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SHOCK RELAY OVERLOAD PROTECTION

Product Catalog

01/16 Rev. 0 L14020

www.ustsubaki.com

TSUBAKI
www.ustsubaki.com

INTRODUCTION TO SHOCK RELAY OVERLOAD PROTECTION

The truth is any machine can break.

The probability of impact damage to a machine is inevitable. Eventually, a machine will jam due to an obstruction, feed jam, foreign object intrusion, mechanical failure, etc. Something will happen, and there's no telling when.

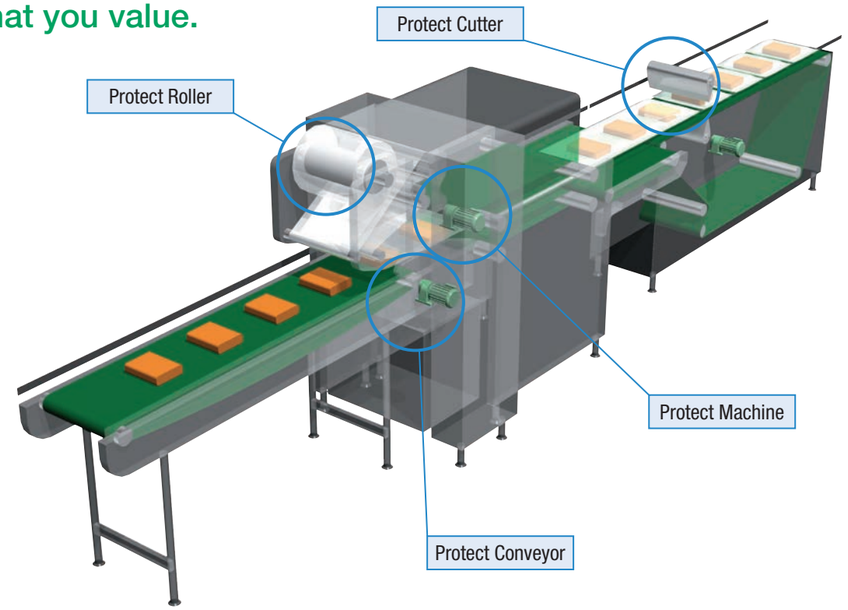
Unintended load changes on the equipment can have big consequences. As equipment becomes more integrated, a shock or jam in one part of the production line can snowball into a complete system shutdown – resulting in damaged equipment, loss of product, and reduced productivity.

It doesn't have to happen.

Tsubaki's family of overload protection devices offer a solution to fit every need. Our family of overload protection devices keeps you productive all day, every day without interruption to assure maximum productivity is maintained.

Tsubaki offers the finest power transmission products in the industry and provides protection for those parts and the equipment they belong to. Tsubaki Shock Relay and Shock Monitor products provide inexpensive insurance for expensive equipment.

Protect what you value.



TSUBAKI SHOCK RELAY

SHOCK RELAY PRODUCT OVERVIEW

TSBED SERIES
Dimensional Envelope
2.8"H X 2.2"W X 3.1"D

Designed to work with inverters. Product features include: digital display, built-in tamper-proof cover, and built-in test button. Choose between self-holding output relay and automatic reset. UL listed.

TSBSC SERIES
Dimensional Envelope
2.9"H X 2.8"W X 3.3"D

Overload or underload, pre-alarm notification and thermal energy protection. Product features include: communication function (4 to 20 mA) to allow central monitoring, works with 20Hz to 200Hz inverters. Panel mount option.

TSBSB SERIES
Dimensional Envelope
2.6"H X 2.2"W X 3"D

Provides overload protection. Select manual or automatic reset output. Monitor AC motors up to 600 volts and 300 Amps. Shock Relay power supply can be AC or 24VDC. 35 mm DIN rail or panel mount. Economically priced, OEM style. UL Listed.

TSB150N SERIES
Dimensional Envelope
4.5"H X 4.9"W X 4.3"D

The original Shock Relay with self-holding circuit and analog meter. In many cases, this Shock Relay series is the easiest to set up.

TSB150M SERIES
Dimensional Envelope
4.5"H X 4.9"W X 4.3"D

A variation of the original Shock Relay, the M series, in addition to standard overload protection provides impact protection with a response time of 0.05 seconds.

TSUBAKI SHOCK RELAY

THE ELECTRONIC SHEAR PIN!

Pioneered by Tsubaki, the Shock Relay protects your equipment against unexpected shock loads, overloads, and underloads before damage occurs. The Shock Relay protects the mechanical parts of your equipment by monitoring the current draw on your electric drive motor, and shutting it down when the motor works too hard for too long.

Advantages to you:

- Back to work with the press of a button
- No moving parts, CPU design ensures repeatability
- Precise set-points retain accuracy day after day
- Permits problem notification by alarm or warning lights
- Protect equipment that is up to 1000 feet away

The Shock Relay adapts to virtually any kind of equipment that's driven by an electric motor and is used in applications in a broad variety of industries.

Some of the common industries and applications are listed below:

Industry	Application
Material handling	Conveyors, turntables, elevators
Water treatment plants	Pumps, scrapers, water screens
Food machinery	Screw and belt conveyors, bucket elevators
Machine tool	Tapping machines, drill presses
Chemical	Pumps, agitators, filters

Shock Relay selection is simple; it is based on the motor voltage and amperage of your equipment.

Shock Relay has an unlimited life – it does not wear out.

Shock Relay accepts single three-phase motors up to 600 volts.

Reacts only when there is a problem

At installation, two set-points are made to the Shock Relay:

- How hard is the equipment allowed to work as measured by motor amperage
- Once the motor starts to work too hard, how soon in seconds must we stop production

Balancing these two settings allows for protection when the unexpected happens, limiting damage and downtime.

TSUBAKI SHOCK RELAY

THEORY OF OPERATION – HOW DOES IT WORK?

