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## Optical Level Switch





# SDX201 SPECIFICATION



Type	Cable type	M12 connection type
Tip material	Glass	
Body material	SUS304 / SUS316	
Supply voltage	10 ~ 28 VDC	
Load current	≤200 mA	
Current consumption	< 25 mA	
Output mode	NPN / PNP	
Output function	NO+NC	
Electrical protection	reverse polarity protection, short circuit protection	
Delay time	0 sec (Standard) / 5 sec ±1 sec (optional)	
Ambient temp.	-20~80 °C	
Operation temp.	-20~100 °C	
Process pressure	< 60 bar	
Anti-ambient light interference	< 500 lux	
IP rating	IP 67	
Indicator light	Red LED	N/A
Cable specifications	PVC or XLPE 24 AWG, L=2 m, 4C (blue, green, black, and brown)	N/A
Max. Installation torque	75 kgf-cm	
Thread options	PT / PF / NPT	
Connection size	3/8" / 1/2"	
UL File Number	E324746	
Dimension (Unit:mm)		



# SD22 SPECIFICATION



Type	Typical	Motor power detection
Tip material	Glass	
	Zinc-plated steel / SUS304 / SUS316	
Body material	PA66 glass fiber reinforced	
Supply voltage	AC 50/60 Hz 115 V $\pm 20\%$ ; AC 50/60 Hz 230 V $\pm 20\%$	
Relay specifications	AC 240 V, 2.5 A, C300	
Switch life time	105 switching cycles	
Ambient temp.	-40 ~ 85 °C	
Operating temp.	-40 ~ 100 °C or 120°C (<1h)	
Delay time (customization)	<ul style="list-style-type: none"> <li>* Relay ON after applying the supply voltage (3s <math>\pm</math> 1s)</li> <li>* Relay OFF after level continue missing (5s <math>\pm</math> 1s)</li> </ul>	<ul style="list-style-type: none"> <li>* Relay ON after applying the supply voltage (3s <math>\pm</math> 1s)</li> <li>* Level monitoring after relay ON (30s <math>\pm</math> 1s)</li> <li>* Relay OFF after level continue missing (5s <math>\pm</math> 1s)</li> </ul>
Self-test function	Yes	
Process pressure	65 bar	
Anti-ambient light interference	< 500 lux	
IP rating	IP 65	
Cable specifications	PVC, 18 AWG, L=1m, 5C color coded	PVC, 18 AWG, L=1m, 6C color coded
Installation torque	100 kgf-cm	
Connecting screw	1/2" (PT, PF, NPT) / M20X1.5 mm	
Tip part weight	Around 51 g	
Body part weight	around 167 g	
UL File Number	SA44153	
Dimension (Unit:mm)	<p>The technical drawing shows the following dimensions and components:</p> <ul style="list-style-type: none"> <li><b>Tip part:</b> <ul style="list-style-type: none"> <li>Thread: 1/2" PF / M20*1.5</li> <li>Material: Zinc-plated steel / SUS304 / SUS316</li> <li>Length: 38.6 mm</li> <li>Includes a Washer and Screw joint.</li> </ul> </li> <li><b>Body part:</b> <ul style="list-style-type: none"> <li>Thread: 1/2" (PT / NPT)</li> <li>Material: Zinc-plated steel / SUS304 / SUS316</li> <li>Includes a Quick coupling.</li> </ul> </li> <li><b>Overall dimensions:</b> <ul style="list-style-type: none"> <li>Total length: 98.0 mm</li> <li>Tip length: 21.6 mm</li> <li>Body length: 68.5 mm</li> <li>Body diameter: 40.7 mm</li> <li>Body diameter at bottom: 48.0 mm</li> <li>Body diameter at top: 65.8 mm</li> <li>Includes a Self-test point and Cable(1m).</li> </ul> </li> </ul>	

# SD22 SERIES

## APPLICATION

- SD22 uses optical technology to achieve level monitoring and is durable to shocks in the environment.
- Uniquely different design (2 separate parts) compared to the traditional optical switch model.
- SD 22's switch body can be removed while the tip remains installed on tank. No tank drainage or leakage required when removing switch.
- Intelligent process control for not only do liquid level detection, but also with other sensors connected in series so that the full system has protection.
- According to customer demand, adjustable delay time length.
- Self-test function.
- The device is able to detect whether sensor body and tip are installed incorrectly.
- The LED indicator is readily apparent users to see.
- Quick coupling provide faster installation and reliable fix.

