



Magnetostrictive Displacement Sensor

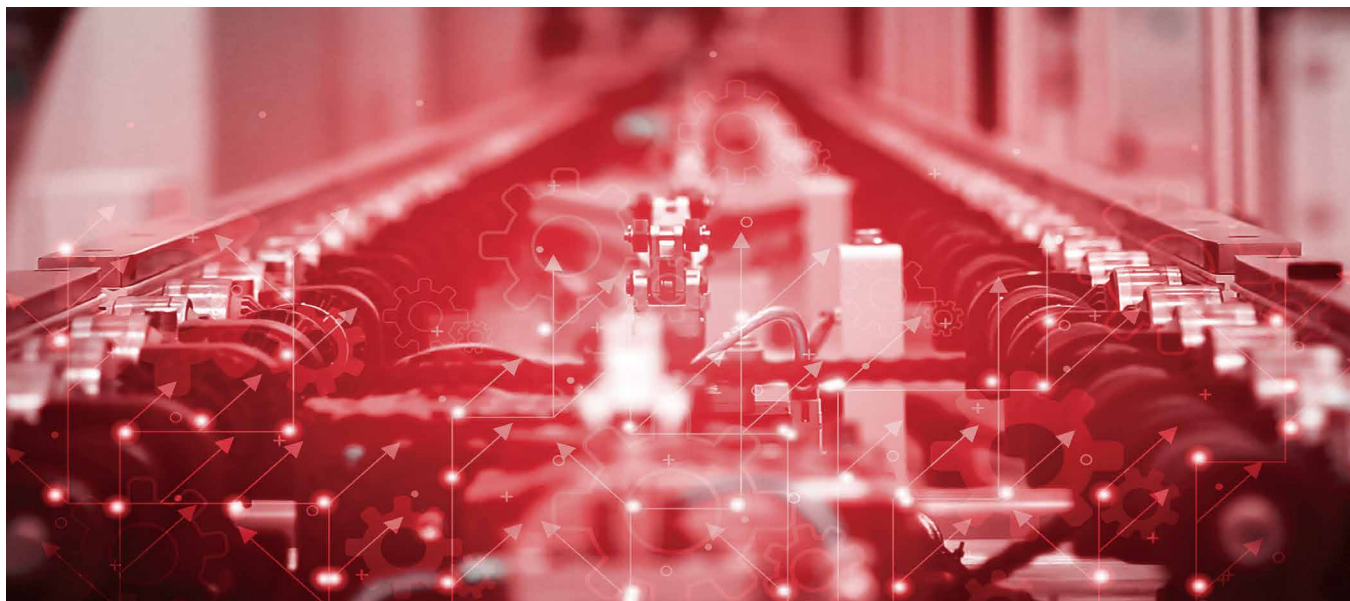
R Series Product manual



• High quality • High precision • Long service life

Company Profile

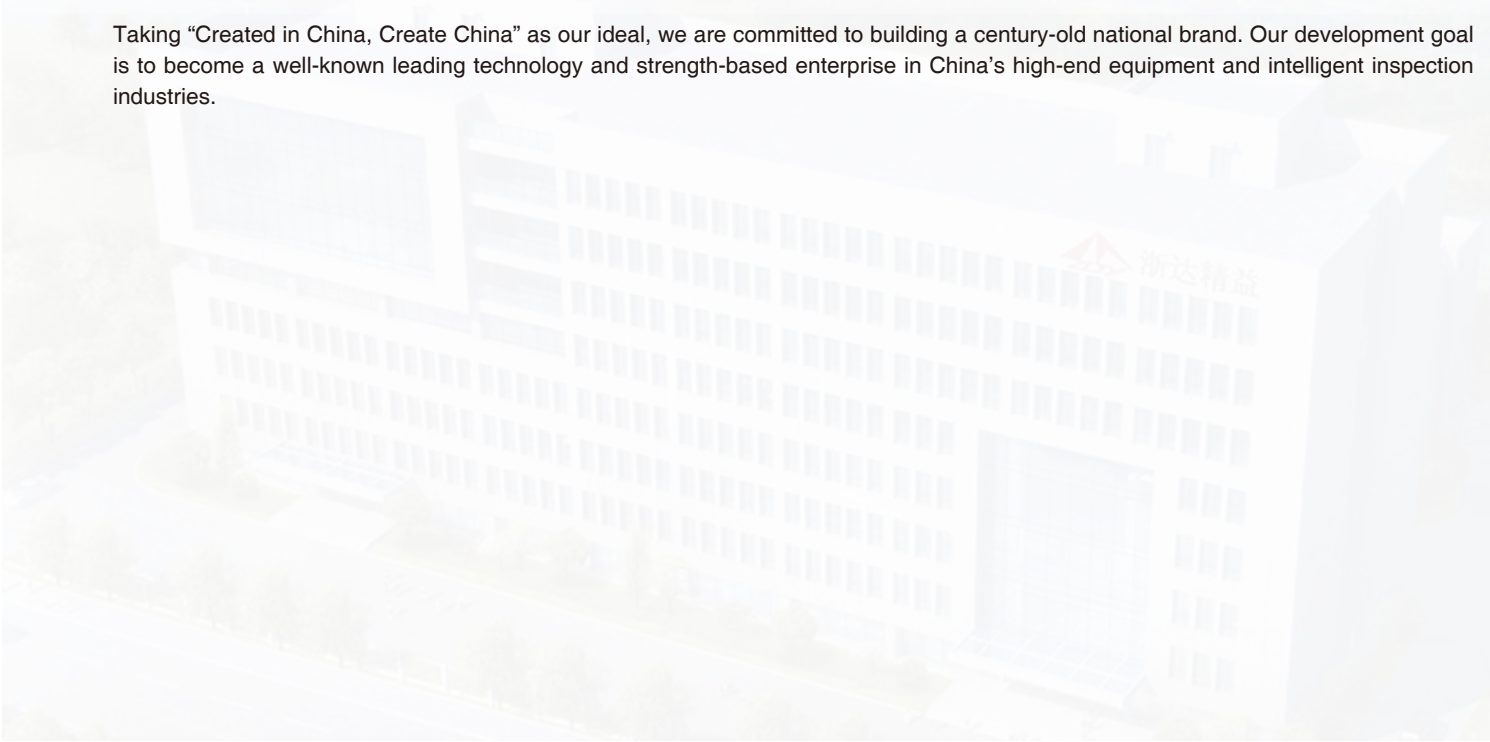
As a technological innovation enterprise born out of Zhejiang University, our company has more than 180 employees, including 4 overseas talents, 4 professors, and 2 associate professors. There are also 12 doctors, and more than 86% of employees with a bachelor degree or above.



