



浙达精益

ZHEDA JINGY







CONTENT

Company Profile	01
Honorary & Qualification	02
TECMagnetostriction Development	03
MH Displacement Sensor Analog Output CAN Bus Output	08
MHA Displacement Sensor Analog Output CAN Bus Output	18
MI Displacement Sensor Analog Output CAN Bus Output	27
MT Displacement Sensor Analog Redundant Output	36
Magnet ring Selection	42
Cable Selection	43
Industrial Application	45



As a technological innovation enterprise born out of Zhejiang University, our company has more than 180 employees, including 4 overseas talents, 4 professors, and 2 associate professors. There are also 12 doctors, and more than 86% of employees with a bachelor degree or above.



We are committed to intelligent manufacturing, high-end equipment, intelligent sensing, intelligent detection, military industry and other fields. Most of our company's products are independently researched and developed, and the market share ranks in the forefront of the domestic industry. A variety of equipment is the first set in China, which breaks the long-term monopoly of foreign companies.

We are a national high-tech enterprise integrating scientific research, product development, engineering design, and technical consulting. Besides, the company has obtained 45 invention patents, 29 utility model patents, 10 software copyrights, and 4 registered trademarks.

Taking "Created in China, Create China" as our ideal, we are committed to building a century-old national brand. Our development goal is to become a well-known leading technology and strength-based enterprise in China's high-end equipment and intelligent inspection industries.



Honorary Qualification





TEC Magnetostriction Development

The magnetostrictive displacement sensor project is included in the national torch plan project





National Natural Science Foundation of China, "Research on Theory and Practice of Real-time Quantitative Detection of Defects in High-temperature Metal Pipelines Based on Magnetostrictive Guided Waves"

IN 2013

National Key R&D Program, "On-line Monitoring and Inspection of Pressure Equipment and Dynamic Risk Management Technology Research"; Zhejiang Province Key R&D Program, "Usonic Guided Wave-based Track Turnout Structural Health Monitoring System"

IN 2017

Key R&D Program of Zhejiang Province, "Research and Demonstration Application of Safety Early Warning Technology for Nearshore High Tower Equipment"

IN 2019

IN 2016

National Major Scientific Instrument and Equipment Development Project, "R&D of Rail Broken Monitoring Equipment and Testing Network in Key Sections" National Natural Science Foundation of China, "Research on the Theory and Practice of On-line Monitoring of Turnout Point Rail Defects Based on Phased Array Guided Wave Sound Field Control"; National Key R&D Project, "Research on Magnetoacoustic Compound Monitoring and Detection Technology for Typical Pressure-bearing Special Equipment Damage"

IN 2018

IN 2021

Science and Technology Progress Award of Zhejiang Province, "High-precision magnetoacoustic sensing technology and industrialization application of important components".

The fourth batch of "Small Giant" enterprises of the Ministry of Industry and

Information Technology of the

People's Republic of China,

and the specialized and

special new enterprises of

IN 2022

Zhejiang Province

Quality Assurance

After years of experience and precipitation, TEC magnetostrictive displacement sensor has built a modern, automatic and standardized production line, which ensures the reliability, stability and consistency of products. Before the new series of products are put into the market, they must pass EMC, vibration, impact, high and low temperature tests. Sensors need to go through signal verification before and after each manufacturing process. After assembly, they are tested and screened one by one. Finally, they pass the calibration and linearity detection of laser interferometer, and the detection results are uploaded to the database for subsequent tracking of products



Laser interferometer Calibrated by laser interferometer can measure up to 1000 points per millimeter

Parts Test

Electro Magnetic Compatibility Test (EMC)

Electrostatic discharge immunity	(GB/T17626.2,IDT IEC61000-4-2)
Radiation immunity of radio frequency electromagnetic field	(GB/T17626.3, IDT IEC61000-4-3)
Immunity of electrical fast transient	(GB/T17626.4, IDT IEC61000-4-4)
Surge (shock) immunity	(GB/T17626.5,IDT IEC61000-4-5)
RF field induced conducted disturbance immunity	(GB/T17626.6, IDT IEC61000-4-6)
Power frequency magnetic field immunity	(GB/T17626.8, IDT IEC61000-4-8)

Temperature Test

Low temperature	(GB/T2423.1, IDT IEC60068-2-1)
High temperature	(GB/T2423.2, IDT IEC60068-2-2)
Constant damp heat	(GB/T2423.3, IDT IEC60068-2-78)
Alternating damp heat	(GB/T2423.4, IDT IEC60068-2-30)
Temperature change	(GB/T2423.22, IDT IEC60068-2-14)

Other Tests

Explosion-proof test	(GB3836.1, IDT IEC60079-0)
Explosion-proof test	(GB3836.2, IDT IEC60079-1)
Explosion-proof test	(GB3836.4, IDT IEC60079-11)
Insulation resistance, insula- tion strength	(GB/T15479)
Impact test	(GB/T2423.5, IDT IEC68-2-27)
Free drop test	(GB/T2423.8, IDT IEC68-2-32)
Vibration test	(GB/T2423.10, IDT IEC68-2-6)



Product introduction

TEC magnetostrictive displacement sensor is a new generation of linear displacement sensor independently developed by Zheda Jingyi. It can provide users with real-time, reliable, accurate and continuous linear displacement signals under harsh operating environment, and is widely used in metallurgical equipment, wind power equipment, construction machinery, rubber machinery, port machinery, energy and other industrial automation fields.