	Color	Status	LED lights
<b>Power</b>	Green	Supply in	ON
<b>Status</b>	Red	High level	OFF
		Low level	ON
		Error	Blinking

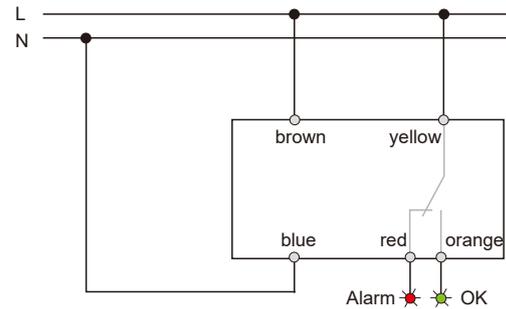
## WORKING FLOW

### ◆ SDB-B0□T□ (5 wire, typical)

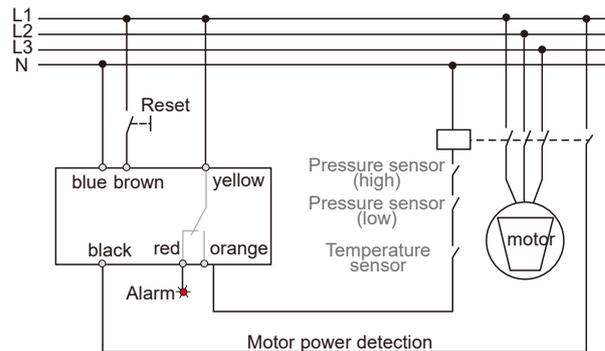
1. Three seconds after the power is turned on, the relay is on.
2. Liquid level detection, level required sustained low 5 seconds, the relay OFF and status light turns on.
3. Liquid level detection, level requires continuous contact for five seconds, the relay turns on, the status light turns off.

## WIRING DIAGRAM

### ◆ SDB-B0□T□ (5 wire, typical)

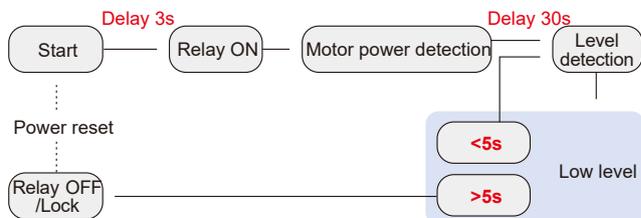
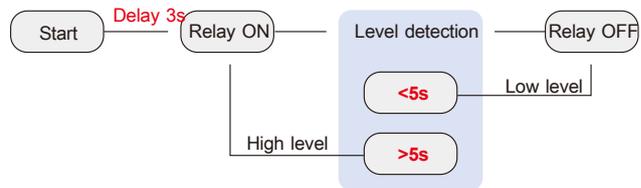


### ◆ SDB-B0□M□ (6 wire, motor power detection)



### ◆ SDB-B0□M□ (6 wire, motor power detection)

1. Three seconds after the power is turned on, the relay turns ON.
2. Detects the motor power supply is normal after a delay of 30 seconds to enter the liquid level detection state.
3. Liquid level detection, level required sustained low for 5 seconds, the relay turns off and status light is turned on lit, enters the Locked state.
4. Need to restart the power to cancel the alarm state and re-start the process.



# ORDER INFORMATION

## Tip

Order code	Connector of tip and body	Connector type	Power supply
Options	A: Crew joint (F) N: Quick coupling (F)	T: Typical (5 wire) M: Motor power detection (6 wire)	AC115V ± 20% AC230V ± 20%
SDXAA1X-0016	A: Crew joint (F)	T: Typical (5 wire)	AC230V ± 20%
SDXAA1X-0009	A: Crew joint (F)	M: Motor power detection (6 wire)	AC115V ± 20%
SDXAA1X-0010	A: Crew joint (F)	M: Motor power detection (6 wire)	AC230V ± 20%
SDXAA1X-0013	N: Quick coupling (F)	T: Typical (5 wire)	AC115V ± 20%
SDXAA1X-0014	N: Quick coupling (F)	T: Typical (5 wire)	AC230V ± 20%
SDXAA1X-0011	N: Quick coupling (F)	M: Motor power detection (6 wire)	AC115V ± 20%
SDXAA1X-0012	N: Quick coupling (F)	M: Motor power detection (6 wire)	AC230V ± 20%

