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RF-Capacitance /Admittance Level Switch



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PRODUCT INTRODUCTION

PRODUCT DESCRIPTION

RF-Capacitance /Admittance level switch is appropriate for application in liquid and solid mediums. It is designed to reduce medium attaching to the probe. This product also offers DPDT output, high/low level failsafe, adjustable time delay, and sensitivity adjustment. Various models are available for high temperature, or limited space environments.

WORKING PRINCIPLE

RF-Capacitance / Admittance level switch consists of a guard section, upper insulation, main probe and grounding. The guard section is designed to overcome possible medium attachment and to secure signal accuracy. The special structure is suitable for detecting different mediums without being affected by attachments.

The upper main probe, guard, and grounding are all insulated. The level of the medium can be detected by the increasing of admittance when medium reaches the main probe.

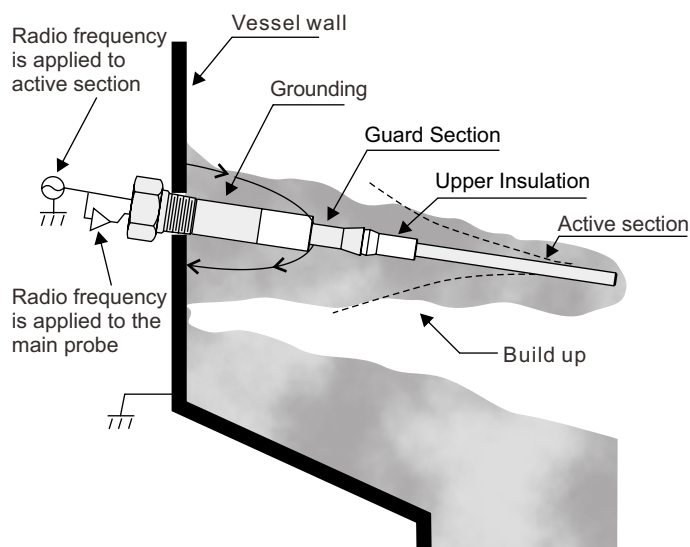
The grounding and the main probe are insulated, thus the device will still function accurately and not cause false alarms when the medium attaches the probe.

FEATURES

- Time delay function from 0-30 seconds
- IP65 housing protection
- 5 A/250Vac output DPDT
- High/low failsafe
- Alarm testing
- Explosion Proof model available

FEATURES

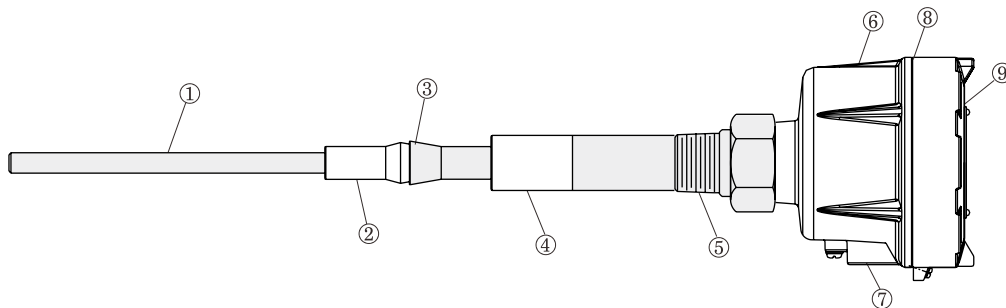
- Anti-Viscosity
- Easy Installation
- Stable; not affected by temperature
- Highest temperature tolerance of 550°C
- Explosion-proof 450°C
- Applicable in liquid, syrup, solid, powder, and surface level detection



CONSTRUCTION & APPLICATION

CONSTRUCTION

1. Main probe: SUS304 or SUS316
2. Upper Insulation: The upper insulated part of the main probe and guard section have very low k dielectric constants and are made of PTFE or PEEK
3. Guard Section: The conductive metal probe helps to dissipate any possible presence of a false signal.
4. Lower Insulation: Due to the low k die-electric constant nature of the main probe, it is comprised of PTFE
5. Connection: 3/4"NPT(Standard model)
6. Housing: Aluminum alloy spray paint
7. Wiring point: 1/2" PT
8. Waterproof O-Ring: Rubber
9. Circuitry: FSH and FSL, Time delay adjustable function

