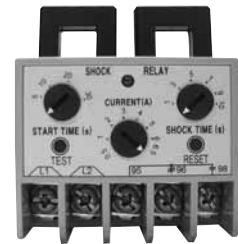


Shock Relays

one more way Tsubaki
saves you money



TSUBAKI
Driving your business.



Shock Relays

one more way Tsubaki
saves you money



At Tsubaki, our commitment is to bring you the highest value in the industry today. Period. And as a full line supplier of power transmission products this commitment extends to our complete line of Shock Relay products as well.

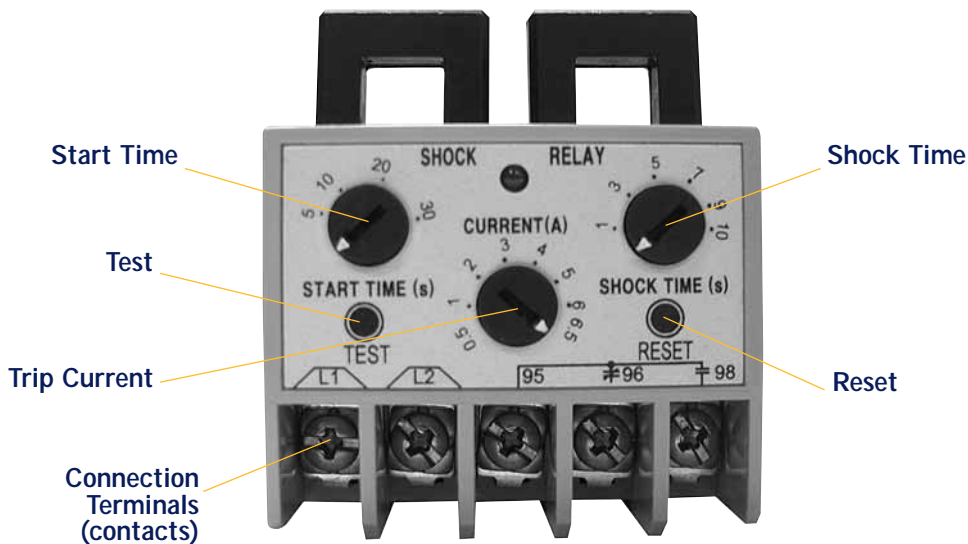
Protect your equipment and investment with Tsubaki shock relays and external current transformers. Unexpected shock loads can damage chains, drives, gears, turbines – the entire mechanical assembly. That means high maintenance, costly repairs, and expensive downtime.

Simply put, when the shock relay detects a problem, it shuts down the line – quickly, safely and securely. That means big savings in both time and money.

After the problem is corrected, the shock relay is reset at the touch of a button. No tear down is required. That means improved efficiency and reduced downtime.

And it's all part of the Tsubaki Advantage: reliable premium products that don't just perform, they outperform the competition. All the while saving you money.

For more information call us at 800-263-7088.



TSBSS05
TSBSS30
TSBSS60



Explanation of Terms

Start Time

During startup, the current draw of a motor is greater than the running current. In order to prevent the shock relay from engaging during startup, the start time of the shock relay is adjustable from 0.2 seconds to 30 seconds. The shock relay will only trip when the current draw of the motor exceeds the trip current and when the start time is reached.

Test

The test button simulates a current overload.

Trip Current

The trip current level is user adjustable and varies according to the shock relay model selected - see specification chart on the following page for complete details. When the actual current level exceeds the preset current (outside of the shock time range), the shock relay will trip.

Shock Time

The shock time feature allows the current overload time to be set. The shock time is adjustable from 0.2 seconds to 10 seconds. The shock relay will only trip when the current draw of the motor exceeds the trip current and when the shock time is exceeded.

Reset

The reset button will reset the shock relay after a current overload.

Connection Terminals (contacts)

There are 5 connection terminals:

L1 & L2: These terminals are used to provide power (from 90VAC to 240VAC) to the shock relay.

95, 96 & 98: These terminals provide output from the shock relay.

The application - such as a motor - can be wired into these terminals.

