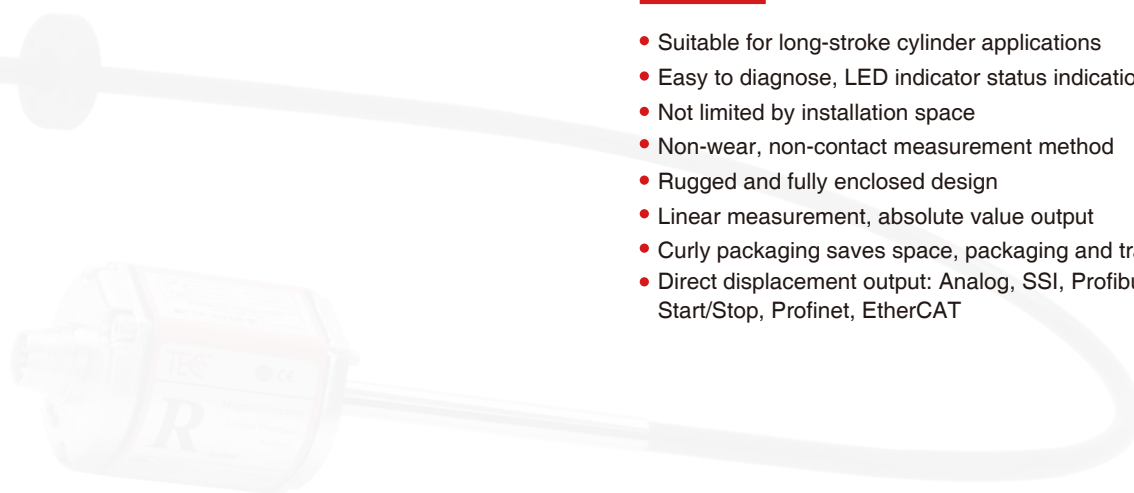


# RF Flexible Outer Tube Displacement Sensor



## Technical Characteristics

- Suitable for long-stroke cylinder applications
- Easy to diagnose, LED indicator status indication
- Not limited by installation space
- Non-wear, non-contact measurement method
- Rugged and fully enclosed design
- Linear measurement, absolute value output
- Curly packaging saves space, packaging and transportation costs
- Direct displacement output: Analog, SSI, Profibus-DP, CANopen, Start/Stop, Profinet, EtherCAT



## CC Product Parameters

### • Input

Measurement data	Position magnet ring
Stroke length	500~7620mm, customized according to customer needs, Up to 23 meters
Number of measurements	1~9

### • Output

Interface	Profibus-DP
Resolution	1 / 5 / 10 / 20 / 50 / 100 μm
Nonlinearity	<±0.01% of full scale, minimum ±50μm
Repetition accuracy	<±0.001% of full scale, min. 1μm
Hysteresis	<10μm
Update time	1KHz (range ≤1m)      500Hz (1m < range ≤2m) 250Hz (2m < range ≤3m), customizable
Temperature coefficient	<30ppm/°C

### • Operating conditions

Magnet velocity	Arbitrary
Protection level	IP65 (When combined with pressure-resistant outer tube, the protection level can reach IP67)
Operating temperature	-40°C ~ +85°C (up to 105°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

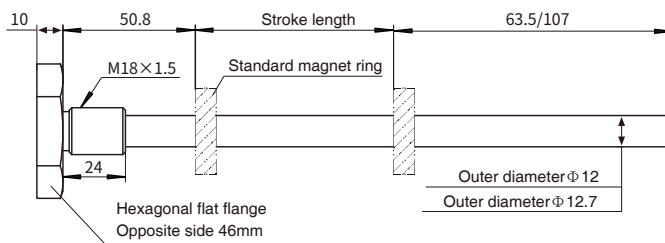
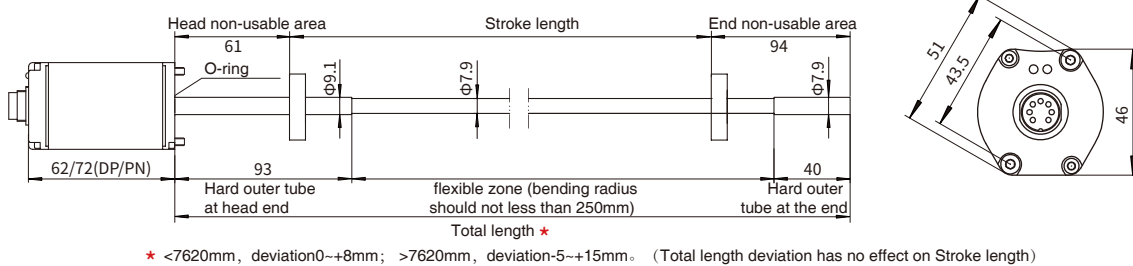
Input voltage	+24Vdc±20%
operating current	<90mA (varying with range)
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	>10MΩ
Insulation strength	500V

### • Structure and materials

Failure indication	Electronic bin cover with LEDs display
Electronic bin	Aluminum alloy
Measuring rod	Stainless steel hose, minimum bending radius 250mm, shipping radius 400mm
Position magnet	Standard magnet ring and various ring magnets
Installation direction	Any direction
Outgoing mode	Cable outlet or Connector

