

Motor Shock Protection Relay



MOTOR SHOCK PROTECTION RELAY

Protect your critical equipment and significant investment with Shock Protection Relays and external current transformers from HMA Flow & Industrial.

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

Simply put, when the Shock Protection Relay detects a problem, it shuts down the line – quickly, safely and securely, saving time and money.

After the problem is corrected, the shock relay is reset at the touch of a button, with no tear down required, thereby improving efficiency and reducing downtime.

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STANDARD SPECIFICATIONS

Items	Model No.	TSBSS05	TSBSS30	TSBSS60	TSBSS100	TSBSS200	TSBSS300	
Common	Load current (current setting range) ^{*3}	0.5 to 5A	3 to 30A	5 to 60A	10 to 100A	20 to 200A	30 to 300A	
	Applicable motor capacity	200V class	0.1 to 0.75kW	1.5 to 5.5kW	7.5 to 11kW	15 to 18.5kW	22 to 37kW	45 to 75kW
		400V class	0.2 to 2.2kW	3.7 to 11kW	15 to 22kW	30 to 45kW	55 to 90kW	110 to 132kW
	Work environment	Ambient temperature	-20°C to 60°C					
		Ambient humidity	45 to 85%RH; no condensation					
		Vibration	Less than 5.9m/s ²					
		Altitude	Less than 2000m					
	Ambient atmosphere	No corrosive gas, dust						
	Unit model No.	TSBSS05	TSBSS30	TSBSS60	TSBSS100	TSBSS200	TSBSS300	
	Current setting accuracy	±10% (full scale)						
Set time range	Start time ^{*3}	*4 0.2 to 30s						
	Shock time ^{*3}	*5 0.2 to 10s						
Control power supply voltage (L1 - L2)	AC100 to 240V, 50/60Hz							
Maximum motor circuit voltage	AC600V, 50/60Hz							
Current detection system	Two-phase CT system							
Output relay *1	Self-holding	Includes self-holding						
	Normal state	At start up there is a 0.5s delay, then the output relay excites						
	Abnormal case	When it trips or the power is shut off, the output relay is not excited						
	Contact capacity	1c contact, AC240V 3A (in the case of a resistance load)						
	Minimum applicable load ^{*2}	DC10V, 10mA						
Output relay life-span	Reset method	Press the RESET button or cut the operation power						
	Mechanical	10,000,000 times						
Electrical	100,000 times							
Test functions	Internal circuit and output relay operation check							
Withstand voltage	Between the circuit and case	AC2000V, 60Hz, 1 minute (power supply circuit and contact circuit)						
	Between contacts	AC1000V, 60Hz, 1 minute						
	Between circuit	AC2000V, 60Hz, 1 minute (power supply circuit and contact circuit)						
Gross mass	0.2kg (not including external CT)							
Power consumption	When AC110V	2.7VA (0.35W)						
	When AC200V	11.0VA (1.2W)						
DIN rail mounting	○						×	
UL-cUL	*6 ×						×	
CE	○						×	
External CT	External CT Model No.	Not needed			TSB2CT100	TSB2CT200	TSB2CT300	
	Rated primary current	—			100A	200A	300A	
	Rated secondary current	—			—	5A	—	
	Rated load	—			—	5VA	—	
	Mass	—			—	0.5kg	—	

Notes: *1. During normal operation the output relay is ON, and when the Shock Relay operates it is OFF (refer to page 112).

*2. When directly inputting output relay contact into the programmable controller (PLC), be aware that a minute electric current can cause contact failure.

As for the input to PLC, it is recommended to drive the relay coil for minute current by relay signal of Shock Relay at first, then input this relay contact to PLC.

*3. Current and time setting ranges can be set within the warranty range, but not the upper or lower level of setting volume.

*4. Although the minimum value on the display is 5s, values smaller than 5s can be set with the dial.

*5. Although the minimum value on the display is 1s, values smaller than 1s can be set with the dial.

*6. Special model is available for the conformance to cUL and CCC standards.

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Part Names and Functions

LOAD CURRENT volume (A)

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 (at the same time, overload time continues to exceed the preset SHOCK TIME), the Shock Relay activates and stops the motor.

START TIME volume (s)

When the motor starts there is a possibility that the motor current will exceed the set current value. To prevent the Shock Relay from tripping due to the spike in start current, start time is set a little bit longer than the period of motor start up to ignore the spike.

