Miniature Circuit Breakers and Supplementary Protectors

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Miniature Circuit Breakers and Supplementary Protectors

Contents

QUICKLAG

Quick Reference

Eaton's 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	Vac	Vdc	Federal Spec. W-C-375b	Interrupting Ratings rms Symmetrical Amperes Vac Ratings 120	120/240	240	Vdc Ratings ② 24–48	62.5	80	Page Number
HQP	P	10–70	1	120/240	24, 48, 62.5	10a, 11a, 12a	—	10,000	—	5,000	③	—	**V4-T24-6**
HQP	P	10–125	2	120/240	24, 48, 80	10a, 12a	—	10,000	—	5,000	5,000	5,000	**V4-T24-6**
HQP	P	10–100	2, 3	240	—	10b, 11b, 12b	—	—	10,000	—	—	—	**V4-T24-6**
QPHW	P	15–70	1	120/240	24, 48, 62.5	14a	—	22,000	—	5,000	③	—	**V4-T24-6**
QPHW	P	15–125	2	120/240	24, 48, 80	14a	—	22,000	—	5,000	5,000	5,000	**V4-T24-6**
QPHW	P	15–100	2, 3	240	—	14b	—	—	22,000	—	—	—	**V4-T24-6**
QHPX	P	15–70	1	120/240	24, 48, 62.5	—	—	42,000	—	5,000	③	—	**V4-T24-7**
QHPX	P	15–100	2	120/240	24, 48, 80	—	—	42,000	—	5,000	5,000	5,000	**V4-T24-7**
QHPX	P	15–100	3	240	—	—	—	—	42,000	—	—	—	**V4-T24-7**
QHPW	P	15–30	1	120/240	24, 48, 62.5	15a	—	65,000	—	5,000	③	—	**V4-T24-7**
QHPW	P	15–30	2	120/240	24, 48, 80	15a	—	65,000	—	5,000	5,000	5,000	**V4-T24-7**
QHPW	P	15–20	3	240	—	15b	—	—	65,000	—	—	—	**V4-T24-7**
QPGF	P, GF	15–40	1	120	—	10a, 11a, 12a	10,000	—	—	—	—	—	**V4-T24-9**
QPGF	P, GF	15–50	2	120/240	—	10a, 11a, 12a	—	10,000	—	—	—	—	**V4-T24-9**

Notes

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

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

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

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.

For Types GHBS, GBHS and BABRP solenoid-operated, remote-controlled circuit breakers, see **Pages V4-T24-31** to **V4-T24-36**.

For Type WMZ circuit breakers, see **Pages V4-T24-49** to **V4-T24-63**.

For Types WMZS and SPHM supplementary protectors, see **Pages V4-T24-64** to **V4-T24-87**.

Eaton's 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	Vac	Vdc	Federal Spec. W-C-375b	Interrupting Ratings rms Symmetrical Amperes Vac Ratings 120	120/240	240	Vdc Ratings ② 24–48	62.5	80	Page Number
QPHGF	P, GF	15–30	1	120	—	10a, 11a, 12a	22,000	—	—	—	—	—	V4-T24-9
QPHGF	P, GF	15–50	2	120/240	—	10a, 11a, 12a	—	22,000	—	—	—	—	V4-T24-9
QPGFEP	P, GFEP	15–40	1	120	—	—	10,000	—	—	—	—	—	V4-T24-9
QPGFEP	P, GFEP	15–50	2	120/240	—	—	—	10,000	—	—	—	—	V4-T24-9
QPHGFEP	P, GFEP	15–30	1	120	—	—	22,000	—	—	—	—	—	V4-T24-9
BABRSP	B	15–30	1	120	—	—	10,000	—	—	—	—	—	V4-T24-12
BABRSP	B	15–30	2	120/240	—	—	—	10,000	—	—	—	—	V4-T24-12
BRRP	P	15–30	1	120	—	—	10,000	—	—	—	—	—	V4-T24-32
BRRP	P	15–30	2	120/240	—	—	—	10,000	—	—	—	—	V4-T24-32
CLRP	P	15–30	1	120	—	—	10,000	—	—	—	—	—	V4-T24-32
CLRP	P	15–30	2	120/240	—	—	—	10,000	—	—	—	—	V4-T24-32
BAB	B	10–70	1	120/240	24, 48, 62.5	10a, 11a, 12a	—	10,000	—	5000	③	—	V4-T24-12
BAB	B	10–125	2	120/240	24, 48, 80	10a, 12a	—	10,000	—	5000	5000	5000	V4-T24-12
BAB	B	10–100	2, 3	240	—	10b, 11b, 12b	—	—	10,000	—	—	—	V4-T24-12
BABRP	B	15–30	1	120	—	—	10,000	—	—	—	—	—	V4-T24-32
BABRP	B	15–30	2	120/240	—	—	—	10,000	—	—	—	—	V4-T24-32
QBAF	B, AF	15–20	1, 2	120/240	—	—	—	10,000	—	—	—	—	V4-T24-15
QBCAF	B, AF, GF	15–20	1, 2	120/240	—	—	—	10,000	—	—	—	—	V4-T24-15
QBHW	B	15–70	1	120/240	24, 48, 62.5	14a	—	22,000	—	5000	③	—	V4-T24-12
QBHW	B	15–125	2	120/240	24, 48, 80	14a	—	22,000	—	5000	5000	5000	V4-T24-12
QBHW	B	15–100	2, 3	240	—	14b	—	—	22,000	—	—	—	V4-T24-12
HBAX	B	15–70	1	120/240	24, 48, 62.5	—	—	42,000	—	5000	③	—	V4-T24-13
HBAX	B	15–100	2	120/240	24, 48, 80	—	—	42,000	—	5000	5000	5000	V4-T24-13
HBAX	B	15–100	3	240		—	—	—	42,000	—	—	—	V4-T24-13
HBAW	B	15–30	1	120/240	24, 48, 62.5	15a	—	65,000	—	5000	③	—	V4-T24-13
HBAW	B	15–30	2	120/240	24, 48, 80	15a	—	65,000	—	5000	5000	5000	V4-T24-13
HBAW	B	15–20	3	240	—	15b	—	—	65,000	—	—	—	V4-T24-13
QBGF	B, GF	15–40	1	120	—	10a, 11a, 12a	10,000	—	—	—	—	—	V4-T24-18
QBGF	B, GF	15–50	2	120/240	—	10a, 11a, 12a	—	10,000	—	—	—	—	V4-T24-18
QBHGF	B, GF	15–30	1	120	—	10a, 11a, 12a	22,000	—	—	—	—	—	V4-T24-18
QBHGF	B, GF	15–30	1	120/240	—	10a, 11a, 12a	—	22,000	—	—	—	—	V4-T24-18
QBGFEP	B, GFEP	15–40	1	120	—	—	10,000	—	—	—	—	—	V4-T24-18
QBGFEP	B, GFEP	15–50	2	120/240	—	—	—	10,000	—	—	—	—	V4-T24-18
QBHGFEP	B, GFEP	15–30	1	120	—	—	22,000	—	—	—	—	—	V4-T24-18
QBHGFEP	B, GFEP	15–30	2	120/240	—	—	22,000	22,000	—	—	—	—	V4-T24-18
QC	C	10–70	1	120/240	24, 48, 62.5	10a, 11a, 12a	—	10,000	—	5000	③	—	V4-T24-41
QC	C	10–100	2	120/240	24, 48, 80	10a, 12a	—	10,000	—	5000	5000	5000	V4-T24-41
QC	C	10–100	2, 3, 4	240	—	10b, 11b, 12b	—	—	10,000	—	—	—	V4-T24-41
QCD	C	10–60	1, 2	120/240	24, 48, 62.5	—	10,000	10,000	—	3000	3000	—	V4-T24-23
QCD	C	10–100	2, 3	240	24, 48, 62.5	—	—	10,000	—	3000	3000	—	V4-T24-23
QCF	C	10–60	1, 2	120/240	24, 48, 62.5	—	10,000	10,000	—	3000	3000	—	V4-T24-42

Notes

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

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

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

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.

For Types GHBS, GBHS and BABRP solenoid-operated, remote-controlled circuit breakers, see **Pages V4-T24-31** to **V4-T24-36**.

For Type WMZ circuit breakers, see **Pages V4-T24-49** to **V4-T24-63**.

For Types WMZS and SPHM supplementary protectors, see **Pages V4-T24-64** to **V4-T24-87**.

Eaton's 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	Vac	Vdc	Federal Spec. W-C-375b	Interrupting Ratings rms Symmetrical Amperes Vac Ratings 120	120/240	240	Vdc Ratings ② 24–48	62.5	80	Page Number
QCF	C	15–20	1, 2	120/240	24, 48, 62.5	—	22,000	—	—	3000	3000	—	**V4-T24-27**
QCF	C	15–30	2, 3	240	24, 48, 62.5	—	—	10,000	—	3000	3000	—	**V4-T24-27**
QCR	C	10–60	1, 2	120/240	24, 48, 62.5	—	10,000	10,000	—	3000	3000	—	**V4-T24-27**
QCR	C	15–20	1, 2	120/240	24, 48, 62.5	—	22,000	—	—	3000	3000	—	**V4-T24-27**
QCR	C	15–30	2, 3	240	24, 48, 62.5	—	—	10,000	—	3000	3000	—	**V4-T24-27**
QCHW	C	15–70	1	120/240	24, 48, 62.5	14a	—	22,000	—	5000	③	—	**V4-T24-22**
QCHW	C	15–100	2	120/240	24, 48, 80	14a	—	22,000	—	5000	5000	5000	**V4-T24-22**
QCHW	C	15–100	2, 3	240	—	14b	—	—	22,000	—	—	—	**V4-T24-22**
QHCX	C	15–70	1	120/240	24, 48, 62.5	—	—	42,000	—	5000	③	—	**V4-T24-22**
QHCX	C	15–100	2	120/240	24, 48, 80	—	—	42,000	—	5000	5000	5000	**V4-T24-22**
QHCX	C	15–100	3	240	—	—	—	—	42,000	—	—	—	**V4-T24-22**
QHCW	C	15–30	1	120/240	24, 48, 62.5	15a	—	65,000	—	5000	③	—	**V4-T24-22**
QHCW	C	15–30	2	120/240	24, 48, 80	15a	—	65,000	—	5000	5000	5000	**V4-T24-22**
QHCW	C	15–20	3	240	—	15b	—	—	65,000	—	—	—	**V4-T24-22**
QCGF	C, GF	15–40	1	120	—	—	10,000	—	—	—	—	—	**V4-T24-29**
QCGF	C, GF	15–50	2	120/240	—	—	—	10,000	—	—	—	—	**V4-T24-29**
QCHGF	C, GF	15–30	1	120	—	—	22,000	—	—	—	—	—	**V4-T24-29**
QCHGF	C, GF	15–30	2	120/240	—	—	—	22,000	—	—	—	—	**V4-T24-29**
QCGFEP	C, GFEP	15–40	1	120	—	—	10,000	—	—	—	—	—	**V4-T24-29**
QCGFEP	C, GFEP	15–50	2	120/240	—	—	—	10,000	—	—	—	—	**V4-T24-29**
QCHGFEP	C, GFEP	15–30	1	120	—	—	22,000	—	—	—	—	—	**V4-T24-29**
QCHGFEP	C, GFEP	15–30	2	120/240	—	—	—	22,000	—	—	—	—	**V4-T24-29**

Notes

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

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

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

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.

For Types GHBS, GBHS and BABRP solenoid-operated, remote-controlled circuit breakers, see **Pages V4-T24-31** to **V4-T24-36**.

For Type WMZ circuit breakers, see **Pages V4-T24-49** to **V4-T24-63**.

For Types WMZS and SPHM supplementary protectors, see **Pages V4-T24-64** to **V4-T24-87**.

.

QUICKLAG Type HQP Single-Pole

Contents

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

Product Description

- All products 15–100A are HACR rated
- Switching duty rated for 120 Vac fluorescent light applications

Standards and Certifications

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

Listed

QUICKLAG Type HQP Single-Pole

QUICKLAG Type: HQP 10,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
10	1HQP1010	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

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
50	HQP1050N	—	HQP2050N	HQP3050N
60	HQP1060N	—	HQP2060N	HQP3060N
100	HQP1100N	—	HQP2100N	HQP3100N

QUICKLAG Type: QPHW 22,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
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	—	—

Notes

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 Type: QHPX 42,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
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 65,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
15	QHPW1015 ①	QHPW2015	—	QHPW3015H
20	QHPW1020 ①	QHPW2020	—	QHPW3020H
25	QHPW1025	QHPW2025	—	—
30	QHPW1030	QHPW2030	—	—

Dimensions

Approximate Dimensions in Inches (mm)

Shipping Data

Number of Poles	Carton Quantity	Approximate Weight Lbs (kg)	Dimensions
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)

Note

① Switching duty rated for 120 Vac fluorescent light applications.

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QUICKLAG Type QPGF Single-Pole Ground Fault Circuit Breaker

Contents

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

Product Description

QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

- 5 mA trip sensitivity

QUICKLAG Ground Fault Equipment Protectors

- 30 mA trip sensitivity

Standards and Certifications

- Built and listed to UL 489

QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

- Built and tested to UL 943

QUICKLAG Ground Fault Equipment Protectors

- Built and listed to UL 1053

Listed

Product Selection

QUICKLAG Type QPGF Single-Pole

Ground Fault Circuit Breakers—5 mA Sensitivity QUICKLAG Type: QPGF 10,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	QPGF1015	QPGF2015
20	QPGF1020	QPGF2020
25	QPGF1025	QPGF2025
30	QPGF1030	QPGF2030
40	QPGF1040	QPGF2040
50	—	QPGF2050

QUICKLAG Type: QPHGF 22,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	QPHGF1015	QPHGF2015
20	QPHGF1020	QPHGF2020
25	QPHGF1025	QPHGF2025
30	QPHGF1030	QPHGF2030

Ground Fault Equipment Breakers—30 mA Sensitivity QUICKLAG Type: QPGFEP 10,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	QPGFEP1015	QPGFEP2015
20	QPGFEP1020	QPGFEP2020
25	QPGFEP1025	QPGFEP2025
30	QPGFEP1030	QPGFEP2030
40	QPGFEP1040	QPGFEP2040
50	—	QPGFEP2050

QUICKLAG Type: QPHGFEP 22,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	QPHGFEP1015	QPHGFEP2015
20	QPHGFEP1020	QPHGFEP2020
25	QPHGFEP1025	QPHGFEP2025
30	QPHGFEP1030	QPHGFEP2030

Special Application Ground Fault Circuit Protectors—5 mA Sensitivity QUICKLAG Type: QPGF 10,000A Interrupting Capacity with Bell Alarm (W1) or Auxiliary Switch (W2)

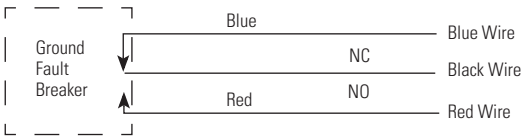
Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	**QPGF1015W1**	**QPGF2015W1**
20	**QPGF1020W1**	**QPGF2020W1**
25	**QPGF1025W1**	**QPGF2025W1**
30	**QPGF1030W1**	**QPGF2030W1**
40	—	**QPGF2040W1**
50	—	**QPGF2050W1**
15	**QPGF1015W2**	—
20	**QPGF1020W2**	—
25	**QPGF1025W2**	—
[30	**QPGF1030W2**	—

Special Application Ground Fault Circuit Protectors—30 mA Sensitivity QUICKLAG Type: QPGFEP 10,000A Interrupting Capacity with Bell Alarm (W1) or Auxiliary Switch (W2)

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	**QPGFEP1015W1**	**QPGFEP2015W1**
20	**QPGFEP1020W1**	**QPGFEP2020W1**
25	**QPGFEP1025W1**	**QPGFEP2025W1**
30	**QPGFEP1030W1**	**QPGFEP2030W1**
40	—	**QPGFEP2040W1**
50	—	**QPGFEP2050W1**
15	**QPGFEP1015W2**	—
20	**QPGFEP1020W2**	—
2	**QPGFEP1025W2**	—
30	**QPGFEP1030W2**	—

Wiring Diagram

Bell Alarm and Auxiliary Contact Schematic



Single-throw double-pole contacts are UL and CSA listed for 5A at 250 Vac.
Bell Alarm (W1)—contacts change state when breaker trips.
Auxiliary Switch (W2)—contacts change state when breaker is opened (or tripped) or closed.
14-inch (355.6 mm) long 18 AWG pigtail wire leads provided.

Dimensions

Approximate Dimensions in Inches (mm)

Shipping Data

Number of Poles	Carton Quantity	Approximate Weight Lbs (kg)	Dimensions
1	24	11.00 (5.0)	12.50 x 6.50 x 5.00 (317.5 x 165.1 x 127.0)
2	5	5.00 (2.3)	15.50 x 6.00 x 4.50 (393.7 x 152.4 x 114.3)

Note

Shipped individually or in carton quantities.

QUICKLAG Type BAB Single-Pole

Contents

Bolt-On Types BAB, QBHW, HBAX, HBAW

Product Description

- All products 15–100A are HACR rated
- Switching duty rated for 120 Vac fluorescent light applications

Standards and Certifications

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

Listed

QUICKLAG Type BAB Single-Pole

QUICKLAG Type: BA 10,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
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

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
50	BAB1050N	—	BAB2050N	BAB3050N
60	BAB1060N	—	BAB2060N	BAB3060N
100	BAB1100N	—	BAB2100N	BAB3100N

QUICKLAG Type: QBHW 22,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
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	—	—

Notes

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

QUICKLAG Type: HBAX 42,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
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
80	—	HBAX2080	—	HBAX3080H
90	—	HBAX2090	—	HBAX3090H
100	—	HBAX2100	—	HBAX3100H

QUICKLAG Type: HBAW 65,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
15	HBAW1015 ①	HBAW2015	—	HBAW3015H
20	HBAW1020 ①	HBAW2020	—	HBAW3020H
25	HBAW1025	HBAW2025	—	—
30	HBAW1030	HBAW2030	—	—

Dimensions

Approximate Dimensions in Inches (mm)

Shipping Data

Number of Poles	Carton Quantity	Approximate Weight Lbs (kg)	Dimensions
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)

Note

① Switching duty rated for 120 Vac fluorescent light applications.

