

TOSHIBA

2E MOTOR PROTECTION RELAYS MODEL RC820

- OVERLOAD & SINGLE-PHASE PROTECTION
- SOLID-STATE
- MANUAL TEST FEATURE
- MANUAL/REMOTE/AUTO RESET
- SURFACE/FLUSH MOUNTING



LISTED



CERTIFIED

2E MOTOR PROTECTION RELAYS

MODEL RC820

Toshiba's 2E relay eliminates many motor failures. This solid state relay features precise motor protection for any horsepower/voltage combination in just three ratings. The 2E provides overload and single phase protection and has an adjustable setting for very wide

range from 3 to 40 sec. (starting characteristic, at 600% current) to accommodate reduced voltage start-ups and high inertia loads. The 2E relay complies with international standards as well as UL (USA) listed and CSA (Canada) certified.

FEATURES

■ OVERLOAD & SINGLE-PHASE PROTECTION

Two protective functions are incorporated.

■ SOLID-STATE

Fully solid-state circuit provides high reliability and precise operation.

■ MANUAL TEST FEATURE

Manual test switch offers convenience for sequence testing.

■ MANUAL/REMOTE/AUTO RESET

Wide selection of reset mode gives application flexibility.

■ SURFACE/FLUSH MOUNTING

Selectable surface or flush mounting.

■ FLEXIBILITY

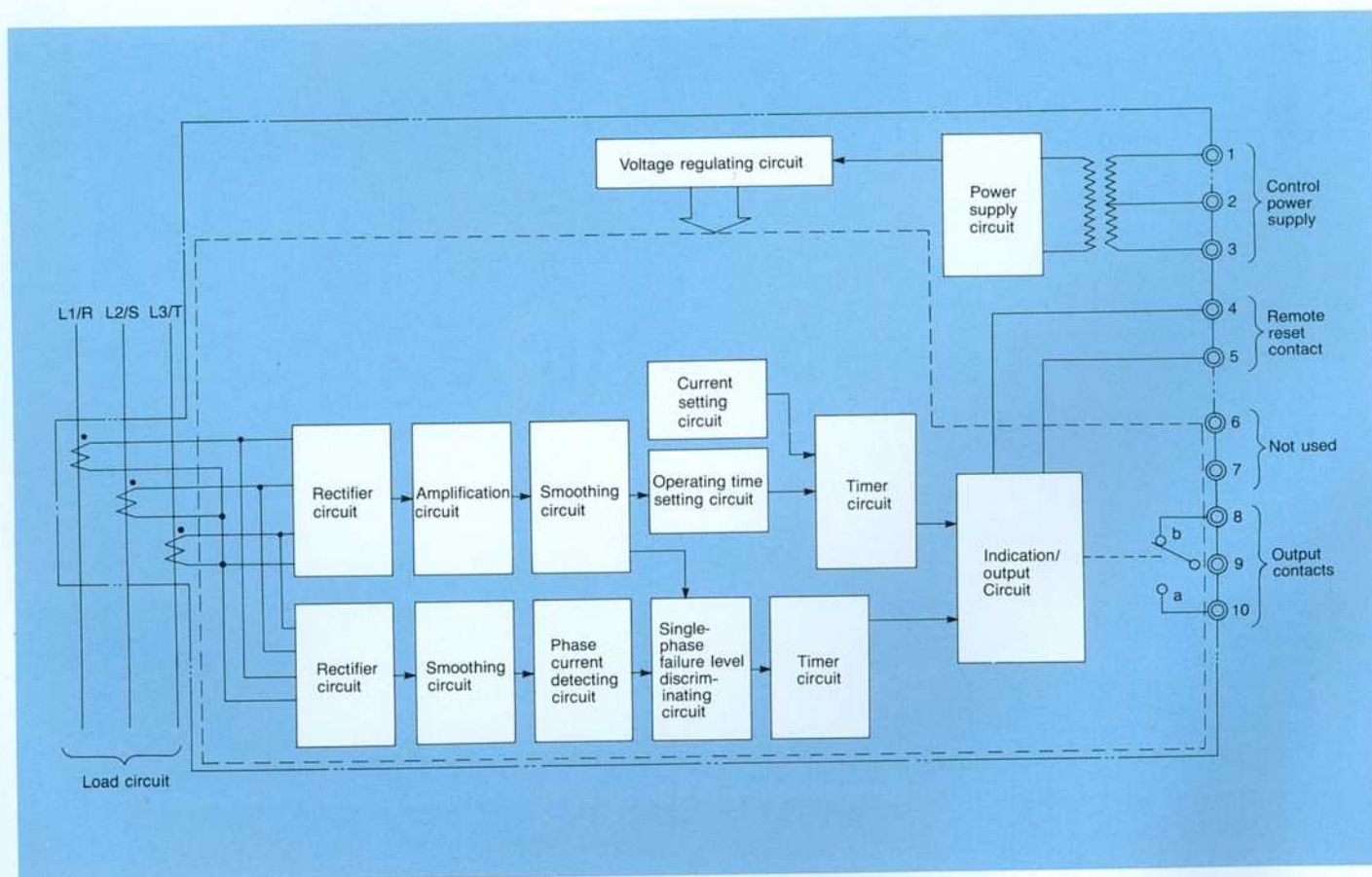
The relay allows for a high degree of flexibility for coordinating with wide range of current and trip time settings.

