



INSTRUCTION MANUAL

CONVEYER FLOW SWITCH

MODEL: PA-1/PA-2

Meanings of indications for safety used in this Instruction Manual are as follows.



WARNING: Indicates that improper handling assumes the risk of a fatal or serious injury.



CAUTION: Indicates that improper handling assumes the risk of injury or damage to property only.

TOWA SEIDEN INDUSTRIAL CO., LTD.

HEAD OFFICE	Phone: 81-6-6340-5522, Fax: 81-6-6340-5519
TOKYO OFFICE	Phone: 81-3-5484-2171, Fax: 81-3-5484-2175
NAGOYA OFFICE	Phone: 81-52-937-5817, Fax: 81-52-937-5836
OSAKA PLANT	Phone: 81-6-6340-2831, Fax: 81-6-6349-6551

URL <http://www.towa-seiden.co.jp>

No.EPA-1000-1

2009. 09. 09

Introduction

1. This instruction manual describes the proper handling method and adjustment method, etc., of the product. Make sure to read the instruction manual before use. In addition, store this manual so that it can be accessed and referred to as needed.
2. The instruction manual describes our standard specifications. Accordingly, if a product we delivered has special specifications, the detailed specifications may differ from the product described in this manual.
3. Details described in the instruction manual are subject to change without notice.
4. If you find any unclear or erroneous points in the instruction manual, please contact our customer service representative.
5. If modification of a product has been carried out for improvement of quality, alternative parts or an alternative product may be provided in place of identical parts. In addition, please be advised that the specifications and/or appearance may be changed without notice. For details, please contact our customer service in the sales department.
6. Modification of a product by a customer is outside the range of our responsibility.

Safety indications used in the instruction manual mean the following .



Warning: Indicates that improper handling assumes the risk of a fatal or injury.



Caution: Indicates that improper handling assumes the risk of injury or damage to property or occurrence of physical damage only.

Table of Contents

Introduction

1. Safety precautions	... (1)
2. Outline	... (2)
3. Specifications	... (3)
4. Handling method	... (4)
5. Attachment of blade to shaft	... (4)
6. Attachment and detachment of cover	... (5)
7. Blade position and operating points	... (5)
8. Adjustment of operating points	... (6)
9. Wiring	... (6)
10. Maintenance	... (8)

1. Safety precautions



Warning

- Before wire connection, make sure to confirm that there is no voltage between the electric wires. Otherwise, electric shock, electric leak, short-circuit, and ignition may occur.
- Never disassemble the product.
- Do not store the product under an adverse environment including a place exposed to direct sunlight, rain, or water drops and a place where harmful gas or liquid exists.



Caution

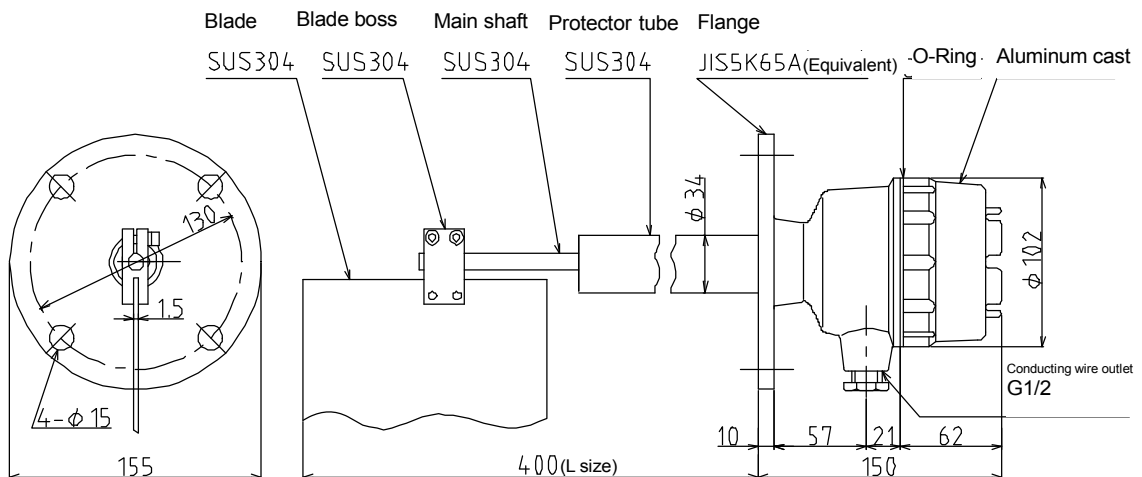
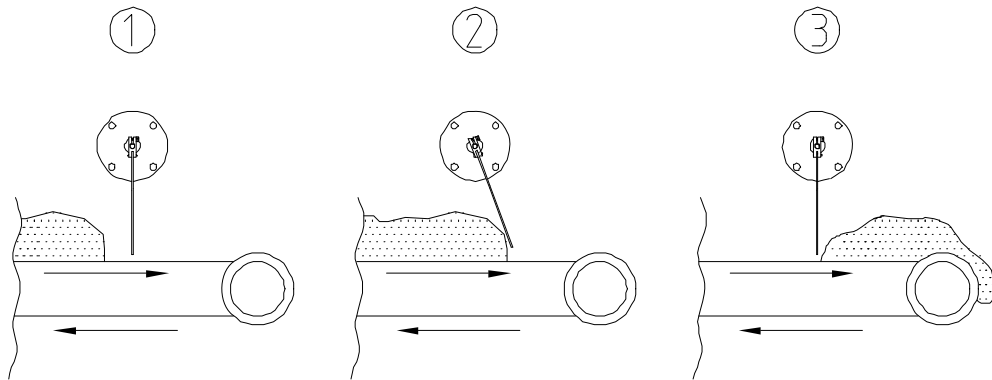
- Make sure to use the product within the specifications.
“Installation environment such as rating and temperature”
- Before energization, make sure to confirm that there is no error in the wiring.
- Do not drop or apply a strong impact. Otherwise it may cause a failure.
- Securely tighten the cover and the conducting wire outlet so that dust or rainwater does not enter.
- Make sure to face the conducting wire outlet downward when installing the product.
- Do not use the product under a corrosive environment (NH₃, SO₂, Cl₂, etc.).

