

Item: Solid State Molded Case Circuit Breaker Sentron Series Sensitrip III

Devices: I-T-E® PD Frame Types SPD6 and SHPD6 Circuit Breakers.

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## Installation Instructions



### **⚠ DANGER**

**Hazardous Voltage.**  
**Will cause death or severe injury.**

Turn off and lock out all power supplying this device before removing cover(s) or device and while cover(s) are removed.

Replace all covers and shields before power supplying this device is turned on.

**NOTE:** Accessory installation should be complete before the circuit breaker is mounted and connected. (See installation instructions supplied with the Accessory before proceeding.)

C. Make sure the device is in the tripped or off position. Depress the red trip button (See Fig. 2) or turn the breaker off.



### SAFETY INSTRUCTIONS

**NOTE:** This instruction outlines the recommended installation procedure.

### Introduction

The PD Frame circuit breaker line includes SPD6 and SHPD6 circuit breaker types. These devices are rated for operating voltages up to 600 VAC, 50/60 Hz.

PD Frame circuit breaker can only be placed into service by using the proper connect-all mounting assembly.

### Installation

The PD Frame devices are for use in individual enclosures, panelboards or other approved equipment.

The installation procedure consists of inspecting, attaching required accessories, mounting the device and connecting and torquing the line and load wire connectors.

Unmounted wire connectors (where required) are available as separate catalog items.

See Fig. 5 for options on installation.

### Circuit Breaker Preparation

- Before installing or servicing breaker, turn off and lock out all power to prevent incidental or accidental contact.
- Make sure that the device is suitable for the installation by comparing nameplate ratings with system requirements. Inspect the device for completeness and check for any damage before mounting.

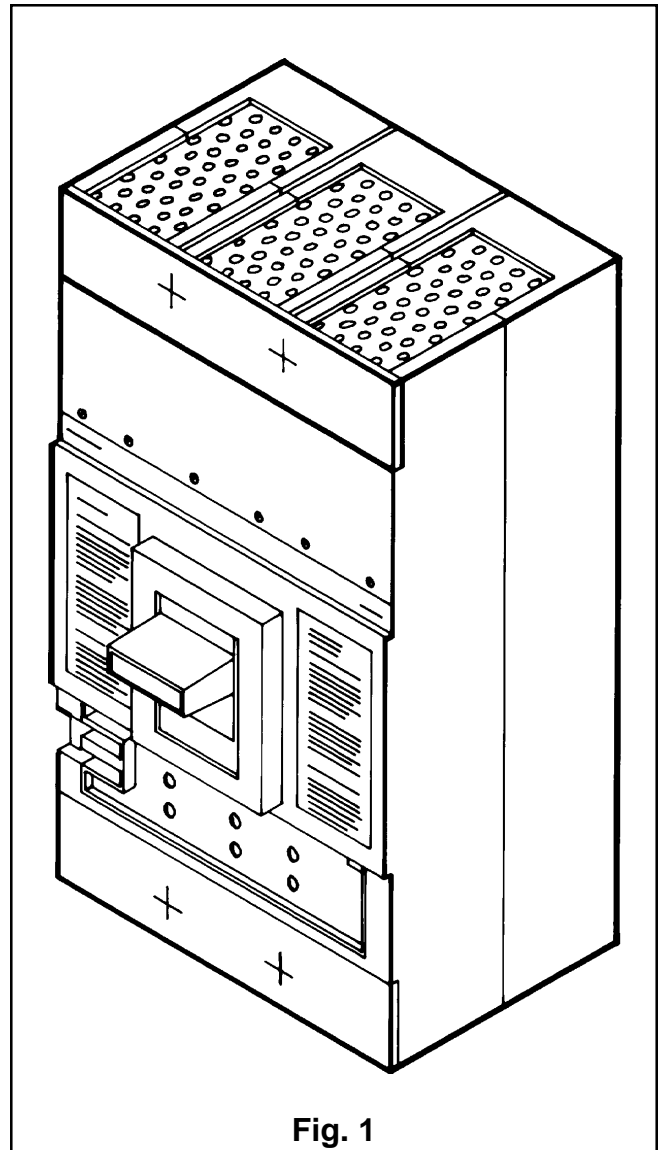
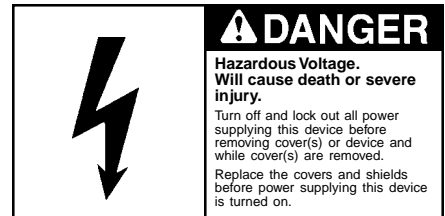


