

Series C Internal Accessories



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Internal Accessories

Product Overview

Alarm Switch

For remote indication of automatic trip operation. Does not function with manual switching; however, it will operate when either a shunt trip or undervoltage release is operated. A “make” contact closes and a “break” contact opens when the alarm/lockout switch operates. The switch automatically resets when the circuit breaker is reset.

Auxiliary Switch

The auxiliary switch provides circuit breaker contact status information by monitoring the position of the molded cross bar that contains the moving contact arms. The auxiliary switch is used for remote indication and interlock system verification, and consists of one or two SPDT switches housed in a plug-in module. Each SPDT switch has one “a” and one “b” contact. When the circuit breaker contacts are open, the “a” contact is open and the “b” contact is closed.

Auxiliary Switch and Alarm Switch Combination

Each catalog number listed in tables on **Pages V4-T2-382** and **V4-T2-383** includes one auxiliary switch and one alarm switch. In an auxiliary switch ASL switch combination, the auxiliary switch is always mounted on the side of the plug-in module next to the center pole of the circuit breaker.

Shunt Trip

The shunt trip provides remote controlled tripping of the circuit breaker. The shunt trip consists of an intermittent rated solenoid with a tripping plunger and a cutoff switch assembled to a plug-in module. When required for ground fault protection applications, certain AC rated shunt trips, as noted in the electrical rating table, are suitable for operation at 55 percent of rated voltage.

Select shunt trip catalog number for the voltage within the indicated voltage range. Shunt trip coils are designed to be applied at specific AC or DC voltages within the voltage range shown. Electrical ratings are also shown on applicable circuit breaker accessory nameplates.

Low Energy Shunt Trip

Low energy shunt trip devices are designed to operate from low energy output signals from dedicated current sensors typically applied in ground fault protection schemes. However, with a proper control voltage source, they may be applied in place of conventional trip devices for special applications. Flux paths surrounding permanent magnets used in the shunt trip assembly hold a charged spring poised in readiness to operate the circuit breaker trip mechanism.

When a 100 microfarad capacitor charged to 28 Vdc is discharged through the shunt trip coil, the resultant flux opposes the permanent magnet flux field, which releases the stored energy in the spring to trip the circuit breaker. As the circuit breaker resets, the shunt trip reset arm is actuated by the circuit breaker handle, resetting the shunt trip. The plug-in module is mounted in retaining slots in the top of the trip unit. Coil is intermittent-rated only. Cutoff provisions required in control circuit.

Undervoltage Release Mechanism

The undervoltage release mechanism monitors a voltage (typically a line voltage) and trips the circuit breaker when the voltage falls to between 70 and 35 percent of the solenoid coil rating.

The undervoltage release mechanism consists of a continuous rated solenoid with a plunger and tripping lever mounted in a plug-in module. The tab on the tripping lever resets the undervoltage release mechanism when normal voltage has been restored and the circuit breaker handle is moved to the reset (or OFF) position. With less than pickup voltage applied to the undervoltage release mechanism, the circuit breaker contacts will not touch when a closing operation is attempted.

Note: Undervoltage release mechanism accessories are not designed for, and should not be used as, circuit interlocks.

Accessory Terminal Block (R-Frame)

(For fixed-mounted configuration.)

Internal accessory wiring leads are normally supplied with pigtail leads (18 AWG) that exit from the right side of the circuit breaker. Where specified, fixed-mounted accessory terminal blocks are available. A maximum of one 24-point terminal block can be installed on the right side of the circuit breaker for the internal accessories.

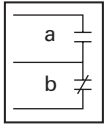
For convenience in determining the appropriate number of terminal block points required, refer to **Page V4-T2-378**.

PowerNet and Zone Interlock Kits (OPTIM 550 only) K-, L- and N-Frames

Eaton's PowerNet Communications Kit can be ordered to add PowerNet communications to an existing OPTIM 550 breaker in the field. An 18-inch (457.2 mm) wiring pigtail is routed to the rear of the breaker: two wires for PowerNet and two wires for 24 Vdc (45 mA load). It is recommended that the power supply be an "isolated high quality" unit.