Product characteristics



Working Principle

The detection mechanism of the magnetostrictive displacement sensor is based on the "Weidmann effect" between the magnetostrictive waveguide wire and the vernier magnet which is the core detection element of the sensor. The excitation module in the sensor electronic bin will apply a query pulse at both ends of the loop where the sensitive detection element (magnetostrictive waveguide wire) is located, and the pulse forms a circumferential ampere annular magnetic field around the waveguide wire at speed of light. The magnetic field is coupled with the permanent magnet magnetic field at the position of the vernier magnet, and a "Weidmann effect" torsional stress wave is formed on the surface of the waveguide wire. The torsional wave transmitted to the end is absorbed by the damping device, and the signal transmitted to the excitation end is received by the detection device. The control module calculates the time difference between the inquiry pulse and the received signal, and multiplies it by the propagation speed of torsional stress wave in the waveguide material, so as to calculate the distance between the torsional wave occurrence position and the measurement reference point, and realize the real-time accurate measurement of the vernier magnet position.



Working principle of magnetostrictive linear displacement sensor

Absolute position

The output of the sensor is relative to a fixed reference point, which does not need to be reset when power supply is restored after power failure; this position is an absolute position. However the general incremental sensor, such as incremental encoder and incremental grating ruler, which needs to find the reference point again.

Environmental conditions

For normal Operating conditionsof displacement sensors, the industry has the following standards:

a) Temperature: 25° (±10°C)

b) Relative humidity: 90% or less Generally, the environment for calibrating and testing sensors is more stringent than the standard requirements.

Measuring range

For the sensor, the physical quantity to be measured is indicated by upper and lower limits. The measurement range is the full scale of motion.

Full scale

Full scale (abbreviated as "F.S") (see measuring range).

Resolution

Refers to the minimum amount of sensor output that can be distinguished. The highest resolution of TEC magnetostrictive displacement sensor can reach1µm.

Nonlinearity

Nonlinearity is the absolute deviation as a percentage of the Stroke length length. In a magnetostrictive sensor, this change is caused by the difference in the propagation velocity of the return signal propagating in the waveguide medium.

Non-contact

Magnetostrictive displacement sensor uses non-contact magnetic induction technology to measure position. Non-contact measurement does not exist mechanical wear and mechanical vibration, which improves the reliability and service life of the sensor.

Temperature coefficient

The temperature coefficient unit is ppm/°C (one millionth per degree Celsius). It refers that the ambient temperature changes by 1 degree Celsius, the amount of change in the position value output by the sensor.

Update time

The time interval between two measurements made by the sensor. The larger the range of the sensor, the longer the update time required.

Multiple position measurement

Measure the position of multiple magnet rings on the sensor stroke shaft or guide rail at the same time.

Precision

The difference between the indicated measured value and the true value can be calculated from the root mean square of the nonlinear deviation, repeatability, and hysteresis.

Hysteresis

The difference in displayed position when reaching the same point from opposite directions along the length of stroke (Note: Magnetostrictive displacement sensors have very little hysteresis and are therefore negligible in most applications).

Drift

Drift refers to the change of output signal or output value under the influence of surrounding environment, such as time or temperature. Please refer to "preheating period" and "temperature coefficient" at the same time.

Shell protection class

The IP (Ingress Prection) standard for shell intrusion protection issued by the International Electrotechnical Commission. For specific IP standard instructions, please refer to the official website of IEC. The optional protection levels of sensors are IP65, IP67 and IP68.

Preheating period

The time required for the sensor to be energized until the output is stable, this deviation can be seen from the calibration curve of the sensor.

Load impedance

The impedance when the external circuit is connected to the output end of the sensor.

Repetition accuracy

The difference in sensor output when the magnet repeatedly reaches the same position from the same direction when measured along the stroke.



MH Displacement Sensor



Technical characteristics

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

External dimensions of cable outlet (fastening mode DM)



External dimensions of cable outlet (fastening method QM)



Head non-usable area





Assembly mode



The assembly method depends on the design of the hydraulic cylinder. The commonly used assembly method is to assembly from the rod end of the hydraulic cylinder, or to assembly 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 \ge E+Z+3mm; 3.Piston rod hole diameter

Pressure-resistant rod	Ø10
Aperture size	≥Ø13

4.Do not exceed the operating pressure during use.





flat-end set screws for fixation with a maximum torque of 0.5 N/m



Assembly mode

Assembly dimensions of outgoing mode-cable outlet (DM)



D	d	L
> 32 < 40	> 18	>28

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

Assembly dimensions of outgoing mode-cable outlet (QM)



D	d	L
> 32 < 40	> 18	>20

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



Electrical connections

Analog (connector)

M12-4Pin Definition	No.	PA	PB	PC
4 2	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)

M12-5 pin female connector			Line colo	r
48	Definition	PA	PB	PC
₹ 34.5	Power supply	Brown	White	Brown
	Ground	Blue	Blue	Blue
	Signal	White	Black	Black

• Analog output (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)

M12-5 pin right angle female connector		Line color		
<u>39</u>	Definition	PA	PB	PC
	Power supply	Brown	White	Brown
	Ground	Blue	Blue	Blue
Ф14.5 •	Signal	White	Black	Black

Analog output (cable outlet)

