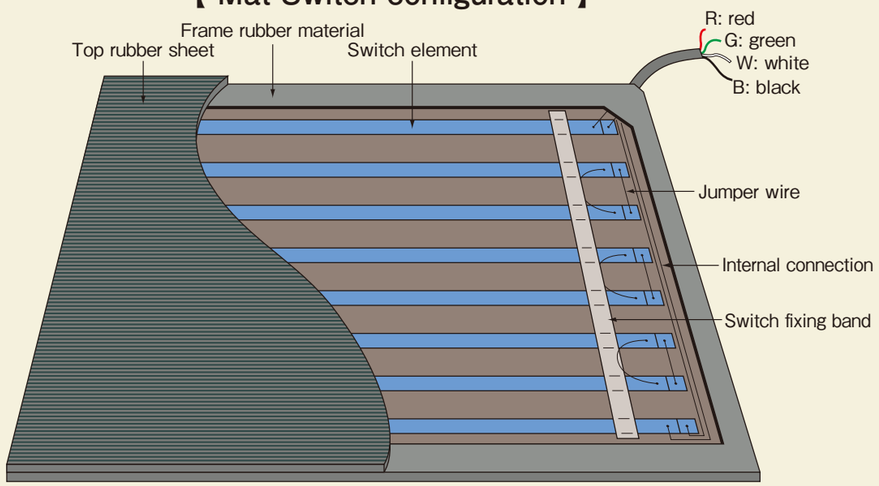
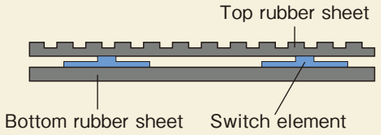
TOKYO SENSOR
MAT SWITCH®
Highly reliable and durable mat switches ranging from standard switches to custom switches

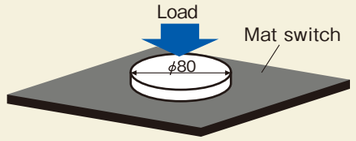
【 Mat Switch configuration 】



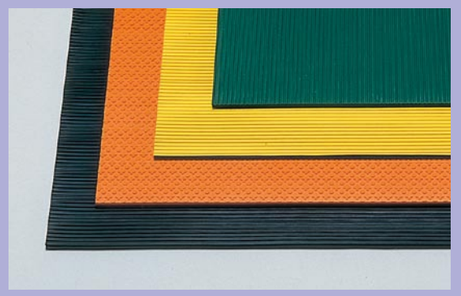
【 Enlarged cross-sectional view】



【 Actuating force measurement method】

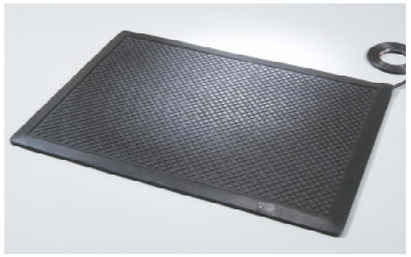


These switches can be used in factories in which machines and robots are used as well as in the home and many other places.
You can select the type of switch that is suitable for your application, from standardswitches to custom-made products.



* The use of a tape switch with a simple construction significantly improves quality, performance and stability.
* Combining a mat switch with an FSC controller enables a broken wire to be detected.
* Excellent impact resistance and durability
* Oil resistant or non-oil resistant high quality rubber can be selected.
* The customer can specify the desired dimensions and shape when ordering a mat switch

Standard products

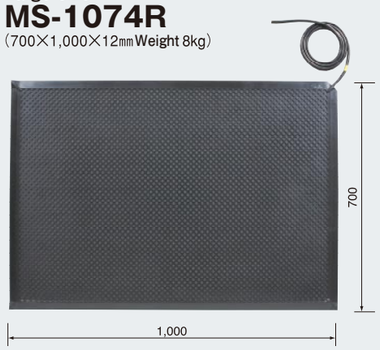


Standard mat switches can be used in factories where press machines, industrial robots and automated machines are installed, as well as in the home.

* These switches are 4-wire output types that support a wire breakage detection function. They use oil resistant rubber.
* The anti-slip pattern on the surface is a block pattern that ensures good slip resistance regardless of the direction in which a person walks over it.
* The edges of the mat are treated so as to prevent people from tripping over it.
* Also available with water resistant specifications (optional) (JIS C 0920: 2003 Protection class 7)

Standard size
MS-754R
(500×700×13㎜ Weight 5kg)

Large size
MS-1074R
(700×1,000×12㎜Weight 8kg)



* Color of top rubber: Black
* Actuating force: Approx. 80 N
* Withstand load: 20 kN (ϕ80 mm, for 1minute)
* Lead wires: SVCTF (black)
  4-core, 0.75 mm2 1,500 mm
  Top right takeoff (R type) (Standard)
  Top left takeoff (L type)
  Mat with both leads (W type)
  Regarding L and W types, check the delivery date.

