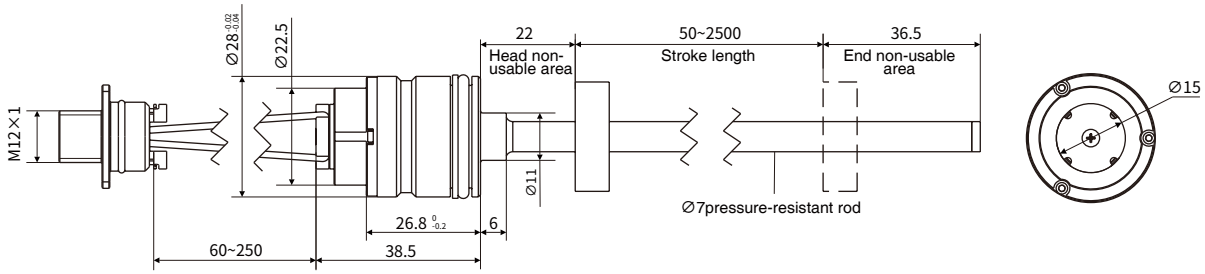
MI Displacement Sensor

Technical characteristics

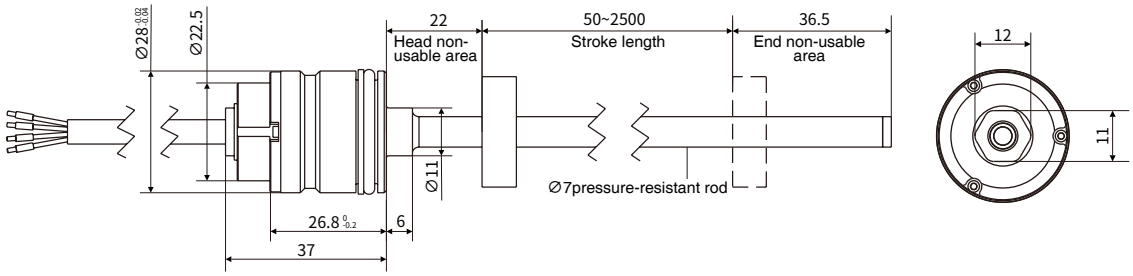
- Specially designed for construction machinery
- High vibration resistance and impact resistance
- Low power consumption design effectively reduces system heating
- Multiple signal (analog and digital signal) output modes
- Linear measurement, absolute position output
- Compact structure, suitable for small Cylinder
- Adapt to harsh environment, IP67 protection level
- Assembled in cylinder, free from environmental and e lectromagnetic interference, non-contact measurement

