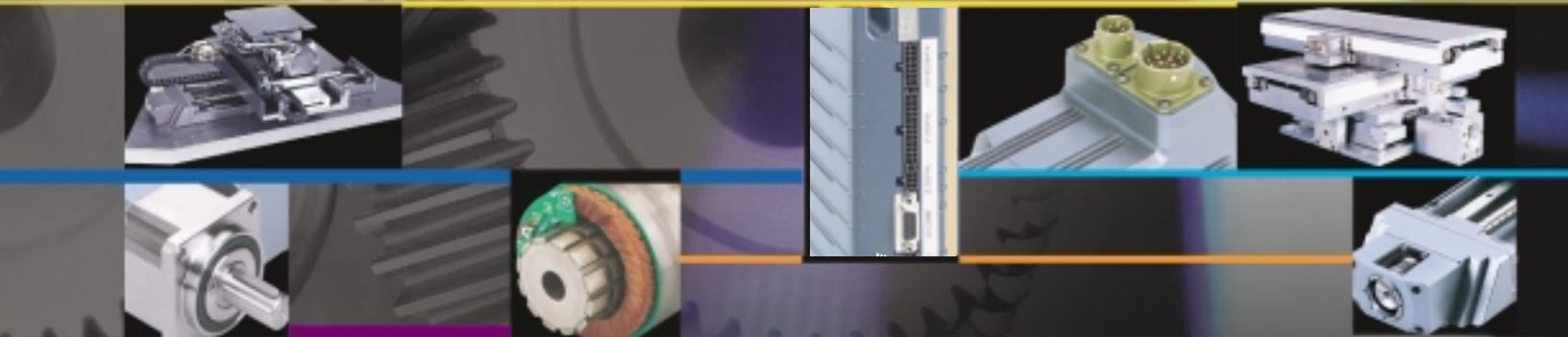


Product Manual

Put Your Ideas
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BAYSIDE[®]
MotionGroup

Frameless Kit Motors
Product Manual



Frameless Kit Motors

Product Manual

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Product Manual

Frameless Kit Motors

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II. Introduction

Thank you for purchasing a Frameless Brushless Kit Motor. Frameless motors allow for direct integration with a mechanical transmission device while eliminating parts and providing high performance in the smallest possible space.

This manual covers the installation and adjustment procedure for the various components of the kit.

Motor sizes covered are:

K032	K375
K044	K500
K064	K700
K089	
K127	
K178	

If you have any questions regarding the installation of your motor, please contact Bayside Motion Group, Technical Services at (516)484-5353 for additional support.

II. Packaging

The various components are packaged in “bubble” wrap to assure that they remain separated during shipment.

Unpacking

Remove the components from the shipping container and remove the “bubble” wrap in preparation for mounting

CAUTION - HANDLING

Rotor

The rotor contains strong, rare-earth permanent magnets which will attract ferrous material over a considerable distance.

DO NOT HANDLE THE ROTOR IN A CASUAL MANNER!

If placed too close to the stator, another rotor or other magnetic material, the rotors can “crash” into the other object and be damaged.

Ideally, rotors should remain in their packing material until required for mounting in your product.

Stator

The stator has exposed copper wire end turns which can be nicked or cut if mis-handled. Do not slide the stator over a rough surface. Ideally, stators should remain in the packing material until required for mounting in your product.

III. Component Mounting

1. General

A frameless kit consists of a stator, a rotor and various components required to provide the commutation signals necessary for control of the motor.

There are three main component groups:

- a) Stator + Rotor + Encoder (user supplied) - For this group, the commutation signals are supplied by the encoder, which must be adjusted per section IV.
- b) Stator + Rotor + Integrated Commutation PCB Assembly - For this group, the commutation signals are supplied by hall sensors which are mounted on a printed circuit board, which in turn, has been mounted to the stator and adjusted at the factory. No adjustment is required by the user.
- c) Stator + Rotor + Commutation Disc + Commutation PCB Assembly - For this group, the commutation signals are supplied by hall sensors which are mounted on a separate printed circuit board. The PCB and the Commutation disc must be mounted by the user and adjusted per section IV.

2. Stator

The stator should be bonded into the product housing using either of the following adhesives:

#702-98 oven cure
Engineered Materials System
132 Johnson Drive
Delaware, OH 43015-8699