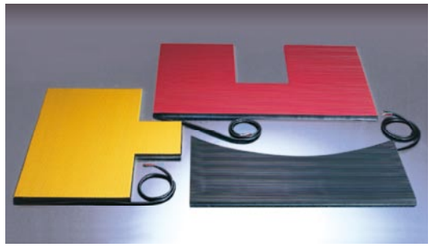
* Avoid placing a mat switch in a puddle or other location that is continuously exposed to water.

Note: Use mat switches on flat floor surfaces. If you place one on an irregular surface, it is likely to malfunction or break down.

Specifications

Rated voltage	5 – 24 V AC/DC
Rated current	0.01 – 0.3 A (resistive load)
Insulating resistance	10 MΩ min (250 VDC)
Dielectric strength between electrodes	250 VDC for 1 minute
Operating temperature range	−10~50℃
Storage temperature	−10~60℃
Storage humidity	90% RH max

Customized products



These mat switches are finished in such a way that they can be readily customized (dimensions, sensitivity, material, etc.), according to the desired application.

* Available as oil resistant, non-oil resistant, thin and thick types to meet various applications.
* Can be manufactured to the customer's desired dimensions and shape.
* Available in a wide range of types, including those that can withstand heavy objects such as automobiles.
* Available with waterproof specifications (optional).

Specifications	Standard	Option
Size	Specified shape within the range of 300 mm × 300 mm – 1,200 mm × 3,000 mm Tolerance: Each side +0 -5 mm	Orange (floral pattern): Up to 1,000 mm × 2,000 mm Black (striped pattern): Up to1,000 mm × 3,000 mm
Thickness	10 mm or 14 mm	10 mm or 14 mm Black (flat) top rubber is 9 mm or 15 mm Orange (floral pattern) and black (striped pattern) top rubber are 11 mm or 15 mm
Lead wires	SVCTF (black) 4-core 0.75 mm2	SVCTF (black) 2-core 0.75 mm2
Length of lead wires	1,500mm	Specified length
Lead wire exit	Top right with longer side of rectangle at the bottom	Position specified according to drawing instructions (Both connecting leads can also be taken off from rear side of mat.)
Anti-tripping design	—	Any side of the mat can be cut tapered.
Sensitivity	Approx. 80 N in the case of a ϕ80 disk	We can manufacture high sensitivity types and sensors that can withstand heavy objects.
Withstand load	20 kN (ϕ80 mm, 1 minute)	—
Water resistance	—	JIS C 0920: 2003 Protection class 7 (Excluding the type of back side wire exit)

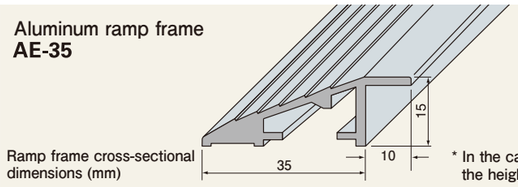
Specifications		Standard	Option
Top rubber	Oil resistant	Black (stripes)	Black (flat), Orange (floral pattern), Black (striped pattern)
	Non-oil resistant	Gray (stripes), Black (stripes)	Black (flat), Red (stripes), Green (stripes), Yellow (stripes)

Ramp frame

Aluminum ramp frames are available to fix the mat in place and to prevent people from tripping over it. Two types are available to match the thickness of the mat. Note that these aluminum ramp frames cannot be used on edges that have been tapered to prevent tripping

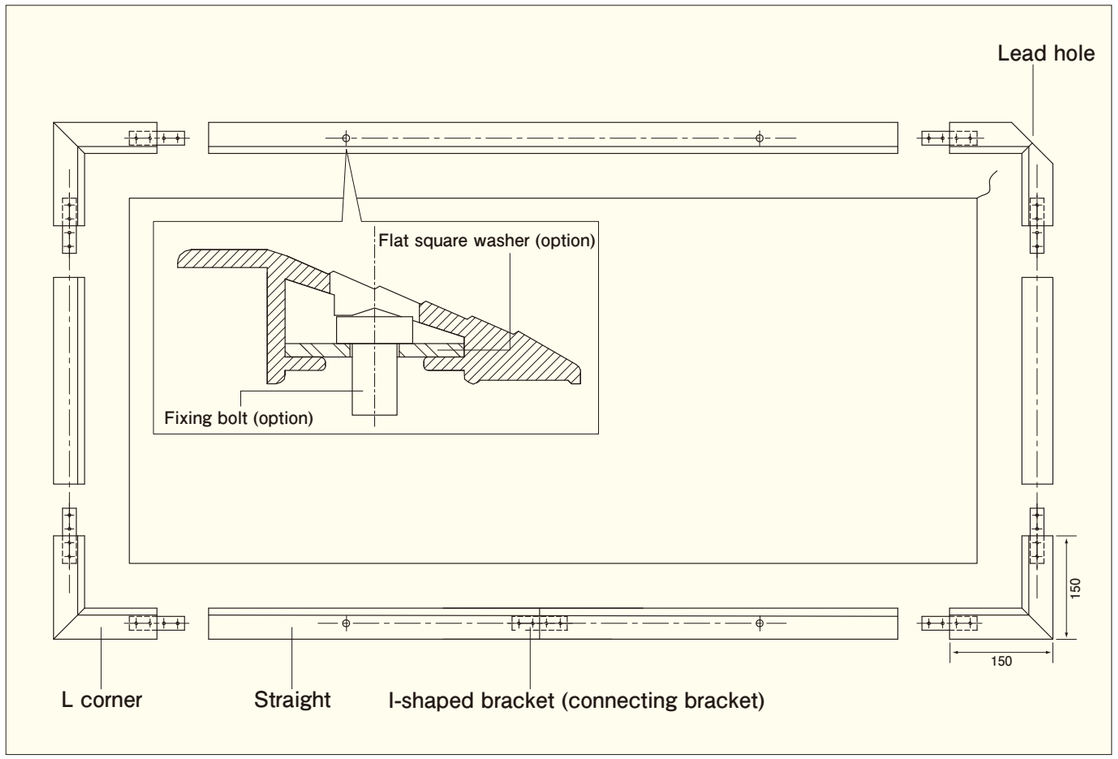
AE-35 (Can be used on mats of thickness 14 mm and 15 mm.)
AE-25 (Can be used on mats of thickness 9 mm – 11 mm.)

