



编码器
传感器

安装操作说明

Installation operation instructions



增量式编码器 Incremental encoder EDK100H系列 series

本安装说明全面涵盖以上系列：
请注意，图示可能与实际产品的型号、材料、颜色和接头类型上发生差异。

This installation guide covers all of the above series:
Please note that the illustration may differ from the actual product model, material, color, and connector type.

目录 List of contents

1、受伤风险 Risk of bodily injury.....	3
2、损坏产品的风险 Risk of damage to the product	4
3、产品部件 Parts of the product	5
4、机械安装 Mechanical installation.....	6
5、电气安装 Electrical installation	10
6、证书 Certificate	13
7、技术参数 Specification parameter.....	14
8、附件 Accessories	21



1、受伤风险 Risk of bodily injury

安装前注意事项 Important before mounting begins:



人身伤害危险
Risk of bodily injury



关闭电源
Switch off the power.



**确保机器处于停机状态。
本产品安装在旋转部件上，在运动状态下操作可能导致人身伤害。**

Make sure the machine is at a standstill. The product is to be mounted on a rotating part that can cause bodily injury when in motion.

2、损坏产品的风险 Risk of damage to the product

本产品为精密测量仪器，应由有经验的人员小心操作。
以下警告适用于，产品在超出技术规范极限值情况下使用。

The product is a precision measuring instrument. It should be handled with care, by experienced person-nel.
The warnings below apply in the event of effects outside the limit values stated in the product's data sheet.



产品损坏风险 Risk of damage to the product



极限温度下

If it is exposed to extreme temperatures



轴上作用力过大

If the shaft is exposed to high mechanical forces



短路或供电电压过高

By short-circuits or an excessively high supply voltage



剧烈振动或冲击

If it is exposed to powerful vibrations or shock



遭受敲打，撞击或其他物理损坏

By impacts or knocks or other physical damage



电子产品被接触时的静电放电

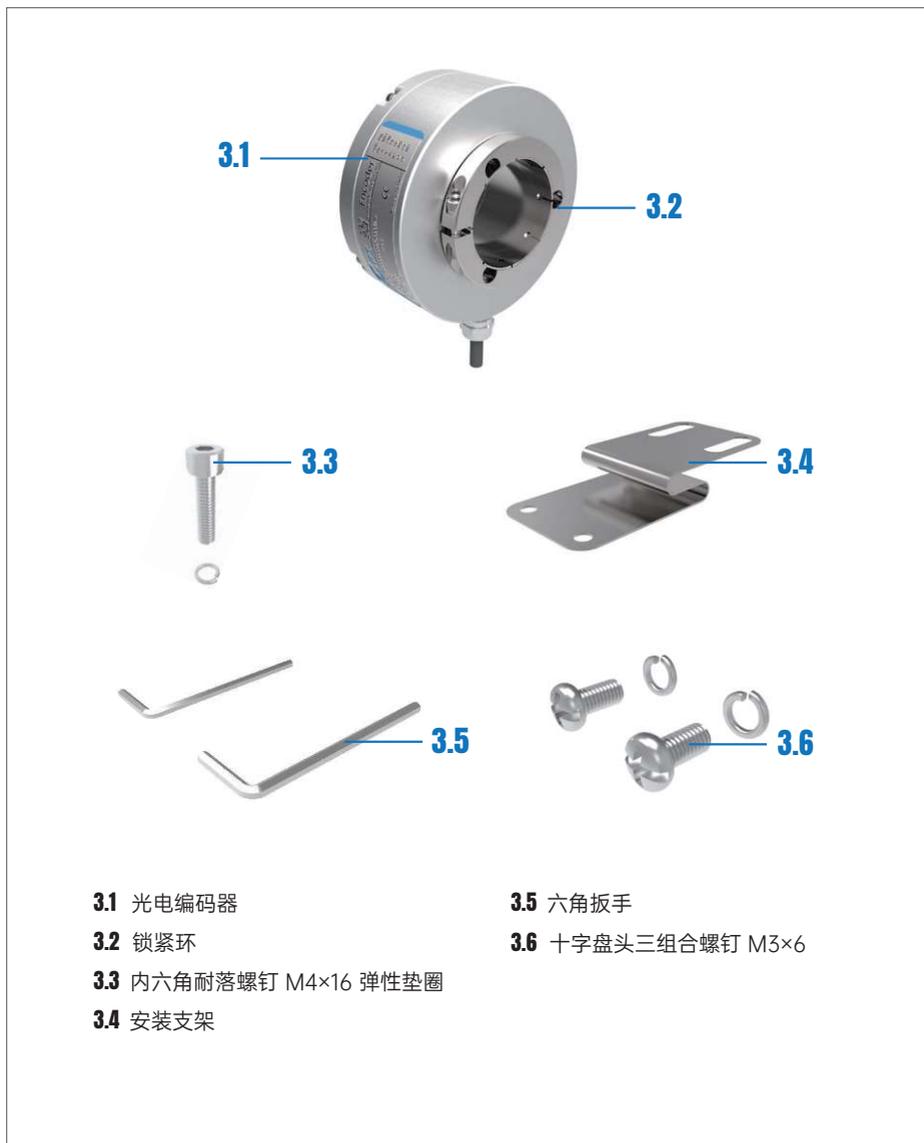
By ESD discharges if the electronics are touched



