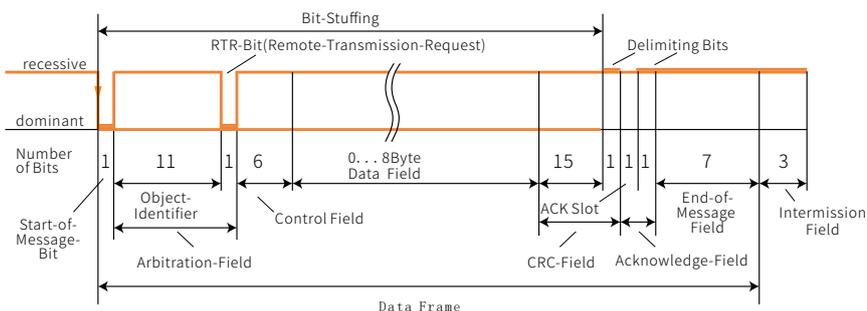




MH-CANopen

MH-pressure resistant outer tube



- + High vibration and shock resistance performance.
- + Compact design: suitable for applications with strict space requirements for the installation of electronics housing, extensive applications in construction machinery.
- + Durust: fully enclosed design with maximum IP69K protection.
- + Straight measurement: absolute value output, no zero.
- + Easy to use: standard signal output, maintenance-free.
- + Maximum durability: continuous non-contact measurement.
- + Full range adjustable: 100% adjustable zero and full range.



