

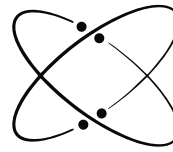
ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

ES Displacement Sensor



Technical Characteristics:

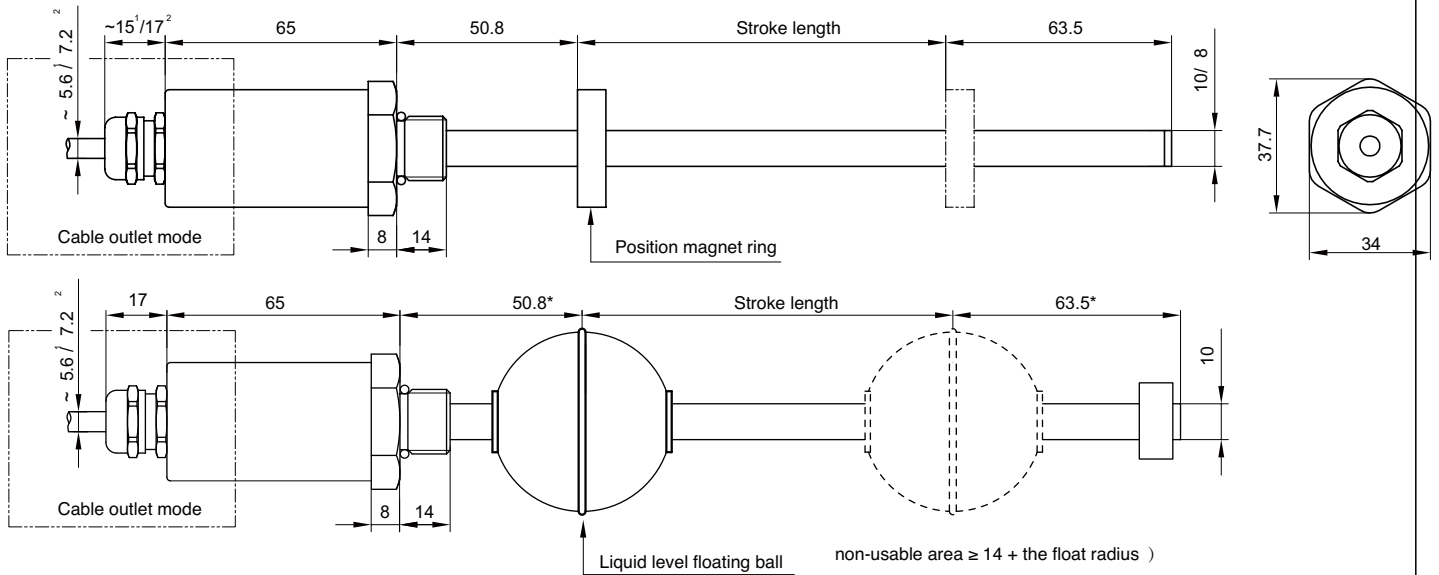
- Compact structure, convenient disassembly and assembly
- Linear measuring, absolute position output
- Multiple interfaces are optional, Modbus etc.
- Rugged and fully enclosed design
- Non-wear, non-contact measuring method
- Adapt to harsh environment and resist high pressure sensor measuring rod



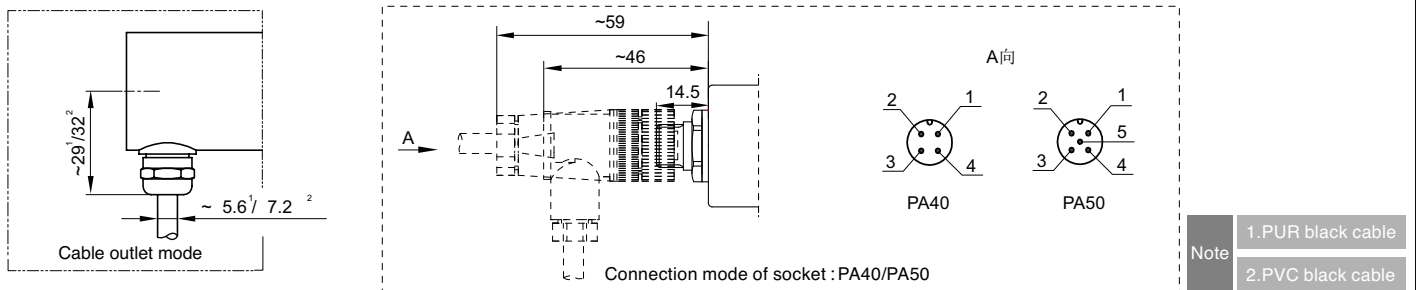
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Structural shape

• Dimensions of cable outlet



• Outline dimensions of connector outlet



Wiring and pin definition

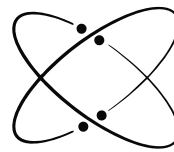
PA40/PA50 pin arrangement		Cable color1*	Cable color2*/3*	Function definition	PA40/PA50 pin arrangement		Cable color1*	Cable color2*	Cable color3*	Function definition
PA40 	1	Brown	Red	+24/12Vdc power supply (-20%~+20%)	PA40 	1	Brown	Red	Red	+24Vdc power supply (-20%~+20%)
PA50 	2	White	Black	GND (power supply circuit)	PA50 	2	White	Black	Black	GND (power supply circuit)
2-wire system (facing the sensor head)	3	Blue	-	Do not connect	4-wire system (facing the sensor head)	3	Blue	Blue	Brown	Magnet ring position signal +
	4	Black	-	Do not connect		4	Black	Green	Green	Magnet ring position signal -
	5	Grey	-	Do not connect		5	-	-	-	Do not connect

