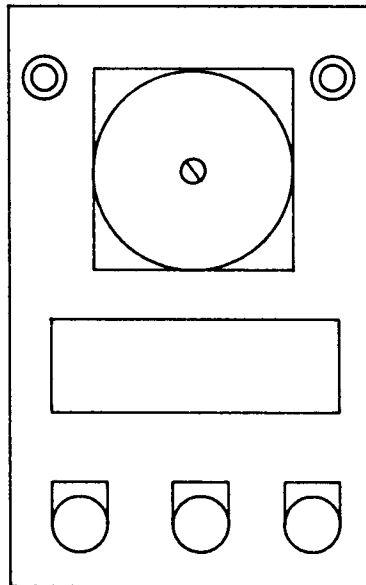


GROUND DETECTOR INSTRUCTION MANUAL



THE ERICKSON MODEL VAP (VISUAL-AUDIBLE-PHASE INDICATION) IS A VOLTAGE SENSITIVE DEVICE WHICH IS USED TO PROTECT EQUIPMENT FROM GROUNDING CONDITIONS OCCURRING ON UNGROUNDED SYSTEMS (3 ϕ 3W DELTA). IT SHOULD NOT BE CONFUSED WITH GFCI (GROUND FAULT CURRENT INTERRUPTER) WHICH IS A CURRENT SENSITIVE DEVICE AND USED FOR ENTIRELY DIFFERENT APPLICATIONS.

THE GROUND DETECTOR IS OPERATIVE ANYWHERE IN THE CIRCUIT BETWEEN ISOLATION TRANSFORMERS IN OTHER WORDS, ONLY ONE DETECTOR IS NEEDED FOR EACH UNGROUND SYSTEM.

THE DETECTOR INCORPORATES THE FOLLOWING THREE CIRCUITS:

- A. THE INDICATION CIRCUIT (FIG.1)
- B. THE SENSING CIRCUIT (FIG.3)
- C. THE ALARM AND FAULT CIRCUIT (FIG.4)

DURING NORMAL OPERATION A 3 ϕ 3W UNGROUND DELTA SYSTEM CAN BE REPRESENTED BY THE VOLTAGE VECTOR DIAGRAM SHOWN IN FIG.2A. THE GROUND INTRODUCED BY OUR DETECTOR CAN BE CONSIDERED TO FLOAT IN THE CENTER OF DELTA. WHEN A GROUND OCCURS THE VOLTAGE RELATIONS CHANGE. FIG.2B SHOWS THE VECTOR RELATIONS FOR A PARTIAL GROUND OCCURRING ON B ϕ . IN THE PHASE INDICATION CIRCUIT, THE INTENSITY AT WHICH THE PHASE LIGHTS GLOW IS DIRECTLY PROPORTIONAL TO THE CORRESPONDING PHASE-TO-GROUND VOLTAGES. THEREFORE, FOR THE CASE SHOWN IN FIG.2B, THE PHASE LIGHTS ON A AND C PHASE WILL INCREASE IN BRIGHTNESS WHILE THE B ϕ LIGHT DIMS. THIS SIGNALS A PARTIAL GROUND ON B ϕ (FOR FULL GROUND,THE PHASE LIGHT GOES OUT). THE ALARM CIRCUIT OPERATES (ON THE 480 VOLTS MODEL) WHEN THE GROUND IMPEDANCE IS APPROXIMATELY 10,000 OHMS. PRESSING THE ACKNOWLEDGE BUTTON SILENCES THE ALARM. THE RED FAULT LIGHT REMAINS LIT UNTIL THE GROUND IS CLEARED. WHEN THE GROUND IS CLEARED THE DETECTOR IS AUTOMATICALLY RESET.

SOME FEATURES ARE:-

NON-ADJUSTABLE:- A DETECTOR FOR OPERATING ROOMS AND SWIMMING POOLS WILL OPERATE AT APPROXIMATELY 66,000 OHMS – TOO SENSITIVE FOR FLOURASCENT BALLAST LOADS AND LONG CONDUCTOR FEEDERS. OUR DETECTOR SENSITIVE TO APP. 10,000 OHMS IS NOT TOO HIGH OR TOO LOW IN ORDER TO PROTECT THE ELECTRICAL EQUIPMENT. REMEMBER THIS IS NOT A PERSONNEL PROTECTOR BUT AN EQUIPMENT PROTECTOR.

DEPENDABILITY:- SEALED RELAYS WHICH ARE NORMALLY DE-ENERGIZED. NO VACUUM TUBES, RESISTORS, CAPACITORS, RECTIFIERS. ALL COMPONENTS ARE DESIGNED FOR LONG LIFE.

