



# TILT

## TILT SWITCH

ONE MOVING PART  
LEVEL MEASUREMENT WITH  
SIMPLE AND RELIABLE  
OPERATION !

### PL-SERIES

LEVEL MEASUREMENT FROM  
LATERAL/LONGITUDINAL  
MOVING OF POWDER AND  
GRANULES



### TC-SERIES

MICROSWITCH  
ACTIVATES WHEN THE  
ENCLOSURE BODY IS  
TILTED AT 17 ° .



# TILT SWITCH

## PL-SERIES TC-SERIES

**ONE MOVING PART  
LEVEL MEASUREMENT WITH SIMPLE AND RELIABLE  
OPERATION !**

**PL SERIES. LEVEL SWITCH DETECTING  
LEVELS FROM LATERAL/LONGITUDINAL  
MOVING OF POWDER AND GRANULES**

### FEATURES OF PL SERIES

Structured simply and robustly, it can withstand the high-impact-load of powder/ granules.  
It can be applied to upper/middle/lower limits.  
No power, low-cost wiring.

### PRINCIPLE OF OPERATION

The top of powder/granules inside a silo becomes dancette as shown on the right, and powder/granules flow along the slope. The flow laterally turns a sensing plate, thus resulting in the shaft tilting, and the level is detected. Sensing all 360° directions of tilt, it can reliably detect the level of unsteady flow of powder/granules as well and output signals.

When the sensing plate and the shaft are buried under powder/granules, it can still keep measuring the level with downward forces of powder/granules. Even if the unit gets upright along the flowage of powder/granules while the shaft and the sensing plate are buried, therefore, it can

### STANDARD SPECIFICATIONS

Measuring Length: L=1,000(minimum) – 6,000(maximum)(Refer to Outline Drawing as to L dimensions)

Activation Point: 5° (Gradient Angle of Shaft)

Contact Capacity: 250VAC-15A, 30VDC-15A

Service Condition: In-a-silo pressure Ambient Pressure

In-a-silo temperature -25 +70

Ambient temperature -25 +70

(no freeze, no condensation)

Protection Rank: IP55 or equivalent, painted color N6

Mounting Flange: JIS5K 65A FF

Conduit Connection: G1/2

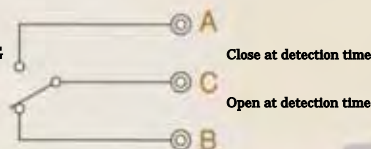
Components provided by customer: Refer to Outline Drawing.

PL-910 8 round steel threaded at both ends

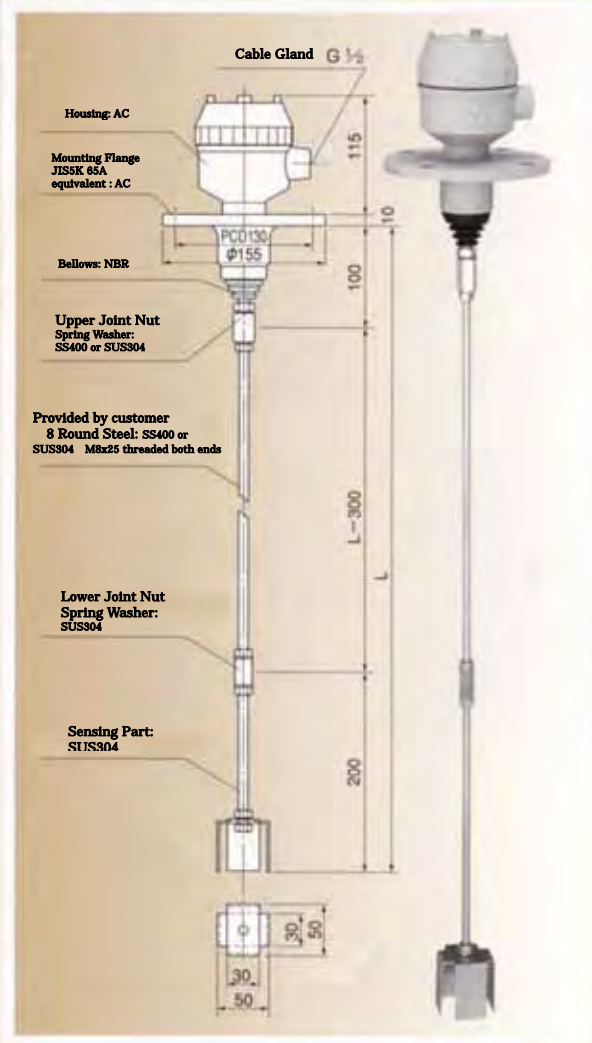
PL-920 32 x 6t flat bar with bolt holes at both ends

Hazardous Area: May be used as Intrinsically Safe with a barrier relay installed together.