2. Outline

This product is a switch in which a signal is changed by a detected object pressing the blade.

The following diagrams show operating examples on the belt conveyor.

- ① Normally the blade is positioned at the standby position due to its own weight.
- ② The detected object pushes the blade up, and when the blade angle exceeds the operating angle, the signal is changed. As long as the detected object pushes the blade, this state is maintained.
- ③ If there is nothing to detect, the signal is returned.



PA-1 L=400 Outline drawing (Standard Specifications)

3. Specifications

Model		PA-1/PA-2
Installation method		Flange JIS5K65A (Equivalent)
Blade shape (Standard) *1		150×230 t=1.5
L-size (Standard) *1		400mm
Materials used (main)	Blade	SUS304
	Main shaft	SUS304
	Protector tube	SUS304
	Flanged case	Aluminum alloy
	Cover	Aluminum alloy
	Seal	Nitrile rubber, Teflon
Paint color	Case, cover	10YR7.5/14
Protection level		IP65 or equivalent
Working ambient temperature		-10~60°C (no freezing and condensation)
Working pressure		Atmospheric pressure
Conducting wire outlet		G1/2
Conducting wire outlet fitting		Cable compatible outer diameter $\varnothing 5\sim 8\text{mm}$
Output		PA-1...1C, PA-2...2C
Contact capacity (resistance load)	Standard	250 V AC 10 A ; 250 V DC 0.3 A
	Z type	250 V AC 0.1 A ; 30 V DC 0.1 A
Operating angle (Standard) *1		Approximately 20°
Hysteresis		Approximately 5°
Insulation Resistance		100M Ω or more (500V DC Megger)
Withstand voltage test		1500V AC for one minute
Mass (Standard) *1		Approximately 2.7Kg

*1 In the case of specifications other than the standard one, confirm the specifications according to the delivery drawing.

4. Installation method

Install the product in a place where the blade can detect the flow of a measured object.
When installing, face the conducting wire outlet below and use bolts and packing according to the standard.