潮湿或化学液体腐蚀（不要竖直安装电缆）

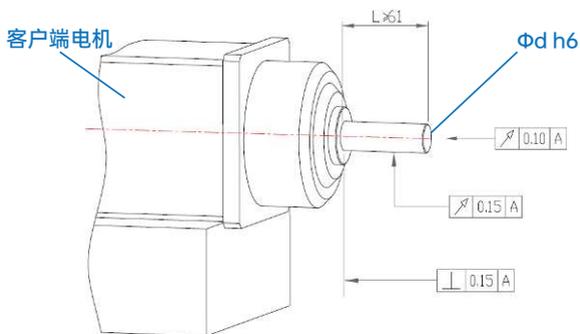
By moisture or chemical fluids (do not install cable pointing upwards)

3、产品部件 Parts of the product



5  本安装说明仅适用于EDK100H系列增量式编码器产品，如果违反原设计用途使用产品，用户需自行承担风险。如有更改，恕不另行通知。
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4、机械安装 Mechanical mounting



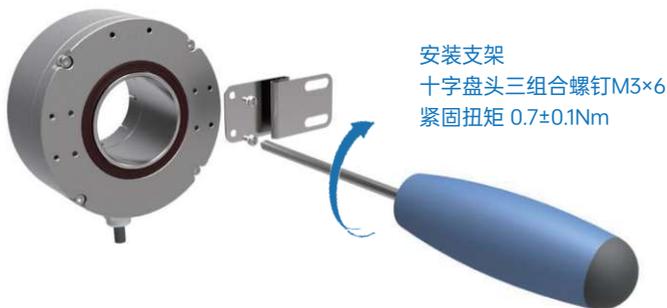
4.1 对客户端电机主轴（电机机座号 160~200）要求：

电机主轴长度见图示， $L \geq 61$

电机主轴 Φd 与编码器配合为基轴制间隙配合 h6/G7

同时保证电机主轴：

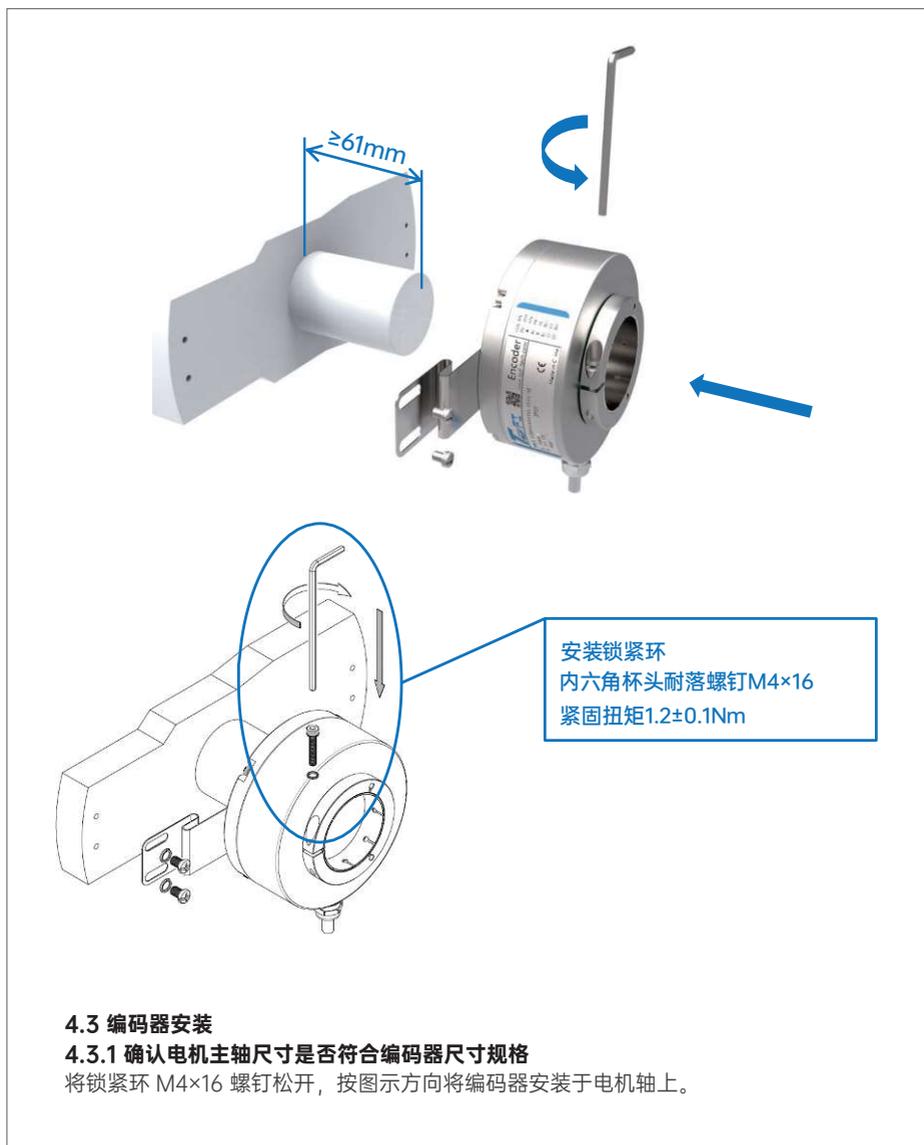
轴向跳动 $\leq 0.10\text{mm}$ ；径向跳动 $\leq 0.15\text{mm}$ ；主轴与连接端面垂直度 $\leq 0.15\text{mm}$



4.2 安装支架组装

十字头螺刀将安装支架、M3×6 十字盘头三组合螺钉按图示方向组装并固定。

目视检测，确认安装支架与编码器安装面无间隙，无移动现象。



4.3.2 固定安装支架

用十字头螺刀将螺钉、弹簧垫圈按图示方向将安装支架紧固。
目视检测，确认安装支架与电机安装面无间隙，无移动现象。



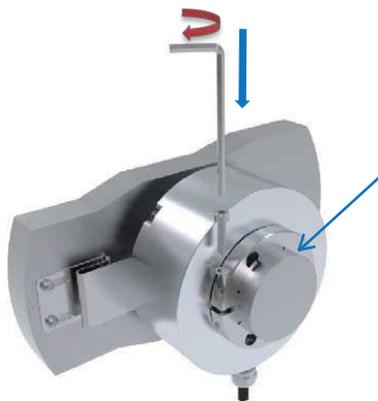
安装直接松动或螺钉脱落，会造成编码器与电机同步，损伤电缆。

螺丝 M4×8；紧固扭矩 $1.2 \pm 0.1 \text{Nm}$

螺丝 M5×8；紧固扭矩 $2.5 \pm 0.2 \text{Nm}$

4.3.3 安装并固定编码器，然后将锁紧环螺钉锁紧。

保证编码器无轴向移动。目视检测，确认编码器主轴与电机轴无间隙。



间隙为0

如果出现锁紧环松动，会造成编码器输出脉冲错误，影响设备正常工作

**机械安装注意事项** Mechanical installation precautions:

检查连接轴的尺寸是否符合编码器数据表中的规格。

Check that the dimensions of the mating shaft match the specifications in the encoder's data sheet

