

**Authorized Distributor** 



Rotary Paddle Level Switch













































### INTRODUCTION

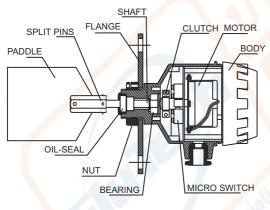
### **WORKING PRINCIPLE**

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).

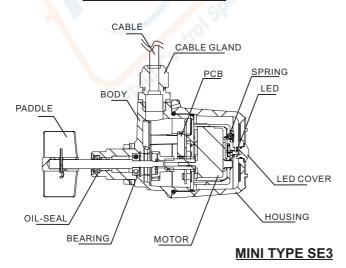
### **APPLICATIONS**

- 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**



### STANDARD TYPE SE1

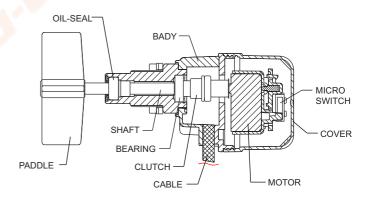


#### **FEATURES**

- 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.



**MINI TYPE SE2** 



### **WORKING PRINCIPLE & TORQUE ADJUSTING**

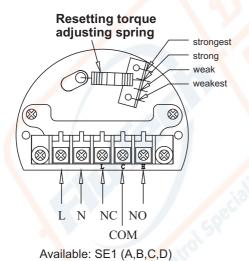
# CONTROL SWITCH WORKING PRINCIPLE

- 1. A synchronous turning motor indicates the tank or container's material isn't obstructing the paddles, C & L [COM & NC] are connected.
- 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.
- 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 aret "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.

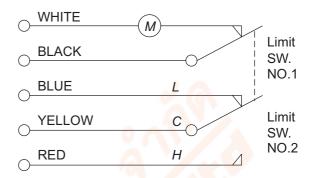




Available: SE1(E)

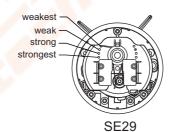
24Vdc

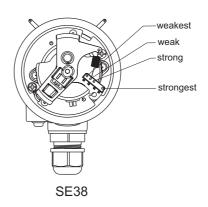
NO NC COM

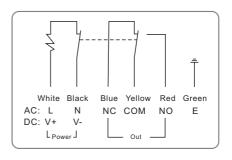


 Do not tamper with the spring as it may cause the Rotary Paddle to malfunction.

### Spring adjusting hole







Available:SE2/SE3

### STANDARD TYPE

• **Power source :** (A)110Vac,(B)220Vac,(C)240Vac,

(D)24Vac, 50/60Hz (E)24Vdc

Power consumption : 3W

• 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/cm flange

• Protection/ material : IP65 / ADC-12

• Conduit: 1/2"PF

Material density: 0.5 g/cm³

### **SCREW TYPE**

SE110 Series

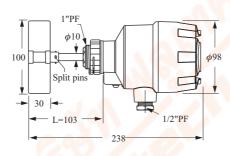
- Horizontal mounting
- Operation Temperature (-20°C ~ 70°C)
- Weight: 1.2 kg

### **FLANGE TYPE**

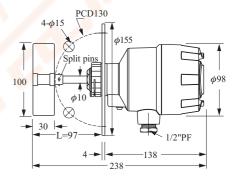
SE111Series

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

### **SE110 Series**



### **SE111 Series**



# SHAFT PROTECTIVE TUBE TYPE

SE120 Series

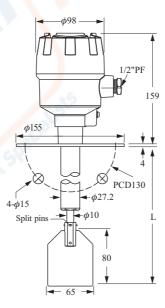
- Horizontal /Vertical mounting
- Operation Temperature (-20°C ~ 70°C)
- Weight: 1.2 kg
- Standard Length:
- L--250mm (2.2 kg)
- L--500mm (2.5 kg)
- L--75<mark>0</mark>mm (2.8 kg)
- Customized lengths available

