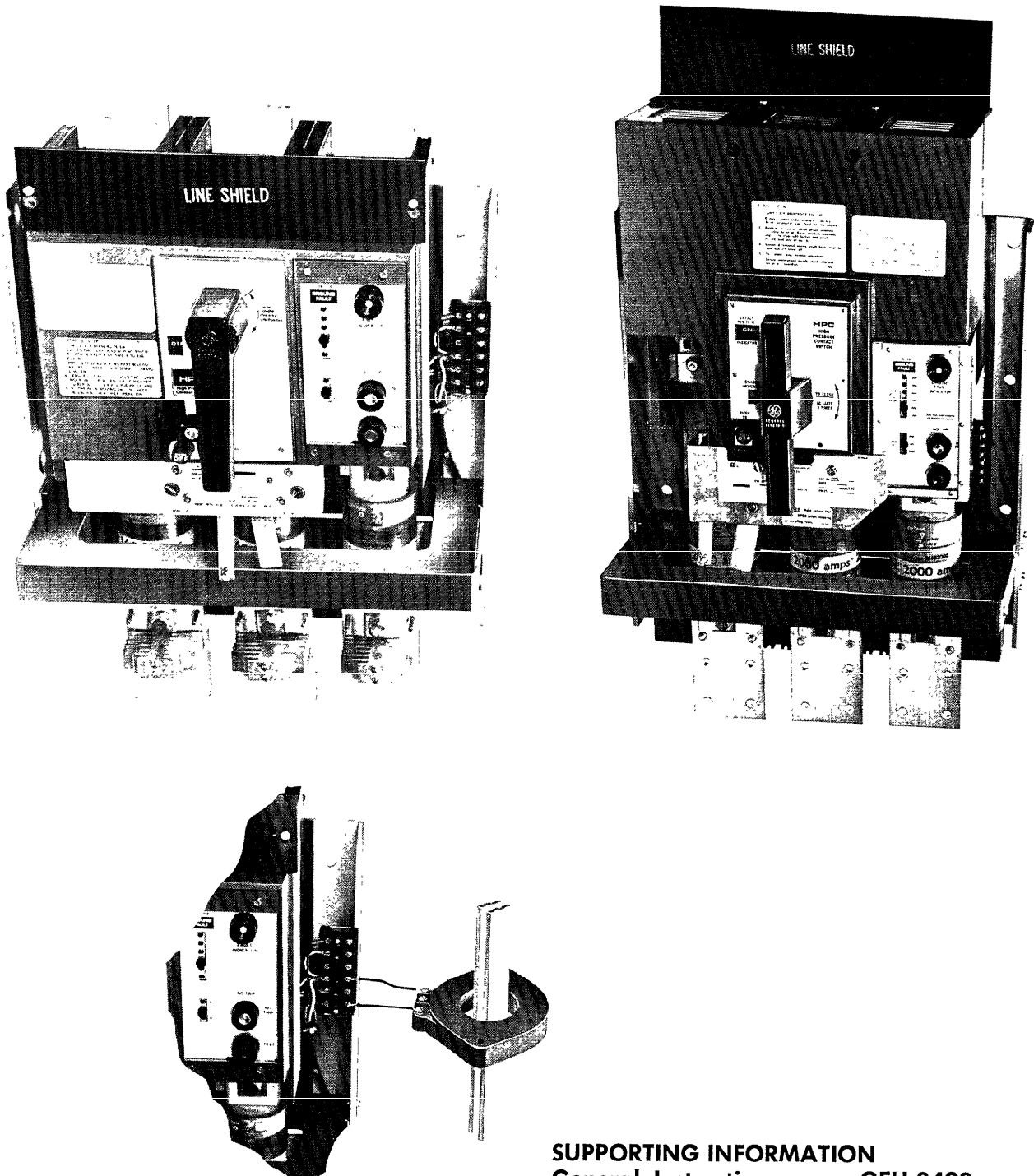




TYPE THP GROUND FAULT SYSTEM

For Use With All HPC Switches



SUPPORTING INFORMATION

General Instructions **GEH-3493**
Technical Bulletin **GET-6205**

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

RELAYS

General

Used on solidly grounded power systems in conjunction with a Type HPC switch having a flux-shifting shunt trip this relay with appropriate sensor or sensors will detect ground fault currents and cause the switch to open when these currents reach preselected values of current and time.

