

RH/RP Displacement Sensor- Profibus-DP Bus Output



Technical Characteristics

- Rugged and fully enclosed design
- Non-wear, non-contact measurement method
- Linear measurement, absolute output
- High resolution, up to 5µm
- Easy diagnosis, LEDs real-time condition monitoring
- Repetition accuracy is less than 0.001% F.S
- Digital technology, stable and reliable
- Direct Profibus-DP signal output
- Supports simultaneous measurement of multiple magnet ring positions

T t Product parameters-Profibus-DP bus output

• Input

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

• Output

Interface	Profibus-DP System, ISO74498
Data format	Profibus-DP (EN-50170)
Transmission speed	Maximum 12Mbit/s
Resolution	1 / 5 / 10 / 20 / 50 / 100 μ m
Nonlinearity	$\pm 0.01\%$ of full scale, minimum $\pm 50\mu$ m
Repetition accuracy	$\pm 0.001\%$ of full scale, 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	$< 15\text{ppm}/^\circ\text{C}$

• Structure and Material

Failure indication		Electronic bin coverwith 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

• Operating conditions

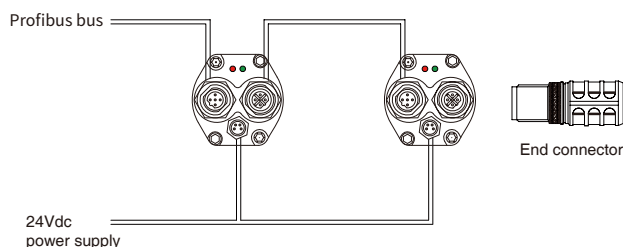
Magnet velocity	Arbitrary
Protection level	IP67RH Stainless Stell Rod/IP65RP Aluminum profile
Operating temperature	$-40^\circ\text{C} \sim +85^\circ\text{C}$
Humidity/dew point	Humidity 90%, no condensation
Shock index	GB/T2423.5 100g(6ms)
Vibration index	GB/T2423.10 20g/10~2000Hz
EMC test	GB/T17626.2/3/4/6/8,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

• Electrical connection

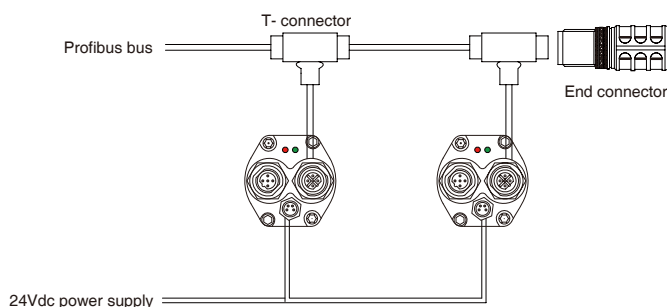
Input voltage	+24Vdc $\pm 20\%$
operating current	$< 80\text{mA}$ (varying with range)
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	$> 10\text{M}\Omega$
Insulation strength	500V

SS Output Characteristics-Profibus-DP Bus Output

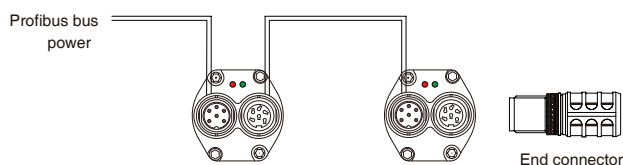
- Connection by 5-pin connector (series connection): The power supply cable is separate from the bus connection.



- Connection by 5-pin connector (parallel connection): a standard T connector with cable for bus connection, the power supply cable is separate. When any sensor on the line is disconnected, the sensors on other lines keep working.



