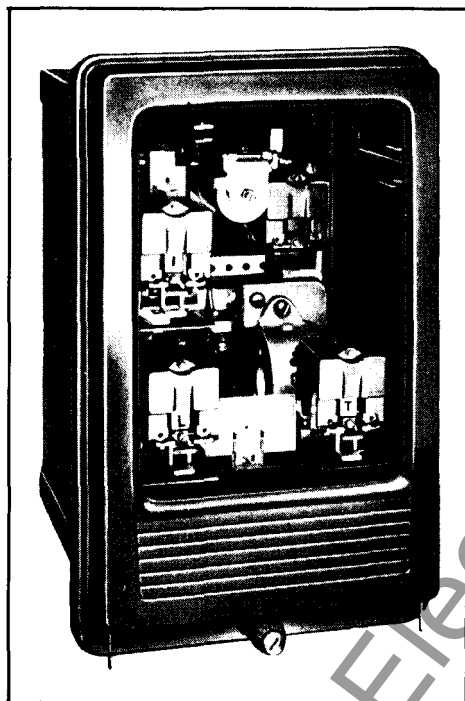


September, 1990
Supersedes DB 41-100C, pages 1-4,
dated August, 1989
Mailed to: E, D, C/41-100A

For Distribution Feeder Circuit
and Ac Motor Protection
Device Number: 50/51

Type COM Overcurrent Relays



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.

Construction

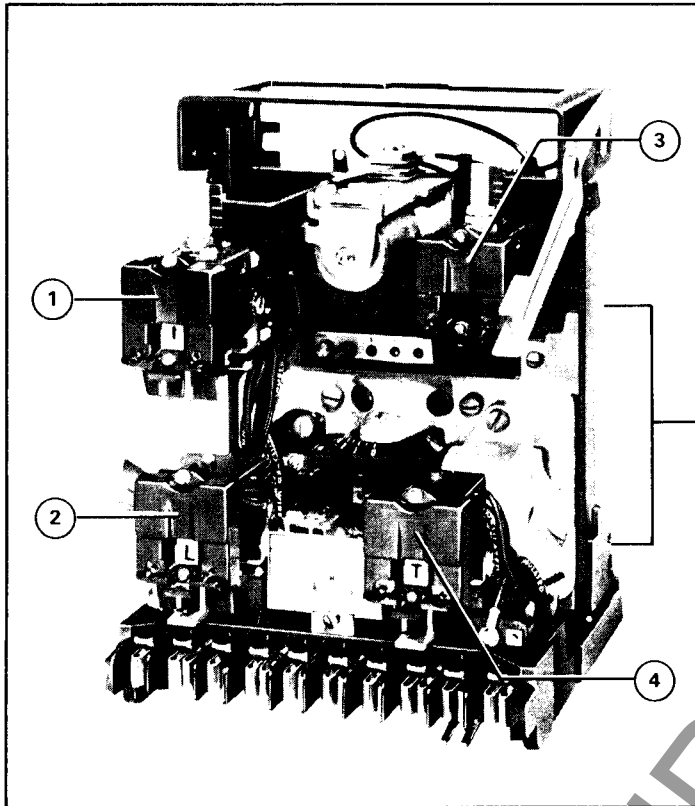


Fig. 1: COM-5 (Style Number 289B511A16) With IIT and IT (No ITH)

