



TRB-1 Blocking Valve, TRB-1 Test Unit and TRB-Static Tripping Unit

Effective: April 1986

Supersedes I.L. 41-841E, Dated August 1978

⊛ Denotes Changed Since Previous Issue

PART I TYPE TRB STATIC TRIPPING UNIT

APPLICATION

The TRB static tripping unit is an auxiliary device energized by protective relays to trip circuit breakers in a double trip relaying scheme. It is suitable to cases where the total trip current of the two breakers is within the relay contact rating, usually 30 amperes. The TRB unit can also be used for isolation of multiple trip paths to one breaker.

Care should be exercised in using the TRB for tripping low sensitivity devices. The capacitor provides a high frequency shunt around the blocking diode. The type TRB-2 device should be used where this may be a problem.

CONSTRUCTION AND OPERATION

The TRB auxiliary units consists of two silicon rectifiers and two capacitors mounted in a small molded case. Each rectifier has a capacitor connected in parallel with it and each set is brought out to separate terminals.

The TRB unit is energized through the trip contacts of the protective relays of which a typical application is illustrated in Fig. 2. Contacts of relay #1, trips breaker #1, and similarly, relay #2 trips breaker #2. Relay contacts PR trips both breakers. The operation of relay #1 will energize only breaker #1. Using the TRB unit, current cannot flow from relay #1 to breaker trip coil #2 because of diode D1.

Relays associated with each particular breaker are isolated from the other breaker, yet both breakers can be tripped without additional time delay by operating a common relay.

CHARACTERISTICS

The TRB static tripping unit is available in two styles. One style applies to 48/125 volt D.C. service and the other is used for 250 volt D.C. applications. Specific characteristics are shown in Table I.

PART II TYPE TRB-1 BLOCKING VALVE

APPLICATION

The TRB-1 blocking valve is an auxiliary device to be used as a directional valve in a relaying scheme.

CONSTRUCTION AND OPERATION

The TRB-1 blocking valve consists of a single silicon rectifier and one capacitor mounted in a small molded case.

The TRB-1 unit is energized through the trip contacts of the protective relay such that trip current is allowed to flow in one direction and is blocked in the opposite direction.

CHARACTERISTICS

The TRB-1 blocking valve is available in two styles. One style applies to 48/125 volt D.C.

All possible contingencies which may arise during installation, operation or maintenance, and all details and variations of this equipment do not purport to be covered by these instructions. If further information is desired by purchaser regarding this particular installation, operation or maintenance of this equipment, the local ABB Power T&D Company Inc. representative should be contacted.

service and the other is used for 250 volt D.C. applications. Specific characteristics are shown in Table I.

**PART III
TYPE TRB-1 TEST UNIT
S#407C275G03**

APPLICATION

The primary application of the TRB-1 test unit is as a second harmonic generator for testing the harmonic restraint unit of the Types HU and HU-1 transformer differential relays.

CONSTRUCTION AND OPERATION

The TRB-1 test unit consists of a single silicon rectifier mounted in a small molded case. It is energized by an A.C. 60 hertz source as shown in Fig. 3. The half wave rectifier current from the TRB-1 combines with a 60 hertz A.C. current to produce a second harmonic wave which is introduced for test purposes into the harmonic restraint unit of the HU and HU-1 relays.

CHARACTERISTICS

The TRB-1 test unit is rated for 5 amperes continuous at 120 volts 60 hertz. It uses a type **IN1203** silicon rectifier unit which has a maximum allowable inverse voltage rating of 300 volts.

**PART IV
APPLICABLE TO
BOTH TRB AND TRB-1**

INSTALLATION

The units should be mounted on switchboard panels or their equivalent in a location free from dirt, moisture, and heat. Mount the units by means of two mounting screws directly to the panel.

RENEWAL PARTS

If one of the silicon rectifier units becomes damaged, it can be removed from its mounting bracket and replaced with a new rectifier ordered by type number as given in the section titled characteristics. When soldering the connection to the rectifier, it is preferable to use eutectic solder. **DO NOT** apply heat any longer than required to produce a satisfactory solder connection.

