ABB Power T&D Company Inc.
Relay Division
Coral Springs, FL 33065

Instruction Leaflet
I.L. 41-251.21A

Effective: March 1996
Supersedes I.L. 41-251.21, dated January 1984

(|) Denotes Change Since Previous Issue

Type CRN-1 Reverse Power Relay

(50 and 60 Hz for Class 1-E Applications)

These instructions are supplementary to I.L. 41-251.2 and relate to type CRN-1 Relays which are recommended for Class 1E applications. Refer to I.L. 41-251.2 for details on construction and operation of this relay.

⚠ CAUTION

Before putting relays into service, remove all blocking which may have been inserted for the purpose of securing the parts during shipment, make sure that all moving parts operate freely, inspect the contacts to see that they are clean and close properly, and operate the relay to check the settings and electrical connections.

1. APPLICATION

These relays have been specially designed and tested to establish their suitability for Class 1E applications in accordance with the ABB Power T&D Company program for Class 1E Qualification Testing as detailed in bulletin STR-1.

"Class 1E" is the safety classification of the electric equipment and systems in nuclear power generating stations that are essential to emergency shutdown of the reactor, containment isolation, cooling of the reactor, and heat removal from the containment and reactor, or otherwise are essential in preventing significant release of radioactive material to the environment.

The type CRN-1 relay is a single phase directionally controlled timing relay used to protect ac generators from motoring. When such a condition occurs and persists for a predetermined time interval, the generator may be tripped or an alarm sounded. The CRN-1 may also be used to sense lagging power factor load flow in an abnormal direction. The directional unit has 30 deg. maximum torque characteristics and the timer unit is adjustable from approximately 2 to 40 seconds.

2. CONSTRUCTION AND OPERATION

Certain units of these relays have been specially designed to meet the fragility requirements of a seismic environment. In most cases, the construction is similar to the non-seismic units except spring restraint is greater and therefore more power is required to make them operate.

The timer unit is similar to Type CV relay described in I.L. 41-201.4.

The CV units contain a special shield covering the spring, located above the disc, to prevent the spring from contacting grounded elements during extreme vibrations.

The ICS has a single operate rating and requires special calibration procedures to make it less sensitive to vibration.The internal schematic of the CRN-1 is shown in figure 1.

2.1. CV UNIT

A spring shield covers the reset spring of the CV unit. To remove the spring shield, requires that the damp-

ing magnet be removed first. The screw connection holding the lead to the moving contact should be removed next. The second screw holding the moving contact assembly should then be loosened not removed. ***(CAUTION: this screw terminates into a nut held captive beneath the molded block. If screw is removed, difficulty will be experienced in the reassembly of the moving contact assembly.)*** Slide the spring shield outward and remove from relay. Tighten the screw holding the moving contact assembly to the molded block.

2.2. INDICATING CONTACTOR SWITCH (ICS)

2.2.1. Rating

Ampere Pickup	Ohms dc Resistance
0.2	8.5
1.0	0.37
2.0	0.10

2.2.2. Settings

There are no settings to make on the indicating contactor switch (ICS).

2.2.3. Routine Check

Close the main relay contacts and pass sufficient dc current through the trip circuit to close the contacts of the ICS. This value of current should not be greater than the particular ICS nameplate rating. The indicator target should drop freely.

Repeat above except pass 85% of ICS nameplate rating current. Contacts should not pickup and target should not drop.

2.2.4. Adjustment and Calibration

Initially adjust unit on the pedestal so that armature fingers do not touch the yoke in the reset position (viewed from top of switch between cover and frame). This can be done by loosening the mounting screw in the molded pedestal and moving the ICS in the downward position.

a. Contact Wipe – Adjust the stationary contact so that both stationary contacts make with the moving contacts simultaneously and wipe 1/64" to 3/64" when the armature is against the core.

b. Target – Manually raise the moving contacts and check to see that the target drops at the same time as the contacts make or up to 1/16" ahead. The cover may be removed and the tab holding the target reformed slightly if necessary. However, care should be exercised so that the target will not drop with a slight jar.

c. Pickup – The unit should pickup at 98% rating and not pickup at 85% of rating. If necessary, the cover leaf springs may be adjusted. To lower the pickup current use a tweezer or similar tool and squeeze each leaf spring approximately equal by applying the tweezer between the leaf spring and the front surface of the cover at the bottom of the lower window.

