General Manufacturer of Foot Switches

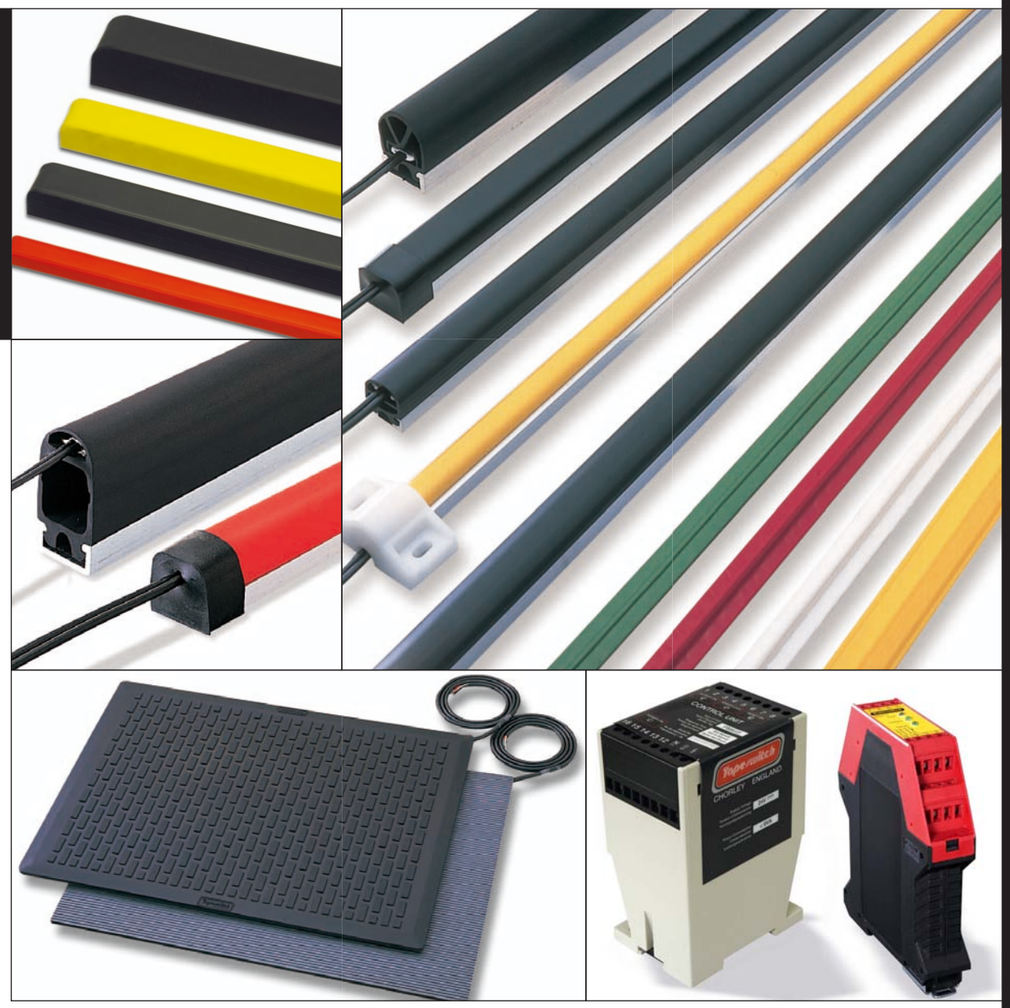
オジデン®
大阪自動電機株式會社

CATALOG No.97T
GENERAL CATALOG

TAPE&MAT SWITCHES

TAPE&MAT SWITCHES

www.ojiden.co.jp



Sales Agent

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OJIDEN

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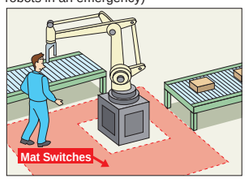
OJIDEN

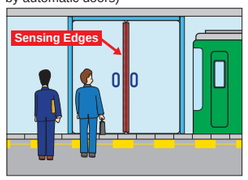
Rendering Safety and Security in All Situations Extensive Applications Limited Only by Ideas

Whether used to prevent accidents or communicate messages, OJIDEN's series of switches are being brought into full play in widely ranging social scenes -- at homes, offices, factories, hospitals, and public installations.
Drawing on the company's state-of-the-art technical expertise, the exceptional reliability of these switches invariably adds to the safety and security of the systems in which they are used. They also come in a variety of types, e.g., in the form of tapes, mats, and edges, so that you may choose the one perfectly suited to the desired application and the location of use to serve as part of your safety and security considerations.

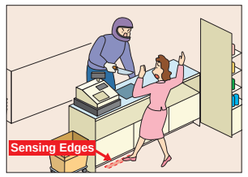
For Safety Enhancement
(suspending the operation of industrial robots in an emergency)



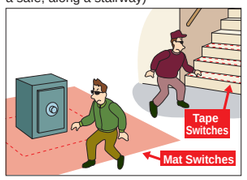
For Safety Enhancement
(sounding an alarm to prevent trapping by automatic doors)



For Crime Prevention
(alerting to an ongoing crime)

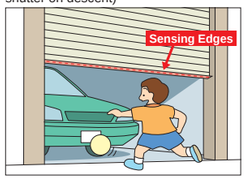


For Crime Prevention
(alerting to an ongoing crime -- around a safe, along a stairway)

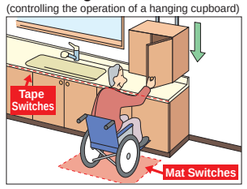


For Crime Prevention
(monitoring building premises)

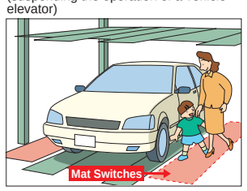
For Safety Enhancement
(suspending the operation of a garage shutter on descent)



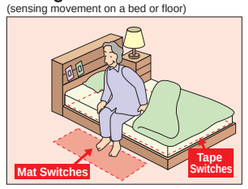
For Safety
Care Management Enhancement
(controlling the operation of a hanging cupboard)



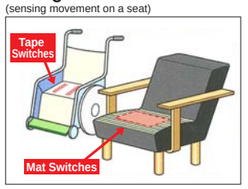
For Safety Enhancement
(suspending the operation of a vehicle elevator)



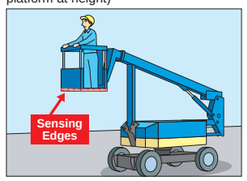
For Care Management Enhancement
(sensing movement on a bed or floor)



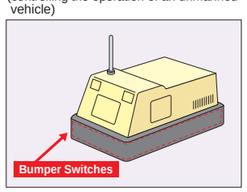
For Care Management Enhancement
(sensing movement on a seat)



For Safety Enhancement
(suspending the operation of a work platform at height)



For Safety Enhancement
(controlling the operation of an unmanned vehicle)



Perfect Choice as a Safety Device

The switches are the perfect choice in creating safety zones where the suspension of operation is of utmost importance in an emergency or in preventing trapping by automatic doors.

Size-free Switches

While being convenient and durable, some switches even permit cutting to desired lengths.

Long Life of 1,000,000 Activations

The switches are long-lasing, going on/off as many as 1,000,000 times (tested with open/close operations of 24V, 0.3A relays). See the specifications table.

Easily Mounted

The switches may be mounted as easily as attaching them with adhesive, double-sided tape, or aluminum mounting channel.

Limitless Uses and Applications

The switches may be used in extensive applications, e.g., for safety enhancement in factory automation (FA), general automation, crime prevention -- there are as many uses as there are ideas.

Bends and Fits in a Limited Space

The switches may be mounted and operated even in a narrow, cylindrical space (if R50 or more).

Outdoors

The switches have long been used for outdoor applications and have a good track record to prove their performance. (To be used outdoors, the switches must be of a special waterproof type.)

Smart Appearance

The colored tape switches can serve as an interior ornament, adding to the décor with their pleasingly slender, thin appearance.

Tapeswitch CORPORATION

AN INDUCTOTHERM INDUSTRIE

Some of the products introduced herein make use of Ribbon Switches® of Tapeswitch Corporation (US company) as their principal switch elements. Indicative of their shape and derived from the company name, the term tape switch has gained currency in industry circles both in parlance and in print. With the consent of the company, OJIDEN now includes both tape switch (T.S.C.) and ribbon switch in its corporate glossary of terms.

