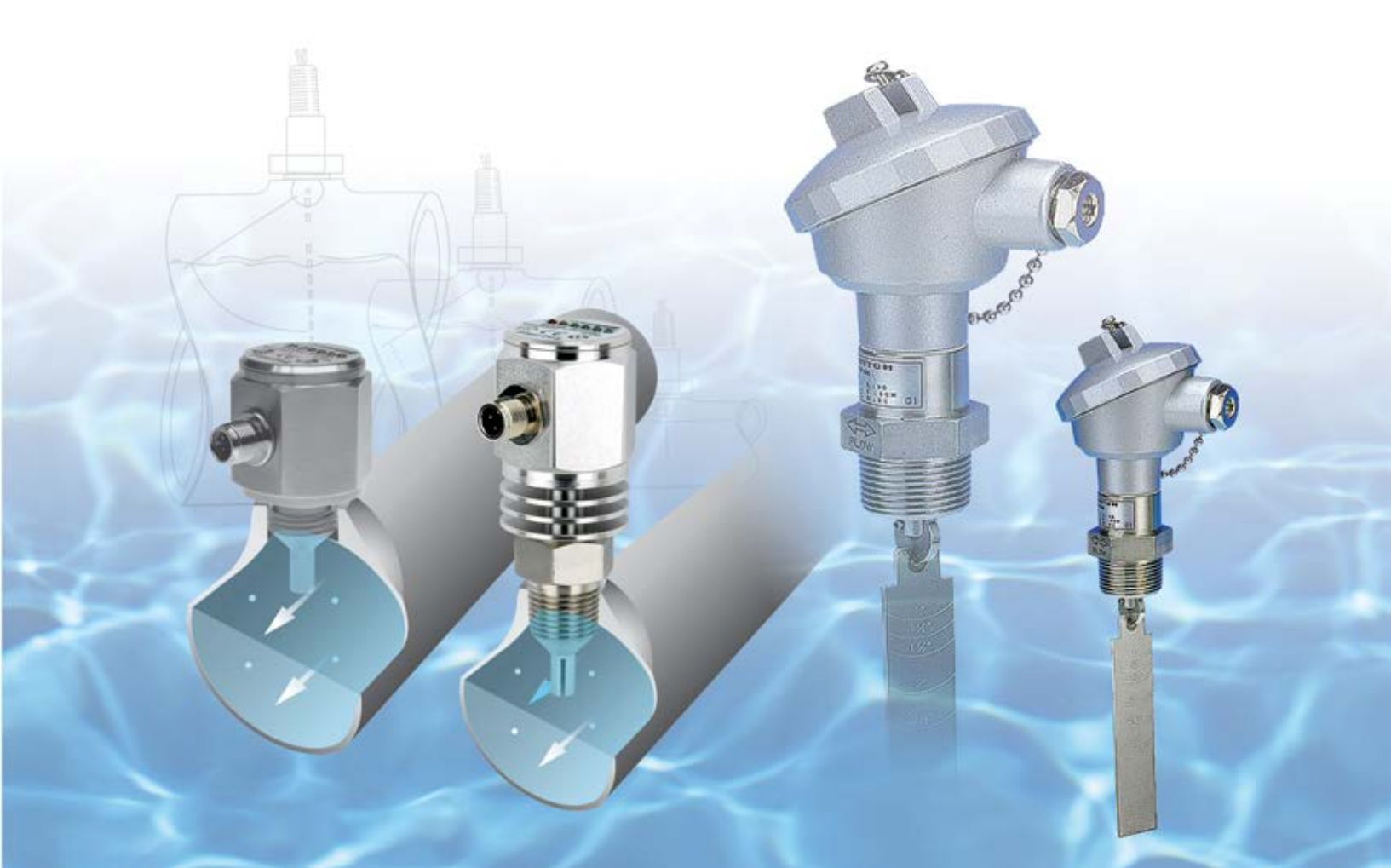




Thermal Dispersion Flow Switch



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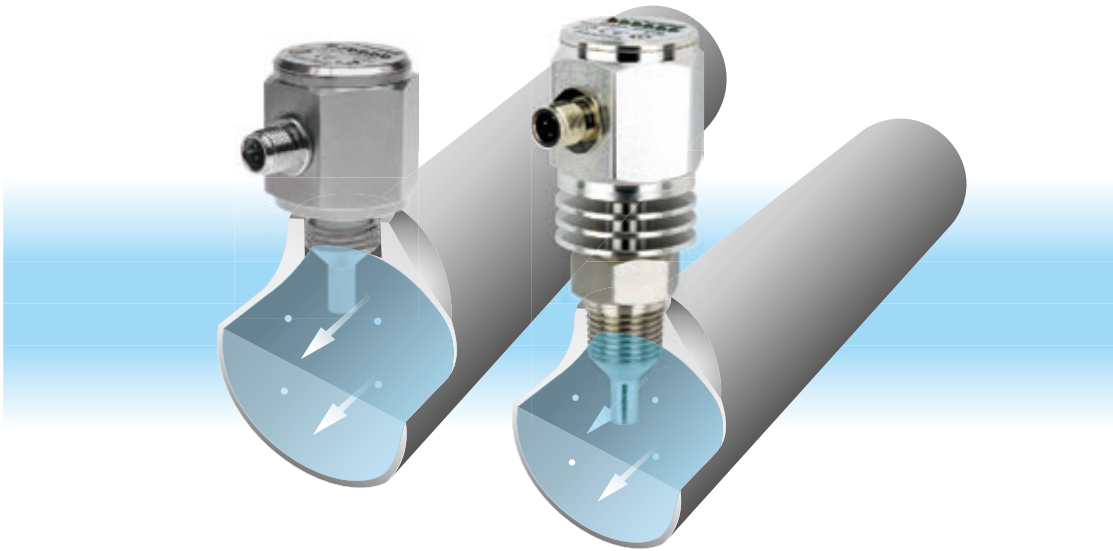


PRODUCT INTRODUCTION

OPERATING PRINCIPLE

Thermal dispersion flow switches measure the velocity of a liquid inside a pipe or channel. The switch's probe contains two key components – a heating sensor and temperature sensor. The heating sensor is positioned closest to the flowing liquid and provides a consistent heat. The temperature sensor measures the temperature emitted from the heating sensor.

When liquid is flowing, there is a temperature difference between the two sensors. The temperature difference has an inverse relationship with the flow velocity (fast flowing liquids will result in greater heat differences and vice versa). Since the device contains no moving parts, has no wear and tear and maintains a long lifespan.



