

Thermal Dispersion & Paddle Type Level Switch

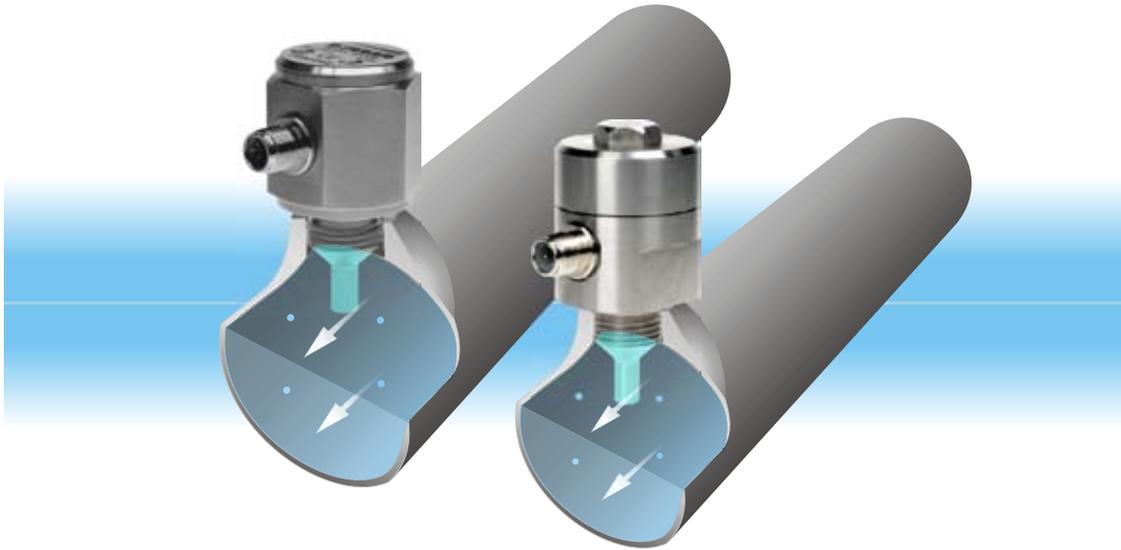
PRODUCT INTRODUCTION

OPERATING PRINCIPLE

Thermal dispersion flow switch is a precise flow sensing device, whose movement principle is heat diffusion.

The probe consists of two temperature sensors. One sensor measures the temperature of the fluid when the probe is immersed. The other sensor is heated by a constant power.

This creates a temperature difference between two sensors. Temperature difference is an inverse ratio to the flow velocity. The probe and housing are made by stainless steel or engineering plastic. Since the device is without moving parts, therefore there is no wear and tear problem.



FEATURE

- Comparing to the traditional paddle type flow switch, thermal dispersion flow switch offers high sensitivity, no limitation of installing location, and no moving parts wear and tear.
- Different materials can be adopted to suit liquid with impurities, acidity, and alkaline.
- Probe length could be made in order to meet any application.
- There are three different output signals for users to choose.

APPLICATION

Water Power Plant, HVAC Systems, Steel Making, Petrochemical, Shipyard, Food Process, Pharmaceutical, Optical, Semiconductor, and any transporting pipes and cooling pipes flow control.

PRODUCT SPECIFICATION

Drawing			
Model	SP200-□-□-□-□-□ Compact Type	SP201-□-□-□-□-□ Extension Type	SP202-□-□-□-□-□ High Temp. Type
Measuring Range	Water: 1~150 cm/s Oil: 3~300 cm/s	Water: 1~150 cm/s Oil: 3~300 cm/s	Water: 1~150 cm/s Oil: 3~300 cm/s
Ambient Temperature	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 80°C
Operating Temperature	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 120°C
Alarm Output	Open Collector : NPN / PNP(<400mA) Relay : 1A/30Vdc, 0.3A/125Vac (NO or NC)		
Operating Pressure	100 bar (max.)	100 bar (max.)	100 bar (max.)
LED Indication:	Flow velocity below set point- Red LED on, Open Flow velocity equals set point- Yellow LED on, Close Flow velocity above set point- 4 Green LED to indicate flow speed, Close		
Housing	SUS304 / 316L	SUS304 / 316L	SUS304/ 316/ 316L
Protection Level	IP67		
Warm-up Time	Approx. 10 Sec	Approx. 15 Sec	Approx. 15 Sec
Connection Thread	G1/2, G1/4, NPT1/2	G1/2, NPT1/2	G1/2, G1/4, NPT1/2
Operating Voltage	19 ~ 30Vdc		
Power consumption	50mA (max.)		
Wiring	3-wire NPN/PNP Power-brown Grounding-blue Output-black		
Accessory	Gasket, 2m Cable		