Cable code:511806	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 \leq 250 Ω)							
Voltage	0.5 ~ 4.5Vdc or 0.25~4.75Vdc (load resistance \geq 10K Ω)							
Possilution	±0.1mm (range<500mm)							
Resolution	range:+4096 (range>500mm)							
Nonlinearity	±0.1mm (\leq 250mm) or 0.04%F.S	(>250mm)						
Repetition accuracy	±0.1mm							
Update time	2ms							
• Operating cond	itions							
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 25g/10~2000Hz							
	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							
EMC toot	GB/T17626.4 Electric Fast Transient Pulse Group Anti-interference, Grade 3, Class B							
EMC lest	GB/T17626.5 Surge (Impact) 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 Mag	gnetic Field Anti-interfer	rence, Grade 4, Class A					
• Electrical conne	ections	Construction	on and materials					
Input voltage	9~ 32Vdc	Electronic compartment	304Lstainless steel					
Power consumption	<1W	Measuring rod	304Lstainless steel					
Polarity protection	Maximum-30Vdc	Operating	Rated pressure Pn: 35MPa maximum pressure					
Overvoltage protection	Maximum36Vdc	pressure grade	Pmax: 45MPa for stell rod with diameter of 10mm					
Insulation resistance	>10MΩ	Assembly	Any direction					
Insulation strength	500V	Position magnet	Various ring magnets					
Outgoing mode	Cable outlet or connector							



● Selection Guide-Analog Output

$\underbrace{M}_{01} \underbrace{H}_{02} - \underbrace{M}_{03} \underbrace{J}_{04} \underbrace{J}_{05} \underbrace{J}_{06} \underbrace{J}_{07} - \underbrace{S}_{08} \underbrace{J}_{09} - \underbrace{J}_{10} \underbrace{J}_{11} \underbrace{J}_{12} \underbrace{J}_{13} - \underbrace{J}_{14} \underbrace{J}_{15} \underbrace{J}_{16} - \underbrace{M}_{17} \underbrace{J}_{18}$									
01 -	02	5	Sensor shell form	D	М			3-pin cable outlet	
ΜН		F	Flange shell Φ48mm	D	М	0	1	1m cable	
				D	М	R	1	0.1m cable, ordering method within 1 m	
- 03	07		Measuring range	0	м			3-pin cable outlet (internal thread fastening)	
		(0050~2500 mm,step length 1mm	Q	м		1		
00	00		Mounting throad form	Q	M	D	1	0.1m cable ordering method within 1 m	
00-				Q	IVI	ĸ	T	0.111 Cable, ordering method within 1 m	
SA		ł	Pressure-resistant rod, diameter 10mm	1	4 -	16	;	Signal output mode	
S C		1	M4 thread at the end	А	0	1		Current output, 4~20mA	
S F		F	Pressure-resistant rod, diameter 7mm	А	1	1		Current output, 20~4mA	
10	12		Connection form	V	0	1		Voltage output, 0.5~4.5V	
10-	10			V	1	1	,	Voltage output 4.5~0.5V	
ΡA			3 wires, M12 IP69K, 4 pins (1-3-2)	V	-	2	,	Voltage output $0.25 \sim 4.75 V$	
PA	0	6	60mm, minimum length of wiring harness	v V	1	2	Voltage output, 4.75-0.25V		
ΡA	2	5	250mm, maximum length of wiring harness	V	1	2	,		
ΡB			3 wires, M12 IP69K, 4 pins $(2-3-4)$	V	1	2 2			
ΡB	0	6	60mm, minimum length of wiring harness	V	L	З		Voltage output, 10~0V	
ΡB	2	5	250mm, maximum length of wiring harness						
ΡC			3 wires, M12 IP69K, 4 pins (1-3-4)	1	7- 1	18		Non-usable area at head and end, customizable	
РС	0	6	60mm minimum length of wiring harness	М	0		;	30mm+36.5mm	
P C	2	5	250mm, maximum length of wiring harness	М	1		;	30mm+63.5mm	
P T			3 scattered, brown-white-green						
ΡΤ	0	6	60mm, minimum length of wiring harness						
ΡT	2	5	250mm, maximum length of wiring harness						

• Selection example

For example: MH-M0300-SA-PA08-A01-M0

Indicates: MH flange diameter 48mm, stroke length of 300mm, pressure-resistant rod with diameter of 10mm, M12 4-pin male connector, current output of 4~20mA, non-usable area at head and end of 30mm + 36.5 mm.

Electrical connections

•CAN (connector)

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

• CANopen (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 (cable outlet)

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

• M12-5 pin socket



• CANopen (line color definition of right angle female connector)

M12-5pin right angle female connector	Line color		
	Definition	PC	
	Power supply	Brown	
	Ground	White	
¢14.5	CAN High	Yellow	
	CAN Low	Green	



● Product Parameters-CANopen Output

• Input						
Measurement data	Position (vernier magnet)					
Stroke length	50~2500 mm					
Output						
Interface	CAN bus ISODIS11898, CAN	open conforms to CIA DS	-301V3.0, sensor specification DS-406V3.1			
Transmission speed	maximum 1Mbit/s					
Resolution	±0.1mm					
Nonlinearity	±0.1mm (≤250mm) or 0.049	%F.S (>250mm)				
Repetition accuracy	±0.1mm					
Update time	2ms					
Operating condit	tions					
Magnet velocity	Arbitrary					
Protection level	IP67					
Operating temperature	-40 °C ~ +105 °C					
Humidity/dew point	Humidity 90%, no condensation	1				
Temperature drift coefficie	ent <30ppm/°C					
Shock index	GB/T2423.5 100g (11ms)					
Vibration index	GB/T2423.10 25g/10~2000Hz					
	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					
EMC test	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 connect		Constructio Electronic	2041 steipless steel			
Input voltage	9~ 32V0C	compartment				
Power consumption		Measuring rod	304LStamess steel			
Polarity protection	maximum-30Vdc	Operating pressure grade	Rated pressure Pn: 35MPa maximum pressure Pmax: 45MPa for stell rod with diameter of 10mm			
Overvoltage protection						
insulation resistance	>10MM	Assembly	Any direction			
Input voltage Power consumption Polarity protection Overvoltage protection Insulation resistance Insulation strength	9~ 32Vdc <1W maximum-30Vdc maximum36Vdc >10MΩ 500V	Electronic compartment Measuring rod Operating pressure grade Assembly Position magnet	304Lstainless steel 304Lstainless steel Rated pressure Pn: 35MPa maximum pressure Pmax: 45MPa for stell rod with diameter of 10mm Any direction Various ring magnets			

