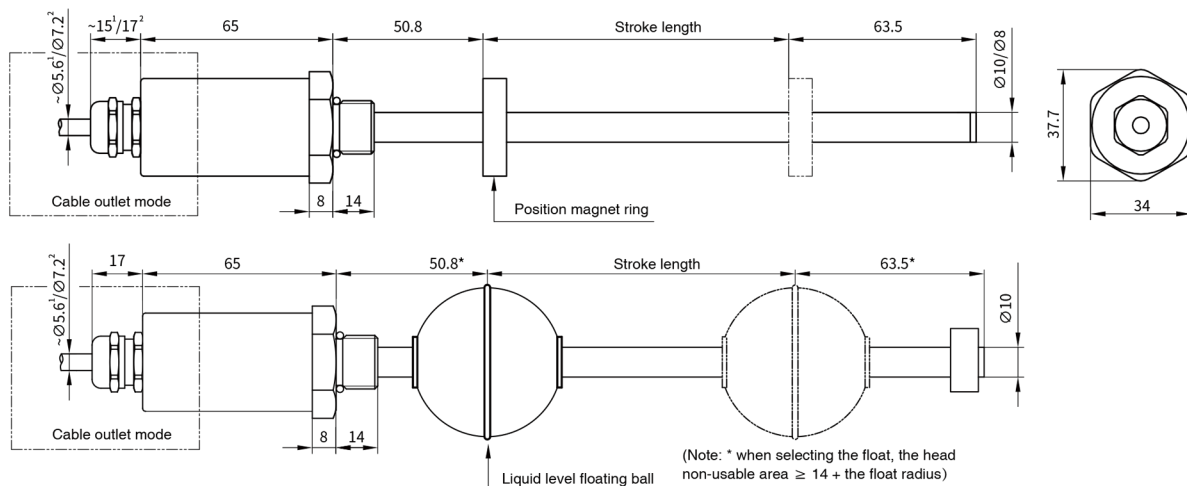


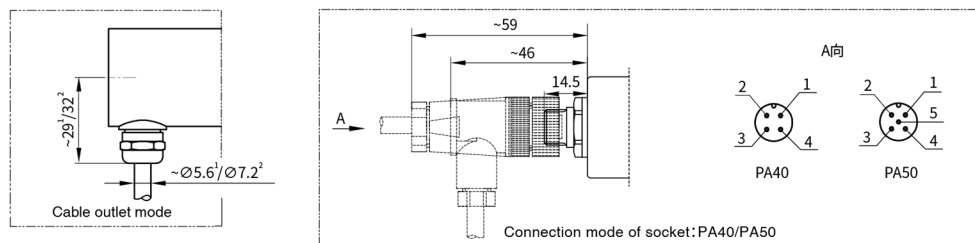
ES Modbus Output Displacement Sensor

Structural shape

- Dimensions of cable outlet



- Outline dimensions of connector outlet



- 注
1. PUR黑色线缆
 2. PVC黑色线缆

Wiring and pin definition

PA40/PA50 pin arrangement	Cable color1*	Cable color2*	Cable color3*	Function definition
	1	Brown	Red	24Vdc power supply (-20%~+20%)
	2	White	Black	GND (power supply circuit)
	3	Blue	Yellow	T+ (A)
	4	Black	White	T- (B)
	5	-	-	Do not connect

(facing the sensor head)

Note: * Cable color1: Cable PUR sheath, black, -40~80°C, end scattered

* Cable color2: Cable PUR sheath, orange, -20~90°C, end scattered

* Cable color 3: Cable PVC sheath, black, -40~80°C, end scattered

ES Modbus Output Displacement Sensor

ES Modbus Output-Product Parameters

• Input

Measuring data	Position magnet ring or position floating ball
Stroke length	25~3500 mm, others can be customized according to needs