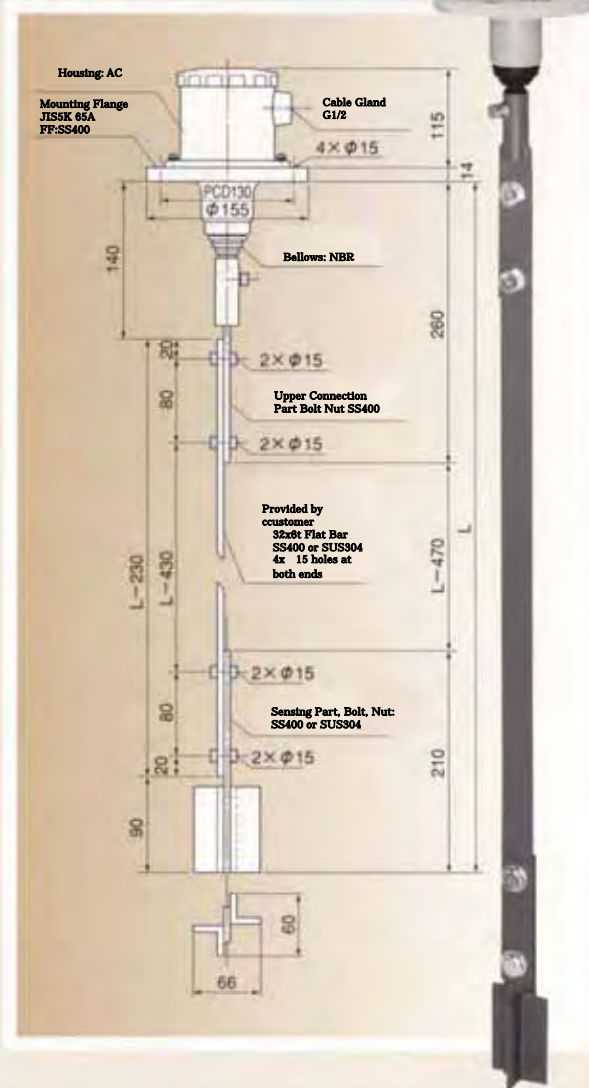
### TERMINAL DRAWING



### PL-910



### PL-920





## ONE MOVING PART LEVEL MEASUREMENT WITH SIMPLE AND RELIABLE OPERATION !

### INSTALLING NOTE OF PL SERIES

Determine the distance from Wall Surface with reference to the following drawing. Make mounting-flange-face flat.

Exert your cares so that clamping portions may not be vibrated or bended as it senses the vibration of the ceiling board of a silo or the bending possibly caused by people walking thereon.

Exert your cares so that the shaft may swing with thrown powder/granules or airflow inside the silo by not more than 50°.

In such a case that, when the shaft tilts nearly at 5°, the contact repeats ON/OFF due to vibration of powder/granules, you may stabilize signals with delay timer relay.



### APPLICATION

PL-910: Suited for Sand, Charcoal dust, Plastic pellets, Grain, Feedstuff and other powder/granules that least adhere to shaft and sensing plate.

PL-920: Suited for granules/block such as Gravel, Broken stone, Block coal. It can particularly withstand the great shock.



TC SERIES..... WHEN ENCLOSURE BODY IS TILTED AT 17° STEEL BALL ROLLS OFF, ACTIVATING THE MICROSWITCH.

### TC SERIES IN GENERAL

Suspend the tilt switch unit from the ceiling by using wire and so on. Rising materials contact the tilt switch, which makes the housing begin to tilt. When the unit is tilted at 17° or more, the contact of housed switch is switched.