### SHAFT LENGTH ADJUSTABLE TYPE

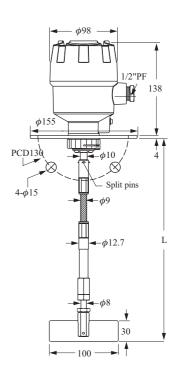
SE130 Series

- 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

### SE120 Series



### **SE130 Series**



### STANDARD TYPE

### **HI-TEMP TYPE**

#### SE140 Series

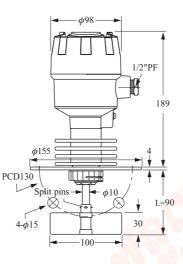
- Horizontal mounting
- Temp. (-20°C ~ 200°C)
- Weight: 2.1 kg

### **HI-TEMP TYPE** PROTECTIVE TUBE TYPE

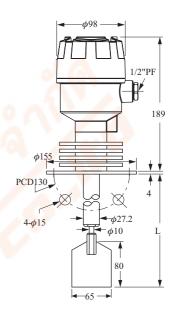
### SE141 Series

- 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

### SE140 Series



### **SE141 Series**

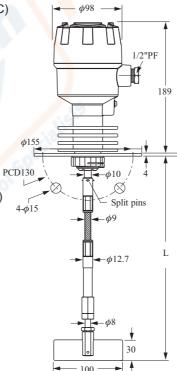


### **HI-TEMP SHAFT** LENGTH ADJUSTABLE TYPE

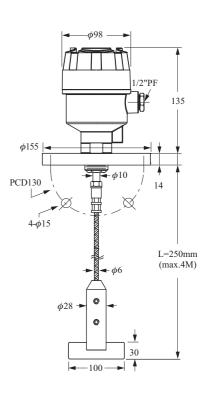
#### SE146 Series

- 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

### **SE146 Series**



### SE160 Series



#### **CABLE WIRE TYPE**

### SE160 Series

- 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

## **MODEL NUMBER / ORDER CODE COMPARISON TABLE**

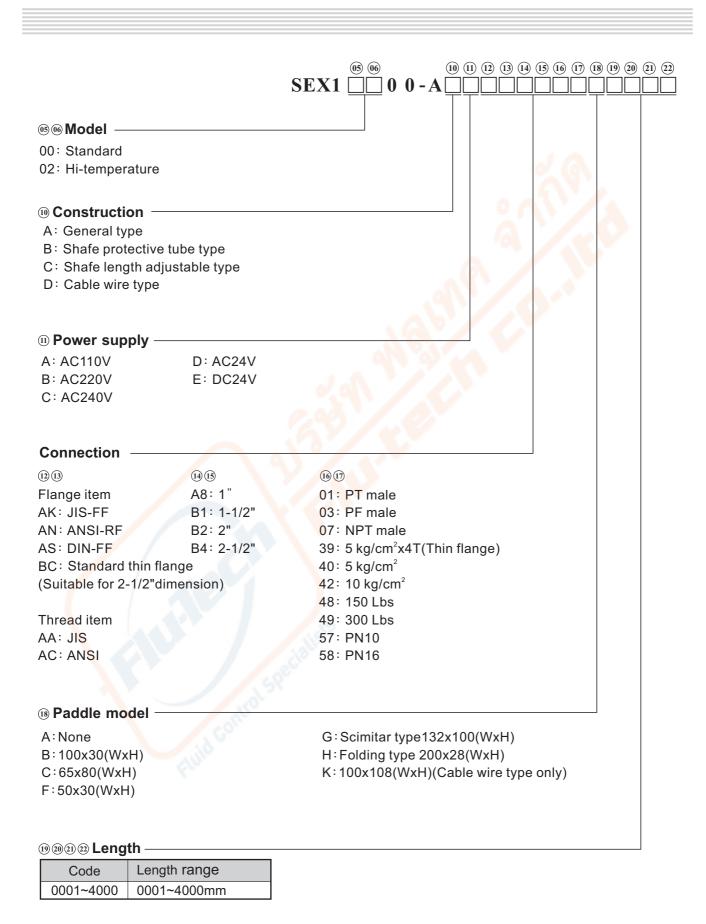
| Model Number | Order Code   |
|--------------|--------------|
| SE110        | SEX10000-AA  |
| SE111        | 3EX 10000-AA |
| SE120        | SEX10000-AB  |
| SE130        | SEX10000-AC  |
| SE140        | SEX10200-AA  |
| SE141        | SEX10200-AB  |
| SE146        | SEX10200-AC  |
| SE160        | SEX10000-AD  |

