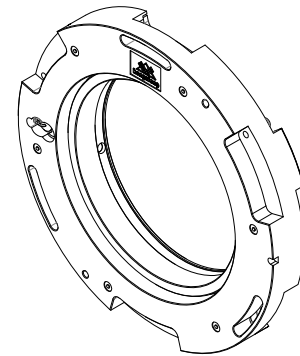
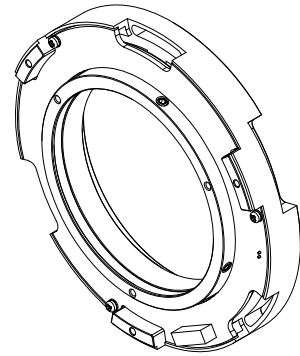


Z100

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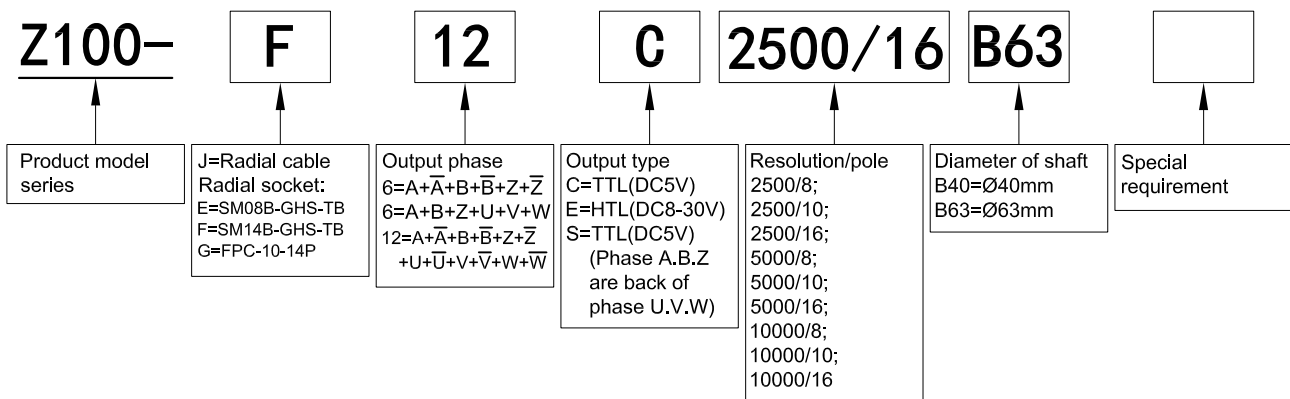
Incremental Type (Through hole, Non-bearing)

- Feature: This product is a professional designed of ultra-thin bearingless encoder, easy to install and various shaft holes to select. It perfectly solve user' s installation solution in the limited space, has obtained the national invention patent because of its unique structure
- Application: servo motor, robot, etc .
- External dimensions: external diameter $\varnothing 100\text{mm}$, thickness 16mm, diameter of shaft $\varnothing 63\text{mm}$ (Max)
- Resolution: up to 10000P/R
- Supply voltage: DC5V; DC8-30V
- Cable length: 300mm
- Socket: E=SM08B-GHS-TB;
F=SM14B-GHS-TB;
G=FPC-10-14P
(need to select the matching socket)
- Weight: about 200g



Model Guide

- Model form (filled required parameters in the box as following)



