

ES Displacement Sensor



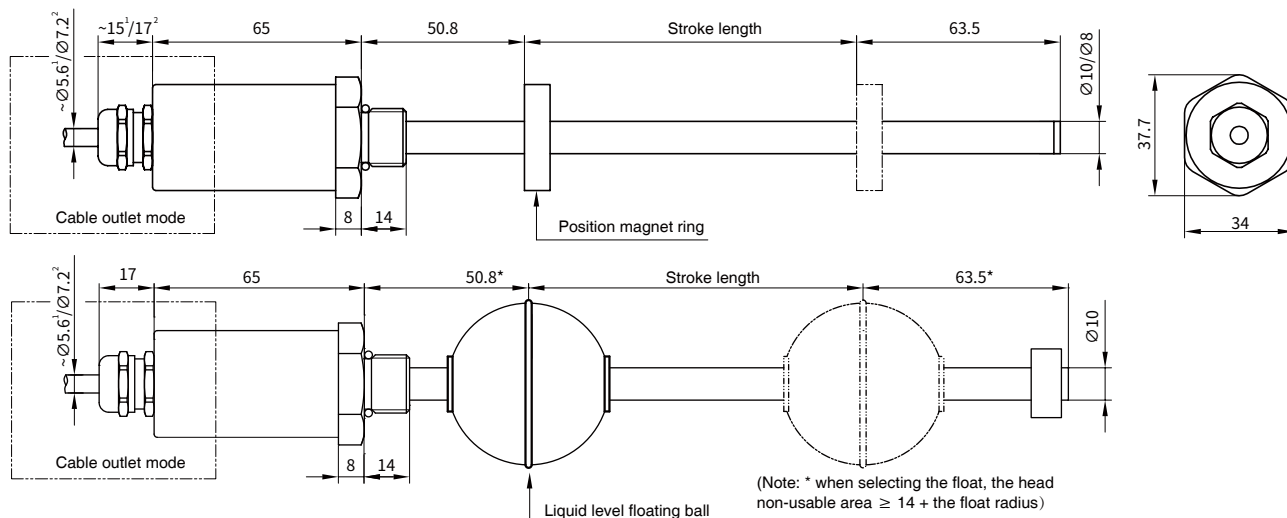
Technical Characteristics

- Compact structure, convenient disassembly and assembly
- Linear measuring, absolute position output
- Multiple interfaces are optional, Modbus etc
- Rugged and fully enclosed design
- Non-wear, non-contact measuring method
- Adapt to harsh environment and resist high pressure sensor measuring rod

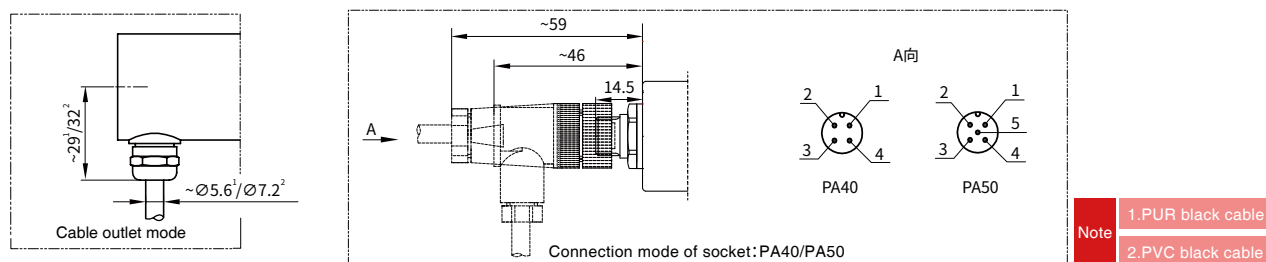
ES-Analog Output

► Structural shape

• Dimensions of cable outlet



• Outline dimensions of connector outlet



► Wiring and pin definition



• PA40/PA50 pin arrangement - 2-wire system (Sensor Oriented)

Pin	Wire color1*	Wire color2*/3*	Function definition
1	Brown	Red	+24/12Vdc power supply (-20%~+20%)
2	White	Black	GND (power supply circuit)
3	Blue	-	Do not connect
4	Black	-	Do not connect
5	Grey	-	Do not connect

• PA40/PA50 Pin Arrangement-Four Wire (Sensor Oriented)

Pin	Wire color1*	Wire color2*	Wire color3*	Function definition
1	Brown	Red	Red	+24Vdc power supply (-20%~+20%)
2	White	Black	Black	GND (power supply circuit)
3	Blue	Blue	Brown	Magnet ring position signal +
4	Black	Green	Green	Magnet ring position signal -
5	-	-	-	Do not connect

Note: * Wire color 1*: Cable PUR sheath, black, -40~80°C, end scattered

* Wire color 2*: Cable PUR sheath, orange, -20~90°C, end scattered

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

ES Analog Output - Product Parameters

• Input

Measuring data	Position magnet
Stroke length	25~3500 mm, others can be customized according to needs