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

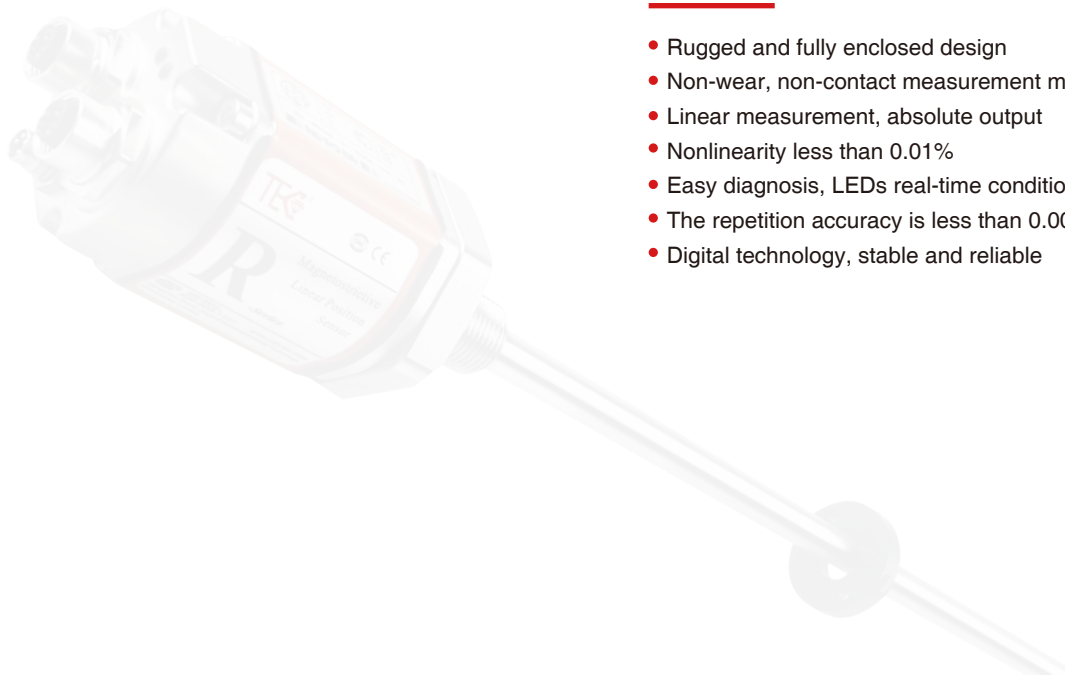


RH/RP Displacement Sensor - Profinet Output



Technical Characteristics

- Rugged and fully enclosed design
- Non-wear, non-contact measurement method
- Linear measurement, absolute output
- Nonlinearity less than 0.01%
- Easy diagnosis, LEDs real-time condition monitoring
- The repetition accuracy is less than 0.001%
- Digital technology, stable and reliable



C Product Parameters-Profinet Output

• Input

Measurement data	Position magnet ring
Stroke length	25~5500 mm, customized according to customer needs
Number of measurements	1~9

• Output

Interface	Profinet IO RT
Data protocol	TEC Profile and Encoder Profile 4.1
Transmission speed	Maximum 100Mbit/s
Resolution	1 / 2 / 5 / 10 / 20 / 50 / 100 μ m
Nonlinearity	$\leq \pm 0.01\%$ of full scale, minimum $\pm 50\mu$ m
Repetition accuracy	$< 0.001\%$ for full-scale taxis, minimum $\pm 1\mu$ m
Update time	1KHz (range ≤ 1 m) 500Hz ($1\text{m} < \text{range} \leq 2$ m) 250Hz ($2\text{m} < \text{range} \leq 3$ m), customizable
Hysteresis	$< 10\mu$ m
Temperature coefficient	$< 15\text{ppm}/^\circ\text{C}$

• Operating conditions

Magnet velocity	Arbitrary
Protection level	IP67RH Stainless Stell 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

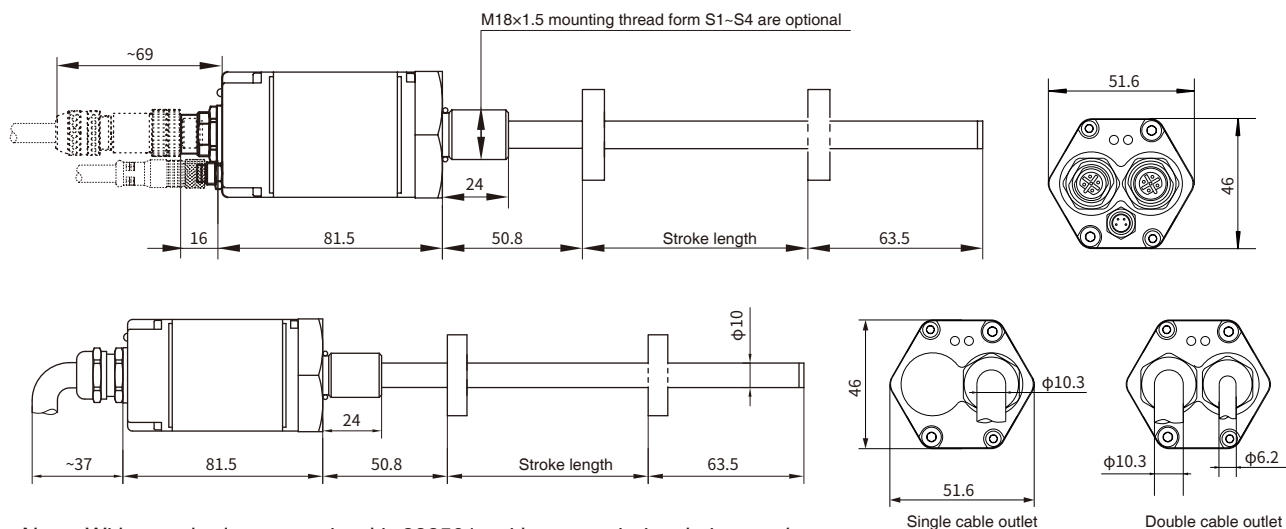
Input voltage	+24Vdc $\pm 20\%$
operating current	$< 90\text{mA}$ (varying with range)
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	$> 10\text{M}\Omega$
Insulation strength	500V