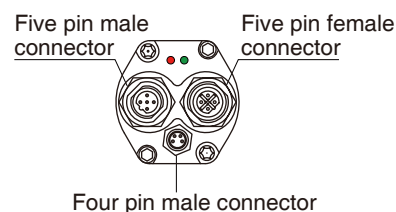
- Connection with a 6-pin connector (series connection)



LU LED Real-time State Monitoring and Diagnosis

- The integrated LEDs (red or green) provide the basic status feedback and troubleshooting function of the sensor.

Green light	ON	ON	Flash	Flash
Red light	OFF	ON	OFF	ON
Function	Normal work	Magnets not detected or incorrect number	Waiting for host parameters	Programming state



Bb Programming

- The TEC sensor can be programmed in the field using a USB converter. No need to open the electronic bin, USB port power supply, standard cable connection, fully meets the needs of customers. The following parameters of the sensor can be modified by the configuration software of PC: setting the slave station address; Graphical display of magnet ring position value; Diagnose the sensor online by error code.



USB Converter
(Order No.TEC612814)



Sensor Programming Window

A a Installation and Use Instructions - Profibus-DP Bus Output

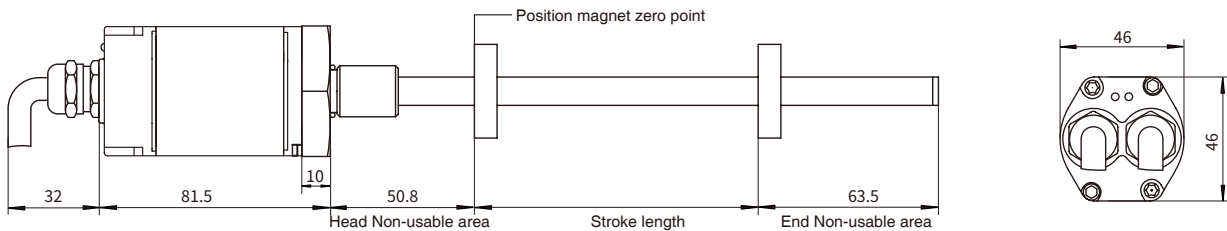
The DP output magnetostrictive sensor meets the Profibus-DP (EN 50 170) protocol. The sensor transmits the absolute position data of the magnet ring to the controller in the form of RS-485 standard serial asynchronous, and the maximum transmit rate can reach 12Mbps. The Profibus-DP interface provides powerful diagnostic and setting functions in the form of GSD data sheets.

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

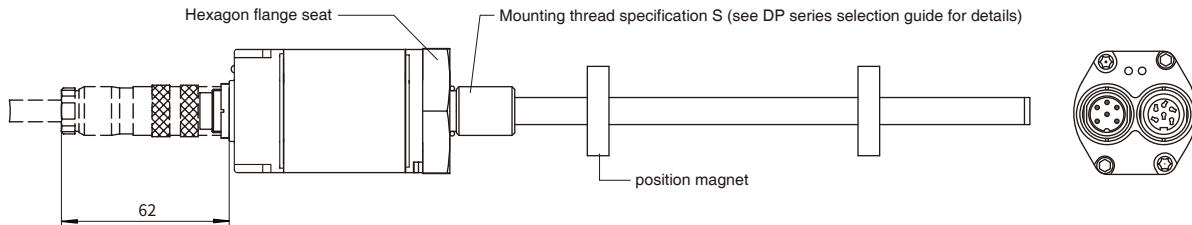
RH series pressure-resistant rodshell, built-in installation design for hydraulic system, pressure-resistant 35MPa continuous, flexible and simple installation mode, mounting thread form M18×1.5 or M20×1.5 or 3/4"-16UNF-3A.

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.