Structural Shape

Connector external dimensions

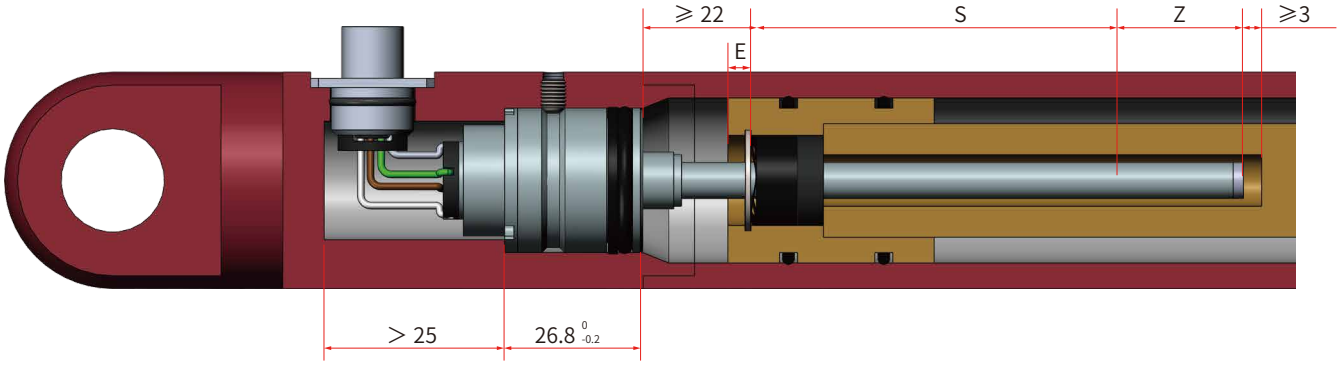


External dimensions of cable outlet



Assembly mode

Example

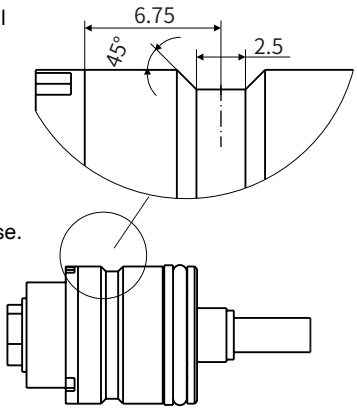


The assembly method depends entirely on the design of the hydraulic cylinder. The commonly used assembly method is to install from the rod end of the hydraulic cylinder, or to install from the cylinder head end of the hydraulic cylinder. In both assembly methods, O-ring and auxiliary gasket are used for air sealing.

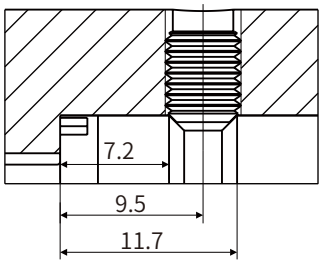
Note: 1.The position magnet should not contact the stell rod;
2.Drilling depth of piston rod⩾E+Z+3mm;
3.Piston rod hole diameter

Stell rod	∅7
Aperture size	⩾∅10

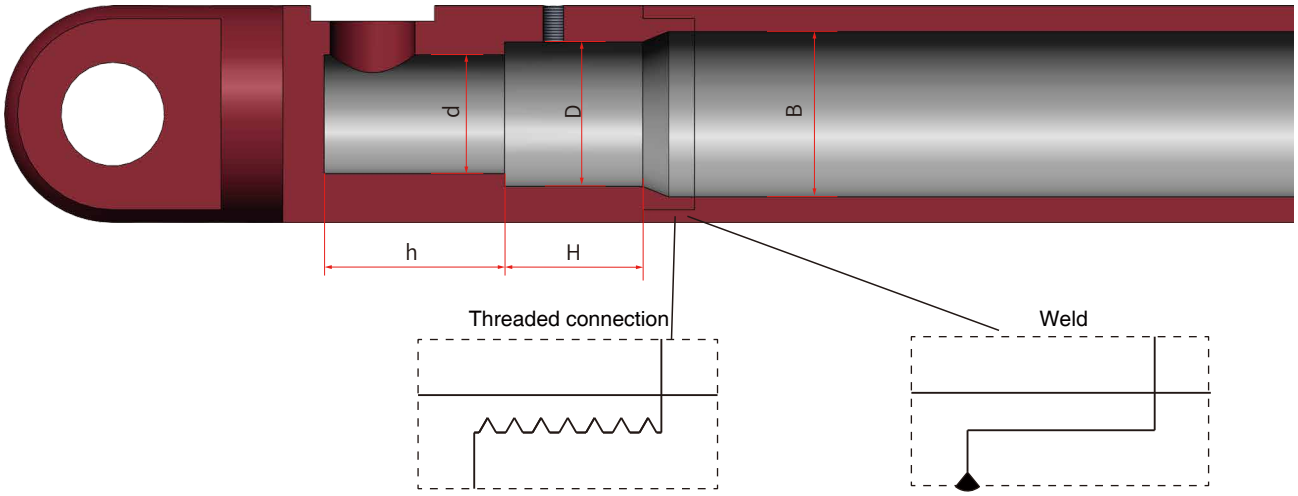
4.Do not exceed the operating pressure during use.



Flange shell with O-ring and auxiliary washer



Use M5 internal hexagon flat-end setting screws for fixation with a maximum torque of 0.5 N/m

