



**ABB**

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

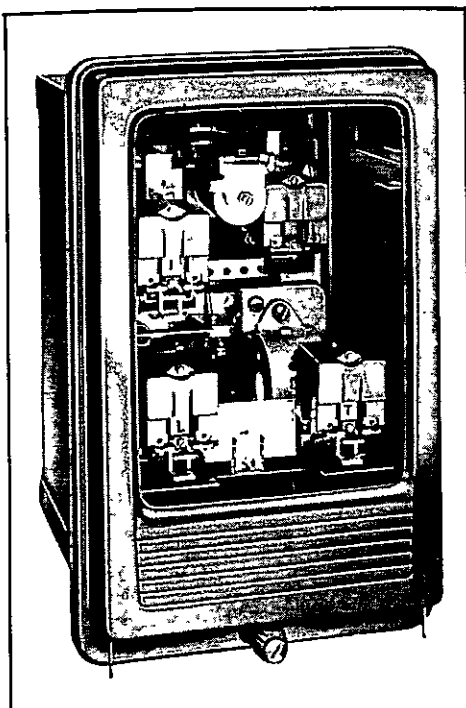
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Page 1

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For Distribution Feeder Circuit  
and Ac Motor Protection

## Overcurrent Relays Type COM



Single-Phase Non-Directional Adjustable Time Delay

### Application

Type COM relays are designed for distribution feeder circuit applications where high speed overcurrent protection is required in conjunction with a reclosing relay to protect a lateral fuse for one reclosure and to allow the fuse to blow following that for permanent faults.

They are available with six different time-curve operating characteristics (long time, definite time, moderately inverse time, inverse time, very inverse time, and extremely inverse time).

The COM-5, COM-8, and COM-11 are adaptable to ac motor protection where it is desired to sound an alarm at motor rating and trip instantaneously or with time delay for overload or fault currents.

### Distribution Feeder Protection

The type COM relays, with two instantaneous trip units (IIT and ITH), provide all the functions of the standard type CO relay plus the advantage of permitting the low set instantaneous unit to be locked out by a reclosing relay and at the same time, the high set instantaneous unit is left in the trip circuit to provide high speed clearing of "close in" faults. Coordination with other devices is assured by selection of proper time curve overcurrent units.

The COM-5 and COM-8 relays are available with a 6 cycle time delay in the pickup of the ITH unit. The COM-11 relay is available

with a 7 cycle time delay for the ITH unit. These relays are applicable to lines where the time delay is used to permit pole mounted reclosers to clear transient faults without tripping the feeder circuit breaker. After one operation of the low set (ITH or IT) instantaneous unit its contact circuit is locked out by the reclosing relay, which then permits fuse operation to clear the fault.

### Ac Motor Protection

The COM-5, COM-8, and COM-11 relays are particularly adaptable to large ac motor protection. The long time characteristics of the time overcurrent unit permit normal starting and small overloads within the thermal capabilities of the motor, and provides an alarm (or tripping as desired) at load currents slightly above full load. The low set (ITH) instantaneous unit is normally set to close its contacts at moderate overloads or near the service factor of the motor. The high set instantaneous unit (IIT) is set above locked rotor current to provide high speed tripping on heavy faults. See curve figure 3.

Use of the COM-5 relay with a 6-cycle time delay is indicated for application requiring the relay to over-ride high values of asymmetrical starting or fast transfer currents. See curve figure 4.

