INSTRUCTIONS

GEI-44093A

SUPERSEDES GEI-44093

RELAYS

IMPEDANCE RELAY

TYPE CFZ15A

LOW VOLTAGE SWITCHGEAR DEPARTMENT

GENERAL ELECTRIC

PHILADELPHIA, PA.

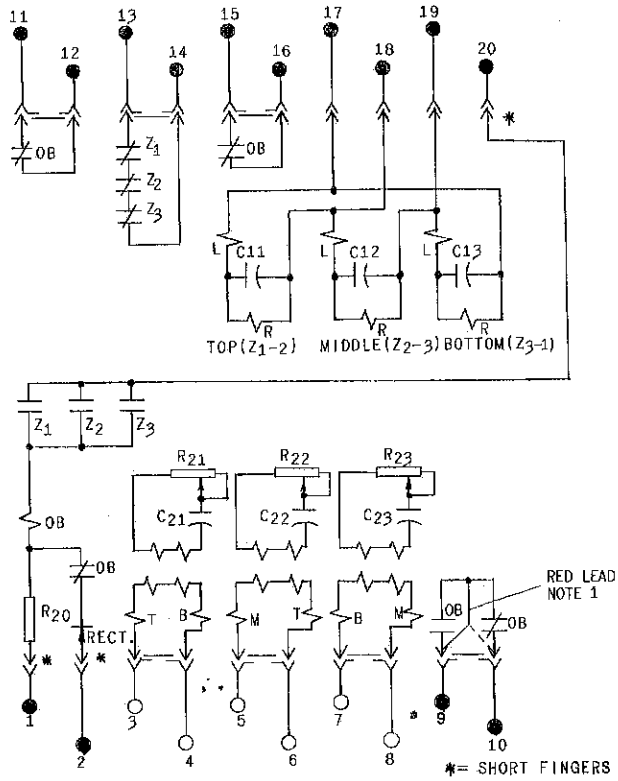


Fig. 1 (369A760)

* Fig. 1 Internal Connections

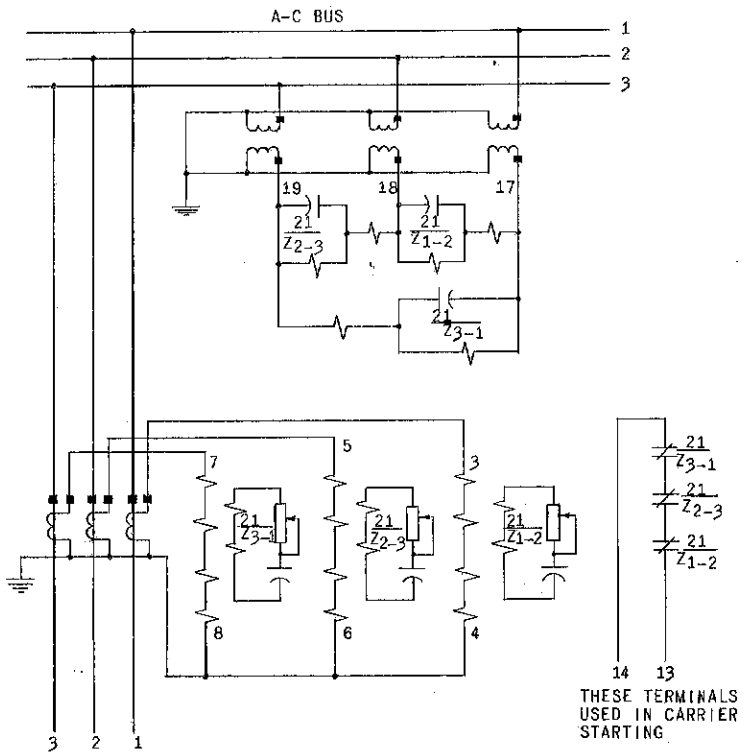


Fig. 2 (402A910)

Fig. 2 External Connections

* Denotes change since superseded issue.

IMPEDANCE RELAY
TYPE CFZ15A

INTRODUCTION

The Type CFZ15A relay is an induction cylinder type impedance relay similar to the Type CFZ13A described in the included instructions GEI-25369. These included instructions apply to the Type CFZ15A relay except as noted below.

RATINGS

The relays are rated for continuous operation at 120 volts and 5 amperes, 60 cycles. Ratings of the OB unit and the main unit contacts are the same for the Type CFZ13A relay.

BURDENS

The burden imposed on each potential transformer, with connections as in Fig. 2 at 120 volts, 60 cycles is 2.0 volt-amperes at unity power factor. The burden imposed on each current transformer at 5 amperes, 60 cycles is 16 volt-amperes at 0.6 power factor.

DESCRIPTION

RELAY UNITS

Except for the interconnections of coils, the units of the Type CFZ15A relay are similar to those of the Type CFZ13 relay described in the included instructions. The operating coils of the three units are interconnected in such a manner that the closing torque of the top unit is proportional to $I_1 - I_2$, that of the middle unit to $I_2 - I_3$, and that of the bottom unit to $I_3 - I_1$, with external connections as shown in Fig. 2 of these instructions. Such operation on delta currents insures that the relay will have the same reach on either phase-to-phase or three-phase faults.