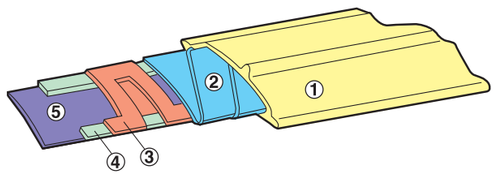
TAPE SWITCHES

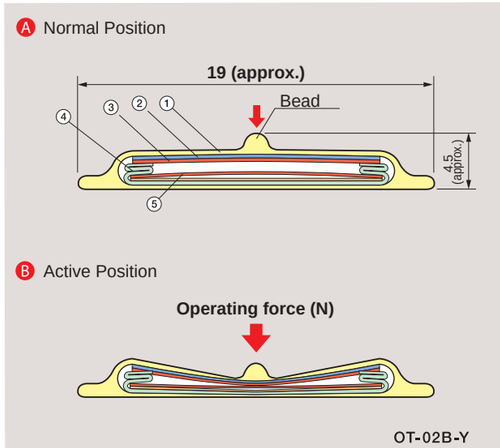
TAPE SWITCHES INFORMATION

OJIDEN's tape switches are exported to countries around the world. While used primarily in factory automation (FA)-related equipment in securing safety, they are now finding applications in our immediate surroundings in the way of automating homes/shops (HA) and becoming part of medical equipment, all thanks to their globally acclaimed high performance and reliability.

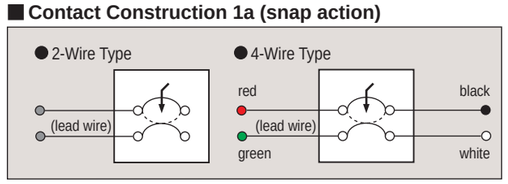
Construction and Operating Principles of Tape Switches

As its name suggests, the switch is shaped in the form of a tape containing a snap-action contact. It is made of lengths of quenched spring material serving as conducting plates. The plates are thickly coated by copper-plating and held together with Mylar (PET) film in between them serving as an insulator and with sheathing (PVC) formed by extrusion molding on the outside.





Contact Construction 1a (snap action)



Typical Construction of a Tape Switch
① External sheathing (PVC, polyvinyl chloride)
② Upper insulator (Mylar film)
③ Upper conducting plate (phosphor bronze)
④ Intermediate/lower insulator (Mylar film)
⑤ Lower conducting plate (copper-plated steel)

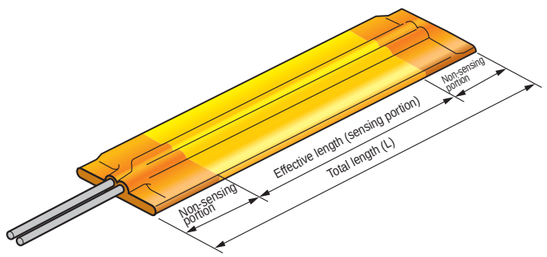
Points to Note When Ordering Tape Switches

① Indicate the model and the total length (L).

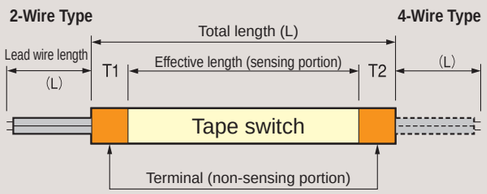
② Indicate the length (L) of the lead wire and the lead-out configuration in terms of 2-wire (1-ended) and 4-wire (2-ended).

※ In the absence of indication, a 2-wire type (1-ended) will be shipped.

③ For outdoor uses, clearly indicate the need for extra water-proofing and other requirements.



(standard specifications for terminal processing by a high-frequency welding tool)

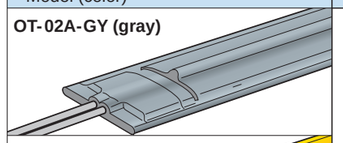
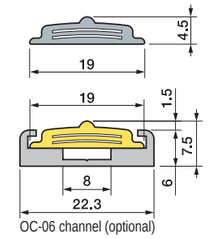
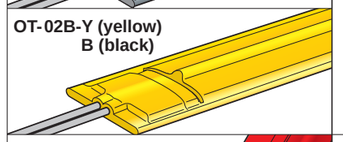
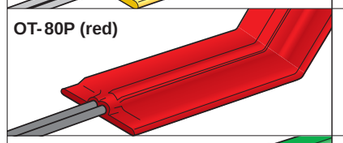
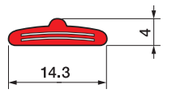
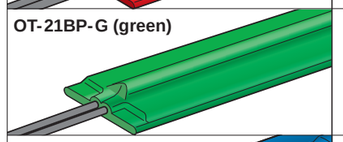
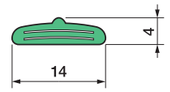
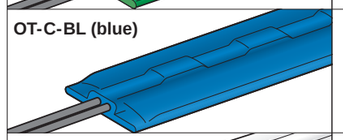
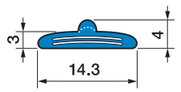
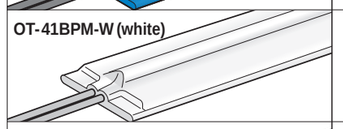
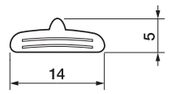
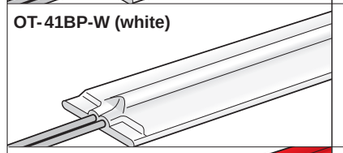
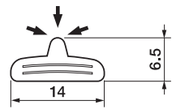
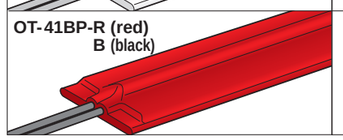
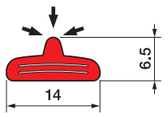


Processing Dimensions (standard type, mm)

Dimensions \ Model	02A 02B 80P	21BP 41BP C
2-/4-Wire type non-sensing portion (T1/T2)	25	20
2-/4-Wire lead wire (L)	500	500

NOTE:OT-80P has a non-sensing portion other than on both its terminals owing to its internal construction.

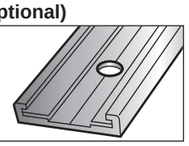
Standard Tape Switch

Model (color)	Cross-sectional configuration (mm)	Operating force and weight	Applications and features
OT-02A-GY (gray) 		30 N (approx.) Weight 110 g/m (approx.)	● High operating force (recovery) (02A-GY) ● High sensitivity (02B-Y, 02B-B) ● Applications: conveyers, elevators, seat (mat) sensor for entertainment equipment, medical equipment, various automation equipment, built-in sensors for crime-prevention devices and safety edges ● Bending angle: R50 (approx.) ● See the mounting diagram on the left for a cross-sectional view. ● Accommodation of extra waterproofing upon request ● Mounting channel: OC-06 (optional)
OT-02B-Y (yellow) B (black) 		12 N (approx.) Weight 100 g/m (approx.)	
OT-80P (red) 		Operating angle 10° to 15° 2.2 N (approx.) Weight 60 g/m (approx.)	● VFF 0.5 mm, 0.5 m (standard) ● 2-way activation (in response to bending at 10° to 15° or pressing) ● No bending processing ● Maximum length: 3 m ● Applications: inside beds/chairs; collision prevention ● Non-sensitive portion in addition to on both terminals
OT-21BP-G (green) 		3N (approx.) Weight 85 g/m (approx.)	● High sensitivity, Low protrusion ● Applications: built-in sensors in various edges, safety sensors in medical equipment, crime-prevention and on-hand switches ● Bending angle: R50 (approx.) ● Accommodation of extra waterproofing upon request
OT-C-BL (blue) 		3N (approx.) Weight 62 g/m (approx.)	● High sensitivity (bead surfaced with special texture) ● Accommodation of extra waterproofing upon request
OT-41BPM-W (white) 		4 N (approx.) Weight 80g/m (approx.)	● Extra high sensitivity (higher than that of OT-41BP-W below and primarily built in safety edges) ● Bending angle: R50 (approx.) ● Accommodation of extra waterproofing upon request ● Mounting channel: OC-04 (optional)
OT-41BP-W (white) 		10 N (approx.) Weight 100g/m (approx.)	● High sensitivity, High protrusion ● Multi-directional activation (See the arrows in the diagram on the left.) ● Application: door edges, various medical equipment, parking equipment, as safety sensors in industrial equipment ● Bending angle: R50 (approx.) ● Accommodation of extra waterproofing upon request ● Mounting channel: OC-04 (optional)
OT-41BP-R (red) B (black) 		10 N (approx.) Weight 100g/m (approx.)	● Available in 2 colors: red (R), black (B) ● Maximum length: 200 m ● Applications: as emergency stop switches for belt conveyers/tooling machinery ● Accommodation of extra waterproofing upon request ● Mounting channel: OC-04 (optional)

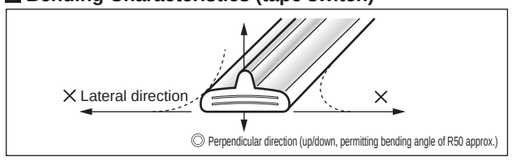
Aluminum Mounting Channel (optional)

OC-04: for OT-41BP, TS3
OC-06: for OT-02A, 02B

◆ The channel may be 2 m long max. (Holes may optionally be drilled.)
◆ For details (e.g., dimensions, mounting method), see P12.
◆ A single channel may be shipped in parts (lengths).



