

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	Multiple, depending on the output interface

• Output

Interface	Analog
Resolution	16-bit D/A or 0.0015% of full scale (min 1 μ m)
Nonlinearity	< \pm 0.01% of full scale, minimum \pm 50 μ m
Repetition accuracy	< \pm 0.001% of full scale, min. 1 μ m
Hysteresis	<10 μ m
Update time	1KHz (range \leq 1m) 500Hz (1m<range \leq 2m) 250Hz (2m<range \leq 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 to105 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

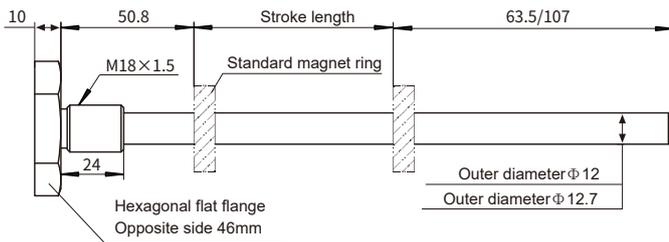
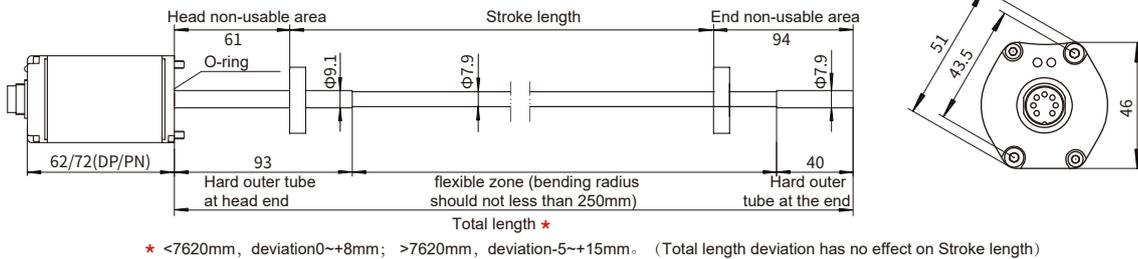
Input voltage	+24Vdc \pm 20%
operating current	<90mA (varying with range)
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	> 10M Ω
Insulation strength	500V

• 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



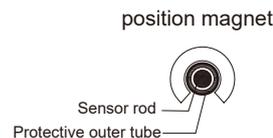
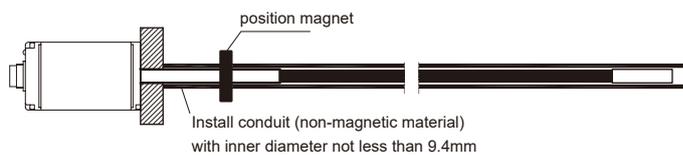
Option: Pressure-resistant outer pipe with flange, outer diameter 12mm/12.7mm

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.

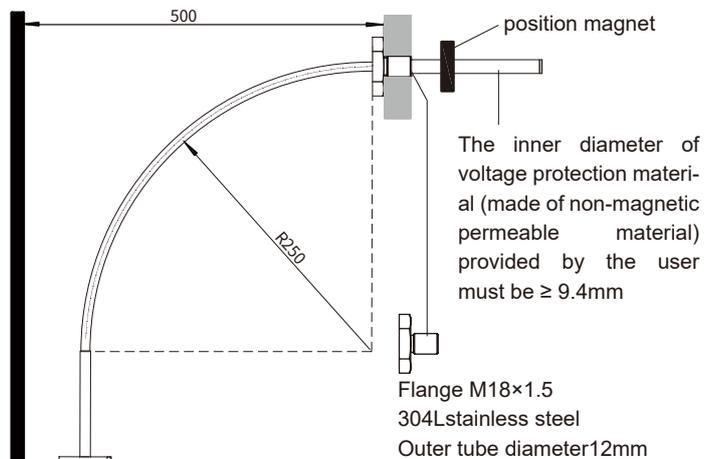
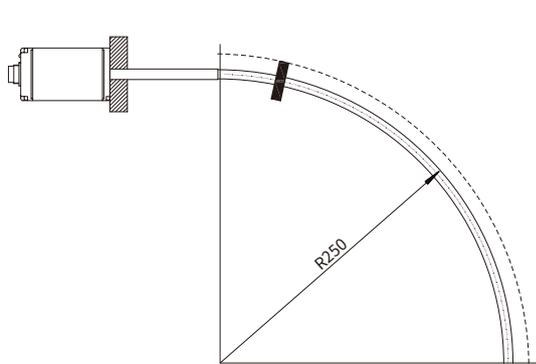
• Installation instruction of RF flexible outer tube sensor

Two non-magnetic bolts are required for the installation of the sensor electronic bin. Long-stroke sensors need non-magnetic tube support (inner diameter ≥ 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)



Common Accessories - Analog Output

Accessory name/ model	Dimensions	Accessory name/ model	Dimensions	Accessory name/ model	Dimensions
Standard magnet ring Order No.: 211501		Magnetic isolation gasket		6-pin Female Connector Order No.: 312701	
Sector magnet Order No.: 211502		Sector magnetic isolation gasket		6-pin 90 Female Connector Order No.: 312702	

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

J Wiring Mode

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

Analog



• Pin arrangement of six-pin male connector (facing the sensor head)

