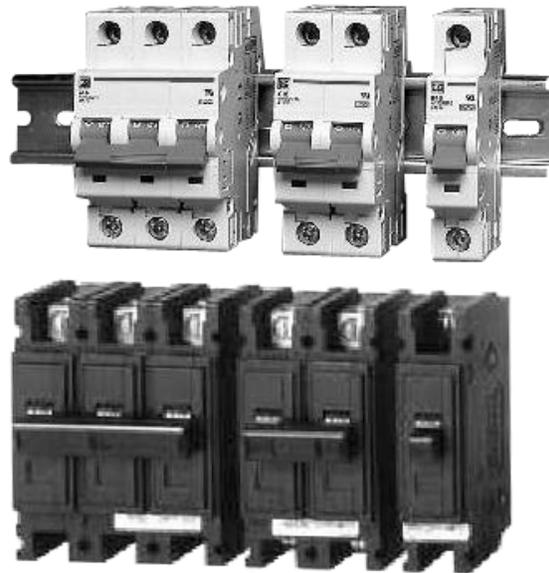


Miniature Circuit Breakers & Supplementary Protectors

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Miniature Circuit Breakers and Supplementary Protectors

QUICKLAG®

Quick Reference

Table 11-1. Eaton's Cutler-Hammer® QUICKLAG® Industrial Circuit Breakers ① Plug-In, Bolt-On, Cable-In/Cable-Out

Circuit Breaker Type	Circuit Breaker Type Code	Continuous Ampere Rating at 40°C	Number of Poles	Volts		Federal Spec. W-C-375b	Interrupting Ratings rms Symmetrical Amperes						Page Number
				ac	dc		ac Ratings Volts			dc ②			
							120	120/240	240	24 – 48	62.5	80	
HQP	P	10 – 70	1	120/240	24, 48, 62.5	10a, 11a, 12a	—	10,000	—	5,000	③	—	11-4
HQP		10 – 125	2	120/240	24, 48, 80	10a, 12a	—	10,000	—	5,000	5,000	5,000	11-4
HQP		10 – 100	2, 3	240	—	10b, 11b, 12b	—	—	10,000	—	—	—	11-4
QPHW	P	15 – 70	1	120/240	24, 48, 62.5	14a	—	22,000	—	5,000	③	—	11-4
QPHW		15 – 125	2	120/240	24, 48, 80	14a	—	22,000	—	5,000	5,000	5,000	11-4
QPHW		15 – 100	2, 3	240	—	14b	—	—	22,000	—	—	—	11-4
QHPX	P	15 – 70	1	120/240	24, 48, 62.5	—	—	42,000	—	5,000	③	—	11-4
QHPX		15 – 100	2	120/240	24, 48, 80	—	—	42,000	—	5,000	5,000	5,000	11-4
QHPX		15 – 100	3	240	—	—	—	—	42,000	—	—	—	11-4
QHPW	P	15 – 30	1	120/240	24, 48, 62.5	15a	—	65,000	—	5,000	③	—	11-4
QHPW		15 – 30	2	120/240	24, 48, 80	15a	—	65,000	—	5,000	5,000	5,000	11-4
QHPW		15 – 20	3	240	—	15b	—	—	65,000	—	—	—	11-4
QPGF	P, GF	15 – 40	1	120	—	10a, 11a, 12a	10,000	—	—	—	—	—	11-5
QPGF		15 – 50	2	120/240	—	10a, 11a, 12a	—	10,000	—	—	—	—	11-5
QPHGF	P, GF	15 – 30	1	120	—	10a, 11a, 12a	22,000	—	—	—	—	—	11-5
QPHGF		15 – 50	2	120/240	—	10a, 11a, 12a	—	22,000	—	—	—	—	11-5
QPGFEP	P, GFEP	15 – 40	1	120	—	—	10,000	—	—	—	—	—	11-5
QPGFEP		15 – 50	2	120/240	—	—	—	10,000	—	—	—	—	11-5
QPHGFEP	P, GFEP	15 – 30	1	120	—	—	22,000	—	—	—	—	—	11-5
QPHGFEP		15 – 30	2	120/240	—	—	22,000	22,000	—	—	—	—	11-5
BABRSP	B	15 – 30	1	120	—	—	—	10,000	—	—	—	—	11-16
BABRSP		15 – 30	2	120/240	—	—	—	10,000	10,000	—	—	—	11-16
BRRP	P	15 – 30	1	120	—	—	10,000	—	—	—	—	—	11-16
BRRP		15 – 30	2	120/240	—	—	—	10,000	—	—	—	—	11-16
CLRP	P	15 – 30	1	120	—	—	10,000	—	—	—	—	—	11-16
CLRP		15 – 30	2	120/240	—	—	—	10,000	—	—	—	—	11-16

① QUICKLAG circuit breakers are suitable for application in relative humidity 0 – 95% noncondensing.

② Two-pole dc interrupting ratings based on 2 poles connected in series. Not UL® listed.

③ 62.5 Vac interrupting rating is 3800 AIC 10 – 50 amperes and 2500 AIC 55 – 100 amperes continuous.

Note: Circuit Breaker Type Codes: **P** Plug-In; **B** Bolt-On; **C** Cable-In/Cable-Out; **GF** Ground Fault, 5 mA; **GFEP** Ground Fault, 30 mA.

Note: For Types GHBS, GBHS and BABRP Solenoid-Operated, Remote-Controlled Circuit Breakers, see **Pages 11-16 – 11-19**.

Note: For Type WMT Circuit Breakers, see **Pages 11-27 – 11-36**.

Note: For Types WMS and SPHM Supplementary Protectors, see **Pages 11-37 – 11-50**.

QUICKLAG

Quick Reference (Continued)

Tables 11-1. Eaton's Cutler-Hammer QUICKLAG Industrial Circuit Breakers ① Plug-In, Bolt-On, Cable-In/Cable-Out (Continued)

Circuit Breaker Type	Circuit Breaker Type Code	Continuous Ampere Rating at 40°C	Number of Poles	Volts		Federal Spec. W-C-375b	Interrupting Ratings rms Symmetrical Amperes						Page Number
				ac	dc		ac Ratings Volts			dc ②			
							120	120/240	240	24-48	62.5	80	
BAB	B	10 – 70	1	120/240	24, 48, 62.5	10a, 11a, 12a	—	10,000	—	5,000	③	—	11-6
BAB	B	10 – 125	2	120/240	24, 48, 80	10a, 12a	—	10,000	—	5,000	5,000	5,000	11-6
BAB	B	10 – 100	2, 3	240	—	10b, 11b, 12b	—	—	10,000	—	—	—	11-6
BABRP	B	15 – 30	1	120	—	—	10,000	—	—	—	—	—	11-13
BABRP	B	15 – 30	2	120/240	—	—	—	10,000	—	—	—	—	11-13
QBAF	B, AF	15 – 20	1, 2	120/240	—	—	—	10,000	—	—	—	—	11-7
QBAG	B, AF, GF	15 – 20	1, 2	120/240	—	—	—	10,000	—	—	—	—	11-7
QBHW	B	15 – 70	1	120/240	24, 48, 62.5	14a	—	22,000	—	5,000	③	—	11-6
QBHW	B	15 – 125	2	120/240	24, 48, 80	14a	—	22,000	—	5,000	5,000	5,000	11-6
QBHW	B	15 – 100	2, 3	240	—	14b	—	—	22,000	—	—	—	11-6
HBAX	B	15 – 70	1	120/240	24, 48, 62.5	—	—	42,000	—	5,000	③	—	11-6
HBAX	B	15 – 100	2	120/240	24, 48, 80	—	—	42,000	—	5,000	5,000	5,000	11-6
HBAX	B	15 – 100	3	240	—	—	—	—	42,000	—	—	—	11-6
HBAW	B	15 – 30	1	120/240	24, 48, 62.5	15a	—	65,000	—	5,000	③	—	11-6
HBAW	B	15 – 30	2	120/240	24, 48, 80	15a	—	65,000	—	5,000	5,000	5,000	11-6
HBAW	B	15 – 20	3	240	—	15b	—	—	65,000	—	—	—	11-6
QBGF	B, GF	15 – 40	1	120	—	10a, 11a, 12a	10,000	—	—	—	—	—	11-8
QBGF	B, GF	15 – 50	2	120/240	—	10a, 11a, 12a	—	10,000	—	—	—	—	11-8
QBHGF	B, GF	15 – 30	1	120	—	10a, 11a, 12a	22,000	—	—	—	—	—	11-8
QBHGF	B, GF	15 – 30	2	120/240	—	10a, 11a, 12a	—	22,000	—	—	—	—	11-8
QBGFEP	B, GFEP	15 – 40	1	120	—	—	10,000	—	—	—	—	—	11-8
QBGFEP	B, GFEP	15 – 50	2	120/240	—	—	—	10,000	—	—	—	—	11-8
QBHGFE	B, GFEP	15 – 30	1	120	—	—	22,000	—	—	—	—	—	11-8
QBHGFE	B, GFEP	15 – 30	2	120/240	—	—	22,000	22,000	—	—	—	—	11-8
QC	C	10 – 70	1	120/240	24, 48, 62.5	10a, 11a, 12a	—	10,000	—	5,000	③	—	11-10
QC	C	10 – 100	2	120/240	24, 48, 80	10a, 12a	—	10,000	—	5,000	5,000	5,000	11-10
QC	C	10 – 100	2, 3, 4	240	—	10b, 11b, 12b	—	—	10,000	—	—	—	11-10
QCD	C (DIN-Rail Mount)	10 – 100	1	120/240	—	—	10,000	—	—	—	—	—	11-11
QCD	C (DIN-Rail Mount)	10 – 100	2	120/240	—	—	10,000	—	—	—	—	—	11-11
QCD	C (DIN-Rail Mount)	10 – 100	3	240	—	—	—	10,000	10,000	—	—	—	11-11
QCF	C	10 – 60	1, 2	120/240	24, 48, 62.5	—	10,000	10,000	—	3,000	3,000	—	11-12
QCF	C	15 – 20	1, 2	120/240	24, 48, 62.5	—	22,000	—	—	3,000	3,000	—	11-12
QCF	C	15 – 30	2, 3	240	24, 48, 62.5	—	—	10,000	—	3,000	3,000	—	11-12
QCR	C	10 – 60	1, 2	120/240	24, 48, 62.5	—	10,000	10,000	—	3,000	3,000	—	11-12
QCR	C	15 – 20	1, 2	120/240	24, 48, 62.5	—	22,000	—	—	3,000	3,000	—	11-12
QCR	C	15 – 30	2, 3	240	24, 48, 62.5	—	—	10,000	—	3,000	3,000	—	11-12
QCHW	C	15 – 70	1	120/240	24, 48, 62.5	14a	—	22,000	—	5,000	③	—	11-10
QCHW	C	15 – 100	2	120/240	24, 48, 80	14a	—	22,000	—	5,000	5,000	5,000	11-10
QCHW	C	15 – 100	2, 3	240	—	14b	—	—	22,000	—	—	—	11-10
QHCX	C	15 – 70	1	120/240	24, 48, 62.5	—	—	42,000	—	5,000	③	—	11-10
QHCX	C	15 – 100	2	120/240	24, 48, 80	—	—	42,000	—	5,000	5,000	5,000	11-10
QHCX	C	15 – 100	3	240	—	—	—	—	42,000	—	—	—	11-10
QHCW	C	15 – 30	1	120/240	24, 48, 62.5	15a	—	65,000	—	5,000	③	—	11-10
QHCW	C	15 – 30	2	120/240	24, 48, 80	15a	—	65,000	—	5,000	5,000	5,000	11-10
QHCW	C	15 – 20	3	240	—	15b	—	—	65,000	—	—	—	11-10
QCGF	C, GF	15 – 40	1	120	—	—	10,000	—	—	—	—	—	11-15
QCGF	C, GF	15 – 50	2	120/240	—	—	—	10,000	—	—	—	—	11-15
QCHGF	C, GF	15 – 30	1	120	—	—	22,000	—	—	—	—	—	11-15
QCHGF	C, GF	15 – 30	2	120/240	—	—	—	22,000	—	—	—	—	11-15
QCGFEP	C, GFEP	15 – 40	1	120	—	—	10,000	—	—	—	—	—	11-15
QCGFEP	C, GFEP	15 – 50	2	120/240	—	—	—	10,000	—	—	—	—	11-15
QCHGFEP	C, GFEP	15 – 30	1	120	—	—	22,000	—	—	—	—	—	11-15
QCHGFEP	C, GFEP	15 – 30	2	120/240	—	—	—	22,000	—	—	—	—	11-15

① QUICKLAG circuit breakers are suitable for application in relative humidity 0 – 95% noncondensing.

② Two-pole dc interrupting ratings based on 2 poles connected in series. Not UL listed.

③ 62.5 Vac interrupting rating is 3800 AIC 10 – 50 amperes and 2500 AIC 55 – 100 amperes continuous.

Note: Circuit Breaker Type Codes: **P** Plug-In; **B** Bolt-On; **C** Cable-In/Cable-Out; **GF** Ground Fault, 5 mA; **GFEP** Ground Fault, 30 mA; **AF** Arc Fault.

Note: For Types GHBS, GBHS and GHQRSP Solenoid-Operated, Remote-Controlled Circuit Breakers, see **Pages 11-16 – 11-19**.

Note: For Type WMT Circuit Breakers, see **Pages 11-27 – 11-36**.

Note: For Types WMS and SPHM Supplementary Protectors, see **Pages 11-37 – 11-50**.

QUICKLAG

QUICKLAG Plug-On Types
HQP, QPHW, QHPX, QHPW



QUICKLAG Type HQP 1-Pole

Product Description

- Built and listed to UL 489.
- All products UL and CSA® listed.
- All products 15 – 100 amperes are HACR rated.
- Switching duty rated for 120 Vac fluorescent light applications.

Technical Data and Specifications

Table 11-2. Shipping Data

Number of Poles	Carton Qty.	Approx. Weight Lbs.(kg)	Dimensions in Inches (mm)
1	24	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
2	12	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
3	8	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)

Product Selection

Table 11-3. Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	1-Pole 120/240 Vac		2-Pole 120/240 Vac		240 Vac		3-Pole 240 Vac	
	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$

QUICKLAG Type: HQP 10,000 Ampere I.C. Thermal-Magnetic Breakers

10	HQP1010		HQP2010		—		HQP3010H ^③	
15	HQP1015 ^{①②}		HQP2015			HQP2015H	HQP3015H	
20	HQP1020 ^{①②}		HQP2020			HQP2020H	HQP3020H	
25	HQP1025		HQP2025			HQP2025H	HQP3025H	
30	HQP1030		HQP2030			HQP2030H	HQP3030H	
35	HQP1035		HQP2035			HQP2035H	HQP3035H	
40	HQP1040		HQP2040			HQP2040H	HQP3040H	
45	HQP1045		HQP2045			HQP2045H	HQP3045H	
50	HQP1050		HQP2050			HQP2050H	HQP3050H	
55	HQP1055		HQP2055			HQP2055H	HQP3055H	
60	HQP1060		HQP2060			HQP2060H	HQP3060H	
70	HQP1070		HQP2070			HQP2070H	HQP3070H	
80	—		HQP2080			HQP2080H	HQP3080H	
90	—		HQP2090			HQP2090H	HQP3090H	
100	HQP1100		HQP2100			HQP2100H	HQP3100H	
110	—		HQP2110			—	—	
125	—		HQP2125			—	—	
150	—		HQP2150			—	—	

QUICKLAG Type: HQP Non-Automatic Switches

50	HQP1050N	—			HQP2050N		HQP3050N	
60	HQP1060N	—			HQP2060N		HQP3060N	
100	HQP1100N	—			HQP2100N		HQP3100N	

QUICKLAG Type: QPHW 22,000 Ampere I.C. Thermal-Magnetic Breakers

15	QPHW1015 ^①		QPHW2015		QPHW2015H		QPHW3015H	
20	QPHW1020 ^①		QPHW2020		QPHW2020H		QPHW3020H	
25	QPHW1025		QPHW2025		QPHW2025H		QPHW3025H	
30	QPHW1030		QPHW2030		QPHW2030H		QPHW3030H	
35	QPHW1035		QPHW2035		QPHW2035H		QPHW3035H	
40	QPHW1040		QPHW2040		QPHW2040H		QPHW3040H	
45	QPHW1045		QPHW2045		QPHW2045H		QPHW3045H	
50	QPHW1050		QPHW2050		QPHW2050H		QPHW3050H	
55	QPHW1055		QPHW2055		QPHW2055H		QPHW3055H	
60	QPHW1060		QPHW2060		QPHW2060H		QPHW3060H	
70	QPHW1070		QPHW2070		QPHW2070H		QPHW3070H	
80	—		QPHW2080		QPHW2080H		QPHW3080H	
90	—		QPHW2090		QPHW2090H		QPHW3090H	
100	—		QPHW2100		QPHW2100H		QPHW3100H	
110	—		QPHW2110		—		—	
125	—		QPHW2125		—		—	

QUICKLAG Type: QHPX 42,000 Ampere I.C. Thermal-Magnetic Breakers

15	QHPX1015 ^①		QHPX2015		—		QHPX3015H	
20	QHPX1020 ^①		QHPX2020		—		QHPX3020H	
25	QHPX1025		QHPX2025		—		QHPX3025H	
30	QHPX1030		QHPX2030		—		QHPX3030H	
35	QHPX1035		QHPX2035		—		QHPX3035H	
40	QHPX1040		QHPX2040		—		QHPX3040H	
45	QHPX1045		QHPX2045		—		QHPX3045H	
50	QHPX1050		QHPX2050		—		QHPX3050H	
55	QHPX1055		QHPX2055		—		QHPX3055H	
60	QHPX1060		QHPX2060		—		QHPX3060H	
70	QHPX1070		QHPX2070		—		QHPX3070H	
80	—		QHPX2080		—		QHPX3080H	
90	—		QHPX2090		—		QHPX3090H	
100	—		QHPX2100		—		QHPX3100H	

QUICKLAG Type: QHPW 65,000 Ampere I.C. Thermal-Magnetic Breakers

15	QHPW1015 ^①		QHPW2015		—		QHPW3015H	
20	QHPW1020 ^①		QHPW2020		—		QHPW3020H	
25	QHPW1025		QHPW2025		—		—	
30	QHPW1030		QHPW2030		—		—	

① Switching duty rated for 120 Vac fluorescent light applications.

② For special low-magnetic breaker, order HQP1015L1 or HQP1020L1.

③ Not UL listed.

QUICKLAG

QUICKLAG Plug-On Ground Fault and Equipment Protectors, Types QPGF, QPHGF, QPGFEP, QPHGFEP



QUICKLAG Type QPGF 1-Pole Ground Fault Circuit Breaker

Product Description

- Built and listed to UL 489.
- QUICKLAG Ground Fault Circuit Breakers, Class A GFCI**
- Built and tested to UL 943.
- 5 mA trip sensitivity.
- QUICKLAG Ground Fault Equipment Protectors**
- Built and listed to UL 1053.
- 30 mA trip sensitivity.

Technical Data and Specifications

Shipping Data

Shipped individually or in carton quantities.

Table 11-4. Shipping Data

Carton Qty.	Approximate Weight Lbs. (kg)	Dimensions in Inches (mm)
1-Pole		
20	11.00 (5.0)	12.50 x 6.50 x 5.00 (317.5 x 165.1 x 127.0)
2-Pole		
5	5.00 (2.3)	15.50 x 6.00 x 4.50 (393.7 x 152.4 x 114.3)

Wiring Diagram

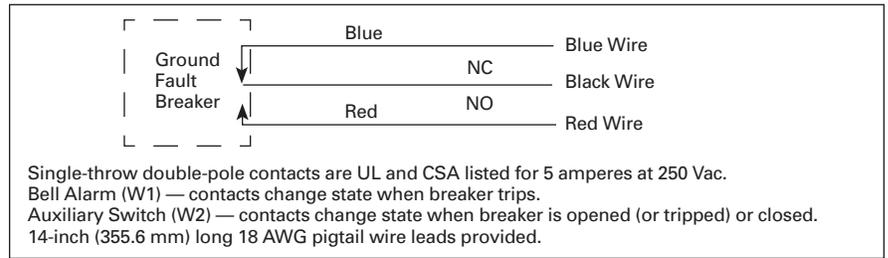


Figure 11-1. Bell Alarm and Auxiliary Contact Schematic

Product Selection

Table 11-5. Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	1-Pole		2-Pole	
	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$

Ground Fault Circuit Breakers — 5 mA Sensitivity

QUICKLAG Type: QPGF 10,000 Ampere I.C. Thermal-Magnetic Breakers

15	QPGF1015		QPGF2015	
20	QPGF1020		QPGF2020	
25	QPGF1025		QPGF2025	
30	QPGF1030		QPGF2030	
40	QPGF1040		QPGF2040	
50	—		QPGF2050	

QUICKLAG Type: QPHGF 22,000 Ampere I.C. Thermal-Magnetic Breakers

15	QPHGF1015		QPHGF2015	
20	QPHGF1020		QPHGF2020	
25	QPHGF1025		QPHGF2025	
30	QPHGF1030		QPHGF2030	

Ground Fault Equipment Protectors — 30 mA Sensitivity

QUICKLAG Type: QPGFEP 10,000 Ampere I.C. Thermal-Magnetic Breakers

15	QPGFEP1015		QPGFEP2015	
20	QPGFEP1020		QPGFEP2020	
25	QPGFEP1025		QPGFEP2025	
30	QPGFEP1030		QPGFEP2030	
40	QPGFEP1040		QPGFEP2040	
50	—		QPGFEP2050	

QUICKLAG Type: QPHGFEP 22,000 Ampere I.C. Thermal-Magnetic Breakers

15	QPHGFEP1015		QPHGFEP2015	
20	QPHGFEP1020		QPHGFEP2020	
25	QPHGFEP1025		QPHGFEP2025	
30	QPHGFEP1030		QPHGFEP2030	

Special Application Ground Fault Circuit Protectors — 5 mA Sensitivity

QUICKLAG Type: QPGF 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

15	QPGF1015W1		QPGF2015W1	
20	QPGF1020W1		QPGF2020W1	
25	QPGF1025W1		QPGF2025W1	
30	QPGF1030W1		QPGF2030W1	
40	—		QPGF2040W1	
50	—		QPGF2050W1	
15	QPGF1015W2		—	
20	QPGF1020W2		—	
25	QPGF1025W2		—	
30	QPGF1030W2		—	

Special Application Ground Fault Circuit Protectors — 30 mA Sensitivity

QUICKLAG Type: QPGFEP 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

15	QPGFEP1015W1		QPGFEP2015W1	
20	QPGFEP1020W1		QPGFEP2020W1	
25	QPGFEP1025W1		QPGFEP2025W1	
30	QPGFEP1030W1		QPGFEP2030W1	
40	—		QPGFEP2040W1	
50	—		QPGFEP2050W1	
15	QPGFEP1015W2		—	
20	QPGFEP1020W2		—	
25	QPGFEP1025W2		—	
30	QPGFEP1030W2		—	

QUICKLAG

Bolt-On Types BAB, QBHW, HBAX, HBAW



QUICKLAG Type BA 1-Pole

Product Description

- Built and listed to UL 489.
- All products UL and CSA listed.
- All products 15 – 100 amperes are HACR rated.
- Switching duty rated for 120 Vac fluorescent light applications.

Technical Data and Specifications

Table 11-6. Shipping Data

Number of Poles	Carton Quantity	Approximate Weight Lbs. (kg)	Dimensions in Inches (mm)
1	24	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
2	12	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
3	8	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)

Product Selection

Table 11-7. Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	1-Pole 120/240 Vac		2-Pole 120/240 Vac		240 Vac		3-Pole 240 Vac	
	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$

QUICKLAG Type: BA 10,000 Ampere I.C. Thermal-Magnetic Breakers

10	BAB1010		BAB2010		BAB2010H ^③		BAB3010H ^③	
15	BAB1015 ^{①②}		BAB2015		BAB2015H		BAB3015H	
20	BAB1020 ^{①②}		BAB2020		BAB2020H		BAB3020H	
25	BAB1025		BAB2025		BAB2025H		BAB3025H	
30	BAB1030		BAB2030		BAB2030H		BAB3030H	
35	BAB1035		BAB2035		BAB2035H		BAB3035H	
40	BAB1040		BAB2040		BAB2040H		BAB3040H	
45	BAB1045		BAB2045		BAB2045H		BAB3045H	
50	BAB1050		BAB2050		BAB2050H		BAB3050H	
55	BAB1055		BAB2055		BAB2055H		BAB3055H	
60	BAB1060		BAB2060		BAB2060H		BAB3060H	
70	BAB1070		BAB2070		BAB2070H		BAB3070H	
80	—		BAB2080		BAB2080H		BAB3080H	
90	—		BAB2090		BAB2090H		BAB3090H	
100	BAB1100		BAB2100		BAB2100H		BAB3100H	
110	—		BAB2110		—		—	
125	—		BAB2125		—		—	

QUICKLAG Type: BA Non-Automatic Switches

50	BAB1050N		—		BAB2050N		BAB3050N	
60	BAB1060N		—		BAB2060N		BAB3060N	
100	BAB1100N		—		BAB2100N		BAB3100N	

QUICKLAG Type: QBHW 22,000 Ampere I.C. Thermal-Magnetic Breakers

15	QBHW1015 ^①		QBHW2015		QBHW2015H		QBHW3015H	
20	QBHW1020 ^①		QBHW2020		QBHW2020H		QBHW3020H	
25	QBHW1025		QBHW2025		QBHW2025H		QBHW3025H	
30	QBHW1030		QBHW2030		QBHW2030H		QBHW3030H	
35	QBHW1035		QBHW2035		QBHW2035H		QBHW3035H	
40	QBHW1040		QBHW2040		QBHW2040H		QBHW3040H	
45	QBHW1045		QBHW2045		QBHW2045H		QBHW3045H	
50	QBHW1050		QBHW2050		QBHW2050H		QBHW3050H	
55	QBHW1055		QBHW2055		QBHW2055H		QBHW3055H	
60	QBHW1060		QBHW2060		QBHW2060H		QBHW3060H	
70	QBHW1070		QBHW2070		QBHW2070H		QBHW3070H	
80	—		QBHW2080		QBHW2080H		QBHW3080H	
90	—		QBHW2090		QBHW2090H		QBHW3090H	
100	—		QBHW2100		QBHW2100H		QBHW3100H	
110	—		QBHW2110		—		—	
125	—		QBHW2125		—		—	

QUICKLAG Type: HBAX 42,000 Ampere I.C. Thermal-Magnetic Breakers

15	HBAX1015 ^①		HBAX2015		—		HBAX3015H	
20	HBAX1020 ^①		HBAX2020		—		HBAX3020H	
25	HBAX1025		HBAX2025		—		HBAX3025H	
30	HBAX1030		HBAX2030		—		HBAX3030H	
35	HBAX1035		HBAX2035		—		HBAX3035H	
40	HBAX1040		HBAX2040		—		HBAX3040H	
45	HBAX1045		HBAX2045		—		HBAX3045H	
50	HBAX1050		HBAX2050		—		HBAX3050H	
55	HBAX1055		HBAX2055		—		HBAX3055H	
60	HBAX1060		HBAX2060		—		HBAX3060H	
70	HBAX1070		HBAX2070		—		HBAX3070H	
80	—		HBAX2080		—		HBAX3080H	
90	—		HBAX2090		—		HBAX3090H	
100	—		HBAX2100		—		HBAX3100H	

QUICKLAG Type: HBAW 65,000 Ampere I.C. Thermal-Magnetic Breakers

15	HBAW1015 ^①		HBAW2015		—		HBAW3015H	
20	HBAW1020 ^①		HBAW2020		—		HBAW3020H	
25	HBAW1025		HBAW2025		—		—	
30	HBAW1030		HBAW2030		—		—	

① Switching duty rated for 120 Vac fluorescent light applications.
 ② For special low-magnetic breaker order BAB1015L1 or BAB1020L1.
 ③ Not UL listed.

Discount Symbol CB-1

Circuit Interrupter

Bolt-On Arc Fault Circuit Interrupter Types QBAF, QBAG

Product Description

- Built and listed to UL 489.
- All products HACR rated.
- Ground Fault Class A GFCI 5 mA.

Product Selection

Table 11-8. 1-Inch (25.4 mm) Wide Bolt-On FIRE-GUARD™ Arc Fault Circuit Interrupter

Poles	Ampere Rating	Configuration	Catalog Number	Price U.S. \$
-------	---------------	---------------	----------------	---------------

Type QBAF 10 kAIC

Single-Pole	15	AFCI AFCI with GFCI	QBAF1015 QBAG1015	
	20	AFCI AFCI with GFCI	QBAF1020 QBAG1020	
2-Pole	15	AFCI AFCI with GFCI	QBAF2015 QBAG2015	
	20	AFCI AFCI with GFCI	QBAF2020 QBAG2020	
2-Pole	15	AFCI with Independent Trip	QBAF2015IT	
	20	AFCI with Independent Trip	QBAF2020IT	

Type QBHAF 22 kAIC

Single-Pole	15	AFCI AFCI with GFCI	QBHAF1015 QBHAG1015	
	20	AFCI AFCI with GFCI	QBHAF1020 QBHAG1020	
2-Pole	15	AFCI AFCI with GFCI	QBHAF2015 QBHAG2015	
	20	AFCI AFCI with GFCI	QBHAF2020 QBHAG2020	
2-Pole	15	AFCI with Independent Trip	QBHAF2015IT	
	20	AFCI with Independent Trip	QBHAF2020IT	

22 kAIC QBHAF-Type AFCIs

Effective immediately, Cutler-Hammer on AFCIs are available for use in SUMter Panels with a 22 kAIC rating. This higher rated breaker will allow us to win jobs where AFCIs are specified at higher than 10 kAIC. This breaker provides standard thermal -magnetic protection of branch circuits. This product will have the same form, fit and function of the current bolt-on AFCI (QBAF Type). Product scope is below. These breakers are in Bid manager for Pow-R-Line 1a, Pow-R-Line 1a-LX, Pow-R-Line 3a and Pow-R-Line 4a panelboards. For series rated combinations, continue to use the less expensive 10 kAIC QBAF and QBAG offerings.

Breakers can also be ordered from Vista.

Features, Benefits and Functions

- 22 kAIC rating at 120 V and 120/240 V.
- 1-pole AFCI (QBHAF) and AFCI with GFI (QBHAG) available.
- 2-pole AFCI (QBHAF), AFCI with GFI (QBHAG) and independent trip (IT) available.
- HID ratings for HID (High Intensity Discharge) lighting.
- All models are HACR rated.
- UL File E7819 for QBHAF.
- UL File E45310 for QBHAG.

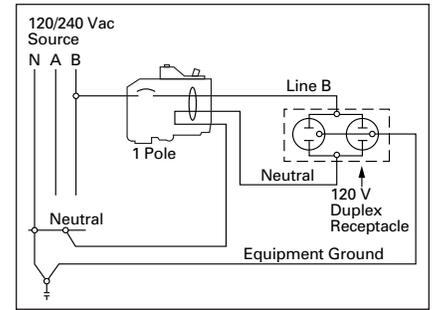


Figure 11-2. Single-Pole 120 Volt Load Application Sourced by 120/240 Vac

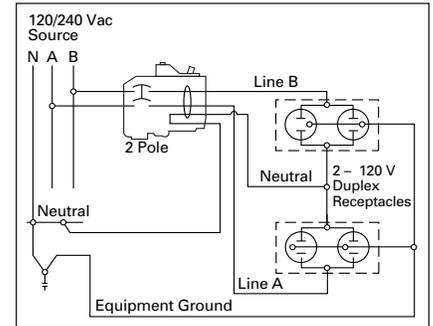


Figure 11-3. Single-Pole Shared Neutral with Multi-Duplex Receptacle Application

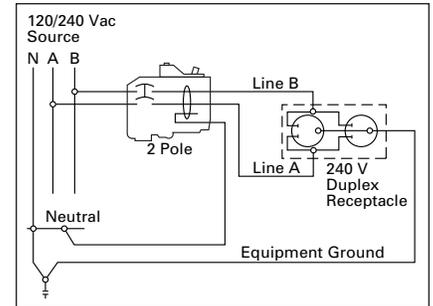


Figure 11-4. 2-Pole 240 Volt Load Application Sourced by 120/240 Vac

Ground Fault

Bolt-On Ground Fault and Equipment Protectors, Types QBGF, QBHGF, QBGFEP, QBHGFEP



QUICKLAG Type QBGF 1-Pole Ground Fault Circuit Breaker

11 Product Description

- Built and listed to UL 489.

QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

- Built and tested to UL 943.
- 5 mA trip sensitivity.

QUICKLAG Ground Fault Equipment Protectors

- Built and tested to UL 1053.
- 30 mA trip sensitivity.

Technical Data and Specifications

Shipping Data

Table 11-9. Shipping Data

Carton Quantity	Approximate Weight Lbs. (kg)	Dimensions in Inches (mm)
1-Pole		
20	11.00 (5.0)	12.50 x 6.50 x 5.00 (317.5 x 165.1 x 127.0)
2-Pole		
5	5.00 (2.3)	15.50 x 6.00 x 4.50 (393.7 x 152.4 x 114.3)

Wiring Diagram

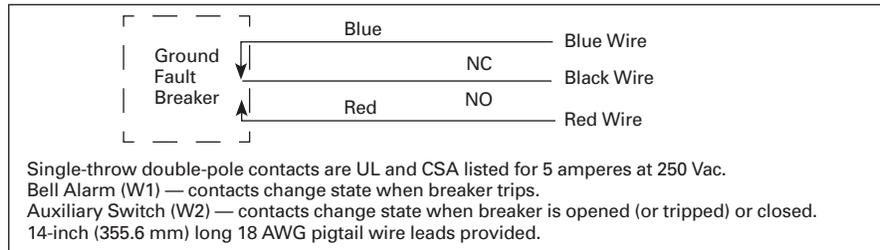


Figure 11-5. Bell Alarm and Auxiliary Contact Schematic

Product Selection

Table 11-10. Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	1-Pole		2-Pole	
	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$
120 Vac			120/240 Vac	

Ground Fault Circuit Breakers — 5 mA Sensitivity

QUICKLAG Type: QBGF 10,000 Ampere I.C. Thermal-Magnetic Breakers

15	QBGF1015		QBGF2015	
20	QBGF1020		QBGF2020	
25	QBGF1025		QBGF2025	
30	QBGF1030		QBGF2030	
40	QBGF1040		QBGF2040	
50	—		QBGF2050	

QUICKLAG Type: QBHGF 22,000 Ampere I.C. Thermal-Magnetic Breakers

15	QBHGF1015		QBHGF2015	
20	QBHGF1020		QBHGF2020	
25	QBHGF1025		QBHGF2025	
30	QBHGF1030		QBHGF2030	

Ground Fault Equipment Protectors — 30 mA Sensitivity

QUICKLAG Type: QBGFEP 10,000 Ampere I.C. Thermal-Magnetic Breakers

15	QBGFEP1015		QBGFEP2015	
20	QBGFEP1020		QBGFEP2020	
25	QBGFEP1025		QBGFEP2025	
30	QBGFEP1030		QBGFEP2030	
40	QBGFEP1040		QBGFEP2040	
50	—		QBGFEP2050	

QUICKLAG Type: QBHGFEP 22,000 Ampere I.C. Thermal-Magnetic Breakers

15	QBHGFEP1015		QBHGFEP2015	
20	QBHGFEP1020		QBHGFEP2020	
25	QBHGFEP1025		QBHGFEP2025	
30	QBHGFEP1030		QBHGFEP2030	

Special Application Ground Fault Circuit Protectors — 5 mA Sensitivity

QUICKLAG Type: QBGF 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

15	QBGF1015W1		QBGF2015W1	
20	QBGF1020W1		QBGF2020W1	
25	QBGF1025W1		QBGF2025W1	
30	QBGF1030W1		QBGF2030W1	
40	—		QBGF2040W1	
50	—		QBGF2050W1	
15	QBGF1015W2		—	
20	QBGF1020W2		—	
25	QBGF1025W2		—	
30	QBGF1030W2		—	

Special Application Ground Fault Circuit Protectors — 30 mA Sensitivity

QUICKLAG Type: QBGFEP 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

15	QBGFEP1015W1		QBGFEP2015W1	
20	QBGFEP1020W1		QBGFEP2020W1	
25	QBGFEP1025W1		QBGFEP2025W1	
30	QBGFEP1030W1		QBGFEP2030W1	
40	—		QBGFEP2040W1	
50	—		QBGFEP2050W1	
15	QBGFEP1015W2		—	
20	QBGFEP1020W2		—	
25	QBGFEP1025W2		—	
30	QBGFEP1030W2		—	

Cable-In/Cable-Out Types QC, QCD, QCHW, QHCX, QHCW

QUICKLAG Type QC 1-Pole
Product Description

- Built and listed to UL 489.
- All products UL and CSA listed.
- All products 10 – 100 amperes are HACR rated.
- Switching duty rated for 120 Vac fluorescent light applications only.

QUICKLAG Type QCD Miniature Circuit Breakers

QCD breakers are used primarily in HVAC and industrial applications.


QUICKLAG Type QCD Miniature Circuit Breaker

- 1 – 3 pole options.
- Modular construction.
- DIN mounted (symmetrical rail 35 x 7.5 DIN/EN 50 022).
- QCD same profile as Type QCR.
- Flexible power feed connection: wire size, position.
- Same breaker size for entire rating range.
- Field mountable accessories: finger shroud proof, quick connect terminals.
- Other accessories: jumper unit.

Technical Data and Specifications
Shipping Data
Table 11-11. Shipping Data

Number of Poles	Carton Quantity	Approximate Weight Lbs. (kg)	Dimensions in Inches (mm)
1	24	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
2	12	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
3	8	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)

Product Selection

Table 11-12. Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	1-Pole		2-Pole				3-Pole		4-Pole	
	120/240 Vac		120/240 Vac		240 Vac		240 Vac		240 Vac	
	Catalog Number	Price U.S. \$								

QUICKLAG Type: QC 10,000 Ampere I.C. Thermal-Magnetic Breakers

5	QC1005 ①		QC2005 ①		—		—		—	
10	QC1010		QC2010		QC2010H ①		QC3010H ①		—	
15	QC1015 ②③		QC2015		QC2015H		QC3015H		QC4015H	
20	QC1020 ②③		QC2020		QC2020H		QC3020H		QC4020H	
25	QC1025		QC2025		QC2025H		QC3025H		QC4025H	
30	QC1030		QC2030		QC2030H		QC3030H		QC4030H	
35	QC1035		QC2035		QC2035H		QC3035H		QC4035H	
40	QC1040		QC2040		QC2040H		QC3040H		QC4040H	
45	QC1045		QC2045		QC2045H		QC3045H		QC4045H	
50	QC1050		QC2050		QC2050H		QC3050H		QC4050H	
55	QC1055		QC2055		QC2055H		QC3055H		QC4055H	
60	QC1060		QC2060		QC2060H		QC3060H		QC4060H	
70	QC1070		QC2070		QC2070H		QC3070H		QC4070H	
80	—		QC2080		QC2080H		QC3080H		QC4080H	
90	—		QC2090		QC2090H		QC3090H		QC4090H	
100	QC1100		QC2100		QC2100H		QC3100H		QC4100H	

QUICKLAG Type: QC Non-Automatic Switches

50	QC1050N		—		QC2050N		QC3050N		—	
60	QC1060N		—		QC2060N		QC3060N		—	
100	QC1100N		—		QC2100N		QC3100N		—	

QUICKLAG Type: QCHW 22,000 Ampere I.C. Thermal-Magnetic Breakers

15	QCHW1015 ②		QCHW2015		QCHW2015H		QCHW3015H		QCHW4015H	
20	QCHW1020 ②		QCHW2020		QCHW2020H		QCHW3020H		QCHW4020H	
25	QCHW1025		QCHW2025		QCHW2025H		QCHW3025H		QCHW4025H	
30	QCHW1030		QCHW2030		QCHW2030H		QCHW3030H		QCHW4030H	
35	QCHW1035		QCHW2035		QCHW2035H		QCHW3035H		QCHW4035H	
40	QCHW1040		QCHW2040		QCHW2040H		QCHW3040H		QCHW4040H	
45	QCHW1045		QCHW2045		QCHW2045H		QCHW3045H		QCHW4045H	
50	QCHW1050		QCHW2050		QCHW2050H		QCHW3050H		QCHW4050H	
55	QCHW1055		QCHW2055		QCHW2055H		QCHW3055H		QCHW4055H	
60	QCHW1060		QCHW2060		QCHW2060H		QCHW3060H		QCHW4060H	
70	QCHW1070		QCHW2070		QCHW2070H		QCHW3070H		QCHW4070H	
80	—		QCHW2080		QCHW2080H		QCHW3080H		QCHW4080H	
90	—		QCHW2090		QCHW2090H		QCHW3090H		QCHW4090H	
100	—		QCHW2100		QCHW2100H		QCHW3100H		QCHW4100H	

QUICKLAG Type: QHCX 42,000 Ampere I.C. Thermal-Magnetic Breakers

15	QHCX1015 ②		QHCX2015		—		QHCX3015H		—	
20	QHCX1020 ②		QHCX2020		—		QHCX3020H		—	
25	QHCX1025		QHCX2025		—		QHCX3025H		—	
30	QHCX1030		QHCX2030		—		QHCX3030H		—	
35	QHCX1035		QHCX2035		—		QHCX3035H		—	
40	QHCX1040		QHCX2040		—		QHCX3040H		—	
45	QHCX1045		QHCX2045		—		QHCX3045H		—	
50	QHCX1050		QHCX2050		—		QHCX3050H		—	
55	QHCX1055		QHCX2055		—		QHCX3055H		—	
60	QHCX1060		QHCX2060		—		QHCX3060H		—	
70	QHCX1070		QHCX2070		—		QHCX3070H		—	
80	—		QHCX2080		—		QHCX3080H		—	
90	—		QHCX2090		—		QHCX3090H		—	
100	—		QHCX2100		—		QHCX3100H		—	

QUICKLAG Type: QHCW 65,000 Ampere I.C. Thermal-Magnetic Breakers

15	QHCW1015 ②		QHCW2015		—		QHCW3015H		—	
20	QHCW1020 ②		QHCW2020		—		QHCW3020H		—	
25	QHCW1025		QHCW2025		—		—		—	
30	QHCW1030		QHCW2030		—		—		—	

① Not UL listed.

