



## Rotary Paddle Level Switch



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# INTRODUCTION

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## WORKING PRINCIPLE

The purpose of the rotary paddle level switch is to detect the presence of solid/powdery material in most kinds of tanks, bins and containers. The unit is usually located through a bin wall at the top, middle or low level of a bin. During normal operation (no material present) a synchronous motor rotates the paddle at RPM. When this paddle rotation is impeded by material, surrounding the paddle, motor will stall and cause the Micro-switch to change state (indicating an alarm or control).

## APPLICATIONS

- Plastics and synthetics
- Chemicals and fertilizer
- Pharmaceuticals
- Food and beverage,
- Agriculture and fodder mills/depots
- Cement as well as ceramics
- Power plants
- Various incinerators

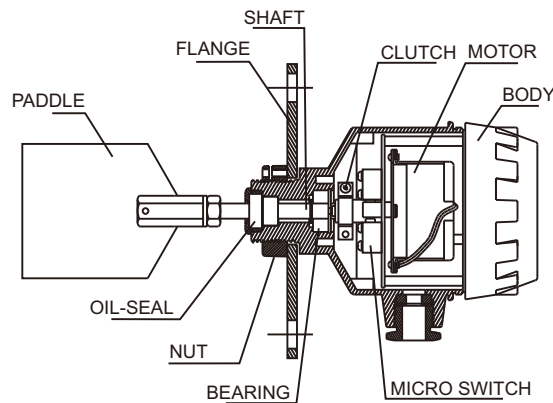
## STRUCTURE

## FEATURES

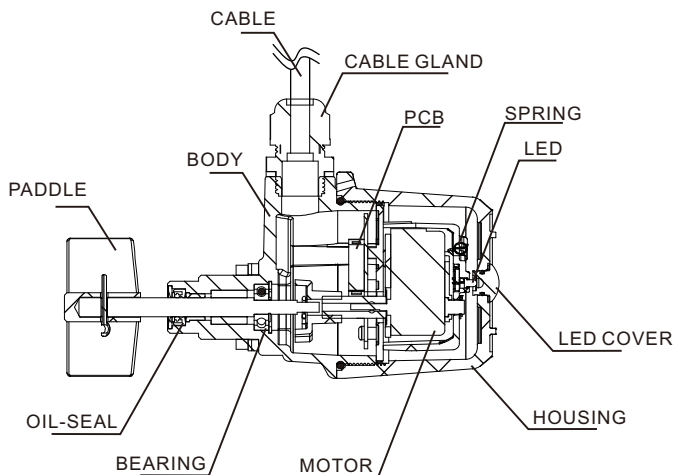
- Rugged sealing ring prevents dust from infiltrating the housing body along the shaft.
- Adjustable torque.  
If the rotary paddle encounters overloading, the motor will automatically shut down the motor to prevent damage to the inner mechanisms and extend motor life.
- Very suitable for small tanks and low density materials
- Adjustable and extendible shaft models available
- A wide variety of paddles are available

## BENEFITS

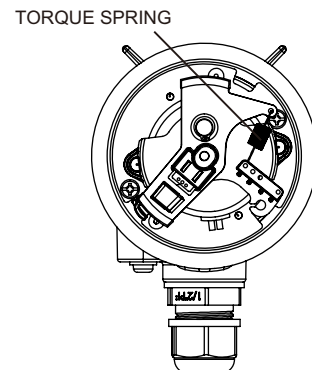
- Airtight sealed device.
- Outdoor and strenuous environment application
- Stable and reliable performance.
- Lightweight and easy to install
- Practically designed to allow maintenance, checks and replacement
- Not necessary to remove the complete set from the tank.



**STANDARD TYPE SE1**



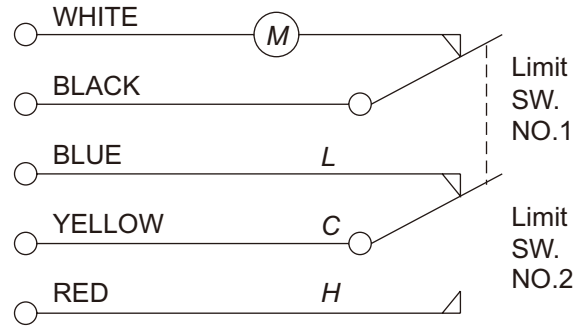
**MINI TYPE SE3**



# WORKING PRINCIPLE & TORQUE ADJUSTING

## CONTROL SWITCH WORKING PRINCIPLE

1. A synchronous turning motor indicates the tank or container's material isn't obstructing the paddles, C & L [COM & NC] are connected.
2. When the material is obstructing the paddles, C&L [COM & NC] are disconnected, C&H [COM & NO] are connected and the motor's current is cut off.
3. When the material drops away from the paddles and the motor starts again C & L [COM & NC] connect and the cycle has begun once again.



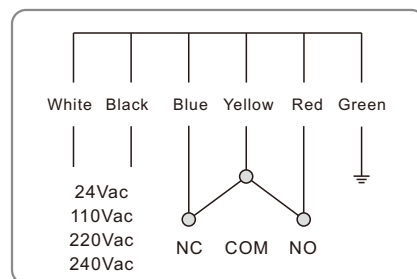
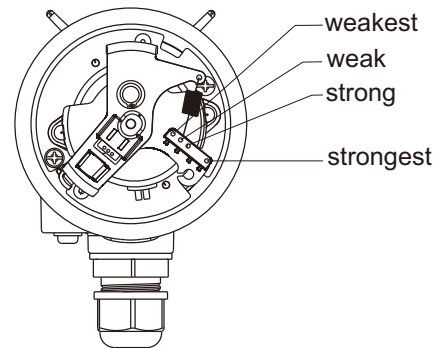
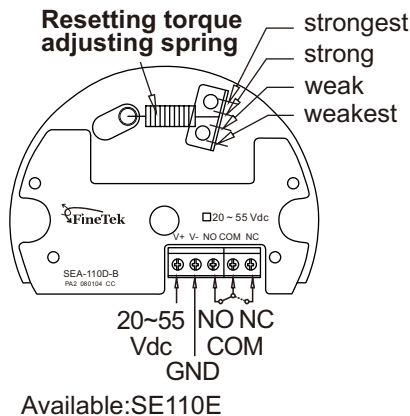
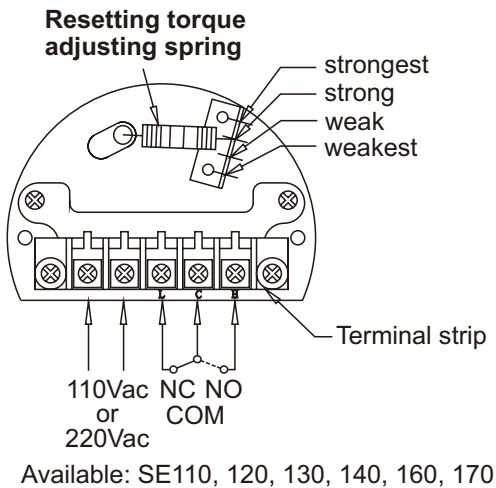
## TORQUE ADJUSTING MECHANISM AND WIRING