ATTRACTIVE DESIGN:- CHASSIS IS CADMIUM PLATED, CABINET IS BAKED ENAMEL. ALL WIRING IS CONNECTED TO TERMINAL BLOCKS. IT IS COMPACT AND EASILY MOUNTED. THE DOOR HAS LIFT PIN HINGES SO THE TUB CAN BE ROUGHED IN SEPERATELY AND IN CASE THE UNIT NEED TO BE SEND BACK TO THE FACTORY FOR TEST OR REPAIR.

LOW POWER CONSUMPTION:- FLOATING ON THE LINE WE DRAW ABOUT 3 WATTS.

BUILT IN POWER SUPPLY:-A 50 VA CONTROL POWER TRANSFORMER HAS BEEN PROVIDED IN ORDER THAT REMOTE DEVICES SUCH AS PILOT LIGHTS, RELAYS, BELLS, REMOTE ACKNOWLEDGE BUTTONS, OR SECURITY SYSTEMS DEVICES CAN BE CONNECTED TO THE TERMINAL BLOCK.

DEMONSTRATION AND TESTING:- THE GROUND DETECTOR CAN BE ORDERED WITH A PUSH-TO-TEST ACCESSORY BUT IT CAN ALSO BE FIELD TESTED BY FOLLOWING THESE DIRECTIONS LOCATED ON THE INSIDE OF THE CABINET.

1. REMOVE GROUND WIRE FROM TERMINAL 'G' COMING FROM THE SERVICE. WE DO THIS SO WE DON'T IMPOSE A GROUND ON THE SERVICE INTENTIONALLY.
2. JUMPER AØ TERMINAL TO G TERMINAL, ACKNOWLEDGE.
3. DUPLICATE TEST ON BØ TERMINAL TO 'G' TERMINAL AND CØ TERMINAL TO 'G' TERMINAL.

INSTALLATION AND WIRING REQUIREMENTS FOR THE GROUND DETECTOR

THE LIST OF SEVEN REQUIREMENTS WERE REQUIRED BY CITY OF CHICAGO AND THE COMMONWEALTH EDISON COMPANY IN ORDER TO MAKE THE UNIT ACCEPTABLE FOR SWITCHBOARD MOUNTING.

IT IS FURTHER UNDERSTOOD BY CODE AND GOOD PRACTICE THAT THE TAP SHOULD BE MADE ON THE LINE SIDE OF THE SERVICE SWITCH AND THE TAP SHOULD BE AS SHORT AS POSSIBLE, FUSED AND NOT SWITCHED.

ALL WIRING LOCATED INSIDE THE CURRENT TRANSFORMER COMPARTMENT SHALL MEET THE FOLLOWING REQUIREMENTS:—

1. ALL WIRE SHALL BE 19 STRAND MTW 90 DEGREE COLOR CODED. RED FOR AØ. BLACK FOR BØ. BLUE FOR CØ. GREEN FOR GROUND.

2. ALL WIRE SHALL BE SPIRAL WRAPPED AND CLAMPED IN A WORKMANSHIP LIKE MANNER.

3. TAP SHALL BE MADE ON THE LOAD SIDE OF THE UTILITY CURRENT TRANSFORMERS AND THE LINE SIDE OF THE SERVICE SWITCH.

4. ALL LIVE TERMINALS TO THE FUSE HOLDERS SHALL BE ENCLOSED AND THE FUSES SHALL BE ACCESSABLE FROM THE EXTERIOR OF THE CABINET.

