



CEY and CEYG

Zone Packaged Reactance and MHO Directional-distance Relays

GE Protective Relays

PHASE PROTECTION-- DESCRIPTION

The **CEY51A** and **CEY52A** are extended range, three-phase, high-speed, single-zone mho directional-distance relays. These relays include three single-phase units with provision for single phase testing. One target and seal-in unit provides indication of operation for all three distance units and the three-phase contacts are brought out to separate terminal studs.

A **CEY53A** is a single phase, extended range, zone-one mho distance relay specifically for shunt reactor protection and includes the normal target seal-in unit.

CEY54A is a three-phase, single-zone, phase mho directional distance relay similar to the **2nd** zone **CEY52A** except the target seal-in connections are modified and the phase contacts are connected in parallel.

APPLICATION

The **CEY51** relay, because of its low transient overreach and its memory action, is primarily a first-zone tripping relay. As such it is applicable as a high-speed tripping unit in direct and permissive under-reaching transferred tripping schemes. It is also very well suited as a first-zone tripping relay in any scheme and will provide complete one-zone protection for three-phase, phase-to-phase and double phase-to-ground faults.

When applying this relay for the protection of a given circuit, it is generally advantageous to select the highest basic reach tap that will provide the desired reach setting. This will insure the highest possible operating torque level. For 1st zone applications, the relay may be set for as much as 90% of the protected line.

The **CEY52** and **CEY54** because of their high speed and memory action char-

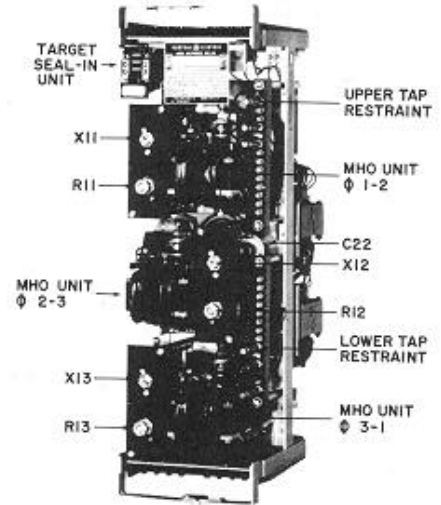
acteristics, find application as a carrier tripping relay in directional comparison schemes, as a permissive and tripping relay in permissive overreaching transferred tripping schemes or as a permissive relay in permissive underreaching transferred tripping schemes. They are also very well suited use as a second-zone relay in any scheme. The transient overreach characteristic of these relays have not been limited to the point where it is suitable for use as a first-zone relay. One **CEY52** relay in conjunction with a suitable **SAM** relay will provide one zone of time delay protection for three-phase, phase-to-phase and double-phase-to-ground faults.

For shunt reactor protection the **Type CEY53A** zone one mho distance relay is available. It provides instantaneous protection against turn-to-turn and single-phase-to-ground faults. The relay is mounted in a single ended size M1 drawout case and three relays are required for each three-phase reactor application. Refer to instruction book for additional information.

GROUND FAULT PROTECTION

The **CEYG51A** is a three-phase, high-speed, single-zone mho type directional distance ground relay. It includes three single phase units with facilities for single phase testing and one target seal-in unit to indicate operation for all three distance units. Also, the ground mho units are provided with separate current circuits for zero sequence current compensation. The mho units are **quadrature** voltage polarized and suitable for normal length transmission line protection.

The **CEYG53A** is a three-phase, high-speed, single-zone mho type directional distance ground relay and the mho units are **median** voltage polarized. Otherwise, similar to the **GEYG51A 2nd** zone relay.



(8036549)
Typical **CEY51A**
Fig. 1. Mho Distance Relay

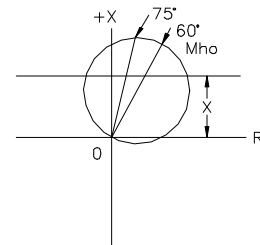


Fig. 2. Typical steady state operating characteristic **CEY52B**

This relay is suitable for longer length transmission lines and is typically applied as the primary ground relay in directional comparison blocking or in permissive overreaching transferred tripping schemes.



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BURDEN DATA

Table 1

Relay Type	②Maximum Current Burden		②Maximum Potential Burden	
	P.F.	V _o	P.F.	V _a
①CEY51A	0.98	2.5	....	14.3
①CEY52A	0.86	1.25	....	17.9
①CEY54A	0.86	1.25	....	17.9
①CEY52B	0.86	1.25	....	17.0
①CEY53A	0.98	2.5	....	14.3
①CEYG51A	0.86	2.0	....	30.2
①CEYG53A	0.98	4.7	....	22.1
At 5 Amp 60Hz		On 100% Taps at 60 Hz		

CONTACT RATINGS

The contacts of these relays will close and carry momentarily 30 amperes dc. However, the circuit breaker trip circuit must be opened by an auxiliary switch contact or other suitable means since the relay contacts have no interrupting rating.