Fig. 1



# Installation Instructions

## Mounting of Breaker onto Connect—All Assembly

- A. Remove the load and line terminal shields (D, Fig. 3 & 4) by loosening the two terminal shield screws (E, Fig. 3 & 4). Also remove end plates (J, Fig. 3 & 4).
- B. Place breaker onto protruding connect-all terminals and fasten breaker to molded mounting base with four slotted fillister head 3/8-16 x 1-3/4 long screws, washers, and lockwashers (G, Fig. 3 & 4). Tighten mounting screws to a torque of 5 to 6 ft. lbs.
- C. Fasten breaker terminal to connect-all terminals with two hex head 3/8-16 x 1-3/4" long copper alloy bolts, washers and lock washers (F, Fig. 3 & 4) per terminal. Tighten these bolts to a torque of 9 to 10 ft. lbs.
- D. Replace all end plates (J, Fig. 3 & 4) and line and load terminal shields (D, Fig. 3 & 4). Tighten terminal shield screws securely.
- E. After mounting the device, line and load terminals and accessory terminals should be connected.

## Circuit Breaker Manual Operation

Manual operation of the circuit breaker is controlled by the circuit breaker handle and the Push-To-Trip button. The circuit breaker handle has three indicating positions, two of which are molded into the handle to indicate ON and OFF. The third position indicates a TRIP position and is between ON and OFF positions. (See Fig. 2)

- A. Circuit Breaker Reset  
 After tripping, the circuit breaker is reset by moving the circuit breaker handle to the reset position and then moving the handle to the ON position.
- B. Push-To-Trip Button  
 The Push-To-Trip button checks the tripping function and is used to manually exercise the operating mechanism.

## Inspection and Field Test

PD Frame devices are designed to provide years of maintenance free service. Sensitrip III Solid State Molded Case circuit breakers may be tested for electronic functionality by the use of a TS-31 test set available from local Siemens sales offices.

**NOTE:** Time current characteristic covers and information on factory installed accessories can be obtained from local Siemens sales offices.

## Maintenance

Experience has shown that properly applied molded case circuit breakers normally do not require maintenance. However, some industrial users may choose to establish an inspection and maintenance procedure to be carried out on a regular basis. For detailed information, consult applicable NEMA publications or your local Siemens sales office.

**NOTE:** Do not spray or allow any petroleum based chemicals, solvents or paints to contact the molded parts or nameplates.

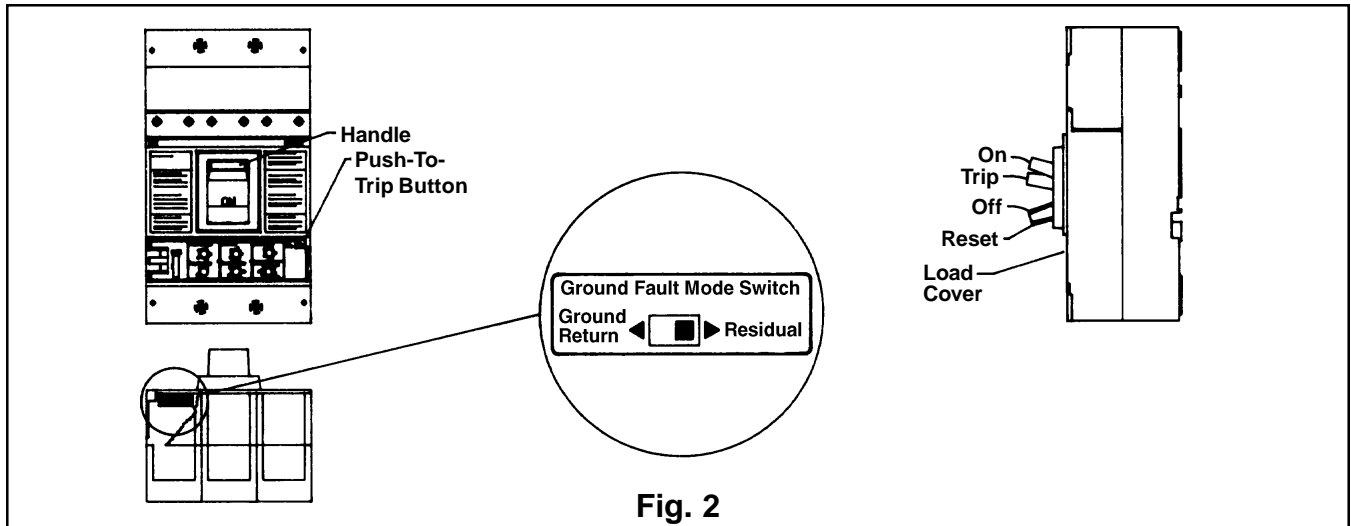
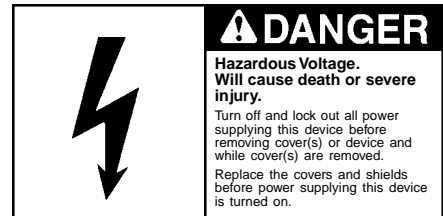


