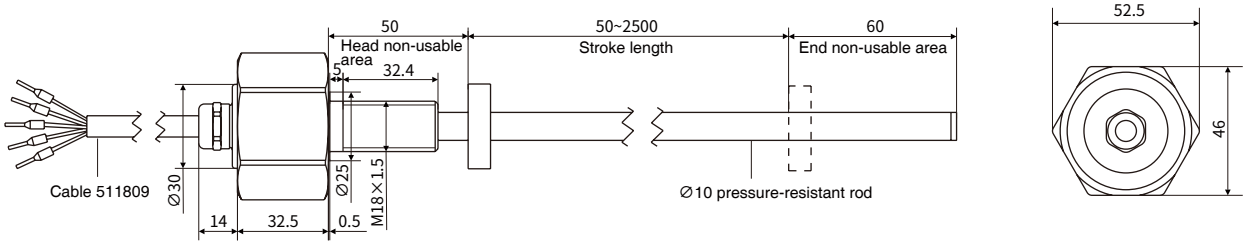
MHA Displacement Sensor

Technical characteristics

- Non-contact measurement
- Linear measurement, absolute position output
- Adapt to harsh environment, IP67 protection level
- Multiple signal (analog and digital signal) output modes
- Specially designed for construction machinery
- High vibration resistance and impact resistance
- Low power consumption design effectively reduces system heating
- Quick assembly through external threads

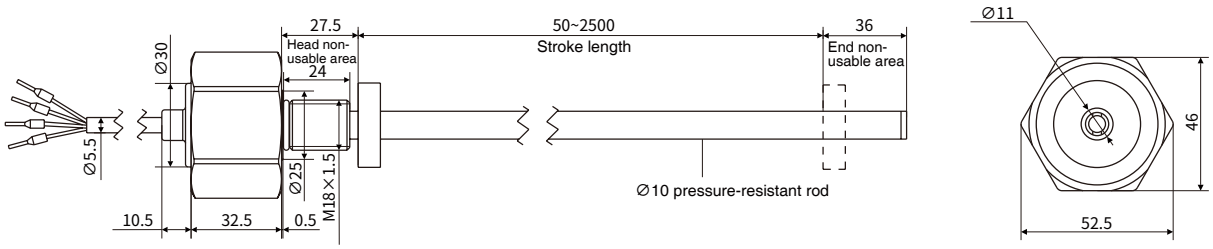
Structural Shape

External dimensions of cable outlet (fastening mode DE)

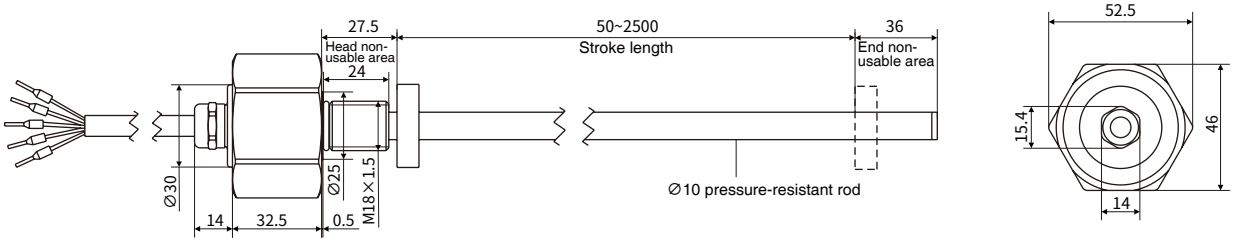


Custom flange：TEC-0204-G3-SC1962_V1.0

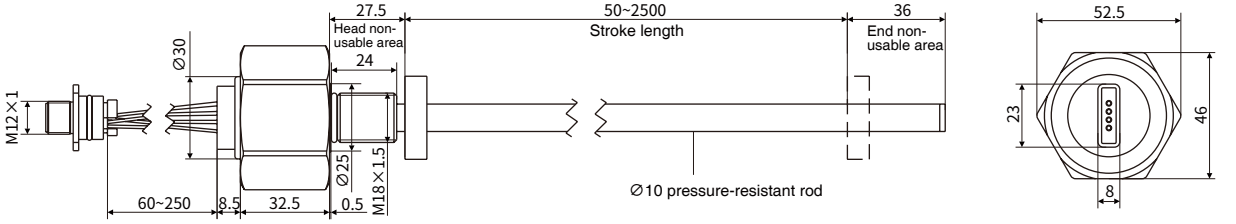
External dimensions of cable outlet (fastening method QM)