② Switching duty rated for 120 Vac fluorescent light applications only.

③ For special low-magnetic breaker order QC1015L1 or QC1020L1.

Note: Non-Automatic Switches, see Page 11-23.

Cable-In/Cable-Out

Table 11-13. QUICKLAG Type QCD 10,000 Ampere I.C. Thermal-Magnetic Breakers

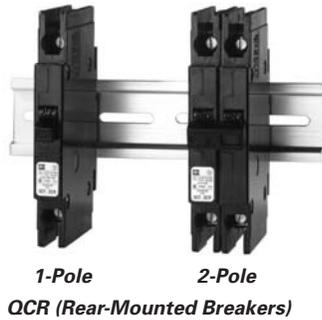
Continuous Ampere Rating at 40°C	1-Pole		2-Pole				3-Pole	
	120/240 Vac		120/240 Vac		240 Vac		240 Vac	
	Catalog Number	Price U.S. \$						
10	QCD1010		QCD2010		—		—	
15	QCD1015		QCD2015		QCD2015H		QCD3015H	
20	QCD1020		QCD2020		QCD2020H		QCD3020H	
25	QCD1025		QCD2025		QCD2025H		QCD3025H	
30	QCD1030		QCD2030		QCD2030H		QCD3030H	
35	QCD1035		QCD2035		QCD2035H		QCD3035H	
40	QCD1040		QCD2040		QCD2040H		QCD3040H	
45	QCD1045		QCD2045		QCD2045H		QCD3045H	
50	QCD1050		QCD2050		QCD2050H		QCD3050H	
55	QCD1055		QCD2055		QCD2055H		QCD3055H	
60	QCD1060		QCD2060		QCD2060H		QCD3060H	
70	—		QCD2070		QCD2070H		QCD3070H	
80	—		QCD2080		QCD2080H		QCD3080H	
90	—		QCD2090		QCD2090H		QCD3090H	
100	—		QCD2100		QCD2100H		QCD3100H	

Table 11-14. QUICKLAG Type QCD Non-Automatic Switches

Continuous Ampere Rating at 40°C	1-Pole		2-Pole				3-Pole	
	120/240 Vac		120/240 Vac		240 Vac		240 Vac	
	Catalog Number	Price U.S. \$						
60	—		—		QCD2060NA		—	
100	—		—		—		—	

Cable-In/Cable-Out

Cable-In/Cable-Out, 1/2-Inch Wide, Types QCR, QCF, QCRH, QCFH



Product Description

Cutler-Hammer Type QCR Circuit Breakers by Eaton Corporation have as a standard feature provisions for 35 mm DIN-rail rear mounting with a spring-loaded release. Optional clips for individual mounting are available as a separate accessory.

Type QCF have two threaded steel inserts to facilitate front mounting with #6 – 32 steel screws. The clamp type terminals are accessible from the rear of the breaker so that cables can be accessed without removal of the breaker from the front cover.

Application Description

QCR and QCF circuit breakers are only 1/2-inch (12.7 mm) wide per pole and are excellent for general purpose industrial applications where space savings is required.

Features, Benefits and Functions

- 1/2-inch (12.7 mm) wide per pole.
- Cable-in/Cable-out.
- Black cases with black handles.
- Three position handle: ON, Tripped (center), OFF.
- Thermal-magnetic protection.
- 1-, 2- and 3-pole.
- 10 kAIC at 120/240 Vac, 10 – 60 amperes.
- 22 kAIC at 120/240 Vac, 15 – 20 amperes.
- 10 kAIC at 240 Vac, 10 – 30 amperes.
- 3 kAIC at 62.5 Vdc (1-pole).
- 3 kAIC at 130 Vdc (2 poles in series).
- Normal operating environment:
 - 0 – 40°C
 - 5 – 95% humidity (noncondensing)

Standards and Certifications

- Built and listed to UL 489.
- UL File Number E7819.
- CSA File Number LR48907.
- Type QCR and QCF circuit breakers are UL listed circuit breakers that are suitable for use as branch circuit protectors.
- All ratings 15 – 60 amperes are HACR rated.

Options and Accessories

QCR and QCF Standard Box Terminals
Factory installed line and load side breaker terminal to accommodate 14 AWG to 4 AWG wire.

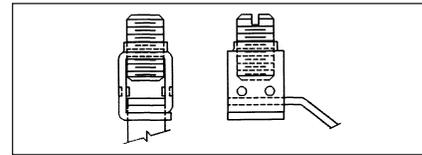


Figure 11-6. Standard Box Terminals

QCR Quick-Connect Terminals

Factory installed two-prong quick-connect terminal on breaker load side suitable for terminating two 10 AWG wire with insulated slip-on terminals as shown. Line side terminal is the standard type.

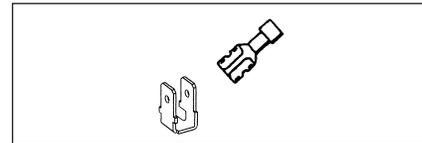


Figure 11-7. Catalog Suffix "P"

QCR and QCF Ring or Spade Lug Terminals (10 to 30 Ampere Ratings Only)

Factory installed line and load side terminals each equipped with a #10 – 32 screw suitable for terminating one 10 AWG wire with insulated ring or spade type terminal as shown.

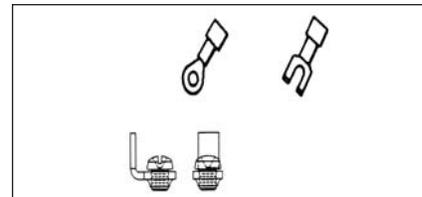


Figure 11-8. Catalog Suffix "T"

Table 11-15. Available QCR and QCF Breaker Accessories

Description	Catalog Number	Price U.S. \$
Steel mounting clip mounts QCR breaker if individual mounting is required. Quantity two required for 1- and 2-pole and four required for 3-pole breakers.	QCRMTGFT	
Removable padlock device for single-pole QCR or QCF breaker.	QCRFPL1P	
Removable padlock device for multi-pole QCR or QCF breaker.	QCRFPLMP	
Padlock bracket assembly for QCR or QCF single- or multi-pole breakers (OFF only).	QCRFLOFF	
Padlock bracket for QCR, lock-off only.	QCRPLOFF	

Discount Symbol CB-1

Product Selection

Table 11-16. QCR Breaker Catalog Numbers ①②③④

Continuous Ampere Rating at 40°C	120/240 Vac		120/240 Vac		240 Vac ⑤			
	1-Pole		2-Pole		2-Pole		3-Pole	
	Catalog Number	Price U.S. \$						

QCR Breaker 10 kAIC Interrupting Ratings

10	QCR1010 QCR1010T —		QCR2010 QCR2010T QCR2010P		— — —		— — —	
15	QCR1015 ⑥ QCR1015T ⑥ —		QCR2015 QCR2015T QCR2015P		QCR2015H QCR2015HT —		QCR3015H QCR3015HT —	
20	QCR1020 ⑥ QCR1020T ⑥ —		QCR2020 QCR2020T QCR2020P		QCR2020H QCR2020HT —		QCR3020H QCR3020HT —	
25	QCR1025 QCR1025T —		QCR2025 QCR2025T QCR2025P		QCR2025H QCR2025HT —		QCR3025H QCR3025HT —	
30	QCR1030 QCR1030T —		QCR2030 QCR2030T QCR2030P		QCR2030H QCR2030HT —		QCR3030H QCR3030HT —	
35	QCR1035 —		QCR2035 QCR2035P		— —		— —	
40	QCR1040 —		QCR2040 QCR2040P		— —		— —	
45	QCR1045 —		QCR2045 QCR2045P		— —		— —	
50	QCR1050 —		QCR2050 QCR2050P		— —		— —	
55	QCR1055 —		QCR2055 QCR2055P		— —		— —	
60 ⑦	QCR1060 —		QCR2060 QCR2060P		— —		— —	

QCR Breaker 22 kAIC Interrupting Ratings

15	QCRH1015 ⑥ QCRH1015T ⑥		QCRH2015 QCRH2015T		— —		— —	
20	QCRH1020 ⑥ QCRH1020T ⑥		QCRH2020 QCRH2020T		— —		— —	

- ① Standard breaker terminals are box type lugs.
- ② Breakers with T Catalog Number Suffix are suitable for line and load side ring terminal connection (#10 – 32 plus/minus terminal screw provided).
- ③ Breakers with P Catalog Number Suffix are suitable for terminating two 10 AWG Quick-Connect Type Terminals per phase on breaker load side.
- ④ Breakers with Shunt Trip (extra pole required on breaker right-hand side) are available on 1-, 2- and 3-pole. Contact the Customer Support Center at 1-800-356-1243.
- ⑤ Breakers with H Catalog Suffix have 240 Vac construction.
- ⑥ All 15 and 20 ampere single-pole breakers are SWD (Switching Duty) rated for fluorescent lighting applications.
- ⑦ 60/75°C Cu/Al wire on all ratings except 60 amperes which requires Cu only conductor.

Cable-In/Cable-Out

Table 11-17. QCF Breaker Catalog Numbers ①②③

Continuous Ampere Rating at 40°C	120/240 Vac		120/240 Vac		240 Vac ④			
	1-Pole		2-Pole		2-Pole		3-Pole	
	Catalog Number	Price U.S. \$						

QCF Breaker 10 kAIC Interrupting Ratings

10	QCF1010 QCF1010T		QCF2010 QCF2010T		— —		— —	
15	QCF1015 ⑤ QCF1015T ⑤		QCF2015 QCF2015T		QCF2015H QCF2015HT		QCF3015H QCF3015HT	
20	QCF1020 ⑤ QCF1020T ⑤		QCF2020 QCF2020T		QCF2020H QCF2020HT		QCF3020H QCF3020HT	
25	QCF1025 QCF1025T		QCF2025 QCF2025T		QCF2025H QCF2025HT		QCF3025H QCF3025HT	
30	QCF1030 QCF1030T		QCF2030 QCF2030T		QCF2030H QCF2030HT		QCF3030H QCF3030HT	
35	QCF1035		QCF2035		—		—	
40	QCF1040		QCF2040		—		—	
45	QCF1045		QCF2045		—		—	
50	QCF1050		QCF2050		—		—	
55	QCF1055		QCF2055		—		—	
60 ⑥	QCF1060		QCF2060		—		—	

QCF Breaker 22 kAIC Interrupting Ratings

15	QCFH1015 ⑤ QCFH1015T ⑤		QCFH2015 QCFH2015T		— —		— —	
20	QCFH1020 ⑤ QCFH1020T ⑤		QCFH2020 QCFH2020T		— —		— —	

① Standard breaker terminals are box type lugs.

② Breakers with T Catalog Number Suffix are suitable for line and load side ring terminal connection (#10 – 32 plus/minus terminal screw provided).

③ Breakers with Shunt Trip Attachment (extra pole required on breaker right-hand side) are available. Contact the Customer Support Center.

④ Breakers with H Catalog Suffix have 240 Vac construction.

⑤ All 15 and 20 ampere single-pole breakers are SWD (Switching Duty) rated for fluorescent lighting applications.

⑥ 60/75°C Cu/Al wire on all ratings except 60 amperes which requires Cu only conductor.

Cable-In/Cable-Out

Cable-In/Cable-Out Ground Fault and Equipment Protectors, Types QCGF, QCHGF, QCGFEP, QCHGFEP



QUICKLAG Type QCGF 1-Pole Ground Fault Circuit Breaker

Product Description

- Built and listed to UL 489.
- All products UL and CSA listed.

QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

- Built and tested to UL 943.
- 5 mA trip sensitivity.

QUICKLAG Ground Fault Equipment Protectors

- Built and tested to UL 1053.
- 30 mA trip sensitivity.

Technical Data and Specifications

Shipping Data

Table 11-18. Shipping Data

Carton Quantity	Approximate Weight Lbs. (kg)	Dimensions in Inches (mm)
1-Pole		
20	11.00 (5.0)	12.50 x 6.50 x 5.00 (317.5 x 165.1 x 127.0)
2-Pole		
5	5.00 (2.3)	15.50 x 6.00 x 4.50 (393.7 x 152.4 x 114.3)

Wiring Diagram

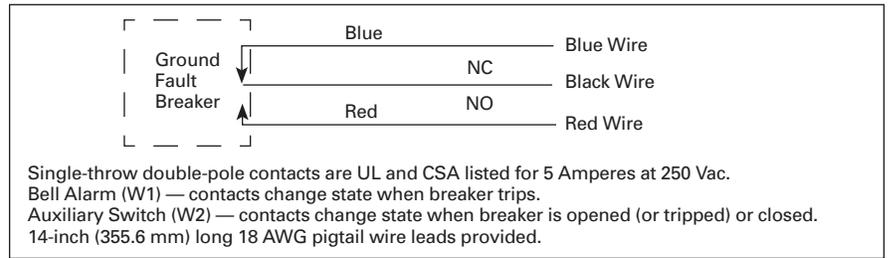


Figure 11-9. Bell Alarm and Auxiliary Contact Schematic

Product Selection

Table 11-19. Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	1-Pole		2-Pole	
	120 Vac		120/240 Vac	
	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$

Ground Fault Circuit Breakers — 5 mA Sensitivity

QUICKLAG Type: QCGF 10,000 Ampere I.C. Thermal-Magnetic Breakers

15	QCGF1015		QCGF2015	
20	QCGF1020		QCGF2020	
25	QCGF1025		QCGF2025	
30	QCGF1030		QCGF2030	
40	QCGF1040		QCGF2040	
50	—		QCGF2050	

QUICKLAG Type: QCHGF 22,000 Ampere I.C. Thermal-Magnetic Breakers

15	QCHGF1015		QCHGF2015	
20	QCHGF1020		QCHGF2020	
25	QCHGF1025		QCHGF2025	
30	QCHGF1030		QCHGF2030	

Ground Fault Equipment Protectors — 30 mA Sensitivity

QUICKLAG Type: QCGFEP 10,000 Ampere I.C. Thermal-Magnetic Breakers

15	QCGFEP1015		QCGFEP2015	
20	QCGFEP1020		QCGFEP2020	
25	QCGFEP1025		QCGFEP2025	
30	QCGFEP1030		QCGFEP2030	
40	QCGFEP1040		QCGFEP2040	
50	—		QCGFEP2050	

QUICKLAG Type: QCHGFEP 22,000 Ampere I.C. Thermal-Magnetic Breakers

15	QCHGFEP1015		QCHGFEP2015	
20	QCHGFEP1020		QCHGFEP2020	
25	QCHGFEP1025		QCHGFEP2025	
30	QCHGFEP1030		QCHGFEP2030	

Special Application Ground Fault Circuit Protector — 5 mA Sensitivity

QUICKLAG Type: QCGF 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

15	QCGF1015W1		QCGF2015W1	
20	QCGF1020W1		QCGF2020W1	
25	QCGF1025W1		QCGF2025W1	
30	QCGF1030W1		QCGF2030W1	
40	—		QCGF2040W1	
50	—		QCGF2050W1	
15	QCGF1015W2		—	
20	QCGF1020W2		—	
25	QCGF1025W2		—	
30	QCGF1030W2		—	

Special Application Ground Fault Equipment Protectors — 30 mA Sensitivity

QUICKLAG Type: QCGFEP 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

15	QCGFEP1015W1		QCGFEP2015W1	
20	QCGFEP1020W1		QCGFEP2020W1	
25	QCGFEP1025W1		QCGFEP2025W1	
30	QCGFEP1030W1		QCGFEP2030W1	
40	—		QCGFEP2040W1	
50	—		QCGFEP2050W1	
15	QCGFEP1015W2		—	
20	QCGFEP1020W2		—	
25	QCGFEP1025W2		—	
30	QCGFEP1030W2		—	

Solenoid-Operated

Solenoid-Operated, Remote-
Controlled Latching Types
BABRP, BABRSP, BRRP
and CLRP

*BABRP and BABRSP Breakers —
1- and 2-Pole*

11

Product Description

Eaton's BABRP, BABRSP, BRRP and CLRP breakers are remotely operated molded case circuit breakers ideally suited for lighting control applications or energy management applications. The BABRP and BABRSP are bolt-on branch circuit breakers designed for use in panelboards. The BRRP is a plug-on branch circuit breaker designed for use in loadcenters not manufactured with breakers with a one-inch wide format and are listed on the "Compatibility list for Classified Applications" — Pub. 26271. In addition to providing conventional branch circuit protection, they include a unique solenoid-operated mechanism that provides for efficient breaker pulse-on and pulse-off operation when used with a suitable controller like Eaton's Cutler-Hammer Pow-R-Command™ lighting control system. These breakers can also be controlled by pushbutton or a PLC unit.

Features, Benefits
and Functions

- Bolt-on line-side terminal (BABRP, BABRSP — Type BA).
- Plug-on line-side terminal (BRRP — Type BR, CLRP — Type CL).
- Cable connected load-side terminal.
- Four-position control terminal.
- Bi-metal assembly for thermal overload protection.
- Fast acting short circuit protection.
- Arc-chute assembly for fast acting arc extinction.
- Three-position handle: OFF, TRIP (Center), ON.
- Handle permits manual switching when control power is lost.
- Mechanical trip indicator.
- 15 and 20 ampere breakers SWD (switching duty) rated.
- HID ratings for HID (high intensity discharge) lighting.
- All models HACR rated.
- Status feedback of control circuit (BABRSP).
- Series rated (BABRP, BABRSP only).
 - BRRP series rated same as BR breakers
 - BABRP, BABRSP same as BA breakers

Solenoid Operating Data

- Power requirements: 24 Vac/dc (20.4 V minimum – 30 V maximum)
 - Controlled signal: +ac/dc 8 ms minimum with zero cross, 300 ms maximum
 - ac: 1.3 cycles minimum, 18 cycles or 300 ms maximum
 - dc: 8 ms minimum, 300 ms maximum
 - Maximum duty cycle of 6 OPEN/CLOSE cycles per minute
- Current draw: open 1 ampere, close 3/4 ampere.
- Blue wire: power input (see power requirements).
- Black wire: remote opening.
- Red wire: remote closing.
- Yellow wire: feedback status from power input, maximum 0.50 ampere draw (BABRSP only).

Operation

- Tripping system — the BABRP, BABRSP, BRRP and CLRP circuit breakers have a permanent trip unit that contains a factory preset thermal (overload) trip element in each pole.
- Operating mechanism — the BABRP, BABRSP, BRRP and CLRP circuit breakers have an over-center toggle mechanism that provides quick-make, quick-break operation. The operating mechanism is trip free. An internal cross-bar provides a common tripping of all multi-pole circuit breakers.

Operating/Application Data

- Ambient temperature: 0 to 40°C.
- Nominal pulse magnitude: 24 Vac/dc.
- Frequency: 50/60 Hz.
- Maximum breaker cycling: 6 operations per minute.
- Tolerance: +10% to -15% of nominal voltage.
- Humidity: 0 to 95% noncondensing.

Table 11-20. Terminal Type

Circuit Breaker Type	Screw Head Type	Wire Type	Terminal	
			Type	Range
BA, BR, CL	Slotted	Cu/Al	Box	(2) #14 – #10 AWG (1) #8 – #6 AWG

Table 11-21. Dimensions per Pole in Inches (mm)

Circuit Breaker Type	Width	Height	Length
BABRP	1.00 (25.4)	4.08 (103.8)	2.91 (74.0)
BABRSP	1.00 (25.4)	4.08 (103.8)	2.91 (74.0)
BRRP	1.00 (25.4)	4.08 (103.8)	2.91 (74.0)
CLRP	1.00 (25.4)	4.08 (103.8)	2.91 (74.0)

Solenoid-Operated

Wiring Diagram

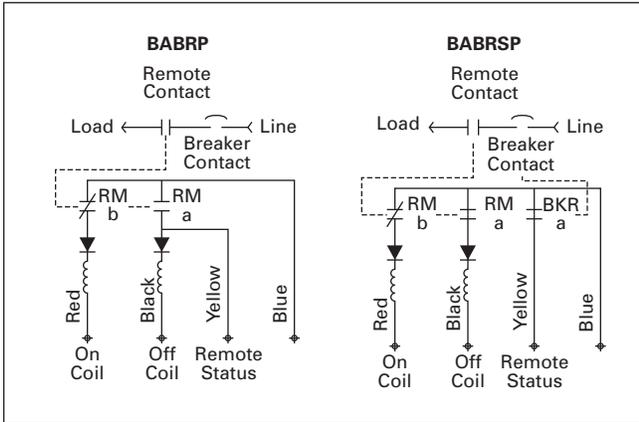


Figure 11-10. Control Circuit for the BABRP and BABRSP

Product Selection

Table 11-22. BABRP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)					Catalog Number	Price U.S. \$
	Ampere Rating ①	Volts ac (50/60 Hz)					
		120	120/240	277/480			
1	15	10,000	—	—	BABRP1015		
1	20	10,000	—	—	BABRP1020		
1	25	10,000	—	—	BABRP1025		
1	30	10,000	—	—	BABRP1030		
2	15	—	10,000	—	BABRP2015		
2	20	—	10,000	—	BABRP2020		
2	25	—	10,000	—	BABRP2025		
2	30	—	10,000	—	BABRP2030		

① Continuous current rating at 40°C.

Table 11-23. BABRP and BABRSP Wire Harness

Description	Catalog Number	Price U.S. \$
This 60-inch (1524.0 mm) wire pigtail provides a connection from a single BABRP's control plug to a customer's pushbutton, relay or PLC. Each box contains 12 pigtails. Wires are 22 AWG, 600V. Order in multiples of 12.	SLBKRPTL1	

Table 11-24. BABRSP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)					Catalog Number	Price U.S. \$
	Ampere Rating ②	Volts ac (50/60 Hz)					
		120	120/240	277/480			
1	15	10,000	—	—	BABRSP1015		
1	20	10,000	—	—	BABRSP1020		
1	25	10,000	—	—	BABRSP1025		
1	30	10,000	—	—	BABRSP1030		
2	15	—	10,000	—	BABRSP2015		
2	20	—	10,000	—	BABRSP2020		
2	25	—	10,000	—	BABRSP2025		
2	30	—	10,000	—	BABRSP2030		

② Continuous current rating at 40°C.

Table 11-25. BRRP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)				Catalog Number	Price U.S. \$
	Ampere Rating	Volts ac (50/60 Hz)				
		120	120/240			
1	15	10,000	—	BRRP115		
	20	10,000	—	BRRP120		
	25	10,000	—	BRRP125		
	30	10,000	—	BRRP130		
2	15	—	10,000	BRRP215		
	20	—	10,000	BRRP220		
	25	—	10,000	BRRP225		
	30	—	10,000	BRRP230		

Table 11-26. CLRP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)				Catalog Number	Price U.S. \$
	Ampere Rating	Volts ac (50/60 Hz)				
		120	120/240			
1	15	10,000	—	CLRP115		
	20	10,000	—	CLRP120		
	25	10,000	—	CLRP125		
	30	10,000	—	CLRP130		
2	15	—	10,000	CLRP215		
	20	—	10,000	CLRP220		
	25	—	10,000	CLRP225		
	30	—	10,000	CLRP230		

Solenoid-Operated

Solenoid Operator — Remote Controlled Latching for Type GHBS, GBHS and GHQRSP Breakers

GHBS — 1-Pole

11

Product Description

The GHBS, GBHS and GHQRSP circuit breakers are bolt-on branch circuit breakers designed for use in panelboards. In addition to providing conventional branch circuit protection, they include a unique solenoid-operated mechanism that provides for efficient breaker pulse-on and pulse-off operation when used with a suitable controller like the Cutler-Hammer Pow-R-Command lighting control system.

Features, Benefits and Functions

- Bolt-on line-side terminal.
- Cable connected load-side terminal.
- Status switch. Remote status and breaker status available from internal auxiliary switches.
- Bi-metal assembly for thermal overload protection.
- Fast acting short circuit protection.

- Arc-runner and arc-chute assembly for fast acting arc extinction.
- Three-position breaker handle: OFF, TRIP (Center), ON.
- Visual indication of the remotely operated contact's position (open, closed or trip).
- Remote override handle permits manual switching when control power is lost.
- 15 and 20 ampere breakers SWD (switching duty) rated.
- 15 and 20 ampere breakers HID rated for HID (High intensity discharge) lighting.
- All models HACR rated.
- Series rated with various Eaton Cutler-Hammer main circuit breakers.

Solenoid Operating Data

- Power requirements: 24 Vac/dc (20.4 V minimum – 30 V maximum)
 - Controlled signal: +ac/dc 8 ms minimum with zero cross, 300 ms maximum
 - ac: 1.3 cycles minimum, 18 cycles or 300 ms maximum
 - dc: 8 ms minimum, 300 ms maximum
 - Maximum duty cycle of 6 OPEN/ CLOSE cycles per minute
- Current draw: open 1 ampere, close 3/4 ampere.
- Blue wire: power input (see power requirements).
- Black wire: remote opening.
- Red wire: remote closing.
- Yellow wire: feedback status from power input, maximum 0.50 ampere draw.

Operation

Mechanism manually operated by external handle allowing ON, OFF and RESET operation. Handle assumes a center TRIP position after performing protective response.

Operating/Application Data

- Ambient temperature: 0 to 40°C.
- Frequency: 48 – 62 Hz.
- Humidity: 0 to 95% noncondensing.

Table 11-27. Terminal Type

Circuit Breaker Type	Circuit Breaker Amperes	Screw Head Type	Terminal	
			Type	Range
GHQRSP	15 – 20	Slotted	Clamp	#14 – #4 AWG

Table 11-28. Dimensions per Pole in Inches (mm)

Circuit Breaker Type	Width	Height ^①	Length ^②
GHQRSP	1.00 (25.4)	4.63 (117.6)	2.81 (71.4)

^① Excluding line terminal.

^② Excluding handle.

Solenoid-Operated

Wiring Diagram

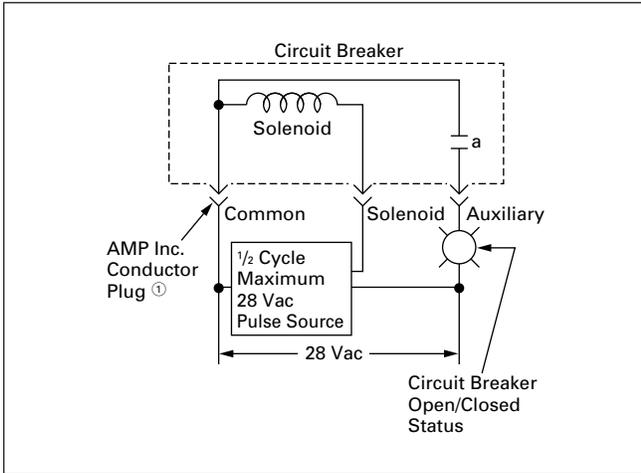


Figure 11-11. Typical Single-Pole Circuit Breaker Schematic Diagram for GHBS and GBHS Breakers

① Purchase separate AMP Inc. conductor plug #640426-3.

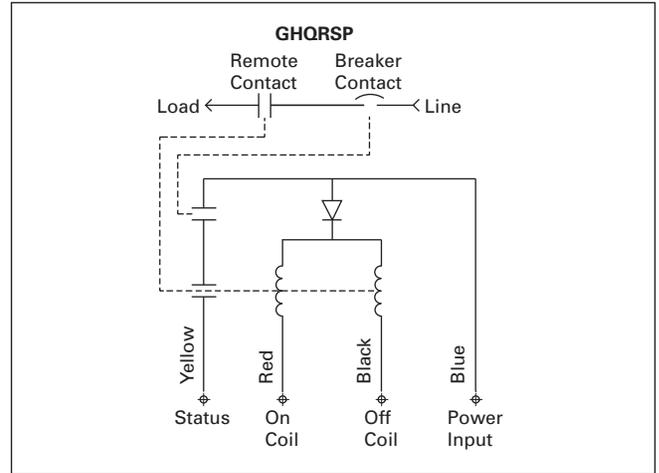


Figure 11-12. Typical Single-Pole Circuit Breaker Schematic Diagram for GHQRSP Breaker

Product Selection

Table 11-29. GHBS UL 489 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)	Volts ac (50/60 Hz)			Catalog Number	Price U.S. \$
		Ampere Rating ②	120	240		
1	15	65,000	—	14,000	GHBS1015D	
1	20	65,000	—	14,000	GHBS1020D	
1	30	65,000	—	14,000	GHBS1030D	
2	15	—	65,000	14,000	GHBS2015D	
2	20	—	65,000	14,000	GHBS2020D	
2	30	—	65,000	14,000	GHBS2030D	

② Continuous current rating at 40°C.

Table 11-30. GBHS CSA 22.2 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)	Volts ac (50/60 Hz)		Catalog Number	Price U.S. \$
		Ampere Rating ③	347/600		
1	15	10,000		GBHS1015D	
1	20	10,000		GBHS1020D	
2	15	10,000		GBHS2015D	
2	20	10,000		GBHS2020D	

③ Continuous current rating at 40°C.

Note: Not UL listed.

Table 11-31. GHQRSP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)	Volts ac (50/60 Hz)				Catalog Number ④	Price U.S. \$
		Ampere Rating ⑤	Volts ac (50/60 Hz)				
			120	120/240	277		
1	15	65,000	65,000	14,000	14,000	GHQRSP1015	
1	20	65,000	65,000	14,000	14,000	GHQRSP1020	
1	30	65,000	65,000	14,000	14,000	GHQRSP1030 ⑥	
2	15	65,000	65,000	14,000	14,000	GHQRSP2015	
2	20	65,000	65,000	14,000	14,000	GHQRSP2020	
2	30	65,000	65,000	14,000	14,000	GHQRSP2030 ⑥	

④ All UL listed circuit breakers are HID (high intensity discharge) rated.

⑤ Continuous current rating at 40°C.

⑥ Available late 2005.

International Rated Types HQP, BA, QC, GFMB, GFXBC

Product Description

QUICKLAG International Circuit Breakers

- Bolt-On Type BA.

QUICKLAG International Ground Fault Circuit Breakers

- Plug-On Type GFMB.
- Cable-In/Cable-Out Type GFXBC.

Standards and Certifications

QUICKLAG International Circuit Breakers

- Built and test certified to BS3871, Pt. 1.
- 50/60 Hz, 40°C.

QUICKLAG International Ground Fault Circuit Breakers

- Built and test certified to BS3871, Pt. 1; BS3871, Section 31-C; BS4293.
- 50/60 Hz, 40°C; 30 mA sensitivity.

Interrupting Ratings

Table 11-32. Interrupting Ratings

Ratings	Suffix E	Suffix HE
International Circuit Breakers		
NEMA® 120/240 Vac	10,000 AIC	10,000 AIC
BS3871 220/380, 240/415 Vac	3,000 AIC	6,000 AIC
International Ground Fault Circuit Breakers		
BS3871 220/380, 240/415 Vac	3,000 AIC	

Technical Data and Specifications

Shipping Data

Table 11-33. Shipping Data

Miniature Circuit Breaker	Number of Poles	Standard Carton Quantity	Approximate Carton Weight Lbs. (kg)	Approximate Standard Carton Dimensions in Inches (mm)
QUICKLAG Type B	1	24	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
	2	12	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
	3	8	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
QUICKLAG Ground Fault				
Type P — All	1	20	11.00 (5.0)	12.50 x 6.50 x 5.00 (317.5 x 165.1 x 127.0)
Types B and C — All	1	20	11.00 (5.0)	12.50 x 7.00 x 5.50 (317.5 x 177.8 x 139.7)
Types P and B — All	2	5	5.00 (2.3)	12.50 x 6.00 x 4.50 (317.5 x 152.4 x 114.3)

Product Selection

Table 11-34. Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	1-Pole		2-Pole		3-Pole	
	240/415 Vac		240/415 Vac		240/415 Vac	
	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$
3000 Ampere I.C. (M3) Bolt-On Thermal-Magnetic Circuit Breakers						
10	BAB1010E		BAB2010E		BAB3010E	
15	BAB1015E		BAB2015E		BAB3015E	
16	—		—		—	
20	BAB1020E		BAB2020E		BAB3020E	
25	BAB1025E		BAB2025E		BAB3025E	
30	BAB1030E		BAB2030E		BAB3030E	
32	—		—		—	
40	BAB1040E		BAB2040E		BAB3040E	
50	BAB1050E		BAB2050E		BAB3050E	
60	BAB1060E		BAB2060E		BAB3060E	
70	BAB1070E		BAB2070E		BAB3070E	
90	—		BAB2090E		BAB3090E	
100	—		BAB2100E		BAB3100E	

6000 Ampere I.C. (M6) Bolt-On Thermal-Magnetic Circuit Breakers

15	BAB1015HE		BAB2015HE		BAB3015HE	
20	BAB1020HE		BAB2020HE		BAB3020HE	
25	BAB1025HE		BAB2025HE		BAB3025HE	
30	BAB1030HE		BAB2030HE		BAB3030HE	
40	BAB1040HE		BAB2040HE		BAB3040HE	
50	BAB1050HE		BAB2050HE		BAB3050HE	
60	BAB1060HE		BAB2060HE		BAB3060HE	
70	BAB1070HE		BAB2070HE		BAB3070HE	
90	—		BAB2090HE		BAB3090HE	
100	—		BAB2100HE		BAB3100HE	

Note: For other 240/415 volt applications, please contact the Customer Support Center at 1-800-356-1243.

Table 11-35. Breaker Catalog Numbers — Ground Fault 1-Pole 30 mA Sensitivity

Continuous Ampere Rating at 40°C	240/415 Vac	
	Catalog Number	Price U.S. \$
3000 Amperes I.C. (M3) Plug-On Thermal-Magnetic Circuit Breakers		
10	GFMB110B2	
15	GFMB115B2	
16	GFMB116B2	
20	GFMB120B2	
25	GFMB125B2	
30	GFMB130B2	
32	GFMB132B2	
40	GFMB140B2	

Note: For other 240/415 volt applications, please contact the Customer Support Center at 1-800-356-1243.

Special Application

Special Application Breakers,
Types HQP, BA, QC



QUICKLAG Type P Switching Neutral

Product Description

QUICKLAG Switching Neutral Circuit Breakers

- Plug-On Type HQP: 10 – 30 amperes, 1 and 2 poles, 10,000 AIC.
- Bolt-On Type BA: 10 – 30 amperes, 1 and 2 poles, 10,000 AIC.
- Cable-In Type QC: 10 – 30 amperes, 1 and 2 poles, 10,000 AIC.

Switching Neutral QUICKLAG Breakers available in 1- and 2-pole configurations, plus neutral pole for applications in accordance with NEC® 514-5, 240-22 and 380-2. A 1-pole device takes two pole spaces, and a 2-pole device takes three pole spaces.

QUICKLAG HID (High Intensity Discharge) Breakers

- Plug-On Type HQP: 15 – 60 amperes, 1 and 2 poles, 10,000 AIC.
- Bolt-On Type BA: 15 – 60 amperes, 1 and 2 poles, 10,000 AIC.
- Cable-In Type QC: 15 – 60 amperes, 1 and 2 poles, 10,000 AIC.

Breakers designed specifically for use with high intensity discharge (HID) lighting applications. (UL listed as standard lighting breakers.)

Molded Case Switches — Non-automatic QUICKLAG Molded Case Switch

- Plug-On Type HQP: 50, 60, 100 amperes, 1, 2 and 3 poles.
- Bolt-On Type BA: 50, 60, 100 amperes, 1, 2 and 3 poles.
- Cable-In Type QC: 50, 60, 100 amperes, 1, 2 and 3 poles.

Standards and Certifications

- All products UL and CSA listed.

Technical Data and Specifications

Shipping Data

Table 11-36. Shipping Data

Miniature Circuit Breaker	Number of Poles	Standard Carton Quantity	Approximate Carton Weight Lbs. (kg)	Approximate Standard Carton Dimensions in Inches (mm)
QUICKLAG Types B, P, C – All	1	24	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
QUICKLAG Types B, P, C – All	2	12	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
QUICKLAG Types B, P, C – All	3	8	9.00 (4.1)	12.50 x 7.50 x 5.00 (317.5 x 190.5 x 127.0)
QUICKLAG Ground Fault Type P – All	1	20	11.00 (5.0)	12.50 x 6.50 x 5.00 (317.5 x 165.1 x 127.0)
Types B and C – All	1	20	11.00 (5.0)	12.50 x 7.00 x 5.50 (317.5 x 177.8 x 139.7)
Types P and B – All	2	5	5.00 (2.3)	12.50 x 6.00 x 4.50 (317.5 x 152.4 x 114.3)

Product Selection

Table 11-37. Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	1-Pole		2-Pole				3-Pole	
	120/240 Vac		120/240 Vac		240 Vac		240 Vac	
	Catalog Number	Price U.S. \$						

QUICKLAG Type: HQP Switching Neutral Thermal-Magnetic Breakers

10	HQP2010B		HQP3010B		—		—	
15	HQP2015B		HQP3015B		—		—	
20	HQP2020B		HQP3020B		—		—	
25	HQP2025B		HQP3025B		—		—	
30	HQP2030B		HQP3030B		—		—	

QUICKLAG Type: BA Switching Neutral Thermal-Magnetic Breakers

10	BAB2010C		BAB3010C		—		—	
15	BAB2015C		BAB3015C		—		—	
20	BAB2020C		BAB3020C		—		—	
25	BAB2025C		BAB3025C		—		—	
30	BAB2030C		BAB3030C		—		—	

QUICKLAG Type: QC Switching Neutral Thermal-Magnetic Breakers

10	QC2010B		QC3010B		—		—	
15	QC2015B		QC3015B		—		—	
20	QC2020B		QC3020B		—		—	
25	QC2025B		QC3025B		—		—	
30	QC2030B		QC3030B		—		—	

Table 11-37. Breaker Catalog Numbers (Continued)

Continuous Ampere Rating at 40°C	1-Pole		2-Pole				3-Pole	
	120/240 Vac		120/240 Vac		240 Vac		240 Vac	
	Catalog Number	Price U.S. \$						
QUICKLAG Type: HQP HID (High Intensity Discharge) Thermal-Magnetic Breakers								
15	HQP1015D		HQP2015D		—		—	
20	HQP1020D		HQP2020D		—		—	
25	HQP1025D		HQP2025D		—		—	
30	HQP1030D		HQP2030D		—		—	
35	HQP1035D		HQP2035D		—		—	
40	HQP1040D		HQP2040D		—		—	
50	HQP1050D		HQP2050D		—		—	
60	HQP1060D		HQP2060D		—		—	
QUICKLAG Type: BA HID (High Intensity Discharge) Thermal-Magnetic Breakers								
15	BAB1015D		BAB2015D		—		—	
20	BAB1020D		BAB2020D		—		—	
25	BAB1025D		BAB2025D		—		—	
30	BAB1030D		BAB2030D		—		—	
35	BAB1035D		BAB2035D		—		—	
40	BAB1040D		BAB2040D		—		—	
50	BAB1050D		BAB2050D		—		—	
60	BAB1060D		BAB2060D		—		—	
QUICKLAG Type: QC HID (High Intensity Discharge) Thermal-Magnetic Breakers								
15	QC1015D		QC2015D		—		—	
20	QC1020D		QC2020D		—		—	
25	QC1025D		QC2025D		—		—	
30	QC1030D		QC2030D		—		—	
35	QC1035D		QC2035D		—		—	
40	QC1040D		QC2040D		—		—	
50	QC1050D		QC2050D		—		—	
60	QC1060D		QC2060D		—		—	
QUICKLAG Type: HQP Non-Automatic Switches								
50	HQP1050N		—		HQP2050N		HQP3050N	
60	HQP1060N		—		HQP2060N		HQP3060N	
100	HQP1100N		—		HQP2100N		HQP3100N	
QUICKLAG Type: BA Non-Automatic Switches								
50	BAB1050N		—		BAB2050N		BAB3050N	
60	BAB1060N		—		BAB2060N		BAB3060N	
100	BAB1100N		—		BAB2100N		BAB3100N	
QUICKLAG Type: QC Non-Automatic Switches								
50	QC1050N		—		QC2050N		QC3050N	
60	QC1060N		—		QC2060N		QC3060N	
100	QC1100N		—		QC2100N		QC3100N	
QUICKLAG Type: QCD Non-Automatic Switches								
60	—		—		QCD2060NA		—	
100	—		—		—		—	

Accessories

Accessories

Table 11-38. Accessories

Accessory Type ①	Description	Order in Multiples of	Catalog Number	Price U.S. \$
Handle Locks: Non-padlockable ②	QUICKLAG Type P, B, C — 1 Pole	10	QL1NPL	
	QUICKLAG Type P, B, C — 2, 3 Poles	10	QL23NPL	
Handle Locks: Padlockable	QUICKLAG Type P, B, C — 1 Pole	10	QL1PL	
	QUICKLAG Type P, B and Ground Fault — 1, 2, 3 Poles	10	QL123PL	
	QUICKLAG Type C — 1, 2, 3 Poles	10	QC123PL	
	QUICKLAG Type P, B — 1, 2, 3 Poles (Off Only)	10	QL123PLOFF	
	QUICKLAG Type C — 1, 2, 3 Poles (Off Only)	10	QC123PLOFF	
Handle Tie	QUICKLAG Handle Tie — 1 Pole	100	QL1HT	
Mounting Hardware	QUICKLAG Type C Face Mounting Clip	24	QCFCLIP	
	QUICKLAG Type C Face Mounting Plate — 1 Pole	10	QC1FP	
	QUICKLAG Type C Face Mounting Plate — 2 Poles	10	QC2FP	
	QUICKLAG Type C Face Mounting Plate — 3 Poles	10	QC3FP	
	QUICKLAG Type C Face Mounting Plate and Lock-off (Off Only) — 2 Pole ③	10	QC2FPLOFF	
	QUICKLAG Type C Face Mounting Plate and Lock-off (Off Only) — 3 Pole	10	QC3FPLOFF	
	QUICKLAG Type C Base Mounting Clamp	10	QCBCLIP	
	QUICKLAG Base Mounting Plate — 6 Poles Total	10	QC6BP	
	QUICKLAG Type C Base Mounting Plate — 6 Poles Total — Heavy-Duty Screw-Secured	10	QC6BPS	
	QUICKLAG Type C (QCD) 2 way jumper unit with cover	10	QCDJ2	
	QUICKLAG Type C (QCD) 4 way jumper unit with cover	10	QCDJ4	
	QUICKLAG Type C (QCD) 6 way jumper unit with cover	10	QCDJ6	
	QUICKLAG Type C (QCD) 2 way jumper unit, no cover	10	QCDJ2T	
	QUICKLAG Type C (QCD) 4 way jumper unit, no cover	10	QCDJ4T	
	QUICKLAG Type C (QCD) 6 way jumper unit, no cover	10	QCDJ6T	
	QUICKLAG Type QCD Finger Protection Attachment	10	QCDFP	
QUICKLAG Type QCD 4 Prong Quick Connect	10	QCDOQUICK		
QUICKLAG Type C DIN-Rail Adapter	6	QCDINADAPT		
QUICKLAG Type QCD Ring Lug Attachment	10	QCDRING		
Dummy Breakers	QUICKLAG Type P	1	HQP1000	
	QUICKLAG Type B	1	BAB1000	
	QUICKLAG Type C	1	QC1000	
	QUICKLAG Type C Clear Choice Breaker	4	QC30SAMPLE	
Miscellaneous	QUICKLAG Type C Spacer	1	QCRSPACER	

① See Page 11-12 for QCR and QCF accessories.