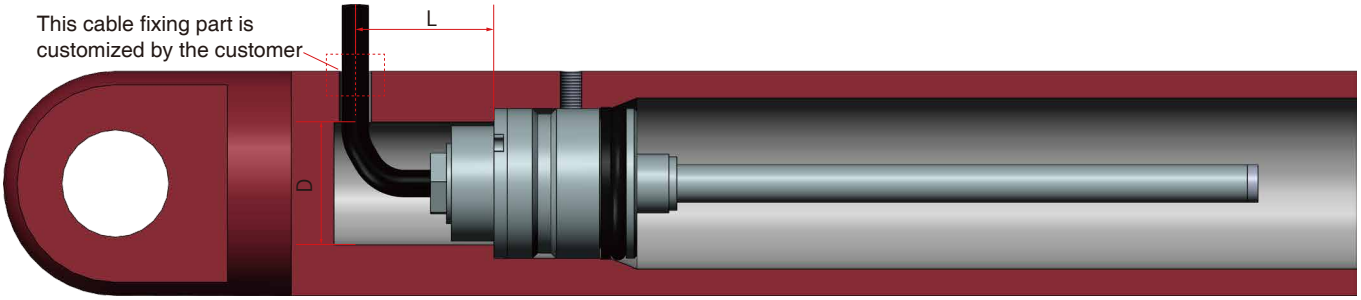


Unit: mm

Model	B Minimum diameter of hydraulic cylinder	D Minimum diameter	H Depth	d Minimum diameter	h Depth
MI	⩾32	28H8（Thread） 28G7（Welding）	$26.8^{+0.2}$	23.5	＜25

Assembly mode

Assembly dimensions of outgoing mode



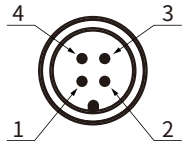
D	L
＞23.5 ＜20	＞ 20

Note: Other dimensions are the same as those of connector cable outlet

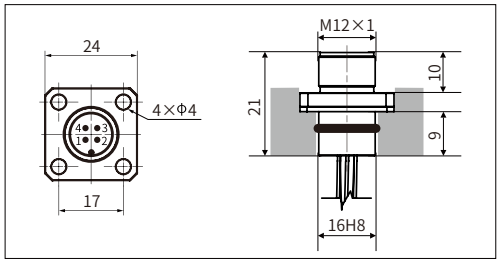
MI-Analog Output

Electrical connections

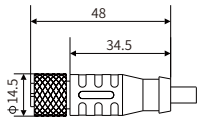
Analog (connector)

M12-4Pin Definition	No.	PA	PB	PC
	1	Power supply	Do not connect	Power supply
	2	Signal	Power supply	Do not connect
	3	Ground	Ground	Ground
	4	Do not connect	Signal	Signal

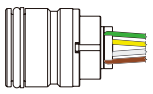
M12-4 pin socket



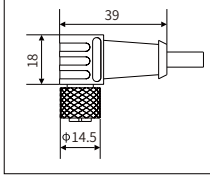
Analog output (line color definition of female connector)

M12-5pin female connector		Line color		
	Definition	PA	PB	PC
	Power supply	Brown	White	Brown
	Ground	Blue	Blue	Blue
	Signal	White	Black	Black

Scattered output

Scattered output	PT	
	Definition	Line color
	Power supply	Brown
	Ground	White
	Signal	Green

Analog output (line color definition of right angle female connector)

M12-5pin right angle female connector		Line color		
	Definition	PA	PB	PC
	Power supply	Brown	White	Brown
	Ground	Blue	Blue	Blue
	Signal	White	Black	Black

Special cable

Cable code:511815	Definition	Line color
	Power supply	Brown
	Ground	White
	Signal	Green

Product Parameters-Analog Output

• Input

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

• Output

Current	4 ~ 20mA (load resistance≤250Ω)
Voltage	0.5 ~ 4.5Vdc or 0.25~4.75Vdc (load resistance≥10KΩ)
Resolution	±0.1mm (range＜500mm) range÷4096 (range＞500mm)
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°C ~ +105°C
Humidity/dew point	Humidity 90%, no condensation
Temperature drift coefficient	<30ppm/°C
Shock index	GB/T2423.5 100g (11ms)
Vibration index	GB/T2423.10 15g/10~2000Hz
EMC test	GB/T17626.2 Electrostatic Discharge Anti-interference Degree, Grade 3, Class A GB/T17626.3 Radio Frequency Electromagnetic Field Radiation Anti-interference Degree, Grade 3, Class A GB/T17626.6 Radio Frequency Field Induced Conducted Disturbance Anti-interference Degree, Grade 3, Class A GB/T17626.8 Power Frequency Magnetic Field Anti-interference Degree, Grade 4, Class A

• Electrical connections

Input voltage	8 ~ 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	304L stainless steel
Measuring rod	304L stainless steel
Operating pressure grade	Rated pressure Pn: 30MPa maximum pressure Pmax: 40MPa for stell rod with diameter of 7mm
Assembly	Any direction
Position magnet	Various ring magnets