## Body

Order code	Connector of tip and body	Connector type	Tip material
Options	A: Crew joint (F) N: Quick coupling (F)	BQ:1/2"PT BR:1/2"PF BU:1/2"NPT M2:M20X1.5	0: SUS304 6: SUS316 Z: Zinc-plated steel
SDXAM1A-MAA5030001	A: Crew joint (F)	BR:1/2"PF	0: SUS304
SDXAM1A-MAA5070001	A: Crew joint (F)	BU:1/2"NPT	0: SUS304
SDXAM1A-MPJ2820001	A: Crew joint (F)	M2:M20X1.5	Z: Zinc-plated steel
SDXAM1A-MAA5010001	N: Quick coupling (F)	BQ:1/2"PT	0: SUS304
SDXAM1A-MAA5030002	N: Quick coupling (F)	BR:1/2"PF	0: SUS304
SDXAM1A-MPA5030001	N: Quick coupling (F)	BR:1/2"PF	Z: Zinc-plated steel
SDXAM1A-MAA5070002	N: Quick coupling (F)	BU:1/2"NPT	0: SUS304

# ORDER INFORMATION

## Refrigeration-glass Probe

SDX4 0 0 07 08 - 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

**07 08 Certification**

00: None  
3A: UL

**Connection**

09 10

AA: JIS  
AC: ANSI

11 12

A5: 1/2"  
J2: M20

13 14

01: PT male  
03: PF male  
07: NPT male  
B2: M20 X1.5

**15 16 Body and Probe material**

MA: Glass+SUS304  
MB: Glass+SUS316  
ME: Glass+SUS Zinc +Plated steel

**17 Power supply**

A: VAC 115V  
B: VAC 230V

**18 Output**

R: Relay

**19 Function**

T: Typical (5 wire)  
M: Motor power detection (6 wire)

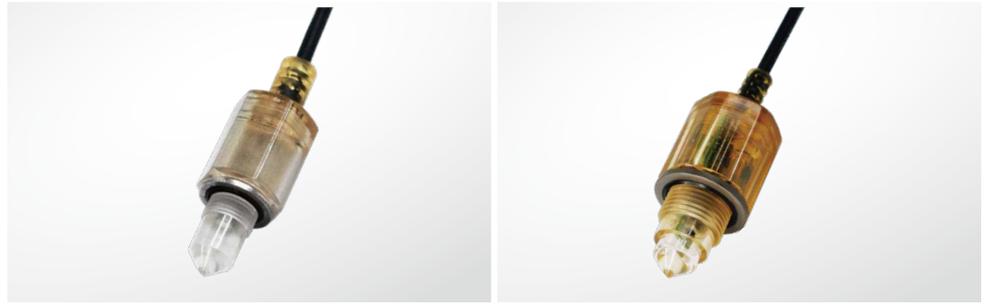
**20 Connector of tip and body**

A: Crew joint (F)  
B: Quick coupling (F)  
C: Crew joint (Glass welding)

**21 22 23 24 Length**

Code	Cable Length
1000	Standard 1000mm

# SDX5 SPECIFICATION



Housing material	PC	PES
Tip material	PC	PES
Supply voltage	10~28 VDC	
Load current	≤100 mA	
Current consumption	<15 mA	
Output mode	NPN / PNP	
Output function	NO / NC	
Electrical protection	reverse polarity protection, short circuit protection	
Ambient temp.	-10~80 °C	
Operation temp.	-10~125 °C	
Process pressure	<10 kg / cm <sup>2</sup>	
IP rating	IP 67	
Indicator light	Red LED	
Cable specifications	PVC or XLPE, 24 AWG, L=2 m, 3C (Brown, Black, and Blue)	
Max. Installation torque	25 kgf-cm	50 kgf-cm
Thread options	M12x1.0 / M12x1.5	PF / NPT
Connection size	M12	3/8"
UL File Number	E324746	
Dimension (Unit:mm)		

※PES(polyethersulfone) is similar PSU(polysulfone), but its heat resistance, strength, and stiffness is better.