The torque spring is applied to adjust the shaft output torque. Default settings are "weak" and can be adjusted to the customer's target based on the tank contents and S.G. (special gravity) of the material.

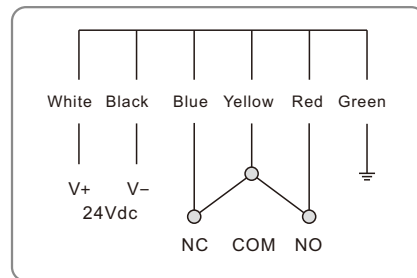
Higher S.G. materials require stronger torque settings. Start with high settings and slowly release the torque force until the appropriate setting is found.

- Do not tamper with the spring as it may cause the Rotary Paddle to malfunction.

### Spring adjusting hole



AC type



DC type

Available: SE3

# STANDARD TYPE

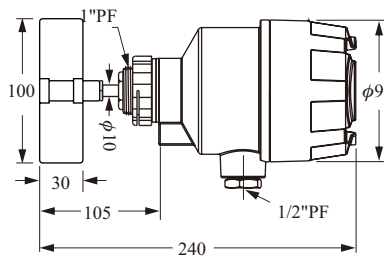
- **Power source** : (A)110Vac,(B)220Vac,(C)240Vac, (D)24Vac, 50/60Hz (E)24Vdc
- **Power consumption** : 3W, 11W(DC24V)
- **Contact capacity** : SPDT, 5A/250Vac
- **Rotary speed** : 1 R.P.M.
- **Insulation test voltage** : 2500V
- **Connection** : 1"PF screw or JIS 2-1/2" × 5kg<sup>2</sup>/cm flange
- **Protection/ material** : IP65 / ADC-12
- **Conduit** : 1/2"PF
- **Material density** : 0.5 g/cm<sup>3</sup>

## SCREW MODEL

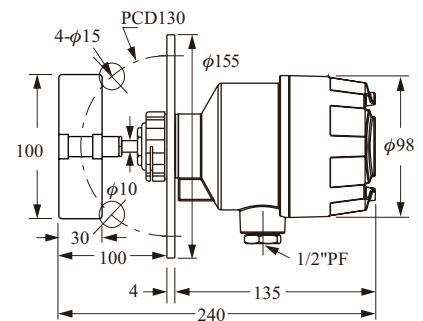
### SE110 Series

- Horizontal mounting
- Operation Temperature (-20°C ~ 70°C)
- Weight: 1.2 kg

**SE110 Series**



**SE111 Series**



## FLANGE MODEL

### SE111Series

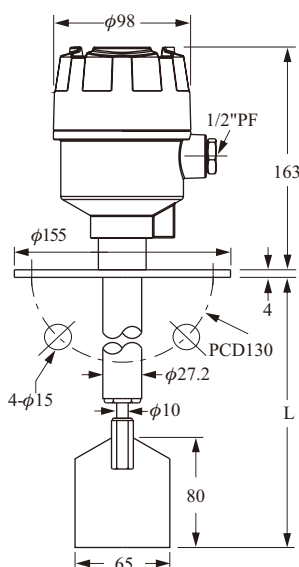
- Horizontal mounting
- Operation Temperature (-20°C ~ 70°C)
- Weight: 1.7 kg

## SHAFT PROTECTIVE TUBE MODEL

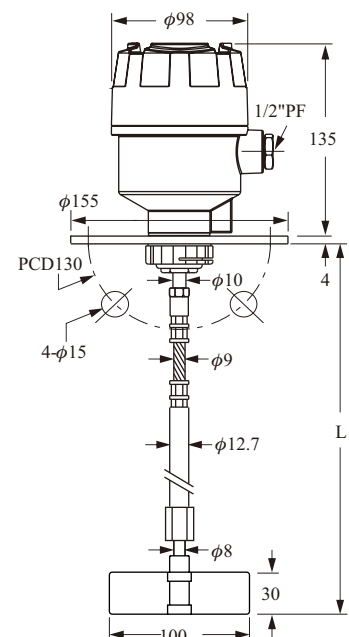
### SE120 Series

- Horizontal /Vertical mounting
- Operation Temperature (-20°C ~ 70°C)
- Weight: 1.2 kg
- Standard Length:
  - L--250mm (2.2 kg)
  - L--500mm (2.5 kg)
  - L--750mm (2.8 kg)
- Customized lengths available

**SE120 Series**



**SE130 Series**



## SHAFT LENGTH ADJUSTABLE MODEL

### SE130 Series

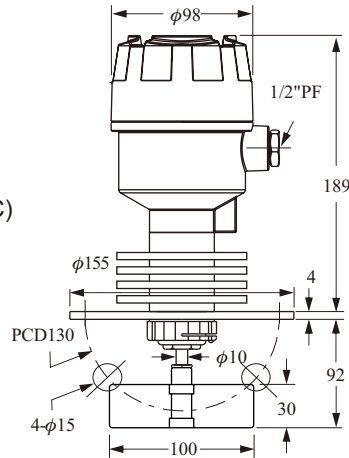
- Vertical mounting
- Operation Temperature (-20°C ~ 70°C)
- Standard Length:
  - L- 460~630mm (2.5 kg)
  - L- 650~1000mm (2.8 kg)
  - L- 760~1200mm (3.0 kg)
- Customized lengths available

