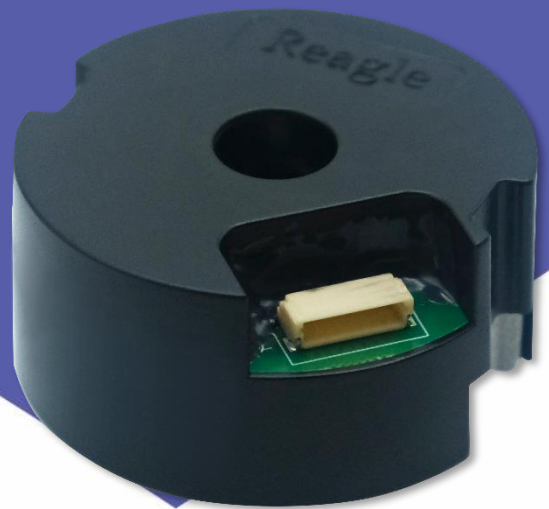


# Multi-Turn Absolute Rotary Encoder

SROA42-M16S23Bit-SSA-C-5V-4M

SROA42-M16S17Bit-SSA-C-5V-4M

## SPECIFICATION

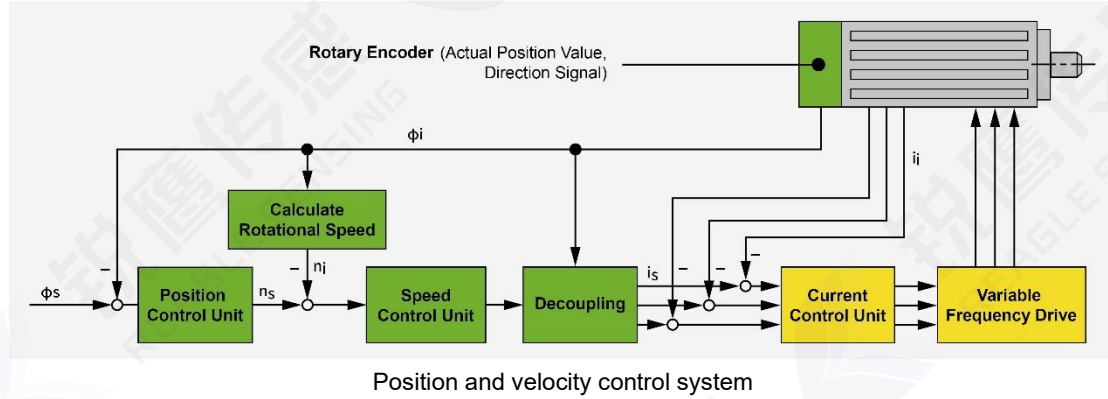


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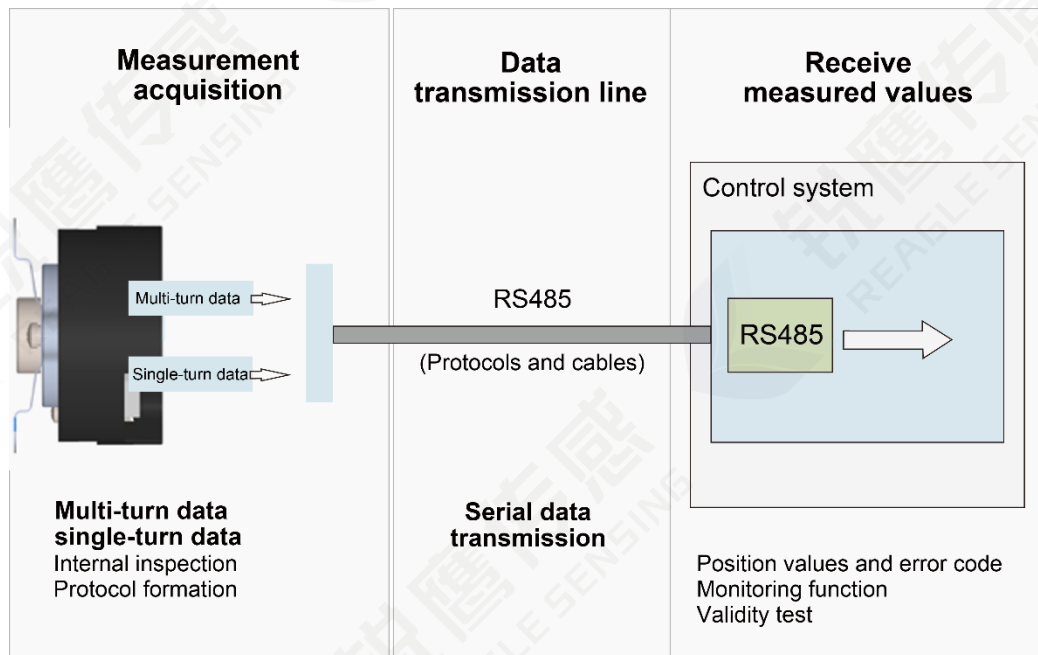
## 1. Summary Info

