

# U.S. TSUBAKI SHOCK RELAY

# U.S. Tsubaki Shock Relay

## - the Electronic Shear Pin!



Protect your equipment and your investment with the U.S. Tsubaki Shock Relay.

Unexpected shock loads – overloads and underloads – can damage chains, drives, gears, turbines – the entire mechanical assembly. That means high maintenance, costly repairs and expensive downtime.

Mechanical devices like shear pins and torque limiters don't provide enough protection. They are just not reliable.

### Electronic Shock Relay from U.S. Tsubaki Acts before the Damage Occurs

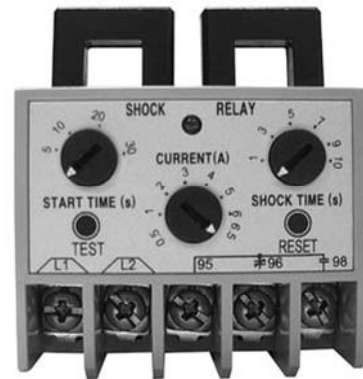
These accurate, adjustable devices can determine if the equipment is operating properly. If the Shock Relay detects a problem, it shuts down the line – fast, safe and secure. That means big savings in time and money for you or your customers.

### Reset at the Touch of a Button

After the problem is corrected, the Shock Relay can be reset at the touch of a button. No teardown is required. That means improved efficiency and reduced downtime.



- Accurate Protection
- Repeatable Performance
- Rapid, Easy Reset
- Quick Installation
- Wide Range of Applications
- Easy Selection



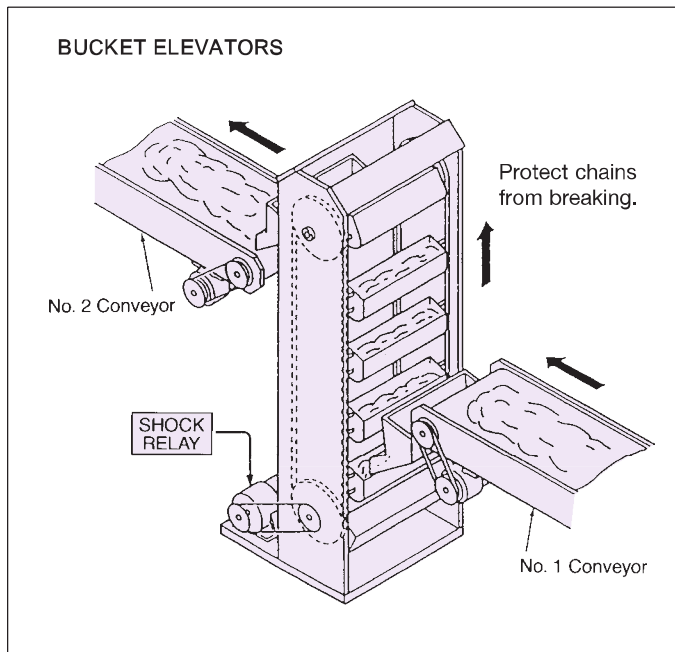
Features	U.S. Tsubaki Shock Relay	Mechanical Device
Stability of operation	excellent	poor
Accuracy of operation	excellent	unsatisfactory
Adjustment of operational range	simple	difficult
Fine adjustment	yes	no
Reset	only push the "RESET" button	considerable time and labor is required
Selection	simple	new design for each application required
Life cycle	long	short
Threshold point	low	high

# U.S. TSUBAKI SHOCK RELAY

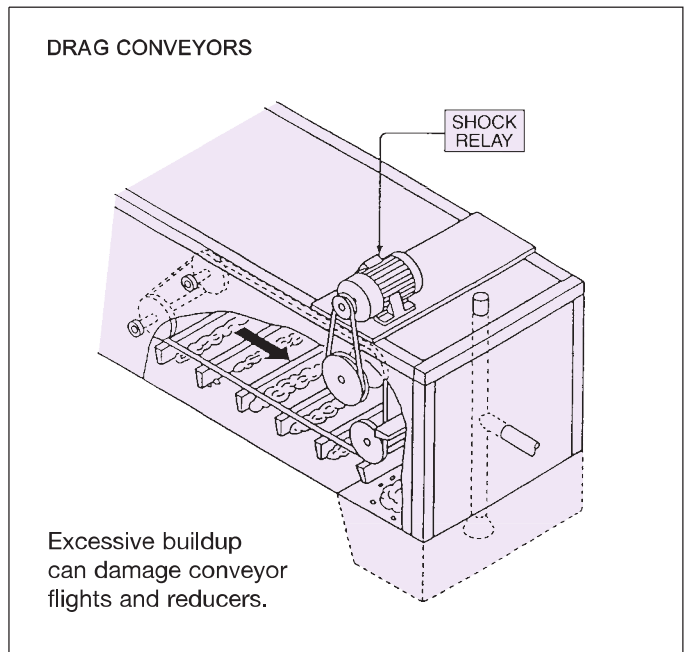
## U.S. Tsubaki Shock Relay

Invented by U.S. Tsubaki, the Shock Relay is a precise electronic protector that adapts to virtually all types of equipment driven by an electric motor. The Shock Relay is installed on applications in the Material Handling Industry, Water Treatment Industry, Food Processing Industry, Agriculture Industry, Machine Tool Industry, Chemical Industry, and others.

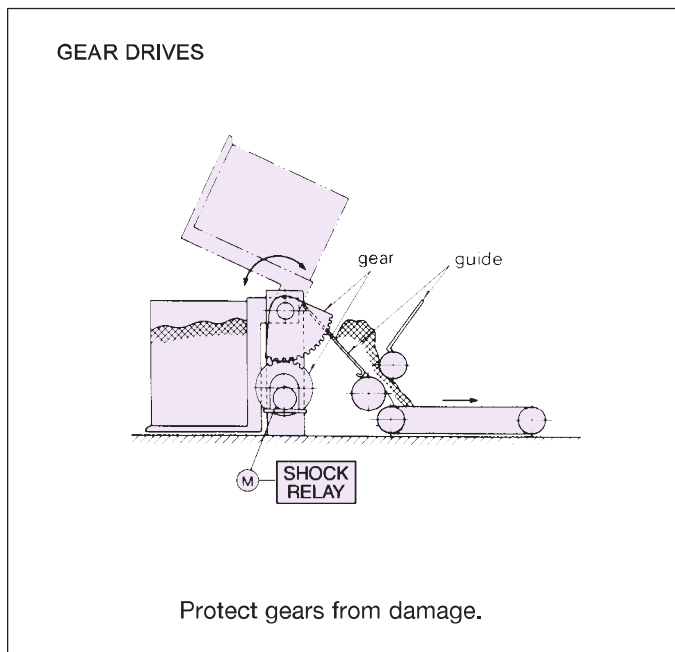
### BUCKET ELEVATORS



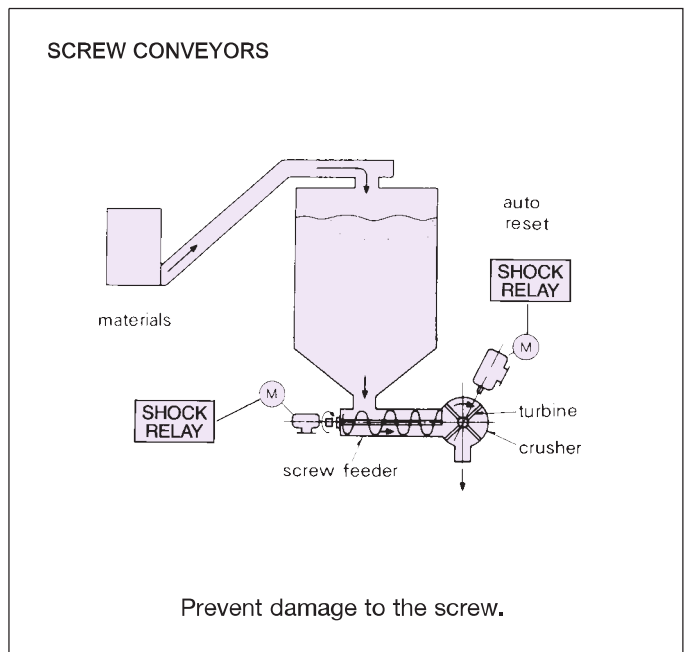
### DRAG CONVEYORS



### GEAR DRIVES



### SCREW CONVEYORS

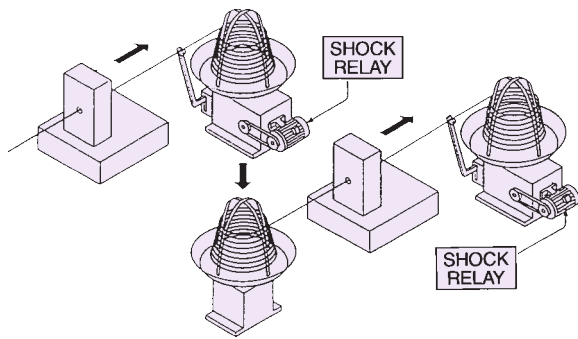


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# Protects Your Application!