Outgoing mode

Selection Guide-CANopen Output

M H	2		$\underbrace{M}_{03} \underbrace{}}_{04} \underbrace{}}_{05} \underbrace{}}_{06} \underbrace{}}_{07} - \underbrace{S}_{08} \underbrace{}}_{09} - \underbrace{}}_{10} \underbrace{}}_{11} \underbrace{}}_{12} \underbrace{}}_{13} - \underbrace{C}_{14} \underbrace{}}_{15} \underbrace{}}_{16} \underbrace{}}_{17} \underbrace{}}_{18} - \underbrace{M}_{19} \underbrace{}}_{20}$
01 - (02		Sensor shell form
МН]		Flange shell Ø48mm
		_	
03 - (07		Measuring range
			0050~2500mm, step length 1mm
08 - (09		Mounting thread form
S A]		Pressure-resistant rod, diameter 10mm
S C	ĺ		Pressure-resistant rod, diameter 10mm; Thread with M4 at end
S F	ĺ		Pressure-resistant rod, diameter 7mm
10 -	13		Connection form
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
DM			CAN special cable outlet
DM	0	1	1m cable
DM	R	1	0.1m cable, ordering method within 1 m
14 -	18		Signal output mode
14 -	15		Output form
C 1]		CANopen
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
18			Number of magnet rings
	1		Single magnet ring
19 - 2	20		Non-usable area at head and end, customizable
Μ 0			30mm+36.5mm
M 1			30mm+63.5mm

• Selection example

For example: MH-M0300-SA-DM05-C1411-M1

Indicates: MH flange diameter 48mm, stroke length 300mm, pressure-resistant rod with diameter 10mm, straight cable form, CANopen output, baud 250kbit/s, resolution 0.1 mm, single magnet ring, head and end non-usable area 30mm +63.5mm.







Technical characteristics

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



External dimensions of cable outlet (fastening mode DE)





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.



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

unit: mm

Thread (d1 ×P)	d₂	d₃	d₄	d₅	Lı	L2	L3	L4	Z ^o
M18×1.5	55	13	24.5	19.8	2.4	28.5	2	14.5	15°



This size is suitable for blind holes

Electrical connections

Analog (connector)

M12-4Pin Definition	No.	PA	PB	PC
$\frac{4}{3}$	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)

M12-5 pin female connector		Li	r	
<u>↓ 48</u>	Definition	PA	РВ	PC
34.5	Power supply	Brown	White	Brown
	Ground	Blue	Blue	Blue
	Signal	White	Black	Black

Analog output (scattered output)

Scattered output	PI				
	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		L	ine colo	or
39	Definition	PA	PB	PC
	Power supply	Brown	White	Brown
	Ground	Blue	Blue	Blue
¢14.5	Signal	White	Black	Black

• Analog output (cable outlet)

Cable code:511806	Definition	Line color
	Power supply	Brown
State and a state	Ground	White
	Signal	Green
Cable code:511809	Definition	Line color
	Power supply	Brown
	Ground	White
	Signal	Blue



● Product Parameters-Analog Output

• Input							
Measurement data	Position (Vernier magnet)						
Stroke length	50~2500 mm						
Output							
Current	4 ~ 20mA (load resistance \leq 250 Ω)						
Voltage	$0.5 \sim 4.5 V dc~or~0.25 {\sim} 4.75 V dc~(load~resistance {\geq} 10 K \Omega)$						
Resolution	±0.1mm (range<500mm)						
nesolution	range÷4096 (range>500mm)						
Nonlinearity	± 0.1 mm (≤ 250 mm) or 0.04%F.S (>250mm)						
Repetition accuracy	±0.1mm						
Update time	2ms						
Operating conditio	ns						
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 25g/10~2000Hz						
	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						
FMC test	GB/T17626.4 Electric Fast Transient Pulse Group Anti-interference, Grade 3, Class B						
ENIC lesi	GB/T17626.5 Surge (Impact) 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 connection	• Construction and materials						
	Electronic						

Input voltage		9~ 32Vdc	Electronic compartment	304Lstainless steel			
Power consum	nption	<1W	Measuring rod	304Lstainless steel			
Polarity protec	ction	Maximum-30Vdc	Operating	Rated pressure Pn: 35MPa maximum pressure			
Overvoltage p	rotection	Maximum36Vdc	pressure grade	Pmax: 45MPa for stell rod with diameter of 10mm			
Insulation resis	stance	$>$ 10M Ω	Assembly	Any direction			
Insulation stre	ngth	500V	Position magnet	Various ring magnets			
Outgoing mod	e	Cable outlet or connector					

