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Intelligent Level Sensor for Pharmaceutical / F&B

FineTek

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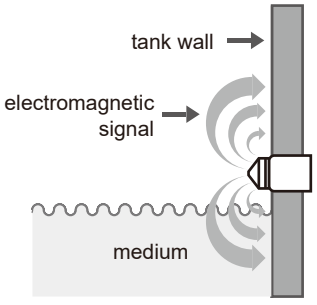
PRODUCT INTRODUCTION

PRINCIPLE

The sensor's working principle by sending "scan-frequency", different material emits different frequency, therefore, the sensor will send the switch sigual while it's powered by material.



FEATURE

- Easy installation by standard connection with IP67/IP68/IP69K as protection grade.
- Compact design, easy carry; can be installed in narrow space or stringent operation condition.
- The surface roughness (Ra) can be customized and applicable for Chemical & pharmaceutical and food processing industries.
- With magnetic test function to examine wiring and operation condition in real time.
- Durable stainless housing.
- Real time site-control by LED indicators.
- Overcurrent protection detects over current and shut down the output immediately.
- Workable in CIP and SIP cleaning environment.
- Unaffected by foam and viscous medium.
- Applicable to measure the single-point level of liquid, viscous medium and powder medium in the container and pipe; also providing pump dry run protection.
- It provides 2 output signals and the sensitivity can be set independently; which helps detect 2 kinds of medium.
- (For instance: Oil and water.)

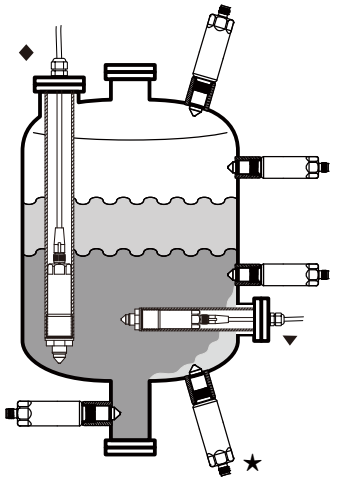
  Acquired NEPSI dust Explosion-proof certificate, Ex ta IIIC T_{200} 100°C Da.

APPLICATION

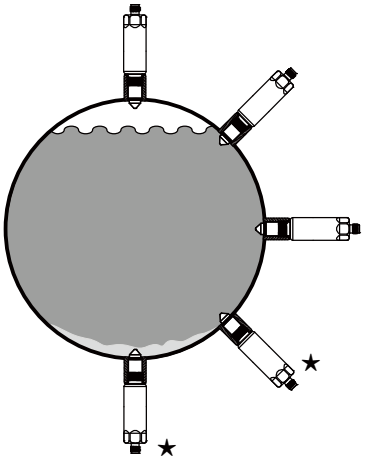
With high/low level of material in the process tank or pipeline, alarm of empty material or switch output is particularly suitable for application in the following industries:

- Food manufacturing
- Beverage manufacturing
- Pharmaceutical manufacturing.

INSTALLATION DIAGRAM



Tank Diagram



Pipeline Diagram

Top diagram shows the sensors installed in the tank for level detection or dry running protection.

Below diagram shows the sensors installed in the pipeline for level detection or alarm for not full pipe.

Note!

1. If the medium with strong viscosity or there is sediment, the installation position shows ★ is not suggested. It may generate failure output signal due to the residue monitored as liquid.

2. For top-mounted installation, the rear-mounted type with the extension of the auxiliary rod can be installed at a lower position (◆: the auxiliary rod is not included in the order).

3. The rear-mounted auxiliary rod extends through the sediment can prevent from severe bridging. (▼: auxiliary rod is not included in the order).

APPLICABLE MEDIUM FORM

Following form, please kindly choose the medium and corresponded default setting. Always ensure the correct setting and corresponded medium.
Attention!! It may cause failure result or unstable operation condition if the application NOT follow the operation range. ● means you can measure the medium based on FineTek default setting.