Fig. 2



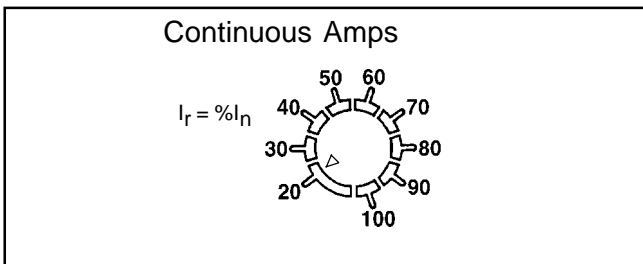
# Installation Instructions

## ELECTRONIC OPERATION

The setting dials on the face of the electronic trip unit are rotary switches that must be properly set to mechanical detent (click stop) positions. An improper switch setting will cause the trip unit to default ( as a fail safe condition) to the lowest permissive setting and, consequently, may result in unintentional or nuisance tripping.

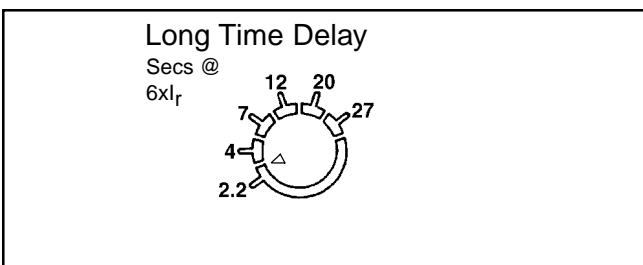
### Continuous Current Switch $I_r = \%I_n$

Adjustments made to this switch can change the continuous amps rating of the breaker to 20, 30, 40, 50, 60, 70, 80, 90 or 100% of the maximum continuous amps rating ( $I_n$ ) of the circuit breaker. The diagram below shows the settings possible on this switch:



### Long Time Delay Seconds @ $6xI_r$

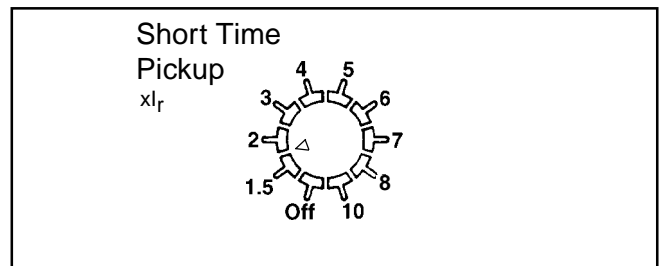
The adjustable long time delay switch allows for selection of long time delays based on  $I^2t$  curves at six times the continuous amps setting ( $I_r$ ). The diagram below illustrates the possible settings for this switch.



### Short Time Pickup $xI_r$ (optional)

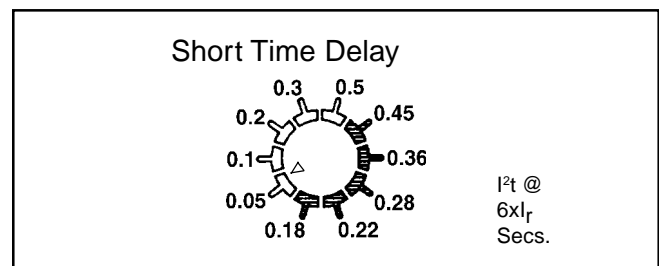
Circuit breakers with the letters "NT" in the catalog number have adjustments to set the Short Time Pickup and the Short Time Delay.