Z100 Specifications 2/9

Output Mode

Output type	Output circuit	Output wave form																																							
TTL(DC5V) HTL(DC8-30V)		<p> $a.b.c.d = \frac{T}{4} \pm \frac{T}{8}$ $e = T \pm \frac{T}{2}$ f: center of phase Z to rise point of phase U, that is $\pm 0.5^\circ$ </p> <p> CW direction \rightarrow (Viewing from front, direction is CW rotation) </p> <p> A.B.Z.U.V.W A.B.Z.U.V.W </p> <table border="1"> <thead> <tr> <th>poles</th> <th>g,h,j,k,m,n</th> <th>r</th> </tr> </thead> <tbody> <tr> <td>8</td> <td>$15 \pm 1^\circ$</td> <td>90°</td> </tr> <tr> <td>10</td> <td>$12 \pm 1^\circ$</td> <td>72°</td> </tr> <tr> <td>16</td> <td>$7.5 \pm 1^\circ$</td> <td>45°</td> </tr> </tbody> </table>	poles	g,h,j,k,m,n	r	8	$15 \pm 1^\circ$	90°	10	$12 \pm 1^\circ$	72°	16	$7.5 \pm 1^\circ$	45°																											
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TTL (phase A.B.Z are back of phase U.V.W)		<p> $a.b.c.d = \frac{T}{4} \pm \frac{T}{8}$ $e = T \pm \frac{T}{2}$ f: center of phase Z to rise point of phase U, that is $\pm 0.5^\circ$ </p> <p> CW direction \rightarrow (Viewing from front, direction is CW rotation) </p> <p> A.B.Z.U.V.W A.B.Z.U.V.W </p> <table border="1"> <thead> <tr> <th>poles</th> <th>g,h,j,k,m,n</th> <th>r</th> </tr> </thead> <tbody> <tr> <td>8</td> <td>$15 \pm 1^\circ$</td> <td>90°</td> </tr> <tr> <td>10</td> <td>$12 \pm 1^\circ$</td> <td>72°</td> </tr> <tr> <td>16</td> <td>$7.5 \pm 1^\circ$</td> <td>45°</td> </tr> </tbody> </table>	poles	g,h,j,k,m,n	r	8	$15 \pm 1^\circ$	90°	10	$12 \pm 1^\circ$	72°	16	$7.5 \pm 1^\circ$	45°																											
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<p style="text-align: center;">Timing Chart</p> <p> Supply voltage: 5 ± 0.25, 4.25 ± 0.3 Power on: 35MIN, 7 ± 2 Instantaneous power down Power off: 35MIN, 7 ± 2 Mode: 1, 2, 3, 1, 2, 3, 1, 2, 3 Durations: 510 ± 220, 22 ± 11 </p> <p> Symbol signification ★: indicate position of UVW channel ☆: position to start counting ABZ channel □: non-using zone HZ: high impedance </p> <table border="1"> <thead> <tr> <th rowspan="2">No.</th> <th colspan="3">Mode</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>HZ</td> <td>U</td> <td>A</td> </tr> <tr> <td>2</td> <td>HZ</td> <td>\bar{U}</td> <td>\bar{A}</td> </tr> <tr> <td>3</td> <td>HZ</td> <td>V</td> <td>B</td> </tr> <tr> <td>4</td> <td>HZ</td> <td>\bar{V}</td> <td>\bar{B}</td> </tr> <tr> <td>5</td> <td>HZ</td> <td>W</td> <td>Z</td> </tr> <tr> <td>6</td> <td>HZ</td> <td>\bar{W}</td> <td>\bar{Z}</td> </tr> <tr> <td>7</td> <td colspan="3">DC+5V</td> </tr> <tr> <td>8</td> <td colspan="3">OV</td> </tr> </tbody> </table>			No.	Mode			1	2	3	1	HZ	U	A	2	HZ	\bar{U}	\bar{A}	3	HZ	V	B	4	HZ	\bar{V}	\bar{B}	5	HZ	W	Z	6	HZ	\bar{W}	\bar{Z}	7	DC+5V			8	OV		
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■ Electrical Characteristics

Parameter Item	Output type		TTL	TTL (phase A.B.Z are back of phase U.V.W)	HTL
	Supply voltage			DC+5V±5%	
Consumption current			120mA Max		
Top response frequency			200KHz		300KHz
Output capacity	Output current		≤±20mA		≤±50mA
	Output voltage	"H"	≥2.5V		≥V _{cc} -3 V _{dc}
		"L"	≤0.5V		≤ 1V V _{dc}
Rise & Fall time			Less than 1us(cable length: 2m)		
Delay motion time *			—	510±220ms	—
GND			not connect to encoder		

* Phase A.B.Z are back of phase U.V.W when power on.