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Bolt-On Arc Fault Circuit Interrupter QUICKLAG Types QBAF, QBCAF

Contents

Bolt-On Arc Fault Circuit Interrupter Types QBAF, QBCAF

Product Description

- All products HACR rated

Features, Benefits and Functions

- 10 and 22 kAIC rating at 120V and 120/240V
- Single-pole AFCI
- HID ratings for HID (High Intensity Discharge) lighting
- All models are HACR rated

Standards and Certifications

- Built and listed to UL 489
- UL File E7819 for QBAF

UL Listed

Product Selection

QBCAF and QBAF Type AFCIs

Effective immediately, Eaton 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 (QBCAF and 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 QBCAF and QBAF offerings.

Breakers can also be ordered from Vista.

QBHCAF

1-Inch (25.4 mm) Wide Bolt-On Arc Fault Circuit Interrupter

Poles	kAIC Rating	Ampere Rating	Configuration	Catalog Number
Type QBCAF Combination AFCI				
Single-pole	10 kAIC	15	Combination AFCI	**QBCAF1015**
		20	Combination AFCI	**QBCAF1020**
	22 kAIC	15	Combination AFCI	**QBHCAF1015**
		20	Combination AFCI	**QBHCAF1020**
Type QBAF Branch Feeder AFCI				
Single-pole	10 kAIC	15	Branch Feeder AFCI	**QBAF1015**
		20	Branch Feeder AFCI	**QBAF1020**
	22 kAIC	15	Branch Feeder AFCI	**QBHAF1015**
		20	Branch Feeder AFCI	**QBHAF1020**

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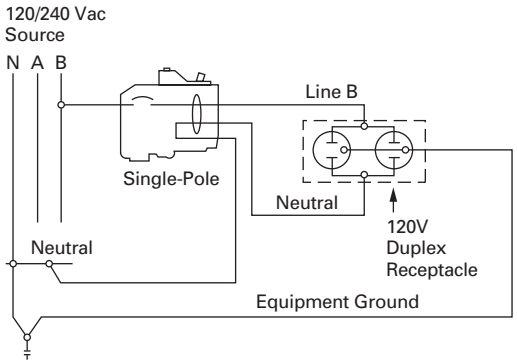
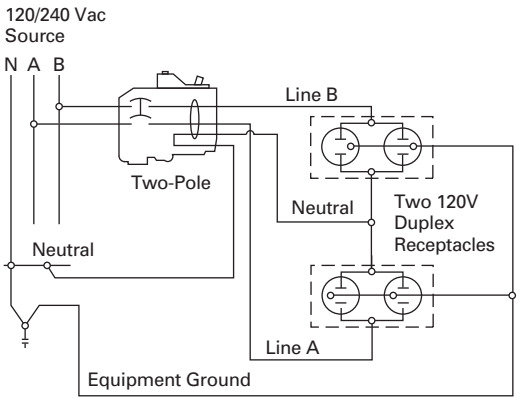
Wiring Diagrams

Single-Pole 120V Load Application Sourced by 120/240 Vac



Single-Pole Shared Neutral with Multi-Duplex Receptacle Application



QUICKLAG Type QBGF Single-Pole Ground Fault Circuit Breaker

Contents

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

Product Description

QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

- 5 mA trip sensitivity

QUICKLAG Ground Fault Equipment Protectors

- 30 mA trip sensitivity

Standards and Certifications

- Built and tested to UL 489

QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

- Built and tested to UL 943

QUICKLAG Ground Fault Equipment Protectors

- Built and tested to UL 1053

Listed

24 **Product Selection**

QUICKLAG Type QBGF Single-Pole

Ground Fault Circuit Breakers—5 mA Sensitivity QUICKLAG Type: QBGF 10,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	QBGF1015	QBGF2015
20	QBGF1020	QBGF2020
25	QBGF1025	QBGF2025
30	QBGF1030	QBGF2030
40	QBGF1040	QBGF2040
50	—	QBGF2050

QUICKLAG Type: QBHGF 22,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	QBHGF1015	QBHGF2015
20	QBHGF1020	QBHGF2020
25	QBHGF1025	QBHGF2025
30	QBHGF1030	QBHGF2030

Ground Fault Equipment Breakers—30 mA Sensitivity QUICKLAG Type: QBGFEP 10,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	QBGFEP1015	QBGFEP2015
20	QBGFEP1020	QBGFEP2020
25	QBGFEP1025	QBGFEP2025
30	QBGFEP1030	QBGFEP2030
40	QBGFEP1040	QBGFEP2040
50	—	QBGFEP2050

QUICKLAG Type: QBHGFEP 22,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	QBHGFEP1015	QBHGFEP2015
20	QBHGFEP1020	QBHGFEP2020
25	QBHGFEP1025	QBHGFEP2025
30	QBHGFEP1030	QPHGFEP2030

Special Application Ground Fault Circuit Protectors—5 mA Sensitivity QUICKLAG Type: QBGF 10,000A Interrupting Capacity with Bell Alarm (W1) or Auxiliary Switch (W2)

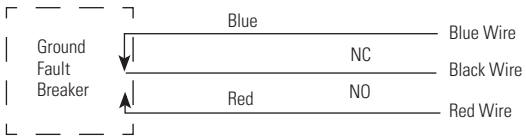
Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	**QBGF1015W1**	**QBGF2015W1**
20	**QBGF1020W1**	**QBGF2020W1**
25	**QBGF1025W1**	**QBGF2025W1**
30	**QBGF1030W1**	**QBGF2030W1**
40	—	**QBGF2040W1**
50	—	**QBGF2050W1**
15	**QBGF1015W2**	—
20	**QBGF1020W2**	—
25	**QBGF1025W2**	—
30	**QBGF1030W2**	—

Special Application Ground Fault Circuit Protectors—30 mA Sensitivity QUICKLAG Type: QBGFEP 10,000A Interrupting Capacity with Bell Alarm (W1) or Auxiliary Switch (W2)

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
15	**QBGFEP1015W1**	**QBGFEP2015W1**
20	**QBGFEP1020W1**	**QBGFEP2020W1**
25	**QBGFEP1025W1**	**QBGFEP2025W1**
30	**QBGFEP1030W1**	**QBGFEP2030W1**
40	—	**QBGFEP2040W1**
50	—	**QBGFEP2050W1**
15	**QBGFEP1015W2**	—
20	**QBGFEP1020W2**	—
25	**QBGFEP1025W2**	—
30	**QBGFEP1030W2**	—

Wiring Diagram

Bell Alarm and Auxiliary Contact Schematic



Single-throw double-pole contacts are UL and CSA listed for 5A at 250 Vac.
Bell Alarm (W1)—contacts change state when breaker trips.
Auxiliary Switch (W2)—contacts change state when breaker is opened (or tripped) or closed.
14-inch (355.6 mm) long 18 AWG pigtail wire leads provided.

Dimensions

Approximate Dimensions in Inches (mm)

Shipping Data

Number of Poles	Approximate Weight Lbs (kg)	Dimensions
1	11.00 (5.0)	12.50 x 6.50 x 5.00 (317.5 x 165.1 x 127.0)
2	5.00 (2.3)	15.50 x 6.00 x 4.50 (393.7 x 152.4 x 114.3)

Note

Shipped individually or in carton quantities.

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QUICKLAG Type QC Single-Pole

Contents

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

Product Description

- All products 10–100A are HACR rated
- Switching duty rated for 120 Vac fluorescent light applications only

Standards and Certifications

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

Listed

Product Selection

QUICKLAG
Type QC Single-Pole

QUICKLAG Type: QC 10,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number	Four-Pole 240 Vac Catalog Number
5	QC1005 ①	QC2005 ①	—	—	—
10	QC1010	QC2010	QC2010H ①	QC3010H ①	—
15	QC1015 ②	QC2015	QC2015H	QC3015H	QC4015H
20	QC1020 ②	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
70	—	QC2080	QC2080H	QC3080H	QC4080H
90	—	QC2090	QC2090H	QC3090H	QC4090H
100	QC1100	QC2100	QC2100H	QC3100H	QC4100H

QUICKLAG Type: QC Non-Automatic Switches

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number	Four-Pole 240 Vac Catalog Number
50	QC1050N	—	QC2050N	QC3050N	—
60	QC1060N	—	QC2060N	QC3060N	—
100	QC1100N	—	QC2100N	QC3100N	—

Notes

① Not UL listed.

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

For special low-magnetic breaker, order **QC1015L1** or **QC1020L1**.Non-automatic switches, see **Page V4-T24-42.**

QUICKLAG Type: QCHW 22,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number	Four-Pole 240 Vac Catalog Number
15	QCHW1015 ①	QCHW2015	QCHW2015H	QCHW3015H	QCHW4015H
20	QCHW1020 ①	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
70	—	QCHW2080	QCHW2080H	QCHW3080H	QCHW4080H
90	—	QCHW2090	QCHW2090H	QCHW3090H	QCHW4090H
100	—	QCHW2100	QCHW2100H	QCHW3100H	QCHW4100H

QUICKLAG Type: QCHX 42,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number	Four-Pole 240 Vac Catalog Number
15	QCHX1015 ①	QCHX2015	—	QCHX3015H	—
20	QCHX1020 ①	QCHX2020	—	QCHX3020H	—
25	QCHX1025	QCHX2025	—	QCHX3025H	—
30	QCHX1030	QCHX2030	—	QCHX3030H	—
35	QCHX1035	QCHX2035	—	QCHX3035H	—
40	QCHX1040	QCHX2040	—	QCHX3040H	—
45	QCHX1045	QCHX2045	—	QCHX3045H	—
50	QCHX1050	QCHX2050	—	QCHX3050H	—
55	QCHX1055	QCHX2055	—	QCHX3055H	—
60	QCHX1060	QCHX2060	—	QCHX3060H	—
70	QCHX1070	QCHX2070	—	QCHX3070H	—
70	—	QCHX2080	—	QCHX3080H	—
90	—	QCHX2090	—	QCHX3090H	—
100	—	QCHX2100	—	QCHX3100H	—

QUICKLAG Type: QHCW 65,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number	Four-Pole 240 Vac Catalog Number
15	QHCW1015 ①	QHCW2015	—	QHCW3015H	—
20	QHCW1020 ①	QHCW2020	—	QHCW3020H	—
25	QHCW1025	QHCW2025	—	—	—
30	QHCW1030	QHCW2030	—	—	—

Notes

① Switching duty rated for 120 Vac fluorescent light applications only.

Non-automatic switches, see **Page V4-T24-42.**

QUICKLAG Type QCD Miniature Circuit Breakers

QCD breakers are used primarily in HVAC and industrial applications.

- Single-, two- and three-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

QUICKLAG Type QCD Miniature Circuit Breaker

QUICKLAG Type QCD 10,000A Interrupting Capacity Thermal-Magnetic Breakers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
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	—	**QCD2090**	**QCD2090H**	**QCD3100H**
	—	**QCD2100**	**QCD2100H**	—

QUICKLAG Type QCD Non-Automatic Switches

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
60	—	—	**QCD2060NA**	—
100	—	—	—	—

Dimensions

Approximate Dimensions in Inches (mm)

Shipping Data

Number of Poles	Carton Quantity	Approximate Weight Lbs (kg)	Dimensions
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)

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

Single-Pole *Two-Pole* *Single-Pole* *Two-Pole*

QCR (Rear-Mounted Breakers) *QCF (Front-Mounted Breakers*

Contents

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

Product Description

Eaton Type QCR circuit breakers 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

Standards and Certifications

- Built and listed to UL 489
- UL File No. E7819
- CSA File No. LR48907
- Type QCR and QCF circuit breakers are UL listed circuit breakers that are suitable for use as branch circuit protectors
- All ratings 15–60A are HACR rated

Listed

Product Selection

Cable-In/Cable-Out, 1/2-Inch Wide

QCR Breaker Catalog Numbers ①②③④

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac ⑤ Catalog Number	Three-Pole Catalog Number
QCR Breaker 10 kAIC Interrupting Ratings				
10	QCR1010	QCR2010	—	—
	QCR1010T	QCR2010T	—	—
	—	QCR2010P	—	—
15	QCR1015 ⑥	QCR2015	QCR2015H	QCR3015H
	QCR1015T ⑥	QCR2015T	QCR2015HT	QCR3015HT
	—	QCR2015P	—	—
20	QCR1020 ⑥	QCR2020	QCR2020H	QCR3020H
	QCR1020T ⑥	QCR2020T	QCR2020HT	QCR3020HT
	—	QCR2020P	—	—
25	QCR1025	QCR2025	QCR2025H	QCR3025H
	QCR1025T	QCR2025T	QCR2025HT	QCR3025HT
	—	QCR2025P	—	—
30	QCR1030	QCR2030	QCR2030H	QCR3030H
	QCR1030T	QCR2030T	QCR2030HT	QCR3030HT
	—	QCR2030P	—	—
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	QCRH2015	—	—
	QCRH1015T ⑥	QCRH2015T	—	—
20	QCRH1020 ⑥	QCRH2020	—	—
	QCRH1020T ⑥	QCRH2020T	—	—

Notes

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 single-, two- and three-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 20A single-pole breakers are SWD (Switching Duty) rated for fluorescent lighting applications.
⑦ 60/75°C Cu/Al wire on all ratings except 60A, which requires Cu only conductor.

Cable-In/Cable-Out, 1/2-Inch Wide

QCF Breaker Catalog Numbers ①②③

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac ④ Catalog Number	Three-Pole Catalog Number
QCF Breaker 10 kAIC Interrupting Ratings				
10	QCF1010	QCF2010	—	—
	QCF1010T	QCF2010T	—	—
15	QCF1015 ⑤	QCF2015	QCF2015H	QCF3015H
	QCF1015T ⑤	QCF2015T	QCF2015HT	QCF3015HT
20	QCF1020 ⑤	QCF2020	QCF2020H	QCF3020H
	QCF1020T ⑤	QCF2020T	QCF2020HT	QCF3020HT
25	QCF1025	QCF2025	QCF2025H	QCF3025H
	QCF1025T	QCF2025T	QCF2025HT	QCF3025HT
30	QCF1030	QCF2030	QCF2030H	QCF3030H
	QCF1030T	QCF2030T	QCF2030HT	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	QCFH2015	—	—
	QCFH1015T ⑤	QCFH2015T	—	—
20	QCFH1020 ⑤	QCFH2020	—	—
	QCFH1020T ⑤	QCFH2020T	—	—

Notes

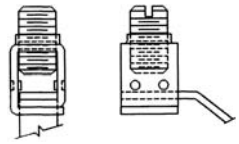
① Standard breaker terminals are box type lugs.
② Breakers with **T** Catalog Number Suffix are suitable for line and load side ring terminal connection (#10–32 plus/minus terminal screw provided).
③ Breakers with Shunt Trip Attachment (extra pole required on breaker right-hand side) are available. Contact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

QCR and QCF Options and Accessories

QCR and QCF Standard Box Terminals

Factory-installed line and load side breaker terminal to accommodate14 AWG to 4 AWG wire.

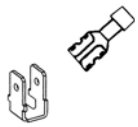
Standard Box Terminals



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.

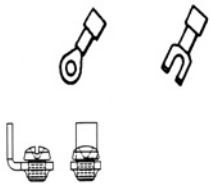
Catalog Suffix "P"



QCR and QCF Ring or Spade Lug Terminals (10 to 30A 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.

Catalog Suffix "T"



Available QCR and QCF Breaker Accessories

Description	Catalog Number
Steel mounting clip mounts QCR breaker if individual mounting is required. Quantity two required for single- and two-pole and four required for three-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**

Technical Data and Specifications

- Single-, two- and three-pole
- 10 kAIC at 120/240 Vac, 10–60A
- 22 kAIC at 120/240 Vac, 15–20A
- 10 kAIC at 240 Vac, 10–30A
- 3 kAIC at 62.5 Vdc (single-pole)
- 3 kAIC at 130 Vdc (two poles in series)
- Normal operating environment:
  - 0–40°C
  - 5–95% humidity (noncondensing)

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QUICKLAG Type QCGF Single-Pole Ground Fault Circuit Breaker

Contents

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

Product Description

QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

- 5 mA trip sensitivity

QUICKLAG Ground Fault Equipment Protectors

- 30 mA trip sensitivity

Standards and Certifications

QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

- Built and tested to UL 943

QUICKLAG Ground Fault Equipment Protectors

- Built and tested to UL 1053

UL Listed

Product Selection

QUICKLAG Type QCGF Single-Pole Ground Fault Circuit Breaker

Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	Single-Pole 120 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number
Ground Fault Circuit Breakers—5 mA Sensitivity QUICKLAG Type: QCGF 10,000A Interrupting Capacity Thermal-Magnetic Breakers		
15	QCGF1015	QCGF2015
20	QCGF1020	QCGF2020
25	QCGF1025	QCGF2025
30	QCGF1030	QCGF2030
40	QCGF1040	QCGF2040
50	—	QCGF2050
QUICKLAG Type: QCHGF 22,000A Interrupting Capacity 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 10,000A Interrupting Capacity Thermal-Magnetic Breakers		
15	QCGFEP1015	QCGFEP2015
20	QCGFEP1020	QCGFEP2020
25	QCGFEP1025	QCGFEP2025
30	QCGFEP1030	QCGFEP2030
40	QCGFEP1040	QCGFEP2040
50	—	QCGFEP2050
QUICKLAG Type: QCHGFEP 22,000A Interrupting Capacity 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 10,000A Interrupting Capacity 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 10,000A Interrupting Capacity 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	—

Wiring Diagram

Bell Alarm and Auxiliary Contact Schematic

Single-throw double-pole contacts are UL and CSA listed for 5A at 250 Vac.
Bell Alarm (W1)—contacts change state when breaker trips.
Auxiliary Switch (W2)—contacts change state when breaker is opened (or tripped) or closed.
14-inch (355.6 mm) long 18 AWG pigtail wire leads provided.

Dimensions

Approximate Dimensions in Inches (mm)

Shipping Data

Number of Poles	Carton Quantity	Approximate Weight Lbs (kg)	Dimensions
1	20	11.00 (5.0)	12.50 x 6.50 x 5.00 (317.5 x 165.1 x 127.0)
2	5	5.00 (2.3)	15.50 x 6.00 x 4.50 (393.7 x 152.4 x 114.3)

BABRP and BABRSP Breakers—Single- and Two-Pole

Contents

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

Product Description

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 load-centers not manufactured with breakers with a 1-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 Pow-R-Command™ lighting control system. These breakers can also be controlled by pushbutton or a PLC unit.

