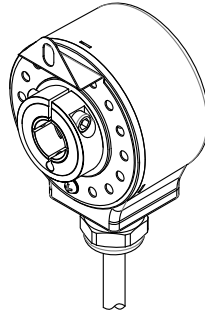


K52

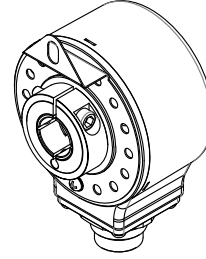
Specifications 1/6

Incremental Type(Hollow Shaft)

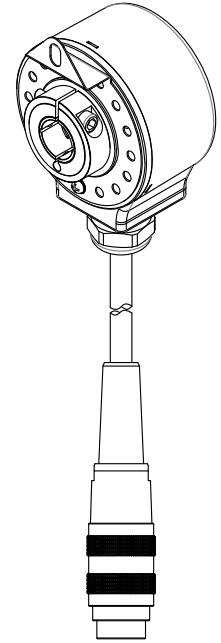
- Feature: sturdy and durable, various circuit mode and cable connection available, easy to install
- Application: automation control like motor, CNC, textile machine, industrial assembly line, etc.
- External dimensions: external diameter $\varnothing 51\text{mm}$, thickness 39mm , diameter of shaft $\varnothing 8\text{mm}; \varnothing 10\text{mm}; \varnothing 12\text{mm}; \varnothing 14\text{mm}; \varnothing 15\text{mm}$
- Resolution: Max to 23040ppr
- Supply voltage: DC5V; DC8-30V
- Protection: IP50; IP65
- Cable length: 1000mm
- Weight: about 310g



K52-T



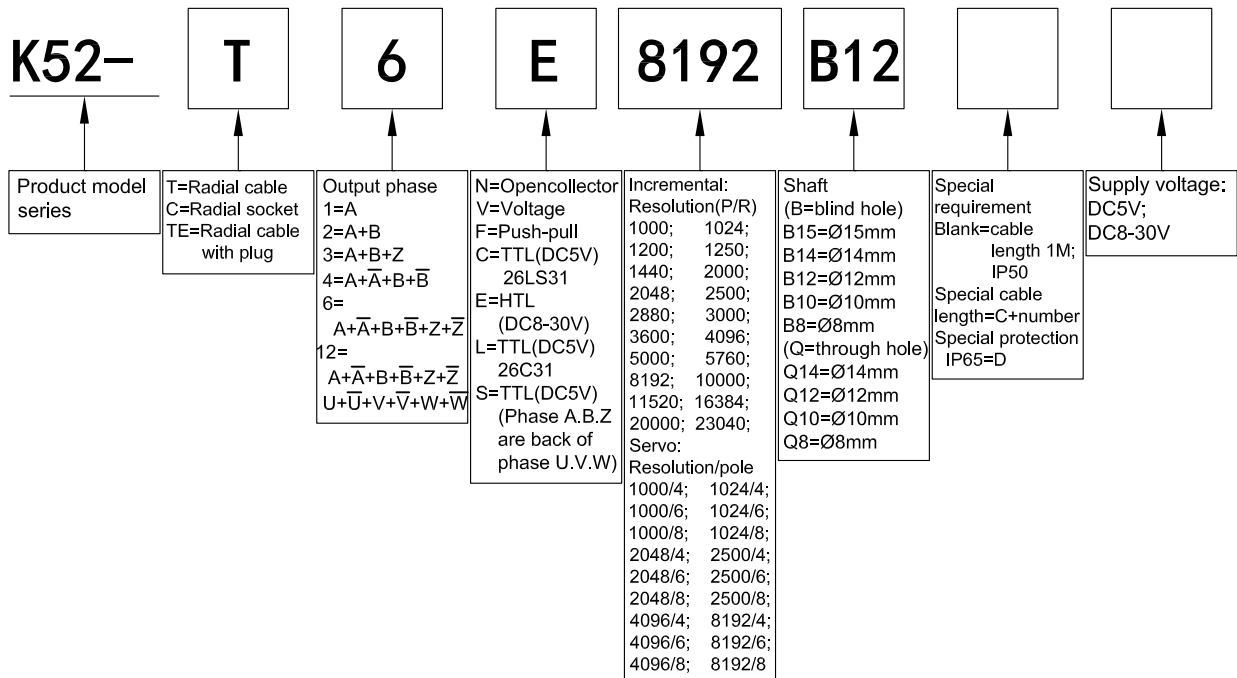
K52-C



K52-TE

Model Guide

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



- Must choose supply voltage: DC5V ; DC8-30V
- Leaf spring 50T55 (Pls refer to specification on page 6/6)