### New / Old paddle model comparison table

| New | Figure   | Dimension(WxH) | Old |
|-----|--|----------------|-----|
| В   | W H<br>H<br>Rectangular shaped type  | 100x30         | A   |
| С   | <b>TIT</b>   | 65x80          | В   |
| D   | W  | 65x120         | С   |
| E   | Shovel shaped type   | 80x80          | D   |
| F   | Rectangular type, one sided  | 50x30          | E   |
| G   | 132<br>100<br>Scimitar shaped type   | 132x100        | F   |
| Н   | 28 28 Hinged type  | 200x28         | J   |
| К   | $\begin{array}{c} & & & & & \\ \downarrow & & & & \\ \downarrow & & & & \\ \downarrow & & & &$ | 100x108        | Х   |

# PROBE LENGTH LIST FOR STANDARD TYPE (WITH DIFFERENT PADDLES)

| W                       | W H H              |        | W                 | 132                  | 28          |        |
|-------------------------|--------------------|--------|-------------------|----------------------|-------------|--------|
| Rectangular shaped type | Shovel shaped type |        | Rectangular type, | Scimitar shaped type | Hinged type |        |
| 100x30                  | 65x80              | 65x120 | 80x80             | one sided<br>50x30   | 132x100     | 200x28 |
| SE110                   | L=155              | L=195  | L=155             | L=107                | L=195       | L=127  |
| SE111                   | L=149              | L=189  | L=149             | L=101                | L=189       | L=121  |
| SE140                   | L=142              | L=182  | L=142             | L=94                 | L=182       | L=114  |



### **EXPLOSION PROOF TYPE**

NEPSI Ex d IIC T3~T6 Gb Ex tD A20/A21 IP65 T80°C / T95°C / T130°C / T190°C ATEX (a) II 2G Ex d IIB T3 or T4 or T5 or T6 Gb (a) II 2D Ex tb IIIC T200°C or T135°C or T100°C or T85°C Db IECEX Ex db IIB T3 or T4 or T5 or T6 Gb Ex tb IIIC T200°C or T135°C or T100°C or T85°C Db

● **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/cm² (std.)

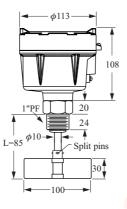
• Housing material : AL Alloy, ADC-12

Conduit: 1/2" (std.) or 3/4"NPT
 Material density: 0.5 g/cm³

# EXPLOSION PROOF CONNECTION TYPE

SE170 series

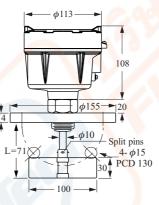
- Horizontal mounting
- Temp. (-20°C ~ 70°C)



# EXPLOSION PROOF FLANGE TYPE

SE171 series

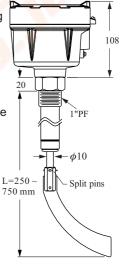
- Horizontal mounting
- Temp. (-20°C ~ 70°C)



# EXPLOSION PROOF SHAFT PROTECTION TYPE

SE172 series

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



 $\phi$ 113

# EXPLOSION PROOF ADJUSTABLE SHAFT TYPE

SE173 series

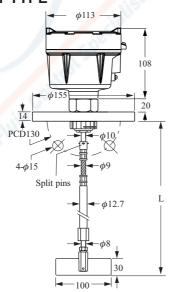
- Vertical mounting
- Temp. (-20°C ~ 70°C)
- Standard Length (option):

L-- 450 ~630mm

L-- 650 ~1000mm

L-- 760 ~1200mm

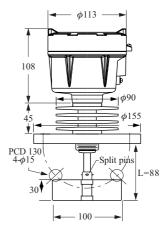
 Special length is made by order



# EXPLOSION PROOF HI-TEMP TYPE

SE174 series

- Horizontal mounting
- Temp. (-20°C ~ 190°C)



### **EXPLOSION PROOF TYPE**

### **EXPLOSION PROOF HI-TEMP SHAFT** PROTECTIVE TUBE TYPE SE175 Series

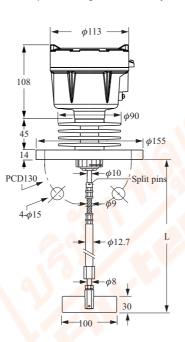
- Horizontal /Vertical mounting • Temp. (-20°C ~ 190°C)
- · Special length is made by order