A a Installation Instructions-Profinet Output

• RH pressure-resistant rod mounting dimensions

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.

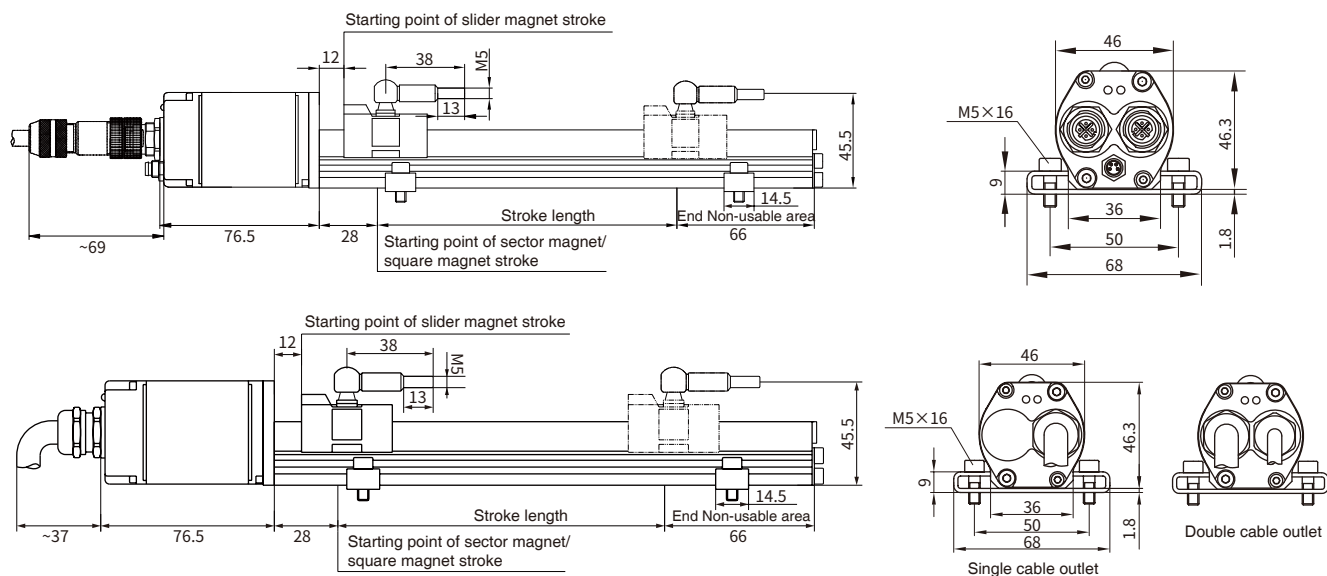
Note: The measurement Non-usable area shown in the figure indicates that the output value of the sensor in this area is zero or unreliable. The values of the head and end Non-usable areas of this product are 50.8 m and 63.5 m respectively. The value of the measurement Non-usable area can be appropriately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



Note: With standard magnet ring kit 288501, with magnetic insulation gasket and fixing screw; Plug 321723 when Connector is equipped with cable plug