通过完整组件的慢速旋转来检查编码器的径向偏移。偏移不应超过0.1mm，否则将缩短编码器的使用寿命或影响系统的精度。

Check the encoder's radial runout with slow rotation of complete assembly. The runout should not exceed 0.1 mm, as this may shorten the encoder's service life or influence the system accuracy

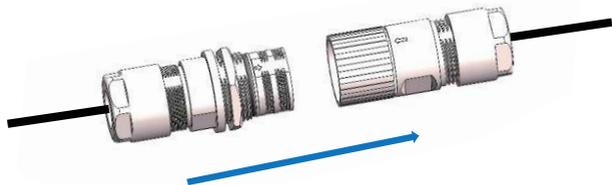
保持传动轴和编码器轴的清洁，远离任何润滑油和油渍。

Keep the drive shaft and encoder shaft clean, away from any lubricating oil and oil stains.

轴承在任何情况下不允许加入润滑油。

Bearings are not allowed to add lubricating oil under any circumstances.

5、电气安装 Electrical mounting



5.1 对接插头的安装示意

Installation illustration for the connection plug.

将插头和插座的标记点对正按图示方向插入

Align the marking points of the plug and the socket, insert them in the direction shown in the diagram:



5.2 对接插头锁紧

Locking of the connection plug

插头安装后，将锁紧螺母顺时针方向旋紧并固定在插座上。

After the plug is installed, tighten the locking nut clockwise and fix it on the socket



电气安装注意事项 Electrical installation precautions:

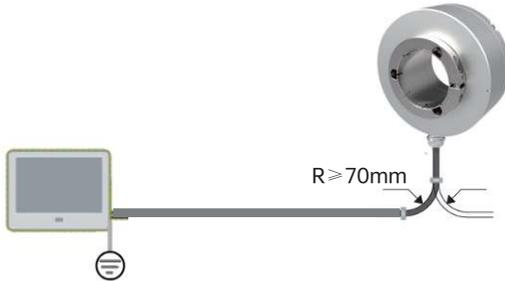


电缆出线应避免同潮湿或化学液体腐蚀方向

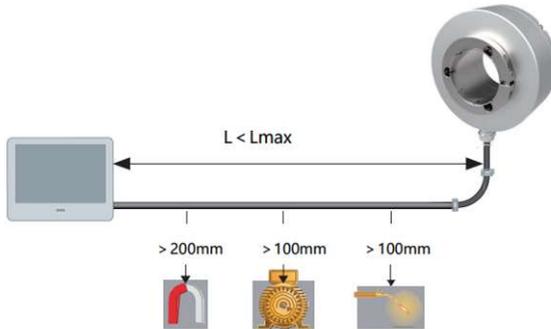
The cable outlet should avoid the direction of moisture or chemical liquid corrosion



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使用屏蔽双绞线电缆。屏蔽电缆必须连接到底座两端，并单点接地。
Use a shielded twisted-pair cable. The shielding must be connected to the chassis at both ends and be earthed at one point.



请将潜在干扰源放置在离电缆建议的距离外，确保电缆长度不超过图示中的规定值。
Keep potential sources of disturbance at the recommended distance from the cable. Make sure that the length of the cable does not exceed the value specified in the picture.



电缆排布半径，确保电缆弯曲半径超过允许的最小值。
Ensure that the cable's bending radius exceeds the permitted minimum value.

**电气安装注意事项** Electrical installation precautions:

将所有导线视为带电线路，必须对所有未使用的导线做绝缘处理。

Treat all wires as live. Any wires not in use must be insulated.

更换坏的编码器时，请勿将新旧编码器部件相互结合。

Do not combine old encoder parts with new ones, when replacing a worn out encoder.