	Item	Water Based	Low Moisture/ Sugar Content	Oil Based/ Powder
1	Tap water	●		
2	Seawater	●		
3	Pure water	●		
4	Beer	●		
5	Wine	●		
6	Liquor(40%)		●	
7	Juice (Stock)	●		
8	Juice (Distillate)	●		
9	Milk	●		
10	Yoghurt Drink	●		
11	Vinegar	●		
12	Condensed Milk 7.5%	●		
13	Chocolate(40°C)		●	
14	Syrup		●	
15	Honey		●	
16	Fructose	●		
17	Albumen	●		
18	Yolk		●	
19	Egg(Liquid)	●		
20	Jam(Almond)	●		
21	Jam(Strawberry)	●		
22	Barbecue Sauce	●		
23	Soy Sauce	●		
24	Flour			●
25	Starch			●
26	Cocoa Powder			●
27	Coffee Powder			●
28	Hazelnut Powder(40°C)			●
29	Pepper(Ground)			●
30	Mashed Potatoes			●
31	Creamer(Powder)			●
32	Salt			●
33	Caster Sugar			●
34	Crystal Sugar(Ground)			●
35	Mayonnaise			●
36	Butter		●	
37	Olive Oil			●
38	Palm Oil			●
39	Canola Oil			●
40	Sunflower Oil			●
41	Linseed oil			●
42	Glycerin	●		
43	Mineral Oil(15W40)			●
44	Acetone		●	
45	Methanol	●		
46	Ethanol	●		

STANDARD SPECIFICATIONS

	Normal (Standard type/ Extension type/ Mini type)	**Rear install type**	**Explosion proof type**
Scope (optional)	Water-based media, oil-based media, powder media, dual-level media (such as oil+water), fluid with separation layer (such as bubbles)		Powder media
Ambient temperature	-40~85°C(-40~185°F)	-40~80°C(-40~176°F)	-20°C~70°C(-4°F~158°F)
Process temperature	Continuous: max.100°C while ambient temp. -40°C~85°C (-40°F~185°F) Short time(1hr): max.150°C (Mini type: max.135°C) while ambient temp. -40°C~ 60°C (-40°F~140°F)	-40~80°C(-40~176°F)	Max.100°C while ambient temp.: -20°C~70°C (-4°F~158°F)
Rated voltage	18VDC~30VDC		
Power consumption	Max. 50mA		
Over voltage protection	overvoltage category II		
Reversal protection	Yes		
Switch output (optional)	2 switches: 1st NO mode and 2nd NC mode.		
Output mode	PNP/NPN (optional)		
Switch delay function	<1 second(maximum 60 seconds)		
Output load current	Max. 100 mA		Max. 50 mA
Voltage drop	Max. 2.5V		
Short-circuit protection	Yes, short-time pulse		
Overload protection	Yes		
Electric connection	M12 4PIN connector		
Wetted material (optional)	SUS316、SUS316L		
Process pressure	-1~40 bar		
Contact specification	G 1/2"	M32*P1.5	G 1/2"
Probe material/surface Roughness	PEEK/Ra<0.8		PEEK-1000/Ra<0.8
Housing protection (optional)	IP67/IP68/IP69K (Under water 1meter, IP68 can last for 30 days).		
LED Indicator	Yellow LED for starting, Green LED for resetting		
Simulation output test (not available for mini type)	Magnetic test (lean a magnet close to the + sing for 2 seconds, there will be switching output)		
Digital communication	IO Link V1.1		
Standard compliance	IEC61000-4-2, IEC61000-4-4, IEC61000-4-11		
Explosion-proof certificate	N/A		NEPSI Ex ta IIIC T_{200} 100°C Da.

Warning!

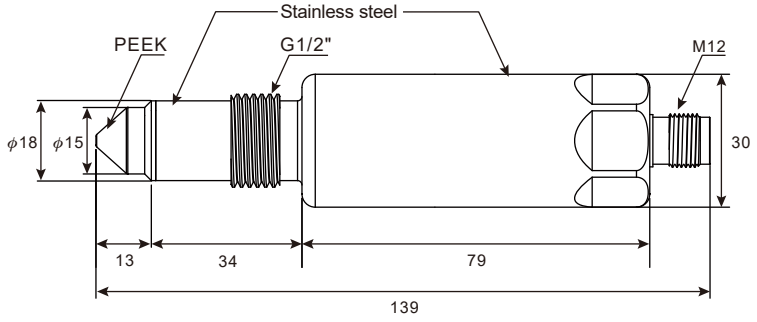
1. Only Explosion-proof type can be installed and used in Combustible dust explosion environment.
2. The sensor must be installed with the exclusive “Thread connector” or “Thread adapter”, in order to ensure the installation sensor operate normally and avoid leakage.
3. The electrical connection of this device has achieved IP68/IP69K protection grade, so it must be connected with the corresponding M12 connection cable in order to be installed effectively.
4. Explosion-proof type must be installed with M12 connection cable approved by NEPSI, in order to use it in the explosion environment (please refer to chapter Accessories - Thread Connector/ ADAPTOR").
5. Please refer to the " SIS Sanitary Intelligent Level Switch Operation Instruction” for the installation and operation of the product.