Application 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.

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 20A 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

QUICKLAG Type QCGF Single-Pole Ground Fault Circuit Breaker

BABRP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Ampere Rating ①	Interrupting Capacity (Symmetrical Amperes) Vac (50/60 Hz) 120	120/240	277/480	Catalog Number
1	15	10,000	—	—	**BABRP1015**
	20	10,000	—	—	**BABRP1020**
	25	10,000	—	—	**BABRP1025**
	30	10,000	—	—	**BABRP1030**
2	15	—	10,000	—	**BABRP2015**
	20	—	10,000	—	**BABRP2020**
	25	—	10,000	—	**BABRP2025**
	30	—	10,000	—	**BABRP2030**

BABRP and BABRSP Wire Harness

Description	Catalog Number
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**

BABRSP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Ampere Rating ①	Interrupting Capacity (Symmetrical Amperes) Vac (50/60 Hz) 120	120/240	277/480	Catalog Number
1	15	10,000	—	—	**BABRSP1015**
	20	10,000	—	—	**BABRSP1020**
	25	10,000	—	—	**BABRSP1025**
	30	10,000	—	—	**BABRSP1030**
2	15	—	10,000	—	**BABRSP2015**
	20	—	10,000	—	**BABRSP2020**
	25	—	10,000	—	**BABRSP2025**
	30	—	10,000	—	**BABRSP2030**

BRRP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Ampere Rating	Interrupting Capacity (Symmetrical Amperes) Vac (50/60 Hz) 120	120/240	Catalog Number
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**

CLRP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Ampere Rating	Interrupting Capacity (Symmetrical Amperes) Vac (50/60 Hz) 120	120/240	Catalog Number
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**

Note

① Continuous current rating at 40°C.

Technical Data and Specifications

Solenoid Operating Data

- Power requirements: 24 Vac/Vdc (20.4V minimum–30V 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 1A, close 3/4A
- Blue wire: power input (see power requirements)
- Black wire: remote opening
- Red wire: remote closing
- Yellow wire: feedback status from power input, maximum 0.50A draw (BABRSP only)

Operation

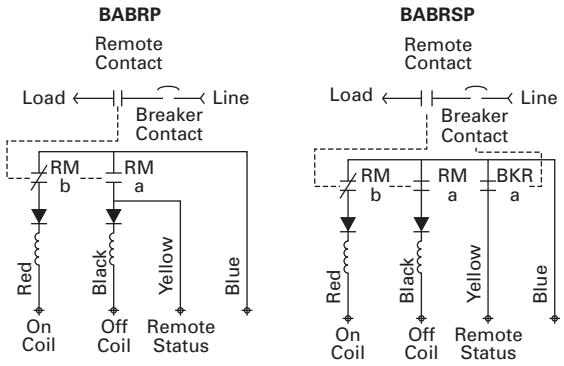
- Tripping system—the BABRP, BABRSP, BRRP and CLRP circuit breakers have a permanent trip unit that contains a factory preset thermal (overload) trip element in each pole
- Operating mechanism—the BABRP, BABRSP, BRRP and CLRP circuit breakers have an over-center toggle mechanism that provides quick-make, 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/Vdc
- Frequency: 50/60 Hz
- Maximum breaker cycling: 6 operations per minute
- Tolerance: +10% to –15% of nominal voltage
- Humidity: 0 to 95% noncondensing

Wiring Diagrams

Control Circuit for the BABRP and BABRSP



GHBS and GHQRSP

Contents

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

Product Description

Eaton's GHBS, GBHS and GHQRSP circuit breakers are bolt-on branch circuit breakers designed for use in 277/480 Vac 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 Eaton's 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 20A breakers SWD (switching duty) rated.
- 15 and 20A breakers HID rated for HID (High intensity discharge) lighting
- All models HACR rated
- Series rated with various Eaton main circuit breakers

Product Selection

GHBS—Single-Pole

GHBS UL 489 Interrupting Ratings

Number of Poles	Ampere Rating ①	Interrupting Capacity (Symmetrical Amperes) Vac (50/60 Hz) 120	240	277/480	Catalog Number
1	15	65,000	—	14,000	**GHBS1015D**
	20	65,000	—	14,000	**GHBS1020D**
	30	65,000	—	14,000	**GHBS1030D**
2	15	—	65,000	14,000	**GHBS2015D**
	20	—	65,000	14,000	**GHBS2020D**
	30	—	65,000	14,000	**GHBS2030D**

GBHS CSA 22.2 Interrupting Ratings (Not UL Listed)

Number of Poles	Ampere Rating ①	Interrupting Capacity (Symmetrical Amperes) Vac (50/60 Hz) 347/600	Catalog Number
1	15	10,000	**GBHS1015D**
	20	10,000	**GBHS1020D**
2	15	10,000	**GBHS2015D**
	20	10,000	**GBHS2020D**

GHQRSP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Ampere Rating ①	Interrupting Capacity (Symmetrical Amperes) Vac (50/60 Hz) 120	120/240	277	480Y/277	Catalog Number ②
1	15	65,000	65,000	14,000	14,000	**GHQRSP1015**
	20	65,000	65,000	14,000	14,000	**GHQRSP1020**
	30	65,000	65,000	14,000	14,000	**GHQRSP1030**
2	15	65,000	65,000	14,000	14,000	**GHQRSP2015**
	20	65,000	65,000	14,000	14,000	**GHQRSP2020**
	30	65,000	65,000	14,000	14,000	**GHQRSP2030**

Notes

① Continuous current rating at 40°C.

② All UL listed circuit breakers are HID (high intensity discharge) rated.

Technical Data and Specifications

Solenoid Operating Data

- Power requirements: 24 Vac/Vdc (20.4V minimum–30V 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 1A, close 3/4A
- Blue wire: power input (see power requirements)
- Black wire: remote opening
- Red wire: remote closing
- Yellow wire: feedback status from power input, maximum 0.50A 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

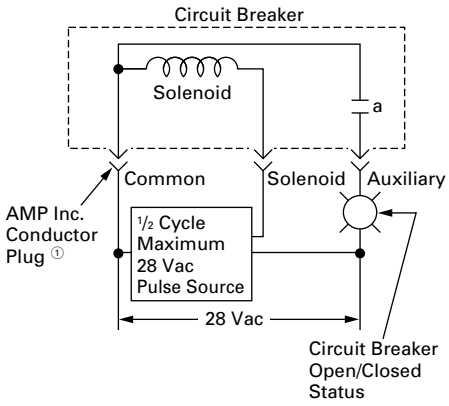
- Ambient temperature: 0–40°C
- Frequency: 48–62 Hz
- Humidity: 0–95% noncondensing

Terminal Type

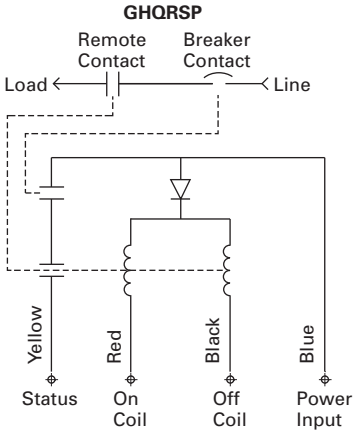
Circuit Breaker Type	Circuit Breaker Amperes	Screw Head Type	Terminal Type	Range
GHQRSP	15–20	Slotted	Clamp	#14–#4 AWG

Wiring Diagrams

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



Typical Single-Pole Circuit Breaker Schematic Diagram for GHQRSP Breakers



Dimensions

Approximate Dimensions in Inches (mm)

Dimensions per Pole

Circuit Breaker Type	Width	Height ②	Length ③
GHQRSP	1.00 (25.4)	4.63 (117.6)	2.81 (71.4)

Notes

① Purchase separate AMP Inc. conductor plug #640426-3.
② Excluding line terminal.
③ Excluding handle.

International Rated

Contents

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

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Product Selection

NEED CAPTION

Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	Single-Pole 240/415 Vac Catalog Number	Two-Pole 240/415 Vac Catalog Number	Three-Pole 240/415 Vac Catalog Number
3000A Interrupting Capacity (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**
6000A Interrupting Capacity (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**

Breaker Catalog Numbers—Ground Fault Single-Pole 30 mA Sensitivity

Continuous Ampere Rating at 40°C	240/415 Vac Catalog Number
3000A Interrupting Capacity (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 240/415V applications, please contact the Customer Support Center at 1-800-356-1243.

Technical Data and Specifications

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	3000 AIC	6000 AIC
International Ground Fault Circuit Breakers		
BS3871 220/380, 240/415 Vac	3000 AIC	

Dimensions

Approximate Dimensions in Inches (mm)

Shipping Data

Miniature Circuit Breaker	Number of Poles	Standard Carton Quantity	Approximate Carton Weight Lbs (kg)	Approximate Standard Carton
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)

QUICKLAG Type P Switching Neutral

Contents

Special Application Breakers, Types HQP, BA, QC

Product Description

Breakers

- Plug-on Type HQP: 10–30A, single- and two-pole, 10 kAIC
- Bolt-on Type BA: 10–30A, single- and two-pole, 10 kAIC
- Cable-in Type QC: 10–30A, single- and two-pole, 10 kAIC

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

QUICKLAG HID (High Intensity Discharge) Breakers

- Plug-on Type HQP: 15–60A, single- and two-pole, 10 kAIC
- Bolt-on Type BA: 15–60A, single- and two-pole, 10 kAIC
- Cable-in Type QC: 15–60A, single- and two-pole, 10 kAIC

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, 60,100A, single-, two- and three-pole
- Bolt-on Type BA: 50, 60,100A, single-, two- and three-pole
- Cable-in Type QC: 50, 60,100A, single-, two- and three-pole

Standards and Certifications

- All products UL and CSA listed

Listed

Product Selection

QUICKLAG Type P Switching Neutral

Breaker Catalog Numbers

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
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**	—	—
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**	—	—

Breaker Catalog Numbers, continued

Continuous Ampere Rating at 40°C	Single-Pole 120/240 Vac Catalog Number	Two-Pole 120/240 Vac Catalog Number	Two-Pole 240 Vac Catalog Number	Three-Pole 240 Vac Catalog Number
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 ①

Handle Locks: Non-Padlockable ②

	Description	Order in Multiples of	Catalog Number
QL1NPL 	QUICKLAG Type P, B, C—single-pole	10	**QL1NPL**
QL23NPL 	QUICKLAG Type P, B, C—two- and three-pole	10	**QL23NPL**

Handle Locks: Padlockable ②

	Description	Order in Multiples of	Catalog Number
QL1PL 	QUICKLAG Type P, B, C—single-pole	10	**QL1PL**
QL123PL 	QUICKLAG Type P, B and ground fault—single-, two- and three-pole	10	**QL123PL**
QC123PL 	QUICKLAG Type C —single-, two- and three-pole	10	**QC123PL**
	QUICKLAG Type P, B—single-, two- and three-pole (off only)	10	**QL123PLOFF**
	QUICKLAG Type C—single-, two- and three-pole (off only)	10	**QC123PLOFF**

Notes

① See **Page V4-T24-27** for QCR and QCF accessories.

② Can lock in ON or OFF position.

Mounting Hardware

	Description	Order in Multiples of	Catalog Number
QCFCLIP	QUICKLAG Type C face mounting clip	24	**QCFCLIP**
			
QC1FP	QUICKLAG Type C face mounting plate—single-pole	10	**QC1FP**
			
QC2FP	QUICKLAG Type C face mounting plate—two-pole	10	**QC2FP**
			
QC3FP	QUICKLAG Type C face mounting plate—three-pole	10	**QC3FP**
			
	QUICKLAG Type C face mounting plate and lock-off (off only)—two-pole ①	10	**QC2FPLOFF**
	QUICKLAG Type C face mounting plate and lock-off (off only)—three-pole	10	**QC3FPLOFF**
QCBCLIP	QUICKLAG Type C base mounting clamp	10	**QCBCLIP**
			
QC6BP	QUICKLAG Type mounting plate—six poles total	10	**QC6BP**
			

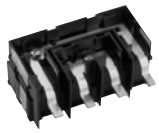
Note

① Suitable for ground fault breakers.

Mounting Hardware, continued

Description	Order in Multiples of	Catalog Number
QUICKLAG Type C base mounting plate—six 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	**QCDQUICK**
QUICKLAG Type C DIN rail adapter	6	**QCDINADAPT**
QUICKLAG Type QCD ring lug attachment	10	**QCDRING**

QCDJ4



QCDINADAPT

QCDRING

Dummy Breakers

Description	Order in Multiples of	Catalog Number
QUICKLAG Type P	1	**HQP1000**
QUICKLAG Type B	1	**BAB1000**
QUICKLAG Type C	1	**QC1000**
QUICKLAG Type C clear choice breaker	4	**QC30SAMPLE**

Miscellaneous

Description	Order in Multiples of	Catalog Number
QUICKLAG Type C Spacer	1	**QCRSPACER**

QCRSPACER

Handle Tie

Description	Order in Multiples of	Catalog Number
QUICKLAG handle tie—single-pole	100	**QL1HT**

QL1HT

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Factory Modifications and Installed Terminals

Factory Modifications ①

Type of Modification	Breaker Type	Catalog Suffix
Shunt trip (requires one extra pole space on right side) 120, 208, 240 Vac Draws 2.6A at 120V, draws 11A at 24 Vdc	QUICKLAG Types P, B and C	**S**
Shunt trip (requires one extra pole space on right side) 24, 48 Vac/Vdc Draws 2.6A at 120V, draws 11A at 24 Vdc	QUICKLAG Types P, B and C	**S1**
Special calibration (50°C) (no UL)	QUICKLAG Types P, B and C	**V**
Shock testing	QUICKLAG Types P, B and C	**L**
Freeze testing	QUICKLAG Types P, B and C	**Y**
Moisture-fungus treatment	QUICKLAG Types P, B, C and ground fault	**F**
Marine duty	QUICKLAG Types P, B, C	**H08**
Naval duty	QUICKLAG Types P, B, C	**H09**
400 Hz calibration	QUICKLAG Types P, B, C	**G**
Specific DC ratings (breaker marked with a max. Vdc rating)	QUICKLAG Types P, B, C	**Q thru Q9** ②

Spare Terminal Hardware Screws (Lugs not Included)

Terminal Type	Description	Order in Multiples of	Catalog Number
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**

Notes

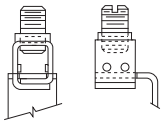
① Contact Eaton for factory modifications available for QCR and QCF breakers.

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 Vdc (QCR 1P).

Technical Data and Specifications

Factory-Installed Breaker Terminals

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

1

Steel Box Lug

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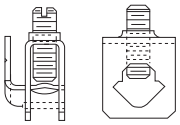
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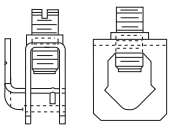
Steel Box Lug

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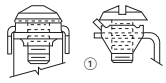

Steel Ring Type

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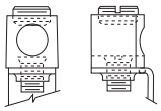
Aluminum Box Lug

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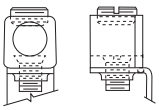
Aluminum Box Lug

8

4-Prong Quick Connect

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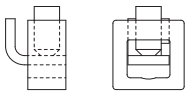
QCD Terminal Assembly 10–60A

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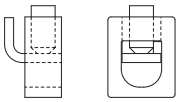

QCD Terminal Assembly 70–100A

Note

① Clamp on line side only.

Dimensions

Approximate Dimensions in Inches (mm)

Shipping Data

Miniature Circuit Breaker	Number of Poles	Standard Carton Quantity	Approximate Carton Weight Lbs (kg)	Approximate Standard Carton
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)

WMZ Circuit Breakers

Optimum and Efficient Protection for Every Application

Contents

WMZ Circuit Breaker

Product Overview

Optimum product quality, tested reliability and safety stand for best protection of personnel, installations and plant. Eaton's WMZ DIN rail mountable circuit breaker is designed for use in branch service applications.

Application Description

Feeder and branch circuit protection for:

- Convenience receptacle circuits (internal/external)
- Motor control circuits
- Load circuits leaving the equipment (external)
- HACR equipment (heating, air conditioning, refrigeration) (internal/external)
- PLC I/O points
- Computers
- Power supplies
- Control instrumentation
- Relays
- UPS
- Power conditioners

Features

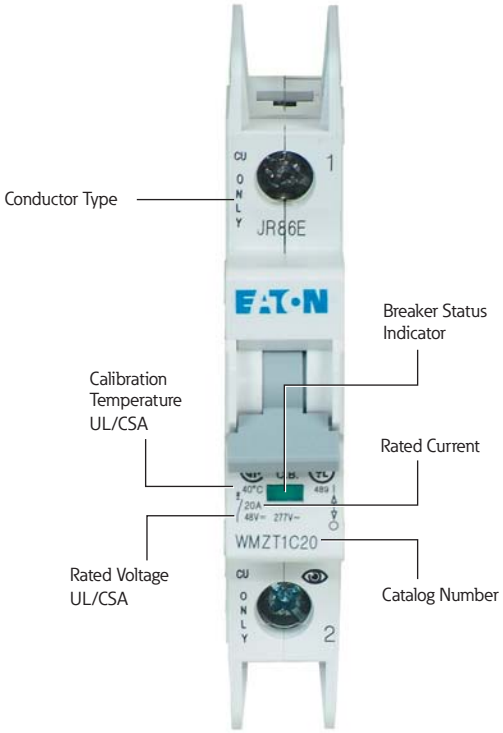
- Complete range of UL 489 listed DIN rail mounted miniature circuit breakers up to 40A current rating
- Standard ratings of 10 kAIC at 277/480 Vac
- Select amperages available at 14 kAIC at 277/480 Vac and 10 kAIC at125 Vdc
- Current limiting design provides fast short-circuit interruption that reduces the let-through energy, which can damage the circuit
- Suitable for branch circuit device protection
- Thermal-magnetic overcurrent protection
  - Two levels of short-circuit protection, categorized by C and D curves
- Trip-free design—breaker can not be defeated by holding the handle in the ON position
- Captive screws cannot be lost
- SWD (switching duty)—suitable for switching fluorescent lighting loads ($I_n \leq 20A$)
- For use in applications for which UL 1077 or CSA C22.2 No.235 are also allowed
- Field-installable shunt trip and auxiliary switch subsequent mounting
- Separate version for ring-tongue connection (Type WMZT….T), terminal screws can be removed (on both sides)
- Module width of only 17.7 mm (per pole)
- Contact Position Indicator (red/green)
- Easy installation on DIN rail
- Possibility for sealing the toggle in ON or OFF position

Device Printing on Front and Side

Installation options

These branch circuit breakers are available in two terminal configurations: standard box terminals that accept multiple conductors and ring-tongue terminals, ideally suited to demanding requirements of the semi-conductor industry.