■ Environmental Specifications

Slew speed	(top response frequency / pulse)×60
Environmental temperature	Operating: -20~+105°C; Storage: -25~+110°C
Environmental humidity	Operating and storage: 35~85%RH (noncondensing)

Z100

Specifications 4/9

■ Connection

● Radial cable

No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Color	shielding	red	black	white	green	yellow	white/black	green/black	yellow/black	blue	gray	pink	blue/black	gray/black	pink/black
Function	GND	DC	OV	A	B	Z	\bar{A}	\bar{B}	\bar{Z}	U	V	W	\bar{U}	\bar{V}	\bar{W}

● 8-Pin Radial Socket Table 1

Socket Pin No.	Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8
Function	Z	\bar{Z}	B	\bar{B}	A	\bar{A}	OV	+DC

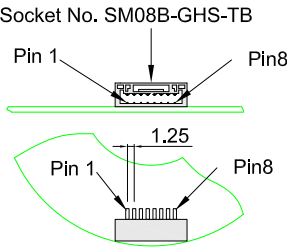
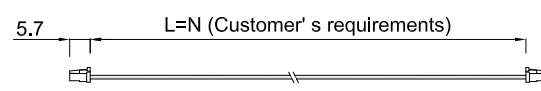

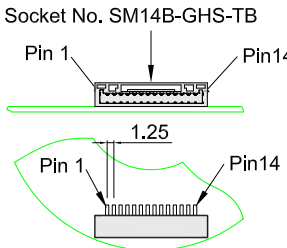
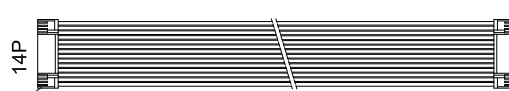
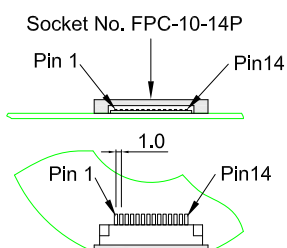
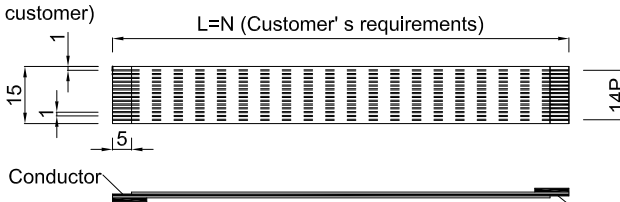
● 8-Pin Radial Socket Table 2

Socket Pin No.	Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8	
Mode	1	HZ	HZ	HZ	HZ	HZ	HZ	+DC	OV
	2	U	\bar{U}	V	\bar{V}	W	\bar{W}		
	3	A	\bar{A}	B	\bar{B}	Z	\bar{Z}		

