Low-Cost Brushless Pancake Resolver

Sizes 15, 21 and 22

TYPICAL APPLICATIONS

Wherever precise position indication is required to interface with computers

- Brushless DC servo commutation, position, and velocity feedback
- Robotics and factory automation
- Machine tools
- Material handling equipment
- Medical instrumentation
- Packaging equipment

FEATURES

- 1, 2, 3, 4 speeds standard; others available
- Ideal for brushless dc motor commutation
- Compact design
- Mounts directly on motor shaft: no coupling devices needed
- No brushes or contacts
- High reliability: long-life design; no bearings or electronics
- Compatible with A/D converters
- 1,200–10,000 Hz frequency range standard
- Low electrical noise
- Ruggedness in demanding environments: no glass discs or optics to fail
- Low cost
- Custom modifications available

For commutation, position, and velocity feedback

Rugged, reliable -- ideal for demanding environments. Brushless resolvers provide accurate position and velocity feedback as well as commutation in precision equipment, without the structural or temperature restrictions imposed by other electronic feedback devices. They are resistant to the shock and vibration levels often encountered in industrial and instrument applications.

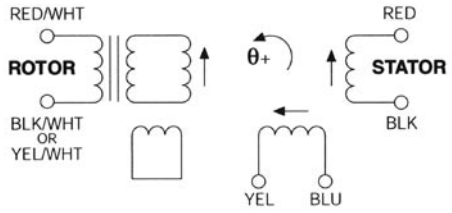
These low-cost brushless resolvers are available in standard sizes or with custom modifications. Our Engineering Department is available for consultation to help tailor a brushless resolver to fit your needs.

SIZE 15 & 21 BRUSHLESS RESOLVER SPECIFICATIONS

Size 15	Brushless Resolvers		
PARAMETER	**JSSB-15-J-05K**	**JSSB-15-D-01H**	**JSSB-15-H-04D**
Primary	Rotor	Rotor	Rotor
Speed	One	One	One
Input Voltage	7Vrms 10KHz	4Vrms 3.4KHz	4Vrms 5KHz
Input Current	50 mA max	75 mA max	25 mA max
Input Power	0.2 watt max.	0.13 watt	0.046 watt
Transformation Ratio (±10%)	0.5	0.5	0.5
Phase Shift	2°	5°	1°
Impedance Zro	105+j170	28+j60	132+j195
Zso	185+j311	23+j34	260+j280
Zrs	160+j270	25+j34	116+j161
DC Resistance			
Stator	77 ohms	10.8 ohms	150 ohms
Rotor	40 ohms	5.6 ohms	25 ohms
Null Voltage	20 mV	15 mV	20 mV
Electrical Error †	±15 minutes	±20 minutes	±15 minutes
Output Voltage	3.5 Vrms	2 Vrms	2 Vrms
Drawing	A	**	B

Typical Schematic

CCW is positive when viewed from mounting end.

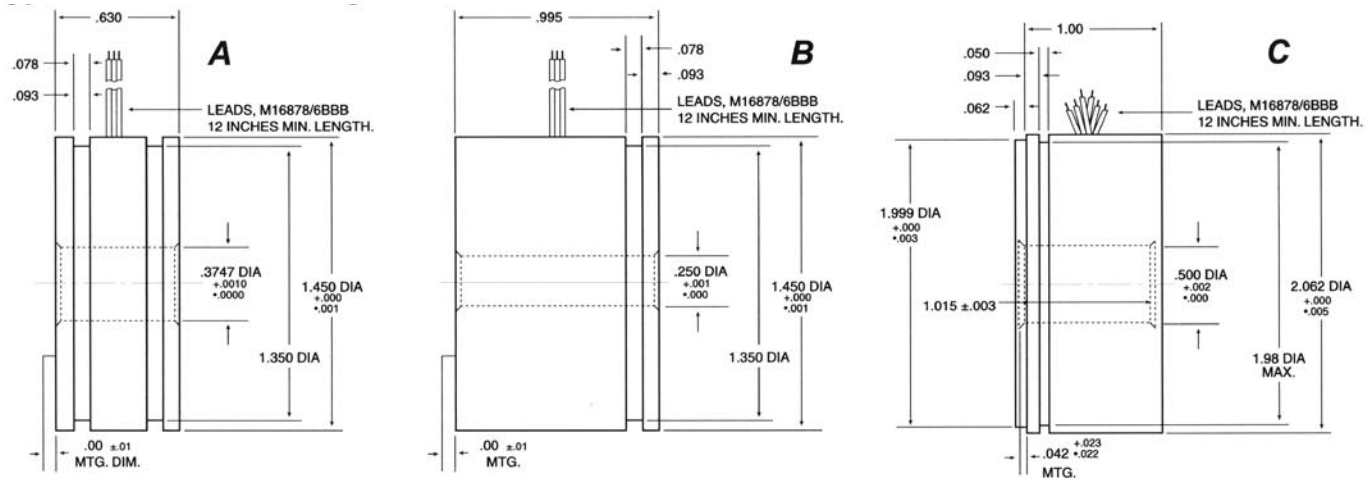


Alternate phasing available on request.