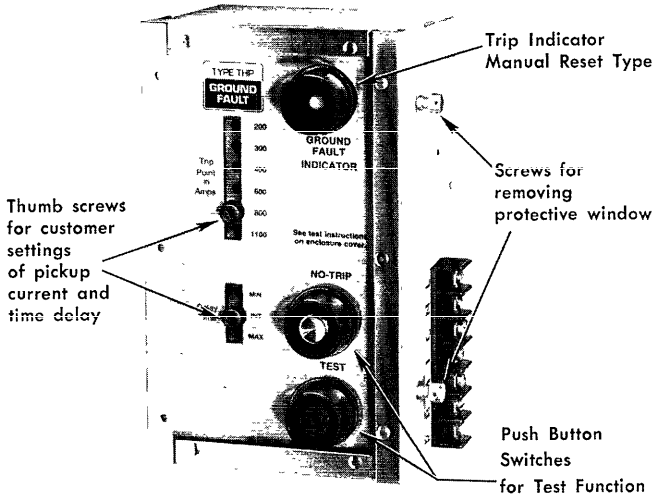


Fig. 1

All relays have 6 pickup current settings, with a range from 200 to 1100 amperes. All relays have 3 settings of time delay (minimum, intermediate, and maximum) for obtaining selectivity to suit each application. The delay time is in accordance with the trip-time chart GES-6177, Figure 2, which may be ordered full-size (10½ x 15) from the GE Distribution. Unit, Hoerle Bldg., Plainville, CT 06062.

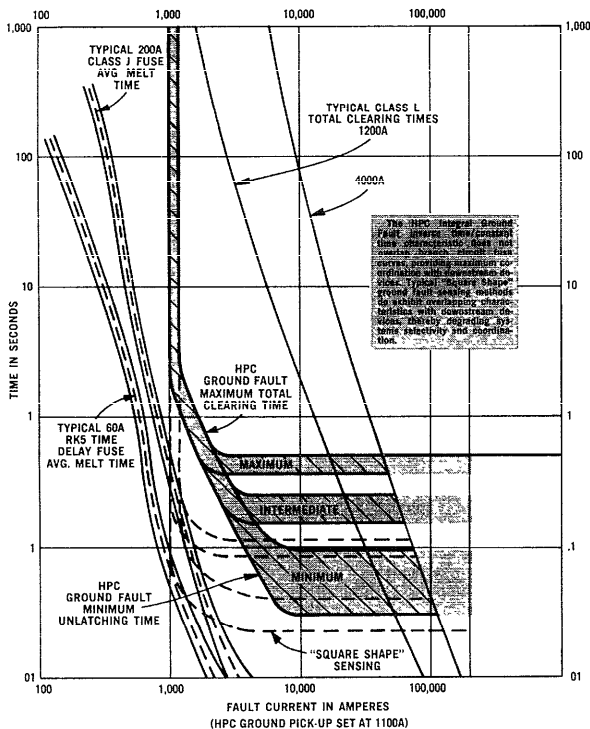


Fig. 2

All the relays are self-powered from the ground fault current as it goes through the windows of the connected sensors. A pop-out target button is available to indicate tripping has occurred because of a ground fault. The target is also self-powered, and continues to indicate by protruding beyond the flush position until it is manually pushed back flush with the background.

Some forms of the relay include two pushbutton switches for testing the system. One switch injects a current of 2.4A into the 700 turn test winding of the sensor, producing a signal equal to that of a 1640A ground fault. A control power source of at least 200 V.A. at 120 VAC, 60 Hz, is needed for this test.

The second switch may be held in during the test routine to disconnect the trip coil and maintain continuity of the power circuit. For such a test, the target will indicate if all parts of the ground fault system are working properly, except for the trip coil. Instructions for performing the test are printed on an aluminum nameplate which is supplied for attachment to the front panel of the switch enclosure, Figure 3.