# $\phi$ 113-108 $-\phi 10$ L=250~ 750 mm Split pins

### **EXPLOSION PROOF HI-TEMP ADJUSTABLE SHAFT TYPE**

SE176 Series

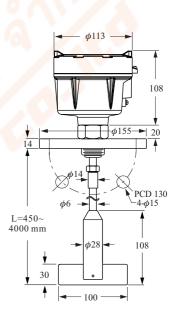
- Vertical mounting
- Temp. (-20°C ~ 190°C)
- Special length is made by order



### **EXPLOSION PROOF CABLE WIRE TYPE**

SE177 Series

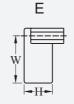
- Vertical mounting
- Temp. (-20°C ~ 70°C)
- Special length is made by order



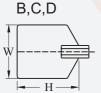
### ■ Paddle Introduction



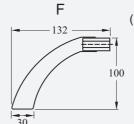
(A) 100x30 (WxH), Min. fixed hole diameter size  $\phi$ 90mm.



(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.



- (B) 65x80 (WxH), Directly mounted into 2-1/2" fixed hole.
- (C) 65x120 (WxH), Directly mounted into 2-1/2" fixed hole.
- (D) 80x80 (WxH)



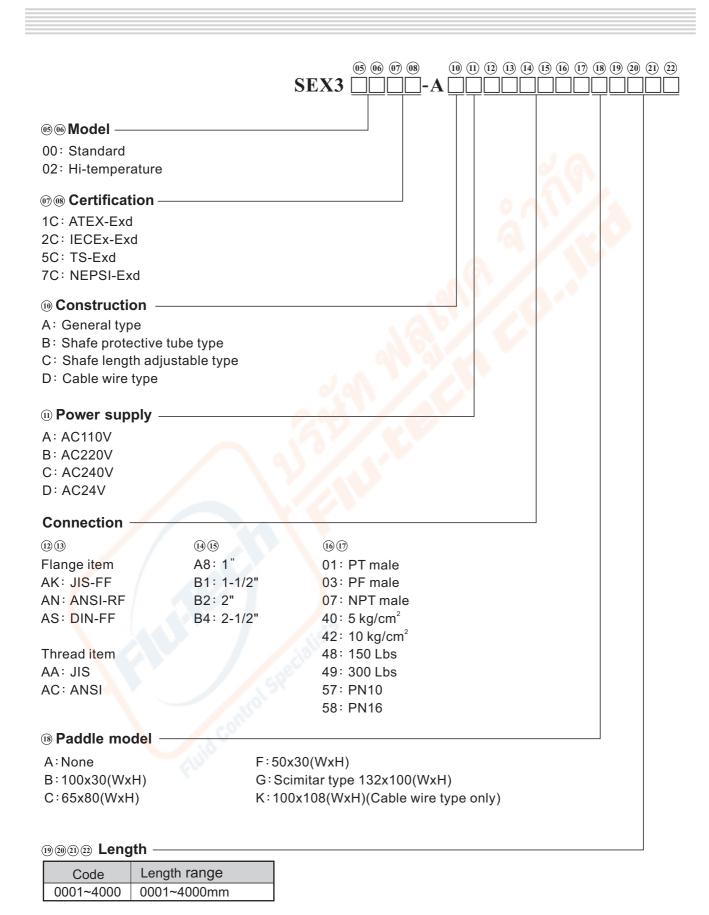
- (F) Scimitar model paddle, Screw tightly on the 1" diameter fixed hole, It Is easier to mount and dismount.

## **MODEL NUMBER / ORDER CODE COMPARISON TABLE**

| Model Number | Order Code   |
|--------------|--------------|
| SE170        | SEX300□□-AA  |
| SE171        | SLX300LLI-AA |
| SE172        | SEX300□□-AB  |
| SE173        | SEX300□□-AC  |
| SE174        | SEX302□□-AA  |
| SE175        | SEX302□□-AB  |
| SE176        | SEX302□□-AC  |
| SE177        | SEX300□□-AD  |