● 14-Pin Radial Socket

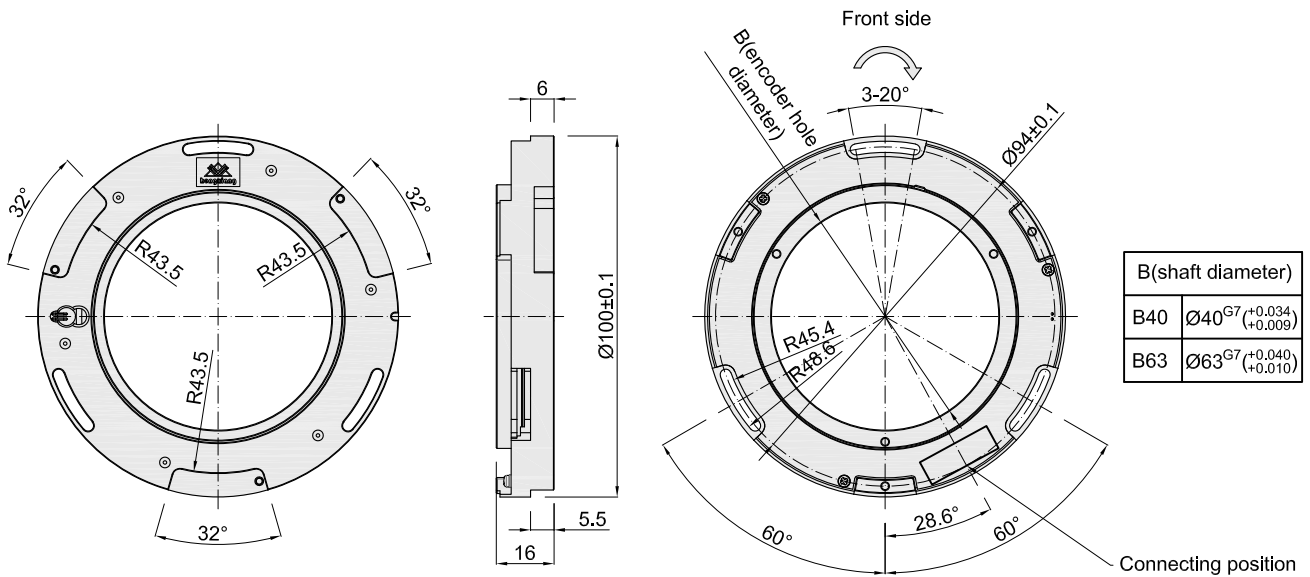
Socket Pin No.	Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8	Pin9	Pin10	Pin11	Pin12	Pin13	Pin14
Function	V	\bar{V}	\bar{U}	U	\bar{W}	W	Z	\bar{Z}	B	\bar{B}	A	\bar{A}	OV	+DC

● Pin Assignments

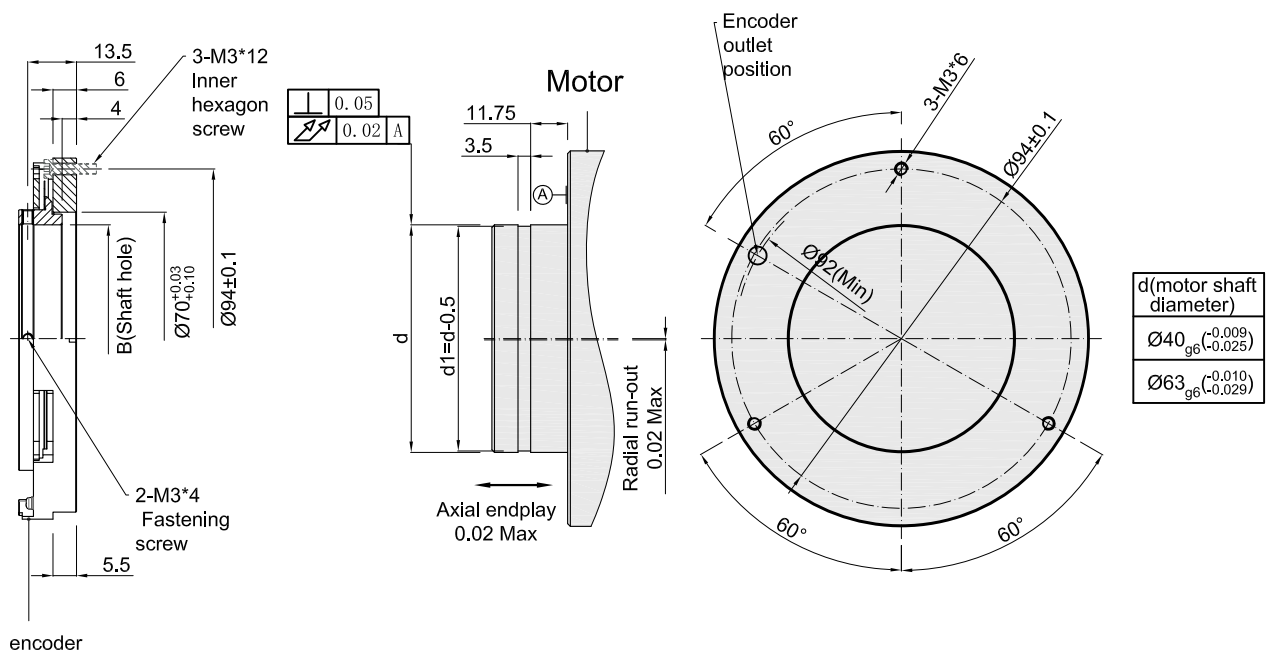
<p>Socket No. SM08B-GHS-TB</p> 	<p>Plug with flexible cord (purchased by customer)</p>  <p>5.7 L=N (Customer's requirements)</p>  <p>8P</p>
<p>Socket No. SM14B-GHS-TB</p> 	<p>Plug No.GHR-08V-S</p>  <p>14P</p> <p>Plug No.GHR-14V-S</p>
<p>Socket No. FPC-10-14P</p> 	<p>Flexible flat cable14P (purchased by customer)</p>  <p>15 1 L=N (Customer's requirements) 14P</p> <p>5</p> <p>Conductor</p>