## A a Installation and Use Instructions

### • Dimensions of RF flexible outer tube sensor



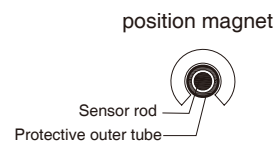
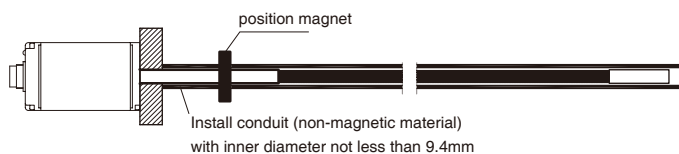
**Option:** Pressure-resistant outer pipe with flange, outer diameter 12mm/12.7mm

The flanged pressure-resistant outer pipe is used to cooperate with RF flexible sensor, which can withstand 35MPa pressure for hydraulic cylinder and provide protection for RF sensor. For large Cylinder, it is necessary to drill a  $\phi 18$ mm deep hole in the piston rod when selecting the pressure pipe with 12mm outer diameter, which can match our magnet ring with large inner diameter.

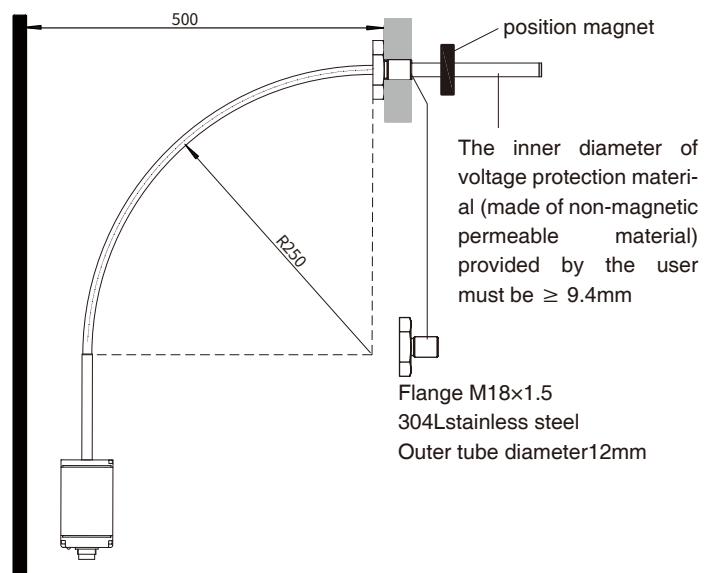
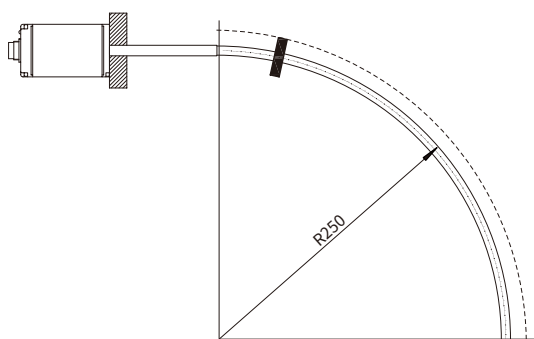
### • Installation instruction of RF flexible outer tube sensor

Two non-magnetic bolts are required for the installation of the sensor electronic bin. Long-stroke sensors need non-magnetic tube support (inner diameter  $\geq 9.4$ ), or bend into the desired shape. Sensors with hexagonal flanges can be easily mounted using non-magnetic bolts. Or you can choose a flanged pressure-resistant outer pipe with an outer diameter of 12mm, with a maximum stroke of 7620mm.

#### Linear measurement (external installation)



#### Arc measurement (external installation)



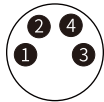
## C Common Accessories-Profibus-DP Bus Output

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	
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

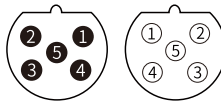
When the sensor is connector output, refer to the pin definition in the following table for wiring mode; when the sensor is cable outlet output, refer to the wire color definition in the following table for connection mode



4-pin connector socket (for power supply)

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

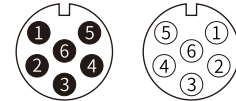
Pin	Wire color	Pin/wire function definition
1	Brown	+24Vdc power supply (-20%+20%)
2	White	Do not connect
3	Blue	0Vdc(power supply circuit)
4	Black	Do not connect



#### • 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 wire

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

R	F	-	M					-	C		-					-	D			-			-		
01	02		03	04	05	06	07		08	09		10	11	12	13		14	15	16		17	18		19	20

01 - 02	Sensor shell form
R F	Hose shell

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
C 1	Without flange
C 2	With flange M18×1.5
C 3	With flange M20×1.5
C 4	With flange 3/4"-16UNF-3A

10 - 13	Connection form
---------	-----------------

10 - 11	Cable outlet mode
D A	Single cable outlet, PUR sheath, cyan,-20~80℃, end scattered
D B	Double cable outlet, PUR sheath, cyan,-20~80℃, end scattered
D C	Double cable outlet, PUR sheath, cyan,-20~80℃, end M16, 6-core, one male connector, one female connector

12 - 13	Cable outlet mode: cable length, 01~99 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 connector (M8)
P D 6 3	A set of 6-pin male connector (M16), a set of 6-pin female connector (M16)

**Note:** For supporting cables, please refer to Profibus-DP Cable Accessories Selection Guide

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
S 9	50.8mm+107mm

19-20	Country
	Refer to the country list, page 130.

## 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.