### New / Old paddle model comparison table

| New | Figure   | Dimension(WxH) | Old |
|-----|--|----------------|-----|
| В   | W H<br>H<br>Rectangular shaped type  | 100x30         | Α   |
| С   | +  | 65x80          | В   |
| D   |  | 65x120         | С   |
| Е   | Shovel shaped type   | 80x80          | D   |
| F   | Rectangular type, one sided  | 50x30          | E   |
| G   | 132<br>100<br>Scimitar shaped type   | 132×100        | F   |
| Н   | 28 Linged type   | 200x28         | J   |
| К   | $ \begin{array}{c c}  & \phi & 28 \\ \hline  & \phi & 30 \\ \hline  & Weights type \end{array} $ | 100x108        | Х   |



### MINI TYPE(ALUMINUM ALLOY COVER)

Housing cover code: 0: Aluminum cover

1: Aluminum cover with LED lamp

● **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: 1R.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 g/cm³

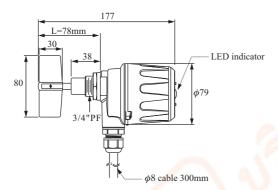
• **Display status**: Green(Working), Red(Stopped)

### STANDARD TYPE

SE38□0 Series

• Operation temperature: -40°C ~ 85°C

• Paddle material: PC

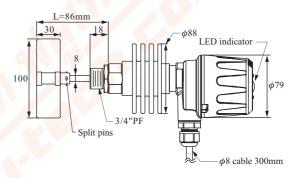


#### HIGH TEMPERATURE TYPE

SE38□4 Series

Operation temperature: -40°C ~ 200°C

Paddle material: SUS304

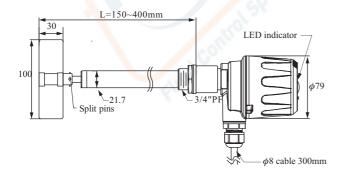


### SHAFT PROTECTIVE TUBE TYPE

SE38□2 Series

• Operation temperature: -40°C ~ 85°C

• Paddle material: SUS304



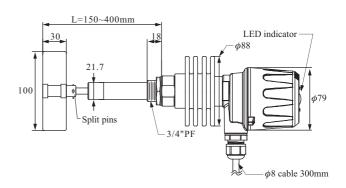
# HIGH TEMPERATURE SHAFT PROTECTIVE TUBE TYPE

SE38

□ 5 Series

• Operation temperature: -40°C ~ 200°C

• Paddle material: SUS304



• 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: 1R.P.M.

• IP rating: IP65

Housing material: Aluminum alloy
 Ambient temperature: -40°C ~ 85°C

• Cable length: 300mm (available for custom length)

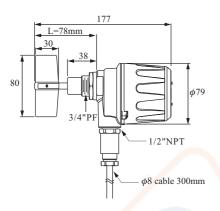
• Material density: 0.3 g/cm<sup>3</sup>

#### STANDARD TYPE

SE3700 Series

• Operation temperature: -40°C ~ 80°C

• Paddle material: PC

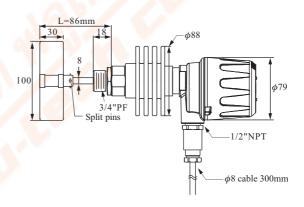


#### HIGH TEMPERATURE TYPE

SE3704 Series

• Operation temperature: -40°C ~ 195°C

• Paddle material: SUS304

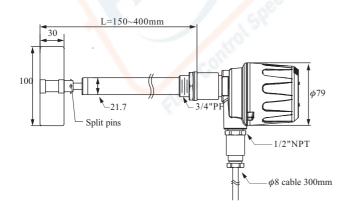


### SHAFT PROTECTIVE TUBE TYPE

SE3702 Series

• Operation temperature: -40°C ~ 80°C

• Paddle material: SUS304

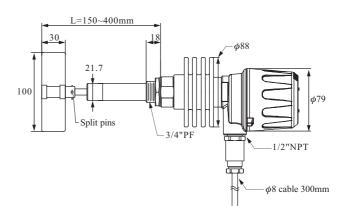


# HIGH TEMPERATURE SHAFT PROTECTIVE TUBE TYPE

SE3705 Series

• Operation temperature: -40°C ~ 195°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: 1R.P.M.