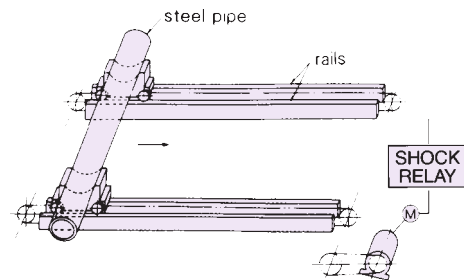
- **Material Handling**  
Conveyors, Turntables, Elevators
- **Water Treatment Plants**  
Pumps, Scrappers, Water Screens
- **Food Machinery**  
Pumps, Agitators, Mixers
- **Agriculture**  
Screw and Belt Conveyors, Bucket Elevators
- **Machine Tool**  
Tapping Machines, Drill Press
- **Chemical Industry**  
Pumps, Agitators, Packagers

## WINDING APPLICATIONS



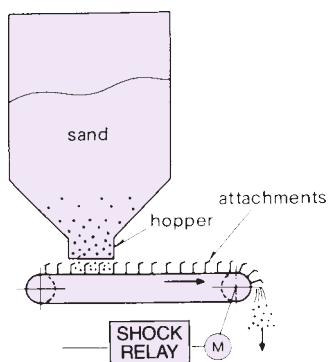
Sense excessive torque and shut off the equipment prior to damage occurring.

## CONVEYOR APPLICATIONS



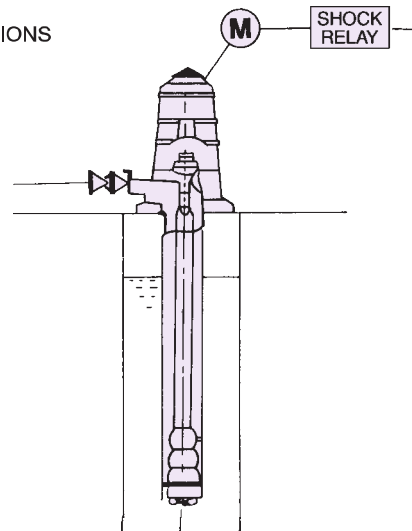
Detect damaging overloads that lead to downtime.

## CHAIN FEEDERS



Protect attachments from damage.

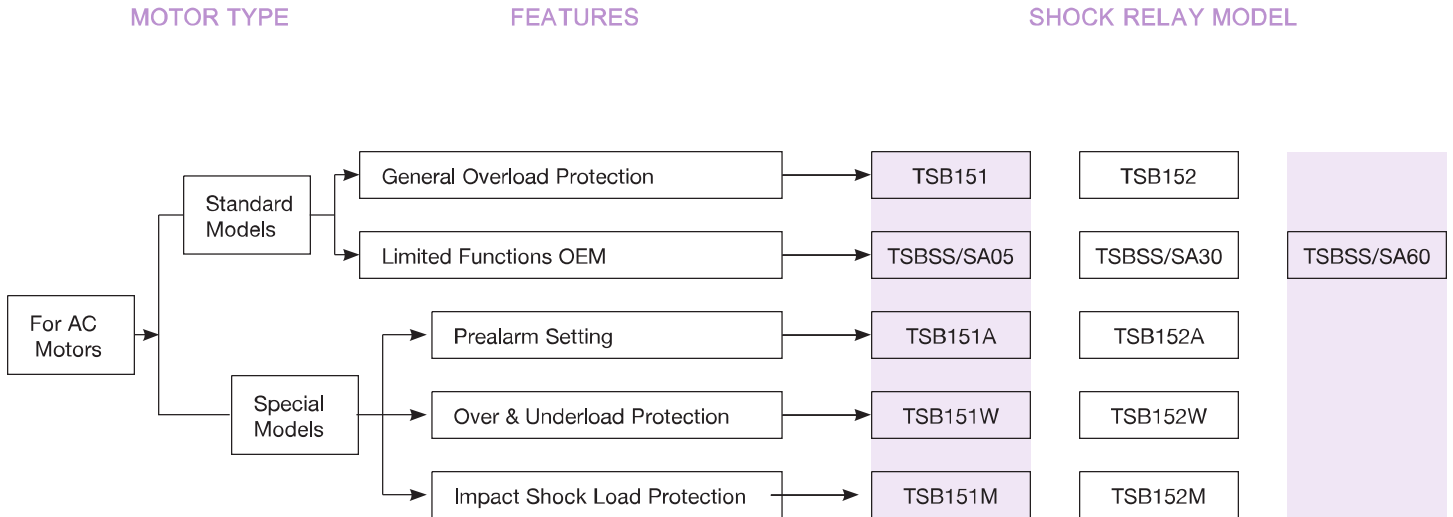
## PUMP APPLICATIONS



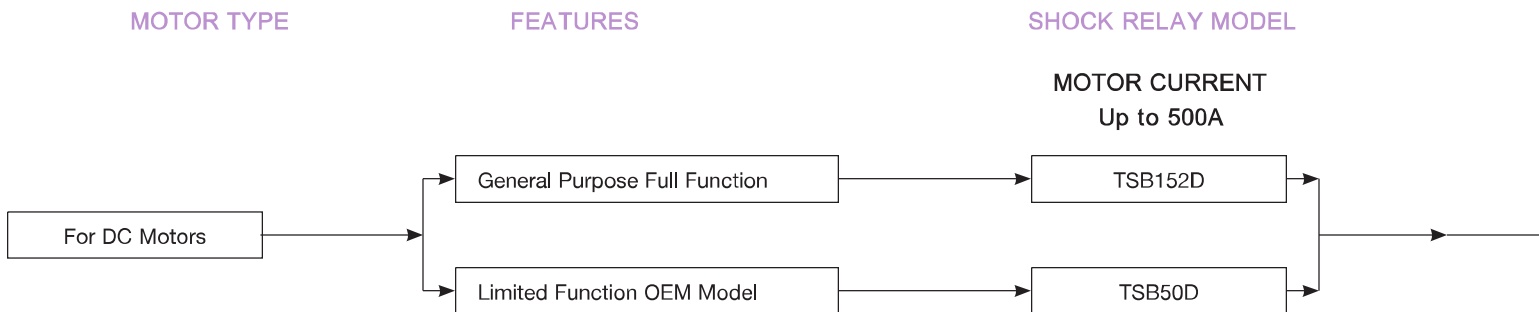
Protect pump from both overloads and underloads.

# U.S. TSUBAKI SHOCK RELAY

## SELECTION GUIDE



Note: Shock Relay is designed to accept all standard single-phase and 3-phase AC motors and all standard DC motors (above 600VAC, Contact U.S. Tsubaki).



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SHUNT SELECTION

AC MOTOR FULL-LOAD CURRENT LIST\*

Motor Current	Shunt No.
1.0 amp	Shunt 1-50
1.5 amp	Shunt 1.5-50
2.0 amp	Shunt 2-50
5 amp	Shunt 5-50
10 amp	Shunt 10-50
20 amp	Shunt 20-50
50 amp	Shunt 50-50
100 amp	Shunt 100-50
150 amp	Shunt 150-50
200 amp	Shunt 200-50
250 amp	Shunt 250-50
300 amp	Shunt 300-50
400 amp	Shunt 400-50
500 amp	Shunt 500-50

HP	RPM	Amperages	
		230 VAC	460 VAC
1/4	1800	.95	.48
	1200	1.140	.70
	900	1.160	.80
1/3	1800	1.19	.60
	1200	1.59	.80
	900	1.80	.90
1/2	1800	1.72	.86
	1200	2.15	1.08
	900	2.38	1.19
3/4	1800	2.46	1.23
	1200	2.92	1.46
	900	3.26	1.63
1	3600	2.80	1.40
	1800	3.56	1.78
	1200	3.76	1.88
	900	4.30	2.15
1 1/2	3600	4.36	2.18
	1800	4.86	2.43
	1200	5.28	2.64
	900	5.60	2.80
2	3600	5.60	2.80
	1800	6.40	3.20
	1200	6.84	3.42
	900	7.90	3.95
3	3600	8.34	4.17
	1800	9.40	4.70
	1200	10.2	5.12
	900	11.4	5.70
5	3600	13.5	6.76
	1800	14.4	7.21
	1200	15.8	7.91
	900	15.9	7.92
7 1/2	3600	19.5	9.79
	1800	21.5	10.7
	1200	21.8	10.9
	900	23.0	11.5