# STANDARD TYPE

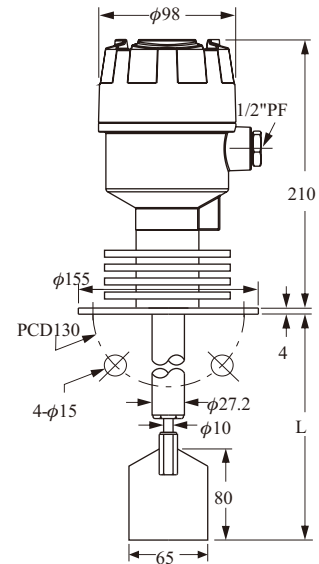
## HI-TEMP TYPE SE140A/B/C/D

- Horizontal mounting
- Temp. (-20°C ~ 200°C)
- Weight: 2.1 kg

## SE140A/B/C/D Series



## SE141A/B/C/D Series



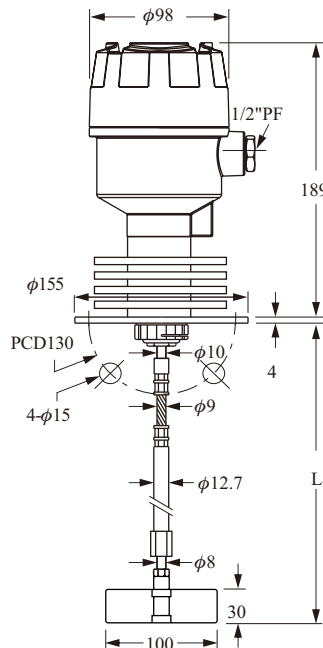
## HI-TEMP TYPE PROTECTIVE TUBE TYPE SE141A/B/C/D/E

- Horizontal /Vertical mounting
- Operation Temperature (-20°C ~ 200°C)
- Standard Length (option):
  - L--250mm (2.6 kg)
  - L--500mm (2.9 kg)
  - L--750mm (3.2 kg)
- Special length is made by order

## HI-TEMP SHAFT LENGTH ADJUSTABLE TYPE SE146A/B/C/D/E

- Vertical mounting
- Operation Temperature (-20°C ~ 200°C)
- Standard Length (option):
  - L- 450~630mm (3 kg)
  - L- 650~1000mm (3.3 kg)
  - L- 760~1200mm (3.5 kg)
- Special length is made by order

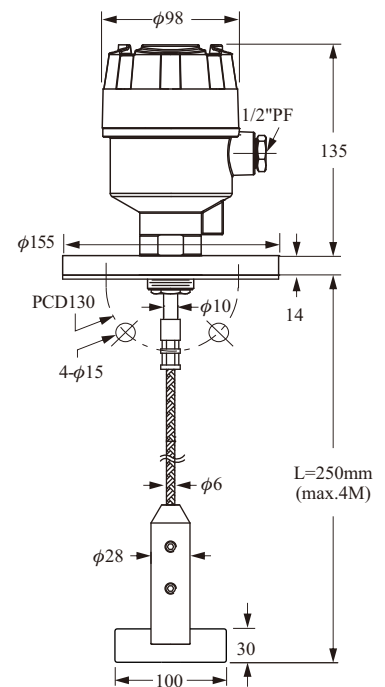
## SE146A/B/C/D/E Series



## SE160A/B/C/D/E Series

## CABLE WIRE TYPE SE160A/B/C/D/E

- Vertical mounting
- Operation Temperature (-20°C ~ 70°C)
- Standard Length (option):
  - L-- 450mm (2.5 kg)
  - L-- 650mm (2.8 kg)
  - L-- 750mm (3 kg)
- Special length is made by order



# MINI TYPE(Aluminum alloy cover)

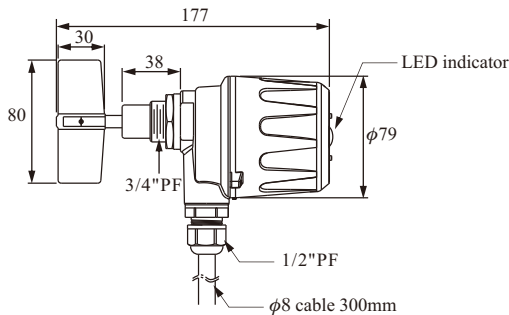
NEPSI PROOF No.GYJ14.1148 DIP A20/21 T, T3~T6 IP65

- **Power source** : (A)110Vac,(B)220Vac,(C)240Vac, (D)24Vac, 50/60Hz,(E)24Vdc
- **Power consumption** : 1.5W
- **Contact capacity** : 5A/250Vac, 5A/30Vdc
- **Rotary speed** : R.P.M.
- **IP rating** : IP65

- **Housing material** : Aluminum alloy
- **Ambient temperature** : -40°C ~ 85°C
- **Cable length** : 300mm (available for custom length)
- **Material density** : 0.3
- **Display status** : Green(Working), Red(Stopped)

