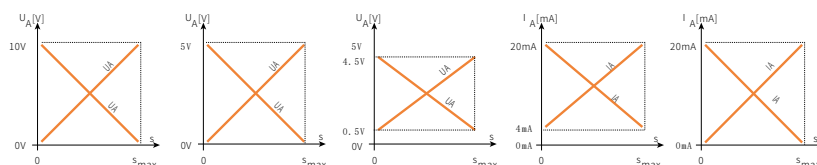




T3F - Analog

T-Series III Data Sheet



- + Updated new generation: stronger performance
- + Direct analog output, position and velocity
- + Resolution highest up to $0.1\mu\text{m}$
- + Stroke length up to 20m



THE NEW GENERATION



High precision



Double anti-interference



High performance chip



Wide operating voltage



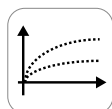
Reverse polarity protection



Shock/vibration resistant

TECHNICAL PARAMETER

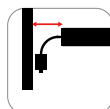
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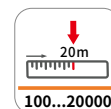
Linear/Curve measurement



Compact for transport and storage



Confined space installation

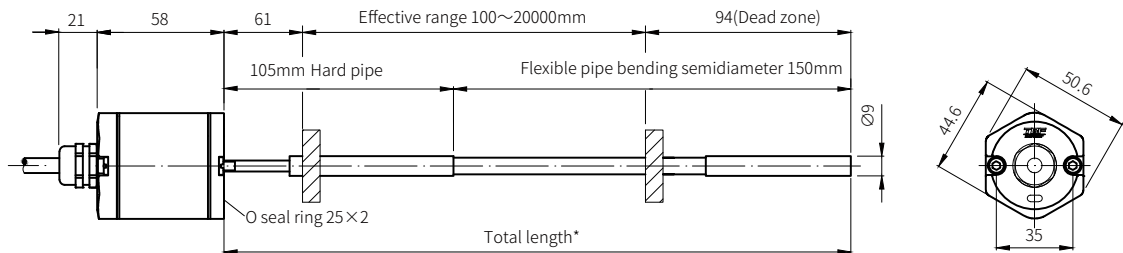


Wider stroke length range

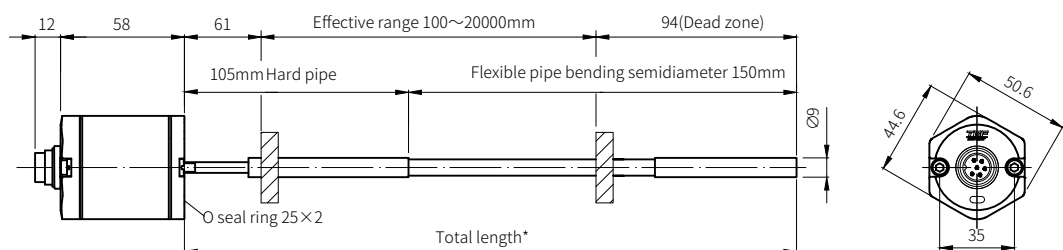
Input	Measured data	Position/Velocity					
	Position measurement range	100...20000mm					
	Velocity measurement range	0.01...10m/s					
Output	Voltage	0...10VDC, 10...0VDC, 0...5VDC, 5...0VDC, 0.5...4.5VDC, 4.5...0.5VDC (Controller min. load impedance >5KΩ)					
	Current	4...20mA, 20...4mA, 0...20mA, 20...0mA (min./max. load 0/750Ω)					
Resolution	Position resolution	16 bit D/A (internal resolution 0.1 μm)					
	Velocity resolution	16 bit D/A (min. 0.01mm/s)					
	None-Linearity	< ±0.02%F.S. (min. ±100μm)					
	Repeatability	< ±0.001%F.S. (min. ±2.5μm)					
	Update time	Stroke length(mm)	≤ 1200	≤ 2400	≤ 4800	≤ 7600	≤ 10000
		Update time	0.5ms	1ms	2ms	5ms	7.5ms
	Temperature coefficient	<30ppm/°C					
Mounting	Mounting position	Any					
	Aluminum profile	Removable fixing card					
	Pressure resistance outer tube	Thread metric M18×1.5, 3/4"-16UNF-3A etc.					
Design/Material	Electronics housing	Aluminum alloy/Zinc alloy					
	Magnet	Stainless soft pipe (Teflon skin), min. bending semidiameter 150mm, shipping semidiameter 500mm					
Electrical connection	Wiring connection	Straight out cable, M12 connector (5 pin) , M16 connector (6 pin) , M12 connector (8 pin) , M16 connector (8 pin)					
	Operating voltage	9VDC...36VDC					
	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)					
Operating conditions	Loop velocity	Any					
	Operating temperature	-40...85°C (105°C customizable)					
	Humidity	90 % relative humidity, no condensation					
	Ingress protection	IP67 installed into pressure pipe (top IP68)					
	Shock	100 g/11 ms, IEC standard 60068-2-27					
	Vibration	5 g/10...2000 Hz, IEC standard 60068-2-6 (resonant frequencies exclusive)					
	EMC	Flexible sensor installed into pressure pipe Electromagnetic emission according to EN 61000-6-4 Electromagnetic immunity according to EN 61000-6-2					
ITEM	CATEGORY	PARAMETER					