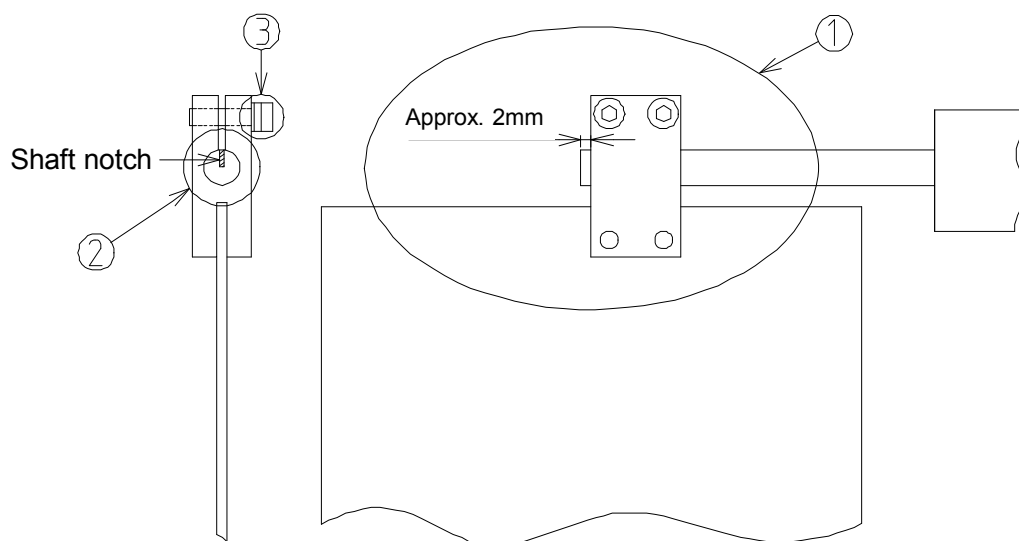


Caution

Install the product so that the conducting wire outlet faces below. Otherwise, rainwater will enter, and this may cause a failure.

5. Attachment of blade to shaft

- ① Insert a blade into the shaft while paying attention to the direction of the blade so that the main shaft protrudes by approximately 2mm.
- ② Adjust the notch of the shaft and the blade boss.
- ③ Reliably tighten the hex socket bolt (M5) to fix the product.



6. Detachment and attachment of cover

- The cover can be attached by screwing.
- To remove the cover, loosen the screw while paying attention to the O-ring. When attaching, check that the O-ring does not twist, sufficiently tighten the screw, and reliably screw.




Caution

Sufficiently and reliably screw the cover.

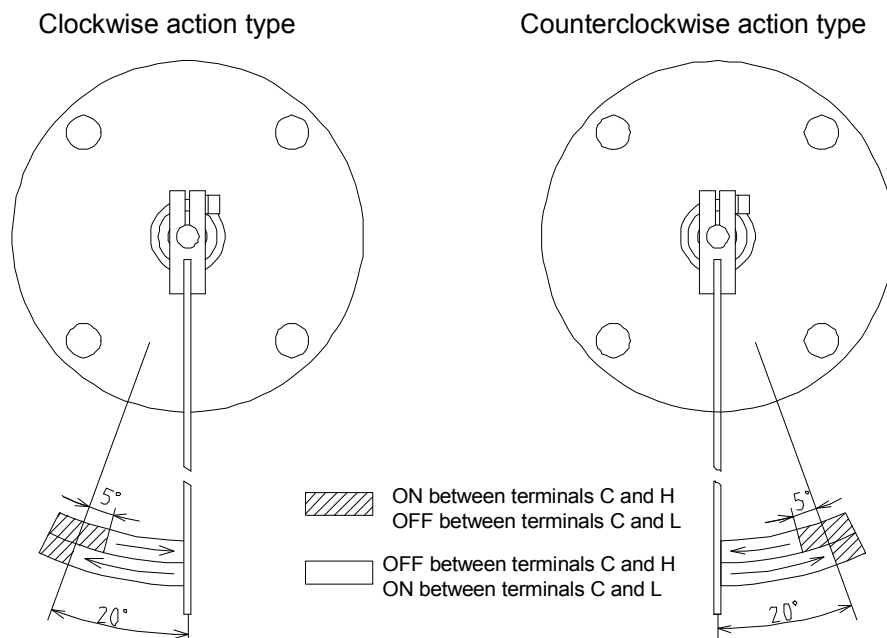
If the product is used outdoors, rainwater and dust will enter, and this may cause a failure.

7. Blade position and operating point

Conveyer flow switch includes the clockwise action type and counterclockwise action type. After confirmation of the customer's specifications, refer to the following diagrams.

When the blade is positioned at the  portion in the diagram, conduction is provided between the terminals C and H.

The following diagrams show switching of the contacts in the case of an operating point of 20°.

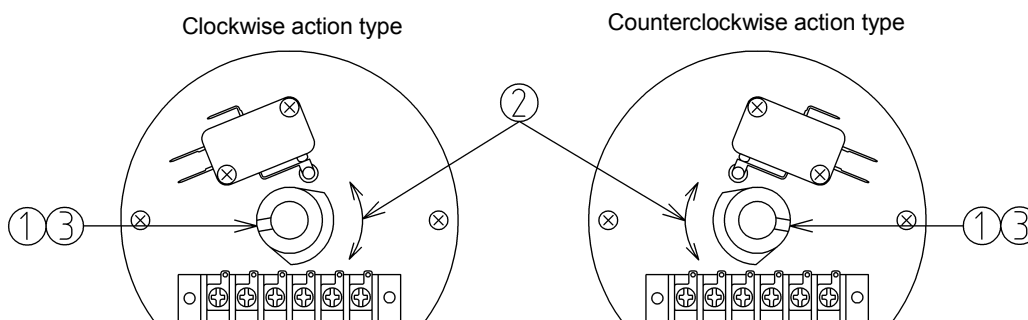


8. Adjustment of operating point

If adjustment of the operating point is required, loosen the hex socket set screw of the cam and deviate the position of the cam with respect to the shaft.