DIMENSIONS

Standard type

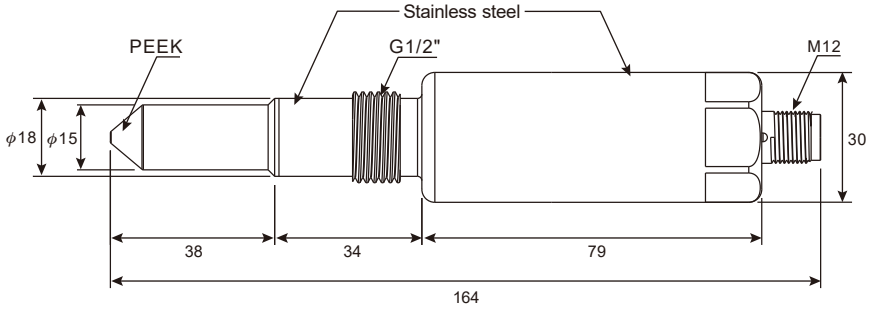
(Unit: mm)

Applied for general medium



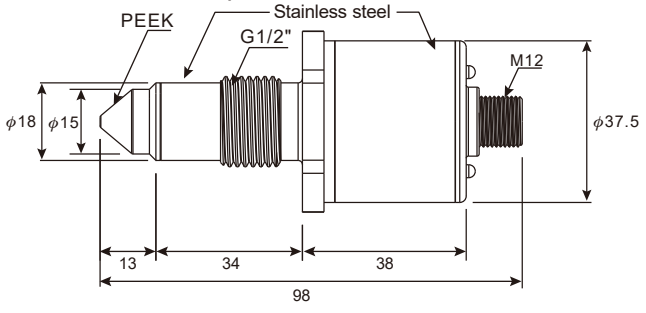
Extension type

Applied for sticky medium or easily buid up medium



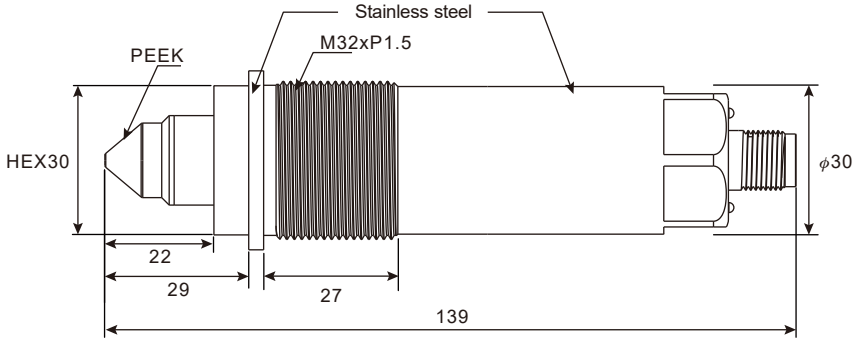
Mini type

Applied for general medium narrow space



Rear install type

Suitable for no hole on the side or installation extension to prevent from severe bridging.



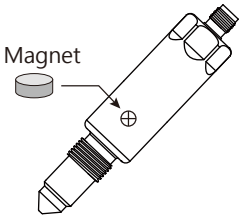
FUNCTIONS

Transistor output	Alarm	Detected level	Output	Output signal	LED indicator
PNP	MAX		OUT1	<100 μA	Green
			OUT2	IL	Yellow
			OUT1	IL	Yellow
			OUT2	<100 μA	Green
	MIN		OUT1	IL	Yellow
			OUT2	<100 μA	Green
			OUT1	<100 μA	Green
			OUT2	IL	Yellow
NPN	MAX		OUT1	<100 μA	Green
			OUT2	IL	Yellow
			OUT1	IL	Yellow
			OUT2	<100 μA	Green
	MIN		OUT1	IL	Yellow
			OUT2	<100 μA	Green
			OUT1	<100 μA	Green
			OUT2	IL	Yellow

- Correspondence output table: OUT 1 sets as NO; OUT 2 sets as NC.
- IL indicates load enabled.

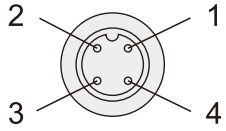
SIMULATION OUTPUT TEST

1. Finished the installation and supply the sensor with 18~30Vdc.
2. Lean a magnet close to the + sing for 2 seconds or more, there will be switching output with corresponding LED light display.
3. Remove the magnet from the + sign, the switching output and corresponding LED light display will return to normal status.