T3F- ____ - **RP** - ____

Straight out cable

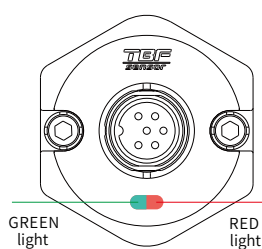
T3F- ____ - **RT** - ____T3F- ____ - **D512** - ____

Aviation plug

T3F- ____ - **D616** - ____T3F- ____ - **D812** - ____T3F- ____ - **D816** - ____

*Total length < 7600mm, error 0/+8mm; > 7600mm, error +15mm /-5mm;
 Total length error has no impact on effective range.

Enhanced monitoring and diagnostic functions



Green light	Red light	Function
ON	OFF	Normal work
ON	ON	Magnet is out of the effective range, or magnet cannot be measured, nor magnet number is correct.
FLASH	ON	Enter programming status

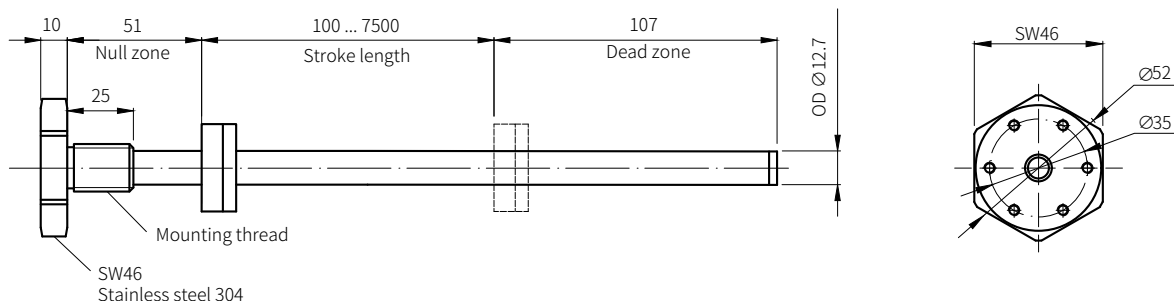
DRAWING

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Pressure pipe

Continuous pressure tolerance of the pressure pipe is 35MPa (70MPa peak).

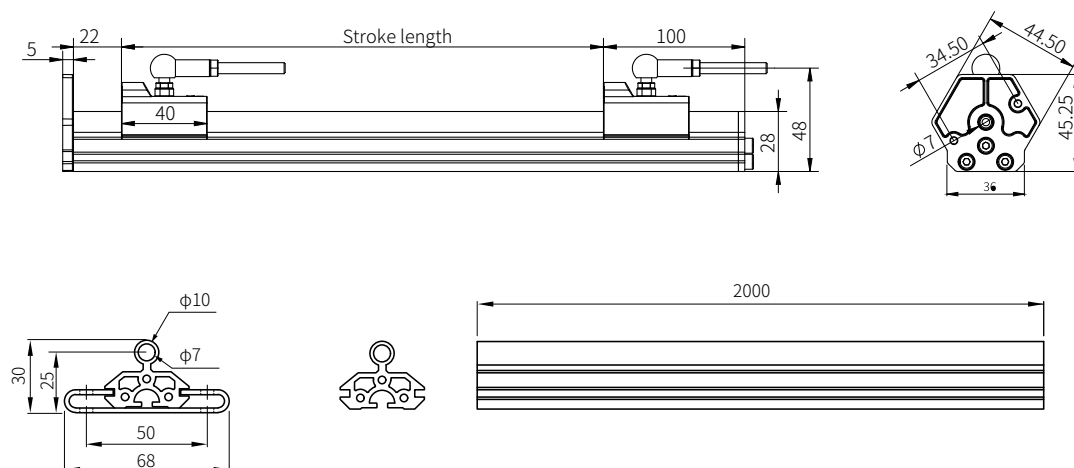
T3F flexible sensor is installed into pressure pipe, straight out cable IP68, aviation plug IP67.