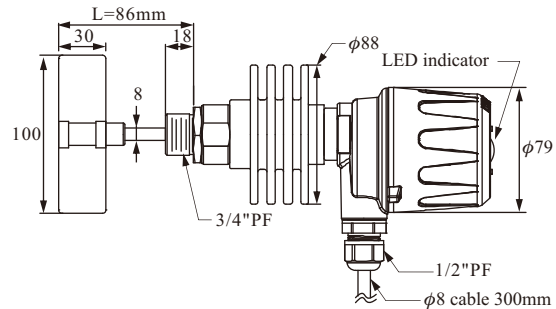
## STANDARD SE3□□0 Series

- Operation temperature: -40°C ~ 85°C
- Paddle material: PC



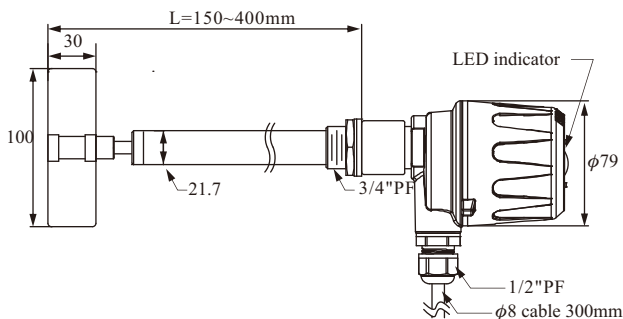
## HIGH TEMPERATURE TYPE SE3□□4 Series

- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304



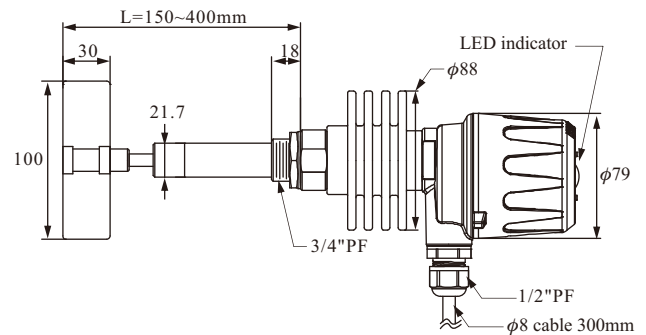
## SHAFT PROTECTIVE TUBE TYPE SE3□□2 Series

- Operation temperature: -40°C ~ 85°C
- Paddle material: SUS304



## HIGH TEMPERATURE SHAFT PROTECTIVE TUBE TYPE SE3□□5 Series

- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304



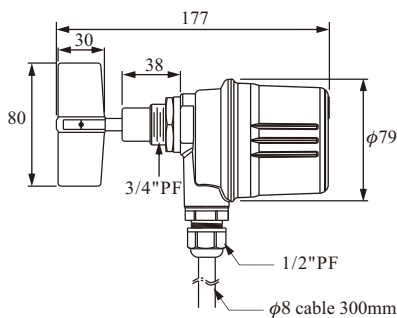
# MINI TYPE(Plastic cover)

- **Power source** : (A)110Vac,(B)220Vac,(C)240Vac,  
(D)24Vac, 50/60Hz,(E)24Vdc
- **Power consumption** : 1.5W
- **Contact capacity** : 5A/250Vac, 5A/30Vdc
- **Rotary speed** : R.P.M.
- **IP rating** : IP65

- **Housing material** : Plastic cover
- **Ambient temperature** : -40°C ~ 85°C
- **Cable length** : 300mm (available for custom length)
- **Material density** : 0.3

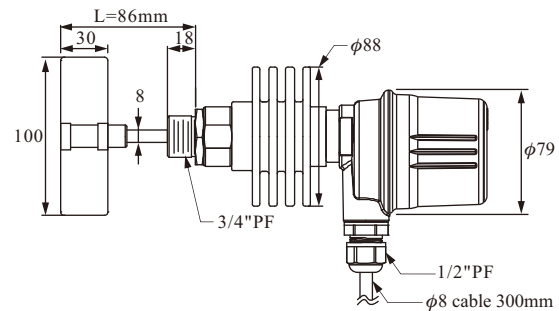
## STANDARD SE3□20 Series

- Operation temperature: -40°C ~ 85°C
- Paddle material: PC



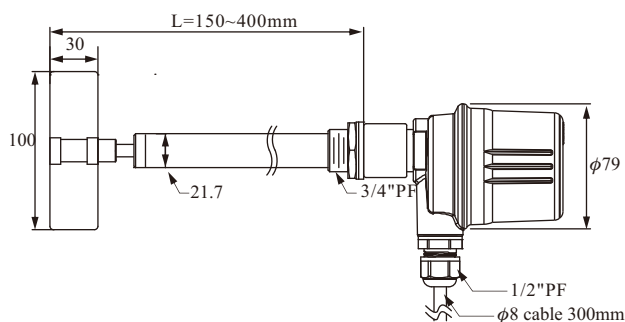
## HIGH TEMPERATURE TYPE SE3□24 Series

- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304



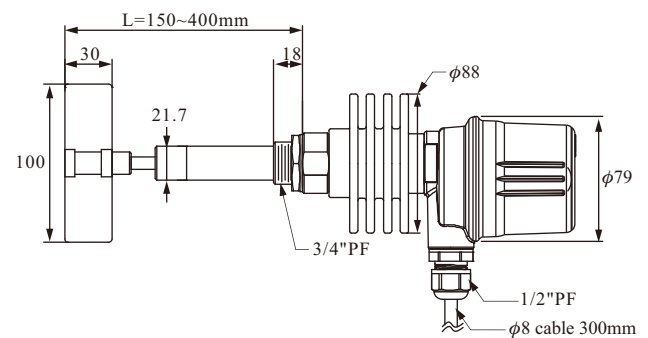
## SHAFT PROTECTIVE TUBE TYPE SE3□22 Series

- Operation temperature: -40°C ~ 85°C
- Paddle material: SUS304



## HIGH TEMPERATURE SHAFT PROTECTIVE TUBE TYPE SE3□25 Series

- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304

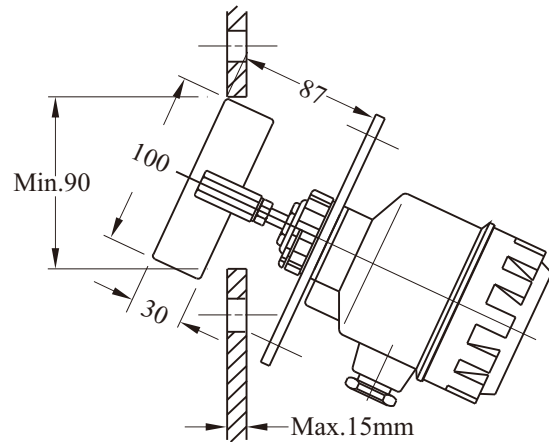
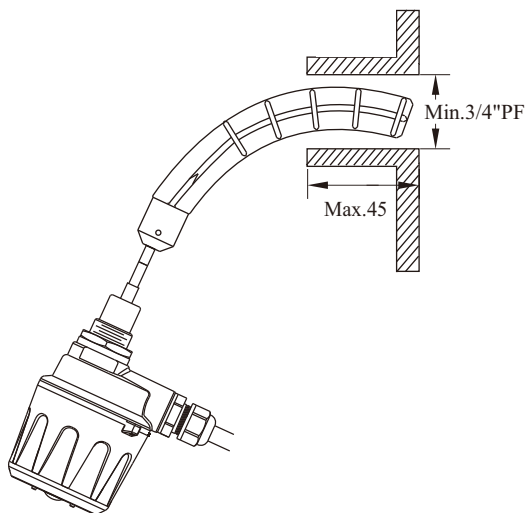