This manual primarily describes how to use the multi-turn straight shaft series SROA42 encoder from Reagle Sensing. This product is mainly used in servo-driven control systems, providing the feedback information required for accurate position and speed control units.



The performance of the encoder has a decisive impact on the essential characteristics of the motor, such as:

- Positioning accuracy
- Speed stability
- Bandwidth, determining the response speed to drive command signals and resistance to interference
- Motor size
- Noise



Equipped with RS485 communication encoder

## 2. Technical Specifications

Model	SROA42-M16S23Bit-SSA-C-5V-4M SROA42-M16S17Bit-SSA-C-5V-4M
Resolution	Supports up to 8388608 (23bit), compatible with 17bit.
Turns	65536 (16bit)
Absolute positioning accuracy	$< \pm 50''$
Repeat positioning accuracy	$< \pm 3''$
Auxiliary Functions	Fault Warning * Electromagnetic Environment Warning * Battery Voltage Warning
Communication interface	RS485
Communication frequency	$\leq 25\text{kHz}$ , Some commands are only supported $\leq 20\text{kHz}$
Baud rate	4Mbps
Input shaft allowable deviation	Axial: —                      Axial play: $< 0.1\text{mm}$ Radial: $\pm 0.1\text{mm}$ Radial play $< 0.01\text{mm}$ Tilt: $< 0.1^\circ$
Main shaft speed	$\leq 6000\text{rpm}$
Shaft diameter	Straight Shaft $\varnothing 6/ \varnothing 8 \text{ mm}$
Moment of inertia	$0.66\text{kg} \cdot \text{mm}^2$
Starting torque (20°C)	$\leq 0.005\text{N} \cdot \text{m}$
Weight	$\approx 0.06\text{kg}$ (excluding cables)
Rotor angular acceleration	$\leq 80000\text{rad/s}^2$ when powered by a power source; $\leq 8000\text{rad/s}^2$ when powered by a battery.
Vibration	Between 10 and 55Hz, maintain amplitude of 1.5mm. Between 55 and 2000Hz, acceleration is $98\text{m/s}^2$ . 2 hours per axis for XYZ, totaling 6 hours.
Mechanical shock	Shock acceleration of $980\text{m/s}^2$ , 11 milliseconds. 3 impacts per direction, totaling 18 impacts.
Operating Temperature	$-20^\circ\text{C} \sim 105^\circ\text{C}$
Relative Humidity	$\leq 90\%$ ( $40^\circ\text{C}/21 \text{ days}$ , based on EN 60068-2-78); No condensation
Enclosure Protection Rating	IP 40