External dimensions of cable outlet (fastening mode DM)

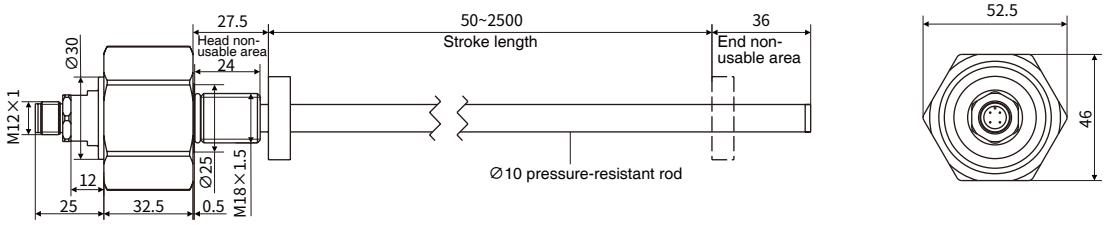


Connector external dimensions (standard type)



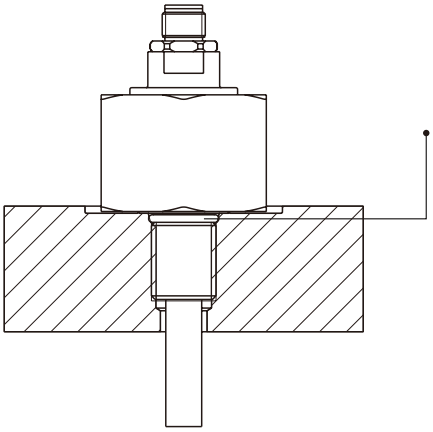
Structural Shape

Connector external dimensions (customized type)



Assembly mode

To seal the flange contact surface by assembling 15.4x2.1 mmO rings in the cut, threaded holes conforming to ISO6149-1 standard must be provided.

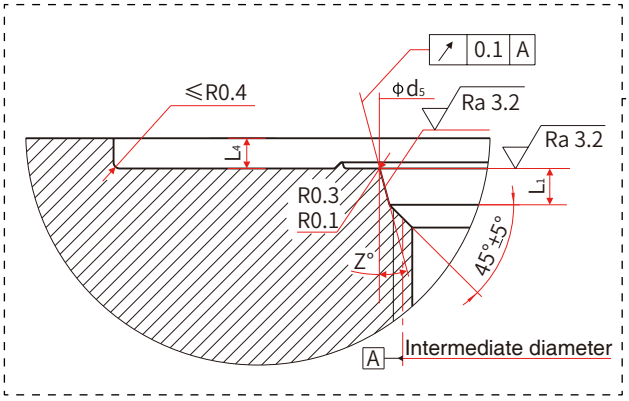


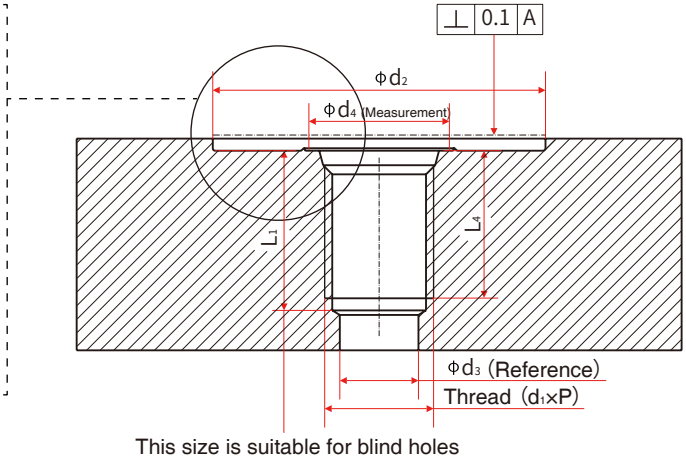
- Seal by O-ring in flange cut

Note::
1.The fastening torque is50Nm;
2.The flange contact surface must be located on the Cylinder assembly surface as a whole;
3.The positioning magnet should not contact with the sensor measuring rod;
4.Do not exceed the peak pressure of equipment;
5.Protect the stell rod from wear.

