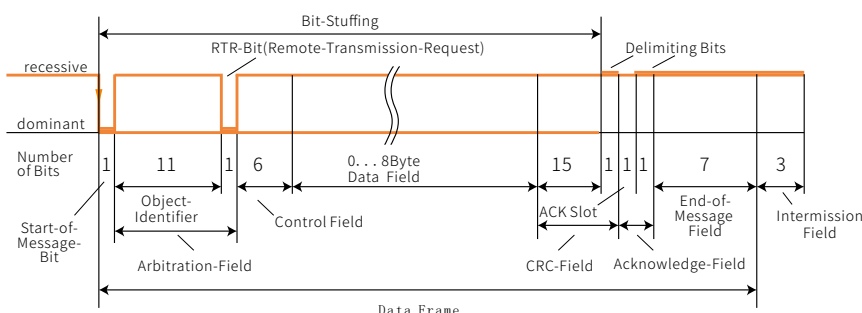




MH-CANopen

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.



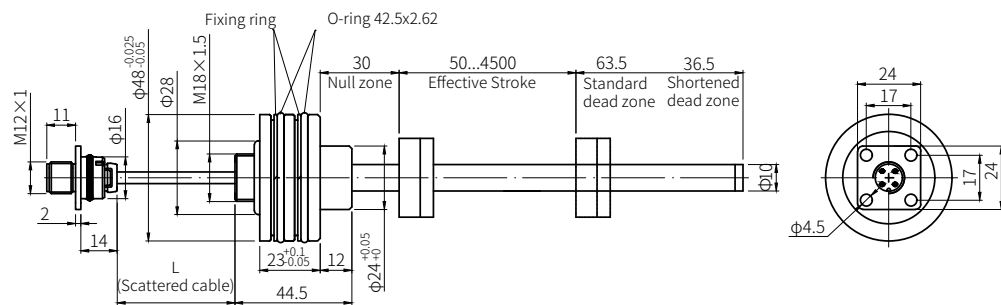
Document Number:
MH-C (V1.5)-EN

TECHNICAL PARAMETER

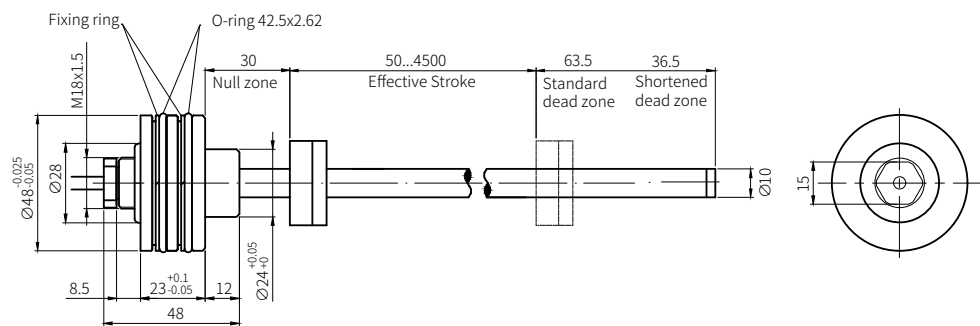
Input											
Measured data	Position/Velocity										
Measurement range	50...4500mm										
Output											
Communication protocols	SAE J1939, CANopen protocol according to CiA DS-301 V3.0, device profile DS-406 V3.1										
Transmission rate	<table><tr><td>Rate (kbit/s)</td><td>1000</td><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><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 standerd 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><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										