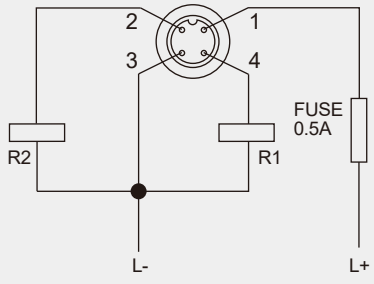
WIRING DIAGRAM

M12 Connector

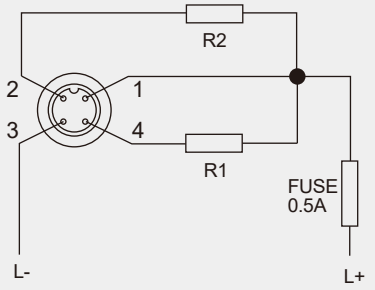


PIN	Connection	wire color
1	Power supply+	Brown
2	OUT2	White
3	Power supply-	Blue
4	OUT1/ communication interface	Black

PNP Wiring

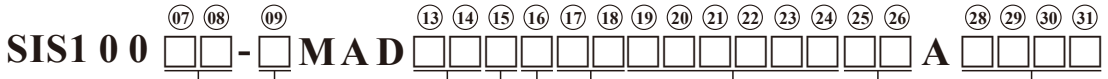


NPN Wiring



- R1 and R2 indicate the load of OUT1 and OUT2.
- To protect the sensor from abnormal condition, we strongly recommend to adopt FUSE 0.5A on the power supply circuit.
- This wire color only represents the property. The actual wire color depends on the connector purchased.
  Note: The accuracy and efficiency can not be guaranteed if using NON-FineTek connector.

ORDER INFORMATION



⑦⑧ Certification

00：N/A　　7D：NEPSI

⑨ Rod type

A: Standard type
B: Extension type
C: Mini type (non-explosion-proof model only)
D: Rear install type (non-explosion-proof model only)

⑬⑭ Output

25：PNP　　26：NPN

⑮ Output function

A: OUT1=NO, OUT2=NC (Default setting)
B: OUT1=NC, OUT2=NO
C: OUT1=NO, OUT2=NO
D: OUT1=NC, OUT2=NC

⑯ Medium type

A: Water-based(Dielectric constant ε ≥ 15)
B: Oils, greases, powders (Dielectric constant ε ≤ 15)
C: With low water content or viscous
(Dielectric constant ε ≤ 15)
D: Powder media (Dielectric constant ε ≥ 1.5),
(only for Explosion-proof)

⑰⑱ Wetted material

MB: SUS316　　MC: SUS316L

⑲ ⑳ ㉑ ㉒ ㉓ ㉔ Connection

AAA517: G 1/2"
ABK582: M32*P1.5 (only for rear install type)

㉕ ㉖ Probe material

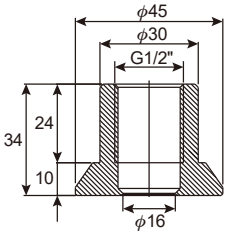
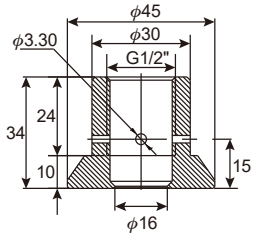
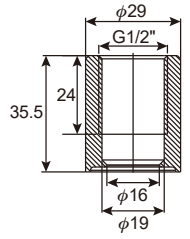
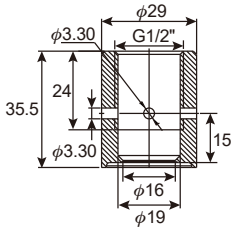
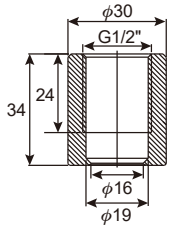
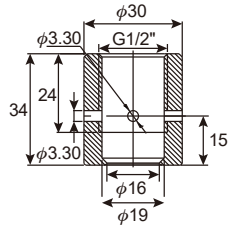
13: PEEK
63: PEEK-1000 (only for Explosion-proof)

㉘ ㉙ ㉚ ㉛ Rod length

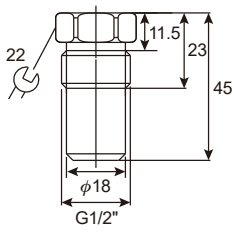
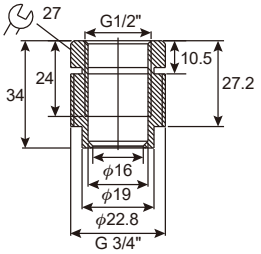
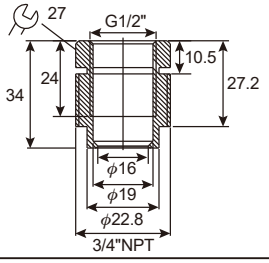
Code	Length
0047	47mm(Standard or Mini type)
0072	72mm(Extension type)
0029	29mm(Rear install type)

