

Molded Case Circuit Breakers and Enclosures

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FAL 1P 15-100 A
FAL/FHL 2P 15-100 A



FAL/FHL 3P 15-100 A

Thermal-magnetic molded case circuit breakers shown on pages 3-2 through 3-13 are permanent trip UL Listed, CSA® Certified, IEC rated, and also meet the requirements of Federal Specification W-C-375B/GEN as indicated on Digest pages 7-4 through 7-7.

NOTE: Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories. See Digest Section 7 for more information.

Table 3.1: F-Frame—100 A, Thermal-Magnetic, Individually-Mounted, Standard Interrupting, 240 Vac

Ampere Rating	Fixed AC Magnetic Trip		1 P		2 P		3 P		Terminal Wire Range (AWG)
	Hold	Trip	120 Vac		240 Vac		240 Vac		
			Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	
15 A	275 A	600 A	FAL12015	198.00	FAL22015	333.00	FAL32015	495.00	AL50FA 14-4 Cu or 12-4 Al
20 A	275 A	600 A	FAL12020	198.00	FAL22020	333.00	FAL32020	495.00	
25 A	275 A	600 A	FAL12025	198.00	FAL22025	333.00	FAL32025	495.00	
30 A	275 A	600 A	FAL12030	198.00	FAL22030	333.00	FAL32030	495.00	
35 A	400 A	850 A	FAL12035	198.00	FAL22035	333.00	FAL32035	495.00	AL100FA 14-1/0 Cu or 12-1/0 Al
40 A	400 A	850 A	FAL12040	198.00	FAL22040	333.00	FAL32040	495.00	
45 A	400 A	850 A	FAL12045	198.00	FAL22045	333.00	FAL32045	495.00	
50 A	400 A	850 A	FAL12050	198.00	FAL22050	333.00	FAL32050	495.00	
60 A	800 A	1450 A	FAL12060	198.00	FAL22060	333.00	FAL32060	495.00	
70 A	800 A	1450 A	FAL12070	261.00	FAL22070	543.00	FAL32070	704.00	
80 A	800 A	1450 A	FAL12080	261.00	FAL22080	543.00	FAL32080	704.00	
90 A	900 A	1700 A	FAL12090	261.00	FAL22090	543.00	FAL32090	704.00	
100 A	900 A	1700 A	FAL12100	261.00	FAL22100	543.00	FAL32100	704.00	

Table 3.2: F-Frame—100 A, Thermal-Magnetic, Individually-Mounted, 480 Vac

Ampere Rating	Fixed AC Magnetic Trip		Standard Interrupting						Terminal Wire Range (AWG)
	Hold	Trip	1P		2P		3P		
			277 Vac, 125 Vdc	\$ Price	480 Vac, 250 Vdc	\$ Price	480 Vac, 250 Vdc	\$ Price	
15 A	275 A	600 A	FAL14015	251.00	FAL24015	609.00	FAL34015	782.00	AL50FA (1) 14-4 Cu or (1) 12-4 Al
20 A	275 A	600 A	FAL14020	251.00	FAL24020	609.00	FAL34020	782.00	
25 A	275 A	600 A	FAL14025	251.00	FAL24025	609.00	FAL34025	782.00	
30 A	275 A	600 A	FAL14030	251.00	FAL24030	609.00	FAL34030	782.00	
35 A	400 A	850 A	FAL14035	251.00	FAL24035	609.00	FAL34035	782.00	AL100FA (1) 14-1/0 Cu or (1) 12-1/0 Al
40 A	400 A	850 A	FAL14040	251.00	FAL24040	609.00	FAL34040	782.00	
45 A	400 A	850 A	FAL14045	251.00	FAL24045	609.00	FAL34045	782.00	
50 A	400 A	850 A	FAL14050	251.00	FAL24050	609.00	FAL34050	782.00	
60 A	800 A	1450 A	FAL14060	251.00	FAL24060	609.00	FAL34060	782.00	
70 A	800 A	1450 A	FAL14070	312.00	FAL24070	788.00	FAL34070	924.00	
80 A	800 A	1450 A	FAL14080	312.00	FAL24080	788.00	FAL34080	924.00	
90 A	900 A	1700 A	FAL14090	312.00	FAL24090	788.00	FAL34090	924.00	
100 A	900 A	1700 A	FAL14100	312.00	FAL24100	788.00	FAL34100	924.00	

Table 3.3: F-Frame—100 A, Thermal-Magnetic, Individually-Mounted, 600 Vac

Ampere Rating	Fixed AC Magnetic Trip		Standard Interrupting				High Interrupting				Current Limiting				Terminal Wire Range (AWG)			
	Hold	Trip	2P		3P		1P		2P		3P		2P			3P		
			600 Vac, 250 Vdc	\$ Price	Cat. No.	\$ Price	600 Vac, 250 Vdc	\$ Price	Cat. No.	\$ Price	277 Vac, 125 Vdc	\$ Price	Cat. No.	\$ Price		600 Vac, 250 Vdc	\$ Price	Cat. No.
15 A	275 A	600 A	FAL26015	704.00	FAL36015	906.00	FHL16015	452.00	FHL26015	1163.00	FHL36015	1358.00	—	—	—	—	—	AL50FA 14-4 Cu or 12-4 Al
20 A	275 A	600 A	FAL26020	704.00	FAL36020	906.00	FHL16020	452.00	FHL26020	1163.00	FHL36020	1358.00	FIL26020	2633.00	FIL36020	3296.00	—	
25 A	275 A	600 A	FAL26025	704.00	FAL36025	906.00	FHL16025	452.00	FHL26025	1163.00	FHL36025	1358.00	FIL26025	2633.00	FIL36025	3296.00	—	
30 A	275 A	600 A	FAL26030	704.00	FAL36030	906.00	FHL16030	452.00	FHL26030	1163.00	FHL36030	1358.00	FIL26030	2633.00	FIL36030	3296.00	—	
35 A	400 A	850 A	FAL26035	704.00	FAL36035	906.00	FHL16035	452.00	FHL26035	1163.00	FHL36035	1358.00	FIL26035	2633.00	FIL36035	3296.00	AL100FA 14-1/0 Cu or 12-1/0 Al	
40 A	400 A	850 A	FAL26040	704.00	FAL36040	906.00	FHL16040	452.00	FHL26040	1163.00	FHL36040	1358.00	FIL26040	2633.00	FIL36040	3296.00		—
45 A	400 A	850 A	FAL26045	704.00	FAL36045	906.00	FHL16045	452.00	FHL26045	1163.00	FHL36045	1358.00	FIL26045	2633.00	FIL36045	3296.00		—
50 A	400 A	850 A	FAL26050	704.00	FAL36050	906.00	FHL16050	452.00	FHL26050	1163.00	FHL36050	1358.00	FIL26050	2633.00	FIL36050	3296.00		—
60 A	800 A	1450 A	FAL26060	704.00	FAL36060	906.00	FHL16060	452.00	FHL26060	1163.00	FHL36060	1358.00	FIL26060	2633.00	FIL36060	3296.00		—
70 A	800 A	1450 A	FAL26070	890.00	FAL36070	1115.00	FHL16070	509.00	FHL26070	1353.00	FHL36070	1541.00	FIL26070	2633.00	FIL36070	3296.00		—
80 A	800 A	1450 A	FAL26080	890.00	FAL36080	1115.00	FHL16080	509.00	FHL26080	1353.00	FHL36080	1541.00	FIL26080	2633.00	FIL36080	3296.00		—
90 A	900 A	1700 A	FAL26090	890.00	FAL36090	1115.00	FHL16090	509.00	FHL26090	1353.00	FHL36090	1541.00	FIL26090	2633.00	FIL36090	3296.00		—
100 A	900 A	1700 A	FAL26100	890.00	FAL36100	1115.00	FHL16100	509.00	FHL26100	1353.00	FHL36100	1541.00	FIL26100	2633.00	FIL36100	3296.00		—

Table 3.4: Interrupting Ratings

Voltage	FAL			FHL	FCL▲	FIL
	240 Vac	480 Vac	600 Vac			
240 Vac	10 kA	18 kA (1P), 25 kA (2P, 3P)	25 kA	25 kA (1P) 65 kA (2P, 3P)	100 kA	200 kA
480 Vac	—	18 kA	18 kA	25 kA (2P, 3P)	65 kA	200 kA
600 Vac	—	—	14 kA	18 kA (2P, 3P)	—	100 kA

▲ See Section 11

Termination Option

Termination Letter
F = No Lugs
L = Lugs both ends
P with MT Suffix = Lugs ON end
P = Lugs OFF end

For factory-installed termination, place termination letter in the third block of the circuit breaker catalog number.

FAL36100
L Termination Letter

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Optional Lugs Page 3-29—3-30
Dimensions Page 3-35
Enclosures: see Digest Section 7

NOTE: Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.

Table 3.5: F-Frame—100 A, Thermal-Magnetic, I-Line® Construction, 240 Vac, Standard Interrupting

Ampere Rating	Fixed AC Magnetic Trip		2 P▲		3 P		Terminal Wire Range (AWG)
			240 Vac		240 Vac		
	Hold	Trip	Cat. No.	\$ Price	Cat. No.	\$ Price	
15 A	275 A	600 A	FA22015()	398.00	FA32015	572.00	AL50FA 14–4 Cu or 12–4 Al
20 A	275 A	600 A	FA22020()	398.00	FA32020	572.00	
25 A	275 A	600 A	FA22025()	398.00	FA32025	572.00	
30 A	275 A	600 A	FA22030()	398.00	FA32030	572.00	
35 A	400 A	850 A	FA22035()	398.00	FA32035	572.00	
40 A	400 A	850 A	FA22040()	398.00	FA32040	572.00	AL100FA 14–1/0 Cu or 12–1/0 Al
45 A	400 A	850 A	FA22045()	398.00	FA32045	572.00	
50 A	400 A	850 A	FA22050()	398.00	FA32050	572.00	
60 A	800 A	1450 A	FA22060()	398.00	FA32060	572.00	
70 A	800 A	1450 A	FA22070()	617.00	FA32070	780.00	
80 A	800 A	1450 A	FA22080()	617.00	FA32080	780.00	
90 A	900 A	1700 A	FA22090()	617.00	FA32090	780.00	
100 A	900 A	1700 A	FA22100()	617.00	FA32100	780.00	



Table 3.6: F-Frame—100 A, Thermal-Magnetic, I-Line® Construction, 480 Vac

Ampere Rating	Fixed AC Magnetic Trip		Standard Interrupting						Terminal Wire Range (AWG)
			1P▲★		2P▲		3P		
			Hold	Trip	277 Vac, 125 Vdc	480 Vac, 250 Vdc	480 Vac, 250 Vdc	480 Vac, 250 Vdc	
15 A	275 A	600 A	—	—	FA24015()	651.00	FA34015	833.00	AL50FA (1) 14–4 Cu or (1) 12–4 Al
20 A	275 A	600 A	—	—	FA24020()	651.00	FA34020	833.00	
25 A	275 A	600 A	—	—	FA24025()	651.00	FA34025	833.00	
30 A	275 A	600 A	—	—	FA24030()	651.00	FA34030	833.00	
35 A	400 A	850 A	FA14035()	302.00	FA24035()	651.00	FA34035	833.00	
40 A	400 A	850 A	FA14040()	302.00	FA24040()	651.00	FA34040	833.00	AL100FA (1) 14–1/0 Cu or (1) 12–1/0 Al
45 A	400 A	850 A	FA14045()	302.00	FA24045()	651.00	FA34045	833.00	
50 A	400 A	850 A	FA14050()	302.00	FA24050()	651.00	FA34050	833.00	
60 A	800 A	1450 A	FA14060()	302.00	FA24060()	651.00	FA34060	833.00	
70 A	800 A	1450 A	FA14070()	332.00	FA24070()	833.00	FA34070	996.00	
80 A	800 A	1450 A	FA14080()	332.00	FA24080()	833.00	FA34080	996.00	
90 A	900 A	1700 A	FA14090()	332.00	FA24090()	833.00	FA34090	996.00	
100 A	900 A	1700 A	FA14100()	332.00	FA24100()	833.00	FA34100	996.00	

Table 3.7: F-Frame—100 A, Thermal-Magnetic, I-Line® Construction, 600 Vac

Ampere Rating	Fixed AC Magnetic Trip		Standard Interrupting						High Interrupting						Current Limiting				Terminal Wire Range (AWG)
			2P▲		3P		1P▲★		2P▲		3P		2P▲		3P				
			Hold	Trip	600 Vac, 250 Vdc	600 Vac, 250 Vdc	277 Vac, 125 Vdc	600 Vac, 250 Vdc	600 Vac, 250 Vdc	600 Vac, 250 Vdc	600 Vac, 250 Vdc	600 Vac, 250 Vdc	600 Vac, 250 Vdc	600 Vac, 250 Vdc	600 Vac, 250 Vdc				
15 A	275 A	600 A	FA26015()	780.00	FA36015	971.00	FH16015()	507.00	FH26015()	1214.00	FH36015	1446.00	—	—	—	—	—	AL50FA 14–4 Cu or 12–4 Al	
20 A	275 A	600 A	FA26020()	780.00	FA36020	971.00	FH16020()	507.00	FH26020()	1214.00	FH36020	1446.00	FI26020()	2763.00	FI36020	3296.00	—		
25 A	275 A	600 A	FA26025()	780.00	FA36025	971.00	FH16025()	507.00	FH26025()	1214.00	FH36025	1446.00	—	—	—	—	—		
30 A	275 A	600 A	FA26030()	780.00	FA36030	971.00	FH16030()	507.00	FH26030()	1214.00	FH36030	1446.00	FI26030()	2763.00	FI36030	3296.00	—		
35 A	400 A	850 A	FA26035()	780.00	FA36035	971.00	FH16035()	507.00	FH26035()	1214.00	FH36035	1446.00	—	—	—	—	—		
40 A	400 A	850 A	FA26040()	780.00	FA36040	971.00	FH16040()	507.00	FH26040()	1214.00	FH36040	1446.00	FI26040()	2763.00	FI36040	3296.00	AL100FA 14–1/0 Cu or 12–1/0 Al		
45 A	400 A	850 A	FA26045()	780.00	FA36045	971.00	FH16045()	507.00	FH26045()	1214.00	FH36045	1446.00	—	—	—	—			
50 A	400 A	850 A	FA26050()	780.00	FA36050	971.00	FH16050()	507.00	FH26050()	1214.00	FH36050	1446.00	FI26050()	2763.00	FI36050	3296.00			
60 A	800 A	1450 A	FA26060()	780.00	FA36060	971.00	FH16060()	507.00	FH26060()	1214.00	FH36060	1446.00	FI26060()	2763.00	FI36060	3296.00			
70 A	800 A	1450 A	FA26070()	947.00	FA36070	1163.00	FH16070()	563.00	FH26070()	1452.00	FH36070	1632.00	FI26070()	2763.00	FI36070	3296.00			
80 A	800 A	1450 A	FA26080()	947.00	FA36080	1163.00	FH16080()	563.00	FH26080()	1452.00	FH36080	1632.00	FI26080()	2763.00	FI36080	3296.00			
90 A	900 A	1700 A	FA26090()	947.00	FA36090	1163.00	FH16090()	563.00	FH26090()	1452.00	FH36090	1632.00	FI26090()	2763.00	FI36090	3296.00			
100 A	900 A	1700 A	FA26100()	947.00	FA36100	1163.00	FH16100()	563.00	FH26100()	1452.00	FH36100	1632.00	FI26100()	2763.00	FI36100	3296.00			

- ▲ 1P and 2P circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix. See Phase Option Table.
- FCL 2P circuit breakers are built using 3P module.
- ◆ FCL circuit breakers are not rated for 250 Vdc.
- ★ Rated 277 Vac, 125 Vdc. 15–30 A circuit breaker suitable for use with 60°C or 75 °C conductors. 35–100 A circuit breakers are suitable for use with 75°C conductors.