• Output

Interface	Modbus RTU protocol
Resolution	Minimum 10um
Nonlinearity	Minimum $\pm 50\mu\text{m}$ or $<0.01\%\text{F.S}$
Repeatability	Minimum $\pm 10\mu\text{m}$ or $<0.001\%\text{F.S}$
Update time	Default 20ms Adjustable according to range 1~50ms
Communication rate	1200/2400/4800/9600/19200/38400/57600/115200 bps
Check method	No/odd/even check (default no check)
Temperature coefficient	$<10\text{ppm}/^\circ\text{C}$ (temperature compensation required)
Temperature functional parameters	The operating temperature resolution is 0.25°C
Temperature measuring position	Electronic compartment
Operating temperature accuracy	$\leq 1^\circ\text{C}$

• Operating conditions

Magnet velocity	Arbitrary
Protection class	IP67
Operating temperature	$-40^\circ\text{C} \sim +75^\circ\text{C}$
Humidity/dew point	Humidity 90%, no condensation
Shock index	GB/T2423.5 50g(6ms)
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 Radiation Anti-interference Degree of Radio Frequency Electromagnetic Field, Grade 3, Class A GB/T17626.4 Anti-interference Degree of Electrical Fast Transient Train, Grade 3, Class B GB/T17626.6 RF Field Induced Conducted Disturbance Immunity, Grade 2, Class A GB/T17626.8 Power Frequency Magnetic Field Immunity, Grade 3, Class A CE certification

• Electrical Connections

Input voltage	9~ 30Vdc
Power consumption	$<80\text{mA}$
Polarity protection	Maximum-30Vdc
Overvoltage protection	Maximum36Vdc
Insulation resistance	$>10\text{M}\Omega$
Insulation strength	500V

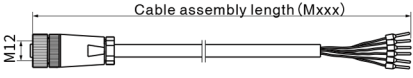
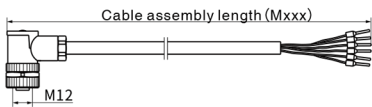
• Construction and Materials

Electronic compartment	304Lstainless steel
Measuring rod	304L/316L stainless steel
Outer tube pressure	35Mpa (continuous)/70Mpa (peak) rod diameter $\Phi 10$
Installation	Any direction, threaded installation (thread specification is optional)
Position magnet	Various annular magnets or floating balls
Outgoing mode	Cable outlet (scattered connection), connector (M12 connector)

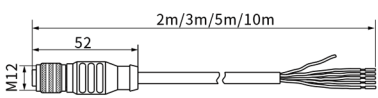
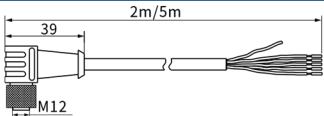
ES Modbus Output Displacement Sensor

ES Modbus Output-Common Options

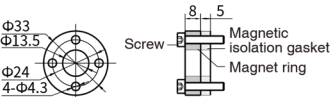
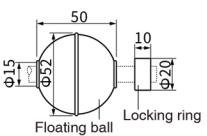
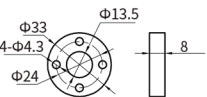
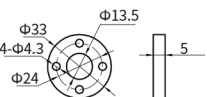
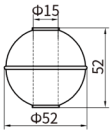
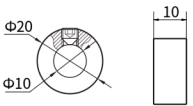
• Plug assembly cable

Accessory name/model	Dimensions	Description
Modbus interface cable assembly Order No.:AST-Mxxx-W06		Mxxx denotes cable length in meters; W06-5-pin PUR black sheath, temperature resistance of -40~80°C Cable assembly.
Modbus interface right angled cable assembly Order No.:AST-Mxxx-W05		Mxxx denotes cable length in meters; W05-5-pin PUR black sheath, temperature resistance of -40~80°C Cable assembly.

• Finished plug cable

Accessory name/model	Dimensions	Description
M12 female connector Order No.:521801-2 (3/5/10)		PUR black sheath, line core 1 brown, 2 white, 3 blue, 4 black, 5 gray, temperature resistance -40°C~80°C.
M12 Right angle female connector Order No.:521804-2 (5)		PUR black sheath, line core 1 brown, 2 white, 3 blue, 4 black, 5 gray, temperature resistance -40°C~80°C.