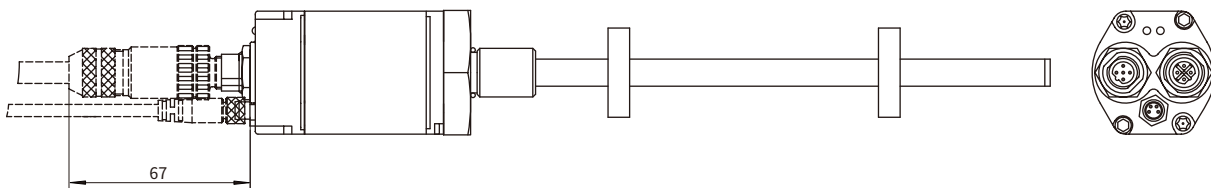
Cable outlet



Six pin Connector



Five pin Connector



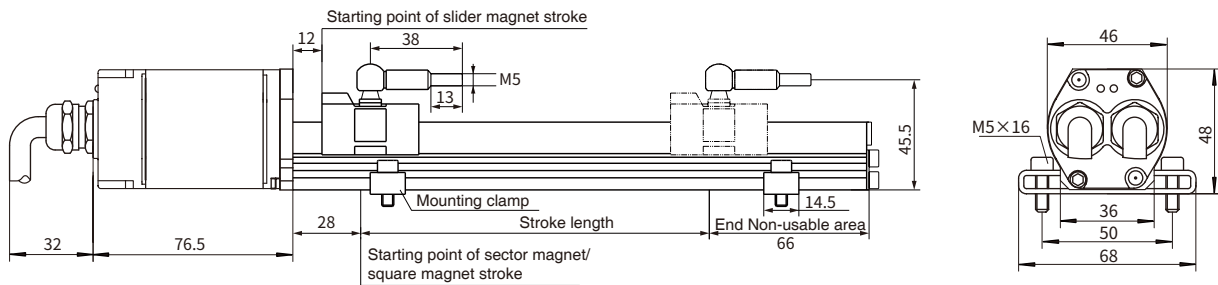
A a Installation Instructions-Profibus-DP Bus Output

• Dimensions and installation guidance of RP aluminum profile sensor

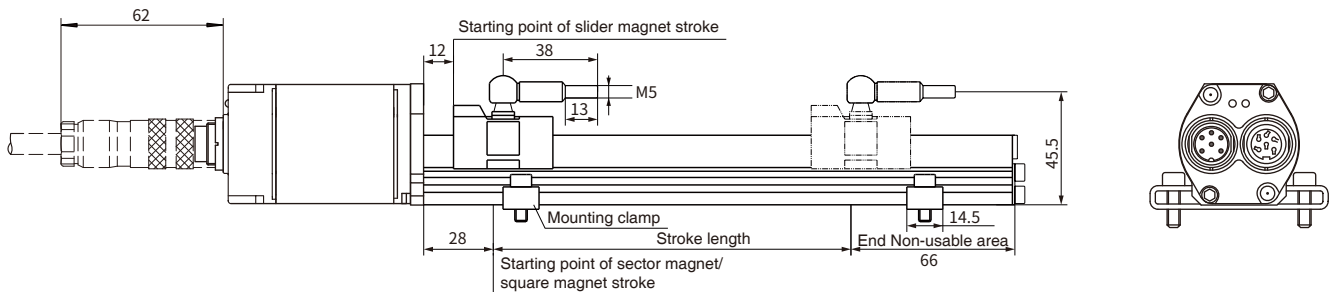
RP Series aluminum profile provides flexible and simple external installation mode, which is suitable for stroke or position detection of linear motion mechanism, and can also be used for external position detection of hydraulic cylinder.

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 value of the measurement Non-usable area at the head and end is 28mm and 66mm respectively. The value of the measurement Non-usable area can be modified appropriately according to the customer's needs, please pointed out when ordering.