# MOUNTING EXAMPLES

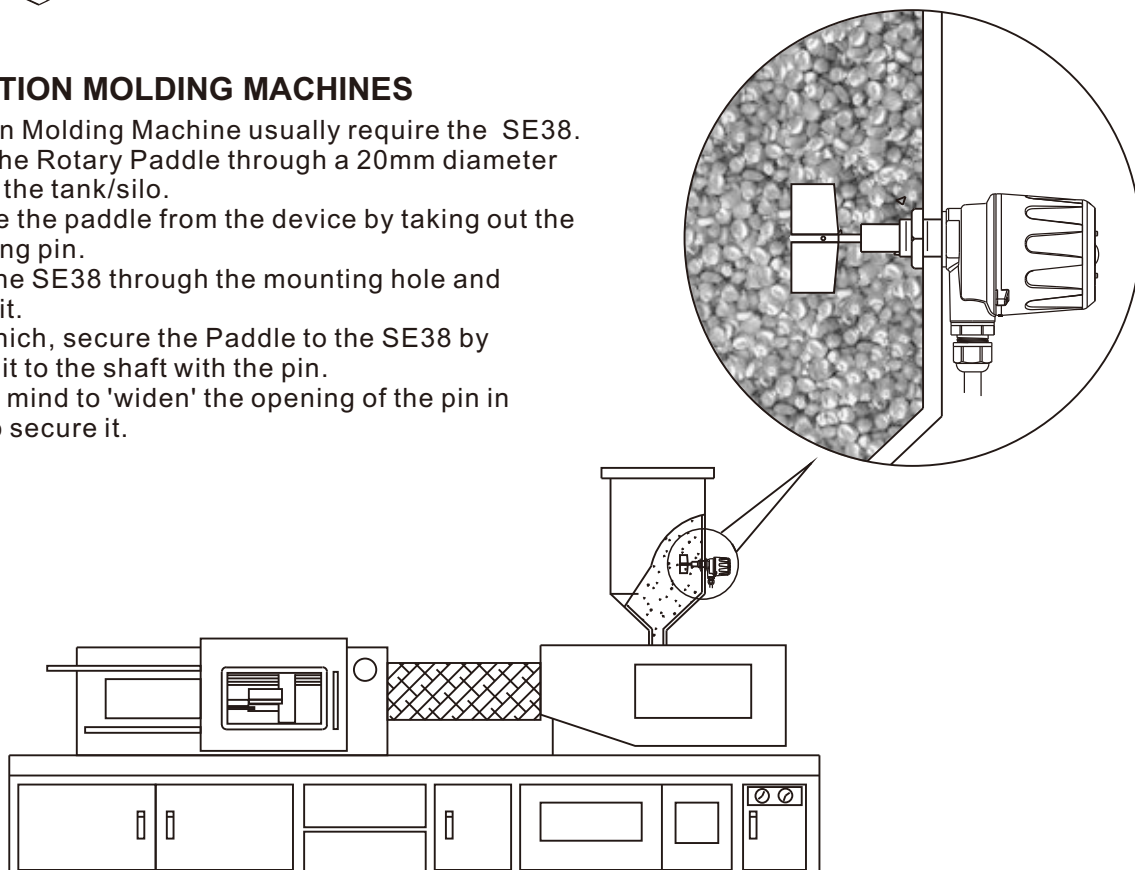
Regular models such as the SE11 should be installed directly on the tank side.  
Mount at a 35° angle the blade through the tank opening or hole sliding the blade in first.

\* The SE170 series minimum hole size should be 95mm in diameter.  
The scimitar model is directly installed on the tank wall method as shown below.  
(Assuming an arc-shaped tank with a 3/4" connection) and then screwing it tight.