ACCESSORIES - THREAD CONNECTOR/ADAPTOR (OPTIONAL)

Thread connector (While sensor welded aside tank wall) specification:

<table>
<tr><th>Connection specification</th><th>Weld opening</th><th>Exterior dimension</th><th colspan="2">Technical parameters</th></tr>
<tr><td rowspan="10">G 1/2"</td><td rowspan="2">ϕ45mm</td><td rowspan="2"> 
</td><td>Material</td><td>Order Code</td></tr>
<tr><td>SUS316</td><td>SISAM1P-MBA245S101</td></tr>
<tr><td colspan="2">SUS316L</td><td>SISAM1P-MCA245S101</td></tr>
<tr><td colspan="3">Application:
• Structural resistance to pressure 50Bar
• Reinforced structure of welding beads ϕ45</td></tr>
<tr><td rowspan="2">ϕ45mm</td><td rowspan="2"> 
</td><td>Material</td><td>Order Code</td></tr>
<tr><td>SUS316</td><td>SISAM1P-MBA145S101</td></tr>
<tr><td colspan="2">SUS316L</td><td>SISAM1P-MCA145S101</td></tr>
<tr><td colspan="3">Application:
• Structural resistance to pressure 50Bar
• Reinforced structure of welding beads ϕ45
• With drain hole</td></tr>
<tr><td rowspan="2">ϕ29mm</td><td rowspan="2"> 
</td><td>Material</td><td>Order Code</td></tr>
<tr><td>SUS316</td><td>SISAM1P-MBA429S101</td></tr>
<tr><td colspan="2">SUS316L</td><td>SISAM1P-MCA429S101</td></tr>
<tr><td colspan="3">Application:
• Structural resistance to pressure 50Bar
• For storage tank DN25~DN100</td></tr>
<tr><td rowspan="2">ϕ29mm</td><td rowspan="2"> 
</td><td>Material</td><td>Order Code</td></tr>
<tr><td>SUS316</td><td>SISAM1P-MBA329S101</td></tr>
<tr><td colspan="2">SUS316L</td><td>SISAM1P-MCA329S101</td></tr>
<tr><td colspan="3">Application:
• Structural resistance to pressure 50Bar
• For storage tank DN25~DN100
• With drain hole</td></tr>
<tr><td rowspan="2">ϕ30mm</td><td rowspan="2"> 
</td><td>Material</td><td>Order Code</td></tr>
<tr><td>SUS316</td><td>SISAM1P-MBA430S101</td></tr>
<tr><td colspan="2">SUS316L</td><td>SISAM1P-MCA430S101</td></tr>
<tr><td colspan="3">Application:
• Structural resistance to pressure 50Bar
• For storage tank</td></tr>
<tr><td rowspan="2">ϕ30mm</td><td rowspan="2"> 
</td><td>Material</td><td>Order Code</td></tr>
<tr><td>SUS316</td><td>SISAM1P-MBA330S101</td></tr>
<tr><td colspan="2">SUS316L</td><td>SISAM1P-MCA330S301</td></tr>
<tr><td colspan="3">Application:
• Structural resistance to pressure 50Bar
• For storage tank
• With drain hole</td></tr>
</table>

Thread adaptor (for small to large diameter installation) specifications

<table>
<tr><th>Female thread specification</th><th>Male thread specification</th><th>Exterior dimension</th><th colspan="2">Technical parameters</th></tr>
<tr><td rowspan="4">None</td><td rowspan="4">G 1/2"</td><td rowspan="4"> 
</td><td>Material</td><td>Order Code</td></tr>
<tr><td>SUS316</td><td>SISAM1P-MBA500S101</td></tr>
<tr><td>SUS316L</td><td>SISAM1P-MCA500S101</td></tr>
<tr><td colspan="2">Application:
• The sealing plug is used to close up any hole on the device to prevent leakage.
• Locking torque 30~50Nm</td></tr>
<tr><td rowspan="8">G 1/2"</td><td rowspan="4">G 3/4"</td><td rowspan="4"> 
</td><td>Material</td><td>Order Code</td></tr>
<tr><td>SUS316</td><td>SISAM1P-MBA600S201</td></tr>
<tr><td>SUS316L</td><td>SISAM1P-MCA600S201</td></tr>
<tr><td colspan="2">Application:
• Small to large diameter connector
• Thread installation for probe connector G 1/2"in G 3/4"</td></tr>
<tr><td rowspan="4">3/4"NPT</td><td rowspan="4"> 
</td><td>Material</td><td>Order Code</td></tr>
<tr><td>SUS316</td><td>SISAM1P-MBA600S301</td></tr>
<tr><td>SUS316L</td><td>SISAM1P-MCA600S301</td></tr>
<tr><td colspan="2">Application:
• Small to large diameter connector
• Thread installation for probe connector G 1/2"in 3/4"NPT</td></tr>
</table>