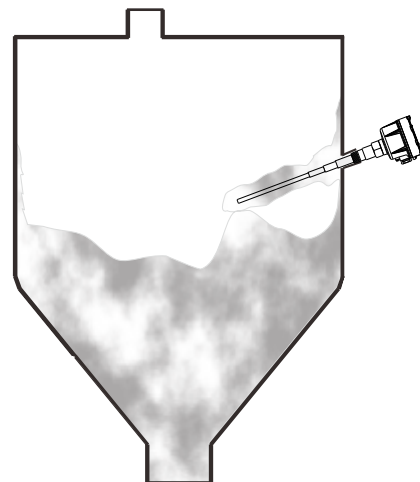


APPLICATION

Storage Tanks, Containers, Wells, Reservoirs and bins containing any liquids, powders or pellets that require precise level detection and control. Key industries include:

- | | |
|--|---|
| ■ Breweries | ■ Chemical |
| ■ Mining | ■ Paper manufacturing |
| ■ Paint manufacturing plant | ■ Power plants |
| ■ Coal | ■ Water and waste water treatment plant |
| ■ Food processing | ■ Tar |
| ■ Flour mills | ■ Food and beverage |
| ■ Glass Industry | |
| ■ Plastics processing, polymers and synthetics | |

EXAMPLE



- 2100/2110: Standard model ----- Applicable to normal environments.
2200: Hi-Temperature model -----Applicable to high temperature environments.
2280: Super Hi-Temperature model -----Applicable to super high temperature environments.
2500: Cable model -----Applicable to big tank and top installation environments.
2600: Mini model -----Applicable to space constraint and small tanks.
17□□: Explosion proof type ----- Ex d IIB T6~T1

CAUTION!

When the environment is with heavy dust blowing, especially for small sized bin (diameter<Ø1m, cubic meter<1.5m³) and the dust will become thicker in the air. The change of capacitance value between dusty air and materials will become too close to influence the measurement. So we will suggest to use SCX series, tuning fork level switch or SEX series, rotary paddle level switch as better solutions for this kind of scenario.

SPECIFICATIONS

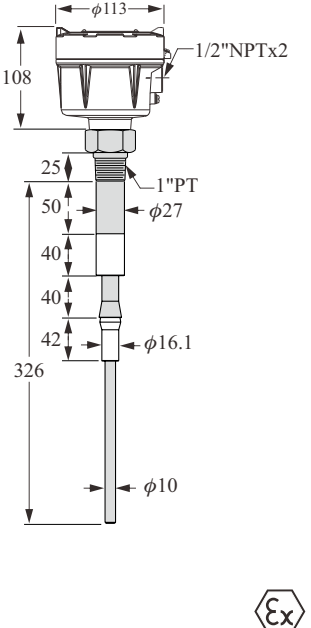
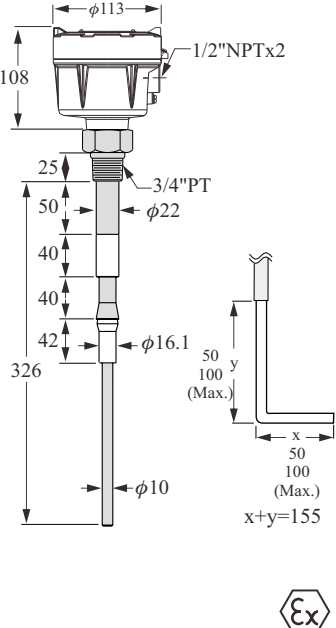
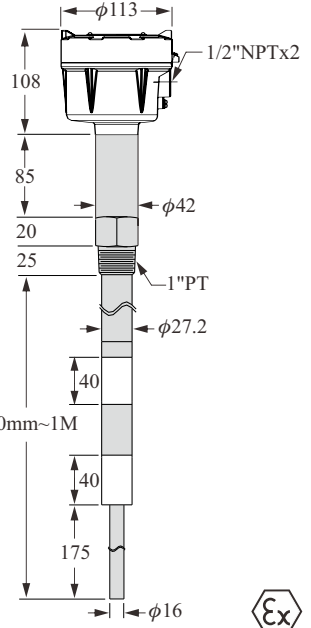
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|--------------------------------|--|--|--|
| Dimension (Unit:mm) | | | |
| Order No. | SB2100 [Standard model] | SB2110 [Standard model] SB2120 [Standard L model] | SB2200 [Hi-Temperature model] |
| Operating temp. | -40°C~150°C | -40°C~150°C | -40°C~232°C |
| Ambient temp. | -40°C~70°C | -40°C~70°C | -40°C~70°C |
| Housing | Aluminum (IP65) | Aluminum (IP65) | Aluminum (IP65) |
| Probe material | SUS304 or 316 | SUS304 or 316 | SUS304 or 316 |
| Insulated material | PTFE | PTFE | PEEK |
| Connection | 1" PT | 3/4" PT | 1" PT |
| Sensitivity | 0.3PF | 0.3PF | 0.3PF |
| Supply voltage | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz |
| Power consumption | Max.2W | Max.2W | Max.2W |
| Contact rating | 5A/250Vac, DPDT | 5A/250Vac, DPDT | 5A/250Vac, DPDT |
| Delay time | 0~30 sec | 0~30 sec | 0~30 sec |
| Fail safe mode | High / low Fail safe mode | High / low Fail safe mode | High / low Fail safe mode |
| Cable entry | Two 1/2" NPT conduit entries | Two 1/2" NPT conduit entries | Two 1/2" NPT conduit entries |
| Operation pressure | 20kg/cm ² | 20kg/cm ² | 20kg/cm ² |