FEATURES

- High sensitivity and accuracy.
- Suitable for corrosive and hazardous conditions.
- Able to be calibrated for liquids with different densities and impurities.
- Suitable for complex locations with easy installation.
- Customized probe lengths available.
- Three different output signals options.

APPLICATION

Petrochemicals, Hydroelectric plants, Shipyard, HVAC Systems, Steel Industry Food and Beverage, Pharmaceutical, Optics and Semiconductor Industry, Cooling pipes flow control
Any pipes carrying liquid where flow measurement is needed.

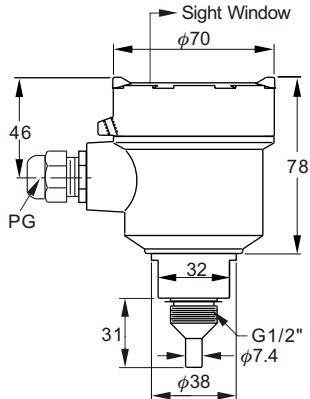
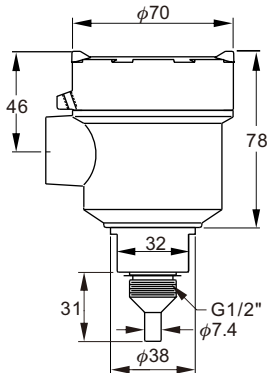
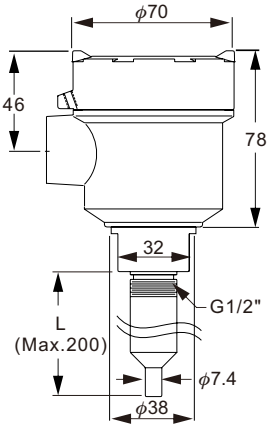
PRODUCT SPECIFICATIONS