All breakers mount on standard 35 mm DIN rail. Bus connectors and feeder terminal facilitate mounting and wiring of multiple miniature circuit breaker arrays in control panel assemblies. These circuit breakers can also be reverse feed.



Standards and Certifications

UL 489

- Standard for molded case circuit breakers (MCCB) for feeder and branch circuit protection
- Products meet the requirements of the National Electrical Code® (NEC®)

Powerful Offering for Machine and System Builders

The WMZ is available with C and D characteristics in accordance with UL 489, CSA C22.2 No.5; UL 1077, CSA C22.2 No.235 and IEC 60947-2.

CSA C22.2 No.5

- Standard for molded case circuit breakers for feeder and branch circuit protection (corresponds closely to UL 489 Standard)
- Products meet the requirements of the Canadian Electrical Code (CEC)
- These devices are RoHS compliant

Listed

Catalog Number Selection

WMZ T 1 C 16 T

Breaker Family	Breaker Type	Number of Poles	Protective Curve	Ampere Rating		Terminal
WMZ = WMZ UL circuit breaker	**T** =10 kAIC **H** =14 kAIC **D** =10 kAIC/DC ①②	**1** = Single-pole **2** = Two-pole **3** = Three-pole ③	**C** = C Curve (5–10X I_n) **D** = D Curve (10–20X I_n) ③	**X0** = 0.5A **01** = 1A **X1** = 1.5A **02** = 2A **03** = 3A **04** = 4A **05** = 5A **06** = 6A **07** = 7A **08** = 8A	**10** = 10A **13** = 13A **15** = 15A **16** = 16A **20** = 20A **25** = 25A **30** = 30A **32** = 32A **40** = 40A	**T** = Ring terminals **[blank]** = Standard box terminals

Notes

① Limited curve and ampere offerings.
② 125 Vdc for single-pole, 250 Vdc for two-pole in series.
③ Not offered for Type WMZD.

WMZT

Single-Pole

Two-Pole

Three-Pole

WMZT UL 489 Circuit Breakers—10 kAIC

Amperes	Single-Pole Catalog Number	Two-Pole Catalog Number	Three-Pole Catalog Number
C Curve (5–10X I_n Current Rating)			
0.5	WMZT1CX0	WMZT2CX0	WMZT3CX0
1	WMZT1C01	WMZT2C01	WMZT3C01
1.5	WMZT1CX1	WMZT2CX1	WMZT3CX1
2	WMZT1C02	WMZT2C02	WMZT3C02
3	WMZT1C03	WMZT2C03	WMZT3C03
4	WMZT1C04	WMZT2C00	WMZT3C04
5	WMZT1C05	WMZT2C05	WMZT3C05
6	WMZT1C06	WMZT2C06	WMZT3C06
7	WMZT1C07	WMZT2C07	WMZT3C07
8	WMZT1C08	WMZT2C08	WMZT3C08
10	WMZT1C10	WMZT2C10	WMZT3C10
13	WMZT1C13	WMZT2C13	WMZT3C13
15	WMZT1C15	WMZT2C15	WMZT3C15
16	WMZT1C16	WMZT2C16	WMZT3C16
20	WMZT1C20	WMZT2C20	WMZT3C20
25	WMZT1C25	WMZT2C25	WMZT3C25
30	WMZT1C30	WMZT2C30	WMZT3C30
32	WMZT1C32	WMZT2C32	WMZT3C32
40	WMZT1C40	WMZT2C40	WMZT3C40
D Curve (10–20X I_n Current Rating)			
0.5	WMZT1DX0	WMZT2DX0	WMZT3DX0
1	WMZT1D01	WMZT2D01	WMZT3D01
1.5	WMZT1DX1	WMZT2DX1	WMZT3DX1
2	WMZT1D02	WMZT2D02	WMZT3D02
3	WMZT1D03	WMZT2D03	WMZT3D03
4	WMZT1D04	WMZT2D04	WMZT3D04
5	WMZT1D05	WMZT2D05	WMZT3D05
6	WMZT1D06	WMZT2D06	WMZT3D06
7	WMZT1D07	WMZT2D07	WMZT3D07
8	WMZT1D08	WMZT2D08	WMZT3D08
10	WMZT1D10	WMZT2D10	WMZT3D10
13	WMZT1D13	WMZT2D13	WMZT3D13
15	WMZT1D15	WMZT2D15	WMZT3D15
16	WMZT1D16	WMZT2D16	WMZT3D16
20	WMZT1D20	WMZT2D20	WMZT3D20
25	WMZT1D25	WMZT2D25	WMZT3D25
30	WMZT1D30	WMZT2D30	WMZT3D30
32	WMZT1D32	WMZT2D32	WMZT3D32
40	WMZT1D40	WMZT2D40	WMZT3D40

Single-Pole

Two-Pole

Three-Pole

WMZT UL 489 Circuit Breakers with Ring-Tongue Terminals—10 kAIC

Amperes	Single-Pole Catalog Number	Two-Pole Catalog Number	Three-Pole Catalog Number
C Curve with Ring-Tongue Terminals (5–10X I_n Current Rating)			
0.5	WMZT1CX0T	WMZT2CX0T	WMZT3CX0T
1	WMZT1C01T	WMZT2C01T	WMZT3C01T
1.5	WMZT1CX1T	WMZT2CX1T	WMZT3CX1T
2	WMZT1C02T	WMZT2C02T	WMZT3C02T
3	WMZT1C03T	WMZT2C03T	WMZT3C03T
4	WMZT1C04T	WMZT2C04T	WMZT3C04T
5	WMZT1C05T	WMZT2C05T	WMZT3C05T
6	WMZT1C06T	WMZT2C06T	WMZT3C06T
7	WMZT1C07T	WMZT2C07T	WMZT3C07T
8	WMZT1C08T	WMZT2C08T	WMZT3C08T
10	WMZT1C10T	WMZT2C10T	WMZT3C10T
13	WMZT1C13T	WMZT2C13T	WMZT3C13T
15	WMZT1C15T	WMZT2C15T	WMZT3C15T
16	WMZT1C16T	WMZT2C16T	WMZT3C16T
20	WMZT1C20T	WMZT2C20T	WMZT3C20T
25	WMZT1C25T	WMZT2C25T	WMZT3C25T
30	WMZT1C30T	WMZT2C30T	WMZT3C30T
32	WMZT1C32T	WMZT2C32T	WMZT3C32T
40	WMZT1C40T	WMZT2C40T	WMZT3C40T
D Curve with Ring-Tongue Terminals (10–20X I_n Current Rating)			
0.5	WMZT1DX0T	WMZT2DX0T	WMZT3DX0T
1	WMZT1D01T	WMZT2D01T	WMZT3D01T
1.5	WMZT1DX1T	WMZT2DX1T	WMZT3DX1T
2	WMZT1D02T	WMZT2D02T	WMZT3D02T
3	WMZT1D03T	WMZT2D03T	WMZT3D03T
4	WMZT1D04T	WMZT2D04T	WMZT3D04T
5	WMZT1D05T	WMZT2D05T	WMZT3D05T
6	WMZT1D06T	WMZT2D06T	WMZT3D06T
7	WMZT1D07T	WMZT2D07T	WMZT3D07T
8	WMZT1D08T	WMZT2D08T	WMZT3D08T
10	WMZT1D10T	WMZT2D10T	WMZT3D10T
13	WMZT1D13T	WMZT2D13T	WMZT3D13T
15	WMZT1D15T	WMZT2D15T	WMZT3D15T
16	WMZT1D16T	WMZT2D16T	WMZT3D16T
20	WMZT1D20T	WMZT2D20T	WMZT3D20T
25	WMZT1D25T	WMZT2D25T	WMZT3D25T
30	WMZT1D30T	WMZT2D30T	WMZT3D30T
32	WMZT1D32T	WMZT2D32T	WMZT3D32T
40	WMZT1D40T	WMZT2D40T	WMZT3D40T

Notes

Interrupting capacity: 10 kA UL/CSA; 15 kA IEC 60947.

Optional connections for ring-tongue terminals.

WMZH

Single-Pole

Two-Pole

Three-Pole

WMZH UL 489 Circuit Breakers — 14 kAIC

Amperes	Single-Pole Catalog Number	Two-Pole Catalog Number	Three-Pole Catalog Number
C Curve (5–10X I_n Current Rating)			
15	**WMZH1C15**	**WMZH2C15**	**WMZH3C15**
16	**WMZH1C16**	**WMZH2C16**	**WMZH3C16**
20	**WMZH1C20**	**WMZH2C20**	**WMZH3C20**
25	**WMZH1C25**	**WMZH2C25**	**WMZH3C25**
D Curve (10–20X I_n Current Rating)			
13	**WMZH1D13**	**WMZH2D13**	**WMZH3D13**
15	**WMZH1D15**	**WMZH2D15**	**WMZH3D15**
16	**WMZH1D16**	**WMZH2D16**	**WMZH3D16**
20	**WMZH1D20**	**WMZH2D20**	**WMZH3D20**

Single-Pole

Two-Pole

Three-Pole

WMZH UL 489 Circuit Breakers with Ring-Tongue Terminals

Amperes	Single-Pole Catalog Number	Two-Pole Catalog Number	Three-Pole Catalog Number
C Curve (5–10X I_n Current Rating)			
15	**WMZH1C15T**	**WMZH2C15T**	**WMZH3C15T**
16	**WMZH1C16T**	**WMZH2C16T**	**WMZH3C16T**
20	**WMZH1C20T**	**WMZH2C20T**	**WMZH3C20T**
25	**WMZH1C25T**	**WMZH2C25T**	**WMZH3C25T**
D Curve (10–20X I_n Current Rating)			
13	**WMZH1D13T**	**WMZH2D13T**	**WMZH3D13T**
15	**WMZH1D15T**	**WMZH2D15T**	**WMZH3D15T**
16	**WMZH1D16T**	**WMZH2D16T**	**WMZH3D16T**
20	**WMZH1D20T**	**WMZH2D20T**	**WMZH3D20T**

Notes

Interrupting capacity: 10 kA UL/CSA; 15 kA IEC 60947.

Optional connections for ring-tongue terminals.

WMZD

Single-Pole

Two-Pole

WMZD UL 489 Circuit Breakers—10 kAIC at 125 Vdc Per Pole

Amperes	Single-Pole Catalog Number	Two-Pole Catalog Number
C Curve (5–10X I_n Current Rating)		
2	**WMZD1C02**	**WMZD2C02**
3	**WMZD1C03**	**WMZD2C03**
4	**WMZD1C04**	**WMZD2C04**
5	**WMZD1C05**	**WMZD2C05**
6	**WMZD1C06**	**WMZD2C06**
7	**WMZD1C07**	**WMZD2C07**
8	**WMZD1C08**	**WMZD2C08**
10	**WMZD1C10**	**WMZD2C10**
13	**WMZD1C13**	**WMZD2C13**
15	**WMZD1C15**	**WMZD2C15**
16	**WMZD1C16**	**WMZD2C16**
20	**WMZD1C20**	**WMZD2C20**
25	**WMZD1C25**	**WMZD2C25**
30	**WMZD1C30**	**WMZD2C30**
32	**WMZD1C32**	**WMZD2C32**
40	**WMZD1C40**	**WMZD2C40**

Notes

Interrupting capacity: 10 kA at 125 Vdc UL/CSA.
125 Vdc for single-pole, 250 Vdc for two-pole in series.

Accessories

WMZ UL 489 Breakers

Description	Catalog Number
Two-pole contact or auxiliary contact/trip indicating contact	**WMZSAUXTRIP**
Auxiliary contact	**WMZTAUX**
Shunt trip 110–415 Vac	**WMZTST415**
Shunt trip 12–110 Vac	**WMZTST110**
Padlock hasp	**WMZPLK**
Bus bar—single-pole 6 terminals	**WMZT1P6T**
Bus bar—single-pole 12 terminals	**WMZT1P12T**
Bus bar—single-pole 18 terminals	**WMZT1P18T**
Bus bar—two-pole 6 terminals	**WMZT2P6T**
Bus bar—two-pole 12 terminals	**WMZT2P12T**
Bus bar—two-pole 18 terminals	**WMZT2P18T**
Bus bar—three-pole 6 terminals	**WMZT3P6T**
Bus bar—three-pole 12 terminals	**WMZT3P12T**
Bus bar—three-pole 18 terminals	**WMZT3P18T**
Three-pole bus bar shroud	**WMZT3PSHROUD**
Extension terminal—35 mm (2–14 AWG)	**WMZT35EXT**
Bus connector—conductors up to 50 mm^2 (~1/0 AWG)	**WMZTBCON**

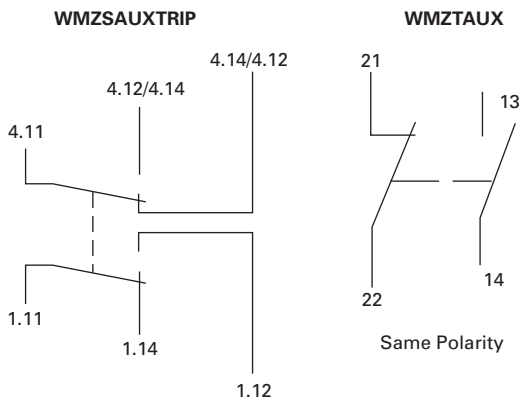
Tripping Signal Switch WMZSAUXTRIP, WMZTAUX

- Design according to IEC/EN 60947-5-1, IEC/EN 62019 and UL
- Field installable
- The specified minimum voltages are per contact—take into account particularly in case of series connection
- Self-cleaning contacts
- Contact material and design particularly suitable for extra low voltage
- WMZSAUXTRIP: the function of one of the two change-over contacts can be switched from “auxiliary switch” to “tripping signal switch”

Attention: The voltage of the WMZT...circuit breaker is limited to 300V with this auxiliary installed.

- Tripping signal contact transmits message of electric tripping, not mechanical switch-off
- Test key for contact function “electrical tripping”
- WMZTAUX: will allow for > 480Y/277 Vac rating

Connection Diagram



Technical Data and Specifications

Trip Curve Chart

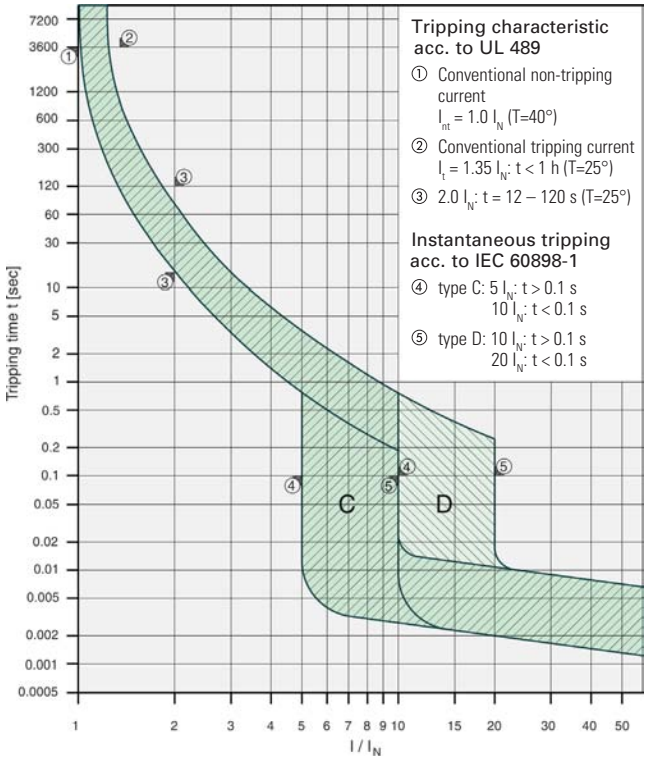
Eaton WMZ branch circuit breakers are available with "C" and "D" tripping characteristics.

C-curve devices are suitable for application where medium levels of inrush current are expected. Applications include small transformers, lighting, pilot devices, control circuits and coils. C-curve devices provide a medium magnetic trip point.

D-curve devices are suitable for applications where high levels of inrush current are expected. The high magnetic trip point prevents nuisance tripping in high inductive applications such as motors, transformers and power supplies.

Eaton WMZ devices are current limiting, which means they interrupt fault currents within one-half cycle of the fault. Current limiting devices offer superior protection by reducing peak let-through current and energy.