TEST button

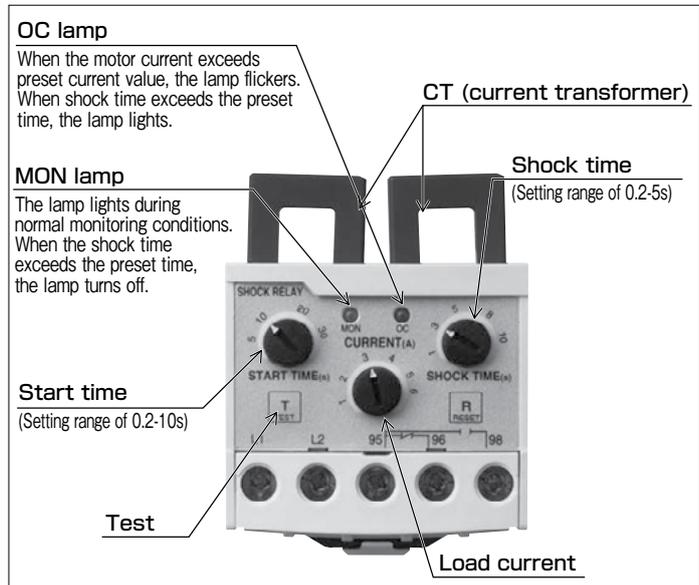
Shock Relay operation can be tested stand-alone or during motor operation.
(When testing the Shock Relay, continue to press and hold the TEST button longer than the set START TIME or SHOCK TIME, whichever is longer.)

RESET button

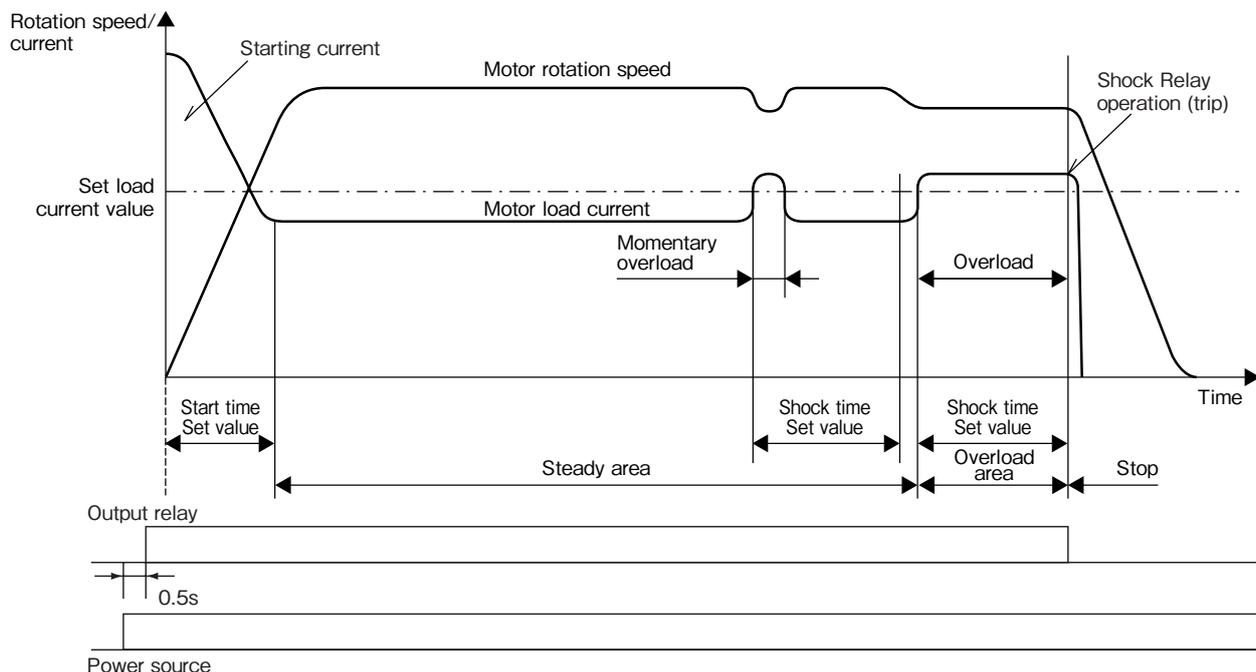
After the Shock Relay activates, the RESET button is used to cancel the self-holding of the output contact.

