RB Flat Displacement Sensor

Technical Characteristics

- Non-wear, non-contact measurement method
- Rugged and fully enclosed design
- Linear measurement, absolute position output
- Low power consumption design effectively reduces system heating
- Sealing grade up to IP67
- Multiple signal type optional：Analog、SSI、CANopen

Product Parameters

• Input

Measurement data	Position Magnet ring
Stroke length	50mm~5500mm， customized according to customer's needs
Number of measurements	1

• Output

Interface	Analog、SSI、CANopen
Resolution	Analog: 16-bit D/A or 0.0015% of full scale (min. 1μm) Digital quantity: 1 / 2 / 5 / 10 / 20 / 40 / 50 / 100 μm
Nonlinearity	< ± 0.01% of full scale, Min. ± 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 ring velocity	Arbitrary
Protection level	IP67
Operating temperature	-40℃ ~ +85℃
Humidity/dew point	100%，relative humidity
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	＜100mA（varying with range）
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	＞10MΩ
Insulation strength	500V

• Structure and materials

Electronic bin	304 stainless steel
Measuring rod	304 stainless steel
Outer tube pressure resistance	35MPa (continuous)/70MPa (peak) or 350ba (continuous)/700ba (peak)
Position magnet	Standard magnetic ring and various ring magnets
Mounting thread	6 M6X16 screws， M18×1.5、 M20×1.5（Customizable）
Installation direction	Any direction
Connection type	Cable outlet or connector

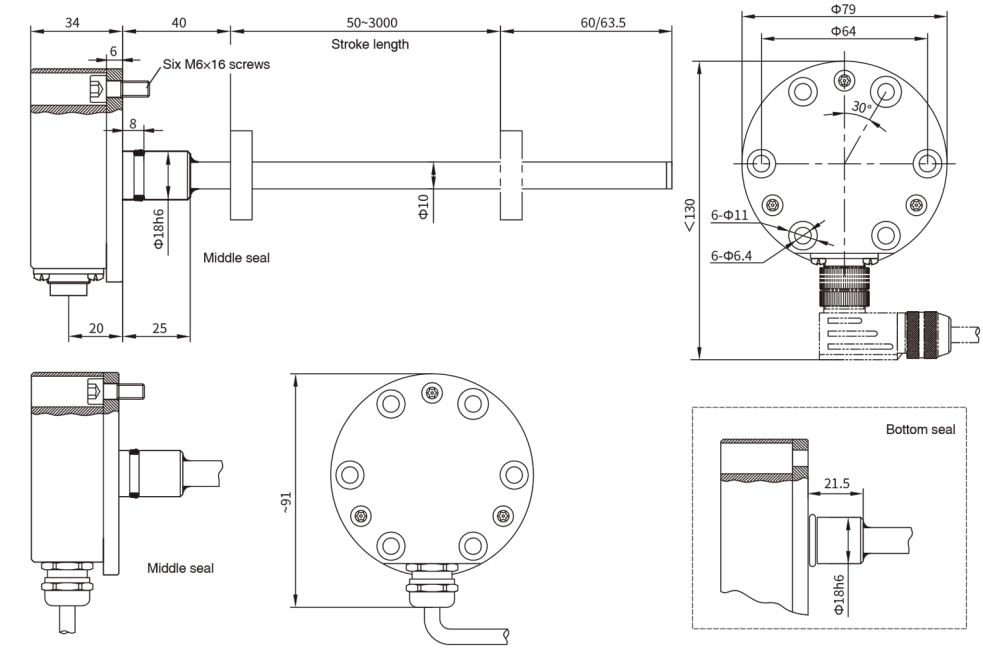
A a Installation and Instructions for use

Output characteristic

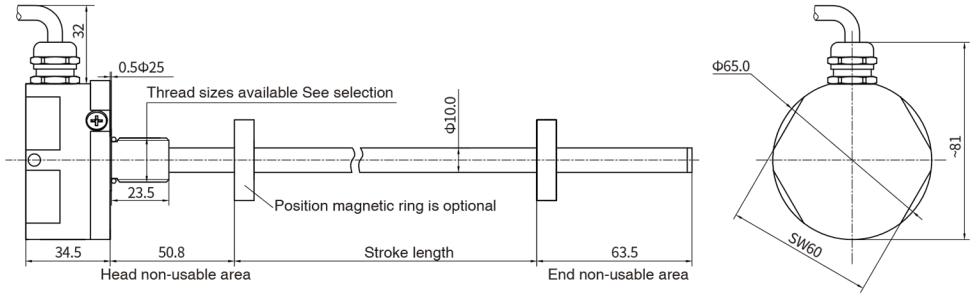
RB series sensors have high-strength protective shell and high working temperature, and are durable, which can provide users with continuous, reliable and real-time displacement signals in harsh environment. The sensor has a completely stainless steel shell. It is suitable for installing in hydraulic cylinder and measuring the stroke of piston, and is widely used in energy and mining industries. Thanks to its flat and compact design, the sensor is very suitable for cylinder installation in narrow space.