HP	RPM	Amperages	
		230 VAC	460 VAC
10	3600	25.4	12.7
	1800	26.8	13.4
	1200	28.0	14.0
	900	30.5	15.2
15	3600	36.4	18.2
	1800	39.2	19.6
	1200	41.4	20.7
	900	44.5	22.2
20	3600	50.4	25.2
	1800	51.2	25.6
	1200	52.8	26.4
	900	54.9	27.4
25	3600	60.8	30.4
	1800	64.8	32.4
	1200	65.6	32.8
	900	67.3	33.7
30	3600	73.7	36.8
	1800	75.6	37.8
	1200	78.8	39.4
40	3600	96.4	48.2
	1800	101	50.4
	1200	102	50.6
50	3600	120	60.1
	1800	124	62.2
	1200	126	63.0
	60	3600	143
1800		149	74.5
1200		150	75.0
75		3600	179
	1800	183	91.6
	1200	184	92.0
100	3600	231	115
	1800	236	118
	1200	239	120
125	3600	292	146
	1800	293	147
	1200	298	149

\*Amperages shown are approximates only. Shock Relay can also be used on motors below 1/4 hp and above 125 hp.



# U.S. TSUBAKI SHOCK RELAY

## TSB151, TSB152

### Shock Relay for Overload Protection

#### ACTUAL LOAD METER

Actual current of the motor is indicated in percentages, which makes it easy to set "LOAD CURRENT," regardless of the value of the actual current load.

#### LOAD CURRENT

This presets the load current at the optimum setting in the range from 30% to 130% of the motor's current. When the actual load current exceeds the preset current for the preset SHOCK TIME, the SHOCK RELAY trips to break the motor circuit. Audible alarm devices or warning lamps may be installed if desired.

The LOAD CURRENT should be preset by observing the ACTUAL LOAD METER condition because the motor generally runs under its rated current value.

#### FINE ADJUSTMENT

Adjustment is preset at the factory. When fine adjustment of actual load current is required, this may be used to adjust from -5% to +30% of the indicated meter value.

#### START TIME

When starting a motor, the starting current value is greater than the running current. This starting current value continues until the motor reaches normal speed. During this starting period, the time of which mainly depends on the type of load, the function of detecting the overload current is disabled. Adjustable range is from 0.2 to 20 seconds.

#### TERMINALS FOR CONNECTION

All terminals are located on the upper surface to provide easy access.

#### POWER INDICATOR

Indicates that the power supply is on.

#### TRIP INDICATOR

Lamp comes on when SHOCK RELAY trips.

#### TEST BUTTON

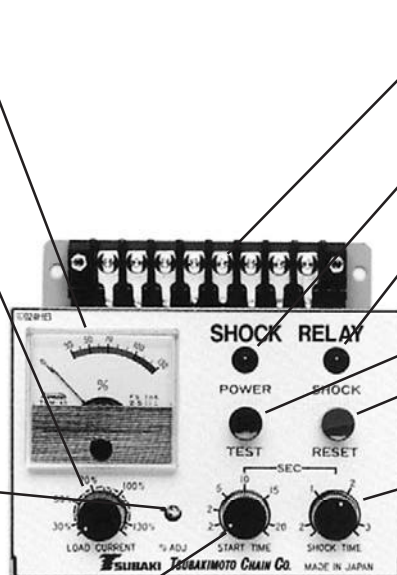
This switch is used to verify SHOCK RELAY operation.

#### RESET BUTTON (manual)

Reset can be done quickly whenever a cycle restart is desired.

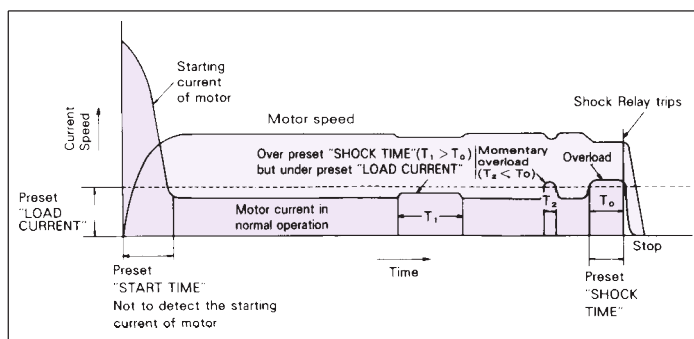
#### SHOCK TIME

This presets the overload period. Range is variable from 0.2 to 3 seconds. Every momentary load over the preset current with a shorter period than the preset period is ignored. When the overload equals the preset period, the SHOCK RELAY will trip immediately to break the power supply to the motor.

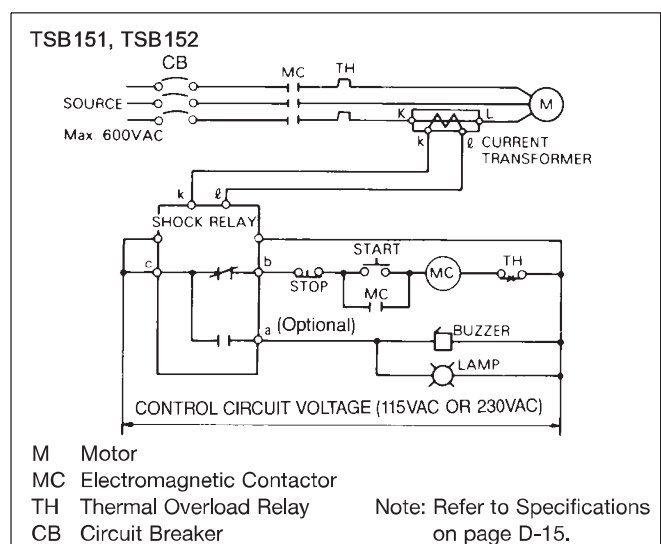


U.S. Tsubaki SHOCK RELAY monitors the change in motor current that closely approximates the torque output of the motor. Should the motor current exceed the preset LOAD CURRENT point for a preset length of SHOCK TIME (continuous overload time), the SHOCK RELAY will shut down the motor power supply.

#### DIAGRAM OF OPERATION



#### TYPICAL CONNECTING DIAGRAM

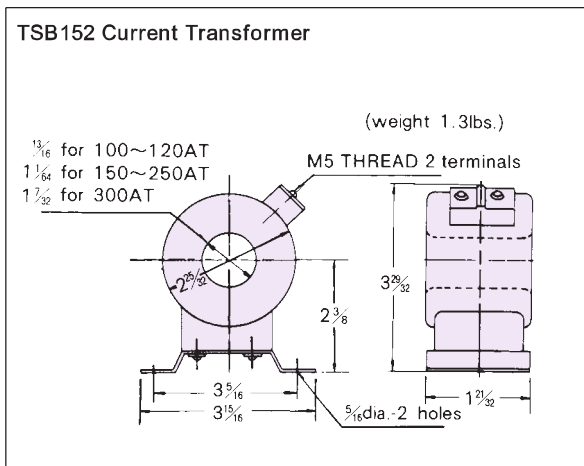
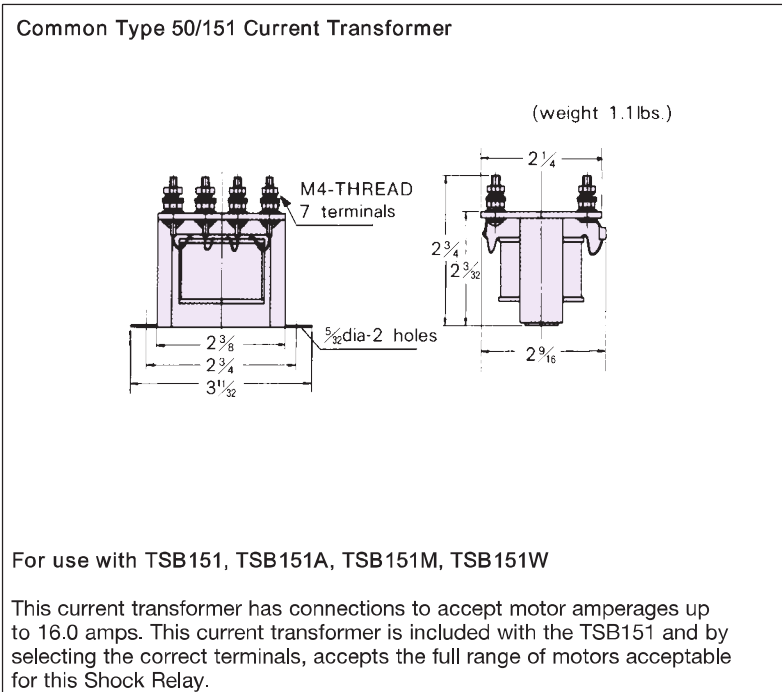
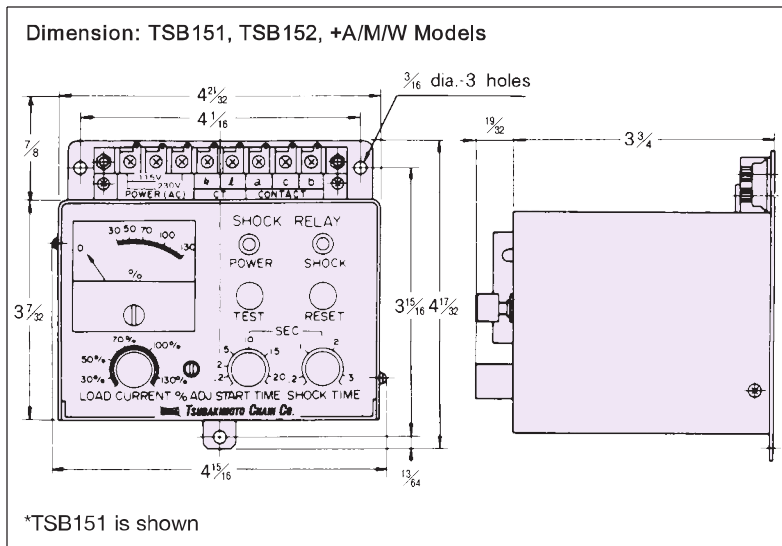