Output Mode

Output type	Output circuit	Output wave form	Connection
OC		<p> $a.b.c.d = \frac{T}{4} \pm \frac{T}{8}$ Phase A is ahead of B by $\frac{T}{4} \pm \frac{T}{8}$, rotate direction CW (View from shaft end, direction is clockwise rotation) CW direction \rightarrow </p>	0=GND 1=red=DC5V; DC8-30V 2=black=OV 3=white=A 4=green=B 5=yellow=Z
Push-Pull		<p> $a.b.c.d = \frac{T}{4} \pm \frac{T}{8}$ Phase A is ahead of B by $\frac{T}{4} \pm \frac{T}{8}$, rotate direction CW (View from shaft end, direction is clockwise rotation) CW direction \rightarrow </p>	
Voltage		<p> $a.b.c.d = \frac{T}{4} \pm \frac{T}{8}$ Phase A is ahead of B by $\frac{T}{4} \pm \frac{T}{8}$, rotate direction CW (View from shaft end, direction is clockwise rotation) CW direction \rightarrow </p>	
TTL HTL		<p> $a.b.c.d = \frac{T}{4} \pm \frac{T}{8}$ Phase A is ahead of B by $\frac{T}{4} \pm \frac{T}{8}$, rotate direction CW (View from shaft end, direction is clockwise rotation) CW direction \rightarrow </p>	

K52

Specifications 3/6

● Output Mode

Output type	Output circuit	Output wave form	Connection																																																																	
TTL		<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 $\pm 0.3^\circ$ </p> <p>CCW direction → (Viewed from shaft end when installing)</p>	0=shielding=GND 1=A=red=DC5V 2=C=black=OV 3=E=white=A 4=G=green=B 5=J=yellow=Z 6=L=white/black= \bar{A} 7=M=green/black= \bar{B} 8=N=yellow/black= \bar{Z} 9=O=blue=U 10=P=grey=V 11=R=pink=W 12=S=blue/black= \bar{U} 13=T=grey/black= \bar{V} 14=U=pink/black= \bar{W}																																																																	
TTL (A, B, Z 迟后 U, V, W)	<table border="1"> <thead> <tr> <th>pole</th> <th>g, h, j, k, m, n</th> <th>r</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>$30 \pm 1^\circ$</td> <td>180°</td> </tr> <tr> <td>6</td> <td>$20 \pm 1^\circ$</td> <td>120°</td> </tr> <tr> <td>8</td> <td>$15 \pm 1^\circ$</td> <td>90°</td> </tr> </tbody> </table>	pole	g, h, j, k, m, n	r	4	$30 \pm 1^\circ$	180°	6	$20 \pm 1^\circ$	120°	8	$15 \pm 1^\circ$	90°	<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 $\pm 0.3^\circ$ </p> <p>CCW direction → (Viewed from shaft end when installing)</p>	<table border="1"> <thead> <tr> <th rowspan="2">No.</th> <th rowspan="2">Function Color</th> <th colspan="3">Mode</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>white</td> <td>HZ</td> <td>U</td> <td>A</td> </tr> <tr> <td>6</td> <td>white/ black</td> <td>HZ</td> <td>\bar{U}</td> <td>\bar{A}</td> </tr> <tr> <td>4</td> <td>green</td> <td>HZ</td> <td>V</td> <td>B</td> </tr> <tr> <td>7</td> <td>green/ black</td> <td>HZ</td> <td>\bar{V}</td> <td>\bar{B}</td> </tr> <tr> <td>5</td> <td>yellow</td> <td>HZ</td> <td>W</td> <td>Z</td> </tr> <tr> <td>8</td> <td>yellow/ black</td> <td>HZ</td> <td>\bar{W}</td> <td>\bar{Z}</td> </tr> <tr> <td>1</td> <td>red</td> <td colspan="3">DC+5V</td> </tr> <tr> <td>2</td> <td>black</td> <td colspan="3">OV</td> </tr> <tr> <td>0</td> <td>shielding</td> <td colspan="3">GND</td> </tr> </tbody> </table>	No.	Function Color	Mode			1	2	3	3	white	HZ	U	A	6	white/ black	HZ	\bar{U}	\bar{A}	4	green	HZ	V	B	7	green/ black	HZ	\bar{V}	\bar{B}	5	yellow	HZ	W	Z	8	yellow/ black	HZ	\bar{W}	\bar{Z}	1	red	DC+5V			2	black	OV			0	shielding	GND		
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Timing Chart																																																																				
<p>Symbol signification</p> <ul style="list-style-type: none"> ★: indicate position of UVW channel ☆: position to start counting ABZ channel ▨: non-using zone HZ: high impedance 																																																																				