Document Number:
MH-C (V1.4)-EN

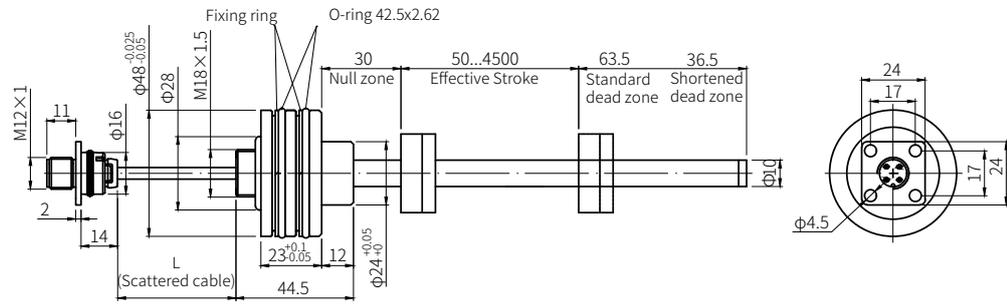
TECHNICAL PARAMETER

Input											
Measured data	Position/Velocity										
Measurement range	50...4500mm										
Output											
Communication protocols	CAN bus system protocol, ISO11898,CAN open CIA standard DS-301 V3.0 encoder profile DS-406 V3.1										
Transmission rate	<table border="1"> <tr> <td>Rate (kbit/s)</td> <td>1000</td> <td>500</td> <td>250</td> <td>125</td> </tr> <tr> <td>Cable length (meter)</td> <td>< 25</td> <td>< 100</td> <td>< 250</td> <td>< 500</td> </tr> </table>	Rate (kbit/s)	1000	500	250	125	Cable length (meter)	< 25	< 100	< 250	< 500
Rate (kbit/s)	1000	500	250	125							
Cable length (meter)	< 25	< 100	< 250	< 500							
Resolution											
Resolution:position	2/5/10/100µm										
Resolution: velocity	1mm/s										
None-Linearity	< ±0.04%F.S.										
Repeatability	< ±0.005%F.S										
Update time	<table border="1"> <tr> <td>Stroke length</td> <td>≤ 1200mm</td> <td>≤ 2400mm</td> <td>≤ 4500mm</td> </tr> <tr> <td>Update time</td> <td>0.5ms</td> <td>1ms</td> <td>2ms</td> </tr> </table>	Stroke length	≤ 1200mm	≤ 2400mm	≤ 4500mm	Update time	0.5ms	1ms	2ms		
Stroke length	≤ 1200mm	≤ 2400mm	≤ 4500mm								
Update time	0.5ms	1ms	2ms								
Temperature coefficient	< 30ppm/°C										
Mounting											
Mounting position	Any										
Mounting	Extrusion mounting										
Design/Material											
Electronics housing	Stainless steel 304										
Measuring rod	Stainless steel 304、 316L										
Magnet	Standard magnet										
Electrical connection											
Wiring connection	Straight out cable, aviation plug										
Operating voltage	+24VDC (-15/+20%)										
Polarity protection	Up to -36VDC										
Overvoltage protection	Up to +36VDC										
Power consumption	< 70mA (varies with range size)										
Dielectric strength	500 VDC (DC ground to machine ground)										
Terminal resistance	120Ω (Software-adjustable on and off)										
Operating conditions											
Magnet velocity	Any										
Operating temperature	-40...105°C (customizable)										
Humidity	90 % relative humidity, no condensation										
Operating pressure ratings	Φ10 Measuring rod: 35MPa (continuous) ,70MPa (peak) Φ7 Measuring rod: 30MPa (continuous) ,45MPa (peak)										
Ingress protection	IP68 / IP69K (Straight out cable)										
Shock	100 g/6 ms, IEC standard 60068-2-27										
Vibration	IEC standard 60068-2-64 Φ10 rod: 20 g (root-mean-square value)10...2000 Hz (resonant frequencies excluded) Φ7 rod: 15 g (root-mean-square value)10...2000 Hz (resonant frequencies excluded)										
EMC	Compliant with: ISO 14982: Agricultural and Forestry Machinery ISO 16750-2: Road vehicles										
	<table border="1"> <tr> <td>Anti-interference</td> <td>ISO 11452-2 (200V/m Antenna) ISO 11452-4 (200mA BCI)</td> </tr> <tr> <td>Transient pulse</td> <td>ISO 7637-1/2</td> </tr> <tr> <td>E.S.D.</td> <td>ISO/TR 10605</td> </tr> </table>	Anti-interference	ISO 11452-2 (200V/m Antenna) ISO 11452-4 (200mA BCI)	Transient pulse	ISO 7637-1/2	E.S.D.	ISO/TR 10605				
Anti-interference	ISO 11452-2 (200V/m Antenna) ISO 11452-4 (200mA BCI)										
Transient pulse	ISO 7637-1/2										
E.S.D.	ISO/TR 10605										