Pin	Wire color 1*	Wire color 2*	Pin/wire function definition
1	Blue	Grey	No.1 Magnet position signal(+)
2	Green	Pink	Position signal of No.1 Magnet(-)
3	Yellow	Yellow	Reservation
4	White	Green	Reservation
5	Red	Brown	+24Vdc power supply (-20%~+20%)
6	Black	White	0 Vdc (power supply circuit)

Analog

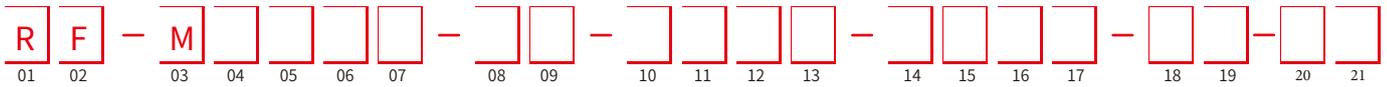


• Pin arrangement of eight-pin male connector (facing the sensor head direction)

Pin	Wire color3*	Pin/wire function definition
1	Yellow	Current output
2	Grey	0Vdc(Current/Voltage Loop)
3	Pink	Reservation
4	-	Reservation
5	Green	0...10V
6	Blue	0 Vdc (power supply circuit)
7	Brown	+24Vdc power supply (-20%~+20%)
8	White	Reservation

Note: * Wire color 1: Cable PUR sheath, orange,-20-90 C
* Wire color 2/3: Cable PVC sheath, orange,-20-105 C

X x Selection Guide-Analog



01 - 02 Sensor shell form

R	F	Hose shell
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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

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	H	PUR sheath, orange,-20~90℃, end scattered, wire color 1
D	U	PVC sheath, orange,-20~105℃, end scattered, wire color 2
D	B	PVC sheath, orange,-20~105℃, end scattered, wire color 3
D	I	PUR sheath, orange,-20~90℃, end with 6-pin connector
D	V	PVC sheath, orange,-20~105℃, end with 6-pin connector
D	C	PVC sheath, orange,-20~105℃, end with 8-pin connector

12 - 13 Cable length, 01~99 units: meters (Cable outlet mode)

10 - 13 Connector mode

P	H	6	0	M16 male connector (6-pin)
P	B	8	0	M16 male connector (8-pin)

Note: For supporting cables, please refer to Analog/Start-Stop Cable Accessories Selection Guide

14 - 17 Signal output mode

14 - 15 Output form and direction

A	0	Current output, 4 ~ 20mA
A	1	Current output, 20 ~ 4mA
A	2	Current output, 0 ~ 20mA
A	3	Current output, 20 ~ 0mA
V	0	Voltage output, 0 ~ 10V
V	1	Voltage output, 10 ~ 0V
V	2	Voltage output, -10 ~ +10V
V	3	Voltage output, +10 ~ -10V
V	4	Voltage output, 0 ~ 5V
V	5	Voltage output, 5 ~ 0V
V	6	Voltage output, -5 ~ +5V
V	7	Voltage output, +5 ~ -5V

16 Number of magnet rings

1	Single magnet ring
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17 No magnet ring state

A	Keep the original value
B	Maximum value
C	Minimum value

18 - 19 Non-usable area at head and end, customizable

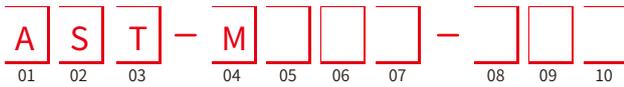
S	0	50.8mm+63.5mm
S	9	50.8mm+107mm
S	B	61mm+94mm

20-21 Country

[][]	Refer to the country list
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- Description: RF regular stroke is 500~7620mm, if you need longer stroke, please call our company to customize.
- Selection example:RF-M6000-C1-PH60-A01C-S0-CN
Indicates: the installation mode of the ordered product is built-in RF flexible structure, the stroke length is 6000m, six pin connector, 4-20A output, the output value of non-magnet ring is the minimum value, the single magnet ring, without connecting flange, the non-usable area at the head is 50.8mm, and the non-usable area at the end is 63.5mm.

M M Selection of Analog/Start-Stop Cable Fittings



01 - 03	Type
A S T	Analog/Start-Stop interface
04 - 07	Cable length
M * * *	Less than 3 digits are preceded by zeros, and M means metric system, unit m
08 - 10	Cable type and outlet mode
H 0 1	One end of 6-pin (M16) female connector, and one end scattered, wire color 1
H 0 3	One end of 6-pin (M16) right angle female connector, and one end scattered, wire color 1
U 0 1	One end of 6-pin (M16) female connector, and one end scattered, wire color 2
U 0 2	One end of 8-pin (M16) female connector, and one end scattered, wire color 3
U 0 3	One end of 6-pin (M16) right angle female connector, and one end scattered, wire color 2
U 0 4	One end of 8-pin (M16) right angle female connector, and one end scattered, wire color 3
Note	H: Cable type, PURsheath, orange, -20~90 °C
	U: Cable type, PVCsheath, orange, -20~105 °C

- Selection example: AST-M005-H01
Indicates: Analog or Start-Stop interface cable, cable length 5 meters, PURsheath, orange, -20~90°C, one end of the cable is 6-pin (M16) female connector, and one end scattered.
- Selection example:AST-M010-U04
Indicates: Analog or Start-Stop interface cable, cable length 10 meters, PVC sheath, orange, -20~105C, one end of the cable is an 8-pin (M16) right angle female connector, and one end scattered.