Loctite #325 + #7075 room temperature cure
Loctite Corp.
Reedy Hill, CT 06067

Figure 1

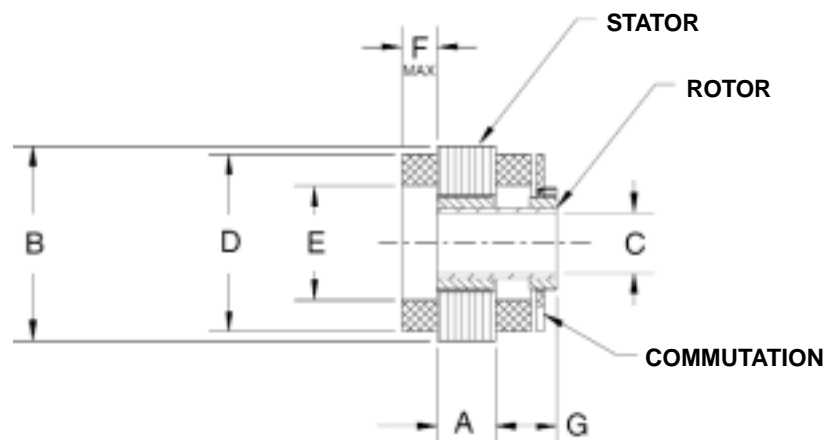


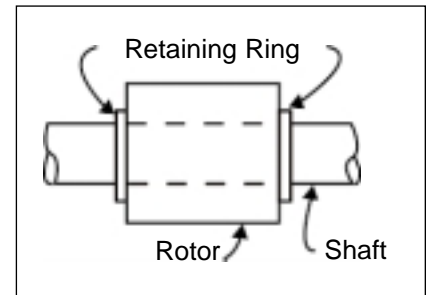
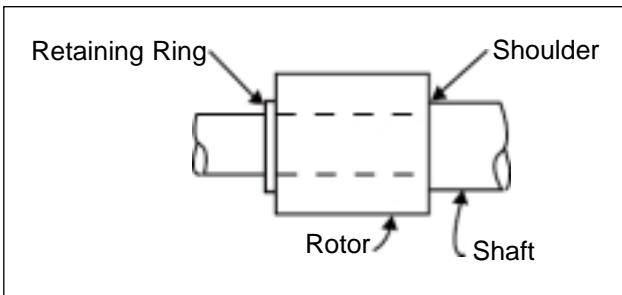
Table 1

FRAME	B		C		D		E		F		G	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
K032	31.775	<u>1.251</u>	7.620	<u>0.300</u>	27.94	1.10	16.51	0.65	6.35	0.25	12.45	0.49
	31.750	1.250	7.595	0.299								
K044	44.475	<u>1.751</u>	13.970	<u>0.550</u>	40.64	1.60	26.16	1.03	7.87	0.31	13.97	0.55
	44.425	1.749	13.945	0.549								
K064	63.526	<u>2.501</u>	23.520	<u>0.926</u>	60.71	2.39	38.10	1.50	9.65	0.38	15.75	0.62
	63.475	2.499	23.495	0.925								
K089	88.926	<u>3.501</u>	40.640	<u>1.600</u>	85.85	3.38	54.61	2.15	9.91	0.39	15.95	0.78
	88.875	3.499	40.615	1.599								
K127	127.025	<u>5.001</u>	58.420	<u>2.300</u>	122.17	4.81	74.17	2.92	12.70	0.50	18.80	0.74
	126.975	4.999	58.390	2.299								
K178	177.800	<u>7.003</u>	110.64	<u>4.355</u>	172.72	5.80	111.51	4.39	20.30	0.80	26.42	1.04
	177.72	6.997	110.38	4.345								
K375	95.275	<u>3.751</u>	50.93	<u>2.005</u>	88.9	3.50	52.32	2.06	12.70	0.50	18.80	0.74
	95.225	3.749	50.67	1.995								
K500	127.05	<u>5.002</u>	68.20	<u>2.685</u>	115.32	4.54	70.6	2.75	20.5	0.81	26.67	1.05
	126.95	4.998	68.14	2.675								
K700	177.88	<u>7.003</u>	115.19	<u>4.535</u>	158.24	6.23	117.60	4.63	18.8	0.74	24.89	0.98
	177.72	6.997	114.93	4.525								

Housing ID should be 0.001 in. to 0.002 in. larger than the maximum stator OD shown in Figure 1 and Table 1.

3. Rotor

The shaft should be designed to provide the use of one or two retaining rings (Waldes Tru-Arc or equivalent) as follows:



Bond the rotor assembly to the shaft with: Loctite # 7471 + #609

For the type b) component group, the rotor should be located as shown in Figure 1.

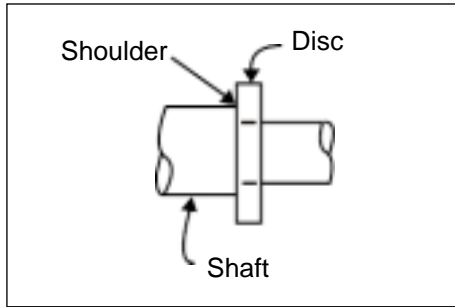
For the type a) and c) groups, the rotors should be centered axially within the stator.

4. Commutaiton disc

For the type c) group, the commutation (xolox) disc must be bonded on the shaft as follows, using

Loctite #325 + #7075

In order create a repeatable design, the poles of the commutation disc (edge magnetized) should be lined up with the poles of the rotor. Axial location will depend on the product design, but a step in the shaft will provide exact location and assure perpendicularity of the disc.