# SDX5 SPECIFICATION



<b>Housing material</b>	SUS304 / SUS316
<b>Tip material</b>	PES
<b>Supply voltage</b>	10~28 VDC
<b>Load current</b>	≤100 mA
<b>Current consumption</b>	<15 mA
<b>Output mode</b>	NPN / PNP
<b>Output function</b>	NO / NC
<b>Electrical protection</b>	reverse polarity protection, short circuit protection
<b>Ambient temp.</b>	-10~80 °C
<b>Operation temp.</b>	-10~125 °C
<b>Process pressure</b>	<40 kg / cm <sup>2</sup>
<b>IP rating</b>	IP 67
<b>Indicator light</b>	Red LED
<b>Cable specifications</b>	PVC or XLPE, 24 AWG, L=2 m, 3C (Brown, Black, and Blue)
<b>Max. Installation torque</b>	100 kgf-cm
<b>Thread options</b>	PT/PF / NPT
<b>Connection size</b>	3/8 "
<b>UL File Number</b>	E324746
<b>Dimension (Unit:mm)</b>	

※PES(polyethersulfone) is similar PSU(polysulfone), but its heat resistance, strength, and stiffness is better.

# SDX5 SERIES

## FEATURE

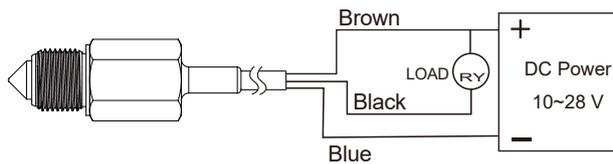
- NPN, PNP open collector output to energize relay or PLC
- Housing material of PC, PES for applicable in water, oil, liquid solution, liquor, alcohol, organic solvent...etc.
- PC, PES for acidity and alkaline
- Over-current and reverse polarity protected
- LED status indication

## WIRING

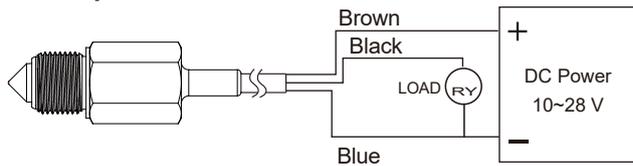
※ Do not operate without load. Use the correct power supply according to the load.

- Lead wire

### NPN output



### PNP output



# ORDER INFORMATION

## Plastic probe

SDX5 ⑤ ⑥ ⑦ ⑧ - ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔

**⑤ ⑥ Model**

00: Standard

**⑦ ⑧ Certification**

00: None  
3A: UL

**Connection**

**⑨ ⑩**

AA: JIS  
AC: ANSI

**⑪ ⑫**

A4: 3/8"  
I3: M12

**⑬ ⑭**

01: PT male(Only SUS304,316)  
03: PF male  
07: NPT male  
78: M12X1.0(Only PC,PES)  
82: M12X1.5(Only SUS304,316)

**⑮ ⑯ Body and Probe material**

11: PC (Only PC body material)  
35: PES (Only PES body material)  
MA: SUS304+PES  
MB: SUS316+PES  
GA: SUS304+Glass  
GB: SUS316+Glass

**⑰ Power supply**

A: 10~28Vdc

**⑱ Output**

P: PNP  
N: NPN

**⑲ Wiring**

A: Cable

**⑳ Contact**

A: NO  
B: NC

**㉑ ㉒ ㉓ ㉔ Length**

Code	Cable Length
0000	None
2000	Standard 2000mm

# SDX501 SPECIFICATION



<b>Housing material</b>	PES	SUS304 · SUS316
<b>Tip material</b>	PES	PES
<b>Supply voltage</b>	5VDC ± 10%; 12VDC ± 10%	
<b>Current consumption</b>	Max. 10 mA	
<b>Output Type and Load Current</b>	3-wire PNP · Source 40mA max.	
	3-wire NPN · Sink 40mA max. , up to 30VDC	
<b>Output function</b>	NO / NC	
<b>Electrical protection</b>	Reverse polarity protection; ESD protection on input and output terminals.	
<b>Ambient temp.</b>	-40 ~ 80°C	
<b>Operation temp.</b>	-40 ~ 110°C	
<b>Process pressure</b>	Max. 17kg/cm <sup>2</sup>	
<b>IP rating</b>	IP 67	
<b>Indicator light</b>	Red LED indicates NC output status.	N / A
<b>Cable specifications</b>	3 x TPE Insulated · 22AWG · L:152mm · Wire colors: Red, Black, Blue	
<b>Connection size</b>	1/2"-20 UNF-2A, 1/4" NPT, M12x1.0	
<b>Dimension (Unit:mm)</b>		

※PES(polyethersulfone) is similar PSU(polysulfone), but its heat resistance, strength, and stiffness is better.