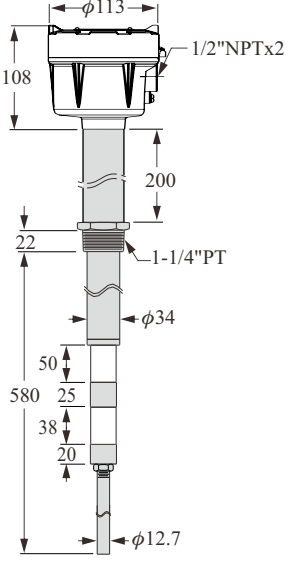
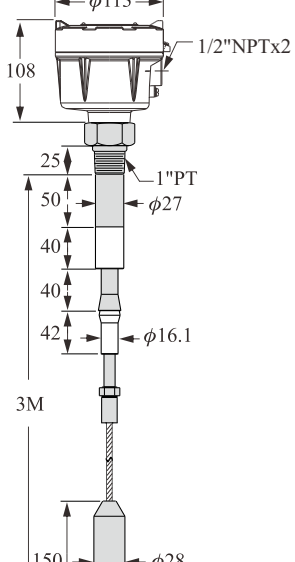
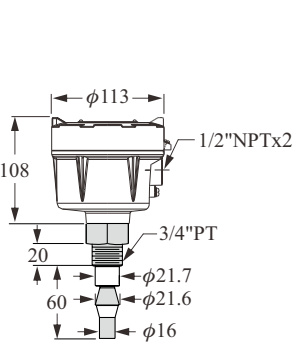
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|--------------------------------|--|--|--|
| Dimension (Unit:mm) | | | |
| Order No. | SB2280 [Super Hi-Temp Model] | SB2500 [Cable Model] | SB2600 [Mini Model] |
| Operating temp. | -40°C~550°C | -40°C~150°C | -40°C~150°C |
| Ambient temp. | -40°C~70°C | -40°C~70°C | -40°C~70°C |
| Housing | Aluminum (IP65) | Aluminum (IP65) | Aluminum (IP65) |
| Probe material | SUS304 or 316 | SUS304 or 316 | SUS304 or 316 |
| Insulated material | Ceramic | PTFE | PTFE |
| Connection | 1-1/4" PT | 1" PT | 3/4" PT |
| Sensitivity | 0.3PF | 0.3PF | 0.3PF |
| Supply voltage | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz |
| Power Consumption | Max.2W | Max.2W | Max.2W |
| Contact rating | 5A/250Vac, DPDT | 5A/250Vac, DPDT | 5A/250Vac, DPDT |
| Delay time | 0~30 sec | 0~30 sec | 0~30 sec |
| Fail safe mode | High / low Fail safe mode | High / low Fail safe mode | High / low Fail safe mode |
| Cable entry | Two 1/2" NPT conduit entries | Two 1/2" NPT conduit entries | Two 1/2" NPT conduit entries |
| Operation pressure | ATM | 20kg/cm ² | 20kg/cm ² |

