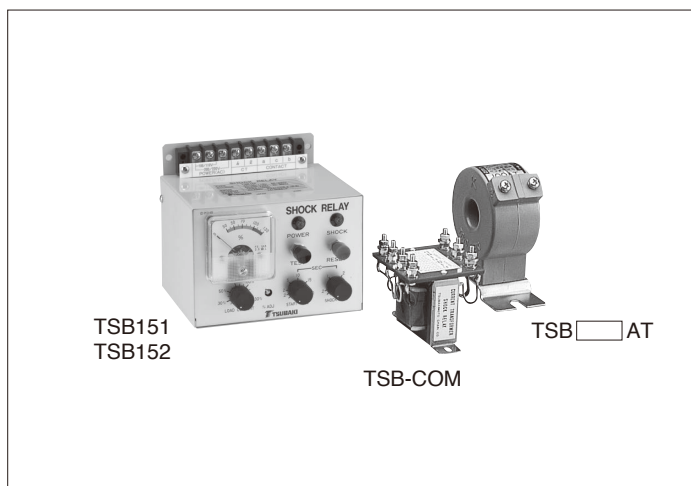


# Shock Relay 150 Series

## Features

- Analog meter
- Self-holding type
- Special MTO models and optional specifications are available



TSB151  
TSB152

TSB-COM

TSB  AT

## Standard specifications

Model		TSB151-COM	TSB152, TSB <input type="text"/> AT*1
Applicable motor capacity	200V class	0.2 to 3.7kW*2	5.5 to 90kW
	400V class	0.2 to 3.7kW	5.5 to 90kW
Max. motor circuit voltage		AC600V 50/60Hz	
Load current setting range*3		30 to 130% (100%=5mA)	30 to 130% (100%=5A)
Start time setting range*3		0.2 to 20s	
Shock time setting range*3		0.2 to 3s	
Rated operating power supply voltage		AC100/110V or AC200/220V, 50/60Hz $\pm 10\%$	
Operating power supply voltage fluctuation range		90 to 110% of rated value	
Current setting accuracy		$\pm 10\%$ (full-scale)	
Current detection system		1-phase CT system	
Output relay	Operation	Self-holding	
	Contact capacity	1c contact, AC250V 0.2A (inductive load $\cos\phi=0.4$ )	
	Min. applicable load*4	DC24V, 4mA	
	Life	100,000 activations	
Usage environment	Ambient temperature	$-10$ to $+50^{\circ}\text{C}$	
	Ambient humidity	45 to 85% RH; no condensation	
	Ambient vibration	$5.9\text{m/s}^2$ or less	
	Altitude	2000m or less	
	Atmosphere	No dust or corrosive gas	
Withstand voltage	Between circuit-housing	700V AC, 60Hz, 1 minute (power supply circuit and contact circuit)	
	Between contacts	700V AC, 60Hz, 1 minute	
	Between circuits	700V AC, 60Hz, 1 minute (power supply circuit and contact circuit)	
Protective structure		IP20	
Mass		1.0kg	
Power consumption		1.2VA	
External CT	Accessory external CT model	TSB-COM	TSB <input type="text"/> AT ( <input type="text"/> ...Rated input current value)
	Rated input current	0.75A, 1.5A, 1.75A, 2.0A, 2.5A, 3.3A, 4.0A 5.3A, 7.0A, 9.0A, 10.0A, 16.0A	100A, 120A, 150A, 200A, 250A, 300A
	Rated output current	5mA	5A
	Rated load	0.5VA	5VA
	Mass	0.5kg	0.6kg

Notes: \*1. TSB152 and TSB AT (external CT) have different model numbers.

\*2. If the TSB-COM-A (small-capacity CT) is used, a motor of 0.1kW or less can be used.

\*3. Current and time setting ranges are settable ranges, not the upper and lower levels of setting volume.

\*4. When directly inputting output relay contact into the programmable controller (PLC), be aware that a minute electric current can cause contact failure. Therefore, before inputting the output relay contact into the PLC, it is recommended that you drive the relay coil for a minute current via the relay signal.

## Part names and functions

### % Display meter

The meter displays the percentage of the motor current in operation vs. the motor rated current. (The rated current here is based on "Motor rated current" in the CT selection table on page 28.)

### LOAD CURRENT knob

Load current can be set to stop the motor at the desired level when overload occurs. When the motor current exceeds the preset current value (continues to exceed the preset shock time), the Shock Relay activates and stops the motor.

### % Adjust knob

If the input from the CT is 5mA (TSB151) or 5A (TSB152), the meter can be modified in the 95 to 130% range. Also, after adjusting the % adjuster, the meter scale indicator and load current set scale are the same.