Basic type

Basic type with aviation plug

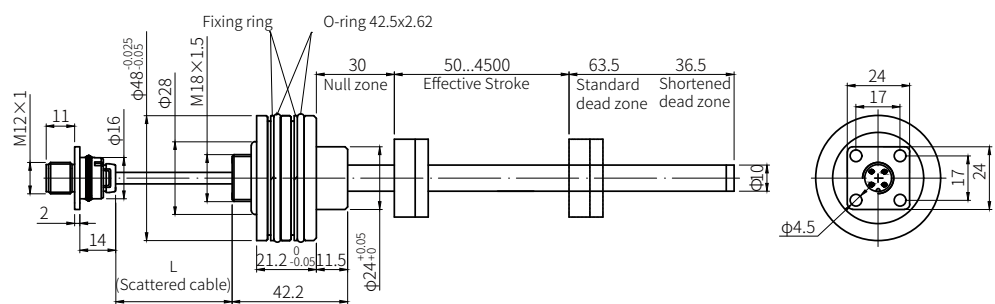


Basic type with straight-out cable

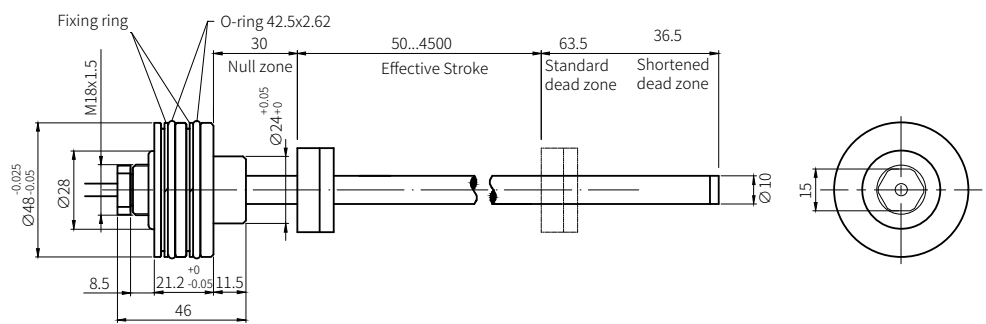


Customized type

Customized type with aviation plug

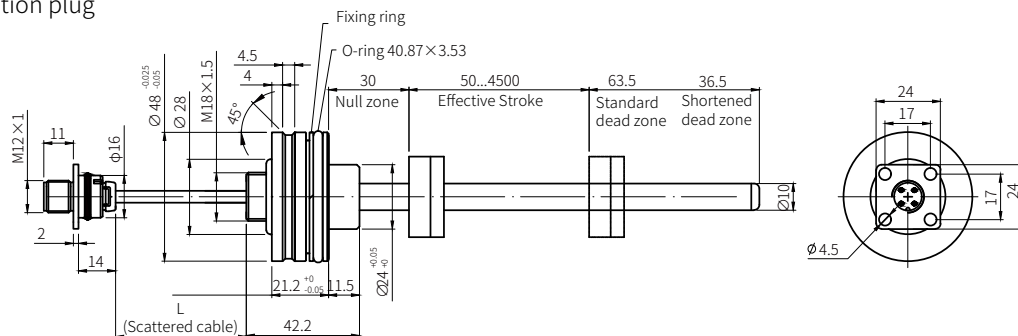


Customized type with straight-out cable

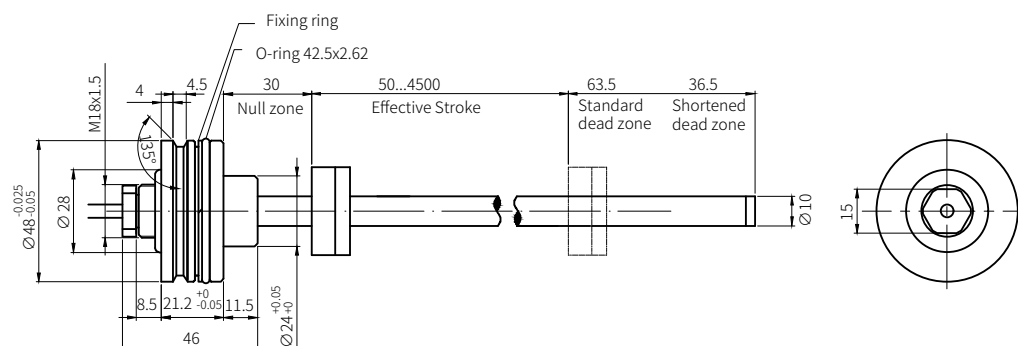


Thimble type

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.



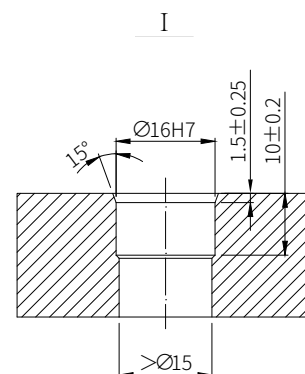
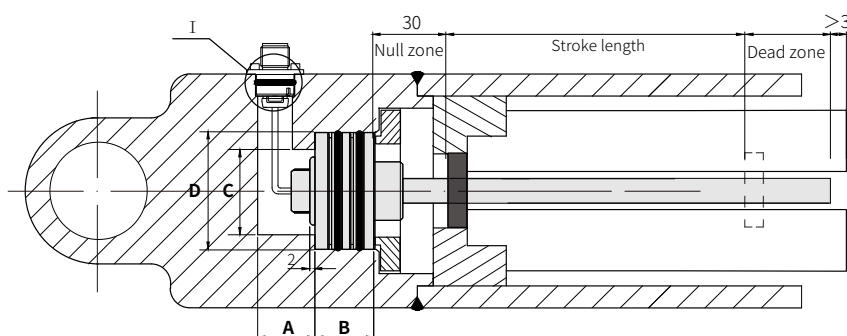
Magnetic ring