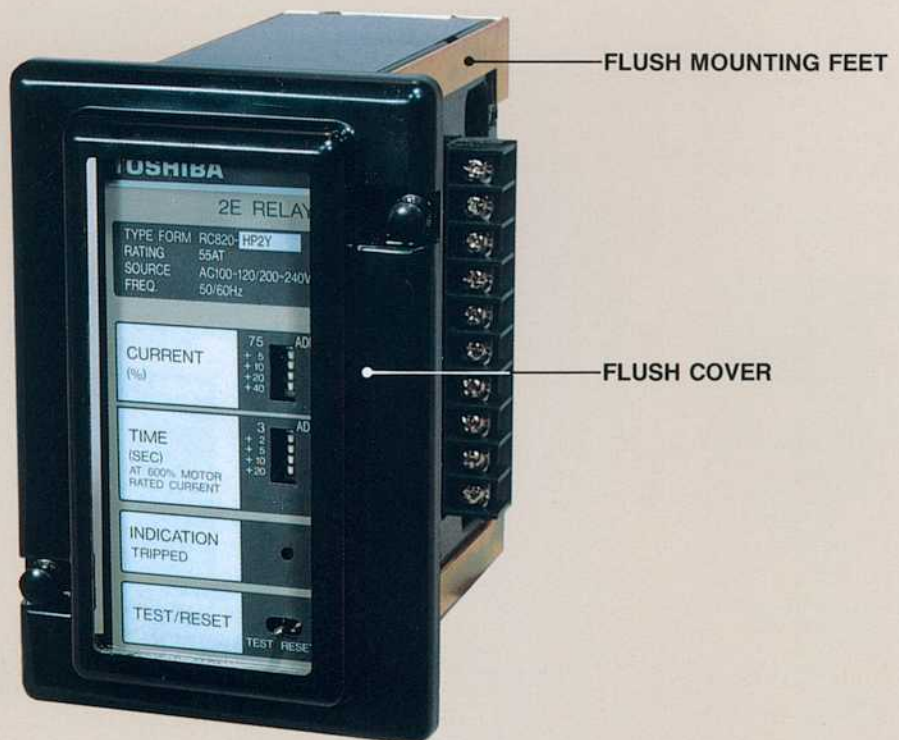
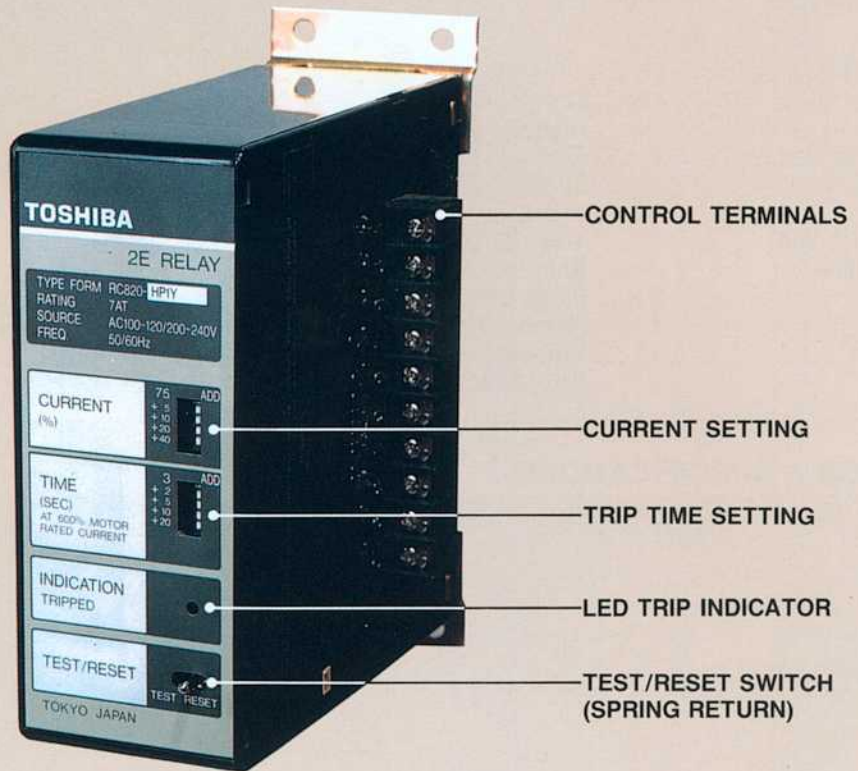
■ VISIBLE TRIP INDICATOR