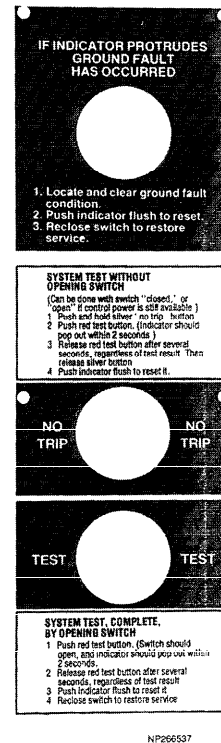


Fig. 3

Use the aluminum nameplate as a template to mark the location of the .094 diameter holes for the self threading screws to mount the nameplate. The screws are supplied in a plastic bag taped to the cover of the switch.

If the relay has no indication or test functions, a pressure sensitive label reading "This circuit is provided with ground fault protection," is shipped with the switch for application to the front panel of the switch enclosure.

SENSORS

For this ground fault system, a sensor is usually factory mounted in the HPC switch in a position surrounding all the fuses or fuse mounting pads. If the circuit includes an unswitched phase, such as a neutral conductor, an additional sensor of suitable physical size and thermal rating (See Table I for available selections.) should be mounted, encircling that conductor, and wired in parallel with the internally mounted sensor at the terminal block of the relay. The same type of external sensor could be used for "ground strap" sensing in the main circuit of a power system. See Figures 4a, 4b, and 4c pages 6 and 7, illustrating usage of the components of this system, including possible use of components of the GE "Ground-Break™" System.

(Figure 4)

GE Type TGS sensors must be used with the Ground-Break system. All sensors are electrically identical. Select each sensor so that conductors will have the required electrical and magnetic spacings to the edge of the sensor window. See Table I for a listing of the available sensors.