Device Number: 51

Construction

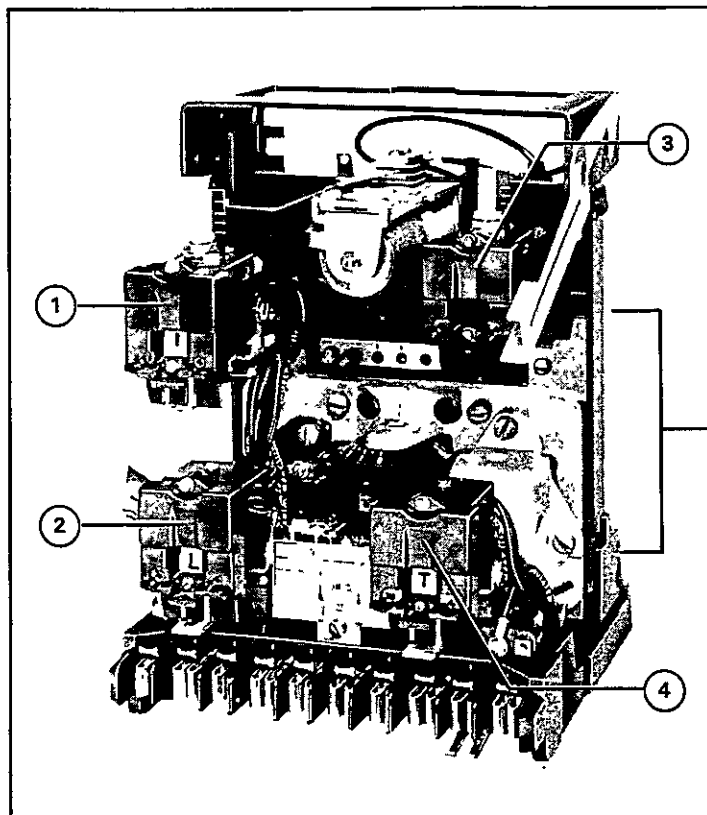


Fig. 1: COM-5 (Style Number 289B511A16) With IIT and IT (No ITH)

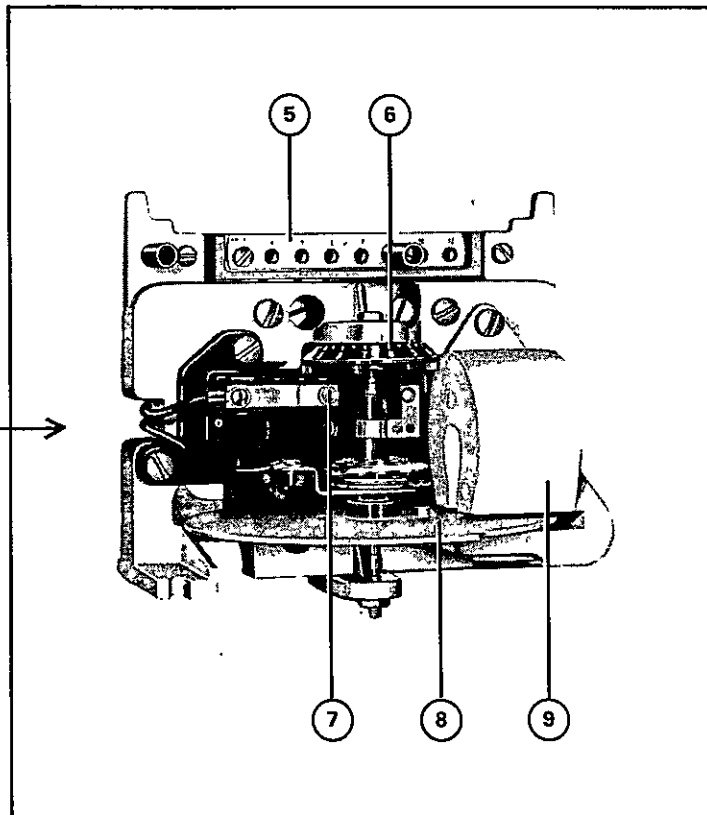


Fig. 2: Time Delay Overcurrent Unit (CO)

Type COM relays consist of a time overcurrent unit (CO), one instantaneous trip unit (IIT), one high dropout instantaneous trip unit (ITH) and two indicating contactor switches. One of these ICS units (right hand) operates in conjunction with the time overcurrent unit, and the other (left hand) is used in the circuit with the high dropout instantaneous unit.

The time overcurrent unit is available with any one of six time curve characteristics (CO-5, 6, 7, 8, 9 and 11), permitting complete coordination with other relays on the system.