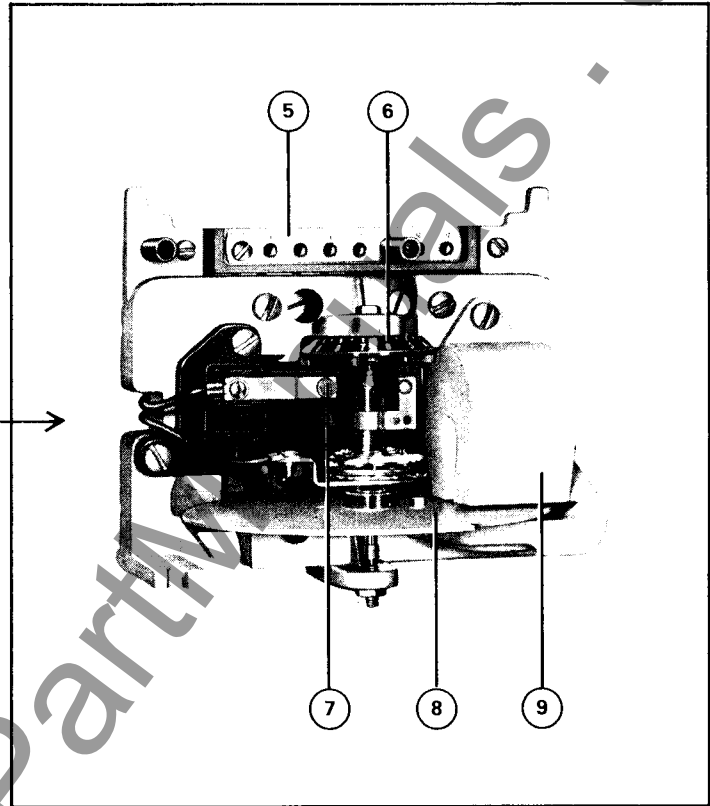


Fig. 2: Time Delay Overcurrent Unit (CO)

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 1/2 (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

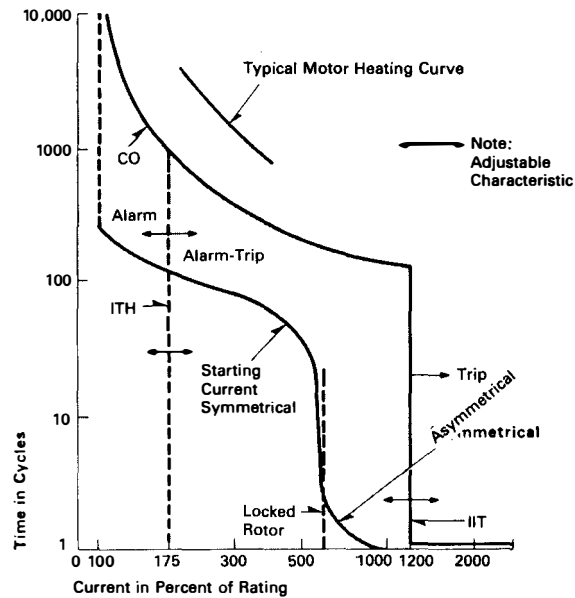


Fig. 3: COM-5 Time Curve Characteristic For Ac Motor Protection (Without Timer)

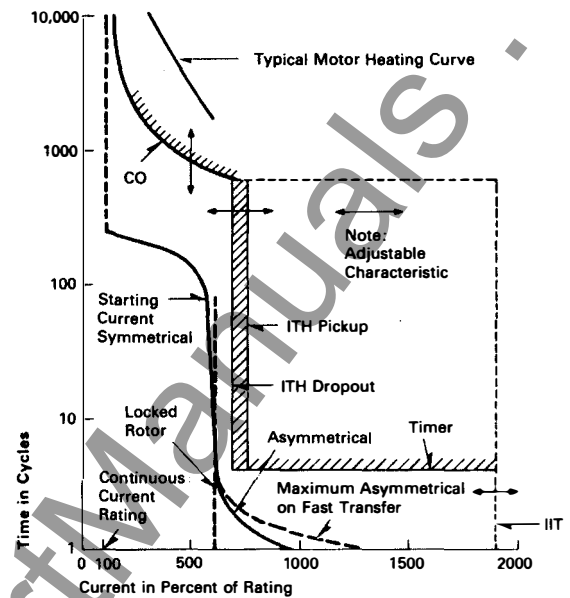


Fig. 4: COM-5 Time Curve Characteristic For Ac Motor Protection (With Timer)