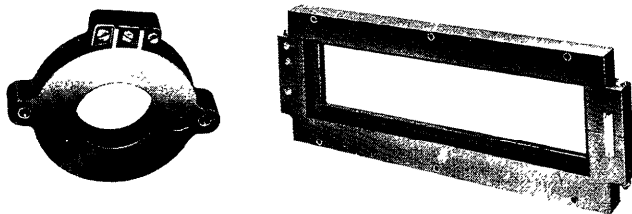


Fig. 4

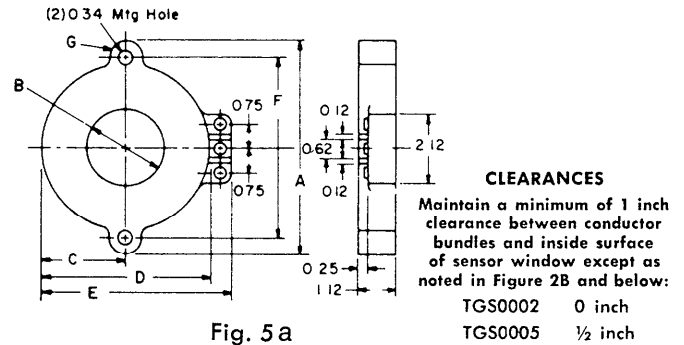


Fig. 5a

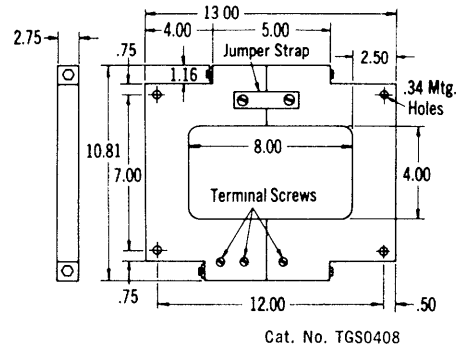


Fig. 5b

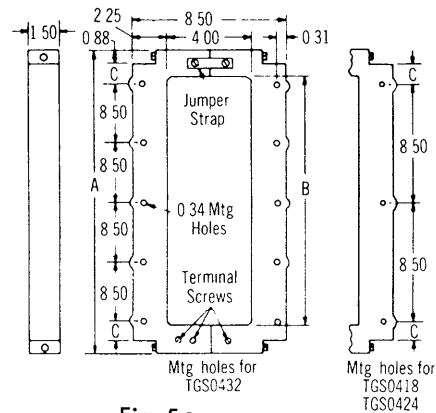


Fig. 5c

TABLE I — GROUND-BREAK™ SENSORS

Cat. No.	Window Size	Type Core	Wt.	DIMENSIONS							Figure No.
				A	B	C	D	E	F	G	
ROUND (Solid Core)											
TGS0002	2½ in. I.D.	Solid	3 lbs	6.62	2.50	2.56	5.12	5.75	5.62	0.50	5a
TGS0005	5 in. I.D.	Solid	4 lbs	9.50	5.00	3.94	7.88	8.50	8.50	0.50	
TGS0008	8 in. I.D.	Solid	7 lbs	12.75	8.00	5.44	10.88	11.50	11.50	0.62	
RECTANGULAR (Split Core)				No. of Mtg. Holes	A	B	C	Figure No.			
TGS0408	4 x 8 in.	Split	17 lbs	4				5b			
TGS0418	4 x 18 in.	Split	18 lbs	6	23.25	18.00	2.12	5c			
TGS0424	4 x 24 in.	Split	21 lbs	6	29.25	24.00	5.12				
TGS0429	4 x 29 in.	Split	23 lbs								
TGS0432	4 x 32 in.	Split	25 lbs	10	37.25	32.00	0.62				
TGS0808	8 x 8 in.	Split	25 lbs	6				5d			
TGS0808A	8 x 8 in.	Split	20 lbs								
TGS0808S	8 x 8 in.	Solid	20 lbs	4				5e			
TGS0810	8 x 10 in.	Split	22 lbs	4				5f			
TGS0818	8 x 18 in.	Split	31 lbs	6	23.25	18.00	2.12	5g			
TGS0824	8 x 24 in.	Split	37 lbs	6	29.25	24.00	5.12				
TGS0832	8 x 32 in.	Split	50 lbs	10	37.25	32.00	0.62				
TGS0838	8 x 38 in.	Split	57 lbs	10	43.25	38.00	3.62				
TGS1113	11 x 13 in.	Split	30 lbs	6				5h			