PRODUCT SPECIFICATION

Drawing	
Model	SP220-□-□□-□□ Economy Type
Measuring Range	Water: 1~150 cm/s Oil: 3~300 cm/s
Ambient Temperature	-20 ~ 80°C
Operating Temperature	-20 ~ 80°C
Alarm Output	Open Collector : NPN / PNP (<400mA) Relay : 1A/30Vdc, 0.3A/125Vac (NO or NC)
Operating Pressure	100 bar (max.)
LED Indication:	Flow velocity below set point- Red LED on, Open Flow velocity equals set point- Yellow LED on, Close Flow velocity above set point- 4 Green LED to indicate flow speed, Close
Housing	PC
Protection Level	IP65
Warm-up Time	Approx. 15 Sec
Connection Thread	G1/2, NPT1/2
Operating Voltage	19 ~ 30Vdc
Power consumption	50mA (max.)
Wiring	3-wire NPN/PNP Power-brown Grounding-blue Output-black
Accessory	Gasket, 2m Cable
Footnote	Can not set Sensitivity and Alarm

PRODUCT SPECIFICATION

Drawing		
	 Cert. Number GYJ071446	
Model	SP210 Stainless Steel Type	SP170-(1/2) Explosion Proof Type
Measuring Range	Water: 1~150 cm/s Oil: 3~300 cm/s	Water: 1~150 cm/s Oil: 3~300 cm/s
Ambient Temperature	-20 ~ 80°C	-20 ~ 80°C
Operating Temperature	-20 ~ 80°C	-20 ~ 80°C
Alarm Output	Relay: 5A/250Vac	Relay: 5A/250Vac
Operating Pressure	100 bar (max.)	100 bar (max.)
LED Indication:	Flow velocity below set point- Red LED on, Open Flow velocity equals set point- Yellow LED on, Close Flow velocity above set point- 4 Green LED to indicate flow speed, Close	
Housing	SUS304	SUS304
Wetted material	SUS304 / 316 / 316L	SUS304 / 316 / 316L
Protection Level	IP67	IP67
Warm-up Time	Approx. 15 Sec	Approx. 15 Sec
Connection Thread	G1/2, NPT1/2	G1/2, NPT1/2
Operating Voltage	19 ~ 30Vdc	19 ~ 30Vdc
Power consumption	60mA (max.)	60mA (max.)
Wiring	5-wire Relay Output Power- red Grounding- black COM- white NC- yellow NO- blue	
Accessory	Gasket, 2m Cable	_____

INSTALLATION

INSTALLATION

Please use given water-proof gasket for installing.

1. "a" above and below the SP in diagram 1 has to be 4 times greater than its internal diameter of pipe. (Fig. 1)
2. Make sure that the pipe is bubble-free for proper alarming. (Fig. 2)
3. For not-fully-filled pipes, SP needs to be installed underneath. Liquid level needs to be higher than the probe height. (Fig. 3)
4. SP must be screwed tightly to avoid liquid leakage from leaking out. It can be installed in any angle. For best sensitivity and response speed, please refer to the installation in (Fig. 4)
5. This is to protect the wear and tear to the device. Please install filter upstream the Spin case impurities in the liquid destroy the SP.

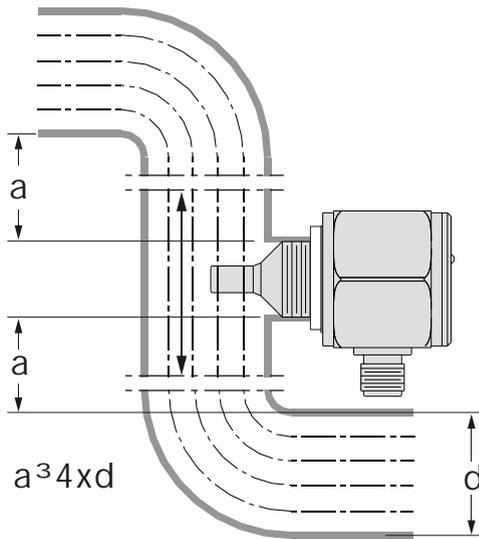


Fig. 1

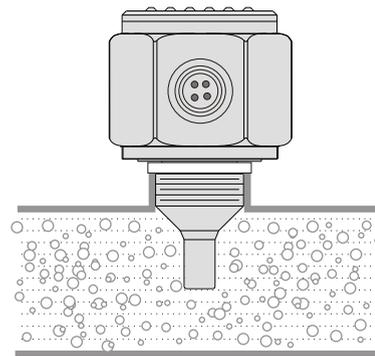


Fig. 2

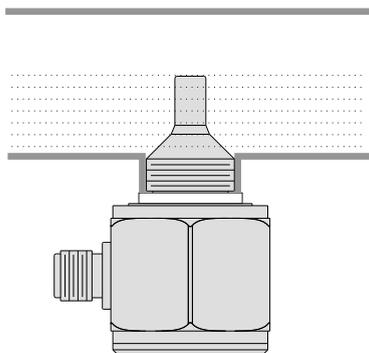


Fig. 3

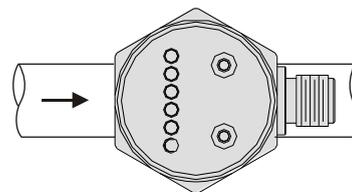


Fig. 4

CONNECTOR DIAGRAM

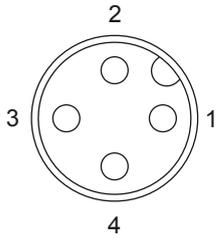


Fig. 5
Wire terminal diagram
(NPN, PNP and 1A relay output type)