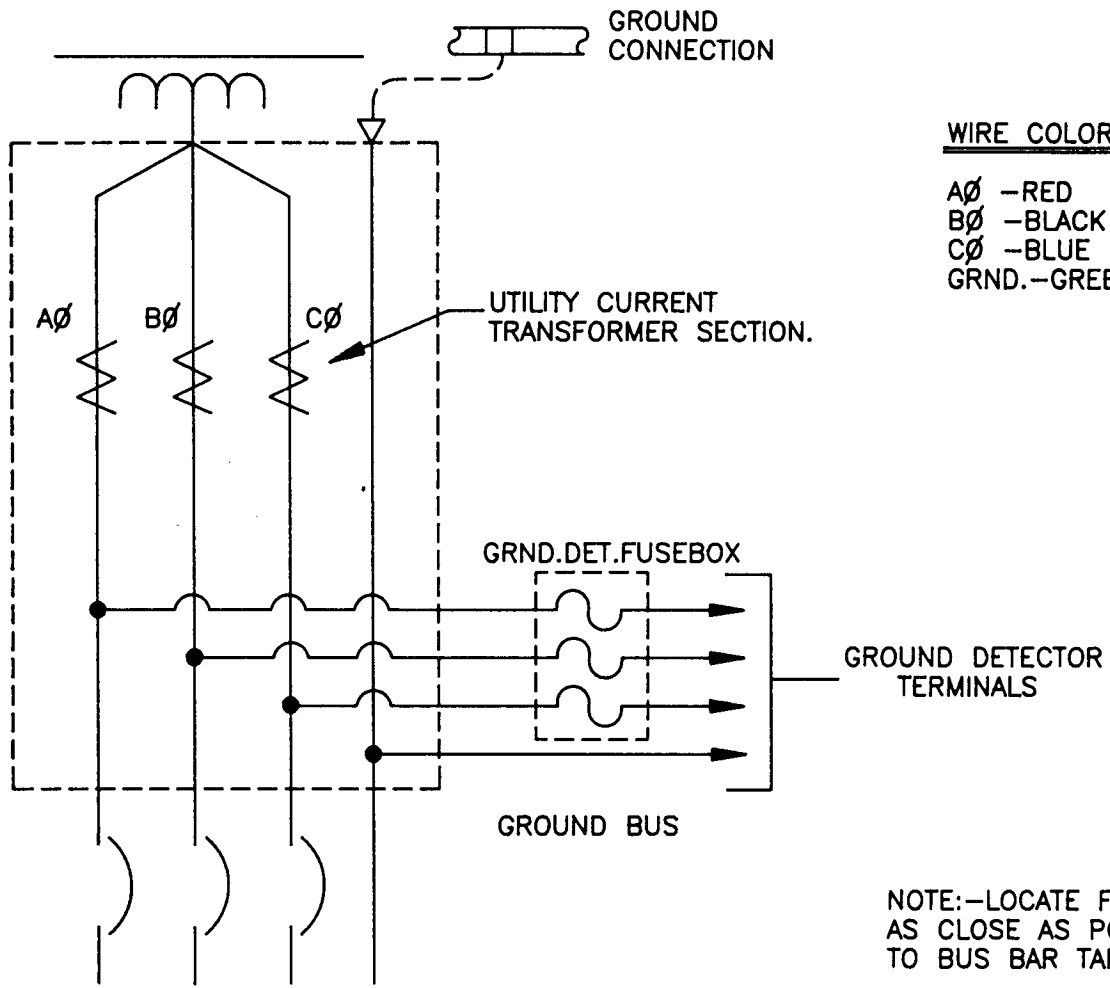
5. THE FUSE HOUSING SHALL BE LOCATED IN SUCH A POSITION AS TO NOT INTERFERE WITH INTERIOR COMPONENTS AND ALLOW PROPER VOLTAGE CLEARANCE TO LIVE PARTS.

6. FUSES SHALL HAVE CAPABILITIES OF WITHSTANDING THE AVAILABLE FAULT CURRENT OF THE SERVICE.

7. THE FUSE HOLDER SHALL BE DEAD FRONT 600 VOLT RATED.

NOTE:—SEE SKETCHES ON MOUNTING OF GDMF (GROUND DETECTOR MOUNTING FRAME) AND GDFB (GROUND DETECTOR FUSE BOX.)

RECOMMENDED INSTALLATION WIRING.



WIRE COLOR CODE

- AØ - RED
- BØ - BLACK
- CØ - BLUE
- GRND. - GREEN

NOTE:--LOCATE FUSEBOX AS CLOSE AS POSSIBLE TO BUS BAR TAPS.

TROUBLE SHOOTING:-

THE DETECTOR IS TO INDICATE A PROBLEM IN THE SYSTEM AND NOT NECESSARILY TELL YOU WHAT THE PROBLEM IS.

DO NOT USE A VOLTMETER TO CHECK FOR GROUNDS ON ANY UNGROUNDED SYSTEM BECAUSE A VOLTMETER WILL JUST DRAW THE PHASE CLOSER TO GROUND. THREE EQUALLY MATCHED VOLTMETERS CAN BE USED AT THE SAME TIME. A MODIFICATION WITH THREE VOLTMETERS IS ALSO AVAILABLE.

IF THE DETECTOR SHOWS A GROUND YOU CANNOT AT FIRST LOCATE, LIFT THE GROUND WIRE OFF THE 'G' TERMINAL AND THE DETECTOR SHOULD RESET TO NORMAL. IF THE DETECTOR DOES NOT RESET, SEND IT TO THE ERICKSON ELECTRICAL EQUIPMENT CO. FOR REPAIR.

IF IT DOES RESET IT SELF, AN EFFORT TO ISOLATE THE GROUND SHOULD BE CONDUCTED. OPEN FEEDER SWITCHES AND RECLOSE THEM IF THEY ARE FEEDING CIRCUITS WHICH ARE MORE APT TO BECOME GROUNDED BECAUSE OF WATER OR CONDITIONS IN THE AREA. IF THE FAULT CANNOT BE CLEARED BY OPENING FEEDER SWITCHES, THE MAIN SWITCH MUST BE OPENED AND IF STILL IT DOESN'T CLEAR, THE UTILITY SHOULD BE NOTIFIED.

