



IB 7.1.1.7-8
Issue C

INSTRUCTIONS

Field Ground Relay

FIELD GROUND DETECTOR RELAY

Type 64F	Catalog Series 430F	Test Case
Type 64F	Catalog Series 230F	Standard Case

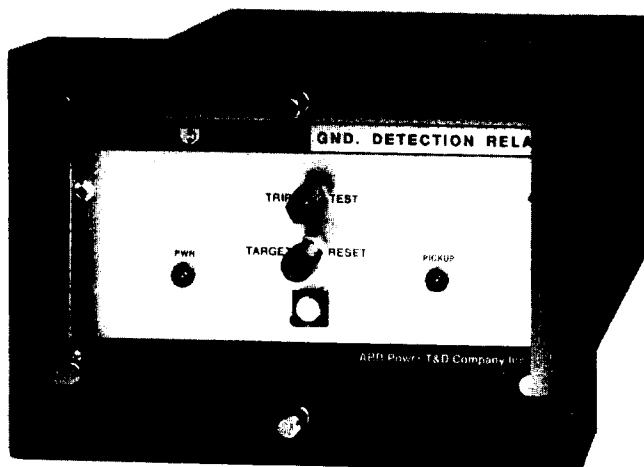


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INTRODUCTION

These instructions contain the information required to properly install, operate, and test the Type 64F Field Ground Detector Relay, catalog series 230F and 430F.

The relay is housed in a case suitable for conventional semiflush panel mounting. All connections to the relay are made at the rear of the case and are clearly numbered. Relays of the 430F catalog series are similar to relays of the 230F series. Both series provide the same basic functions and are of totally drawout construction; however, the 430F series relays provide integral test facilities, and are preferred for new installations. Also, sequenced disconnects on the 412 series prevent nuisance operation during withdrawal or insertion of the relay if the normally-open contacts are used in the application.

No settings are required on this relay. The target is reset by means of a pushbutton extending through the relay cover.

PRECAUTIONS

The following precautions should be taken when applying these relays:

1. Incorrect wiring may result in damage. Be sure wiring agrees with the connection diagram for the particular relay before energizing. *Wiring for the 430F series is not the same as for the 230 series units.*
2. Apply only the rated control voltage marked on the relay front panel.
3. High voltage insulation tests are not recommended. See the section on testing for additional information.
4. The entire circuit assembly of the relay is removable. The unit should insert smoothly. Do not use excessive force.
5. Follow test instructions to verify that the relay is in proper working order.

CAUTION: *since troubleshooting entails working with energized equipment, care should be taken to avoid personal shock. Only competent technicians familiar with good safety practices should service these devices.*

CAUTION: *this relay is designed to be directly connected to the field winding of a machine. Therefore, dc field voltage will be present at the rear terminals of the relay. Also, if the relay is withdrawn from its case, this dc voltage will be present on the connectors on the inside of the case at the rear.*

PLACING THE RELAY INTO SERVICE

1. RECEIVING, HANDLING, STORAGE

Upon receipt of the relay (when not included as part of a switchboard) examine for shipping damage. If damage or loss is evident, file a claim at once and promptly notify Asea Brown Boveri. Use normal care in handling to avoid mechanical damage. Keep the relay clean and dry.

2. INSTALLATION

Mounting:

The outline dimensions, panel drilling, and cutout information is given in Figure 1.

Connections:

Internal connections for both catalog series 230F and 430F are given in Figure 2.

Typical external connections for catalog series 430F units are shown in Figure 3.

These relays have metal front panels which are connected through printed circuit board runs and connector wiring to a terminal at the rear of the relay case. The terminal is marked "G". In all applications this terminal should be wired to ground.

There is no required polarity for the ac control voltage connections to terminals 7 and 8.

3. SETTINGS

There are no settings to be made on the Type 64F relay.

4. INDICATORS

Two light emitting diodes and a target are provided to assist operating personnel with information on the status of the relay. The green led, when lit, indicates the presence of control power to the relay. The red led indicates that a ground exists on the machine field, and that the 64F relay is picked up. At the same time, the target will be set to show orange.

The type 64F is a self-resetting relay, so if the ground condition is removed, the red led will go out and the relay will drop out. However, the target indicator will retain its indication until manually reset by pushing the Target Reset button. Control power must be present to reset the target.

APPLICATION DATA

The Type 64F Machine Field Ground Detector Relay is designed for the detection of grounds in normally ungrounded circuits such as the field winding of a machine.

The relay impresses a dc voltage between the protected circuit and ground, and detects the flow of current when a ground occurs. The sensitivity of the relay in detecting grounds is a function of the nominal dc operating voltage of the field winding and the point in the winding where the ground occurs. Lowest sensitivity results for grounds on the negative lead, and is approximately 5000 ohms. This characteristic is shown in Figure 4.