D - PT COMPONENTS

The TSB151 and TSB152 series SHOCK RELAY allows easy connection into new or existing applications. For single or three phase motors, simply wire the current transformer that we supply into one line of the motor and the SHOCK RELAY into the control circuit (stop-start circuit).

The SHOCK RELAY is powered by the same voltage as the control circuit to the motor starter, usually 115V or 230V single phase. If a different control voltage is used, a step down transformer may be required.

The supplied current transformer is then connected in one line of the motor that is being monitored. Motor voltages above 600 volts require special considerations. Contact U.S. Tsubaki.



When ordering the TSB152, please select the correct size current transformer from the chart below. The transformer selected should closely match the motor amperage. U.S. Tsubaki will include the transformer you select with the TSB152 Shock Relay.

Current Transformer for TSB152			
Full-Load Current (amps)	Selected CT	Full-Load Current (amps)	Selected CT
20	100AT	83	250AT
25	100AT	100	100AT
30	120AT	120	120AT
33	100AT	125	250AT
37	150AT	150	150AT
40	120AT	200	200AT
50	100AT	250	250AT
60	120AT	300	300AT
		400	400AT

When selecting a Shock Relay and compatible Current Transformer, locate the closest rating to the actual motor current in the list.

**Selection Example**

1. For 4 pole, 230V, 7½HP motor: rated current 21.5 amps, choose TSB152, 100AT current transformer.
2. For 4 pole 230V, 50HP motor: rated current 124 amps, choose TSB152, 250AT current transformer.



# U.S. TSUBAKI SHOCK RELAY

## TSBSS Series – Manual Reset TSBSA Series – Automatic Reset

### Overload Protection – OEM Model

For use with single and three-phase motors up to 300 amps

#### START TIME

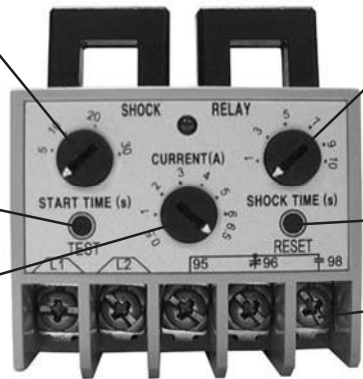
During startup, the current draw of a motor is greater than the running current. In order to prevent the Shock Relay from engaging during startup, the start time is adjustable from 0.2 seconds to 30 seconds.

#### TEST

The test button simulates a current overload.

#### CURRENT (A)

The trip current level is user adjustable and varies according to the Shock Relay model selected. The Shock Relay will only trip when the current draw of the motor exceeds both the current setting and the shock time setting.



#### 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.

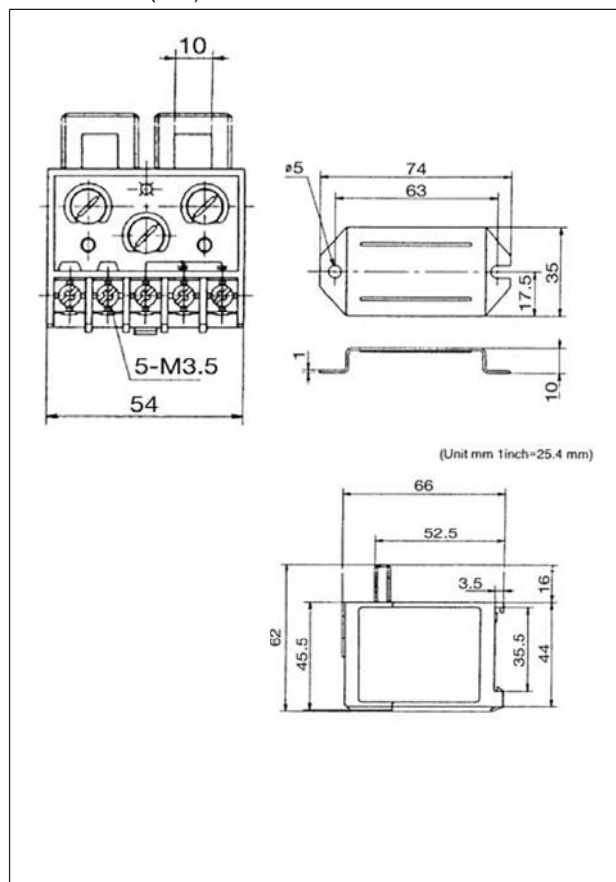
#### RESET BUTTON (SS model)

SA is auto reset.

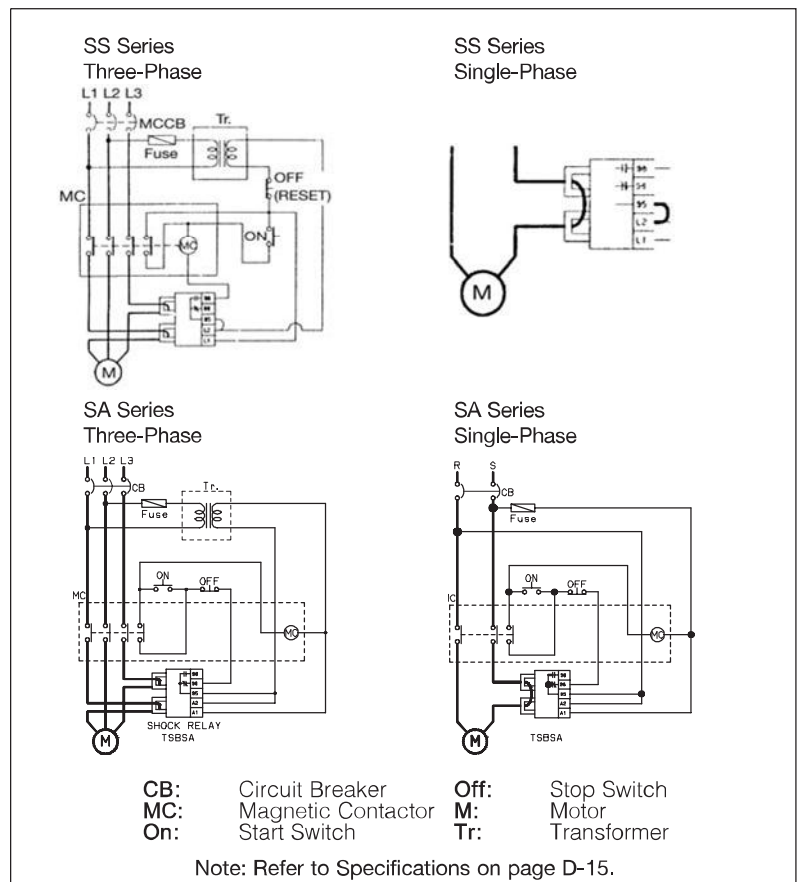
#### CONNECTION TERMINALS (CONTACTS)

L1 & L2: Used to provide power to the Shock Relay. 95, 96 & 98: 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.

