

TIP 3 series

Linear Position Sensor



Feature:

Non-contact measurement, built-in structure, compact mechanism, and low power consumption equipment.
The repeatability accuracy is $\pm 0.1\text{mm}$ and the nonlinearity is less than 0.05% F.S.
Linear measurement, analog output /Canopen output.
The maximum measurable stroke is 2500 mm

Details:

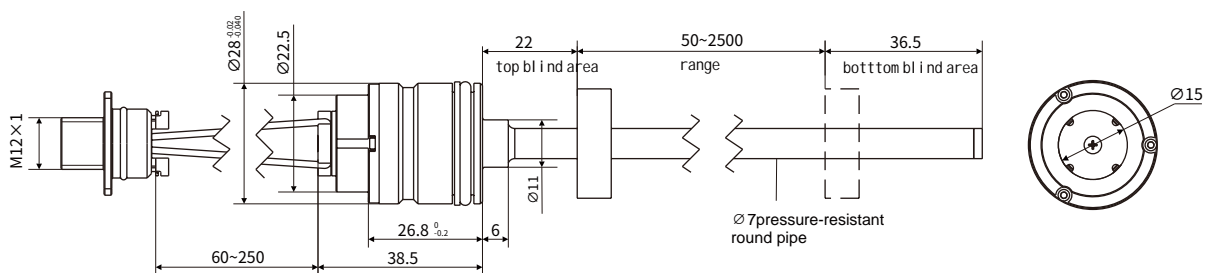
- The measuring rod is made of 304L stainless steel
- Threaded interface M18*1.5 (optional)
- 304L closed cylindrical flange for the electronic compartment
- External pipe pressure: 30 MPa(continuous), 70MPa(peak)
- The cable outlet method is direct cable or aviation plug
- Standard magnetic rings for position magnets and various ring-shaped magnets

Usages:

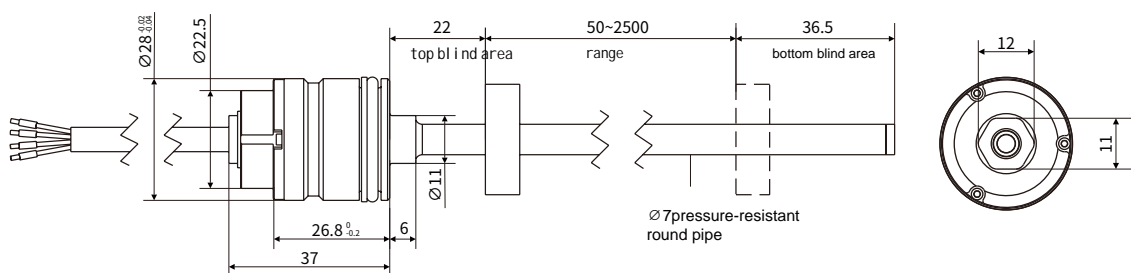
- Liquid level measurement
- Built-in oil cylinder matching
- Hydraulic presses and pile drivers are specially designed for construction machinery

Dimensions:

- The outgoing line of the aviation socket

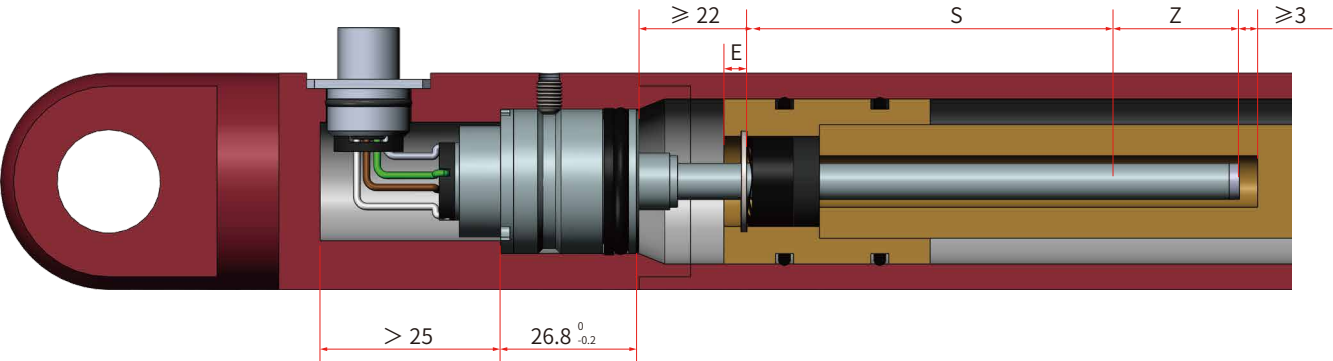


output cable



installation method:

