Configuration (**Table 2**): PVC jacket, 105°C rated, overall foil shield; 24 AWG conductors, minimum
3) Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace -XXXX with -0020
4) *Index not provided on all models. See ordering information.
5) **For watertight applications, use NEMA4 10 pin cable & connector 109209-XXXX.
6) "MS" Type mating connectors and pre-build cables are rated NEMA 12
7) "M12" Cable assemblies are rated IP67

Dynapar™ brand

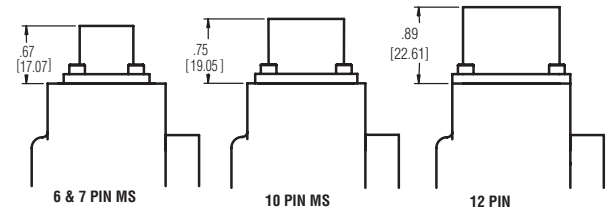
SERIES HS35R

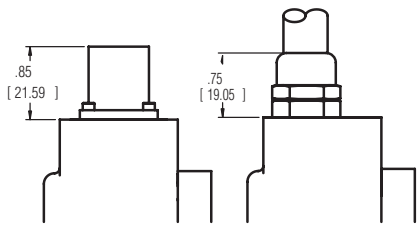
DIMENSIONS inch [mm]

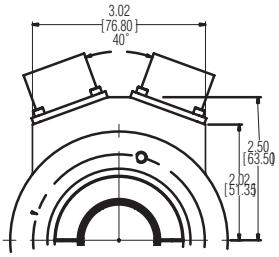


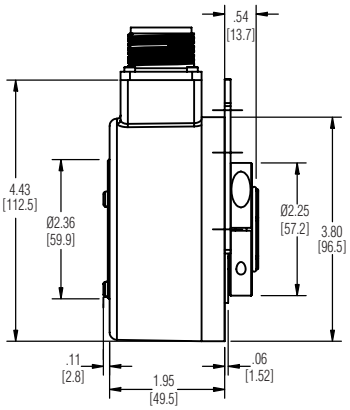


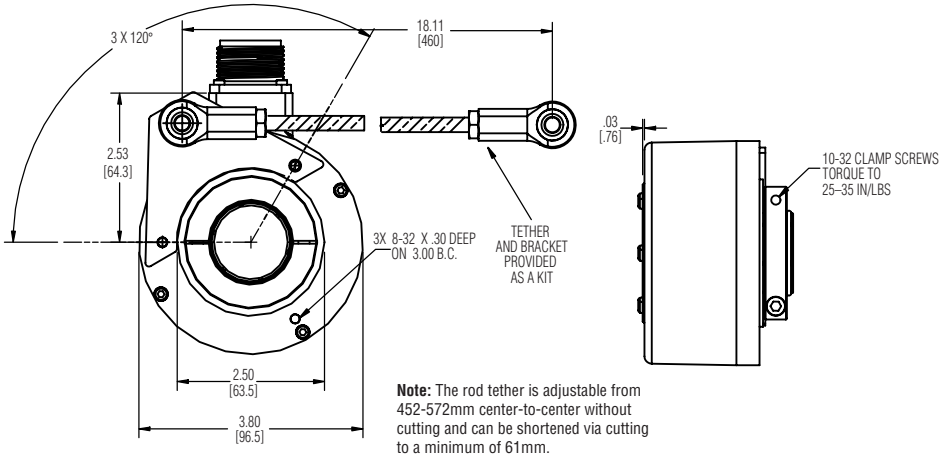
SHOWN WITH 10 PIN CONNECTOR
FOR REFERENCE