如果产品有接地带，必须确保良好接地。

If the product comes with an earthing strap,

使用时，请不要超过额定电压范围，如施加额定电压以上的电压时，会引起仪器故障和烧毁

Do not use the product in excess of the rated voltage. Applying voltages beyond the rated voltage range may cause the product to break or burn.

高压线和动力线并行走线时，会因感应而发生误动作或故障，所以请分开走线。

Avoid wiring the product's cables parallel to power lines or high-voltage lines. Doing so may cause the product to malfunction due to induction or may cause the damage the product.

使用电源如发生浪涌，请在电源间接上浪涌吸收器，为了避免干扰，请尽量在短距离之内连线。

If surge occurs in the power supply. Connect a surge absorber between the power supply terminals to absorb the surge. minimize the wiring length to prevent the product from being affected by noise, etc.

在接通电源或切断电源时，容易发生错误脉冲，所以请在接通电源1秒后，及切断电源1秒前使用。

Since improper pulses may occur when the power is turned on or off, use the devices connected to this product at least 1.0 seconds before or after the power is turned on or off.

请严格按照编码器接线表中规定的颜色接线，需注意电源线极性，以避免引起仪器烧损。

Be careful when wiring, such as being careful with the polarities of the power supply. Incorrect wiring may break or burn the product

编码器的信号电缆线不能用力拉拔或弯折。

Encoder cables do not apply an excessive being pulling or bending.

请不要拆卸、修理、改造本产品。

Never disassemble, repair nor tamper with the product



6、证书 Certificate

产品的符合性声明、证书和最新操作指南请浏览www.tofi-tech.com，可搜索产品型号查看具体产品详情。

For the conformity declaration, certificates and the latest operation guidelines of the product, please visit www.tofi-tech.com. You can search by product model to view the detailed information of the specific product.



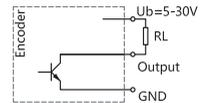
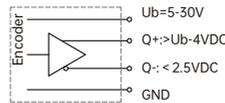
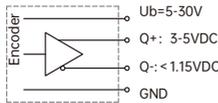
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7、规格参数 Specification parameter

7.1 机械参数 Mechanical parameter

轴径 Shaft diameter	空心轴 Hollow shaft $\Phi 25$ 、 $\Phi 30$ 、 $\Phi 35$ 、 $\Phi 38$ 、 $\Phi 40$ 、 $\Phi 42$ 、 $\Phi 45$ mm
防护等级 Protection	IP66
每分钟最大转速 Speed	3000RPM; 4000RPM (-40°C...+70°C)
最大轴负荷 Shaft loading	100N 轴向, 200N 径向
冲击 Shock resistance	100g, 6ms
振动 Vibration resistance	10g, 10...2000HZ
轴承寿命 Bearing life	10^9 转turns
转动惯量 Rotor moment of inertia	$< 150 \times 10^{-6} \text{ kgm}^2$ (取决于轴尺寸)
启动力矩 Starting torque	$< 0.1\text{Nm}$
主轴材料 Shaft material	不锈钢
主体材料 Main materials	铝合金 Aluminium alloy
外壳材料 Housing material	铝合金 Aluminium alloy
工作温度 Working temperature	-40°C...+85°C
贮存温度 Storage temperature	-40°C...+85°C
重量 Weight	$\approx 1\text{kg}$ (2米电缆)