External Wiring

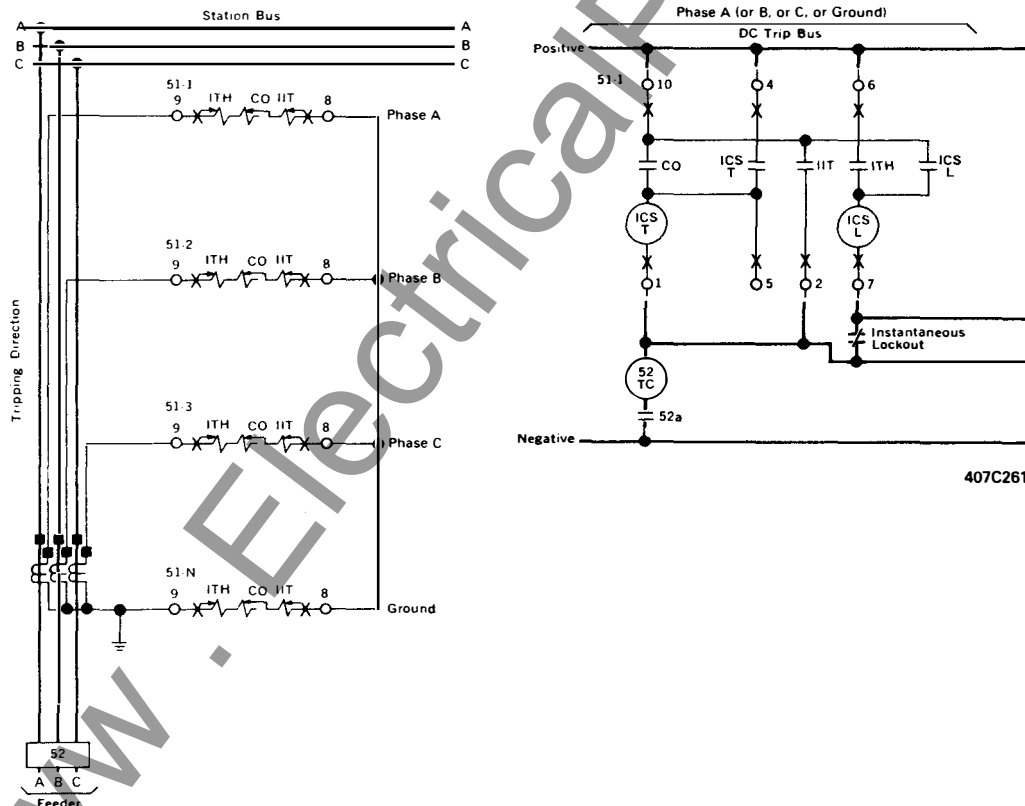


Fig. 5: Distribution Feeder Protection (COM)

External Wiring

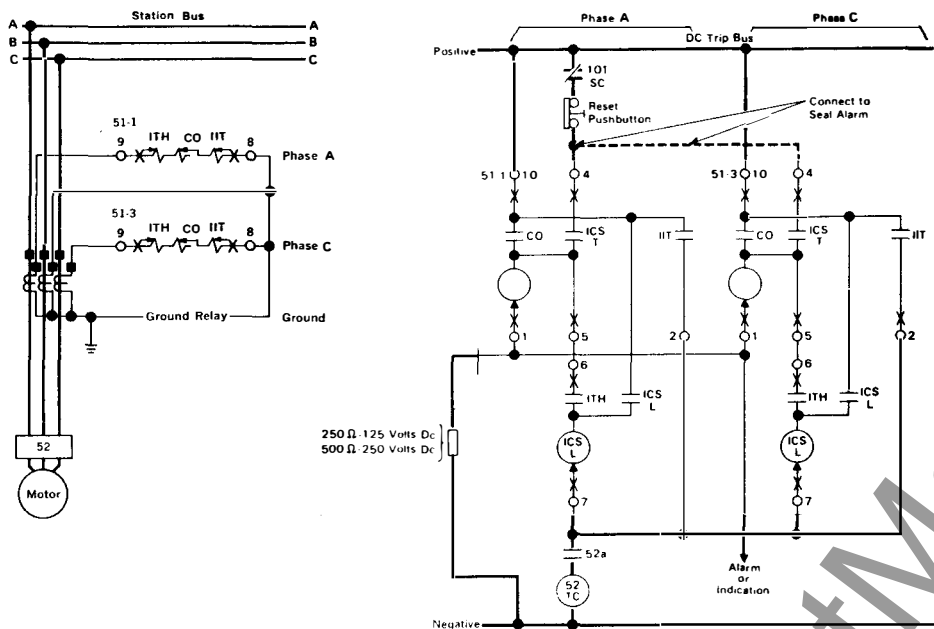


Fig. 6: Ac Motor Protection (COM-5 Without Timer)