LED indicator shows relay trip status clearly until reset.

■ INTERNATIONALLY RECOGNIZED

The relay complies with international standards as well as UL (USA) listed and CSA (Canada) certified.





NOMENCLATURE

RC820—HP 1 Y 12

(1)	(2)	(3)	(4)	(5)
(1) Model (Series) No.	RC820			
(2) Reset Mode	HP ... Manual Reset AP.... Auto Reset			
(3) Current Rating	1 7 AT 2 55 AT 3 110 AT			
(4) Control Volt.	Y 100-120/200-240 V AC			
(5) Variation	—..... Standard Surface Mounting 2 Flush Mounting 12 Remote Reset (Standard) 72 Remote Reset (UL Listed/CSA Certified)			

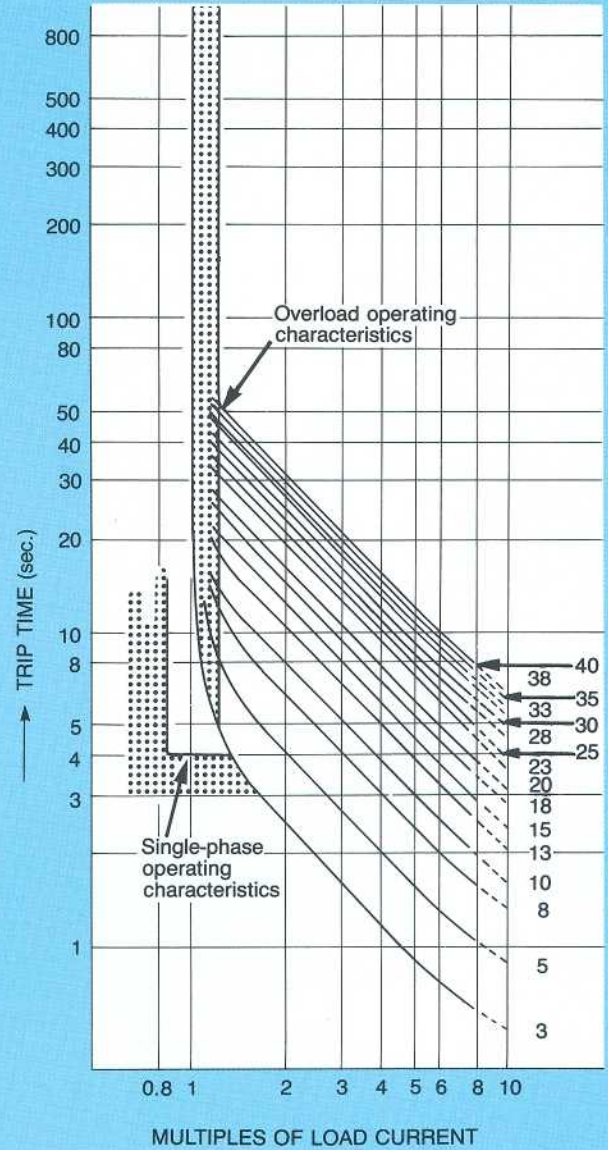
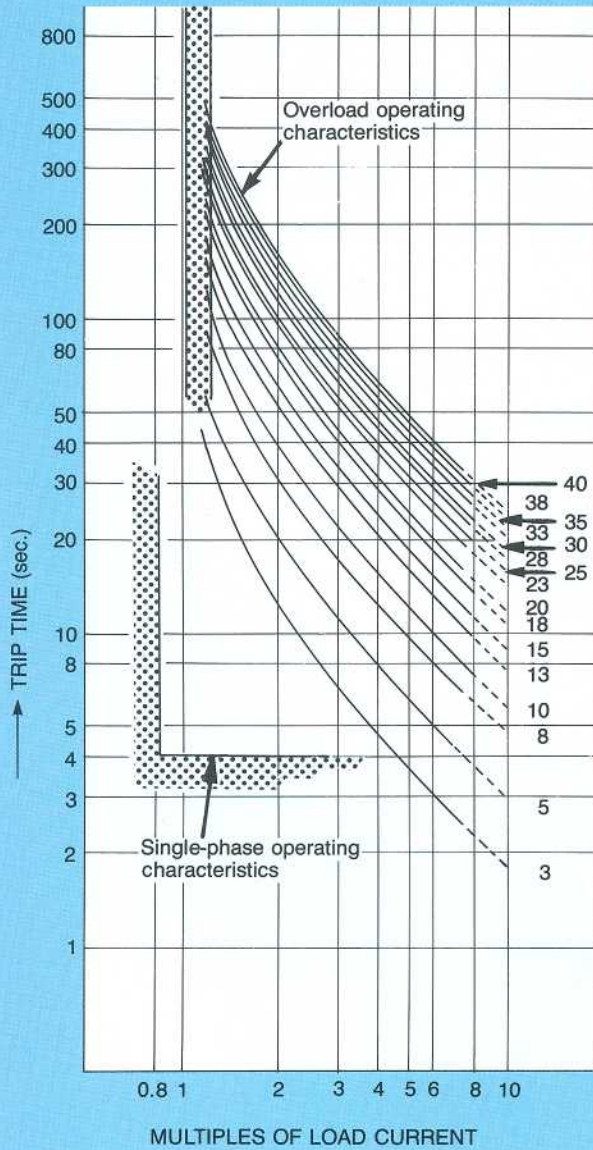
SELECTION

RESET	MOUNTING	UL & CSA	MODEL NO.
MANUAL	SURFACE	YES	RC820-HP□□Y
	FLUSH	NO	RC820-HP□□Y2
AUTO	SURFACE	YES	RC820-AP□□Y
		NO	RC820-HP□□Y12
REMOTE	SURFACE	YES	RC820-HP□□Y72

RATINGS & SPECIFICATIONS

Item		Model	RC820-HP1Y AP1Y	RC820-HP2Y AP2Y	RC820-HP3Y AP3Y
Applicable Circuit		Three-phase circuit rated up to 600V AC, 50/60 Hz—Direct (Also, applicable to high-voltage circuit by combining with high-voltage CT)			
Rated Current	Rated Ampere-turns (AT)		7AT	55AT	110AT
	Setting Range	75—150% of rated AT			
Overload Protection	Ultimate Operating Current	105—125% of setting current			
	Trip Time Setting Range	3—40 sec. for starting characteristics at 600% of setting current			
	Operating Time Accuracy	± 20% of setting time			
Single-Phase Protection	Minimum Operating Current	85% of setting current under one-phase completely loss (When measured on either remaining phase).			
	Operating Time	Less than 4 sec.			
Control Power	Rating	100—120V/200—240 V AC, 1 ϕ , 50/60 Hz			
	Allowable Volt. Fluctuation	85%—110%			
Power Consumption	Control Power Circuit	2 VA			
	Detecting (CT) Circuit	0.3 VA/phase at rated current			
Output Contact Capacity	Contact Arrangement	1NO—NC (SPDT/Form C)			
	Contact Capacity	120V AC-5.0A (Resistive load) 120 V AC-3.0A (Inductive load, pf = 0.40) 125V DC-0.2A (L/R = 7ms) 250V DC-0.1A (L/R = 7ms) NEMA B300			
Weight		Approx. 1 kg (2.2 lbs.)			