7.2 电气参数 Electrical parameter



输出电路 Output circuit	TTL	RS422	HTL	HCHTL	Open Collector
电源 Supply voltage	5VDC	5-30VDC	5-30VDC	5-30VDC	5-30V
空载电流 Power consumption (no load)	Max.80mA	Max.80mA	Max.125mA	Max.125mA	Max.80mA
最大负载电流 Signal level high	$\pm 40\text{mA}$	$\pm 200\text{mA}$	$\pm 40\text{mA}$	$\pm 200\text{mA}$	-50mA
最高输出频率 Pulse frequency	300KHz	300KHz	300KHz	300KHz	100KHz
信号高电平 Signal level high	3-5V	3-5V	$> +U_b - 4\text{V}$	$> +U_b - 4\text{V}$	-
信号低电平 Signal level low	$< 1.15\text{V}$	$< 1.15\text{V}$	$< 2.5\text{V}$	$< 2.5\text{V}$	-
最长电缆长度 Cable length max	100kHz时50m 50m at 100kHz	100kHz时350m 350m at 100kHz	100kHz时30m 30m at 100kHz	100kHz时350m 350m at 100kHz	100kHz时20m 20m at 100kHz
上升/下降时间 Tr Rise/ Fall time Tr	Max.1 μs	Max.1 μs	Max.1 μs	Max.1 μs	-
接口保护 Interface protection	浪涌保护、反极性保护、短接保护、静电保护 Surge protection, polarity reversal protection, short circuit protection, static electricity protection				



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7.3 端子配置 Terminal assignment

六通道

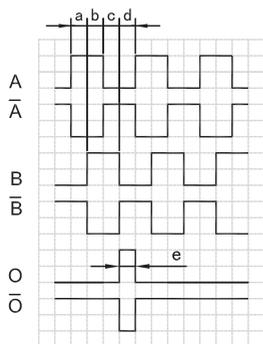
信号		0V	+Ub	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
色标		白 WH	棕 BN	绿 GN	粉 PK	黄 YE	蓝 BU	灰 GY	红 RD	屏蔽 Shield
型号: 9218 插头, M18, 9针 逆时针		2	7	1	3	4	5	6	8	PH ¹⁾
型号: 9223 插头, M23, 12针 顺时针		10	12	5	6	8	1	3	4	PH ¹⁾
型号: 9223-2 插头, M23, 12针 逆时针		10	12	5	6	8	1	3	4	PH ¹⁾
型号: 9312 插头, M23, 12针 顺时针		10	12	5	6	8	1	3	4	9

四通道

信号		0V	+Ub	A	\bar{A}	B	\bar{B}	\perp
色标		白 WH	棕 BN	绿 GN	粉 PK	黄 YE	蓝 BU	屏蔽 Shield
型号: 9312 插头, M23, 12针 顺时针		1	2	3	6	4	7	9