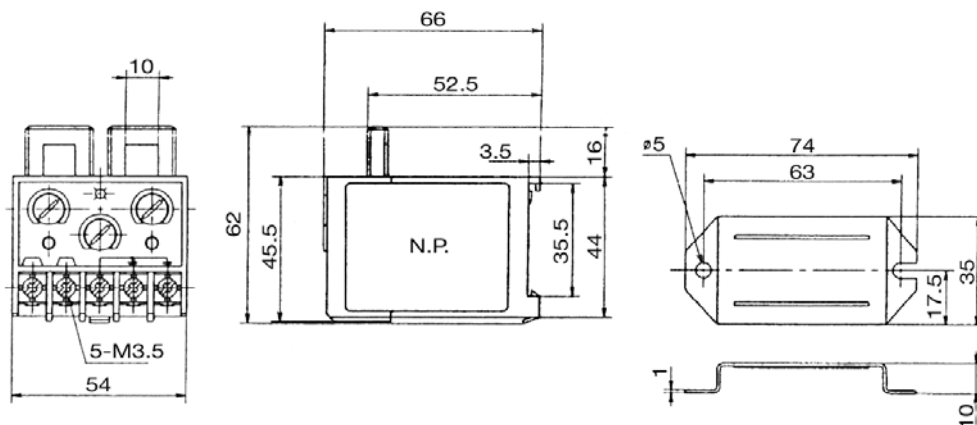
When the shock relay trips, the circuit opens and the application stops.



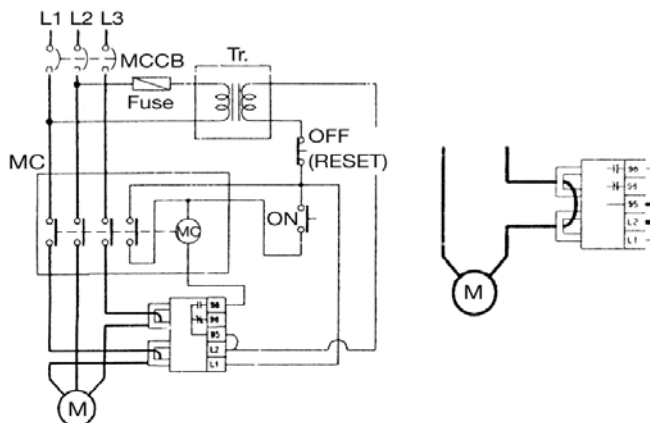
“SS” Series Shock Relays Specifications

SPECIFICATIONS / MODEL	TSBSS05	TSBSS30	TSBSS60
Built-in or External Current Transformer	Built-in	Built-in	Built-in
Motor Horsepower at 200 VAC	0.08hp ~ 1.5hp	2hp ~ 7.5hp	10hp ~15hp
Motor Horsepower at 400 VAC	0.27hp ~ 3hp	5hp ~ 15hp	20hp ~ 30hp
Load Current Setting Range	0.5A ~ 5A	3A ~ 30A	5A ~ 60A
Trip Output Relay - contact rating	3A load	3A load	3A load
Trip Output Relay - status	Normally Loaded	Normally Loaded	Normally Loaded
Start Time Setting Range	0.2 ~ 30 sec.	0.2 ~ 30 sec.	0.2 ~ 30 sec.
Shock Time Setting Range	0.2 ~ 10 sec.	0.2 ~ 10 sec.	0.2 ~ 10 sec.
Input Voltage	90VAC to 240VAC 60HZ	90VAC to 240VAC 60HZ	90VAC to 240VAC 60HZ
Test Function Built-in	Yes	Yes	Yes
Mounting available for 35mm DIN rail or panel	Yes	Yes	Yes
Operating Temperature Range	-4°F ~ 158°F	-4°F ~ 158°F	-4°F ~ 158°F
CUL Approval	Yes	Yes	Yes

“SS” Series Shock Relays Dimensions (mm)



“SS” Series Shock Relays Typical Wiring Diagram



- CB: Circuit Breaker
- MC: Magnetic Contactor
- On: Start Switch
- Off: Stop Switch
- M: Motor
- Tr: Transformer



"SS" Series Shock Relay Plus External Current Transformer



TSBSS100
TSBSS200
TSBSS300

The external current transformer is wired together with the "SS" series shock relay to provide overload protection for applications using larger motors – typically over 100A. See specification chart below for more details.