Table 3.8: Phase Options

Phase Option Letter	1P	2P	3P
A	FA14035A		
B	FA14035B		
C	FA14035C		
AB		FA24030AB	
AC		FA24030AC	
BC		FA24030BC	
ABC			FA34030
CBA			FA34030CBA

Table 3.9: Interrupting Ratings

Voltage	FA			FH	FC▼	FI
	240 Vac	480 Vac	600 Vac			
240 Vac	10 kA	18 kA (1P), 25 kA (2P, 3P)	25 kA	25 kA (1P) 65 kA (2P, 3P)	—	200 kA
277 Vac	—	18 kA	—	—	—	—
480 Vac	—	18 kA	18 kA	25 kA (2P, 3P)	—	200 kA
600 Vac	—	—	14 kA	18 kA (2P, 3P)	—	100 kA

▼ See Section 11.

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 Optional Lugs Page 3-29—3-30
 Dimensions Page 3-35
 Enclosures: see Digest Section 7

NOTE: Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.



KAL/KHL
2P and 3P
70–250 A



KIL36250



Q4L
2P and 3P
250–400 A

Table 3.10: K-Frame—250 A, Thermal-Magnetic, Individually-Mounted, 600 Vac

Ampere Rating	Adjustable AC Magnetic Trip▲		Current Limiting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	
2P, 600 Vac, 250 Vdc					
110	550 A	1100 A	KIL26110	6177.00	AL250KA (1) 4 AWG–350 kcmil Al
125	625 A	1250 A	KIL26125	6177.00	
150	750 A	1500 A	KIL26150	6177.00	
175	875 A	1750 A	KIL26175	6177.00	
200	1000 A	2000 A	KIL26200	6177.00	AL250KI (1) 1/0 AWG–350 kcmil Al
225	1125 A	2250 A	KIL26225	6177.00	
250	1250 A	2500 A	KIL26250	7223.00	
3P, 600 Vac, 250 Vdc					
110	550 A	1100 A	KIL36110	7754.00	AL250KA (1) 4 AWG–350 kcmil Al
125	625 A	1250 A	KIL36125	7754.00	
150	750 A	1500 A	KIL36150	7754.00	
175	875 A	1750 A	KIL36175	7754.00	
200	1000 A	2000 A	KIL36200	7754.00	AL250KI (1) 1/0 AWG–350 kcmil Al
225	1125 A	2250 A	KIL36225	7754.00	
250	1250 A	2500 A	KIL36250	9081.00	

Table 3.11: Q4-Frame—400 A, Thermal-Magnetic, Individually-Mounted, 240 Vac

Ampere Rating	Adjustable AC Magnetic Trip▲		Standard Interrupting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	
2P, 240 Vac					
250	1250 A	2500 A	Q4L2250	3171.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
300	1500 A	3000 A	Q4L2300	3171.00	
350	1750 A	3500 A	Q4L2350	3171.00	
400	2000 A	4000 A	Q4L2400	3171.00	
3P, 240 Vac					
250	1250 A	2500 A	Q4L3250	3831.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
300	1500 A	3000 A	Q4L3300	3831.00	
350	1750 A	3500 A	Q4L3350	3831.00	
400	2000 A	4000 A	Q4L3400	3831.00	

- ▲ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal value shown.
- KC circuit breakers are 480 Vac

Table 3.12: Interrupting Ratings

Voltage	KIL	Q4
240 Vac	200 kA	25 kA
480 Vac	200 kA	—
600 Vac	100 kA	—

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 Optional Lugs Page 11-25
 Dimensions Page 11-4
 Enclosures: see Digest Section 7

NOTE: Consider using PowerPac[®] circuit breakers for situations requiring circuit breaker accessories.



KA/KH/KC 2P and 3P
4.5 in. (114 mm)
Mounting Height



KI 2P and 3P
4.5 in. (114 mm)
Mounting Height



Q4 2P and 3P
6 in. (152 mm)
Mounting Height

Table 3.13: K-Frame—250A, Thermal-Magnetic, I-Line[®] Construction, 600 Vac

Ampere Rating	Adjustable AC Magnetic Trip [▲]		Current Limiting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	
2P, 600 Vac, 250 Vdc ♦					
110	550 A	1100 A	KI26110()	6633.00	AL250KA (1) 4 AWG–350 kcmil Al
125	625 A	1250 A	KI26125()	6633.00	
150	750 A	1500 A	KI26150()	6633.00	
175	875 A	1750 A	KI26175()	6633.00	
200	1000 A	2000 A	KI26200()	6633.00	AL250KI (1) 1/0 AWG–350 kcmil Al
225	1125 A	2250 A	KI26225()	6633.00	
250	1250 A	2500 A	KI26250()	7704.00	
3P, 600 Vac, 250 Vdc					
110	550 A	1100 A	KI36110	8375.00	AL250KA (1) 4 AWG–350 kcmil Al
125	625 A	1250 A	KI36125	8375.00	
150	750 A	1500 A	KI36150	8375.00	
175	875 A	1750 A	KI36175	8375.00	
200	1000 A	2000 A	KI36200	8375.00	AL250KI (1) 1/0 AWG–350 kcmil Al
225	1125 A	2250 A	KI36225	8375.00	
250	1250 A	2500 A	KI36250	9267.00	

Table 3.14: Q4-Frame—400 A, Thermal-Magnetic, I-Line[®] Construction, 240 Vac

Ampere Rating	Adjustable AC Magnetic Trip [▲]		Standard Interrupting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	
2P, 240 Vac ♦					
250	1250 A	2500 A	Q422250()	3435.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
300	1500 A	3000 A	Q422300()	3435.00	
350	1750 A	3500 A	Q422350()	3435.00	
400	2000 A	4000 A	Q422400()	3435.00	
3P, 240 Vac					
250	1250 A	2500 A	Q43250	4313.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
300	1500 A	3000 A	Q43300	4313.00	
350	1750 A	3500 A	Q43350	4313.00	
400	2000 A	4000 A	Q43400	4313.00	

▲ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal value shown.

■ KC circuit breakers are 480 Vac

♦ 2P and 3P circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix. See Phase Option Table.

Table 3.15: Interrupting Ratings

Voltage	KI	Q4
240 Vac	200 kA	25 kA
480 Vac	200 kA	—
600 Vac	100 kA	—

Table 3.16: Phase Options

Phase Option Letter	2P	3P
AB	KA26250AB	
AC	KA26250AC	
BC	KA26250BC	
ABC		KA36250
CBA		KA36250CBA

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NOTE: Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.



LAL/LHL MC
For Mission Critical
Power Loads
available in 200, 225, 250,
and 400 A @ 480 Vac

Table 3.17: L-Frame—400 A, Thermal-Magnetic, Individually-Mounted, High Magnetic Withstand Circuit Breakers For Mission Critical Loads

Ampere Rating	AC Magnetic Level Factory Set▲	Standard Interrupting		High Interrupting		Terminal Wire Range
		Cat. No.	\$ Price	Cat. No.	\$ Price	
LA/LH MC Circuit Breaker, 3P, 480 Vac						
200 A	4000 A	LAL34200MC	4962.00	LHL34200MC	7941.00	AL250LA (1) 4 AWG–350 kcmil Al
225 A	4500 A	LAL34225MC	4962.00	LHL34225MC	7941.00	
250 A	5000 A	LAL34250MC	5355.00	LHL34250MC	8336.00	
400 A	8000 A	LAL34400MC	6615.00	LHL34400MC	9596.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al

▲ AC magnetic setting tolerances are +0–25% from max. value shown.

Table 3.18: L-Frame—600 A, Thermal-Magnetic, Individually-Mounted Circuit Breakers, 600 Vac

Ampere Rating	Adjustable AC Magnetic Trip		Standard Interrupting		High Interrupting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
2P, 600 Vac, 250 Vdc							
125 A	625 A	1250 A	LAL26125	3807.00	LHL26125	6362.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
150 A	750 A	1500 A	LAL26150	3807.00	LHL26150	6362.00	
175 A	875 A	1750 A	LAL26175	3807.00	LHL26175	6362.00	
200 A	1000 A	2000 A	LAL26200	3807.00	LHL26200	6362.00	
225 A	1125 A	2250 A	LAL26225	3807.00	LHL26225	6362.00	
250 A	1250 A	2500 A	LAL26250	3807.00	LHL26250	6362.00	
300 A	1500 A	3000 A	LAL26300	3807.00	LHL26300	6362.00	
350 A	1750 A	3500 A	LAL26350	3807.00	LHL26350	6362.00	
400 A	2000 A	4000 A	LAL36400	3807.00	LHL26400	6362.00	
3P, 600 Vac, 250 Vdc							
125 A	625 A	1250 A	LAL36125	4619.00	LHL36125	7598.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
150 A	750 A	1500 A	LAL36150	4619.00	LHL36150	7598.00	
175 A	875 A	1750 A	LAL36175	4619.00	LHL36175	7598.00	
200 A	1000 A	2000 A	LAL36200	4619.00	LHL36200	7598.00	
225 A	1125 A	2250 A	LAL36225	4619.00	LHL36225	7598.00	
250 A	1250 A	2500 A	LAL36250	4619.00	LHL36250	7598.00	
300 A	1500 A	3000 A	LAL36300	4619.00	LHL36300	7598.00	
350 A	1750 A	3500 A	LAL36350	4619.00	LHL36350	7598.00	
400 A	2000 A	4000 A	LAL36400	4619.00	LHL36400	7598.00	



LAL/LHL
2P and 3P
125–400 A

Table 3.19: L-Frame—600 A, Current-Limiting, Individually-Mounted Circuit Breakers, 600 Vac

Ampere Rating	Adjustable AC Magnetic Trip		Extra-High Interrupting		Current Limiting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
2P, 600 Vac							
300 A	1500 A	3200 A	LCL26300	7479.00	LIL26300	8604.00	(2) 4/0 AWG–500 kcmil Al
350 A	1750 A	3200 A	LCL26350	7479.00	LIL26350	8604.00	
400 A	2000 A	3200 A	LCL26400	7479.00	LIL26400	8604.00	
450 A	2250 A	4200 A	LCL26450	7823.00	LIL26450	12551.00	
500 A	2500 A	4200 A	LCL26500	7823.00	LIL26500	12551.00	
600 A	3000 A	4200 A	LCL26600	7823.00	LIL26600	12551.00	
3P, 600 Vac							
300 A	1500 A	3200 A	LCL36300	8312.00	LIL36300	9563.00	(2) 4/0 AWG–500 kcmil Al
350 A	1750 A	3200 A	LCL36350	8312.00	LIL36350	9563.00	
400 A	2000 A	3200 A	LCL36400	8312.00	LIL36400	9563.00	
450 A	2250 A	4200 A	LCL36450	8691.00	LIL36450	13949.00	
500 A	2500 A	4200 A	LCL36500	8691.00	LIL36500	13949.00	
600 A	3000 A	4200 A	LCL36600	8691.00	LIL36600	13949.00	



LIL36600
2P and 3P 300–600 A

Table 3.20: Interrupting Ratings

Voltage	LAL	LHL	LCL	LIL
240 Vac	42 kA	65 kA	100 kA	200 kA
480 Vac	30 kA	35 kA	65 kA	200 kA
600 Vac	22 kA	25 kA	35 kA	100 kA

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NOTE: Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.



LA / LH 2P and 3P
6 in. (152 mm)
Mounting Height

Table 3.21: L-Frame—400 A, Thermal-Magnetic, I-Line® Construction, High Magnetic Withstand Circuit Breakers For Mission Critical Loads

Ampere Rating	AC Magnetic Level Factory Set▲	Standard Interrupting		High Interrupting		Terminal Wire Range
		Cat. No.	\$ Price	Cat. No.	\$ Price	
LA/LH MC Circuit Breaker, 3P, 480 Vac						
200 A	4000 A	LA34200MC	5571.00	LH34200MC	8771.00	AL250LA (1) 4 AWG–350 kcmil Al
225 A	4500 A	LA34225MC	5571.00	LH34225MC	8771.00	
250 A	5000 A	LA34250MC	5681.00	LH34250MC	8882.00	
400 A	8000 A	LA34400MC	7241.00	LH34400MC	10142.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al

▲ Factory set AC magnetic setting tolerances are +0–25% from max. value shown.

Table 3.22: L-Frame—600 A, Thermal-Magnetic I-Line® Construction Circuit Breakers, 600 Vac

Ampere Rating	Adjustable AC Magnetic Trip■		Standard Interrupting		High Interrupting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
2P, 600 Vac, 250 Vdc▲							
125 A	625 A	1250 A	LA26125()	4053.00	LH26125()	6762.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
150 A	750 A	1500 A	LA26150()	4053.00	LH26150()	6762.00	
175 A	875 A	1750 A	LA26175()	4053.00	LH26175()	6762.00	
200 A	1000 A	2000 A	LA26200()	4053.00	LH26200()	6762.00	
225 A	1125 A	2250 A	LA26225()	4053.00	LH26225()	6762.00	
250 A	1250 A	2500 A	LA26250()	4053.00	LH26250()	6762.00	
300 A	1500 A	3000 A	LA26300()	4053.00	LH26300()	6762.00	
350 A	1750 A	3500 A	LA26350()	4053.00	LH26350()	6762.00	
400 A	2000 A	4000 A	LA26400()	4053.00	LH26400()	6762.00	
3P, 600 Vac, 250 Vdc							
125 A	625 A	1250 A	LA36125	4944.00	LH36125	8145.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
150 A	750 A	1500 A	LA36150	4944.00	LH36150	8145.00	
175 A	875 A	1750 A	LA36175	4944.00	LH36175	8145.00	
200 A	1000 A	2000 A	LA36200	4944.00	LH36200	8145.00	
225 A	1125 A	2250 A	LA36225	4944.00	LH36225	8145.00	
250 A	1250 A	2500 A	LA36250	4944.00	LH36250	8145.00	
300 A	1500 A	3000 A	LA36300	4944.00	LH36300	8145.00	
350 A	1750 A	3500 A	LA36350	4944.00	LH36350	8145.00	
400 A	2000 A	4000 A	LA36400	4944.00	LH36400	8145.00	



LI 2P and 3P
7.5 in. (190 mm)
Mounting Height

Table 3.23: L-Frame—600 A, Current-Limiting, I-Line® Construction, Circuit Breakers, 600 Vac

Ampere Rating	Adjustable AC Magnetic Trip■		Extra-High Interrupting		Current Limiting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
2P, 600 Vac▲							
300 A	1500 A	3200 A	LC26300()	8312.00	LI26300()	9563.00	AL600LI5 (2) 4/0 AWG–500 kcmil Al
350 A	1750 A	3200 A	LC26350()	8312.00	LI26350()	9563.00	
400 A	2000 A	3200 A	LC26400()	8312.00	LI26400()	9563.00	
450 A	2250 A	4200 A	LC26450()	8691.00	LI26450()	13949.00	
500 A	2500 A	4200 A	LC26500()	8691.00	LI26500()	13949.00	
600 A	3000 A	4200 A	LC26600()	8691.00	LI26600()	13949.00	
3P, 600 Vac							
300 A	1500 A	3200 A	LC36300	9234.00	LI36300	10673.00	AL600LI5 (2) 4/0 AWG–500 kcmil Al
350 A	1750 A	3200 A	LC36350	9234.00	LI36350	10673.00	
400 A	2000 A	3200 A	LC36400	9234.00	LI36400	10673.00	
450 A	2250 A	4200 A	LC36450	9657.00	LI36450	15498.00	
500 A	2500 A	4200 A	LC36500	9657.00	LI36500	15498.00	
600 A	3000 A	4200 A	LC36600	9657.00	LI36600	15498.00	

▲ 2P and 3P circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix. See Phase Option Table.

■ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal value.