Bending Characteristics (tape switch)



Ratings

Rated voltage/current	AC/DC28V-1A
Withstand voltage	AC 500V (1 min)
Contact life	1,000,000 activations (tested with relay; 24 V, 0.3 A load) or more
Operating force	2.2 N (220 gf) to 27 N (2.7 kgf) approx. (underφ15 pressing plate)
Insulation resistance	100 MΩ or more (by 500 VDC insulation tester)
Contact resistance	1.0 MΩ or less (if under operating force or more)
Operating temperature range	−10℃～+60℃
Withstand load	1470 N (150 kgf; underφ100 pressing plate for 1 min)
Waterproofing property	Water-tight, drip-proof (IP-54 equivalent)
Lead wire	w/ VFF (0.75 mm, 0.5 m; standard) ※OT-80P: w/ VFF (0.5 mm2, 0.5 m)

SENSING EDGES

SENSING EDGES

Also known as a safety edge, the sensing edge is a sensor consisting of an external housing and an internal tape switch whose properties and functions are adapted to provide special characteristics.

Applications and Features

The sensing edge serves as an effective means of preventing trapping by automatic doors (including elevator, vehicle, home, high-speed shutter doors) and machines or suspending the operation of medical equipment in an emergency and avoiding collision of unmanned vehicles (bumpers).

Ratings

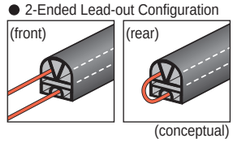
Rated voltage/current	AC/DC28V-1A
Withstand voltage	AC 500V (1 min)
Contact life	1,000,000 activations (tested with relay; 24 V, 0.3 A load)
Operating force	7.5 N (750 gf) to 30 N (3.0 kgf) approx. (underφ15 pressing plate)
Insulation resistance	100 MΩ or more (by 500 VDC insulation tester)
Contact resistance	1.0 MΩ or less (if under operating force or more)
Operating temperature range	−10℃～+60℃
Withstand load	1470 N (150 kgf; underφ100 pressing plate for 1 min)
Waterproofing property	Water-tight, drip-proof (IP-54 equivalent)
Lead wire	w/ VFF (0.75 mm2, 0.5 m)

4-Wire Lead and Open Circuit Detector

- A 4-wire control circuit (open circuit detector) for use in combination is recommended as part of standard specifications. If used, the circuit calls for a 4-wire lead. (P13-15)

◆ Orders may be for a single circuit and requests for the length of the lead wire (L), lead-out configuration (1-ended, 2-ended), and the like are accommodated.

● 2-Ended Lead-out Configuration



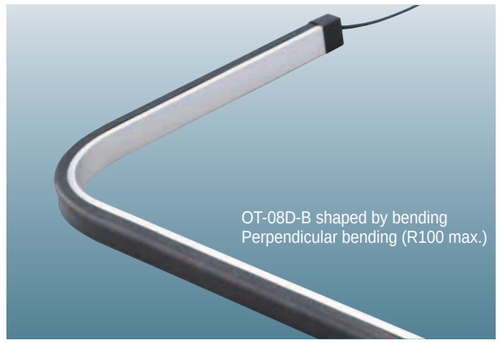
(conceptual)

Channel Designations

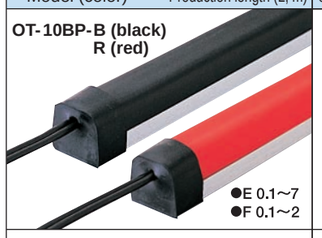
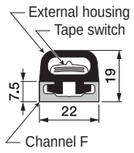
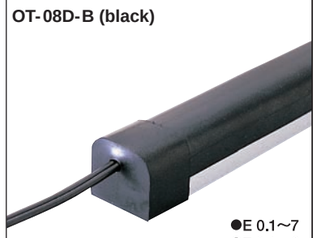
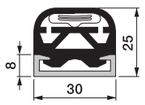
◆ Channel F refers to the aluminum flat type.
◆ Channel A refers to the aluminum angle type.
◆ Please indicate the sensor model and the channel designation (F or A) when placing an order for a channel separately.

Processing the Channel and Mounting the Edge

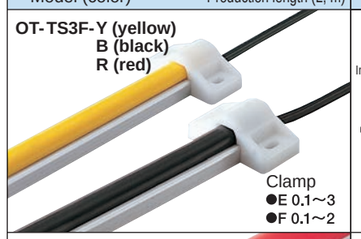
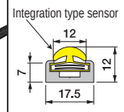
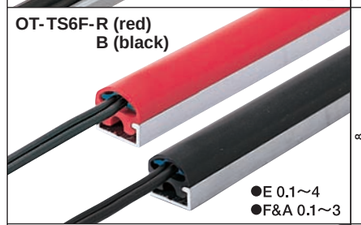
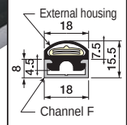
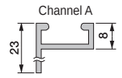
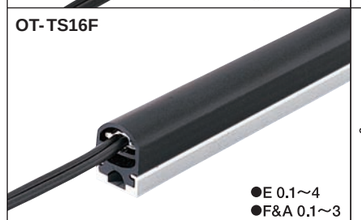
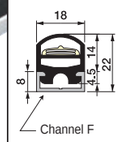
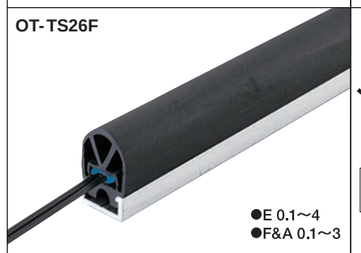
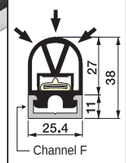
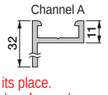
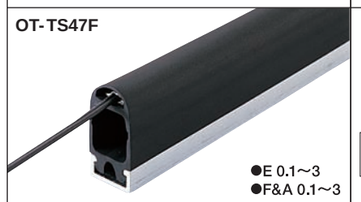
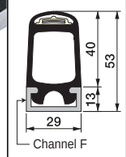
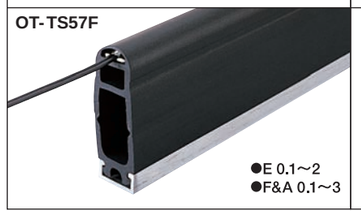
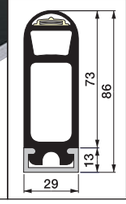
1. All sensor models come standard with a channel F.
2. A long channel may be formed by joining channel segments. (in units of L =1000 mm)
3. Drill holes in the channel separately before starting the mounting work. (Use screws of M3 to M6 (dia.) for fixing to suit a specific model.)
4. While keeping the external housing against the channel, fit it into the cover groove first along one side. Apply a solution of a household detergent or the like to the cover groove of the other side, and press the housing firmly in place in both grooves. (See the User Guide that comes with the product.)
5. The internal tape switch may easily be repaired or replaced.



■ Sensing Edges (All safety edges come standard with a flat channel F.)

Model (color) / Production length (L, m)	Cross-sectional configuration (mm)	Operating force and weight	Margin of contraction (mm)	Applications and features
OT-10BP-B (black) **R (red)**  ●E 0.1～7 ●F 0.1～2	 	17 N (approx.) Weight 490 g/m (approx.)	[Overrun cushioning property] 3 (approx.)	● External sheathing: PVC (polyvinyl chloride) ● Small-size edge: instantaneous activation type ● Color: 2; black (B), red (R) ● Applications: collision detection; machinery, medical equipment, doors, bumpers, etc. ● End cap: standard (both ends) ● Fixing screw diameter: M3 to M4 flat head screw recommended ● Channel F only
OT-08D-B (black)  ●E 0.1～7 ●F 0.1～2	 	14 N (approx.) Weight 690 g/m (approx.)	6 (approx.)	● External sheathing: EPDM (ethylene propylene diene monomer) ● Medium-size edge: high sensitivity type ● Applications: collision detection; machinery, medical equipment, doors, bumpers, etc. ● End cap: standard (both ends). ● Fixing screw diameter: M4 to M6 flat head screw recommended ● Channel F only (bending in perpendicular direction: R100 approx.)

■ Sensing Edges (All safety edges come standard with a flat channel F.)