● Selection Guide-Analog Output

Ø	Selection Guide-Analog Output								
M 01	02	1 2	A 03	$- \underbrace{M}_{04} \underbrace{O5}_{06} \underbrace{O7}_{07} \underbrace{O8}_{08} - \underbrace{S}_{09} \underbrace{O7}_{10} - \underbrace{S}_{09} \underbrace{O7}_{10} - \underbrace{S}_{09} \underbrace{S}_{10} - \underbrace{S}_{10} \underbrace{S}_{$	11	12	13	3	14 - <u>I</u> <u>I</u> - <u>M</u> <u>I</u>
01	L - ()3		Sensor shell form	Q	М			3-pin cable outlet (internal thread fasten
М	Н	Α		Hexagon flange shell	Q	М	0	1	1m cable
]		_		Q	М	R	1	0.1m cable, ordering method within 1 m
04	4 - C)8		Measuring range		F			3-pip cable outlet (511800 cable is used
			(0050~2500 mm,step length 1mm		с	0	1	1m apple
00) _ 1	0		Mounting thread form		E		1	0.1m cable ordering method within 1 m
C.				Standard flange, proceure resistant red	D		ĸ		o. In cable, ordering method within 1 m
3	A		Ċ	diameter 10mm	D	М			3-pin cable outlet
S	В		(Custom flange: TEC-0204-G3-SC1962_V1.0,	D	М	0	1	1m cable
			_		D	М	R	1	0.1m cable, ordering method within 1 m
11	L - 1	L4	(Connection form	1	-	17		Simul autout made
Р	А	0	0	Custom, M12 IP69K, 4 pins (1-3-2))			
Р	Α			3 wires, M12 IP69K, 4 pins (1-3-2)	A	0	1		Current output, 4~20mA
Р	Α	0	6	60mm, minimum length of wiring harness	A	1	1		Current output, 20~4mA
Р	А	2	5	250mm, maximum length of wiring harness	V	0	1		Voltage output, 0.5~4.5V
Р	В	0	0	Custom, M12 IP69K, 4 pins (2-3-4)	V	1	1		Voltage output, 4.5~0.5V
P	B	•	•	3 wires. M12 IP69K. 4 pins (2-3-4)	V	0	2		Voltage output, 0.25~4.75V
P	B	0	6	60mm minimum length of wiring barness	V	1	2		Voltage output, 4.75~0.25V
P	B	2	5	250mm maximum length of wiring harness	V	0	3		Voltage output, 0~10V
		_	-		V	1	3		Voltage output, 10~0V
Р	C	0	0	Custom, M12 IP69K, 4 pins (1-3-4)					
Р	C			3 wires, M12 IP69K, 4 pins (1-3-4)	18	8- 1	9		Non-usable area at head and end, custo
Р	C	0	6	60mm, minimum length of wiring harness	М	2]		27.5mm+36mm
Р	C	2	5	250mm, maximum length of wiring harness	М	3]		50mm+60mm
Ρ	Т			3 scattered, brown-white-green					
Ρ	Т	0	6	60mm, minimum length of wiring harness					
Ρ	Т	2	5	250mm, maximum length of wiring harness					

(511809 cable is used) ring method within 1 m ring method within 1 m 20mA ~4mA

(internal thread fastening)

~0V t head and end, customizable

Selection example

For example: MHA-M0300-SA-PA08-A01-M2

Indicates: MHA structure hexagonal flange shell, 300mm stroke length, 10mm diameter pressure-resistant rod, M12 connector 4-pin male connector, current output of 4~20mA, non-usable area at head and end of 27.5mm +36mm.



MHA-CANopen Output

Electrical connections

• CAN (connector)

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

• CAN (line color definition of female connector)



• CAN (cable outlet)

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

• M12-5 pin socket



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



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	± 0.1 mm (≤ 250 mm) or 0.04% F.S (> 250 mm)
Repetition accuracy	±0.1mm
Update time	2ms
Operating cond	litions
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 25g/10~2000Hz
	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
EMC test	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 connect	ctions	Construction and materials				
Input voltage	9~ 32Vdc	Electronic compartment	304Lstainless steel			
Power consumption	<1W	Measuring rod	304Lstainless steel			
Polarity protection	maximum-30Vdc	Operating	Rated pressure Pn: 35MPa maximum pressure			
Overvoltage protection	maximum36Vdc	pressure grade	Pmax: 45MPa for stell rod with diameter of 10mm			
Insulation resistance	$>$ 10M Ω	Assembly	Any direction			
Insulation strength	500V	Position magnet	Various ring magnets			
Outgoing mode	Cable outlet or connector					



● Selection Guide-CANopen Output

M 01	02		A -	- M	06	07	08		S 09 10	—	12	13	14	- <u>C</u>	5 16	17	18	19	 M 20 21
0	1 - ()3	Se	nsor shell fo	rm														
М	Н	A	He	xagon flange	shell														
				0 0															
04	4 - ()8	Me	easuring rang	ge														
			00	50~2500mm,	step le	ength	1mm												
09	9 - 1	10	Мс	ounting threa	d form														
S	Α		Pre	essure-resista	ant rod,	diame	ter 10m	ım											
1	1 - 1	4	Co	nnection for	m														
Ρ	С	0	0	Custom, M12	IP69K,	5 pins	(2-3-4	- 5)											
Р	С		4	wiring harne	ess, M12	2 IP69	K, 5 pir	ns (2-3	3-4- 5)										
Р	C	0	66	0mm, minin	num len	gth of	wiring I	narnes	S										
Р	C	2	5 2	250mm, max	imum l	ength	of wiring	g harne	ess										
D	М			CAN special c	able ou	itlet													
D	M	0	1 1	m cable			ما ، نامام زير												
D	IVI	ĸ	1 (. Im cable, of	aenng	metho		1 1 111											
1.	5 - 1 -	.9	Sig	gnal output r	node														
1	5 - 1	16	Ou	tput form															
C	17		CA	Nopen															
	11	1	Ва 10	00Kbit/c	2	00	0Kbit/c		2	FOOKbit/	'c								
		1	25	0Khit/s	5	12	5Khit/s		5	100Kbit/	5								
		7	50	Kbit/s	8	20	Kbit/s		•	10010010	5								
	18		Re	solution															
		1	0.1	mm															
	19		Nu	mber of mag	gnet rir	ngs													
		1	Sir	Single magnet ring															
2	0 - 2	21	No	Non-usable area at head and end, customizable															
М	2		27.	.5mm+36mm															

• 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 27.5mm + 36mm.