## INJECTION MOLDING MACHINES

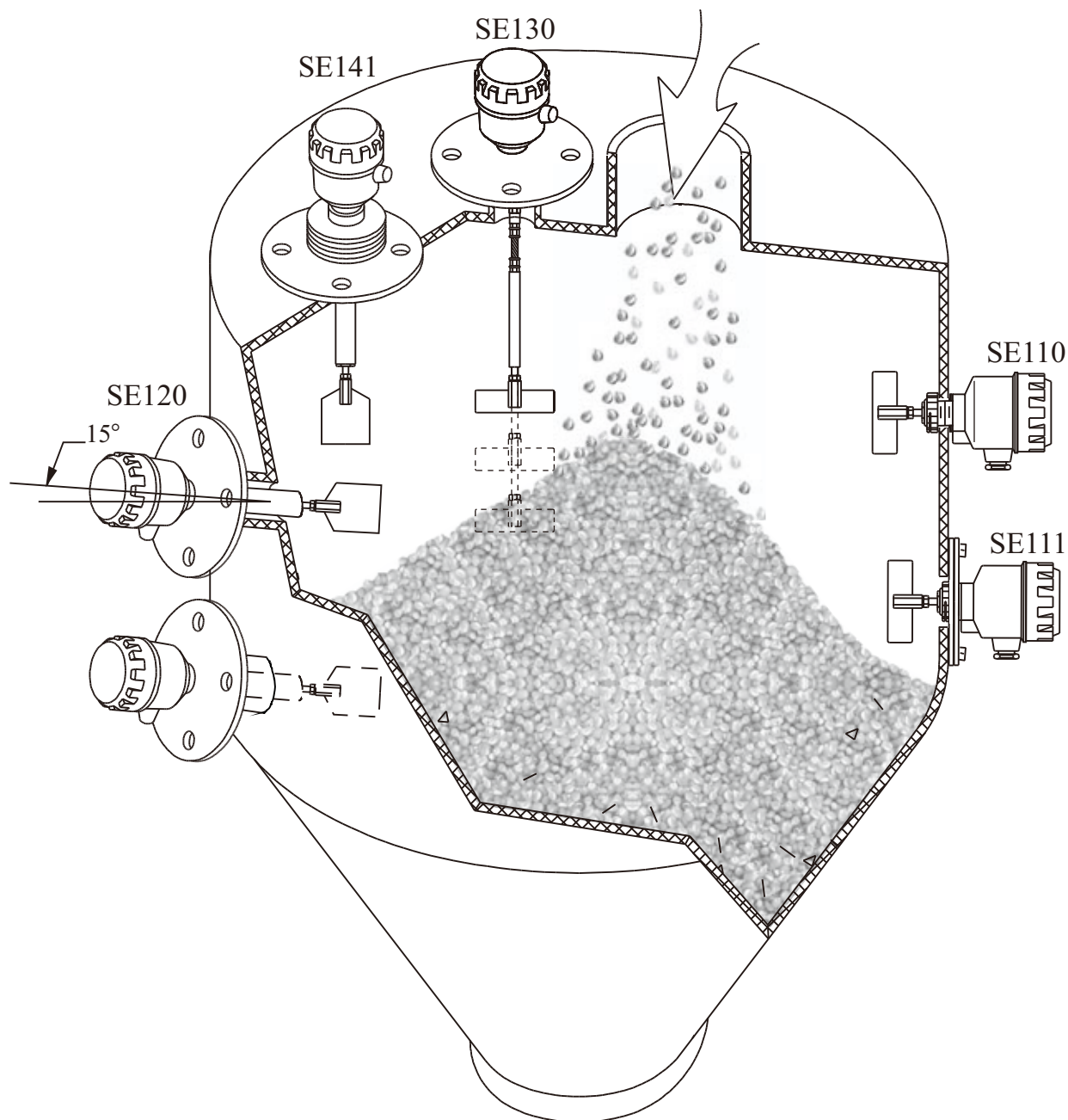
Injection Molding Machine usually require the SE38.  
Install the Rotary Paddle through a 20mm diameter hole on the tank/silo.  
Remove the paddle from the device by taking out the fastening pin.  
Insert the SE38 through the mounting hole and tighten it.  
After which, secure the Paddle to the SE38 by locking it to the shaft with the pin.  
Keep in mind to 'widen' the opening of the pin in order to secure it.





## EXAMPLES

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### INSTALLATION NOTICES

1. Side mount the sensor at a downward angle of 15° ~20° to decrease the material inflow impact.
2. For high temperature application (more than 70°C), please use the SE14□ Series.
3. For SE110~SE140 using a 1" inlet, please apply the scimitar model and screw directly.
4. For SE130, SE146 series have flexible and extendible shafts.
5. Please ensure the lead wire enters the housing from the bottom and the nuts are fastened to secure the device.



# HOW TO ORDER

SE3        (     )

## HOUSING TYPE

- 7: Ex proof type
- 8: General type

## HOUSING COVER

- 0: Aluminum cover
- 1: Aluminum cover with LED lamp
- 2: Plastic cover
- ※1 and 2 are not available for SE37.

## MODEL

- 0: Standard
- 2: Shaft protective tube
- 4: High temperature
- 5: High temperature shaft protective tube

## SUPPLY VOLTAGE

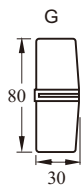
- A: 110Vac, 50/60Hz
- B: 220Vac, 50/60Hz
- C: 240Vac, 50/60Hz
- D: 24Vac, 50/60Hz
- E: 24Vdc

## CONNECTION

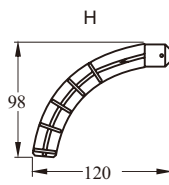
Size for flange or screw		Specification	
C: 3/4"	I: 4"	M: 5kg/cm <sup>2</sup>	Z : PN40
D: 1"	J: 5"	N: 10kg/cm <sup>2</sup>	Q: PT
3: 1-1/4"	K: 6"	O: 150Lbs	R: PF(G)
E: 1-1/2"	S: Special	P: 300Lbs	T: BSP
F: 2"		W: PN10	U: NPT
G: 2-1/2"		X : PN16	S : Special
H: 3"		Y : PN25	

## PADDLE SHAPE (mm)

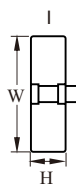
- G: Cross paddle
- H: Scimitar paddle
- I: 100x30 (WxH)
- K: Folding paddle
- S: Special
- : None



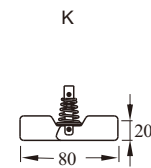
Material: PC



Material: PC



Material: Stainless steel



Material: Stainless steel

## CABLE LENGTH (mm)

- 0500: below 500mm
  - 1000: 501~1000mm
  - 1500: 1001~1500mm
- ※500mm per unit  
 ※Standard length 300mm

⋮

# EXPLOSION PROOF MODEL

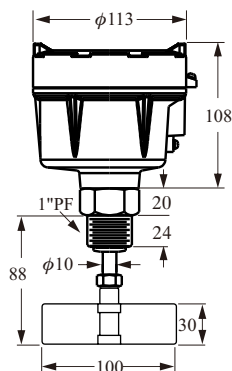
NEPSI PROOF No. GYJ111214 Ex d IIC T3~T6  
 PTB PROOF No. 05 ATEX 1029 Ex II 2G Ex d IIB T6~T3 Gb  
 Ex II 2D Ex tb IIIC T85°C~T200°C Db IP65

- **Power source** : (A)110Vac, (B)220Vac, (C)240Vac  
(D)24Vac, 50/60Hz
- **Power consumption** : 3W
- **Contact capacity** : SPDT, 3A/250Vac
- **Rotary speed** : 1 R.P.M.
- **Insulation test voltage** : AC 1500V × 1minute

- **Connect** : 1"PF screw or flange 1"~6"  
2-1/2" × 5kg/cm<sup>2</sup> (std.)
- **Housing material** : AL Alloy, ADC-12
- **Conduit** : 1/2" (std.) or 3/4"NPT
- **Material density** : 0.5 g/cm<sup>3</sup>