Table I
 * (Applicable to Part I and Part II)

Style and Type	Rated Circuit Volts D.C.	Rectifier Used	Surge Rating in Amperes (1 Second)	Rectifier Reverse Rating				Maximum Forward Voltage Drop At 30 Amperes
				Maximum Volts	Leakage Current		At CKT Volts	
					At Max. Volts			
					Nominal At 25°C	Maximum At 150°C		
TRB 407C275G01	48/125	IN1203	30	300	2 μ A	1.75MA	1 μ A	1.25
TRB 407C275G02	250	IN1206	30	600	2 μ A	1MA	1 μ A	1.25
TRB-1 184A414G12	48/125	IN1203	30	300	2 μ A	1.75MA	1 μ A	1.25
TRB-1 184A414G13	250	IN1206	30	600	2 μ A	1MA	1 μ A	1.25

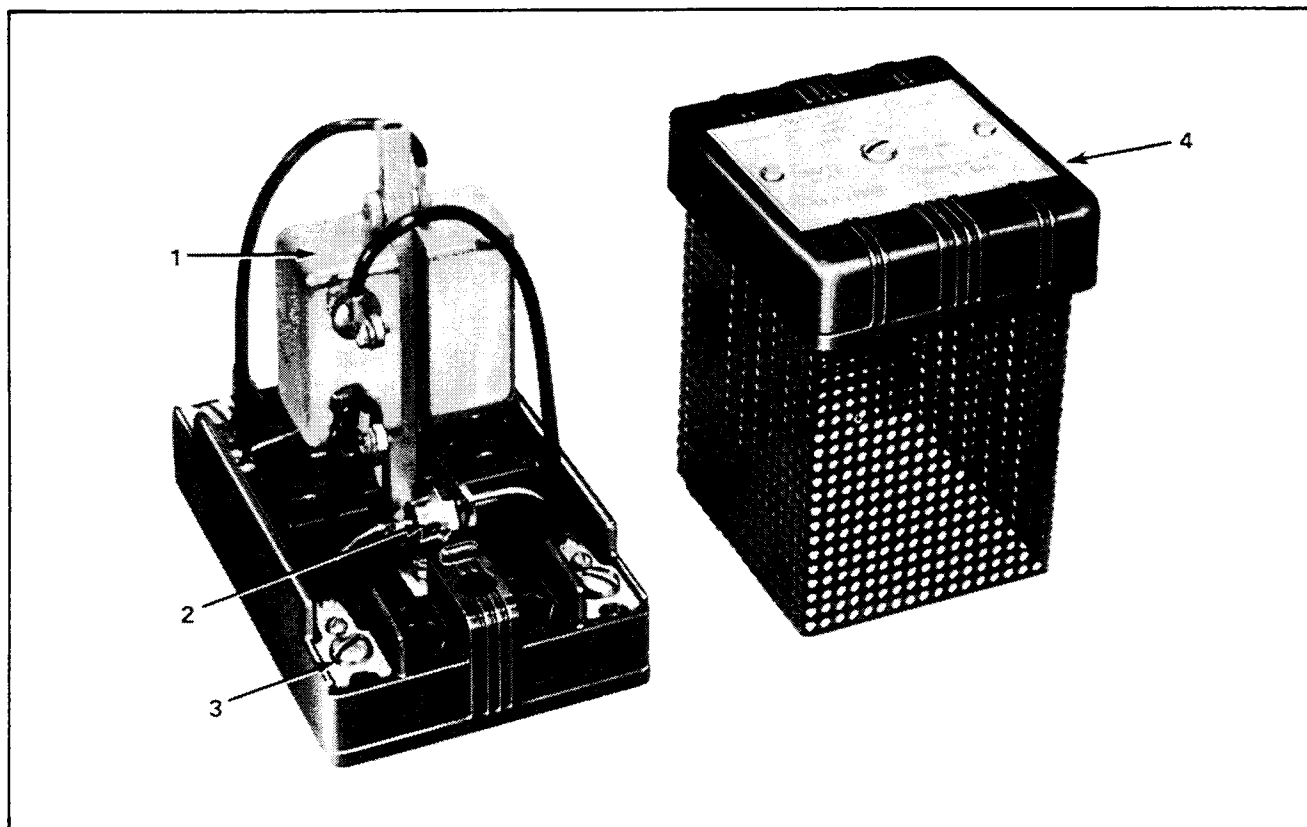


Fig. 1. Type TRB Static Tripping Unit with Cover Removed
 1 – Capacitor, 2 – Silicon Rectifier, 3 – Terminal, 4 – Cover

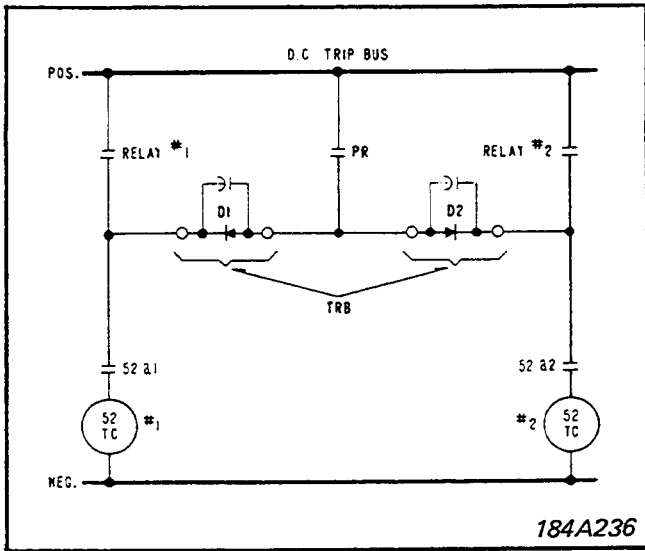


Fig. 2. Operational Schematic

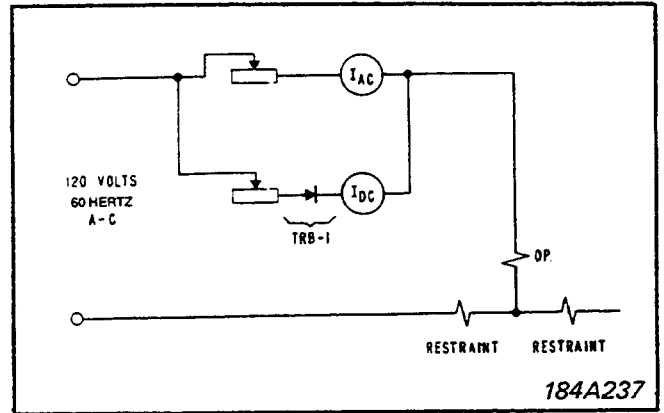


Fig. 3. Typical Test Setup of Type HU and Type HU-1 Relay using Type TRB-1 Test Unit.