Aluminum ramp frame
AE-35



Ramp frame cross-sectional dimensions (mm)

* In the case of AE-25, the height is 12 mm.

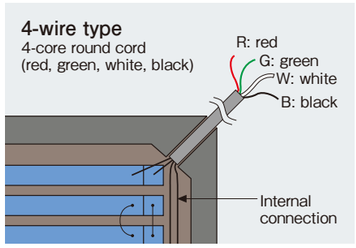


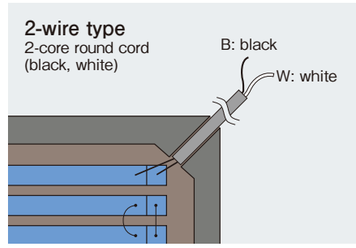
Mat Switch

Variety of lead wires

●4-wire type
A round 4-core cord is wired from one end of the mat switch. Red & black are connected to the upper electrode, and white & green are connected to the lower electrode.
The lead wires can be connected to an FSC controller to allow a broken wire to be detected. Two types of mats are available:connection mat(leads on both ends)and end mat(lead on one end).

●2-wire type
A 2-core cord is wired from one end of the mat switch. This switch is used only to output ON/OFF signals. It cannot detect a broken wire when an FSC control is used.



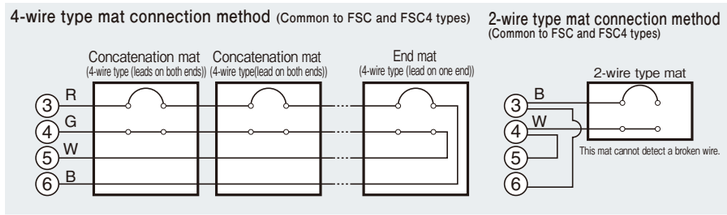


4-wire type (leads on both ends)	SVCTF (black) 4-core 0.75mm² ×2
4-wire type (lead on one end)	SVCTF (black) 4-core 0.75mm²
2-wire type with terminating resistor	SVCTF (black) 2-core 0.75mm²
2-wire type (both leads)	SVCTF (black) 2-core 0.75mm² ×2
2-wire type (one lead)	SVCTF (black) 2-core 0.75mm²

Mat switch specifications and connection method (Refer to P21, 22, 23 and 24.)

■Specifications

Rated voltage	5 – 24 V AC/DC
Rated current	0.01 – 0.3 A (resistive load)
Insulation resistance between electrodes	10 MΩ min (250 VDC)
Withstand voltage between electrodes	250 VDC for 1 minute
Recommended operating temperaturerange	-10 – 50°C
Storage temperature	-10 – 60°
Storage humidity	90% RH max



Example for ordering a mat switch (Unit of dimensions: mm)

800 × 1200 × t10 Oil resistant Black stripes L/W1500 Top right
① ② ③ ④ ⑤ ⑥ ⑦

① Lengthwise dimension: The short side is the lengthwise dimension.
② Widthwise dimension: The long side is the widthwise dimension.
③ Thickness: Refer to P16. 10 and 14 are the basic thicknesses.
④ Material: Either oil resistant or non-oil resistant
⑤ Top rubber (Color and pattern): Refer to P17.
⑥ Length of lead wire: 1500 unless otherwise specified
⑦ Position of lead wire: Specify the position of the lead wire based on ① and ②.
(If the position is not specified, it is top right.)
Clearly indicate other option specifications.

Tokyo Sensor's standard mat switches are of 4-wire type specifications. Consequently, when used in combination with an FSC controller, they can detect a broken wire. These switches can also be easily changed over to 2-wire types. (Refer to III on P24.)