- ① Indicating Instantaneous Trip (IIT)
- ② Indicating Contactor Switch (ICS) Seal-in Unit for ITH
- ③ Instantaneous Trip Unit (IT)
- ④ Indicating Contactor Switch (ICS) Seal-in unit for time delay overcurrent unit.

- ⑤ Tap Block  
Indicates minimum current required to close relay contact.
- ⑥ Time Dial  
Indicates initial position of the moving contact over a 270° range. Time dial indexes from ½ (minimum time) to 11 (maximum time).
- ⑦ Stationary Contact  
Made of pure silver. Will close 30 amperes at 250 volts dc. Has sufficient wipe to assure positive contact. In fast breaker reclosing schemes which require quick-opening relay contacts, the metal plate is reversed, holding the stationary contact fixed against the backstop.
- ⑧ Induction Disc  
Spiral shaped to compensate for the spring windup. Provides accurate pickup at any disc position. Spring adjuster permits in between tap pickup adjustment.

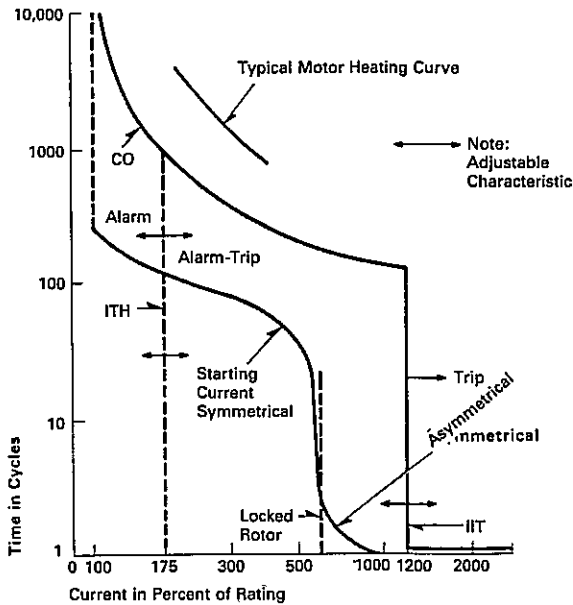
- ⑨ Damping Magnet  
High strength Alnico magnet controls relay operating time of low current values. Keeper screw permits micrometer adjustment of the damping magnet without shifting the location of the magnet, and allows relay to be accurately calibrated at low currents.

**Electromagnet**

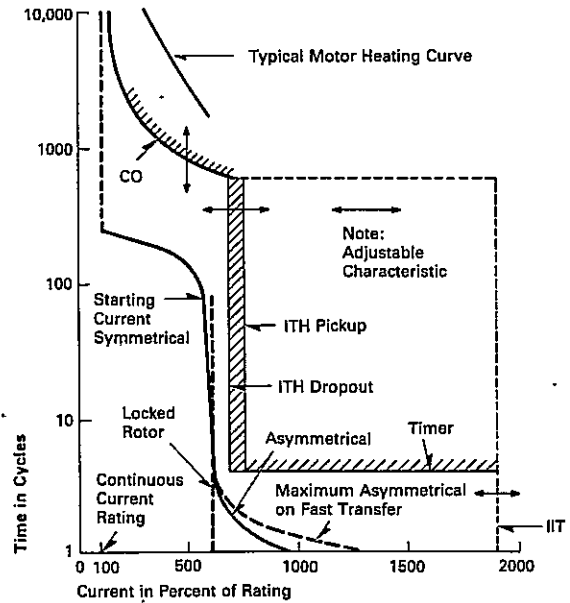
On COM-5, COM-6, COM-7, COM-8 and COM-9 relays a main tapped coil is placed in the center leg of an "E" type laminated magnetic structure. Flux produced by this coil returns through the two outer legs of the electromagnet. A shading coil on the left leg of the electromagnet creates an out-of-phase flux which reacts with the main coil flux in the air gap of the electromagnet to cause disc rotation in the contact closing direction.

The COM-11 electromagnet is similar in construction, except that both outer legs have windings to produce the necessary out-of-phase fluxes required to contact-closing rotational torque.