Model (color) / Production length (L, m)	Cross-sectional configuration (mm)	Operating force and weight	Margin of contraction (mm)	Applications and features
OT-TS3F-Y (yellow) **B (black)** **R (red)**  Clamp ●E 0.1～3 ●F 0.1～2	 	27 N (approx.) Weight 280 g/m (approx.)	[Overrun cushioning property] 1 (approx.)	● External sheathing: PVC (polyvinyl chloride) ● Integrated formation with external cover ● Micro edge: instantaneous activation type ● Color: 3; red (R), black (B), yellow (Y) ● Applications: automatic doors, medical equipment, foot switches ● Fixing screw diameter: M3 flat head screw recommended (channel) ● End cap: none, with clamp doubling as cap ● Chanel F, clamp: standard (※For configuration and dimensions, see P12.)
OT-TS6F-R (red) **B (black)**  ●E 0.1～4 ●F&A 0.1～3	 	9 N (approx.) Weight 330 g/m (approx.)	1 to 2 (approx.)	● External sheathing: PVC (polyvinyl chloride) ● Mini edge: instantaneous activation type, high sensitivity peripheral switch ● Color: 2; black (B), red (R); TS6 only ● Applications: moving doors, medical tables, machinery, etc. ● Fixing screw diameter: M3 to M4 flat head screw recommended ● End cap: optional ● Channels F, A: both available (option: for both TS6/16)  ● When placing an order for an angle channel, delete the suffix F of the model designation, and indicate A in its place. EX:OT-TS16A ● There may be a lead time in filling orders for angle channels.
OT-TS16F  ●E 0.1～4 ●F&A 0.1～3	 	14 N (approx.) Weight 390 g/m (approx.)	6 (approx.)	
OT-TS26F  ●E 0.1～4 ●F&A 0.1～3	 	30 N (approx.) Weight 760 g/m (approx.)	9 (approx.)	● External sheathing: PVC (polyvinyl chloride) ● Medium-size edge: instantaneous activation type, excels in lateral operation to reduce need for post-operation action ● Applications: machine edge gates, stage lifts, bumpers, elevator doors, etc. ● Fixing screw diameter: M4 to M6 flat head screw recommended ● End cap: optional ● Channels F, A: both available  ● When placing an order for an angle channel, delete the suffix F of the model designation, and indicate A in its place. ● There may be a lead time in filling orders for angle channels.
OT-TS47F  ●E 0.1～3 ●F&A 0.1～3	 	13 N (approx.) Weight 950 g/m (approx.)	25 (approx.)	● External sheathing: TPE (polyolefin-family thermoplastic elastomer) ● Large-size edge: instantaneous activation type ● Accommodation of instantaneous and low-speed operation ● Reduction of shock from instantaneous and low/high-speed operation (priority on operation) ● Applications: high-speed door switches, gym doors, accordion doors, vehicle bumper switches, etc. ● Fixing screw diameter: M4 to M6 flat head screw recommended ● End cap: optional ● Channels F, A: both available (option: for both TS47/57)  ● When placing an order for an angle channel, delete the suffix F of the model designation, and indicate A in its place. ● There may be a lead time in filling orders for angle channels.
OT-TS57F  ●E 0.1～2 ●F&A 0.1～3	 	13 N (approx.) Weight 1500 g/m (approx.)	60 (approx.)	

◆ Symbols Used ●E (edge): refers to the external housing (protective cover) and indicates available production lengths (L, m). ◆ A channel length may represent the sum of the lengths of individual channel segments.
●F (flat) ●A (angle): refers to the aluminum channel configuration and length. (A long channel may be formed by joining channel segments.)

MAT SWITCHES

MAT SWITCHES

With the spread of factory automation (FA), the interiors of factories are increasingly becoming hazardous to us because of the presence of the large number of industrial robots and large-scale machines, requiring us to do what we can to eliminate the identified hazards as responsible members

OJIDEN's mat switches use tape switch elements of Tapeswitch. Known for their safety performance and high reliability, you may choose them with confidence.

Applications and Features

The characteristics of mat switches may be brought to full play in various ways in eliminating hazards; e.g., by creating an off-limits zone around an industrial robot, NC tooling machine, and the like, installing them in automatic doors, or using them as part of crime-prevention systems.

1. Contains a long-life, high-reliability built-in tape switch.
2. Excels in resisting impact as from a dropping object. Permits repairs in the event of damage or line disconnection.
3. Manufactured of high-quality rubber. Both oil-resisting (NBR) and non oil-resisting (NR) types designed against slippage (block/rib texture).

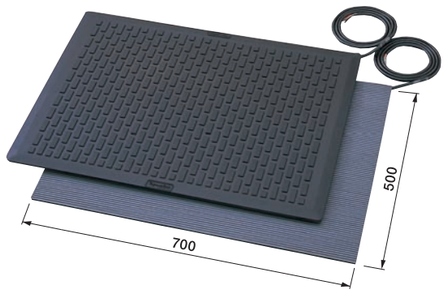
◆ A 4-wire control circuit (open circuit detector) for use in combination is recommended as part of standard specifications. (P13-15)

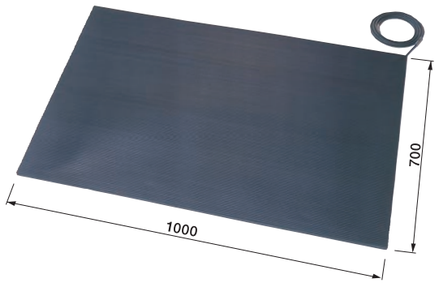
■ Ratings

Rated voltage/current	AC/DC28V-1A
Withstand voltage	AC 500V (1 min)
Contact life	1,000,000 activations (tested with relay; 24 V, 0.3 A load)
Operating force	40 N (4000 gf) to 60 N (6000 gf) approx. (under φ90 pressing plate)
Insulation resistance	100 MΩ or more (by 500 VDC insulation tester)
Contact resistance	0.05 to 1.6 MΩ or less (if under operating force or more)
Withstand load	1960 N (200 kgf; underφ100 pressing plate for 1 min)
Exterior sheathing (rubber)	available in 2 types: oil-resisting (NBR), non oil-resisting (NR)
Lead wire	w/ S-VCTF (0.75 mm2, 4 strands, 1.5 m)

4-Wire Mat Switch for Creation of a Safety Zone

- **OM-754** block-texture rubber (black), oil-resisting (NBR)
- **OM-7541** rib-texture rubber (gray), non oil-resisting (NR)
- **OM-1074** rib-texture rubber (black), oil-resisting (NBR)





■ Table of Mat Switch Models

Model	Size (mm) H×W×t	Surface pattern (color)	Material	Operating force	Operating temperature range (℃)	Waterproof property (IP)	Weight (kg, approx.)	Inventory designation
OM-754	500×700×14	Block (black)	Oil-resisting rubber (NBR)	50 N (approx.)	−10～+60℃	Drip-tight (IP-54 equivalent)	5.0	○
OM-7541	500×700×10	Rib (gray)	Non oil-resisting rubber (NR)	50 N (approx.)			4.0	○
OM-1074	700×1000×14	Rib (black)	Oil-resisting rubber (NBR)	50 N (approx.)			8.5	○

◆ Inventory designation: if ○, available in stock.

Placing Orders for Custom-size Mat Switches

Category — Height (H) × Width (W) × Thickness (T) (10 or 14 mm) — Lead wire

① Material and color: NBR (oil-resisting), NR (non oil-resisting)

② Size: Dimensions (mm), Configuration (by simple diagram)

③ Lead-out and position and length of lead wire

◆ Maximum Size Per Mat
1200 H x 3000 W x 10 or 14 T
※ If orange, 1000 H x 2000 W x 15 T.

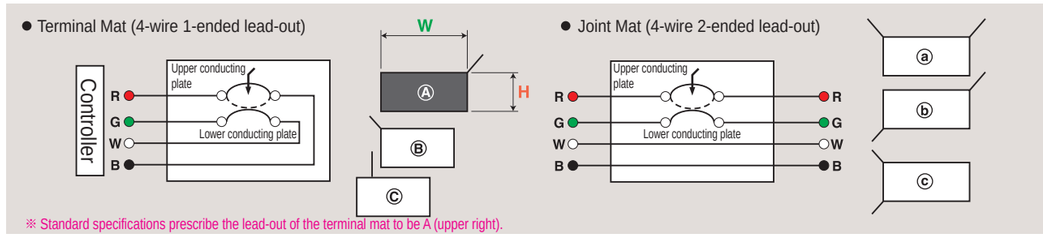
◆ Provide appropriate information (1 through 3 on left).

◆ If a custom-size mat switch is desired, its use in combination with a fail-safe controller is recommended.

◆ The orders will be filled with a short lead time.