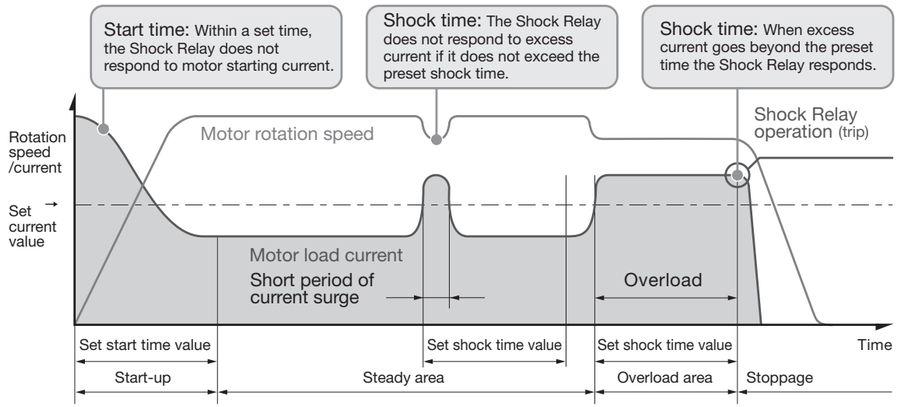


Figure 1: Shock Relay operation example

Figure 1 above reflects a typical set-up for a Tsubaki Shock Relay. As depicted in the above example, the Shock Relay is set up to accept a higher motor amperage draw at start-up for a limited amount of time. This "Start Time" period allows the motor to spool to its steady state operation mode where maximum continuous RPM is achieved, and current draw drops to a normal value that is below the maximum "Current Value" set in the Shock Relay. As depicted, the amperage draw of the motor then momentarily increases (resulting in a drop in RPM due to induced load) above the maximum "Current Value" setting, but quickly falls back to a steady state value. Since the "Shock Time" value was not exceeded, the Shock Relay does not trip, and allows continued operation. However, as time passes by, the Shock Relay senses an increase in motor amperage draw and a drop in RPM that exceeds set current value and "Shock Time." The overload condition sensed by the Shock Relay causes the unit to trip, resulting in the Shock Relay breaking the motor starter contact – thus, shutting the system down to prevent mechanical damage from occurring.

Important Key Concepts:
* Shock Relays generally work with any voltage AC motor, single or three-phase.
* Besides the power to the motor, the Shock Relay needs its own power supply. Power supply requirements generally fall into 115 or 230V single phase.
* It is best practice to have one Shock Relay monitor one motor. Grouping multiple motors to a single Shock Relay generally does not give satisfactory results.

TSUBAKI SHOCK RELAY

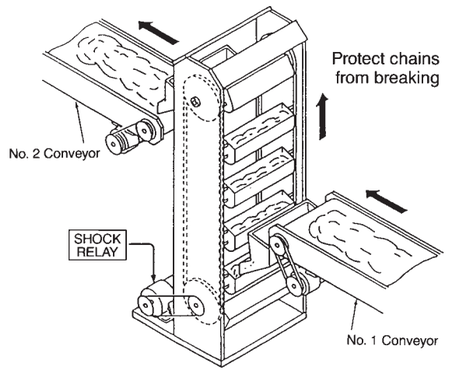
TARGET MARKETS & APPLICATION EXAMPLES

Target Markets

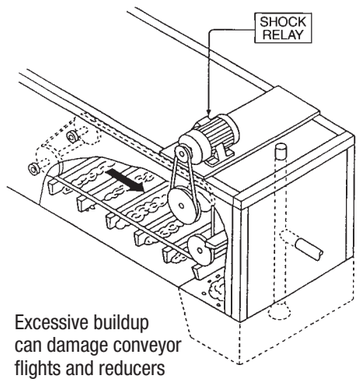
- Material Handling
  Conveyors, Turntables, Elevators
- Water Treatment Plants
  Pumps, Scrapers, Water Screens
- Food Machinery
  Pumps, Agitators, Mixers
- Agriculture
  Screw and Belt Conveyors, Bucket Elevators
- Machine Tool
  Tapping Machines, Drill Press
- Chemical Industry
  Pumps, Agitators,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

Application Examples

Bucket Elevators

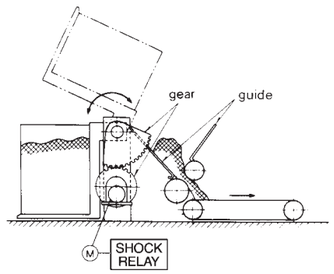


Drag Conveyors



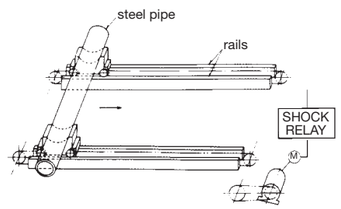
Excessive buildup
can damage conveyor
flights and reducers

Gear Drives



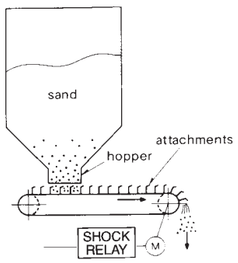
Protect gears from damage

Conveyor Applications



Detect damaging overloads that
lead to downtime

Chain Feeders



Protect attachments from damage

HOW TO ORDER

The model code listed below is intended to provide an example of how a given Tsubaki Shock Relay is configured. The most important aspect of ordering a Tsubaki Shock Relay is knowing the electric drive motor horsepower, voltage and amperage rating. As seen below, these three attributes are used to select the correct size range. Selecting a given series is a matter of preference based upon the features and benefits of a given Shock Relay series.

How to Order Code: Example Model # TSBSB Series Shock Relay

TSB	SB	30

Shock Relay	Series	Max Amperage	Amperage Range	230 Volt Motor HP*	460 Volt Motor HP*
Tsubaki Shock Relay Overload Protection	SB Series: Basic overload protection. Manual reset with fail safe contact	5	0.5 - 6A	1/8 to 1 HP	1/4 to 3 HP
		10	1 - 12A	2 to 3 HP	3 to 5 HP
		30	3 - 30A	5 to 7 HP	7 to 15 HP
		60	5 - 60A	10 to 15 HP	20 to 30 HP
		100	10 - 100A	20 to 25 HP	40 to 60 HP
		200	20 - 200A	30 to 50 HP	70 to 120 HP
		300	30 - 300A	60 to 100 HP	150 to 175 HP

* The motor horsepower ranges are approximates; best option is to select based on actual current readings.

The above example for the TSBSB series Shock Relay is used to illustrate the various models within one Shock Relay series and How to Order a Shock Relay for your application.

TSB: There are two families within Tsubaki's line of electronic protection devices. The Shock Relay series begins with TSB. The Shock Monitor series begins with TSM.

SB: The SB-series is one of five types of Shock Relays, each having slightly different features and focusing on different types of applications. While there is overlap between the Shock Relay series, the combinations of features such as ease of set-up, type of display, and communication options will make one Shock Relay series more desirable than another. See the preceding page for a delineation of the various Shock Relay series.

30: The numerical sizing of a Shock Relay series. The TSBSB series is available in seven sizes and for this series, the number relates to the max amperage rating for that Shock Relay. While all Shock Relays can be adjusted over a wide range of amperages, here are a few suggestions that will aid with selection:

- **Select the Shock Relay based on actual running amperage**
  There is a tendency to oversize the electric motor for the application. For example, the motor nameplate may say 6 amps but measurement shows the application only uses 3 amps. Select the Shock Relay based on the 3-amp reading.