• Magnet ring/floating ball

Accessory name/model	Dimensions	Description
Standard magnet ring kit Order No.:288501		One magnet ring 211501, one gasket 211521 (thickness 5mm), four M4X20 socket screws with spring wgreysers.
Floating ball kit Order No.:266001		One floating ball 211546, a set of locking rings 211589. Floating ball material 304, pressure resistance 2.5MPa, density 0.6; locking ring material 304.
Standard magnet ring Order No.:211501		
Magnetic isolation gasket Order No.:211521		
Floating ball Order No.:211546		Material 304, pressure resistance 2.5 MPa, density 0.6
Locking ring Order No.:211589		Material 304

Note: For other accessories, please refer to general options

ES Modbus Output Displacement Sensor

ES Modbus Output-Selection Guide



01 - 02	Sensor shell form
E S	Pressure-resistant pipe

03 - 07	Range (0025~5500mm, others can be customized as needed)
	0025~0500mm step length 5mm
	0500~0750mm step length 10mm
	0750~1000mm step length 25mm
	1000~3500mm step length 50mm

08 - 09	Mounting thread form
S 1	M18X1.5, measuring rod diameter 10mm, 304 material
S 2	M20X1.5, measuring rod diameter 10mm, 304 material
S 3	3/4"-16UNF-3A, measuring rod diameter 10mm, 304 material
T 1	M18X1.5 mounting thread, measuring rod diameter 8mm, 316 material
T 2	M20X1.5 mounting thread, measuring rod diameter 8mm, 316 material
T 3	3/4"-16UNF-3A mounting thread, measuring rod diameter 8mm, 316 material

10 - 13	Connection form
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10 - 11	Outlet type
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D E	Cable outlet, PVC sheath, black, -40~80°C, end scattered, Cable color 3
D W	Cable outlet, PUR sheath, black, -40~80°C, end scattered, Cable color 1
D H	Cable outlet, PUR sheath, orange, -20~90°C, end scattered, Cable color 2
C W	Side outlet, PUR sheath, black, -40~80°C, end scattered, Cable color 1
C H	Side outlet, PUR sheath, orange, -20~90°C, end scattered, Cable color 2

12 - 13	Cable length, 01~99 meters
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10 - 13	Connector form
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P A 4 0	M12 4-pin socket, plug cable needs to be selected separately
P A 5 0	M12 5-pin socket, plug cable needs to be selected separately

14 - 19	Signal output mode
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14	Communication protocol and power supply
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R	RTU protocol, 24Vdc power supply, resolution 0.1mm
K	RTU protocol 1, 9~30Vdc power supply, resolution 0.1mm
B	RTU protocol 2, 24Vdc power supply, resolution 0.01mm, with temperature measuring

15	Communication rate
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1	19200 bps	2	1200 bps	3	2400 bps
4	4800 bps	5	38400 bps	6	57600 bps
7	115200 bps	9	9600 bps		

16	Output forward and reverse
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0	Forward (when the magnet ring or floating ball is far away from the electronic compartment, the output value increases)
1	Reverse (when the magnet ring or floating ball is far away from the electronic compartment, the output value decreases)

17	Reserved bit
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1	Single magnet ring	2	Single floating ball
3	Double floating ball	4	Double magnet ring
5	Tri-magnet ring		

18	No magnet ring state
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A	keep the original value
B	Maximum (Output forward default value)
C	Minimum value (output reverse default value)

19	Check method
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0	No check (default)	1	Odd check	2	Even check
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20 - 21	Non-usable area at head and end
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S 0	50.8mm+63.5mm
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Selection example

For example: ES-M0300-S1-PA50-R111C-S0

Indicates: ES voltage-resistant round pipe structure, 300mm Stroke length, M18X1.5 installation thread, 10mm diameter, 304 material measuring rod, M12 5-pin socket connection mode, 24Vdc power supply RTU protocol output, baud rate 19200bps, reverse output, single position magnet ring, output 0 without magnet ring, standard head and end non-usable area 50.8 mm+63.5mm.(Note: Factory default address 1)

Supply list

Sensor, certificate, instruction manual, optional parts (optional separately)