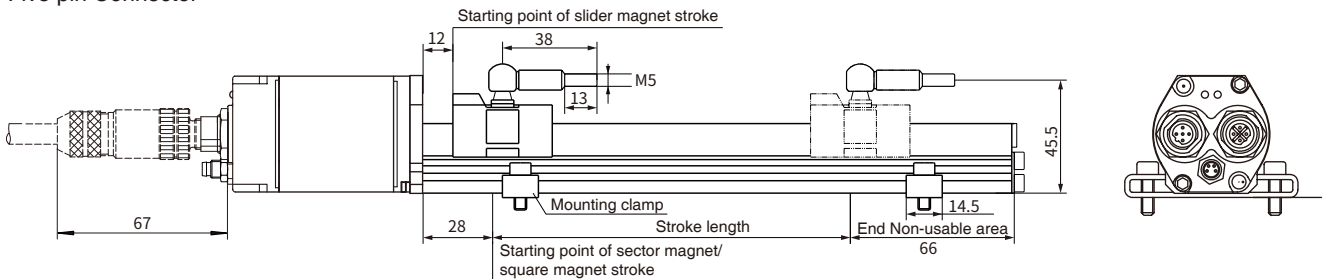
Cable outlet



Six pin Connector



Five pin Connector



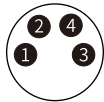
C Common Accessories-Profibus-DP Bus Output

Accessory name/ model	Dimensions	Accessory name/ model	Dimensions	Accessory name/ model	Dimensions
Standard Magnet ring Order No.: 211501		Magnetic isolation gasket		5-pin connector male head (B code) Order No.: 312706	
Sector magnet Order No.: 211502		Sector magnetic isolation gasket		5-pin female connector (B code) Order No.: 312707	
Slider magnet Order No.: 211503		Square magnet Order No.: 211508		5-pin T-shaped male connector Order No.: 312708	
Accessory name/ model	Dimensions	Accessory name/ model	Dimensions	Accessory name/ model	Dimensions
5-pin 90° Connector male Order No.: 312709		6-pin Connector male Order No.: 312714		4-pin Female Connector (For power supply) Order No.: 522000-XX xx-cable length in m	
5-pin 90° female connector Order No.: 312710		6-pin female connector Order No.: 312701		4-pin 90° female connector (For power supply) Order No.: 522001-XX xx-cable length in m	
5-pin end connector Order No.: 312705		6-pin end male connector Order No.: 312715			

Note: Please refer to "Magnet ring Selection" for details of magnet ring kit and other models.

• Wiring mode

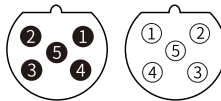
When the sensor is connector output, refer to the pin definition in the following table for wiring mode; when the sensor is cable outlet output, refer to the wire color definition in the following table for connection mode



4-pin connector socket (for power supply)

• 4-pin male connector pin arrangement (facing the sensor head direction)

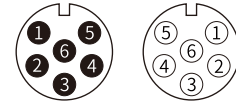
Pin	Wire color	Pin/wire function definition
1	Brown	+24Vdc power supply (-20%+20%)
2	White	Do not connect
3	Blue	0Vdc(power supply circuit)
4	Black	Do not connect



• 5-pin male connector, female connector pin arrangement (facing the direction of the sensor head)

Pin	Wire color	Pin/wire function definition
1	-	VP+5N(applicable to end wiring only) *
2	Green	RxD/TxD-N(Bus)
3	-	DGnd(end connection only) *
4	Red	RxD/TxD-P(Bus)
5	Shielded wire	Ground the cable shield

Note: * Only applicable to signal connection of sensor female connector

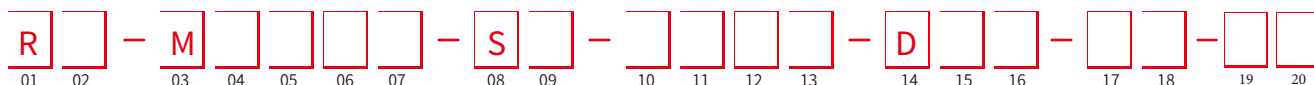


• 6-pin male connector, female connector pin arrangement (facing the direction of the sensor head)