#### DIMENSIONS (mm)



#### TYPICAL CONNECTING DIAGRAM



D - PT COMPONENTS

# TSBSS/SA Shock Relay with External Current Transformer

SS/SA SERIES  
Shock Relay



**EXTERNAL CURRENT TRANSFORMER**  
The external current transformer is wired together with the SS/SA Series Shock Relay to provide overload protection for applications using larger motors, typically more than 60A.

## SPECIFICATIONS

Shock Relay Model	TSBSS/SA05	TSBSA10	TSBSS/SA30	TSBSS/SA60
Motor HP 230 VAC	0.125 hp ~ 1.5 hp	0.75 hp ~ 3 hp	2 hp ~ 7.5 hp	10 hp ~ 15 hp
Motor HP 460 VAC	0.25 hp ~ 3 hp	1.5 hp ~ 7.5 hp	5 hp ~ 15 hp	20 hp ~ 30 hp
Load Current Setting Range	0.5A ~ 5A	1A ~ 10A	3A ~ 30A	5A ~ 60A
Shock Relay with External Current Transformer Model	TSBSS/SA100	N/A	TSBSS/SA200	TSBSS/SA300
Transformer	TSB2CT100	N/A	TSB2CT200	TSB2CT300
Motor HP 230 VAC	20 hp ~ 25 hp	N/A	30 hp ~ 50 hp	60 hp ~ 100 hp
Motor HP 460 VAC	40 hp ~ 60 hp	N/A	75 hp ~ 125 hp	150 hp ~ 200 hp
Load Current Setting Range	60A ~ 100A	N/A	100A ~ 200A	200A ~ 300A
Common to all TSBSS/SA units	TSBSS/SA05 TSBSS/SA100	TSBSA10	TSBSS/SA30 TSBSS/SA200	TSBSS/SA60 TSBSS/SA300
Trip Output Relay Status				
Energized/Fail Safe to Open	SS only	N/A	SS only	SS only
Not Energized	SA only	SA only	SA only	SA only
Trip Output Relay Contact rating	3A load			
Start Time Setting Range	0.2 ~ 30 sec			
Shock Time Setting Range	0.2 ~ 10 sec			
Shock Relay Power Supply	90 ~ 240 VAC			
Test Function	Built In			
Mounting	35mm DIN Rail or Panel			
Operating Temperature Range	-4°F ~ 158°F			

# U.S. TSUBAKI SHOCK RELAY

## TSB151A, TSB152A

### Overload Protection Plus Pre-Alarm Setting

#### ACTUAL LOAD METER

Actual current of the motor is indicated in percentages, which makes it easy to set "LOAD CURRENT," regardless of the value of the actual current load.

#### LOAD CURRENT

This presets the load current at the optimum setting in the range from 30% to 130% of the motor's current. When the actual load current exceeds the preset current for the preset SHOCK TIME, the SHOCK RELAY trips to break the motor circuit.

#### ALARM SET POINT

This presets the level at which an Alarm will sound. The Alarm can provide prior warning of an impending problem that may be correctable prior to the need to shut down the equipment.

#### START TIME

When starting a motor, the starting current value is greater than the running current. This starting current value continues until the motor reaches normal speed. During this starting period, the time of which mainly depends on the type of load, the function of detecting the overload current is disabled. Adjustable range is from 0.2 to 20 seconds.

#### POWER INDICATOR

Indicates that the power supply is on.

#### TRIP INDICATOR

Lamp comes on when SHOCK RELAY trips.

#### TEST BUTTON

This switch is used to verify SHOCK RELAY operation. The TSB151A and TSB152A have a test switch for both the alarm set point and the overload set point.

#### RESET BUTTON (manual)

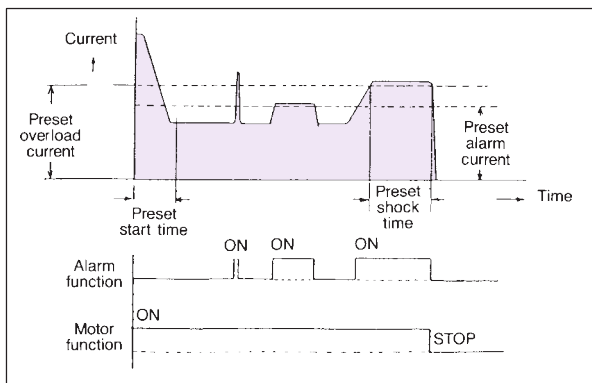
Reset can be done quickly whenever a restart is desired.

#### SHOCK TIME

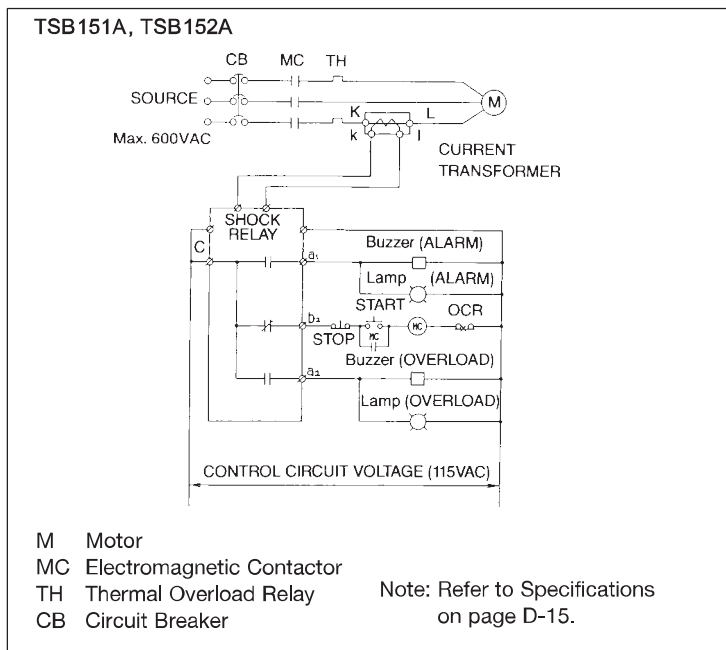
This presets the overload period. Range is variable from 0.2 to 3 seconds. Every momentary load over the preset current with a shorter period than the preset period is ignored. When the overload equals the preset period, the SHOCK RELAY will trip immediately to break the power supply to the motor.



#### DIAGRAM OF OPERATION



#### TYPICAL CONNECTING DIAGRAM



Dimensions and current transformer selection are the same as for the TSB151 and TSB152. Refer to page D-8.

Note: Refer to Specifications on page D-15.

# TSB151M, TSB152M

## Overload Protection Plus Impact Detection

### ACTUAL LOAD METER

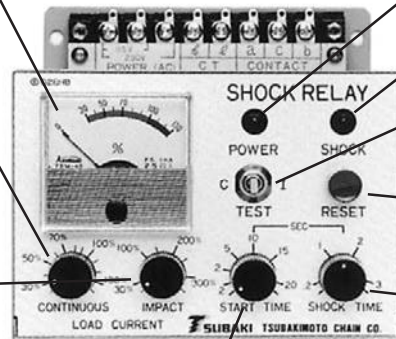
Actual current of the motor is indicated in percentages, which makes it easy to set "LOAD CURRENT," regardless of the value of the actual current load.

### LOAD CURRENT

This presets the load current at the optimum setting in the range from 30% to 130% of the motor's current. When the actual load current exceeds the preset current for the preset SHOCK TIME, the SHOCK RELAY trips to break the motor circuit.

### IMPACT SET POINT

This presets the point at which an Impact Shock Load is deemed dangerous. When the actual load current exceeds this level for more than 5/100 of a second, the SHOCK RELAY trips to break the motor circuit.



### POWER INDICATOR

Indicates that the power supply is on.

### TRIP INDICATOR

Lamp comes on when SHOCK RELAY trips.

### TEST BUTTON

This switch is used to verify SHOCK RELAY operation.

### RESET BUTTON (manual)

Reset can be done quickly whenever a cycle restart is desired.

### SHOCK TIME

This presets the overload period. Range is variable from 0.2 to 3 seconds. Every momentary load over the preset current with a shorter period than the preset period is ignored. When the overload equals the preset period, the SHOCK RELAY will trip immediately to break the power supply to the motor.