As in the Type CFZ13A relay the restraint element consists of two coil and magnet assemblies mounted on top of the unit in the location where the holding coils are normally mounted. These coils are connected in series-parallel combination with a capacitor such that the two fluxes are approximately 90 degrees apart. This produces a constant pull on the restraint armature which is proportional to the square of the voltage applied to the coil circuits.

INSTALLATION

CONNECTIONS

Internal connections of the Type CFZ15A relay are shown in Fig. 1 of these instructions. Typical external connections as shown in Fig. 2.

ADJUSTMENTS

The impedance units have been set at the factory for minimum pickup current of 6 amperes at 100 volts. This setting should be satisfactory in most applications, but in some instances may have to be increased to avoid operation on heavy load currents. If a change in setting is necessary, refer to the section entitled "Recalibrating Relay".

* MOUNTING

The outline and panel drilling dimensions are shown in Fig. 10 of the included instructions.

MAINTENANCE

RECALIBRATING THE RELAY

If the calibration of the relay has been disturbed or it becomes necessary to change the pick-up current, the following procedure is recommended:

Before any calibration tests are made, allow the relay to heat for 90 minutes at rated current and voltage. The restraint circuits can be energized as in Fig. 3A; the current circuits, by jumpering terminals 4-5 and 6-7 and connecting 3 and 8 to the current source.

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.

* Denotes change since superseded issue.

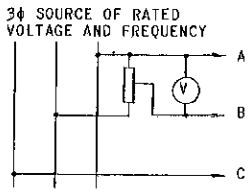
Calibration adjustments on the CFZ15A relay are complicated by the fact that the operating coils, and hence the floating coils of the three units are interconnected as noted in the description of the units and as shown on the internal connections diagram. Consequently changing any one of the floating circuit resistors (R_{21}, R_{22}, R_{23}) affects the calibration of two units. A scheme is suggested below which permits setting pickup at any desired point within the specified range without the need for extensive cross-adjustment of resistors.

1. Remove restraint voltage and connect the operating circuits as in Fig. 3B for the specific unit being adjusted. Check the pick-up at zero volts; it should be 1.0 amperes. If not, it can be restored by a slight change in the upper control spring tension.

2. Connect the operating circuit as in Fig. 3C for the specific unit. With this connection only half the operating circuit of the unit will be energized. Refer to Fig. 4 and determine what pickup current at zero volts, with this "half-circuit" connection, is equivalent to the desired pick-up current with normal circuit and 100 volts restraint. Set the unit to pickup at this current by means of indicated resistor. For example if a pickup of 9 amperes at 100 volts is required, the tap unit would be set for 3 ampere pickup at zero volts, using the Fig. 3C connections and adjusting R_{21}.

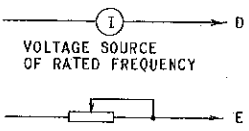
3. Repeat items 1 and 2 for the remaining units.

4. Now check the pickup of each unit at 100 volts using the circuits in Figs. 3A and 3B. Slight refinements in pickup can now be made by means of R_{21}, R_{22}, and R_{23} to obtain the desired accuracy.



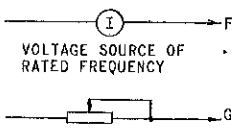
UNIT BEING TESTED	CONNECT A,B,C, TO TERMINALS SHOWN		
	A	B	C
TOP	17	18	19
MIDDLE	18	19	17
BOTTOM	19	17	18

(A)



UNIT BEING TESTED	CONNECT D TO:	E TO:	JUMPER TERMINALS
TOP	3	5	4-6
MIDDLE	5	7	6-8
BOTTOM	7	3	8-4

(B)



UNIT BEING TESTED	CONNECT F TO:	G TO:	ADJUST RES.
TOP	3	4	R_{21}
MIDDLE	5	6	R_{22}
BOTTOM	7	8	R_{23}

(C)

Fig. 3 (402A909)

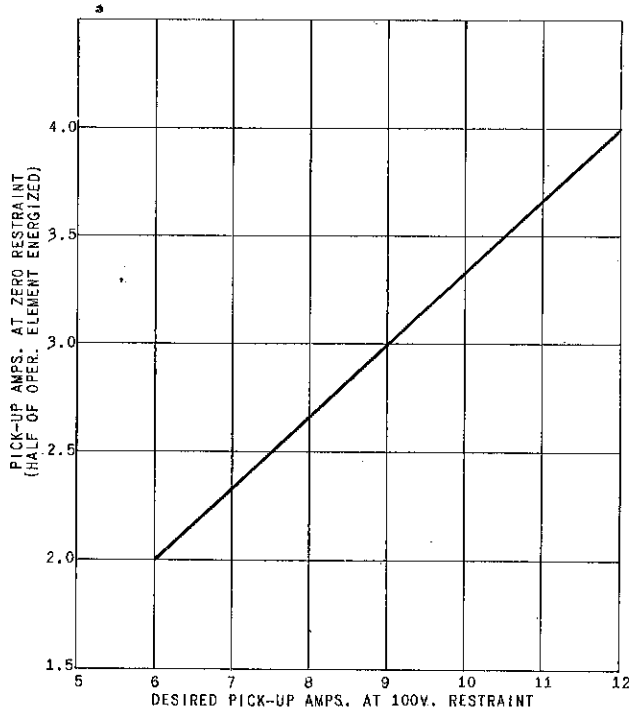


Fig. 3 Test Connections

Fig. 4 Calibration Curve