• IP rating: IP65

Housing material: Plastic cover
Ambient temperature: -40°C ~ 85°C

• Cable length: 300mm (available for custom length)

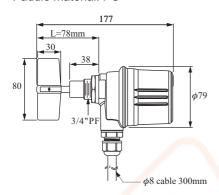
• Material density: 0.3 g/cm<sup>3</sup>

#### STANDARD TYPE

SE3820 Series

• Operation temperature: -40°C ~ 85°C

• Paddle material: PC

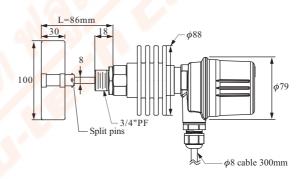


#### HIGH TEMPERATURE TYPE

SE3824 Series

Operation temperature: -40°C ~ 200°C

• Paddle material: SUS304

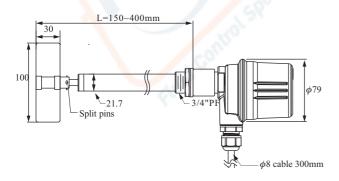


### SHAFT PROTECTIVE TUBE TYPE

SE3822 Series

Operation temperature: -40°C ~ 85°C

• Paddle material: SUS304

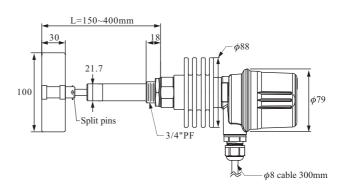


# HIGH TEMPERATURE SHAFT PROTECTIVE TUBE TYPE

SE3825 Series

• Operation temperature: -40°C ~ 200°C

• Paddle material: SUS304



### MODEL NUMBER / ORDER CODE COMPARISON TABLE

| Model Number | Order Code  |
|--------------|-------------|
| SE3700       | SEX2007D-AA |
| SE3702       | SEX2007D-AB |
| SE3704       | SEX2027D-AA |
| SE3705       | SEX2027D-AB |
| SE3800       | SEX20000-AA |
| SE3810       | SEX20000-BA |
| SE3820       | SEX20000-CA |
| SE3802       | SEX20000-AB |

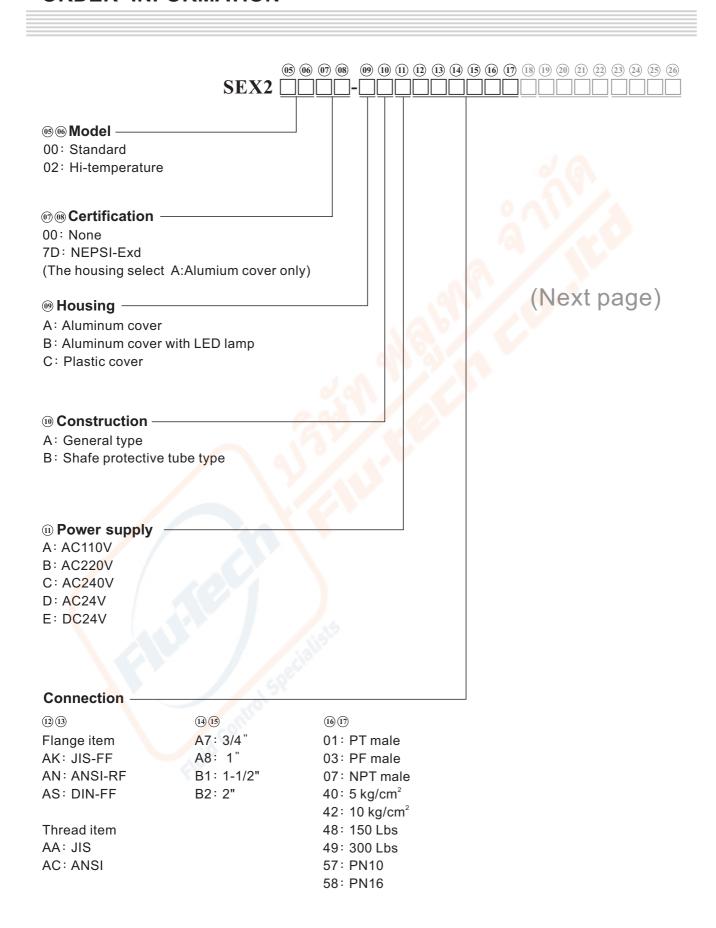
| Model Number | Order Code                |
|--------------|---------------------------|
| SE3812       | SEX20000-BB               |
| SE3822       | SEX20000-CB               |
| SE3804       | SEX20200-AA               |
| SE3814       | SEX2 <mark>0200-BA</mark> |
| SE3824       | SEX20200-CA               |
| SE3805       | SEX20200-AB               |
| SE3815       | SEX20200-BB               |
| SE3825       | SEX20200-CB               |