ORDER CODE

HD	M	
		Stroke length
		0100...7500mm (5mm increments)
		Thread
	M	Metric M18x1.5
	V	Metric M20x1.5
	S	3/4"-16UNF-3A
	W	Metric M24x1
		If not selected, thread M18x1.5 by default.

Aluminum profile



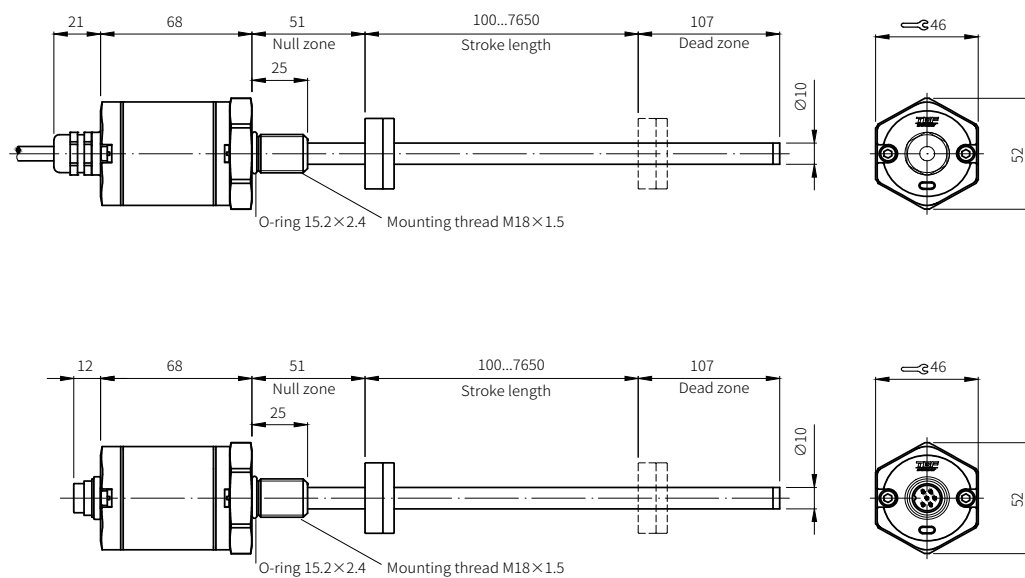
ORDER CODE

H3P	M	
		Stroke length
		0025...5600mm (5mm increments)
		Magnet
	S	Magnet slider joint at top
	V	Magnet slider joint at front
	F	Suspension magnet
	U	U- magnet