SHOCK TIME volume (s)

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



Operating Mode

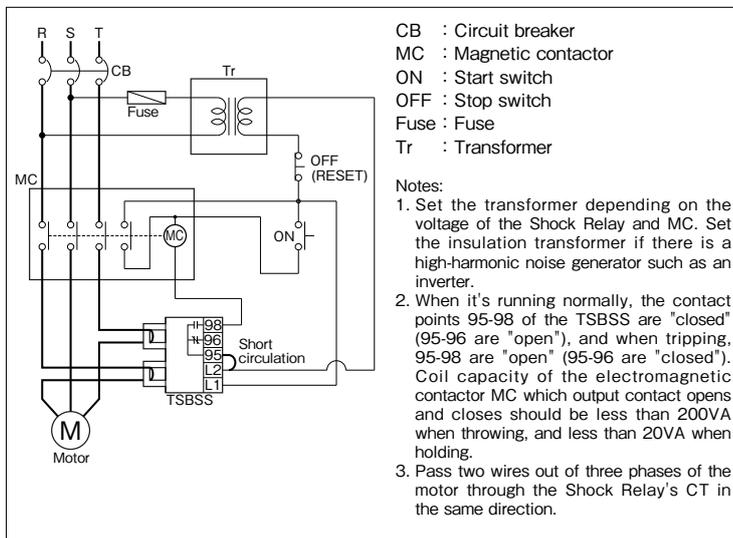


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Outline dimensions

<p>CT unit TSBSS05/TSBSS30/TSBSS60</p> <p>Mass: 0.2kg</p>	<p>CT externally mounted type TSBSS100/TSBSS200/TSBSS300</p> <p>The external CT (current transformer) is wired before delivery.</p> <p>Mass: 0.7kg</p>
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Basic connection diagram

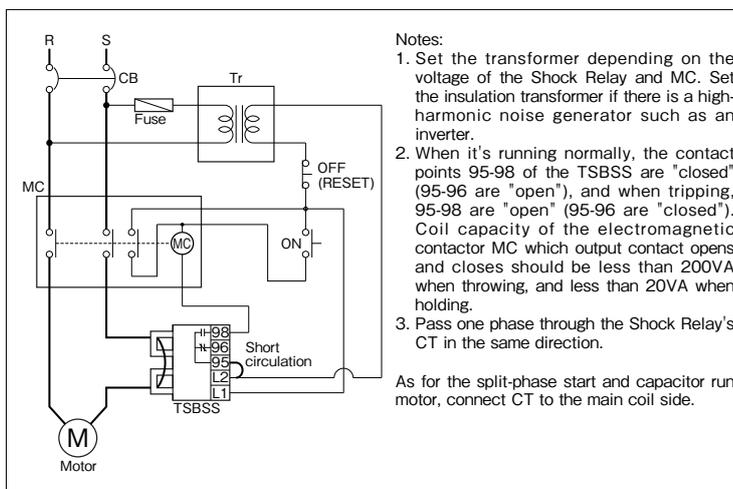


Notes on usage

- During normal operation, the output relay is excited (ON). When overload is detected and the Shock Relay activates or the power supply is cut, the output relay is de-excited (OFF).
- Pass the motor wire(s) through the CT hole the number of times referenced in the chart below. In order to increase the current setting accuracy, the number of wires that pass through the CT hole is 2 times or more for small motor currents. When the motor load factor is low, increase the number of wires that pass through the CT hole as necessary. Furthermore, when the number of the wires that pass through the CT hole is more than 2, it is necessary to convert the current scale value of current volume. (Ex.) When a wire passes two times through the CT, the value on the current scale should be at half value.

AC200V class motor			AC400V class motor		
Capacity (kW)	Shock Relay Model No.	No. of wires that pass through the CT hole	Capacity (kW)	Shock Relay Model No.	No. of wires that pass through the CT hole
0.1	TSBSS05	4	—	—	—
0.2	TSBSS05	3	0.2	TSBSS05	4
0.4	TSBSS05	2	0.4	TSBSS05	3
0.75	TSBSS05	1	0.75	TSBSS05	2
1.5	TSBSS30	3	1.5	TSBSS05	1
2.2	TSBSS30	2	2.2	TSBSS05	1
3.7	TSBSS30	1	3.7	TSBSS30	3
5.5	TSBSS30	1	5.5	TSBSS30	2
7.5	TSBSS60	1	7.5	TSBSS30	1
11	TSBSS60	1	11	TSBSS30	1
—	—	—	15	TSBSS60	1
—	—	—	18.5	TSBSS60	1
—	—	—	22	TSBSS60	1

Single-phase motor reference schematic for when using the motor



- Because products conforming to CE markings have been electro-magnetically tested for compatibility based on industrial environmental standards, they are not for household, commercial or light industrial use.

Model No.

CT Unit Type - External Mounted CT Type

TSBSS05