5. Commutation PCB Assembly

For the type c) group, the commutation PCB assembly must be located in close proximity to the commutation disc. It can be either forward or rearward facing, but must be able to be rotated during final assembly to allow alignment of the commutation signals per Section IV.

IV. Signal Timing

To provide proper motor operation, commutation signals must be aligned with the stator BEMF signals.

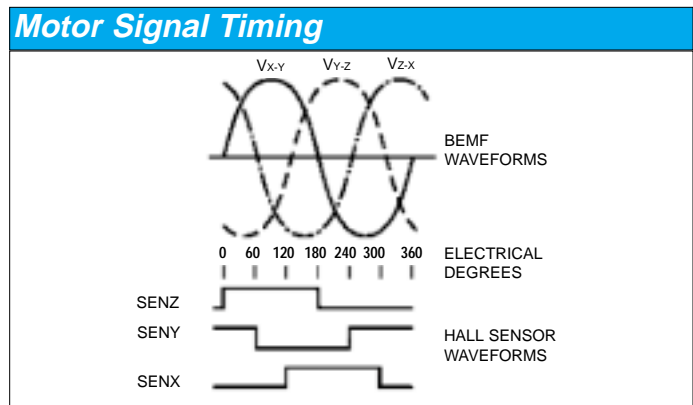
When adjustment is required, you must provide a means for driving the motor with another motor while observing the BEMF and commutation signals with an oscilloscope.

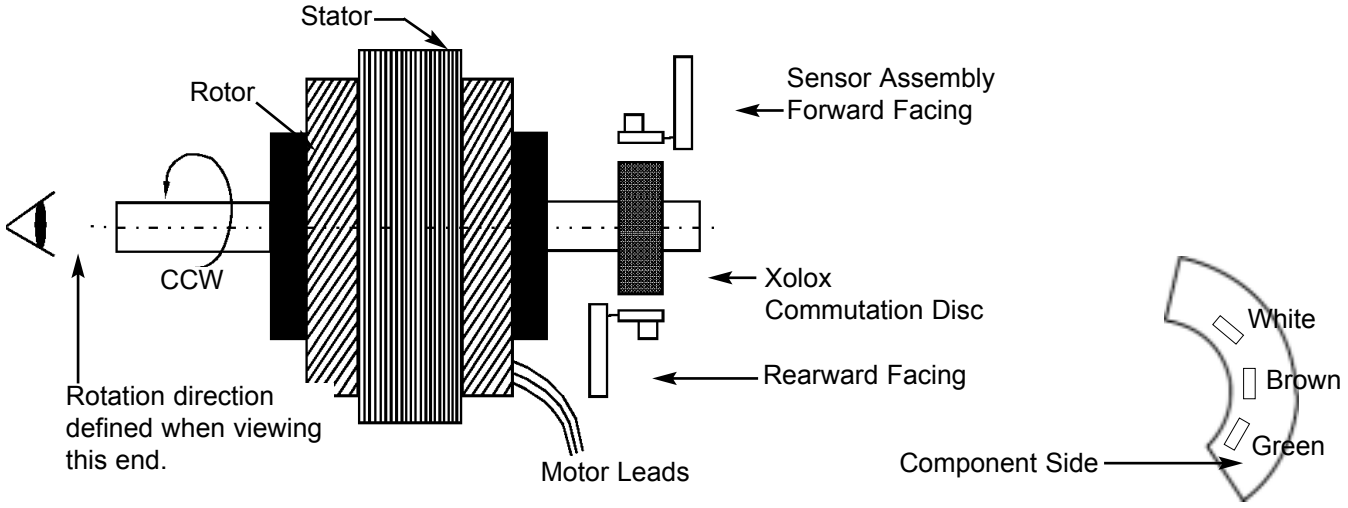
For the type a) group, the encoder body must be rotated until the signals are aligned as shown below.

For the type b) group, no adjustment is required.

For the type c) group, the PCB assembly must be rotated until the signals are aligned as shown below. Typically, the PCB is mounted on the inside of the rear housing plate, which in turn, should be designed to rotate. (See Section V)

Power Leads	Forward
Phase X	Red
Phase Y	Black
Phase Z	White





Commutation Assembly

Sensor Leads	Forward	Rearward
SEN Z	Brown	Brown
SEN Y	Green	White
SEN X	White	Green
+ 5 Volt	Vio	Vio
Ground	Gry	Gry

V. Design & Assembly Tips

1. When assembling the rotor into the stator, provide sturdy lateral support so the rotor does not shift radially and impact the inner surface of the stator, resulting in magnet damage.
2. If the stator is always placed in the same position in the housing (using the yellow index dot on the stator) the location of the PCB assembly for the type c) group will also be in a specific location. This will eliminate the need for adjustment. Contact Bayside Motion Group for more detailed assistance.