OPERATING CHARACTERISTIC CURVE



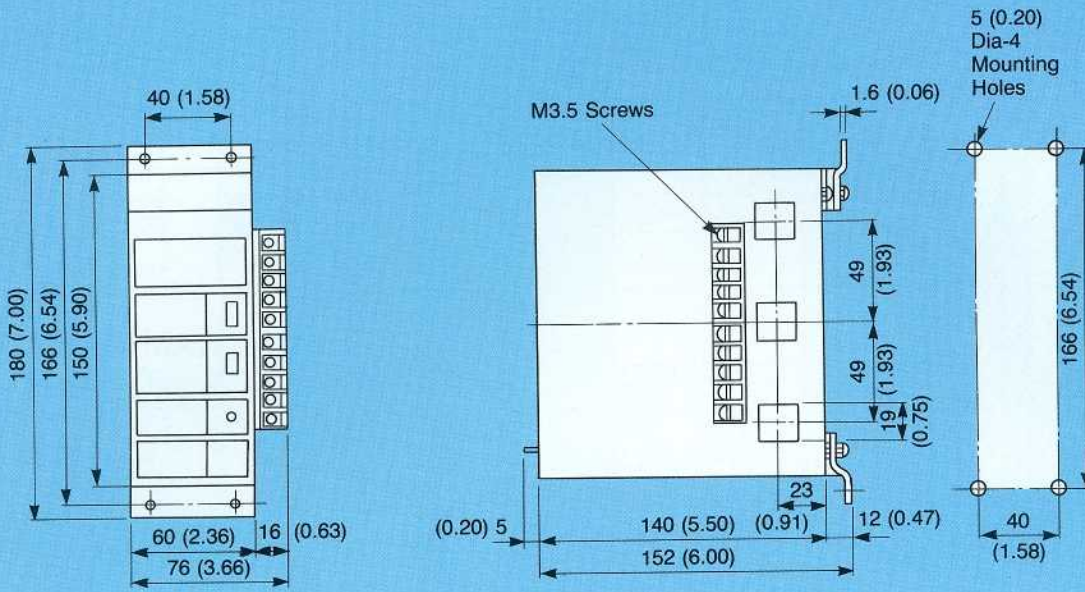
→ **STARTING CHARACTERISTIC**

→ **RUNNING CHARACTERISTIC**

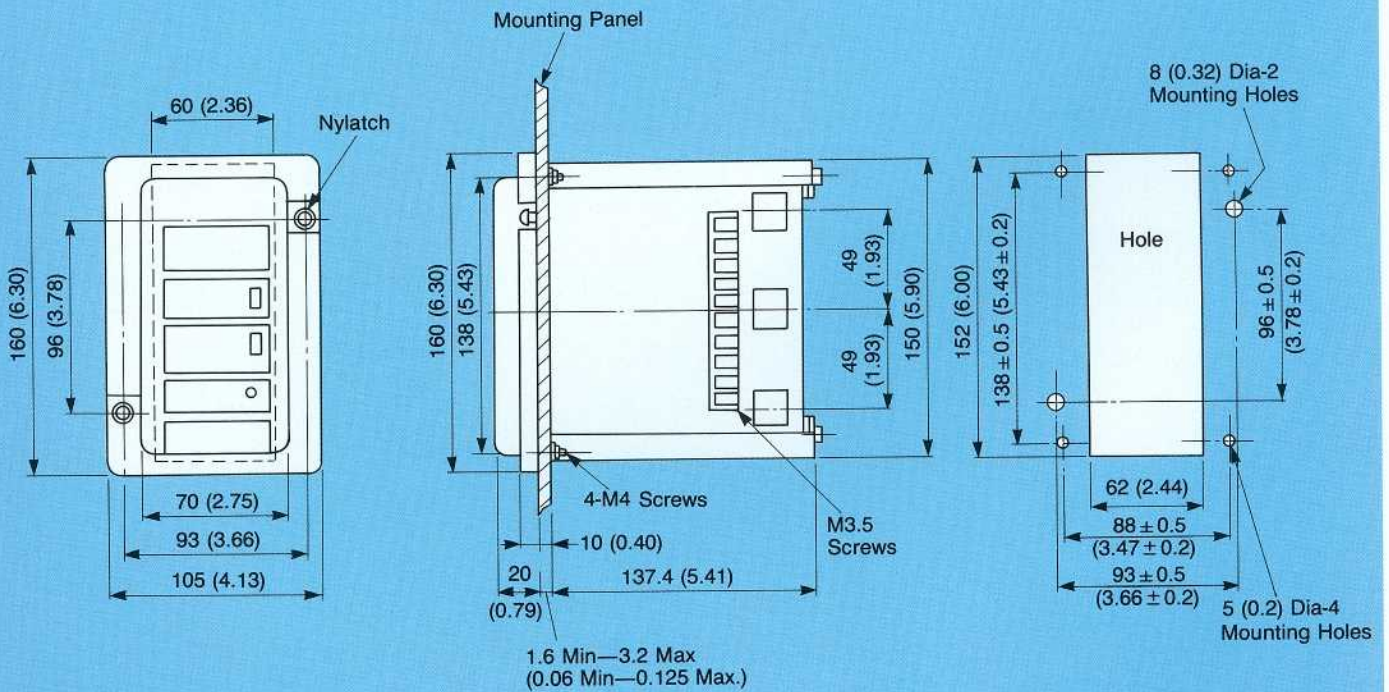
- (Notes) (1) Overload operating characteristics
 Ultimate operating current--105--125% of setting current
 (2) Single-phase operating characteristics
 Min. operating current--85% of setting current