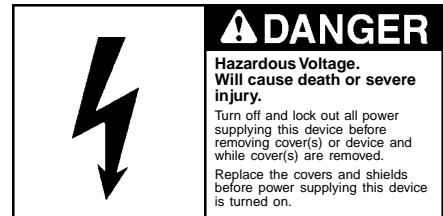
The adjustable short time pickup switch allows for selection of short time pickup in a range from 1.5 to 10 times the setting of the Adjustable Continuous Amps Switch. The OFF position disables the function. The diagram below illustrates the possible settings for this switch.



### Short Time Delay Seconds (optional)

The adjustable short time delay switch allows for selection from two ranges of short time delays. The first range of settings enable the breaker to be set for fixed time delays of .05, .1, .2, .3, or .5 seconds. The second range of settings enable the breaker to be set for short time delays based on  $I^2t$  curves at six times the continuous amps setting. The diagram below illustrates the possible settings for this switch.

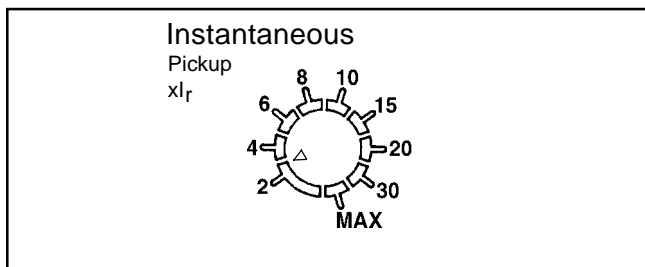




# Installation Instructions

## Instantaneous Trip Switch $xI_r$

The adjustable instantaneous trip switch allows selection of a tripping point from 2 to 30 times the ampere rating. The MAX setting sets the instantaneous pickup to the override level (see note below). The diagram below illustrates the possible settings for this switch.



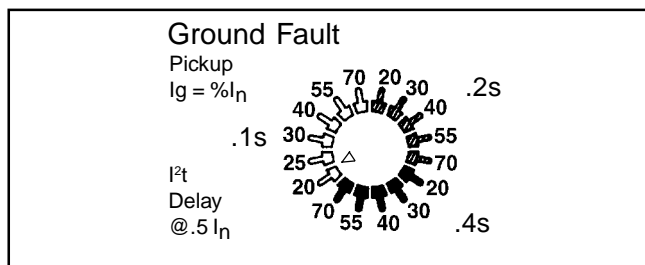
**NOTE:** Breaker contains an override at multiples of the maximum continuous current rating. These multiples are (7) times for 1400A breakers and Six (6) times for 1600A breakers. Above these levels, the short time delay is no longer operational. The breaker will trip instantaneously.

## Ground Fault (optional)

Pickup  $I_g = \% I_n$   
 Delay  $I^2t @ .5 I_n$

Circuit breakers with the letter “G” included in the catalog number have intergral equipment ground fault protection. These circuit breakers have an adjustment to set the Ground Fault Pickup current ( $I_g$ ) as a percentage of the Maximum Continuous Current rating ( $I_n$ ).

The pickup has a built in time delay. Three time delays are available of 0.1, 0.2 or 0.4 seconds. These are selected by using the appropriate area of the setting. Below 50% Maximum Continuous Current rating ( $I_n$ ), the pickup delay has an  $I^2t$  slope.



The ground fault option has two modes of operation. The mode is set by a switch on the bottom of the trip unit with the settings identified as GROUND RETURN and RESIDUAL. These function as follows: RESIDUAL SETTING (OUTGOING CIRCUIT METHOD) — This is the standard position that the breaker is set to when shipped from the factory. With the switch in this position, the circuit breaker may be used on 3 phase 3 wire or, with the addition of an external neutral sensing transformer, on 3 phase 4 wire systems. See Neutral Sensing Transformer section for more information.


GROUND RETURN SETTING (GROUND RETURN METHOD) — This setting may only be used for service disconnects or separately derived systems. With the switch in this position, the circuit breaker may be used on 3 phase 3 wire and 3 phase 4 wire systems. An external sensing transformer, which is installed on the main bonding jumper, is required for this method. See Neutral Sensing Transformer section for more information.