Drawings			
Model	SP200-□-□-□-□ Compact model	SP201-□-□-□-□ Extension model	SP202-□-□-□-□ High Temp. model
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 temp.	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 80°C
Operating temp.	-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 / 316 / 316L		
Wetted part	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 SPECIFICATIONS

Drawings	
Model	SP220-□-□-□-□ Economy model
Measuring range	Water: 1~150 cm/s Oil: 3~300 cm/s
Ambient temp.	-20 ~ 80°C
Operating temp.	-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
Wetted part	SUS304 / 316 / 316L
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	Sensitivity and Alarm setting not available.

PRODUCT SPECIFICATION

Drawings						
Model	SP210 Stainless Steel model		SP170-(1/2) Explosion Proof model		SP171-(1/2) Explosion-proof extension model	
Measuring range	Water: 1~150 cm/s Oil: 3~300 cm/s					
Ambient temp.	-20 ~ 80°C					
Operating temp.	-20 ~ 80°C					
Alarm output	Relay: 5A/250Vac		Relay: 3A/250Vac			
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	SUS304					
Wetted part	SUS304 / 316 / 316L					
Protection level	IP67					
Warm-up time	Approx.15 Sec					
Connection thread	G1/2, NPT1/2					
Operating voltage	19 ~ 30Vdc					
Power consumption	60mA (max.)					
Wiring	5-wire Relay Output Power- red Grounding- black COM- white NC- yellow NO- blue					
Accessory	Gasket, 2m Cable		_____		_____	

INSTALLATION

INSTALLATION

1. Use the water-proof gasket provided
2. The distance "a" should be 4 times larger than the switches' screw diameter. (Fig. 1)
3. The pipe is bubble free for proper functioning. (Fig. 2)
4. For not-completely-filled pipes, install from the bottom. The liquid level needs to be higher than the probe height. (Fig. 3)
4. Screw tightly to avoid. Can be installed from various angles. For best sensitivity and response speed, please install using in the demonstrated in Fig. 4
5. Installing a filter upstream can decrease liquid impurities which can reduce wear and tear on the switch.