aviation socket output

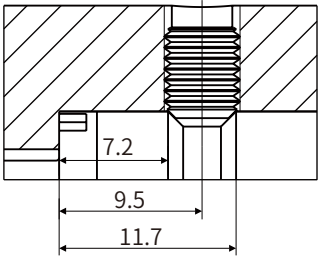
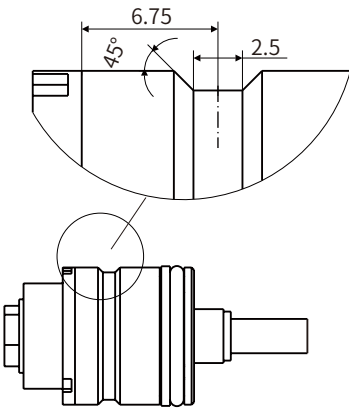


The installation method is entirely dependent on the design of the hydraulic cylinder. The commonly used installation method is to install from the end of the hydraulic cylinder rod, or it can also be installed from the end of the cylinder head of the hydraulic cylinder. In both installation methods, O-rings and auxiliary gaskets are used for air sealing.

- note:
- 1. The position magnet must not come into contact with the pressure-resistant outer tube.
 - 2. The drilling depth of the piston rod is $\geq E+Z+3\text{mm}$;
 - 3. Diameter of the piston rod hole

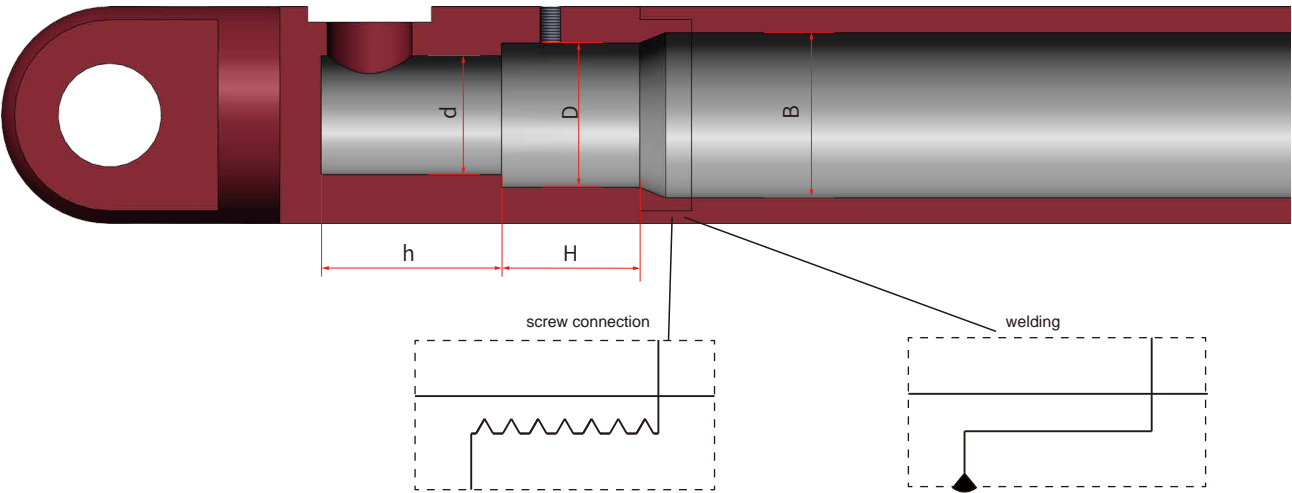
Pressure-resistant round pipe	$\varnothing 7$
aperture	$\geq \varnothing 10$

4. Do not exceed the working pressure during use.



Fix it with M5 hexagon socket flat-end set screws, with a maximum torque of 0.5N/m