## Neutral Sensing Transformer.

An external transformer is required for circuit breakers equipped with ground fault protection when operating in the RESIDUAL mode on 3 phase 4 wire systems and when operating in the GROUND RETURN mode on any system. The sensors listed below must be used for these applications. The sensor catalog number must be matched to the circuit breaker Maximum Continuous Current rating ( $I_n$ ) as shown in the table. Please note that sensors used with other breaker types cannot be used with the SPD circuit breakers. Installation instructions are included with the sensors.

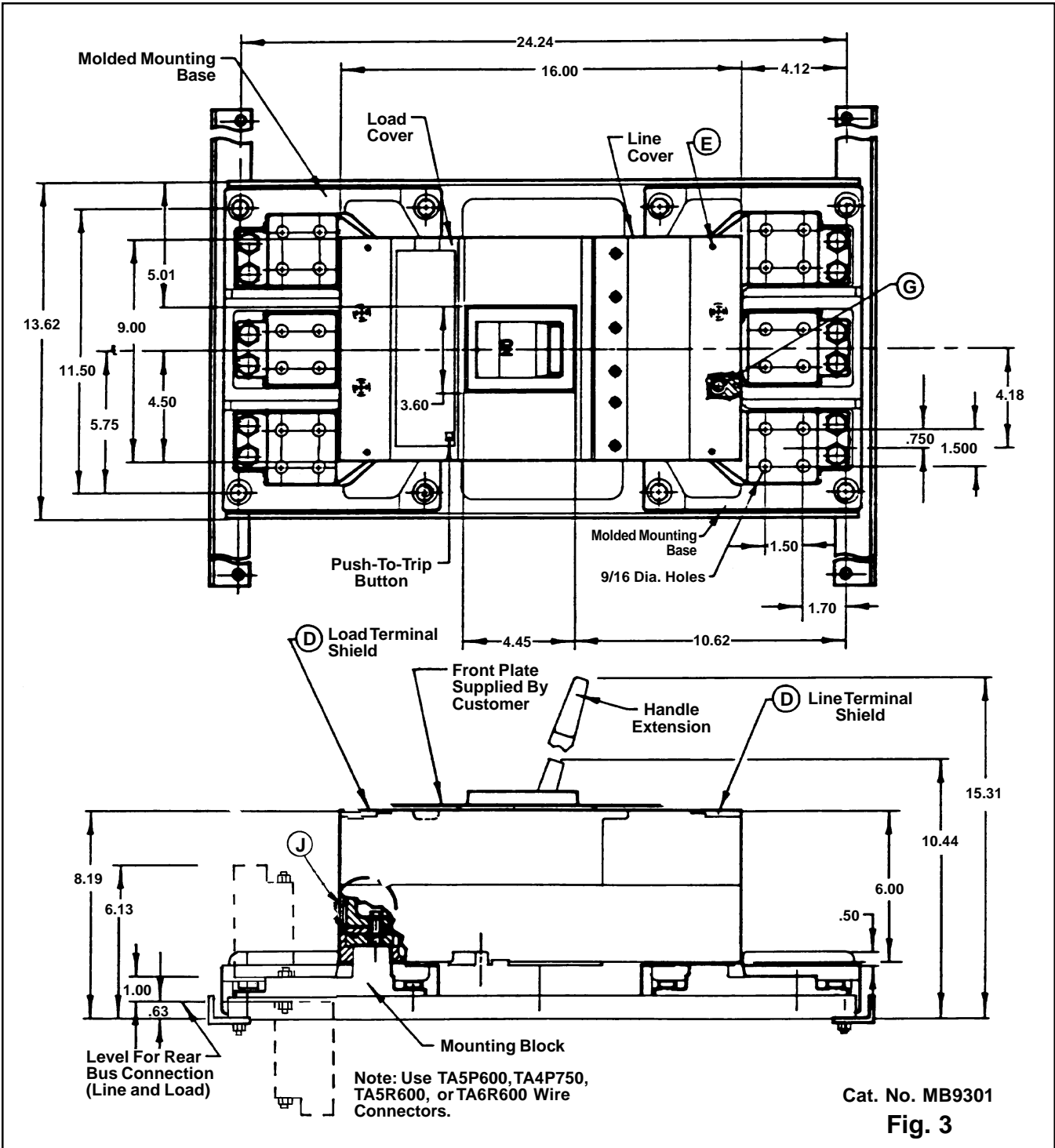
The following Neutral Sensing Transformers are to be used when equipped with ground fault and used on a 3 phase 4 wire system.