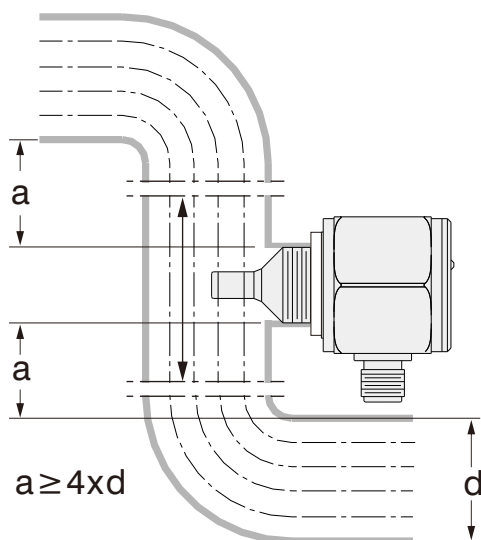


Fig. 1

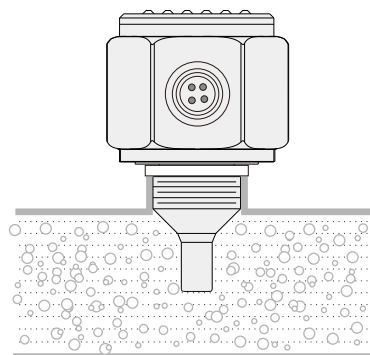


Fig. 2

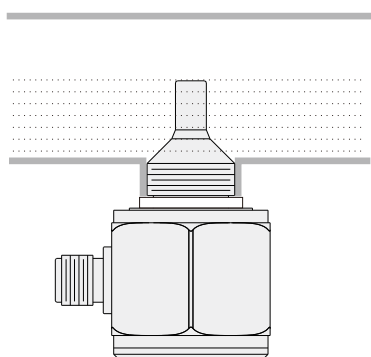


Fig. 3

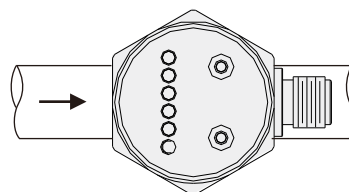


Fig. 4

CWIRING AND CONNECTIONS

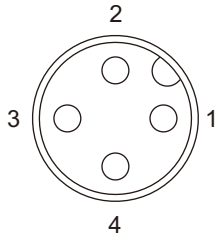


Fig. 5
Wire terminal diagram
(NPN, PNP and 1A relay output type)

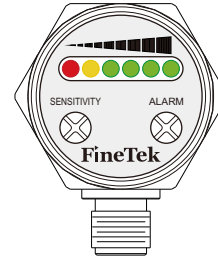


Fig. 6

WIRING

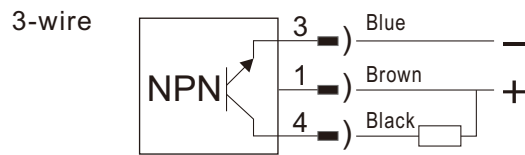


Fig. 7, NPN output type wiring

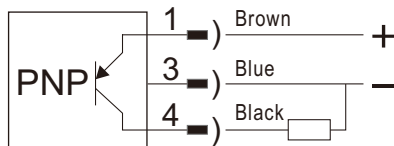


Fig. 8, PNP output type wiring

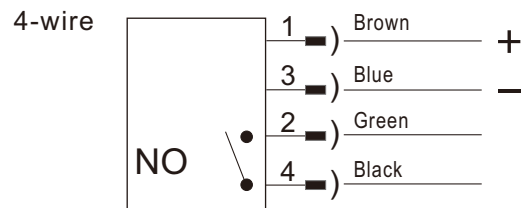


Fig. 10, Relay output type wiring (NO)

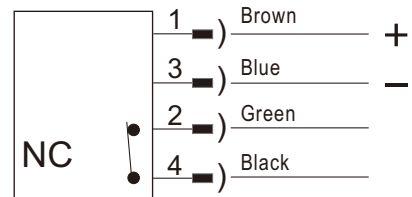


Fig. 11, Relay output type wiring (NC)

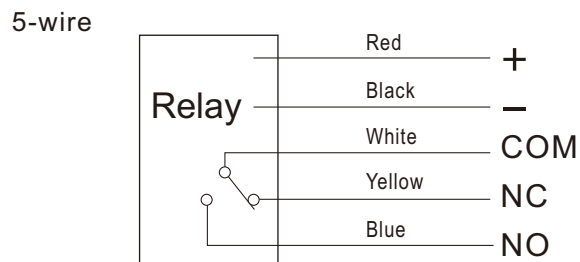
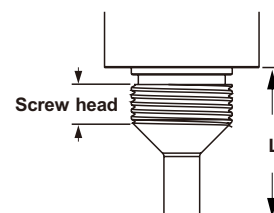


Fig. 9, Relay output type wiring

SCREW TABLE

Standard				
Screw	PF,BSP		PT,NPT	
	Screw head	L	Screw head	L
1/4"	8.5mm	25mm	10mm	25mm
1/2"	10.5mm	31mm	19mm	40mm
1"	16mm	36mm	20mm	40mm

Extension				
Screw	PF,BSP		PT,NPT	
	Screw head	Screw head	Screw head	Screw head
1/2"	11.5mm	16mm	16mm	20mm
1"	16mm		20mm	



HOW TO ORDER

SP2 - - - - - ()

Model Description

- 0: Compact model
- 1: Stainless Steel model $\phi 70 \times 78$
(for SPDT 5A/250Vac)
- 2: Economy model (Plastic Housing)