Specifications		Standard	Optional
Upper rubber	Oil-resisting (NBR)	Black (rib-texture rubber)	Black (flat); Orange (flower pattern) ※15 T (thickness) only.
	Non oil-resisting (NR)	Gray (rib-texture rubber)	Green (rib-texture rubber); Yellow (rib-texture rubber); Red (rib-texture rubber); Black (rib-texture rubber); Black (flat)

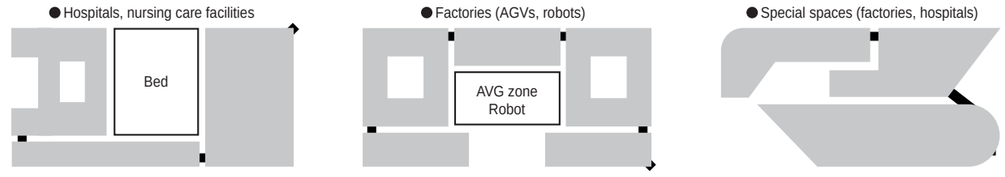
Dimensions (configuration) and Lead Wire Lead-out Position/Color Coding (R: red, G: green, W: white, B: black)



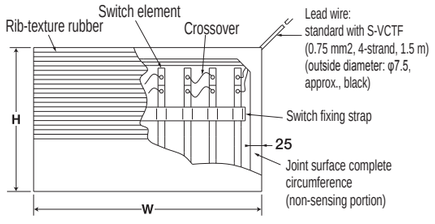
※ Standard specifications prescribe the lead-out of the terminal mat to be A (upper right).

Custom/Multi-zone Mat Switch

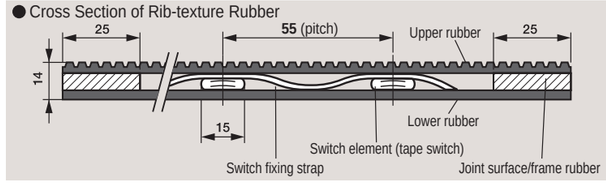
◆ The mats may be of a combination of different colors, altered (shape), hollowed out, and joined.



Basic Construction and Parts



Enlargement of Cross Section



Under-Rug Switching Runner

MAT SWITCHES

These thin CVP and PE Series of mat switches may be placed under a carpet or a rug. Hidden underneath, they will prove to be a highly effective means of preventing crimes.

Applications and Features

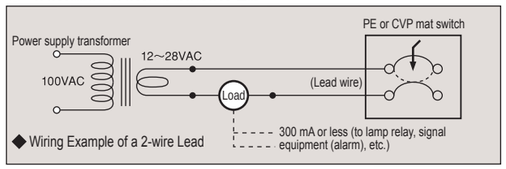
■ CVP Series (UL-certified)

- ● They operate at 28 V AC/DC and 1 A (rated voltage/current).
- ● Being 4.4 mm in thickness, they are thin yet excels in drip resistance and durability.
- ● They may be used either exposed on the floor or placed under a carpet or rug.

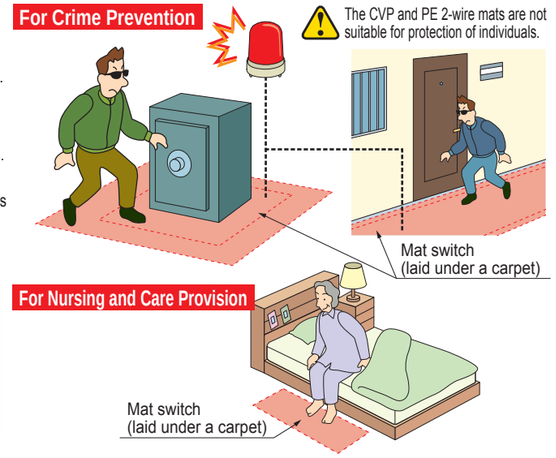
■ PE Series (for indoor use)

- ● They operate at 28 VAC/DC and 1 A (rated voltage/current).
- ● While being 2.4 mm in thickness, they are not waterproof and are used indoors.
- ● They may be cut to desired lengths, creating a wide area of detection.
- ● A 2-wire lead is soldered for connection, and the mats are laid under floor boards or a carpet. (See the User Guide that comes with the product.)

● Contact Construction 1a



◆ Wiring Example of a 2-wire Lead



CVP Switching Mat Switch (2-wire type)

UL-certified product

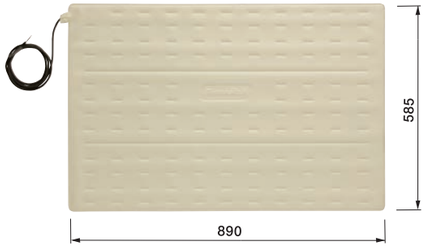
CVP723

UL-certified product

CVP623

CVP301

- ● The mat may be easily installed for detection of human movement (e.g., of those with wandering symptoms). They are inconspicuous and made of softer material for better durability and texture.



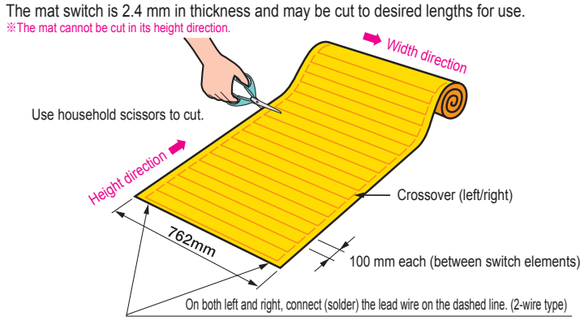
■ Table of Mat Switch Models

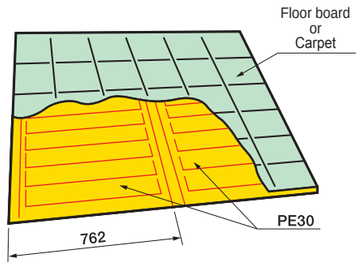
Model	Size (mm) H×W×t	Lead wire 2-wire type	Surface pattern (color)	Material	Operating force (underφ90 pressing plate)	Operating temperature range	Waterproof property	Weight (kg, approx.)
OM-CVP623	152×585×4.4	Included (0.4 m, approx.)	Olive	Vinyl	60 N (approx.)	−5~+60℃	Heat seal, drip-proof	0.3
OM-CVP723	432×585×4.4	Included (1.8 m, approx.)						0.75
OM-CVP301	585×890×4.4	Included (robot cable; 1.5 m, approx.)	Beige	Vinyl	60 N (approx.)	−5~+60℃	Water-tight, drip-proof	1.4

PE Under-rug Switching Runner (2-wire type)

The mat switch is 2.4 mm in thickness and may be cut to desired lengths for use.

※The mat cannot be cut in its height direction.



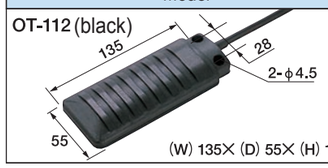


■ Table of Mat Switch Models

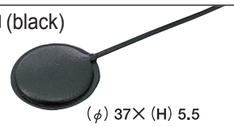
Model	Size (mm) H×W×t	Lead wire 2-wire type	Surface pattern (color)	Material	Operating force (underφ90 pressing plate)	Operating temperature range	Waterproof property
OM-PE30	7500×762×2.4	Separately available	Yellow	Polyethylene film	60 N (approx.)	−5~+60℃	Non drip-proof

FOOT SWITCHES TOUCH PADS

■ Foot Switches

Model	Operating force (underφ90 pressing plate) and weight	Applications and features
OT-112 (black)  (W) 135× (D) 55× (H) 15.5	107 N (approx.) 230 g (approx.)	● External sheathing: NBR (oil-resisting rubber) ● Applications: for operation of medical equipment, general small-size industrial equipment, and sewing equipment ● Drip-proof ● Flexible and durable, resistant to stomping and jumping ● a-contact (momentary type) ● Lead wire: included (S-VCTF; 0.75 mm2, 2-strand, 2 m ● Mounting: with 2-M4 or double-sided tape, etc. ● Rated voltage/current: 28 V AC/DC, 1 A

■ Touch Pads

Model	Operating force (underφ90 pressing plate) and weight	Applications and features
OT-TP-2 (black)  (W) 50× (D) 50× (H) 10	28 N (approx.) 24 g (approx.)	● External sheathing: PVC (polyvinyl chloride) ● a-contact (momentary type) ● Lead wire: included (24 AWG, 2-strand, 480 mm) ● Mounting: with double-sided tape, adhesive, etc. ※Electrical ratings: Use 28 V AC or DC, 0.3 A or less for safety. (produced by Tapeswitch Corporation)
OT-NO-1 (black)  (φ) 37× (H) 5.5	17 N (approx.) 7 g (approx.)	● External sheathing: PVC (polyvinyl chloride) ● Applications: wide-ranging; e.g., for detection in an area with a limited mounting space, for transmission of a signal in response to release (lifting) of an object. ● Thin, water-tight ● a-contact (momentary type) ● Lead wire: included (24 AWG, 2-strand, 480 mm) ● Mounting: with double-sided tape, adhesive, etc. ※Electrical ratings: Use 28 V AC or DC, 0.3 A or less for safety. (produced by Tapeswitch Corporation)
OT-NO-2 (black)  (W) 27.5× (D) 22× (H) 5.5	11 N (approx.) 7 g (approx.)	