IF TWO WHITE LIGHTS ARE DIM AND ONE IS OUT --- YOU PROBABLY HAVE A BURNT OUT LAMP. IF AØ IS OUT AND BØ & CØ ARE DIM, AØ HAS BLOWN FUSE. IF CØ IS DIM AND AØ AND BØ ARE OUT, EITHER AØ OR CØ IS OPEN.

IF THE GROUND SEEMS TO BE INTERMITTENT, LOOK FOR ROTATING OR MOVING THREE PHASE EQUIPMENT.

ACCESSORIES AND MODIFICATIONS:-

- A. DRY CONTACTS (X FEATURE)
- B. PUSH TO TEST LIGHTS (Y FEATURE)
- C. FAULT LIGHT FLASHER (Z FEATURE)
- D. WEATHERPROOF ENCLOSURE (WP FEATURE)
- E. NEMA 12 ENCLOSURE.
- F. FUNGUS PROOFING
- G. SWITCHBOARD MOUNTING FRAME. (GDMF)
- H. FUSE BOX
- I. REMOTE STATIONS (FLUSH OR SURFACE) (SRS OR FRS)
- J. VOLTMETER INDICATION
- K. HIGH VOLTAGE DETECTOR (HVAP)
- L. EXPLOSION PROOF
- M. SINGLE PHASE PROTECTION