### 3. Electrical Parameters

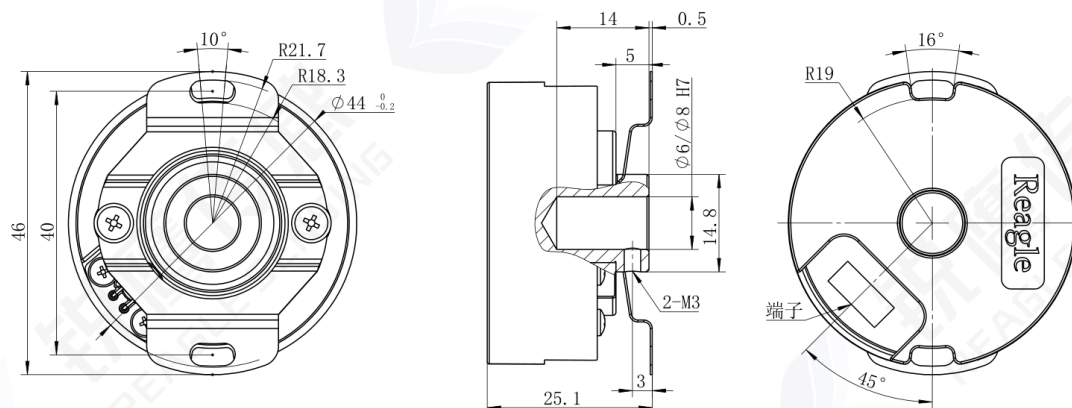
Items		T=25°C		
		Min.	Typ.	Max.
Main power supply voltage		4.75 V	5V	5.25V
Main power supply current (Typ)		--	90mA	--
Battery voltage		--	3.6V DC	--
Battery fault voltage		--	2.9V	--
Battery warning voltage		--	3.1V	--
Mode switching voltage	Main power supply to low power mode	--	4.2V	--
	low power mode to main power supply	--	4.3V	--
Differential Level	High	3.5V	--	--
	Low	--	--	1.7V
Edge change time		--	--	100ns
Insulation resistance		50MΩ	--	--

### 4. Cable Definition

Cable color	Definition
red	5V
black	GND
blue	485+
yellow	485-
brown	Battery +
white	Battery GND
shielding mesh	PE

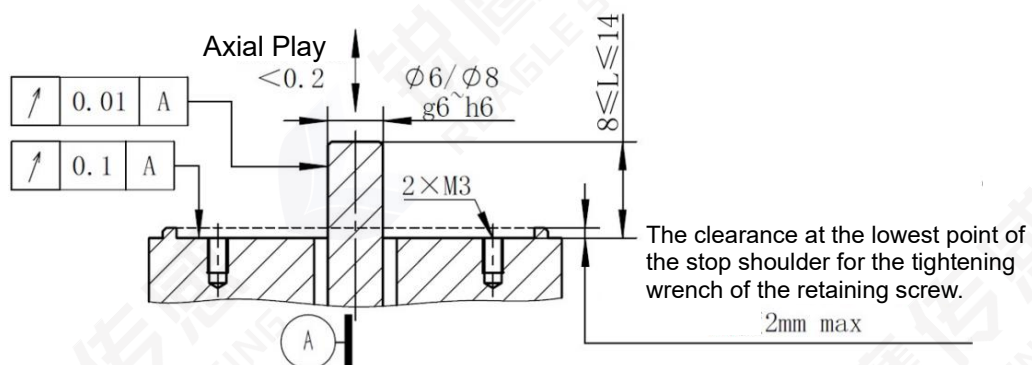
## 5. Mechanical Specifications

### ◇ Product Structure Dimension Diagram



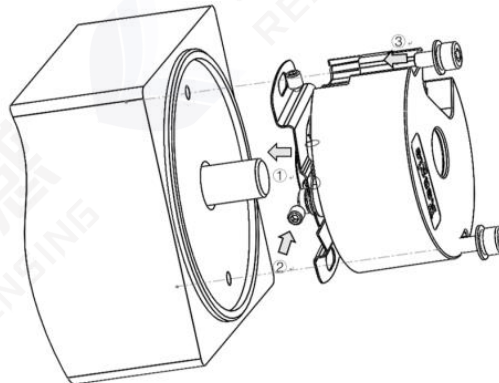
【Note】 The above refers to the default connecting plate.