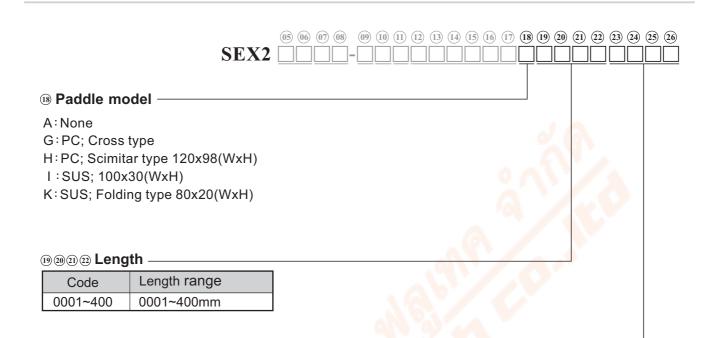
New / Old paddle model comparison table

|     | T   |                |     |
|-----|---|----------------|-----|
| New | Figure  | Dimension(WxH) | Old |
| G   | Room State of the | 80x30          | G   |
| Н   | 98<br>98<br>120<br>Scimitar shaped type   | 98x120         | Н   |
| 1   | W H<br>H<br>Rectangular shaped type   | 100x30         | Ι   |
| К   | 20   20   Hinged type   | 80x20          | К   |

# PROBE LENGTH LIST FOR MINI TYPE (WITH DIFFERENT PADDLES)

| Appearance diagram  | 80  | 98                                     | W  | 20                         |
|---------------------|---|--|--|----------------------------|
| Paddle model        | Cross<br>bladed type<br>80x30 (PC)  | Scimitar<br>shaped type<br>98x120 (PC) | Rectangular<br>shaped type<br>100x30 (SUS) | Hinged type<br>80x20 (SUS) |
| SE38 0 L=78mm       | L=78  | L=174                                  | L=104                                      | L=100                      |
| SE38 4  L=86mm  100 | Not suitable for high temperature ( > 120°C) Stainless steel paddle suggested |  | L=86                                       | L=82                       |
| SE290               | L=87  | L=183                                  | L=113                                      | L=109                      |





### 23 24 25 26 Cable wire length

| Code      | Length range |
|-----------|--------------|
| 0300~5000 | 0300~5000mm  |



## MINI TYPE(ECONOMY)

• Power source : (A)110Vac,(B)220Vac,

(D)24Vac, 50/60Hz

• Power consumption: 1.5W

• Contact capacity: 3A/250Vac, 3A/30Vdc

• Rotary speed: 1R.P.M.

• IP rating: IP65

Housing material: Plastic cover
Ambient temperature: -20°C ~ 80°C

• Cable length: 300mm (available for custom length)

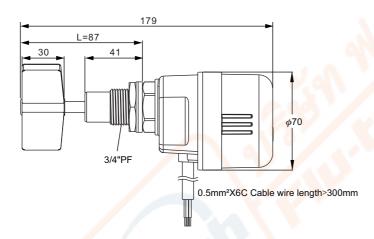
• Material density: 0.3 g/cm<sup>3</sup>