TSBSB SERIES - SHOCK RELAY

Features:

- Output relay is self-holding type
- Contacts open when an overload is detected and remain until the reset button is pushed
- Fail-safe relay de-energizes when over current detected
- Economically priced
- Wide current setting range
- High degree of repeatability with low hysteresis
- Includes TEST and RESET buttons
- All-in-one unit with built-in current transformer
- 35 mm DIN rail mount or panel mount
- Can be used with single-phased motors
- UL listed
- Permits trip notification by alarm or warning lights

All-in-one unit with CT

CT (current transformer)

How to Order Code: Example Model # for TSBSB Series Shock Relay

TSB	SB	30

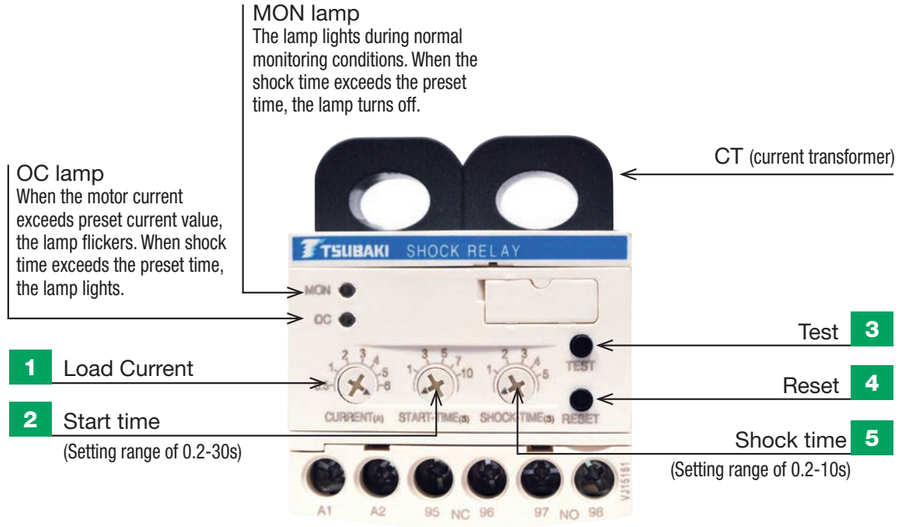
Shock Relay	Series	Max Amperage	Amperage Range	230 Volt Motor HP*	460 Volt Motor HP*
Tsubaki Shock Relay Overload Protection	SB Series: Basic overload protection. Manual reset with fail safe contact	5	0.5 - 6A	1/8 to 1 HP	1/4 to 3 HP
		10	1 - 12A	2 to 3 HP	3 to 5 HP
		30	3 - 30A	5 to 7 HP	7 to 15 HP
		60	5 - 60A	10 to 15 HP	20 to 30 HP
		100	10 - 100A	20 to 25 HP	40 to 60 HP
		200	20 - 200A	30 to 50 HP	70 to 120 HP
		300	30 - 300A	60 to 100 HP	150 to 175 HP

* The motor horsepower ranges are approximates; best option is to select based on actual current readings. Select the Shock Relay based on the motor amperage or motor horsepower.

The following table provides a breakdown of the components provided when ordering a given TSBSB Series Shock Relay. Note that TSBSB Shock Relay sizes with model numbers containing 100, 200, and 300 require additional components when selected. For example, a TSBSB100 Shock Relay will be supplied with a TSBSB05 Shock Relay and a TSB2CT100 current transformer.

TSBSB - All in one unit		TSBSB Externally Mounted Current Transformer Type		
Shock Relay Assembly Part Number	Current Transformer Part Number	Shock Relay Assembly Part Number	Shock Relay Part Number	Current Transformer Part Number
TSBSB05	Not Applicable	TSBSB100	TSBSB05	TSB2CT100
TSBSB10	Not Applicable	TSBSB200	TSBSB05	TSB2CT200
TSBSB30	Not Applicable	TSBSB300	TSBSB05	TSB2CT300
TSBSB60	Not Applicable	NA		

TSBSB SERIES - SHOCK RELAY



Control interface

1 LOAD CURRENT

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.

2 START TIME

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.

3 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.)

4 RESET Button

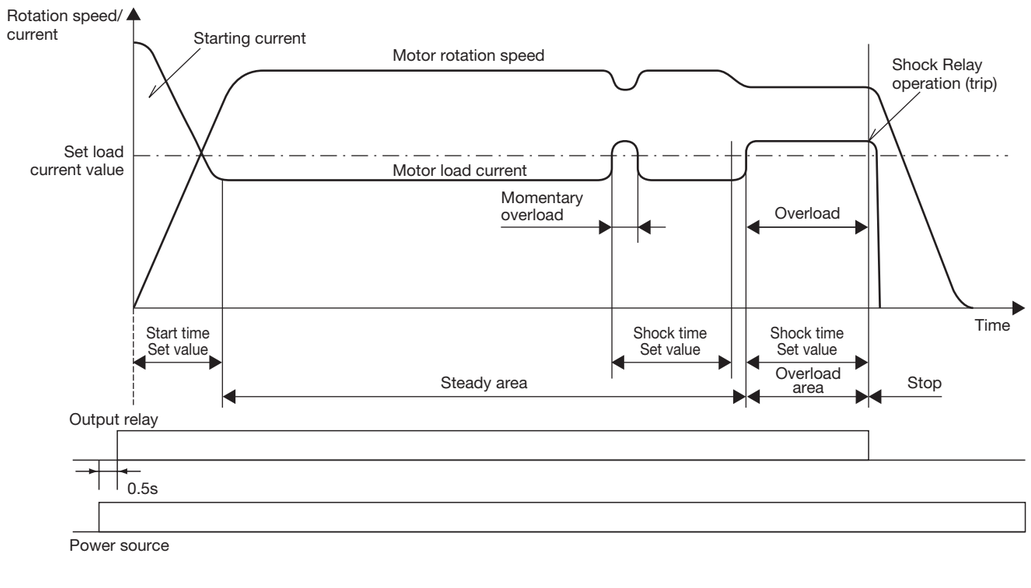
After the Shock Relay activates, the RESET button is used to cancel the self-holding of the output contact.

5 SHOCK TIME

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.