② Can lock in ON or OFF position.

③ Suitable for ground fault breakers.

④ Please contact your local Eaton sales office.

Handle Locks



QL1NPL



QL23NPL



QL1PL



QL123PL



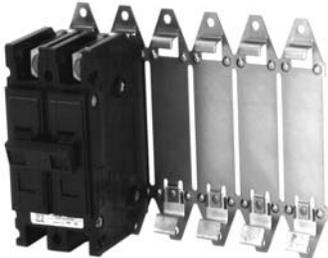
QC123PL

Handle Tie



QL1HT

Discount Symbol CB-1

Mounting Hardware**QCFLIP****QC1FP****QC2FP****QC3FP****QCBCLIP****QC6BP****QCDJ4****QCDINADAPT****QCDQUICK****QCDFP****QCRSPACER****QCDRING**

Factory Modifications

Factory Modifications and Installed Terminals

Table 11-39. Factory Modifications ①

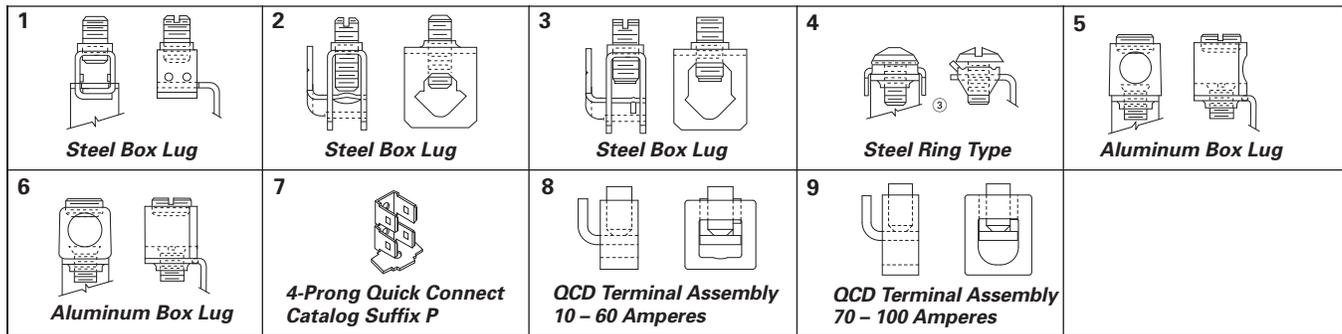
Type of Modification	Breaker Type	Catalog Suffix	Adder U.S. \$
Shunt Trip (Requires 1 extra pole space on right side) 120, 208, 240 Vac 24, 48 Vac/dc Draws 2.6A at 120 volts, Draws 11 amperes at 24 Vdc	QUICKLAG Types P, B and C QUICKLAG Types P, B and C	S S1	138.00 138.00
Special Calibration (50°C) (no UL) Shock Testing Freeze Testing	QUICKLAG Types P, B and C QUICKLAG Types P, B and C QUICKLAG Types P, B and C	V L Y	20% 30% 30%
Moisture-Fungus Treatment Marine Duty Naval Duty 400 Hz Calibration Specific dc Ratings (Breaker marked with a max. Vdc rating)	QUICKLAG Types P, B, C and Ground Fault QUICKLAG Types P, B, C QUICKLAG Types P, B, C QUICKLAG Types P, B, C QUICKLAG Types P, B, C	F H08 H09 G Q thru Q9 ②	15.00 10% 10% 20% 20%

① Contact Eaton for factory modifications available for QCR and QCF breakers.

② Q = 32 Vdc; Q1 = 32 – 40 Vdc; Q2 = 37.5 Vdc; Q3 = 45 Vdc; Q4 = 48 Vdc; Q5 = 50 Vdc; Q6 = 62.5 Vdc; Q7 = 75 Vdc (2P); Q8 = 80 Vdc (2P); Q9 = 125 Vdc (QCR 2P); Q10 = 62.5 dc (QCR 1P)

Table 11-40. Factory-Installed Breaker Terminals

Breaker Type	Continuous Ampere Rating	Standard Line Terminal			Standard Load Terminal			Optional Terminals (20% List Price Adder)	
		Terminal Type	Wire Type	Wire Range (AWG)	Terminal Type	Wire Type	Wire Range (AWG)	Line	Load
QUICKLAG Type P HQ, QPHW, QHPX, QHPW	10 – 30 35 – 50 55 – 125	Plug-on female clips which mate with the bus stabs			1 2 3	Cu/Al Cu/Al Cu/Al	14 – 4 14 – 4 8 – 1/0	N/A	3 3 —
QUICKLAG Ground Fault QPGF, QPGFEP, QPHGF, QPHGFEP	10 – 40 10 – 30	Plug-on female clips which mate with the bus stabs			1 (1-pole) 1 1	Cu/Al Cu/Al Cu	14 – 4 14 – 8 14 – 8	N/A	3 3 —
QUICKLAG Type B BAB, QBHW, HBAX, HBAW	10 – 40 35 – 50 55 – 125	Extended tangs which bolt directly to the bus			1 (1- and 2-pole) 2 (3-pole) 3	Cu/Al Cu/Al Cu/Al	14 – 4 14 – 4 8 – 1/0	N/A	3 3 —
QUICKLAG Ground Fault QBG, QBGFEP, QBHGF, QBHGFEP	10 – 40 10 – 30	Extended tangs which bolt directly to the bus			1 (1-pole) 1 1	Cu/Al Cu/Al Cu	14 – 4 14 – 8 14 – 8	N/A	N/A
QUICKLAG Type C QC, QCHW, QHCX, QHCW	10 – 20 25 – 60 70 – 100	5 6 7	Cu/Al Cu/Al Cu/Al	TBD TBD TBD	5 2 3	Cu/Al Cu/Al Cu/Al	14 – 10 14 – 4 8 – 1/0	6, 7 5, 7 5	6, 7, 8 5, 6, 7, 8 5, 7, 8
QUICKLAG QCR, QCF	10 – 55 60	1 1	Cu/Al Cu	TBD TBD	1 1	Cu/Al Cu	14 – 4 14 – 4	N/A	N/A
QUICKLAG Ground Fault QCGF, QCGFEP, QCHGF, QCHGFEP	10 – 20 25 – 50 10 – 30	6 6 6	Cu/Al Cu/Al	TBD TBD	1 1	Cu/Al Cu/Al	14 – 4 14 – 4	6, 7 5, 7	5 5
QUICKLAG QCD	10 – 60 70 – 100	9 10	Cu/Al Cu	14 – 4 4 – 1/0	9 10	Cu/Al Cu	14 – 4 4 – 1/0	See Accessories	



③ Clamp on line side only.

Table 11-41. Spare Terminal Hardware Screws (Lugs not Included)

Terminal Type	Description	Order in Multiples of	Catalog Number	Price U.S. \$
1	QUICKLAG Terminal Screw	10	QLLDTSA	
2	QUICKLAG Terminal Screw	10	QLLDTSB	
3	QUICKLAG Terminal Screw	10	QLLDTSC	
5	QUICKLAG Binding Head Terminal Screw and Clamp	10	QLBHTSE	
6 and 7	QUICKLAG Terminal Screw	10	QLLNTSFG	

Discount Symbol **CB-1**

WMT

Type WMT Circuit Breaker



Single-Pole WMT

Product Description

Eaton's Cutler-Hammer WMT circuit breaker is 35 mm DIN-rail mountable designed for use in branch service applications. UL and CSA recognize the circuit breaker under UL 489 and CSA 22.2. This breaker provides standard thermal-magnetic protection of branch circuits.

Application Description

Cutler-Hammer WMT breakers are ideal for providing protection in a multitude of applications including:

- Motor control circuits.
- Branch circuit.
- PLC I/O points.
- Computers.
- Power supplies.
- Control instrumentation.
- Contactor coils.
- Relays.
- UPS.
- Power conditioners.
- High vibration.
- Shock resistant.

Features, Benefits and Functions

- Complete range of UL 489 listed DIN-rail mounted miniature circuit breakers up to 40 ampere current rating.
- Current limiting design provides fast short circuit interruption that reduces the let-through energy, which can damage the circuit.
- Suitable for branch circuit device protection.
- Thermal-magnetic overcurrent protection.
 - Three Levels, categorized by B, C and D curves
 - **B Curve — 3 to 5X:** Suited for applications where maximum protection is required for control circuits from low level short circuit faults that could damage wiring.
 - **C Curve — 5 to 10X:** Is positioned for medium inrush startup currents, to provide protection for small transformers, pilot devices, etc.
 - **D Curve — 10 to 20X:** Provides a magnetic range to allow for higher inrush levels during startup, that are usually seen with motors, transformers and other high inductive systems.

- Suitable for reverse feeding.
- IP2X finger-safe design.
- Replaces fuses in low ampere ratings.
- Color-coded status indicator window — RED = ON or GREEN = OFF.
- UL 486 listed terminals.

Operating Data

- Calibrated temperature: 40°C.
- Operating temperature range: -5 to +40°C.
- Frequency: 60 Hz.
- Interrupting rating: 10 kA.
- Ratings from 0.5 A to 40 A.
- Voltage: up to 240 Vac.
- Available in 1-, 2-, 3- and 4-poles.

Standards and Certifications

- Manufactured in a facility that are accredited with ISO 9001:2000 (Quality System); ISO 14001 (Environmental); ISO 17025 (Laboratory).
- UL file number: E7819, Issue Number: AB-4941.
- CSA file number: LR43556.

Technical Data and Specifications

Table 11-42. Terminal Type

Ampere Rating	Torque Settings	Terminal Type	Screw Head Type	Wire Type	AWG Wire Size
0.5 – 40	21 in lbs.	Pressure Plate	Combination Phillips Flat Head	Copper	8

Table 11-43. Dimensions in Inches (mm)

Item	Width	Height	Length
WMT, 1-Pole	0.70 (17.8)	3.00 (76.2)	4.50 (114.3)
WMT, 2-Pole	1.40 (35.6)	3.00 (76.2)	4.50 (114.3)
WMT, 3-Pole	2.10 (53.3)	3.00 (76.2)	4.50 (114.3)
WMT, 4-Pole	2.80 (71.1)	3.00 (76.2)	4.50 (114.3)

WMT

Trip Curves

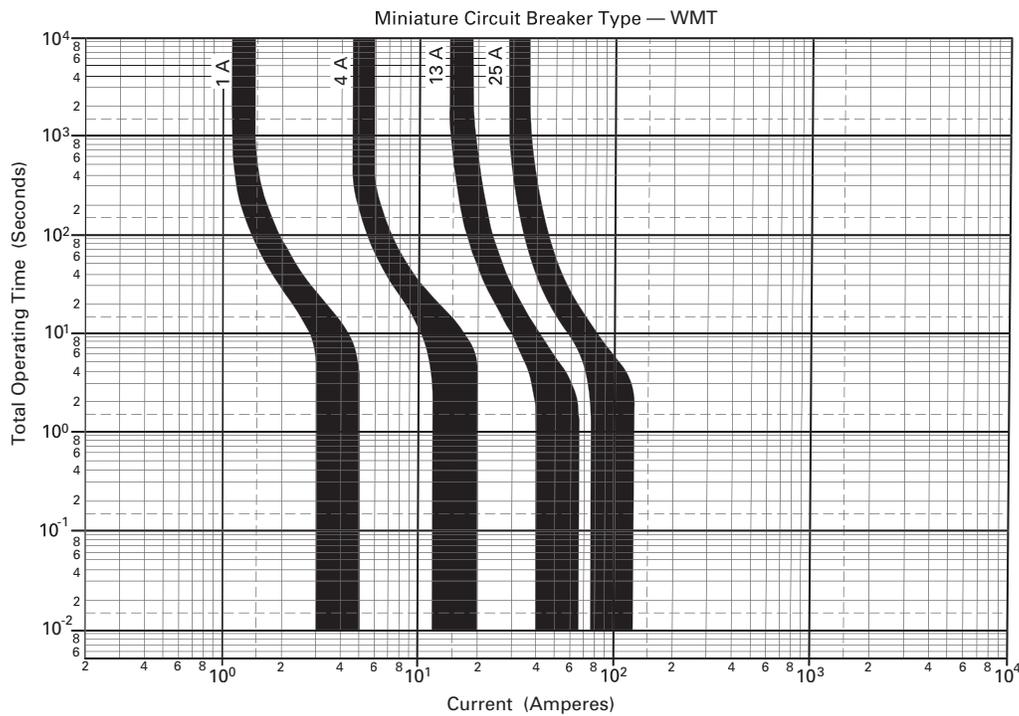


Figure 11-13. Time/Current Characteristics — Miniature Circuit Breakers Curve B — 1, 4, 13 and 25 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

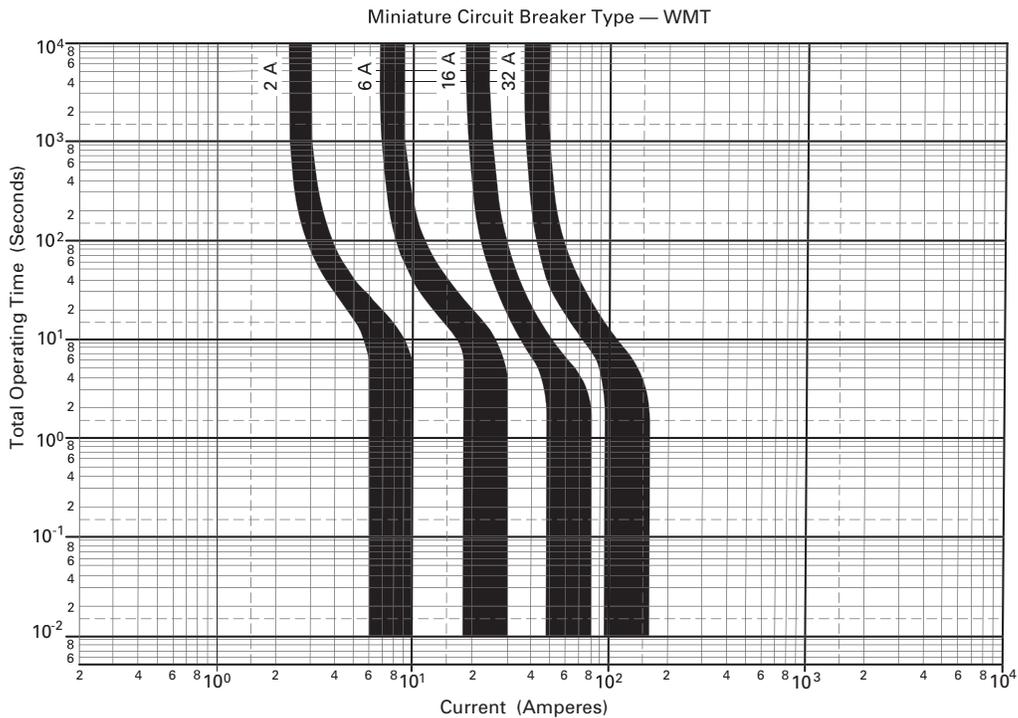


Figure 11-14. Time/Current Characteristics — Miniature Circuit Breakers Curve B — 2, 6, 16 and 32 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

11

WMT

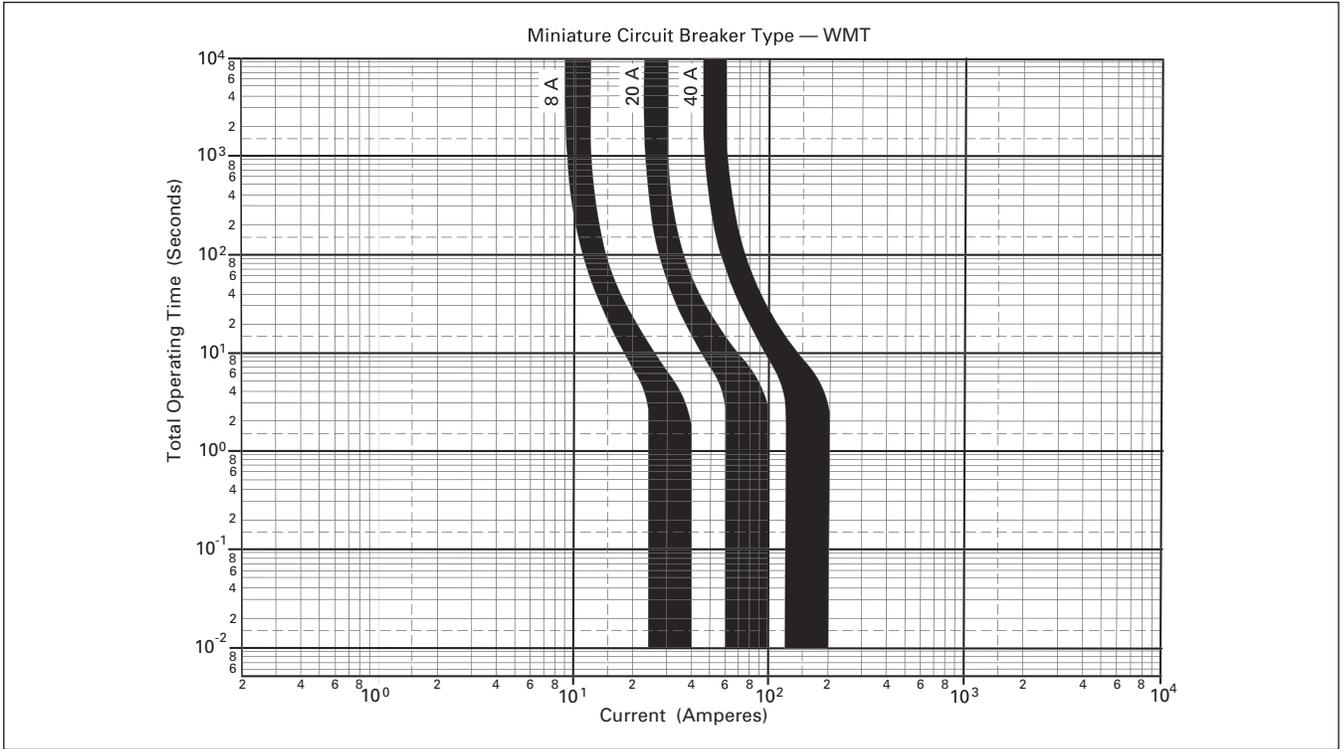


Figure 11-15. Time/Current Characteristics — Miniature Circuit Breakers Curve B — 8, 20 and 40 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

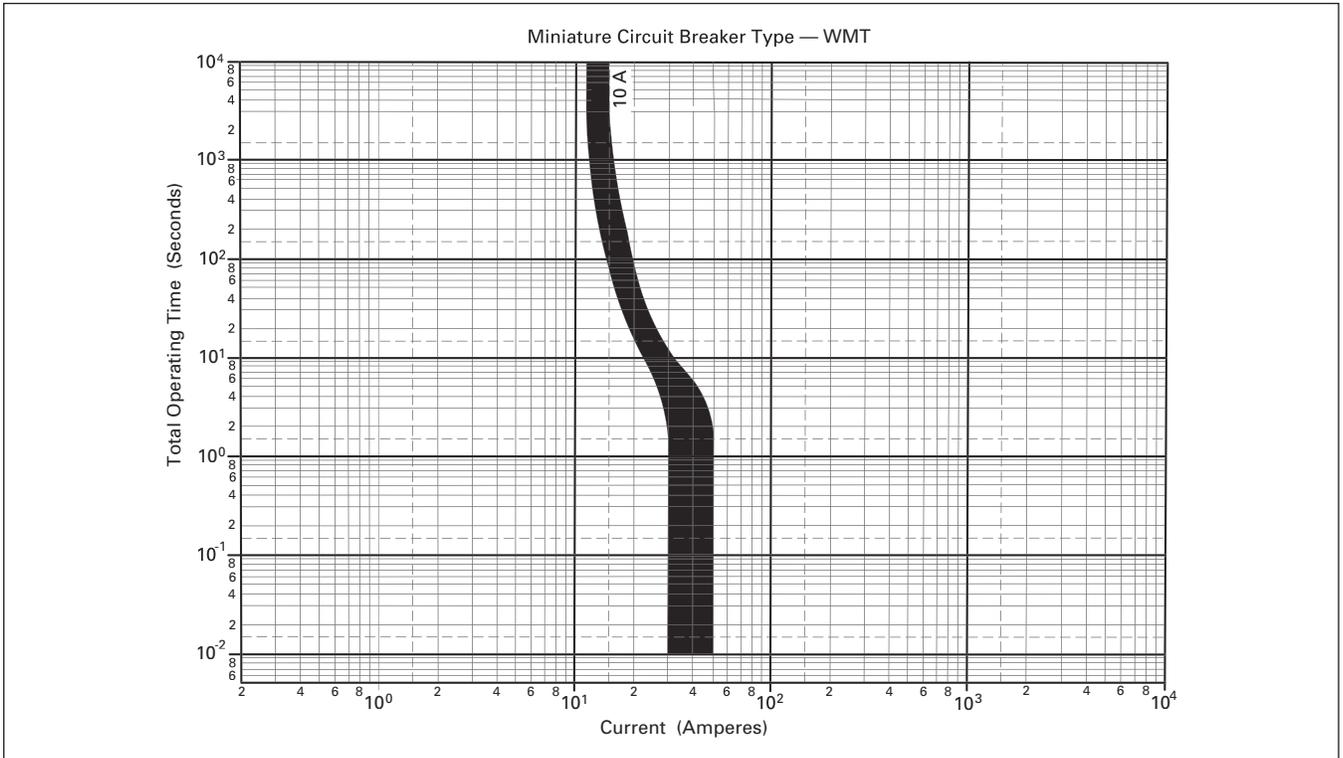


Figure 11-16. Time/Current Characteristics — Miniature Circuit Breakers Curve B — 10 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

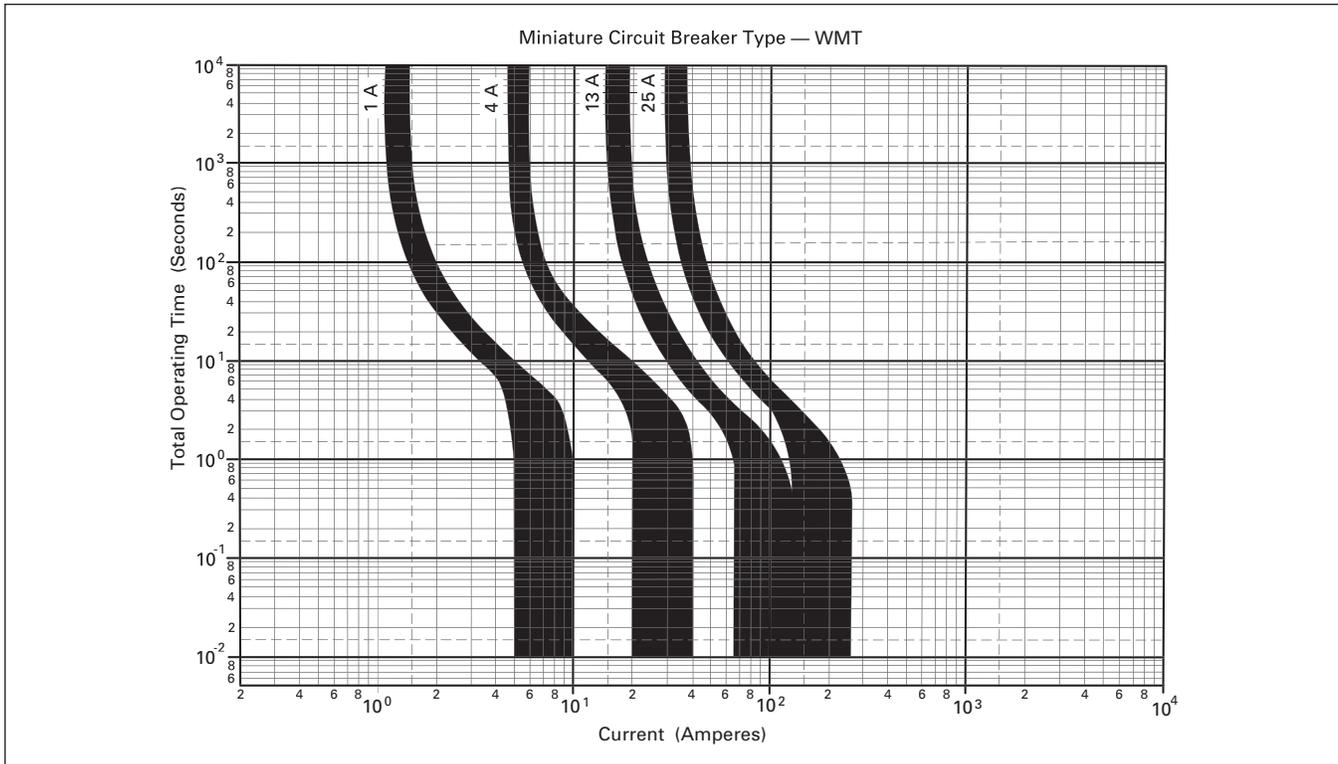


Figure 11-17. Time/Current Characteristics — Miniature Circuit Breakers Curve C — 1, 4, 13 and 25 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

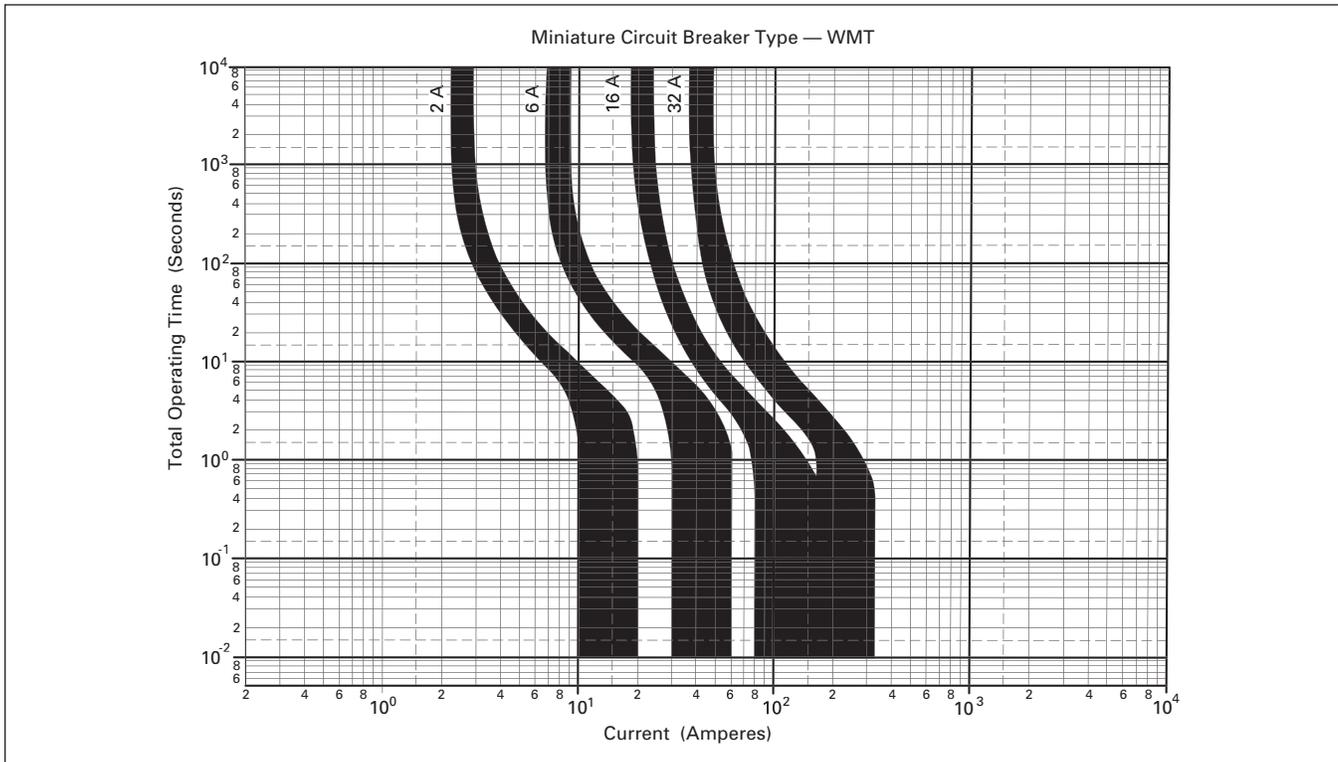


Figure 11-18. Time/Current Characteristics — Miniature Circuit Breakers Curve C — 2, 6, 16 and 32 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

WMT

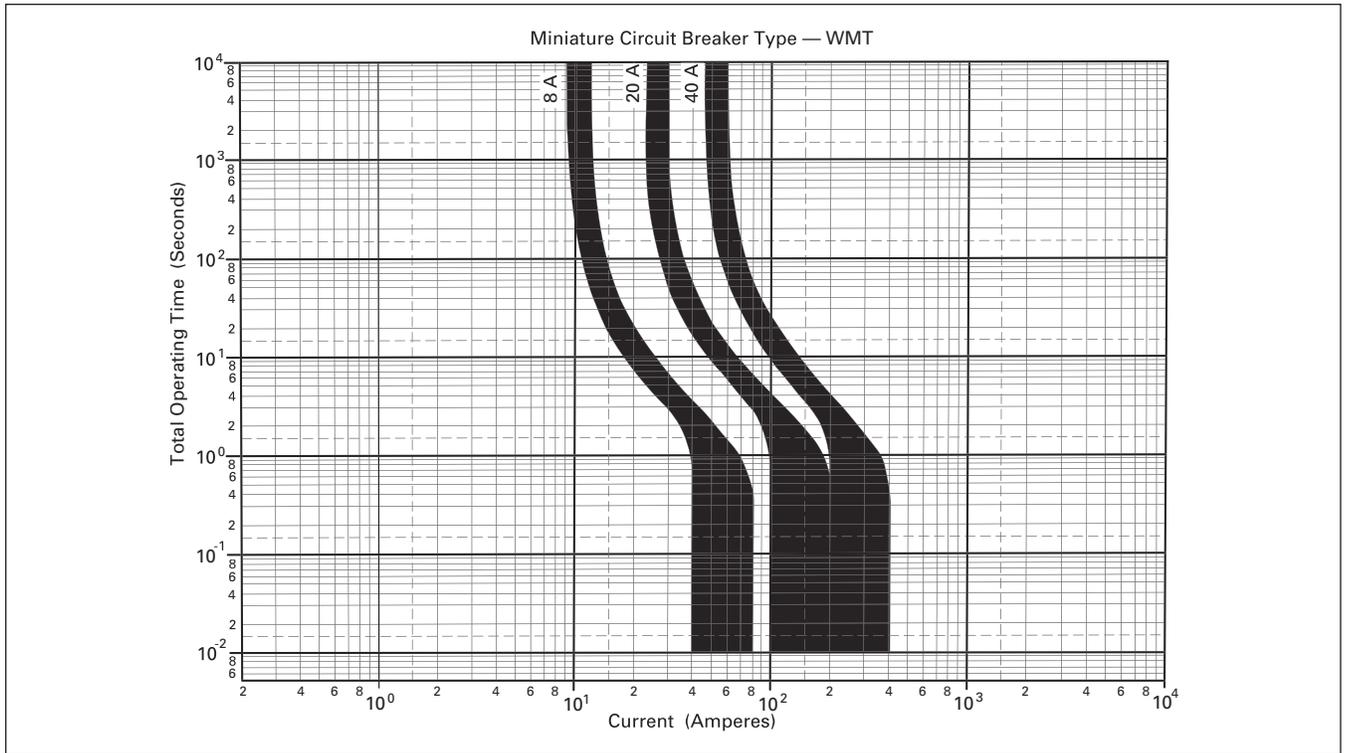


Figure 11-19. Time/Current Characteristics — Miniature Circuit Breakers Curve C — 8, 20 and 40 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

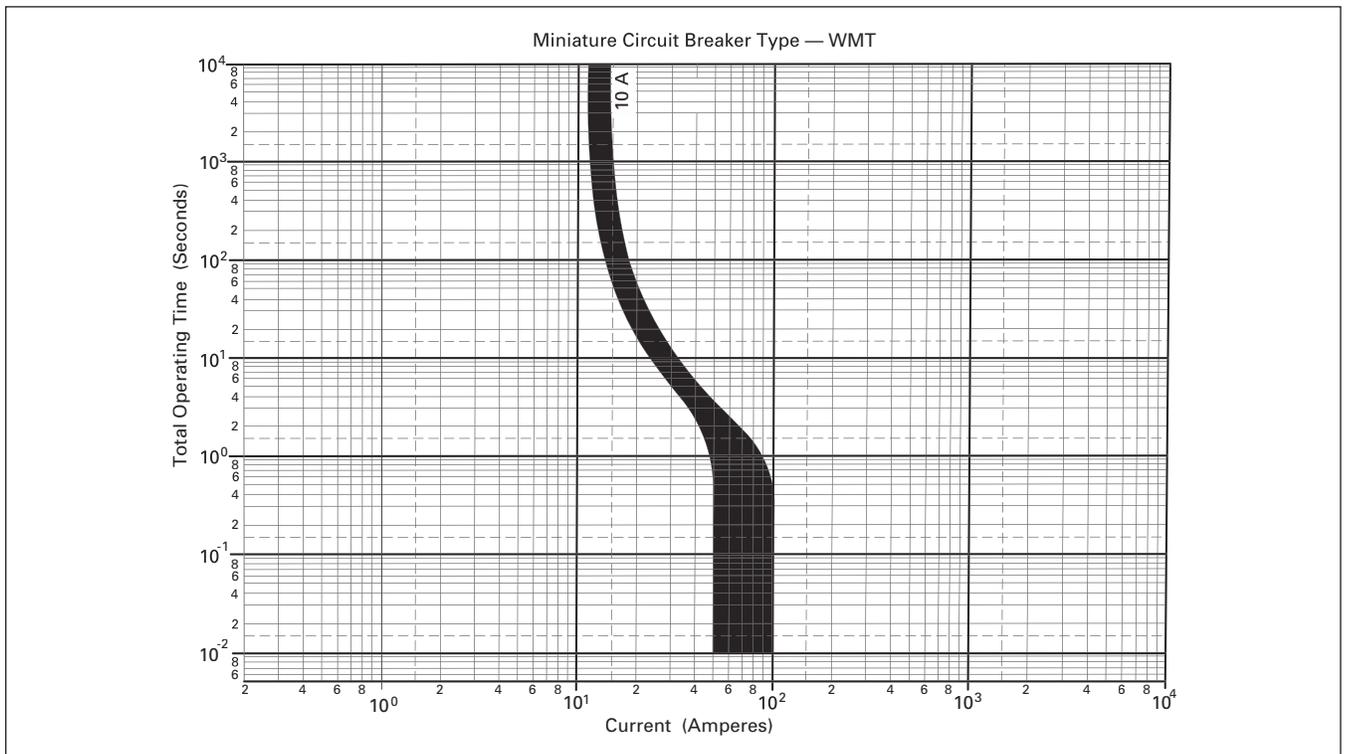


Figure 11-20. Time/Current Characteristics — Miniature Circuit Breakers Curve C — 10 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

WMT

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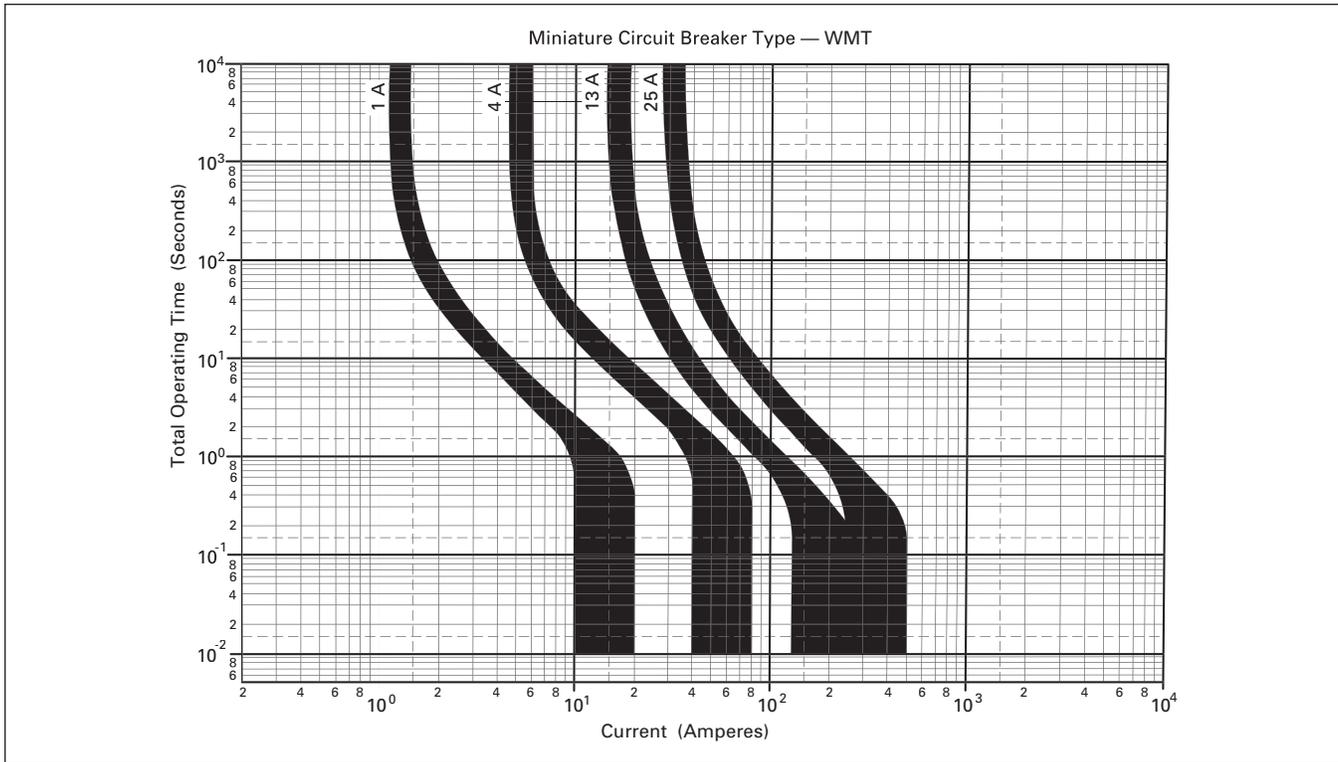


Figure 11-21. Time/Current Characteristics — Miniature Circuit Breakers Curve D — 1, 4, 13 and 25 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

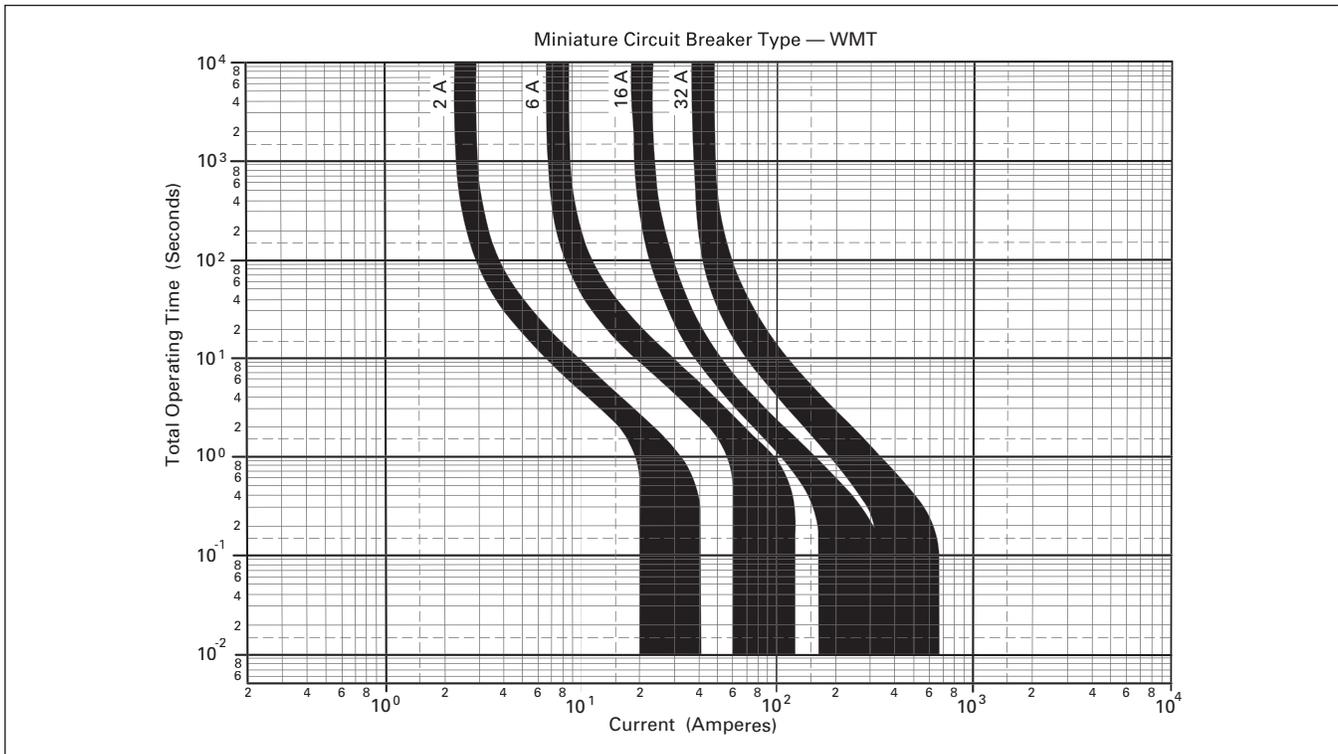


Figure 11-22. Time/Current Characteristics — Miniature Circuit Breakers Curve D — 2, 6, 16 and 32 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