Table 3.24: Interrupting Ratings

Voltage	LA	LH	LC	LI
240 Vac	42 kA	65 kA	100 kA	200 kA
480 Vac	30 kA	35 kA	65 kA	200 kA
600 Vac	22 kA	25 kA	35 kA	100 kA

Table 3.25: Phase Options

Phase Option Letter	2P	3P
AB	LA26400AB	
AC	LA26400AC	
BC	LA26400BC	
ABC		LA36400
CBA		LA36400CBA

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3 MOLDED CASE CIRCUIT BREAKERS

Standard-Function Features:

- 80% rated
- True RMS sensing
- Interchangeable rating plugs
- LSI, LS(I)G, trip configurations
- Short-time delay = I²t IN and ground-fault delay = I²t OUT
- Integral ground-fault testing
- LED long-time pickup indication
- Thermal & magnetic backup protection
- Long-time & ground-fault memory
- Optional local trip indicators—overload, short circuit, ground-fault
- Optional local ammeter/trip indicator
- Universal test set available
- Optional I-Line® mounting (LX, LXI)
- Optional neutral current transformer for 4-wire systems

Full-Function Features:

- 100% rated (600 sensor LE/LEL circuit breakers are 80% rated)
- True RMS sensing
- Interchangeable rating plugs
- PowerLogic® compatible
- LI, LIG, LS(I), LS(I)G (instantaneous OFF) configurations
- Short-time delay = I²t IN & I²t OUT and ground-fault delay = I²t IN & I²t OUT
- Short-time withstand rating
- Integral ground-fault testing
- Optional ground-fault alarm (no trip) (Requires CIM3F with PowerLogic, see Bulletin 0502DB0001.)
- LED long-time pickup indication
- Zone-selective interlocking (short-time & ground-fault)
- Long-time & ground-fault memory
- Local Trip Indicators—overload, short circuit, ground-fault
- Local ammeter/trip indicator
- Universal test set available
- Optional I-Line® mounting (LE)
- Optional neutral current transformer for 4-wire systems

Table 3.26: L-Frame—600 A, Micrologic Series B Trip System, Individually-Mounted, 3P, 600 Vac

Sensor Size	Ampere Rating	Trip Function	Standard Function		Standard Function Current Limiting		100% Rated Full Function■		Installed Rating Plug	Terminal Wire Range
			Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price		
250	100	LI	—	—	—	—	LEL36100LI	7692.00	ARP040	AL600LI35 (2) 1 AWG–350 kcmil Al/Cu
		LSI	LXL36100	5616.00	LXIL36100	11262.00	LEL36100LS	13035.00		
		LIG	—	—	—	—	LEL36100LIG	9768.00		
		LSIG	LXL36100G	7692.00	LXIL36100G	13338.00	LEL36100LSG	15111.00		
	125	LI	—	—	—	—	LEL36125LI	7692.00	ARP050	
		LSI	LXL36125	5616.00	LXIL36125	11262.00	LEL36125LS	13035.00		
		LIG	—	—	—	—	LEL36125LIG	9768.00		
150	LI	—	—	—	—	LEL36150LI	7692.00	ARP060		
	LSI	LXL36150	5616.00	LXIL36150	11262.00	LEL36150LS	13035.00			
	LIG	—	—	—	—	LEL36150LIG	9768.00			
400	175	LI	—	—	—	—	LEL36175LI	7692.00	ARP070	
		LSI	LXL36175	5616.00	LXIL36175	11262.00	LEL36175LS	13035.00		
		LIG	—	—	—	—	LEL36175LIG	9768.00		
		LSIG	LXL36175G	7692.00	LXIL36175G	13338.00	LEL36175LSG	15111.00		
	200	LI	—	—	—	—	LEL36200LI	7692.00	ARP080	
		LSI	LXL36200	5616.00	LXIL36200	11262.00	LEL36200LS	13035.00		
		LIG	—	—	—	—	LEL36200LIG	9768.00		
600 ▲	225	LI	—	—	—	—	LEL36225LI	7692.00	ARP090	
		LSI	LXL36225	5616.00	LXIL36225	11262.00	LEL36225LS	13035.00		
		LIG	—	—	—	—	LEL36225LIG	9768.00		
		LSIG	LXL36225G	7692.00	LXIL36225G	13338.00	LEL36225LSG	15111.00		
	250	LI	—	—	—	—	LEL36250LI	7692.00	ARP100	
		LSI	LXL36250	5616.00	LXIL36250	11262.00	LEL36250LS	13035.00		
		LIG	—	—	—	—	LEL36250LIG	9768.00		
400	300	LI	—	—	—	—	LEL36300LI	10691.00	ARP075	
		LSI	LXL36300	8618.00	LXIL36300	16400.00	LEL36300LS	16034.00		
		LIG	—	—	—	—	LEL36300LIG	12767.00		
		LSIG	LXL36300G	10694.00	LXIL36300G	18476.00	LEL36300LSG	18110.00		
	350	LI	—	—	—	—	LEL36350LI	10691.00	ARP088	
		LSI	LXL36350	8618.00	LXIL36350	16400.00	LEL36350LS	16034.00		
		LIG	—	—	—	—	LEL36350LIG	12767.00		
600 ▲	400	LI	—	—	—	—	LEL36400LI	10691.00	ARP100	
		LSI	LXL36400	8618.00	LXIL36400	16400.00	LEL36400LS	16034.00		
		LIG	—	—	—	—	LEL36400LIG	12767.00		
		LSIG	LXL36400G	10694.00	LXIL36400G	18476.00	LEL36400LSG	18110.00		
	450	LI	—	—	—	—	LEL36450LI	14688.00	ARP075	
		LSI	LXL36450	12611.00	LXIL36450	23250.00	LEL36450LS	20031.00		
		LIG	—	—	—	—	LEL36450LIG	16764.00		
600 ▲	500	LI	—	—	—	—	LEL36500LI	14688.00	ARP083	
		LSI	LXL36500	12611.00	LXIL36500	23250.00	LEL36500LS	20031.00		
		LIG	—	—	—	—	LEL36500LIG	16764.00		
		LSIG	LXL36500G	14687.00	LXIL36500G	25326.00	LEL36500LSG	22107.00		
	600	LI	—	—	—	—	LEL36600LI	14688.00	ARP100	
		LSI	LXL36600	12611.00	LXIL36600	23250.00	LEL36600LS	20031.00		
		LIG	—	—	—	—	LEL36600LIG	16764.00		
		LSIG	LXL36600G	14687.00	LXIL36600G	25326.00	LEL36600LSG	22107.00		

▲ 600 A sensor is 80% rated
■ Substitute (A) in place of (G) for ground-fault alarm (pickup indication only). Requires CIM3F and PowerLogic, or see Data Bulletin 0502DB0001. No instantaneous OFF position for LI or LIG trip function type circuit breakers.

NOTE: Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.

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Table 3.27: Interrupting Ratings

Voltage	LXL	LEL	LXIL
240 V	100 kA	100 kA	200 kA
480 V	65 kA	65 kA	200 kA
600 V	35 kA	35 kA	100 kA

3 MOLDED CASE CIRCUIT BREAKERS



Micrologic Standard-Function Trip Systems (LXL, LXIL)



Micrologic Full-Function Trip Systems (LEL)

NOTE: Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.

Table 3.28: L-Frame—600 A, Micrologic Series B Trip System, I-Line® Construction, 3P, 600 Vac▲

Sensor Size	Ampere Rating	Trip Function	Standard Function		Standard Function Current Limiting		100% Rated Full Function■		Installed Rating Plug	Terminal Wire Range
			Cat. No.	\$ Price	Catalog No.	\$ Price	Cat. No.	\$ Price		
250	100	LI	—	—	—	—	LE36100LI	8078.00	ARP040	AL600LI35 (2) 1 AWG–350 kcmil Al/Cu
		LSI	LX36100	5898.00	LXI36100	11825.	LE36100LS	13421.00		
		LIG	—	—	—	—	LE36100LIG	10154.00		
		LSIG	LX36100G	7974.00	LXI36100G	13901.	LE36100LSG	15497.00		
	125	LI	—	—	—	—	LE36125LI	8078.00	ARP050	
		LSI	LX36125	5898.00	LXI36125	11825.	LE36125LS	13421.00		
		LIG	—	—	—	—	LE36125LIG	10154.00		
		LSIG	LX36125G	7974.00	LXI36125G	13901.	LE36125LSG	15497.00		
	150	LI	—	—	—	—	LE36150LI	8078.00	ARP060	
		LSI	LX36150	5898.00	LXI36150	11825.	LE36150LS	13421.00		
		LIG	—	—	—	—	LE36150LIG	10154.00		
		LSIG	LX36150G	7974.00	LXI36150G	13901.	LE36150LSG	15497.00		
	175	LI	—	—	—	—	LE36175LI	8078.00	ARP070	
		LSI	LX36175	5898.00	LXI36175	11825.	LE36175LS	13421.00		
LIG		—	—	—	—	LE36175LIG	10154.00			
LSIG		LXL36175G	7974.00	LXI36175G	13901.	LE36175LSG	15497.00			
200	LI	—	—	—	—	LE36200LI	8078.00	ARP080		
	LSI	LX36200	5898.00	LXI36200	11825.	LE36200LS	13421.00			
	LIG	—	—	—	—	LE36200LIG	10154.00			
	LSIG	LX36200G	7974.00	LXI36200G	13901.	LE36200LSG	15497.00			
225	LI	—	—	—	—	LE36225LI	8078.00	ARP090		
	LSI	LX36225	5898.00	LXI36225	11825.	LE36225LS	13421.00			
	LIG	—	—	—	—	LE36225LIG	10154.00			
	LSIG	LX36225G	7974.00	LXI36225G	13901.	LE36225LSG	15497.00			
250	LI	—	—	—	—	LE36250LI	8078.00	ARP100		
	LSI	LX36250	5898.00	LXI36250	11825.	LE36250LS	13421.00			
	LIG	—	—	—	—	LE36250LIG	10154.00			
	LSIG	LX36250G	7974.00	LXI36250G	13901.	LE36250LSG	15497.00			
400	300	LI	—	—	—	LE36300LI	11223.00	ARP075	(2) 4/0 AWG–500 kcmil Al/Cu	
		LSI	LX36300	9047.00	LXI36300	17222.	LE36300LS			16566.00
		LIG	—	—	—	—	LE36300LIG			13299.00
		LSIG	LX36300G	11123.00	LXI36300G	19298.	LE36300LSG			18642.00
	350	LI	—	—	—	—	LE36350LI	11223.00		ARP088
		LSI	LX36350	9047.00	LXI36350	17222.	LE36350LS	16566.00		
400	LI	—	—	—	—	LE36400LI	11223.00	ARP100		
	LSI	LX36400	9047.00	LXI36400	17222.	LE36400LS	16566.00			
	LIG	—	—	—	—	LE36400LIG	13299.00			
	LSIG	LX36400G	11123.00	LXI36400G	19298.	LE36400LSG	18642.00			
600 ▲	450	LI	—	—	—	LE36450LI	15422.00	ARP075		
		LSI	LX36450	13241.00	LXI36450	24413.	LE36450LS		20765.00	
		LIG	—	—	—	—	LE36450LIG		17498.00	
		LSIG	LX36450G	15317.00	LXI36450G	26489.	LE36450LSG		22841.00	
	500	LI	—	—	—	—	LE36500LI	15422.00	ARP083	
		LSI	LX36500	13241.00	LXI36500	9413.	LE36500LS	20765.00		
600	LI	—	—	—	—	LE36600LI	15422.00	ARP100		
	LSI	LX36600	13241.00	LXI36600	24413.	LE36600LS	20765.00			
	LIG	—	—	—	—	LE36600LIG	17498.00			
	LSIG	LX36600G	15317.00	LXI36600G	26489.	LE36600LSG	22841.00			

- ▲ 600 A sensor is 80% rated
- Substitute (A) in place of (G) for ground-fault alarm (pickup indication only). Requires CIM3F and Powerlogic, or see Data Bulletin 0502DB0001. No instantaneous OFF position for LI or LIG trip function type circuit breakers.
- ◆ Type LX, LXI and LE circuit breakers are NOT recommended for use on single motor branch circuits.

Table 3.29: Interrupting Ratings

Voltage	LX	LE	LXI
240 Vac	100 kA	100 kA	200 kA
480 Vac	65 kA	65 kA	200 kA
600 Vac	35 kA	35 kA	100 kA

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Mag-Gard® Motor Circuit Protector

Instantaneous trip magnetic only circuit breakers have a single adjustment which simultaneously sets the magnetic trip level of each individual pole. Mag-Gard circuit breakers comply with NEC® requirements for providing motor circuit protection when installed as part of a UL Listed combination controller having motor overload protection. Interrupting ratings are established for these UL Recognized Components only when they are used in combination with motor starters with properly sized overload relays and contactors.

Mag-Gard circuit breakers will accept the same lugs and accessories as equivalent thermal-magnetic circuit breakers. Mag-Gard circuit breakers are available with I-Line construction. H-construction Mag-Gard circuit breakers are also available.

Table 3.30: Magnetic Only LAL Mag-Gard, 400 A, 600 Vac, 50/60 Hz

Ampere Rating		Adjustable▲ Trip Range	3P only	
			Cat. No.	\$ Price
LAL■	400	500–1000 A	LAL3640022M	4619.00
		750–1600 A	LAL3640028M	4619.00
		1000–2000 A	LAL3640030M	4619.00
		1125–2250 A	LAL3640031M	4619.00
		1250–2500 A	LAL3640032M	4619.00
		1500–3000 A	LAL3640033M	4619.00
		1750–3500 A	LAL3640035M	4619.00
		2000–4000 A	LAL3640036M	4619.00

▲ UL magnetic trip setting tolerances are -20%/+30% from the nominal values shown.
 ■ 250 Vdc ratings are available. No UL component recognition.

Circuit Breaker	250 Vdc Multiplier
LAL	High = 1.2 Low = 1.4

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Mag-Gard® Motor Circuit Protector



Class 680, 685

by Schneider Electric
 www.schneider-electric.us



Adjustable instantaneous-trip circuit breakers are intended for use in combination with motor starters with overload relays for the protection of motor circuits from short circuits. Other specific applications include rectifiers and resistance welders. These circuit breakers contain a magnetic trip element in each pole with the trip point adjustable from the front. Interrupting ratings are determined by testing the instantaneous-trip circuit breakers in combination with a contactor and overload relay.

Select instantaneous-trip circuit breakers as follows:

1. Use selection table for motors, other than NEMA Design E, with locked-rotor indicating code letters per NEC® Table 430.7 (b) as follows:

Horsepower	Motor Code Letters
1/2 or less	A-L
3/4 to 1-1/2	A-K
2 to 3	A-J
5 to 25	A-H
30 to 125	A-G
150 or more	A-F

For other motors order a special thermal-magnetic circuit breaker with magnetic trip settings for the specific motor— specify motor horsepower, voltage, frequency, full-load current and code letter or locked rotor current.

2. Determine motor hp rating from the motor nameplate.
3. Refer to the table at right and select an instantaneous-trip circuit breaker with an Ampere rating recommended for the hp and voltage involved.
4. Select an adjustable trip setting of at least 800%, not to exceed 1300%, of the motor full-load Amperes. (FLA) for other than Design E motors. For Design E motors, select an adjustable trip setting of at least 1100% not to exceed 1700% of FLA.
5. The NEC 1300% maximum setting may be inadequate for instantaneous-trip circuit breakers to withstand current surges typical of the magnetization current of autotransformer type reduced voltage starters, or open transition wye-delta starters during transfer from “start” to “run,” constant hp multi-speed motors, and motors labeled “high efficiency.” Select thermal-magnetic circuit breakers from Digest page 7-32 for those applications.
6. Part-winding motors, per NEC® 430.3, should have two circuit breakers selected from the above at not more than one half the allowable trip setting for the horsepower rating. The two circuit breakers should operate simultaneously as a disconnecting means per NEC 430.103.

Table 3.31: Adjustable Instantaneous-Trip L-Frame Circuit Breakers for Single Motor Circuit Protection

Hp Ratings of Induction Type Squirrel-Cage and Wound Rotor Motors				▲ Full Load Amperes	Mag-Gard Circuit Breaker Cat. No.	Magnetic Trip Settings ■	
3Ø 60 Hz ac						MIN	MAX
200 V	230 V	460 V	575 V				
75		200		221	LAL3640033M	700%	1400%
				240	LAL3640035M	700%	1500%
				242	LAL3640035M	700%	1400%
100	100			248	LAL3640035M	700%	1400%
				285	LAL3640036M	700%	1400%
				289	LAL3640036M	700%	1400%
		250	300	302	LAL3640036M	700%	1300%
				312	LAL3640036M	600%	1300%



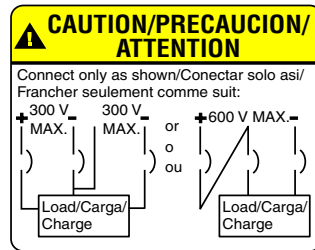
The UL Listed thermal-magnetic molded case circuit breakers shown below are specifically designed for use on ungrounded dc systems having a maximum short-circuit voltage of 500 Vdc or a maximum floating (unloaded) voltage of 600 Vdc. The circuit breakers are suitable for use only with UPS (uninterruptible power supplies) and ungrounded systems.