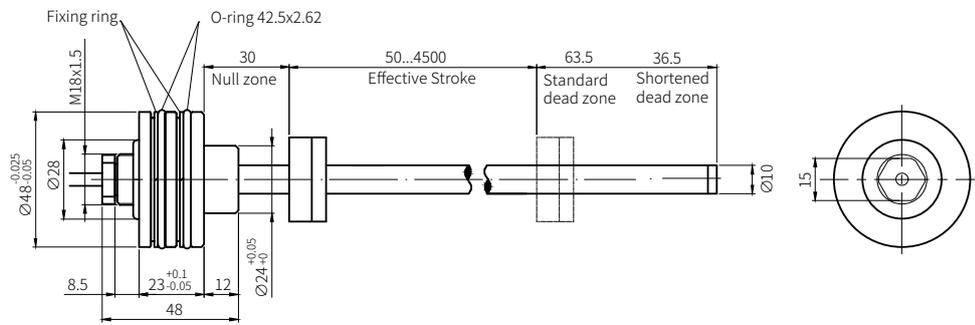
TECHNICAL DRAWING

Basic type

Basic type with aviation plug

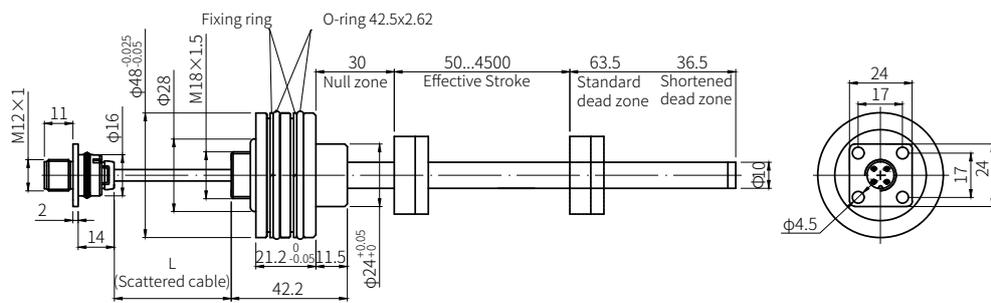


Basic type with straight-out cable

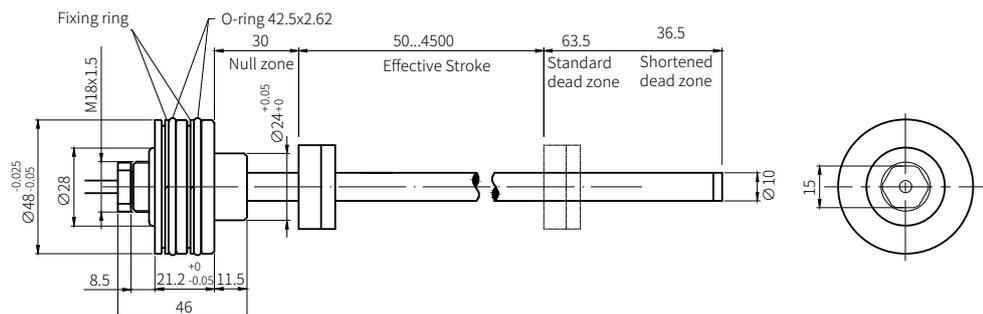


Customized type

Customized type with aviation plug

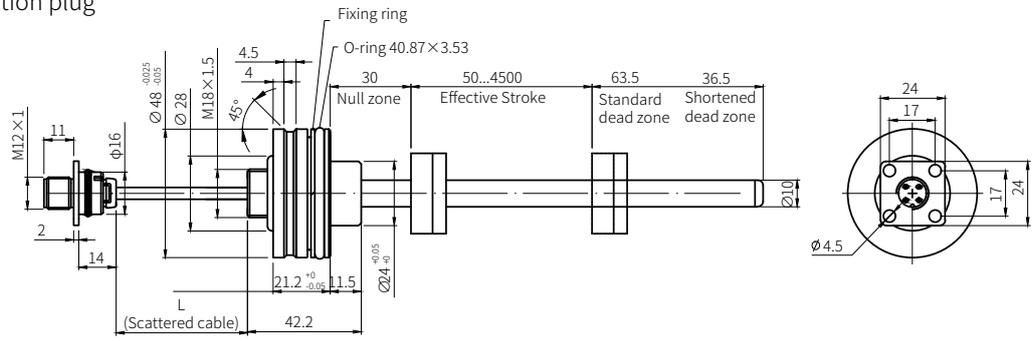


Customized type with straight-out cable

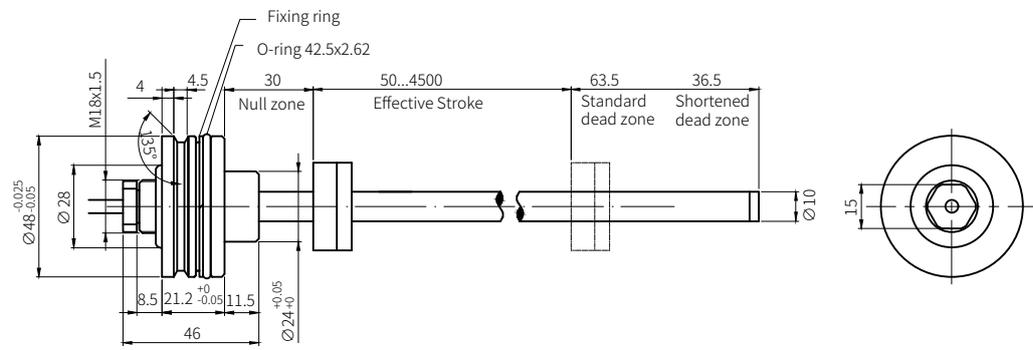


Thimble type

Thimble type with aviation plug



Thimble type with straight-out cable



For selection of supporting magnetic rings and non-permeable gaskets, please refer to the attachment for details.