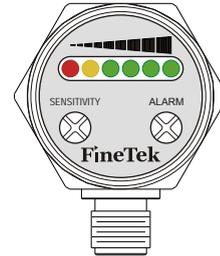


Fig. 6

WIRING

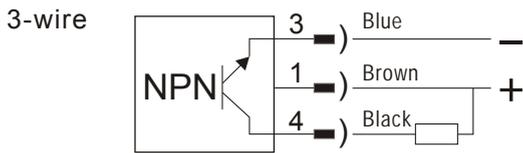


Fig. 7, NPN output type wiring

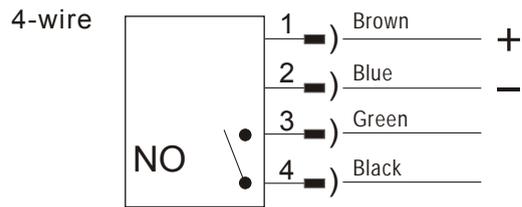


Fig. 10, NO Relay output type wiring

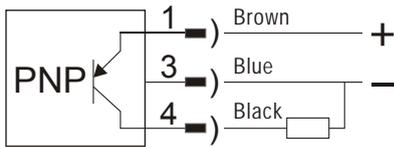


Fig. 8, PNP output type wiring

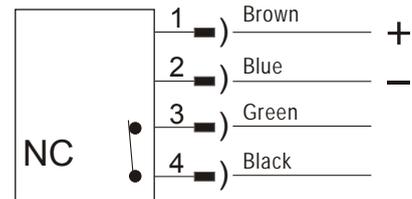


Fig. 11, NC Relay output type wiring

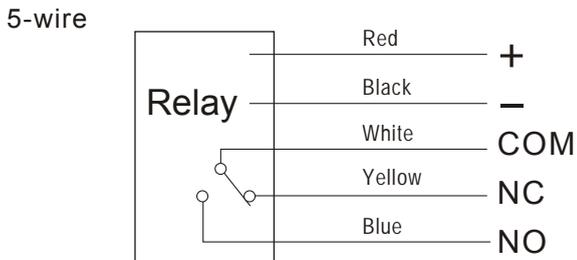


Fig. 9, Relay output type wiring

CODE NAME INFORMATION

SP2 - - - - - ()

Model Description

- 0: Compact Type
- 1: Stainless Steel Type ϕ 70X78
(for SPDT 5A/250Vac)
- 2: Economy Type (Plastic Housing)

Probe Type

- 0: Standard Type
- 1: Probe Extension Type
- 2: 120°C High Temperature Type
(Except SP220)

Material

- 0: SUS304 L: SUS316L S: Other
- 6: SUS316 F: PVDF (for SP203 only)

Connection

Size	Specification
A: 3/8" (10A)	Q: PT
B: 1/2" (15A)	T: BSP
C: 3/4" (20A)	R: PF
D: 1" (25A)	U: NPT
2: 1/4"	V: GAS
S: Other	S: Other

*Standard thread connection: 1/2"PF, 1/2"NPT, 1/2"PT

Output

- N: NPN (current limit: 400mA)
- P: PNP (current limit: 400mA)
- A: Relay 1A/30Vdc (NO)
- B: Relay 1A/30Vdc (NC)
- C: Relay 5A/250Vac (NC) (for SP210/ SP211/ SP212)

Cable Wire Length(unit: m)

- 0: None 2: 2m 5: 5m

Length L (Unit: mm)

- * Tolerance of the total product length is ± 5 mm
- * In case of not affecting original functions, dimensions are subject to change without notice.
- * Please contact us for specific extension probe.
- * Max.200mm
- * PVDF and PTFE are available for standard models.

CODE NAME INFORMATION

SP170- - - - ()

Model Description

70 --Explosion Proof Type

Material

1: SUS304
2: SUS316L

Size	Specification
B: 1/2" (15A) D: 1" (25A) S: Other	Q: PT T: BSP R: PF V: GAS U: NPT S: Other

Output

C: SPDT 5A/250Vac

Length L (Unit: mm)

- * Please contact us for specific extension probe.
- * In case of not affecting original functions, dimensions are subject to change without notice.
- * Tolerance of the total product length is $\pm 5\text{mm}$
- * Max.200mm