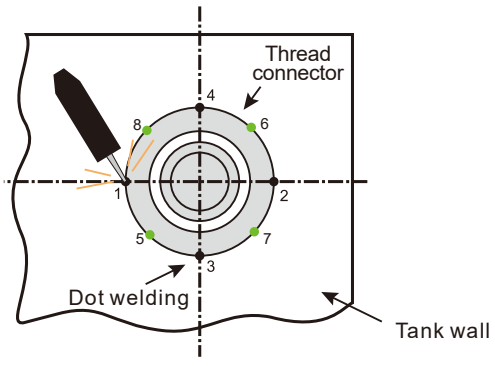
Instructions for using the thread connector and adaptor

- For application related to food and environmental hygiene EHEDG or 3A standards, please comply with requirements stipulated in laws and regulations.
- The 3A certification specified here applies only to the sealed sensor equipped with PEEK probe.
- The surface should not be contaminated or damaged.
- Welding must be performed by authorized professionals.
- Do not install the sensor when it is cooling down during or after welding.
- The material of the welding rod must meet connector and tank (pipeline) standards.
- The welding power and degree of penetration must meet the tank (pipeline) wall thickness and requirements stipulated in laws and regulations.
- Welding should not cause any deformation to the thread connector, which may hinder installation.
- The seal of the thread connector should not be damaged by weld spatter or collision.
- For the welding operation, please refer to "SISB Welding Adapter / Thread Adaptor Operating Instructions".

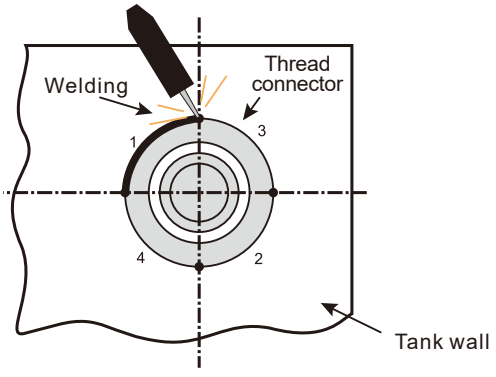
Installation of thread connector

1. Drill a hole in the tank/pipeline wall while in installation position based on the external diameter of the "thread connector" with a maximum tolerance of + 0.2mm.
2. Perform dot welding with sufficient strength of 4-8 points in the junction between the tank/pipeline wall and the "thread connector", with the same spacing as shown in Figure 1.
3. Weld the section between the two points as well as the opposite section. Finish the operation by section Based on Figure 2 & Figure 3. This is mainly to avoid welding stress and overheating, which may result in deformation of the "thread connector" and affect installation.
4. After welding is completed, there should be enough time for the "thread connector" to cool down before installing the sensor.
5. The screw thread and sealing surface should have no welding traces and damage.
6. If the sealing surface of the "thread connector" is damaged, it can no longer be used. In this case, replace the item and repeat the welding process.

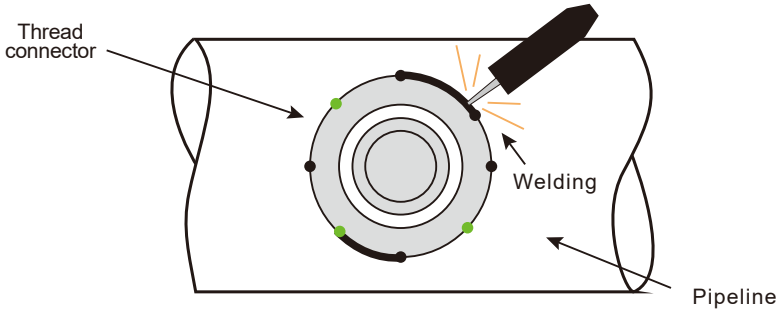
※It is recommended that thread connector should be locked with bolt (don't lock too tight) before welding. After welding is completed, it can be removed after cooling to minimize welding deformation.