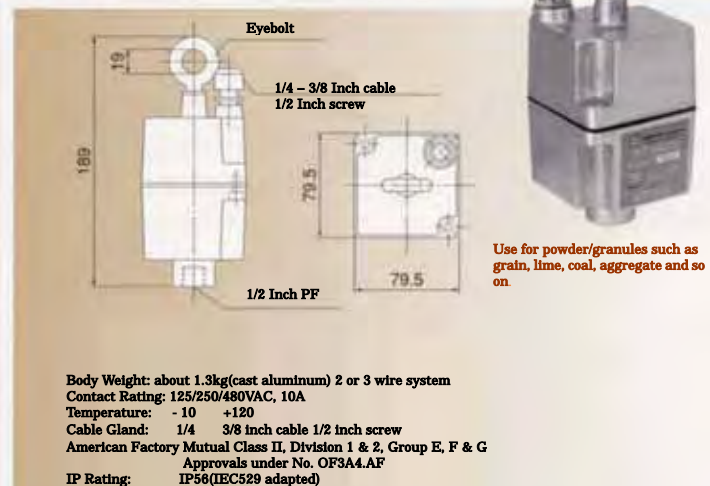


### PRINCIPLE OF OPERATION

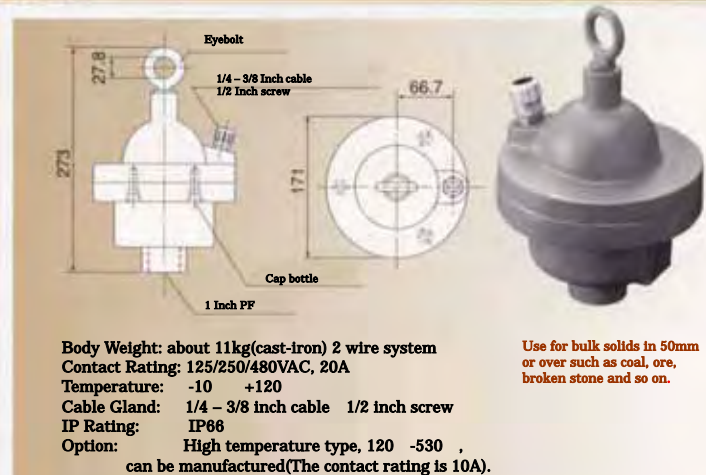
It houses steel ball inside, and, when the body gets upright, the steel ball centers itself on a microswitch.

When the body is tilted at 17° or more, the steel ball rolls off to deactivate the microswitch and switch the contact.

### TC-3X TC-3X DUST EXPLOSION-PROOF TILT SWITCH



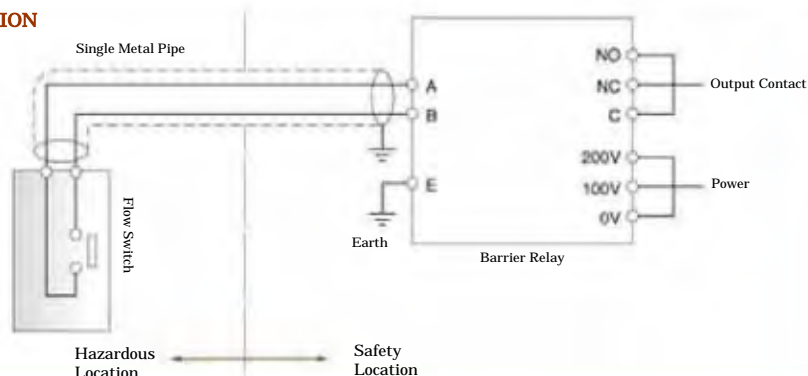
### TC-1 HEAVY LOADING TILT SWITCH



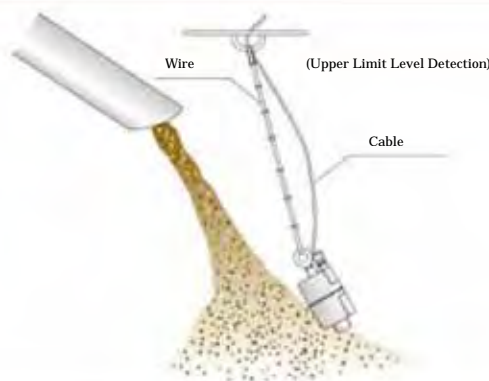
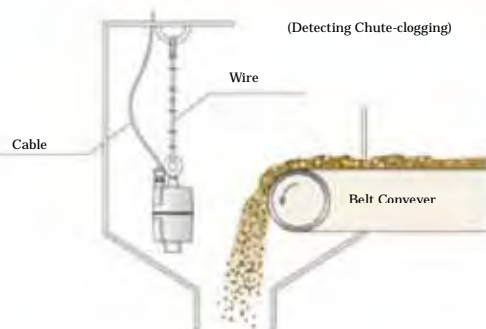
## PL SERIES - HAZARDOUS LOCATION

PL Level Switch can be used as Intrinsically Safe Explosion-proof Type if put together with a barrier relay.