■ Electrical Characteristics

Parameter Item	Output type	OC		Voltage		Push-pull		TTL(26LS31)	TTL(26C31)	TTL(26C31) (Phase A,B,Z are back of phase U,V,W)	HTL(HD7)
		Supply voltage		DC+5V±5% & DC8V-30V±5%						DC+5V±5%	
Consumption current		100mA Max						120mA Max			
Allowable ripple		≤3%rms									
Top response frequency		100KHz						200KHz		300KHz	
Output type	Output current	Input	≤30mA	Load resistance 2.2K	≤30mA	≤±20mA		≤±50mA			
		Output	—		≤10mA						
	Output voltage	"H"	—	—	≥[(Supply voltage) -2.5V]	≥2.5V		≥Vcc-3 V _{DC}			
		"L"	≤0.4V	≤0.7V(less than 20mA)	≤0.4V(30mA)	≤0.5V		≤ 1V V _{DC}			
Load voltage	≤DC30V		—		—						
Rise & Fall time		Less than 2us(cable length: 2m)						Less than 1us(Cable length: 2m)		≤100ns	
Insulation strength		AC500V 60s									
Insulation resistance		10MΩ									
Mark to space ratio		45% to 55%									
Phase shift between A & B		90°±10° (low speed,frequency ≤1000Hz)									
		90°±20° (high speed,frequency >1000Hz)									
Origin motion		Low level available	High level available	Low level available	—		Low level available	—			
Delay motion time *		—						510±220ms		—	
GND		not connect to encoder									

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

■ Mechanical Characteristics

Shaft	Ø15mm(blind hole); Ø14mm(blind hole); Ø12mm; Ø10mm; Ø8mm(stainless steel)
Starting torque	Less than 9.8×10^{-3} N·m
Inertia moment	Less than 6.5×10^{-6} kg·m ²
Shaft load	Radial 50N; Axial 30N
Slew speed	≤3000 rpm; IP65≤2000 rpm; IP65≤1500 rpm (Through hole)
Bearing Life	1.5×10^9 revs at rated load(100000hrs at 2500RPM)
Shell	Die cast aluminum
Weight	about 310g