WMT

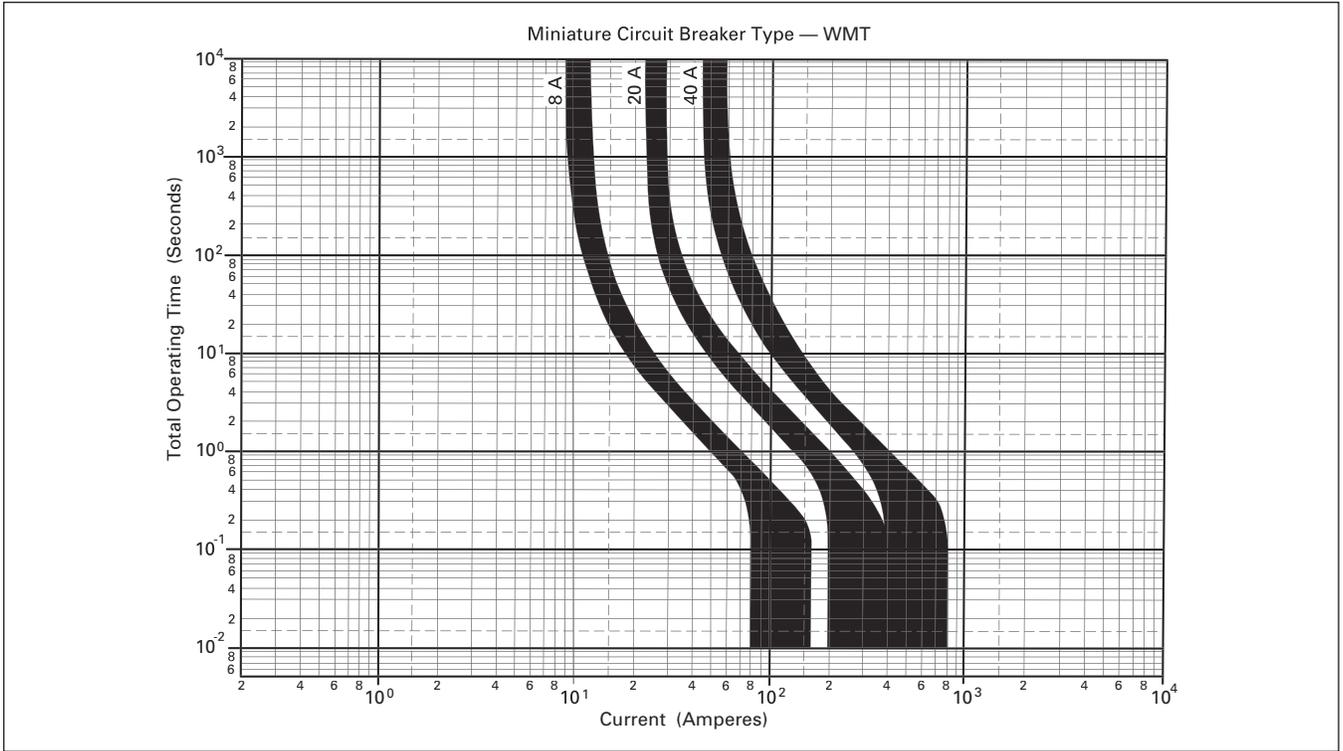


Figure 11-23. Time/Current Characteristics — Miniature Circuit Breakers Curve D — 8, 20 and 40 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

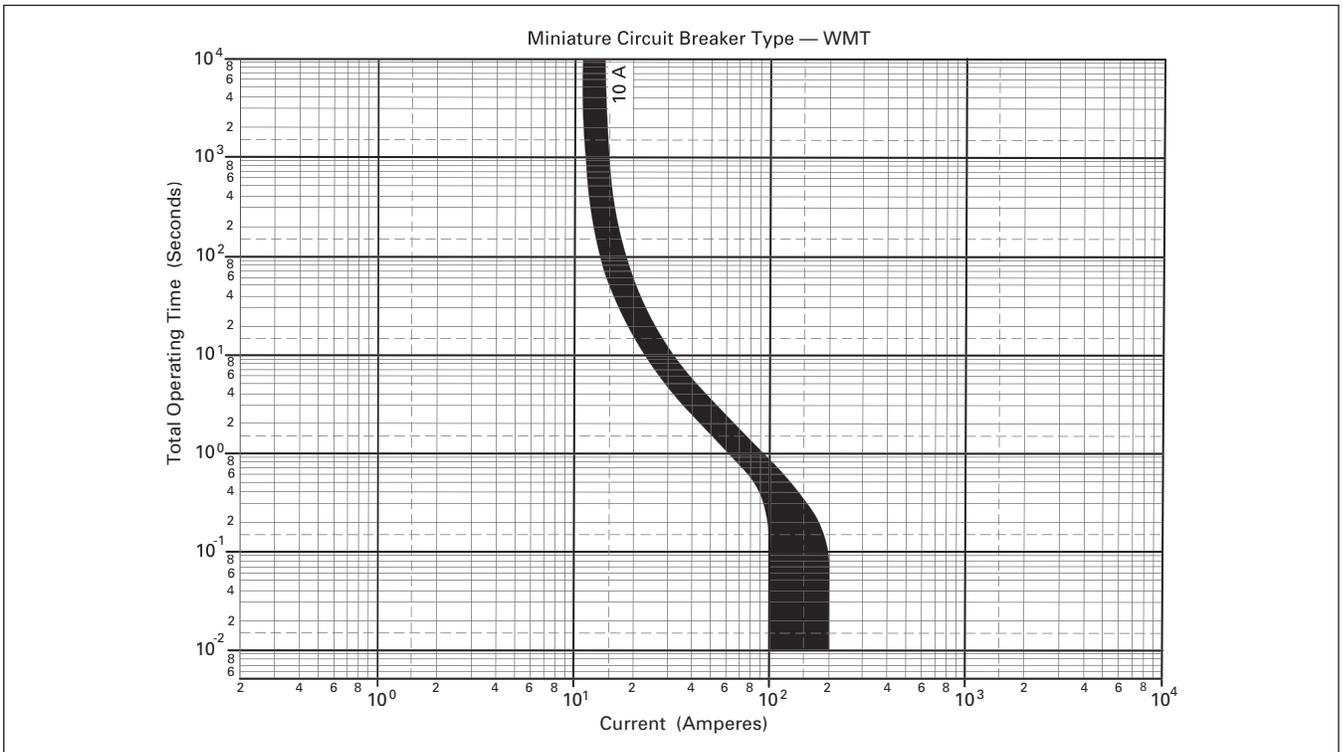


Figure 11-24. Time/Current Characteristics — Miniature Circuit Breakers Curve D — 10 Amperes Ref. Ambient Temp. 40°C — Total Operating Time V Current for Discrimination Purposes

WMT

Product Selection

Table 11-44. WMT B Curve UL 489 and CSA 22.2 (10,000 Interrupting Rating)

Number of Poles	Ampere Rating	Curve	Catalog Number	Price U.S. \$
1	6	B	WMTB1006	
1	7	B	WMTB1007	
1	8	B	WMTB1008	
1	10	B	WMTB1010	
1	13	B	WMTB1013	
1	15	B	WMTB1015	
1	16	B	WMTB1016	
1	20	B	WMTB1020	
1	25	B	WMTB1025	
1	30	B	WMTB1030	
1	32	B	WMTB1032	
1	40	B	WMTB1040	
2	6	B	WMTB2006	
2	7	B	WMTB2007	
2	8	B	WMTB2008	
2	10	B	WMTB2010	
2	13	B	WMTB2013	
2	15	B	WMTB2015	
2	16	B	WMTB2016	
2	20	B	WMTB2020	
2	25	B	WMTB2025	
2	30	B	WMTB2030	
2	32	B	WMTB2032	
2	40	B	WMTB2040	
3	6	B	WMTB3006	
3	7	B	WMTB3007	
3	8	B	WMTB3008	
3	10	B	WMTB3010	
3	13	B	WMTB3013	
3	15	B	WMTB3015	
3	16	B	WMTB3016	
3	20	B	WMTB3020	
3	25	B	WMTB3025	
3	30	B	WMTB3030	
3	32	B	WMTB3032	
3	40	B	WMTB3040	
4	6	B	WMTB4006	
4	7	B	WMTB4007	
4	8	B	WMTB4008	
4	10	B	WMTB4010	
4	13	B	WMTB4013	
4	15	B	WMTB4015	
4	16	B	WMTB4016	
4	20	B	WMTB4020	
4	25	B	WMTB4025	
4	30	B	WMTB4030	
4	32	B	WMTB4032	
4	40	B	WMTB4040	

11

Discount Symbol SP-1

WMT

Table 11-45. WMT C Curve UL 489 and CSA 22.2 (10,000 Interrupting Rating)

Number of Poles	Ampere Rating	Curve	Catalog Number	Price U.S. \$
1	0.5	C	WMTC1000	
1	1	C	WMTC1001	
1	2	C	WMTC1002	
1	3	C	WMTC1003	
1	4	C	WMTC1004	
1	5	C	WMTC1005	
1	6	C	WMTC1006	
1	7	C	WMTC1007	
1	8	C	WMTC1008	
1	10	C	WMTC1010	
1	13	C	WMTC1013	
1	15	C	WMTC1015	
1	16	C	WMTC1016	
1	20	C	WMTC1020	
1	25	C	WMTC1025	
1	30	C	WMTC1030	
1	32	C	WMTC1032	
1	40	C	WMTC1040	
2	0.5	C	WMTC2000	
2	1	C	WMTC2001	
2	2	C	WMTC2002	
2	3	C	WMTC2003	
2	4	C	WMTC2004	
2	5	C	WMTC2005	
2	6	C	WMTC2006	
2	7	C	WMTC2007	
2	8	C	WMTC2008	
2	10	C	WMTC2010	
2	13	C	WMTC2013	
2	15	C	WMTC2015	
2	16	C	WMTC2016	
2	20	C	WMTC2020	
2	25	C	WMTC2025	
2	30	C	WMTC2030	
2	32	C	WMTC2032	
2	40	C	WMTC2040	
3	0.5	C	WMTC3000	
3	1	C	WMTC3001	
3	2	C	WMTC3002	
3	3	C	WMTC3003	
3	4	C	WMTC3004	
3	5	C	WMTC3005	
3	6	C	WMTC3006	
3	7	C	WMTC3007	
3	8	C	WMTC3008	
3	10	C	WMTC3010	
3	13	C	WMTC3013	
3	15	C	WMTC3015	
3	16	C	WMTC3016	
3	20	C	WMTC3020	
3	25	C	WMTC3025	
3	30	C	WMTC3030	
3	32	C	WMTC3032	
3	40	C	WMTC3040	
4	0.5	C	WMTC4000	
4	1	C	WMTC4001	
4	2	C	WMTC4002	
4	3	C	WMTC4003	
4	4	C	WMTC4004	
4	5	C	WMTC4005	
4	6	C	WMTC4006	
4	7	C	WMTC4007	
4	8	C	WMTC4008	
4	10	C	WMTC4010	
4	13	C	WMTC4013	
4	15	C	WMTC4015	
4	16	C	WMTC4016	
4	20	C	WMTC4020	
4	25	C	WMTC4025	
4	30	C	WMTC4030	
4	32	C	WMTC4032	
4	40	C	WMTC4040	

Discount Symbol SP-1

WMT

Table 11-46. WMT D Curve UL 489 and CSA 22.2 (10,000 Interrupting Rating)

Number of Poles	Ampere Rating	Curve	Catalog Number	Price U.S. \$
1	0.5	D	WMTD1000	
1	1	D	WMTD1001	
1	2	D	WMTD1002	
1	3	D	WMTD1003	
1	4	D	WMTD1004	
1	5	D	WMTD1005	
1	6	D	WMTD1006	
1	7	D	WMTD1007	
1	8	D	WMTD1008	
1	10	D	WMTD1010	
1	13	D	WMTD1013	
1	15	D	WMTD1015	
1	16	D	WMTD1016	
1	20	D	WMTD1020	
1	25	D	WMTD1025	
1	30	D	WMTD1030	
1	32	D	WMTD1032	
1	40	D	WMTD1040	
2	0.5	D	WMTD2000	
2	1	D	WMTD2001	
2	2	D	WMTD2002	
2	3	D	WMTD2003	
2	4	D	WMTD2004	
2	5	D	WMTD2005	
2	6	D	WMTD2006	
2	7	D	WMTD2007	
2	8	D	WMTD2008	
2	10	D	WMTD2010	
2	13	D	WMTD2013	
2	15	D	WMTD2015	
2	16	D	WMTD2016	
2	20	D	WMTD2020	
2	25	D	WMTD2025	
2	30	D	WMTD2030	
2	32	D	WMTD2032	
2	40	D	WMTD2040	
3	0.5	D	WMTD3000	
3	1	D	WMTD3001	
3	2	D	WMTD3002	
3	3	D	WMTD3003	
3	4	D	WMTD3004	
3	5	D	WMTD3005	
3	6	D	WMTD3006	
3	7	D	WMTD3007	
3	8	D	WMTD3008	
3	10	D	WMTD3010	
3	13	D	WMTD3013	
3	15	D	WMTD3015	
3	16	D	WMTD3016	
3	20	D	WMTD3020	
3	25	D	WMTD3025	
3	30	D	WMTD3030	
3	32	D	WMTD3032	
3	40	D	WMTD3040	
4	1	D	WMTD4001	
4	2	D	WMTD4002	
4	3	D	WMTD4003	
4	4	D	WMTD4004	
4	5	D	WMTD4005	
4	6	D	WMTD4006	
4	7	D	WMTD4007	
4	8	D	WMTD4008	
4	10	D	WMTD4010	
4	13	D	WMTD4013	
4	15	D	WMTD4015	
4	16	D	WMTD4016	
4	20	D	WMTD4020	
4	25	D	WMTD4025	
4	30	D	WMTD4030	
4	32	D	WMTD4032	
4	40	D	WMTD4040	

Accessories

Padlock Accessories

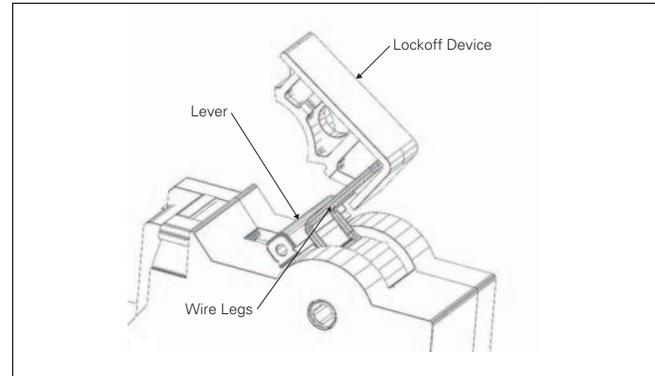


Figure 11-25. Opened Lockoff Device

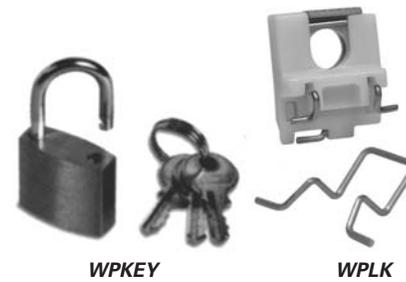


Table 11-47. Padlocking Accessories

Description	Module Width	Catalog Number	Price U.S. \$
Padlocking Attachment	—	WMBL2	
Padlock Key	—	WPKEY	

WMS — Supplementary Protector



Single-Pole



2-Pole



3-Pole

Product Description

- Dual standard breaker:
 - Recognized by UL and CSA under UL 1077 and CSA 22.2
 - Third-party approved by KEMA according to IEC 898
- CE marked in accordance with Low Voltage Directive (LVD) (73/23/EEC).
- Used to provide overcurrent protection where branch protection (for example UL 489 MCCB) is already provided or not required.
- Installed as a component within or part of an appliance or a piece of electrical equipment.
- Ideal replacement for fuses that are applied as a supplementary protector, i.e., in addition to branch protection (if required).
- 35 mm DIN-rail mountable, utilizing metallic “extra strength” spring clip.
- Light gray case with gray handle, that is marked “O” for OFF and “I” for ON.
- UL File Number E162396.
- CSA File Number LR105508-2.

Application Description

Cutler-Hammer Supplementary Protectors are ideal for providing protection in a multitude of applications, including:

- Motor control circuits.
- Control power transformers.
- Relays.
- Contactor coils.
- PLC I/O points.
- Lighting circuits.

Features, Benefits and Functions

- Current limiting design provides fast short circuit interruption that reduces the let-through energy which can damage the circuit.
- Thermal-magnetic overcurrent protection:
 - Three levels, categorized by B, C and D curves
 - In direct relation to continuous rating of device
 - **B Curve — 3 to 5X:** Suited for applications where maximum protection is required for control circuits from low level short circuit faults that could damage the wiring.
 - **C Curve — 5 to 10X:** Is positioned for medium inrush startup currents, to provide protection for small transformers, pilot devices, etc.
 - **D Curve — 10 to 20X:** Provides a magnetic range to allow for higher inrush levels during startup, that are usually seen with motors, transformers and other high inductive systems.
- Color-coded status indicator window — Red = ON or Green = OFF.
- IP20 finger protection.
- Provision for dual connection — line and load:
 - Fork or pin bus bars
 - Cable direct into terminal
 - Cable utilizing Ring Tung connector
- 35 mm DIN-rail mountable, utilizing “extra strength” spring clip.

Features, Benefits and Functions (Continued)

Field-Mountable Accessories

- Quick 3-step process.
- No tools required.
- Auxiliary switch.
- Combined auxiliary switch and bell alarm.
- Shunt trip.
- Undervoltage release.
- Fork and pin bus bar combs:
 - Standards
 - IEC 60947-1
 - UL 1077
 - Marking
 -
 - Length
 - Short — 12 circuit
 - Long — 1 meter
 - Configurations include device only plus device with 1/2 module auxiliary or alarm switch
 - UL/CSA File Number E197132
 - Insulated bus bar
 - Two caps supplied as standard with all 2- and 3-phase bus bars. Additional caps available as an accessory
 - Single pack

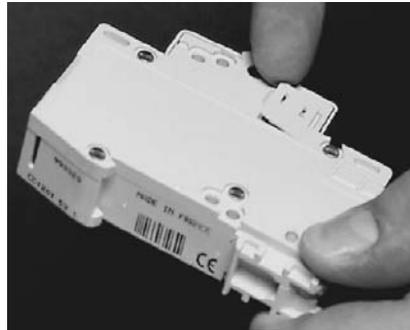
Standards and Certifications

- UL recognized under UL 1077.
- CSA 22.2.
- IEC 898.
- IEC 60947-2.

Accessory “Quick 3-Step” Field Mounting

Three Steps to fitting any of the side mounted accessories. No tools required.

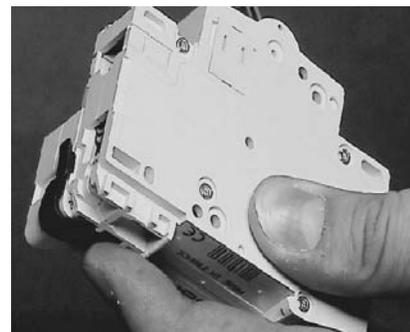
Before you do this, you should make sure the device is in the OFF position — check the handle position and flag indicator.



Step One — Remove Left-Hand “Accessory Window”



Step Two — Place the Accessory’s Clip into the Device’s Positioning Groove



Step Three — Push the Blue Pivot Clip Up, and Snap into Place

Product Specifications

The WMS Supplementary Protector is a dual-rated product for both ac and dc supplies, in accordance with UL 1077, CSA 22.2 and IEC 898 standards and is marked with CE in accordance with the Low Voltage Directive. With this dual standard product, the customer can include it within their design, knowing that, in the vast majority of cases wherever their equipment is used, the product is in line with the local UL, CSA or IEC (European) requirements. This is very important as the different areas of the world market draw closer together and the need for breakers that meet different standards is a common, everyday occurrence.

It is to be applied in conjunction with a branch protector (if branch protection is required) and can be a replacement for similarly applied fuses. Its advantage over fuses is that it is resettable and the device’s status is easily and clearly identified by the position of the handle and the flag indicator.

In addition to this, the user is able to select a device that provides maximum reliability and accuracy to fit their various applications (of which there are many) due to the availability of a wide range of current ratings from 0.5 to 60 amperes and three different overcurrent characteristic curves, B, C and D. With easy mounting of the device on a 35 mm DIN-rail and also the “Quick 3 Step” field mountable accessories, it is now easier for the customer to select and apply this modular range. In addition, utilizing the bus bar comb to connect multiple devices from a single power source, saves time as multiple wire connections are no longer required. Due to the smaller modular width of the device and accessories, it enables them to save space in their panel or equipment — which directly leads to cost savings!

Technical Data

Table 11-48. IEC Ratings

Ampere Rating	Curve	Volts ac	Short Circuit Capacity (A)	
			IEC 898, I _{cn}	IEC 947-2, I _{cu}
0.5 – 5	C, D	240/415	10,000	10,000
6 – 40	B, C, D	240/415	10,000	10,000
50 – 60	B, C	240/415	10,000	10,000

Table 11-49. UL/CSA Ratings

Ampere Rating	Number of Poles	Curve	Volts ac	Short Circuit Capacity (A)	
				UL 1077	CSA 235
6 – 60	1	B	120	10,000	10,000
0.5 – 60	1	C, D	120	10,000	10,000
6 – 60	2, 3, 4	B	240	10,000	10,000
0.5 – 60	2, 3, 4	C, D	240	10,000	10,000
6 – 60	1	B	277	6,000	6,000
0.5 – 60	1	C, D	277	6,000	6,000
6 – 60	2, 3, 4	B	480	5,000	5,000
0.5 – 60	2, 3, 4	C, D	480	5,000	5,000

Table 11-52. Accessory Technical Data

Auxiliary Switch	Auxiliary Alarm Switch	Shunt Trip	UVR	Electrical Characteristics	Cable Size		Tightening Torque		Catalog Number	Price U.S. \$
					mm ²	AWG	Nm	lb-in		
No	Yes	No	No	1 Changeover Contact 240 V ~ 6 A	0.5 to 4	18 to 12	0.8	7.1	WAL1A1B	
Yes	No	No	No	2 Changeover Contact 240 V ~ 6 A	0.5 to 4	18 to 12	0.8	7.1	WAX1A1B	
No	No	Yes	No	230 – 415 V ~ /110 – 130 V ---	0.5 to 4	18 to 12	0.8	7.1	WST415A	
No	No	Yes	No	9 – 48 V --- /48 V ~	0.5 to 4	18 to 12	0.8	7.1	WST48D	
No	No	Yes	No	110V --- /220 V ~	0.5 to 4	18 to 12	0.8	7.1	WST220A	
No	No	No	Yes	240 V ~ /110 – 130 V ---	0.5 to 4	18 to 12	0.8	7.1	WUVR240A	
No	No	No	Yes	48 V --- /24 – 48 V ~	0.5 to 4	18 to 12	0.8	7.1	WUVR48D	

Table 11-50. dc Ratings

Ampere Rating	Number of Poles	Curve	Volts dc	Short Circuit Capacity (A)	
				UL 1077	CSA 235
0.5 – 63	1	B, C, D	65	10,000	10,000
0.5 – 63	2	B, C, D	130	10,000	10,000

Table 11-51. Cable Size and Torque Setting — WMS

Ampere Rating	Cable Size		Tightening Torque	
	mm ²	AWG	Nm	lb-in
0.5 – 60	1 to 25	14 to 6	2.8	24.8

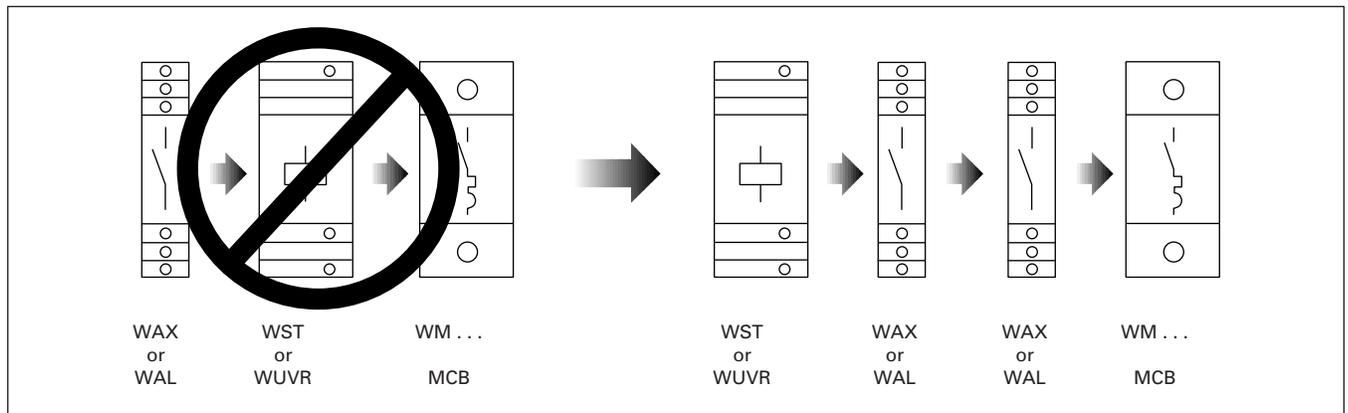


Figure 11-26. Grouping of Accessories

Bus Bar Combs

Table 11-53. Connection Type — Fork and Pin

Connection Type	Rating by Connection Point		Configuration		Insulated	Marks
	Mid	End	Device	Devices + Aux. Switch		
Fork	110	55	Yes	Yes	Yes	UL CE
Pin	130 & 150 ①	80 & 90 ①	Yes	Yes	Yes	CE

① Single-phase highest, with 2- and 3-phase bus bars lowest stated rating.

WMS

Technical Data (Continued)

Table 11-54. WMS — Shipping Data

Pole Configuration	Pack Quantity	Pack Dimensions in Inches (mm)	Pack Weight Lbs/oz. (kg)
1	12	9.06 x 3.19 x 3.78 (230.1 x 81.0 x 96.0)	3 lbs. 3 oz. (1.43)
2	6	9.06 x 3.19 x 3.78 (230.1 x 81.0 x 96.0)	3 lbs. 4 oz. (1.46)
3	4	9.06 x 3.19 x 3.78 (230.1 x 81.0 x 96.0)	3 lbs. 5 oz. (1.48)
4	3	9.06 x 3.19 x 3.78 (230.1 x 81.0 x 96.0)	3 lbs. 7 oz. (1.54)

Table 11-55. Bus Bar Comb Weights in Ounces (kg)

Description	1-Phase	2-Phase	3-Phase
Short Device	1.94 (.06)	3.58 (.1)	4.38 (.12)
Device + Aux.	2.53 (.07)	4.15 (.12)	4.89 (.14)
Long Device	9.19 (.26)	16.51 (.47)	22.14 (.63)
Device + Aux.	8.27 (.23)	15.77 (.45)	21.26 (.6)

Approximate Dimensions

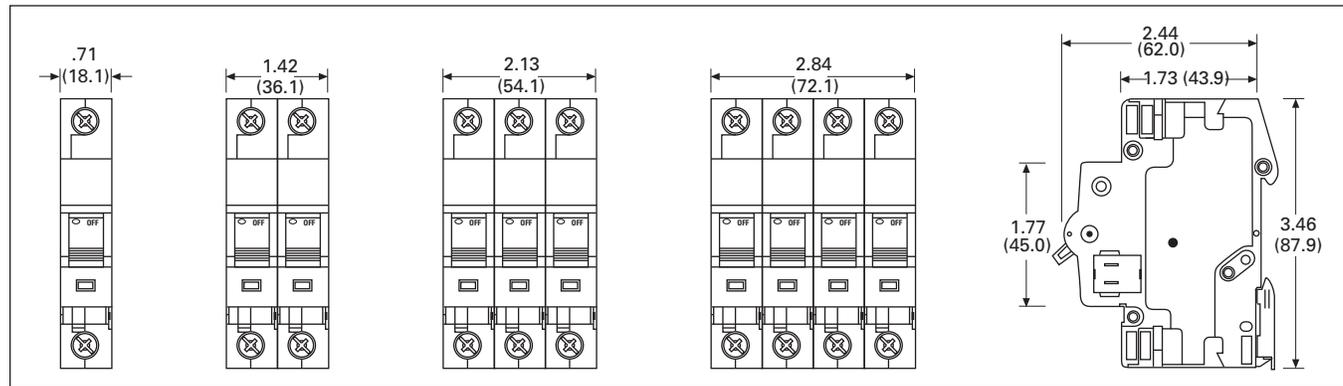


Figure 11-27. Approximate Dimensions in Inches (mm) — Not for Construction Purposes

Trip Curves

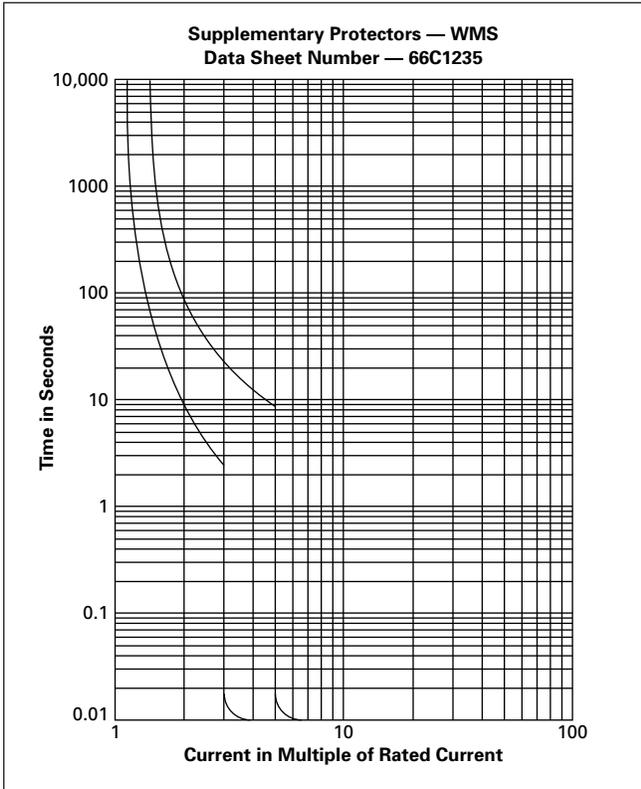


Figure 11-28. MCB Curve B Time/Current Characteristic

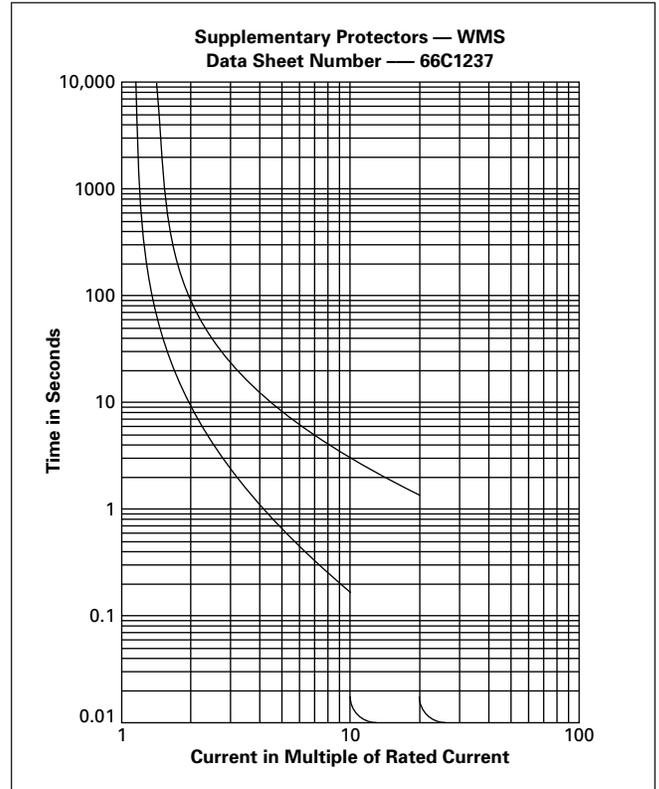


Figure 11-30. MCB Curve D Time/Current Characteristic

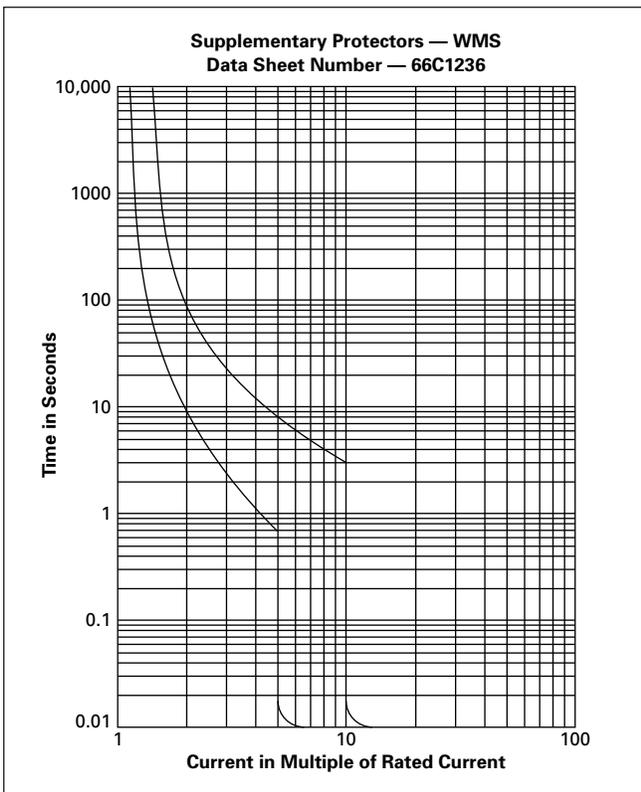


Figure 11-29. MCB Curve C Time/Current Characteristic

WMS

Product Selection



Single-Pole

Table 11-56. Product Selection — Single-Pole

Ampere Rating	B Curve – 3 to 5 I _n Catalog Number	Price U.S. \$	C Curve – 5 to 10 I _n Catalog Number	Price U.S. \$	D Curve – 10 to 20 I _n Catalog Number	Price U.S. \$
0.5	—		WMS1C00		WMS1D00	
1	—		WMS1C01		WMS1D01	
2	—		WMS1C02		WMS1D02	
3	—		WMS1C03		WMS1D03	
4	—		WMS1C04		WMS1D04	
5	—		WMS1C05		WMS1D05	
6	WMS1B06		WMS1C06		WMS1D06	
7	WMS1B07		WMS1C07		WMS1D07	
8	WMS1B08		WMS1C08		WMS1D08	
10	WMS1B10		WMS1C10		WMS1D10	
13	WMS1B13		WMS1C13		WMS1D13	
15	WMS1B15		WMS1C15		WMS1D15	
16	WMS1B16		WMS1C16		WMS1D16	
20	WMS1B20		WMS1C20		WMS1D20	
25	WMS1B25		WMS1C25		WMS1D25	
30	WMS1B30		WMS1C30		WMS1D30	
32	WMS1B32		WMS1C32		WMS1D32	
40	WMS1B40		WMS1C40		WMS1D40	
50	WMS1B50		WMS1C50		—	
60	WMS1B60		WMS1C60		—	

11



2-Pole

Table 11-57. Product Selection — 2-Pole

Ampere Rating	B Curve – 3 to 5 I _n Catalog Number	Price U.S. \$	C Curve – 5 to 10 I _n Catalog Number	Price U.S. \$	D Curve – 10 to 20 I _n Catalog Number	Price U.S. \$
0.5	—		WMS2C00		WMS2D00	
1	—		WMS2C01		WMS2D01	
2	—		WMS2C02		WMS2D02	
3	—		WMS2C03		WMS2D03	
4	—		WMS2C04		WMS2D04	
5	—		WMS2C05		WMS2D05	
6	WMS2B06		WMS2C06		WMS2D06	
7	WMS2B07		WMS2C07		WMS2D07	
8	WMS2B08		WMS2C08		WMS2D08	
10	WMS2B10		WMS2C10		WMS2D10	
13	WMS2B13		WMS2C13		WMS2D13	
15	WMS2B15		WMS2C15		WMS2D15	
16	WMS2B16		WMS2C16		WMS2D16	
20	WMS2B20		WMS2C20		WMS2D20	
25	WMS2B25		WMS2C25		WMS2D25	
30	WMS2B30		WMS2C30		WMS2D30	
32	WMS2B32		WMS2C32		WMS2D32	
40	WMS2B40		WMS2C40		WMS2D40	
50	WMS2B50		WMS2C50		—	
60	WMS2B60		WMS2C60		—	



3-Pole

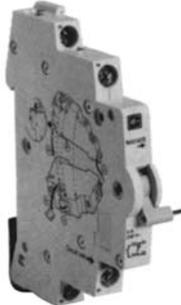
Table 11-58. Product Selection — 3-Pole

Ampere Rating	B Curve – 3 to 5 I _n Catalog Number	Price U.S. \$	C Curve – 5 to 10 I _n Catalog Number	Price U.S. \$	D Curve – 10 to 20 I _n Catalog Number	Price U.S. \$
0.5	—		WMS3C00		WMS3D00	
1	—		WMS3C01		WMS3D01	
2	—		WMS3C02		WMS3D02	
3	—		WMS3C03		WMS3D03	
4	—		WMS3C04		WMS3D04	
5	—		WMS3C05		WMS3D05	
6	WMS3B06		WMS3C06		WMS3D06	
7	WMS3B07		WMS3C07		WMS3D07	
8	WMS3B08		WMS3C08		WMS3D08	
10	WMS3B10		WMS3C10		WMS3D10	
13	WMS3B13		WMS3C13		WMS3D13	
15	WMS3B15		WMS3C15		WMS3D15	
16	WMS3B16		WMS3C16		WMS3D16	
20	WMS3B20		WMS3C20		WMS3D20	
25	WMS3B25		WMS3C25		WMS3D25	
30	WMS3B30		WMS3C30		WMS3D30	
32	WMS3B32		WMS3C32		WMS3D32	
40	WMS3B40		WMS3C40		WMS3D40	
50	WMS3B50		WMS3C50		—	
60	WMS3B60		WMS3C60		—	

Discount Symbol SP-1

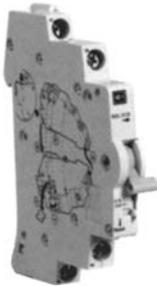
Accessories

Auxiliary Switch



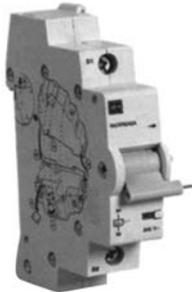
Auxiliary Switch

Alarm Switch



Alarm Switch

Undervoltage Release



Undervoltage Release

Padlock Accessories



WPKEY

WPLK

Table 11-59. Accessories

Description	Module Width	Catalog Number	Price U.S. \$
Auxiliary Switch			
Number of Contacts: 1A/1B	1/2	WAX1A1B	
Alarm Switch			
Number of Contacts: 1A/1B	1/2	WAL1A1B	
Shunt Trip			
Voltage: 110/220 Vac	1	WST220A	
240/415 Vac	1	WST415A	
12/48 Vdc	1	WST48D	
Undervoltage Release			
Voltage: 240 Vac	1	WUVR240A	
48 Vdc	1	WUVR48D	
24 Vdc	1	WUVR24D	
ID Labels			
Identification Labels	—	WIDL	
Padlock Accessories			
Padlocking Attachment	—	WPLK	
Padlock Key		WPKEY	
Lockoff			
Lockoff for 1 – 4-Pole Supplementary Protector	—	WAMPLK	

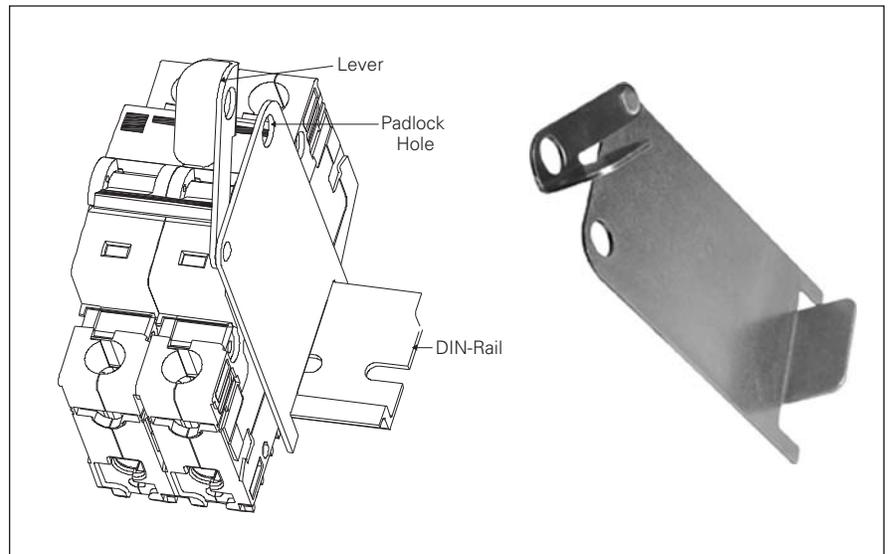


Figure 11-31. WMS Lockoff — WAMPLK

WMS

Accessories

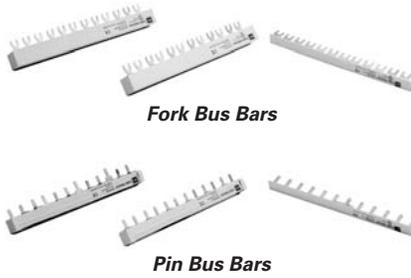


Table 11-60. Bus Bar Combs

Phases	Configuration	Length (mm)	Actual Length (mm)	Number of Devices	Bus Bar Catalog Number	Price U.S. \$	End Cap Catalog Number ①	Price U.S. \$
Fork Connection								
1-Phase	Device	Short	210	12 Unit	WBC1F12		Not Required	
	Device	Long	100	57 Unit	WBC1F57		Not Required	
	Device + Aux	Short	315	12 Unit	WBC1F12A		Not Required	
	Device + Aux	Long	1000	37 Unit	WBC1F37A		Not Required	
2-Phase	Device	Short	210	6 Unit	WBC2F6		WBCCAP10UL	
	Device	Long	100	28 Unit	WBC2F28		WBCCAP10UL	
	Device + Aux	Short	255	6 Unit	WBC2F6A		WBCCAP10UL	
	Device + Aux	Long	1000	22 Unit	WBC2F22A		WBCCAP10UL	
3-Phase	Device	Short	210	4 Unit	WBC3F4		WBCCAP10UL	
	Device	Long	106	19 Unit	WBC3F19		WBCCAP10UL	
	Device + Aux	Short	235	4 Unit	WBC3F4A		WBCCAP10UL	
	Device + Aux	Long	1000	16 Unit	WBC3F16A		WBCCAP10UL	

Pin Connection

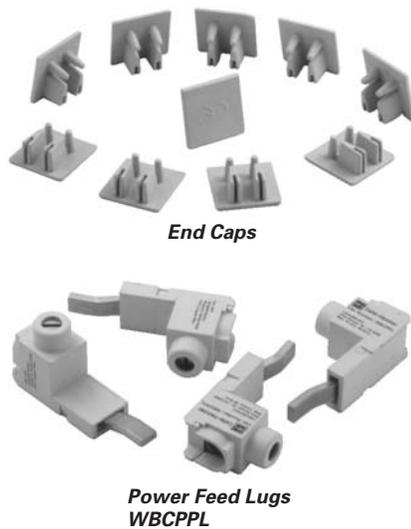
1-Phase	Device	Short	210	12 Unit	WBC1P12		Not Required	
	Device	Long	100	57 Unit	WBC1P57		Not Required	
	Device + Aux	Short	315	12 Unit	WBC1P12A		Not Required	
	Device + Aux	Long	1000	37 Unit	WBC1P37A		Not Required	
2-Phase	Device	Short	210	6 Unit	WBC2P6		WBCCAP10CE	
	Device	Long	100	28 Unit	WBC2P28		WBCCAP10CE	
	Device + Aux	Short	210	6 Unit	WBC2P6A		WBCCAP10CE	
	Device + Aux	Long	1000	22 Unit	WBC2P22A		WBCCAP10CE	
3-Phase	Device	Short	210	4 Unit	WBC3P4		WBCCAP10CE	
	Device	Long	106	19 Unit	WBC3P19		WBCCAP10CE	
	Device + Aux	Short	235	4 Unit	WBC3P4A		WBCCAP10CE	
	Device + Aux	Long	1000	16 Unit	WBC3P16A		WBCCAP10CE	

① Each 2- and 3-phase bus bar comb is supplied complete with two end caps, additional end caps are available as an accessory.