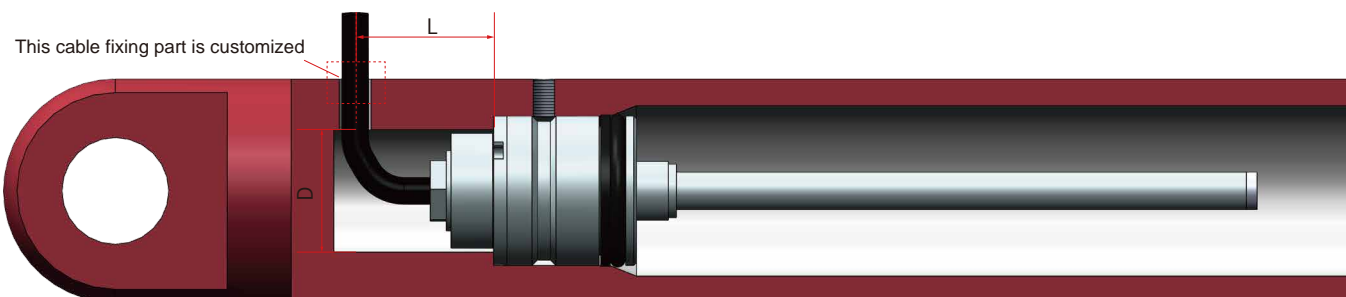
Flange housing with O-rings and auxiliary gaskets



unit: mm

type	B Minimum diameter of the hydraulic cylinder	D min diameter	H depth	d min diameter	h depth
MI	≥ 32	28H8 (screw) 28G7 (welding)	$26.8^{+0.2}_{-0.1}$	23.5	> 25

cable output



D	L
> 23.5 < 20	> 20

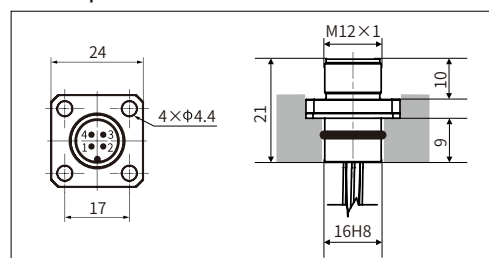
Note: The remaining dimensions are the same as the form of the aviation plug outlet cable

Interface definition:

• analog (aviation socket)

M12-4pin definition	no	PA	PB	PC
	1	power	none	power
	2	signal	power	none
	3	ground	ground	ground
	4	none	signal	signal

• M12-4pin socket



• analog (straight female wire definition)

M12-5pole straight female		wire color		
	define	PA	PB	PC
	power	br	Wt	br
	ground	bl	bl	bl
	signal	Wt	bk	bk

• wire output

散线输出	PT	
	def	wire color
	power	Br
	ground	Wt
	signal	Gn

• analog (bent female wire definition)

M12-5pole bent female		wire color		
	define	PA	PB	PC
	power	br	Wt	br
	ground	bl	bl	bl
	signal	Wt	bk	bk

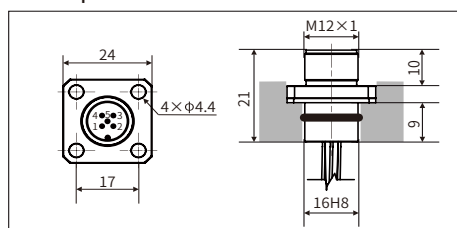
• special cable

cable no:511815	def	wire color
	power	Br
	ground	Wt
	signal	Gn

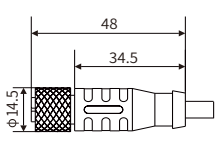
• CAN (aviation socket)

M12-5pin definition	no	PC
	1	none
	2	power
	3	ground
	4	CAN high
	5	CAN low

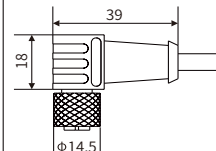
• M12-5pin socket




● CAN (straight female wire definition)

M12-5pole straight female	wire color	
	def	PC
	power	br
	ground	Wt
	CAN high	Yl
	CAN low	Gn

● CAN (bent female wire definition)

M12-5pole bent female	wire color	
	def	PC
	power	br
	ground	Wt
	CAN high	Yl
	CAN low	Gn

