

# Harowe™ Resolver Selection Guide

	BRUSHLESS ULTRA-PERFORMANCE RESOLVERS									
	HOUSED			FRAMELESS						
	Heavy-Duty		Mill-Duty	Heavy-Duty					Heavy-Duty High Accuracy	
										
11	R11	Series R25	10	15	21	31	55	HaroMax® 15	HaroMax® 21	
<b>Nominal Size (OD)</b>	1.1 inch	1.1 inch	2.5 inch	1.0 inch	1.5 inch	2.1 inch	3.1 inch	5.5 inch	1.5 inch	2.1 inch
<b>Mounting System</b>	Servo	Servo	Flange/Servo	Flange/Servo	Flange/Servo	Flange/Servo	Flange/Servo	Flange/Servo	Flange/Servo	Flange/Servo
<b>Flux Shield Technology</b>		●	●	●	●	●	●	●	●	●
<b>Shaft/Max Bore Sizes</b>	Shaft Size: 0.120" (3.05mm)	Shaft Size: 0.120" (3.05mm)	Shaft Size: 0.3745" (9.51mm)	Max Bore Size: 0.25" (6mm)	Max Bore Size: 0.472" (12mm)	Max Bore Size: 0.800" (20mm)	Max Bore Size: 1.576" (40mm)	Max Bore Size: 3.651" (93mm)	Max Bore Size: 0.472" (12mm)	Max Bore Size: 0.800" (20mm)
<b>Input Volts (Vrms)</b>	2 to 26	2 to 6	2 to 8	2 to 12	2 to 12	2 to 12	2 to 12	2 to 12	2 to 12	2 to 12
<b>Input Frequency (Hz)</b>	400 to 5K	2K to 10K	2K to 10K	2K to 10K	2K to 10K	2K to 10K	2K to 10K	2K to 10K	2K to 10K	2K to 10K
<b>Transformation Ratio</b>	.39 to 1.75	.45 to 1.4	.25 to 1.0	.25 to 1.0	.25 to 1.0	.25 to 1.0	.25 to 1.0	.25 to 1.0	.25 to 1.0	.25 to 1.0
<b>Resolver Speed (electrical/mechanical cycles)</b>	1X, 2X, 4X or 5X	1X	1X, 2X or 3X	1X	1X, 2X, 3X or 4X	1X, 2X, 3X or 4X	Multi-speeds available (up to 8X)	Multi-speeds available (up to 32X)	1X	1X
<b>Electrical Error (Accuracy) for 1X versions only</b>	±3 arcmin	±6 arcmin	±7 arcmin	±15 arcmin	±10 arcmin	±7 arcmin	±20 arcmin	±30 arcmin	±5 arcmin	±5 arcmin
<b>Bearing Load Ratings</b>	17 lb (static), 44 lb (dynamic)	61 lb (static), 148 lb (dynamic)	303 lb (static), 741 lb (dynamic)							
<b>Max Bearing Radial Play</b>	.0002 to .0005 in	.0003 to .0009 in	.0002 to .0005 in							
<b>Bearing Type</b>	Type ABEC 3	Type ABEC 1	Type ABEC 1							
<b>Shock, Vibration and Radiation Resistance</b>	High shock resistance	High shock resistance	Shock: 200g Vibration: 40g	High shock, vibration and radiation resistance	High shock, vibration and radiation resistance	High shock, vibration and radiation resistance	High shock, vibration and radiation resistance	High shock, vibration and radiation resistance	High shock and vibration resistance	High shock and vibration resistance
<b>Operating Temperature</b>	Up to 125°C	Up to 125°C	Up to 125°C	Up to 200°C	Up to 200°C	Up to 200°C	Up to 200°C	Up to 200°C	Up to 200°C	Up to 200°C
<b>Housing Material</b>	Steel	Steel	Aluminum	Steel	Steel or Aluminum	Steel or Aluminum	Steel	Steel	Aluminum	Aluminum
<b>Enclosure Rating</b>			(IP65)							

\*Consult Applications Engineering for any customized needs

## SELECTION CRITERION

MECHANICAL				ELECTRICAL			
1	Construction-	Housed or Frameless		1	Primary	Rotor or Stator	
2	Input-	Shaft OD or Bore ID		2	Speed	Single or Multiple	
3	Special Considerations	Operating Temperature		3	Excitation Voltage-	Vrms	
		High Shock		4	Excitation Frequency-	Hz	
		High Vibration		5	Output Voltage-	Vrms	
		Radiation Hardening			or		
		High RPM			Transformation Ratio		
		Other		6	Accuracy	arc min	
				7	Maximum Phase Shift	degrees	

# HAROWE RESOLVERS

Harowe brand resolvers are suited for high temperature (up to 220°C) applications, and have outstanding mechanical shock and vibration specs. In addition, shielded, spaced-support bearings provide up to 10x the life of duplex bearings. Toothwound models cut electrical error 50 percent, and brushless models eliminate components that can limit life.

Unlike rotary encoders, which use a coded disk to determine position and have a digital output, resolvers are magnetic drives that use two sets of rotating windings and a fixed core winding to generate an analog (sine and cosine) feedback output. Considered more rugged than encoders, they are used in adverse operating conditions involving extreme temperature, high shock and vibration, and dirty environments.

## Application/Industries:

- Robotics
- Machine Tool
- Wood Working
- Metal Working
- Plant Automation



## Series 11 Housed Brushless Resolver

Ideal mate for brushless servomotors. Brushless construction uses a rotary transformer to pass the reference signal to the rotor, eliminating components that can limit life and cause noise. Series 11 has excellent angular accuracy and repeatability. It is rated up to 125°C for high temperature applications.



## Series R25 Heavy Duty Resolvers

Brushless resolvers are the better choice over encoders for applications that involve very high temperature, vibration and shock, and dirty environments. The R25 uses a front-and-rear bearing arrangement that gives two or three times the radial load bearing capacity and up to ten times the life of competing packages having duplex bearings. Rated for ruggedness: IP-65 protection, 125°C continuous duty, shock to 200g, and vibration to 40g.



## Frameless Brushless Resolvers

Provide absolute position feedback for brushless motors, robots, and direct-drive motors in precision rotary platforms and similar servo applications. The series is ruggedized against vibration and shock, able to operate up to 200°C, resistant to noise, and impervious to most industrial contaminants. Options include multiple speeds, radiation hardened, high temperature, flux shielding technology, and stainless steel housing. HaroMax Resolvers in sizes 15 and 21 feature toothwound design that reduces electrical error 50 percent.

For additional information or to receive a full-line catalog, contact your Dynapar representative at 1.800.873.8731 or visit our web site at: [www.dynapar.com](http://www.dynapar.com)

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### Satellite Locations:

**North America:** North Carolina, South Carolina, Connecticut, Massachusetts, New York, Canada.

**West Indies:** St. Kitts

**Europe:** United Kingdom, Italy, France, Germany, Spain, Slovakia

**South America:** Brazil

**Asia:** China, Japan, Korea, Singapore