#### **STANDARD**

SE290 A/B/D

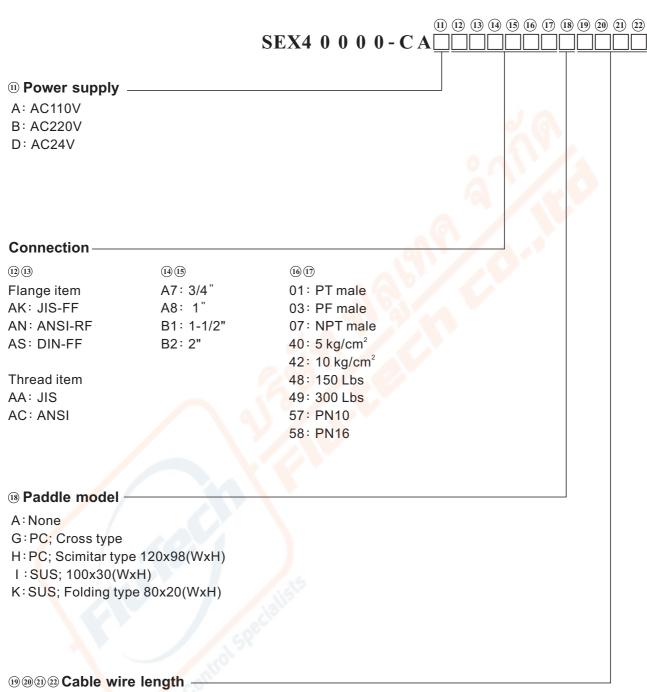
• Operation temperature: -20°C ~ 80°C

• Paddle material: PC



### MODEL NUMBER / ORDER CODE COMPARISON TABLE

| Model Number | Order Code   |
|--------------|--------------|
| SE290A       | SEX40000-CAA |
| SE290B       | SEX40000-CAB |
| SE290C       | SEX40000-CAC |
| SE290D       | SEX40000-CAD |



| 0 | 3            |
|---|--------------|
| Code                                    | Length range |

| Code      | Length range |
|-----------|--------------|
| 0300~5000 | 0300~5000mm  |

### **MOUNTING EXAMPLES**

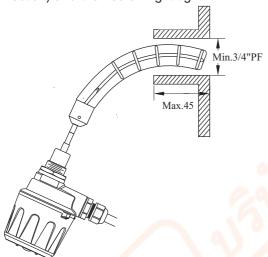
Regular models such as the SE11should be installed directly on the tank side.

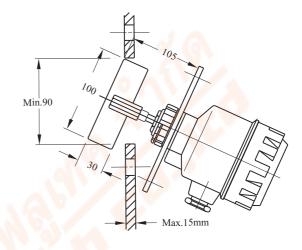
Mount at a 35° angle the blade through the tank opening or hole sliding the blade in first.

\* 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

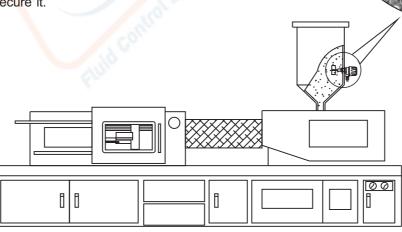
Injection Molding Machine usually require the SE38. Install the Rotary Paddle through a 20mm diameter hole on the tank/silo.

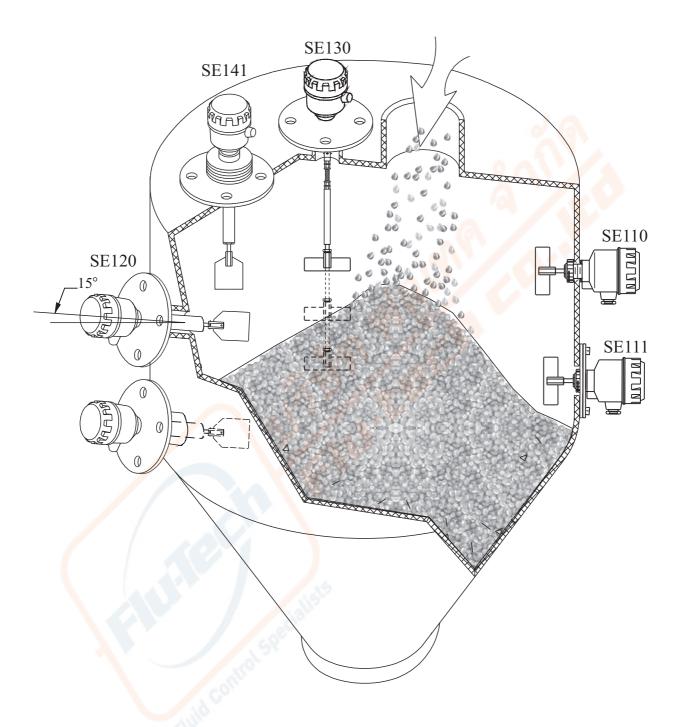
Remove the paddle from the device by taking out the fastening pin.

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.





### 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.