"SS" Series Shock Relays & Included External Current Transformer Specifications

SPECIFICATIONS / MODEL	TSBSS100	TSBSS200	TSBSS300
Shock Relay Model	TSBSS05	TSBSS05	TSBSS05
External Current Transformer Model	TSB2CT100	TSB2CT200	TSB2CT300
Motor Horsepower at 230 VAC	20hp ~ 25hp	30hp ~ 50hp	60hp ~100hp
Motor Horsepower at 460 VAC	40hp ~ 60hp	75hp ~120hp	150hp ~175hp
Load Current Setting Range	10A ~ 100A	20A ~ 200A	30A ~ 300A
Trip Output Relay - contact rating	3A load	3A load	3A load
Trip Output Relay - status	Normally Loaded	Normally Loaded	Normally Loaded
Start Time Setting Range	0.2 ~ 30 sec.	0.2 ~ 30 sec.	0.2 ~ 30 sec.
Shock Time Setting Range	0.2 ~ 10 sec.	0.2 ~ 10 sec.	0.2 ~ 10 sec.
Input Voltage	90VAC to 240VAC 60HZ	90VAC to 240VAC 60HZ	90VAC to 240VAC 60HZ
Test Function Built-in	Yes	Yes	Yes
Mounting available for 35mm DIN rail or panel	No	No	No
Operating Temperature Range	-4°F ~ 158°F	-4°F ~ 158°F	-4°F ~ 158°F



TSBSD10 TSBSD60



Explanation of Terms

Digital Display

The digital display indicates the actual current, trip level, time and the trip code.

Test

The test button simulates a current overload.

Reset

The reset button will be used to reset the shock relay after a current overload.

Trip Current

The trip current level can be set by the operator. When the actual current level exceeds the preset current (outside of the shock time range), the shock relay will trip.

Start Time

During startup, the current draw of a motor is greater than the running current. In order to prevent the shock relay from engaging during startup, the start time of the shock relay is adjustable from 0.3 seconds to 12 seconds. The shock relay will only trip when the current draw of the motor exceeds the preset current and when the start time is met.

Shock Time

This feature allows the shock relay to ignore normal machine fluctuations, yet react when a true problem develops. The shock time is adjustable from 0.3 seconds to 3 seconds. The shock relay will only trip when the current draw of the motor exceeds the trip current and when the shock time is met.

Alarm Current

An alarm can be connected to the terminals on the front panel of the shock relay. The alarm current can be set to between 50% and 100% of the trip current level. This allows for a pre-alarm warning when the current draw is approaching the preset current level.

If an alarm is not being used, the alarm current setting can be set to the "off" position.

DIP Switches

The shock relay has 4 DIP Switches that toggle between two settings and that allow the shock relay to be configured for a particular application.

The DIP switches are:

- 1: "No Voltage Release" (on/off)** This switch changes the status of contacts 95-96 and 97-98. For example, in left-hand position contacts 95-96 are normally closed; and in the right-hand position, contacts 95-96 are normally open. This adds flexibility to aid installation.
- 2: "Phase Loss Protection" (on/off)** When set to the "on" mode (right hand position), the connected motor will shut down if one of the three phases of the motor drops out. The motor will also shut down if there is a phase imbalance. The "off" mode (left hand position) disables this feature.
- 3: "Reset" (manual/automatic)** When set to the "manual" mode, if the shock relay trips due to current overload or phase failure, the shock relay must be reset manually by pushing the "reset" button. In the "automatic" mode, the shock relay automatically resets one second after the current overload causes it to trip. Also in the "automatic" mode, the shock relay must be manually reset after phase failure causes it to trip.
- 4: "Alarm Relay's Movement" (flicker/continuous)** This feature works with the alarm current setting. In the left-hand position, "flicker" mode, when the alarm current setting is met, the alarm will activate by blinking/flickering one time per second. Essentially this is a "pre-alarm" to indicate the potential for a problem. In this mode, the motor will continue to operate. When the problem is corrected and when the current drops to normal, the alarm will stop. If the situation is not corrected and the shock relay trips, (shutting down the application) the alarm will stay on, but now blinks/flickers at a rate of two-times per second. In the right-hand position, "continuous" mode, the alarm will be activated when the motor current is between the pre-alarm set point and the overload trip point. If the current drops below the setting or if the shock relay trips, the alarm will turn off.



Explanation of Terms (Continued)

Connection Terminals (contacts)

There are 4 sets (pairs) of connection terminals.

A1 & A2

These terminals are used to provide power to the unit.

95 & 96

These terminals are for the trip output relay and are "normally closed". The application - such as a motor - could be wired into these terminals. When the shock relay trips, the circuit opens and the application stops.

97 & 98

The circuit connected to these terminals is "normally open". A warning device such as an alarm or light could be wired into these terminals. When the shock relay trips, the circuit closes and the warning device is activated.