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



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. 6.75

2.5

Note: 1.The position magnet should not contact the stell

rod;

2.Drilling depth of piston rod \geq E+Z+3mm;

3.Piston	rod	hole	dia	meter

Stell rod	Ø7
Aperture size	≥Ø10

4.Do not exceed the operating pressure during use.





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





Assembly mode

Assembly dimensions of outgoing mode



MI-Analog Output

Electrical connections

Analog (connector)

M12-4Pin Definition	No.	PA	PB	PC
4 3	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

Analog output (line color definition of female connector)

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

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

M12-5pin right angle female connector		L	ine colo	r
3 9 →	Definition	PA	РВ	PC
	Power supply	Brown	White	Brown
	Ground	Blue	Blue	Blue
¢14.5 ★	Signal	White	Black	Black

M12-4 pin socket



Scattered output

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

Special cable



● Product Parameters-Analog Output

• Input	
Measurement dat	a Position (vernier magnet)
Stroke length	50~2500 mm
Output	
Current	$4 \sim 20 \text{mA} (\text{load resistance} \le 250 \Omega)$
Voltage	$0.5 \sim 4.5$ Vdc or $0.25 \sim 4.75$ Vdc (load resistance ≥ 10 K Ω)
Resolution	±0.1mm (range<500mm)
resolution	range÷4096 (range>500mm)
Nonlinearity	± 0.1 mm (≤ 250 mm) or 0.04% F.S (>250mm)
Repetition accurac	±0.1mm
Update time	2ms
• Operating c	onditions
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
	GB/T17626.2 Electrostatic Discharge Anti-interference Degree, Grade 3, Class A
EMC test	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		Construction and materials		
Input voltage	8 ~ 32Vdc	Electronic compartment	304L stainless steel	
Power consumption	<1W	Measuring rod	304L stainless steel	
Polarity protection	Maximum-30Vdc	Operating	Rated pressure Pn: 30MPa maximum pressure	
Overvoltage protection	Maximum36Vdc	pressure grade	Pmax: 40MPa for stell rod with diameter of 7mm	
Insulation resistance	$> 10 M\Omega$	Assembly	Any direction	
Insulation strength	500V	Position magnet	Various ring magnets	
Outaoina mode	Cable outlet or connector			



● Selection Guide-Analog Output

M 01	02	2		$\underbrace{M}_{03} \underbrace{O}_{04} \underbrace{O}_{05} \underbrace{O}_{06} \underbrace{O}_{07} - \underbrace{S}_{08} \underbrace{O}_{09} - \underbrace{O}_{10} \underbrace{O}_{11} \underbrace{D}_{12} \underbrace{O}_{13} - \underbrace{O}_{14} \underbrace{D}_{15} \underbrace{O}_{16} - \underbrace{M}_{17} \underbrace{D}_{18}$		
01	()2		Sensor shell form		
М	Ι			Flange shell Ф28mm		
03	3 - 0)7		Measuring range		
				0050~2500 mm, step length 1mm		
00						
		19				
3	F			Pressure-resistant rod, diameter /mm		
10) - 1	.3		Connection form		
Ρ	А			3 wires, M12 IP69K, 4 pins (1-3-2)		
Р	А	0	6	60mm, minimum length of wiring harness		
Р	Α	2	5	250mm, maximum length of wiring harness		
Р	В			3wires, M12 IP69K, 4 pins (2-3-4)		
Ρ	В	0	6	60mm, minimum length of wiring harness		
Р	В	2	5	250mm, maximum length of wiring harness		
Р	С			3 wires, M12 IP69K, 4 pins (1-3-4)		
Р	С	0	6	60mm, minimum length of wiring harness		
Р	С	2	5 250mm, maximum length of wiring harness			
Р	Т		3 scattered, brown-white-green			
Р	Т	0	6 60mm, minimum length of wiring harness			
Р	Т	2	5	250mm, maximum length of wiring harness		
Т				3-pin cable outlet		
T		0	1	1 m cable		
	Ι	R	1	0.1m cable, ordering method within 1 m		
14	- 1	16		Signal output mode		
А	0	1		Current output, 4~20mA		
А	1	1		Current output, 20~4mA		
V	0	1	Voltage output, 0.5~4.5V			
V	1	1	Voltage output, 4.5~0.5V			
V	0	2	Voltage output, 0.25~4.75V			
V	1	2		Voltage output, 4.75~0.25V		
17	'- 1	8		Non-usable area at head and end, customizable		
М	6			22mm+36.5mm		
М	7			22mm+63.5mm		

Selection example

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

Indicates: MI 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 mm+36.5mm.

MI-CANopen Output

Electrical connections

• CAN (connector)

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

• CAN (line color definition of female connector)

M12-5pin 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

• M12-5 pin socket



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

M12-5pin right angle female connector	Line color	
. 39 .	Definition	PC
	Power supply	Brown
	Ground	White
	CAN High	Yellow
¢14.5 ↔	CAN Low	Green