**Time Curves**

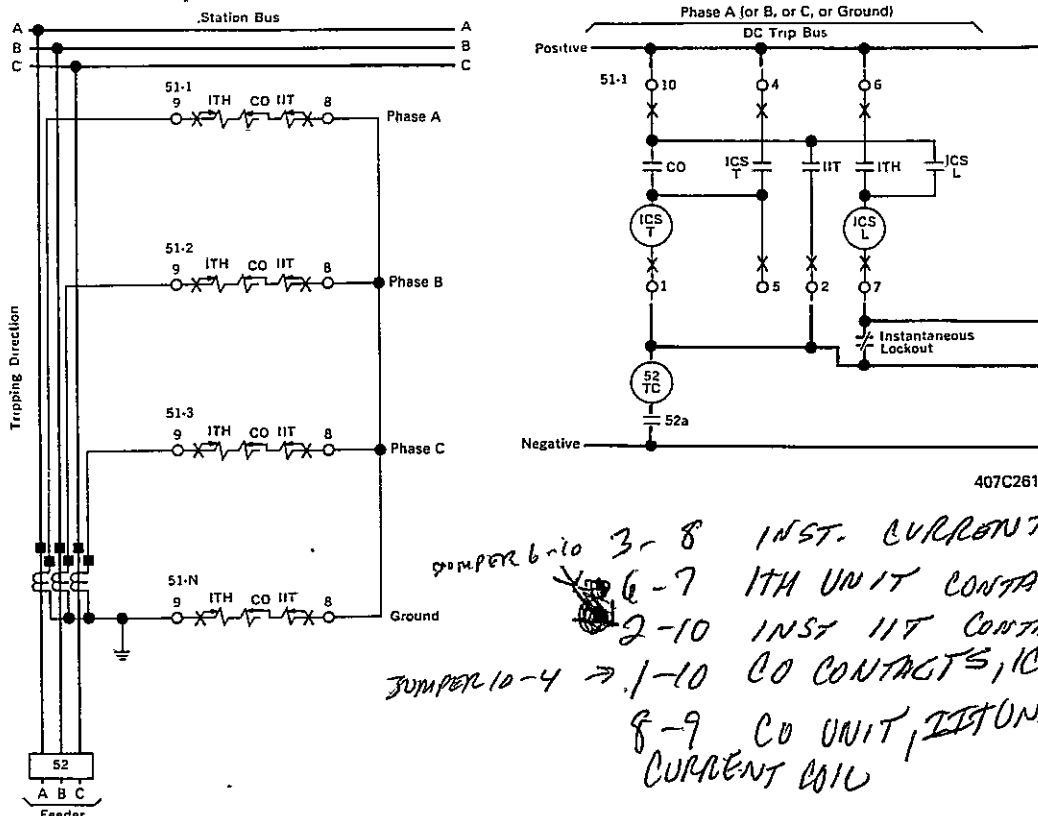


**Fig. 3: COM-5 Time Curve Characteristic For Ac Motor Protection (Without Timer)**



**Fig. 4: COM-5 Time Curve Characteristic For Ac Motor Protection (With Timer)**

**External Wiring**



**Fig. 5: Distribution Feeder Protection (COM)**



External Wiring

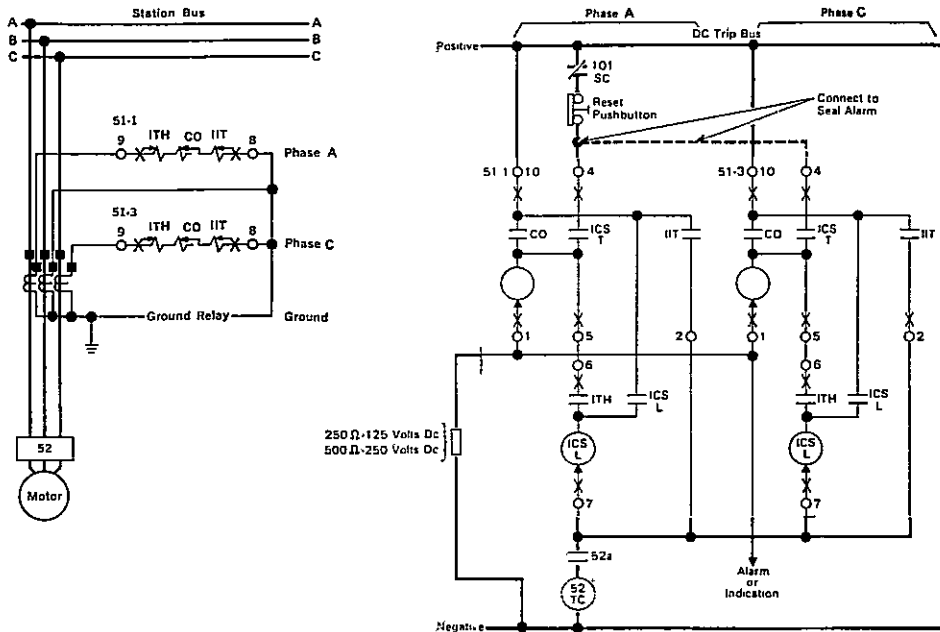


Fig. 6: Ac Motor Protection (COM-5 Without Timer)

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Device Number Chart

- 51 - Overcurrent Relay, Type COM
- CO - Time Overcurrent Unit
- IT - Instantaneous Trip
- IIT - Indicating Instantaneous Trip
- ITH - Low Set Instantaneous Trip
- ICS/L } - Indicating Contactor Switch
- ICS/T }
- 52 - Power Circuit Breaker