TSBSB - OPERATING MODE

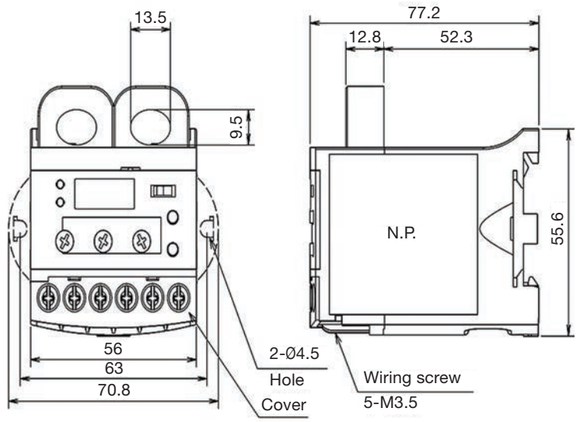
Operation mode



Dimensional envelope drawing

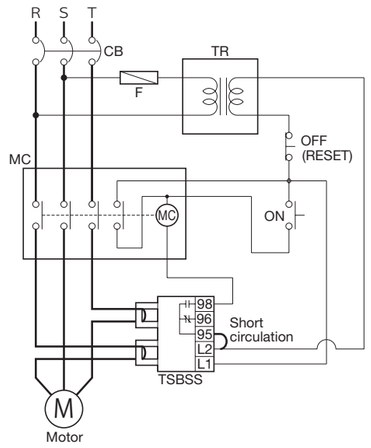
TSBSB

All dimensions in millimeters unless noted.



TSBSB - OUTLINE DIMENSIONS & BASIC WIRING SCHEMATIC

Basic electrical schematic

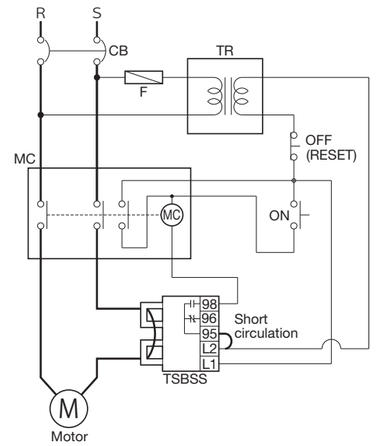


CB: Circuit breaker
MC: Magnetic contactor
ON: Start switch
OFF: Stop switch
F: Fuse
TR: Transformer

Notes:

1) Set the transformer (TR) depending on the voltage of the Shock Relay and MC. Set the insulation transformer if there is a high-harmonic noise generator such as an inverter.
2) When it's running normally, the contact points 95-98 of the TSBSS are "closed" (95-96 is "open"), and when tripping, 95-98 are "open" (95-96 is "closed"). Coil capacity of the electromagnetic contactor MC which output contact opens and closes should be less than 200VA when throwing, and less than 20VA when holding.
3) Pass two wires out of three phases of the motor through the Shock Relay's CT in the same direction.

Single-phase motor electrical schematic



Notes:

1) Set the transformer (TR) depending on the voltage of the Shock Relay and MC. Set the insulation transformer if there is a high-harmonic noise generator such as an inverter.
2) When it's running normally, the contact points 95-98 of the TSBSS are "closed" (95-96 are "open"), and when tripping, 95-98 are "open" (95-96 are "closed").
   Coil capacity of the electromagnetic contactor MC which output contact opens and closes should be less than 200VA when throwing, and less than 20VA when holding.
3) Pass one phase through the Shock Relay's CT in the same direction. As for the split-phase start and capacitor run motor, connect CT to the main coil side.

TSBED SERIES - SHOCK RELAY

Features:

- Works with inverter 20 to 200 Hz
- User adjustable for manual or automatic reset
- Digital display
- Adjustable Start Time, Shock Time, and Current setting
- Built-in tamper-resistant cover over controls
- Built-in Test Function
- Includes motor locked rotor protection
- DIN rail or panel mount
- Manual or Automatic Reset
- UL listed
- Permits trip notification by alarm or warning lights

TSBED Series Shock Relay

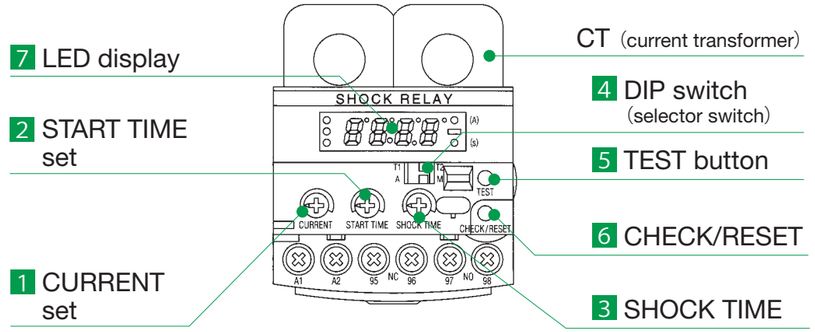
How to Order Code: Example Model # TSBED Series Shock Relay

TSB	020	ED	-1

Shock Relay	Model Size	Series	Supply Voltage	Amperage Range	230 Volt Motor HP*	460 Volt Motor HP*
Tsubaki Shock Relay	020	**ED Series: Digital Display**	**-1: 100 to 120 VAC**	0.2 – 2.4A	1/8 to 1 HP	1/8 to 2HP
	075			1.2 – 5.8A	1/2 to 2 HP	1/2 to 5 HP
	220		**-2: 200 to 240 VAC**	3 – 14 A	1 - 1/2 to 5 HP	2 to 10 HP
	550			6 – 34 A	2 - 1/2 to 10 HP	5 to 25 HP

* The motor horsepower ranges are approximates; best option is to select based on actual current readings. Select the Shock Relay based on the motor amperage or motor horsepower.

TSBED - CONTROL INTERFACE



1

Current Setting (CURRENT)

Sets current at the value at which trip occurs.

2

Start Time Setting (START TIME)

Sets start time (start compensating time). When the motor starts, there is a possibility that the motor current will exceed the set current value, but during the start time period it will not trip.

3

Shock Time Setting (SHOCK TIME)

Sets shock time (output delay time). When the motor current exceeds the set current value the count begins, and when shock time has elapsed, it will trip.

4

DIP Switch (selector switch)

Setting	Purpose				
No. of motor leads that pass through the CT T1/ T2	Current value set range selection	T1	No. of passes through the CT:1	T2	No. of passes through the CT:2
Trip reset A / M	Output relay reset selection	A	It automatically returns from the trip state one second after current value returns below the current setting value.	M	Trip state is maintained until the check/reset button is pressed. It then resets.

5

TEST Button (TEST)

When the LED displays current value, pressing the TEST button will carry out an operation test.

6

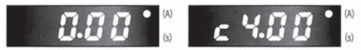
CHECK/RESET Button (CHECK/RESET)

(During normal operation) By pressing the CHECK/RESET button when the LED displays current value, it switches to the setting screen.
(During trip) When the CHECK/RESET button is pressed, trip is cleared and the display switches to the current value.
(During set-up) When the LED display is at the setting screen, pressing the CHECK/RESET button will switch between the current, start time, and shock time settings, in this order.