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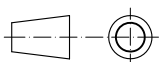
Basic Dimensions



Assembling requirement



Unit: mm



= Rotate direction of signal output shaft

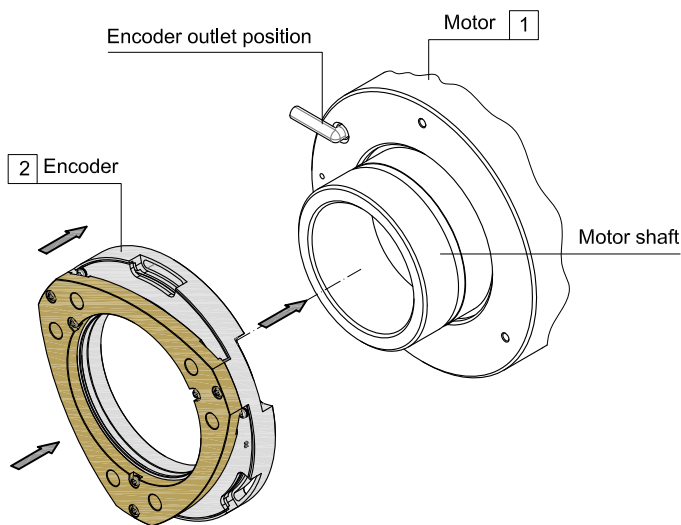
Z100 Specifications 6/9

Assembling steps for UVW encoder(servo only)

Step 1

- a. Before installing the encoder, first confirm the starting zero position of the motor and lock it tightly to ensure the motor shaft won't move until the encoder is completely installed, otherwise the zero position of the encoder cannot be aligned with the zero position of the motor,
- b. put the encoder (2) directly on the motor shaft and gently push it to the motor platform by hand.

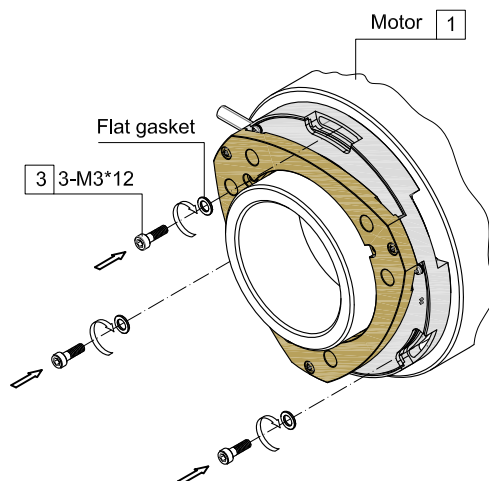
Note: For the tolerance of the encoder shaft sleeve and the motor shaft, please refer to page 5.



Step 2

Apply thread glue to the front of the three M3*12 bolts (3), and fix them on the motor (1) together with the spring washer and flat plate.

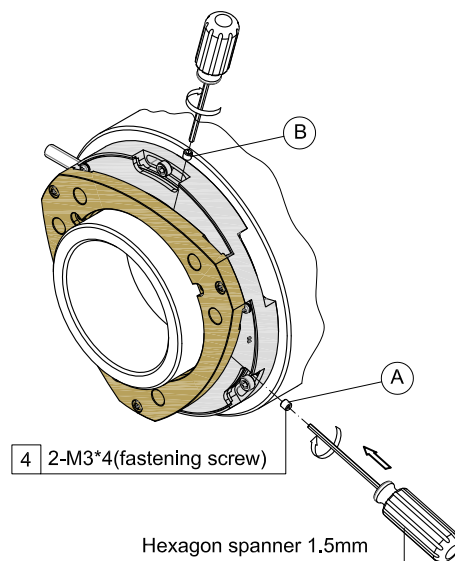
Note: At this time, the screws do not need to be tightened or loosened too much. The force is based on the ability to turn the encoder by hand.