(Figure 1)



(Figure 2)

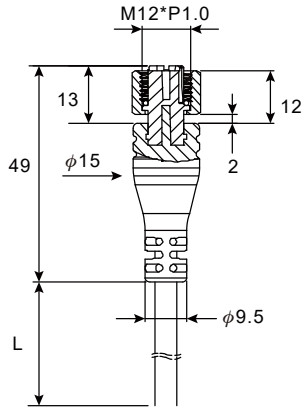


Pipeline welding(Figure 3)

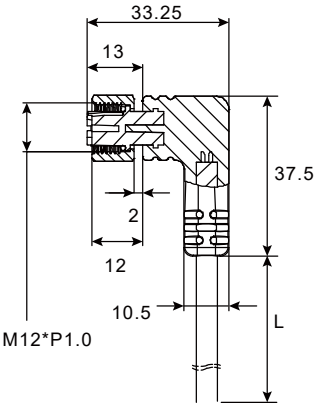
ACCESSORIES-ELECTRICAL CABLE CONNECTOR (OPTIONAL)

M12 ELECTRICAL CABLE CONNECTOR

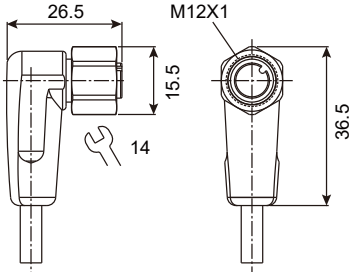
Order Code: PCL10100-67AA232204C5000

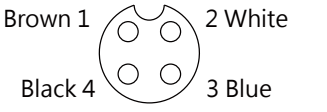


Order Code: PCL10000-67AA232204C5000

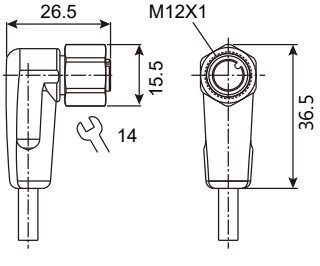


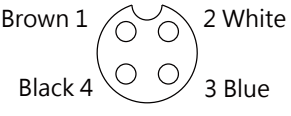
Order Code: PC312-1231415M01





Order Code: PC312-1232410501





M12 CONNECTOR SPECIFICATIONS

Order Code	Connector type	Cable length	Voltage rating	Current rating	Protection grade
PC312-1231415M01 ※	Elbow 90°	5m	250Vac/300Vdc	Max.4A	IP67 IP68 IP69K
PCL10100-67AA232204C5000	Straight 180°	5m	250Vac	Max.4A	IP67
PCL10000-67AA232204C5000	Elbow 90°	5m	250Vac	Max.4A	IP67
PC312-1232410501 ※	Elbow 90°	5m	10~36Vdc	Max.4A	IP67 IP68 IP69K

※ Use M12 cable type in dust explosion-proof environment which approved by NEPSI;
ADOAH040VAS0005E04, ADOAH043VAS00005E04 (Order code; PC3121231415M011, PC312-1232410501)

NEW/OLD MODEL NO. COMPARISON TABLE

Old Model NO.	Order Code
26-0522-5M	PC312-1231415M01
26-0523-5M	PCL10100-67AA232204C5000
26-0524-5M	PCL10000-67AA232204C5000
SCA-3371	PC312-1232410501

ACCESSORIES - PROGRAMMER BOX (OPTIONAL)

PROGRAMMER BOX

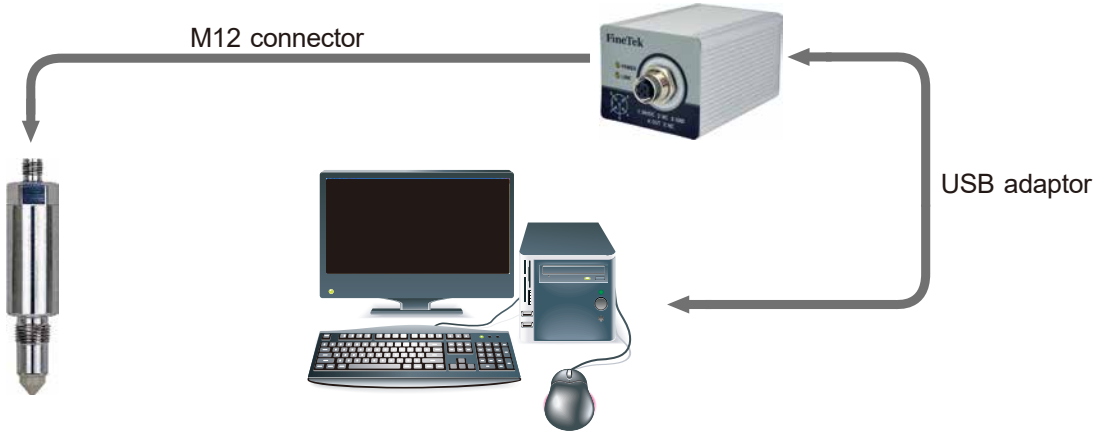
Order Code	SISBA1X-0004
Exterior dimension(mm)	87X61X50(L XW XH)
Voltage rating	5Vdc(from USB)
Current consumption	Max.500mA
Input interface	Mini USB
Output interface	M12-5C A-Coded
Ambient temperature	-20°C~45°C(-4°F~113°F)
Protection grade	IP20