This two-level voltage rating allows these circuit breakers to be applied to battery sources having a short-circuit availability of 20,000 amperes for FH, KH, LH, and MH circuit breakers and 25,000 amperes for PAF circuit breakers at 500 Vdc.

FH, KH, LH and MH circuit breakers are provided with an adjustable magnetic trip that is readily accessible by means of a single adjustment on the face of the circuit breaker. PAF circuit breakers have a fixed magnetic trip range.

These circuit breakers are UL Listed for the interrupting ratings shown only if applied with three poles connected in series (series connection is external to circuit breaker). See diagram below.

NOTE: Due to external series connection, I-Line® circuit breakers are not available for this application.



Source = 600 Vdc max. (floating)
500 Vdc max. (loaded)

Table 3.32: DC Molded Case Circuit Breakers

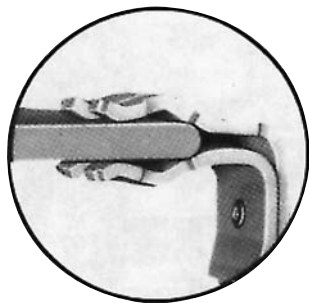
Ampere Rating	Circuit Breaker Cat. No.	Adjustable Magnetic Trip Range—DC Amperes▲		Interrupting Rating @ 500 Vdc	\$ Price
		Low	High		
150 A	JGL37150D81	350	600	20 k AIR	3779.00
175 A	JGL37175D81	350	600		3779.00
200 A	JGL37200D82	500	850	20 k AIR	3779.00
225 A	JGL37225D82	500	850		3779.00
250 A	JGL37250D82	500	850		5001.00
30 A	FHL3603013DC	50	180	20 k AIR	1358.00
50 A	FHL3605014DC	75	260		1358.00
100 A	FHL3610016DC	150	580		1541.00
250 A	LHL3625025DC	625	1250	20 k AIR	7598.00
300 A	LHL3630026DC	750	1500		7598.00
350 A	LHL3635029DC	875	1750		7598.00
400 A	LHL3640030DC	1000	2000		7598.00
450 A	MHL3645031DC	1125	2250		9456.00
500 A	MHL3650032DC	1250	2500	20 k AIR	9456.00
600 A	MHL3660033DC	1500	3000		9456.00
700 A	MHL3670035DC	1750	3500		11882.00
800 A	MHL3680036DC	2000	4000		11880.00
900 A	MHL3690039DC	2500	5000		14078.00
1000 A	MHL36100040DC	2500	5000		14078.00
1200 A	MHL36120040DC	2500	5000		25 k AIR
Ampere Rating	Circuit Breaker Cat. No.	Fixed Magnetic Trip Range—DC Amperes▲		Interrupting Rating @ 500 Vdc	\$ Price
		Hold	Trip		
1200 A	PAF361200DC	1200	1620	25 k AIR	24726.00
1600 A	PAF361600DC	1600	2160		24726.00
2000 A	PAF362000DC	2000	2700		24726.00
2500 A	PCF362500DC	2500	3375	25 k AIR	39365.00

- ▲ Magnetic trip tolerances are -20%/+30% from the nominal values shown.
- Suitable for use only in a ventilated enclosure. Minimum enclosure dimensions are 38" h x 20" w x 7" d with a minimum of 300 square inches of ventilation near the top and bottom of the enclosure.

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Enclosures: see Digest Section 7

MOLDED CASE CIRCUIT BREAKERS

3



Plug-on Connector



Bolted Connector

Bolt-On I-Line®

(20% Price Adder)

The standard I-Line circuit breaker is designed to provide a high quality, secure connection between the distribution bus and circuit breaker. I-Line circuit breakers use plug-on type line-side connectors. The parallel line-side connectors “clamp” around the bus bars. In case of a short circuit, the increased magnetic flux causes the connectors to grasp the bus bars even tighter. I-Line circuit breakers with bolted connections have clamp-on jaws that are bolted around the main bus, as shown. The bolt-on I-Line design is offered as an alternative in order to meet specifications requiring a bolted connection. Bolt-on I-Line construction is available on FY, QB, QD, QG, QJ, Q4, FA, FH, FI, KI, LA, and LH frame circuit breakers and molded case switches, and SL100, SL225 and SL400 sub-feed lugs.

To order on all products except QB, QD, QG and QJ, simply add the letter “B” in the catalog number prefix of the circuit breaker, e.g., FA36100 becomes FAB36100. For QB, QD, QG and QJ, insert the letter “E” in the third position, e.g., QBE, QDE, etc.

Top-Feed I-Line

(No Additional Charge)

I-Line panelboards may require the use of a top-feed I-Line circuit breaker in applications where a top-feed main circuit breaker is required. This involves having the I-Line jaw connectors on the OFF end of the circuit breaker, as opposed to the standard location on the ON end of the circuit breaker. To designate this construction, simply place the suffix “MT” at the end of the circuit breaker catalog number, e.g., FA36100 becomes FA36100MT. On LA or LH top-feed I-Line circuit breakers, accessories must be factory installed. This option is available in PowerPact® H and J-frame by placing a “K” in the 4th position (termination indicator) of the circuit breaker catalog number, e.g., HGA36125 becomes HGK36125. This option is not available on L-frame (600 A only), M-frame, N-Frame or Powerpact M-, P- and R-frame.

“CBA” I-Line Jaw Configuration (Non-PowerPact Circuit Breaker)

(No Additional Charge)

Standard 1-pole and 2-pole I-Line circuit breakers are ordered by designating the required phase connection letters as a suffix to the circuit breaker catalog number. 3-pole circuit breakers do not require this phase designation and are supplied with an “ABC” phase jaw configuration as standard. In most applications this is acceptable since the phase loading is evenly distributed. In applications where the phases must be reversed it is possible to order a “CBA” jaw configuration by simply placing the letters “CBA” at the end of the standard catalog number, e.g., FA36100 becomes FA36100CBA.

Control Wire Tap Lugs

(No Additional Charge if Field Installed; 20% Price Adder if Factory Installed)

Control wire tap lugs are used in applications requiring connection to a small wire (22-14 AWG) for control circuits. This is accomplished by crimping the wire to a standard wire crimp terminal (not included) and fastening the terminal to the circuit breaker lug. On LA lugs, the lug is drilled to accept a 6-32 screw (included) to secure the crimp connector. On FA lugs, a flat slip-on crimp connector is used to attach to a shim-like connector placed under the circuit breaker lug.

Note: To order as a factory-installed device on FA, FH, FI, KI, Q4, LA, LH, LC, LI, LXI, LX or LC circuit breakers, add suffix number 8041 to circuit breaker catalog number, e.g., KIL362258041. To order as a factory-installed device on MG, MJ, PG, PJ, PL, RG, RJ and RL use the product selector or the respective PowerPact catalog. Tapped lugs will be installed on the “ON” and “OFF” ends of the circuit breaker.

Table 3.33: Control Wire Terminations for Circuit Breakers

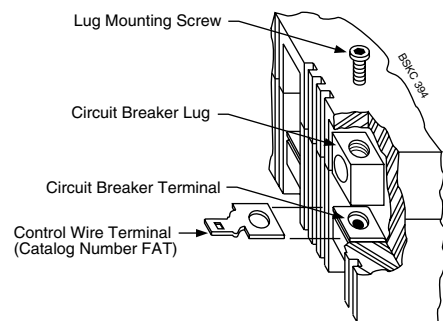
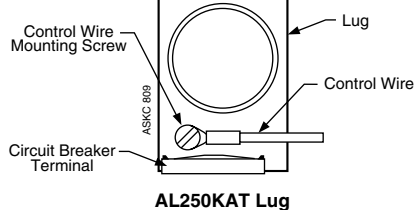
Circuit Breaker	Control Wire Termination Kits			Factory Installed \$ Price (Suffix 8041)
	Cat. No.	Standard Package Quantity	\$ Price Per Lug	
FA, FH, FI	FAT▲	1	8.40	Add 20% to price of circuit breaker
KI	AL250KIT	1	113.00	
Q4, LA, LH	AL400LAT	1	40.80	
LC, LI, LXI, LX, LE	AL600L35T	1	53.00	
	AL600L15T	1	44.60	
MA, MH, MX, ME	AL900MAT	1	111.00	
	AL1000MAT	1	111.00	
NA, NC, NX, NE	AL1200NE6T	1	228.00	

▲ Use fully-insulated 0.250 in slip-on connectors.

Table 3.34: Tapped Lugs for PowerPact® Circuit Breakers

Circuit Breaker	Amperes Max.	Kit Cat. No.	Standard Package Qty.	\$ Price Per Kit
MG, MJ, PG, PJ, PL	800 A	AL800M23TK	3	312.00
		AL800P6TK	3	458.00
PG, PJ, PL	800 A	AL800M23TK4	4	414.00
		AL800P6TK4	4	608.00
	1200 A	AL1200P24TK	1	138.00
		AL1200P25TK	3	416.00
		AL1200P25TK4	4	555.00
		AL1200R53TK■	1	237.00

■ I-Line Only.



3 MOLDED CASE CIRCUIT BREAKERS

Rear-Connected Studs



Rear-connected studs are designed to allow rear termination in applications such as control panels where wire gutter space may be limited. The studs may be bolted directly to the bus or lugs may be attached to the studs.

NOTE: Long and short studs must be alternated on adjacent poles to assure proper electrical clearance

Rear- Connected Studs

Table 3.35: Rear-Connected Studs—Not UL Listed

Circuit Breaker Cat. No. Prefix	Ampere Ratings	Stud Cat. No.	Dimensions				\$ Price Per Stud
			Overall Length	To Back of Circuit Breaker	Diameter	Threads/Inch	
FAL, FHL	15–100 A	FAS20	2-1/4 in.	2 in.	3/8 in.	16	70.00
FAL, FHL	15–100 A	FAS42	4-7/8 in.	4-1/4 in.	3/8 in.	16	92.00
LAL, LHL	125–400 A	LAS54	6-3/16 in.	5-1/2 in.	3/4 in.	16	243.00
LAL, LHL	125–400 A	LAS114	12-3/16 in.	11-1/2 in.	3/4 in.	16	360.00

Note: Use alternate size studs on adjacent poles to obtain proper electrical clearance.

Special Magnetic or Thermal Calibration

(20% Price Adder)

Magnetic

The magnetic trip ranges for standard circuit breakers are listed in the Square D Digest. Requirements outside this range are best accommodated by selecting another standard circuit breaker. In some cases where this is not practical, a circuit breaker may be ordered with special magnetic calibration. Special magnetic calibration is not possible in all cases. Circuit breakers with special magnetic calibration and an **adjustable** magnetic trip range are **not** UL Listed; those with a **fixed** magnetic trip setting are UL Listed. Consult Square D/Schneider Electric local sales office for more information.

50 Degrees C

UL 489 Listed molded case circuit breakers are calibrated for 40 degree C ambient temperature. To meet requirements of higher ambient conditions, circuit breakers can be factory calibrated for a 50 degree C ambient temperature. Circuit breakers with special thermal calibration are not UL Listed. To order 50° calibration, add "35" suffix. Consult local sales office for more information.

Visi-Blade™ Circuit Breakers

(20% Price Adder)

Visi-blade construction is a modification to the cover of a thermal-magnetic circuit breaker, a molded case switch, or a Mag-Gard® circuit breaker which provides a "window" through which the position of the movable contacts can be verified. Luminescent paint is applied to the movable contact arms to clearly indicate their position. Gases produced during high level interruption may cause clouding of the Visi-blade window. Visi-Blade circuit breakers listed below are UL Listed except for FH circuit breakers. Visi-Blade construction is not available on circuit breakers not included in table below.



Visi-Blade Circuit Breaker

Add suffix letter "V" to the circuit breaker catalog number, i.e., FAL 36100V.

Table 3.36: Available Visi-Blade Circuit Breakers

Circuit Breaker Prefix	Amperes	\$ Price
FA, FH▲■	15–100 A	20% Price Adder
LA, LH	125–400 A	

- ▲ FH circuit breaker is not UL Listed.
- Not available on 1P FA/FH circuit breakers.

Moisture and Fungus Resistant Treatment for Circuit Breakers

(20% Price Adder)

This treatment covers the application of moisture and fungus resistant varnish to circuit breakers and molded case switches.

- The varnish meets Military Specification MIL-V-173C VARNISH, MOISTURE AND FUNGUS RESISTANT.
- The treatment meets military Specification MIL-T-152E TREATMENT, MOISTURE AND FUNGUS-RESISTANT, OF COMMUNICATIONS, ELECTRONIC, AND ASSOCIATED ELECTRICAL EQUIPMENT.

The treatment of circuit breakers in accordance with said specifications is intended to protect them against the moisture and fungus condition encountered in service by retarding the absorption of moisture and inhibiting the growth of fungi.

To order for F- and L-frame circuit breakers, place the suffix "FT" at the end of the circuit breaker catalog number, e.g., FAL36100 becomes FAL36100FT. To order for QB, QD, and QG circuit breakers, place the suffix "YF" at the end of the circuit breaker catalog number, e.g., QDL32150 becomes QDL32150YF. ED, EG, EF, GJL, PowerPact® D-, H-, J-, M-, P- and R-frame circuit breakers are inherently fungus resistant and need no further treatment.

Short Handle for LA/LH Circuit Breakers (No Additional Charge)

Certain applications of the LA/LH circuit breakers (as mains in particular panelboards) require the use of a slightly shorter operating handle. For ordering information refer to the chart below.

Table 3.37: Catalog Numbers for Short Handle LA/LH Circuit Breakers

Lug Configuration Desired		Catalog "Prefix Indication"	Catalog "Suffix Indication"	Circuit Breaker Cat. No.
ON End	OFF End			
Lugs	Lugs	"L"	"MB"	LAL36400MB
No Lugs	Lugs	"P"	"MB"	LAP36400MB
Lugs	No Lugs	"P"	"MT"	LAP36400MT
No Lugs	No Lugs	"F"	"MB"	LAF36400MB

P-Frame Replacement Handle

Replacement handle assemblies for PA, PC, PE, PX and PH circuit breakers (produced after March 1975) are available.

Table 3.38: P-Frame Replacement Handle

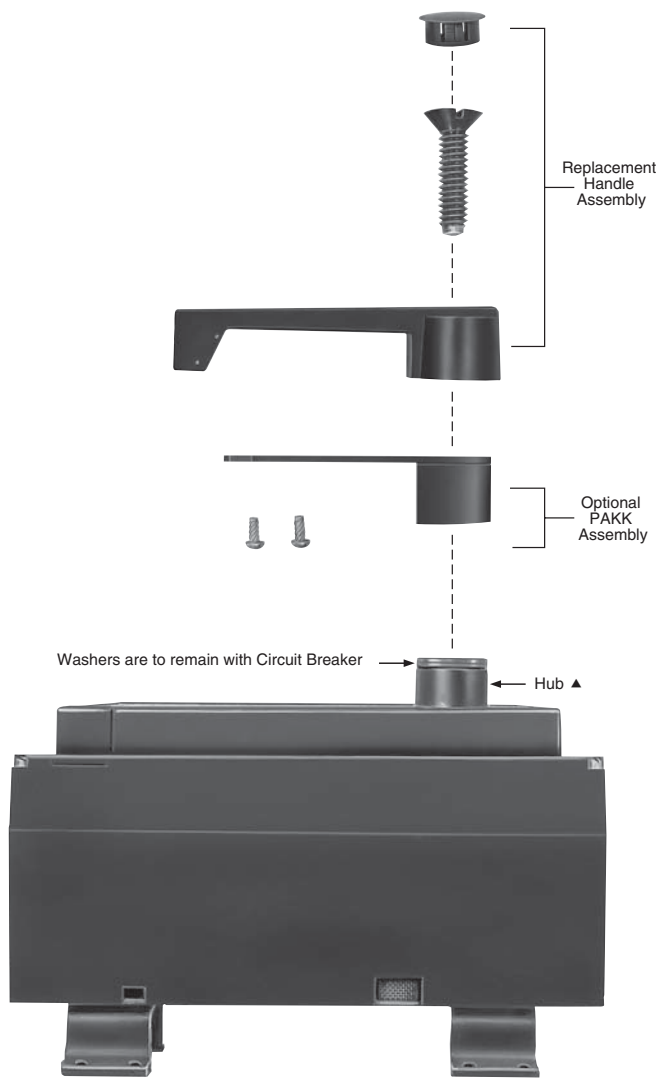
Circuit Breaker Cat. No. Prefix	Replacement Handle Cat. No.	\$ Price
PAF, PAE, PHF, PHE, PCF, PEC, PEF, PXF	HRPA	111.00

P-Frame Key Interlock Adapter Plate

PAKK Kit – An adapter plate that is added under the circuit breaker handle to allow mechanical interlocking with a key interlock (not included). The kit includes all the necessary hardware to mount onto the circuit breaker handle.