   If the pickup is low, the front cover must be removed and the leaf spring bent outward equally.

3. RENEWAL PARTS

Repair work can be done most satisfactorily at the factory. However, interchangeable parts can be furnished to the customers who are equipped for doing repair work. When ordering parts always give the complete nameplate data.

RELAY –TYPE CRN-1 - REVERSE POWER - SINGLE TRIP
IN TYPE FT 21 CASE

(FOR CLASS 1E APPLICATION)

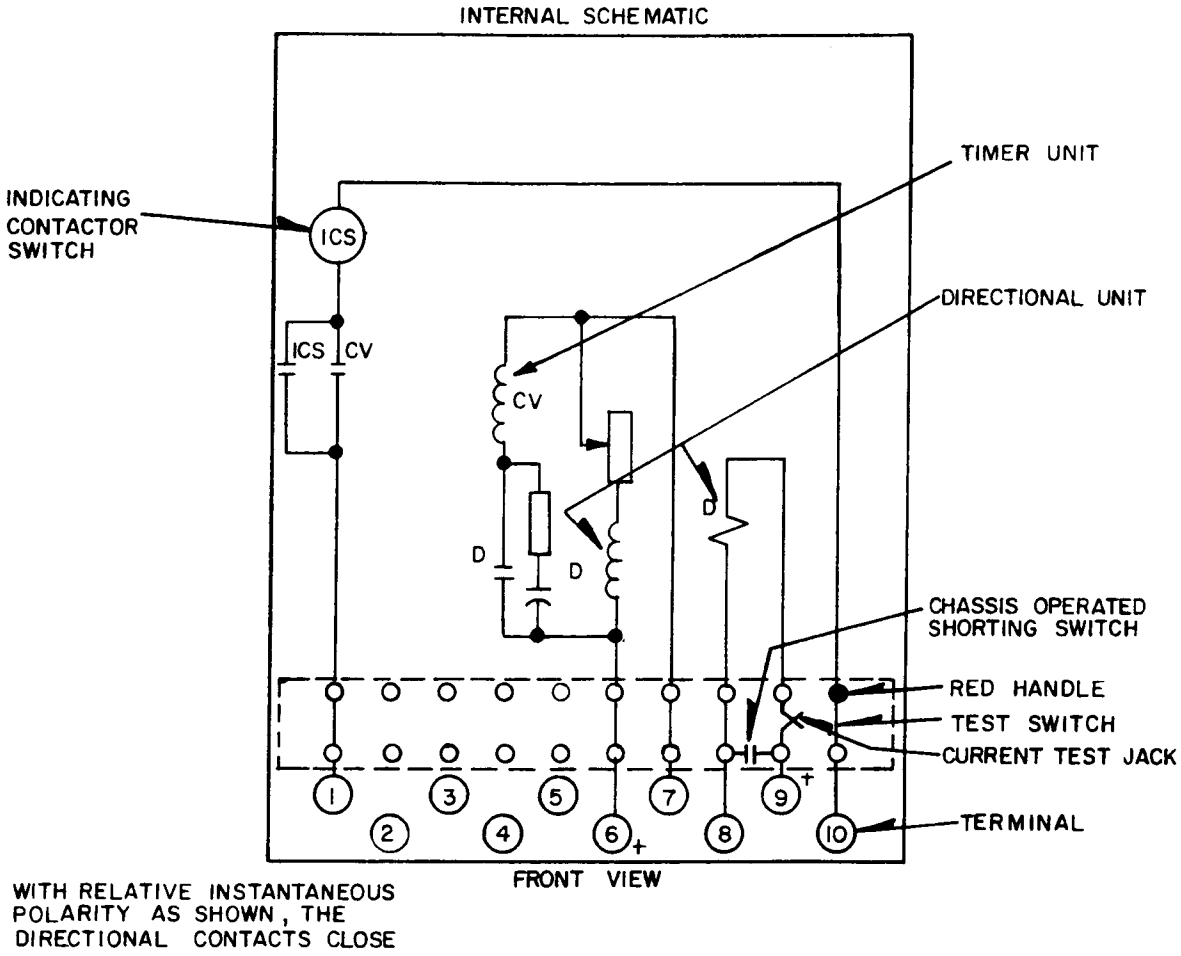

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Figure 1: Internal Schematic of the Type CRN-1 Relay