To insure reliable detection, the machine rotor iron must be properly grounded. Consult machine manufacturer for his recommended practice.

AC control power is used for this relay, as the internal control power transformer provides the isolation between the control power circuits and the connection to the machine field. The output contacts may be used in either ac or dc control circuits. The 64F relay will be inoperative if the ac control power source is lost. An auxiliary contact is provided to alarm on loss of control power.

Specifications:

Control Voltage: 120 Vac, 50/60 Hz., 0.05 A maximum.

Machine Field Voltage: Nominal 600 vdc.
Ceiling 750 vdc.
Reverse 1200 vdc. max.

Sensitivity: See Figure 4. Minimum sensitivity 5000 ohms for ground on negative lead.

Operating Time: 1 second, typical.

Contact Rating:	at 125 vdc	at 120 vac	
	30 amperes	30 amperes	tripping.
	5 amperes	5 amperes	continuous.
	0.3 ampere	1 ampere	break, inductive.

Operating Temperature: -30 to +70 degrees C.

Dielectric Withstand: 2000 vac rms, 60 seconds, between circuits.

Catalog Numbers: Test Case Style - 430F0261 (preferred for new installations)
Standard Case Style - 230F0261

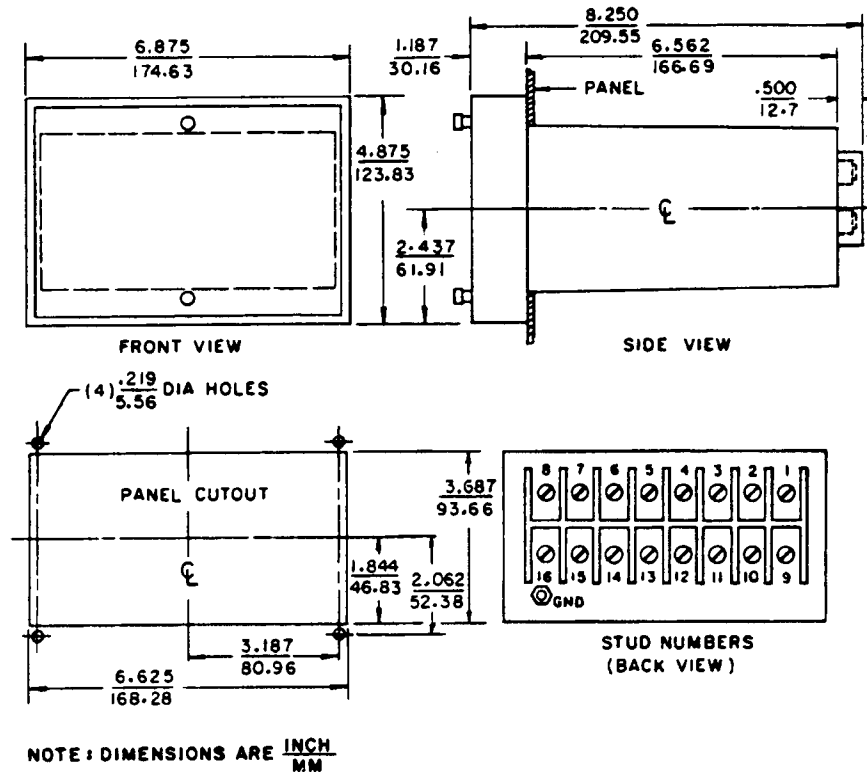


FIGURE 1: RELAY OUTLINE AND PANEL DRILLING

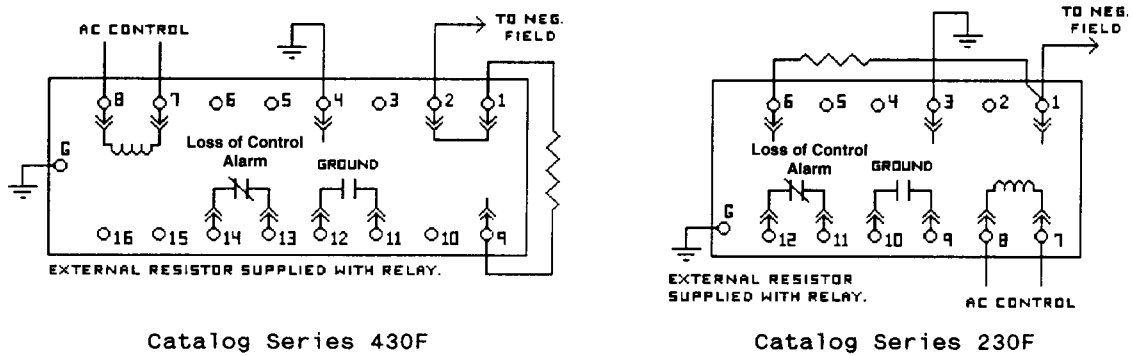


FIGURE 2: INTERNAL CONNECTIONS

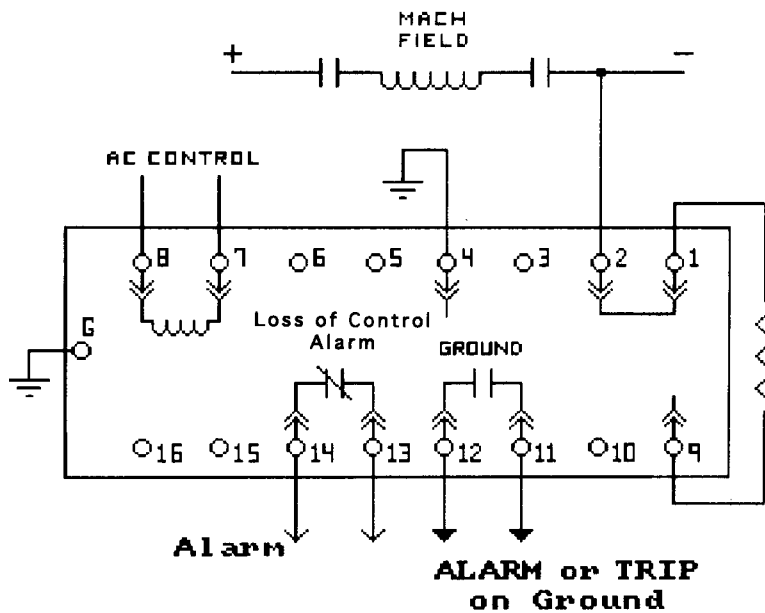


FIGURE 3: Typical External Connections, Catalog Series 430F

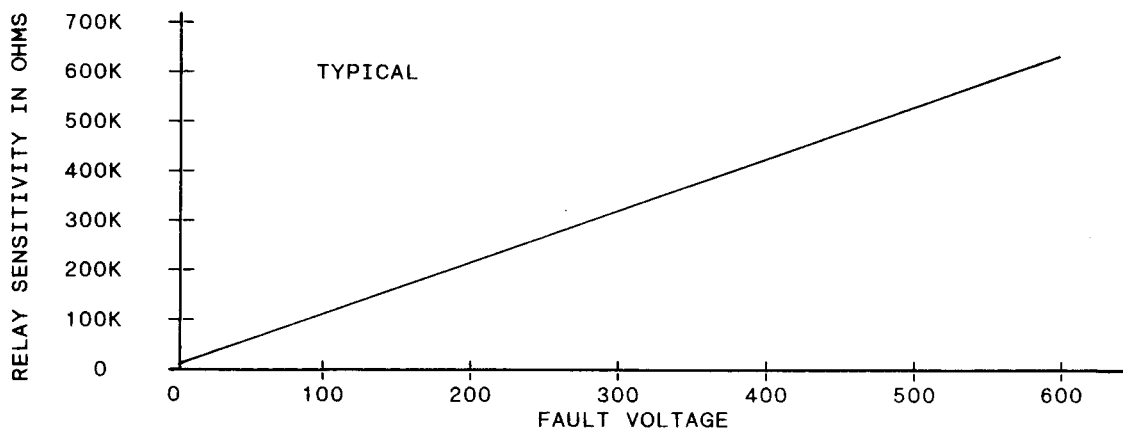


FIGURE 4: Sensitivity Characteristic

Note: Fault Voltage is defined as the dc field voltage measured from the negative lead to the faulted point in the winding.

TESTING

1. MAINTENANCE AND RENEWAL PARTS

No routine maintenance is required on these relays. Follow test instructions to verify that the relay is in proper working order. We recommend that an inoperative relay be returned to the factory for repair; however, a schematic diagram can be provided on request. Renewal parts will be quoted by the factory on request.

430F Series Units

Metal handles provide leverage to withdraw the relay assembly from the case. The assembly is identified by the catalog number stamped on the front panel and a serial number stamped on the bottom of the circuit board.

Test connections are readily made to the drawout relay unit by using standard banana plug leads at the rear vertical circuit board. This rear board is marked for easier identification of the connection points.

Important: in order to test the drawout unit of the Type 64F relay, a resistor must be connected temporarily between terminals 1 and 9 on the rear vertical circuit board. The value of this resistor should be marked on the rear circuit board. A 25 watt resistor is sufficient for testing. If no resistor is available, the resistor assembly mounted on the rear of the relay case could be removed and used. Be sure to re-install the resistor on the case at the conclusion of testing.