Step 3

Apply thread glue to the front of the two m3*4 top screws (4) on the side of the encoder and tighten them to fix the encoder's disk to the motor shaft.

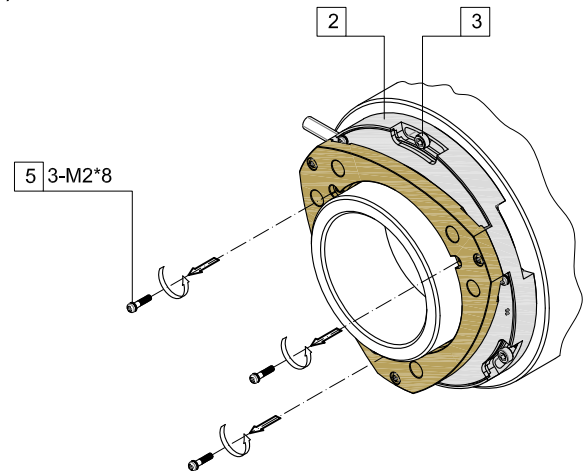
Note:
Follow the tightening sequence of the two screws as figure, first A then B
Recommended tightening force is 0.6N.m



■ Assembling steps for UVW encoder(Continued)

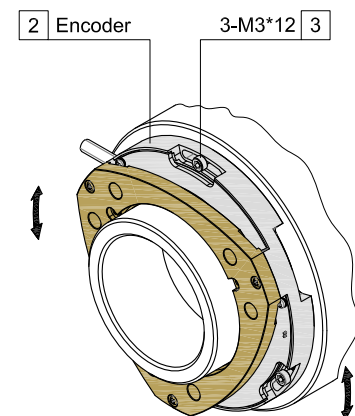
Step 4

Remove the three M2*8 bolts (5) and discard them to complete the separation between the encoder disk and the encoder body



Step 5

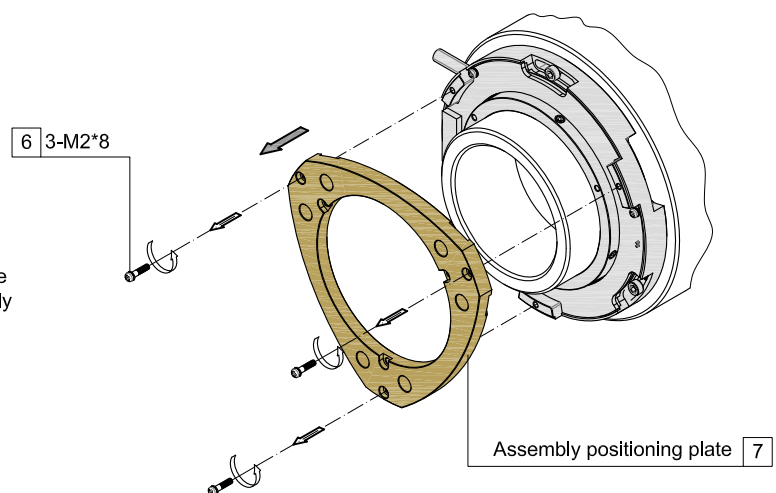
- Connect the encoder signal wires, power on, and connect to the oscilloscope or other testing equipment that can read the zero signal of the motor and encoder.
- Turn the encoder (2) from left to right and observe the testing equipment until the zero position of the encoder is aligned with the zero position signal of the motor.
- Then tighten the three M3*12 bolts (3), (recommended tightening force is 0.6 N.m)
- The zero position of the motor can be unlocked at this time, but the motor still can't be rotated.