7

LED Display

Current value and set current are displayed when (A) is indicated on the display screen (to the left of the A). (A = ampere)



Current value | Current set-up

Start time and shock time set up are displayed when (s) is indicated on the display screen (to the left of the s). (s = second)

Start time set-up | Shock time set-up

TSBED - OPERATING MODE

Operation mode

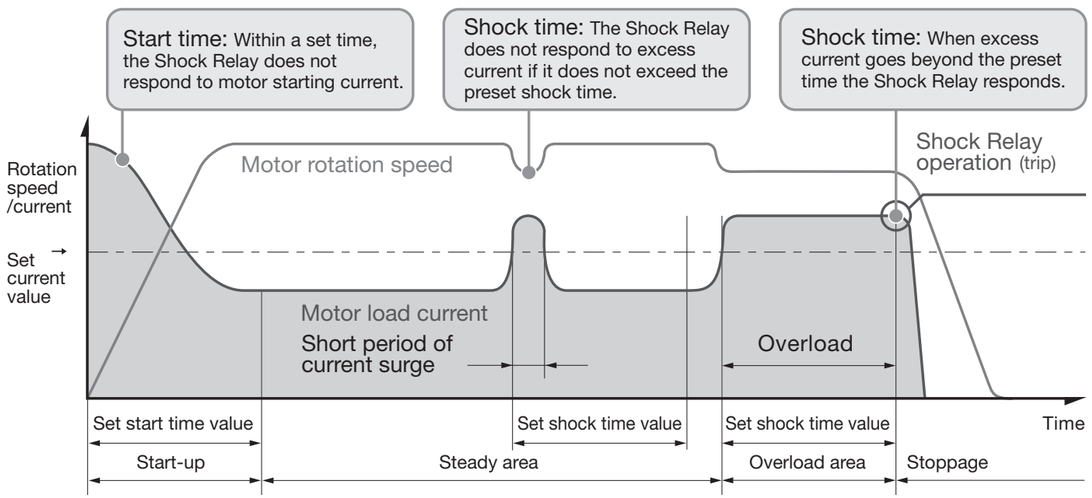


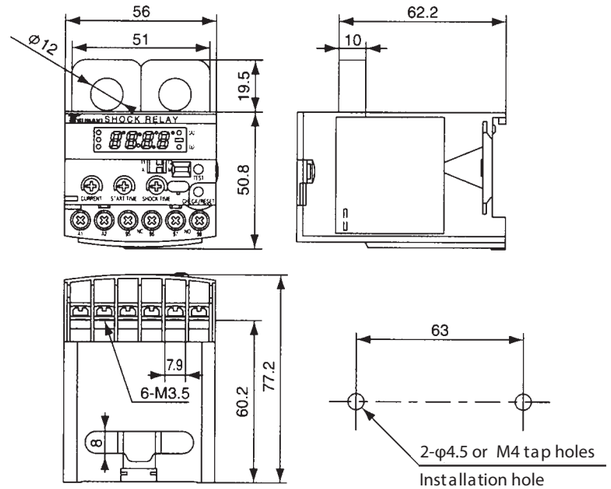
Figure 2: TSBED Series Shock Relay operation mode

Figure 2 above reflects a typical set-up for a TSBED Series Shock Relay. As depicted in the above example, the Shock Relay is set up to accept a higher motor amperage draw at start-up for a limited amount of time. This "Start Time" period allows the motor to spool to its steady state operation mode where maximum continuous RPM is achieved, and current draw drops to a normal value that is below the maximum "Current Value" set in the Shock Relay. As depicted, the amperage draw of the motor then momentarily increases (resulting in a drop in RPM due to induced load) above the maximum "Current Value" setting, but quickly falls back to a steady state value. Since the "Shock Time" value was not exceeded, the Shock Relay does not trip, and allows continued operation. However, as time passes by, the Shock Relay senses an increase in motor amperage draw and a drop in RPM that exceeds set current value and "Shock Time." The overload condition sensed by the Shock Relay causes the unit to trip, resulting in the Shock Relay breaking the motor starter contact – thus, shutting the system down to prevent mechanical damage from occurring.

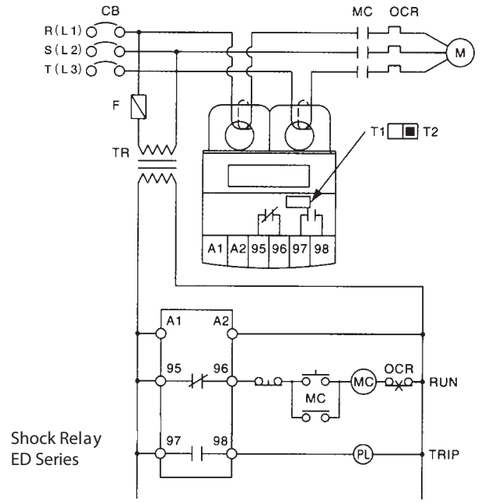
TSBED - OUTLINE DIMENSIONS & BASIC WIRING SCHEMATIC

Dimensional envelope drawing

All dimensions in millimeters unless noted.



TSBED basic wiring schematic



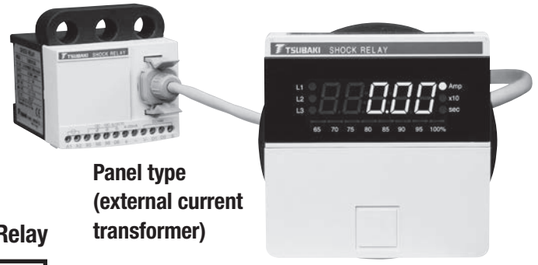
CB: Circuit breaker
MC: Magnetic contactor
F: Fuse
TR: Transformer
OCR: Over current relay
PL: Trip light

TSBSC SERIES - SHOCK RELAY

Features:

- Communication function allows central monitoring
- The 4 to 20 mA output allows communication to a central control, or as input to controls that operators monitor and adjust to maintain production
- Panel mounting with remote display option
- Both Under current and Over current monitoring
- Inverter compatible from 20 to 200 Hz
- Locked rotor protection
- Phase imbalance protection
- Phase loss protection
- Thermal overload protection
- Can be used with single-phased motors
- Multiple operations can be linked together and monitored from one location.