注: ¹⁾ PH=屏蔽连接在接插件外壳上

信号输出 Signal output

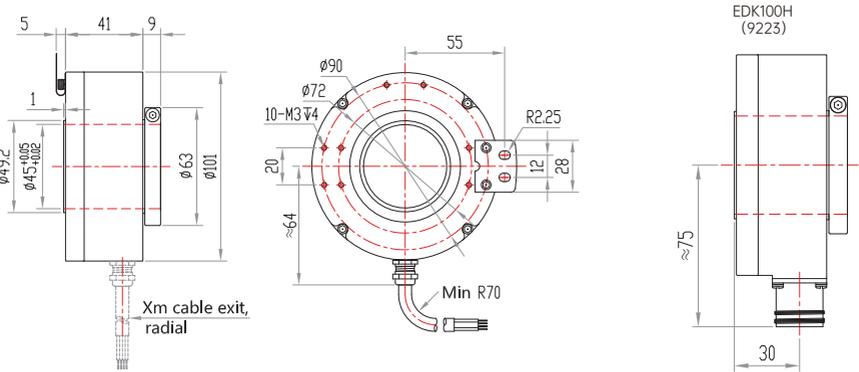


注：O路信号与A、B路信号相位关系不作规定

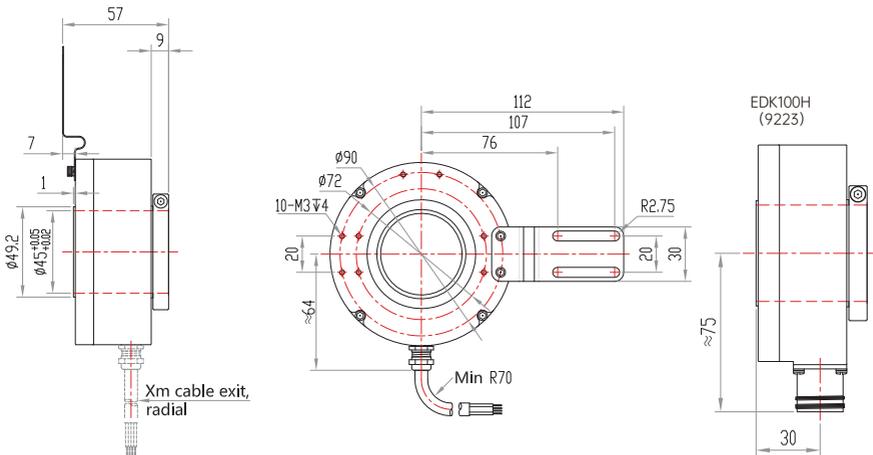
- ☞ 从锁紧环方向看，
逆时针旋转输出的波形图
- a、b、c、d = $T/4 \pm T/8$
- e = $T/4 \pm T/8$