Table 11-61. Bus Bar Accessories

Description	Pack Quantity	Catalog Number	Price U.S. \$
End Caps ②			
For Use with 2- and 3-Phase Fork Bus Bars	10	WBCCAP10UL	
For Use with 2- and 3-Phase Pin Bus Bars	10	WBCCAP10CE	
Power Feed Lugs			
Connection of Oversized Wires to Feed Bus Bar (50 mm ² /10-1 AWG)	4	WBCPPL	
Direct Connection to Feed Fork Bus Bar (35 mm ²)	4	WBCFPL	
Bus Bar Tooth Cap			
Shroud Unused Bus Bar Connection	10	WBCTCAP10	

② Each 2- and 3-phase bus bar comb is supplied complete with two end caps.



SPHM — Supplementary Protector



Single-Pole



2-Pole



3-Pole

Product Description

- IEC breaker recognized by UL under UL 1077.
- Used to provide overcurrent protection where branch protection (for example UL 489 MCCB) is already provided or not required.
- Installed as a component within or part of an appliance or a piece of electrical equipment.
- Ideal replacement for fuses that are applied as a supplementary protector i.e., in addition to branch protection (if required).
- 35 mm DIN-rail mountable, utilizing the molded spring clip.
- Light Gray case with Off White handle, that is marked "O" for OFF and "I" for ON.
- UL File Number E69553.

Application Description

Cutler-Hammer Supplementary Protectors by Eaton Corporation are ideal for providing protection in a multitude of applications, including:

- Motor control circuits.
- Control power transformers.
- Relays.
- Contactor coils.
- PLC I/O points.
- Lighting circuits.
- Fluctuating ambients.
- High vibration.
- Shock resistant.

Features, Benefits and Functions

- **Environmental, Vibration and Shock Resistant:** Mil-spec qualification for fungus resistance, humidity, salt spray resistance and shock vibration resistance.
- **Heat Induced Nuisance Tripping Eliminated:** The protector is designed to "hold in" at 100% continuous rated current, regardless of ambient temperatures from -40° to +85°C.
- **Immediate Reset After Trip:** The protector can be reset (closed) immediately after an overcurrent trip without a "cooling off" period.
- **1/2 Cycle High Inrush Tolerance — 8X (standard), 18X and 25X:** The protector is available with different levels of tolerance to 1/2 cycle current spikes — standard tolerance is 8X the continuous current rating; in addition 18X and 25X are also available.
- **Overcurrent Curves, Long, Medium or Short Delay:** Time characteristic curves are available as Short, Medium and Long Delay.
- **Integral Auxiliary Switch (optional selection):** One auxiliary switch (a or b) can be factory installed per pole — a separate pole for auxiliary is NOT required. Contact Eaton for price adder.
- **Precise Overcurrent Calibration:** The protector can be precisely calibrated to a wide variety of current ratings, from 0.1 to 50 continuous amperes.
- **DIN-Rail Mountable:** The protector can be easily mounted, utilizing its quick release spring clip to attach it to a 35 mm DIN-rail.

Standards and Certifications

- UL recognized under UL 1077.
- CSA 22.2 No. 235.
- VDE 0660.
- IEC 60947-2.
- CE marked.

SPHM

Product Specifications

The SPHM Supplementary Protector is a dual rated product for both ac and dc supplies, in accordance with UL 1077, CSA 22.2, VDE 0660 and IEC 60947-2 standards.

It is to be applied in conjunction with a branch protector (if branch protection is required) and can be a replacement

for similarly applied fuses. Its advantages over fuses are that it is resettable and the device's status is easily and clearly identified by the position of the handle. In addition to this, the user is able to select a device that precisely fits the application (of which there are many) due to the availability of a wide range of current ratings, three levels of inrush tolerance (8X, 18X or 25X) and flexible time characteristic curves

(Short, Medium and Long Delay). In addition to this, the SPHM's protection performance is *not* adversely affected and is resistant to abnormal or changing ambient temperatures or even excessive environmental factors. The design allows it to be utilized in environments that can expose it to fungus, shock or out of the ordinary vibration.

Technical Data and Specifications

Table 11-62. Short Circuit Capacity

Standards and Approvals	Ampere Rating	Volts ac 50/60 Hz	Volts dc	Interruption Capacity ($I_{cu} = I_{cs}$)
UL 1077 CSA 22.2	0.1 – 30 35 – 50	277/480 250	— 80	3000 5000
VDE 0660 IEC-60947-2	0.1 – 50 0 – 50	230/400 —	— 80	1500 3000

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Approximate Dimensions

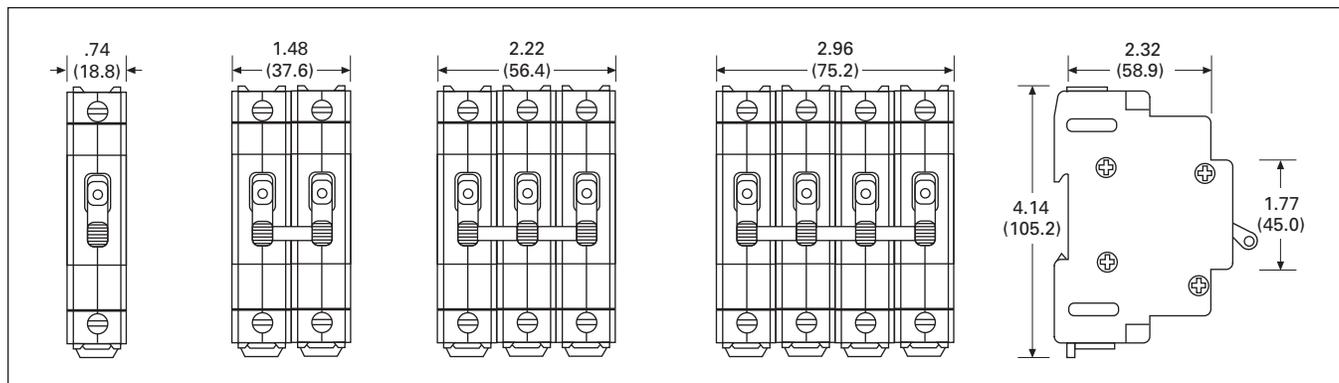


Figure 11-32. Approximate Dimensions in Inches (mm) — Not for Construction Purposes

Table 11-63. SPHM — Shipping Data

Pole Configuration	Pack Quantity	Pack Dimensions in Inches (mm)	Pack Weight Lbs oz. (kg)
1	1	2.05 x 3.94 x 5.12 (52.1 x 100.1 x 130.0)	7 oz. (.20)
2	1	2.05 x 3.94 x 5.12 (52.1 x 100.1 x 130.0)	12 oz. (.34)
3	1	3.54 x 3.94 x 5.12 (89.9 x 100.1 x 130.0)	1 lb. 2 oz. (.51)
4	1	3.54 x 3.94 x 5.12 (89.9 x 100.1 x 130.0)	1 lb. 7 oz. (.65)

Trip Curves

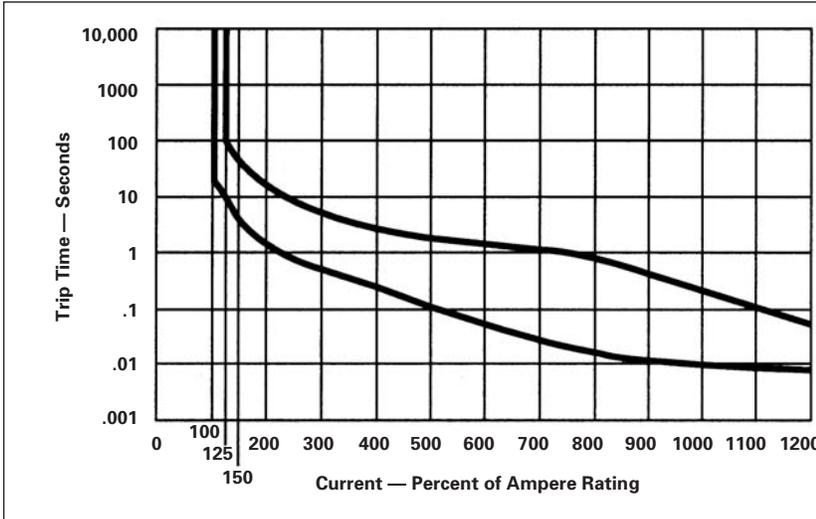


Table 11-64. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

Percent Overload	Delay Maximum (Seconds)	Delay Minimum (Seconds)
100	No Trip	No Trip
101 – 125	May Trip	May Trip
125	110	10
150	50	4.5
200	18	1.7
300	6	.55
400	2.8	.25
500	1.9	1.1
600	1.5	.05
700	1.2	.025
800	.8	.015
900	.41	.011
1000	.2	.01
1100	.1	.009
1200	.05	.008

Figure 11-33. 8X Continuous Current — Curve 2, Medium Delay, Option M

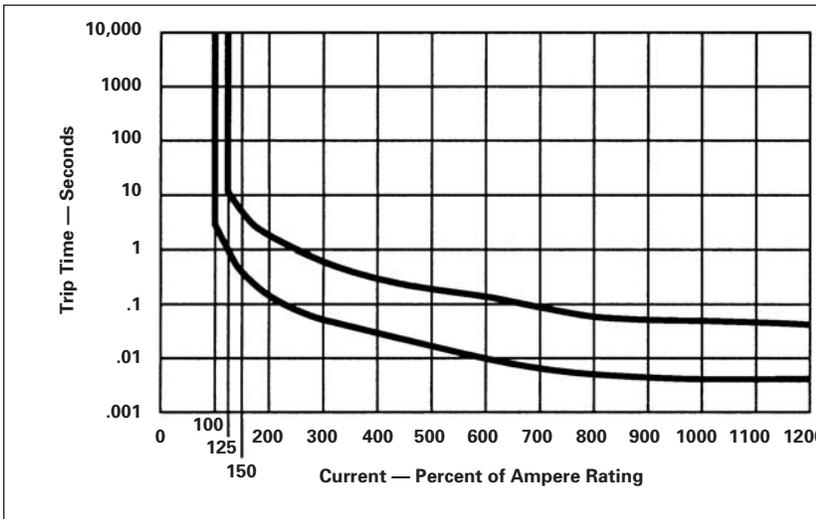


Table 11-65. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

Percent Overload	Delay Maximum (Seconds)	Delay Minimum (Seconds)
100	No Trip	No Trip
101 – 125	May Trip	May Trip
125	12	1
150	5	.4
200	1.9	.15
300	.64	.054
400	.3	.03
500	.2	.017
600	.14	.01
700	.09	.007
800	.06	.005
900	.052	.0044
1000	.05	.004
1100	.046	.004
1200	.04	.004

Figure 11-34. 8X Continuous Current — Curve 3, Short Delay, Option S

SPHM

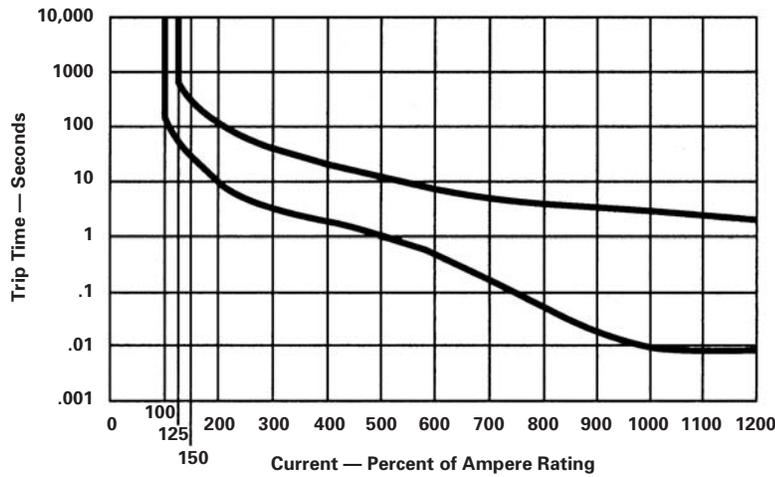


Table 11-66. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

Percent Overload	Delay Maximum (Seconds)	Delay Minimum (Seconds)
100	No Trip	No Trip
101 - 125	May Trip	May Trip
125	700	60
150	350	30
200	120	10
300	42	3.4
400	22	2
500	12.5	1.1
600	8	.5
700	5.2	.17
800	4	.05
900	3.4	.02
1000	3	.01
1100	2.5	.0084
1200	2	.008

Figure 11-35. 18X Continuous Current — Curve 10, Long Delay, Option L

11

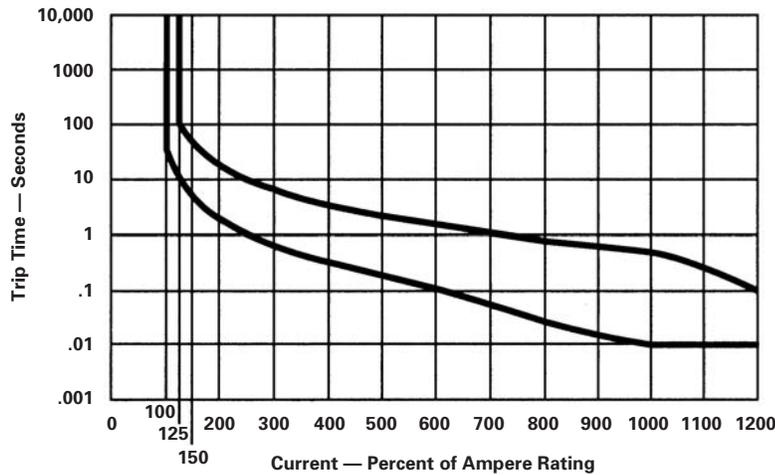


Table 11-67. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

Percent Overload	Delay Maximum (Seconds)	Delay Minimum (Seconds)
100	No Trip	No Trip
101 - 125	May Trip	May Trip
125	110	10
150	50	4.5
200	18	1.7
300	6.9	.54
400	4	.3
500	2.75	.18
600	2	.1
700	1.4	.04
800	1	.02
900	.75	.013
1000	.5	.01
1100	.25	.01
1200	.1	.01

Figure 11-36. 18X Continuous Current — Curve 20, Medium Delay, Option M

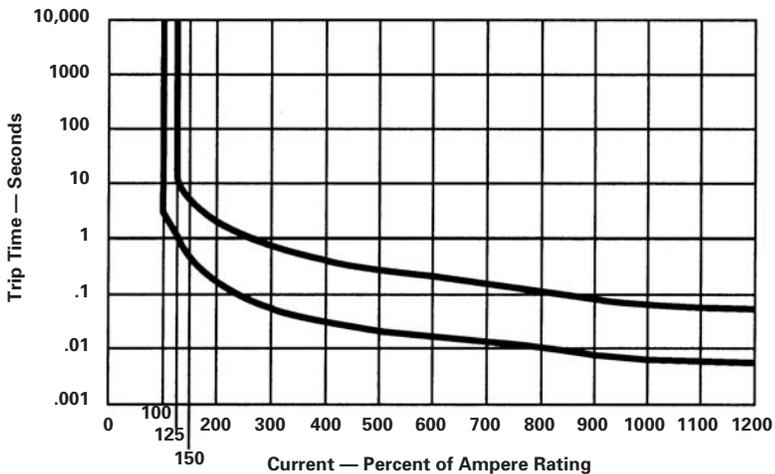


Table 11-68. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

Percent Overload	Delay Maximum (Seconds)	Delay Minimum (Seconds)
100	No Trip	No Trip
101 - 125	May Trip	May Trip
125	12	1
150	5	.4
200	1.9	.15
300	.73	.052
400	4	.03
500	.27	.02
600	.2	.015
700	.14	.012
800	.1	.01
900	.074	.0076
1000	.06	.006
1100	.053	.0053
1200	.05	.005

Figure 11-37. 18X Continuous Current — Curve 30, Short Delay, Option S

SPHM

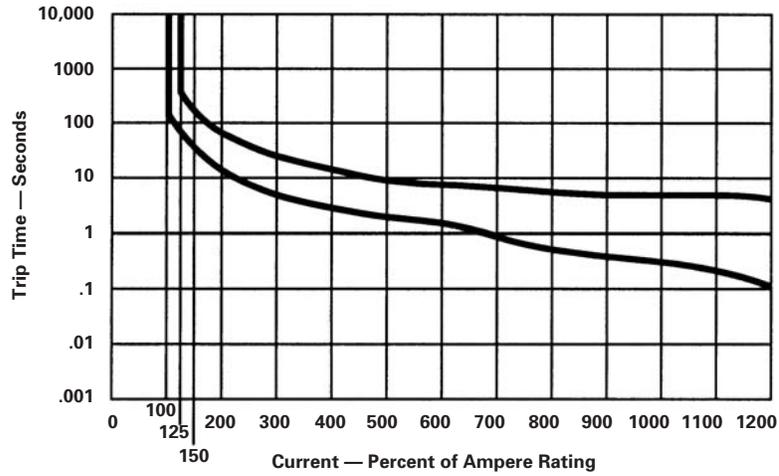


Figure 11-38. 25X Continuous Current — Curve 251, Long Delay, Option L

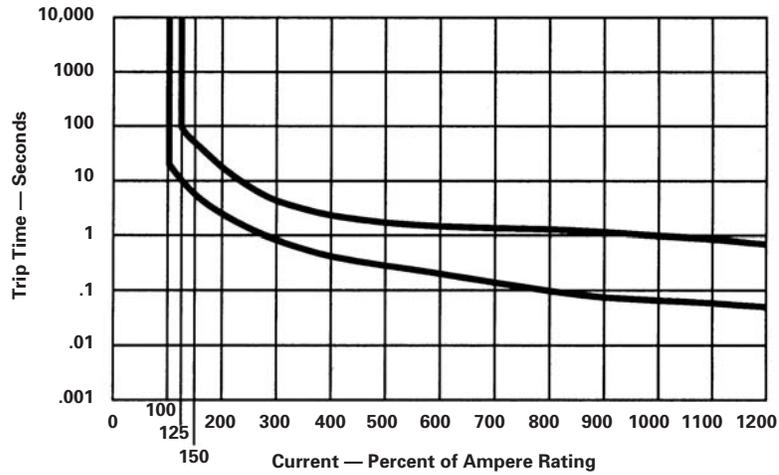


Figure 11-39. 25X Continuous Current — Curve 252, Medium Delay, Option M

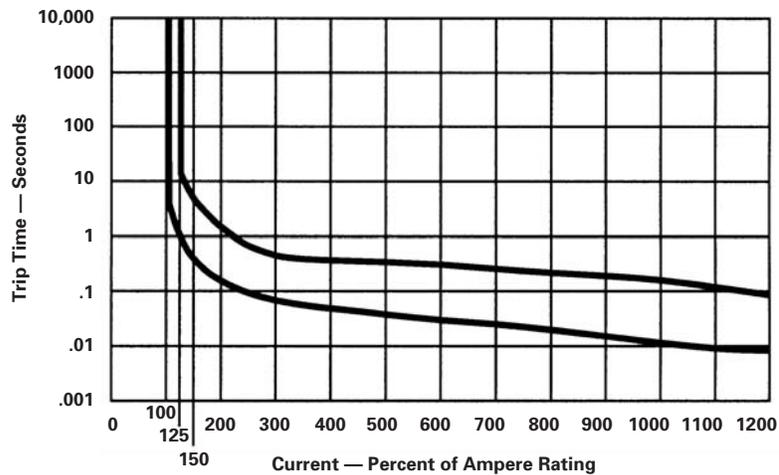
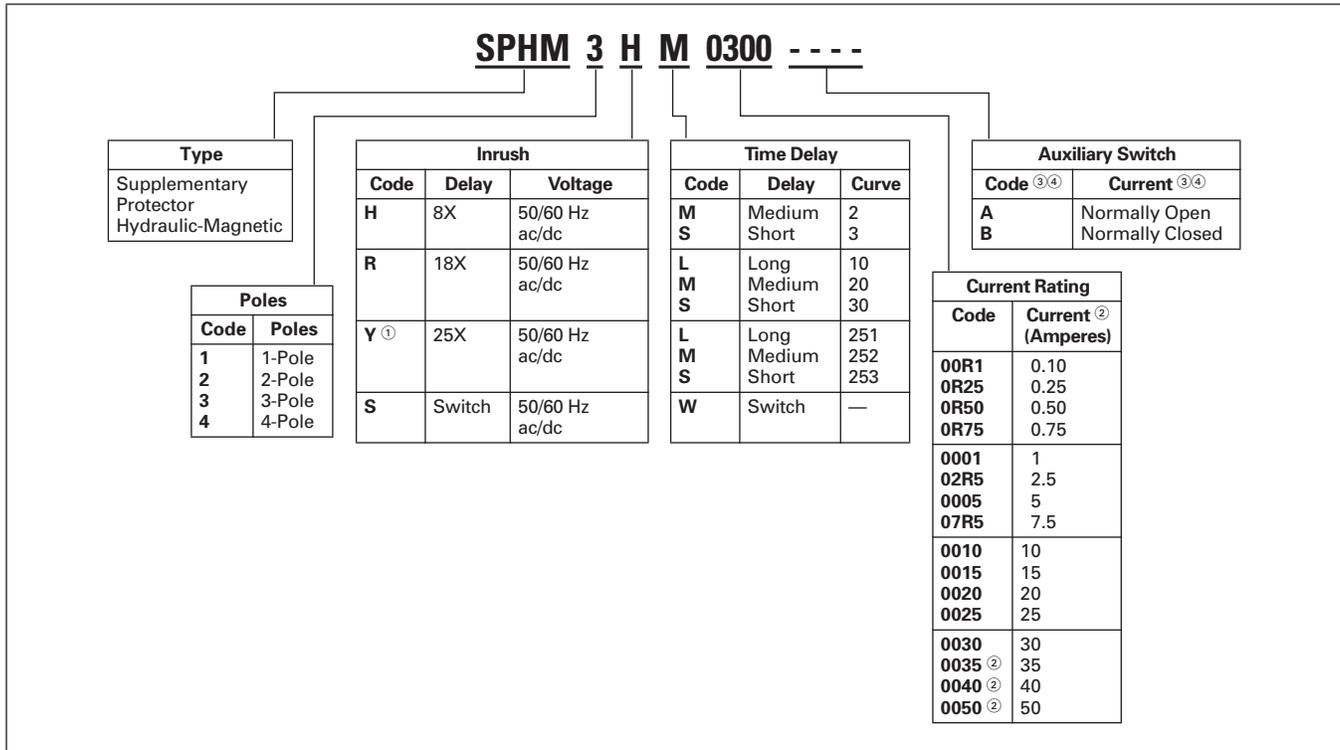


Figure 11-40. 25X Continuous Current — Curve 253, Short Delay, Option S

SPHM

Product Selection

Table 11-69. SPHM Catalog Numbering System



- ¹ Maximum of 40 amperes available at 25x inrush.
- ² UL recognized to 250 Vac, 5 kA above 30 amperes.
- ³ One A or B contact maximum per pole. Contacts will be arranged left to right (e.g., BAB suffix on 3-pole breaker).
- ⁴ Contact Eaton for availability and price.

Table 11-70. SPHM Product Selection ⁵

Continuous Current Ampere Rating	18X (Standard Inrush Tolerance) Medium Delay Curve 20							
	1-Pole 277 Vac Catalog Number	Price U.S. \$	2-Pole 277/480 Vac Catalog Number	Price U.S. \$	3-Pole 277/480 Vac Catalog Number	Price U.S. \$	4-Pole 277/480 Vac Catalog Number	Price U.S. \$
0.1	SPHM1RM00R1 ⁶		SPHM2RM00R1 ⁶		SPHM3RM00R1 ⁶		SPHM4RM00R1	
0.25	SPHM1RM0R25 ⁶		SPHM2RM0R25 ⁶		SPHM3RM0R25 ⁶		SPHM4RM0R25	
0.50	SPHM1RM0R50 ⁶		SPHM2RM0R50 ⁶		SPHM3RM0R50 ⁶		SPHM4RM0R50	
0.75	SPHM1RM0R75 ⁶		SPHM2RM0R75 ⁶		SPHM3RM0R75 ⁶		SPHM4RM0R75	
1	SPHM1RM0001 ⁶		SPHM2RM0001 ⁶		SPHM3RM0001 ⁶		SPHM4RM0001	
2.5	SPHM1RM02R5 ⁶		SPHM2RM02R5 ⁶		SPHM3RM02R5 ⁶		SPHM4RM02R5	
5.0	SPHM1RM0005 ⁶		SPHM2RM0005 ⁶		SPHM3RM0005 ⁶		SPHM4RM0005	
7.5	SPHM1RM07R5 ⁶		SPHM2RM07R5 ⁶		SPHM3RM07R5 ⁶		SPHM4RM07R5	
10	SPHM1RM0010 ⁶		SPHM2RM0010 ⁶		SPHM3RM0010 ⁶		SPHM4RM0010	
15	SPHM1RM0015 ⁶		SPHM2RM0015 ⁶		SPHM3RM0015 ⁶		SPHM4RM0015	
20	SPHM1RM0020 ⁶		SPHM2RM0020 ⁶		SPHM3RM0020 ⁶		SPHM4RM0020	
25	SPHM1RM0025 ⁶		SPHM2RM0025 ⁶		SPHM3RM0025 ⁶		SPHM4RM0025	
30	SPHM1RM0030 ⁶		SPHM2RM0030 ⁶		SPHM3RM0030 ⁶		SPHM4RM0030	

Continuous Current Ampere Rating	250 Vac							
	1-Pole 250 Vac Catalog Number	Price U.S. \$	2-Pole 250 Vac Catalog Number	Price U.S. \$	3-Pole 250 Vac Catalog Number	Price U.S. \$	4-Pole 250 Vac Catalog Number	Price U.S. \$
35	SPHM1RM0035 ⁶		SPHM2RM0035 ⁶		SPHM3RM0035 ⁶		SPHM4RM0035	
40	SPHM1RM0040 ⁶		SPHM2RM0040 ⁶		SPHM3RM0040 ⁶		SPHM4RM0040	
50	SPHM1RM0050 ⁶		SPHM2RM0050 ⁶		SPHM3RM0050 ⁶		SPHM4RM0050	

- ⁵ For stocking information: please contact Eaton for current stocking situation.
- ⁶ To identify catalog number for other Inrush and Delay categories, replace underlined letters from Catalog Number Selection above. Contact Eaton for availability and price.

Discount Symbol SP-1

Heinemann® Hydraulic-Magnetic Circuit Breakers

Product Description

Eaton has combined Heinemann and Cutler-Hammer technologies to give customers the best protective solutions available in the world from 12 to 38,000 volts. Heinemann offers product designers the broadest ranges of hydraulic-magnetic circuit breakers from 0.1 to 1200 amperes.

Nuisance Tripping Eliminated

Heinemann hydraulic-magnetic circuit breakers offer three major advantages:

- Elimination of nuisance tripping caused by high ambient temperatures in or near the installation. The breaker responds only to current variations, not to temperature change.
- Continuous operation at 100% current. There is no such assurance with a thermal device, which may fail to carry rated current when subjected to above normal ambient temperatures. A Heinemann breaker rated at 20 amperes, for example, will sustain 20 amperes, even at elevated temperatures. Derating and other forms of temperature compensation are unnecessary.
- Immediate reset. Since there are no thermal elements, heat build-up is not a factor. Therefore, no "cooling off" period is required after a fault.

Guaranteed Power Availability

Using a controlled time delay, Heinemann circuit breakers can eliminate nuisance tripping caused by transient current surges. In any installation where a power supply or compressor motor is on the line, an inrush of current occurs when the equipment is first turned on. The bigger the equipment, the larger the surge. Although inrush surges are, in fact, transient overloads, they usually pose no threat of damage to the line or the equipment. So, it's simply not necessary or even desirable to interrupt the power when they occur.

The hydraulically controlled time-delay mechanism of a Heinemann breaker eliminates nuisance tripping without reducing the overload protection. The delay is inversely proportional to the overload; response is quicker on large overloads where greater potential danger exists, and slower on small overloads. For sensitive electronic equipment, Heinemann breakers can be purchased with an instantaneous trip feature to prevent damage.

Precision Protection

The current rating of the hydraulic-magnetic circuit breaker is determined by the number of wire turns in the load sensing coil. By altering the number of turns and the wire size, Heinemann can provide a breaker of virtually any rating within the unit's overall current carrying range. Regardless of your needs, we can deliver custom equipment protection, even at fractional amperages.

Shock and Vibration

A precision, counterbalanced armature design prevents mechanical tripping due to shock and vibration. This makes the Heinemann family of products perfect anywhere shock and vibration are a concern. Some popular applications include railcars, mobile industrial equipment, generators and marine power distribution.

Global Ready

Heinemann breakers are tested to meet global certifications and standards including UL, CE, VDE, TUV and CSA.

Mission Control

With a variety of control and indicating options, the Heinemann line of circuit breakers allows you to take control of your complex operations. Available with integral remote trip coils and indicating contacts, Heinemann breakers can be integrated into your control logic. We also offer a lighted handle design that can allow operators to see breaker conditions at a distance.

Self-Adjusting

The time delay feature is self-adjusting to ambient temperature conditions. At high ambients where the overload tolerance of most circuits is lowered, the viscosity of the fluid in the breaker's dashpot is lessened, and the time delay is thereby shortened. At low temperatures, the response is correspondingly longer to allow for cold equipment startups.

Features, Benefits and Functions

Hydraulic-Magnetic



Hydraulic-Magnetic

- Precision custom calibration.
- Requires no derating (100% rated).
- Ambient compensating (-40°C to +85°C).
- Immediate reset after fault.
- Broad range of integral internal accessories.
- Provides equipment and wire protection.

Fuse Protection



Fuse Protection

- No-reset capability.
- Fuses degrade over time.
- Protection effected by ambient temperature.
- Requires more panel space.
- No accessories available.
- Provides equipment and wire protection.

Thermal-Magnetic



E125S Thermal-Magnetic Breaker

- Fixed calibration band, wide variation.
- Device must be derated to 80% load.
- Protection effected by ambient temperature.
- Requires "cooling-off" period.
- Accessories in multi-pole devices only.
- Provides basic wire protection.

Heinemann

2. Self-Cleaning Contacts

Sliding pivot point causes a wiping action across the contacts each time a breaker is switched. This cleaning motion helps keep surface resistance low, extending contact life. (Contacts are made of silver alloy for minimal wattage loss.)

3. Efficient Blowout Grid

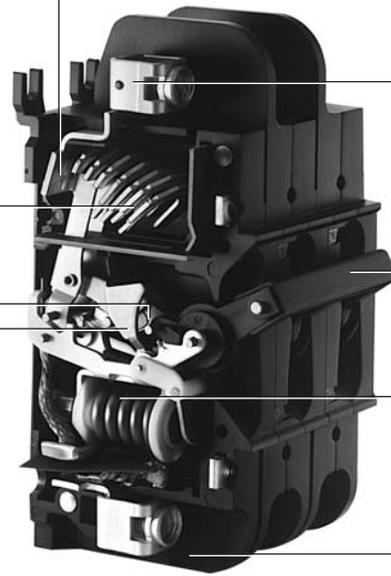
U-shaped grid plates quickly draw out, fragment and extinguish contact arc. Charring and pitting are minimized.

4. Sturdy Toggle and Latch

Strong, durable and highly efficient. Latch is shock-resistant, yet provides very fast operation. Trip-free construction makes it impossible to hold the breaker closed against a fault. (Even when handle is held in ON position, contacts trip free of fault condition.)

5. Balanced Armature

Counterbalanced armature design helps prevent mechanical tripping caused by shock and vibration. Meets MIL-STD-202 requirements.



1. Broad Selection of Terminal Styles

Pressure connector, threaded stud, hook, bus, plug-in and quick-connect terminals (with holes for optional soldering) are available.

6. Two-Position Switching

Two handle positions, ON and OFF (no ambiguous "reset" position). After fault clearance, simply snap the handle back to ON.

7. Load-Sensing Coil

Magnetic unit measures current, not temperature, making it unnecessary to derate for high-ambient service. Coil will carry 100% rated load as specified in the appropriate response curve.

8. Fungus-Resistant Case

Circuit breakers are housed in special plastic casings that significantly reduce fungal growth and contamination.

Inside a Heinemann Hydraulic-Magnetic Circuit Breaker

The Hydraulic Principal

The hydraulic-magnetic technology used in the Heinemann line of circuit breakers delivers precision protection and a controlled response to changes in load current. Utilizing a coil of wire to measure the magnetic flux produced in the circuit, in combination with the dampening effect of an oil-filled tube, Heinemann circuit breakers provide reliable, consistent protection characteristics in all environments.

The Heinemann hydraulic-magnetic circuit breaker operates on load-current produced magnetic flux variation in a solenoid. The coil is wound around a hermetically sealed, non-magnetic tube containing a spring-loaded, moveable iron core and a silicone liquid fill. With the load current either at or below the breaker's nominal rating, the magnetic flux is of insufficient strength to move the core, and it remains at the end of the tube opposite the armature.

On an overload, the magnetic flux force increases, pulling the iron core into the coil toward the armature end of the tube. This core insertion reduces the reluctance of the magnetic circuit and further increases the strength of the magnetic field. The silicone liquid regulates the core's speed of travel, creating a controlled trip delay that is inversely proportional to the magnitude of the overload. If the overload subsides before the core reaches the pole piece, the core returns to its original position, and the breaker does not trip. (For non-delay applications, the breaker is modified to omit the intentional delay.)

When the magnetic flux reaches a predetermined value, the armature is attracted to the pole piece and the breaker trips. (The breaker may trip before the core reaches the pole piece if the critical flux value is achieved first.) On very heavy overloads or short circuits, the flux produced by the coil above, regardless of core position, is sufficient to pull in the armature. This circuit interruption occurs with no intentional delay — a highly desirable response characteristic.



Core at End of Tube Opposite Armature



Overload Subsides Before Core Reaches Pole Piece



Armature Pulled In

Technical Data

Personalized Protection To Fit Your Application

With advanced hydraulic-magnetic technology, we're able to match our breaker performance to meet your exact application requirements. Whether you choose a standard curve, or one of our special application curves, we're sure to have a device that meets your needs. In addition, if you have specific requirements that can't be met with one of our off-the-shelf products, we can custom configure a breaker to protect your equipment.

To find out more about custom breaker solutions, or for application assistance, you can contact our Technical Resource Center at 1-800-356-1243 or via e-mail at trc@eaton.com.

Time Delay Curves and Typical Applications

The curves shown indicate the magnitude and duration of overloads, which will be tolerated before tripping occurs. By selecting the proper curve, breaker response can be closely matched to safe operating limits of the equipment or circuitry. The following are standard curves for typical applications on ac and dc circuits.

Curve 1

Allows the largest and most prolonged overload needed to prevent nuisance tripping on motor circuits.

Curve 2

A medium delay accommodates mixed loads consisting of lights, motors and resistive heating, where the breaker is rated to the wiring instead of to any specific load.

Curve 3

Permits a very brief time delay period before tripping and is used for protection of transformers and electronic circuits.

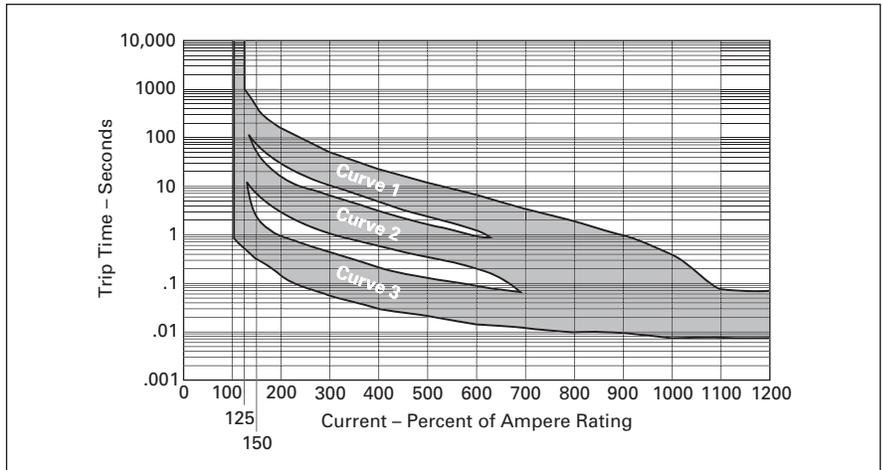


Figure 11-41. Curves 1, 2 and 3, dc

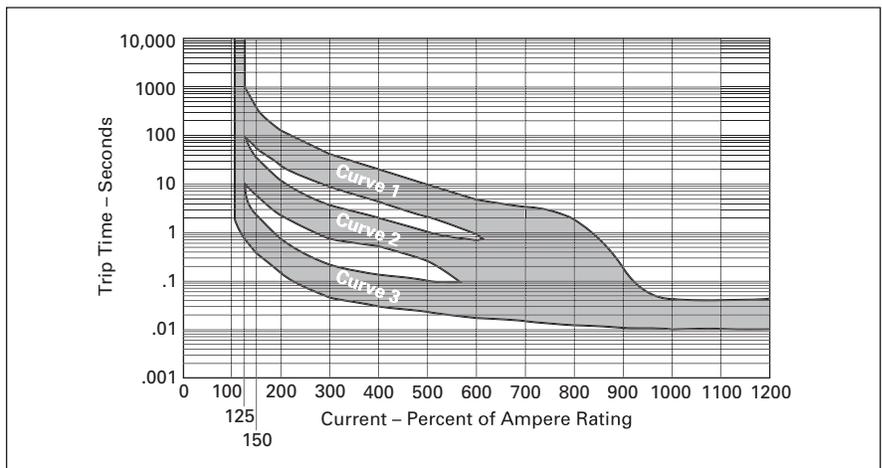


Figure 11-42. Curves 1, 2 and 3, 50/60 Hz

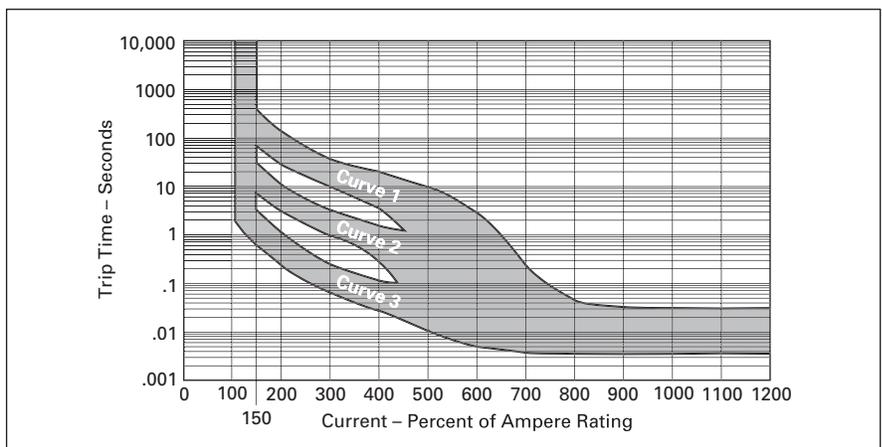


Figure 11-43. Curves 1, 2 and 3, 400 Hz

Time Delay Curves and Typical Applications

Curve P

Non-time-delay breakers have no deliberately imposed delay and will trip instantaneously at any load above 120% of rated current.