Table 3.39: P-Frame Key Interlock Adapter Plate

Cat. No.	\$ Price
PAKK	185.00



▲ The "hub" under normal conditions is insulated. When the phenolic handle is removed, a label is exposed warning of the hub being energized. That can only happen if a short circuit or severe overload occurs. The ionized gasses inside the circuit breaker could momentarily (1-2 cycles) put a high voltage potential on the hub.

**Exchange Guarantee Prices, Permanent Trip Molded Case
Circuit Breakers**

When a Square D permanent trip circuit breaker is supplied to meet a specification requiring an interchangeable trip unit, it may be exchanged for another circuit breaker of the same type with a different trip setting.

When entering an order for the replacement circuit breaker:

1. Reference "Exchange Price Guarantee" as a line item marking on the replacement order. The replacement order will be billed at normal authorized selling net price.
2. Request Return Material Authorization referencing "Exchange Price Guarantee" and the replacement exchange price guarantee invoice number.

When the circuit breaker is returned to Cedar Rapids, credit will be issued for the difference between the replacement net price billed and the exchange list price (from the table below) times the same multiplier used on the replacement order. The list price used to determine credit will be based on the highest trip setting of the circuit breakers involved in the exchange.

Only those circuit breaker types below are eligible for this exchange guarantee program.

Table 3.40: Exchange Guarantee Circuit Breakers

Circuit Breaker Type	Trip Range	Exchange List \$ Price
LA	All	2465.00
LH	All	4055.00
LC	All	4434.00

Lug Deletion (No Additional Charge)

In some applications, the circuit breaker does not require lugs on one or both ends. To meet this requirement, the circuit breaker should be ordered with the desired lug configuration as indicated below. If necessary, lugs may be removed in the field. However, if lugs are removed in the field, circuit breaker **Types** FH, FC, Q4 LA and LH must be secured with pan-mounting screws, or have "P" screws (cover screws and nuts) installed securing the base to the cover.

Table 3.41: Lug Configuration▲

ON End	OFF End	Circuit Breaker Prefix – Suffix
Lugs	Lugs	"L" (e.g., FAL36100)
No Lugs	No Lugs	"F" (e.g., FAF36100)
No Lugs	Lugs	"P" (e.g., FAP36100)
Lugs	No Lugs	"P – MT" (e.g., FAP36100MT)

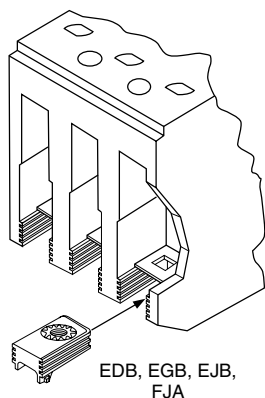
- ▲ See information on termination kits below
- MT suffix also required (except for PowerPact®).

Termination Insert Kits

The standard lugs supplied with EDB, EGB, EJB, and FJA circuit breakers and molded case switches are secured by means of a screw fastened through the circuit breaker terminal into the lug body. If the standard lug is removed and a bolted connection to the circuit breaker terminal pad is desired, a threaded insert kit is required. The insert is installed below the terminal pad. For ordering information see chart below.

Table 3.42: Termination Kit Inserts

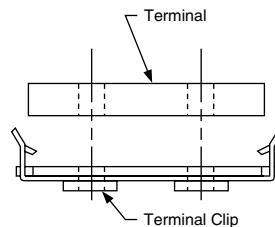
Kit Cat. No.	Inserts Per Kit	Circuit Breakers	\$ Price Per Kit
TIKFD	3	EDB, EGB, EJB, FJA	17.40



3 MOLDED CASE CIRCUIT BREAKERS

LC, LI, LE, LX and LXI Circuit Breaker Termination Clip Kit

The standard lugs supplied with LC, LI, LE, LX and LXI circuit breakers are secured by means of a screw fastened through the circuit breaker terminal into the lug body. If the standard lug is removed and a bolted connection to the circuit breaker terminal is desired, the AL600IN threaded terminal clip kit is required to make this connection. The AL600IN clip snaps onto the bottom of the terminal. For ordering information, see chart below.



LC, LI, LE, LX and LXI Circuit Breakers

Table 3.43: Termination Clip Kit

Kit Cat. No.	Clips Per Kit	Circuit Breakers	\$ Price Per Kit
AL600IN	3	LC, LI, LE, LX, LXI	65.00

Electric Joint Compound

I-Line® circuit breakers, I-Line busway plug-on units, I-Line panelboards and switchboards, QMB plug-on switches and motor control center plug-on units are supplied with factory applied joint compound on the plug-on connectors. The compound should not be removed because it contributes to the overall performance of the connection.

Whenever one of these units is removed and reinstalled, the joint compound should be reapplied. Catalog number PJC 7201 is a two-ounce container of compound specially formulated for the I-Line, QMB and motor control center connections.

No other type of commercially available joint compound should be used.



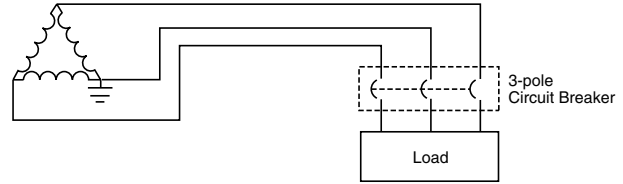
Table 3.44: Electric Joint Compound

Use With	Cat. No.	\$ Price
I-Line Circuit Breakers, QMB Plug-On Units, or Model-V MCC Units	PJC7201	19.80
SED Drawout Circuit Breakers	PJC8311	42.80

Circuit Breakers for Grounded B-Phase (BØ) (Corner-Grounded Delta) Systems (No Additional Charge)

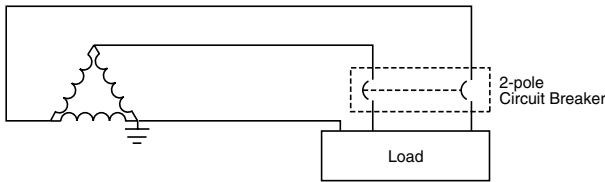
Ordering Information For Grounded BØ Circuit Breakers

1. There is no additional charge for grounded BØ circuit breakers.
2. For use on 480 V systems, FH and LH type circuit breakers must be ordered as 600 V versions and with a 5861 suffix (i.e. FHL361005861).
3. For use on 240 V systems, FH type circuit breakers may be ordered as 480 V versions with a 5861 suffix (i.e. FHL341005861).
4. FA and LA type circuit breakers are not available with grounded B phase markings.
5. Two-pole 240 V grounded B-phase circuit breakers (except EDB, EGB, EJB, QB, QD, QG, and QJ) will be built using three-pole modules.
6. Two-pole grounded BØ circuit breakers will be labeled with 240 Vac interrupting ratings. Three-pole grounded BØ circuit breakers will be labeled with 480 Vac interrupting ratings.
7. No self-certification is available for interrupting ratings greater than shown in the tables below.



3Ø 480 Vac Corner-Grounded Delta System

NOTE: Three-pole circuit breakers must be used on three-phase 480 V corner-grounded delta systems. The outside poles are to be connected to the ungrounded phase and the grounded conductor connected to the center pole. Connecting the circuit breaker in a manner other than that described or shown may result in an unsafe application of the circuit breaker.



3Ø 240 Vac Corner-Grounded Delta System

Table 3.45: Application Data for 240 Vac 3Ø Corner-Grounded Delta System

Cat. No. Prefix	Poles	UL Listed Interrupting Rating	
		Ampere Rating	240 Vac Interrupting Rating
QO-H, QOB-H	2	15-100 A	5 kA
QB, QD, QG, QJ	2▲	70-250 A	10 kA
EDB, EGB, EJB	2▲	15-125 A	18 kA, 35 kA, 65 kA
HD, HG, HJ, HL	2▲	15-150 A	18 kA, 35 kA, 65 kA, 100 kA
JD, JG, JJ, JL	2■	150-250 A	
FH, FHL	2■	15-100 A	42 kA
LH, LHL	2■	125-400 A	30 kA
PG, PJ, PK, PL Electronic Trip Unit	2■◆	600-1200 A	65 kA
RJ Electronic Trip Unit	2■◆	1200-2500 A	100 kA
RL Electronic Trip Unit	2■◆	1200-2500 A	125 kA
MG, MJ Electronic Trip Unit	3◆	300-800 A	
PG, PK Electronic Trip Unit	3◆	600-1200 A	65 kA
PG, PK Micrologic [®] Trip Unit	3◆	250-1200 A	
PJ, PL Electronic Trip Unit	3◆	600-1200 A	100 kA
PJ, PL Micrologic Trip Unit	3◆	250-1200 A	
RG, RK Electronic Trip Unit	3◆	1200-2500 A	65 kA
RG, RK Micrologic Trip Unit	3◆	600-2500 A	
RJ Electronic Trip Unit	3◆	1200-2500 A	100 kA
RJ Micrologic Trip Unit	3◆	600-2500 A	
RL Electronic Trip Unit	3◆	1200-2500 A	
RL Micrologic Trip Unit	3◆	600-2500 A	125 kA

- ▲ Standard labeling includes grounded B phase.
- Built using 3P module.
- ◆ Electronic = ET1.0 Electronic Trip System
Micrologic = 3.0, 5.0, 3.0A, 5.0A, 6.0A, 5.0P, 6.0P, 5.0H and 6.0 H Micrologic Trip System.

Table 3.46: 480 Vac 3Ø Corner-Grounded Delta System

Cat. No. Prefix	Poles★	UL Listed Interrupting Rating★	
		Ampere Rating	480 Vac Interrupting Rating
HD, HG, HJ, HL	3	15-150 A	18 kA, 35 kA, 65 kA, 100 kA
JD, JG, JJ, JL	3	150-250 A	
FH, FHL	3	15-100 A	10 kA
LH, LHL	3	125-400 A	14 kA
MG, MJ Electronic Trip Unit	3▼	300-800 A	35 kA
PG, PK Electronic Trip Unit	3▼	600-1200 A	35 kA, 65 kA
PG, PK Micrologic Trip Unit	3▼	250-1200 A	
PJ, PL Electronic Trip Unit	3▼	600-1200 A	65 kA, 100 kA
PJ, PL Micrologic Trip Unit	3▼	250-1200 A	
RG, RJ, RK, RL Electronic Trip Unit	3▼	1200-2500 A	35 kA, 65 kA, 100 kA
RG, RJ, RK, RL Micrologic Trip Unit	3▼	600-2500 A	
NT	3	800-1200	100 kA
NW	3	800-6000	150 kA

- ★ The grounded phase should be connected through the center pole only.
- ▼ Electronic = ET1.0 Electronic Trip System
Micrologic = 3.0, 5.0, 3.0A, 5.0A, 6.0A, 5.0P, 6.0P, 5.0H and 6.0 H Micrologic Trip System.

These circuit breakers with the properly selected trip range provide protection for trailing cables in compliance with the Federal Register for Mining Applications.

The thermal-magnetic circuit breakers listed below have thermally-responsive trip elements in addition to adjustable instantaneous trip mechanisms. They allow for independent selection of thermal and magnetic trip characteristics. See selection chart below. For Mag-Gard® instantaneous trip magnetic-only circuit breakers refer to Digest.

Table 3.47: Circuit Breakers for Mining Applications

Adjustable Magnetic Trip Range		Cat. No.	\$ Price
Low	High		
50 A	180 A	FAL3603013T	996.00
75 A	260 A	FAL3605014T	996.00
150 A	580 A	FAL3610016T	1226.00
500 A	1000 A	LAL3612522T	4619.00
		LAL3615022T	4619.00
		LAL3617522T	4619.00
		LAL3620022T	4619.00
		LAL3622522T	4619.00
		LAL3625022T	4619.00

Table 3.47: Circuit Breakers for Mining Applications

Adjustable Magnetic Trip Range		Cat. No.	\$ Price
Low	High		
1000 A	2000 A	LAL3620030T	4619.00
		LAL3622530T	4619.00
		LAL3625030T	4619.00
		LAL3630030T	4619.00
		LAL3635030T	4619.00
		LAL3640030T	4619.00
1250 A	2500 A	LAL3625032T	4619.00
		LAL3630032T	4619.00
		LAL3635032T	4619.00
		LAL3640032T	4619.00
1500 A	3000 A	LAL3630033T	4619.00
		LAL3635033T	4619.00
		LAL3640033T	4619.00
1750 A	3500 A	LAL3635025T	4619.00
		LAL3640035T	4619.00

UL Marine Listed Circuit Breakers

A standard for molded case circuit breakers which are intended to be installed and used aboard a boat or vessel is included in Supplement SA to UL 489, "Standard for Molded Case Circuit Breakers and Circuit Breaker Enclosures" (also referred to as UL product category DKTY). This UL Standard was established in accordance with U.S. Coast Guard regulations, applicable American Boat and Yacht Council Inc. publications, and NFPA® 302 "Standard for Motor Craft (Pleasure and Commercial)". In order to be UL Listed for marine use, circuit breakers must not use aluminum or aluminum alloys for terminal connections and must be calibrated at an ambient temperature of 40 °C. Standard circuit breakers should not be specified or used in place of marine circuit breakers.

The following table lists those circuit breakers which are UL Marine Listed for use on vessels over 65 ft. (19.8 m) in length. (PowerPact H and J-frame circuit breakers can also be used in vessels under 65 ft. [19.8 m] in length.)

Table 3.48: Circuit Breakers for Marine Applications

Cat. No. Prefix	Poles	Ampere Rating	Application	Cat. No.	\$ Price
FA, FAL	2	15-100 A	For use only on vessels over 65 feet (19.8 m) in length.	Add the number "9" after the catalog number prefix of the standard circuit breaker catalog number. Example: Standard FAL36100 Marine FAL936100	There is a 20% adder to the price of the equivalent standard circuit breaker. All marine circuit breakers are supplied with copper lugs.
	3	15-100 A			
FH, FHL	2, 3	15-100 A			
FI, FIL	2, 3	20-100 A			
KI, KIL	2, 3	110-250 A			
LA, LAL	2, 3	125-400 A			
LH, LHL	2, 3	125-400 A	For use on vessels over and under 65 feet (19.8 m) in length.	Add a "YA" after the standard circuit breaker catalog number. Example: Standard HGL36100 Marine HGL36100YA	
PowerPact® HD, HG, HJ, HL	2, 3	15-150 A			
PowerPact JD, JG, JJ, JL	2, 3	150-250 A			
PowerPact MG, MJ	2, 3	300-800 A			
PowerPact PG, PJ, PL	2, 3, 4	100-1200 A	For use only on vessels over 65 feet (19.8 m) in length.		
PowerPact RG, RJ, RL	2, 3, 4	600-2500 A			

For use on vessels over 65 ft. (19,8 m) in length
Para utilizarse en embarcaciones mayores a 65 pies (19,8 m) de longitud
À utiliser sur des navires ayant plus de 65 pi (19,8 m) de long

UL Naval Listed Circuit Breakers

A standard for molded case circuit breakers which are intended or use aboard non-combatant and auxiliary naval ships is included in Supplement SB to UL 489, "Standard for Molded Case Circuit Breakers and Circuit Breaker Enclosures". The following table lists those circuit breakers which are UL Naval Listed for use on vessels under 65 feet (19.8 m) in length.

