



Magnetostrictive Displacement Sensor

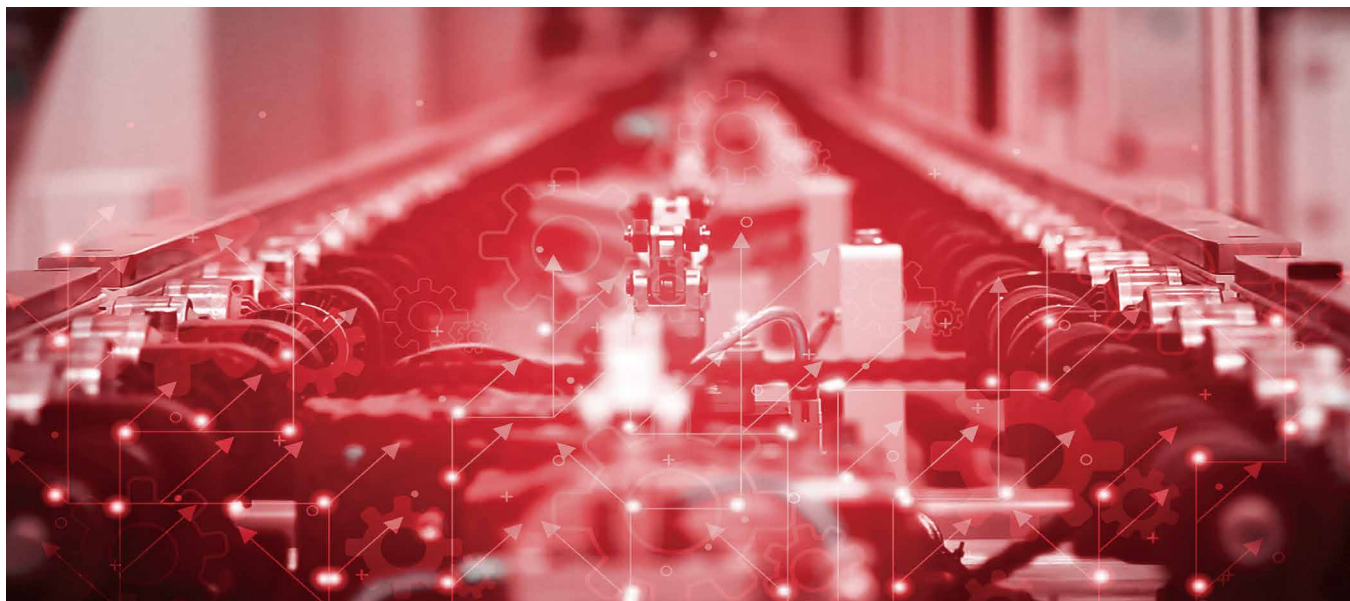
R Series Product manual



• High quality • High precision • Long service life

Company Profile

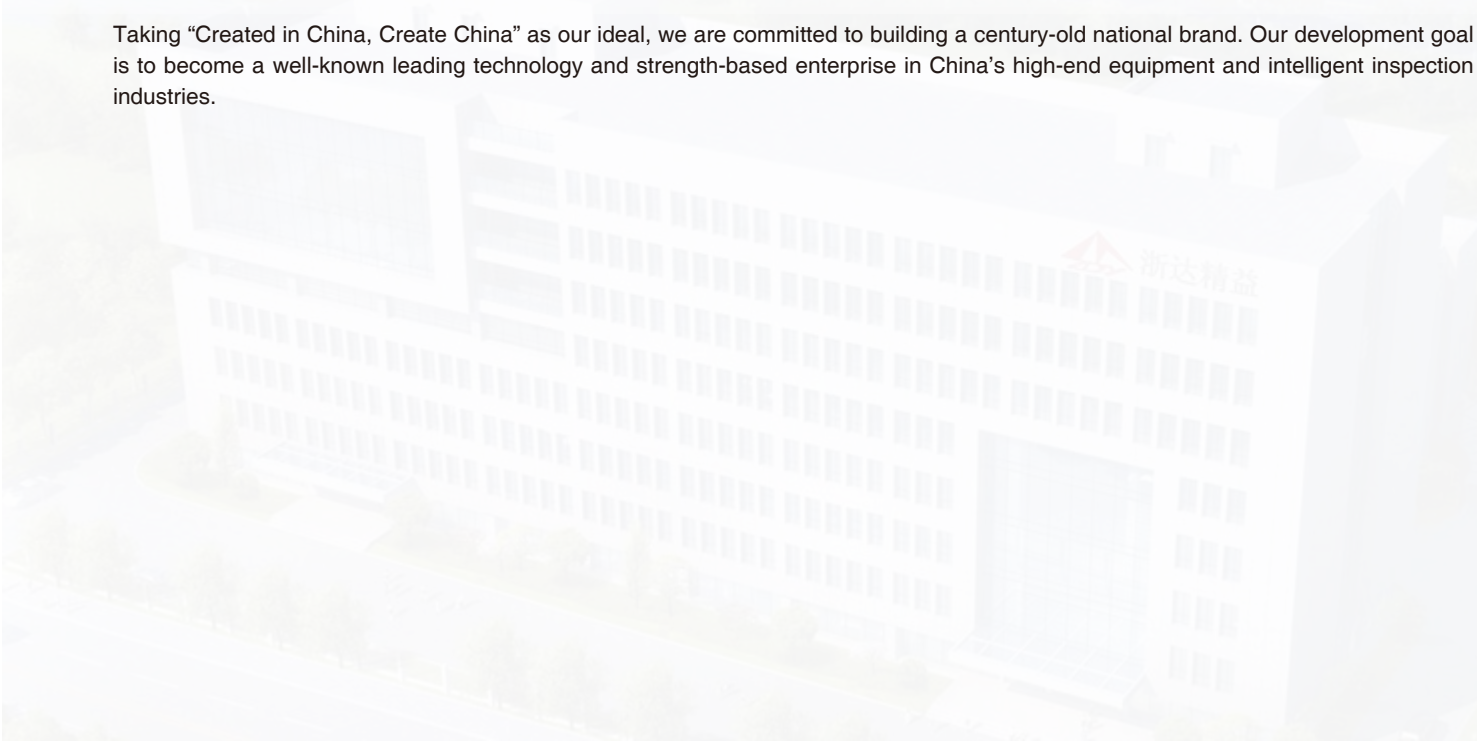
As a technological innovation enterprise born out of Zhejiang University, our company has more than 180 employees, including 4 overseas talents, 4 professors, and 2 associate professors. There are also 12 doctors, and more than 86% of employees with a bachelor degree or above.



We are committed to intelligent manufacturing, high-end equipment, intelligent sensing, intelligent detection, military industry and other fields. Most of our company's products are independently researched and developed, and the market share ranks in the forefront of the domestic industry. A variety of equipment is the first set in China, which breaks the long-term monopoly of foreign companies.

We are a national high-tech enterprise integrating scientific research, product development, engineering design, and technical consulting. Besides, the company has obtained 45 invention patents, 29 utility model patents, 10 software copyrights, and 4 registered trademarks.

Taking "Created in China, Create China" as our ideal, we are committed to building a century-old national brand. Our development goal is to become a well-known leading technology and strength-based enterprise in China's high-end equipment and intelligent inspection industries.