SPECIFICATION

PTB PROOF NO. 09 ATEX 1057  II 2G Ex d IIB T6~T1

 II 2D Ex tD A21 IP65 T445°C~T80°C

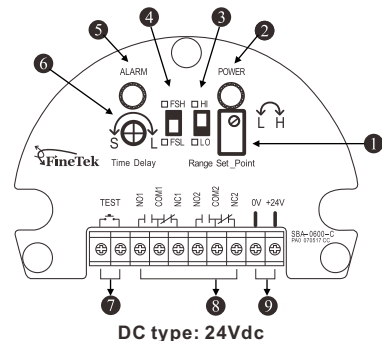
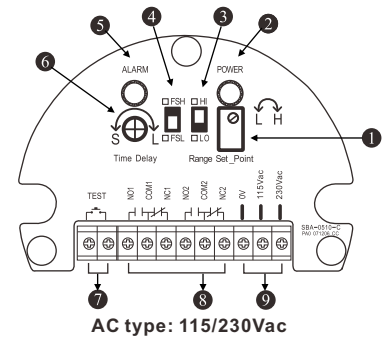
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|--------------------------------|---|--|---|
| Dimension (Unit:mm) |  |  |  |
| Order No. | SB1710 [Standard model] | SB1711 [Standard model] SB1712 [Standard L model] | SB1720 [Hi-Temp model] |
| Operating temp. | -40°C~150°C | -40°C~150°C | -40°C~232°C |
| Ambient temp. | -20°C~70°C | -20°C~70°C | -20°C~70°C |
| Housing | Aluminum (IP65) | Aluminum (IP65) | Aluminum (IP65) |
| Probe material | SUS304 or 316 | SUS304 or 316 | SUS304 or 316 |
| Insulated material | PTFE | PTFE | PEEK |
| Connection | 1" PT | 3/4" PT | 1" PT |
| Sensitivity | 0.3PF | 0.3PF | 0.3PF |
| Supply voltage | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz |
| Power consumption | Max.2W | Max.2W | Max.2W |
| Contact rating | 3A/250Vac, DPDT | 3A/250Vac, DPDT | 3A/250Vac, DPDT |
| Delay time | 0~30 sec | 0~30 sec | 0~30 sec |
| Fail safe mode | High / low Fail safe mode | High / low Fail safe mode | High / low Fail safe mode |
| Cable entry | Two 1/2" NPT conduit entries | Two 1/2" NPT conduit entries | Two 1/2" NPT conduit entries |
| Operation pressure | 20kg/cm ² | 20kg/cm ² | 20kg/cm ² |

| | | | |
|--------------------------------|---|--|---|
| Dimension (Unit:mm) |  |  |  |
| Order No. | SB1728 [Super Hi-Temp model] | SB1750 [Cable model] | SB1760 [Mini model] |
| Operating temp. | -40°C~450°C | -40°C~150°C | -40°C~150°C |
| Ambient temp. | -20°C~70°C | -20°C~70°C | -20°C~70°C |
| Housing | Aluminum (IP65) | Aluminum (IP65) | Aluminum (IP65) |
| Probe material | SUS304 or 316 | SUS304 or 316 | SUS304 or 316 |
| Insulated material | Ceramic | PTFE | PTFE |
| Connection | 1-1/4" PT | 1" PT | 3/4" PT |
| Sensitivity | 0.3PF | 0.3PF | 0.3PF |
| Supply voltage | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz | 24Vdc ± 20% or 115/230Vac ± 10%, 50/60Hz |
| Power consumption | Max.2W | Max.2W | Max.2W |
| Contact rating | 3A/250Vac, DPDT | 3A/250Vac, DPDT | 3A/250Vac, DPDT |
| Delay time | 0~30 sec | 0~30 sec | 0~30 sec |
| Fail safe mode | High / low Fail safe mode | High / low Fail safe mode | High / low Fail safe mode |
| Cable entry | Two 1/2" NPT conduit entries | Two 1/2" NPT conduit entries | Two 1/2" NPT conduit entries |
| Operation pressure | ATM | 20kg/cm ² | 20kg/cm ² |