Breaker Rating	Transformer
1400	N14SPD
1600	N16SPD



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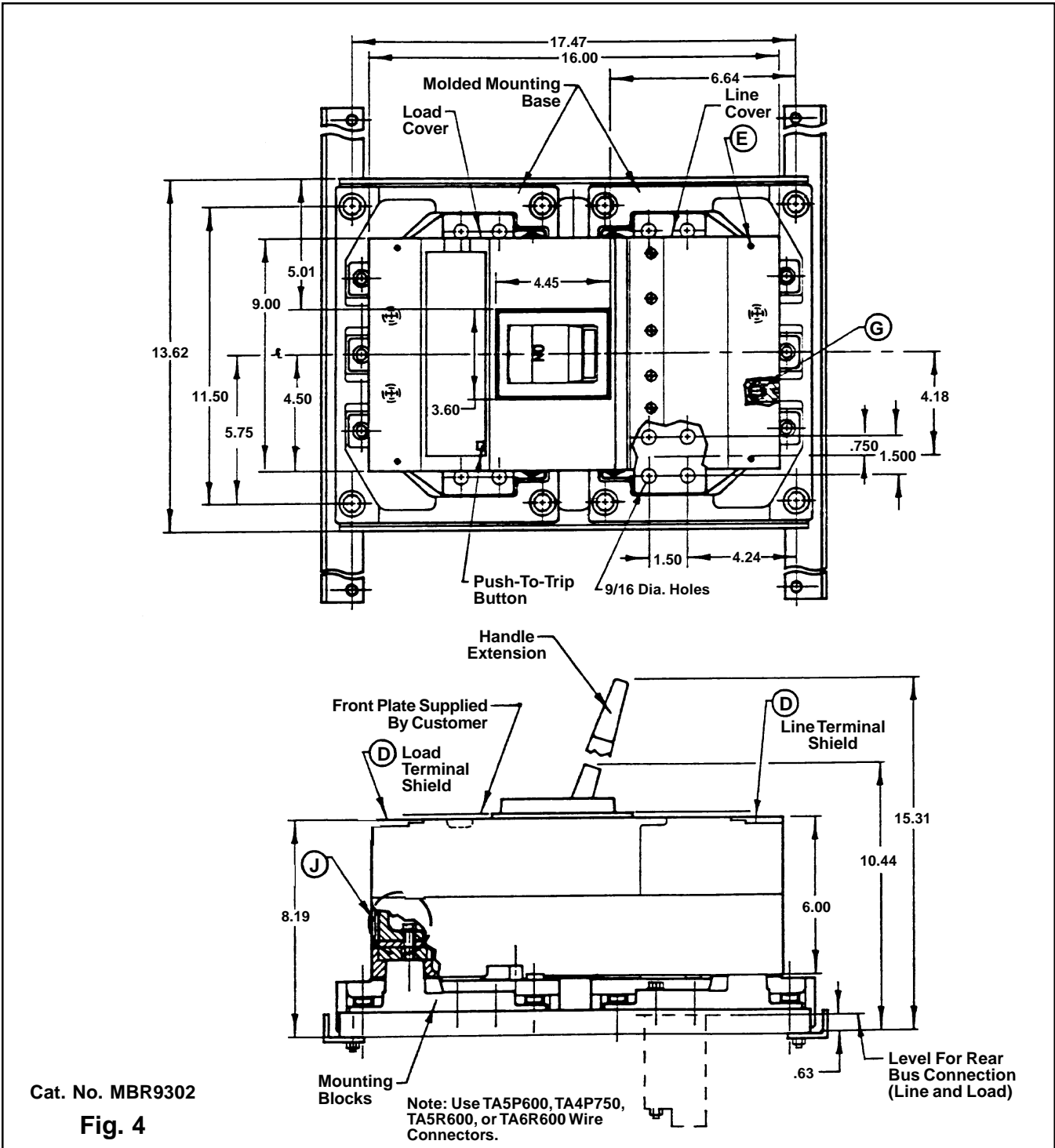
# Installation Instructions






**⚠ DANGER**  
 Hazardous Voltage.  
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 Replace the covers and shields before power supplying this device is turned on.