Step 6

- Remove the three M2*8 bolts (6)
- Take off the assembly positioning plate (7), the encoder is ready to use now

Note: If you want to reset the zero position or remove the encoder (2), you must replace the assembly positioning plate (7).



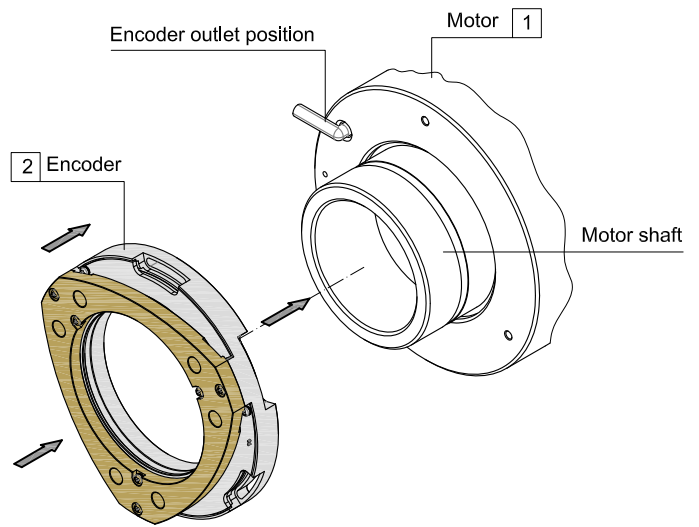
Z100 Specifications 8/9

Assembling steps without UVW encoder

Step 1

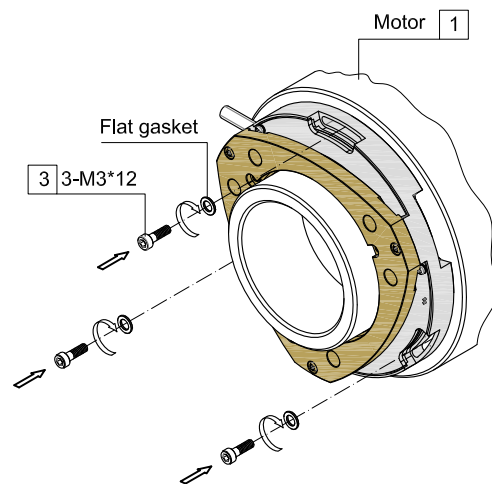
Put the encoder (2) directly on the motor shaft and gently push it to the motor platform by hand.

Note: For the tolerance of the encoder shaft sleeve and the motor shaft, please refer to page 5.



Step 2

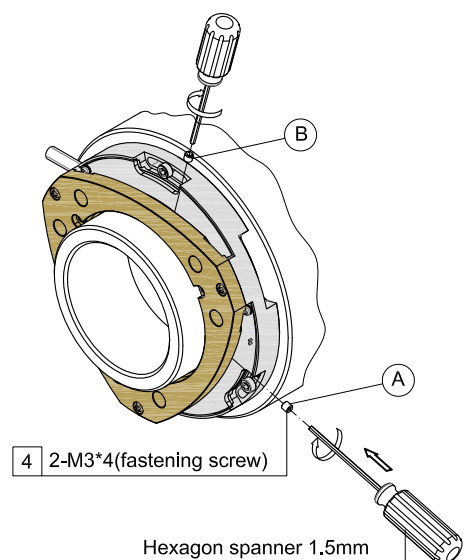
Apply thread glue to the front of the three M3*12 bolts (3), and fix them to the motor (1) together with spring washer and flat plate, and then tighten them with a fixed torque of 0.6N.m.



Step 3

Apply thread glue to the front of the two M3*4 top screws (4) on the side of the encoder and tighten them to fix the encoder's disk on the motor shaft.

Note:
Follow the tightening sequence of the two screws as figure, first A then B
Recommended tightening force is 0.6N.m



■ Assembling steps without UVW encoder (Continued)

Step 4

- a. Remove the three M2*8 bolts (6) in turn.
- b. Take off the assembly positioning plate (7), the encoder is ready to use now

Note: If you want to reset the zero starting point or remove the encoder (2), you must replace the assembly positioning plate(7).