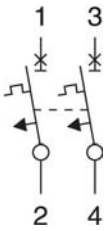
Tripping Characteristics



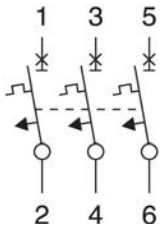
Connection Diagrams

Single-pole

Two-pole



Three-pole



Miniature Circuit Breakers WMZ

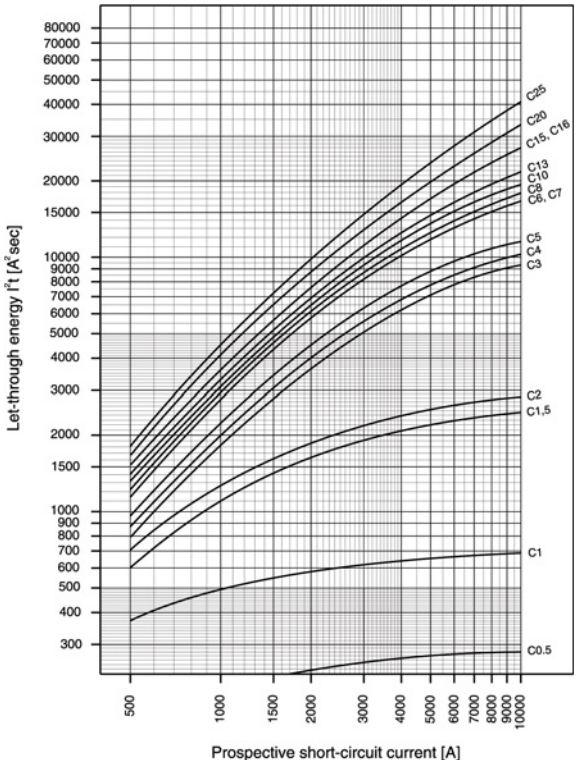
Description	Specification	
Electrical		
Design according to	UL 489, CSA C22.2 No.5, IEC 60947-2	
Rated Voltage WMZT		
UL/CSA	10 kAIC at 277/480V from 0.5A to 32A	
UL/CSA	10 kAIC at 240 Vac for 40A	
UL/CSA	10 kAIC at 48 Vdc per pole	
IEC 947-2	15 kAIC at 240/415 Vac	
Rated Voltage WMZD		
UL/CSA	10 kAIC at 125 Vdc per pole (two poles max.)	
	10 kAIC at 250 Vdc with two poles connected in series	
Rated Voltage WMZH		
UL/CSA	14 kAIC at 277/480V at listed amperages	
IEC 947-2	15 kAIC at 240/415 Vac	
Rated frequency	50/60 Hz	
Rated Breaking Capacity WMZT		
UL/CSA	10 kA	
IEC 947-2	15 kA	
Rated Breaking Capacity WMZH		
UL/CSA	14 kA	
IEC 947-2	15 kA	
Characteristic	C, D	
Endurance	≥ 20,000 operations	
Line voltage connection	Suitable for reverse feed	
Mechanical		
Frame size	45 mm	
Device height	105 mm	
Device width	17.7 mm per pole	
Mounting	Quick fastening with two lock-in positions on IEC/EN 60715	
Upper and lower terminals	Open mouth/lift terminals	
Terminal capacity	One wire	AWG 18 – 6
	Two wires	AWG 8 – 10
Terminal Fastening Torque	AWG 18-21: 21 lb-in	
	AWG 10-8: 25 lb-in	
	AWG 6: 36 lb-in	
Mounting	Independent of position	
Calibration Temperature		
UL 489, CSA C22.2 No.5	40°C	
IEC 60947-2	30°C	

Power Loss at I_n

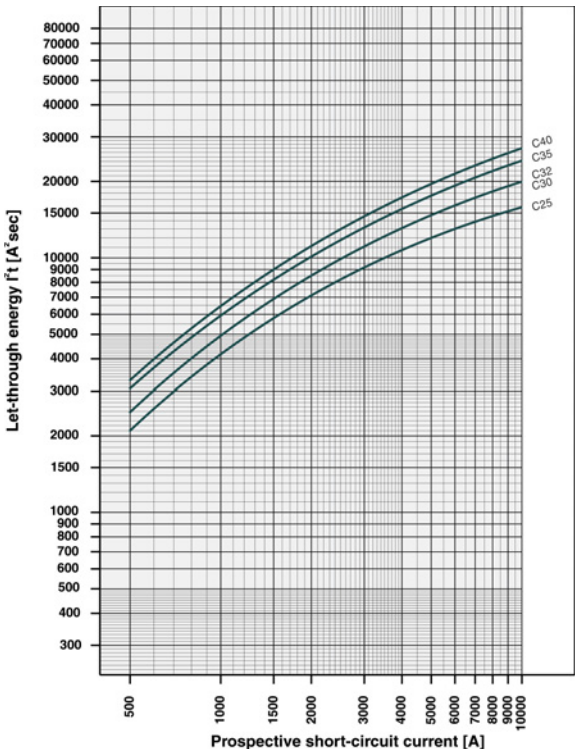
	Characteristic C			Characteristic D		
I_n [A]	Single-Pole P [W]	Two-Pole P [W]	Three-Pole P [W]	Single-Pole P [W]	Two-Pole P [W]	Three-Pole P [W]
0.5	1.6	3.2	4.7	1.6	3.2	4.8
1.0	1.1	2.2	3.4	0.8	1.5	2.3
1.5	1.3	2.6	3.9	1.0	2.1	3.1
2.0	1.4	2.8	4.3	1.0	2.1	3.1
3.0	1.2	2.4	3.6	1.2	2.4	3.6
4.0	1.4	2.9	4.3	1.4	2.9	4.3
5.0	1.9	3.7	5.6	1.5	2.9	4.4
6.0	1.2	2.3	3.5	1.2	2.3	3.5
7.0	1.4	2.8	4.3	1.4	2.8	4.3
8.0	1.4	2.8	4.2	1.2	2.4	3.7
10.0	1.8	3.6	5.3	1.5	3.0	4.5
13.0	2.4	4.7	7.1	2.0	4.1	6.1
15.0	1.9	3.8	5.6	1.5	3.1	4.6
16.0	2.1	4.3	6.4	1.7	3.5	5.2
20.0	2.9	5.8	8.7	1.8	3.7	5.5
25.0	3.1	6.2	9.3	2.6	5.1	7.7
30.0	3.0	6.0	9.0	2.7	5.4	8.1
32.0	3.4	6.8	10.2	3.1	6.2	9.3
35.0	3.7	7.4	11.0	3.8	7.6	11.3
40.0	4.0	8.1	12.1	3.9	7.8	11.6

Let-Through Energy

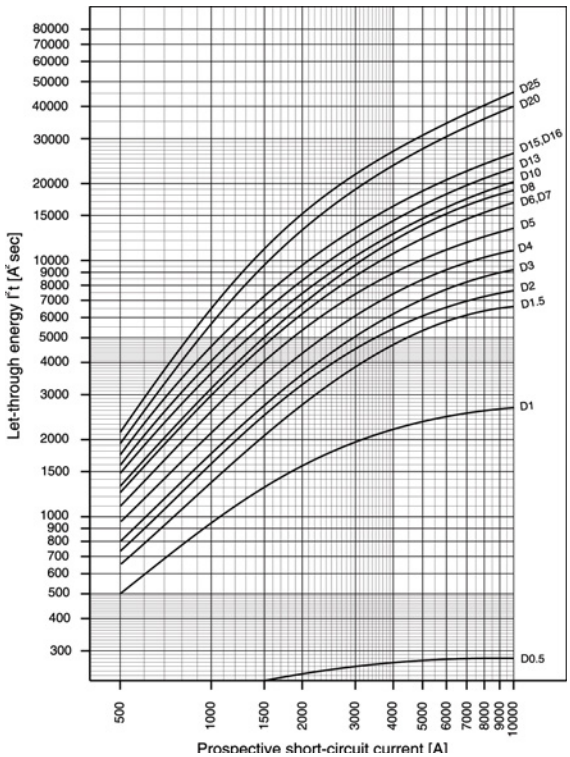
Characteristic C (0.5–32A), 277V



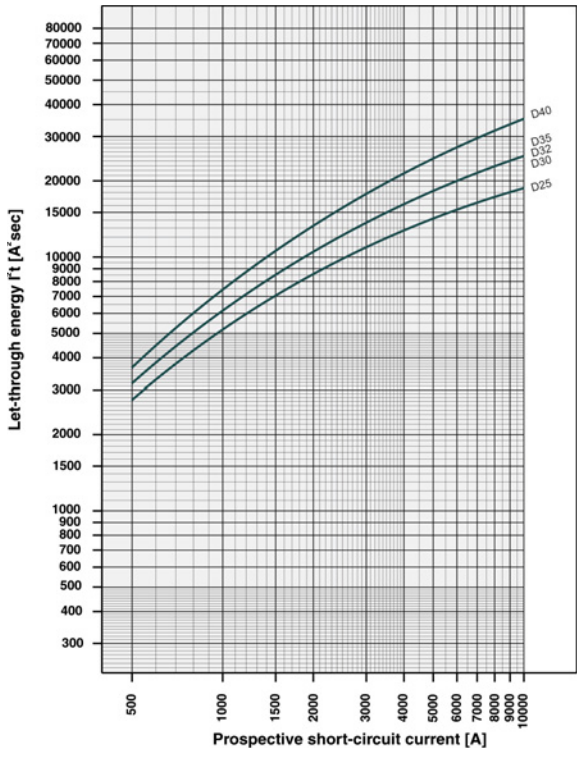
Characteristic C (40A), 240V



Characteristic D (0.5–32A), 277V

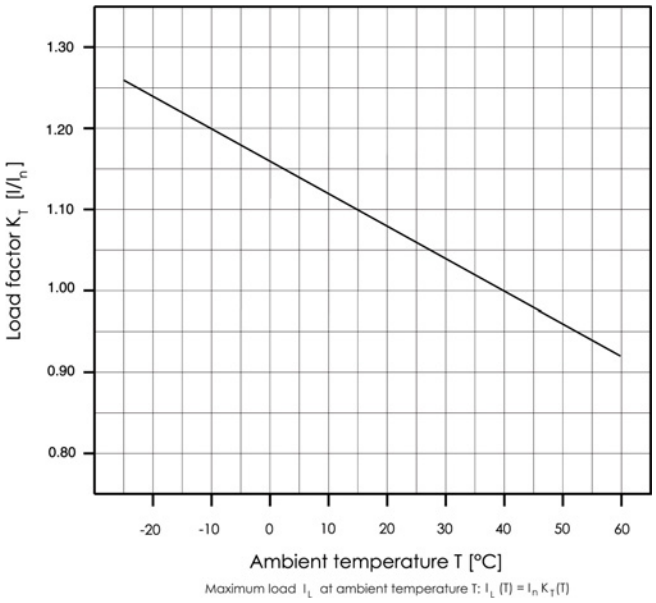


Characteristic D (40A), 240V



Influence of Ambient Temperature T on Load Carrying Capacity

Device Market Current Rating I_n (A) at 40°C	I_n (A) at Higher Ambient Temperature							
	15°C	20°C	25°C	30°C	40°C	50°C	55°C	60°C
0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1.0	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9
1.5	1.7	1.6	1.6	1.6	1.5	1.4	1.4	1.4
2.0	2.2	2.2	2.1	2.1	2.0	1.9	1.9	1.8
3.0	3.3	3.2	3.2	3.1	3.0	2.9	2.9	2.8
4.0	4.4	4.3	4.2	4.2	4.0	3.8	3.8	3.7
5.0	5.5	5.4	5.3	5.2	5.0	4.8	4.7	4.6
6.0	6.6	6.5	6.4	6.2	6.0	5.8	5.6	5.5
7.0	7.7	7.6	7.4	7.3	7.0	6.7	6.6	6.4
8.0	8.8	8.6	8.5	8.3	8.0	7.7	7.5	7.4
10.0	11.0	10.8	10.6	10.4	10.0	9.6	9.4	9.2
13.0	14.3	14.0	13.8	13.5	13.0	12.5	12.5	12.0
15.0	16.5	16.2	15.9	15.6	15.0	14.4	14.1	13.8
16.0	17.6	17.3	17.0	16.6	16.0	15.4	15.0	14.7
20.0	22.0	21.6	21.2	20.8	20.0	19.2	18.8	18.4
25.0	27.5	27.0	26.5	26.0	25.0	24.0	23.3	23.0
30.0	33.0	32.4	31.8	31.2	30.0	28.8	28.2	27.6
32.0	35.2	34.6	33.9	33.3	32.0	30.7	30.1	29.4
40.0	44.0	43.2	42.4	41.6	40.0	38.4	37.6	36.8



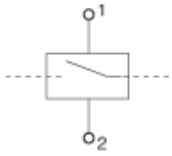
WMZ UL 489

Description	WMZSAUXTRIP	WMZTAUX
Electrical		
Contact function	2CO	1NO + 1NC
Rated voltage	230V	250V
Frequency	50/60 Hz	50/60 Hz
Rated current	2A	6A
Rated thermal current I_{th}	2A	6A
Utilization category AC13 rated operational current I_e	3A/250 Vac	3A/250 Vac
Utilization category AC15 rated operational current I_e	2A/250 Vac	2A/250 Vac
Utilization category DC12 rated operational current I_e	0.5A/110 Vdc	0.5A/110 Vdc
		0.25A/220 Vdc
Rated insulation voltage U_i	250 Vac	250 Vac
Minimum operational voltage per contact U_{min}	5 Vdc	5 Vdc
Minimum operational current I_{min}	10 mA dc	10 mA ac/dc
Rated peak withstand voltage U_{imp} (1.2/50µ)	2.5 kV	4 kV
Conditional short-circuit current I_k with back-up fuse 6A	1 kA	1 kA
Max. back-up fuse, overload and short circuit	6A gL	—
Mechanical		
Tripping indicator "electrical tripping"	Blue/white	—
Frame size	45.0 mm	45.0 mm
Device height	80.0 mm	80.0 mm
Device width	8.8 mm (0.5MU)	8.8 mm (0.5MU)
Mounting	Onto switching dev.	—
Degree of protection, built-in	IP40	IP40
Terminal protection	Finger and hand touch safe according to BGV A3, ÖVE-EN 6	Finger and hand touch safe according to BGV A3, ÖVE-EN 6
Terminals	Lift terminals	Lift terminals
Terminal capacity	20–14 AWG	0.5 – 2.5 mm^2
Terminal screws	M3 (Pozidrive Z0)	M3 (Pozidrive Z0)
Fastening torque of terminal screws	7 lb-in	Max. 1.2 Nm

Shunt Trip Release WMZTST

- Remote release for subsequent mounting onto WMZT
- Additional installation of standard auxiliary switch is possible
- Position indicator red–green

Connection Diagram



Shunt Trip Release WMZTST

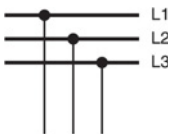
Description	WMZTST110	WMZTST415
Electrical		
Can be mounted onto	WMZT/WMZH/WMZD	WMZT/WMZH/WMZD
Operational voltage range	12–110 Vac	110–415 Vac
	12–60 Vdc	110–230 Vdc
Frequency	50/60 Hz	50/60 Hz
Mechanical		
Frame size	45.0 mm	45.0 mm
Device height	105.0 mm	105.0 mm
Device width	17.5 mm	17.5 mm
Mounting	Quick fastening with two lock-in positions on EN 50022	
Degree of protection, built-in	IP40	IP40
Terminal Protection	Finger and hand touch safe according to BGV A3, ÖVE-EN 6	
Terminals	Open mouthed/lift	Open mouthed/lift
Terminal capacity 1 and 2 wires	18–10 AWG	18–10 AWG

Bus Bar Block UL 489 (Pin)

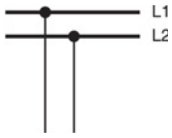
- Tested according to UL 489
- Do not cut
- Extension terminal 35 mm^2 WMZT35EXT for copper conductors
- For covering of not used pins, use bus bar tag shrouds WMZT3PSHROUD

Connection Diagrams

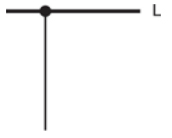
WMZT3P



WMZT2P



WMZT1P



Bus Bar Block UL 489 (Pin)

Description	UL 489	IEC/EN 60947-2
Electrical		
Rated operational voltage	480/277 Vac	—
	96 Vdc	—
Rated frequency	50/60 Hz	—
Rated voltage	—	690 Vac
Overvoltage category	—	III
Rated impulse withstand voltage U_{imp}	—	9.5 kV
Rated current	80A	80A
Rated conditional short-circuit current AC with 350A gG	—	15 kA
Short-circuit current	10 kA	—
Mechanical		
Bus bar cross section	—	16 mm^2 Cu
Flame class according to UL 94	V0	—
Pollution degree	—	2
Comparative tracking index	—	CTI 600
Minimum clearance (intern/extern)	—	> 9.5/25.4 mm
Minimum creepage distance (intern/extern)	—	> 12.7/50.8 mm
Resistance to climatic conditions	—	According to DIN/ EN60068

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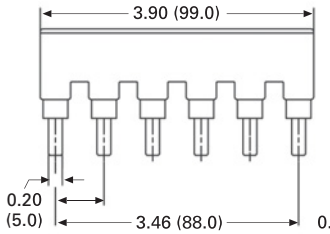
Dimensions

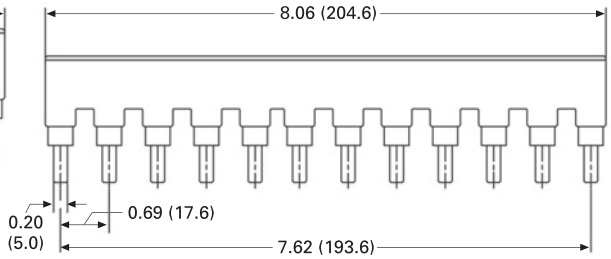
Approximate Dimensions in Inches (mm)

WMZ

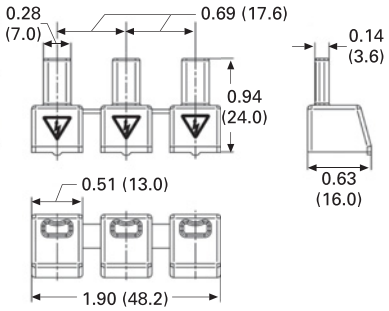
WMZT _ _ 6T



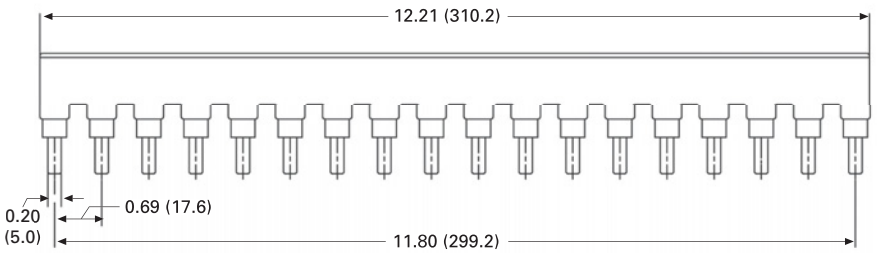
WMZT _ _ 12T



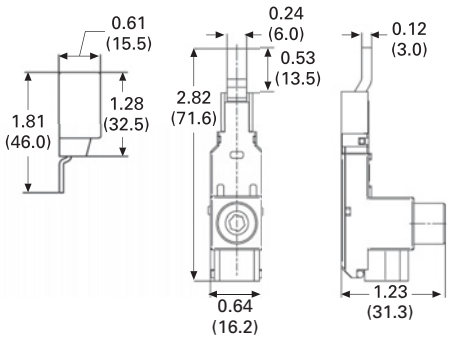
WMZT3PSHROUD



WMZT _ _ 18T



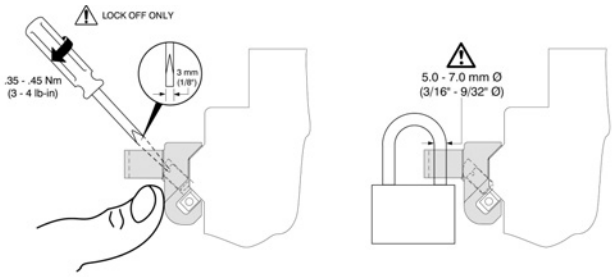
WMZT35EXT

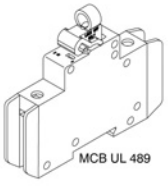


WMZT35EXT

Description	UL 489	IEC/EN 60947-2
	# 2–14 AWG	2.5–35 mm^2
	60/75°C Cu	Cu
	0.56 in	14 mm
Tested according to		Tightening torque of terminal screws
UL 486A	# 14 AWG	≥ 2.3 Nm
UL 486B	# 8–12 AWG	≥ 2.8 Nm
UL 486E	# 6–1 AWG	4 Nm