The programmer box function is to transmit sensor data to PC for reading and editing. Mainly supports calibration and parameter setting for SIS Intelligent Level Sensor.

- Reading current sensor parameter setting.
- Changing sensor parameter setting.
- Adjusting sensor sensitivity of current medium in real time.
- Calibrating current measuring value and do necessary adjustment promptly..

Note: The programmer box is only working while sensor data requiring transmit to PC for reading and editing, not a permanent connection automatic device.

SYSTEM DIAGRAM

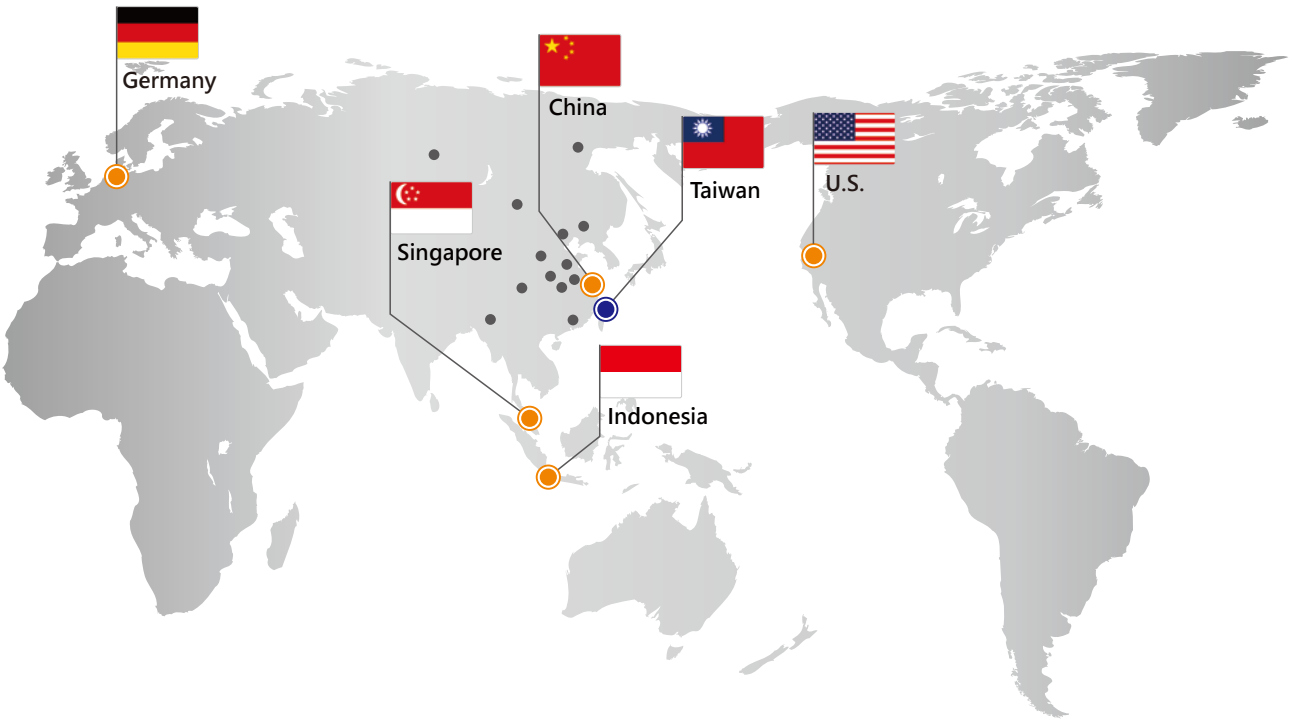


Using M12 connector to link SIS Impedance Spectroscopy Sensor" with programmer box.

Transmitting the sensor data by USB cable from programmer box to PC.

Note: The accuracy and efficiency can not be guaranteed if using NON-FineTek connector.

Global Network



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