WIRING DIAGRAMS

DESCRIPTION OF PANEL FUNCTION

- ① Set_Point: A clockwise turn(H) will result in higher admittance and lower sensitivity, while a counter-clockwise turn(L) will result in lower admittance and higher sensitivity.
- ② Red LED: When the LED is ON, it indicates power ON.
- ③ Range: For (HI) high k die-electric material, $\epsilon > 10$ / For (LO) low k die-electric material, $\epsilon < 10$.
- ④ FSH/FSL: (FSH) High level fail-safe alarm/(FSL) low level fail-safe alarm.
- ⑤ Green LED: Alarm (FSH) indicator is ON, it is empty; when it is OFF, it is loaded; Alarm (FSL) indicator is ON, it is loaded; when it is OFF, it is empty.
- ⑥ Time Delay: Set the time delay of alarm output within 0~30 seconds. Turning clockwise (L) can set to a longer time, while turning counter-clockwise (S) can set to a shorter time.
- ⑦ Analog test: Analog alarm test function, and terminal jumping switch function.
- ⑧ Relay output: Connect terminal to load, command or control.
- ⑨ Power input: Connect terminal to the power supply system.



FAILSAFE ALARM

FSH high level failsafe alarm:

SB2□□□ series switch is installed at the high level point the FSH switch mode is "on". When the medium has no contact with the probe, the green LED lights up and relay output COM/NC is in an open state. When the medium level reaches high level and it touches the probe (or in the case of blackout), the green LED turns off and the relay output COM/NC is closed. When the relay output COM/NC is closed, it implies the FSH alarm has been activated.

ALARM CALIBRATION

Setting for High Level Alarm

1. Switch the FSH/FSL Knob to FSH
2. Switch the Range Knob to LO.
3. Switch the Time Delay Knob to S (Minimum).
4. Decrease the level of the medium to below the measuring probe.
5. Spin the set point knob till the Alarm LED (Green light) lights up.
6. Firstly, increase the level of the medium till it covers half of the measuring probe and the Alarm LED (green light) shut off. Secondly, spinning the Set Point Knob clockwise till Alarm LED (green light) lights up. If the Alarm LED (green light) still does not lights up after spinning it till the end, please adjust the range switch to HI and repeat procedure 5. Thirdly, record the numbers of turns and its angle, then switch the knob counterclockwise back for 1/4 twist circle and angle.
7. Adjusting the delay time for alarm (0~30 seconds): If turning the time delay knob clockwise, the delay time is postponed, while turning the Time delay knob counterclockwise, the delay time is shortened.

FSL low level failsafe alarm:

SB2□□□ series switch is installed at the low level, the FSL mode is "on". When the medium touches the probe the green LED lights up and the relay output COM/NC is in an open state.

When the medium level drops below the low level and the medium does not have contact with the probe (or in the case of blackouts), the green LED turns off and relay output COM/NC is closed. When relay output COM/NC is closed, it implies the FSL alarm has been activated.

Setting for Low Level Alarm

1. Move the FSH/FSL button to FSL.
2. Move the 'range' button to LO.
3. Turn the 'time delay' knob to S (Minimum).
4. Lower the level of the medium to cover half of the measuring probe.
5. Turn the 'set point' screw counterclockwise till the Alarm LED lights up. If the LED hasn't lit up after turning it fully to the end, please adjust the 'range' button to HI and repeat procedure 5.
6. Now, decrease the level of the medium until it is below the measuring probe and the Alarm LED has turned off. Next, turn the 'set point' screw counterclockwise until the Alarm LED (green light) lights up [Recording the numbers of turns you make]. Finally, turn back the 'set point' screw clockwise for 3/4 twist circle.
7. Adjust the delay time for the alarm (0~30 seconds): When turning the 'time delay' knob clockwise, the delay time is postponed. Turning the 'time delay' knob counterclockwise, the delay time will be shortened.