Honorary Qualification



RH/RP Displacement Sensor- EtherCAT Output



Technical Characteristics

- Rugged and fully enclosed design
- Non-wear, non-contact measurement method
- Linear measurement, absolute position output
- Easy diagnosis, LEDs real-time condition monitoring
- Nonlinearity less than 0.01%
- The repetition accuracy is less than 0.001%
- Up to 9 magnet position, speed, status information output

C Product parameters-EtherCAT output

• Input

Measurement data	Position magnet ring
Stroke length	25~5500mm
Number of measurements	1~9

• Output

Interface	EtherCAT Ethernet Control Automation Technology
Data protocol	EtherCAT 100 Base-TX
Transmission speed	Maximum 100Mbit/s
Resolution	1 ~ 100 μ m, adjustable
Nonlinearity	$<\pm 0.01\%$ of full scale, minimum 50 μ m
Repetition accuracy	$<\pm 0.001\%$ of full scale, minimum $\pm 1\mu$ m
Update time	≥ 0.25 ms, depending on the measuring stroke
Hysteresis	$<10\mu$ m
Temperature coefficient	<15 ppm/ $^{\circ}$ C

• Operating conditions

Magnet velocity	Arbitrary
Protection level	IP67RH Stainless Steel Rod/IP65RP Aluminum profile
Operating temperature	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Humidity/dew point	Humidity 90%, no condensation
Shock index	GB/T2423.5 100g(6ms)
Vibration index	GB/T2423.10 20g/10~2000Hz
EMC Test	GB/T17626.2/3/4/6/8, Grade 4/3/4/3/3, Class A, CE Certification

• Structure and Material

Failure indication		Electronic bin cover with LEDs display
RH Series	Electronic bin	Aluminum alloy
	Measuring rod	304 stainless steel
	Outer tube pressure	35MPa (continuous)/70MPa (peak) or 350bar (continuous)/700bar (peak)
	Position magnet	Standard magnet ring and various ring magnets
RP Series	Electronic bin	Aluminum alloy
	Measuring rod	Aluminum alloy
	Position magnet	Slider magnet, square magnet, sector magnet
Mounting thread form		M18×1.5、 M20×1.5、 3/4"-16UNF-3A (customizable)
Installation direction		Any direction
Outgoing mode		Cable outlet or Connector

• Electrical Connection

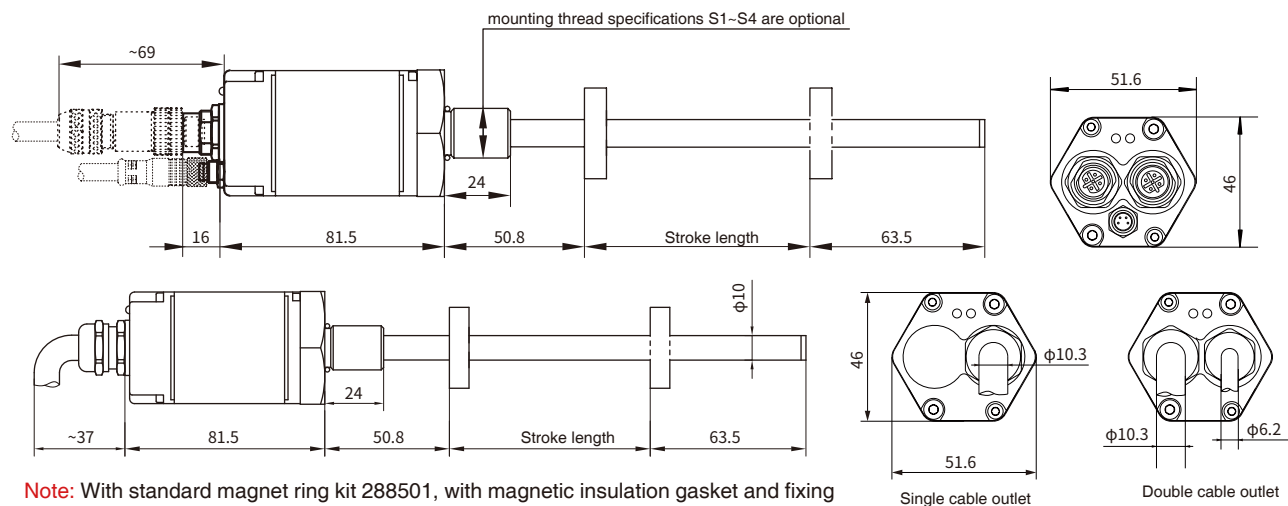
Input voltage	+24Vdc $\pm 20\%$
operating current	<90 mA (varying with range)
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	>10 M Ω
Insulation strength	500V