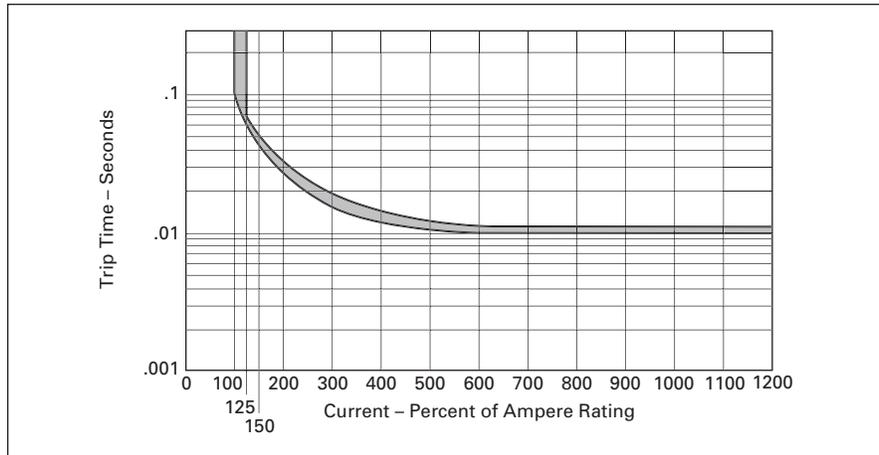


Figure 11-44. Curve P, Non-delay

Curve 10

High Inrush — Time delays similar to Curves 1, 2 and 3 with high-inrush surge capabilities.

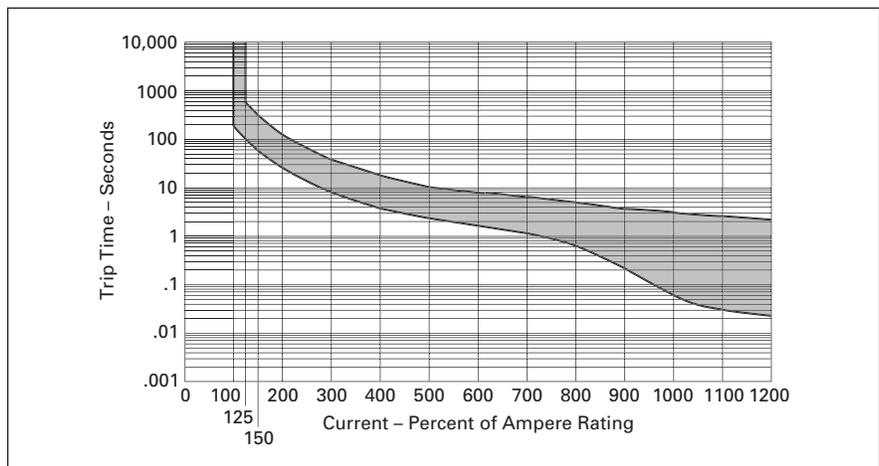


Figure 11-45. Curve 10

Curve 20

High Inrush — Time delays similar to Curves 1, 2 and 3 with high-inrush surge capabilities.

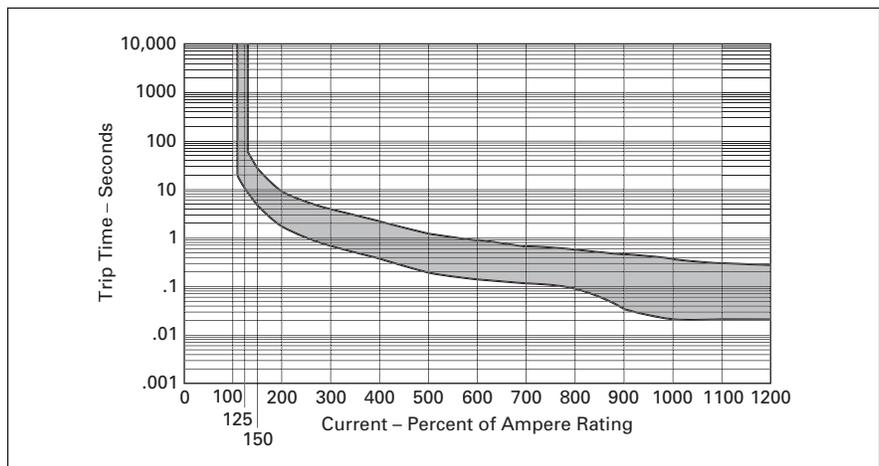


Figure 11-46. Curve 20

Curve 30

High Inrush — Time delays similar to Curves 1, 2 and 3 with high-inrush surge capabilities.

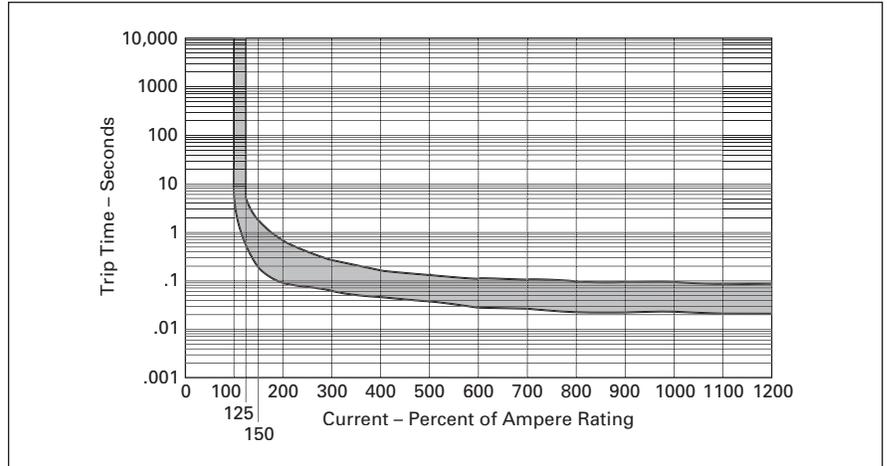


Figure 11-47. Curve 30

Curve 100

High Inrush — For ferroresonant power supplies, distribution transformers, data processing equipment, etc., which may draw starting surges as high as 3000% normal load. To accommodate brief surges of this magnitude for approximately a half cycle of line current, or 8.3 milliseconds (long enough to get the equipment online without tripping), high inrush models are available.

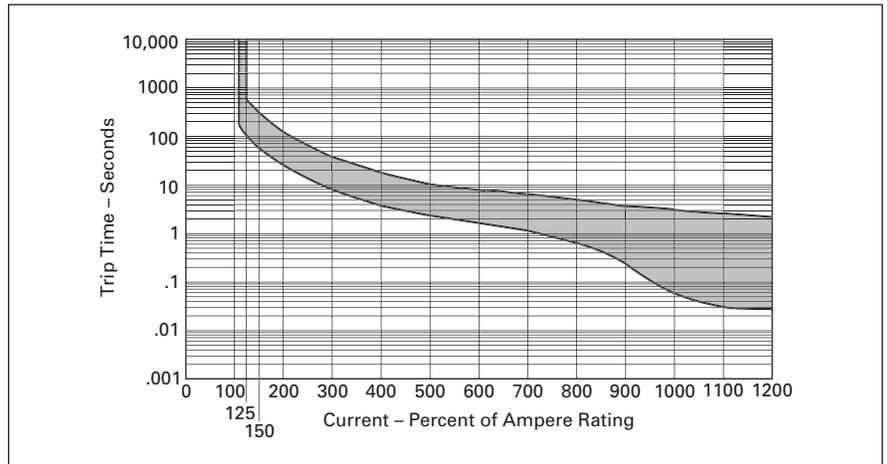


Figure 11-48. Curve 100

Internal Circuits

Product Specifications

All time-delay curves shown are based on the fact that circuit breakers are not preloaded. (Breakers do not carry current prior to application of overload for calibration testing.) Curves are plotted at an ambient temperature of 77°F (25°C), with breakers in the standard wall-mount position.

Heinemann Breakers are 100% Rated

All circuit breakers shall hold 100% rated load continuously. Time-delay circuit breakers may trip between 101% and 125% of rated load; must trip at 125% and above, as shown on the time-delay curve selected. Breakers rated for ac/dc operation may trip between 101% and 135%; must trip at 135% and above.

Non-time-delay circuit breakers may trip instantaneously between 101% and 120% of rated load; must trip instantaneously at 120% and above.

Ambient Compensating

Time delay will decrease as ambient temperature is raised and increase as ambient is lowered.

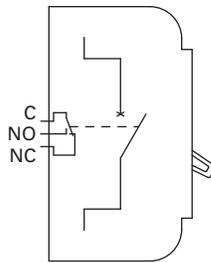
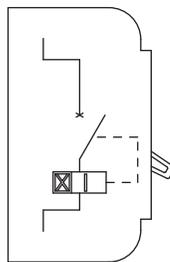
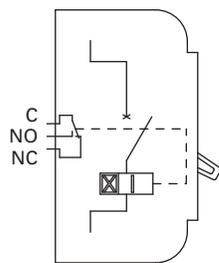
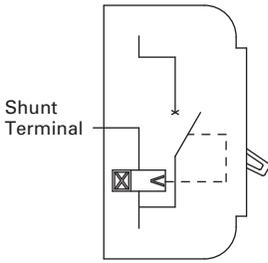
Note: These curves are presented for product selection purposes only. For detailed curve information by frame, please visit www.eaton.com/heinemann.

Heinemann circuit breakers are available in a variety of electrical configurations. When ordering a breaker, you must specify the internal circuit type. Each pole can be configured separately, making the design flexible around your application.

The most common configuration is "Series Trip" which means that the magnetic coil is in series with the main power circuit of the breaker, providing overcurrent protection. By configuring poles separately, you can design equipment that will work in multiple environments.

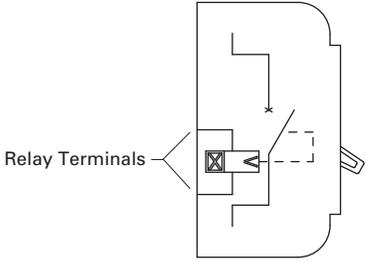
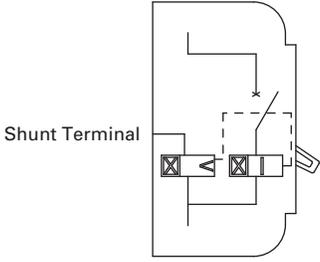
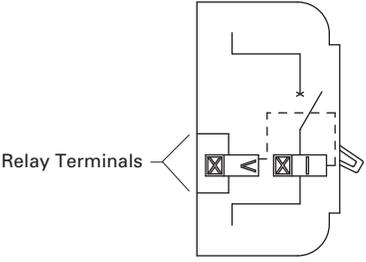
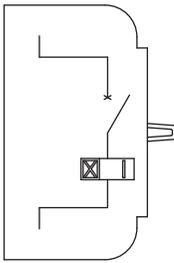
For instance, by configuring individual poles with different amperage ratings, you could design your equipment to work on different voltages. You could also use the relay trip function to shut down the power circuit while leaving the control circuit energized during a system fault.

Table 11-71. Internal Circuits

Circuit	Diagram	Description
Switch	Internal Circuits Represented: 0, 12 	Switch only (without coil) with or without auxiliary contact.
Series Trip	Internal Circuits Represented: 3, 8 	The contacts and the coil are in series. It is often used as the main switch.
Series Trip With Auxiliary Contact	Internal Circuits Represented: 2, 9 	The contacts and the coil are in series. Auxiliary contacts are placed behind the circuit breaker and mechanically connected to the releasing system.
Shunt Tap	Internal Circuit Represented: 5 	Enables two loads to be checked by means of a single circuit breaker. However, it only releases if there is an overload in the main circuit. The sum of the two nominal currents must not exceed the peak current of the contacts. With this execution, it is also possible to adjust the tripping through a potentiometer between the load terminals.

Internal Circuits

Table 11-71. Internal Circuits (Continued)

Circuit	Diagram	Description
Relay Trip	Internal Circuit Represented: 6 	Relay tripping can be used for releasing the circuit breaker by the intermediary of a monitor or a safety device installed at a distance. The contacts are electrically separated from the coil. Consequently, all the currents and voltages within the permissible limits can be used. Coils are either current or voltage sensitive.
Dual Control (DUCON)	Internal Circuits Represented: 15, 25 	The version is used both for the protection of the load finding itself in series with the circuit breaker and for the release via a voltage. The main coil is in series with the contact and the DUCON coil is shunt trip.
Dual Control DUCON (Series + Relay)	Internal Circuits Represented: 16, 26 	Dual Control DUCON allows separate control of the shunt trip coil when the load is not energized. Similar to a shunt trip coil in a molded case breaker.
Mid-Trip	Internal Circuit Represented: 98 	Series overload, mid-trip handle position.

Circuit Breaker Series

Product Selection

KD Series



KD Series Pushbutton

A low-cost pushbutton supplementary protector for electrical equipment. Designed to fit a standard 5/8" round or "D" shaped panel cutout. With a variety of accessories, the KD Series is a perfect replacement for traditional panel-mounted fuse holders.

Table 11-72. KD Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Thermal	1	250 Vac	0.25 – 20 A	1 kA
		32 Vdc	0.25 – 15 A	0.2 kA
		50 Vdc	0.25 – 10 A	0.2 kA

PROPAK Series



PROPAK Series Circuit Breaker

Miniature single- or 2-pole circuit breaker available with paddle or rocker handle. Available with or without illumination and a variety of internal accessories including auxiliary switches and remote tripping options. Carries UL 1077, CSA and VDE approvals.

Table 11-73. PROPAK Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Hydraulic-Magnetic	1	250 Vac	0.1 – 20 A	1 kA
		50 Vdc	0.1 – 20 A	1 kA
		72 Vdc	0.1 – 20 A	1 kA

J Series



J Series Circuit Breaker

Small lightweight hydraulic-magnetic circuit breaker perfect for telecom and marine applications. Available in ratings from 0.1 – 50 amperes, the J Series offers a variety of options including snap-in mounting and rocker style handles. The compact size of the J Series makes it well suited for applications where space comes at a premium.

Table 11-74. J Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Hydraulic-Magnetic	1	125 Vac	0.2 – 50 A	1 kA ①
		250 Vac	0.1 – 50 A	5 kA ①
	3	415 Vac	0.1 – 30 A	1.5 kA ①
		32 Vdc	0.1 – 50 A	5 kA
	4	72 Vdc	0.1 – 30 A	2 kA
		80 Vdc	0.1 – 20 A	1 kA

① With series fuse.

SPHM Series



SPHM Series Circuit Breaker

The SPHM Series Circuit Breaker snaps easily onto a standard 35 mm DIN rail. This saves valuable installation time. Available with a wide range of accessories, the SPHM Series is the perfect alternative to DIN-rail mounted fuse blocks.

Table 11-75. SPHM Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Hydraulic-Magnetic	1	250 Vac	0.1 – 63 A	5 kA
	2	480/277 Vac	0.1 – 30 A	3 kA
	3	80 Vdc	0.1 – 63 A	5 kA
	4	—	—	—

AMR Series



AMR Series Circuit Breaker

Ultra-high interrupting circuit breaker for single- or multi-pole applications. The AMR Series delivers significant performance advantages in a compact package. Available as a UL 489 listed device, suitable for branch circuit protection, the AMR can be used in a wide variety of applications, including lighting and power distribution equipment. Also carries UL 1077, CSA and TUV approvals.

Table 11-76. AMR Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Hydraulic-Magnetic	1	120/240 Vac	0.2 – 30 A	10 kA ①
	2	250 Vac	0.1 – 100 A	3 kA ①
	3	277 Vac	0.2 – 20 A	10 kA ②
	4	480 Vac	0.1 – 30 A	3 kA ②
		80 Vdc	0.1 – 100 A	5 kA
		125 Vdc	0.1 – 100 A	5 kA

① 5 kA with series fuse.

② With series fuse.

C Series



C Series Circuit Breaker

High-current circuit breaker for single- or multi-pole applications, the C Series is one of Eaton's most versatile breakers. With a 600 Vac rating and the ability to select from a variety of trip curves, the C Series is an alternative to thermal-magnetic breakers in harsh environments or when precision is essential.

Table 11-77. C Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Hydraulic-Magnetic	1	240 Vac	1 – 100 A	5 kA
	2	480 Vac	0.1 – 100 A	Up to 10 kA ③
	3	600 Vac	0.1 – 77 A	Up to 10 kA ③
	4	125 Vdc	0.1 – 100 A	5 kA

③ With series fuse.

GH Series



GH Series Circuit Breaker

The GH Series offers all of the advantages of a completely magnetic 3-pole breaker with a 14,000 ampere interrupting capacity. Perfect for applications in extreme environments where thermal-magnetic breakers would have otherwise been selected. The GH breaker is UL listed (489/508) for branch circuit applications.

Table 11-78. GH Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Hydraulic-Magnetic	1	480 Vac	0.5 – 100 A	14 kA
	2	250 Vdc	0.5 – 100 A	14 kA
	3	—	—	—

AM1P Series



AM1P Series Circuit Breaker

The AM1P breaker is designed for telecommunication sites with high current demands and limited space. With a 250 ampere current carrying capacity and improved interrupting ratings up to 50 kA, the AM1P breaker gives unparalleled performance in site applications. The AM1P series is UL 489A listed.

Table 11-79. AM1P Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Hydraulic-Magnetic	Multiple	80 Vdc	100 – 250 A	up to 50 kA
	—	—	—	—

Circuit Breaker Series

GJ Series



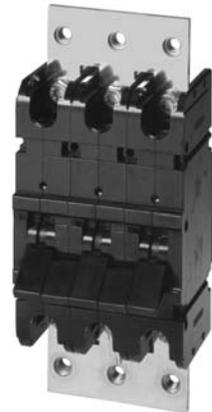
GJ Series Circuit Breakers

High-current circuit breakers in a compact package, the GJ Series offers protection up to 250 amperes. Add the precision of hydraulic-magnetic protection on your critical loads over 100 amperes.

Table 11-80. GJ Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Hydraulic-Magnetic	1	250 Vac	0.5 – 250 A	10 kA
	2	250 Vdc	0.5 – 250 A	10 kA
	3	—	—	—

GJ1P Series



GJ1P Series Circuit Breaker

Similar to the GJ, the GJ1P Series has increased capacity and is available in current ratings up to 1200 amperes. The GJ1P is a UL 489 listed device delivering superior performance.

Table 11-81. GJ1P Series Ratings

Technology	Poles	Voltage	Current	Int. Capacity
Hydraulic-Magnetic	1	65 Vac	100 – 1200 A	25 kA
	2	160 Vdc	100 – 1200 A	10 kA
	3	—	—	—

KD Series



KD Series Pushbutton Circuit Protector

Product Description

The KD Pushbutton Circuit Protector provides circuit protection similar to a fuse but does not require replacement after a fault. This resettable design allows your customer to stay online and eliminate downtime.

Features, Benefits and Functions

- Easy installation — The KD Series is easily installed in a 5/8" round or D-Shaped panel cutout similar to that used on conventional panel-mounted fuse holders. It can be mounted from either the front or rear and is held in place by special hardware. Its 1/4" quick-connect terminals are solderable.
- Resettable pushbutton circuit protector:
 - Provides basic thermal protection
 - Ratings from 0.25 – 20 amperes
 - UL recognized
- Positive action — The KD Pushbutton Circuit Protector trips without delay on short circuit, and with a controlled delay upon sustained overloads upon tripping, the contacts open with a positive snap action, thereby suppressing the arc.
- Protective covers — For applications where equipment may be exposed to dust or moisture, protective boots are available. Two styles are available, one which protects the breaker from splashing water and another which seals the panel opening.

Standards and Certifications

The KD Series has been tested to meet the requirements of UL 1077, and is recognized as a supplemental protector by UL. We also carry CSA approval for applications in Canada.

Technical Data and Specifications

Dimensions in Inches and (mm)

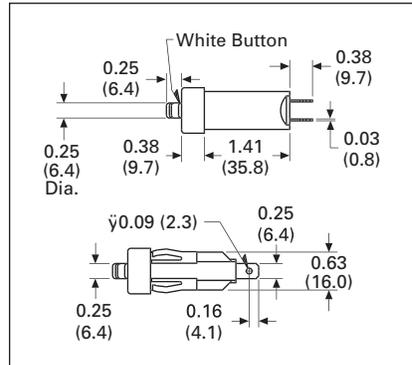


Figure 11-49. Dimensions with Front Mount Clip Installed

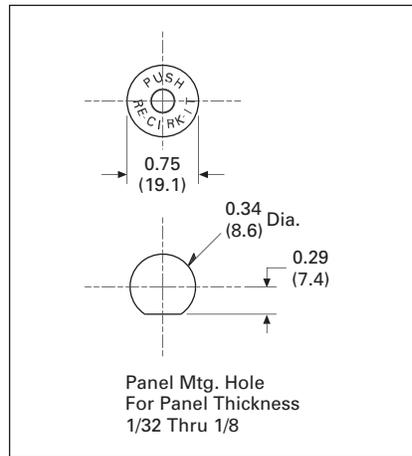


Figure 11-50. Panel Mounting Hole

Accessories

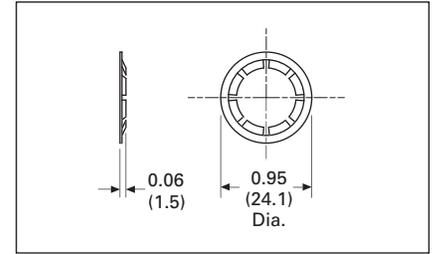


Figure 11-51. #006-10417 Retaining Ring

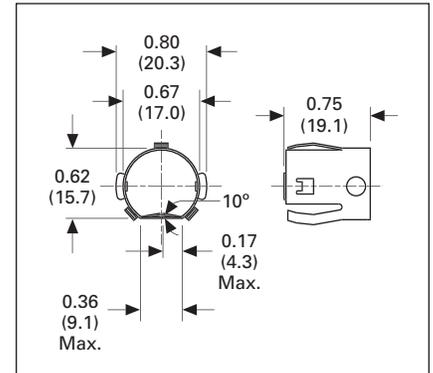


Figure 11-52. #006-10478 Front Mount Clip

Product Selection

Table 11-82. KD Series Standard Product Offering

Current Amperes	Catalog Number	Price U.S. \$
.25	KD1-0R25	
.50	KD1-0R50	
.75	KD1-0R75	
1.00	KD1-1	
1.50	KD1-1R5	
1.75	KD1-1R75	
2.00	KD1-2	
2.50	KD1-2R5	
3.00	KD1-3	
4.00	KD1-4	
5.00	KD1-5	
6.00	KD1-6	
7.00	KD1-7	
8.00	KD1-8	
9.00	KD1-9	
10.00	KD1-10	
15.00	KD1-15	
20.00	KD1-20	

To order the slip-on boot, choose Catalog Number 006-10469 or for a panel sealing version, purchase Catalog Number 006-10528.

PROPAK Series

PROPAK Series



PROPAK Hydraulic-Magnetic Breaker

Product Description

The PROPAK offers the performance of a hydraulic-magnetic breaker in a miniature package. Available in 1- or 2-pole versions, the PROPAK can be used in a variety of applications up to 250 Vac. All breakers ship with mounting hardware included and have quick-connect terminals for fast installation.

Features, Benefits and Functions

- Time delay options — Choose from instantaneous or standard time delay curves 2 or 3. A high inrush version is also available.
- Hydraulic-magnetic circuit protector:
 - 1- or 2-poles
 - 0.1 to 20 amperes
 - Auxiliary switch option
 - Meets MIL-STD for shock, vibration, temperature and humidity
- Accessories — Some popular accessories include optional internal auxiliary contacts and screw terminal adapters.

Standards and Certifications

The PROPAK series is UL recognized under UL 1077 and carries CSA approval. Each unit carries an interrupting capacity of 1 kA at maximum voltage of 250 Vac or 72 Vdc.

Technical Data and Specifications

Dimensions in Inches and (mm)

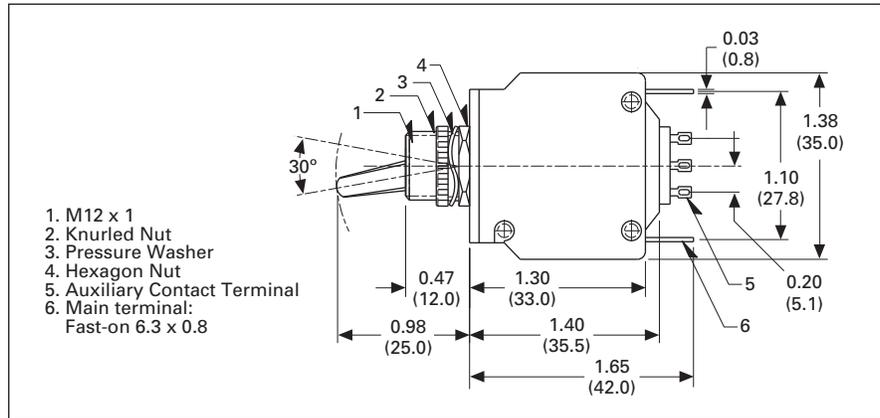


Figure 11-53. Type PBB 1-Pole

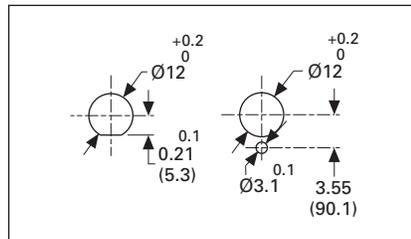


Figure 11-54. Panel Cut-out

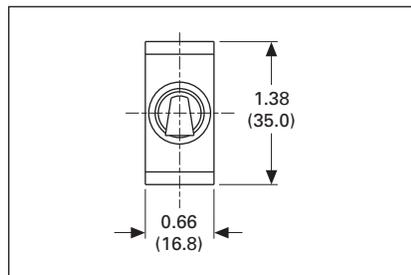


Figure 11-55. Type PBB 1-Pole

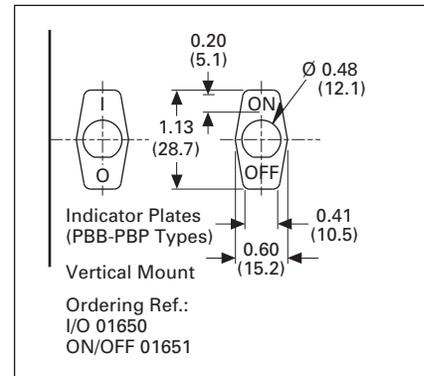
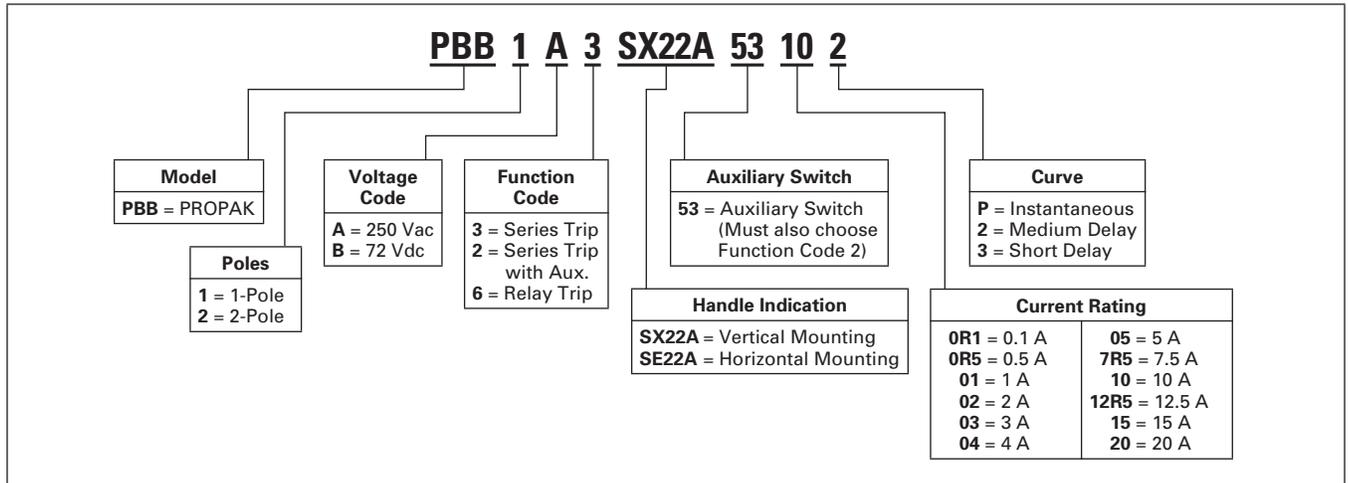


Figure 11-56. Indicator Plates

Product Selection

Table 11-83. PROPAK Series Catalog Numbering System



J Series

J Series



Standard Style JA Snap-in Mounting JB



Rocker Style JC



Sealed Toggle JE

Product Description

Eaton's J Series is one of the most versatile breakers offered in the Heine-mann product line. The J Series can be used in a wide variety of applications including tele-com, rail, marine and mobile equipment. Multiple mounting and handle configurations allow you to customize your equipment. These include rocker handles, snap-in mounting, sealed toggle actuators and color-coded handles.

Features, Benefits and Functions

- Compact size — The J Series breakers are small and lightweight, saving valuable space in crowded control panels or weight in portable equipment. Since the J Series is magnetically actuated, the breaker generates minimal heat, and breakers can be mounted in densely packed panels with no effect on performance.
- Easy installation — The J Series is designed for fast, easy panel mounting. Its round bezel eliminates square cuts during panel fabrication, and shortens panel production time. Cutout preparation is as simple as punching or drilling three common-center holes per breaker.

- Terminals — The J Series is ready to accept either standard push-on or screw terminal connections.
- Accessories — Available with integral auxiliary switches, shunt and relay trip options, as well as a variety of external accessories including protective shields and adapter plates.
- Harsh environments — In areas where the breaker may be subjected to water spray or splashing, the J Series is available in a sealed mounting version. Utilizing a molded silicone rubber seal, the exposed handle is protected from the elements when used in conjunction with a sealed panel. For areas requiring a completely sealed breaker, the J Series is also available in a UL 1500 Ignition-Protected Construction. Please refer to the Special Application section of this brochure.

Standards and Certifications

The J Series is ready for your global applications. In addition to UL 1077, the breaker also carries CSA and IEC 380 approvals.

Technical Data and Specifications

Dimensions in Inches and (mm)

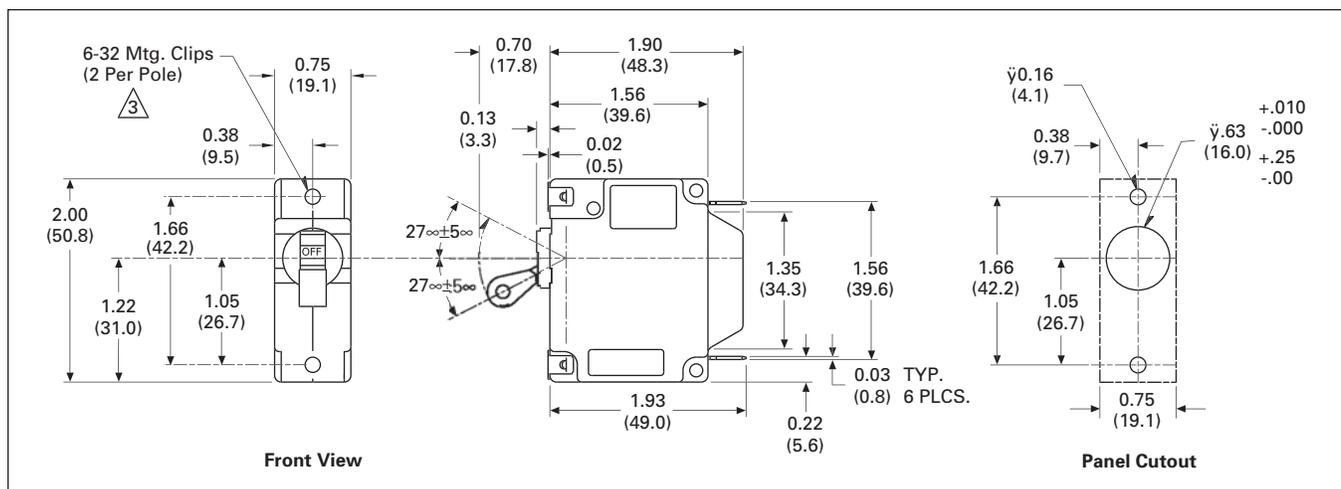


Figure 11-57. J Series Basic Dimensions

J Series

Product Selection

Stock Availability

Standard breaker configurations are available from our regional distribution centers or from one of our 2,300 distributor locations worldwide.

Standard Breaker Configurations

The J Series can be ordered in a number of standard configurations utilizing the table to the right. Once you create your catalog number, you can contact our Technical Resource Center for verification and quotations.

Custom Applications

The J Series is also available in a number of custom configurations to meet your specific application needs. To order a special application breaker, you can visit our Web site at www.eaton.com/heinemann for a list of custom modifications and information on how to obtain a proprietary catalog number. You may also contact the Technical Resource Center for application information and breaker selection assistance.

Table 11-84. Standard Product Offering
 250 Vac/65 Vdc Push-on Terminals

Poles	Current (Amperes)	Curve	Catalog Number	Price U.S. \$
1	1	2	JA1SD3A000102E	
1	1	3	JA1SD3A000103E	
1	2.5	2	JA1SD3A02R502E	
1	2.5	3	JA1SD3A02R503E	
1	5	2	JA1SD3A000502E	
1	5	3	JA1SD3A000503E	
1	7.5	2	JA1SD3A07R502E	
1	7.5	3	JA1SD3A07R503E	
1	10	2	JA1SD3A001002E	
1	10	3	JA1SD3A001003E	
1	15	2	JA1SD3A001502E	
1	15	3	JA1SD3A001503E	
1	20	2	JA1SD3A002002E	
1	20	3	JA1SD3A002003E	
1	25	2	JA1SD3A002502E	
1	25	3	JA1SD3A002503E	
1	30	2	JA1SD3A003002E	
1	30	3	JA1SD3A003003E	
2	1	2	JA2SD3A000102E	
2	1	3	JA2SD3A000103E	
2	2.5	2	JA2SD3A02R502E	
2	2.5	3	JA2SD3A02R503E	
2	5	2	JA2SD3A000502E	
2	5	3	JA2SD3A000503E	
2	7.5	2	JA2SD3A07R502E	
2	7.5	3	JA2SD3A07R503E	
2	10	2	JA2SD3A001002E	

Poles	Current (Amperes)	Curve	Catalog Number	Price U.S. \$
2	10	3	JA2SD3A001003E	
2	15	2	JA2SD3A001502E	
2	15	3	JA2SD3A001503E	
2	20	2	JA2SD3A002002E	
2	20	3	JA2SD3A002003E	
2	25	2	JA2SD3A002502E	
2	25	3	JA2SD3A002503E	
2	30	2	JA2SD3A003002E	
2	30	3	JA2SD3A003003E	
3	1	2	JA3SD3A000102E	
3	1	3	JA3SD3A000103E	
3	2.5	2	JA3SD3A02R502E	
3	2.5	3	JA3SD3A02R503E	
3	5	2	JA3SD3A000502E	
3	5	3	JA3SD3A000503E	
3	7.5	2	JA3SD3A07R502E	
3	7.5	3	JA3SD3A07R503E	
3	10	2	JA3SD3A001002E	
3	10	3	JA3SD3A001003E	
3	15	2	JA3SD3A001502E	
3	15	3	JA3SD3A001503E	
3	20	2	JA3SD3A002002E	
3	20	3	JA3SD3A002003E	
3	25	2	JA3SD3A002502E	
3	25	3	JA3SD3A002503E	
3	30	2	JA3SD3A003002E	
3	30	3	JA3SD3A003003E	

Table 11-85. J Series Catalog Numbering System

JA1S A 3 A 0015 01 E

Style ①	Number of Poles	Description	Handle Color	Mounting
JA_S	1 to 4	Toggle Handle	White ON/OFF	6-32
JB_S	1 to 4	Snap-in Mount	White ON/OFF	N/A
JC_S	1 to 4	Rocker Handle	White ON/OFF	6-32
JE_S	1 to 3	Sealed Toggle	N/A	3/8-32

Voltage, Terminal and Frequency Code			
Code	Frequency	Terminal Location	Maximum Voltage
A	50/60 Hz	Push-on	277 ac
T	50/60 Hz	8-32 Screw	277 ac
K	50/60 Hz	10-32 Screw	277 ac
B	dc	Push-on	65 dc
V	dc	8-32 Screw	65 dc
L	dc	10-32 Screw	65 dc
D	60 Hz/dc	Push-on	250 ac/65 dc
E	60 Hz/dc	8-32 Screw	250 ac/65 dc
R	60 Hz/dc	10-32 Screw	250 ac/65 dc
C	400 Hz	Push-on	250 ac
W	400 Hz	8-32 Screw	250 ac
N	400 Hz	10-32 Screw	250 ac

Approval Code				
A = Up to 250 Vac UL 1077				
Up to 65 Vdc UL 1077				
L = 277 Vac UL 1077				

Internal Circuit Type and Inrush Catalog Code				
N/A	STD	18X	25X	Internal Circuit
0	—	—	—	Switch Only
—	3	8	8	Series Trip
—	2	9	39	Series Trip w/Aux.
—	5	—	—	Shunt/Tap
—	6	—	—	Relay Trip

Current Rating ②	
Code	Current (Amperes)
0R02	0.02
0R10	0.10
0R25	0.25
0R50	0.50
0R75	0.75
0001	1
02R5	2.5
0005	5
07R5	7.5
0010	10
0015	15
0020	20
0025	25
0030	30
0040	40
0050	50

Voltage Rating	
E	= 0 – 250 Vac
F	= 251 – 277 Vac
G	= 415 Vac ③
N	= 0 – 65 Vdc

Time Delay Curve	
0P	= Instant
01	= Long Delay Std. Inrush
02	= Medium
03	= Short
10	= Long Delay 18X Inrush
20	= Medium Delay 18X Inrush
30	= Short Delay 18X Inrush
251	= Long Delay 25X Inrush
252	= Medium Delay 25X Inrush
253	= Short Delay 25X Inrush

① Choose style and select from 1 to 4 poles, and enter the number in position 3 of the catalog number. For example, a JA1S would identify a 1-pole JA Series breaker.
 ② Enter the four digit current rating. For example, use code "0015" for a 15 ampere current rating. For fractional amperages, use an "R" to designate the decimal point. For 10 ampere, enter the code "0R10."
 ③ Non-standard. Consult technical support 1-800-356-1243.

SPHM Series

SPHM Series



SPHM Series Circuit Breaker

Product Description

The SPHM Series Circuit Breaker line is designed to provide supplementary protection on ac circuits up to 250 volts or stand-alone overcurrent and short-circuit protection on dc circuits up to 80 volts. Recognized by UL and CSA, the SPHM Series has the features required by panel builders and meets the requirements of UL 508A when utilized in control circuits.

Application Description

SPHM Series Circuit Breakers are DIN-rail mountable for quick installation,

and are perfect for a wide range of applications including:

- Motor control circuits.
- Control power transformers.
- Relays.
- Contactor coils.
- PLC I/O points.

With proven hydraulic-magnetic protection, the SPHM Series Circuit Breaker can be used to provide precision protection regardless of ambient temperature.

Features, Benefits and Functions

- Environmental, vibration and shock resistant — Mil-spec qualification for fungus resistance, humidity, salt spray resistance and shock vibration resistance.
- Heat-induced nuisance tripping eliminated — The protector is designed to “hold in” at 100% continuous rated current, regardless of ambient temperatures from -40°C to +85°C.
- Immediate reset after trip — The protector can be reset (closed) immediately after an overcurrent trip without a “cooling off” period.

- 1/2 cycle high inrush tolerance — 8X (Standard), 18X and 25X — The protector is available with different levels of tolerance to 1/2 cycle current spikes. Standard tolerance is 8X the continuous current rating; in addition 18X and 25X are also available.
- Overcurrent curves, long, medium or short delay — Time characteristic curves are available as Short, Medium and Long Delay.
- Integral auxiliary switch (optional selection) — One auxiliary switch (a or b) can be factory installed per pole — a separate pole for auxiliary is NOT required. Contact Eaton for price adder.
- Precise overcurrent calibration — The protector can be precisely calibrated to a wide variety of current ratings, from 0.1 to 50 continuous amperes.
- DIN-rail mountable — The protector can be easily mounted, utilizing its quick release spring clip to attach it to a 35 mm DIN rail.

Standards and Certifications

UL recognized under UL 1077, CSA 22.2, VDE 0660, IEC 60947-2.