Table 3.49: Circuit Breakers for Navel Applications

Cat. No. Prefix	Poles	Ampere Rating	Application	Cat. No.	\$ Price
HD, HG, HJ, HL	2, 3	15-150 A	For use on non-combat and auxiliary naval ships over and under 65 feet (19.8 m) in length.	Add a "YA" after the standard circuit breaker catalog number. Example: Standard HGL36100 Marine HGL36100YA	There is a 20% adder to the price of the equivalent standard circuit breaker. All marine circuit breakers are supplied with copper lugs.
JD, JG, JJ, JL	2, 3	150-250 A			

Factory-Installed Electrical Accessories

Electrical accessories are available on all molded case circuit breakers except FY and QOM1 circuit breakers.

- Alarm switch is the only accessory available for the 1-pole FA circuit breaker.
- Combination accessories may be ordered by description, i.e., 1021 and 1212.
- All AC electrical accessories shown below are rated for 50/60 Hz.
- Add 20% to accessory price for each field-installable accessory that is factory-installed.
- See page 3-21 for field-installable accessories. See Digest page 7-35 for PowerPact® circuit breaker accessories.

1A Alarm Switch Configuration

Color Code: Red Leads



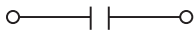
Circuit Breaker Open or Closed



Circuit Breaker Tripped

1B Alarm Switch Configuration

Color Code: Red Leads



Circuit Breaker Tripped

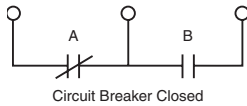


Circuit Breaker Open or Closed

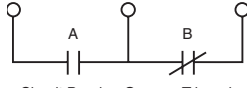
Auxiliary Switch Contact Configuration

Color Code:
"A" Contact - Yellow Leads
"B" Contact - Blue Leads
Common-Striped Leads

1A/1B



Circuit Breaker Closed



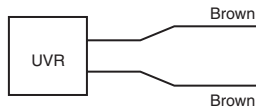
Circuit Breaker Open or Tripped

Table 3.50: Factory-Installed Accessories for Thermal-Magnetic Circuit Breakers

Accessory	Description	Rated Voltage	Coil Burden▲	Suffix	\$ Price Adder						
Shunt Trip	Trips the circuit breaker from a remote location by means of a trip coil energized from a separate circuit. A 120 V shunt trip will operate at 55% or more of rated voltage. All other shunt trips will operate at 75% or more of rated voltage. Application <ul style="list-style-type: none"> • For use with momentary or maintained push button. • Sure Trip Capacitor Unit requires 48 Vdc shunt trip. • Leads: (2) Black 18 AWG Cu. 	24 Vac	21 VA	-1042■	755.00						
		120 Vac	24 VA	-1021◆	755.00						
		208 Vac	107 VA	-1021	755.00						
		240 Vac	154 VA	-1021	755.00						
		277 Vac	14 VA	-1037■	755.00						
		480 Vac	45 VA	-1037■	755.00						
		24 Vdc	36 VA	-1027	755.00						
		48 Vdc	36 VA	-1028	755.00						
		125 Vdc	44 VA	-1029	755.00						
		250 Vdc	15 VA	-1030★	755.00						
Ground-Fault Shunt Trip	Trips the circuit breaker electrically using the signal from a Micrologic® Ground-Fault Module. Application <ul style="list-style-type: none"> • For use only with obsolete GP Ground-Censor® system or add on ground-fault module. • Leads: (2) Orange 18 AWG Cu. 	—	—	-G★	755.00						
Undervoltage Trip (UVR)	Trips the circuit breaker electrically when a control circuit falls below 35 to 70% of nominal (not field adjustable). Picks up at 35–85% of nominal voltage. Application <ul style="list-style-type: none"> • UVR must be energized in order to close the circuit breaker. • Leads: (2) Brown 18 AWG Cu leads. 	24 Vac 120 Vac 240 Vac 24 Vdc 48 Vdc	5 VA 8 VA 8 VA 2 VA 3 VA	-1143★ -1121◆ -1124 -1127 -1128	755.00 755.00 755.00 755.00 755.00						
Time Delay Unit	Provides adjustable time delay for UVR of 0.1 to 0.6 second before circuit breaker trips. Application <ul style="list-style-type: none"> • For use only with -1121 UV trip. • Adjustable time delay (0.1 to 0.6 second). • I-Line unit requires 1.5 in. (38 mm) of mounting space. • Leads: (2) Brown 18 AWG Cu and (2) Black/White 18 AWG Cu. 	120 Vac		<table border="1"> <thead> <tr> <th colspan="2">Cat. No.</th> </tr> <tr> <th>Unit Mt.</th> <th>I-Line®</th> </tr> </thead> <tbody> <tr> <td>690UVTD</td> <td>690UVTDI</td> </tr> </tbody> </table>	Cat. No.		Unit Mt.	I-Line®	690UVTD	690UVTDI	1941.00
Cat. No.											
Unit Mt.	I-Line®										
690UVTD	690UVTDI										
Auxiliary Switches	Monitors circuit breaker contact status and provides a remote signal indicating the circuit breaker contacts are OPEN or CLOSED. Application <ul style="list-style-type: none"> • Max. Load = FA, FH, FI, LC, LE, LI, LX, LXI. • 10 A @ 125–250 Vac, ¼ hp @ 125–250 Vac, 5 A @ 30 Vdc • Leads: Yellow for "A", Blue for "B", Striped for common 18 AWG Cu. 	1A/1B 2A/2B 3A/3B	See load info. in App. text at left	-1212 -1352 -1364▼	312.00 623.00 800.00						
Alarm Switches	Used with control circuits and actuated only when the circuit breaker has tripped. Standard construction includes a normally-open contact. Application <ul style="list-style-type: none"> • Max. Load = 10 A @ 125–250 Vac • Max. Load = 15 A @ 30 Vdc • Leads: (2) Red 18 AWG Cu. 	1A 1A 1B 1B	250 Vac 28 Vdc 250 Vac 48 Vdc	See load info. in App. text at left -2100 -2100 -2103 -2103	312.00 312.00 312.00 312.00						

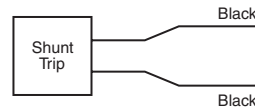
- ▲ Coil burden values do not apply to LC, LE, LI, LX and LXI. Consult Field Sales office for more information.
- Not available on FI or KI circuit breakers.
- ◆ LC, LE, LI, LX, and LXI circuit breakers operate at 75% or more of rated voltage.
- ★ Not available on LC, LE, LI, LX, LXI circuit breakers.
- ▼ Not available in FA, FC, FH, FI and KI circuit breakers.

Undervoltage Trip Wiring Diagram



Brown Wires To Be Connected To Control Power

Shunt Trip Wiring Diagram



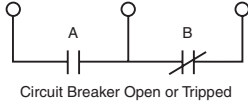
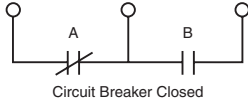
Black Wires To Be Connected To Control Power

690UVTD Wiring Diagram

**Auxiliary Switch
Contact Configuration**

Color Code:
A Contact - Yellow Leads
B Contact - Blue Leads
Common-Striped Leads

1A/1B



**1A Alarm Switch
Configuration**

Color Code: Red Leads

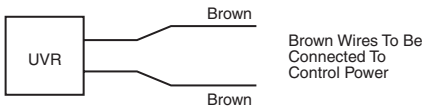


**1B Alarm Switch
Configuration**

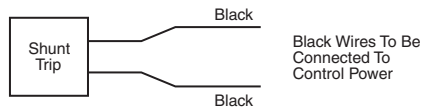
Color Code: Red Leads



**Undervoltage Trip
Wiring Diagram**



**Shunt Trip
Wiring Diagram**



Field-Installable Electrical Accessories

Complete field-installable accessory catalog number by inserting suffix from 3-20 between the parentheses in the catalog numbers shown in the table below. (Example: LA11212) See 3-20 for accessory pricing; add 20% to factory-install field-installable devices.

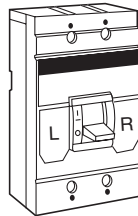
Table 3.51: Field-Installable Accessories for Thermal-Magnetic and Electronic Trip Circuit Breakers

Circuit Breaker	Shunt Trip	Ground-Fault Shunt Trip [▲]	Undervoltage Trip	Auxiliary Switches	Alarm Switch
Miniature Circuit Breakers, EH and EH-PL	Factory-Installed Only	Not Available	Not Available	Factory-Installed Only	Factory-Installed Only
FA, FH, FI, KI	Factory-Installed Only	Factory-Installed Only	Factory-Installed Only	Factory-Installed Only	Factory-Installed Only
LA, LH Series 4 [■]	LA1()	LA1G	LA1()	LA1()	Factory-Installed Only Right Pole
Q4	LA1()	LA1G	LA1()	LA1()	Factory-Installed Only Right Pole
LC, LE, LI, LX, LXI	LC1()	LC1G	LC1()	LC1()	Factory-Installed Only

- ▲ Used with obsolete GP Ground-Censor[®] system or add-on ground-fault modules.
- With LA and LH top-feed circuit breakers (suffix MT, I-Line jaws on OFF end) all accessories must be factory installed.

Complete field-installable accessory catalog number by inserting suffix from 3-20 between the parentheses in the catalog numbers shown in the table below. (Example: LA11212) See 3-20 for accessory pricing; add 20% to factory-install field-installable devices.

Table 3.52: Accessory Mounting Locations



LA, LH, Q4 Series 4 circuit breakers or newer = Field-installable accessories

LC, LI, LX, LXI circuit breakers = Field-installable accessories

Both accessory ports will accept shunt trips, UVRs and auxiliary switches. Alarm switches are factory installable **only** (right pole). Maximum of one device per port.



KAMO2120AC
With KAL Circuit Breaker



FAMO1 and FAMOP
With FAL Circuit Breaker

Electrical Operators

Provides remote ON, OFF/RESET control of molded case circuit breakers.

- A complete line of field-installable electrical operators.
- Not applicable on LC/LI/LE/LX/LXI circuit breakers.
- Installing side mounted motor operators on non I-Line® circuit breakers requires the use of a separate mounting pan.
- Side mounted electrical operators require an additional 4-1/2 in. (114 mm) of mounting space in I-Line installations.

When remote indication of circuit breaker status is required, order circuit breaker with 1A-1B auxiliary switch for ON-OFF Indication and alarm switch for TRIP Indication. Electrical operators require SPDT maintained contact switch. Refer to Class 9001 control unit listing for operators and pilot lights.

NOTE: Not available on Mag-Gard® circuit breakers and molded case switches.

Table 3.53: Electrical Operators

Circuit Breaker Prefix	Top Mount			Side Mount			Mounting Pan	
	Voltage	Cat. No.	\$ Price	Voltage	Cat. No.	\$ Price	Cat. No.	\$ Price
FA, FH	—	—	—	120 Vac	FAMO1	1304.00	—	—
FAL, FHL	—	—	—	120 Vac	FAMO1	1304.00	FAMOP	108.00
FI, KI	—	—	—	120 Vac	KAMO1	3506.00	—	—
FIL, KIL	120 Vac	KAMO2120AC	3642.00	120 Vac	KAMO1	3506.00	KAMOP	134.00
	240 Vac	KAMO2240AC	3642.00					
	24 Vdc	KAMO224DC	3642.00					
	125 Vdc	KAMO2125DC	3642.00					
LA, LH, Q4	—	—	—	120 Vac	LAMO1	4518.00	—	—
LAL, LHL, Q4L	120 Vac	LAMO2120AC	4704.00	120 Vac	LAMO1	4518.00	LAMOP	185.00
	240 Vac	LAMO2240AC	4704.00					
	24 Vdc	LAMO224DC	4704.00					
	125 Vdc	LAMO2125DC	4704.00					
MAL, MHL	120 Vac	MAMO2120AC	4704.00	120 Vac	MAMO1	4518.00	MAMOP	1856.00
	240 Vac	MAMO2240AC	4704.00					
	24 Vdc	MAMO224DC	4704.00					
	125 Vdc	MAMO2125DC	4704.00					
PA, PH, PC, PE, PX	120 Vac	PAMO2	5544.00	—	—	—	—	—

Handle Accessories

Table 3.54: Handle Accessories

Circuit Breaker Prefix	Poles	Cat. No.	\$ Price
Handle Tie			
(2)FA	3	FKHT	215.00
(2)FI,(2)KI, or (1)FI + (1)KI	2,3	FKHT	215.00
(2)LA or (2)Q4	2,3	LAHT	497.00
California Title 24 Comb. Handle Tie and Lock Off			
FY	(3)1P	FY3HT	53.00
FA	(3)1P	FA3HT	53.00
Handle Extension			
LA, LH, LE, LI, LX, LXI, Q4	2,3	AHEXLI	95.00

▲ Locks OFF only.

Circuit Breaker Prefix	Poles	Cat. No.	\$ Price
Handle Padlock Attachment (locks ON or OFF)			
FY Series 1	1	HPAFYQ	19.80
FA, FH, FC, FI	1,2,3	HPAFK	24.20
FY Series 2,	2,3	HPAFK	24.20
KI	2,3	HPAFKF▲	32.60
LA, LH, Q4	2,3	HPALM	26.00
		HPAXLM	27.60
LC, LE, LI, LX, LXI	2,3	AHPALI	25.20

Cylinder Lock

Used to lock the circuit breaker in the OFF position. Circuit breaker cannot be reset when locked OFF.

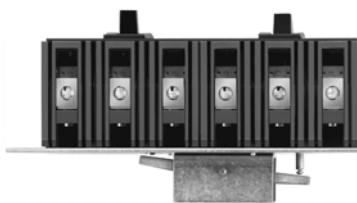
Table 3.55: Cylinder Lock

Circuit Breaker Prefix	Factory Installed Suffix	Field Installable Cat. No.	\$ Price
FA, FAL, FH, FHL	—CL	Factory-installed only	315.00
LA, LAL, LH, LHL, Q4	Field-installable only	LA1CL	315.00

■ Not available on Mag-Gard circuit breakers and molded case switches.

Interlocks

Table 3.56: Walking Beam Mechanical Interlock Components♦



Walking Beam Mechanical Interlock
Requires 2 circuit breakers with WB suffix,
1 walking beam assembly and 1 mounting pan.

Circuit Breaker Prefix	Manually Operated						Electrically Operated					
	Operator Suffix	\$ Price Adder	Walking Beam Ass'y.		Mounting Pan		Operator Suffix	\$ Price Adder	Walking Beam Ass'y.		Mounting Pan	
			Cat. No.	\$ Price	Cat. No.	\$ Price			Cat. No.	\$ Price	Cat. No.	\$ Price
FAL, FHL	WB	246.00	FA4WB	134.00	FAWBP4	177.00	WBMO	246.00	FA9WB	200.00	FAWBP9	242.00
LAL, LHL	WB	246.00	LA6WB	179.00	LAWBP6	242.00	WBMO	246.00	LA10WB	213.00	LAWBP10	309.00

♦ Fully enclosed interlocked units are available in Type 1 and Type 3R enclosures, with two neutrals provided in each enclosure. The completely enclosed assembly is not UL Listed. Please consult your nearest Square D/Schneider Electric local sales office for more information.