INSTALLATION

Unit: mm (in)

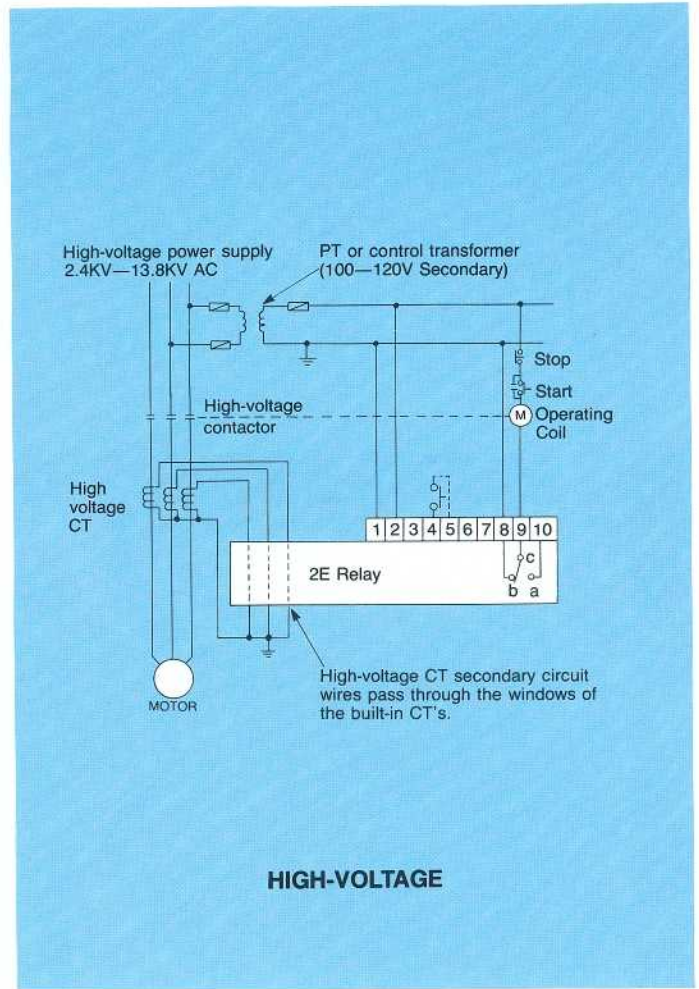
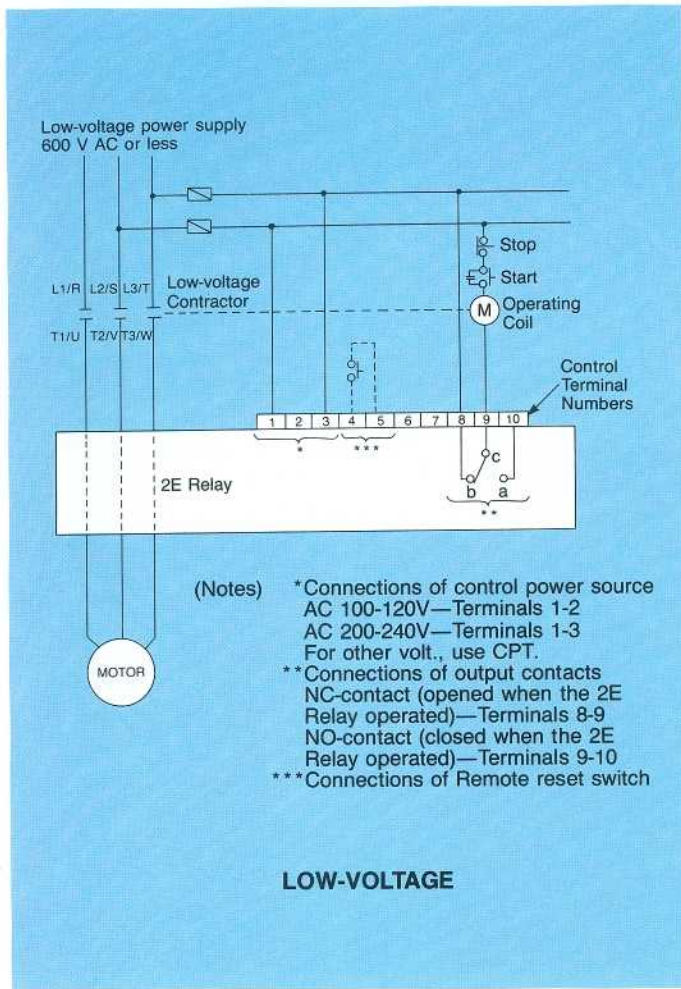