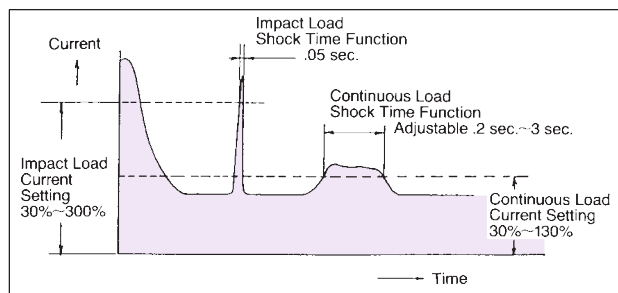
### START TIME

When starting a motor, the starting current value is greater than the running current. This starting current value continues until the motor reaches normal speed. During this starting period, the time of which mainly depends on the type of load, the function of detecting the overload current is disabled. Adjustable range is from 0.2 to 20 seconds.

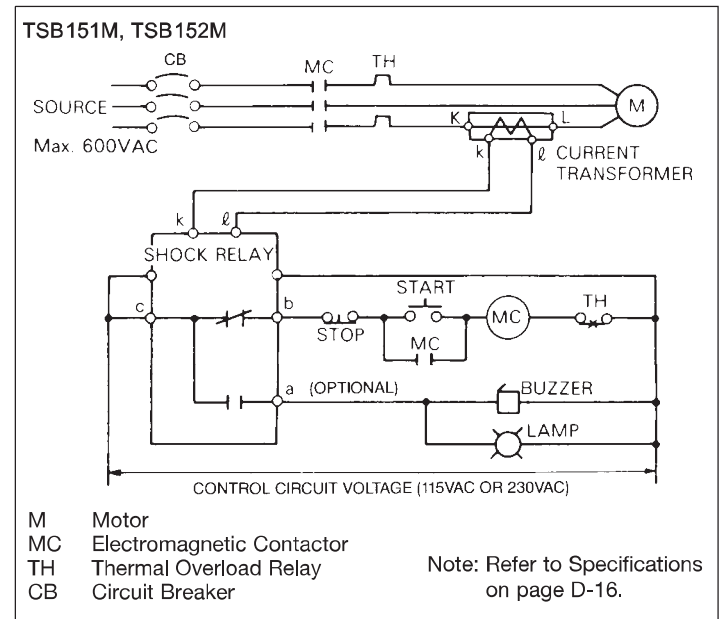
### SPECIFICATIONS

Load Current Setting	For Impact Load	30% ; 300%
	For Continuous Load	30% ; 130%
Shock Time Setting	For Impact Load	.05 sec. (fixed)
	For Continuous Load	.2 sec. ; 3 sec.

### DIAGRAM OF OPERATION



### TYPICAL CONNECTING DIAGRAM



Dimensions and current transformer selection are the same as for the TSB151 and TSB152. Refer to page D-8.

# U.S. TSUBAKI SHOCK RELAY

## TSB151W, TSB152W

### Overload and Underload Protection

#### ACTUAL LOAD METER

Actual current of the motor is indicated in percentages, which makes it easy to set "LOAD CURRENT," regardless of the value of the actual current load.

#### OVERLOAD CURRENT

This presets the load current at the optimum setting in the range from 30% to 130% of the motor's current. When the actual current exceeds the preset current for the preset SHOCK TIME, the SHOCK RELAY trips to break the motor circuit.

#### UNDERLOAD CURRENT

This presets the lower acceptable load current limit. When the actual load current falls below this level for the preset SHOCK TIME, the SHOCK RELAY trips to break the motor circuit.



#### TERMINALS FOR CONNECTION

All terminals are located on the upper surface to provide easy access.

#### POWER INDICATOR

Indicates that the power supply is on.

#### TRIP INDICATOR

Lamp comes on when SHOCK RELAY trips.

#### TEST BUTTON

This switch is used to verify SHOCK RELAY operation.

TSB151W and TSB152W have a test switch for both upper and lower levels.

#### RESET BUTTON (manual)

Reset can be done quickly whenever a restart is desired.

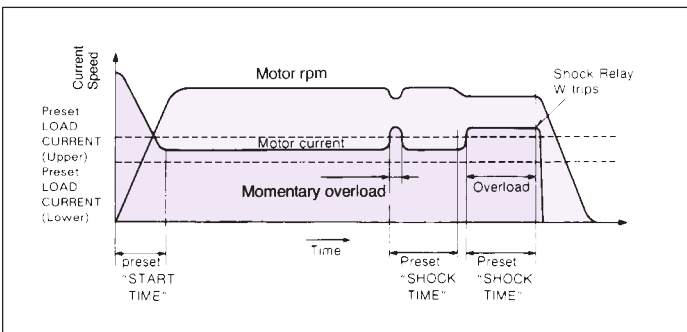
#### SHOCK TIME

This presets the overload period. Range is variable from 0.2 to 3 seconds. Every momentary load over the preset current with a shorter period than the preset is ignored. When the overload equals the preset period, the SHOCK RELAY will trip immediately to break the power supply to the motor.

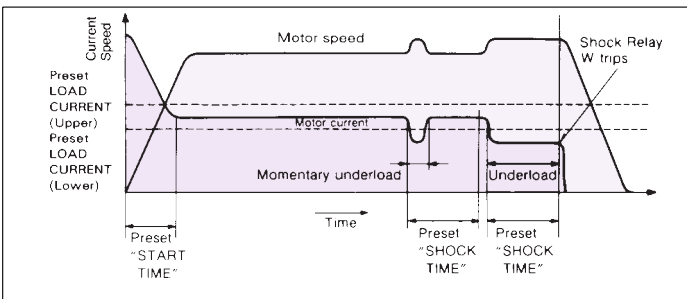
#### START TIME

When starting a motor, the starting current value is greater than the running current. This starting current value continues until the motor reaches normal speed. During this starting period, the time of which mainly depends on the type of load, the function of detecting the overload is disabled. Adjustable range is from 0.2 to 20 seconds.

#### DIAGRAM OF OPERATION OVERLOAD

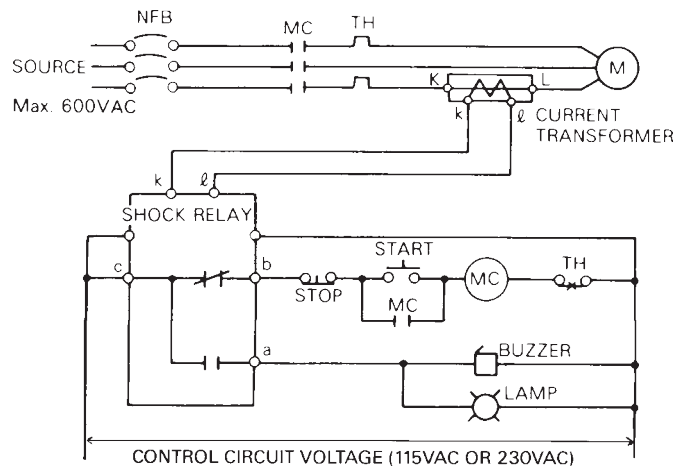


#### UNDERLOAD



#### STANDARD CONNECTING DIAGRAM

##### TSB151W, TSB152W



- M Motor
- MC Electromagnetic Contactor
- TH Thermal Overload Relay
- CB Circuit Breaker

Note: Refer to Specifications on page D-16.

Dimensions and current transformer selection is the same as for TSB151 and TSB152. Refer to page D-8.

D - PT COMPONENTS



# TSB50D, TSB152D

## Overload Protection for D.C. Motors

### ACTUAL LOAD METER

Actual current of the motor is indicated in percentages, which makes it easy to set "LOAD CURRENT," regardless of the value of the actual current load.

### LOAD CURRENT

This presets the load current at the optimum setting in the range from 30% to 130% of the motor's current. When the actual load current exceeds the preset current for the preset SHOCK TIME, the SHOCK RELAY trips to break the motor circuit.

### START TIME

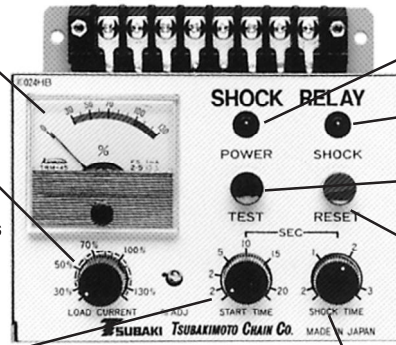
When starting a motor, the starting current value is greater than the running current. This starting current value continues until the motor reaches normal speed. During this starting period, the time of which mainly depends on the type of load, the function of detecting the overload current is disabled. Adjustable range is from 0.2 to 20 seconds.

### CURRENT FLOW INDICATOR

This lamp lights when the load current flows into the SHOCK RELAY. This is after the fixed 3-second start time.

### SHUNT SELECTION

The D.C. Motor Shock Relay has basically the same functions and dimensions as the standard TSB152 and TSB50. Differences exist in that a shunt is required to monitor direct current of the D.C. motor in place of using a current transformer.