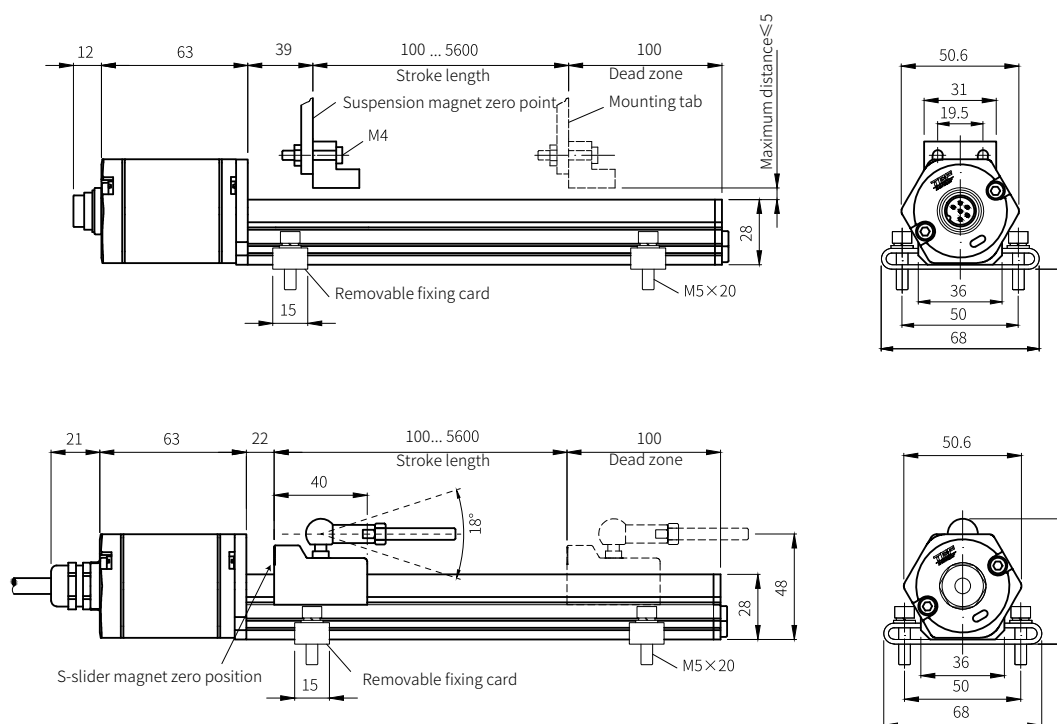
Combination example drawings

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Flexible sensor installed into pressure pipe



Flexible sensor installed into aluminum profile



MOUNTING DRAWING

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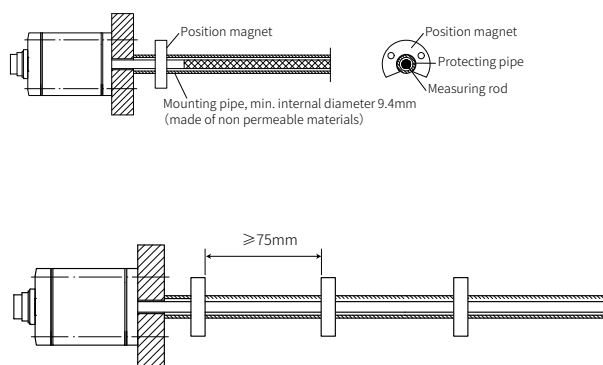
T3FH type of installation diagram

Electronics housing for T3F flexible sensor employs two M4x60 non permeable screws for installation.

When arc measurement is adopted, the flexible pipe can be bended into required shape with min. bending semidiameter 150mm.

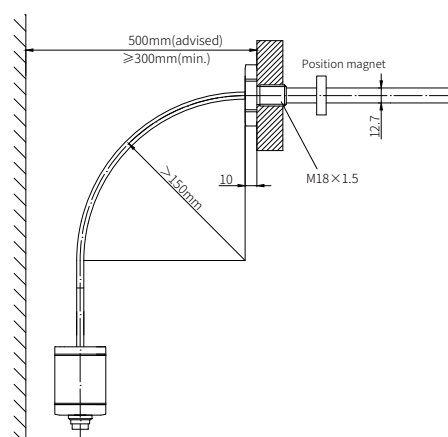
With long range sensor, pipes made of non permeable materials can be used as support. In addition, pressure pipe with flange can also be ordered to support and protect the sensor.