### START TIME knob

To prevent the Shock Relay from operating due to the motor start-up current, set the start time a little bit longer than the time the motor settles into the steady zone.

### Terminals

All terminals are located on the upper portion of the Shock Relay, making wiring easy.

### POWER indicator

Lights up when the Shock Relay is turned on.

### Activation indicator

Lights up when the Shock Relay is operating.

### TEST button

Shock Relay operation can be tested stand-alone or during motor operation.

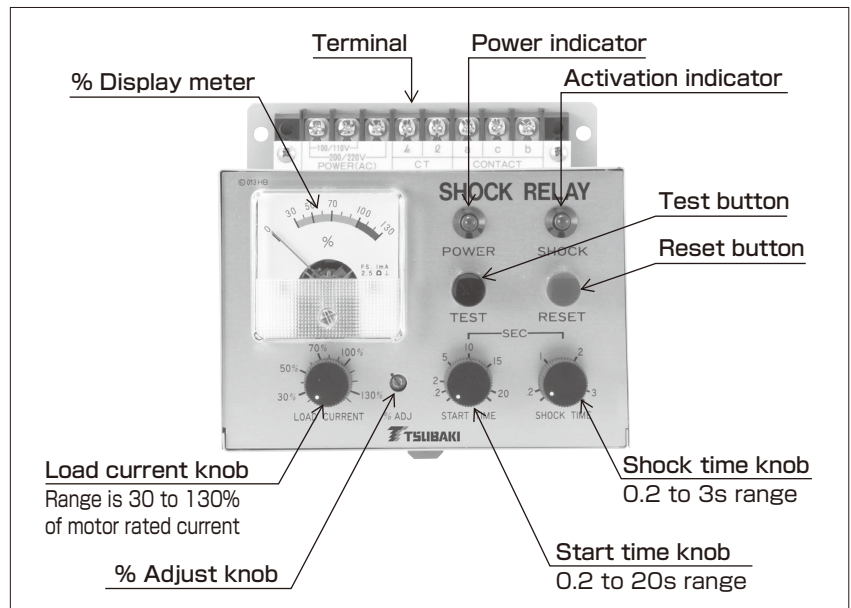
(When testing the Shock Relay, continue to press and hold the TEST button longer than the set start time or shock time, whichever is longer.)

### RESET button

After the Shock Relay activates, the RESET button is used to cancel the self-holding of the output contact.

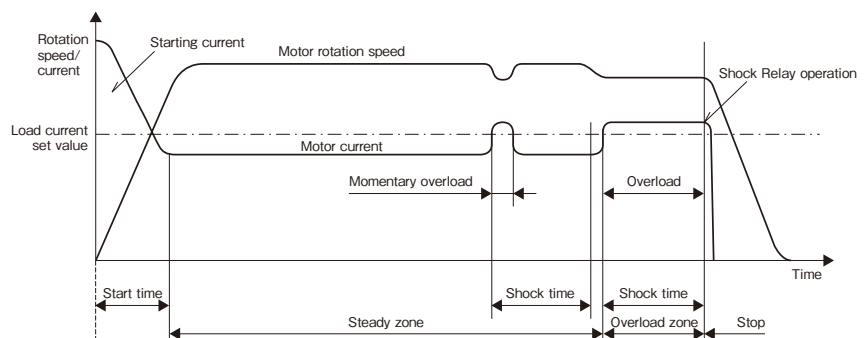
### SHOCK TIME knob

Shock time is the amount of time set until the Shock Relay activates when overload occurs. Within the set time, the Shock Relay will not activate, even if it is overloaded.