Pin	Wire color	Pin/wire function definition
1	Green	RxD/TxD-N(bus)
2	Red	RxD/TxD-P(bus)
3	-	DGnd(for end wiring only) *
4	-	VP+5N(for end wiring only) *
5	Black	+24Vdc power supply (-20%+20%)
6	Blue	0 Vdc (power supply circuit)

Note: * Only applicable to signal connection of sensor female connector

X x Selection Guide-Profibus-DP Bus Output



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
Only for RP Series	C	1	Sector magnet
	C	2	Slider magnet
	C	3	Square magnet

10 - 13 Connection form

10 - 11 Cable outlet mode

D	A	Single cable outlet, PUR sheath, cyan, -20~80°C, end scattered
D	B	Double cable outlet, PUR sheath, cyan, -20~80°C, end scattered
D	C	Double cable outlet, PUR sheath, cyan, -20~80°C, M16, 6-pin, end with a male connector and a female connector

12 - 13 Cable outlet: cable length, 01 to 99 meters

10 - 13 Connector mode

P	D	5	3	One set of 5-pin male connector (M12), one set of 5-pin female connector (M12), One set of 4-pin male connectors (M8)
P	D	6	3	One set of 6-pin male connectors (M16), one set of 6-pin female connectors (M16)

Note: See Profibus-DP cable accessories selection for supporting cables

14 - 16 Signal output mode

14	Profibus Protocol
15	Number of magnet rings (1~9 optional)
16	0-single magnet B-single/multiple magnet rings

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)

19 - 20 Country

		Refer to the country list, page 130.
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- Note: The forward output of the sensor means that when the magnet ring moves away from the electronic bin, the output value increases and decreases when the magnet ring moves in the reverse direction.

- Selection example: RH-M0300-S1-PD53-D10-S0-CN

Indicates: The ordered product model is RH structure displacement sensor, with a measuring range of 300mm, mounting thread form of M18×1.5 (metric system), measuring rod diameter of 10mm, 304 material, 5-pin Connector connection, Profibus signal output, single magnet ring, head end Non-usable area of 50.8mm and end Non-usable area of 63.5mm.

P p Profibus-DP Cable Accessories Selection

D	P	-	M				-			
01	02		03	04	05	06		07	08	09

01 - 02	Type
D P	Profibus-DP interface

03 - 06	Cable length
M * * *	Less than 3 digits are preceded by zeros, and M means metric system, unit m

07 - 09	Cable type、utlet mode
H 0 1	One end of 5-pin (M12) female connector, and one end scattered
H 0 2	One end of 5-pin (M12) female connector, and one end scattered
H 0 3	One end of 5-pin (M12) right angle female connector, and one end scattered
H 0 4	One end of 5-pin (M12) right angle maleconnector, and one end scattered
Z 0 5	One end of 6-pin (M16) female connector, and one end scattered
Z 0 6	One end of 6-pin (M16) female connector, and one end scattered
Z 0 7	One end of 6-pin (M16) right angle female connector, and one end scattered
H 1 2	One end of 5-pin (M12) female connector; One end of 5-pin (M12) female connector
H 3 4	One end of 5-pin (M12) right angle male connector; One end of 5-pin (M12) right angle female connector
Z 5 6	One end of 6-pin (M16) male connector and one end of 6-pin (M16) is female connector

Note	H: Cable type, PUR sheath, purple, 2 cores,-20~80℃
	Z: Cable type, PUR sheath, cyan, 5-pin,-20~80C℃

- Selection example: DP-M020-H01

Indicates: Profibus-DP interface cable, 20 meters long, PUR sheath, purple, 2 cores,-20~80℃, 5-pin (M12) at one end of the cable are female connector, and the other end is scattered.

- Selection example: DP-M015-Z56

Indicates: Profibus-DP interface cable, with a length of 15m, PUR sheath, cyan, 5 cores,-20~80℃, with 6-pin (M16) at one end male connector and 6-pin (M16) at the other end female connector.