Adjustment procedures

- ① Loosen the set screw.
- ② Rotate the cam to adjust the operating point. If it is rotated upward, the operating angle is reduced, and if it is rotated downward, the angle is increased.
- ③ Tighten the set screw to fix the cam.



Caution

Confirm that the cam reliably presses the roller of the switch.

In addition, if any screw other than the cam is loosened, the positional relationship between the microswitch and the main shaft will deviate, and this may cause a malfunction.

9. Wiring

9-1. Electric wire and piping used

- If piping is used, use flexible tubes or Plica tubes (flexible metal conduit) for installation of piping so that it can be checked later. In this case, remove the conducting wire outlet fitting, and use a #17 box connector for thick steel. In the case of a box connector for thin steel, the screw is not applicable.
- If a cable is used, reliably tighten the conducting wire outlet fitting for fixing. Select a cable with an outer diameter of $\varnothing 5 \sim 8$ mm after finishing.
- Use a strand wire for the core wire of an electric wire. The recommended electric wire size is 0.5mm^2 .
- The terminal block is 6mm in width and attached with M3 screws. The recommended crimp-type terminal size is R1.25-3.
- The conducting wire outlet fitting compatible size is $\varnothing 5 \sim 8$ mm.



Caution

After wiring, tighten the conducting wire outlet fitting.
If it is not securely tightened, rainwater or dust will enter, and this may cause a failure.



Caution

Adjust the cable size to the outlet fitting size.
If the cable size is not appropriate, rainwater or dust will enter, and this may cause a failure.

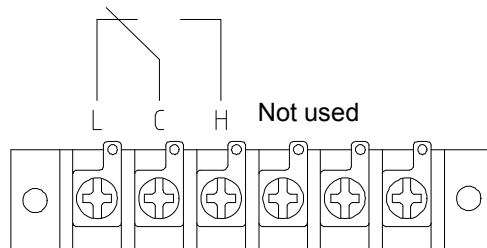
9-2. Connection



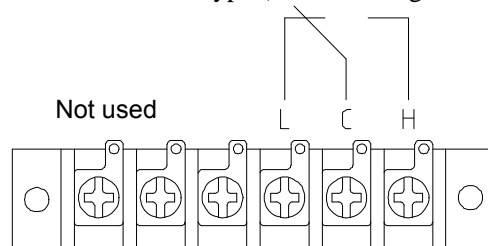
Warning

Install wiring after confirmation that there is no voltage between the electric wires to be connected.
Otherwise, electric shock, electric leak, short-circuit and ignition may occur.

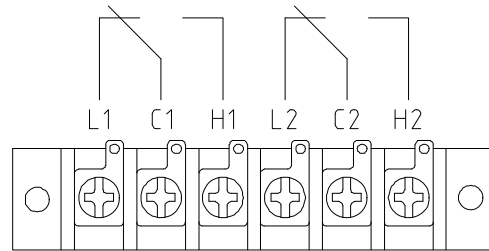
- Install wiring properly with reference to the following terminal array.
- PA-1 Clockwise action type (when nothing is detected)



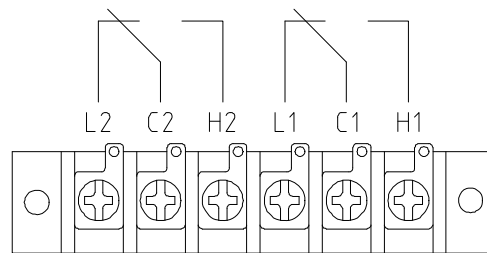
- PA-1 Counterclockwise action type (when nothing is detected)



- PA-2 Clockwise action type (when nothing is detected)



- PA-2 Counterclockwise action type (when nothing is detected)



10. Maintenance

For periodic inspection, confirm the following items.

- Check that the case cover is not loosened. If it is not securely tightened, rainwater and dust will enter, and this may cause a failure.
- Check that the fixing bolts and screws are not loosened.
- Check that the blade, main shaft, and protector tube are not bent.