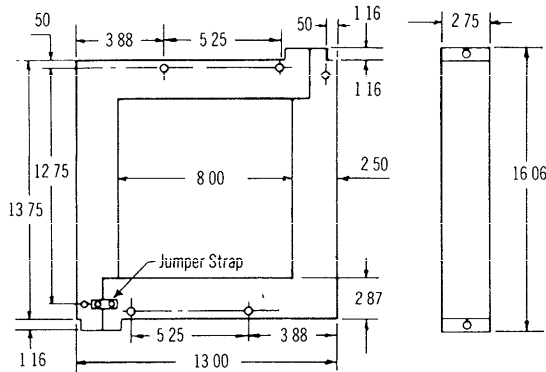


Fig. 5d

Cat. No TGS0808

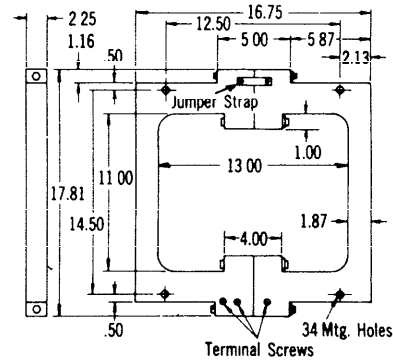


Fig. 5h

Cat No. TGS1113

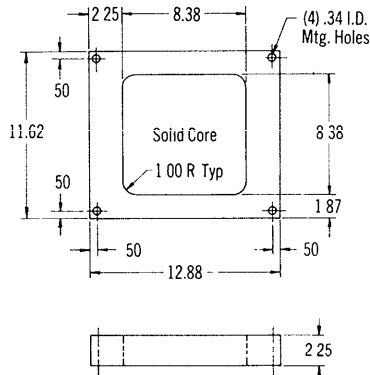


Fig. 5e

Cat No TGS0808S

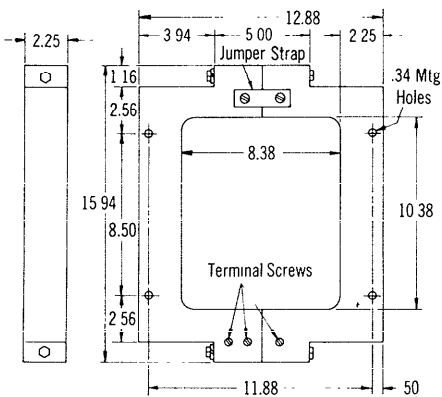


Fig. 5f

Cat No TGS0810

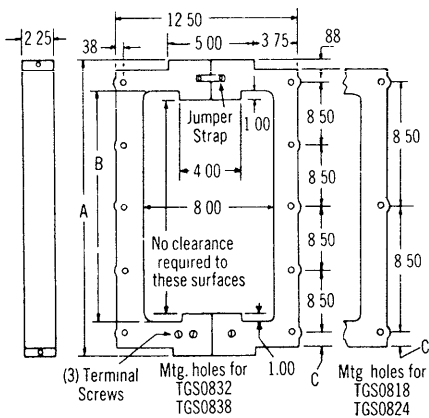


Fig. 5g

SENSOR MOUNTING INSTRUCTIONS

1. Bolt the two halves of the split core sensors together, using the hardware provided, and torque bolts to 70 inch lbs.
2. Attach jumper strap with hardware provided to both halves of split core sensor. Torque strap mounting screws to 20 inch lbs.
3. Attach sensor to supporting brackets with a minimum of four bolts for the rectangular sensors and two bolts for the round sensors. Bolt torque should not exceed 45 inch lbs.

SYSTEM RATINGS

This ground fault system for G.E. Type HPC switches and Class L fuses may be safely applied on circuits up to 200,000A available, with up to 600 VAC.

CUSTOMER SETTINGS

For access to the customer adjustment knobs, remove screws retaining Lexan® window and lift off.

A coordination study of the specific electrical distribution system is the proper way to determine the customer settings of pickup current and time delay. A compromise must usually be made between maximum continuity (both settings on maximum) and maximum safety (both settings on minimum). Very often, main and feeder switches would be set at 600A ground fault pickup to be selective with lighting breakers, whereas branch circuit switches would be set at 200A. pickup. The time delay setting would be minimum unless normal overloads or selectivity with downstream interrupters required more time delay.

ENCLOSURES

Dimensions and Ventilation Requirements for Typical Enclosures

(See Fig. 1.)

Data	HPC Switch Ampere Rating					
	800A	1200-1600A	2000A	2500A	3000A	4000A
Min. Volume (Cubic Inches)	8,400	11,100	28,000	28,000	30,000	54,650
"A" Min. Ventilation Top and Bottom ^① (Square Inches)	23	63	63	172	172	189
"B" Min. Line to Grd. (Inches)	2	2	2	2	2	9
"C" Min. Height (Inches)	28	30	40	40	40	52
"D" Min. Width (Inches)	25	25	25	25	25	30
"E" Mounting Depth ^② (Inches)	8.66	8.66	9.38	9.38	9.38	11.12
"F" Min. to Grd. or Insulation (Inches)	3.5	3.5	3	3	3	3

- ① Ventilating openings can be in alternate locations but must provide equivalent ventilating area.
- ② For switches with integrally mounted 3 ϕ current sensor (cat. nos. with suffix G3T, G3R, G31, BG3T, BG3R, BG31) add 1.62 in. to dim. "E".