Typical performance characteristics at 25°C
† Higher accuracies available
*± 21 minutes max with 30 minutes max spread
**Contact the Engineering Department
£ 20 minutes spread

Size 21	Brushless Resolvers							
PARAMETER	**JSSB-21-B-02J**	**JSSB-21-B-04J**	**JSSB-21-B-03J**	**JSSB-21-F-06E**	**JSMB-21-B-06J**	**JSMB-21-B-04J**	**JSMB-21-B-05J**	**JSMB-21-B-07J**
Primary	Rotor	Rotor	Rotor	Rotor	Rotor	Rotor	Rotor	Stator
Speed	One	One	One	One	Four	Three	Two	Two
Input Voltage	7.5 Vrms 6.6 KHz	6 Vrms 1.2 KHz	4 Vrms 5 KHz	7 Vrms 10 KHz	7.5 Vrms 4 KHz	7.5 Vrms 4 KHz	7.5 Vrms 4 KHz	7 Vrms 4 KHz
Input Current	55 mA max	10 mA max	25 mA max	50 mA max	70 mA max	66 mA max	58 mA max	2.5 mA max
Input Power	0.22 watt	0.03 watt	0.05 watt	0.17 watt	0.225 watt	0.29 watt	0.26 watt	0.007 watt
Transformation Ratio (±10%)	1.0	0.46	0.5	0.5	1.0	1.0	1.0	0.5
Phase Shift	–14.5°	21°	–7.5°	–7°	12°	4°	6°	–8°
Impedance Zro	100+j125	505+j590	115+j150	100+j140	70+j110	85+j100	75+j105	3100+j5800
Zso	862+j1760	1120+j975	350+j620	190+j300	730+j1400	1070+j1760	600+j985	1300+j2800
Zrs	90+j120	520+j505	105+j145	83+j130	67+j100	80+j94	68+j92	2600+j5220
DC Resistance								
Stator	290 ohms	675 ohms	145 ohms	24 ohms	450 ohms	590 ohms	360 ohms	444 ohms
Rotor	25 ohms	200 ohms	31 ohms	55 ohms	25 ohms	25 ohms	25 ohms	856 ohms
Null Voltage	30 mV	30 mV	20 mV	30 mV	30 mV	30 mV	30 mV	20 mV
Electrical Error †	±21 minutes £	±21 minutes *	±15 minutes	±21 minutes *	±10 minutes	±10 minutes	±10 minutes	±10 minutes
Output Voltage	7.5 Vrms	2.76 Vrms	2 Vrms	3.5 Vrms	7.5 Vrms	7.5 Vrms	7.5 Vrms	3.5 Vrms
Drawing	C	C	C	**	C	C	C	C

Typical Outline Drawing

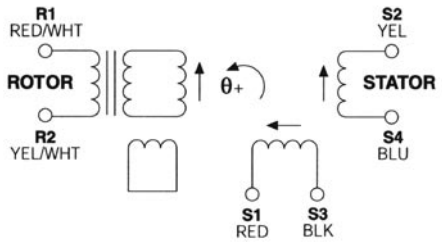


Size 22 BRUSHLESS RESOLVER SPECIFICATIONS

Size 22	Brushless Resolvers		
PARAMETER	**JSSB-22-A-01A**	**JSMB-22-D-03D**	**JSMB-22-D-02D**
Primary	Rotor	Rotor	Rotor
Speed	One	Two	Three
Input Voltage	5Vrms 4KHz	7.5Vrms 4KHz	7.5Vrms 4KHz
Input Current	30 mA max	65 mA max	65 mA max
Input Power	0.61 watt max.	0.290 watt	0.290 watt
Transformation Ratio (±10%)	0.525	0.750	0.750
Phase Shift ±3°	–9°	2.6°	5°
Impedance Zro Zso Zrs	92+j175 230+j425 194+j390	80+j106 435+j725 72+j95	82+j107 613+j994 77+j100
DC Resistance Stator Rotor	 75 ohms 19.5 ohms	 217 ohms 25 ohms	 357 ohms 25 ohms
Null Voltage	20 mV	20 mV max.	20 mV max.
Electrical Error †	±14 minutes	±7 minutes	±5 minutes
Output Voltage	2.1 Vrms	5.6 Vrms	5.6 Vrms
Operating Temp.	–55° to +150°C	–55° to +150°C	–55° to +150°C
Weight	230 grams nom.	230 grams nom.	230 grams nom.
HI-POT TEST: windings to GND between windings	 500 V 60Hz 250 V 60Hz	 500 V 60Hz 250 V 60Hz	 500 V 60Hz 250 V 60Hz