Magnetic ring

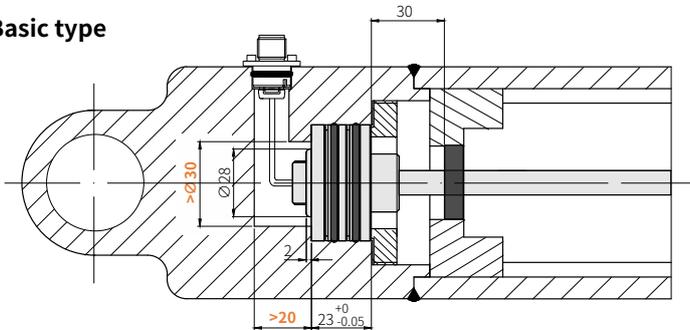


Non-permeable gasket

MECHANICAL MOUNTING DIAGRAM

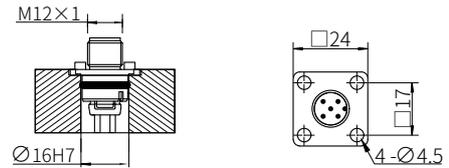
- + Secure the magnet with non-permeable gasket.
- + The size of hole in the piston rod depends on factors such as hydraulic pressure and piston speed. The minimum hole size is $\Phi 10$ ($\Phi 7$ measuring rods) or $\Phi 13.5$ ($\Phi 10$ measuring rods).
- + The top mounting hole of the cylinder is greater than 30mm in diameter and 20mm in depth.
- + The thimble is made of flat head top wire, and the force distance is $< 0.5\text{N.m}$.

Basic type

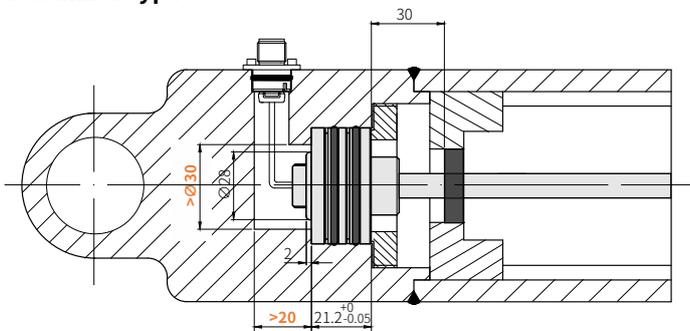


M12 connector

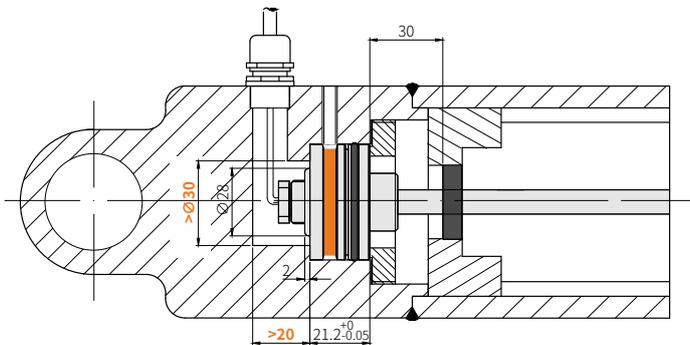
4 single lines, 0.5mm^2



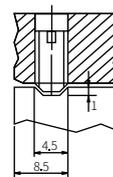
Customized type



Thimble type



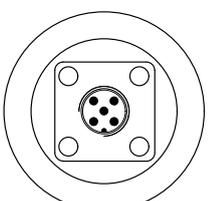
e.g. retaining with set screw DIN913
M5x10 (with flat point!)
max. torque 0.5Nm



Wiring

When connected with aviation plug, define by wire pin;

When connected with waterproof connector straight out cable, define by wire color.