● Product parameters-CANopen Output

• Input	
Measurement dat	Position (Vernier magnet)
Stroke length	50~2500 mm
Output	
Interface	CAN bus ISO DIS 11898, CANopen complies with CIA DS-301V3.0, Sensor Specification DS-406V3.1
Transmission spe	ed maximum1Mbit/s
Resolution	±0.1mm
Nonlinearity	±0.1mm (≤250mm) or 0.04%F.S (>250mm)
Repetition accura	cy ±0.1mm
Update time	2ms
Operating c	onditions
Magnet velocity	Arbitrary
Protection level	IP67
Operating temperature	-40°C ~ +105°C
Humidity/dew	Humidity 90%, no condensation
Temperature drift coefficient	<30ppm/ [°] C
Shock index	GB/T2423.5 100g (11ms)
Vibration index	GB/T2423.10 15g/10~2000Hz
	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
EMC test	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		Construction and materials	
Input voltage	8~ 32Vdc	Electronic compartment	304L stainless steel
Power consumption	<1W	Measuring rod	304L stainless steel
Polarity protection	maximum -30Vdc	Operating	Rated pressure Pn: 30MPa maximum pressure Pmax: 40MPa for stell rod with diameter of 7mm
Overvoltage protection	maximum 36Vdc	pressure grade	
Insulation resistance	$>$ 10M Ω	Assembly	Any direction
Insulation strength	500V	Position magnet	Various ring magnets
Outgoing mode	Cable outlet or connector		

Selection Guide-CANopen Output

M 01	02	2		$\underbrace{M}_{03} \underbrace{O}_{04} \underbrace{O}_{05} \underbrace{O}_{06} \underbrace{O}_{07} - \underbrace{S}_{08} \underbrace{O}_{09} - \underbrace{I}_{10} \underbrace{I}_{11} \underbrace{I}_{12} \underbrace{I}_{13} - \underbrace{C}_{14} \underbrace{I}_{15} \underbrace{I}_{16} \underbrace{I}_{17} \underbrace{I}_{18} - \underbrace{M}_{19} \underbrace{I}_{20}$
01	C)2		Sensor shell form
М	Ι			Flange shell Φ28mm
02)7		
0.) - (, ,		
				0050~2500 mm, step length mm
80	3 - C)9		Mounting thread form
S	F			Pressure-resistant rod, diameter 7mm
10) - 1	13		Connection form
Ρ	С			4 wiring harness, M12 IP69K, 5 pins (2-3-4-5)
Ρ	С	0	6	60mm, minimum length of wiring harness
Ρ	С	2	5	250mm, maximum length of wiring harness
Т	М			CAN special cable outlet
Т	М	0	1	1m cable
Т	М	R	1	0.1m cable, ordering method within 1 m
15	5 - 1	9		Signal output mode
15	5 - 1	16		Output form
С	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
17	7_ 1	8		Non-usable area at head and end, customizable
M	6			22mm+36 5mm
M	7]		22mm+63.5mm
IVI	<u>'</u>	J		

• Selection example

For example: MI-M0300-SF-TM05-C1411-M6

Indicates: MI flange diameter 28mm, stroke length 300mm, pressure-resistant rod with diameter 7mm, cable outlet form, CANopen output, baud 250kbit/s, resolution 0.1 mm, single magnet ring, non-usable area at head and end 22mm +36.5mm.







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
- Adapt to harsh environment, IP67 protection level
- Assembled in Cylinder, free from environmental and electromagnetic interference, non-contact measurement
- Redundant sensor system to improve the safety and s tability of construction machinery

Structural shape

Connector external dimensions



MT-Analog Output

Electrical connections

• Channel 1 analog (connector)

M12-4 Pin Definition	No.	PD
4 _ 3	1	Power supply
	2	Do not connect
	3	Ground
1/2	4	Signal

• Channel 2 analog (connector)

M12-5 Pin Definition	No.	PD
	1	Power supply
	2	Signal
	3	Ground
	4	Do not connect
	5	Do not connect

• M12-4pin socket



• M12-5pin socket





Assembly mode

Example ≥ 36.5 S Z ≥ 3

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. 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 \geq E+Z+3mm; 3.Piston rod hole diameter

Stell rod	Ø10	
Aperture size	≥Ø13	

MT

52

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



48H8 (thread)

48G7 (welding)

40 +0.2

> 32.5 < 40

2	7/20	
С	1/50	

>22

● Product parameters

• Input	
Measurement data	Position (vernier magnet)
Stroke length	50~2500 mm
Output	
Current	$4 \sim 20 \text{mA} \text{ (load resistance} \le 250 \Omega)$
Voltage	$0.5 \sim 4.5 V dc \text{ or } 0.25 \sim 4.75 V dc \text{ (load resistance} \ge 10 K\Omega)$
Resolution	±0.1mm (range<500mm)
Hocolation	range:+4096 (range>500mm)
Nonlinearity	± 0.1 mm (≤ 250 mm) or 0.04%F.S (>250mm)
Repetition accuracy	±0.1mm
Update time	2ms
Operating condi	tions
Magnet velocity	Arbitrary
Protection level	Sensor shell IP67; M12 Connector System IP69K
Operating temperature	-40°C ~ +105°C
Humidity/dew point	Humidity 90%, no condensation
Temperature drift coefficient	<30ppm / [°] C
Shock index	GB/T2423.5 100g (6ms)
Vibration index	GB/T2423.10 15g/10~2000Hz
	GB/T17626.2 Electrostatic Discharge Anti-interference, Grade 3, Class B
	GB/T17626.3 Radio Frequency Electromagnetic Field Radiation Anti-interference, Grade 3, Class A
EMC toot	GB/T17626.4 Electric Fast Transient Group Anti-interference, Grade 3, Class B
	GB/T17626.5 Surge (Impact) 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		Construction and materials		
Input voltage	9~ 32Vdc	Electronic compartment	304L stainless steel	
Power consumption	<1W	Measuring rod	304L stainless steel	
Polarity protection	maximum -30Vdc	Operating	Rated pressure Pn: 35MPa maximum pressure Pmax: 45MPa for stell rod with diameter of 10mm	
Overvoltage protection	maximum 36Vdc	pressure grade		
Insulation resistance	$>$ 10M Ω	Assembly	Any direction	
Insulation strength	500V	Position magnet	Various ring magnets	
Outgoing mode	Cable outlet or connector			