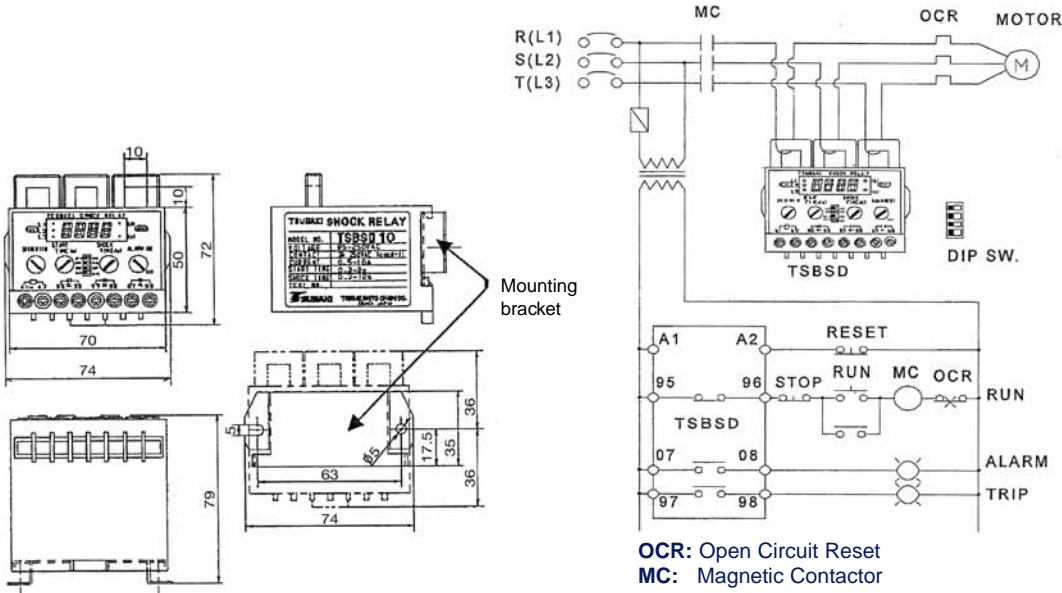
07 & 08

These terminals are used to connect an alarm. This circuit is "normally open". When the alarm set point is reached, the circuit closes and then the alarm is activated. This could be considered a pre-alarm to indicate the potential for a problem should the current increase further.

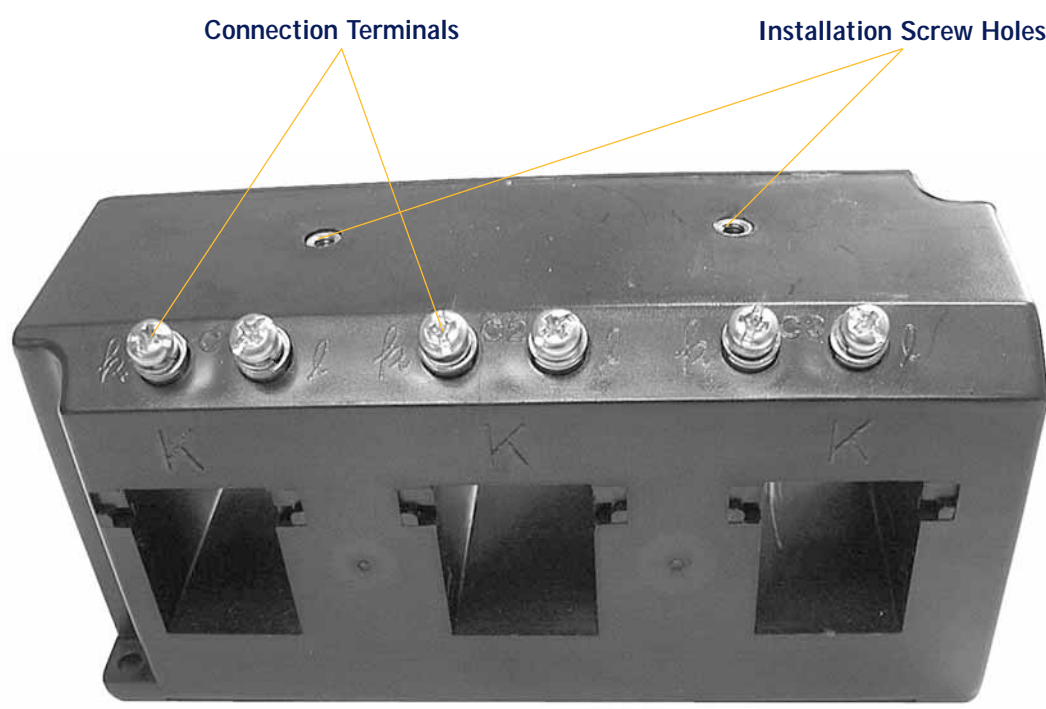
"SD" Series Digital Display Shock Relays Specifications