Linear measurement



Spacing between multiple magnets shall be $\geq 75\text{ mm}$

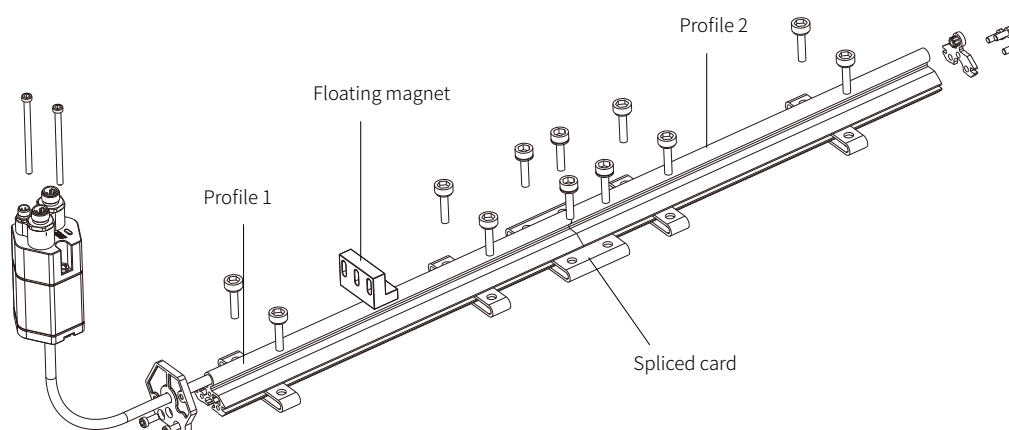
Pressure pipe



T3FP type of installation diagram

T series external guide rail sensors are fixed with removable fixing cards. The distance between the cards should be with in 500mm.

When the sensors are used under extremely severe shock and vibration conditions, it is recommended to configure a removable fixing card every 250mm.



For spliced profiles:

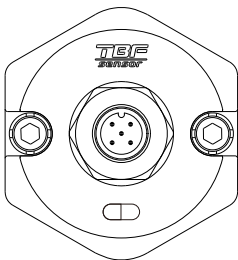
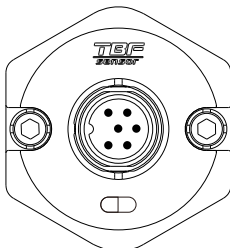
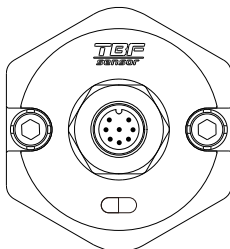
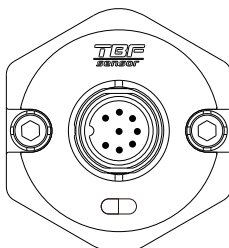
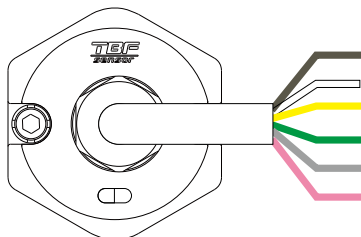


Ensure the joints are flush.

Only compatible with floating magnets or U-shaped magnets.

FUNCTION

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5 pin M12 connector	D512	PIN	Function	
	 View on sensor	1	9 VDC...36 VDC	
		2	Signal output 1	
		3	0 VDC (GND)	
		4	Signal output 2*	
		5	Signal ground	
6 pin M16 connector	D616	PIN	Function	
	 View on sensor	1	Signal output 1	
		2	Signal ground 1	
		3	Signal output 2 *	
		4	Signal ground 2 *	
		5	9 VDC...36 VDC	
		6	0 VDC (GND)	
8 pin M12 connector	D812	PIN	Function	
	 View on sensor	1	Signal ground 2 *	
		2	Signal ground 1	
		3	Signal output 2 *	
		4	NC	
		5	Signal output 1	
		6	0 VDC (GND)	
		7	9 VDC...36 VDC	
		8	NC	
8 pin M16 connector	D816	PIN	Current	Voltage
	 View on sensor	1	Current signal (output 1)	NC
		2	Signal ground	Signal ground
		3	Current signal (output 2) *	Voltage signal (output 2) *
		4	NC	NC
		5	NC	Voltage signal (output 1)
		6	0 VDC (GND)	0 VDC (GND)
		7	9 VDC...36 VDC	9 VDC...36 VDC
		8	NC	NC
Straight out cable		Color	Function	
		Brown	9 VDC...36 VDC	
		White	0 VDC (GND)	
		Yellow	Signal ground1	
		Green	Signal output 1	
		Gray	Signal output 2 *	
		Pink	Signal ground2 *	
""adaptable for dual output signal connection				

ORDER CODE

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Basic structure

T3F - C - - - - M - - - - -			
Pipe mounting	Stroke length	Connection type	Output
C Basic structure	00100...20000mm (< 1000: 50mm increments) > 1000: 250mm increments) Max. range 7500mm (pressure pipe installed)	RP__ Straight out __m high performance cable RT__ Straight out __m high temperature cable (Fill in zero if less than 2 places) D512 5 pin M12 connector D616 6 pin M16 connector D812 8 pin M12 connector D816 8 pin M16 connector	(Output Code)