## Operating mode

### ■ Overload operating mode

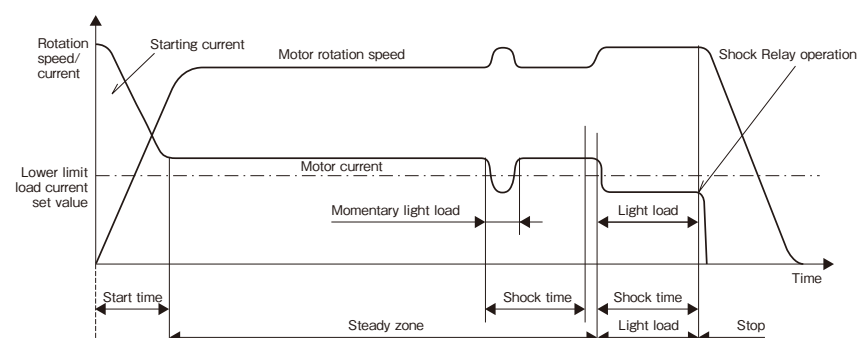


### ■ Light-load operating mode

TSB151W, 152W

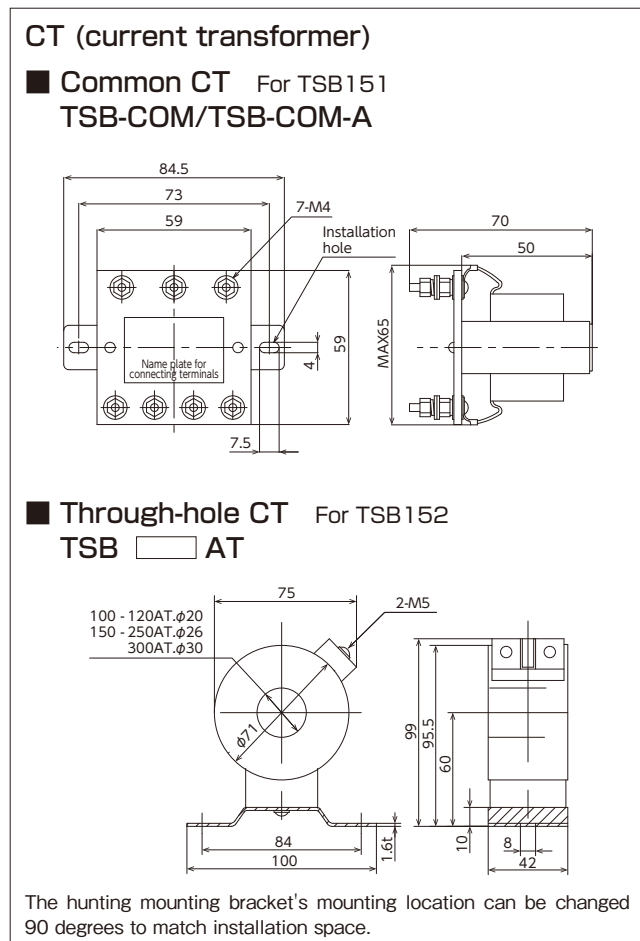
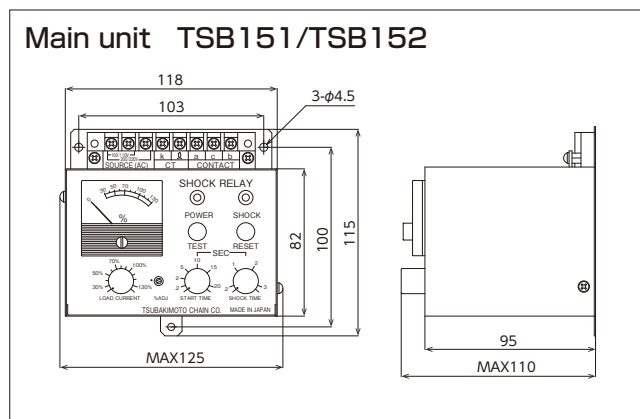
(Lower/upper limit detector specifications)

Note: Because there is only one output relay, it is not possible to distinguish between overload operation and light-load operation.



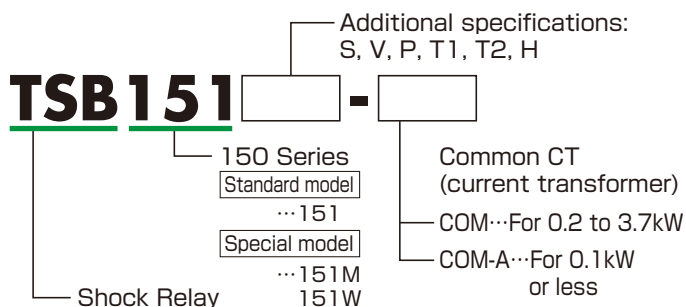
# Shock Relay 150 Series

## Outline dimensions

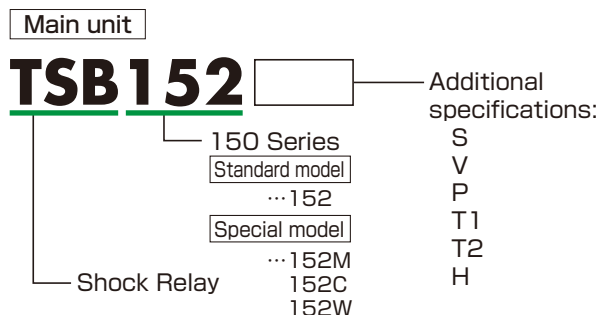


## Model

### ■ For motors 3.7kW or smaller



### ■ For motors 5.5kW or larger



### Through-hole CT



Note: Use the main unit and CT as a set.