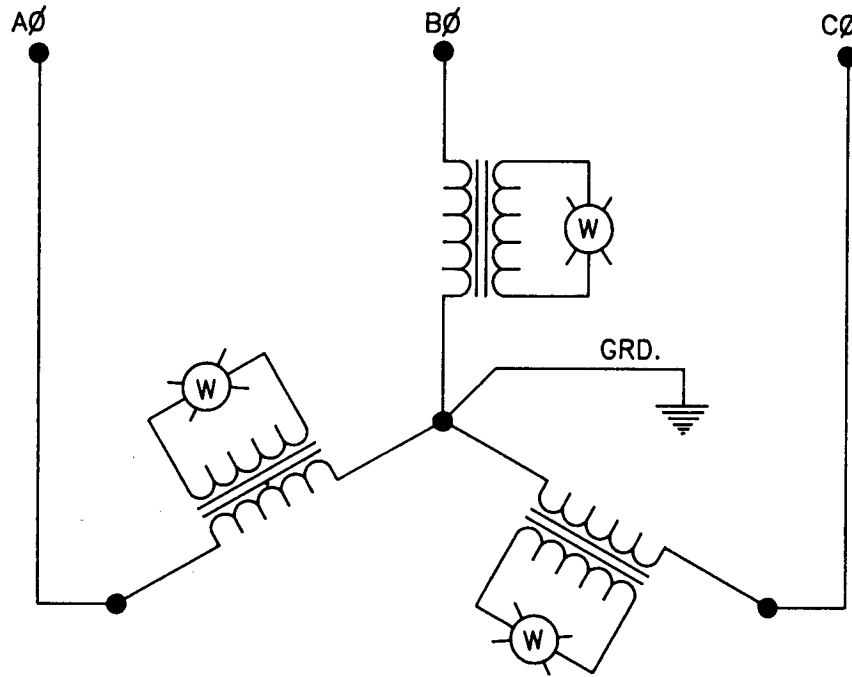


FIGURE #1 - - - - THE THE INDICATION CIRCUIT

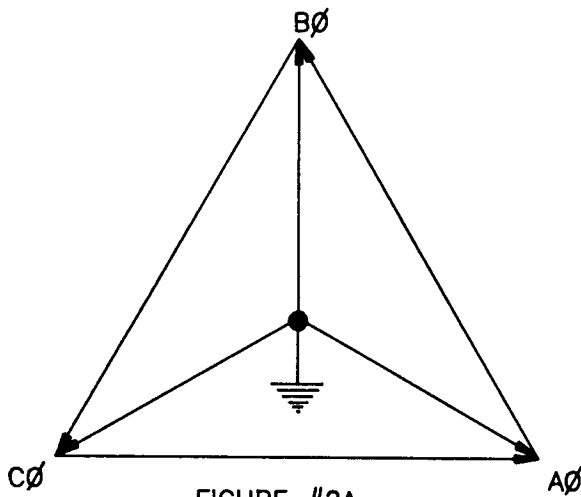


FIGURE #2A
VECTOR DIAGRAM -NORMAL

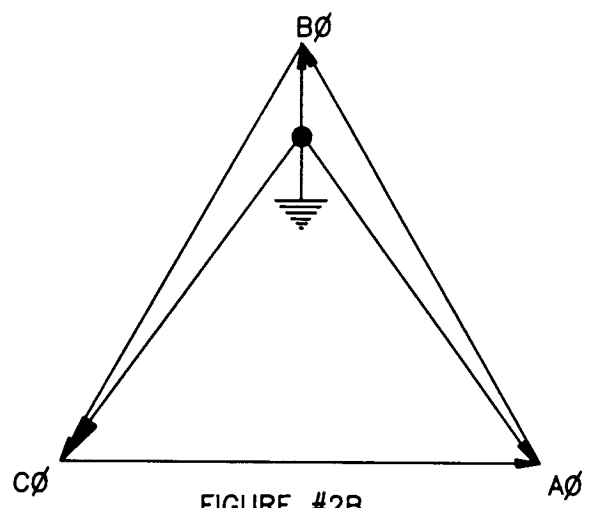


FIGURE #2B
VECTOR DIAGRAM -GROUND

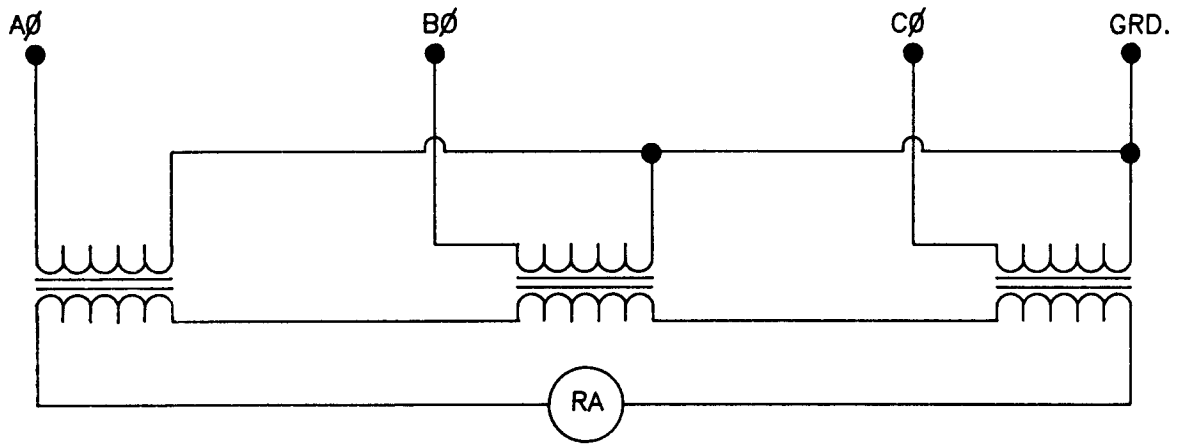
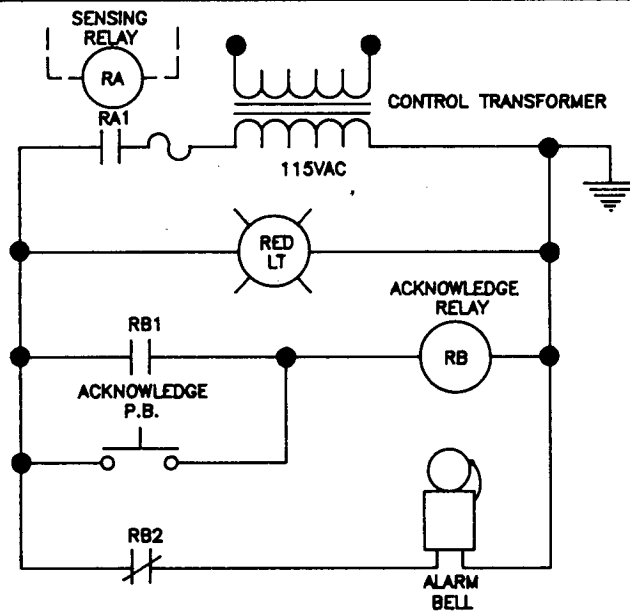


FIGURE # 3 THE SENSING CIRCUIT



NOTE:--ALL DEVICES ARE 120 VAC IN THE ALARM CIRCUIT. REMOTE DEVICES SHOULD ALSO BE 120 VAC.