All-in-one type (built-in current transformer)



Panel type (external current transformer)

How to Order Code: Example Model # TSBSC Series Shock Relay

TSB	SC	B	34

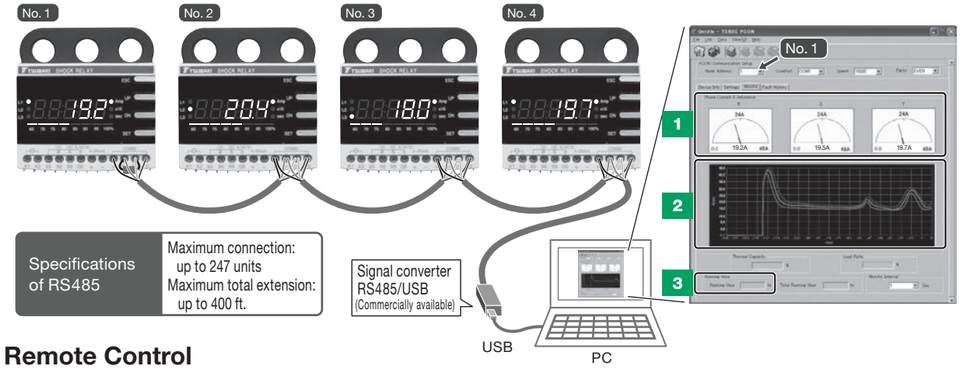
Shock Relay	Series	Type	Max Amperage	Amperage Range	230 Volt Motor HP*	460 Volt Motor HP*
Tsubaki Shock Relay	SC Series: Serial Communication	B: All-in One Type	05	0.15 – 6.40A	1/16 to 2 HP	1/8 to 5 HP
			30	3 – 14A	1 to 10 HP	2 to 25 HP
			60	10 – 60A	5 to 25HP	10 to 50 HP
		S: Panel Mount Type	100	12 – 100A	5 to 40 HP	10 to 75 HP
			200	24 – 200A	10 to 75H	20 to 150 HP
			300	36 – 300A	15 to 125 HP	25 to 250 HP

* The motor horsepower ranges are approximates; best option is to select based on actual current reading. Select the Shock Relay based on the motor amperage or motor horsepower.

The following table provides a breakdown of the components provided when ordering a given TSBSC Series Shock Relay. Note that TSBSC Shock Relay sizes with model numbers containing 100, 200, and 300 require additional components when selected. For example, a Panel Type TSBSCS200 Shock Relay will be supplied with a TSBSC06 unit, TSBSCD display, TSB3CT200 current transformer, and a TSBSCC05 cable.

TSBSC Model Composition - All in One Type Unit			TSBSC Model Composition - Panel Type Unit				
Shock Relay Assembly Model #	Shock Relay #	Current Transformer #	Shock Relay Assembly Model #	Shock Relay #	Display Model #	Current Transformer #	Cable Model #
TSBSCB06	TSBSCB06	Not Applicable	TSBSCS06	TSBSCS06	TSBSCD	Not Applicable	TSBSCC05-30
TSBSCB34	TSBSCB34	Not Applicable	TSBSCS34	TSBSCS34	TSBSCD	Not Applicable	TSBSCC05-30
TSBSCB60	TSBSCB60	Not Applicable	TSBSCS60	TSBSCS60	TSBSCD	Not Applicable	TSBSCC05-30
TSBSCB100	TSBSCB06	TSB3CTC100	TSBSCS100	TSBSCS06	TSBSCD	TSB3CT100	TSBSCC05-30
TSBSCB200	TSBSCB06	TSB3CTC200	TSBSCS200	TSBSCS06	TSBSCD	TSB3CT200	TSBSCC05-30
TSBSCB300	TSBSCB06	TSB3CTC300	TSBSCS300	TSBSCS06	TSBSCD	TSB3CT300	TSBSCC05-30

TSBSC - COMMUNICATION FUNCTION



1 Remote Control
Display the current of each phase L1, L2 and L3 on the PC screen by reading them from specified Shock Relay address.

2 Display Current Change
Plot the current value of each phase at specified intervals. Data for the last 159 events can be displayed.

3 Display Accumulated Operation Time
Can be utilized for equipment maintenance such as oil filling, filter cleaning, etc.

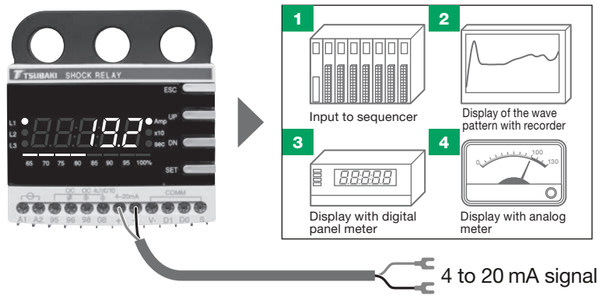
4 to 20 mA analog signal

"What is a 4 to 20 mA analog signal?"

A 4 to 20 mA analog signal is a standard instrumentation signal used around the world.
Instrumentation signal:

- Voltage signal: DC 0 to 5 V, DC 0 to 10 V, etc.
- Current signal: DC 4 to 20 mA, DC 0 to 20 mA, etc.

Current signals are less susceptible to influence from electrical noise than voltage signals.
In addition, DC 4 to 20 mA, when compared to DC 0 to 20 mA, is more precise in the event of wire disruption or breaks. Therefore, DC 4 to 20 mA is used frequently, specifically in the case of long transmission distances (several tens of meters) or in answer to requests for reducing noise influence.



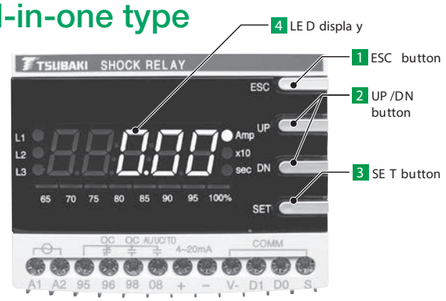
Example of application

1 Automatic control of the input and viscosity depending on the load by inputting the current draw to the sequencer of a crusher or mixer.
2 Figuring out the operation and loading conditions for the equipment by recording the load current of a trial unit, then using it as the basis for an optimal equipment design.
3, 4 Activation of a digital or analog meter with DC 4 to 20 mA signal for remote centralized monitoring of pumps, etc.

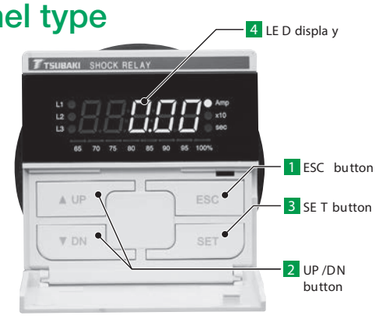
In the case of TSBSCB60 (Max. 60 A), it is possible to transmit DC 0 to 60 A as a DC 4 to 20 mA signal.
In addition, output value correction is available due to the scaling adjustment function of the DC 4 to 20 mA output of the TSBSC Series.