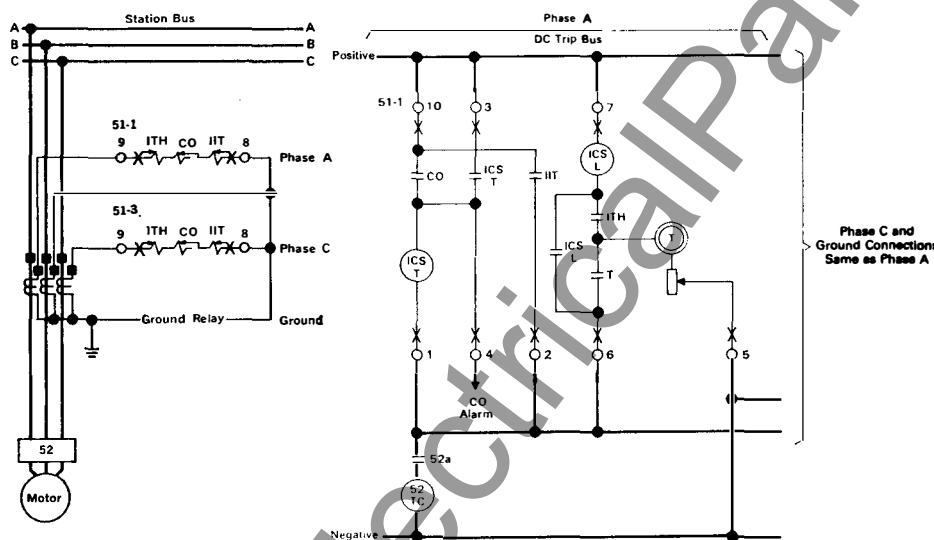


Fig. 7: Ac Motor Protection (COM-5 With Timer)

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 - Power Circuit Breaker
- 52 - Breaker Auxiliary Contact
- 52a - Breaker Trip Coil
- 52TC - Breaker Control Switch
- 101 - Breaker Control Switch

Device Number Chart

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

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

List Prices: PL 41-020
 Technical Data: TD 41-025
 Instructions: IL 41-102
 Renewal Parts: RPD 41-917
 Flexitest Case Dimensions: DB 41-076
 Other Protective Relays:
 Application Selector Guide, TD 41-016



December, 1990
Supersedes TD 41-020, Type COM on
pages 11 and 12, dated November, 1987
Mailed to: E, D, C/41-100A

For Distribution Feeder Circuit and Ac Motor
Protection

Type COM Overcurrent Relays

Overcurrent, Non-Directional, Single Phase (Device Number: 50/51)

Type and Time Curve	Auxiliary Time Delay Unit (6 Cycles)	Current Range: Amps Ac				Indicating Contactor Switch⑨	Relay Data		Case Size
		Time Unit Spst-cc	IIT #1④	IT Unit #2	ITH Unit ⑤		Internal Schematic	Style Number	
COM-5①② Long	Without	0.5-2.5	4-16	None	2-4	0.2/2.0 amp dc 2 ICS units per relay	183A989	289B355A09	FT-21
			10-40		2-4			289B355A10	
		2-6	10-40		4-8			289B355A11	
			20-80		4-8			289B355A12	
	With	0.5-2.5	20-80		16-32			289B355A15	FT-21
			40-160		16-32			289B355A16	
		2-6	10-40		6-12			289B355A13	
			20-80		6-12			289B355A14	
		4-12	20-80		16-32			289B355A17	
			40-160		16-32			289B355A18	
	With	0.5-2.5	2-8	None	2-4		184A036	289B456A09	FT-21
			4-16		2-4			289B456A10	
		2-6	10-40		4-8			289B456A13	
			10-40		16-32			289B456A21	
		4-12	20-80		4-8			289B456A14	FT-21
			20-80		16-32			289B456A15	
		0.5-2.5	40-160		16-32			289B456A16	FT-21
			10-40		6-12			289B456A17	
		2-6	20-80		6-12			289B456A18	FT-21
			40-160		16-32			289B456A19	
COM-6① Definite	Without	0.5-2.5	2-8	None	1-4	0.2/2.0 amp dc 2 ICS units per relay	183A989	289B511A09	FT-21
			4-16		1-4			289B511A10	
		2-6	10-40		2-8			289B511A11	
			4-16		2-8			289B511A12	FT-21
	With	0.5-2.5	10-40		2-8			289B511A13	
			20-80		10-40			289B511A14	
		2-6	40-160		10-40			289B511A15	
			40-160		20-80			289B511A16	
		4-12	20-80		16-32			290B471A09	FT-21
			40-160		16-32			290B471A10	
	With	0.5-2.5	10-40		4-8		183A989	290B471A11	
			20-80		4-8			290B471A12	
		2-6	20-80		16-32			290B471A13	
			40-160		16-32			290B471A14	
		4-12	10-40		6-12			290B471A15	FT-21
			20-80		6-12			290B471A16	
		0.5-2.5	20-80		16-32		183A989	290B471A17	
			40-160		16-32			290B471A18	
		2-6	10-40		4-8			290B471A19	FT-21
			20-80		4-8			290B471A20	

- ① 50 Hertz relays and auxiliaries can be supplied at same price. Order "Similar to Style Number except 50 Hertz".
- ② Relays with time delay auxiliary unit suitable for use on dc control circuits rated 24/48/125/250 volts dc. Shipped connected for 125-volt dc service.
- ③ ICS: Indicating Contactor Switch (dc current operated) having seal-in contacts and indicating target which are actuated when the ICS coil is energized at or above pickup current setting. Suitable for dc control voltages up to and including 250 volts dc. Two current ranges available:
(1) 0.2/2.0 amps dc, with tapped coil.
(2) 1.0 amp dc, without taps.