Technical Data

Dimensions in Inches and (mm)

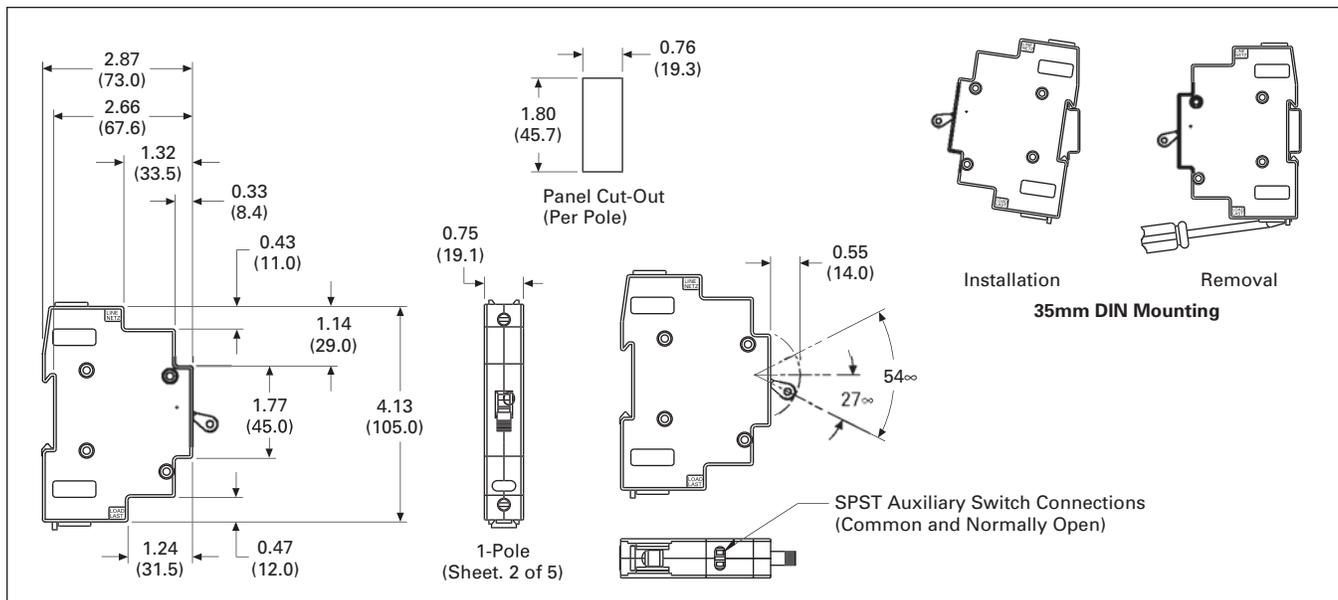


Figure 11-58. SPHM Basic Dimensions

SPHM Series

Product Selection

Standard Breaker Configurations

The SPHM Series can be ordered in a number of standard configurations utilizing the table to the right. Once you create your catalog number, you can contact our Technical Resource Center for verification and quotations.

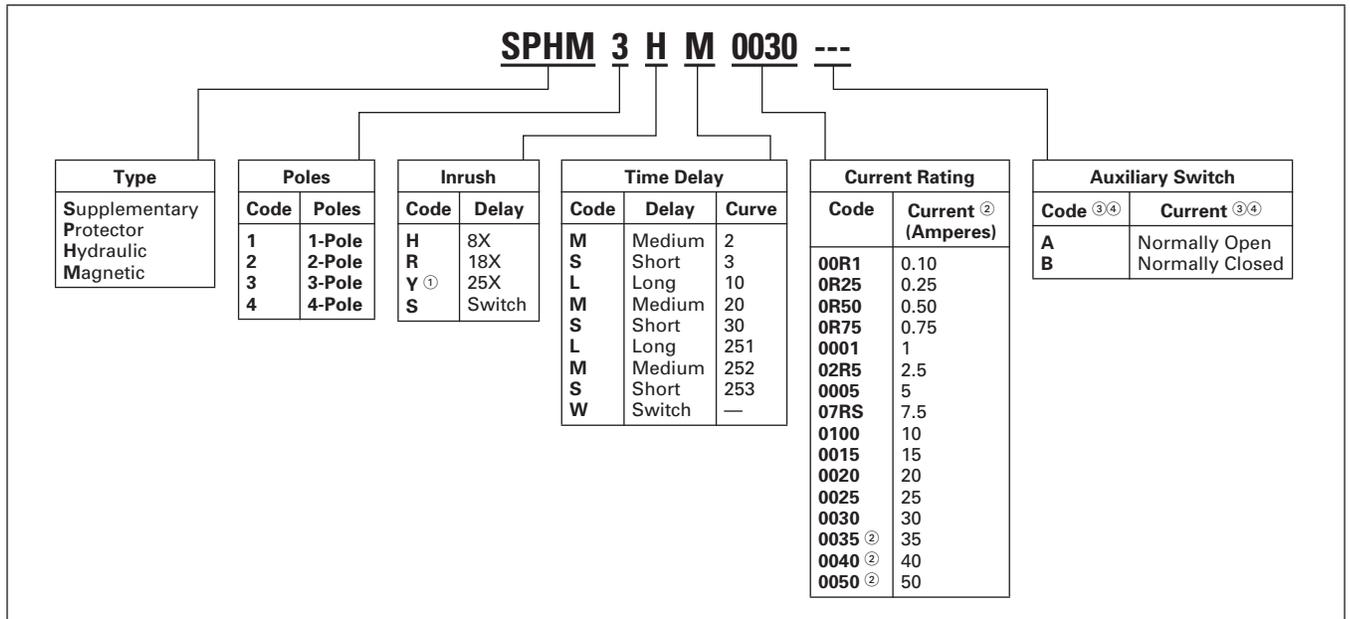
Custom Applications

The SPHM Series is also available in a number of custom configurations to meet your specific application needs. To order a special application breaker, you can visit our Web site at www.eaton.com/heinemann for a list of custom modifications and information on how to obtain a proprietary catalog number. You may also contact the Technical Resource Center for application information and breaker selection assistance.

Table 11-86. SPHM Standard Product Offering

Poles	Current (Amperes)	Curve	Catalog Number	Price U.S. \$
1	0.10	2	SPHM1RM00R1	
1	0.25	2	SPHM1RM0R25	
1	0.50	2	SPHM1RM0R50	
1	0.75	2	SPHM1RM0R75	
1	1.00	2	SPHM1RM0001	
1	2.50	2	SPHM1RM02R5	
1	5.00	2	SPHM1RM0005	
1	7.50	2	SPHM1RM07R5	
1	10.0	2	SPHM1RM0010	
1	15.0	2	SPHM1RM0015	
1	20.0	2	SPHM1RM0020	
1	25.0	2	SPHM1RM0025	
1	30.0	2	SPHM1RM0030	
1	35.0	2	SPHM1RM0035	
1	40.0	2	SPHM1RM0040	
1	50.0	2	SPHM1RM0050	
2	0.10	2	SPHM2RM00R1	
2	0.25	2	SPHM2RM0R25	
2	0.50	2	SPHM2RM0R50	
2	0.75	2	SPHM2RM0R75	
2	1.00	2	SPHM2RM0001	
2	2.50	2	SPHM2RM02R5	
2	5.00	2	SPHM2RM0005	
2	7.50	2	SPHM2RM07R5	
2	10.0	2	SPHM2RM0010	
2	15.0	2	SPHM2RM0015	
2	20.0	2	SPHM2RM0020	
2	25.0	2	SPHM2RM0025	
2	30.0	2	SPHM2RM0030	
2	35.0	2	SPHM2RM0035	
2	40.0	2	SPHM2RM0040	
2	50.0	2	SPHM2RM0050	
3	0.10	2	SPHM3RM00R1	
3	0.25	2	SPHM3RM0R25	
3	0.50	2	SPHM3RM0R50	
3	0.75	2	SPHM3RM0R75	
3	1.00	2	SPHM3RM0001	
3	2.50	2	SPHM3RM02R5	
3	5.00	2	SPHM3RM0005	
3	7.50	2	SPHM3RM07R5	
3	10.0	2	SPHM3RM0010	
3	15.0	2	SPHM3RM0015	
3	20.0	2	SPHM3RM0020	
3	25.0	2	SPHM3RM0025	
3	30.0	2	SPHM3RM0030	
3	35.0	2	SPHM3RM0035	
3	40.0	2	SPHM3RM0040	
3	50.0	2	SPHM3RM0050	

Table 11-87. SPHM Series Catalog Numbering System



① Maximum of 40 amperes available at 25X inrush.
 ② UL recognized to 250 Vac, 5 kA above 30 amperes.
 ③ One A or B contact maximum per pole. Contacts will be arranged left to right (e.g. BAB suffix on 3-pole breaker).
 ④ Contact Eaton for availability and price at 1-800-356-1243.

AMR Series

AMR Series



Standard Style (AMR)



Illuminated Style (AML)



Rocker Style (ACR)

Product Description

The Heinemann AMR Series is the logical choice for applications requiring greater interrupting performance coupled with the sensitivity of hydraulic-magnetic protection. The precisely tailored time delays and ability to interrupt high currents make them ideal for critical applications.

Application Description

The AMR Series is designed for global applications, meeting a variety of international standards. It combines the proven high quality and reliability of the former AM Series with the spacing, dielectric and interrupt requirements of the IEC Standard 60947-2. The AMR Series carries the CE Mark, VDE and TUV approvals, and is available with metric hardware for OEMs exporting their equipment overseas.

Features, Benefits and Functions

- Current range up to 100 A 50/60 Hz ac/125 Vdc, 60 A 400 Hz ac.
- 100% rated.
- Plug-in, screw or stud terminals.
- Handles knurled for positive grip.
- Operating temperature -40°C to +85°C.
- Available with internal auxiliary or alarm switch, relay trip function and shunt tap.
- Shock-tested for shock in accordance with MIL-STD-202.
- Vibration-tested in accordance with MIL-STD-202.
- Dielectric strength tested in accordance with MIL-STD-202.
- Insulation resistance of 100 megaohms minimum at 500 Vdc, per MIL-STD-202.
- Flammability specifications of UL 94-VO case, UL 94-HB handle.
- Available with UL 1500 Ignition Protected for Marine Applications. Refer to the special applications section for more information.
- Direct replacement for discontinued AM and NAM/S models.

Handle Configurations

Standard Black Toggle

For industrial and commercial applications, where economical design and construction is a concern. Order Prefix "AMR."

Illuminated Toggle

Provides indication of breaker status via the integral multicolored LED. Can be custom configured for indication of ON, OFF, Tripped or Ready status. Order Prefix "AML."

Rocker Style

Used where style and performance is required. The rocker style handle delivers the performance of the AMR Series with European styling. Order Prefix "ACR."

Standards and Certifications

The AMR Series is UL 489 Listed and CSA certified for branch circuit applications. It is also UL 1077 recognized for use in panels where branch circuit protection is already provided. Available in a wide variety of configurations, the AMR Series is rated as high as 100 amperes at 240 Vac or 80 Vdc. It is the solution for demanding applications requiring up to 50,000 amperes interrupting capacity. The 50,000 amperes interrupting capacity is at 65 Vdc UL 489A, telecom applications.

All UL 489 listed configurations are suitable for normal and reverse feed connection, for easy installation.

Table 11-88. UL 489 Ratings

Poles	Current (Amperes)	Voltage	KA
1	0.02 – 100	65 Vdc	50
1, 2	0.02 – 50	120/240 Vac	10
3	0.02 – 30	240 Vac	10
1	0.02 – 20	277 Vac	10

Approvals

- UL 1077 recognized.
- UL 489 listed.
- UL 489A listed for telecom applications.
- IEC 60947-2.
- VDE.
- TUV.

Technical Data

Dimensions in Inches and (mm)

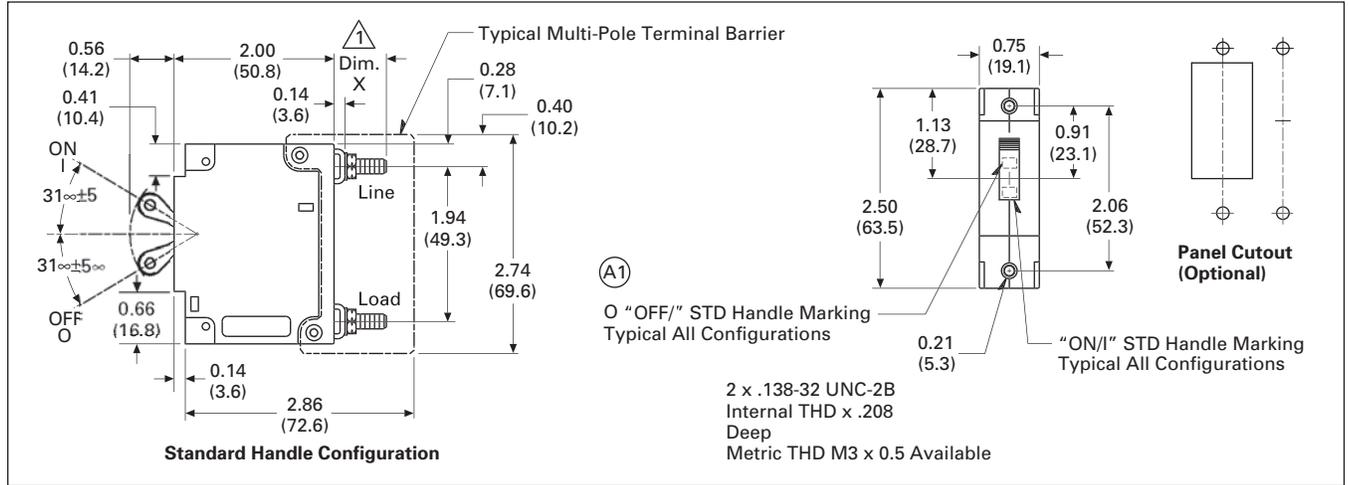


Figure 11-59. AMR Handle Configuration and Typical Dimensions

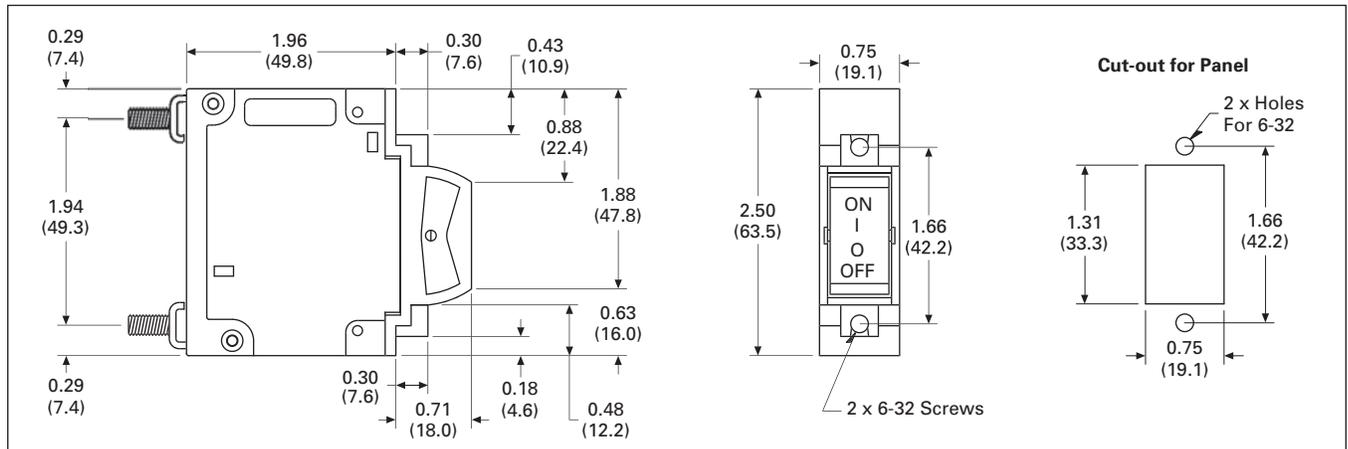


Figure 11-60. ACR Typical Dimensions

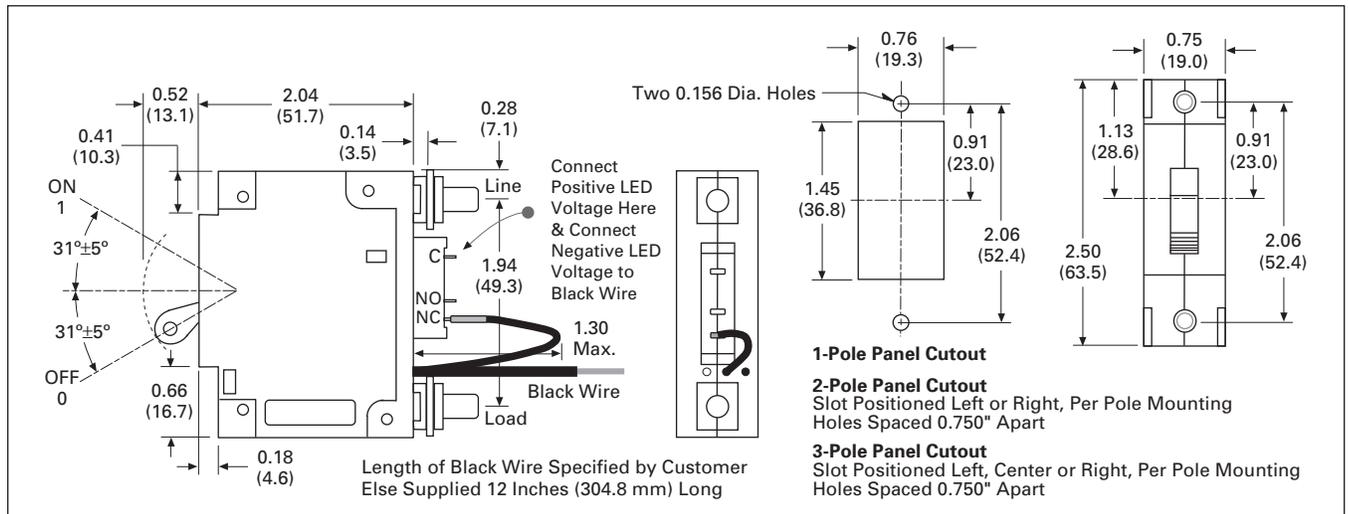


Figure 11-61. AML Typical Dimensions

AMR Series

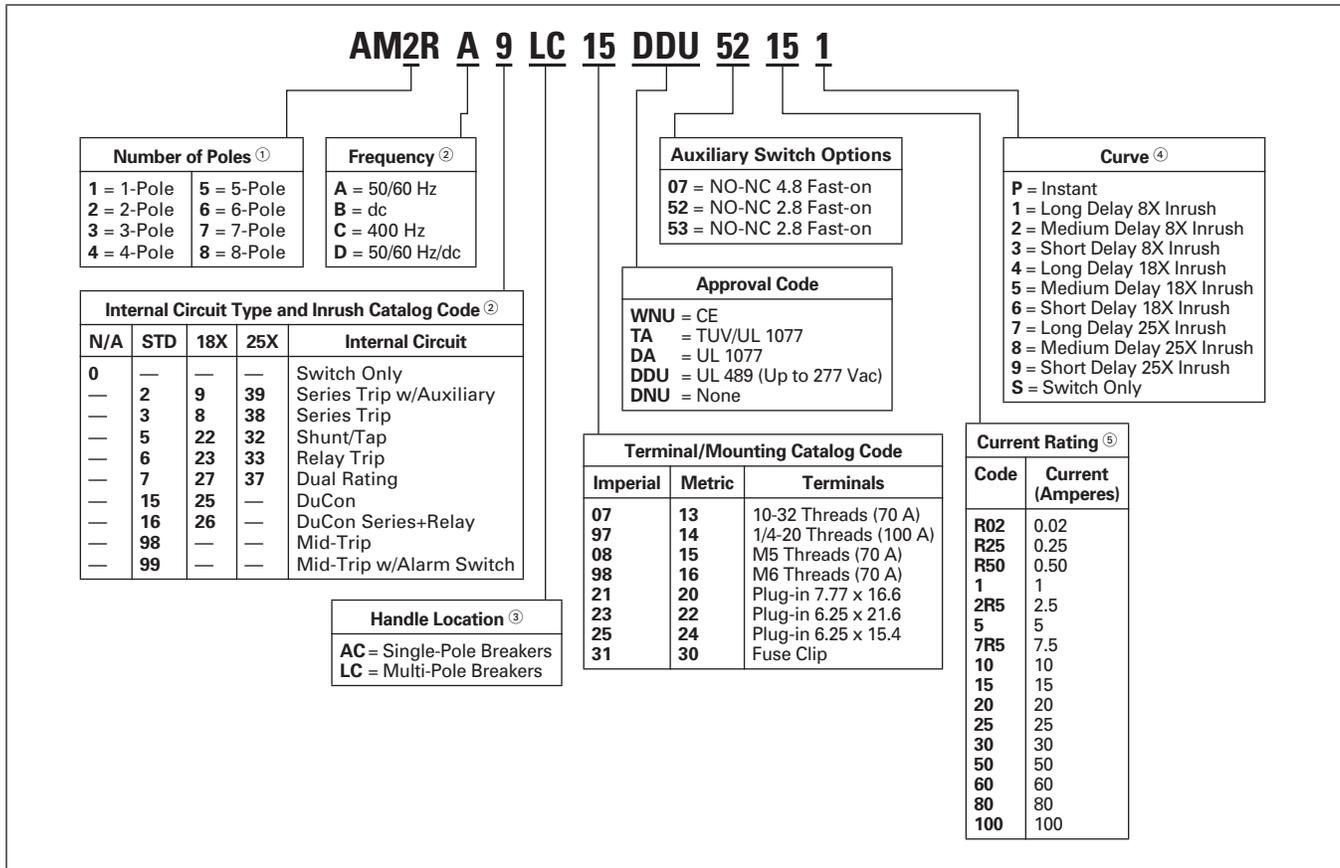
Product Selection

The following catalog numbers can be ordered from stock.

Table 11-89. AMR Standard Black Toggle Current

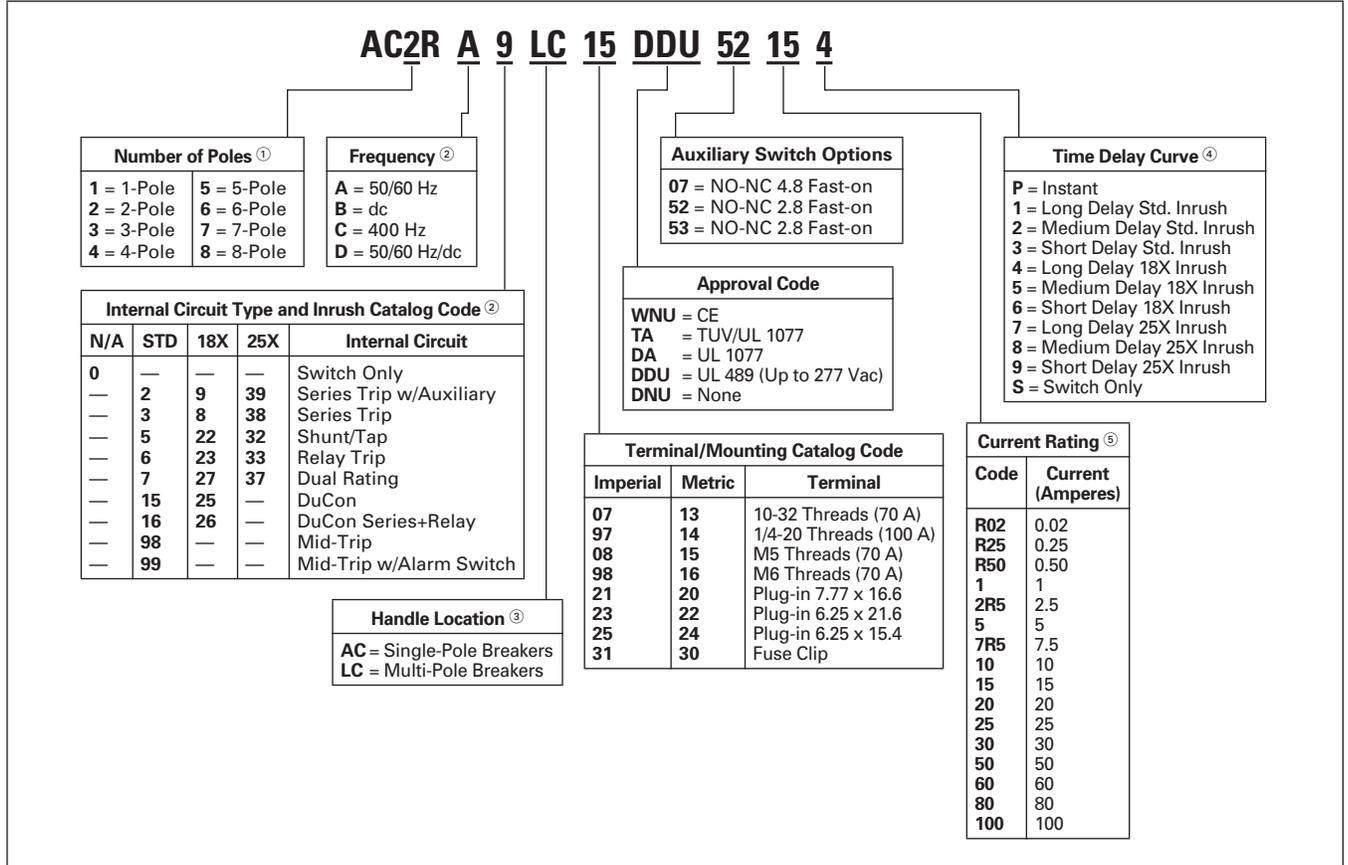
Current (Amperes)	Curve	1-Pole	Price U.S. \$	2-pole	Price U.S. \$	3-pole	Price U.S. \$
		Catalog Number		Catalog Number		Catalog Number	
1.00	2	AM1RA3AC07DA12		AM2RA3AC07DA12		AM3RA3AC07DA12	
2.50	2	AM1RA3AC07DA2R52		AM2RA3AC07DA2R52		AM3RA3AC07DA2R52	
5.00	2	AM1RA3AC07DA52		AM2RA3AC07DA52		AM3RA3AC07DA52	
7.50	2	AM1RA3AC07DA7R52		AM2RA3AC07DA7R52		AM3RA3AC07DA7R52	
10.0	2	AM1RA3AC07DA102		AM2RA3AC07DA102		AM3RA3AC07DA102	
15.0	2	AM1RA3AC07DA152		AM2RA3AC07DA152		AM3RA3AC07DA152	
20.0	2	AM1RA3AC07DA202		AM2RA3AC07DA202		AM3RA3AC07DA202	
30.0	2	AM1RA3AC07DA302		AM2RA3AC07DA302		AM3RA3AC07DA302	
50.0	2	AM1RA3AC07DA502		AM2RA3AC07DA502		AM3RA3AC07DA502	
80.0	2	AM1RA3AC97DA802		AM2RA3AC97DA802		AM3RA3AC97DA802	

Table 11-90. AMR Catalog Numbering System



① Select from 1 to 8 poles, and enter the number in position 3 of the catalog number. For example, an AM3L would identify a 3-pole AML breaker.
 ② On multi-pole breakers, Steps 2 and 3 can be repeated if subsequent poles are different than the first. Identification starts from left-hand side when viewing the front of the breaker.
 ③ These will provide standard handle locations. For additional options, contact the Technical Resource Center.
 ④ Specific data on trip curves can be found on the Web at www.eaton.com/heinemann.
 ⑤ Enter the whole number current rating. For example, use code "15" for a 15 A current rating. For fractional amperages, use an "R" to designate the decimal point. For 0.10 A, enter the code "R10." Current range up to 100 amperes 50/60 Hz, 60 amperes 400 Hz, 100 Adc.

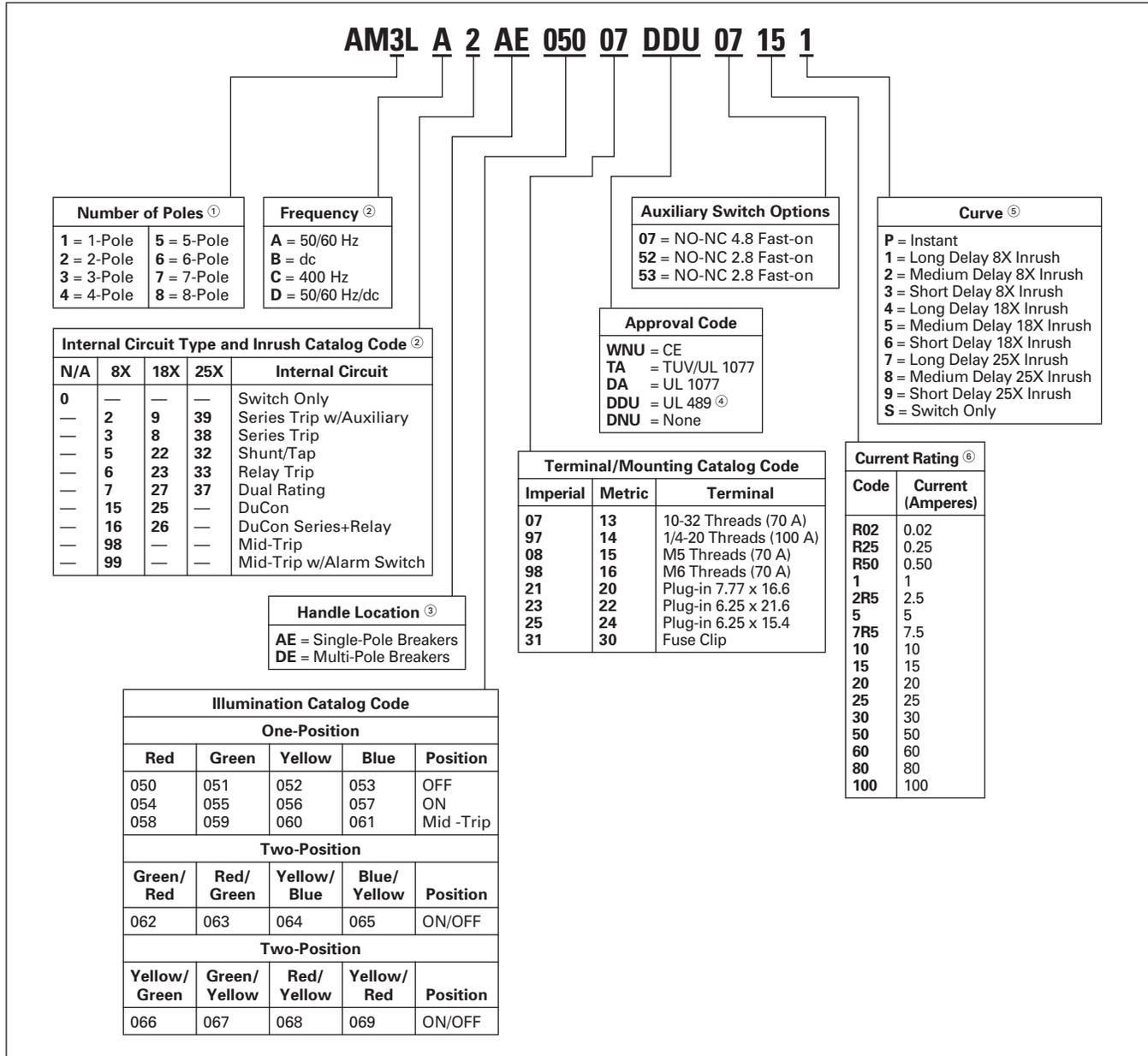
Table 11-91. ACR Catalog Numbering System



- ① Select from 1 to 8 poles, and enter the number in position 3 of the catalog number. For example, an AM3L would identify a 3-pole AML breaker.
- ② On multi-pole breakers, Steps 2 and 3 can be repeated if subsequent poles are different than the first. Identification starts from left-hand side when viewing the front of the breaker.
- ③ These will provide standard handle locations. For additional options, contact the Technical Resource Center.
- ④ Specific data on trip curves can be found on the Web at www.eaton.com/heinemann.
- ⑤ Enter the whole number current rating. For example, use code "15" for a 15 A current rating. For fractional amperages, use an "R" to designate the decimal point. For 0.10 A, enter the code "R10." Current range up to 100 amperes 50/60 Hz, 60 amperes 400 Hz, 100 Adc.

AMR Series

Table 11-92. AML Catalog Numbering System



- ① Select from 1 to 8 poles, and enter the number in position 3 of the catalog number. For example, an AM3L would identify a 3-pole AML breaker.
- ② On multi-pole breakers, Steps 2 and 3 can be repeated if subsequent poles are different than the first. Identification starts from left-hand side when viewing the front of the breaker.
- ③ These will provide standard handle locations. For additional options, contact the Technical Resource Center.
- ④ Up to 277 Vac.
- ⑤ Specific data on trip curves can be found on the Web at www.eaton.com/heinemann.
- ⑥ Enter the whole number current rating. For example, use code "15" for a 15 A current rating. For fractional amperages, use an "R" to designate the decimal point. For 0.10 A, enter the code "R10."

C Series



CD Rear Connection Front Mounting



CF Front Connected Back Panel Mounting

Product Description

Eaton's Heinemann C Series breakers incorporate the benefits of hydraulic-magnetic technology in a familiar molded case design. The C Series is popular in outdoor locations, in either high temperature or low temperature environments where nuisance tripping might have been a problem in the past.

Application Description

The C Series is built for a wide range of applications, and is one of the most versatile designs. From heating and air conditioning to modern railcars, the C Series breaker is built for the most demanding industrial applications.

With the precision overcurrent protection provided by the C Series, many manufacturers have been able to extend their warranties and deliver more reliability to their customers. Popular in the HVAC market, the C Series delivers true equipment protection, ensuring OEMs that their equipment will be safe in any environment.

Available in a wide range of mounting options, the C Series breaker can be ordered as either a front or back connected device.

Features, Benefits and Functions

- Environmental, vibration and shock resistant — Mil-spec qualification for fungus resistance, humidity, salt spray resistance and shock vibration resistance.
- Heat-induced nuisance tripping eliminated — The protector is designed to “hold in” at 100% continuous rated current, regardless of ambient temperatures from -40°C to +85°C.

- Immediate reset after trip — The protector can be reset (closed) immediately after an overcurrent trip without a “cooling off” period.
- 1/2 cycle high inrush tolerance – 8X (Standard) and 25X — The protector is available with different levels of tolerance to 1/2 cycle current spikes. Standard tolerance is 8X the continuous current rating; in addition, 25X is also available.
- Overcurrent curves, long, medium or short delay — Time characteristic curves are available as Short, Medium and Long Delay.
- Integral auxiliary switch (optional selection) — One auxiliary switch (a or b) can be factory installed per pole. A separate pole for auxiliary is NOT required. Contact Eaton for price adder.
- Precise overcurrent calibration — The protector can be precisely calibrated to a wide variety of current ratings, from 0.1 to 100 continuous amperes.

Standards and Certifications

- UL 1077/UL 489 and CSA 22.2.
- Due to its rugged construction, the C Series is UL listed through 240 Vac or 125 Vdc. The breaker also carries ratings up to 600 Vac as a UL Recognized Device under UL 508.

Technical Data

Dimensions in Inches and (mm)

11

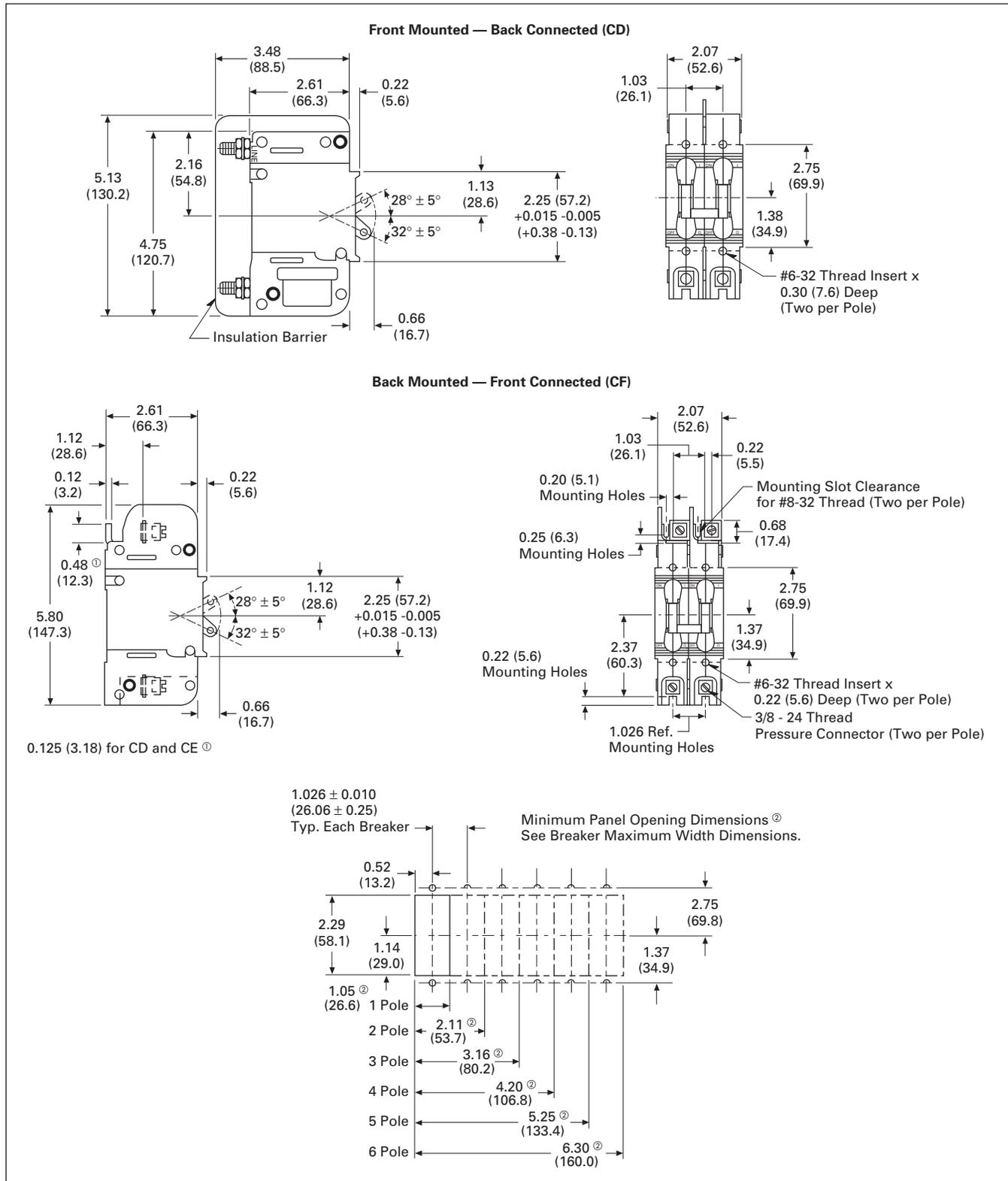


Figure 11-62. C Series Typical Dimensions

C Series

Product Selection

Standard Catalog Numbers

Standard C Series breakers are UL listed for applications at 240 volts or less, and are built with mechanical lugs for cable connection. All breakers are panel mount, cable in/out design.

Standard Breaker Configurations

The C Series can be ordered in a number of standard configurations utilizing the tables to the right. Once you create your catalog number, you can contact our Technical Resource Center for verification and quotations.

Custom Applications

The C Series is also available in a number of custom configurations to meet your specific application needs. To order a special application breaker, you can visit our Web site at www.eaton.com/heinemann for a list of custom modifications and information on how to obtain a proprietary catalog number. You may also contact the Technical Resource Center for application information and breaker selection assistance.

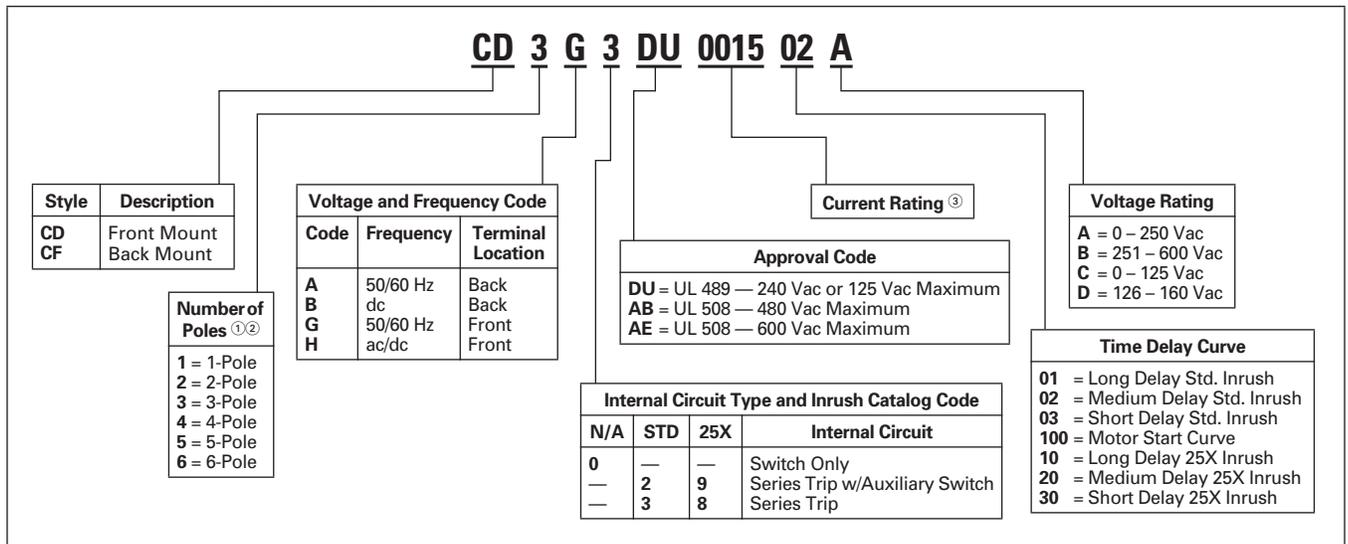
Table 11-93. Standard Product Offering

CF Standard Breakers are configured for ac circuits, back panel mounting, and cable in/cable out. Standard breakers are configured for ac circuits, rear connection.