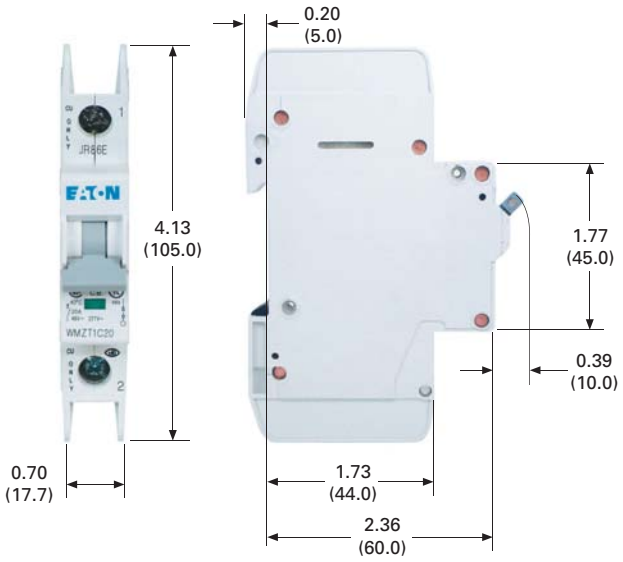
Lockout Attachment



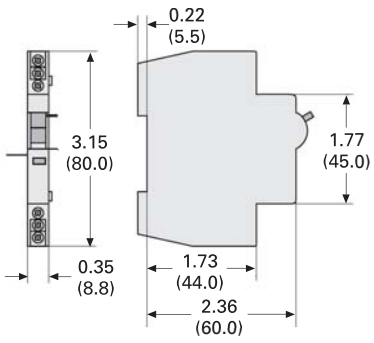


Approximate Dimensions in Inches (mm)

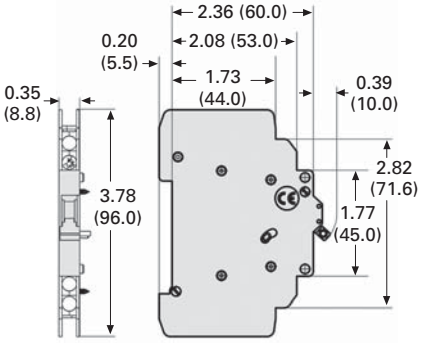
Miniature Circuit Breakers WMZ



WMZ UL 489



WMZSAUXTRIP



WMZTAUX

WMZS Circuit Breakers

Contents

WMZS Circuit Breaker

Product Overview

Optimum product quality, tested reliability and safety stand for best protection of personnel, installations and plant. Eaton's WMZS DIN rail mountable circuit breaker is designed for use in control panel applications.The WMZS is available with B, C and D characteristics in accordance with UL 1077, CSA C22.2 No.235 and IEC 60947-2.

Application Description

Supplementary protection:

- Control circuits
- Lighting
- Business equipment
- Appliances

Features

- Complete range of UL 1077 listed DIN rail mounted miniature circuit breakers up to 63A current rating
- Standard ratings of 10 kAIC at 277/480 Vac
- Current limiting design provides fast short-circuit interruption that reduces the let-through energy, which can damage the circuit
- Offers supplementary protection
- Thermal-magnetic overcurrent protection
  - Three levels of short-circuit protection, categorized by B, C and D curves
- Trip-free design—breaker can not be defeated by holding the handle in the ON position
- Captive screws cannot be lost
- Fulfill UL 1077, CSA C22.2 No.235 and also IEC 60947-2 Standard
- Field-installable shunt trip and auxiliary switch subsequent mounting
- Module width of only 0.69 inches (17.5 mm) per pole
- Contact Position Indicator (red/green)
- Easy installation on DIN rail
- Possibility for sealing the toggle in ON or OFF position

Advanced Features

Breakers install on standard DIN rail

Available in single-, two- and three-pole models

Color-coded indicator provides breaker status for easy troubleshooting

Captive posidrive terminal screws with finger and back-of-hand protection (IP20)

Trip-free design; breaker cannot be defeated by holding the handle in the ON position

Breaker information printed on the front of the device for quick identification

Standards and Certifications

Worldwide Acceptance

WMZS Supplementary Protectors are UL Recognized for use in the United States in accordance with NFPA® 70 (NEC). The devices comply with UL 1077 and CSA 22.2 No. 235, meeting the requirements for supplementary protectors. These devices are for international and domestic use, and also comply with IEC 60947-2 and are CE marked. These devices are RoHS compliant.

Catalog Number Selection

WMZS 1 B 10

Breaker Family
WMZS = Supplementary Protector

Number of Poles
1 = Single-pole
2 = Two-pole
3 = Three-pole

Protective Curve
B = B Curve (3–5X I_n)
C = C Curve (5–10X I_n)
D = D Curve (10–20X I_n)

Ampere Rating		
00 = 0.5A	**07** = 7A	**25** = 25A
01 = 1A	**08** = 8A	**30** = 30A
02 = 2A	**10** = 10A	**32** = 32A
03 = 3A	**13** = 13A	**40** = 40A
04 = 4A	**15** = 15A	**50** = 50A
05 = 5A	**16** = 16A	**63** = 63A
06 = 6A	**20** = 20A	

Product Selection

WMZS Product Selection—B Curve (3–5X In Current Rating)

Suitable for applications where protection against low level short circuit faults in control wiring is desired. Instantaneous trip is 3–5X continuous rating of device (I_n). Applications include PLC wiring, business equipment, lighting, appliances and some motors. Low magnetic trip point.

Single-Pole

Two-Pole

Three-Pole

B Curve (3–5X I_n Current Rating)—Designed for Resistive or Slightly Inductive Loads ①②③

Amperes	Single-Pole Catalog Number	Two-Pole Catalog Number	Three-Pole Catalog Number
6	**WMZS1B06**	**WMZS2B06**	**WMZS3B06**
7	**WMZS1B07**	**WMZS2B07**	**WMZS3B07**
8	**WMZS1B08**	**WMZS2B08**	**WMZS3B08**
10	**WMZS1B10**	**WMZS2B10**	**WMZS3B10**
13	**WMZS1B13**	**WMZS2B13**	**WMZS3B13**
15	**WMZS1B15**	**WMZS2B15**	**WMZS3B15**
16	**WMZS1B16**	**WMZS2B16**	**WMZS3B16**
20	**WMZS1B20**	**WMZS2B20**	**WMZS3B20**
25	**WMZS1B25**	**WMZS2B25**	**WMZS3B25**
30	**WMZS1B30**	**WMZS2B30**	**WMZS3B30**
32	**WMZS1B32**	**WMZS2B32**	**WMZS3B32**
40	**WMZS1B40**	**WMZS2B40**	**WMZS3B40**
50	**WMZS1B50**	**WMZS2B50**	**WMZS3B50**
63	**WMZS1B63**	**WMZS2B63**	**WMZS3B63**

WMZS Product Selection—C Curve (5–10X In Current Rating)

Suitable for applications where medium levels of inrush current are expected. Instantaneous trip is 5–10X rating of device (In). Applications include small transformers, lighting, pilot devices, control circuits, and coils. Medium magnetic trip point.

Single-Pole

Two-Pole

Three-Pole

C Curve (5–10X I_n Current Rating)—Designed for Inductive Loads ①④⑤

Amperes	Single-Pole Catalog Number	Two-Pole Catalog Number	Three-Pole Catalog Number
0.5	**WMZS1C00**	**WMZS2C00**	**WMZS3C00**
1	**WMZS1C01**	**WMZS2C01**	**WMZS3C01**
2	**WMZS1C02**	**WMZS2C02**	**WMZS3C02**
3	**WMZS1C03**	**WMZS2C03**	**WMZS3C03**
4	**WMZS1C04**	**WMZS2C04**	**WMZS3C04**
5	**WMZS1C05**	**WMZS2C05**	**WMZS3C05**
6	**WMZS1C06**	**WMZS2C06**	**WMZS3C06**
7	**WMZS1C07**	**WMZS2C07**	**WMZS3C07**
8	**WMZS1C08**	**WMZS2C08**	**WMZS3C08**
10	**WMZS1C10**	**WMZS2C10**	**WMZS3C10**
13	**WMZS1C13**	**WMZS2C13**	**WMZS3C13**
15	**WMZS1C15**	**WMZS2C15**	**WMZS3C15**
16	**WMZS1C16**	**WMZS2C16**	**WMZS3C16**
20	**WMZS1C20**	**WMZS2C20**	**WMZS3C20**
25	**WMZS1C25**	**WMZS2C25**	**WMZS3C25**
30	**WMZS1C30**	**WMZS2C30**	**WMZS3C30**
32	**WMZS1C32**	**WMZS2C32**	**WMZS3C32**
40	**WMZS1C40**	**WMZS2C40**	**WMZS3C40**
50	**WMZS1C50**	**WMZS2C50**	**WMZS3C50**
63	**WMZS1C63**	**WMZS2C63**	**WMZS3C63**

Notes

① In North America, these switches are UL recognized and CSA certified as Supplementary Protection devices. Per the intent of NEC (National Electrical Code), Article 240, and CEC (Canadian Electrical Code), Part 1 C22.1, supplementary breakers cannot be used as a substitute for the branch circuit protective device. They can be used to provide overcurrent protection within an appliance or other electrical equipment where branch circuit overcurrent protection is already provided, or is not required.

② Designed for resistive or slightly inductive loads.

③ Response time of instantaneous trip: 3–5X I_n current rating.

④ Designed for inductive loads.

⑤ Response time of instantaneous trip: 5–10X I_n current rating.

WMZS Product Selection—D Curve (10 – 20X In Current Rating)

Suitable for applications where high levels of inrush current are expected. Instantaneous trip is 10–20X rating of device (In). The high magnetic trip point prevents nuisance tripping in high inductive applications such as motors, transformers and power supplies.

Single-Pole

Two-Pole

Three-Pole

D Curve (10–20X I_n Current Rating)—Designed for Inductive Loads ①②③

Amperes	Single-Pole Catalog Number	Two-Pole Catalog Number	Three-Pole Catalog Number
0.5	**WMZS1D00**	**WMZS2D00**	**WMZS3D00**
1	**WMZS1D01**	**WMZS2D01**	**WMZS3D01**
2	**WMZS1D02**	**WMZS2D02**	**WMZS3D02**
3	**WMZS1D03**	**WMZS2D03**	**WMZS3D03**
4	**WMZS1D04**	**WMZS2D04**	**WMZS3D04**
5	**WMZS1D05**	**WMZS2D05**	**WMZS3D05**
6	**WMZS1D06**	**WMZS2D06**	**WMZS3D06**
7	**WMZS1D07**	**WMZS2D07**	**WMZS3D07**
8	**WMZS1D08**	**WMZS2D08**	**WMZS3D08**
10	**WMZS1D10**	**WMZS2D10**	**WMZS3D10**
13	**WMZS1D13**	**WMZS2D13**	**WMZS3D13**
15	**WMZS1D15**	**WMZS2D15**	**WMZS3D15**
16	**WMZS1D16**	**WMZS2D16**	**WMZS3D16**
20	**WMZS1D20**	**WMZS2D20**	**WMZS3D20**
25	**WMZS1D25**	**WMZS2D25**	**WMZS3D25**
30	**WMZS1D30**	**WMZS2D30**	**WMZS3D30**
32	**WMZS1D32**	**WMZS2D32**	**WMZS3D32**
40	**WMZS1D40**	**WMZS2D40**	**WMZS3D40**

Notes

① In North America, these switches are UL recognized and CSA certified as Supplementary Protection devices. Per the intent of NEC (National Electrical Code), Article 240, and CEC (Canadian Electrical Code), Part 1 C22.1, supplementary breakers cannot be used as a substitute for the branch circuit protective device. They can be used to provide overcurrent protection within an appliance or other electrical equipment where branch circuit overcurrent protection is already provided, or is not required.

② Designed for highly inductive loads.

③ Response time of instantaneous trip: 10–20X I_n current rating.

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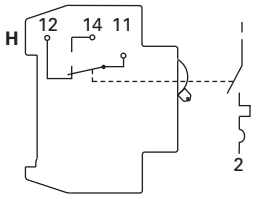
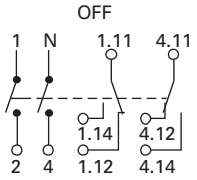
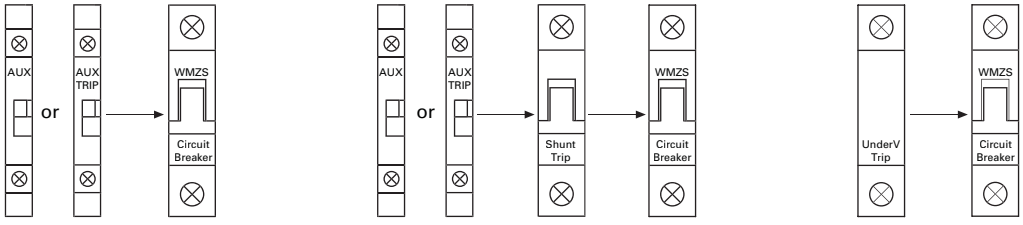
Accessories

Auxiliary Contacts and Voltage Trips

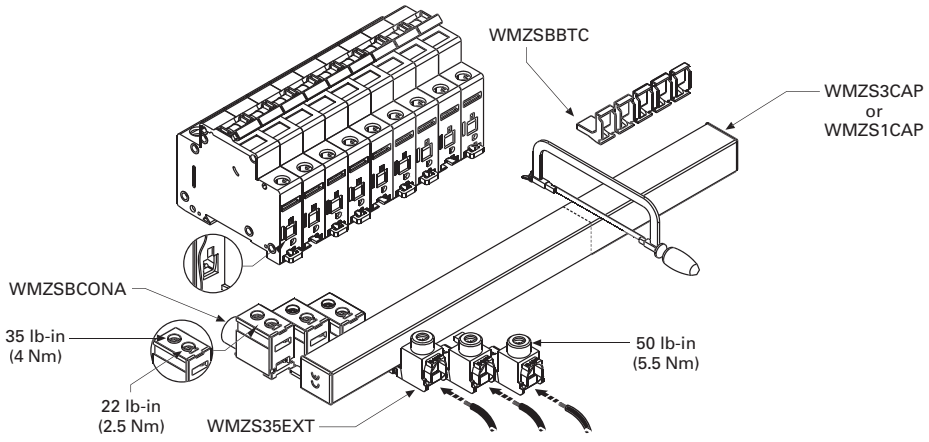
Module	Circuit Diagram	Description	Rated Operational Voltage	Catalog Number
Standard Auxiliary Contacts				
		1NO/1NC Installs on left side of WMZS or shunt trip Max. one per WMZS (1077) device Switches when WMZS is tripped electrically or manually	230 Vac	**WMZSAUX**
Auxiliary/Trip Indicating Contact				
		Small selector screw changes mode Two Form C (changeover) contacts Installs on left side of WMZS or shunt trip Auxiliary contacts switch when WMZS is tripped electrically or manually Trip indicating contact switches only when WMZS is tripped electrically	230 Vac	**WMZSAUXTRIP**
Undervoltage Trip				
		Prevents WMZS from operating unless voltage is present Installs on left side of WMZS Includes test button	115 Vac 230 Vac 400 Vac	**WMZSUVR115** **WMZSUVR230** **WMZSUVR400**
Shunt Trip				
		Allows remote trip of WMZS Installs on left side of WMZS	110–415 Vac 110–230 Vdc 12–110 Vac 12–60 Vdc	**WMZSST415** **WMZSST110**

Allowable Combinations of Accessories



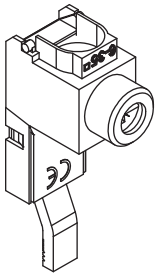
Bus Bar System

Description	Rated Operational Current (A)	Number of Poles per Device	Number of Terminals	Catalog Number
Without Auxiliary Contacts				
For connecting WMZS Supplementary Protectors without auxiliary contacts. May be fed from line or load side.	80	1	57	**WMZS1P57T**
		2	56	**WMZS2P56T**
		3	57	**WMZS3P57T**
	100	1	57	**WMZS1P57T25**
		2	56	**WMZS2P56T25**
		3	57	**WMZS3P57T25**
Auxiliary/Trip Indicating Contact				
For connecting WMZS Supplementary Protectors without auxiliary contacts. May be fed from line or load side.	80	1	37	**WMZS1P37TAUX**
		2	46	**WMZS2P46TAUX**
		3	48	**WMZS3P48TAUX**
	100	1	37	**WMZS1P37T25AUX**
		2	46	**WMZS2P46T25AUX**
		3	48	**WMZS3P48T25AUX**



Pin Type Incoming Supply Terminals

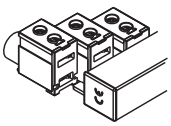
Incoming Terminal



Description	Catalog Number
Accommodates conductors up to 25 mm^2 (~ AWG 4) Finger-safe connection	**WMZS35EXT**