### POWER INDICATOR

Indicates that the power supply is on.

### TRIP INDICATOR

Lamp comes on when SHOCK RELAY trips.

### TEST BUTTON

This switch is used to verify SHOCK RELAY operation.

### RESET BUTTON (manual)

Reset can be done quickly whenever a cycle restart is desired.

### SHOCK TIME

This presets the overload period. Range is variable from 0.2 to 3 seconds. Every momentary load over the preset current with a shorter period than the preset is ignored. When the overload equals the preset period, the SHOCK RELAY will trip immediately to break the power supply to the motor.



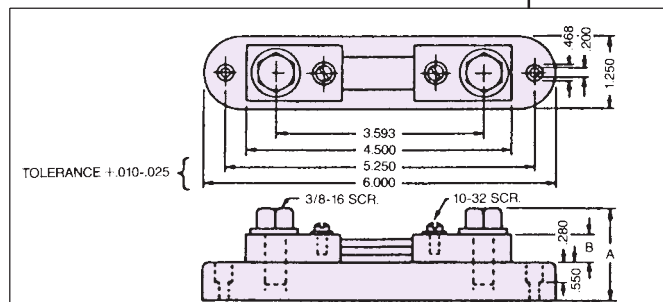
### LOAD CURRENT ADJUSTMENT

Adjustable range is from 50% to 130%.

### SHOCK TIME

Adjustable range is from 0.3 to 3 seconds.

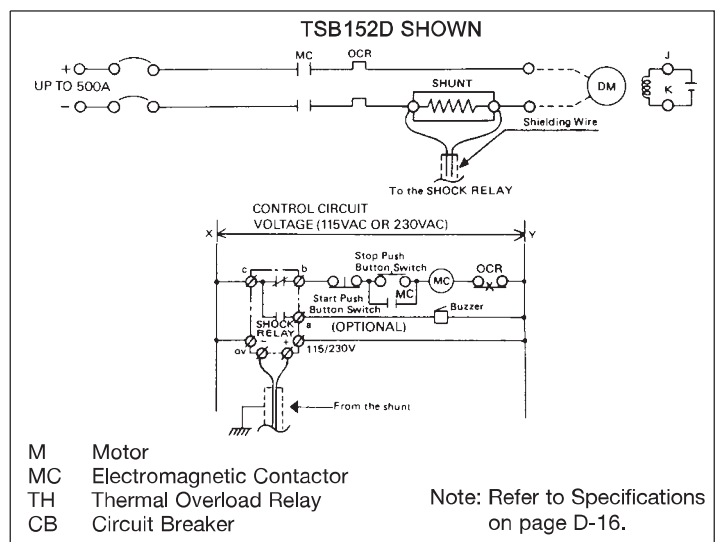
Note: TSB50D automatically resets when the motor power is disconnected. If manual reset is required, it is possible by installing a separate reset button.



When ordering the TSB152D or TSB50D, select the correct shunt from the chart. The shunt selected should closely match the motor's armature amperage. U.S. Tsubaki will include the shunt you select with the Shock Relay.

CATALOG NUMBER	AMP	A	B
Shunt 1-50	1	1.38	.500
Shunt 2-50	2	1.38	.500
Shunt 5-50	5	1.38	.500
Shunt 10-50	10	1.38	.500
Shunt 20-50	20	1.38	.500
Shunt 50-50	50	1.38	.500
Shunt 100-50	100	1.38	.500
Shunt 150-50	150	1.38	.500
Shunt 200-50	200	1.38	.500
Shunt 250-50	250	1.63	.750
Shunt 300-50	300	1.63	.750
Shunt 400-50	400	1.63	.750
Shunt 500-50	500	1.63	.750

### TYPICAL CONNECTING DIAGRAM



- M Motor
- MC Electromagnetic Contactor
- TH Thermal Overload Relay
- CB Circuit Breaker

Note: Refer to Specifications on page D-16.



# U.S. TSUBAKI SHOCK RELAY

## SPECIFICATIONS

### SPECIFICATIONS\*

FEATURES	TSB151	TSB152
Motor Amps	0.25 - 16 amps	17 - 400 amps
Load Current Range	30 - 130%	30 - 130%
Start Time Setting Range	0.2 - 20 sec.	0.2 - 20 sec.
Shock Time Setting Range	0.2 - 3 sec.	0.2 - 3 sec.
Input Voltage for Operation	115/230 Volt 50/60 Hz	115/230 Volt 50/60 Hz
Allow. Input Voltage Fluctuation	10%	10%
Input Current from C.T. Secondary	5mA	5A
Meter Fine Tuning Adjustment	Yes	Yes
Output Contact	Transfer Contact 250VAC 0.2A at inductive load*	Transfer Contact 250VAC 0.2A at inductive load*
Test Button	Yes	Yes
Withstanding Voltage	1500VAC @ 60Hz for 1 min. between terminal and enclosure	1500VAC @ 60Hz for 1 min. between terminal and enclosure
Surface Color	Munsell 7.5BG4/1.5	Munsell 2.5Y/2
Weight	2.2 lbs.	2.6 lbs.
Power Consumption	1.2VA	1.2VA
Operating Temperature Range	14°F - 122°F	14°F - 122°F
Operating Humidity	85% R.H. or less	85% R.H. or less
Max. Elevation	1,000m	1,000m
Atmosphere	Free of corrosive gas and dust	Free of corrosive gas and dust

### SPECIFICATIONS\*

FEATURES	TSBSS	TSBSA
Motor Amps	Refer to page D-10	Refer to page D-10
Load Current Range	10 - 130%	10 - 130%
Start Time Setting Range	0.2 ~ 30 sec.	0.2 - 30 sec.
Shock Time Setting Range	0.2 ~ 10 sec.	0.2 - 10 sec.
Input Voltage for Operation	90 ~ 250 VAC	90 ~ 250 VAC
Allow. Input Voltage Fluctuation	10%	10%
Input Current from C.T. Secondary	NA	NA
Meter Fine Tuning Adjustment	NA	NA
Output Contact	3A/250 VAC, Resistive	3A/250 VAC, Resistive
Test Button	Yes	Yes
Withstanding Voltage	2000VAC, 5mA @ 60Hz for 1 min. between terminal and enclosure	2000VAC, 5mA @ 60Hz for 1 min. between terminal and enclosure
Surface Color	NA	NA
Weight	0.35 lbs.	0.35 lbs.
Power Consumption	2.7VA	2.7VA
Operating Temperature Range	-4°F - 158°F	-4°F - 158°F
Operating Humidity	45 - 85% R.H.	45 - 85% R.H.
Max. Elevation	2,000m	2,000m
Atmosphere	Free of corrosive gas and dust	Free of corrosive gas and dust

### SPECIFICATIONS\*

FEATURES	TSB151A	TSB152A
Motor Amps	0.25 - 16 amps	17 - 400 amps
Load Current Range	30 - 130%	30 - 130%
Alarm Load Current Range	30 - 130%	30 - 130%
Start Time Setting Range	0.2 - 20 sec.	0.2 - 20 sec.
Shock Time Setting Range	0.2 - 3 sec.	0.2 - 3 sec.
Input Voltage for Operation	115 Volt 50/60 Hz	115 Volt 50/60 Hz
Allow. Input Voltage Fluctuation	10%	10%
Input Current from C.T. Secondary	5mA	5A
Meter Fine Tuning Adjustment	Yes	Yes
Output Contact	Transfer Contact 250VAC 0.2A at inductive load*	Transfer Contact 250VAC 0.2A at inductive load*
Test Button	Yes	Yes
Withstanding Voltage	1500VAC @ 60Hz for 1 min. between terminal and enclosure	1500VAC @ 60Hz for 1 min. between terminal and enclosure
Surface Color	Munsell 7.5BG4/1.5	Munsell 2.5Y/2
Weight	2.2 lbs.	2.6 lbs.
Power Consumption	1.2VA	1.2VA
Operating Temperature Range	14°F - 122°F	14°F - 122°F
Operating Humidity	85% R.H. or less	85% R.H. or less
Max. Elevation	1,000m	1,000m
Atmosphere	Free of corrosive gas and dust	Free of corrosive gas and dust

\*CAUTION: If the starter coil in the magnetic contactor (MC) of the monitored motor exceeds the Shock Relay output contact's capacity, an auxiliary relay must be installed to prevent damage to the Shock Relay. The instruction manual included with each Shock Relay details how to add this auxiliary relay if required.