- 52a - Breaker Auxiliary Contact
- 52TC - Breaker Trip Coil
- 101 - Breaker Control Switch

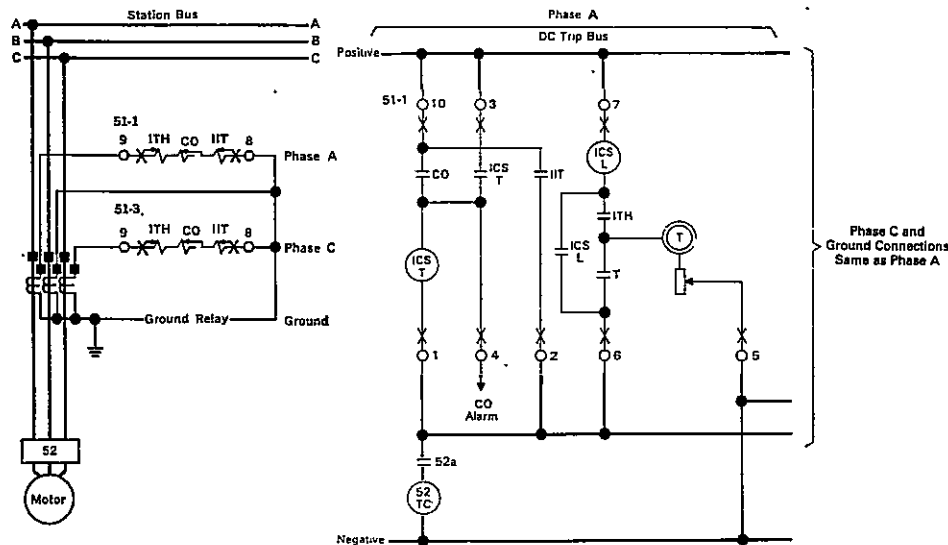


Fig. 7: Ac Motor Protection (COM-5 With Timer)

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- 52 - Circuit Breaker
- a - Breaker Auxiliary Contact
- TC - Breaker Trip Coil

Weights and Carton Dimensions

Type	Flexitest Case Type	Weight, Lbs.: Approx.		Domestic Shipping Carton Dimensions: Inches
		Net	Shipping	
COM-5, COM-6, COM-7, COM-8, COM-9, COM-11	FT-21	12	16	9 x 12 x 13

Further Information

Prices and Ordering Information: PL 41-020  
Case Dimensions: DB 41-075  
Instructions: IL 41-102  
Renewal Parts: RPD 41-101A1  
Other Protective Relays: Application/  
Selector Guide TD 41-010