Test Plug:

A test plug assembly, catalog 400X0002 is available for use with the 412 series units. This device plugs into the relay case on the switchboard and allows access to all external circuits wired to the case. See Instruction Book IB 7.7.1.7-8 for details on the use of this device.

Caution: the test plug should not be used when the field is energized, as terminal 2 of the test plug will be connected to the field when inserted into the 64F relay case.

230F Series Units

Drawout circuit boards of the same catalog number are interchangeable. A unit is identified by the catalog number stamped on the front panel and a serial number stamped on the bottom side of the drawout circuit board.

An 18 point extender board (cat 200X0018) is available that may be helpful in bench testing and troubleshooting. *It should not be used for in service testing, as machine field voltage would be present on its terminals.*

2. HIGH POTENTIAL TESTS

High potential tests are not recommended. A hi-pot test was performed at the factory before shipping. If a control wiring insulation test is required, partially withdraw the relay unit from its case sufficient to break the rear connections before applying the test voltage.

3. BUILT-IN TEST FUNCTION

Tests should be made with a de-energized main circuit. Control power must be available to make this test.

The built-in test is provided as a convenient functional test of the relay and associated circuit. When you depress the button labelled TRIP, the measuring and timing circuits of the relay are actuated. The output contacts transfer to trip the circuit breaker or other associated circuitry, and the target is displayed.

4. ACCEPTANCE TESTS

A typical test circuit for 430F series units is shown in Figure 5a, and for 230F units in Figure 5b. Apply rated control voltage; the green control power led should come on. Both output contacts should be open. Press the Target Reset button. The target should show black. Close the switch, connecting the test resistor RT. The red pickup indicator should light, and the Ground contact should close. The target should have set to orange. Open the switch, disconnecting RT. The red led should go out and the Ground contact should open. Reset the target. Open the control power switch. The control power Alarm contact should close, and the green led go out.

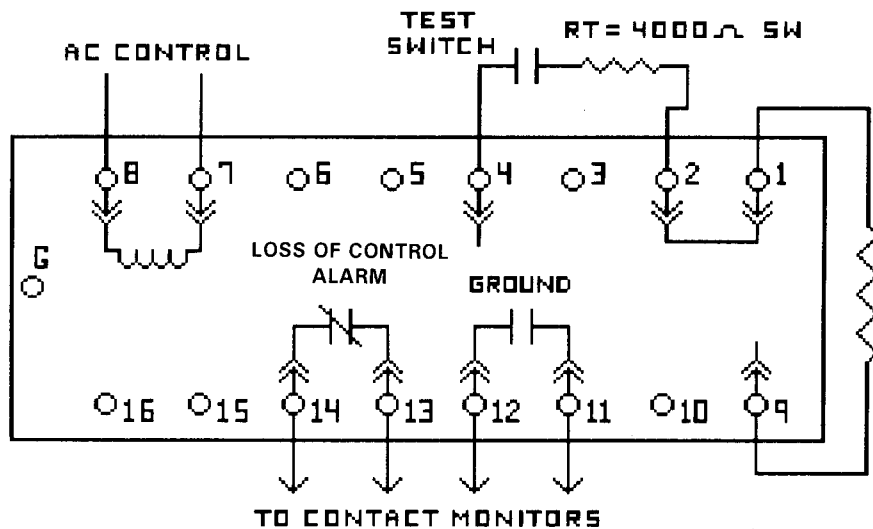


FIGURE 5a: Typical Test Connections, 430F Series Units.

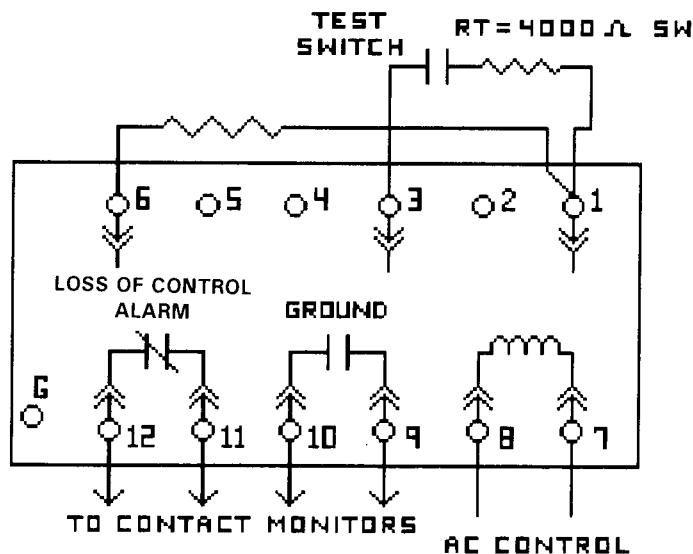


FIGURE 5b: Typical Test Connections, 230F Series Units