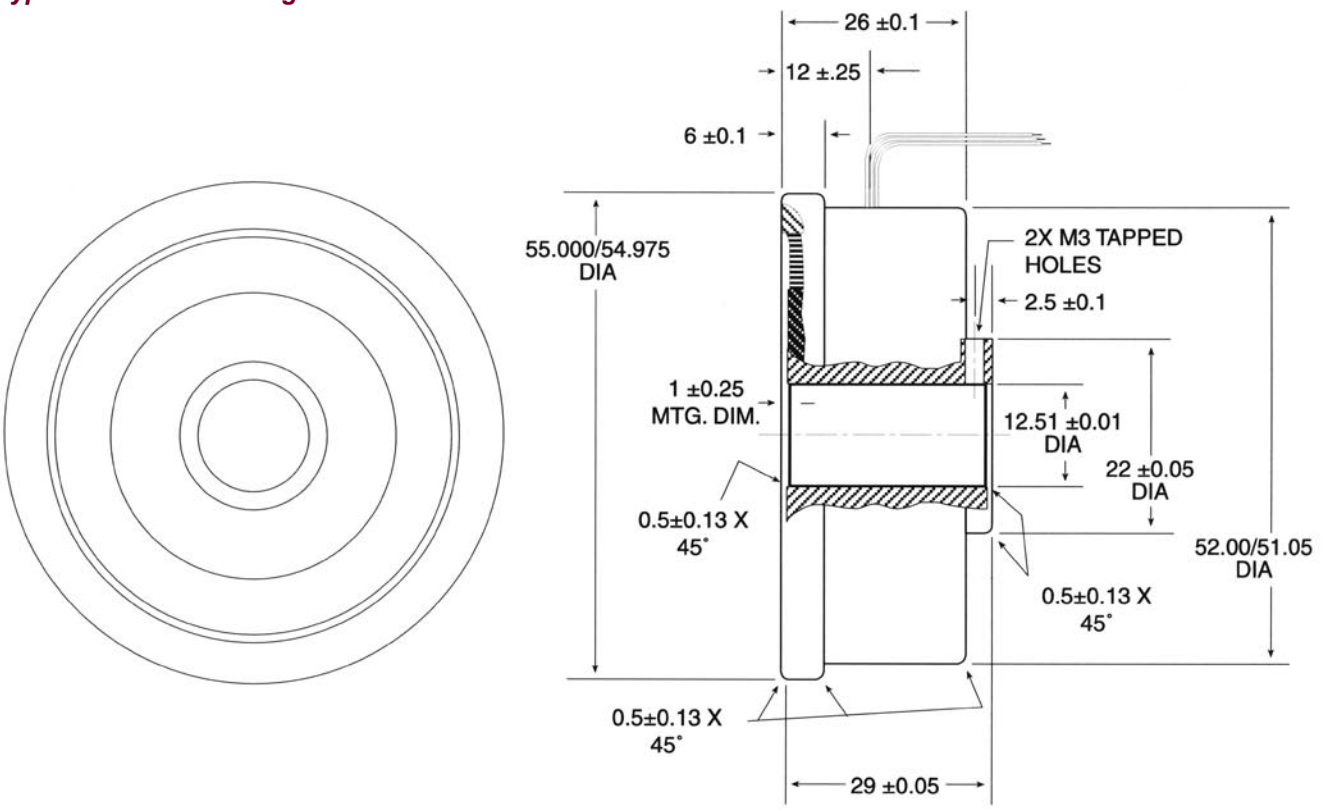
Typical Schematic

CCW is positive when viewed from side opposite mounting end.



Alternate phasing available on request.

Typical Outline Drawing



Dimensions are in millimeters.

Pancake Brushless Resolvers

These units provide accurate position and velocity feedback as well as commutation in precision equipment, without the structural or temperature restrictions imposed by other electronic feedback devices. They are highly resistant to the shock and vibration levels often encountered in industrial environments, and do not require protection from the dirt, oil or other contaminants that normally occur in factory conditions.

Pancake brushless resolvers are supplied as separate rotor and stator assemblies, which are then mounted directly in the user's system. Since the energy is transmitted into and out of the rotor assembly by means of electromagnetic fields, no slip rings and brushes are necessary, reducing the cost and increasing the reliability of these devices.

The pancake brushless resolvers are designed with larger than normal airgaps, in comparison with a "standard" pancake resolver, to allow for a greater degree of imprecision in mounting. Normal considerations for these units require the rotor to be mounted inside the stator with an eccentricity no greater than 0.003 inch, and that the rotor and stator mounting surfaces be set in line within 0.020 inch. If eccentricities larger than 0.003 inch occur, the accuracy of the resolver will probably degrade; if the axial alignment exceeds 0.020 inch, input current, input power and phase shift will increase, while the output voltage drops. The mounting surfaces and the actual quantitative specifications for mounting, both concentrically and axially, may be found on the individual outline drawing for each unit type.

Normally, the housing assembly is held in place in the user's equipment by the use of synchro clamps and the mounting grooves or flanges provided on the outside of the housing. Rotor assemblies are usually mounted adhesively, by using a keyway provided in the rotor bore, by clamping against the end of the hub, by set screws in tapped holes provided in the rotor hub, or by some combination of these methods.

These low-cost pancake brushless resolvers are available in the standard sizes and configurations shown, or with custom modifications to either the given mechanical or electrical characteristics. Our Engineering Department is available to assist you in tailoring these units to fit the specific requirements of your system.