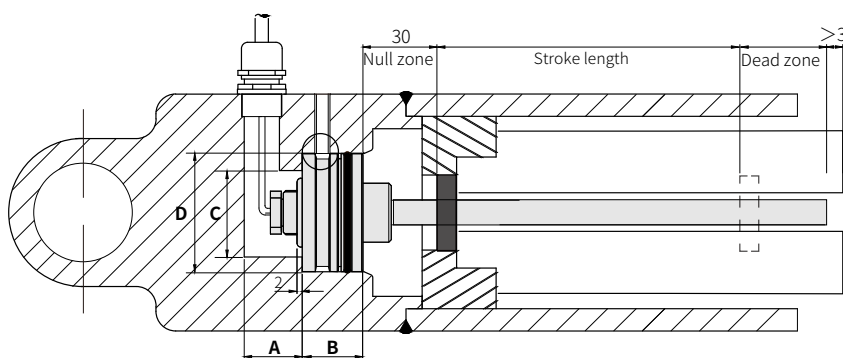
Non-permeable gasket

MECHANICAL MOUNTING DIAGRAM

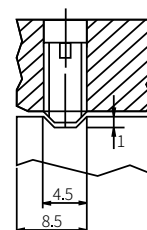
Double seal (Basic type/ Customized type)



Thimble type



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



Type	A depth (mm)		B depth (mm)	C Ø (mm)	D Ø (mm)
	straight-out cable	connector			
Basic type(Double seal)	> 20	≥ 15	23 ^{+0.2}	> 30	48H8
Customized type(Double seal)			21.2 ^{+0.2}		
Thimble type			21.2 ^{+0.2}		

Surface Ra < 0.8mm



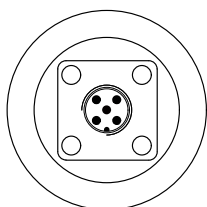
- + The size of hole in the piston rod depends on factors such as hydraulic pressure and piston speed. The minimum hole size is Φ10 (Φ7 measuring rods) or Φ13.5 (Φ10 measuring rods).
- + Thimble type, thimble adopts flat head wire, torque 0.5N·m.
- + The borehole depth > Effective stroke + Dead zone + 3mm.

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



View on sensor

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]Output	[2][3] Resolution ratio	[4] Baud rate	[5][6]Node-ID
C CANopen*	01 100μm *	0 1000kBit/s	01...7F Hexadecimal 01...7F*(CANopen)
	11 5μm	1 800kBit/s	6 50kBit/s
	21 2μm	2 500kBit/s	7 20kBit/s
	31 10μm	3 250kBit/s*	8 10kBit/s
		4 125kBit/s	

SAE-J1939 Fill: [1][2][3] - [4] - [5][6] (Note: “*” as default)

[1]Output	[2][3] Resolution ratio	[4] Baud rate	[5][6]Node-ID
J SAE J1939*	01 100μm *	2 250kBit/s*	01...FD Hexadecimal 01...FD*(SAW J1939)
	11 5μm	3 125kBit/s	
	21 2μm		
	31 10μm		

Cycle time: CANopen default 10ms,SAE J1939 default 20ms.

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

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

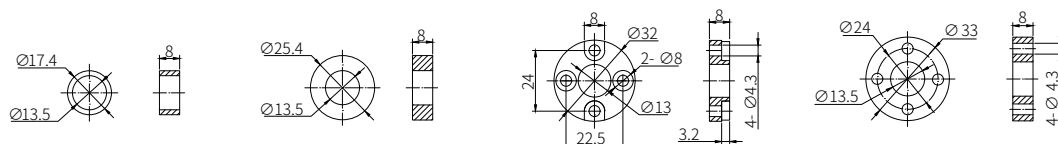
Explanation: MH series straight out cable customized type (electronics housing thickness 21.2mm) with measuring rod diameter of 7mm (dead zone 63.5mm), range 390mm, straight out 100mm high performance cable with 5 pin aviation plug, CANopen protocol, resolution 5μm, baud rate 250kBit, node ID 7F.

■ For more customizable products,
please contact us.



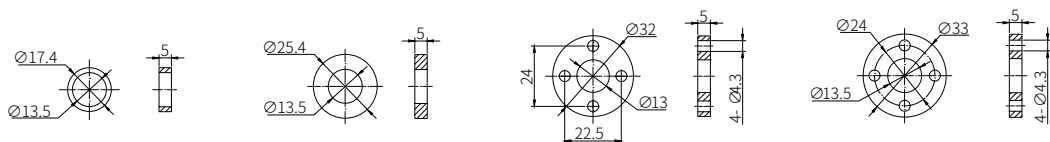
ACCESSORIES

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

Fitting non-permeable gasket



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

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