BUMPER SWITCHES

BUMPER SWITCHES

OJIDEN's bumper switches are safety switches characterized by their excellent cushioning property, serving to eliminate hazards by detecting contact or collision.

Applications and Features

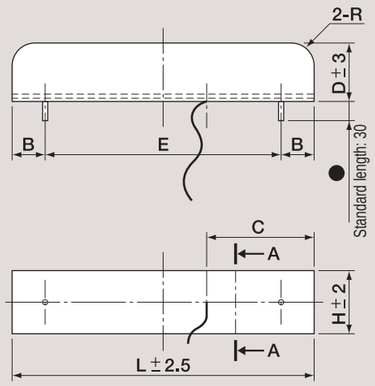
The switches may readily be installed in unmanned vehicles, medical/care-related robots, large-scale X/Y tables, or other moving equipment for prevention of accidents.

■ Specifications

	Standard	Optional			
Rated voltage/current	AC/DC28V-1A				
External sheathing	Vinyl leather	Vinyl leather	Splash	LASTAN (heat-resistant)	Aluminum leather
External sheathing color	Black	User-specified	Black	Gray	Metallic gloss
External sheathing sewing	Stitching				
Cushioning material	Urethane foam				
Base plate	Plywood (15 mm thick; 2400 mm max. in length)	Steel sheet, aluminum, hard vinyl chloride			
Mounting screw	M8 L=30mm	As specified by user			
Operating force	30 N (approx.)				
Wire type	4-wire or 2-wire resistance type				
Lead wire	VFF 0.3mm² red, black x 2	As specified by user			
Lead wire length	500mm	As specified by user			

※ The bumper switches are custom-made items. Provide necessary information by furnishing a drawing.

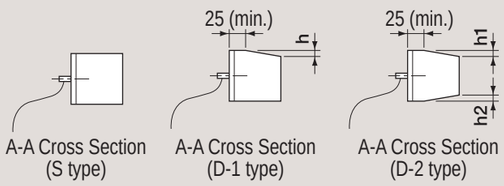
Body Dimensions/Configuration



● When placing an order, provide the following information:

- ◆L length (mm)
- ◆D depth (mm)
- ◆H height (mm)
- ◆R corner radius (R≦D-30)
- ◆B・E mounting screw position
- ◆C lead wire lead-out position

※The minimum H and D dimensions are 50 mm (reference only).



※Indicate dimension h.

ACCESSORIES

■ Accessories

Applications and Features

The clamp is used to fix the channel in place (both sides).

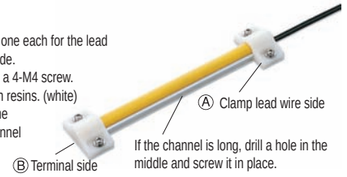
●OC-043

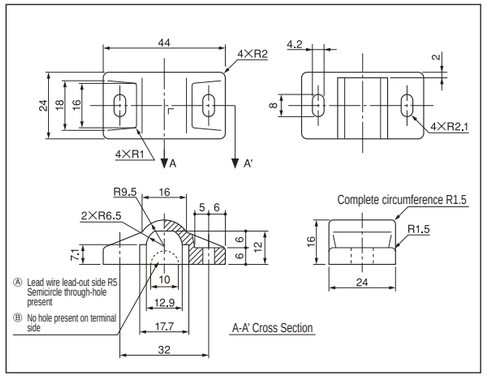
Applicable model: TS3F
(OC-04 additionally available)

Applications and Features

In addition to fixing a channel in place, the clamp provides the functions of an end cap and can help improve the marketability of products (e.g., OT-TS3F, OT-41BP).

- A single set of clamps contains one each for the lead wire side and for the terminal side.
- The clamp is fixed in place with a 4-M4 screw.
- The camp is molded of Duracon resins. (white)
- OT-TS3 Series of products come standard with an aluminum channel and clamps.
- The clamp portions on both ends are non-sensing portions.



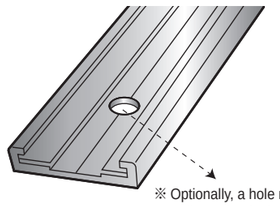


Aluminum Mounting Channel

Use the channel when mounting a tape switch (P4).

●OC-04 applicable models: OT-41BP, TS3
●OC-06 applicable models: OT-02A, 02B

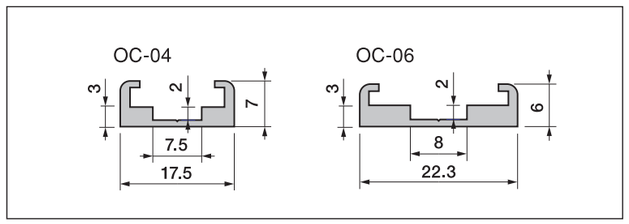
- ◆ The maximum length is 2 m. (For a longer channel, join multiple channels.)
- ◆ The channel may be shipped in parts (lengths).



※ Optionally, a hole may be drilled.
Indicate the desired dimensions by furnishing a drawing.

Mounting the Channel

① Drill a mounting hole (for M3 to M4 screws), and screw it in place. If desired, tape it in place using double-sided tape.
② Thereafter, insert the switch.

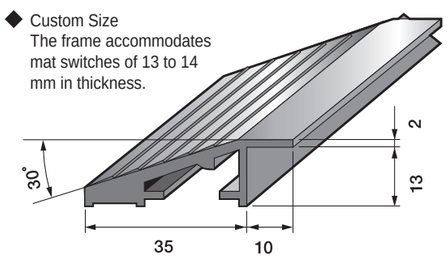


Aluminum Joint Frame (option)

The frame fixes the sides around the mat switch in place in the shape of a slope, serving to prevent tripping. Not only aesthetically pleasing, it draws attention for better identification of a hazardous area.
Contact us for further information. Mounting dimensional drawings are available.

●OMC-45 (joint frame)

◆ Custom Size
The frame accommodates mat switches of 13 to 14 mm in thickness.



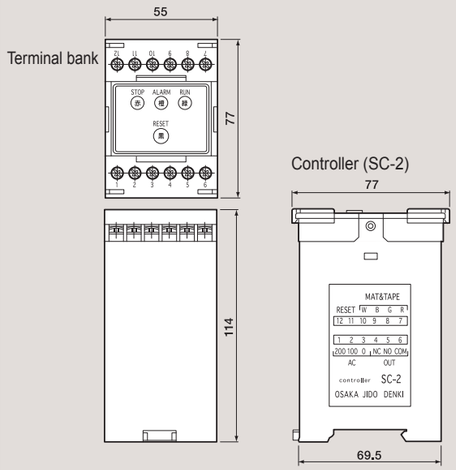
FAIL-SAFE CONTROLLER

4-Wire Type Control Circuit (open circuit detector)

The fail-safe controller is an open circuit detection circuit that serves to create a safety zone as part of factory automation work.

Used in combination with a 4-wire type mat switch, edge/tape switch, or the like, it ensures an output identical to that occurring in response to switch activation in the event of a problem on the power supply or a line disconnection/power outage in switching circuitry.

● SC-2
(for AC-specific application)



■ Specifications

Input voltage	AC100, 200V
Power consumption	5W
Output contract	1c AC250V-5A, DC30V-5A
Output contact life	50,000 activations (250 VAC, 5 A)
Mounting	DIN rail type, no mounting hole
Material	ABS resin
Weight	274 g (approx.)

■ Guide to a 4-wire Type Control Circuit

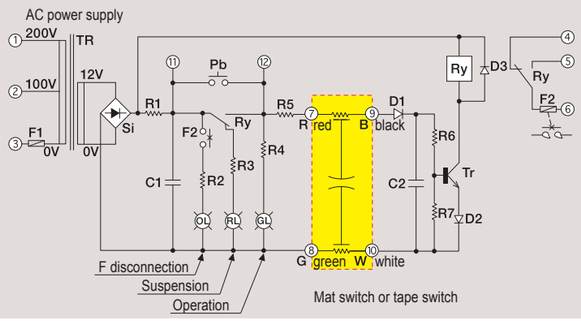
The circuit is used in combination with a 4-wire type mat switch, edge/tape switch, or the like for detection of line disconnections.

