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

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	CANBus System Protocol, IS0 DIS11898　CANopen　CIA Standard DS-301V3.0 Encoder Profile DS-406V3.1
Resolution	1 / 2 / 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/℃

• Operating conditions

Magnet velocity	Arbitrary
Protection level	IP65（When combined with pressure-resistant outer tube，the protection level can reach IP67）
Operating temperature	-40℃ ~ +85℃（up to105℃）
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

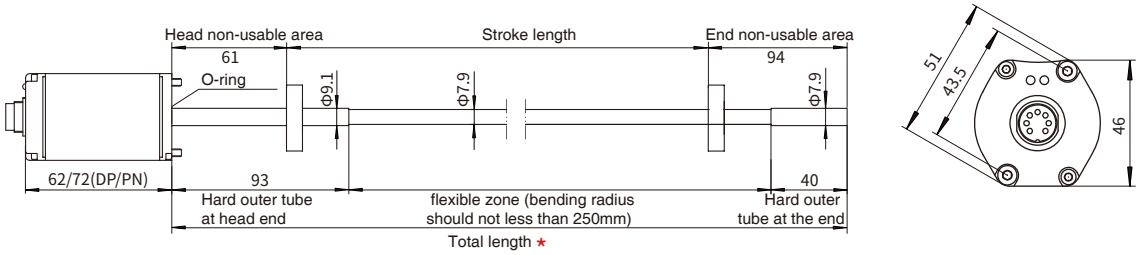
Input voltage	+24Vdc±20%
operating current	＜90mA（varying with range）
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	＞10MΩ
Insulation strength	500V

• Structure and materials

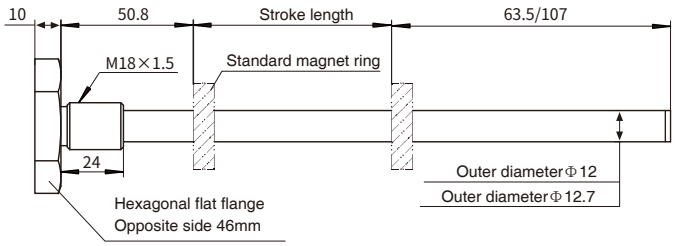
Failure indication	Electronic bin cover with LEDs display
Electronic bin	Aluminum alloy
Measuring rod	Stainless steel hose, minimum bending radius 250mm, shipping radius 400mm
Position magnet	Standard magnet ring and various ring magnets
Installation direction	Any direction
Outgoing mode	Cable outlet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

Aa Installation and Use Instructions

• Dimensions of RF flexible outer tube sensor



★ <7620mm，deviation0~+8mm； >7620mm，deviation-5~+15mm。（Total length deviation has no effect on Stroke length）



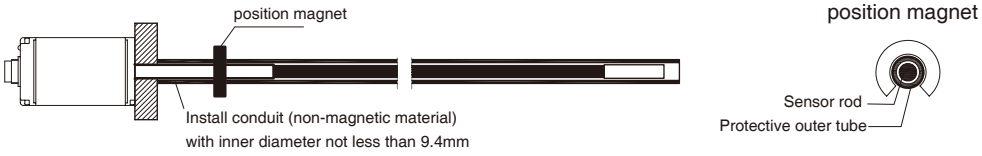
Option: Pressure-resistant outer pipe with flange, outer diameter 12mm/12.7mm

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 ϕ18mm 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.

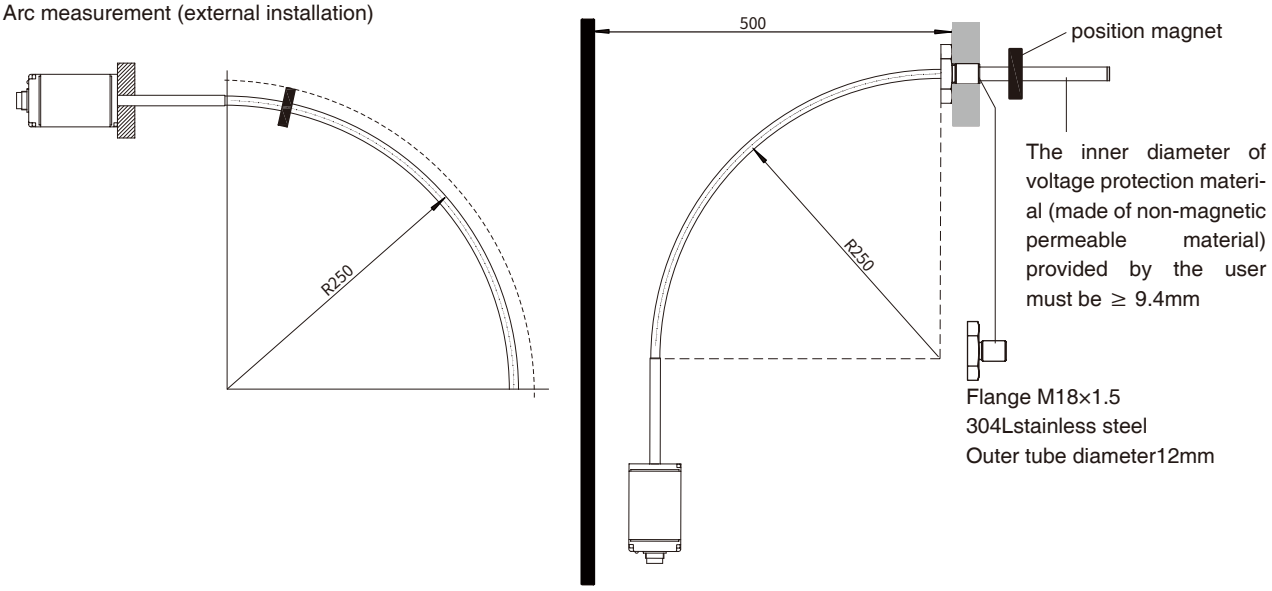
• Installation instruction of RF flexible outer tube sensor

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.