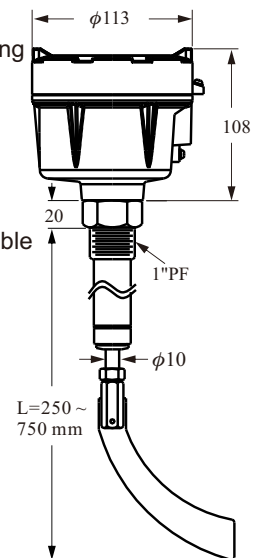
## EXPLOSION PROOF CONNECTION MODEL SE170 series

- Horizontal mounting
- Temp. (-20°C ~ 70°C)



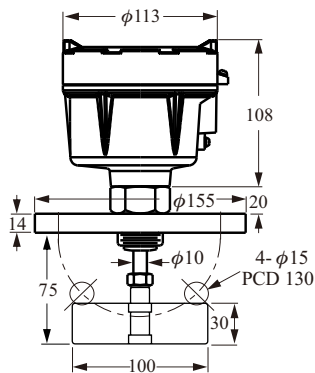
## EXPLOSION PROOF SHAFT PROTECTION MODEL SE172 series

- Horizontal /Vertical mounting
- Temp. (-20°C ~ 70°C)
- Standard Length (option):  
L-- 250mm  
L-- 500mm  
L-- 750mm
- Customized lengths available



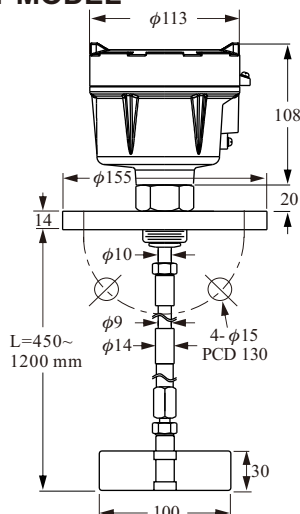
## EXPLOSION PROOF FLANGE MODEL SE171 series

- Horizontal mounting
- Temp. (-20°C ~ 70°C)



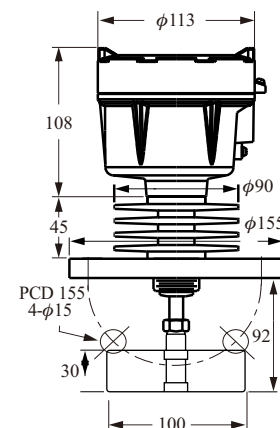
## EXPLOSION PROOF ADJUSTABLE SHAFT MODEL SE173 series

- Vertical mounting
- Temp. (-20°C ~ 70°C)
- Standard Length (option):  
L-- 450 ~630mm  
L-- 650 ~1000mm  
L-- 760 ~1200mm
- Special length is made by order



## EXPLOSION PROOF HI-TEMP MODEL SE174 series

- Horizontal mounting
- Temp. (-20°C ~ 200°C)

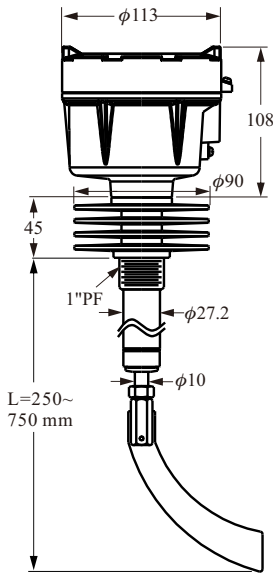


# EXPLOSION PROOF MODEL

NEPSI PROOF No. GYJ111214 Ex d IIC T3~T6  
 PTB PROOF No. 05 ATEX 1029 Ⓢ II 2G Ex d IIB T6~T3 Gb  
 Ⓢ II 2D Ex tb IIIC T85°C~T200°C Db IP65

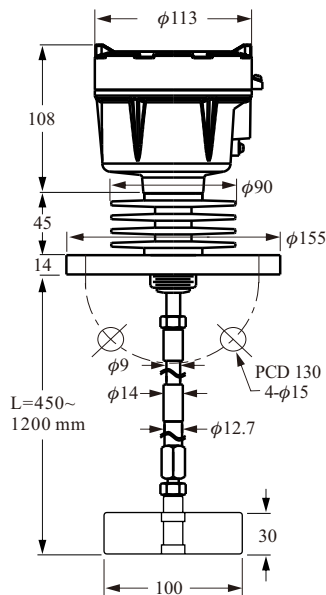
## EXPLOSION PROOF HI-TEMP SHAFT PROTECTIVE TUBE MODEL SE175

- Horizontal /Vertical mounting
- Temp. (-20°C ~ 200°C)
- Special length is made by order



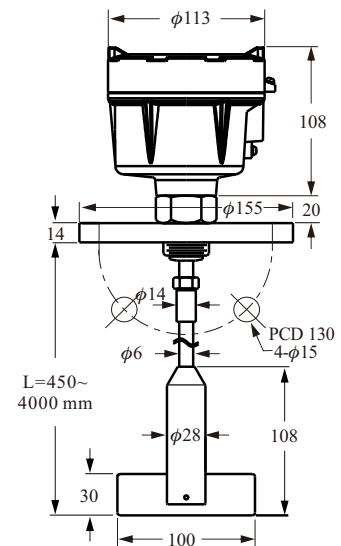
## EXPLOSION PROOF HI-TEMP ADJUSTABLE SHAFT MODEL SE176

- Vertical mounting
- Temp. (-20°C ~ 200°C)
- Special length is made by order



## EXPLOSION PROOF CABLE WIRE MODEL SE177

- Vertical mounting
- Temp. (-20°C ~ 70°C)
- Special length is made by order



## ■ Paddle Introduction

	<p>(A) 100x30 (WxH), Min. fixed hole diameter size φ90mm.</p>		<p>(E) 50x30 (WxH), Suitable for high S.G. raw materials. Use a small size paddle to decrease the impact of material falling directly on paddle.</p>
	<p>(B) 65x80 (WxH), Directly mounted into 2" fixed hole.                  (C) 65x120 (WxH), Directly mounted into 2" fixed hole.                  (D) 80x80 (WxH)</p>		<p>(F) Scimiter model paddle, Screw tightly on the 1" diameter fixed hole, It is easier to mount and dismount.</p>

# HOW TO ORDER

SE1       (    )