Bus Incoming Supply Terminals

Incoming Terminal

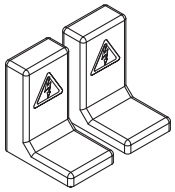


Description	Catalog Number
50 mm^2 #14–1 AWG 75 Deg Wire 115A/Y, 480V UL 160A/Y 690V IEC	**WMZSBCONA**

Protective Accessories

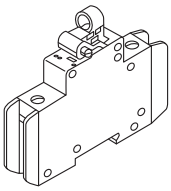
Description	Catalog Number
For covering unused terminals	**WMZSBBTC**

Bus Bar Terminal Cover



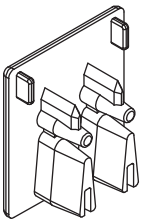
Description	Catalog Number
Prevents reactivation of the device during maintenance Holds one padlock	**WMZPLK**

Padlock Hasp

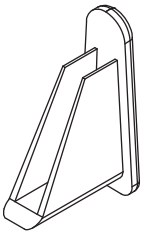


Bus Bar End Cap

Fork Connector Two- and Three-Pole



Fork Connector Two- and Three-Pole



Description	Number of Poles	Catalog Number
Install after cutting bus bar Protects end of bus bar	2 and 3	**WMZS3CAP**
	1	**WMZS1CAP**

Technical Data and Specifications

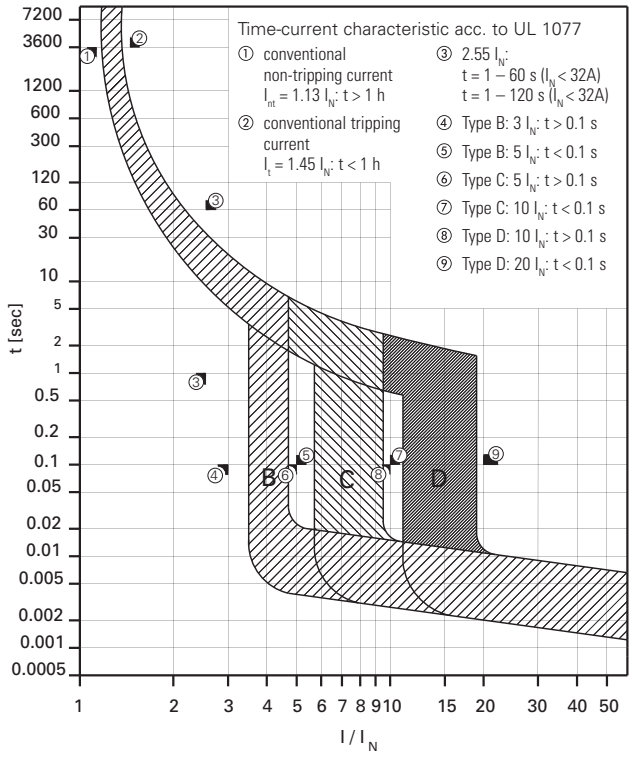
Trip Curve Charts

Three Tripping Curves to Choose

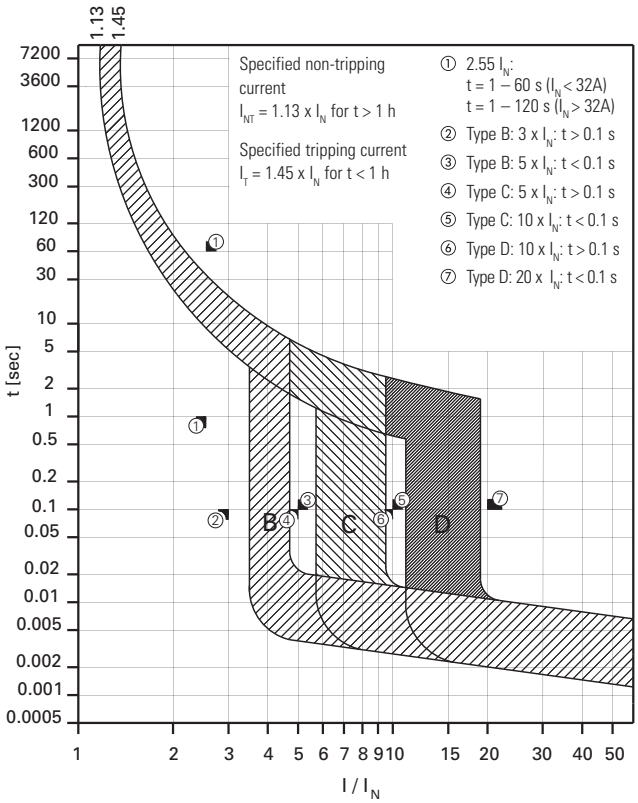
Eaton WMZS Supplementary Protectors are available with three different tripping characteristics, including Type B, C and D. Definitions for each trip curve are contained on the ordering pages and can be used to determine the optimal characteristic for your application. For example, low level short-circuit faults in control wiring, such as PLCs, are best protected by devices with Type B trip characteristics (3 to 5X continuous rating of the device (I_n).

Even though not required by NEC or CEC for Supplementary Protectors, Eaton's WMZS devices are current limiting, which means they interrupt fault currents within one half cycle. Current limiting devices offer superior protection by reducing peak let-through current and energy.

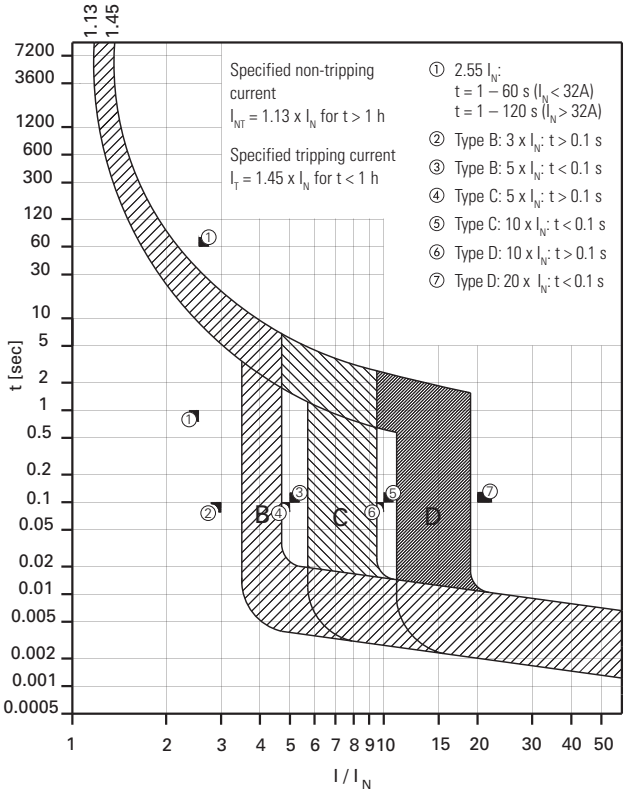
WMZS Tripping Curves



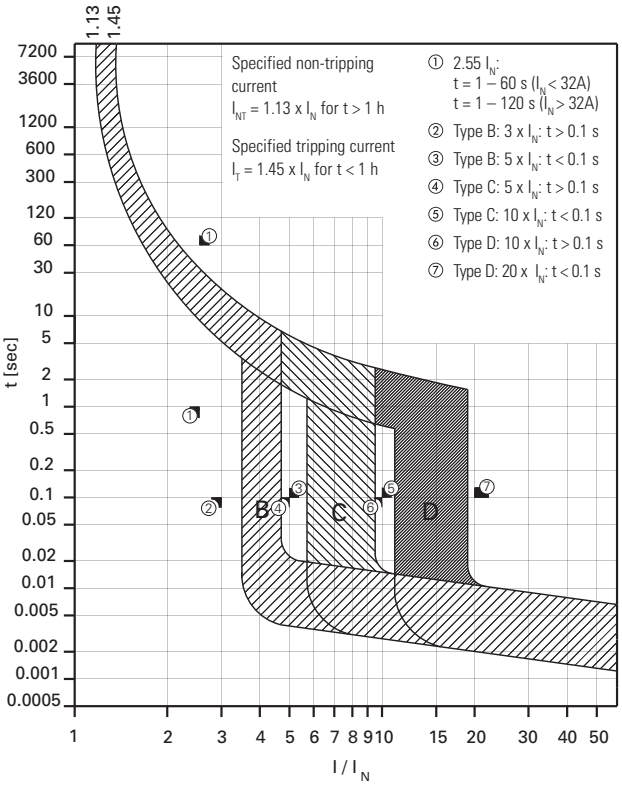
B Curve



D Curve



C Curve



Technical Data

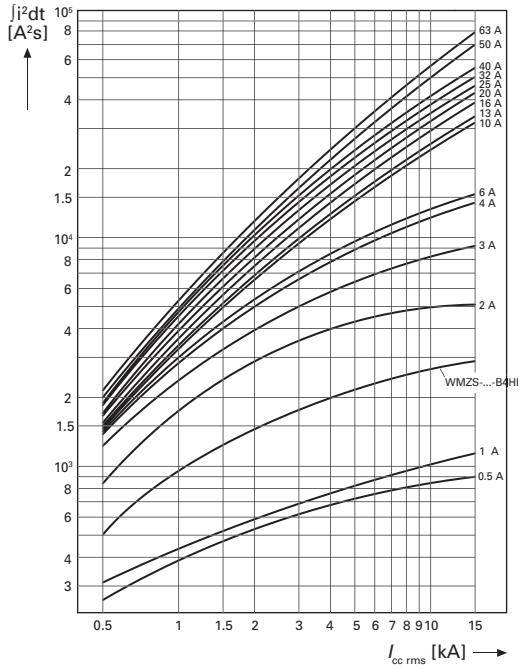
Description	B Curve	C Curve	D Curve
Electrical			
Approvals	UR (UL 1077), CSA (CSA 22.2 No. 235), CE		
Standards	IEC/EN 60947-2		
Short-circuit trip response	3 x 5 I_n	5 x 10 I_n	10 x 20 I_n
Supplementary Protectors—UL/CSA			
Current range	6–63A	0.5–63A	0.5–40A
Maximum voltage ratings—UL/CSA			
Single-pole	277 Vac	277 Vac	277 Vac
	48 Vdc	48 Vdc	48 Vdc
Two-, three-pole	480Y/277 Vac	480Y/277 Vac	480Y/277 Vac
Two poles in series	96 Vdc	96 Vdc	96 Vdc
Thermal tripping characteristics			
Single-pole	1.35 x I_n @ 40°C	1.35 x I_n @ 40°C	1.35 x I_n @ 40°C
Multi-pole	1.45 x I_n @ 40°C	1.45 x I_n @ 40°C	1.45 x I_n @ 40°C
Short-circuit ratings (at max. voltage)			
Single-pole	10 kA (5 kA for 40–63A device)	10 kA (5 kA for 40–63A device)	5 kA
Two-, three-pole	10 kA (5 kA for 40–63A device)	10 kA (5 kA for 40–63A device)	5 kA
Single-pole	10 kA @ 48 Vdc	10 kA @ 48 Vdc	10 kA @ 48 Vdc
Two poles in series	10 kA @ 96 Vdc	10 kA @ 96 Vdc	10 kA @ 96 Vdc
Miniature Circuit Breaker—IEC			
Current range	6–63A	0.5–63A	0.5–40A
Maximum voltage ratings—IEC 60947-2			
Single-pole	230 Vac	230 Vac	230 Vac
	48 Vdc	48 Vdc	48 Vdc
Two-, three-pole	230/400 Vac	230/400 Vac	230/400 Vac
Maximum voltage ratings—IEC 60898			
Single-pole	240 Vac	240 Vac	240 Vac
	48 Vdc	48 Vdc	48 Vdc
Two-, three-pole	240/415 Vac	240/415 Vac	240/415 Vac
Thermal tripping characteristics			
Single-pole	> 1 hour @ 1.05 x I_n	> 1 hour @ 1.05 x I_n	> 1 hour @ 1.05 x I_n
Multi-pole	< 1 hour @ 1.3 x I_n	< 1 hour @ 1.3 x I_n	< 1 hour @ 1.3 x I_n
Interrupt ratings (at max. voltage)			
IEC 60947-2	15 kA	15 kA	15 kA
IEC 60898	10 kA	10 kA	10 kA
Operational switching capacity	7.5 kA	7.5 kA	7.5 kA
Max. back-up fuse [gL/gG]	125A	125A	125A
Rated impulse withstand—U_{imp}	4000 Vac	4000 Vac	4000 Vac
Rated insulation voltage—U_i	440 Vac	440 Vac	440 Vac

Technical Data, continued

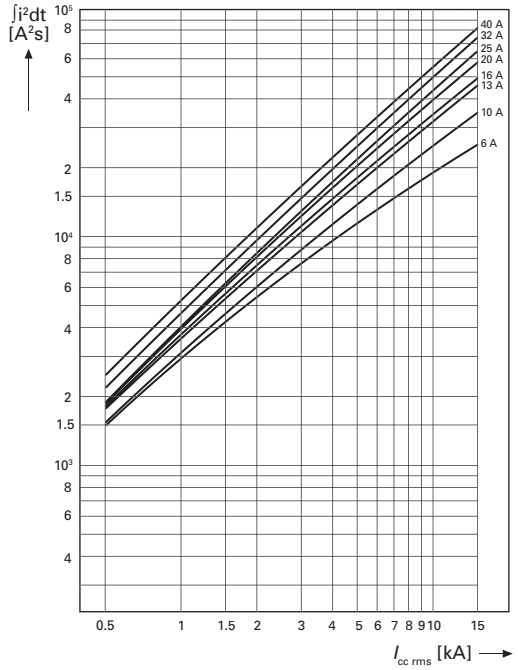
Description	B Curve	C Curve	D Curve
Environmental/General			
Selectivity class	3	3	3
Lifespan (operations)	> 10,000 (1 operation = ON/OFF)	> 10000 (1 operation = ON/OFF)	> 10000 (1 operation = ON/OFF)
Shock (IEC 68-2-22)	10g–120 ms	10g–120 ms	10g–120 ms
Operating temperature range	+23 to +104°F (–5 to +40°C)	+23 to +104°F (–5 to +40°C)	+23 to +104°F (–5 to +40°C)
Shipment and short-term storage	–40 to +185°F (–40 to +85°C)	–40 to +185°F (–40 to +85°C)	–40 to +185°F (–40 to +85°C)
Housing material	Nylon	Nylon	Nylon
Mechanical			
Standard Front Dimension			
Device height	80 mm	80 mm	80 mm
Terminal protection	Finger and back-of-hand proof to IEC 536	Finger and back-of-hand proof to IEC 536	Finger and back-of-hand proof to IEC 536
Mounting width per pole	17.5 mm	17.5 mm	17.5 mm
Mounting	IEC/EN 60715 top-hat rail	IEC/EN 60715 top-hat rail	IEC/EN 60715 top-hat rail
Degree of protection	IP20	IP20	IP20
Terminals top and bottom	Twin-purpose terminals	Twin-purpose terminals	Twin-purpose terminals
Supply connection	Line or load side	Line or load side	Line or load side
Terminal capacity [mm^2]	1 x 25 (AWG 4–18) / 2 x 10 (AWG 8–18)	1 x 25 (AWG 4–18) / 2 x 10 (AWG 8–18)	1 x 25 (AWG 4–18) / 2 x 10 (AWG 8–18)
Torque	2.4 Nm	2.4 Nm	2.4 Nm
Imperial torque	21 lb-in (AWG 18–12), 25 lb-in (AWG 10–8), 36 lb-in (AWG 6–4)	21 lb-in (AWG 18–12), 25 lb-in (AWG 10–8), 36 lb-in (AWG 6–4)	21 lb-in (AWG 18–12), 25 lb-in (AWG 10–8), 36 lb-in (AWG 6–4)
Thickness of bus bar material	0.8–2 mm	0.8–2 mm	0.8–2 mm
Mounting position	As required	As required	As required