FIGURE # 4 THE ALARM CIRCUIT

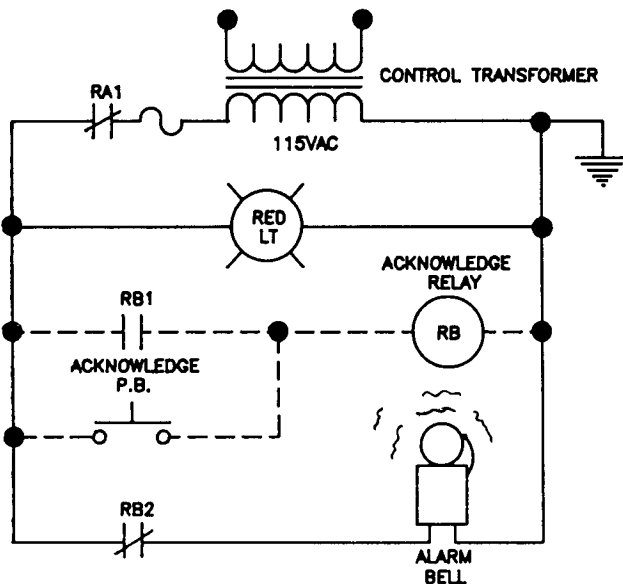


FIGURE # 5 ALARM CIRCUIT-ENERGIZED

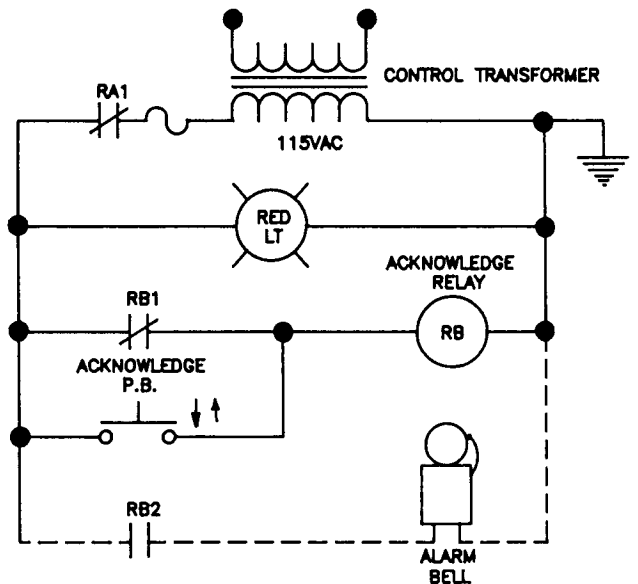
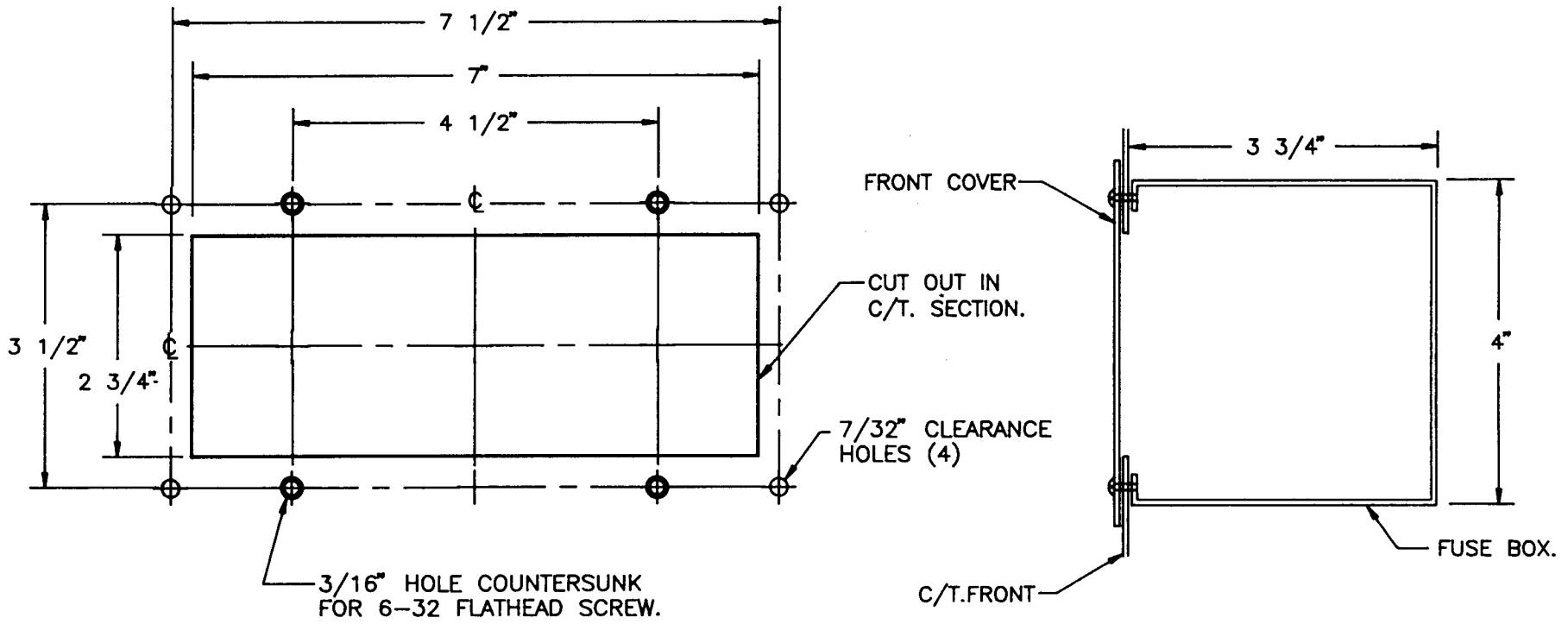