Rating of ICS unit used in specific types of relays is shown in price tables. All other ratings must be negotiated.

When ac current is necessary in a control trip circuit, the ICS unit can be replaced by an ACS unit.

The ACS unit may be supplied in place of an ICS unit at no additional cost. Specify system voltage rating on order.

④ IIT: Indicating Instantaneous Trip rated per ranges shown in price tables. Unit is nondirectional, adjustable, and has target actuated when coil is energized at or above pickup setting. Unit has a dropout ratio of 65% at minimum setting and 90% at maximum setting.

⑤ ITH: High dropout Instantaneous Trip rated per ranges shown in price tables. Unit has a dropout to pickup ratio of 90% over entire 2 to 1 pickup range. Contacts close when ITH coil is energized at or above pickup setting.

Overcurrent, Non-Directional, Single Phase, Continued

Type and Time Curve	Auxiliary Time Delay Unit	Current Range: Amps Ac				Indicating Contactor Switch②	Relay Data		
		Time Unit Spst-cc	IIT Unit #1④	IT Unit #2	ITH Unit ⑤		Internal Schematic	Style Number	Case Size
COM-7① Moderately inverse	Without	0.5-2.5	4-16 10-40	None	2-4 2-4	0.2/2.0 amp dc 2 ICS units per relay	183A989	290B472A09 290B472A10	FT-21
		2-6	10-40 20-80 20-80 40-160		4-8 4-8 16-32 16-32		290B472A11 290B472A12 290B472A13 290B472A14		
			4-12		10-40 20-80 20-80 40-160		4-8 6-12 16-32 16-32	290B472A15 290B472A16 290B472A17 290B472A18	
COM-8① Inverse	Without	0.5-2.5	4-16 10-40	None	2-4 2-4	0.2/2.0 amp dc 2 ICS units per relay	183A989	290B473A09 290B473A10	FT-21
		2-6	10-40 20-80 20-80 40-160		4-8 4-8 16-32 16-32		290B473A11 290B473A12 290B473A13 290B473A14		
			4-12		10-40 20-80 20-80 40-160		6-12 6-12 16-32 16-32	290B473A15 290B473A16 290B473A17 290B473A18	
	With (6 Cycles)	2-6	10-40 10-40	None	4-8 8-16		184A036	290B473A27 290B473A25	FT-21
		4-12	10-40		8-16		290B473A26		
COM-9① Very inverse	Without	0.5-2.5	4-16 10-40	None	2-4 2-4	0.2/2.0 amp dc 2 ICS units per relay	183A989	290B474A09 290B474A10	FT-21
		2-6	10-40 20-80 20-80 40-160		4-8 4-8 16-32 16-32		290B474A11 290B474A12 290B474A13 290B474A14		
			4-12		10-40 20-80 20-80 40-160 4-16		6-12 6-12 16-32 16-32 16-32	290B474A15 290B474A16 290B474A17 290B474A18 290B474A19	
COM-11① Extremely inverse	Without	0.5-2.5	4-16 10-40	None	2-4 2-4	0.2/2.0 amp dc 2 ICS units per relay	183A989	290B475A09 290B475A10	FT-21
		2-6	10-40 20-80 20-80 40-160		4-8 4-8 16-32 16-32		290B475A11 290B475A12 290B475A13 290B475A14		
			4-12		10-40 20-80 20-80 20-80 40-160		6-12 2-4 6-12 16-32 16-32	290B475A15 290B475A19 290B475A16 290B475A17 290B475A18	
	With (7 Cycles)	2-6	10-40	None	6-12		184A036	290B475A24	
		4-12	10-40		6-12		290B475A25		

① 50 Hertz relays and auxiliaries can be supplied at same price. Order "Similar to Style Number, except 50 Hertz".

② ICS: Indicating Contactor Switch (dc current operated) having seal-in contacts and indicating target which are actuated when the ICS coil is energized at or above pickup current setting. Suitable for dc control voltages up to and including 250 volts dc. Two current ranges available:
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④ ITH: High dropout Instantaneous Trip rated per ranges shown in price tables. Unit has a dropout to pickup ratio of 90% over entire 2 to 1 pickup range. Contacts close when ITH coil is energized at or above pickup setting.

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