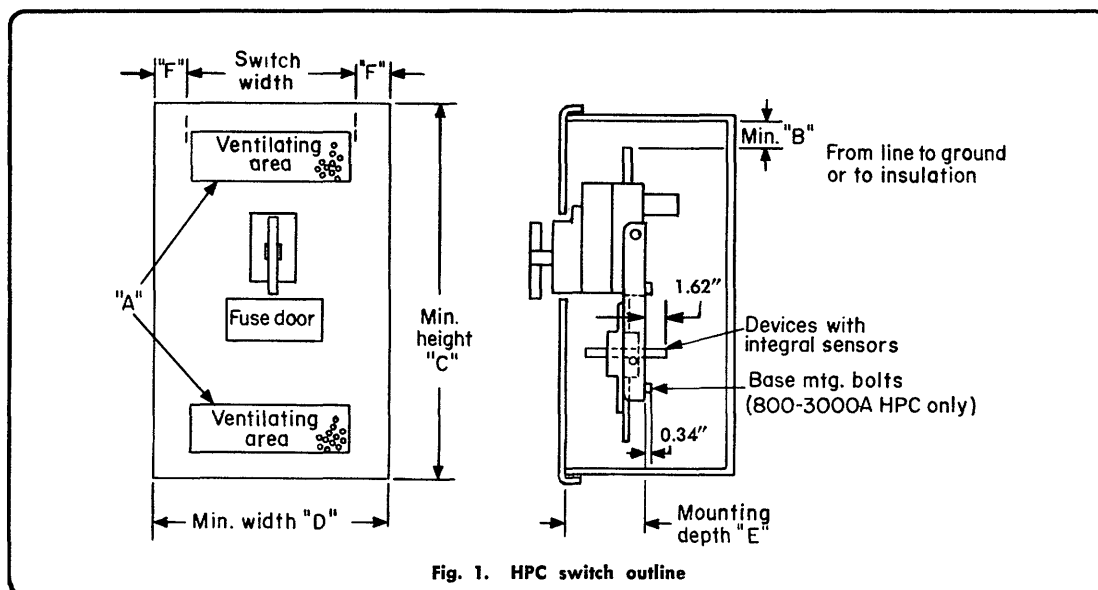


Fig. 1. HPC switch outline

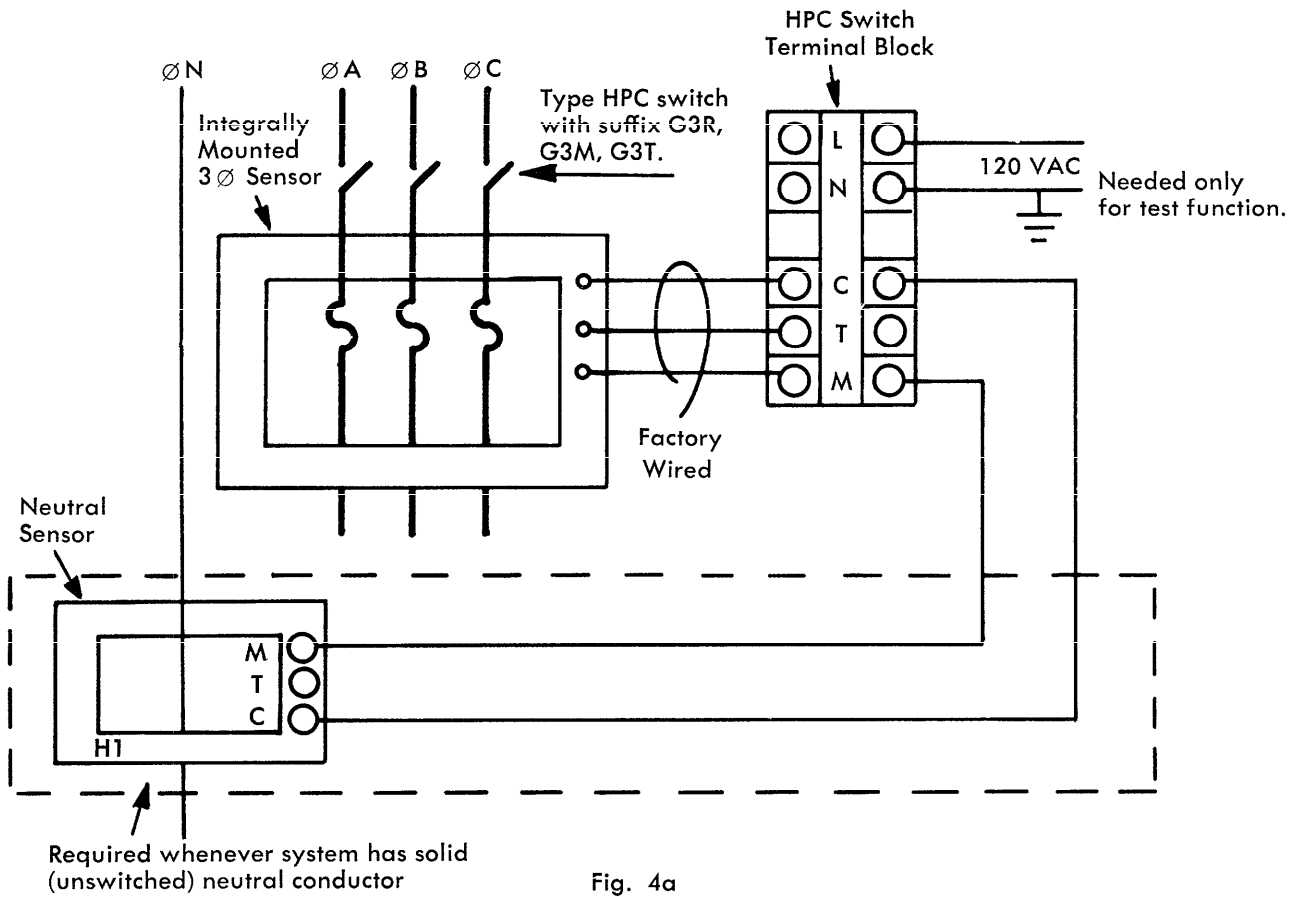


Fig. 4a

HPC with Integrally