TSBSC - CONTROL INTERFACE

All-in-one type



Panel type

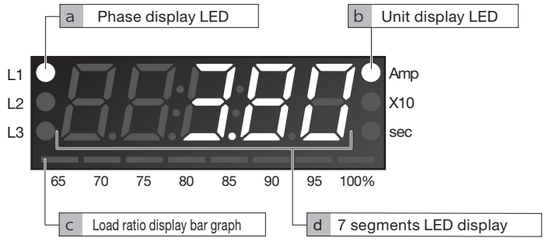


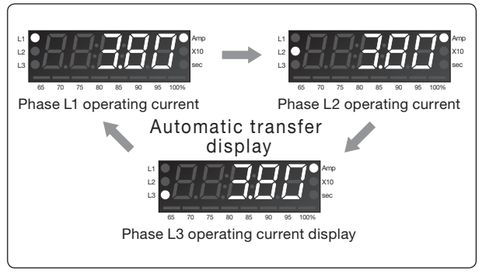
1 **ESC Button (reset)**
Releases the trip or returns back to the initial setting display.
Pushing the reset button after completing parameter settings to return back to initial screen.

2 **UP/DN Button (UP/DOWN)**
Switch to parameter mode and change data settings.

3 **SET Button (set)**
Confirm and register parameter setting data.

3 **LED display**





a. Phase display LED
Displays the electric motor phase (L1(R)► L2(S)► L3(T)) which shows the current, changes every 2 seconds.

b. Unit display LED
LED which indicates the unit.

c. Load ratio display bar graph
Can be utilized as a guide when setting OC (Over current setting value). Displays the ratio as a percentage (%); Operational load current/OC current setting value

d. Seven segment LED
Displays operation current, parameter setting value, cause of trip, etc.

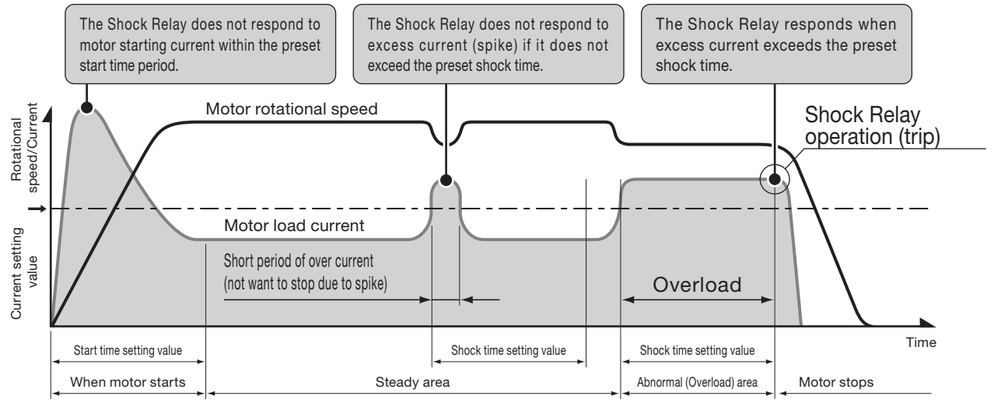
Digital ammeter functions

1) While in normal operation, it is possible to change the displayed phase, and set it. Release by pushing the ESC button.

2) Trip record (3 most recent) can be viewed by pushing and holding the ESC button 5 sec. or longer. Push the UP/DN buttons to cycle through and confirm current values (cycles L1"L2"L3"L1"...). The order of the trip record appears on a bar graph in the order of 100%, 95%, and 90% for easy confirmation. Release by pushing the ESC button.

TSBSC - OPERATING MODE

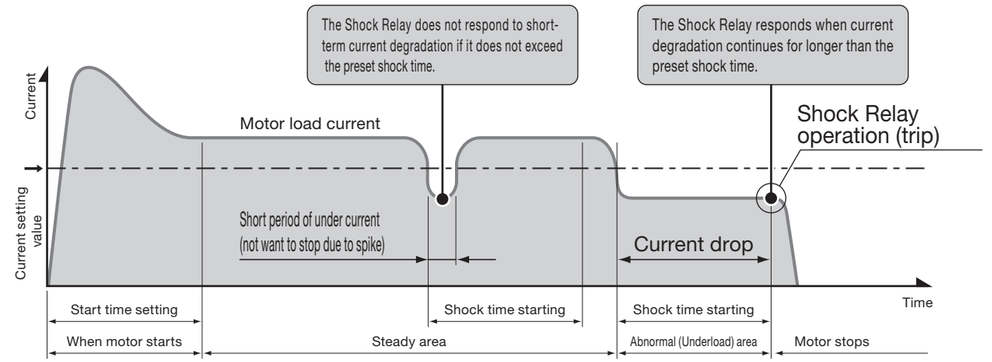
Overload operation mode



Light load operation (underload detection) mode

Once the motor current falls below the preset level, underload is detected and a signal is sent to stop the motor. For under-load detection, the output contact is set to alarm output.*

* However, in case of the underload detection, the output contact becomes choice of either alarm output or no action.



Communication function

Communication Specification

Item	Content
Transmittance standards	RS-485
Max. transmittance distance	1200m (depends on transmittance speed)
Transmittance system	Half-duplex system; modbus protocol
Transmittance speed	1.2k to 38.4kbps

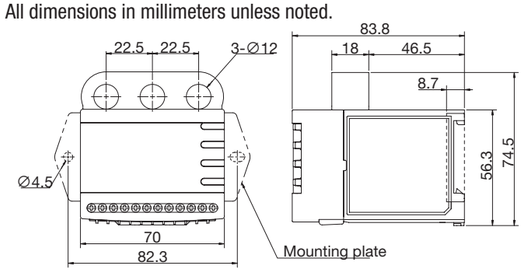
TSBSC - OUTLINE DIMENSIONS

Dimensional envelope drawing

TSBSCB06/TSBSCB34/TSBSCB60

All-in-one type main unit

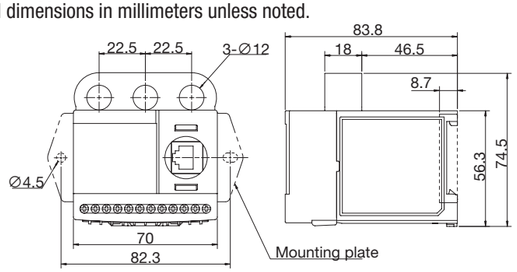
All dimensions in millimeters unless noted.



TSBSCS06/TSBSCS34/TSBSCS60

Panel type main unit

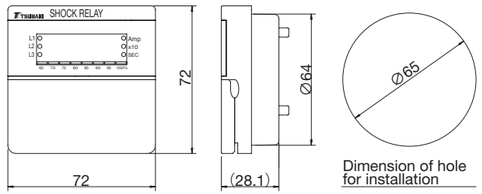
All dimensions in millimeters unless noted.



TSBSCD

Panel type display unit

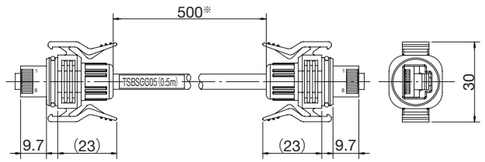
All dimensions in millimeters unless noted.