Flexible sensor installed into pressure pipe

T3F - - - - M - - - - -			
Pipe mounting	Stroke length	Connection type	Output
M Thread M18×1.5 with pressure pipe S 3/4"-16UNF-3A with pressure pipe	00100...7500mm	Same as above	(Output Code)

Flexible sensor installed into aluminum profile

T3FP - - - - M - - - - -			
Magnet	Stroke length	Connection type	Output
S Magnet slider joint at top V Magnet slider joint at front F Suspension magnet U U- magnet	00100...5600mm (5mm increments)	Same as above	(Output Code)

Analog Output Code		[1][2]-[3][4][5]-____				
[1] System	[2] Output	[3][4] Current/Voltage				[5] Magnet
1 Standard	1 Position	A0	4...20mA (forward)	V0	0...10V (forward)	1 one magnet
K Anti-vibration program	2 Position and velocity*	A1	20...4mA (reverse)	V1	10...0V (reverse)	2 two magnets
	3 Position and reverse position	A2	0...20mA (forward)	V2	0...5V (forward)	
	4 Differential (2 magnets)	A3	20...0mA (reverse)	V3	5...0V (reverse)	
	5 Position and temperature inside the sensor electronics housing**	A4	4...20mA (dual output forward)	V5	0.5...4.5V (forward)	
	6 Position and rate*			V8	4.5...0.5V (reverse)	

Note: forward, data grows larger when the magnet is distant from the electronics housing;
reverse, data grows larger when the magnet approaches the electronics housing.

Note: For the speed/rate option, the maximum speed or rate value is added at the end of the code:

* Speed: the option speed output: (0.01...9.9m/s), the code is 001...999; Example: (-0.5 ... 0 ... 0.5m/s = 4 ... 12 ... 20ma) = 12-A01-050

* Speed: option speed output: (0.01...9.9m/s), code 001...999; For example: (-5.5 ... 0 ... 5.5m/s = 20 ... 4 ... 20ma) = 16-A01-550

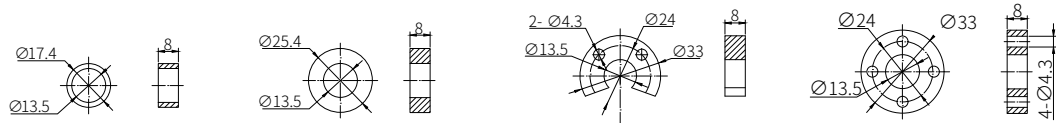
** Temperature: internal temperature of the electronic compartment: 4...20mA(-40°C -+100°C).

Model selection | Model: T3F-M-00600M-D512-11-A01

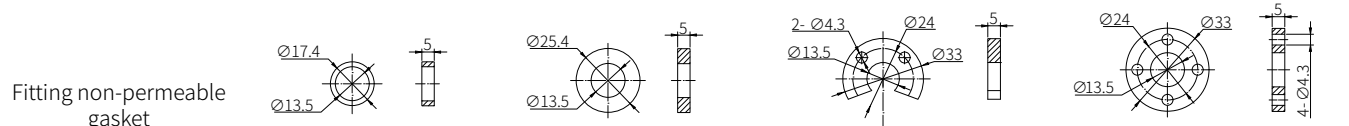
Explanation: T series III generation, T3F flexible sensor, installed inside pressure pipe, mounting thread metric M18x1.5, stroke length 600mm, 5pin M12 aviation plug, standard, position measurement, 4...20mA (forward), single magnet.