• Output

Current	4 ~ 20mA or 0 ~ 20mA (min/max load 0/500Ω)
Voltage	0 ~ 10Vdc or 0~5Vdc (minimum load resistanc $\geq 10K\Omega$)
Resolution	±0.01mm, 16bit DA, 4-wire system current ±0.1mm, 16bit DA, 4-wire system voltage ±0.1mm, 12bit DA, 2-wire system current
Nonlinearity	0.05% F.S
Repeatability	Same resolution
Update time	2-wire system 100 ms 4-wire system 1ms (range $\leq 1m$) 、2ms (1m<range $\leq 2m$) 、3ms (range $> 2m$)
Temperature coefficient	<50ppm/°C

• Operating conditions

Magnet velocity	Arbitrary
Protection class	IP67
Operating temperature	-40°C ~ +75°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 Conducted Disturbance Degree Induced by Radio Frequency Field, Grade 2, Class A GB/T17626.8 Power Frequency Magnetic Field Immunity, Grade 3, Class A CE certification

• Electrical Connections

Input voltage	+24Vdc power supply (-20%~+20%): 4-wire system +24/12Vdc power supply (-20%~+20%): 2-wire system
Power consumption	<80mA
Polarity protection	Maximum-30Vdc
Overvoltage protection	Maximum36Vdc
Insulation resistance	>10MΩ
Insulation strength	500V

• Construction and Materials

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

ES Analog Output-Selection Guide

ES - M - - - - -

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21

01 - 02 Sensor shell form

E S	Pressure-resistant pipe
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03 - 07 Measuring 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
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S 2	M20X1.5, measuring rod diameter 10mm, 304 material
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S 3	3/4"-16UNF-3A, measuring rod diameter 10mm, 304 material
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T 1	M18X1.5 mounting thread, measuring rod diameter 8mm, 316 material
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T 2	M20X1.5 mounting thread, measuring rod diameter 8mm, 316 material
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T 3	3/4"-16UNF-3A mounting thread, measuring rod diameter 8mm, 316 material
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10 - 13 Connection form

10 - 11 Connection

D E	Cable outlet, PVC sheathed, black, -40~80°C, end scattered, Cable color 3
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D W	Cable outlet, PUR sheath, black, -40~80°C, end scattered, Cable color 1
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D H	Cable outlet, PUR sheath, orange, -20~90°C, end scattered, Cable color 2
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C W	Side outlet, PUR sheath, black, -40~80°C, end scattered, Cable color 1
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C H	Side outlet, PUR sheath, orange, -20~90°C, end scattered, Cable color 2
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12 - 13 Cable length, 01~99 unit: meter

10 - 13 Connector form

P A 4 0	M12 4-pin socket, plug cable needs to be selected separately
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P A 5 0	M12 5-pin socket, plug cable needs to be selected separately
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14 - 17 Signal output mode

14 - 15 Communication interface

A 0	Current output, 4 ~ 20mA
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A 1	Current output, 20 ~ 4mA
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A 2	Current output, 0 ~ 20mA
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A 3	Current output, 20 ~ 0mA
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A 4	2-wire current, 4~20mA
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A 5	2-wire current, 20~4mA
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V 0	Voltage output, 0 ~ 10V
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V 1	Voltage output, 10 ~ 0V
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V 4	Voltage output, 0 ~ 5V
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V 5	Voltage output, 5 ~ 0V
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16 Reserved bit

1	Magnet ring
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2	Floating ball
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17 No magnet ring state

A	Keep the original value
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B	Maximum (default)
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C	Minimum value
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18 - 19 Non-usable area at head and end

S 0	50.8mm+63.5mm
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20-21 Country

 	Refer to the country list
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• Selection example

For example: ES-M0300-S1-PA50-A01B-S0-CN

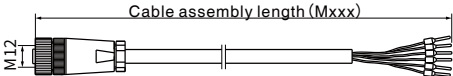
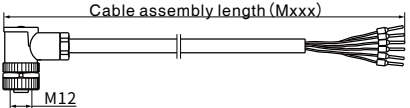
Indicates: ES rod structure series, 300mm Stroke length, M18X1.5 installation thread, 10mm diameter, 304 material measuring rod, M12 5-pin socket form, current output of 4~20mA, single position magnet ring (magnet ring needs to be selected separately), non-magnet ring status display > 20mA value, head and end non-usable area of 50.8 mm+63.5mm.

• Supply list

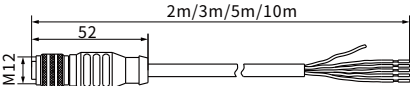
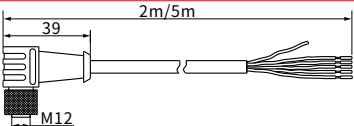
Sensor, certificate, instruction manual, optional parts (optional separately)

▶ ES Analog Output-Common Options

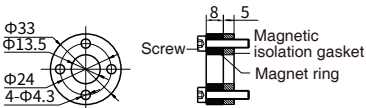
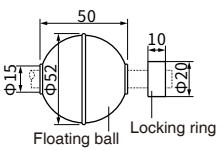
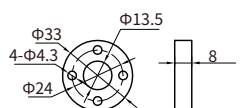
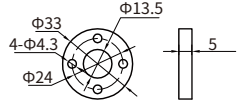
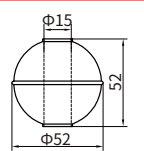

• Plug assembly cable

Accessory name/model	Dimensions	Description
Analog Output 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.
Analog output 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 ball211546, 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