① Connect the 4-wire mat switch for example; then, connect a 100/200 V power supply.
② Keep a low-level current flowing at all times, thereby keeping the relay contact built in the SC-2 ON. (The light-emitting diode glows green.)
③ Under the weight of an individual, the voltage drops so that the relay contract goes OFF. (The light-emitting diode glows red instead of green.)
④ In the event of an open circuit or short circuit, the absence of voltage causes the relay contact to go OFF. (The light-emitting diode glows red instead of green.)
⑤ In the event of a power outage or blowout of a fuse, the relay contact goes OFF. (The light-emitting diode goes OFF.)

→ Activates the emergency stop circuit. → The machine stops to operate.

◆ The CS-2 circuit is designed based on self-maintaining circuitry, calling for resetting each time the mat/tape switch is activated.
◆ If a direct circuit configuration (without the need for resetting) is used, short-circuit reset terminals 11 and 12 with a lead wire. (See the diagram below.)

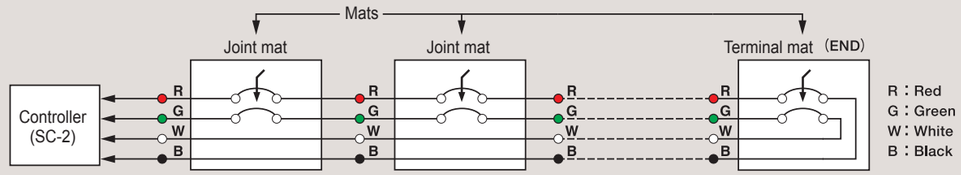
● SC-2 Controller Circuit Diagram



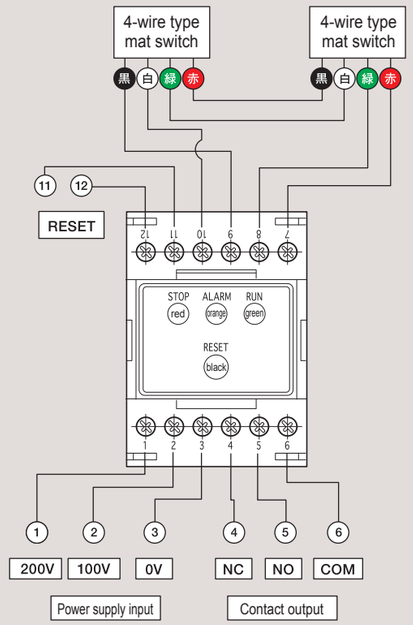
※Avoid the outdoors and a site subject to water, oil, or excessive vibration for use.

4-Wire Type Control Circuit (Fail-safe Controller) Wiring Example

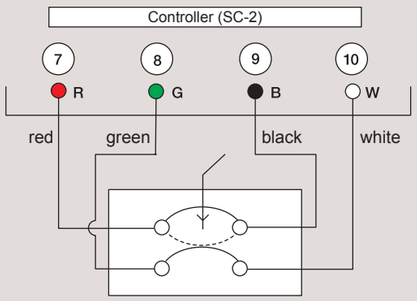
● Wiring Example 1: 4-wire type mats in a coupled configuration



● Wiring Example 2: 4-wire type terminal mat (2 pc.)
SC-2 (fail-safe controller)

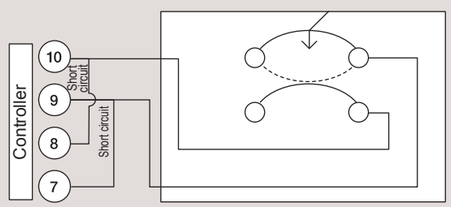


● Wiring Example 3: 4-wire type edge/tape switch

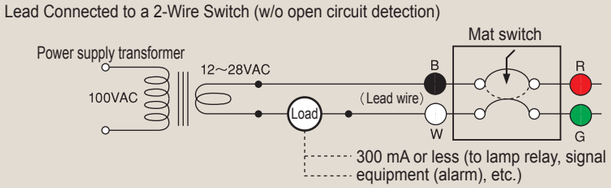


※Be sure each terminal number matches the wire color indicated.

● Wiring Example 4: 2-wire type mat/tape switch (w/o open circuit detection)



◆ 4-Wire Lead Connected to a 2-Wire Switch (w/o open circuit detection)



● Activation is initiated in response to the weight of an individual (e.g., activating the relay circuit and others).
◆ Open circuits are not detected.

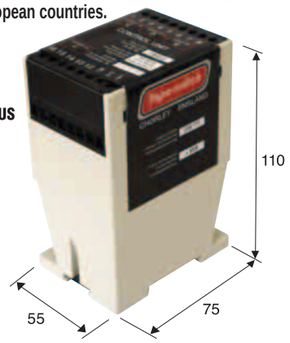
※ Other Ways of Connecting to a 2-wire Switch
1.Use red (R) - green (G).
2.Use red, black - green, white in a bundle.
◆ Insulate the lead wires not in use.

FAIL-SAFE CONTROLLER

Fail-safe Controller (open circuit detector; CE-certified)

The controller is employed in 4-wire mat switches/sensing edges exported to the US and European countries.

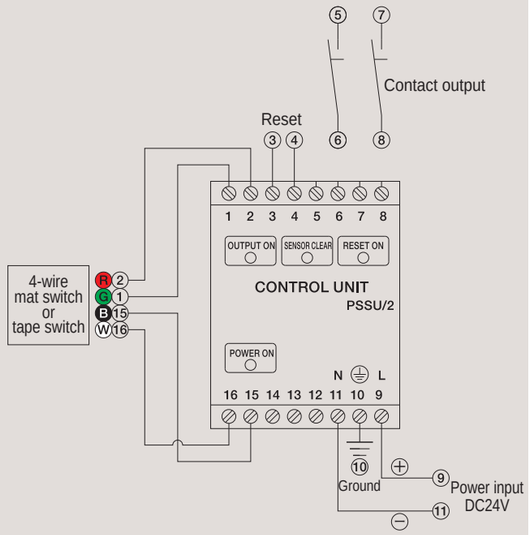
● PSSU-2
(DC application-specific)



■ Specifications

Safety class	3 (EN954-1)
Input voltage	DC24V
Power consumption	6W
Safety output	2 circuits (2a-contact)
Output contact	DC24V-2A
Reset function	Only externally (remote)
Monitor output	Absent
Monitor lamp	Present
Mounting	DIN rail type, w/ mounting hole (2-φ 4-6)
Material	Polycarbonate
Weight	250 g (approx.)

● Connection Terminals and Wiring Example



※ NOTE:Not designed for use in a direct circuit.

Fail-safe Controller (open circuit detector; CE-certified)

The controller uses a high-accuracy safety double coil.

● PRSU-4

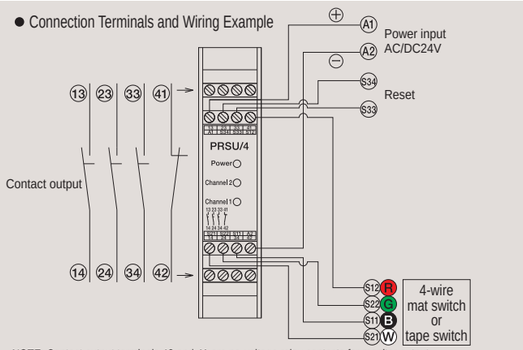
◆ The circuit of PRSU-4 is designed based on self-maintaining circuitry, calling for resetting each time the mat/tape switch is activated.

◆ If a direct circuit (without the need for resetting) is used, short-circuit reset terminals (S34) and (S33) with a lead wire. (See the diagram below.)

■ Specifications

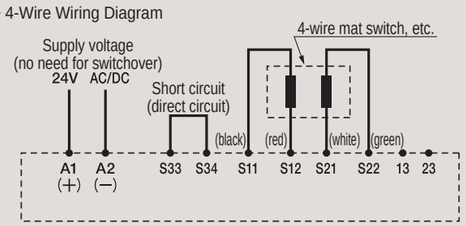
Safety class	3 (EN954-1)
Input voltage	DC24V
Power consumption	5W
Safety output	3 circuits (3a-contact)
Output contact	AC230V-5A
Reset function	Directly or externally (remote)
Monitor output	Present (in normal state; 1b-contact)
Monitor lamp	Absent
Mounting	DIN rail type, no mounting hole
Material	Polycarbonate
Weight	170 g (approx.)

● Connection Terminals and Wiring Example



NOTE: Contact output terminals 42 and 41 are no-voltage relay contacts for monitor output.
Do not use them for suspension of machine operation in an emergency, as they are not safety outputs.