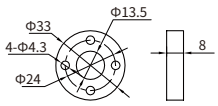
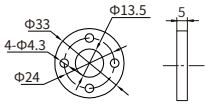
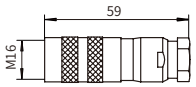
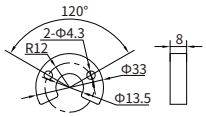
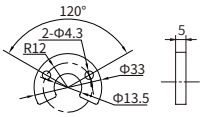
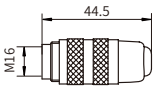
Linear measurement (external installation)



Arc measurement (external installation)



Common Accessories - CAN Bus Output

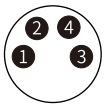
Accessory name/ model	Dimensions	Accessory name/ model	Dimensions	Accessory name/ model	Dimensions
Standard Magnet ring Order No.: 211501		Magnetic isolation gasket		6-pin female connector Order No.: 312701	
Sector magnet Order No.: 211502		Sector magnetic isolation gasket		6-pin end female connector Order No.: 312722	

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

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 wire color definition in the following table for connection mode

CAN Bus output
Four-pin connector socket (for power supply)



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

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

CAN Bus output

- Five-pin male connector and female connector pin arrangement (facing the sensor head direction)

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

CAN Bus output

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

Pin	Wire color	Pin/wire function definition
1	Green	CAN (-)
2	Yellow	CAN (+)
3	-	Do not connect
4	-	Do not connect
5	Brown	+24Vdc power supply (-20%~+20%)
6	White	0 Vdc (power supply circuit)

Selection Guide-CAN Bus

R	F	–	M					–			–					–	C					–		–		
01	02		03	04	05	06	07		08	09		10	11	12	13		14	15	16	17	18		19	20		21	22

01 - 02 Sensor shell form

RF	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

C1	Without flange
C2	With flange M18×1.5
C3	With flange M20×1.5
C4	With flange 3/4"-16UNF-3A

10 - 13 Connection form

10 - 11 Cable outlet mode

DA	PVC sheath, purple, 4 cores,-40℃~75℃, end scattered

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

0DR1	PVC sheath, length 150mm, end 5-pin male connector

10 - 13 Connector mode

PD60	6-pin male connector (M16)
PD62	Two sets of 6-pin male connector (M16)
PD50	5-pin male connector (M12)
PD52	5-pin male connector (M12), one set of 5-pin female connector (M12)
PD54	5-pin male connector (M12), 5-pin female connector (M12), 4-pin male connector (M8)

Note: For supporting cables, please refer to CAN Bus cable Accessories selection

14 - 18 Signal output mode

14 Interface

C	CAN bus

15 Protocol type

1	CANopen	2	CANBasic

16 Baud

1	1000kBit/s	2	800kBit/s
3	500kBit/s	4	250kBit/s
5	125kBit/s	6	100kBit/s
7	50kBit/s	8	20kBit/s

17 Resolution

1	0.1mm	2	0.05mm
3	0.02mm	4	0.01mm
5	0.005mm	6	0.002mm
7	0.001mm		

18 Number of Magnet rings（1~9 optional）

19 - 20 Non-usable area at head and end, customizable

S0	50.8mm+63.5mm
S9	50.8mm+107mm

21-22 Country

Refer to the country list

Selection of CAN Bus Cable Accessories

C	A	N	–	M				–			
01	02	03		04	05	06	07		08	09	10

01 - 03	Type
C A N	CAN Bus
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
C	PVC sheath, purple, 4 cores,-40~75C
09 - 10	Connection
0 1	One end of 6-pin (M16) female connector, and one end scattered
0 2	One end of 5-pin (M12) female connector, and one end scattered
0 3	One end of 5-pin (M12) male connector, and one end scattered
0 4	One end of 5-pin (M12) right angle female connector, and one end scattered
0 5	One end of 6-pin (M16) right angle female connector, and one end scattered
1 1	6-pin (M16) female connector at both ends
2 3	One end 5-pin (M12) female connector and one end 5-pin (M12) male connector

- Selection example: CAN-M015-C01

  Indicates: CAN bus interface cable, 15m long, PVC sheath, purple, 4-pin,-40~75C, 6-pin (M16) at one end of the cable are female connector, and one end scattered.

- Selection example: CAN-M020-C23

  Indicates: CAN bus interface cable, 20 meters long, PVC sheath, purple, 4 cores,-40~75C, with 5-pin (M12) at one end female connector and 5-pin (M12) at the other end male connector.