Selection Guide-Analog Output

M	I	–	M					–	S		–					–				–	M		–		
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
MI	Flange shell Φ28mm

03 - 07	Measuring range
	0050~2500 mm，step length 1mm

08 - 09	Mounting thread form
SF	Pressure-resistant rod, diameter 7mm

10 - 13	Connection form
PA	3 wires, M12 IP69K, 4 pins (1-3-2)
PA06	60mm，minimum length of wiring harness
PA25	250mm，maximum length of wiring harness
PB	3wires, M12 IP69K, 4 pins (2-3-4)
PB06	60mm，minimum length of wiring harness
PB25	250mm，maximum length of wiring harness
PC	3 wires, M12 IP69K, 4 pins (1-3-4)
PC06	60mm，minimum length of wiring harness
PC25	250mm，maximum length of wiring harness
PT	3 scattered, brown-white-green
PT06	60mm，minimum length of wiring harness
PT25	250mm，maximum length of wiring harness
TI	3-pin cable outlet
TI01	1m cable
TIR1	0.1m cable, ordering method within 1 m

14 - 16	Signal output mode
A01	Current output，4~20mA
A11	Current output，20~4mA
V01	Voltage output，0.5~4.5V
V11	Voltage output，4.5~0.5V
V02	Voltage output，0.25~4.75V
V12	Voltage output，4.75~0.25V

17- 18	Non-usable area at head and end, customizable
M6	22mm+36.5mm
M7	22mm+63.5mm

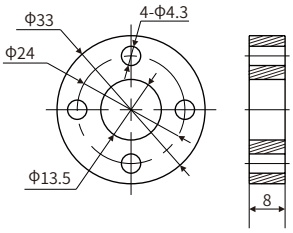
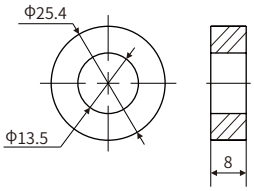
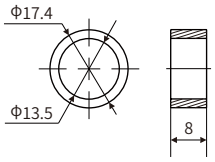
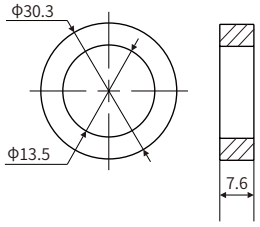
19-20	Country
	Refer to the country list

● Selection example

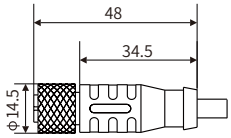
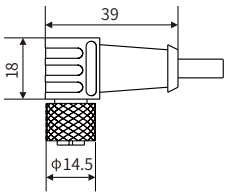
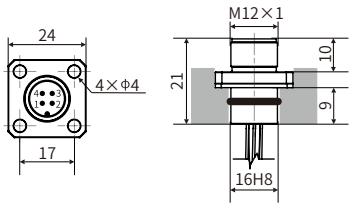
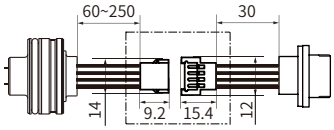
For example：MI-M0300-SF-PA06-A01-M6-CN

Indicates: MI series flange diameter 28mm, 300mm stroke length, 7mm diameter pressure-resistant rod, 60mm, minimum length of wiring harness, current output of 4~20mA, non-usable area at head and end of 22 +36.5.

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.：521801-2/3/5/10/15	 5×0.25mm² φ5.6±0.2mm	Conductor: 5-pin, brown/white/blue/black/gray Sheath color: Black Shielding layer: tinned copper woven mesh Sheath material：PUR Temperature：(-40~80°C) Line length: 2m/3m/5m/10m/15m
 5-pin M12 right angle female connector Order No.： 521804-2/3/5/10/15	 5×0.25mm² φ5.6±0.2mm	Conductor: 5-pin, brown/white/blue/black/gray Sheath color: Black Shielding layer: tinned copper woven mesh Sheath material: PUR Temperature：(-40~80°C) Line length: 2m/3m/5m/10m/15m
 TPU three-pin black cable(M) Order No.：511815	3C×0.2SQ φ5.1±0.2mm	Conductor: 3-pin, brown/white/green- Sheath color: Black Shielding layer: tinned copper woven mesh Sheath Material: Polyurethane (TPU) Temperature：(-40~80°C)
 MH 4-pin wire socket Order No.：600000		
 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