● CAN (output cable)

cable no:511816	def	wire color
	power	Br
	ground	Wt
	CAN high	Yl
	CAN low	Gn

Tech Parameter

Parameter	unit	Detail
Range	mm	50 - 2500 (25mm per level、range customized) ,
output signal		(0.5-4.5) / (0.25-4.75) VDC (min load > 10K Ohm) (4 - 20) mA (max load 250 Ohm) , CAN bus ISO DIS11898 , CANopen accord with CIA DS-301V3.0
Resolution		range / 4096 mm ,
Linearity	± %	analog: range > 250mm (< 0.05% F.S.) , range ≤ 250mm min ± 150um
Repeatability	± %	0.04.F.S (< 0.04% F.S.)
Hysteresis	±	< 0.04% .F.S
refresh frequency	ms	2
Transmission rate		max 1M bit/s
Working temperature	℃	-40 - +105
Temperature coefficient	ppm/℃	< 30
Working voltage	V	(9-32) VDC MAX=36 VDC(overload protection)
Power consumption	W	< 1
Electrical impact	V	500 (Between the electrical and mechanical ground)
Reverse voltage protection	V	max - 30 VDC
Impact index	g	100(single) / IEC standard 68-2-27
Vibration	g	10/10-2000HZ/IEC standard 68-2-26
Protection class		IP67
certificate level		accord with CE-standard (pass EMC approval)
working humidity		90% (relative humidity) no condensation allowed
EMC Test		GB/T17626.2 Anti-interference degree of electrostatic discharge, level3, A class GB/T17626.3 Anti-interference degree of radio frequency electromagnetic field radiation, level3, A class GB/T17626.6 The anti-interference degree of conducted disturbance induced by radio frequency field, level3, A class GB/T17626.8 Anti-interference degree of power frequency magnetic field, level4, A class

▶ Product parameters -CANOpen output

• output

test data	position (Vernier magnetic ring)
effective range	50~2500 mm

• output

interface	CANbus ISO DIS 11898, CANOpen accord with CIA DS-301V3.0, sensor standard DS-406V3.1
transmission	max 1Mbit/s
resolution	±0.1mm
linearity	±0.1mm (≤250mm) 或 0.04%F.S (>250mm)
repeatability	±0.1mm
update time	2ms

• working condition

speed of magnet ring	any speed rate
protection class	IP67
working temperature	-40°C ~ +105°C
Humidity/Dew point:	90% humidity, no condensation
Temperature coefficient	<30ppm/°C
impact index	GB/T2423.5 100g (11ms)
vibration index	GB/T2423.10 15g/10~2000Hz

EMC Test	GB/T17626.2 Anti-interference degree of electrostatic discharge, grade 3, Class A
	GB/T17626.3 Radio frequency electromagnetic field radiation anti-interference degree, grade 3, Class A
	GB/T17626.6 The anti-interference degree of conducted disturbance induced by radio frequency field, grade 3, Class A
	GB/T17626.8 Power frequency magnetic field anti-interference degree, grade 4, Class A

• Electrical connection

output voltage	8~ 32Vdc
power consumption	<1W
polarity protection	max-30Vdc
overload protection	max 36Vdc
isolation resistance	>10MΩ
isolating strength	500V
output way	cable or connection

• structure and materials

Electrical cell	304L stainless steel
Detect stick	304L stainless steel
Work pressure level	The rated pressure Pn of the pressure-resistant outer tube with a diameter of 7mm is 30MPa Maximum pressure Pmax:40MPa
installation	any direction
position marker	various of magnet ring

▶ Selection Guide -CANOpen Output

MI - M - S - - C1 - M
 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20

01 - 02				sensor housing type															
M I				flange housing ϕ28mm															
03 - 07				range															
				0050~2500 mm, l evel 1mm															
08 - 09				fixing screw type															
S F				Pressure-resistant round pipe, with a diameter of 7mm															
10 - 13				connection type															
P C				4 wires, M12 IP69K, 5PIN (2-3-4-5)															
P C 0 6				60mm, min cable length															
P C 2 5				250mm, max cable length															
T M				CAN used straight cable															
T M 0 1				1m cabl e															
T M R 1				0.1m cable, order way for below 1m of cable															
15 - 19				signal output type															
15 - 16				output type															
C 1				CANopen															
17				baud rate															
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				quantity of magnetic ring															
1				singl e															
17- 18				blind area customized															
M 6				22mm+36.5mm															
M 7				22mm+63.5mm															

● Selection example

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

Indicated: MI flange diameter 28mm, 300mm effective stroke, 7mm diameter pressure-resistant round pipe, direct cable form, CANopen output, baud rate 250Kbit/s, resolution 0.1mm, single magnetic ring, blind zone at the beginning and end 22mm+36.5mm.