FIGURE # 6 ALARM CIRCUIT-ACKNOWLEDGED

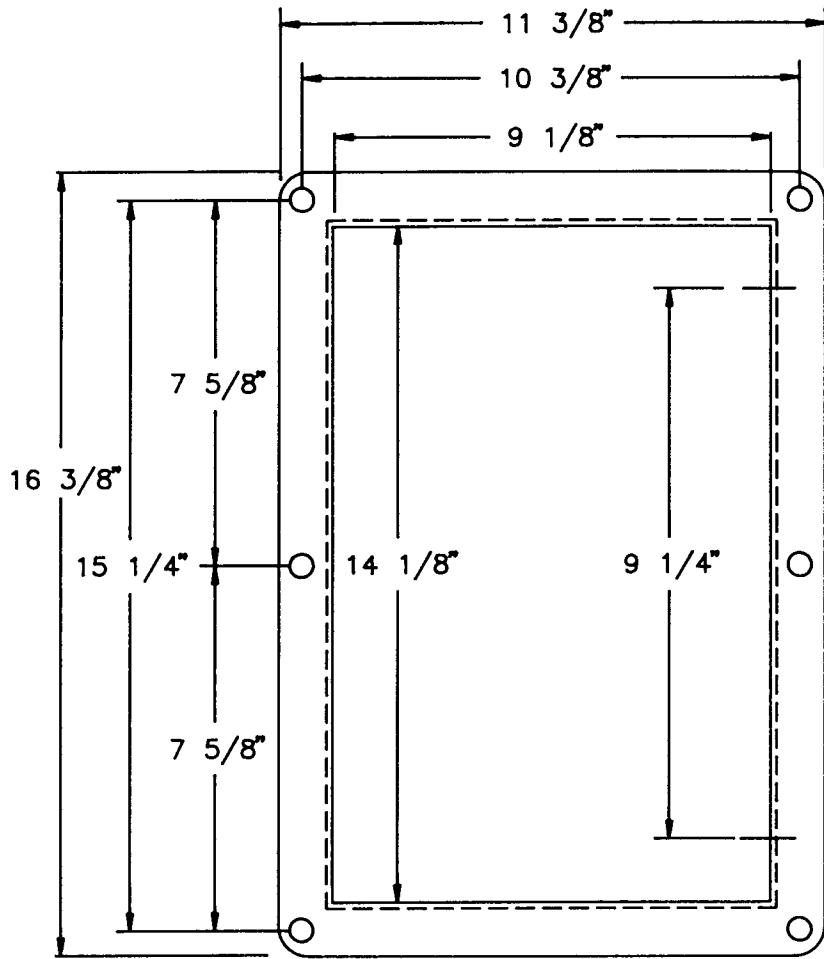
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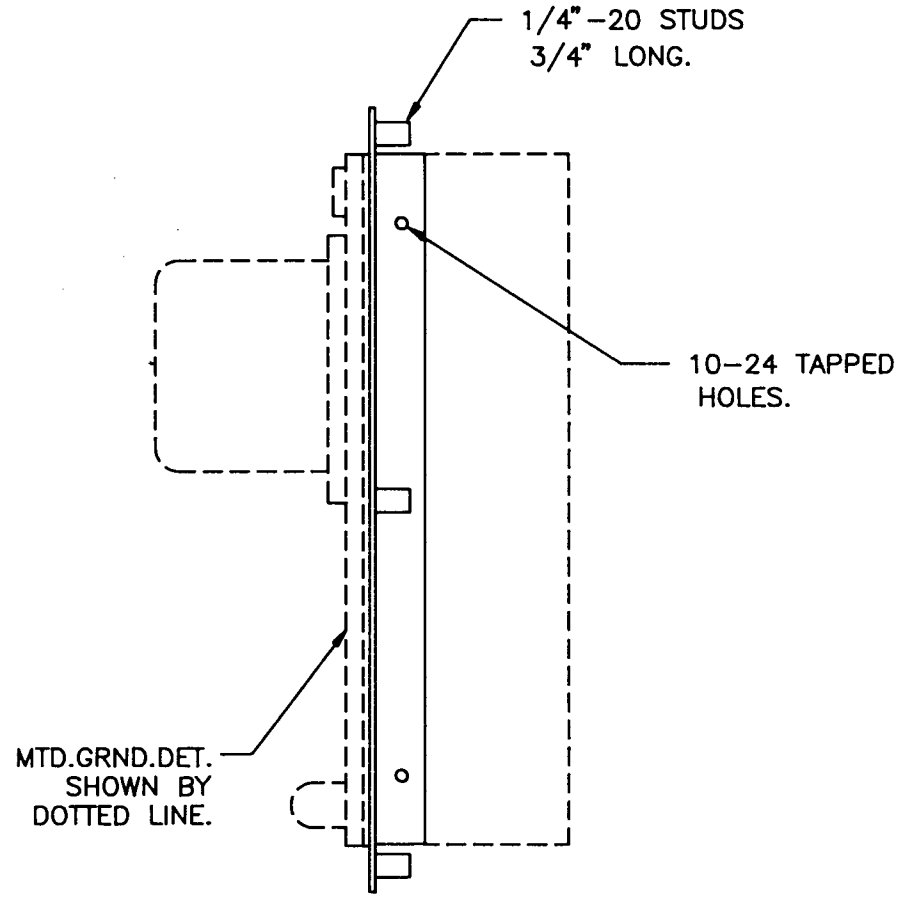
CUTOUT DETAILS