Tsubaki uses COM-5-XX through-hole CTs from Toyo Keiki Co., Ltd.

## Through-hole CT comparison chart

Current	Tsubakimoto Chain	Toyo Keiki
100A	TSB100AT	COM-5-20 100AT
120A	TSB120AT	COM-5-20 120AT
150A	TSB150AT	COM-5-26 150AT
200A	TSB200AT	COM-5-26 200AT
250A	TSB250AT	COM-5-26 250AT
300A	TSB300AT	COM-5-30 300AT

## Standard model and special models with optional specifications

Optional specifications		Subtropical spec.	Control power supply voltage modification	Panel mounted	Start time modification	Shock time modification	Auto-reset
Model		S	V	P	T1	T2	H
Standard	151/152	○	○	○	○	○	○
Impact load detection	151M/152M	○	○	○	○	○	○
1A input (motor capacity is not necessary to consider)	152C	○	○	○	○	○	○
Upper/lower limit detection	151W	○	○	○	○	○	○
	152W	○	○	○	○	○	○

Notes: 1. Refer to page 10 for detailed specifications

2. For optional specifications V, specify control power source

3. For optional specifications T1 and T2, indicate the start time and shock time modification time.

◎ : Multiple specifications available

## CT (current transformer)

### ■ Common CT: for motors 3.7kW or smaller

- TSB-COM (standard) can be used with 0.2 to 3.7kW motors.
- TSB-COM-A (small capacity) can be used with motors up to and including 0.1kW.

### ■ TSB-COM (standard type)

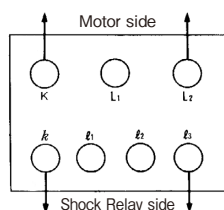
Motors (kW)	Power supply: AC200/220V			Power supply: AC400/440V		
	Motor rated current (A)	Connecting terminal	Shock Relay side	Motor rated current (A)	Connecting terminal	Shock Relay side
0.2	1.75	K-L <sub>2</sub>	k-ℓ <sub>1</sub>	0.75	K-L <sub>2</sub>	ℓ <sub>1</sub> -ℓ <sub>2</sub>
0.4	2.5	K-L <sub>2</sub>	k-ℓ <sub>2</sub>	1.5	K-L <sub>2</sub>	ℓ <sub>2</sub> -ℓ <sub>3</sub>
0.75	4.0	K-L <sub>2</sub>	k-ℓ <sub>3</sub>	2.0	L <sub>1</sub> -L <sub>2</sub>	ℓ <sub>2</sub> -ℓ <sub>3</sub>
1.5	7.0	K-L <sub>1</sub>	k-ℓ <sub>1</sub>	3.3	L <sub>1</sub> -L <sub>2</sub>	k-ℓ <sub>2</sub>
2.2	10.0	K-L <sub>1</sub>	k-ℓ <sub>2</sub>	5.3	L <sub>1</sub> -L <sub>2</sub>	k-ℓ <sub>3</sub>
3.7	16.0	K-L <sub>1</sub>	k-ℓ <sub>3</sub>	9.0	K-L <sub>1</sub>	ℓ <sub>1</sub> -ℓ <sub>3</sub>

Note: Common CT motor side L<sub>1</sub>-L<sub>2</sub> or Shock Relay side ℓ<sub>1</sub>-ℓ<sub>2</sub> can be combined with a 1A output CT.

### ■ TSB-COM-A (small-capacity type)

Motor rated current (A)	Connecting terminal	
	Motor side	Shock Relay side
0.15	K-L <sub>2</sub>	k-ℓ <sub>1</sub>
0.25	K-L <sub>2</sub>	k-ℓ <sub>2</sub>
0.4	K-L <sub>2</sub>	k-ℓ <sub>3</sub>
0.6	K-L <sub>1</sub>	k-ℓ <sub>1</sub>
1.0	K-L <sub>1</sub>	k-ℓ <sub>2</sub>
1.6	K-L <sub>1</sub>	k-ℓ <sub>3</sub>

Note: Select by current value.



### ■ Through-type CT for motors 5.5kW or larger

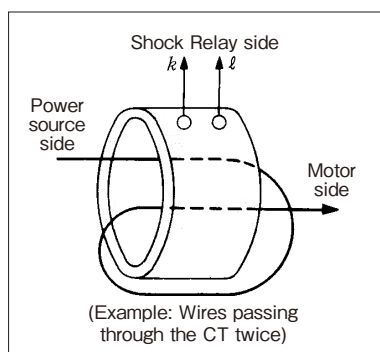
- Select a CT size applicable to motor capacity.