# ORDER INFORMATION

## Plastic probe

**SDX5 0 1** ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ **A** ⑳ ㉑ ㉒ ㉓ ㉔

### ⑦ ⑧ Certification

00: None  
3A: UL

### Connection

⑨ ⑩

AA: JIS  
AC: ANSI

⑪ ⑫

A2: 1/4"  
A5: 1/2"  
I3: M12

⑬ ⑭

07: NPT male  
15: UNF male  
78: M12X1.0

### ⑮ ⑯ Body and Probe material

35: PES  
MA: SUS304+PES  
MB: SUS316+PES

### ⑰ Power supply

C: 5VDC±10%  
D: 12VDC±10%

### ⑱ Output

P: PNP  
N: NPN

### ⑳ Contact

A: NO  
B: NC

### ㉑ ㉒ ㉓ ㉔ Length

Code	Cable Length
0152	Standard 152mm

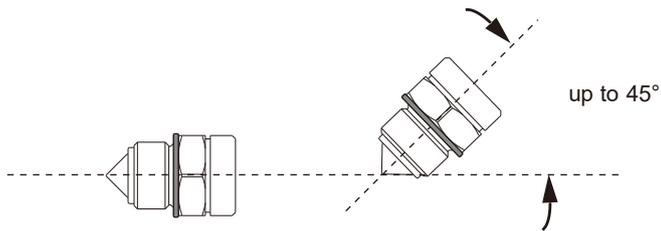
Cable: 3 × TPE insulated wires

Wire color definition:

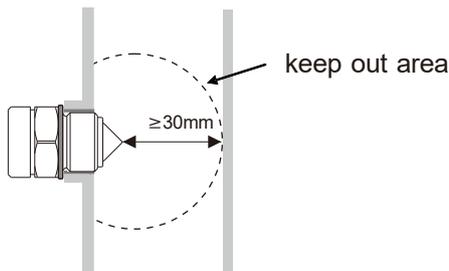
Red – Power (+)    Black – Power (–)    Blue – Switching output

# CAUTION

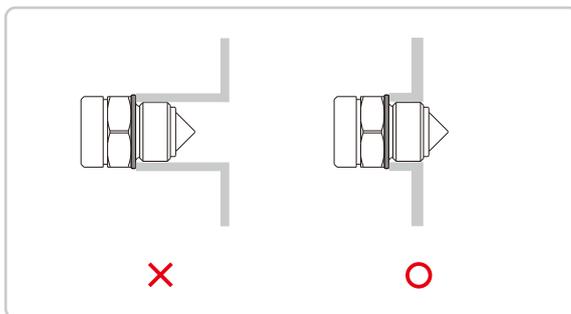
- Cable wiring to be done in accordance with the operating manual connection.
- The manual tightening torque between the probe and the body may vary depending on the series and model. Please refer to the corresponding specifications.
- During installation note that the cable outlet direction is downward.
- This product is not for solids in solution, solids containing adhesion of suspended or viscous liquids.
- Do not scratch the tip of sensor.
- This product can not be used in the environment with an infrared light source.
- We recommend the following installation below. The horizontal plane parallel to the  $0^{\circ} \sim 45^{\circ}$  for optimal installation angle.



- This product can not be installed in the liquid at the flow entry point.
- Don't have any reflective surface or other interference at the front cone radius 30mm, as shown.
- The tip of optical level switches front of the sensor and the tank wall must be at least distance 30mm, as shown.