A a Installation Instructions-EtherCAT Output

• Dimensions and installation guidance of RH pressure-resistant rod sensor

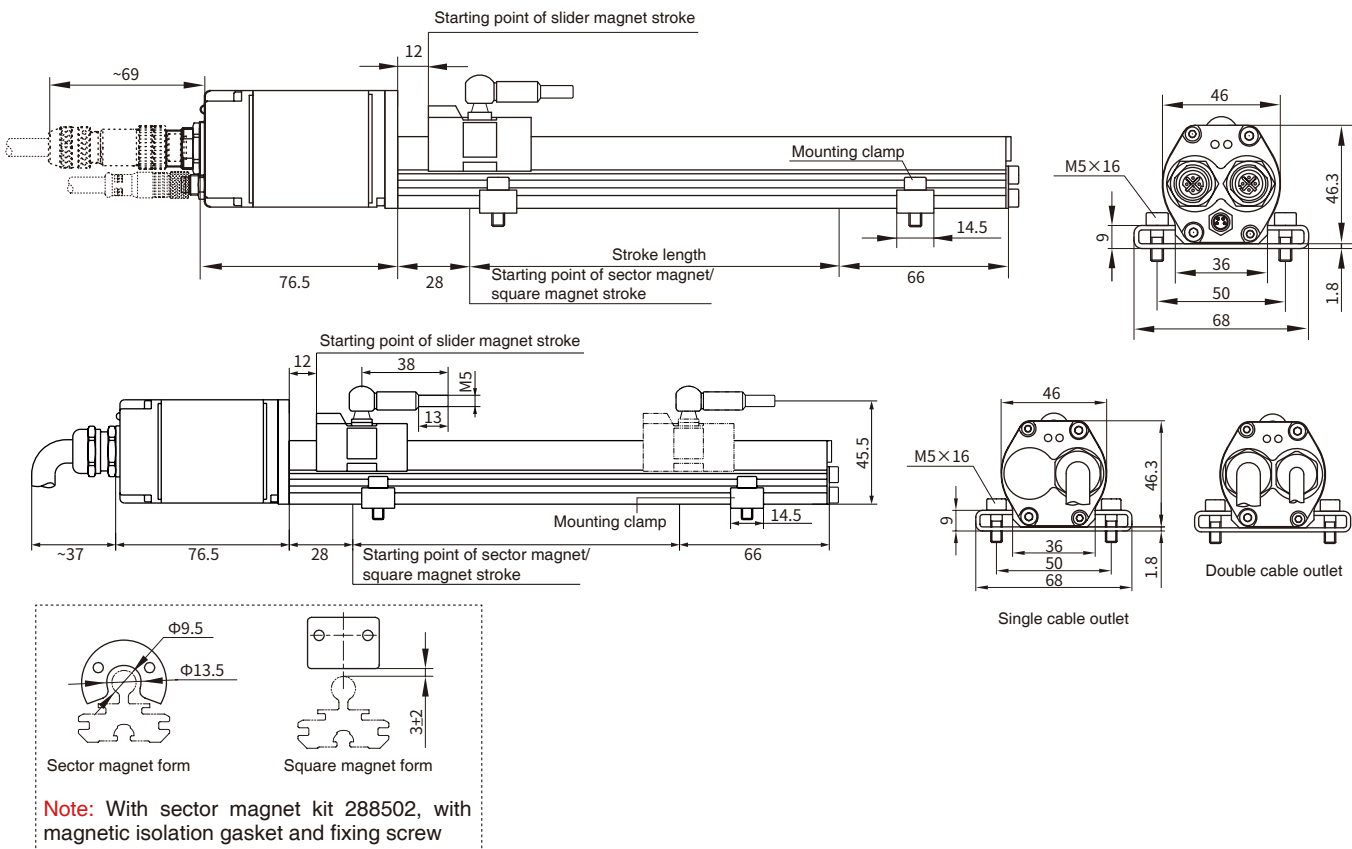
RH series pressure-resistant rodshell, built-in installation design for hydraulic system, pressure-resistant 35MPa continuous, flexible and simple installation mode. Mounting thread form M18×1.5 or M20×1.5 or 3/4"-16UNF-3A.