Auxiliary Switch

Auxiliary Switch



G-Frame Auxiliary Switch (RH Only)

Electrical Ratings			Contact Arrangement	Factory Suffix	Catalog Number ^{①②}
Volts	Frequency	Amperes			
240	50/60 Hz	6	1a/1b	A3	1288C74G03
240	50/60 Hz	6	2a/2b	A6	1288C73G03

F-Frame and HMCP (F) Auxiliary Switch

Number of Contacts A and B	Mounting Location (Pole)	Factory Mounted Connection Type and Location				Factory Installation Kit ^④	
		18-Inch (457.2 mm) Pigtail Leads				Terminal Block	Pigtail Leads
		Same Side Suffix Number	Rear ^③ Suffix Number	Opposite Side Suffix Number	Same Side Suffix Number	Catalog Number	Terminal Block Catalog Number
1	Left ^⑤	A01	A02	A03	A04	A1X1PK	A1X1LTK
	Left ^⑤	A15 ^⑦	A16 ^⑦	A17 ^⑦	—	E1X1PK	—
	Right or Neutral ^⑥	A05	A06	A07	A08	A1X1PK	A1X1RTK ^⑧
	Right or Neutral ^⑥	A18 ^⑦	A19 ^⑦	A20 ^⑦	—	—	—
2	Left ^⑤	A09	A10	—	A11	A2X1LPK	A2X1LTK
	Left ^⑤	A21 ^⑦	A22 ^⑦	—	—	E2X1LPK	—
	Right or Neutral ^⑥	A12	A13	—	A14	A2X1RPK	A2X1RTK ^⑧
	Right or Neutral ^⑥	A23 ^⑦	A24 ^⑦	—	—	E2X1RPK	—

F-Frame with Electronic Trip Unit Auxiliary Switch ^⑨

Number of Contacts A and B	Mounting Location (Pole)	Factory Mounted Connection Type and Location				Factory Installation Kit ^④	
		18-Inch (457.2 mm) Pigtail Leads				Terminal Block	Pigtail Leads
		Same Side Suffix Number	Rear ^③ Suffix Number	Opposite Side Suffix Number	Same Side Suffix Number	Catalog Number	Terminal Block Catalog Number
Trip Unit Type 310+							
1	Right	A30	A31	A32	—	—	—
Trip Unit Type 210+							
1	Right	A33	A34	A35	—	—	—

J-Frame and HMCP (J) Auxiliary Switch

Number of Contacts A and B	Mounting Location (Pole)	Factory Mounted Connection Type and Location				Field Mounted Factory Installation Kit ^⑩	
		18-Inch (457.2 mm) Pigtail Leads				Terminal Block	Pigtail Leads
		Same Side Suffix Number	Rear ^③ Suffix Number	Opposite Side Suffix Number	Same Side Suffix Number	Catalog Number	Terminal Block Catalog Number
1	Left	A01	A02	A03	A04	A1X2PK	A1X2LTK
	Right ^⑩	A05	A06	A07	A08	A1X2PK	A1X2RTK ^⑩
2	Left	A09	A10	—	A11	A2X2PK	A2X2LTK
	Right ^⑩	A12	A13	—	A14	A2X2PK	A2X2RTK ^⑩

Notes

- ① Includes 24-inch external pigtail leads, 18 AWG (16–0.010).
- ② A maximum of two internal accessories may be mounted in a three-pole circuit breaker. Suitable for mounting in right pole only of two- or three-pole breaker.
- ③ Standard pigtail lead exit location.
- ④ Not listed with Underwriters Laboratories; for field installation.
- ⑤ Pigtail wire size: 18 AWG (0.82 mm²).
- ⑥ Not for use on F-Frame with electronic trip unit.
- ⑦ 125 volts (max.), 50/60 Hz switch for use in electronic circuit of 100 micro amperes and 15 Vdc minimum.
- ⑧ Not for use on four-pole circuit breakers.
- ⑨ Only for use on three-pole F-Frame breakers with electronic trip unit. Installation auxiliary switch for FD electronic breakers on right pole must be performed at breaker factory.
- ⑩ Listed with Underwriters Laboratories for field installation or interchangeable trip unit breakers under E64983.
- ⑪ Standard mounting location—leads exit rear of breaker.

Accessories Selection Guide and Ordering Information

Enclosures

Type 1 General Purpose

- Surface or flush mounting
- 15–1200 ampere range
- 600 Vac, 500 Vdc

Type 1 enclosed breakers are designed for use in commercial buildings, apartment buildings and other areas where a general purpose enclosure is applicable. The breaker is front operable and is capable of being padlocked in either the ON or OFF position. Ratings through 1200 amperes are listed with Underwriters Laboratories as approved for service entrance application. Both surface and flush mounted enclosures are available.