Threaded holes conforming to ISO6149-1 (for pressure-resistant rods with a diameter of 10mm) unit: mm

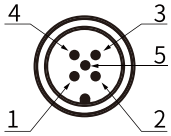
Thread (d1 ×P)	d_2	d_3	d_4	d_5	L_1	L_2	L_3	L_4	Z^0
M18×1.5	55	13	24.5	19.8	2.4	28.5	2	14.5	15°



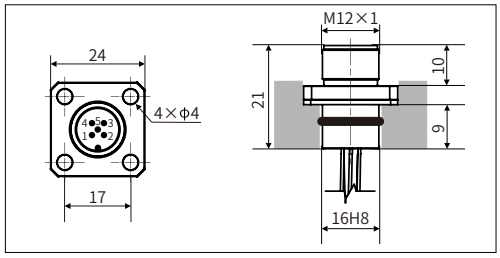


Electrical connections

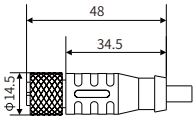
- CAN（connector）

M12-5 Pin Definition	No.	PC
	1	Do not connect
	2	Power supply
	3	Ground
	4	CAN High
	5	CAN Low

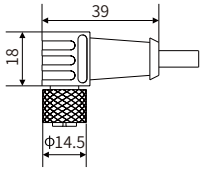
- M12-5 pin socket



- CAN（line color definition of female connector）

M12-5 pin female connector	Line color	
	Definition	PC
	Power supply	Brown
	Ground	White
	CAN High	Yellow
	CAN Low	Green

- CAN（line color definition of right angle female connector）

M12-5pin right angle female connector	Line color	
	Definition	PC
	Power supply	Brown
	Ground	White
	CAN High	Yellow
	CAN Low	Green

- CAN（cable outlet）

Cable code:511816	Definition	Line color
	Power supply	Brown
	Ground	White
	CAN High	Yellow
	CAN Low	Green

Product Parameters-CANopen Output

• Input

Measurement data	Position (vernier magnet)
Stroke length	50~2500 mm

• Output

Interface	CANbus ISO DIS 11898, CANopen complies with CIA DS-301V3.0, Sensor Specification DS-406V3.1
Transmission speed	maximum 1Mbit/s
Resolution	±0.1mm
Nonlinearity	±0.1mm (≤250mm) or 0.04%F.S (>250mm)
Repetition accuracy	±0.1mm
Update time	2ms

• Operating conditions

Magnet velocity	Arbitrary
Protection level	IP67
Operating temperature	-40℃ ~ +105℃
Humidity/dew point	Humidity 90%, no condensation
Temperature drift coefficient	<30ppm/℃
Shock index	GB/T2423.5 100g(11ms)
Vibration index	GB/T2423.10 25g/10~2000Hz
EMC test	GB/T17626.2 Electrostatic Discharge Anti-interference, Grade 3, Class A GB/T17626.3 Radio Frequency Electromagnetic Field Radiation Anti-interference, Grade 3, Class A GB/T17626.4 Electric Fast Transient Group Anti-interference, Grade 3, Class B GB/T17626.6 Radio Frequency Field Induced Conducted Disturbance Anti-interference, Grade 3, Class A GB/T17626.8 Power Frequency Magnetic Field Anti-interference, Grade 4, Class A

• Electrical connections

Input voltage	9~ 32Vdc
Power consumption	<1W
Polarity protection	maximum-30Vdc
Overvoltage protection	maximum36Vdc
Insulation resistance	>10MΩ
Insulation strength	500V
Outgoing mode	Cable outlet or connector

• Construction and materials

Electronic compartment	304Lstainless steel
Measuring rod	304Lstainless steel
Operating pressure grade	Rated pressure Pn: 35MPa maximum pressure Pmax: 45MPa for stell rod with diameter of 10mm
Assembly	Any direction
Position magnet	Various ring magnets

Selection Guide-CANopen Output

01	02	03		04	05	06	07	08		09	10		11	12	13	14		15	16	17	18	19		20	21		22	23
M	H	A	–	M					–	S		–					–	C	1				–	M		–		

01 - 03	Sensor shell form
M H A	Hexagon flange shell

04 - 08	Measuring range
	0050~2500mm，step length 1mm

09 - 10	Mounting thread form
S A	Pressure-resistant rod, diameter 10mm

11 - 14	Connection form
P C 0 0	Custom, M12 IP69K, 5 pins（2-3-4-5）
P C	4 wiring harness, M12 IP69K, 5 pins（2-3-4-5）
P C 0 6	60mm，minimum length of wiring harness
P C 2 5	250mm，maximum length of wiring harness
D M	CAN special cable outlet
D M 0 1	1m cable
D M R 1	0.1m cable, ordering method within 1 m