Note: The measurement Non-usable area shown in the figure indicates that the output value of the sensor in this area is zero or unreliable. The default values of the first and last measurement Non-usable areas of this product are 50.8mm and 63.5mm respectively. The value of the measurement Non-usable area can be appropriately modified according to the needs of customers, please pointed out when ordering.

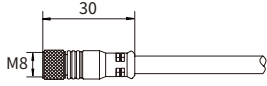
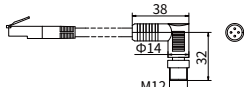
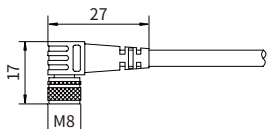
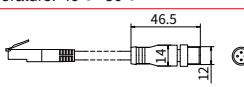
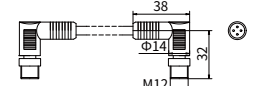
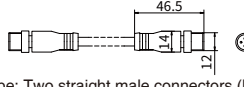


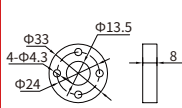
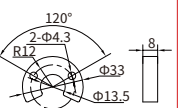
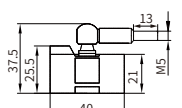
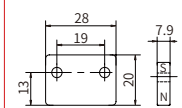
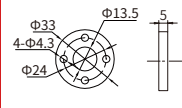
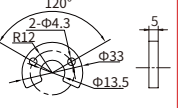
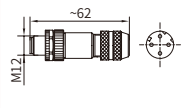
• Dimensions and installation guidance of RP aluminum profile sensor

RP Series aluminum profile provides flexible and simple external installation mode, which is suitable for stroke or position detection of linear motion mechanism, and can also be used for external position detection of hydraulic cylinder.



C Common Accessories-EtherCAT Output

Accessory name/ model		Dimensions	
Female Connector (for power supply) Order No. : 522000-xx (xx- cable length, unit m)		Industrial Ethernet Cable (Cat 5e) d-coded Order No. : 522005-xx (xx- cable length, unit m)	 Connector type: RJ45, 4-pin 90° male connector (M12) Cable sheath: PVC, light blue working temperature:-40 C ~80 C
4-pin90° female connector (for power supply) Order No. : 522001-xx (xx- cable length, unit m)		Industrial Ethernet Cable (Cat 5e) d-coded Order No. : 522006-xx (xx- cable length, unit m)	 Connector Type: RJ45, 4-pin straight male connector (M12) Cable sheath: PVC, light blue Working temperature:-40 C ~80 C
Industrial Ethernet Cable (Cat 5e) d-coded Order No. : 522004-xx (xx- cable length, unit m)	 Connector type: two 4-pin 90° male connectors (M12) Cable sheath: PVC, light blue operating temperature:-40 C ~80 C	Industrial Ethernet Cable (Cat 5e) d-coded Order No. : 522008-xx (xx- cable length, unit m)	 Connector type: Two straight male connectors (M12) Cable sheath: PVC, light blue Working temperature:-40 C ~80 C

Accessory name/ model		Dimensions		Accessory name/ model		Dimensions		Accessory name/ model		Dimensions	
Standard magnet ring Order No. : 211501		Sector magnet Order No. : 211502		Slider magnet Order No. : 211503		Square magnet Order No. : 211508					
Accessory name/ model		Dimensions		Accessory name/ model		Dimensions		Accessory name/ model		Dimensions	
Magnetic isolation gasket		Sector magnetic isolation gasket		4-pin male connector Order No. : 312723							

Note: Please refer to "Magnet ring Selection" and "Cable Selection" for details of cables, magnet rings and other models.