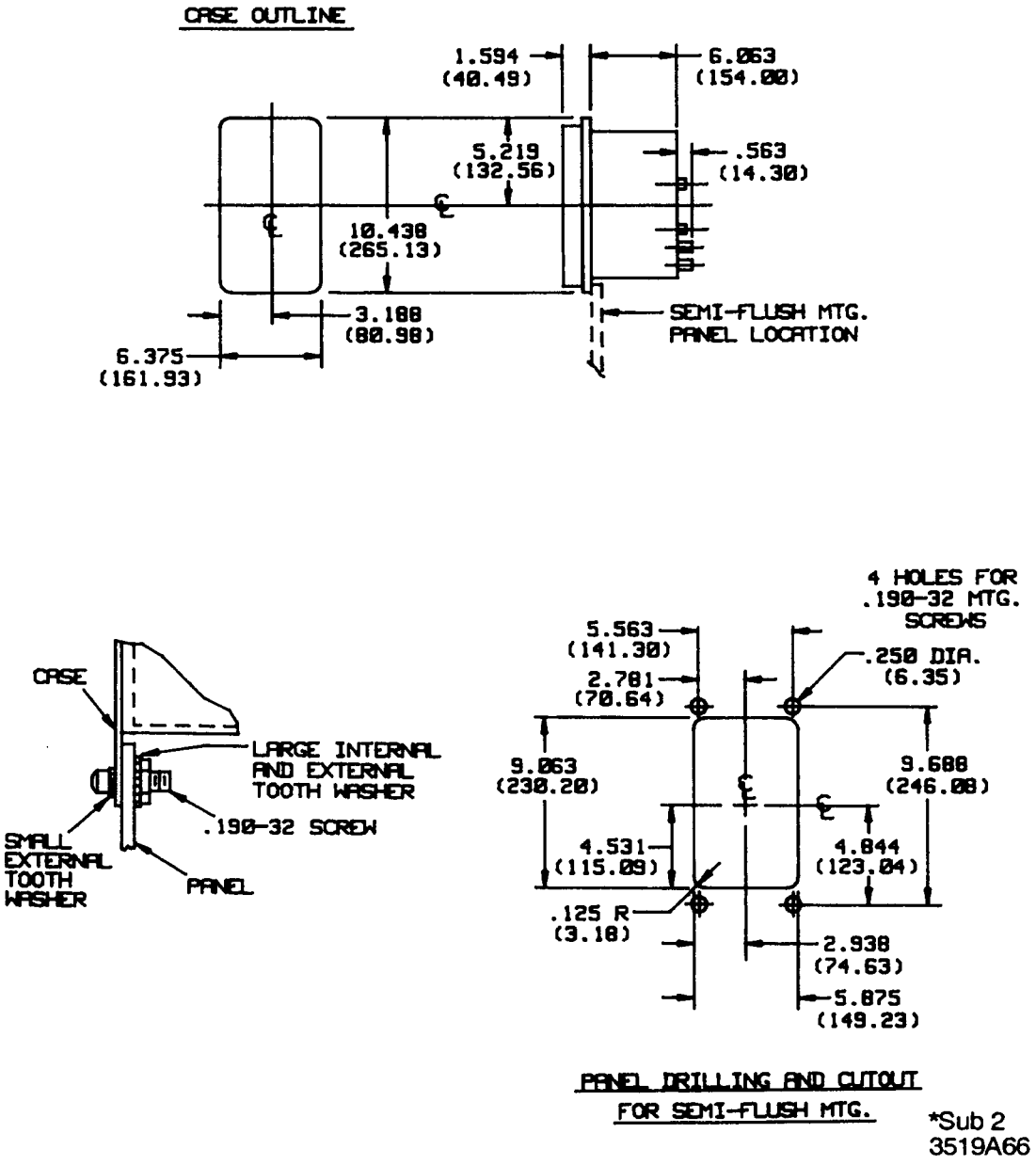

Figure 2: Outline and Drilling Plan for the Type CRN-1 Relay in Type FT-21 Case

ABB Network Partner

ABB Power T&D Company Inc.
4300 Coral Ridge Drive
Coral Springs Florida 33065
954-752-6700
FAX :954-345-5329

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