● 4-Wire Wiring Diagram



⚠ POINTS TO NOTE ABOUT SAFETY
(guide to handling the product)

■ It is very important that you read the User Guide before using the product and keep it in a safe, readily accessible place.

① Use the product within the indicated range of ratings for safety. (Be sure the voltage is 28 V AC/DC, 1 A, or less or a minimum voltage, and the current is 5 V 20 mA or more.)
② Connect the product correctly as indicated in the wiring diagram. (Check the wiring using a tester or the like before using the product.)
③ While the product has a drip-proof construction, do not use it where it may become submerged in water or is subject to constant exposure to water. (Failure to observe this can result in short-circuiting or eclectic shocks. Be sure its external connections are appropriately waterproofed.)
④ Use a special mounting frame when fixing a mat switch in place. (Nails and screws directly used on the mat surface can damage the internal switching mechanism.)
⑤ Be sure the product is installed on a level floor and never on an irregular surface. (Failure to observe this can result in malfunction or open circuits.)
⑥ Do not install the product in a place subject to low/high temperatures or in an environment outside its specifications. (Failure to observe this can result in deterioration of switch performance or a shorter service life.)
⑦ Do not drag or pull up the lead wire of the product, and do not subject its lead-out to excessive force. (Failure to observe this can result in malfunction or open circuits.)
⑧ The product is of a normally-OFF type. Do not keep it activated (ON) under a heavy load over a long period of time. (Failure to observe this can bring about a functional drop in its switching mechanism.)
⑨ When moving or storing the mat switch, do not roll it or keep it bent for a long period of time. (Failure to observe this can result in malfunction or open circuits.)
⑩ Do not use such solvents as thinner, benzene, and toluene on the product. (Failure to observe this can lead to altered properties, discoloration, or other problems.)
⑪ Do not drop a sharp metal piece or the like on the product. (Failure to observe this can lead to short circuiting or open circuits.)
⑫ If possible, employ a fail-safe open circuit detector (e.g., SC-2, PSSU, PRSU; 4-wire control circuit) that remains powered at all times.
⑬ The CVP series of mats and PE30 are not suitable for use as a means of protecting individuals.
⑭ Do not twist the product in a lateral direction.
⑮ Do not deform, disassemble, or modify the product.

■ Maintenance and Safety

① Check to see that the product functions normally before starting work, always turning off the power at the end.
② Do not disassemble or attempt to repair the product (on the part of the user). Upon discovery of a problem, stop using the machine for which the product is used, and follow the appropriate safety procedure.

■ Others

① Problems with the product arising as a result of not observing the foregoing points will invalidate all right to compensation.
② Problems, if any, are deemed to have been compensated for by shipment of a replacement of the product, and OJIDEN will not be liable for any cost of replacement incurred.
③ Where accidents or the like, if any, occurring in connection with a problem in the product are concerned, OJIDEN shall not be liable for associated expenditures.

※The specifications, materials, and other particulars of the products introduced herein are subject to change without notice.
※The colors of the products as they appear herein may differ from actual colors because of printing and filming conditions.

■ EN 999/ISO 13852/JIS B 9715
"Positioning of Protective Devices in Relation to Approach Speeds of Human Bodies"

If used as a means of suspending the operation of a machine in an emergency, there must be an adequate distance of safety.

These standards prescribe minimum distances that must be allowed between the hazard-inducing portion of a machine and the protective device used. Referred to as a "safety distance," it is calculated with reference to the direction of approach of human bodies, response time of the protective device, response time of the machine, and the size of the smallest object detected by the protective device.

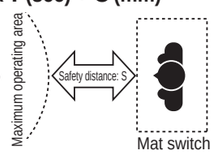
Safety Distance

Distance that must be allowed between safety switch and hazard-inducing portion.

Computational Formula

S (mm) = K (mm/sec) x T (sec) + C (mm)

S:minimum safety distance between maximum operating area and switch detection area
K:human body approach speed (gait speed)
T: length of operation suspension time of entire system
C:additional distance suited to switch detection capability



FOOT SWITCHES

OJIDEN's Foot Switch Series Made in Japan

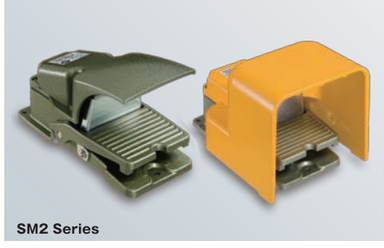
Popularly known also for the production and sale of tape switches and mat switches, OJIDEN is Japan's only one general manufacturer of foot switches.
With the corporate principles firmly rooted in its regard for the welfare of humankind, the company has brought into being a variety of products that contribute to the well-being of the global environment all the while with the safety and economy of their application in mind for the past 50-plus years since its foundation. The reliability of the company's products is highly acclaimed as attested by their extensive use and prominence in diverse fields.

Product Lineup


OFL standard Series

- Various tooling machinery
- Woodworking machinery
- Vehicle transportation
- Facilities equipment
- Household equipment
- Industrial equipment

Other general applications


SM2 Series

- Press equipment
- Shirring equipment
- Various industrial equipment
- Tooling equipment
- Facilities equipment
- Automation line
- Woodworking equipment
- Medical equipment
- Instrumental equipment
- Various equipment
- Sewing equipment
- Household equipment


S6&M6・S7 Series

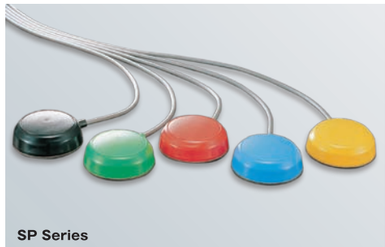
- Medical equipment
- Food processing equipment
- Ocean vessel equipment
- Industrial equipment
- Household equipment


S3 & M3 Series

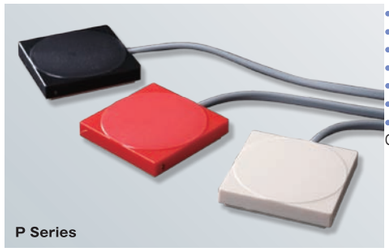
- Medical equipment
- Instrumental equipment
- Photographic equipment
- Industrial equipment (small-size)
- General equipment
- Sewing equipment
- Office equipment
- Household equipment


M4 Series

- Medical equipment
- Office equipment
- Photographic equipment
- Household equipment (small-size)
- Electric equipment
- Sewing equipment


SP Series

- Medical equipment
- Food processing equipment
- Ocean vessel equipment
- Industrial equipment
- Household equipment


P Series

- OA equipment
- Medical equipment
- Electronic equipment
- Sewing equipment
- Educational equipment
- Instrumental equipment
- Household equipment

Other general applications


S5 Series

- Medical equipment
- Office equipment
- Photographic equipment
- Household equipment
- (small-size)
- Electric equipment
- Sewing equipment
- Food factory
- Ocean vessel equipment

ISO9001:2000

Scope of Application

Design, development, and production of foot switches, tape switches, and mat switches.

KES Step 2
(Environment Management Standard)

Scope of Registration

Production and sale-related all corporate operations for foot switches, tape switches, and mat switches executed by the registered organization.

Efforts for Environmental Preservation

Osaka Jido Denki Co., Ltd., acknowledges that the preservation of the global environment is one of the most important issues shared by all humankind and commits itself to the curtailment of loads on the environment through company-wide efforts.

Environmental Policy

With the aim of abating the effects on the environment of its foot switches, tape switches, and mat switches and the activities relating to the manufacture/sale of these products, Osaka Jido Denki Co., Ltd., promotes undertakings that relate to environmental management in line with the following guidelines to achieve a harmonious relationship with the ever important global environment.

We will maintain a keen awareness of the environmental effects of our activities, products, and services on the environment at all times and thus encourage efforts toward the prevention of environmental contamination and improve on our environmental management programs at the same time.

We will remain in complete compliance with the environment-related laws and regulations as well as other relevant requirements associated with our activities, products, and services.

Of the effects on the environment associated with our activities, products, and services, we will address the following as the primary objectives of our environmental management programs:

(1) reduction in power consumption
(2) reduction of wastes and promotion of recycling
(3) reduction in office paper consumption
(4) execution of 3S activities
(5) contribution to society through participation and the like in local environmental programs and cleaning around the corporate site

So that each member may play an active role in activities aimed at the reduction of loads on the environment, we will ensure that the pledge given herein by way of an environmental declaration will be made thoroughly known to all our employees and announced to the general public.

We will take active part in activities aimed at the improvement of the environment of the local community.

In accomplishing the foregoing objectives, we will set forth specific goals and periodically review the progress, thereby further consolidating our environmental management system.