• Wiring mode



4-pin connector socket
(for power supply)

• Connector Connection Mode (Interface 1, 2)

Pin	Line color	Pin/wire function definition
1	Yellow	Tx +
2	White	Rx +
3	Orange	Tx -
4	Blue	Rx -

• Single cable outlet connection mode

Pin	Line color 1*	Pin/wire function definition
1	Yellow	Tx +
2	White	Rx +
3	Orange	Tx -
4	Blue	Rx -
5	Red	24Vdc
6	Black	COM

Note: * Line color 1: light green, PUR sheath, 6 cores,-40C~85 C

• Connector Connection Mode (Interface 3)

Pin	Line color	Pin/wire function definition
1	Brown	+24Vdc (-20%~+20%)
2	White	Do not connect
3	Blue	COM
4	Black	Do not connect

• Double cable outlet connection mode

Pin	Line color1*	Line color2*	Pin/wire function definition
1	Yellow	Yellow	Tx +
2	White	White	Rx +
3	Orange	Orange	Tx -
4	Blue	Blue	Rx -
5	Red	-	24Vdc
6	Black	-	COM

Note: * Line color 2: light green, PUR sheath, 4 cores,-40C~70 C

X Selection Guide-EtherCAT Output

R 01 02 - M 03 04 05 06 07 - 08 09 - 10 11 12 13 - E 14 15 16 17 - 18 19

01 - 02 Sensor shell form

R	H	Pressure-resistant rod (internal or external)
R	P	Aluminum profile (external only)

03 - 07 Measuring range

Four digits, less than four digits are preceded by zero, M means metric system, unitmm

08 - 09 Magnet ring type/mounting thread form

Only for RH series	S	1	M18×1.5, measuring rod diameter 10mm, 304 material
	S	2	M20×1.5, measuring rod diameter 10mm, 304 material
	S	3	3/4"-16UNF-3A, measuring rod diameter 10mm, 304 material
	T	1	M18×1.5, measuring rod diameter 8mm, 304 material
	T	2	M20×1.5, measuring rod diameter 8mm, 304 material
	T	3	3/4"-16UNF-3A, measuring rod diameter 8mm, 304 material
Only for RP Series	C	1	Sector magnet
	C	2	Slider magnet
	C	3	Square magnet

10 - 13 Connection form

D	A	*	*	Single cable outlet, light green, PUR sheath (6 cores)
D	B	*	*	Double cable outlet, light green, PUR sheath (one set of 6 cores, one set of 4 cores)
P	D	5	6	2 sets of 4-pin M12 female connectors, 1 set of 4-pin M8 male connector

Note: * * Indicates the length of cable in meters

14 - 17 Communication interface

14 - 15 Sensor form

E	1	EtherCAT, position and speed, distributed clock optional
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16 - 17 Number of magnet rings

		01~09 optional
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18 - 19 Non-usable area at head and end, customizable

S	0	50.8mm+63.5mm
B	0	30mm+60mm
S	1	28mm+66mm (used in RP series)

● Selection example: RH-M0300-S1 -PD56-E101-S0

Indicates: RH structure series, 300mm Stroke length, M18X1.5 mounting thread, measuring rod diameter 10mm, 304 material, 2 sets of 4-pin female connectors, M12, 1 set of 4-pin male connector, M8, Profinet protocol, single magnet ring, head Non-usable area 50.8mm, end Non-usable area 63.5mm.

L LED real-time state monitoring and diagnosis

● Red and green LEDs built into the sensor head cover provide sensor working condition and diagnostic function.

Green light	Flash	×
Red light	OFF	ON
Function	Normal work	Magnets not detected or incorrect number