Motor (kW)	Power supply: AC200/220V			Power supply: AC400/440V		
	Motor rated current (A)	CT size	No. of wires passing through CT (I)	Motor rated current (A)	CT size	No. of wires passing through CT (I)
5.5	25	100AT	4	14	100AT	7
7.5	30	120AT	4	20	100AT	5
11	50	100AT	2	25	100AT	4
15	60	120AT	2	30	120AT	4
19	75	150AT	2	37	150AT	4
22	100	100AT	1	50	100AT	2
30	120	120AT	1	60	120AT	2
37	150	150AT	1	75	150AT	2
45	170	200AT	1	85	100AT	1
55	200	200AT	1	100	100AT	1
75	250	250AT	1	130	150AT	1
90	300	300AT	1	150	150AT	1

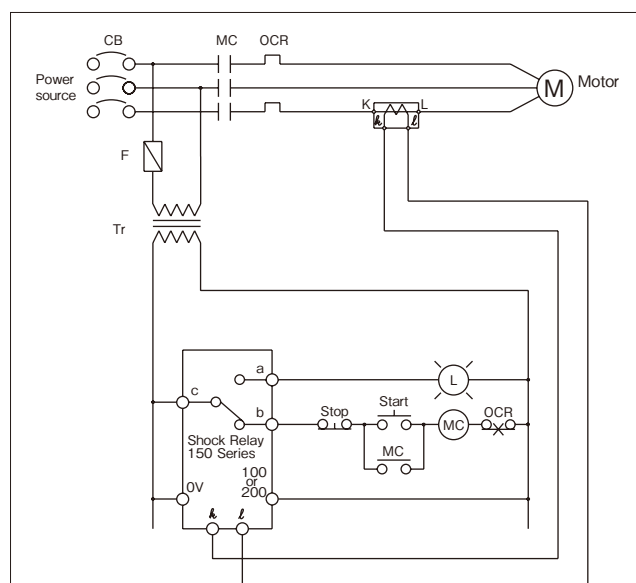
Note: Contact a Tsubaki representative if you need a CT size larger than 300AT.

For single-phase motors or motor capacities not on the selection chart, use the following calculation to make your selection:

$$\text{CT size} \geq \text{Motor rated current} \times \text{Number of wire(s) passing through CT}$$



## Basic connection diagram

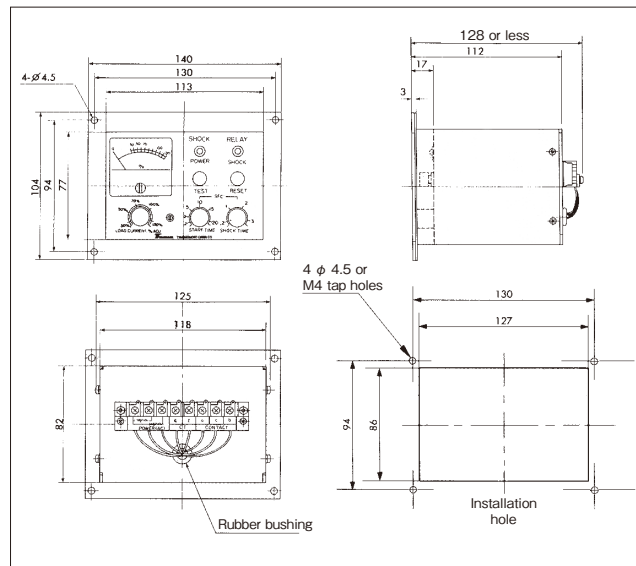


Notes:

1. If the voltage of the main circuit exceeds 220VAC, install a step-down transformer Tr. As well, do not improperly wire the power source wires (AC100V or AC200V).
2. If the CT's secondary side is left open while the primary side is energized, it will cause damage to the CT. When the Shock Relay is not connected, short-circuit the CT's secondary side.
3. The coil capacity of the electromagnetic contactor MC which the TSB150 output contact opens and closes should be less than 200VA when injecting, and less than 20VA when holding.

## Special models and optional specifications

### ■ TSB151P, TSB152P (panel mounted type) outline dimensions



### ■ Notes on CT (current transformer) selection

When the actual motor rated current value is not on the chart, use a through-hole CT or common CT for which the motor rated current is within the 80% to 100% range of the Shock Relay load current.



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