PARTS SELECTION

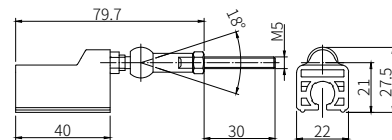
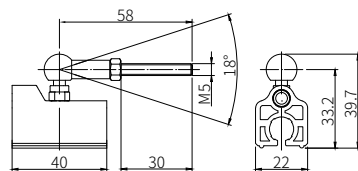
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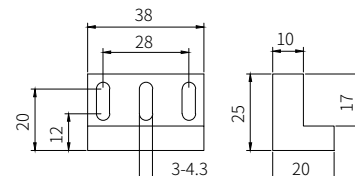
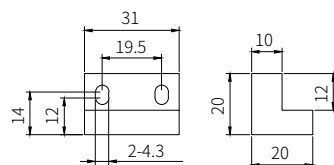
Name	Ring magnet	Ring magnet	U-magnet	Ring magnet
Operating temperature	-40...125°C			
Order code	12-1032	12-1019	12-1017	12-1001



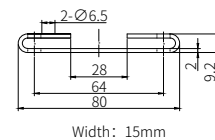
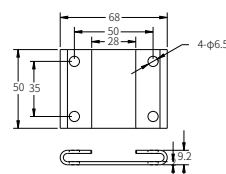
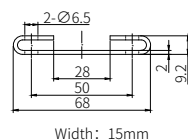
Name	Non-permeable gasket	Non-permeable gasket	Non-permeable gasket	Non-permeable gasket
Operating temperature	-40...125°C			
Order code	12-1037	12-1021	12-1018	12-1008



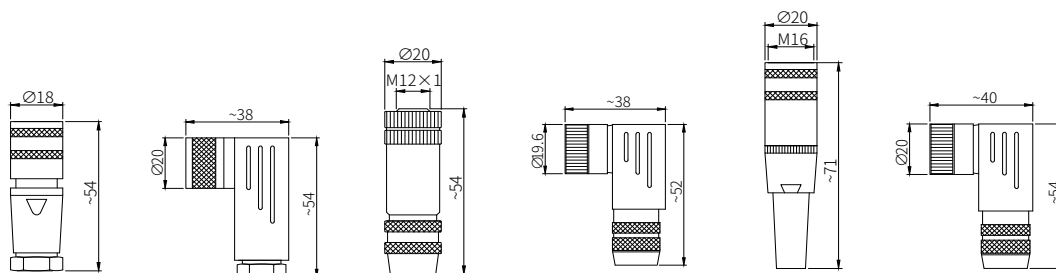
Name	Magnet slider S, joint at top	Magnet slider V, joint at front
Operating temperature	-40...105°C	
Order code	12-1114	12-1115



Name	Suspension magnet 31x20	Suspension magnet 38x25
Operating temperature	-40...105°C	
Order code	12-1010	12-1009



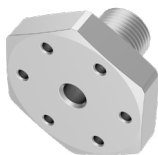
Name	Removable fixing card	Splicing Fixing Clip	Removable fixing card
Order code	11-1003	11-1058	11-1004



Name	6 pin M16 female connector	6 pin M16 female connector (90 degree angle)	8 pin M12 female connector	8 pin M12 female connector (90 degree angle)	8 pin M16 female connector	8 pin M16 female connector (90 degree angle)
End view drawing						
Material	Galvanized nickel					
Fitting diameter	4...6mm	6...8mm	8...10mm	6...8mm	6...9mm	6...8mm
Connection	Welding		Threaded		Welding	
Order code	18-3001	18-3003	18-5004	18-5005	18-5002	18-5003



Connector	5 pin M12 female connector	5 pin female connector (90 degree angle)
Name	Integral cable	Integral cable
Cable	5 wire 0.25mm ² shielded cable	5 wire 0.25mm ² shielded cable
Color/Diameter	Orange/ Ø 6	Orange/ Ø 6
Plug surface	 1-Brown 2-Green 3-White 4-Gray 5-Yellow	 1-Brown 2-Green 3-White 4-Gray 5-Yellow
Length	5...30M	5/10/15/20/30M
Order code	16-1035	16-1040



Name	Threaded flange M18×1.5-6g	Threaded flange 3/4"-16UNF-3A	Pressure rod with threaded flange M18×1.5-6g	Pressure rod with threaded flange 3/4"-16UNF-3A
Material	Stainless steel 304/316L			
Order code	11-1075	11-1076	HD-XXXXM-M	HD-XXXXM-S



Name	Profile with flange length ≤ 5600mm	Profile length: 2000mm
Material	Aluminum alloy, Zinc alloy	Aluminum alloy
Order code	H3P-XXXXM-X	11-1077

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