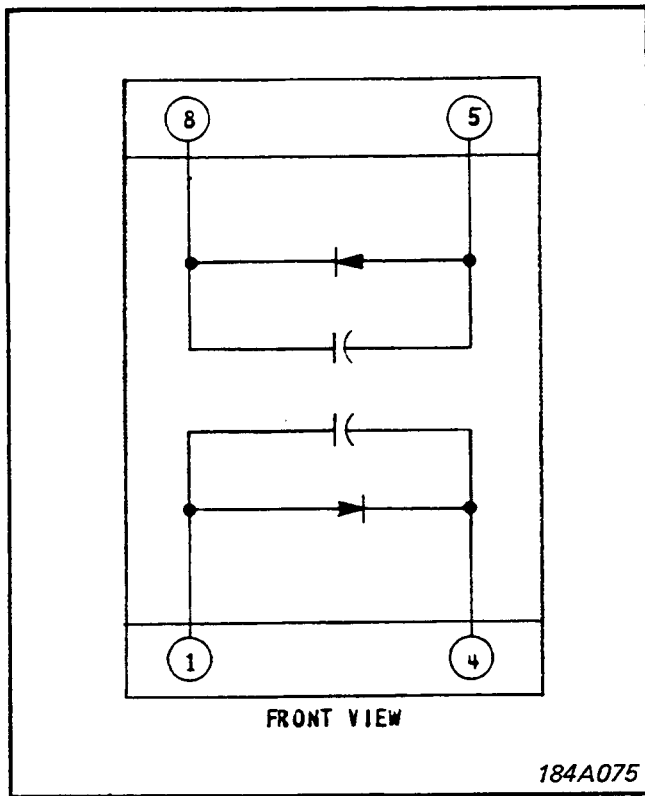


Fig. 4. Internal Schematic of Type TRB Static Tripping Unit

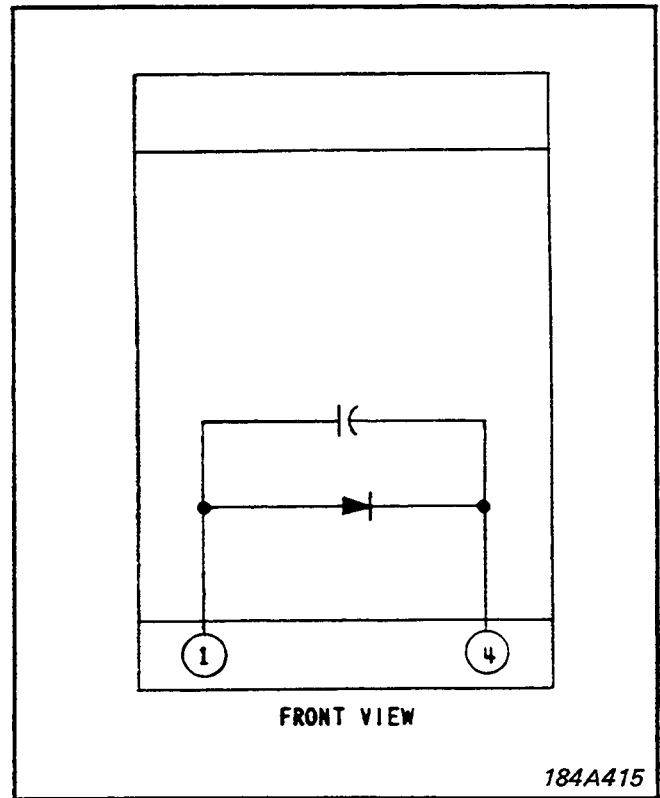


Fig. 5. Internal Schematic of Type TRB-1 Blocking Valve.