• 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-Profinet Output

Accessory name/ model		Dimensions	
4-pin female connector (For power supply) Order No.: 522000-xx (xx- cable length, unit m)			
4-pin90° female connector (For power supply) Order No.: 522001-xx (xx- cable length, unit m)			
For power supply (Cat 5e) d-coded Order No.: 522004-xx (xx- cable length, unit m)		<p>Connector type: two 4-pin 90° male connectors (M12) Cable sheath: PVC, light blue operating temperature:-40 C ~80 C</p>	

Accessory name/ model		Dimensions	
For power supply (Cat 5e) d-coded Order No.: 522005-xx (xx- cable length, unit m)		<p>Connector type: RJ45, 4-pin 90° male connector (M12) Cable sheath: PVC, light blue working temperature:-40 C ~80 C</p>	
For power supply (Cat 5e) d-coded Order No.: 522006-xx (xx- cable length, unit m)		<p>Connector Type: RJ45, 4-pin straight male connector(M12) Cable sheath: PVC, light blue Working temperature:-40 C ~80 C</p>	
For power supply (Cat 5e) d-coded Order No.: 522008-xx (xx- cable length, unit m)		<p>Connector type: Two straight male connectors (M12) Cable sheath: PVC, light blue Working temperature:-40 C ~80 C</p>	

Accessory name/ model		Dimensions	
Standard magnet ring Order No.: 211501			
Sector magnet Order No.: 211502			

Accessory name/ model		Dimensions	
Slider magnet Order No.: 211503			
Square magnet Order No.: 211508			

Accessory name/ model		Dimensions	
Magnetic isolation gasket			
Sector magnetic isolation gasket			

Accessory name/ model		Dimensions	
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

● 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 1: light green, PUR sheath, 6 cores,-40C~85 C

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

X Selection Guide-Profinet Output

R
-
M
-

-

-
N
-

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18

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, unit: mm

08 - 09		Magnet ring type/mounting thread form
Only for RP 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
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),-40C~85℃ (** denotes cable length in meters)
D	B * *	Double cable outlet, light green, PUR sheath (one set of 6 cores,-40C~85C; one set of 4 cores,-40 C~70C) (**denotes cable length in meters)
P	D 5 6	two sets of 4-pin M12 female connectors, one set of 4-pin M8 male connector

Note: For supporting cables, please refer to the Selection Guide of Industrial Ethernet Cable Accessories

14 - 16		Communication interface
14	N	Profinet communication interface
15		Number of magnet rings (1~9 optional)
16		0-General, customizable

17 - 18		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-N10-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.

G Selection of Cable Accessories for Industrial Ethernet

NET - M - - - -

01 02 03 04 05 06 07 08 09 10

01 - 03	Type
N E T	Industrial Ethernet

04 - 07	Cable length
M * * *	Less than 3 digits are preceded by zeros, and M means metric system, unit m

08 - 10	Cable type, outlet mode
08	Cable type
D	PVC sheath, blue, 8-pin, shielded, CAT-5e,-40~85°C
A	PUR sheath, green, 4-pin, shielded, CAT-5eES,-40~70C
09 10	Connection
1 1	Two 4-pin connector, M12, d-code
2 2	Two 4-pin right angle male connectors, M12, d-code
1 3	One end 4-pin connector, M12, d-code, one end shielded RJ45 connector
2 3	One end 4-pin right angle male connector, M12, d-code, one end shielded RJ45 connector

- Selection example: NET-M010-D11
Indicates: Ethernet cable, 10m long, PVC sheath, blue, 8-pin, CAT-5e standard, shielded,-40~85C, 4-pin connector at both ends, M12, d-code.
- Selection example: NET-M020-A23
Indicates: Ethernet cable, 20 meters long, PUR sheath, green, 4-pin, shielded, CAT-5eES,-40~70°C, 4-pin right angle male connector at one end of the cable, M12, d-code, and shielded RJ45 connector at one end.

L LED real-time state monitoring and diagnosis

Green light	ON	ON	ON	Flash
Red light	OFF	ON	Flash	×
Function	Normal work	The network cable is not connected	Configuring	Fault