MODEL NUMBER / ORDER CODE COMPARISON TABLE

| Model Number | Order Code |
|--------------|------------|
| SB2100 | SBX10000-A |
| SB2110 | SBX10000-B |
| SB2120 | SBX10000-D |
| SB2200 | SBX10200-A |
| SB2280 | SBX10800-C |
| SB2500 | SBX10000-E |
| SB2600 | SBX10000-F |

| Model Number | Order Code |
|--------------|------------|
| SB1710 | SBX1001C-A |
| SB1711 | SBX1001C-B |
| SB1712 | SBX1001C-D |
| SB1720 | SBX1021C-A |
| SB1728 | SBX1081C-C |
| SB1750 | SBX1001C-E |
| SB1760 | SBX1001C-F |

ORDER INFORMATION

SBX1 ⑤⑥⑦⑧⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑㉒㉓㉔

⑤⑥ Model

00: Standard

02: High temperature

08: Super high temperature

⑦⑧ Certification

00: None

1C: ATEX-Exd

⑨ Type

A: $\phi 27 + 1$ "PT Standard type

B: $\phi 22 + 3/4$ "PT Standard type

C: High temperature type

D: Standard L type

E: Wire probe type

F: Mini type

⑩ Power supply

A: AC115V/230VAC $\pm 10\%$, 50/60 Hz(Analog alarm function)

B: 24VDC $\pm 20\%$, 50/60 Hz(Analog alarm function)

C: AC115/230VAC $\pm 10\%$, 50/60 Hz

D: 24VDC $\pm 20\%$

Connection

⑪⑫

Flang item

AK: JIS-FF

AN: ANSI-RF

AS: DIN-FF

Thread item

AC: ANSI

AA: JIS

⑬⑭

A7: 3/4"

A8: 1"

B1: 1-1/2"

B2: 2"

B4: 2-1/2"