### ◇ Recommended Motor End Design Dimensions



## 6. Mounting Procedure

### 6.1 Installation Diagram

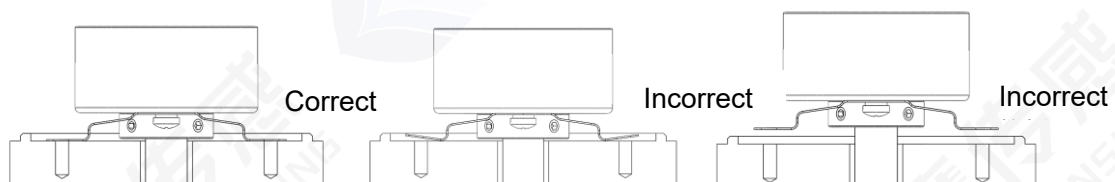


### 6.2 Installation Accessories

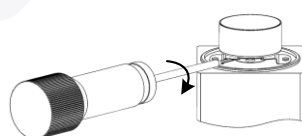
- 1.5mm metric hex key torque wrench
- 2.0mm metric hex key torque wrench

### 6.3 Installation Sequence

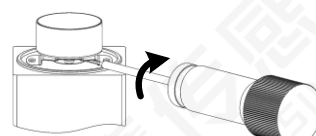
① Insert the encoder assembly onto the motor shaft, ensuring that the bottom surface of the connecting plate is in contact with the rear end cover of the motor. Under normal conditions, the encoder should slide onto the shaft smoothly; if there is any obstruction, check the motor shaft diameter and look for any signs of crushing damage. Do not force the encoder down during the installation process, and avoid striking or pressing on the encoder's circuit board.



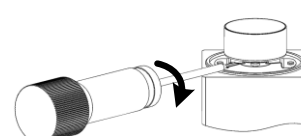
② Coat the head of the M3×4 countersunk end retaining screw with thread adhesive, and use the corresponding hex key torque wrench to screw the first retaining screw into the encoder shaft and lightly tighten it to make contact with the motor shaft; then screw the second retaining screw into the encoder shaft and tighten it with a torque of 7 kgf·cm; finally, tighten the first screw with a torque of 7 kgf·cm.



First step:  
Gently screw in the first retaining screw.

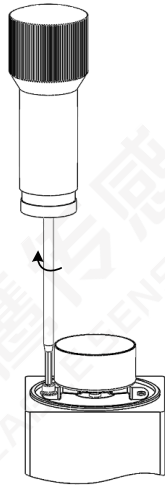


Second step:  
Tighten the second retaining screw with a torque of 7 kgf·cm.

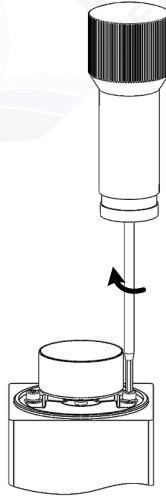


Third step:  
Tighten the first retaining screw with a torque of 7 kgf·cm.

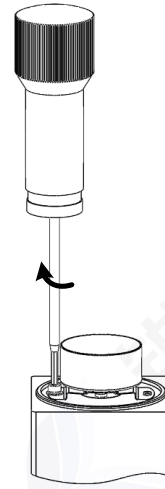
③ Using the corresponding hexagonal torque wrench, lightly tighten one side of the M3 combination screws, then lightly tighten the M3 combination screws on the other side. Afterwards, sequentially tighten the screws on both sides with a torque of 8 ~ 10 kgf·cm



First step:  
Gently screw in the first retaining screw.



Second step:  
Tighten the second retaining screw with a torque of 8-10 kgf·cm.



Third step:  
Tighten the first retaining screw with a torque of 8-10 kgf·cm.

## 7. Communication Specifications

Table: Protocol Parameters

1	Single-circle position resolution	8388608 (23bit, ENID = 0x17) 131072 (17bit, ENID = 0x11)
2	Multi-turn position resolution	65536 (16bit)
3	Overspeed alarm threshold	7200rpm

Please refer to "Ruiying Communication Protocol Description (XJ-4M) [Public]" for the specific content of the protocol.

## 8. Configuration Description

Order codes can be found in the 'REAGLE SENSING Absolute Value Encoder Ordering Instructions'.

Specifications for terminal cables are detailed in the 'REAGLE SENSING Absolute Value Encoder Terminal Cable Drawing'.

Optional Configurations	Description
Axial hole size	Ø6/ Ø8mm
Resolution	17Bit/23Bit
Connection plate pattern	Type A (default type) / Type C / Type D



### Revision History

Date	Version Number	Modification Details or Changes	
		Location	Content
20240119	V1.0	/	New Version

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