Type 3R Rainproof Surface Mounting

- Interchangeable hubs (through 400 amperes)
- 15–1200 ampere range
- 600 Vac, 500 Vdc

This general purpose outdoor service center employs a circuit breaker inside a weatherproof sheet steel breaker enclosure to serve

as a main disconnect and protective device for feeder circuits. Ratings through 1200 amperes are listed by Underwriters Laboratories as suitable for service entrance application.

Type 12 Dustproof Surface Mounting

- No knockouts or other openings
- 15–1200 ampere range
- 600 Vac, 500 Vdc

The Type 12 enclosure is designed in line with specifications for special industry applications where unusually severe conditions involving oil, coolant, dust and other foreign materials exist in the operating atmosphere. The handle padlocks in the OFF position and the cover is interlocked with the handle mechanism to prevent opening the cover with the circuit breaker in the ON position. Ratings through 1200 amperes are listed by Underwriters Laboratories as suitable for service entrance application.

Enclosure Selection Data

Breaker Frame Amperes	Enclosure Type Class	Catalog Number
FG 15–225	Type 1	SFDN225
	Type 3R	RFDN225
	Type 12	JFDN225
JG 175–250	Type 1	SJDN250
	Type 3R	RJDN250
	Type 12	JJDN250
KG 300–400	Type 1	SKDN400
	Type 3R	RKDN400
	Type 12	JKDN400
LG 450–600	Type 1	SLDN600
	Type 3R	RLDN600
	Type 12	JLDN600
NG 700–1200	Type 1	SNDN1200
	Type 3R	RNDN1200
	Type 12	JNDN1200

Options and Accessories

Standard Terminals

Breaker Frame	Max. Amp Rating	AWG Wire Range	Metric Wire Range mm ²	Catalog Number
FG	100	14–1/0	2.5–50	3T100FB ①
FG	150	4–4/0	25–95	3TA225FD ①
JG	250	4–350 kcmil	25–185	TA250KB
KG	350	250–500 kcmil	120–240	TA350K
KG	400	3/0–250 kcmil (2)	95–120	3TA400K ①
LG	600	250–500 kcmil (2)	120–240	3TA603LDK
NG	700	1–500 kcmil (2)	50–300	TA700NB1
NG	1000	3/0–400 kcmil (3)	95–185	TA1000NB1
NG	1200	4/0–500 kcmil (4)	120–300	TA1200NB1

Neutral Kits, Insulated and Groundable

Max. Enclosure Rating (Amperes)	Main Lug Number Size Cu/Al	Ground Lug Size Cu/Al	Catalog Number
100	(1) 14–1/0	(1) 14–1/0	INK100
250	(1) 6–350 kcmil	(1) 4–300 kcmil	INK250
400	(1) 4–750 kcmil or (2) 1/0–250 kcmil	(1) 4–300 kcmil	INK400
600	(2) 250–500 kcmil	(1) 4–300 kcmil	INK600
1200	(3) 1/0 to 750 kcmil or (4) 1/0 to 750 kcmil	(1) 6–250 kcmil	INK1200

Internal Accessories

Auxiliary Switch ②

Breaker Frame	Factory Mounted	1A-1B		2A-2B	
		Field Kit Catalog Number	Factory Mounted	Field Kit Catalog Number	Factory Mounted
FG ③	A06	A1X1PK	A13	A2X1RPK	A13
JG	A06	A1X2PK	A13	A2X2PK	A13
KG	A06	A1X3PK	A13	A2X3PK	A13
LG	A06	A1X4PK	A13	A2X4PK	A13
NG	A06	A1X5PK	A13	A2X5PK	A13

Shunt Trip ②

Breaker Frame	Rating	Factory Mounted	Field Kit Catalog Number
FG ③	12–24 Vdc	S02	SNT1LP03K
JG	12–24 Vdc	S42	SNT2P04K
KG	12–24 Vdc	S42	SNT3P04K
LG	12–24 Vdc	S02	SNT4LP03K
NG	12–24 Vdc	S02	SNT5LP03K

Notes

- ① Package of three terminals.
- ② Other accessories are available. Same as standard frame breakers.
- ③ Field installation on the FG Frame is not UL listed.