Table 3.57: Mechanical Lug Kit Information

Circuit Breaker Application				(Number of Wires Per Lug) Wire Range [▲]	Cat. No.	Lugs Per Kit	\$ Price Per Kit
Standard	Ampere Rating	Optional	Ampere Rating				
Al Lugs for Use with Al or Cu Wire							
FA, FH FI	15–30 A	FA, FH FI	35–100 A	(1) 14–4 AWG Cu or (1) 12–4 AWG Al	AL50FA	3	37.20
FC	35–100 A	FC	15–30 A	(1) 14–3 AWG Cu or (1) 12–1 AWG Al	AL100FA4	3	37.20
FA, FH FI	35–100 A	FA, FH FI	15–30 A	(1) 14–1/0 AWG Cu or (1) 12–1/0 AWG Al	AL100FA	3	37.20
—	—	FA, FH, FC	15–100 A	(1) 12–3 AWG Cu	AL100TF■	3	37.20
—	—	FA	150 A (only)	(1) 2–3/0 AWG	AL150FA	3	37.20
KI	110–175 A	—	—	(1) 4 AWG–350 kcmil	AL250KA	3	113.00
KI	200–250 A	KI	110–175 A	(1) 1/0 AWG–350 kcmil	AL250KI	3	107.00
Q4, LA, LH	125–400 A	—	—	(1) 1 AWG–600 kcmil or (2) 1 AWG–250 kcmil	AL400LA	1	35.70
—	—	Q4, LA, LH	125–400 A	(1) 350–750 kcmil	AL400LH7	1	47.10
LE, LX, LXI	100–250 A	LC, LI, LE, LX, LXI	300–600 A	(2) 1 AWG–350 kcmil	AL600LI35	1	49.60
LI, LE, LX, LXI	300–600 A	LE, LX, LXI	100–250 A	(2) 4/0 AWG–500 kcmil	AL600LI5	1	47.10
—	—	LC, LI, LE, LX, LXI	—	(1) 500–750 kcmil	AL600LI7	1	53.00
Cu Lugs for Use with Cu Wire Only ♦							
FC	15–30 A	—	—	(1) 14–10 AWG Cu	CU30FA4	3	37.20
—	—	FA, FH, FC, FI	15–100 A	(1) 14–1 AWG Cu	CU100FA	3	37.20
—	—	FA, FH, FC	15–100 A	(1) 12–3 AWG Cu	CU100TF■	3	62.00
—	—	KI	110–250 A	(1) 4 AWG–250 kcmil Cu	CU250KA	3	113.00
—	—	Q4, LA, LH	125–400 A	(1) 1 AWG–600 kcmil Cu or (2) 1 AWG–250 kcmil Cu	CU400LA	1	70.00
—	—	LI, LE, LX, LXI	—	(2) 1 AWG–350 kcmil Cu	CU600LI35	1	230.00
—	—	LI, LE, LX, LXI	—	(2) .4/0 AWG–500 kcmil Cu	CU600LI5	1	230.00
—	—	LI, LE, LX, LXI	—	(1) 500–750 kcmil Cu	CU600LI7	1	230.00

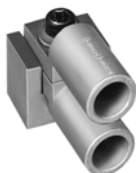
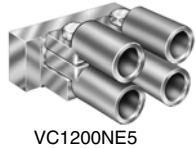
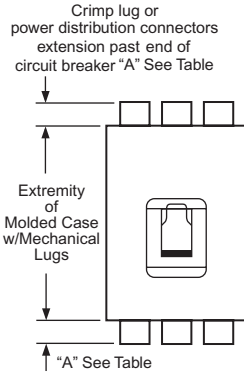
- ▲ Unless otherwise specified, wire sizes apply to both aluminum and copper conductors.
- For use in the OFF end only, when the OFF end is the load end.
- ♦ Use suffix 8002 for factory-installed Cu lugs. (20% adder.)

Compression Lug Kits

Table 3.58: Field-installable Compression Lug Kits▲

Circuit Breaker Type	Wire Range ♦	Dimension A (In)	Max. Lugs Per Terminal	Cat. No.	Lug Qty. Per Kit	\$ Price Per Kit
Aluminum Compression Lug Kits						
FA, FH, FC, FI	8–1/0 AWG	1.3	1	VC100FA	3	175.00
	4 AWG–300 kcmil	1.5	1	VC250KA3	3	255.00
KI	250–350 kcmil	1.5	1	VC250KA35	3	194.00
	250–350 kcmil	1.25	2	VC400LA35	2	194.00
LA, LH, Q4	4 AWG–300 kcmil	1.0	2	VC400LA3	2	202.00
	2/0 AWG–500 kcmil	2.2	1	VC400LA5	1	166.00
	500–750 kcmil	2.5	1	VC400LA7	1	198.00
LI, LE, LX, LXI ■	4 AWG–300 kcmil	1.05	2	VC600LI3	2	295.00
	2/0 AWG–500 kcmil	3.20	2	VC600LI5	2	308.00
	500–750 kcmil	3.45	1	VC600LI7	1	311.00
Copper Compression Lug Kits						
FA, FH, FC, FI	6–1/0 AWG Cu	1.4	1	CVC100FA	3	156.00
KI	2/0 AWG–300 kcmil Cu	1.5	1	CVC250KA3	3	301.00
	2/0 AWG–300 kcmil Cu	1.3	2	CVC400LA3	2	271.00
LA, LH, Q4	250–500 kcmil Cu	2.3	1	CVC400LA5	1	118.00
	250–500 kcmil Cu	3.20	2	CVC600LI5	2	491.00

- ▲ See instruction bulletins for recommended tools.
- These lug kits cannot be used on I-Line® circuit breakers.
- ♦ Unless otherwise specified, wire sizes apply to both aluminum and copper conductors.
- ★ All P-frame circuit breakers require terminal pads for mounting lugs of any type.



Power Distribution Connectors (PDC) for Circuit Breakers—for Field Replacement of Mechanical Lugs

Can be used for multiple load connections on one circuit breaker. Use in place of standard distribution blocks to save space and time.

Field-installable kits, including tin-plated aluminum connectors and all necessary mounting hardware are available for Square D FA, LA and Q4-frame molded case circuit breakers.

Connectors are UL Listed:

- For use on load end of circuit breaker only
- For use in UL508 Industrial Control applications only
- For use in UL 1995/CSA C22.2 No. 236 heating and cooling equipment
- For copper wire only

Table 3.59: PDC Lugs

Use With Circuit Breaker ▼	Circuit Breaker Ampere Rating	Wires Per Terminal & Wire Range▲	Cat. No.	Lug Quantity Per Kit	Dimension A (In.)	\$ Price Per Kit
FAL, FHL, FCL □	15–100 A	(6) 14–6 AWG	PDC6FA6	3	1.0	92.00
		(3) 14–2 AWG	PDC3FA2	3	1.2	92.00
LAL, LHL, Q4L	125–400 A	(6) 12–2/0 AWG	PDC6LA20	1	2.25	182.00
		(12) 14–4 AWG	PDC12LA4	1	1.25	129.00
		(3) 14–2 AWG (1) 2 AWG–250 kcmil	PDC4LA250	1	2.0	129.00

- ▼ Not for use with I-Line circuit breakers.
- ▲ When using fine stranded wire, increased cross sectional area may cause maximum wire size to be reduced.
- OFF end only when OFF end is the load end.

3 MOLDDED CASE CIRCUIT BREAKERS



Combination Local Current Meter and Trip Indicator

Table 3.60: Neutral Current Transformers

Cat. No.	\$ Price	Sensor	Where Used
LE25CT2	588.00	250 A	LXL, LEL, LXIL
LE4CT2	588.00	400 A	
LE6CT2	588.00	600 A	

Table 3.61: Electronic Trip Indicator and Current Meter Field-installable Kits

Device	Cat. No.	Included With Circuit Breaker	Optional	\$ Price
Local Trip Indicator Kit	ALTI	—	LXL, LXIL	1461.00
Local Current Meter Kit/Trip Indicator	ALAM	LEL	LXL, LXIL	2286.00

Table 3.62: Interchangeable Rating Plug Kits for all Circuit Breakers with Micrologic Series B Trip System

Cat. No.	Sensor Multiplier Value	\$ Price
ARP040	0.400	297.00
ARP050	0.500	297.00
ARP056	0.563	297.00
ARP058	0.583	297.00
ARP060	0.600	297.00
ARP063	0.625	297.00
ARP067	0.667	297.00
ARP070	0.700	297.00
ARP075	0.750	297.00
ARP080	0.800	297.00
ARP083	0.833	297.00
ARP088	0.875	297.00
ARP090	0.900	297.00
ARP100	1.000	297.00

Complying with NEC®

The National Electrical Code, Section 240-6(c) exception allows conductor ampere ratings equal to the selected long-time pick-up setting. Square D offers the seals below to restrict access to trip unit once settings are selected.



Electronic Trip Unit with Seals Installed to Restrict Access

Table 3.63: Trip Unit Seals

Description	Cat. No.	Package Quantity	\$ Price
Trip Unit Seal	TUSEAL	100	102.00

Table 3.64: Communication Adapter

Description	Cat. No.	\$ Price
Communication Adapter	CIM3F▲	465.00

▲ Required for Micrologic to communicate with PowerLogic® system.



CIM3F Communication Adapter



by Schneider Electric
www.schneider-electric.us

S48890 and S48895 Restraint Interface Modules

Table 3.65: RIM Requirements

	Micrologic #.0x Trip Units	Square D Micrologic Series B Trip Units	Square D GC-100 Ground-Fault Relay for Equipment Protection	Square D GC-200 Ground-Fault Relay for Equipment Protection	Merlin Gerin STR58 Trip Units	Federal Pioneer USRC and USRCM Trip Units
Micrologic #.0x Trip Units	15	R	R	15	15	R
Square D Micrologic Series B Trip Units	R	26	R	R	R	15
Square D GC-100 Ground-Fault Relay for Equipment Protection	R	R	7	R	R	R
Square D GC-200 Ground-Fault Relay for Equipment Protection	15	R	R	15	15	R
Merlin Gerin STR58 Trip Units	15	R	R	15	15	R
Merlin Gerin STR53 Trip Units	15	R	R	15	15	R
Federal Pioneer USRC and USRCM Trip Units	R	15	R	R	R	15
Square D Add-on Ground-Fault Module for Equipment Protection	R	5	R	R	R	R

Note: R=RIM module is required to restrain any devices.
Numerical References=Maximum number of upstream circuit breakers which can be restrained without requiring a RIM module.

The Restraint Interface Module (RIM) is used to allow zone-selective Interlocking communications between circuit breakers with Micrologic® Series B trip units or Micrologic® #.0x trip units, Compact® STR53 trip units, Masterpact® STR58 trip units, Federal Pioneer USRC and USRCM trip units, and Square D GC series ground-fault relays.

Upstream circuit breakers with Micrologic 3.0A, 5.0A 5.0P, 5.0H, 6.0A, 6.0P, and 6.0H trip units can receive up to 15 input signals without requiring a restraint interface module. If the number of input signals exceeds 15, then a RIM is required. Contact your local Sales Office for RIM requirements.

The restraint interface module operates on either 120 Vac/24 Vdc, or 240 Vac/24 Vdc, 50/50 Hz.

NOTE: The maximum distance between devices is 1000 ft. (305 m)

Table 3.66: Restraint Interface Module (RIM)

Cat. No.	Voltage	\$ Price
S48890	120 Vac/24 Vdc	1860.00
S48895	240 Vac/24 Vdc	1860.00

Circuit Breaker Dimensions

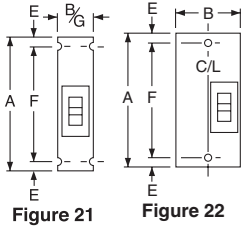


Figure 21

Figure 22

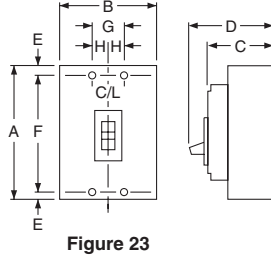


Figure 23

Table 3.67: Circuit Breakers Dimensions

Circuit Breaker Catalog No. Prefix	No. Poles	Fig. No.	Dimensions—Inches							
			A	B	C	D	E	F	G	H
FAL, FHL	1	21	6.00	1.50	3.16	4.13	0.44	5.13	1.50	—
	2	22	6.00	3.00	3.16	4.13	0.44	5.13	—	—
	3	23	6.00	4.50	3.16	4.13	0.44	5.13	1.50	0.75
FIL, KIL	2 & 3	23	8.00	4.50	3.66	4.75	0.44	7.13	1.50	0.75
LC, LI, LE, LX, LXI	2 & 3	23	11.86	7.50	5.48	6.74	0.55	10.75	2.50	—
Q4L, LAL, LHL	2 & 3	23	11.00	6.00	4.06	5.84	0.88	9.25	2.00	1.00

Table 3.68:

Frame Size	Approx. Shipping Weight (Lbs.)
FAL FHL 2-pole FCL	3
FAL FHL 3-pole	5
FIL	8
KIL	9
Q4L	15
LAL LHL	15
LXL LEL LIL	25

Circuit breaker enclosures are UL Listed, CSA Certified and are suitable for use as service equipment except as footnoted.

- The short circuit rating of an enclosed circuit breaker is equal to the rating of the circuit breaker installed, except as footnoted.
- Circuit breakers are ordered and shipped separately for field installation.
- For enclosure accessories refer to page 11-30 . For enclosure dimensions refer to page 11-4.



FA100X



FA100Y

Table 3.69: Circuit Breaker Enclosures

Circuit Breaker			Enclosure					
Cat. No. Prefix	Rating	Poles	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
			NEMA 1 Flush		NEMA 1 Surface		NEMA 3R▲	
LAL, LHL, Q4L	125–400 A	2, 3	LA400F	356.00	LA400S	356.00	LA400R	1655.00
			NEMA 4, 4X, 5, 3, 3R Stainless Steel (Hubs—See page 3-9)		NEMA 12/3R, 12K (Hubs—See page 3-9)			
KIL▼	110–250 A	2, 3	IK250DS	5238.00	With Knockouts (NEMA 12K)		Without Knockouts★ (NEMA 12/3R, 5)	
			NEMA 7♦ Cast Aluminum		NEMA 9△ Cast Aluminum			
FAL□	15–60 A	1, 2, 3	FA060X◇	1620.00	FA060Y■	1227.00		
	15–100 A	1, 2, 3	FA100X◇	2006.00	FA100Y■	1389.00		
JD, JG▽	150–225 A	2, 3	J225X☆	4083.00	J225Y☆	2834.00		

- ▲ Enclosures with NRB or RB suffix have provisions for 3/4 in. through 2-1/2 in. bolt-on hubs in top endwall. Enclosures with R suffix have blank endwalls and require field cut opening. For details and hub catalog numbers see Digest Section 3.
- Not CSA Certified.
- ♦ NEMA 7—Indoor Hazardous Locations—Division 1 and 2, Class I, Groups C and D; Class II, Groups E, F and G; Class III.
- ★ Suitable for rainproof NEMA 3R application by removing drain screw from bottom endwall.
- ▼ Short circuit rating is 100 k AIR at 480 Vac maximum.
- △ NEMA 9—Indoor Hazardous Locations—Division 1 and 2, Class II, Groups E, F and G; Class III
- Use 75°C Copper conductors only.
- ◇ Suitable for rainproof applications—includes PKDB1 breather and drain kit.
- ☆ Not UL listed due to wire bending space.
- ▽ 80% rated breakers only; SCCR 65kA @ 240 Vac, 25kA @ 480 Vac, 18kA @ 600 Vac.

Enclosed Motor-Operated Molded Case Circuit Breakers

NOTE: Contact local Field Office for catalog number prior to quoting or placing an order.

Motor-operated enclosed circuit breakers are utilized whenever it is desired to control the operation of an individually mounted circuit breaker from a remote location. Enclosed motor operated circuit breakers are available in either NEMA 1 or 3R construction. 120 Vac control circuit required for operation of motor operator. Sufficient space is included for field-installation of a terminal block for convenient end-user control circuit wiring. Not UL Listed.

Enclosed motor-operated circuit breaker with neutral

- Specify circuit breaker catalog number (ex: FAL36060)
- Specify side mounted operator only.
- Specify enclosure type (ex: NEMA 1, 3R, 12)
- Specify if neutrals are required (Same price)

Table 3.70: Enclosed Motor-Operated Circuit Breakers

Circuit Breaker Type	\$ Price ▲	
	NEMA 1	NEMA 3R
FAL—240 V	2915.00	3149.00
FAL—480 V	3131.00	3369.00
FAL—600 V	3308.00	3525.00
FHL—600 V	3725.00	3950.00
LAL—600 V	11187.00	11477.00
LHL—600 V	14147.00	14429.00

▲ Price includes 3P circuit breaker, motor operator, and neutral assembly factory assembled in specified enclosure.