TSBSCC05/TSBSCC10/TSBSCC15/ TSBSCC20/TSBSCC30

Panel type communication cable

All dimensions in millimeters unless noted.



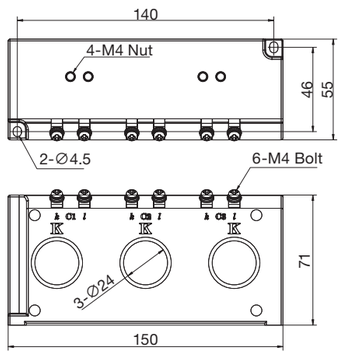
※In case of TSBSCC05 (0.5m specification)

Cable Part No.	Length (in mm)
TSBSCC05	500
TSBSCC05	1,000
TSBSCC05	1,500
TSBSCC05	2,000
TSBSCC05	3,000

TSB3CTC100/TSB3CTC200/ TSB3CTC300

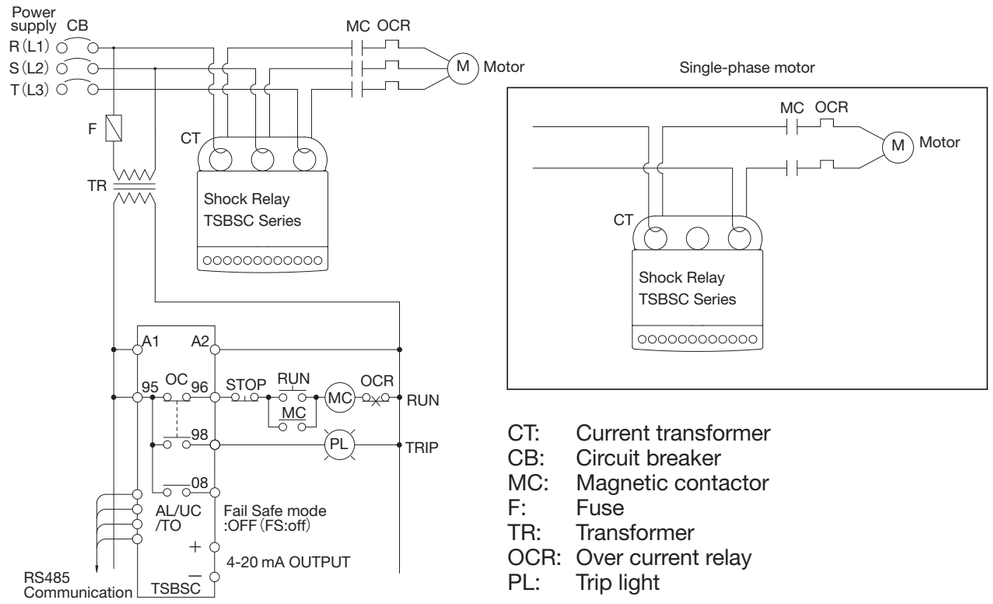
External CT

All dimensions in millimeters unless noted.



TSBSC - BASIC WIRING SCHEMATIC

Basic wiring schematic



CT: Current transformer
CB: Circuit breaker
MC: Magnetic contactor
F: Fuse
TR: Transformer
OCR: Over current relay
PL: Trip light

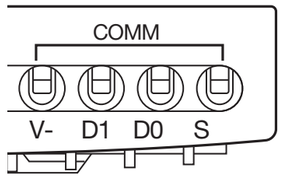
Notes:

1) If necessary, set the stepdown transformer (TR) depending on the voltage on the Shock Relay and electromagnetic contactor (MC). Install an isolating transformer if there is any harmonic noise generating device, such as an inverter.
2) Output relay; Normal condition: not excited, Trip condition: excited
3) Coil capacity of MC connected to the output relay of the Shock Relay is:
   Throw = less than 200VA
   Hold = less than 20VA

In the event that an auxiliary relay is used, have the output relay of the Shock Relay activate the Auxiliary Relay and have the Auxiliary Relay open/close the MC.

Connection with signal converter

1) Prepare a signal converter to use the monitoring software (PCON) of TSBSC.
2) Use twisted cables and connect as follows.



Terminal	Signal	RS485 Terminal
V-	GND	GND
D1	Data (B)	Tx+
D0	Data (A)	Tx-
S	Shield	Shield

TSUBAKI OVERLOAD PROTECTION

PRODUCT
OVERVIEW

TSUBAKI OVERLOAD PROTECTION PRODUCTS

Torque Guard
TGB Series

An economical choice for general use. The TGB series can be used with about any machine. Offers automatic resetting, easy-to-read torque indicator and no backlash.

Torque Guard
TGM Series

The gasket and O-ring sealed construction in the TGM series is unique. Excels in wet, dusty, and oily applications. Designed for long life, tough environments.

Torque Guard
TGX Series

A high-precision option, the TGX series features no backlash and unsurpassed operation rigidity. Ideal for machines that require accurate positioning.

Axial Guard
TGA Series

Offers overload protection using ball and grooves that provide a consistent, user-defined trip point for applications where motion is back and forth rather than rotating. When overloads occur, the Axial Guard “trips” and eliminates the overload that can result in damage and downtime.

Torque Keeper
TFK Series

A mechanical device for industrial equipment brake mechanisms has been designed with abrasion resistance, the use of a torque indicator, weight savings and other aspects that make it easy to use.

MINI-KEEPER
MK Series

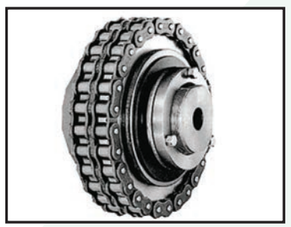
A super-compact slipping clutch and brake, constructed from fine chemicals and engineering plastic. The MINI-KEEPER has a supreme level of lightness, compactness and accuracy and is ideal for braking, accumulating and dragging applications.

Torque Guard
TGZ Series

A release-type protection device, the TGZ series offers on-off clutch capability. Its simple and straightforward adjustments make it easy to use.

Torque Limiter
TL Series

A friction system, mechanical device that limits damage to equipment when an unexpected increase in torque occurs because of a jam or overload by slipping and absorbing the brunt of the force, preventing the increased power from damaging your equipment.



Torque Limiter
Coupling

A flexible coupling that uses a Torque Limiter and special type sprocket and is connected by two rows of roller chains. It acts as an automatic safety device, protecting machinery from damage due to overload.

FOR COMPLETE SPECIFICATIONS ON THESE PRODUCTS PLEASE VISIT OUR WEBSITE AND DOWNLOAD THE FULL CATALOG

www.ustsubaki.com