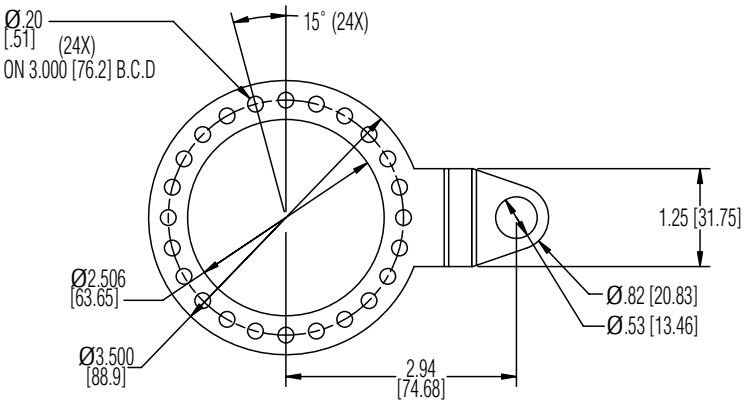
SHOWN WITH ROD TETHER

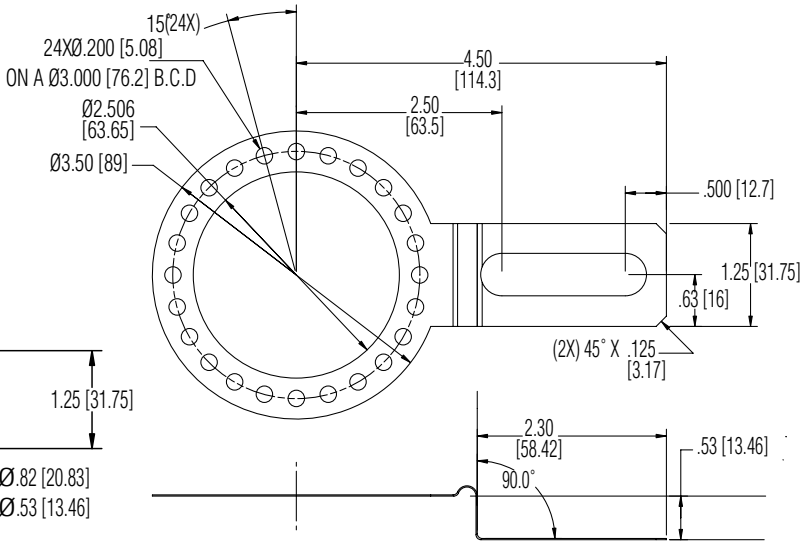
Note: The rod tether is adjustable from 452-572mm center-to-center without cutting and can be shortened via cutting to a minimum of 61mm.

SERIES HS35R

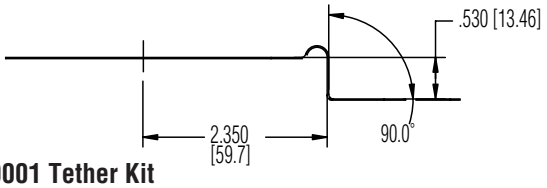
by DYNAPAR™

DIMENSIONS inch [mm]

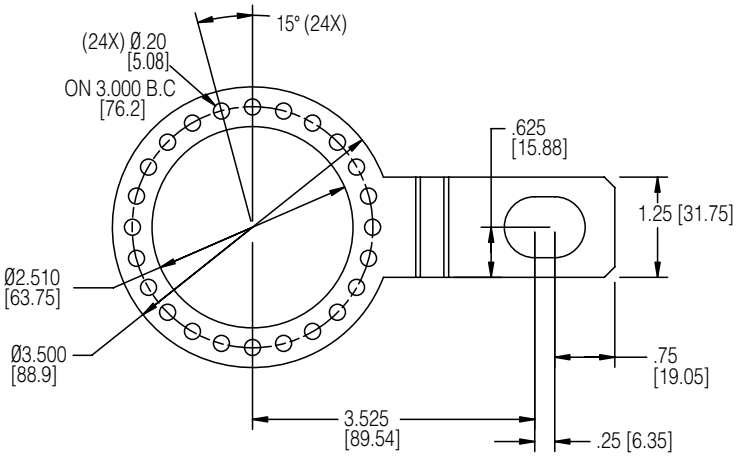


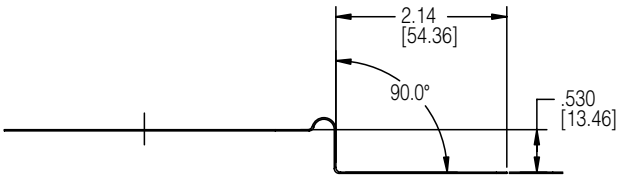


114574-0001 Slotted Tether Kit

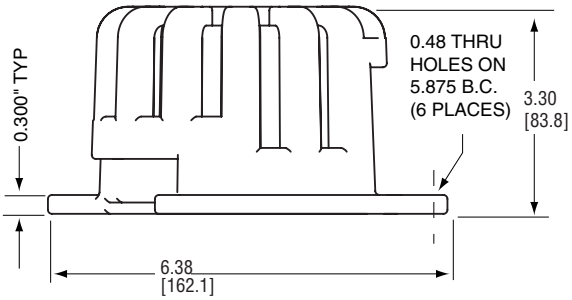


114573-0001 Tether Kit





114575-0001 Tether Kit



OPTIONAL SAFETY COVER(S)

Worldwide Brands: NorthStar™ • Dynapar™ • Hengstler™ • Harowe™

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