Mounted Sensor and Ground Fault Relay

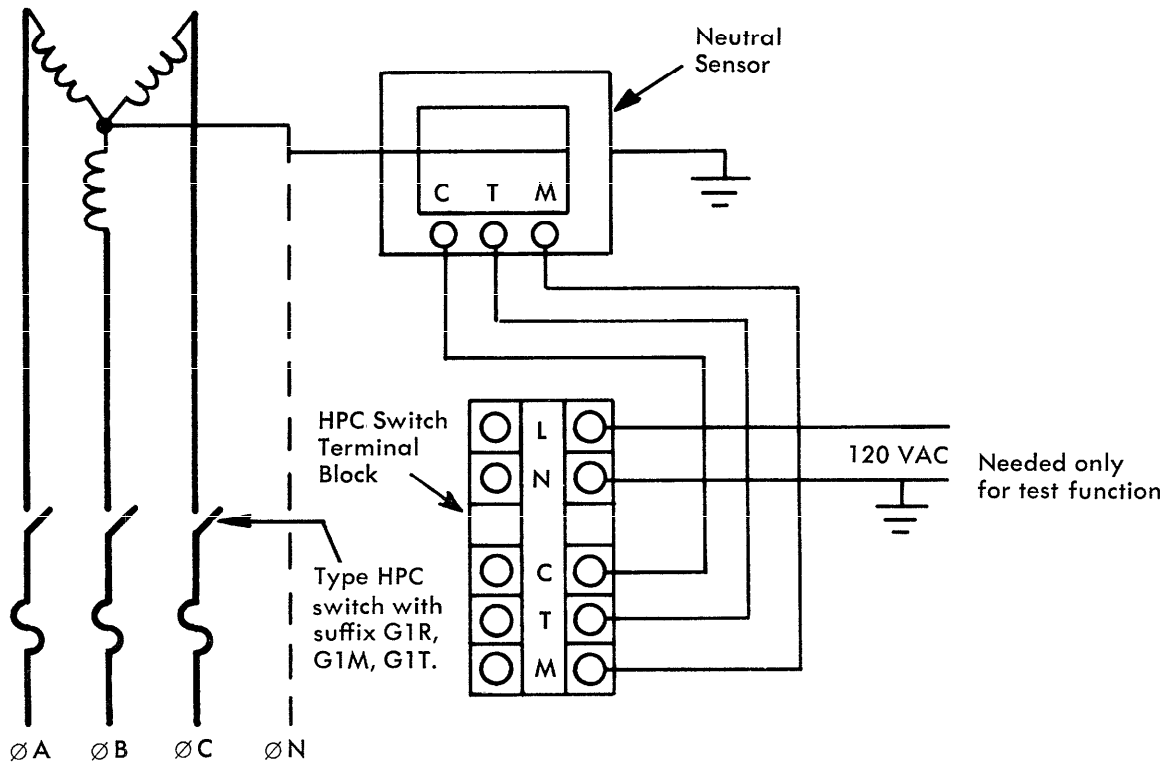


Fig. 4b

FIG. Ground Strap Sensing

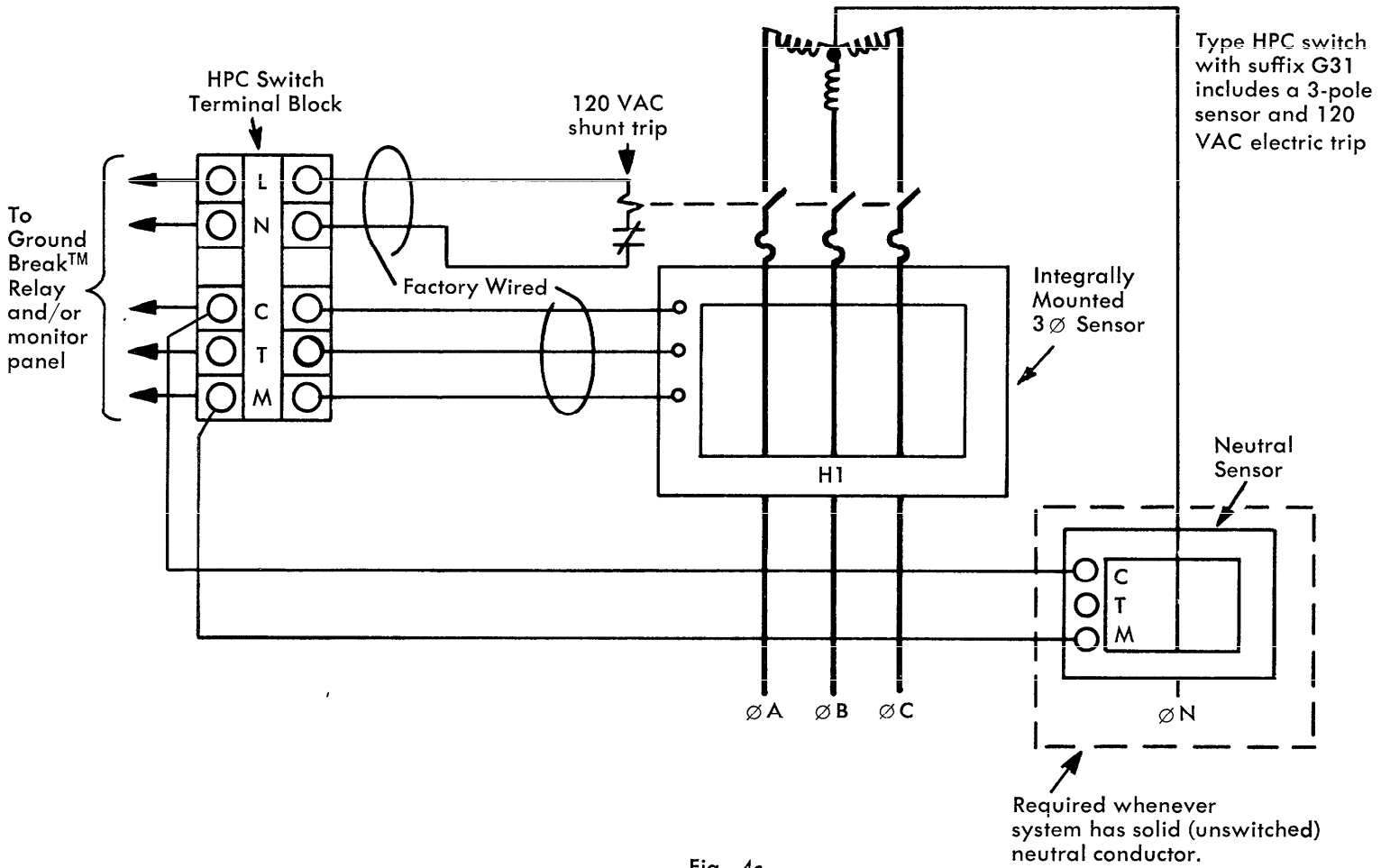


Fig. 4c
 Combined use of Integrally Mounted
 Sensor and Ground-Break™ components.

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