Installation dimensions

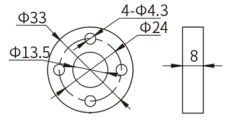
Tight pressure seal type

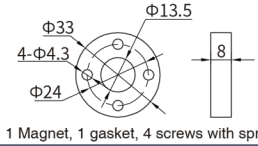


External thread type(Only cable outlet mode are supported)



C c Commonly used accessories

Accessory name/ model	Dimensions
Standard magnetic ring Order No.: 211501	

Accessory name/ model	Dimensions
Standard Magnet ring Kit Order No.: 288501	 Includes: 1 Magnet, 1 gasket, 4 screws with spring washer

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

Selection Guide-Analog Quantity

R	B	–	M					–			–					–					–		
01	02		03	04	05	06	07		08	09		10	11	12	13		14	15	16	17		18	19

01 - 02 Sensor shell form

R B	Compact sealing installation

03 - 07 Stroke length

Four digits, less than four digits are preceded by zero, M means metric system, unit mm

08 - 09 Installation form

S 1	Bottom seal
S 2	Middle seal
S A	M18X1.5 measuring rod diameter 10mm, 304 material
S B	M20X1.5 measuring rod diameter 10mm, 304 material

10 - 13 Connection form

10 - 11 For cable outlet

D H	PUR sheath, orange,-20~90℃, end scattered, cable color 1
D U	PVC sheath, orange,-20~105℃, end scattered, cable color 2
D B	PVC sheath, orange,-20~105℃, end scattered, cable 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 For cable outlet: cable length, 01~99 meters

10 - 13 For connector

P H 6 0	M16 male connector (6 pins)
P B 8 0	M16 male connector (8 pins)

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

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 ring

1	Single magnet ring

17 No magnet ring state

A	Keep the original value
B	Max. value
C	Min. value

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

S 4	40mm+60mm

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.

Examples of selection: RB-M3600-S1-PH60-A01C-S4

Indication: The product is a compact sealed RB structure, with an effective stroke of 3600 mm, a bottom sealed M18×1.5, six-pin connector, output of 4-20 mA, Min. output value of no magnet ring state, single magnet ring, non-usable area of 40mm at the head and 60mm at the end.

Selection Guide-SSI

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

01 - 02 Sensor shell form

R	B	Compact sealing installation

03 - 07 Stroke length

Four digits, less than four digits are preceded by zero, M means metric system, unit mm

08 - 09 Installation form

S	1	Bottom seal
S	2	Middle seal
S	A	M18X1.5 measuring rod diameter 10mm, 304 material
S	B	M20X1.5 measuring rod diameter 10mm, 304 material

10 - 13 Connection form

10 - 11 For cable outlet

D	H	PUR sheath, orange,-20~90℃, end scattered, cable color 1
D	U	PVC sheath, orange,-20~105℃, end scattered, cable color 2
D	B	PVC sheath, orange,-20~105℃, end scattered, cable color 3
D	I	PUR sheath, orange,-20~90℃, end with 7-pin connector
D	V	PVC sheath, orange,-20~105℃, end with 7-pin connector
D	C	PVC sheath, orange,-20~105℃, end with 8-pin connector

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

10 - 13 For connector

P	H	7	0	M16 male connector (7 pins)
P	B	8	0	M16 male connector (8 pins)

Note: See SSI cable fittings selection for supporting cables

14 - 19 Signal output mode

15 Data length

1	24bit	2	25bit	3	26bit*

* 26-bit are parity bits and 25-bit are status bits

16 Data format

B	Binary	G	Gray code

17 Resolution

1	0.1mm	2	0.05mm
3	0.02mm	4	0.01mm
5	0.005mm	6	0.002mm
7	0.001mm	8	0.04mm

18 Direction

0	Forward	1	Reverse

19 Mode

0	Regular

20 - 21 Non-uasble area at head and end, customizable

S	4	40mm+60mm

XX Selection Guide-CAN Bus

R	B	–	M					–			–					–	C					–		
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	B	Compact sealing installation

03 - 07 Stroke length

Four digits, less than four digits are preceded by zero, M means metric system, unit mm

08 - 09 Installation form

S	1	Bottom seal
S	2	Middle seal
S	A	M18X1.5 measuring rod diameter 10mm, 304 material
S	B	M20X1.5 measuring rod diameter 10mm, 304 material

10 - 13 Connection form

10 - 11 For cable outlet

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

12 - 13 Straight-out cable mode: cable length, 01~99 meters

0	D	R	1	PVC sheath, length 150mm, end with 5-pin connector

10 - 13 For connector

P	D	6	0	Set of 6-pin male connectors (M16)

Note: For supporting cables, please refer to CAN bus cable fittings 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

S	4	40mm+60mm