7.4 机械图 Dimensions

EDK100H+8120

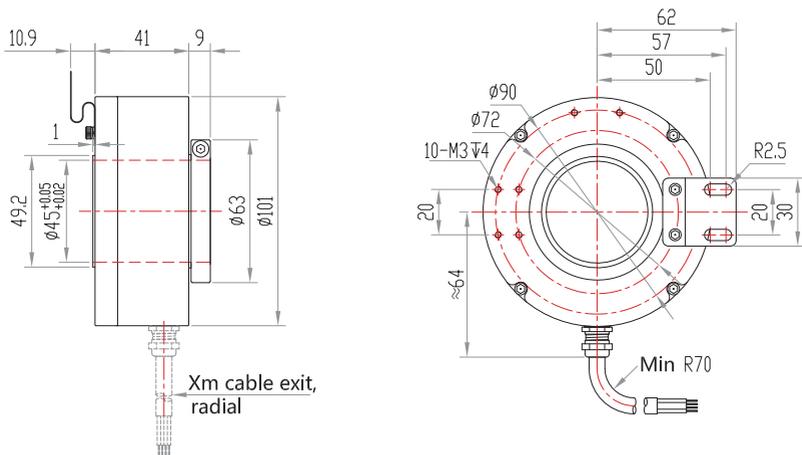


EDK100H+8115

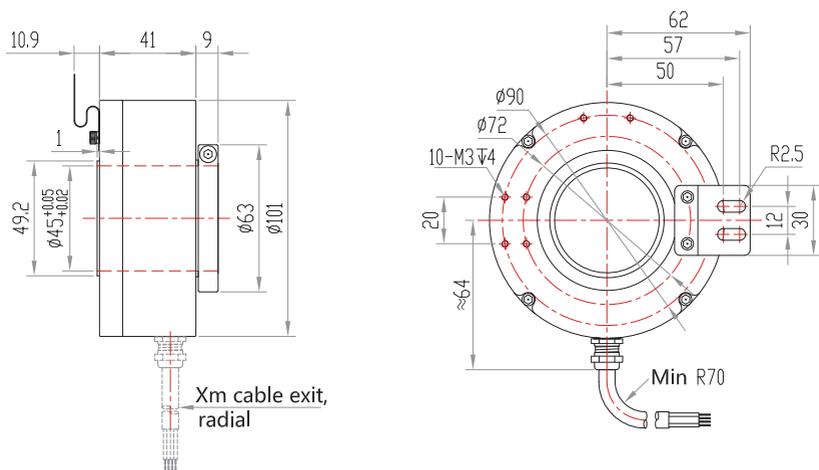


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EDK100H+8116

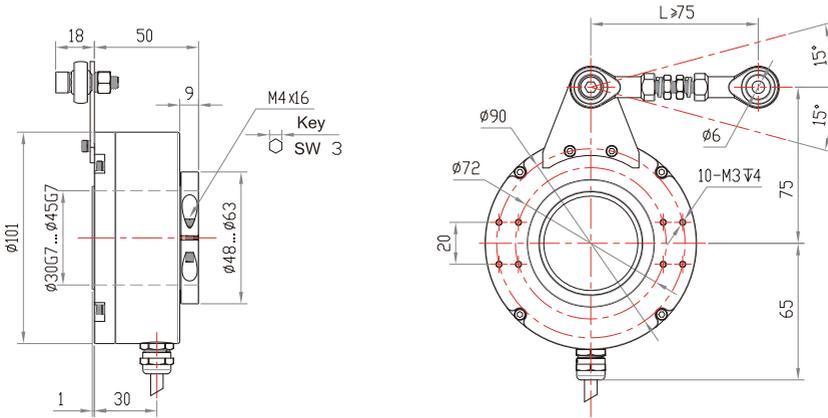


EDK100H+8116-A

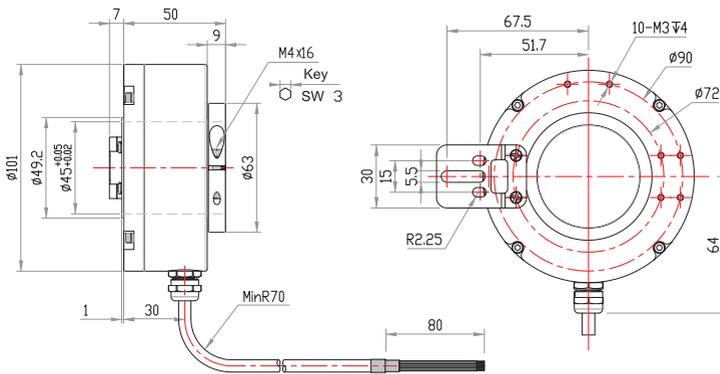


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EDK100H+8150+8561



EDK100H+8161B



8、附件 Accessories

	安装支架 型号 (常规) : 8116		安装支架 型号 (常规) : 8116-A
	安装支架 型号 (常规) : 8117		安装支架 型号 (常规) : 8117-A
	安装支架 型号 (常规) : 8120		安装支架 型号 (常规) : 8161B
	安装支架 型号 (常规) : 8115		
	绝缘轴套 型号 (常规) : 8663 45/38、8663A 45/30、8663M 38/G3/4 (适用于EDK100H45) 8665 30/25.4、8665A 30/25 (适用于EDK100H30)		



接插件和电缆
 型号: 9312/X-18.002
 A头: 插头, M23, 12针, 顺时针, 直头
 B头: 裸线端, ×米电缆, PVC, 双绞屏蔽线3*2*0.2mm², Ø6.8
 *电缆适用于输出信道A+A-B+B-



接插件和电缆
 型号: 9312/X-22.004
 A头: 插头, M23, 12针, 顺时针, 直头