NOTES:

- ①Potential burdens given are the total of polarizing and restraint circuits.
- ②For current and potential burdens other than 100% tap see instruction book for details.

Table 2--TYPICAL ZONE PACKAGED PHASE DISTANCE RELAYS

Normal or Long Lines	
2 Zone	1--CEY51A-D .....1st zone
	1--CEY52A-D 2nd Zone
	1--SAM Timer
3 Zone	1--CEY51A-D .....1st zone
	1--CEY52A-D 2nd Zone
	1--CEB52A-D 3 rd Zone
	1--SAM .....Timer

NOTE.

- (a) Typical Schematic Diagrams for these and other packages are available on request.
- (b) For CEB52 details see pages 3-22 through 3-24.
- (c) For SAM details see Section 6.
- (d) For NAA15G details see page 3-13.



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SELECTION GUIDE

TYPE CEY51A—3 Phase 1st Zone Phase Mho

Application	AC Rating	Target Seal-in Amp	Mho Unit Range Ohms	Max. Torque Angle		Model Number	Case Size	Approx Wt Lb(Kg)	
				Range	Factory Setting			Net	Ship
1st Zone Line	60Hz 120V 5 Amp	0.6/2	0.375-15	60/75°	60°	CEY51A3D	L2D	43(19.5)	50(22.7)
		0.6/2	0.75-30	60/75°	60°	A1D			
		0.6/2	0.75-30	60/75°	75°	A6D			
		0.6/2	1.5-60	60/75°	60°	A9D			
		0.6/2	0.2-8	60/75°	60°	A11D			
		0.2/2	0.375-15	60/75°	60°	A8D			
	50Hz 120V 5 Amp	0.2/2	0.75-30	60/75°	60°	A2D			
		0.6/2	0.75-30	60/75°	60°	A10D			
		0.2/2	0.75-30	60/75°	60°	A4D			
		0.6/2	0.75-30	60/75°	60°	A4D			

Type CEY52A—3 Phase, 2nd or 3rd Zone Phase Mho

2nd or 3rd Zone Line	60Hz 120V 5 Amp	0.6/2	0.5-15	60/75°	60°	CEY52A4D	L2D	43(19.5)	50(22.7)
		0.6/2	1-30	60/75°	60°	A1D			
		0.2/2	0.5-15	60/75°	60°	A3D			
		0.2/2	1-30	60/75°	60°	A2D			
	50Hz 120V 5 Amp	0.6/2	1-30	60/75°	60°	A5D			

TYPE CEY54A—3 Phase, 2nd or 3rd Zone Phase Mso—(Parallel Contacts)

2nd Zone Line	60Hz 120V 5 Amp	0.6/2	1-30	60/75°	60°	CEY54A1D	L2D	43(19.5)	50(22.7)
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Type CEY53A—Single Phase – 1st Zone Phase Mho

Application	Ac Rating	Target Seal-in Amp	Mho or Ohm Unit Range Ohms	Max Torque Angle	Model Number	Case Size	Approx Wt Lb(Kg)	
							Net	Ship
Shunt Reactor	60Hz 120V 5 Amp	0.2/2	0.75-30	75°	CEY53A1A	M1	25(11.3)	31(14.1)
		0.2/2	1.5-60	75°	A2A			

TYPE CEYG51A—3 Phase, 2nd or 3rd Zone Ground Mho—Quadrature Polarized

Line Ground Distance 2nd or 3rd Zone	60Hz 120V 5 Amp 70V Rest	0.6/2	0.5-15	60°	CEYG51A5D	L2D	43(19.5)	50(22.7)
		0.6/2	1-30	60°	A1D			
		0.2/2	1-30	60°	A2D			
	50Hz 120V 5 Amp 70V Rest	0.6/2	1-30	60°	CEYG51A3D			

TYPE CEYG53A – 3 Phase 2nd Zone Ground Mho—Median Polarized

Application	Ac Rating	Target Seal-in Amps	Mho Unit Range Ohms	Max. Torque Angle		Model Number	Case Size	Approx Wt Lb(Kg)	
				Range	Factory Setting			Net	Ship
Line Ground Distance	60Hz 120V 5 Amp 70V Rest	0.2/2	1-30	60/75°	60°	CEYG53A2D	L2D	43(19.5)	50(22.7)
		0.6/2	2-60	60/75°	60°	A1D			

Transmission Line Relays