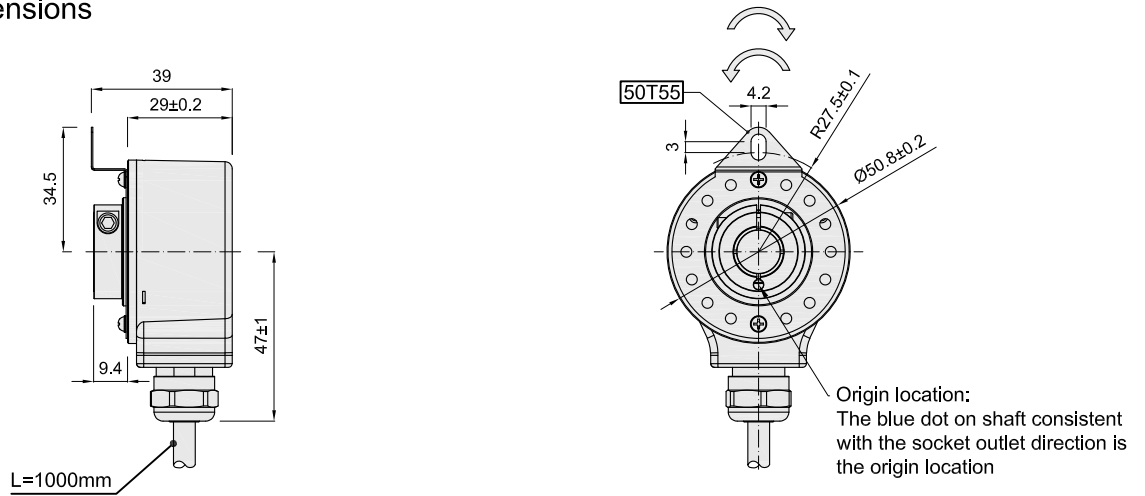
■ Environmental Specifications

Environmental temperature	Operating: -20~+80°C(repeatable winding cable; -10°C); Storage: -25~+85°C
Environmental humidity	Operating and storage: 35~85%RH(noncondensing)
Vibration(endure)	Amplitude 1.52mm,5~55Hz,2h for three axis individually
Shock(endure)	490m/s ² 11ms three times for X,Y,Z direction individually
Protection	IP50; IP65