SURFACE MOUNTING



FLUSH MOUNTING

WIRING



HOW TO SET

Selection of the suitable model may require some preliminary calculations. See "Current Setting" to determine if the calculated "Current Setting %" can be obtained with the selected model given the motor full load current (FLA). Model Selection can also be influenced by wire size which limits the number of turns that can be passed through the CT windows.

(1) Current Setting

$$N(T) = \frac{(2E \text{ AT Rating}) \times (\text{External CT Ratio})}{\text{FLA}}$$

N(T) = Number of wire turns through 2E built-in CTs, round off to nearest integer.

$$(\text{Current Setting } \%) = \frac{\text{FLA} \times N \times 100}{(2E \text{ AT Rating}) \times (\text{External CT Ratio})}$$

Notes: *Select the external CT ratio so that the current setting % is as close to 100% as possible. If no external CT are used, substitute with "1.0".

**For 1.15 Service Factor Motors. If the motor has a 1.0 S.F. multiply the calculated "Current Setting %" by 0.93. (Practice in USA)

Example: 200HP, 460V, 240A Full Load, 1.15 S.F. Across-the-line start.

240 Amps exceeds the highest rated 2E Relay, therefore, external CT's must be used, and the HP1Y, 7 AT rated 2E, will be chosen as the standard model when the current exceeds the HP3Y's rating. If 300/5 CT's are used,

$$\text{the Current Setting } \% = \frac{240 \times N(T) \times 100\%}{7 \times (300)}$$

$$= \frac{N(T) \times 57.14\%}{5}$$

And if 2 turns through the 2E Relay's CT windows (from the external CT's) are used, the % Dial

$$\text{Setting} = 2 \times 57.14 = 114\% = 110\% \text{ or } 115\%$$

(2) Time setting

Determine the protection curve from 2E Relay operating curves, and read the operating time at 600% of setting current. Adjust the time setting dip switch to the nearest setting above the operating time.

ORDERING INFORMATION

- When ordering specify;
- Model No. & Quantity
 - Any Special Requirement

TOSHIBA

TOSHIBA CORPORATION
Industrial Equipment Department

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO, 105, JAPAN
PHONE: 3457-4900, FAX: 5444-9268

Toshiba International Corporation:
Houston, Vancouver
Toshiba International Corporation
Pty. Ltd.: Sydney, Melbourne
Toshiba International (Europe) Ltd.

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