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

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

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

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



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■ ES Analog Output - Product Parameters

• Input

Measuring data	Position magnet ring
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 resistance $\geq 10K\Omega$)
Resolution	$\pm 0.01\text{mm}$, 16bit DA, 4-wire system current $\pm 0.1\text{mm}$, 16bit DA, 4-wire system voltage $\pm 0.1\text{mm}$, 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 $\leq 1\text{m}$) 、2ms ($1\text{m} < \text{range} \leq 2\text{m}$) 、3ms (range $> 2\text{m}$)
Temperature coefficient	$< 50\text{ppm}/^\circ\text{C}$

• Operating conditions

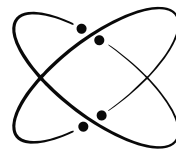
Magnet velocity	Arbitrary
Protection class	IP67
Operating temperature	$-40^\circ\text{C} \sim +75^\circ\text{C}$
Humidity/dew point	Humidity 90%, no condensation
Shock index	GB/T2423.5 50g(6ms)
Vibration index	GB/T2423.10 15g/10~2000Hz
EMC test	GB/T17626.2 Anti-interference Degree of Electrostatic Discharge, 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 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	$< 80\text{mA}$
Polarity protection	Maximum-30Vdc
Overvoltage protection	Maximum36Vdc
Insulation resistance	$> 10M\Omega$
Insulation strength	500V

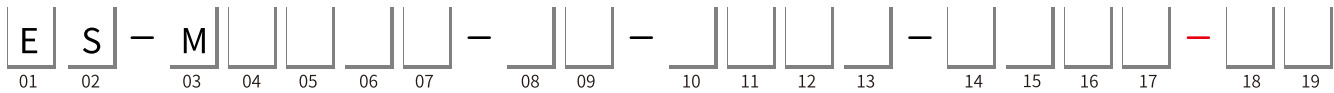
• Construction and Materials

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)



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■ ES Analog Output-Selection Guide



01 - 02	Sensor shell form
E S	Pressure-resistant pipe
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
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
10 - 11	Connection
D E	Cable outlet, PVC sheathed, 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 unit: meter
10 - 13	Connector form
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 - 17	Signal output mode
14 - 15	Communication interface
A 0	Current output, 4 ~ 20mA
A 1	Current output, 20 ~ 4mA
A 2	Current output, 0 ~ 20mA
A 3	Current output, 20 ~ 0mA
A 4	2-wire current, 4~20mA
A 5	2-wire current, 20~4mA
V 0	Voltage output, 0 ~ 10V
V 1	Voltage output, 10 ~ 0V
V 4	Voltage output, 0 ~ 5V
V 5	Voltage output, 5 ~ 0V
16	Reserved bit
1	Magnet ring
2	Floating ball
17	No magnet ring state
A	Keep the original value
B	Maximum (default)
C	Minimum value
18 - 19	Non-usable area at head and end
S 0	50.8mm+63.5mm

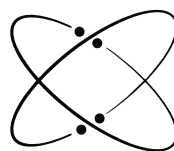
● Selection example

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

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

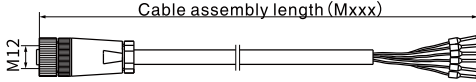
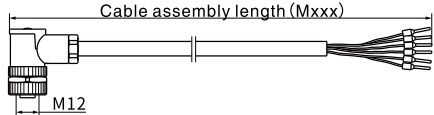
Sensor, certificate, instruction manual, optional parts (optional separately)



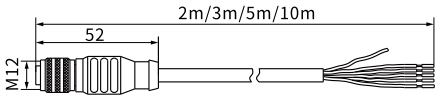
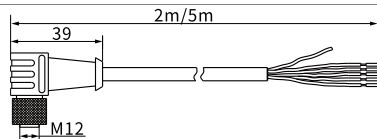
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■ ES Analog Output-Common Options

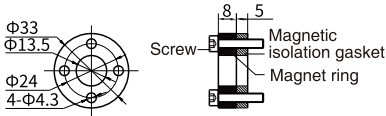
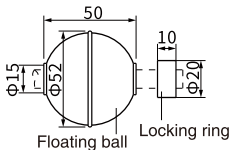
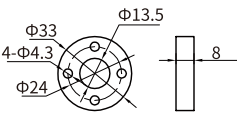
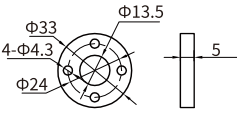
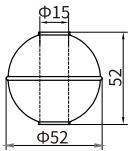
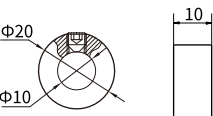
• Plug assembly cable

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 wgreys
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