● Selection Guide

M T -	$-\underbrace{M}_{03} \underbrace{M}_{04} \underbrace{M}_{05} \underbrace{M}_{06} \underbrace{M}_{07} - \underbrace{S}_{08} \underbrace{M}_{09} - \underbrace{M}_{10} \underbrace{M}_{11} \underbrace{M}_{12} \underbrace{M}_{13} - \underbrace{M}_{14} \underbrace{M}_{15} \underbrace{M}_{16} - \underbrace{M}_{17} \underbrace{M}_{18}$
01 - 02	Sensor shell form
ΜΤ	Sensor shell Φ48mm
03 - 07	Measuring range
	0050~2500 mm. step length 1mm
08 - 09	Mounting thread form
S A	Pressure-resistant rod, diameter 10mm
10 - 13	Connection form
P D	Channel 1: 4 single leads, M12 IP69K, 4 pins (1-3-4) Channel 2: 4 single leads, M12 IP69K, 5 pins (1-3-2)
P D 0	6 60mm, minimum length of wiring harness
P D 2	5 250mm, maximum length of wiring harness
14 - 16	Signal output mode
V 2 0	Voltage output, 0.25~4.75V, 0.25~4.75V
V 2 1	Voltage output, 0.5~4.5V, 0.5~4.5V
V 2 2	Voltage output,4.75~0.25V,4.75~0.25V
V 2 3	Voltage output, 4.5~0.5V, 4.5~0.5V
V 3 0	Voltage output, 0.25~4.75V, 4.75~0.25V
V 3 1	Voltage output, 0.5~4.5V, 4.5~0.5V
A 2 0	Current output, 4~20mA, 4~20mA
V 2 1	Current output, 20~4mA, 20~4mA
A 3 0	Current output, 4~20mA, 20~4mA
17_10_	Non-upphis grap at bood and and sustamizable
-11-18	Non-usable area at nead and end, customizable
M 1	30mm+63.5mm

• Selection example

For example: MT-M0300-SA-PD08-A20-M1

Indicates: MT flange diameter 48mm, stroke length 300mm, pressure-resistant rod with diameter 10mm, two-way M12 connector, current output of 4~20mA, non-usable area at head and end of 30mm + 63.5mm.



Magnet ring Selection

Accessory name/model



Magnet ring kit Order No.: 288501



Dimensions

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

Description



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



Accessory name/model	Dimensions	Description
MH Analog Special Cable (M) Order No.: 511806	3C×0.5SQ φ5.5±0.2mm	Conductor: 3-pin, brown/white/green Sheath color: grey Shielding layer: tinned copper woven mesh Sheath material: 105°C polyvinyl chloride (PVC) Temperature: (-40~105°C)
CAN StaticTPU Cable(C) Order No.: 511816	2×2×24AWG φ6.3±0.1mm	Conductor: 4-pin, brown/white, yellow/green Sheath color: Purple Sheath Material: Polyurethane (TPU) characteristic impedance: $110\pm15\Omega$ Temperature: (-40~85°C)
PUR Black Cable Order No.: 511809	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)
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 loose wire socket Order No.: 600000		
MH 5-pin loose wire socket Order No.: 600001	24 4×04 17 17 16H8	





Accessory name/model



5-pin M12 female connector Order No.: 521801-2/3/5/10/15



5-pin M12 right angle female connector Order No.: 521804-2/3/5/10/15



5-pin M12 female connector Order No.: 521806-3/5/10



5-pin M12 right angle female connector Order No.: 521805-3/5/10



MH adapter harness Order No.: 522007



Dimensions

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

Description

Conductor: 5-pin,

brown/white/blue/black/gray



φ 5.6±0.2mm



φ 7.6mm



Sheath color: Black Shielding layer: tinned copper woven mesh Sheath material: PUR Temperature: (-40~80°C) Line length: 2m/3m/5m/10m/15m

Conductor: 4-pin, brown/white, yellow/green Sheath color: Purple Shielding layer: copper wire preparation Application characteristics: Impedance $120 \ \Omega$, special for CAN Temperature: (-30~80°C) Line length: 3m/5m/10m

Conductor: 4-pin, brown/white, yellow/green Sheath color: Purple Shielding layer: copper wire preparation Application characteristics: Impedance $120 \ \Omega$, special for CAN Temperature: (-30~80°C) Line length: 3m/5m/10m

When the Cylinder threading hole is less than 16H8, This harness switching can be used,Plastic shell thickness: 2.8 mm

Industrial Application



Metallurgical industry



Port machinery



Hydraulic machinery



Wind power industry



Injection molding machinery



Vulcanizing machinery



Die casting machinery



Vertical mill machinery



Construction machinery



Papermaking machinery



Liquid level tank



Forming machinery

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杭州浙达精益机电技术股份有限公司

Hangzhou Zheda Jingyi Electromechanical Technology Corporation Limited

销售热线(Sales Hotline):+86(0)571-8720 3588 / 3968

技术支持(Technical Support):131 1571 1470

传 真(Fax):+86(0)571-8971 9270

邮 箱(E-mail):sensor@jingyitech.com

公司官网(Company Web): www.jingyitech.com 产品网站(Product Web):www.zdjytec.com

Headquarters Address (Add): Rooms 401~405, Building 18, Zhejiang Overseas High-level Talent Innovation Park, No.998 Wenyi West Road, Yuhang District, Hangzhou, Zhejiang Province

Address of Sensor Division (Add): No.8-1 Longquan Road, Cangqian Industrial Park, Yuhang District, Hangzhou City, Zhejiang Province

邮 编(P.C.): 311121

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