\*TC series can also be used.

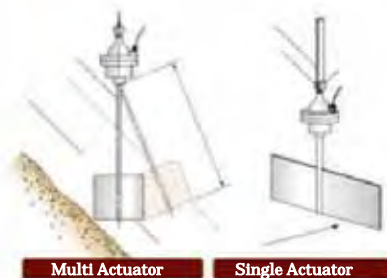


## TC SERIES - APPLICATIONS



## SENSITIVITY UPGRADE BY ACTUATOR

You can upgrade the sensitivity of the tilt switch in mounting 2 or 4 paddle actuators. The actuators are fixed on the tilt switch body with 1/2"PF screws. The dimensions of the actuators and the paddle forms are varied by the nature of materials, the mounting position and so on.



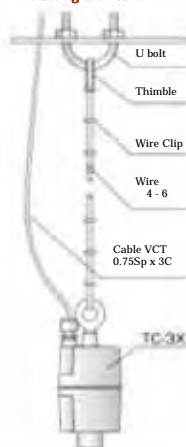
Multi Actuator

Single Actuator

## MOUNTING A TILT SWITCH

Suspend with ample tilt-angular allowance using hanger, chain, wire and so on. Hangers must support the weight of the body and actuators, and avoid using a cable for suspension. The tilted angle is stable at 17° in all directions. You can confirm the actuation position by hearing the unit click. Install it at the location where it may not receive a direct hit of flowing materials.

### Mounting with Wire



## TILT SWITCH WIRING

Opening the enclosure by loosening 2 screws at the lower part on the tilt switch body, you may connect directly with the switch terminal.

### Switch Operation

In tilting: N. C. contact is closed.

Upright position: N. O. contact is closed.

You do not need to demount other switch bracket and so on. In wiring, make sure that cables may not interfere the operation of the tilt switch.

※予告なく仕様変更することがありますので予めご了承下さい。Specifications and descriptions of this catalog are subject to change without notice for improvement.

## ■営業品目 HANDLING ITEMS

- |  |   |
|--|---|
| ① 回転式レベルスイッチ<br>Rotary Paddle Type Level Switch        | ⑩ フロースイッチ<br>Flow Switch                                      |
| ② 振動式レベルスイッチ<br>Vibration Type Level Switch            | ⑪ 電極式レベルスイッチ<br>Electrode Type Level Switch                   |
| ③ 音波式レベルスイッチ<br>Acoustic Level Switch                  | ⑫ フロートスイッチ<br>Float Switch                                    |
| ④ 静電容量式レベルスイッチ<br>Capacitance Type Level Switch        | ⑬ フロート式レベルメータ<br>Float Type Level Indicator                   |
| ⑤ 静電容量式近接センサ<br>Capacitive Proximity Sensor            | ⑭ 超音波式レベルメータ<br>Ultrasonic Type Level Indicator               |
| ⑥ 静電容量式レベルメータ<br>Capacitance Type Level Indicator      | ⑮ コンベア周辺機器<br>Equipment For Conveyor Lines                    |
| ⑦ ダイアフラム式レベルスイッチ<br>Diaphragm Type Level Switch        | ⑯ ダストモニタ<br>Dust Monitor                                      |
| ⑧ チルトスイッチ<br>Tilt Switch                               | ⑰ レーザ式レベルメータ<br>Laser Type Level Indicator                    |
| ⑨ リーク式レベルスイッチ<br>Leak Type Level Switch                | ⑱ 電波式レベルメータ<br>Radio Type Level Indicator                     |
| ⑪ マイクロウェーブスイッチ<br>Microwave Switch                     | ⑲ 液体分析オンラインセンサ<br>On-Line Sensor for Accurate Liquid Analysis |
| ⑫ サウンディング式レベルメータ<br>Sounding Bell Type Level Indicator | ⑳ 液体超音波流量計<br>Ultrasonic Flow Meter                           |

Please surely read the instruction manual when you operate instruments.

Nuclear Power Generation to Rice Milling  
All-round Manufacturer of Level Controllers for Powder, Granules and Liquid

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