Poles	Current (Amperes)	Curve	Catalog Number	Price U.S. \$
1	15	2	CD1A3U001502A	
1	15	3	CD1A3U001503A	
1	20	2	CD1A3U002002A	
1	20	3	CD1A3U002003A	
1	30	2	CD1A3U003002A	
1	30	3	CD1A3U003003A	
2	15	2	CD2A3U001502A	
2	15	3	CD2A3U001503A	
2	20	2	CD2A3U002002A	
2	20	3	CD2A3U002003A	
2	30	2	CD2A3U003002A	
2	30	3	CD2A3U003003A	
3	15	2	CD3A3U001502A	
3	15	3	CD3A3U001503A	
3	20	2	CD3A3U002002A	
3	20	3	CD3A3U002003A	
3	30	2	CD3A3U003002A	
3	30	3	CD3A3U003003A	
3	50	3	CD3A3U005002A	
3	50	2	CD3A3U005003A	
3	60	3	CD3A3U006002A	
3	60	2	CD3A3U006003A	
3	100	3	CD3A3U010002A	
3	100	2	CD3A3U010003A	

Poles	Current (Amperes)	Curve	Catalog Number	Price U.S. \$
1	15	2	CF1G3U001502A	
1	15	3	CF1G3U001503A	
1	20	2	CF1G3U002002A	
1	20	3	CF1G3U002003A	
1	30	2	CF1G3U003002A	
1	30	3	CF1G3U003003A	
2	15	2	CF2G3U001502A	
2	15	3	CF2G3U001503A	
2	20	2	CF2G3U002002A	
2	20	3	CF2G3U002003A	
2	30	2	CF2G3U003002A	
2	30	3	CF2G3U003003A	
3	15	2	CF3G3U001502A	
3	15	3	CF3G3U001503A	
3	20	2	CF3G3U002002A	
3	20	3	CF3G3U002003A	
3	30	2	CF3G3U003002A	
3	30	3	CF3G3U003003A	
3	50	3	CF3G3U005002A	
3	50	2	CF3G3U005003A	
3	60	3	CF3G3U006002A	
3	60	2	CF3G3U006003A	
3	100	3	CF3G3U010002A	
3	100	2	CF3G3U010003A	

Table 11-94. C Series Catalog Numbering System



① Select from 1 to 6 poles, and enter the number in position 3 of the catalog number. For example, a CD3 would identify a 3-pole C Series breaker.
 ② Style includes Toggle Handle with Black ON/OFF handle color.
 ③ Enter the four digit current rating. For example, use code "0015" for a 15 ampere current rating. For fractional amperages use an "R" to designate the decimal point. For 0.10 ampere, enter the code "0R10." Available from 0.10 – 50 amperes.

GH Series

GH Series



GH Series breaker

Product Description

Eaton's GH Series breaker offers the benefits of hydraulic-magnetic protection in a compact, economical design. Heinemann brand breakers have proven their ability by performing in harsh environment installations, indoor and outdoor, requiring a compact, environmentally stable breaker rated to 100 amperes at 480 Vac.

Application Description

Because of their ability to furnish both close-rated locked rotor protection and running overcurrent protection without derating in extreme and highly variable ambient conditions, the Series GH breakers are popular in a variety of industries — air conditioning, electric heating, computer main frame and central processing, transportation and many others. In addition, since the GH Series utilizes hydraulic-magnetic technology, you can specify a breaker to match your particular application.

- Shock — Tested in accordance with MIL-STD-202, Method 213, Test Condition I (100G's at 6 milliseconds).
- Vibration — Tested in accordance with MIL-STD-202, Method 204, 10 to 500 Hz, 0.06-inch total excursion on three mutually perpendicular planes. Shock and vibration tests apply to time delay breakers only and are performed with units carrying full rated current.
- Life — 10,000 cycles.
- Approximate weights GH3 — 3.3 lbs. (14.96 kg)
- Dielectric strength — 1960 Vac.
- Insulation resistance (internal resistance) — Impedance or internal resistance across breaker at full rated load.

Features, Benefits and Functions

- Fungus and humidity resistance — Provided in accordance with MIL-STD-202 by treating all ferrous parts with a special moisture-resistant finish and by using special springs and fungus-resistant cases, covers and handles.

Technical Data

Dimensions in Inches and (mm)

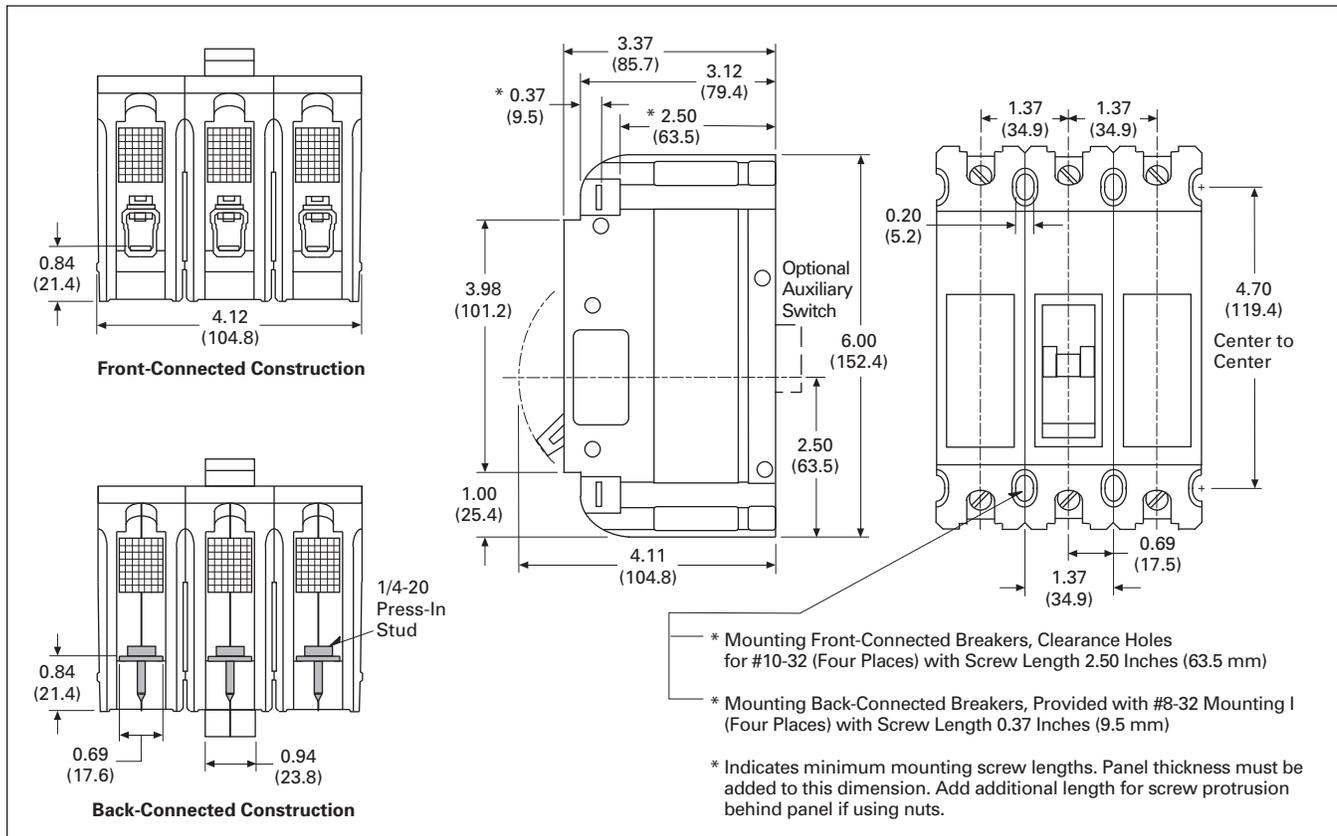


Figure 11-63. GH Basic Dimensions

GH Series

Product Selection

Standard Breaker Configurations

The GH Series can be ordered in a number of standard configurations utilizing the table to the right. Once you create your catalog number, you can contact our Technical Resource Center for verification and quotations.

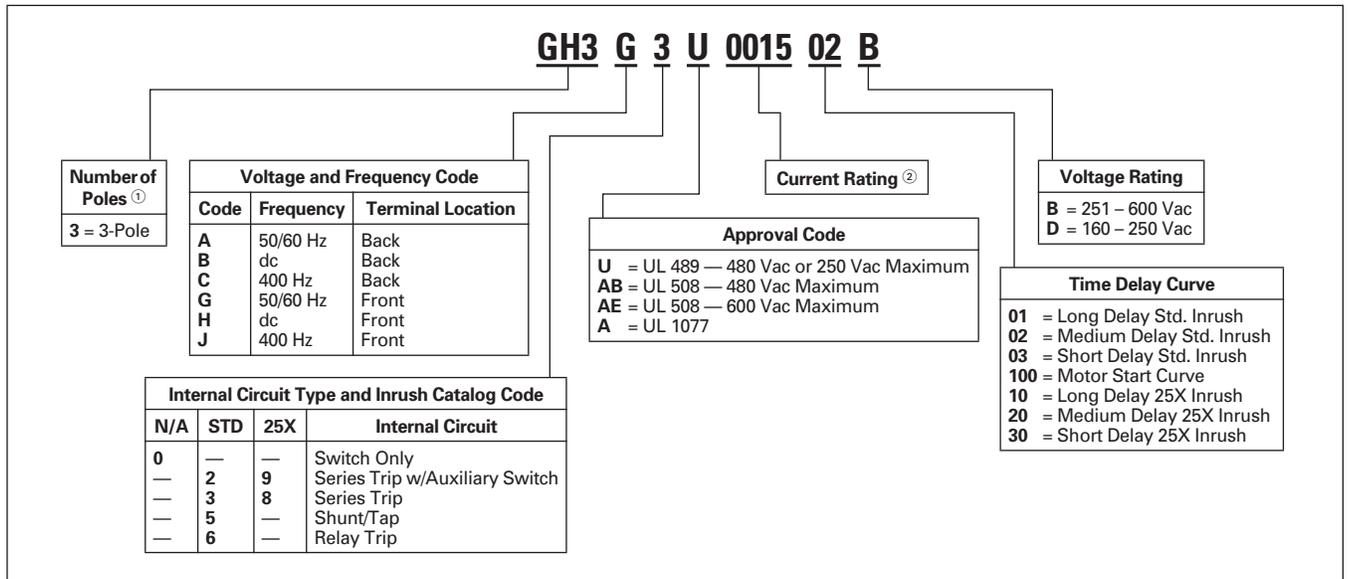
Custom Applications

The GH Series is also available in a number of custom configurations to meet your specific application needs. To order a special application breaker, you can visit our Web site at www.eaton.com/heinemann for a list of custom modifications and information on how to obtain a proprietary catalog number. You may also contact the Technical Resource Center for application information and breaker selection assistance.

Table 11-95. Standard Product Offering

Poles	Current (Amperes)	Curve	Catalog Number	Price U.S. \$
3	15	2	GH3A3U001502B	
3	15	3	GH3A3U001503B	
3	20	2	GH3A3U002002B	
3	20	3	GH3A3U002003B	
3	30	2	GH3A3U003002B	
3	30	3	GH3A3U003003B	
3	50	3	GH3A3U005002B	
3	50	2	GH3A3U005003B	
3	60	3	GH3A3U006002B	
3	60	2	GH3A3U006003B	
3	100	3	GH3A3U010002B	
3	100	2	GH3A3U010003B	

Table 11-96. GH Catalog Numbering System



① Style includes Toggle Handle with Black ON/OFF handle color.

② Enter the four digit current rating. For example, use code "0015" for a 15 ampere current rating. GH Series breakers are available from 15 – 100 amperes.

AM1P Series

AM1P Series



AM1P Series Circuit Breaker

Product Description

Increased performance and compact packaging make the AM1P perfect for demanding dc applications. The AM1P delivers maximum performance in the smallest package size available in the industry.

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Application Description

With a 250 ampere current rating and 50,000 ampere interrupting capacity at 80 Vdc, the AM1P is ideal for telecommunications sites with space constraints or high current applications.

Using a parallel wiring configuration, the AM1P delivers 200 amperes in a 2-pole design and 250 amperes in a 3-pole design. In addition, the AM1P employs a proprietary technology known as PCE or Precision Current Equalization. This technology ensures that current flows evenly through all poles and nuisance tripping is eliminated.

Features, Benefits and Functions

- Maximum current rating up to 250 amperes.
- Plug-in, screw and stud terminals.
- Operating temperature -40°C to +85°C.
- Shock-tested for shock in accordance with MIL-STD-202, Method 213, Test Condition I.
- Vibration-tested in accordance with MIL-STD-202, Method 204, while carrying full-rated current.

- Minimum life of 10,000 on/off operations, with 6,000 at rated current and voltage, and 4,000 at no load.
- Dielectric strength tested in accordance with MIL-STD-202, Method 1500 volts at 50/60 Hz, 1100 Vdc (or twice rating plus 1000 volts).
- Insulation resistance of 100 Megaohms minimum at 500 Vdc, per MIL-STD-202, Method 302.
- Flammability specifications of UL 94-VO Case, UL 94-HB Handle.

Standards and Certifications

The AM1P Series is UL 489A listed.

Technical Data

Dimensions in Inches and (mm)

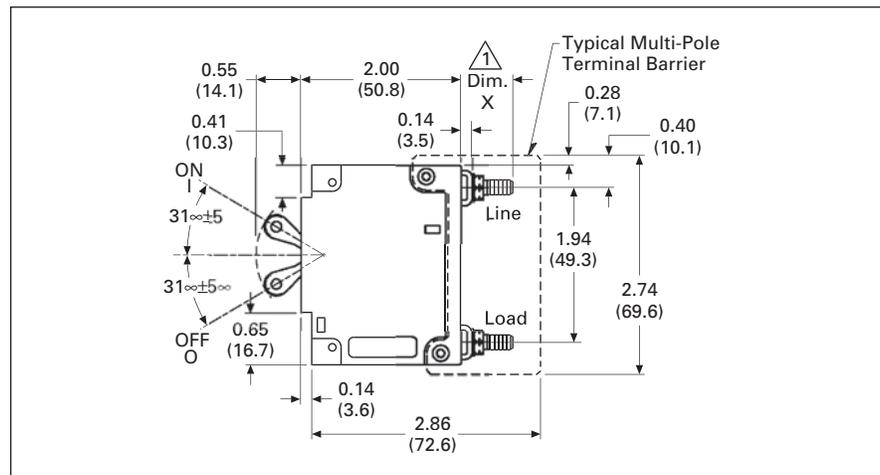


Figure 11-64. Standard Handle Configuration

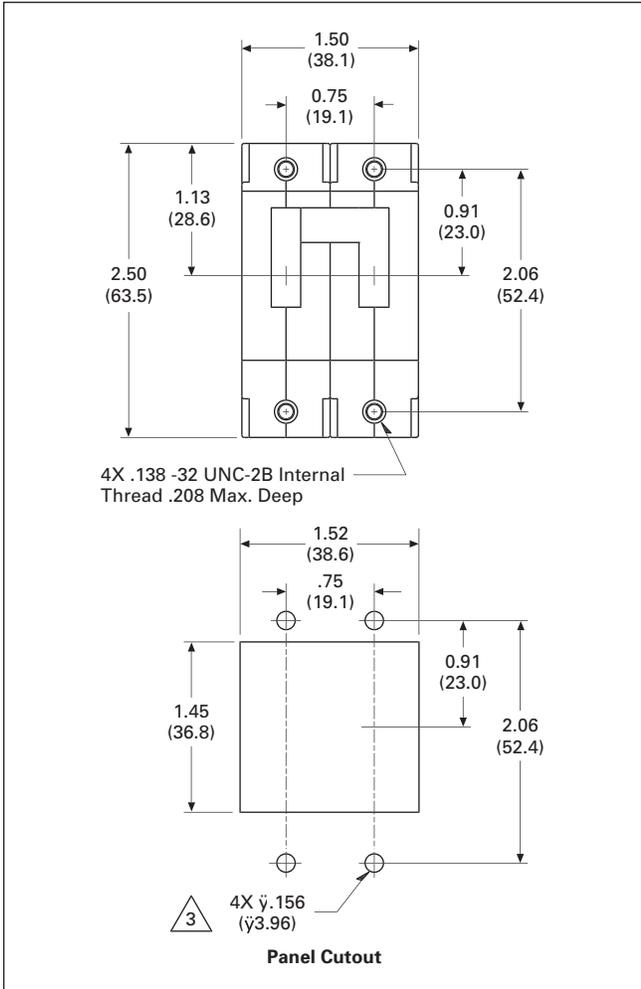


Figure 11-65. 2-Pole Configuration (101 – 200 Ampere)

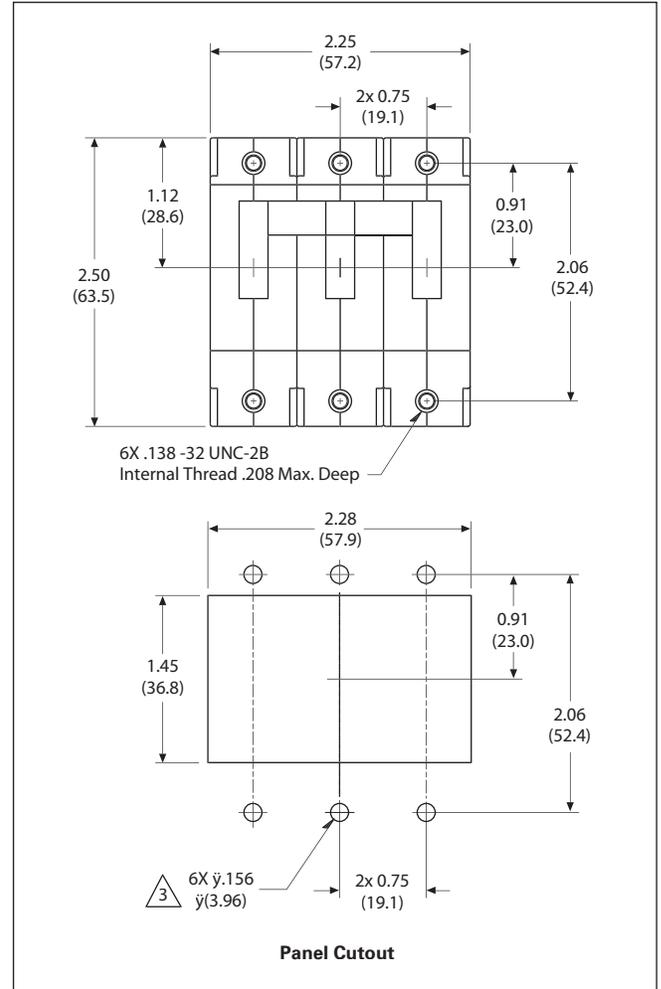
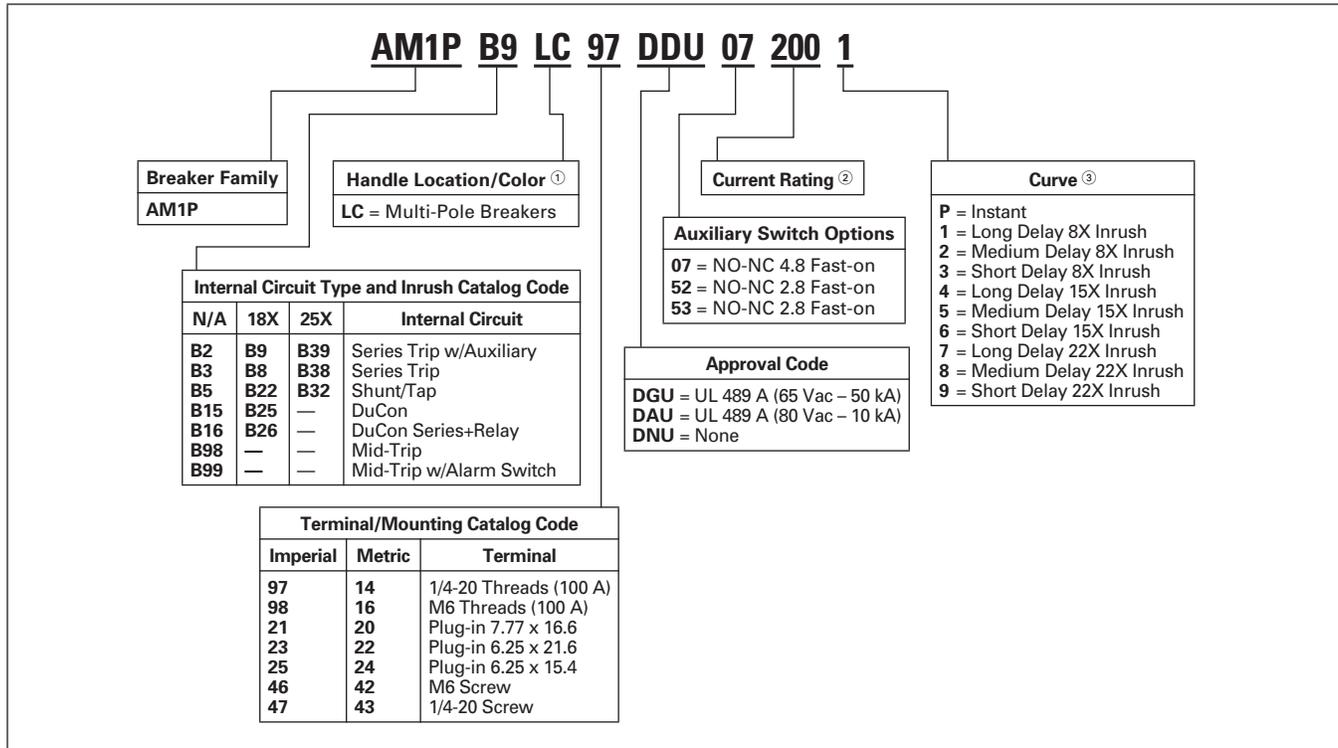


Figure 11-66. 3-Pole Configuration (201 – 250 Amperes)

Product Selection

Table 11-97. AM1 Catalog Numbering System



- ① Specify LC for multi-pole breakers with common trip handle as standard.
- ② Enter the three digit current rating from 101 – 250 amperes. 101 – 200 amperes is configured as 2-poles in parallel, 201 – 250 as 3-poles in parallel.
- ③ Specific data on trip curves can be found on the Web at www.eaton.com/heinemann.

GJ Series



GJ Series Circuit Breakers

Product Description

Heinemann Series GJ Circuit Breakers are the logical choice for high-current service entrance and panelboard installations, as well as control and protection of commercial and industrial lighting, transformers, motors and power supplies. The precisely tailored time delays and ability to interrupt high currents make them ideal for critical applications with inductive or other loads of up to 280 amperes.

Application Description

The hydraulic-magnetic load-sensing and time delay mechanism of the Series GJ is insensitive to changes in ambient or enclosure temperature, adapting it to service conditions encountered in electric vehicles, roof-mounted air conditioners and other outdoor or "heat-loaded" equipment. Unlike thermal breakers, the GJ breaker can be loaded to rated capacity without causing nuisance tripping when ambient temperature rises. It is also well suited for protecting line-sensitive loads, such as critical data processing equipment and computers.

Features, Benefits and Functions

- Standard maximum voltages:
 - GJ1, GJ2 and GJ3: 240 Vac, 50/60/400 Hz
 - GJ1: 125 Vdc
 - GJ2: 125/250 Vdc

Breakers will be labeled with standard maximum (UL) voltage unless otherwise specified.

- Maximum current rating: Up to 280 amperes per pole.
- Interrupting capacities:
 - GJ1: 10 kA at 240 Vac
160 Vdc, 25 kA at 65 Vdc
 - GJ2/3: 18 kA at 240 Vac
10 kA at 125/250 Vdc

Terminal Types

Standard: front-connected, pressure-wire terminals accepting copper or aluminum wire sizes from 78 to 37 mm² (6 to 300 kcmil). Back-connected and many special terminals are available. Consult Customer Service Center.

- Operating temperature range: 40°C to +85°C.
- Fungus and humidity resistance — MIL-STD-202, Ferrous parts incorporate special moisture-resistant finish. Springs, cases and handles are made from fungus-resistant materials.
- Shock — MIL-STD-202, Method 213.
- Test condition — 100g's for 6 milliseconds (Time delay breakers only).
- Vibration — MIL-STD-202, Method 24, 10 to 500 Hz, 0.06-inch total excursion on three mutually perpendicular planes (time delay breakers only). Testing completed at full rated current 50/60 Hz.

Optional Features

- 1-, 2- or 3-pole models.
- Fast, medium or slow response times to accurately match load conditions.
- Auxiliary switch for signaling.
- Back connected series trip, relay or shunt configurations.
- A mounting kit assembly is available for the GJ breakers (Cat. No. 009-18155).

Technical Data

Dimensions in Inches and (mm)

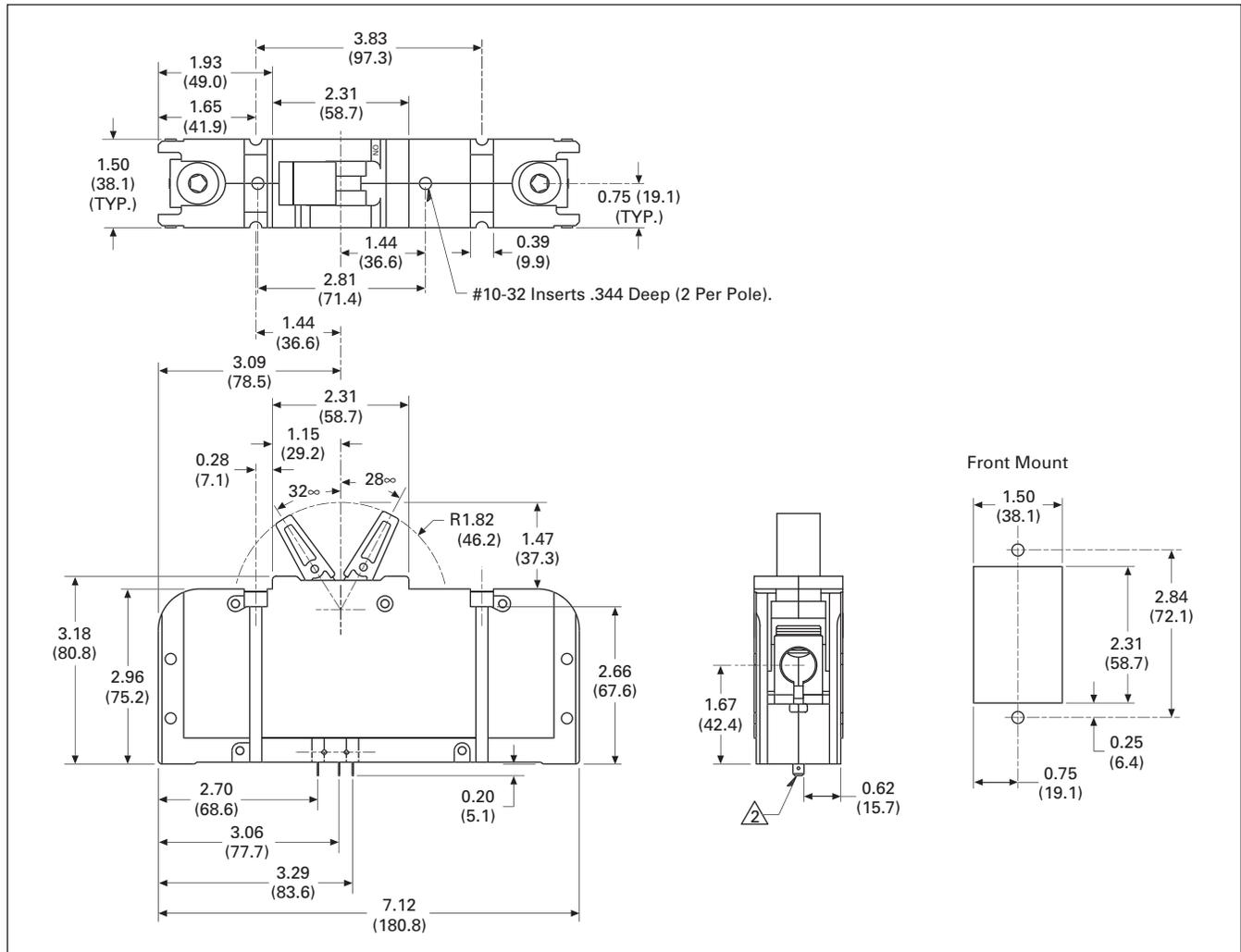


Figure 11-67. GJ Typical Dimensions

Product Selection

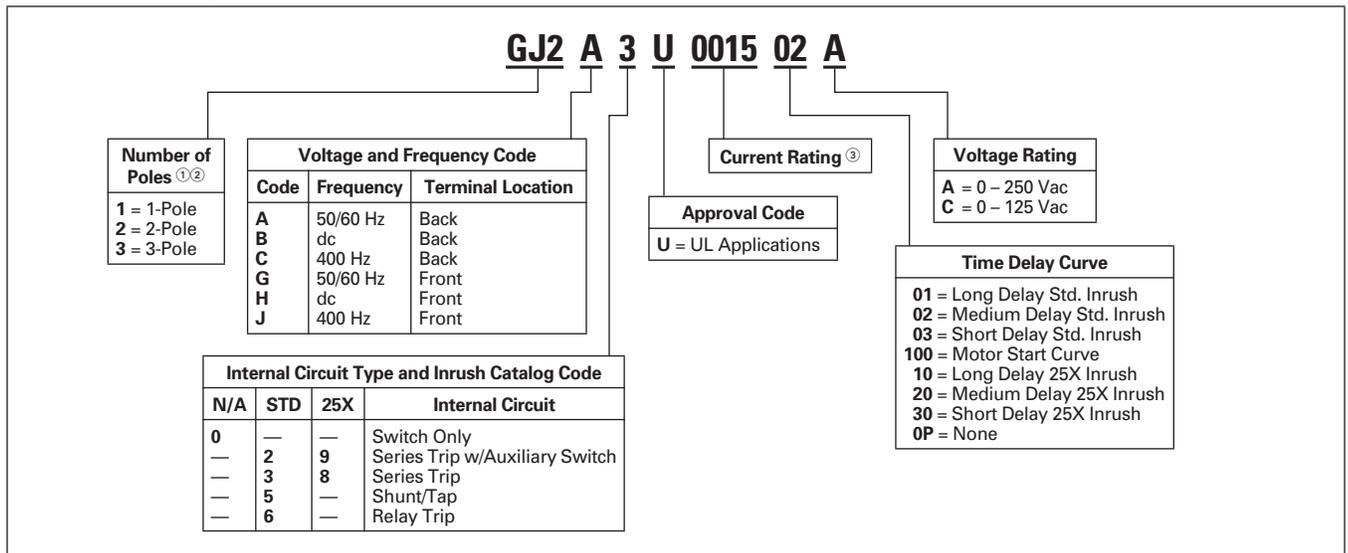
Standard Breaker Configurations

The GJ Series can be ordered in a number of standard configurations utilizing the GJ Catalog Numbering System. Once you create your catalog number, you can contact our Technical Resource Center for verification and quotations.

Custom Applications

The GJ Series is also available in a number of custom configurations to meet your specific application needs. To order a special application breaker, you can visit our Web site at www.eaton.com/heinemann for a list of custom modifications and information on how to obtain a proprietary catalog number. You may also contact the Technical Resource Center for application information and breaker selection assistance.

Table 11-98. GJ Catalog Numbering System



① Select from 1 to 3 poles, and enter the number in position 3 of the catalog number. For example, a GJ2 would identify a 2-pole GJ Series breaker.
 ② Style includes Toggle Handle with Black ON/OFF handle color.
 ③ Enter the four digit current rating. For example, use code "0015" for a 15 ampere current rating. Breakers are available from 100 – 280 amperes.

GJ1P Series

GJ1P Series



GJ1P Series Breaker

Product Description

Eaton Corporation's Heinemann GJ1P breakers offer high-quality circuit protection for dc applications from 100 to 1200 amperes.

Application Description

Their precisely tailored time delays and ability to interrupt high currents makes them ideally suited for critical applications. On overloads exceeding 1000 – 1400% of rating, there is no intentional time delay and the breaker interrupts currents of as much as 100,000 amperes at 65 Vdc up to 1200 amperes.

Features, Benefits and Functions

An optional shunt (25 or 50 millivolt full scale) permits metering of current. Since the shunt output is low voltage, light-gauge wiring can be used from shunt to meter. Indication may be displayed in percent, watts, safe/danger or other dial calibrations. In addition, the bus bar is available in two versions, Standard Size and Reduced Size. Contact your Eaton sales representative for more information.

Precision Current Equalization (PCE) Circuit Breakers

GJ1P breakers rated 250 to 1200 amperes are built in parallel construction. Conventional parallel pole breakers can experience uneven current distribution because of variations in internal resistances. This condition can result in nuisance tripping since the higher current in one parallel branch has the same effect as an overload on the sensing element in that branch. Proprietary Precision Current Equalization (PCE) circuit breakers, on the other hand, allow for differences in internal resistances by automatically distributing the current equally through the parallel current sensing elements, minimizing the danger of nuisance tripping.

The UL listed series GJ1P (UL 489) models are available in a choice of fast, medium or slow response times to accurately match load conditions.

They can be ordered in "series trip," "mid-trip" and "switch only" constructions and are available front- or back-mounted, front- or back-connected, with optional auxiliary switches for signaling.

Technical Data

Dimensions in Inches and (mm)

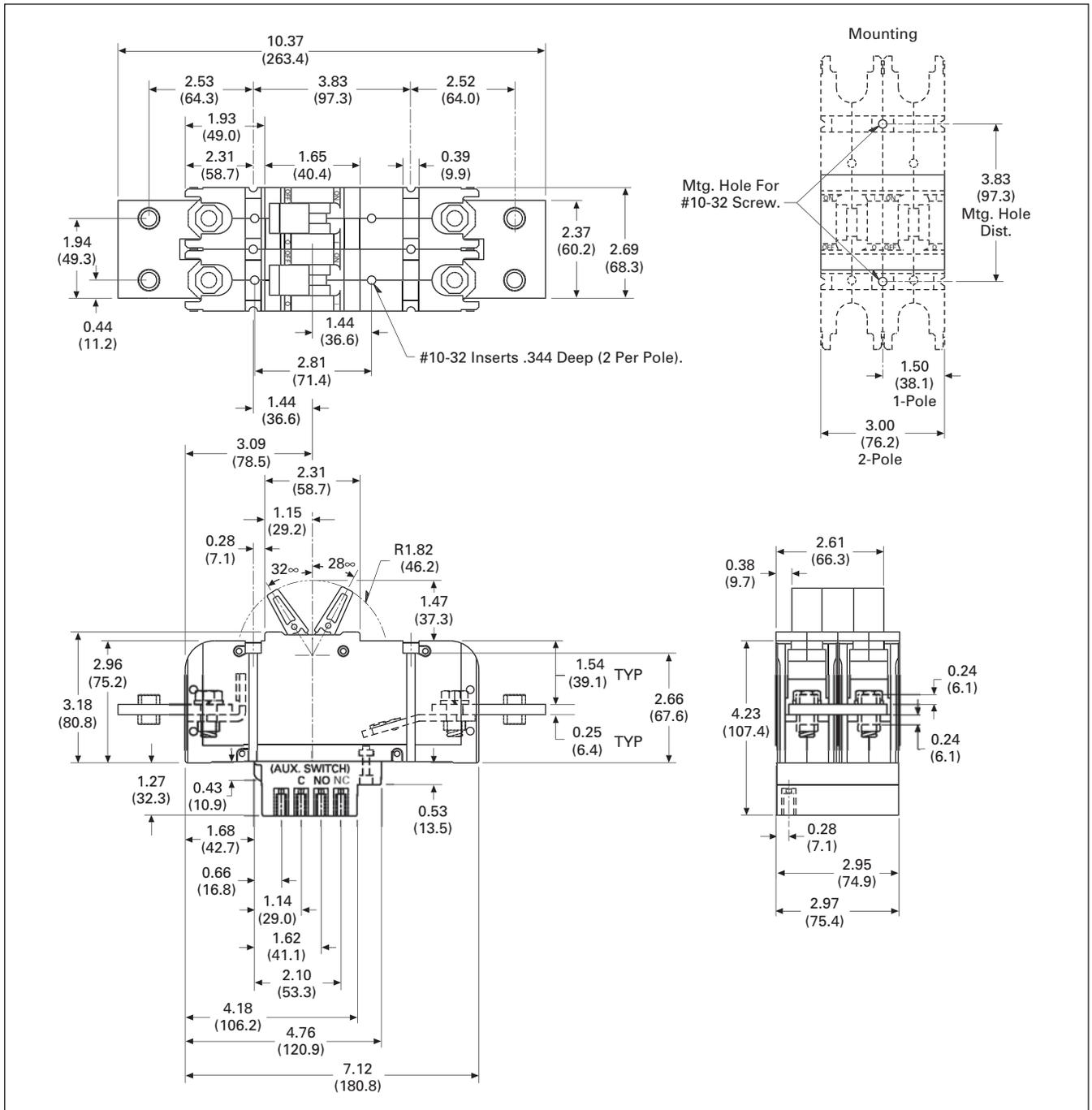
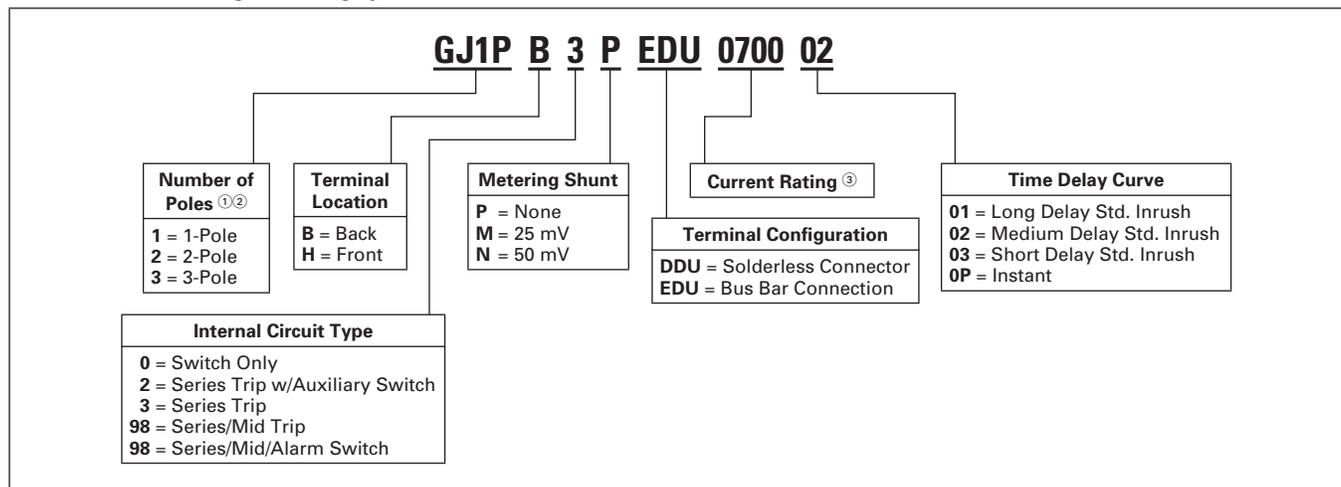


Figure 11-68. GJ1P Typical Dimensions

GJ1P Series

Product Selection

Table 11-99. GJ1P Catalog Numbering System



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- ① Select from 1 to 3 poles, and enter the number in position 3 of the catalog number. For example, a GJ1P would identify a 1-pole GJ Series breaker.
- ② Style includes Toggle Handle with Black ON/OFF handle color and 6-32 mounting.
- ③ Enter the four digit current rating. For example, use code "0015" for a 15 ampere current rating. Breakers are available from 100 – 280 amperes.

Industrial Solutions

Marine Industry



Eaton Heinemann Breakers for Marine Craft

Where there is a need for small, light-weight, low-cost reliable circuit breakers, boat designers have found Eaton Heinemann an excellent choice. Long a standard in the industry, Heinemann breakers meet a wide variety of demanding needs in marine craft.

From a single-pole breaker for ON/OFF switching and overcurrent protection on smaller boats to multi-pole breakers with auxiliary functions on larger vessels, you can expect to find a Heinemann breaker that will meet your requirements.

The JA/S, JE/S and AMR circuit breakers are perfect for basic marine applications exposed to temperature variations and vibration. The JE/S adds a watertight seal and is suitable for locations where water spray and splash might occur.

Eaton Heinemann's marine circuit breakers (MAS, MES and MMR) are UL listed under UL 1500 for Marine Applications and meet all U.S. Coast Guard requirements. The marine line is ignition protected and designed for use aboard gasoline-powered craft in engine compartments and closed areas where gasoline vapors may be present.

In addition, Eaton Heinemann offers services and options for OEMs focused on finding ways to reduce costs without sacrificing quality. Eaton can provide fully wired custom panel solutions eliminating the need to deal with multiple vendors and additional procurement costs.



Photo Caption Needed



Sealed Toggle JE



Photo Caption Needed

Telecommunications



Powering Wireless Telecommunications

Eaton Heinemann circuit breakers power nearly half of all wireless telecommunications equipment in the world. Chosen for their precision protection and high reliability in outdoor environments, Eaton Heinemann circuit breakers deliver reliable power eliminating costs for some of the largest wireless carriers in the U.S. and abroad.

If you are an OEM building Radio Base Station Equipment, or looking for ways to distribute dc power more efficiently, Eaton has a solution ready for your application.

Our facilities in Switzerland have designed both integrated distribution modules (IDM) and bus bar solutions to distribute power to your equipment, requiring less labor during fabrication. In addition, we have developed several custom products to improve the reliability of communications equipment in both civilian and military applications.

Eaton Heinemann is also one of the manufacturers of electrical equipment that can combine the benefits of hydraulic-magnetic protection and ac site power protection in conjunction with Eaton Cutler-Hammer Products.

At Eaton Heinemann, we know the telecommunications business, and we can help shorten your product delivery cycle. From design services, to logistics, to contract manufacturing, Eaton can help you keep your customers communicating.

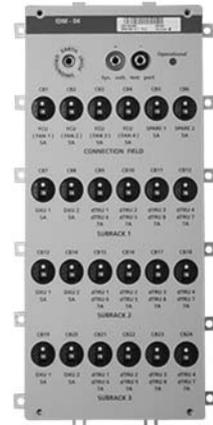


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