 B头: 裸线端, ×米电缆, PVC, 带屏蔽4*2*0.2mm², Ø6.8
 *电缆适用于输出信道A+A-B+B-O+



接插件和电缆
 型号: 9223B/X-18.002
 A头: 插座, M23, 12针, 顺时针, 直头
 B头: 裸线端, ×米电缆, PVC, 双绞屏蔽线3*2*0.2mm², Ø6.8
 *电缆适用于输出信道A+A-B+B-



接插件和电缆
 型号: 9218B/X-18.002
 A头: 插座, M18, 9针, 逆时针, 直头
 B头: 裸线端, ×米电缆, PVC, 双绞屏蔽线3*2*0.2mm², Ø6.8
 *电缆适用于输出信道A+A-B+B-

更多产品信息

了解更多产品信息，请访问 www.tofi-tech.com

根据产品的不同，提供以下信息：

- 选型资料（数据表）
- 安装操作手册
- 通讯手册（软件手册）
- CAD（2D）、STEP（3D）
- 证书



维护 Maintenance

EDK100H系列增量式编码器免维护，如损坏，则无维修选项。

The EDK100H series Incremental encoder are maintenance-free, with no repair options if damaged.



废弃处理 Disposal

必须根据当地有效的现行废弃物废弃处理规定，安全环保地废弃处理无法再使用的设备。

Equipment that is no longer usable must be disposed of safely and environmentally in accordance with local waste disposal regulations currently in force.



编码器
传感器

托菲传感技术（上海）股份有限公司

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