5 pin M12 connector	PIN	Color	Function
	1	-	NC
	2	Brown	+24VDC (-15/+20%)
	3	White	GND
	4	Yellow	CAN H
	5	Green	CAN L

ORDER CODE

M H - - - M - - - -

MH pressure resistance exterior rod

- D Basic type,aviation plug
- B Basic type,straight-out cable
- R Customized type,straight-out cable
- G Customized type, aviation plug
- N Thimble type, straight-out cable
- K Thimble type, aviation plug

Rod

- C Rod Φ10mm (dead zone 63.5mm)
- D Rod Φ7mm (dead zone 63.5mm)
- E Rod Φ10mm (shortened dead zone 36.5mm)
- F Rod Φ7mm (shortened dead zone 36.5mm)
- R Rod Φ10mm with M4x6 thread (dead zone 63.5mm)

Stroke ___M

M=mm (5mm increments)

Connection type

Fill: [1] [2] [3] [4] [5]

[1] and [2]: Cable connection

- R straight-out cable
- DF 5 pin aviation plug

[3]: Cable performance

- P high performance cable
- T high temperature cable

[4] and [5]: Cable length

- __ unit: meter (R)
- Fill in zero if less than 2 places
- __ unit: 10millimetre (DF)

Output signal mode

Fill: [1][2][3] - [4] - [5][6]

(Note: "*" as default)

[1][2][3] Resolution ratio

- C01 100µm *
- C11 5µm
- C21 2µm
- C31 10µm

[4] Baud rate

- | | | | |
|---|------------|---|-----------|
| 0 | 1000kBit/s | 5 | 100kBit/s |
| 1 | 800kBit/s | 6 | 50kBit/s |
| 2 | 500kBit/s | 7 | 20kBit/s |
| 3 | 250kBit/s* | 8 | 10kBit/s |
| 4 | 125kBit/s | | |

[5][6]Node-ID

- 01 Hexadecimal 01...7F*
- .
- .
- .
- 7F

K=Anti-vibration program (Note: for special request, fill in last digit)

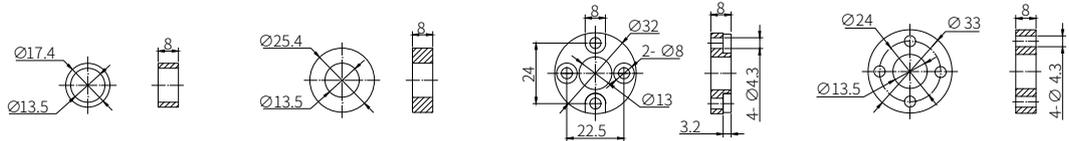
Model | MHR-D-0390M-DFP10-C11-3-7F

Explanation: MH series straight out cable customized type (electronics housing thickness 21.2mm) with measuring rod diameter of 7mm (dead zone 63.5mm), range 390mm, straight out 100mm high performance cable with 5 pin aviation plug, CANopen protocol, resolution 5µm, baud rate 250kBit, node ID 7F.

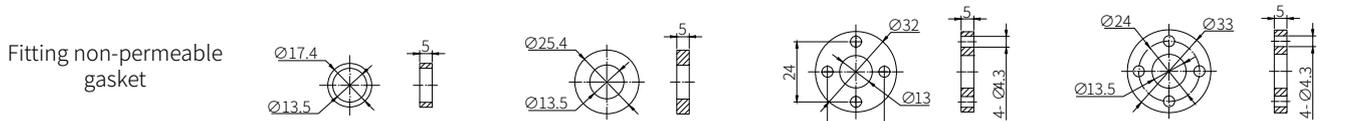


ACCESSORIES

CANopen



Name	Ring magnet	Ring magnet	Ring magnet	Ring magnet
Operating temperature	-40...125°C			
Order code	12-1032	12-1019	12-1024	12-1001



Name	Non-permeable gasket	Non-permeable gasket	Non-permeable gasket	Non-permeable gasket
Operating temperature	-40...125°C			
Order code	12-1037	12-1021	12-1025	12-1008



Connector	5 pin M12 female connector (90 degree angle)	5 pin female connector (90 degree angle)
Name	Integral cable	Integral cable
Cable	2×2×0.25mm ²	2×2×0.25mm ²
Color/Diameter	Gray/ Ø 6	Gray/ Ø 6
Plug surface	 2-Brown 3-White 4-Yellow 5-Green	 2-Brown 3-White 4-Yellow 5-Green
Length	1M	2M
Order code	16-1022	16-1023

Building 6, Dazhu Enterprise Bay,
8th yard of Liangshuihe 2nd street, BDA Beijing P.R.China

Tel: +86 10-67948976 67948916
Fax: +86 10-67948979
Technical support: +86 (0)13370126657

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