# Installation Instructions

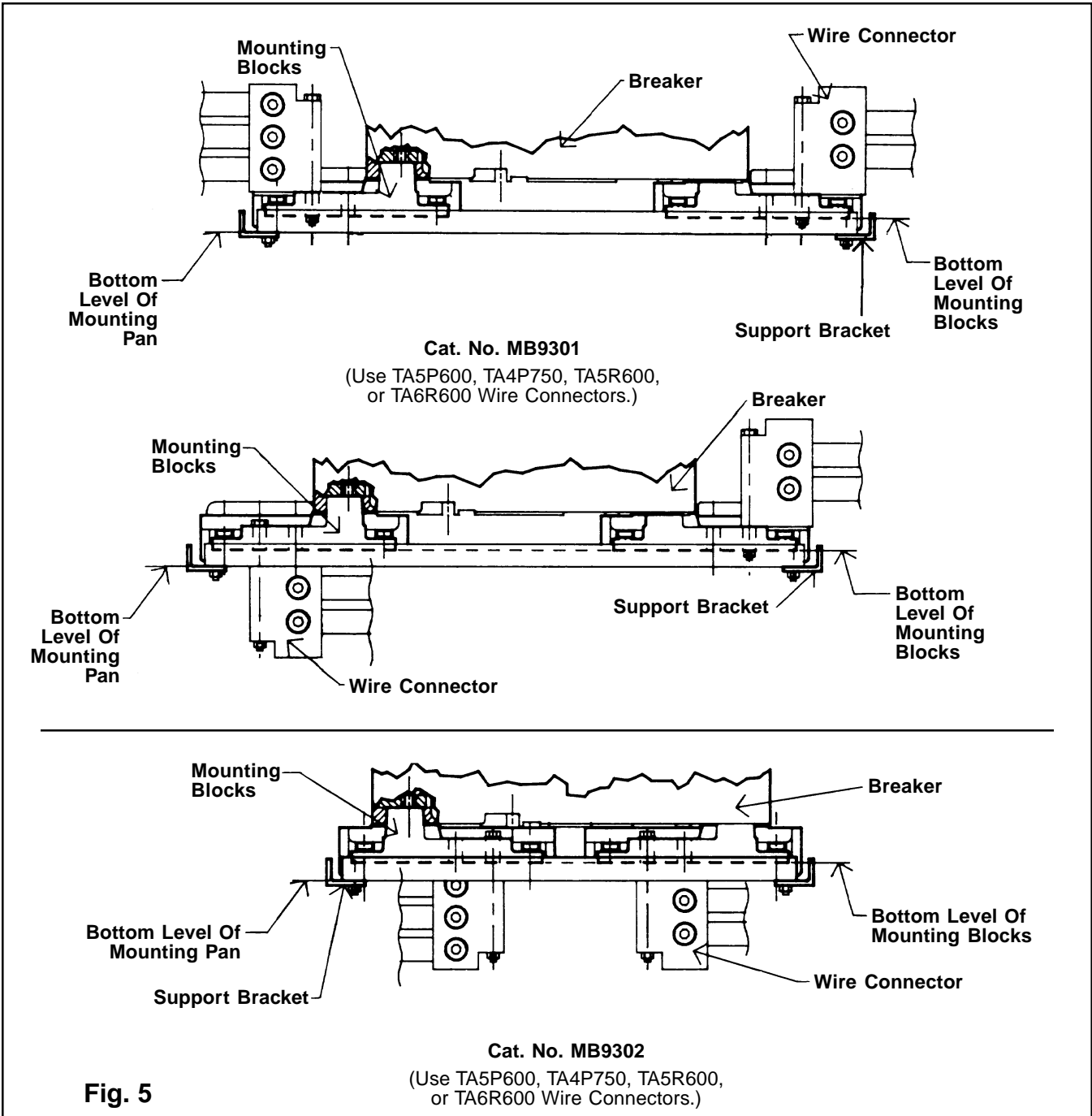


Cat. No. MBR9302

**Fig. 4**

	<b>⚠ DANGER</b>
	<b>Hazardous Voltage.</b> Will cause death or severe injury.
	Turn off and lock out all power supplying this device before removing cover(s) or device and while cover(s) are removed. Replace the covers and shields before power supplying this device is turned on.

# Installation Instructions



This product is covered by the following patent: 4,631,525.