## SPECIFICATIONS

### SPECIFICATIONS\*

FEATURES	TSB151M	TSB152M
Motor Amps	0.25 - 16 amps	17 - 400 amps
Load Current Range	30 - 130%	30 - 130%
Impact Load Current Range	30 - 300%	30 - 300%
Start Time Setting Range	0.2 - 20 sec.	0.2 - 20 sec.
Shock Time Setting Range	0.2 - 3 sec.	0.2 - 3 sec.
Impact Shock Time Setting	0.05 sec. (fixed)	0.05 sec. (fixed)
Input Voltage for Operation	115/230 Volt 50/60 Hz	115/230 Volt 50/60 Hz
Allow. Input Voltage Fluctuation	10%	10%
Input Current from C.T. Secondary	5mA	5A
Meter Fine Tuning Adjustment	Yes	Yes
Output Contact	Transfer Contact 250VAC 0.2A at inductive load*	Transfer Contact 250VAC 0.2A at inductive load*
Test Button	Yes	Yes
Withstanding Voltage	1500VAC @ 60Hz for 1 min. between terminal and enclosure	1500VAC @ 60Hz for 1 min. between terminal and enclosure
Surface Color	Munsell 7.5BG4/1.5	Munsell 2.5Y7/2
Weight	2.2 lbs.	2.6 lbs.
Power Consumption	1.2VA	1.2VA
Operating Temperature Range	14°F - 122°F	14°F - 122°F
Operating Humidity	85% R.H. or less	85% R.H. or less
Max. Elevation	1,000m	1,000m
Atmosphere	Free of corrosive gas and dust	Free of corrosive gas and dust

### SPECIFICATIONS\*

FEATURES	TSB151W	TSB152W
Motor Amps	0.25 - 16 amps	17 - 400 amps
Overload Current Range	30 - 130%	30 - 130%
Underload Current Range	30 - 130%	30 - 130%
Start Time Setting Range	0.2 - 20 sec.	0.2 - 20 sec.
Shock Time Setting Range	0.2 - 3 sec.	0.2 - 3 sec.
Input Voltage for Operation	115/230 Volt 50/60 Hz	115/230 Volt 50/60 Hz
Allow. Input Voltage Fluctuation	10%	10%
Input Current from C.T. Secondary	5mA	5A
Meter Fine Tuning Adjustment	Yes	Yes
Output Contact	Transfer Contact 250VAC 0.2A at inductive load*	Transfer Contact 250VAC 0.2A at inductive load*
Test Button	Yes	Yes
Withstanding Voltage	1500VAC @ 60Hz for 1 min. between terminal and enclosure	1500VAC @ 60Hz for 1 min. between terminal and enclosure
Surface Color	Munsell 7.5BG4/1.5	Munsell 2.5Y7/2
Weight	2.2 lbs.	2.6 lbs.
Power Consumption	1.2VA	1.2VA
Operating Temperature Range	14°F - 122°F	14°F - 122°F
Operating Humidity	85% R.H. or less	85% R.H. or less
Max. Elevation	1,000m	1,000m
Atmosphere	Free of corrosive gas and dust	Free of corrosive gas and dust

### SPECIFICATIONS\*

FEATURES	TSB152D	TSB50D
Motor Amps	Up to 500A	Up to 500A
Load Current Range	30 - 130%	50 - 130%
Start Time Setting Range	0.2 - 20 sec.	3 sec. (fixed)
Shock Time Setting Range	0.2 - 3 sec.	0.3 - 3 sec.
Input Voltage for Operation	115/230 Volt 50/60 Hz	115/230 Volt 50/60 Hz
Allow. Input Voltage Fluctuation	10%	10%
Input Current from C.T. Secondary	50mV	50mV or 100mV
Meter Fine Tuning Adjustment	Yes	No
Output Contact	Transfer Contact 250VAC 0.2A at inductive load*	Transfer Contact 250VAC 0.1A at inductive load*
Test Button	Yes	No
Withstanding Voltage	1500VAC @ 60Hz for 1 min. between terminal and enclosure	1500VAC @ 60Hz for 1 min. between terminal and enclosure
Surface Color	Munsell 10GY8/4	Munsell N-2.0
Weight	2.2 lbs.	0.7 lbs.
Power Consumption	1.2VA	0.6VA
Operating Temperature Range	14°F - 122°F	14°F - 122°F
Operating Humidity	85% R.H. or less	85% R.H. or less
Max. Elevation	1,000m	1,000m
Atmosphere	Free of corrosive gas and dust	Free of corrosive gas and dust

\*CAUTION: If the starter coil in the magnetic contactor (MC) of the monitored motor exceeds the Shock Relay output contact's capacity, an auxiliary relay must be installed to prevent damage to the Shock Relay. The instruction manual included with each Shock Relay details how to add this auxiliary relay if required.

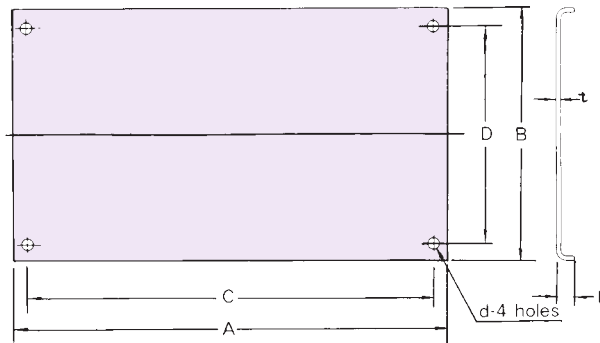
## Shock Relay Accessories

When purchasing Shock Relay, consider these convenient accessories, also available from U.S. Tsubaki.

### ■ Fitting Plate

When mounting Shock Relay in your electrical panel box, save yourself time and money with our fitting plate. Pre-drilled to fit the appropriate model, our fitting plate eliminates the need for you to fabricate and drill your own holes. Refer to the chart below for dimensions.

FITTING PLATE

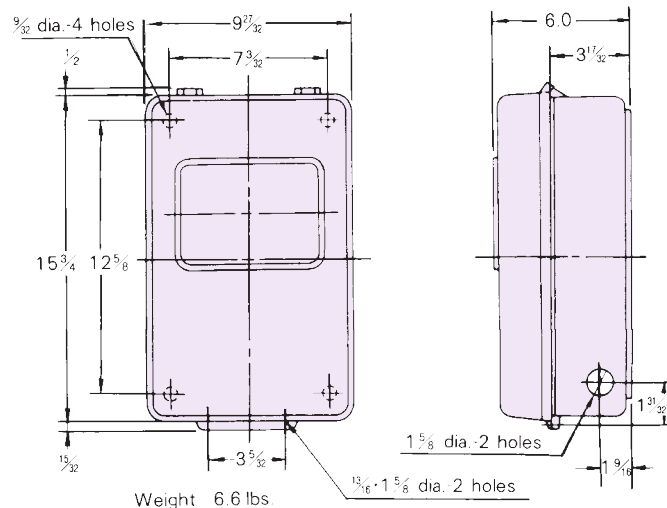


Type	A	B	C	D	E	t	d	Weight
TSB50	7 <sup>3</sup> / <sub>32</sub>	4 <sup>11</sup> / <sub>32</sub>	6 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>32</sub>	1/16	3/64	.8 lbs.
TSB151-152	9 <sup>7</sup> / <sub>16</sub>	5 <sup>17</sup> / <sub>32</sub>	8 <sup>29</sup> / <sub>32</sub>	4 <sup>13</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>32</sub>	5/64	7/32	1.4 lbs.

### ■ Shock Relay Enclosure

Protect your Shock Relay from casual contact, dust and intermittent exposure to splashes and spills of water and other chemicals. Includes a window for easy viewing of the meter and settings. Meets ISO IP44 standards.

Available for models TSB151 and TSB152 series units.



D - PT COMPONENTS



# WARNING

## USE CARE TO PREVENT INJURY COMPLY WITH THE FOLLOWING TO AVOID SERIOUS PERSONAL INJURY

1. Disconnect power. Always lock out power switch before installing, removing, or servicing unit. Comply with Occupational Safety and Health Standards 1910.147 “The Control of Hazardous Energy (Lock Out/Tag Out).”
2. Install in proper enclosure in accordance with NEMA 250-2003 “Enclosures for Electrical Equipment (1000 Volts Maximum)” and NFPA 496 2003 edition “Purged and Pressurized Enclosures for Electrical Equipment, 2003 Edition.” When revisions of these standards are published, the updated edition shall apply.
3. Guards must be provided on all power transmission and conveyor applications in accordance with provisions of ANSI/ASME B 15.1-2000 “Safety Standards for Mechanical Power Transmission Apparatus” and ANSI/ASME B 20.1-2006 “Safety Standards for Conveyors and Related Equipment,” or other applicable standards. When revisions of these standards are published, the updated edition shall apply.

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