SPECIFICATIONS / MODEL	TSBSD10	TSBSD60
Built-in or External Current Transformer	Built-in	Built-in
Motor Horsepower at 230 VAC	0.1hp ~ 3hp	5hp ~15hp
Motor Horsepower at 460 VAC	0.2hp ~ 5hp	7hp ~ 30hp
Load Current Setting Range	0.5A ~ 10A	5A ~ 60A
Trip Output Relay - contact rating	3A load	3A load
Trip Output Relay - status	DIP switch #1 can be set to "normally closed" or "normally open"	
Alarm Output Relay - setting level	50% - 100% of load current setting	50% - 100% of load current setting
Alarm Output Relay - contact rating	3A load	3A load
Alarm Output Relay - status	Loaded 3 seconds after exceeding preset alarm current level	
Open phase, reverse phase, phase unbalance	DIP switch #2 can be set to enable or disable phase failure protection.	
Start Time Setting Range	0.2 sec. ~ 12 sec.	0.2 sec. ~ 12 sec.
Shock Time Setting Range	0.3 sec ~ 3 sec.	0.3 sec ~ 3 sec.
Input Voltage	85VAC ~ 250VAC, 50/60Hz, 85V DC ~ 250V DC	
Test Function Built-in	Yes	Yes
Mounting available for 35mm DIN rail or panel	Yes	Yes
Operating Temperature Range	14°F ~ 122°F	14°F ~ 122°F

"SD" Digital Shock Relay Dimensions (mm) & Typical Wiring Diagram



"SD" Series External Current Transformer



TSB3CT100
TSB3CT200
TSB3CT300

Explanation of Terms

Installation Screw Holes

The digital shock relay is installed by threading the screws into the screw holes on the external current transformer.

Connection Terminals

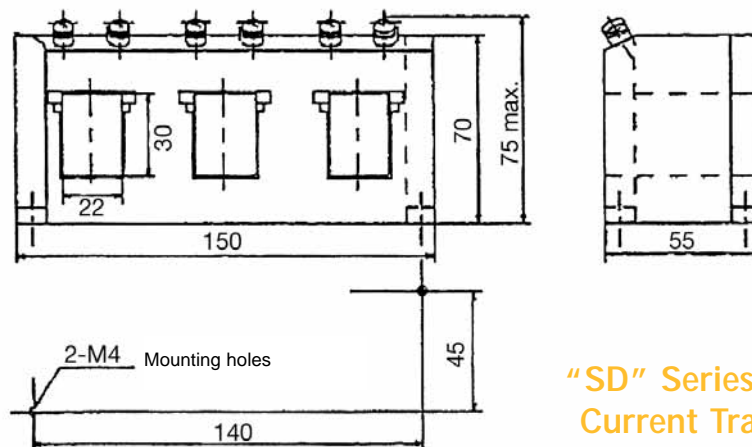
Using the wires included with the external current transformer, loop the wires through the holes on the top of the digital shock relay and attach to the corresponding connection terminals.



"SD" Series External Current Transformer Specifications

Specifications for the External Current Transformer only

SPECIFICATIONS / MODEL	TSB3CT100	TSB3CT200	TSB3CT300
Built-in or External Current Transformer	External	External	External
Motor Horsepower at 230 VAC	20hp ~ 25hp	30hp ~ 50hp	60hp ~ 100hp
Motor Horsepower at 460 VAC	40hp ~ 60hp	70hp ~ 120hp	150hp ~ 175hp
Load Current Setting Range	5A ~ 100A	10A ~ 200A	15A ~ 300A
Mounting available for 35mm DIN rail or panel	No	No	No
Operating Temperature Range	14°F ~ 122°F	14°F ~ 122°F	14°F ~ 122°F



"SD" Series External Current Transformer Dimensions (mm)

Digital Display Shock Relay & External Current Transformer

Installation Example

TSBSD10 Digital Shock Relay & TSB3CT100 External Current Transformer





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