Probe Type

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

Material

- 0: SUS304 L: SUS316L S: Other
- 6: SUS316

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 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 (SPDT) (for SP210/ SP211/ SP212)

Cable Wire Length(unit: m)

- 2: 2m 5: 5m

Length L (Unit: mm)

- ※ Length tolerance: $\pm 5\text{mm}$
- ※ Dimensions are subject to change
- ※ Customized lengths available on request * Max.200mm

HOW TO ORDER

SP170- - - - ()

Model Description

- 70 ---Explosion Proof Type
- 71 ---Explosion-proof extension(Max:L=200mm)

Material

- 1: SUS304
- 2: SUS316L
- 6: SUS316

Continue

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

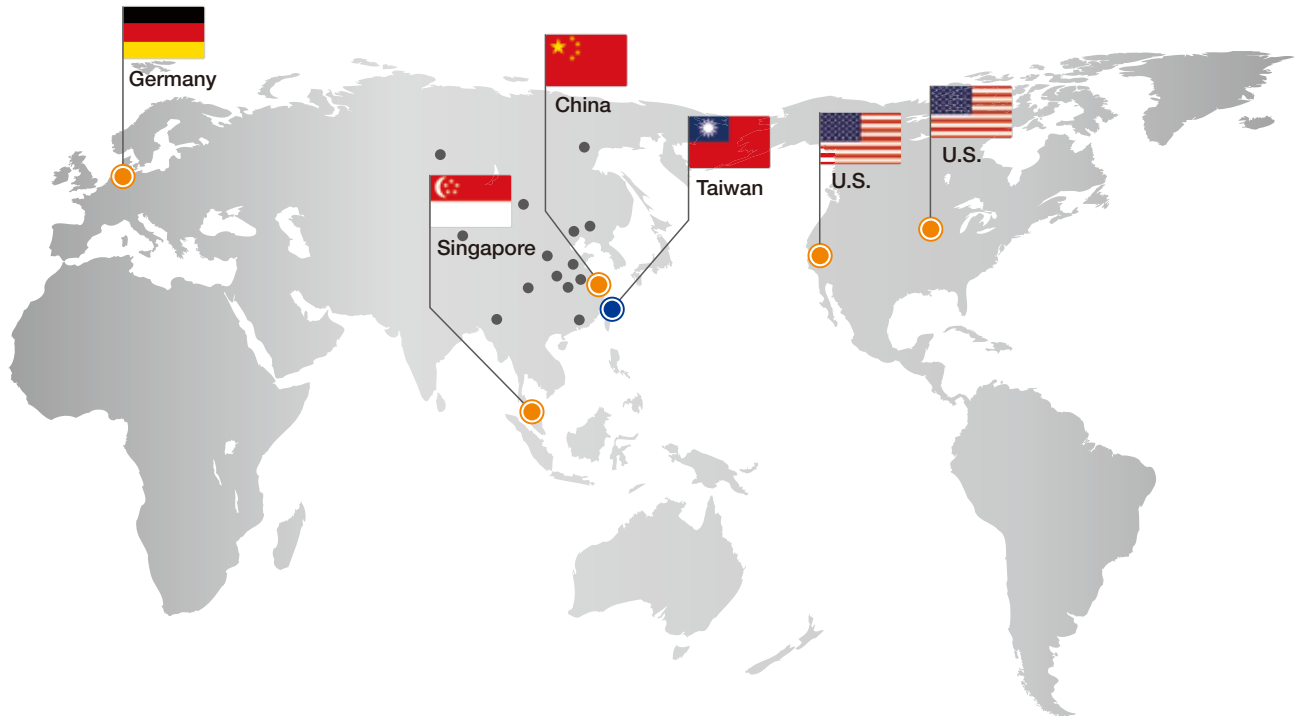
Output

- C: SPDT 3A/250Vac

Length L (Unit: mm)

- ※ Length tolerance: ± 5mm
- ※ Dimensions are subject to change
- ※ Customized lengths available on request * Max.200mm

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