D7: DN20

D8: DN25

D9: DN32

E1: DN40

E2: DN50

E3: DN65

⑮⑯

01: PT male

03: PF male

07: NPT male

40: 5 kg/cm²

42: 10 kg/cm²

48: 150 Lbs

49: 300 Lbs

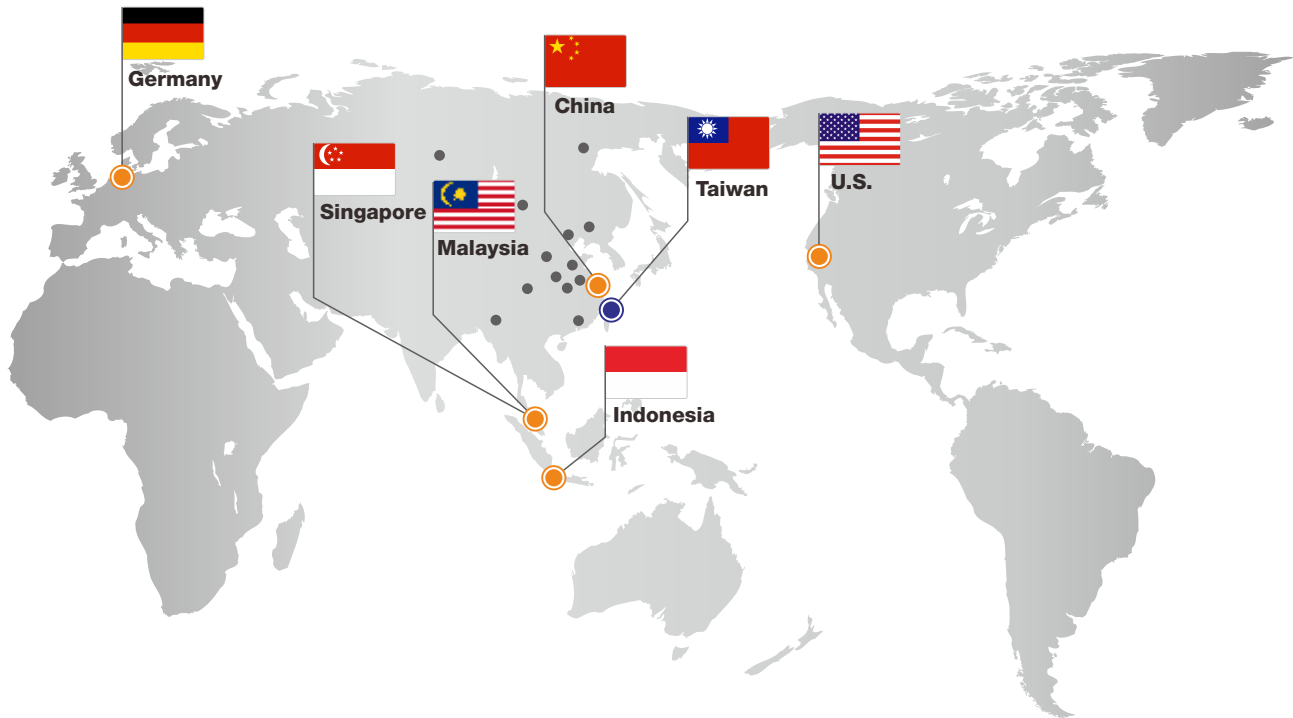
57: PN10

58: PN16

(Next page)

| Code | Probe Length |
|-----------|--------------|
| 0060~3000 | 0060~3000mm |

Global Network



■ Head Quarte

● Taiwan

FineTek Co., Ltd. - Taipei Head Quarter 
No.16, Tzuchiang St., Tucheng Industrial Park
New Taipei City 236, Taiwan
TEL: 886-2-2269-6789
FAX: 886-2-2268-6682
EMAIL: info@fine-tek.com

■ North America

● California, U.S.

Aplus Finetek Sensor Inc. - US Office
355 S. Lemon Ave, Suite D, Walnut,
CA 91789
TEL: 1 909 598 2488
FAX: 1 909 598 3188
EMAIL: info@aplusfine.com

■ Europe

● Germany

FineTek GmbH - Germany Office
Bei den Kämpen 26
21220 Seevetal-Ramelsloh, Germany
TEL: +49-(0)4185-8083-12
FAX: +49-(0)4185-8083-80
EMAIL: info@fine-tek.de

■ Asia

● China

Fine automation Co., Ltd. - Shanghai Factory 
No.451 DuHui Rd, MinHang District, Shanghai,
China 201109
TEL: 86-21-6490-7260
EMAIL: info.sh@fine-tek.com

● Singapore

FineTek Pte Ltd. - Singapore Office
37 Kaki Bukit Place, Level 4 Singapore 416215
TEL: 65-6452-6340
EMAIL: info.sg@fine-tek.com

● Indonesia

PT. FineTek Automation Indonesia - Indonesia Office 
Tunas Bitung Industrial Park Blok C3 No.12 dan No.15
Jalan Raya Serang Km.13.8 Kabupaten Tangerang 15710 Banten
TEL: 62 (021)-2958-1688
EMAIL: info.id@fine-tek.com

● Malaysia

FineTek Co., Ltd. - Malaysia Office
8-05, Plaza Azalea, Persiaran Bandaraya,
Seksyen 14, 40000 Shah Alam, Selangor, Malaysia
TEL: 603-5524-7168
EMAIL: info.my@fine-tek.com

● Mütect Instruments GmbH - Germany Office

Bei den Kämpen 26
21220 Seevetal-Ramelsloh, Germany
TEL: +49-(0)4185-8083-0
FAX: +49-(0)4185-8083-80
EMAIL: muetec@muetec.de



Distributor:



Hitma Instrumentatie

www.hitma-instrumentatie.nl
info@hitma-instrumentatie.nl
+31 (0)297 - 514 833

België / Belgique

www.hitma-instrumentatie.be
info@hitma-instrumentatie.be
+32 (0)2 - 387 28 64

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