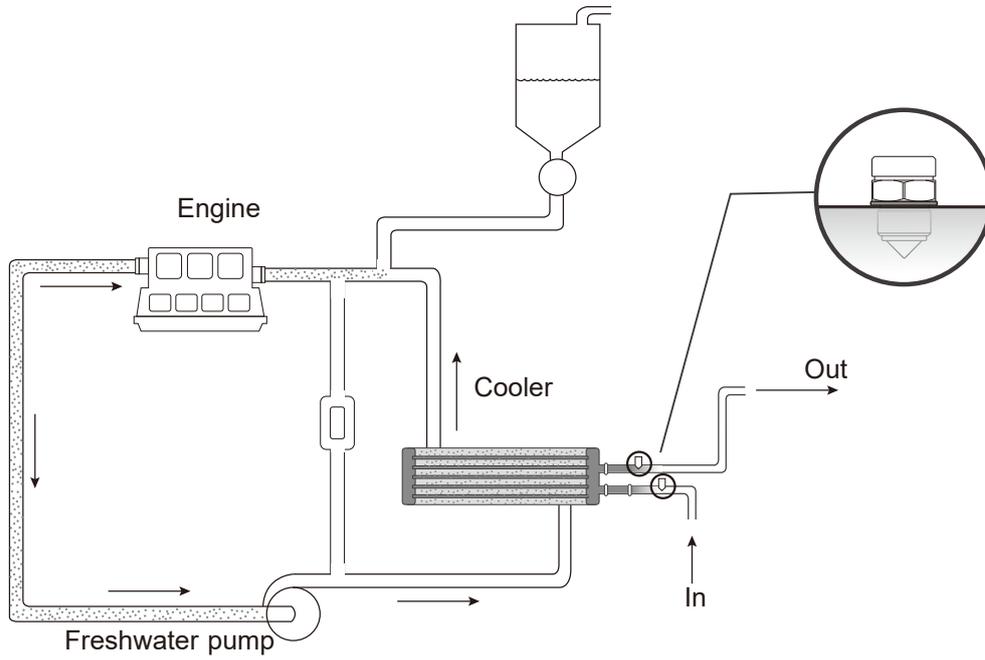


- Install the threaded sleeve photoelectric switch, the tip of switch must break the casing.

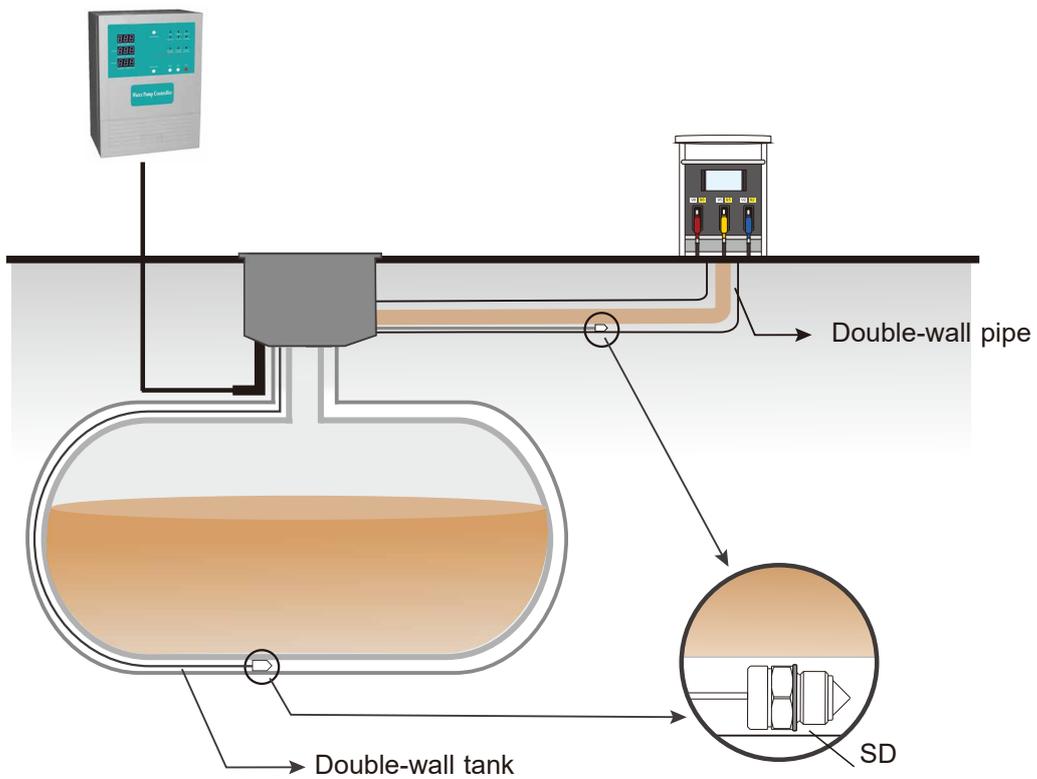


# APPLICATIONS

## Sea water cooling system



## Double-wall pipe and double-wall tank leakage detection





# Global Network



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