Enclosed Molded Case Switches

Enclosed molded case switches are UL Listed devices supplied with factory-installed automatic molded case switch. Use the Cat. No. listed below and add the enclosure style suffix. An insulated groundable neutral, if required, must be ordered separately from page 7-58. Enclosed molded case switches are manufactured on order only.

Table 3.71: Enclosed Molded Case Switches

System	Ampere Rating	Cat. No. Add Suffix	600 Vac Short Circuit Withstand Ratings	\$ Price			
				NEMA 1	NEMA 3R▲	NEMA 4,4X,5	NEMA 12
				(F) or (S)	(RB) or (R)	(DS)	(AWK)
FH—100 A Frame, 3P, 600 Vac Max.							
2P	100	FHE26000()	18 kA	963.00	1277.00	2273.00	1083.00
3P	100	FHE36000()	18 kA	1187.00	1499.00	2432.00	1310.00
LH—400 A Frame, 3P, 600 Vac Max.							
2P	400	LHE26000()	25 kA	3915.00	5174.00	9264.00	4497.00
3P	400	LHE36000()	25 kA	4653.00	5982.00	9999.00	5232.00

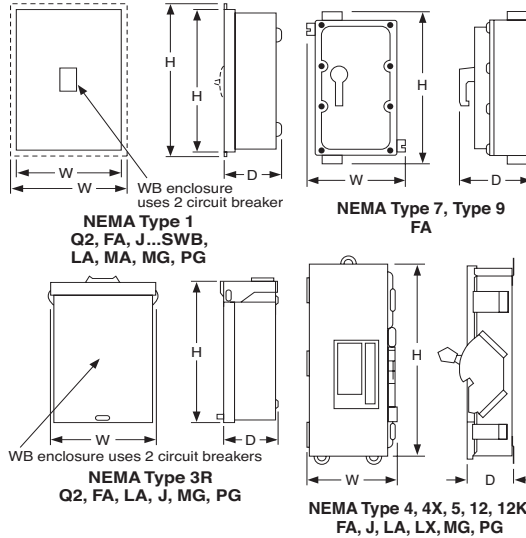
▲ FHE and KHE devices accept bolt-on hubs and have a suffix RB. LHE, MHE and NCE devices have blank endwalls and have a suffix R. For details and hub catalog numbers see page 3-9.

Dimensions: Refer to enclosed circuit breaker dimensions by NEMA type on page 7-58.

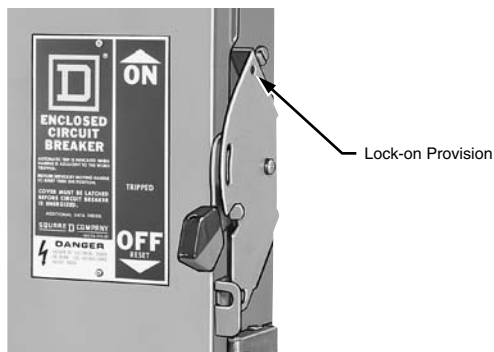
Table 3.72: Enclosure Dimensions

Cat. No.	Series	Approximate Dimension					
		H		W		D	
		in.	mm	in.	mm	in.	mm
FA060X▲	E1	16.00	406	9.88	251	7.00	178
FA060Y▲	E1	16.00	406	9.88	251	7.00	178
FA100X▲	E1	16.00	406	9.88	251	7.00	178
FA100Y▲	E1	16.00	406	9.88	251	7.00	178
LA400F	E2	45.63	1159	16.50	419	6.50	165
LA400R	E2	44.00	1118	15.38	391	7.88	200
LA400S	E2	44.50	1130	15.38	391	6.50	165

▲ Tapped conduit opening, top and bottom endwall: FA060X/Y-3▲, FA100X/Y-1-14", KA225X/Y-2-12".



Lock-On Provisions



Lock-off provisions are standard on all NEMA Type 4-4X-5 stainless steel and NEMA Type 12, 12K circuit breaker enclosures. Provision for one inch hasp padlock is available factory installed. This modification will allow the circuit breaker to be locked in the ON position. When locked in the ON position, the external operator will not indicate if circuit breaker is tripped. UL Listed.

Table 3.73: Price Adder Each Enclosure

Enclosure Prefix	Suffix for Lock-On Provision	\$ Price
FA, J	SPLO	155.00
LA, M, P		234.00

Pilot Light—Selector Switch—Push Button

Pilot lights, push buttons or selector switches are available factory installed in the cover of NEMA Type 3R, (4-4X-5) stainless steel or 12 enclosures. Wiring to contact blocks is not available. Customer must furnish catalog number of device desired. Price = circuit breaker + enclosure + neutral + ground + pilot light, push button and/or selector switch + factory-installed adder. Order by description. Not UL Listed.

Table 3.74: Price Adder

Quantity	\$ Price Adder
For Each Device Installed	297.00

Phenolic Legend Plate

Available engraved and mounted on most circuit breaker enclosures. Legend engraved in 1/4-inch high white letters on black background. Customer must provide legend. UL Listed. Not available on NEMA Type 7 or 9 enclosures.

To order, add suffix NP to standard catalog number (i.e. LA400SNP). Price adder per legend plate: **\$167.00**

Table 3.79: Insulated Groundable Neutral Assembly

Circuit Breaker		Neutral Assembly For Use With						Terminal Lug Data—Total Available (Line plus Load) AWG/kcmil
Cat. No. Prefix	Ampere Rating	NEMA 1 & 3R		NEMA 4, 4X, 5, 12 & 12K		NEMA 7 & 9		
		Cat. No.	\$ Price	Cat. No.	Price	Cat. No.	\$ Price	
KIL	225	—	—	SN225KA	201.00	—	—	(2) 4–300 Al/Cu, plus (2) 14–1/0 Al/Cu
KIL	250	—	—	SN400LA	251.00	—	—	(2) 1–600 or (4) 1–250 Al/Cu, plus (2) 4–300 Al/Cu

Special Paint

UL Listed circuit breaker enclosures are available painted with special safety colors. To order safety colored enclosures add suffixes as noted in Table x.xx to the standard enclosure commercial reference number.

All colors comply with OSHA Standard 1910.144 and ANSI Specification Z535.1 for marking physical hazards.

A minimum quantity of ten is required. Order by description. Not available for NEMA Type 7/9 or stainless steel enclosures.

Shipment: 6 weeks

Table 3.75: Price Adder Each Enclosure

Enclosure Prefix			
FA \$ Price	J \$ Price	LA \$ Price	P \$ Price
113.00	180.00	327.00	513.00

Table 3.76: Safety Colors

Safety Color	Suffix
Black	SP0
Red	SP2
Orange	SP3
Yellow	SP4
Green	SP5
Blue	SP6
Purple	SP7
Gray	SP8
White	SP9

Stainless Steel Front

NEMA Type 1, flush-mount circuit breaker enclosures are available with stainless steel fronts. This modification is desirable in food handling areas such as cafeterias and restaurants. Not UL Listed. Minimum quantity of 10 per catalog number is required.

Table 3.77: Price Each Enclosure

Cat. No.	\$ Price
FA100FSS	1659.00
LA400FSS	2223.00

Enclosed Ground-Fault Modules (GFM)

Ground-fault modules (GFM) can be factory installed on FAL and FHL circuit breakers and enclosed in the next larger size NEMA 1 or 3R enclosure.

Enclosed circuit breaker with ground-fault module

- Specify circuit breaker catalog number
- Specify enclosure type (NEMA 1 or 3R)
- Ground-fault modules are available factory installed. See table below for pricing and availability.

Table 3.78: Enclosed Circuit Breaker with Ground Fault Module

Circuit Breaker Prefix	\$ Price ■	
	NEMA 1	NEMA 3R
FAL, 600 V, 15–60 A	6585.00	7091.00
FAL, 600 V, 70–100 A	6797.00	7307.00

■ Price includes 3P circuit breaker, GFM, neutral assembly and neutral CT factory assembled in specified enclosure

3 MOLDED CASE CIRCUIT BREAKERS

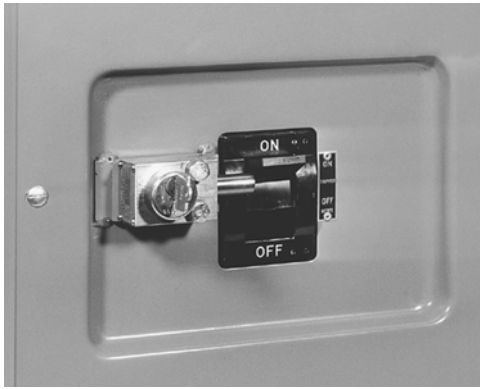
Equipment Ground Kit

Price adder includes price of ground bar kit.

Table 3.80: Ground Kit Price Adder

Enclosure Type	Enclosure Circuit Breaker Cat. No. Prefix	Number of Terminals per Kit	Conductors Per Terminal	Wire Range AWG/kcmil	Field-Installable		Factory-Installed ♦	
					Ground Bar Kit Cat. No.	\$ Price	Suffix	\$ Price
NEMA Type 1 and 3R	FAL, FHL, FIL KIL LAL, LHL	2	1	10–2/0 Cu or 6–2/0 Al	PKOGTA2▼	263.00	GL	191.00
NEMA Type 4-4X-5 stainless steel and NEMA Type 12	FAL, FHL, FIL KIL LAL, LHL, Q4L							
	M, P★	2	1	10–2/0 Cu or 6–2/0 Al		263.00		263.00

- ♦ For factory installation of equipment ground lugs in these or any other enclosures, add suffix GL.
- ★ Use of PKOGTA2 with M, and P enclosure prefix not UL Listed
- ▼ Quantity (2) may be required for some wire installation.









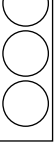
Key Interlock Systems

(Factory installed only)

Interlocks are used to prevent the authorized operator from making an unauthorized operation. Not available on hazardous location devices (NEMA 7/9.)

The key interlock system is a simple and easy method of applying individual key interlock units and assemblies to the above equipment so as to require operation in a predetermined sequence. UL Listed.

Table 3.81: Locking Position Designations

Locking Position	Designation
	Device locked open with key removed.
	Device locked closed with key removed.
	Device locked open or closed with key removed.
	Device locked open with key held.
	Device locked closed with key held.
	Device locked open or closed with key held.
	Multi-lock interlock. (More than one key per lock.)

NOTE: 1. Device locked open (circuit breaker in OFF position).
2. Device locked closed (circuit breaker in ON position).

Quoting:

Contact local Field Sales office for catalog number, availability and pricing prior to quoting a job.

Ordering:

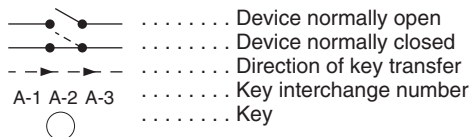
- Order cannot be released for production until the following information has been provided.
- End User—Company name, address
- Function of each lock (e.g., circuit breaker to be locked open with key removed, key held when circuit breaker is closed)
- Existing Equipment—if circuit breaker is to be interlocked with equipment already on site, provide brand of existing lock and key number
- Other New Equipment—if circuit breaker is to be interlocked with new equipment not yet installed at the site, then provide contact person and phone number so that locks may be coordinated
- Additional information may be required upon order entry
- Federal Pioneer locks supplied unless otherwise specified

Table 3.82: Price Adder Per Lock, Each Complete Enclosed Device▲

Device	\$ Price
Enclosed industrial circuit breaker	2055.00

▲ Prices do not apply when more than three devices are interlocked as these schemes normally require more than one key assembly per device.

Diagram Symbols



Sample Application—1

To prevent two devices from being closed simultaneously.

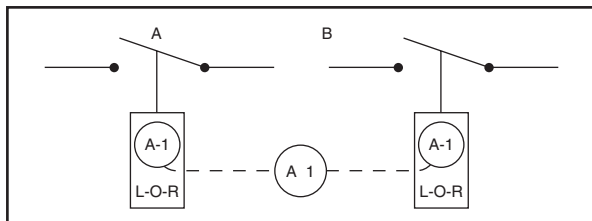


Figure 1

Two devices are shown in Figure 1. In operation they are not closed at the same time. With the interlocks arranged as shown only one key is required in the interlocking system. Both devices are shown open, therefore, the key is free. To close any one device the key is inserted and turned in that particular lock, the key is held in this lock until the device is again locked open. This simple interlocking sequence lends itself to a multitude of applications. The procedure is the same for two devices, neither of which is to be opened at the same time.

Sample Application—2

To prevent opening of switch A when circuit breaker B is closed.

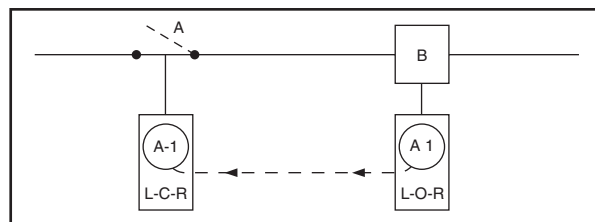


Figure 2

Switch A and circuit breaker B are in closed position. Key A-1 is held in circuit breaker B interlock.

1. Open circuit breaker.
2. Turn key A-1 in L-O-R interlock on circuit breaker B to lock open. Key A-1 is now free.
3. Insert key A-1 in L-C-R interlock on switch A and turn to unlock.
4. Open switch A. Key A-1 is now held. Reverse sequence to restore service.

Sample Application—3

To prevent operation of switch A when circuit breaker B is closed. Permits reclosing of circuit breaker for servicing when switch is locked open.

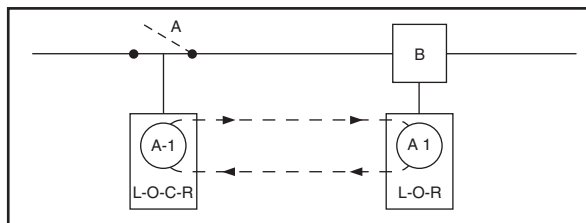


Figure 3

Switch A and circuit breaker B are in closed position. Key A-1 is held in circuit breaker interlock.

1. Open circuit breaker.
2. Turn key A-1 in L-O-R interlock on circuit breaker B to lock open. Key A-1 is now free.
3. Insert key A-1 in L-O-C-R interlock on switch A and turn to unlock.
4. Open switch A.
5. Turn key A-1 in L-O-C-R interlock on switch A to lock open. Key A-1 is now free.
6. Return key A-1 to circuit breaker interlock and unlock for operation during servicing period.

Reverse sequence to restore service.

Sample Application—4 (Main-Tie-Main)

To prevent paralleling of lines A and B.—Two loads, fed from either source.

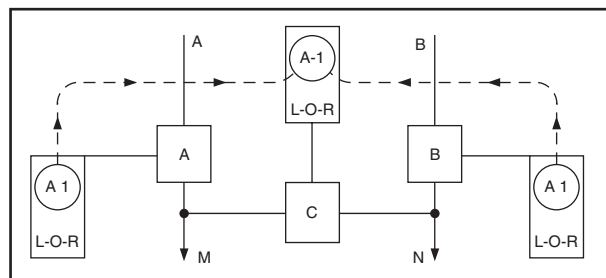


Figure 4

Circuit breaker A is closed to supply load M. Circuit breaker B is closed to supply load N. Tie-circuit breaker C is open. Keys A-1 are held in interlocks on both circuit breakers A and B. Tie-circuit breaker C cannot be closed unless either A or B is locked open.

To transfer load N to circuit breaker A, proceed as follows:

1. Open circuit breaker B.
2. Turn key A-1 in L-O-R interlock on circuit breaker B to lock open. Key A-1 is now free.
3. Insert Key A-1 in L-O-R interlock on tie-circuit breaker C and turn to unlock. Key A-1 is now held.
4. Close tie-circuit breaker C.

Reverse sequence to restore service.

Load M can be supplied through circuit breaker B in a similar manner.