**MODEL NO.** \_\_\_\_\_

- |                                   |   |
|-----------------------------------|---|
| 70: Screw model                   | 74: Hi-temp model                         |
| 71: Flange model                  | 75: Hi-temp shaft protective tube model   |
| 72: Shaft protective tube model   | 76: Hi-temp shaft length adjustable model |
| 73: Shaft length adjustable model | 77: Cable wire model                      |

**VOLTAGE** \_\_\_\_\_

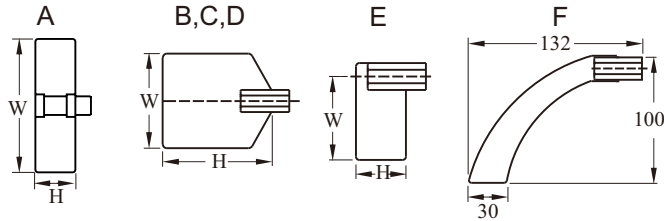
A : 110Vac B : 220Vac C : 240Vac D : 24Vac

**MOUNTING** \_\_\_\_\_

Size for flange or screw		Specification	
D: 1"	I: 4"	M: 5kg/cm <sup>2</sup>	Z: PN40
E: 1-1/2"	J: 5"	N: 10kg/cm <sup>2</sup>	Q: PT
F: 2"	K: 6"	O: 150 Lbs	R: PF (G)
G: 2-1/2"	S: Others	P: 300 Lbs	T: BSP
H: 3"	3: 1-1/4"	W: PN10	U: NPT
		X: PN16	S: Others
		Y: PN25	

**PADDLE SHAPES** \_\_\_\_\_

- A : 100x30 (WxH)
- B : 65x80 (WxH)
- C : 65x120 (WxH)
- D : 80x80 (WxH)
- E : 50x30 (WxH)
- F : Scimitar
- S : Others



**LENGTH (mm)** \_\_\_\_\_

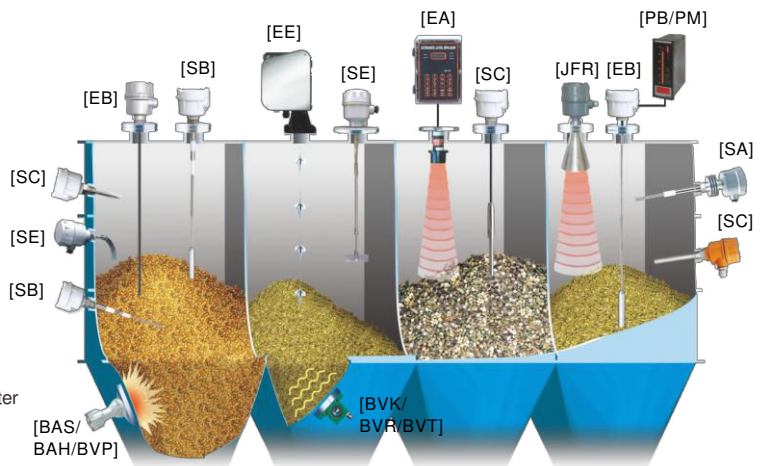
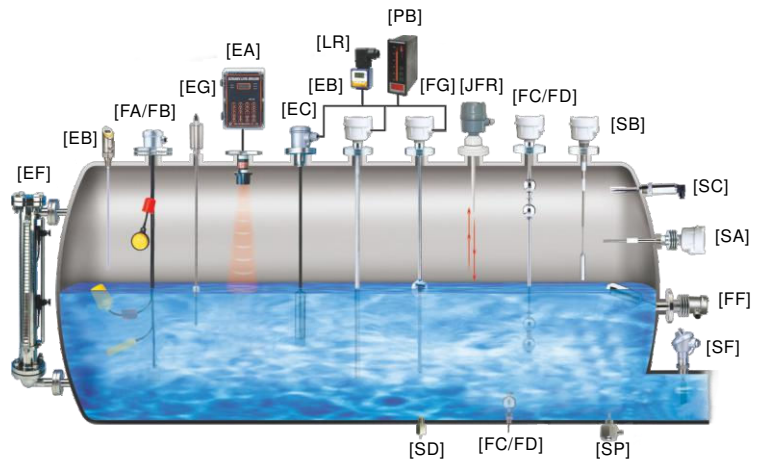
- 0500: below 500mm
  - 1000: 501~1000mm
  - 1500: 1001~1500mm
  - ⋮
- ※ 500mm per Unit  
 ※ The total length of item will be allowed a margin of error of 6mm.

**\* Note**

1. Check the voltage 24Vac, 110Vac, 220Vac, 240Vac, 50/60 Hz.
2. Check the side or top mounting.
3. Check the material specific gravity (S.G.) value.
4. If blockages are frequent or vibrating motors are installed onto the tank wall, our SA140 capacitance level sensor is more suitable.
5. Check whether the rotary paddle can fit through the flange inlet or from the inside of the tank

# EXAMPLES OF TANK MOUNTING

- [FC/FD] Mini Float/Magnetic Float Level Switch
- [FG] Magnetic Float Level Transmitter
- [FF] Side Mounting Float Switch
- [FA/FB] Cable Float Level Switch
- [SP] Thermal Dispersion Flow Switch
- [SF] Paddle Flow Switch
- [SD] Optical Level Switch
- [SE] Rotary Paddle Level Switch
- [SA] Capacitance Level Switch
- [EC] Pressure Level Transmitter
- [LR] Loop Power Indicator
- [SC] Vibrating Probe Level Switch
- [SC] Tuning Fork Level Switch
- [EB] RF-Capacitance Level Transmitter
- [SB] RF-Capacitance / Admittance Level Switch
- [EG] Magnetostrictive Level Transmitter
- [EF] By-Pass Level Transmitter
- [MEF] Mini By-Pass Level Transmitter
- [EA] Ultrasonic Level Transmitter
- [JFR] FMCW Radar Level Transmitter
- [EE] Electromechanical Level Measuring System
- [ED] Speed Monitor
- [SRT/SRS] Conveyer Belt Misalignment Switch & Safety Cable Pull Switch
- [PB/PM] Microprocessor Based Bargraphic Display Scaling Meter
- [BRD/AE] Valve and Controller for Dust Collector System
- [BAS/BAH/BVP] Air Hammer
- [BVK/BVR/BVT] Pneumatic Vibrator



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