SIDE VIEW

MOUNTING DETAILS FOR GRND.DET.FUSEBOX



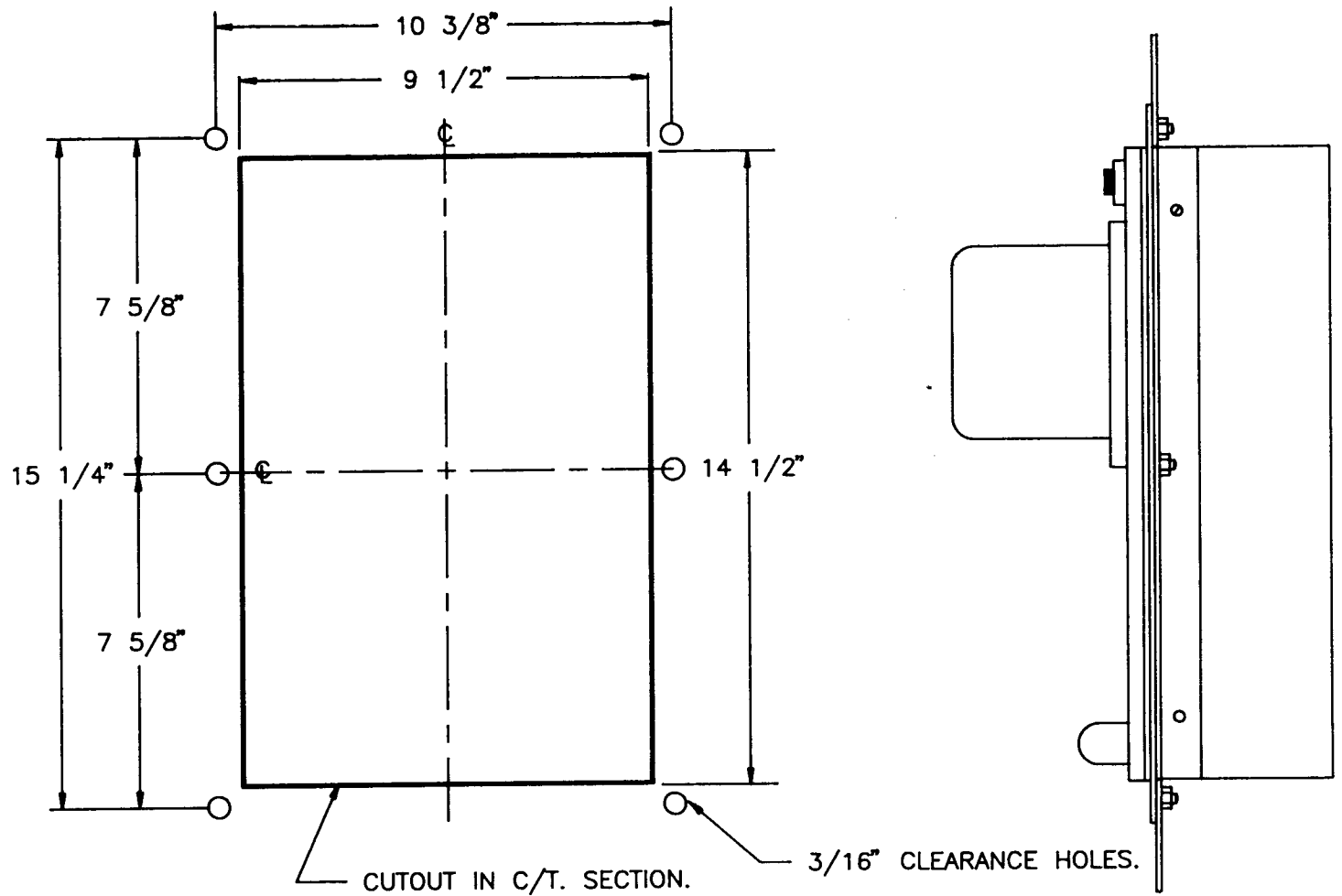
FRONT VIEW



SIDE VIEW

GROUND DETECTOR FRAME

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FRONT VIEW

SIDE VIEW

GROUND DET. MOUNTING DETAILS