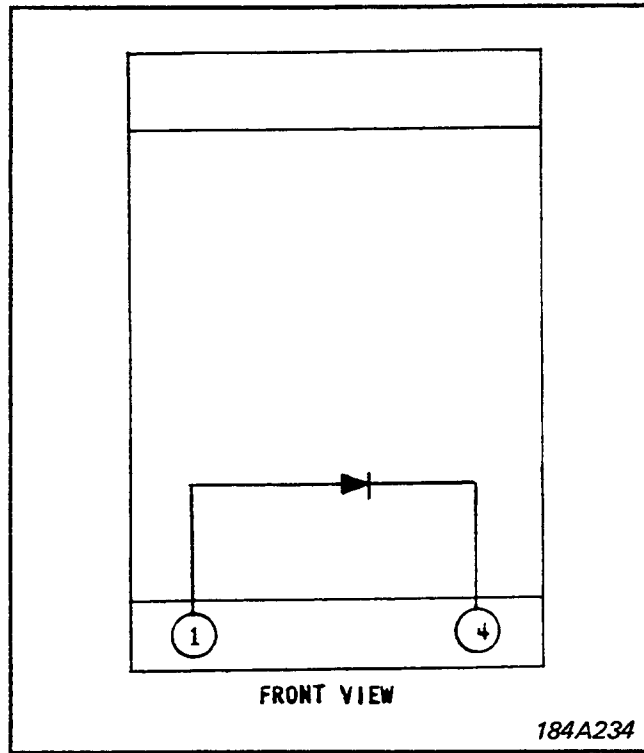


Fig. 6. Internal Schematic of Type TRB-1 Test Unit

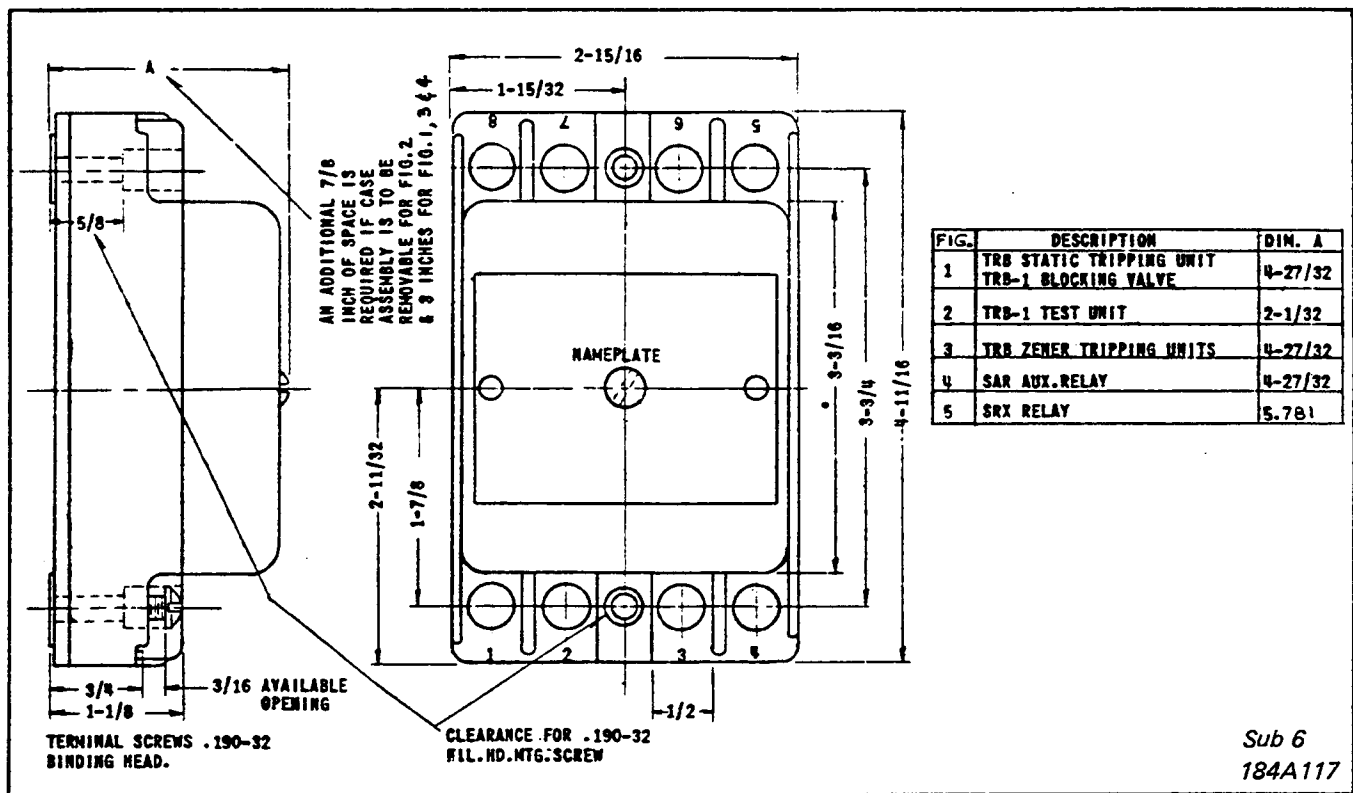


Fig. 7. Outline and Drilling Plan for Type TRB and TRB-1 Auxiliary Units.