15 - 19	Signal output mode
15 - 16	Output form
C 1	CANopen
17	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		

18	Resolution
1	0.1mm
19	Number of magnet rings
1	Single magnet ring

20 - 21	Non-usable area at head and end, customizable
M 2	27.5mm+36mm

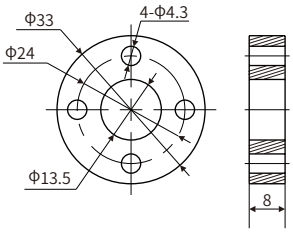
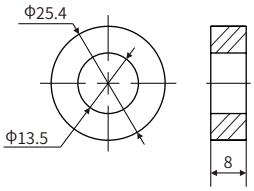
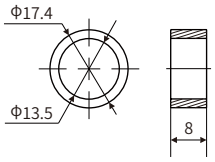
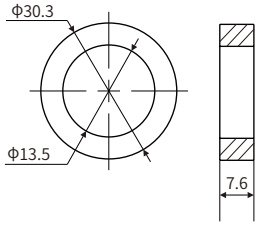
22-23	Country
	Refer to the country list

● Selection example

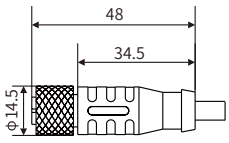
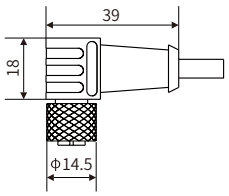
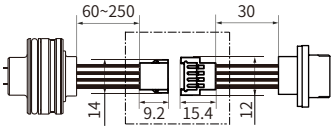
For example：MHA-M0300-SA-DM50-C1411-M2

Indicates: MHA structure hexagonal flange shell, 300mm stroke length, 10mm diameter withstand voltage round pipe, cable outlet form, CANopen output, baud 250kbit/s, resolution 0.1 mm, single magnet ring, head and end non-usable area 27.5 +36.

Magnet Selection

Accessory name/model	Dimensions	Description
 Magnet ring kit Order No.：288501		Magnetic isolation gasket: size same as magnet ring, thickness 5mm Screws：GB/T70.1，M4X18，material304 Spring gasket：GB/T 93，φ 4，material304 Includes: 1 magnet ring, 1 gasket, 4 screws with elastic gasket
 Magnet ring kit Order No.：288506		Magnetic isolation gasket: size same as magnet ring, thickness 5mm Retaining ring：GB/T893,264 Includes: 1 magnet ring, 2 gaskets, 1 retaining ring
 Magnet ring kit Order No.：288507		Magnetic isolation gasket: size same as magnet ring, thickness 5mm Retaining ring：GB/T 893，18 Includes: 1 magnet ring, 2 gaskets, 1 retaining ring
 Magnet ring kit Order No.：288509		Magnetic isolation gasket: size same as magnet ring, thickness 5mm Retaining ring：GB/T893，18 Includes: 1 magnet ring, 2 gaskets, 1 retaining ring

Cable selection

Accessory name/model	Dimensions	Description
 5-pin M12 female connector Order No.：521806-3/5/10	 2×2×0.22mm² φ 7.6mm	Conductor: 4-pin, brown/white, yellow/green Sheath color: Purple Shielding layer: copper wire preparation Application characteristics: Impedance 120 Ω, special for CAN Temperature：(-30~80°C) Line length: 3m/5m/10m
 5-pin M12 right angle female connector Order No.：521805-3/5/10	 2×2×0.22mm² φ 7.6mm	Conductor: 4-pin, brown/white, yellow/green Sheath color: Purple Shielding layer: copper wire preparation Application characteristics: Impedance 120 Ω, special for CAN Temperature：(-30~80°C) Line length: 3m/5m/10m
 MH adapter harness Order No.：522007		When the Cylinder threading hole is less than 16H8, This harness switching can be used,Plastic shell thickness: 2.8 mm
 CAN StaticTPU Cable(C) Order No.：511816	2×2×24AWG φ 6.3±0.1mm	Conductor: 4-pin, brown/white, yellow/green Sheath color: Purple Sheath Material: Polyurethane（TPU） characteristic impedance：110±15Ω Temperature：(-40~85°C)
 MH 5-pin wire socket Order No.：600001