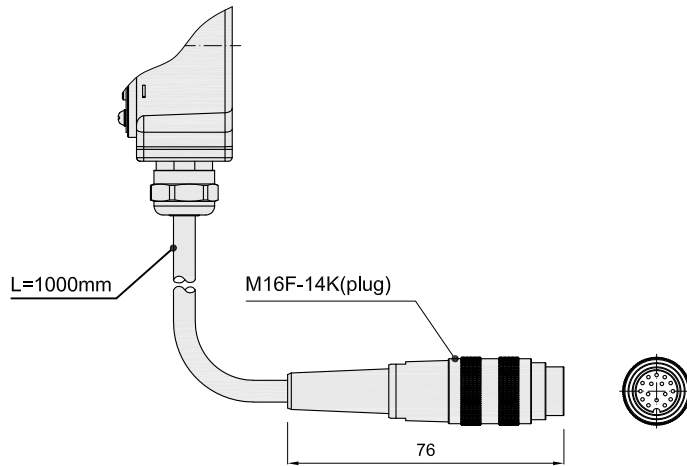
K52 Specifications 5/6

Basic Dimensions

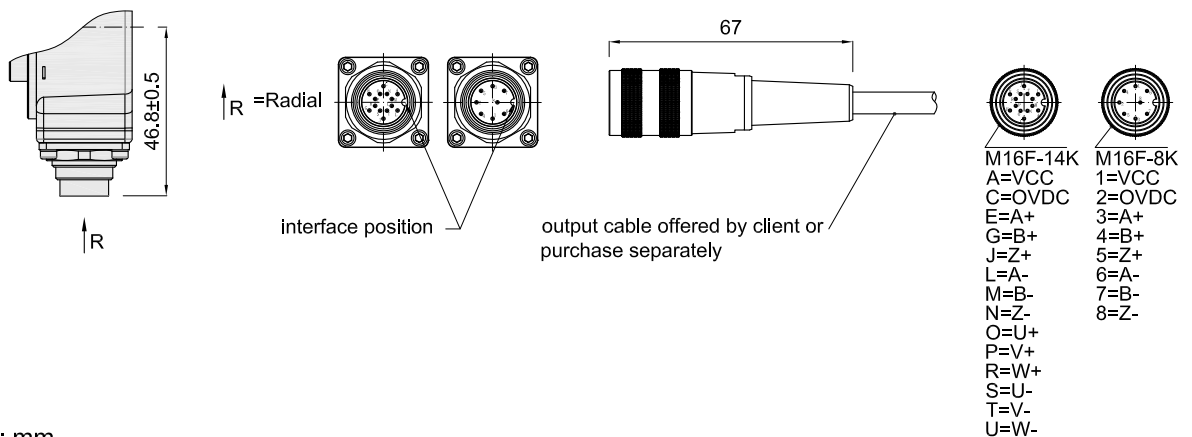
● K52-T



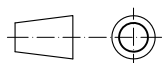
● K52-TE



● K52-C



Unit: mm



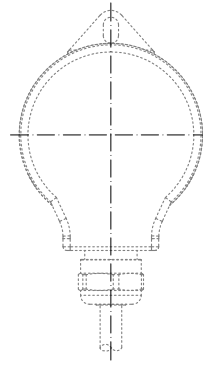
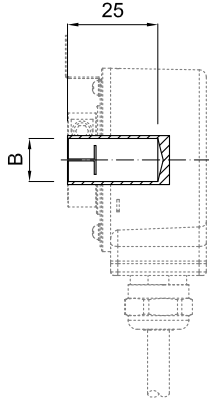
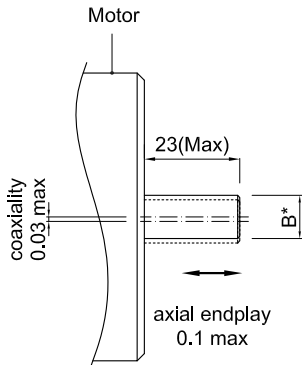
= Rotate direction of incremental signal output shaft

= Rotate direction of servo signal output shaft

K52 Specifications 6/6

■ **Assembling requirement**

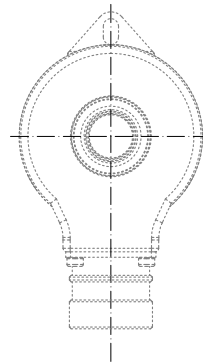
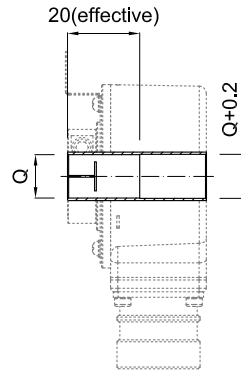
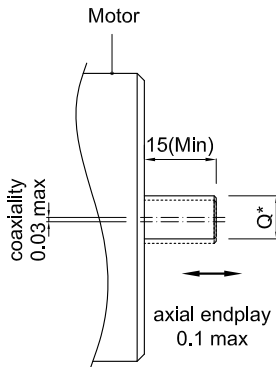
- Blind hole



B	B*
Ø8 ^{H7}	Ø8 ^{g4}
Ø10 ^{H7}	Ø10 ^{g4}
Ø12 ^{H7}	Ø12 ^{g4}
Ø14 ^{H7}	Ø14 ^{g4}
Ø15 ^{H7}	Ø15 ^{g4}

B* Motor shaft diameter tolerance

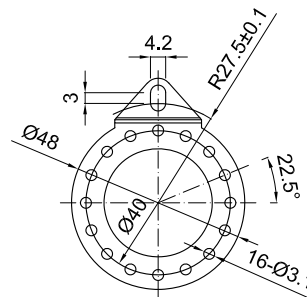
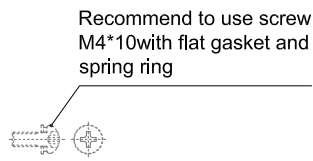
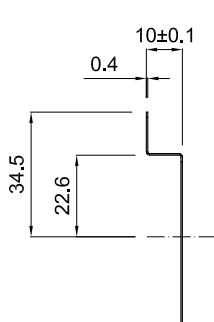
- Through hole



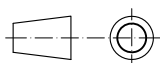
Q	Q*
Ø8 ^{H7}	Ø8 ^{g4}
Ø10 ^{H7}	Ø10 ^{g4}
Ø12 ^{H7}	Ø12 ^{g4}

Q* Motor shaft diameter tolerance

■ **Leaf Spring(50T55)**



Unit: mm



About vibration

Vibration act on encoder always cause wrong pulse ,so we should pay attention to working place. More pulse per revolution , narrower groovy spacing of grating ,more effect to encoder by vibration,when rev is low or stop , vibration act on shaft or main body would cause grating vibrating ,so encoder might make wrong pulse.