Let-Through Energy I^2t

Characteristic B and C

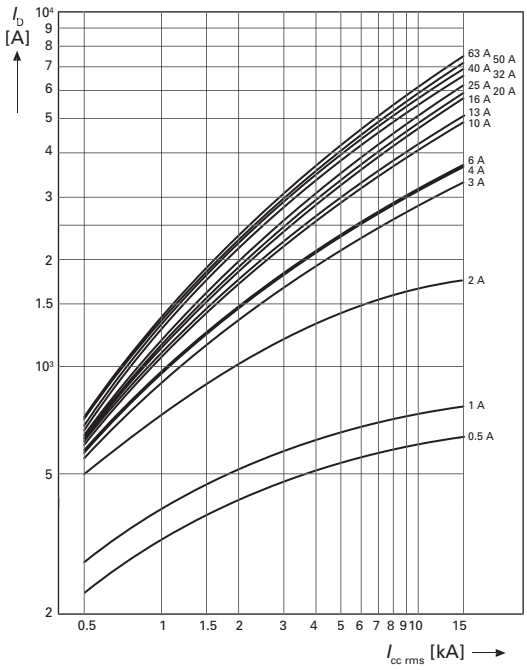


Characteristic D

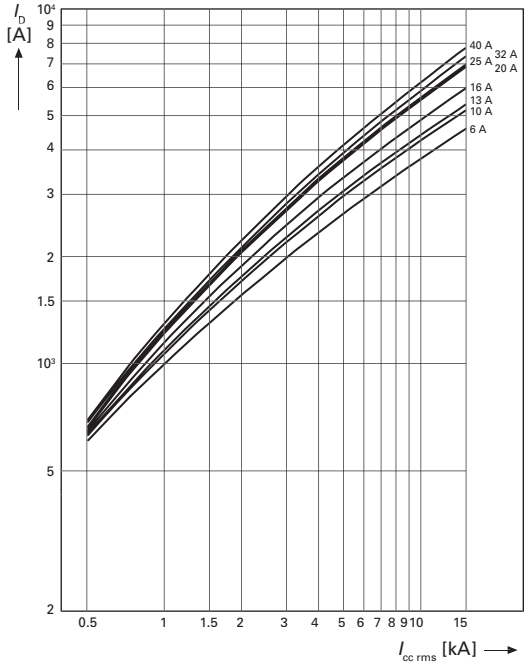


Let-Through Current I_D

Characteristic B and C



Characteristic D



Influence of the Ambient Temperature on the Thermal Tripping Behavior

Corrected values of the rated current dependent on the ambient temperature

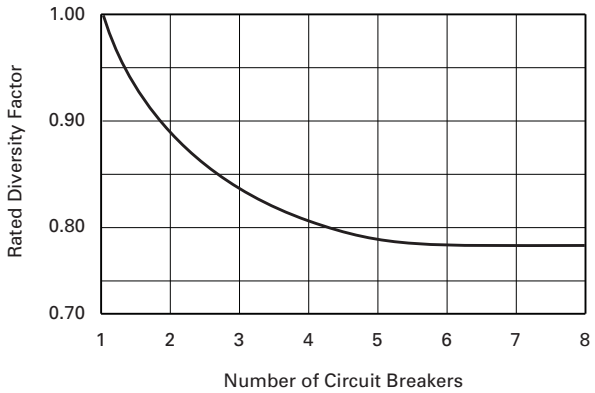
	Ambient Temperature T												
I_n (A)	–25°C	–20°C	–10°C	0°C	10°C	20°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C
0.16	0.2	0.19	0.19	0.18	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.14	0.14
0.25	0.31	0.3	0.29	0.28	0.27	0.26	0.25	0.25	0.24	0.24	0.23	0.23	0.22
0.5	0.61	0.6	0.58	0.56	0.54	0.52	0.5	0.49	0.48	0.47	0.46	0.45	0.44
0.75	0.92	0.9	0.87	0.84	0.81	0.78	0.75	0.74	0.73	0.71	0.69	0.68	0.66
1	1.2	1.2	1.2	1.1	1.1	1	1	0.99	0.97	0.95	0.93	0.9	0.89
1.5	1.8	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.3
1.6	2	1.9	1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4
2	2.4	2.4	2.3	2.2	2.2	2.1	2	2	1.9	1.9	1.9	1.8	1.8
2.5	3.1	3	2.9	2.8	2.7	2.6	2.5	2.5	2.4	2.4	2.3	2.3	2.2
3	3.7	3.6	3.5	3.4	3.3	3.1	3	3	2.9	2.8	2.8	2.7	2.7
3.5	4.3	4.2	4.1	3.9	3.8	3.7	3.5	3.4	3.4	3.3	3.2	3.2	3.1
4	4.9	4.8	4.7	4.5	4.3	4.2	4	3.9	3.9	3.8	3.7	3.6	3.5
5	6.1	6	5.8	5.6	5.4	5.2	5	4.9	4.8	4.7	4.6	4.5	4.4
6	7.3	7.2	7	6.7	6.5	6.3	6	5.9	5.8	5.7	5.6	5.4	5.3
7	8.6	8.4	8.1	7.9	7.6	7.4	7	6.9	6.8	6.7	6.6	6.4	6.3
8	9.8	9.6	9.3	9	8.7	8.4	8	7.9	7.7	7.6	7.4	7.2	7.1
10	12	12	12	11	11	10	10	9.9	9.7	9.5	9.3	9	8.9
12	15	14	14	13	13	13	12	12	12	11	11	11	11
13	16	16	15	15	14	14	13	13	13	12	12	12	12
15	18	18	17	17	16	16	15	15	15	14	14	14	13
16	20	19	19	18	17	17	16	16	15	15	15	14	14
20	24	24	23	22	22	21	20	20	19	19	19	18	18
25	31	30	29	28	27	26	25	25	24	24	23	23	22
32	39	38	37	36	35	33	32	32	31	30	30	29	28
40	49	48	47	45	43	42	40	39	39	38	37	36	35
50	61	60	58	56	54	52	50	49	48	47	46	45	44
63	77	76	73	71	68	66	63	62	61	60	58	57	56

Influence of the Mains Frequency

Influence of the mains frequency on the tripping behavior I_{MA} of the instantaneous release

	Mains Frequency f [Hz]						
Description	16 2/3	50	60	100	200	300	400
$I_{MA}(f)/I_{MA}$ (50 Hz) [%]	91	100	101	106	115	134	141

Load Carrying Capacity of Adjoining Miniature Circuit Breakers



Technical Data

Description	WMZSAUX WMZSAUXTRIP	WMZSST	WMZSUVR
Electrical			
Contact function	1A + 1B	—	—
	2 C/O	—	—
Rated operational voltage U_n	250 Vac	—	115 Vac—WMZSUVR115
			230 Vac—WMZSUVR230
			400 Vac—WMZSUVR400
Voltage range WMZSST110	—	12–110 Vac	—
	—	12–60 Vdc	—
Voltage range WMZSST415	—	110–415 Vac	—
	—	110–230 Vdc	—
Closing threshold [x U_n]	—	—	0.8
Tripping threshold [x U_n]	—	—	0.5
Rated frequency f	50/60 Hz	50/60 Hz	50/60 Hz
General use (UL/CSA)			
AC—230/240 Vac	2/2A	—	—
DC—110/120 Vdc	0.5/0.5A	—	—
Pilot duty	A600/Q600	—	—
Conventional free air thermal current I_{th}	4A	—	—
Rated operational current			
AC-13 I_e	3A (250 Vac)	—	—
AC-15 I_e	2A (250 Vac)	—	—
DC-13 I_e	0.5A (110 Vdc)	—	—
Rated insulation voltage U_i	250 Vac	—	—
Minimum operating voltage per contract U_{min}	5 Vdc	—	—
Rated impulse withstand voltage (1.2/50µ) U_{imp}	2.5 kV	—	—
Rated conditional short-circuit current with 6A back-up fuse I_{SC}	1 kA	—	—
Max. admissible back-up fuse	4A gL	—	—
Mechanical			
Standard front dimension	45 mm	45 mm	45 mm
Device height	80 mm	80 mm	80 mm
Mounting width	8.8 mm	17.6 mm	17.8 mm
Mounting	On MCB	IEC/EN 60715 top-hat rail	IEC/EN 60715 top-hat rail
Degree of protection enclosed	IP40	IP40	IP40
Terminal protection	Protection against electric shock to IEC 536	Protection against electric shock to IEC 536	Protection against electric shock to IEC 536
Terminals	Lift terminals	Twin-purpose terminals	Twin-purpose terminals
Terminal capacity			
Solid	0.5 – 2.5 mm^2	1–2.5 mm^2	2 x (1–2.5) mm^2
Flexible	0.5 – 2.5 mm^2	1–2.5 mm^2	2 x (1–2.5) mm^2
Tightening torque of terminal screws	0.8 – 1.0 Nm (7–9 lb-in)	2.4 Nm (21 lb-in)	0.8 Nm (7 lb-in)

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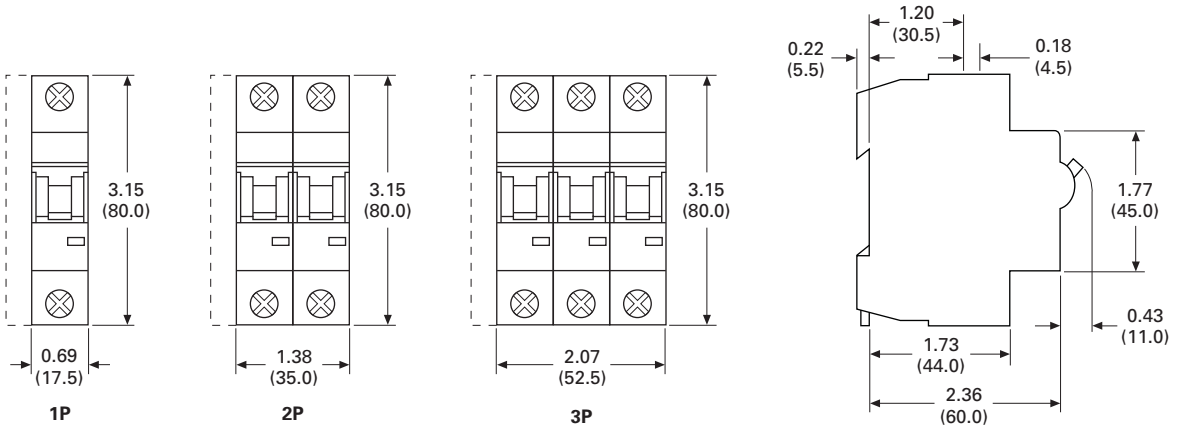
Dimensions

Approximate Dimensions in Inches (mm)

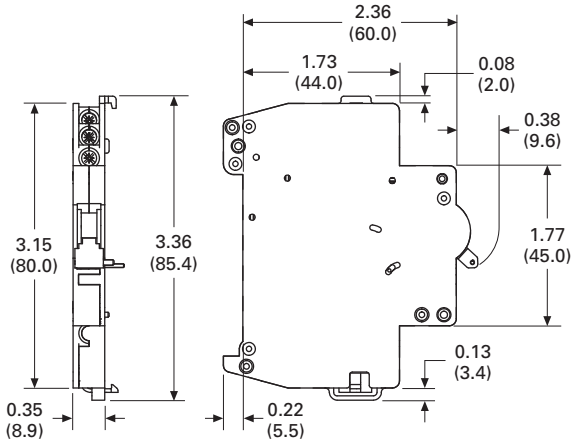
Miniature Circuit Breakers

WMZS



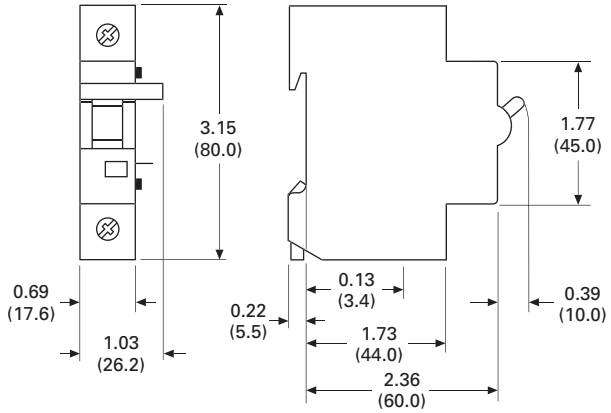
Auxiliary Contacts

WMZSAUX

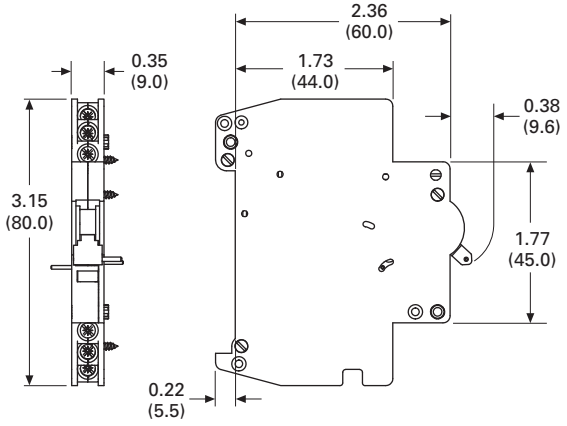


Shunt Releases

WMZSST

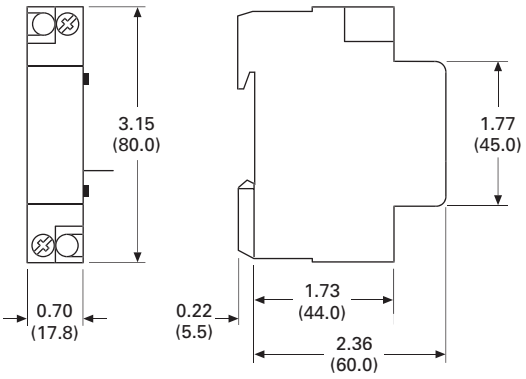


WMZSAUXTRIP



Undervoltage Releases

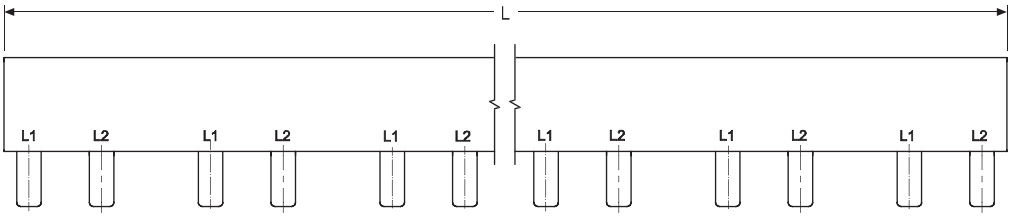
WMZSUVR

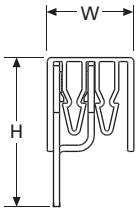


Approximate Dimensions in Inches (mm)

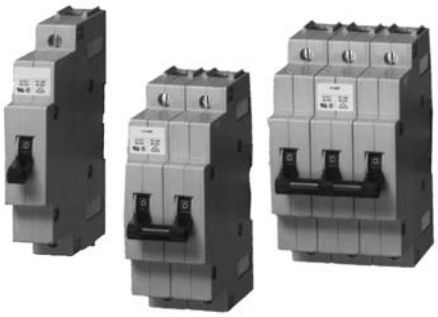
Bus Bar and Accessory Weights and Dimensions

Catalog Number	Unit Weight Lbs (kg)	Length	Width	Height
WMZS1P57T	0.64 (0.29)	39.72 (1009.0)	0.59 (15.0)	0.59 (15.0)
WMZS2P56T	1.41 (0.64)	39.02 (991.0)	0.87 (22.0)	1.46 (37.0)
WMZS3P57T	1.83 (0.83)	39.72 (1009.0)	0.87 (22.0)	1.46 (37.0)
WMZS1P37TAUX	0.57 (0.26)	38.78 (985.0)	0.59 (15.0)	0.59 (15.0)
WMZS2P46TAUX	1.39 (0.63)	39.72 (1009.0)	0.87 (22.0)	1.46 (37.0)
WMZS3P48TAUX	1.74 (0.79)	38.66 (982.0)	0.87 (22.0)	1.46 (37.0)
WMZS1P57T25	0.79 (0.36)	39.72 (1009.0)	0.59 (15.0)	0.59 (15.0)
WMZS2P56T25	1.74 (0.79)	39.02 (991.0)	0.87 (22.0)	1.46 (37.0)
WMZS3P57T25	2.29 (1.04)	39.72 (1009.0)	0.87 (22.0)	1.46 (37.0)
WMZS1P37T25AUX	0.68 (0.31)	38.78 (985.0)	0.59 (15.0)	0.59 (15.0)
WMZS2P46T25AUX	1.61 (0.73)	39.72 (1009.0)	0.87 (22.0)	1.46 (37.0)
WMZS3P48T25AUX	2.14 (0.97)	38.66 (982.0)	0.87 (22.0)	1.46 (37.0)
WMZS35EXT	0.07 (0.03)	2.36 (60.0)	0.67 (17.0)	1.14 (29.0)
WMZSBCONA	0.07 (0.03)	1.57 (40.0)	0.71 (18.0)	1.18 (30.0)
WMZSBBTC	0.007 (0.003)	3.35 (85.0)	0.47 (12.0)	0.94 (24.0)
WMZS1CAP	0.002 (0.001)	0.55 (14.0)	0.20 (5.0)	0.39 (10.0)
WMZS3CAP	0.002 (0.001)	0.94 (24.0)	0.87 (22.0)	0.39 (10.0)





SPHM—Supplementary Protector



Contents

SPHM—Supplementary Protector

Product Description

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.

Application Description

Eaton's 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
- Fluctuating ambients
- High vibration
- Shock resistant

Features, Benefits and Functions

- 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
- **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
- UL File No. E69553
- CSA 22.2 No. 235
- VDE 0660
- IEC 60947-2
- CE marked

Listed

Catalog Number Selection

SPHM

SPHM 3 H M 0300 - - - -

Type
SPHM = Supplementary Protector Hydraulic-Magnetic

Number of Poles
1 = Single-pole
2 = Two-pole
3 = Three-pole
4 = Four-pole

Inrush		
Code	**Delay**	**Voltage**
H	8X	50/60 Hz AC/DC
R	18X	50/60 Hz AC/DC
Y ①	25X	50/60 Hz AC/DC
S	Switch	50/60 Hz AC/DC

Time Delay		
Code	**Delay**	**Curve**
M	Medium	2
S	Short	3
L	Long	10
M	Medium	20
S	Short	30
L	Long	251
M	Medium	252
S	Short	253
W	Switch	—

Auxiliary Switch	
Code ③④	**Current** ③④
A	Normally open
B	Normally closed

Current Rating	
Code	**Current** ② **(Amperes)**
00R1	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
0035 ②	35
0040 ②	40
0050 ②	50

Notes

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

Product Selection

Single-Pole

Two-Pole

Three-Pole

SPHM ①

18X (Standard Inrush Tolerance) Medium Delay Curve 20

Continuous Current Ampere Rating	Single-Pole 277 Vac Catalog Number	Two-Pole 277/480 Vac Catalog Number	Three-Pole 277/480 Vac Catalog Number	Four-Pole 277/480 Vac Catalog Number
0.1	SPHM1RM00R1 ②	SPHM2RM00R1 ②	SPHM3RM00R1 ②	SPHM4RM00R1
0.25	SPHM1RM0R25 ②	SPHM2RM0R25 ②	SPHM3RM0R25 ②	SPHM4RM0R25
0.50	SPHM1RM0R50 ②	SPHM2RM0R50 ②	SPHM3RM0R50 ②	SPHM4RM0R50
0.75	SPHM1RM0R75 ②	SPHM2RM0R75 ②	SPHM3RM0R75 ②	SPHM4RM0R75
1	SPHM1RM0001 ②	SPHM2RM0001 ②	SPHM3RM0001 ②	SPHM4RM0001
2.5	SPHM1RM02R5 ②	SPHM2RM02R5 ②	SPHM3RM02R5 ②	SPHM4RM02R5
5.0	SPHM1RM0005 ②	SPHM2RM0005 ②	SPHM3RM0005 ②	SPHM4RM0005
7.5	SPHM1RM07R5 ②	SPHM2RM07R5 ②	SPHM3RM07R5 ②	SPHM4RM07R5
10	SPHM1RM0010 ②	SPHM2RM0010 ②	SPHM3RM0010 ②	SPHM4RM0010
15	SPHM1RM0015 ②	SPHM2RM0015 ②	SPHM3RM0015 ②	SPHM4RM0015
20	SPHM1RM0020 ②	SPHM2RM0020 ②	SPHM3RM0020 ②	SPHM4RM0020
25	SPHM1RM0025 ②	SPHM2RM0025 ②	SPHM3RM0025 ②	SPHM4RM0025
30	SPHM1RM0030 ②	SPHM2RM0030 ②	SPHM3RM0030 ②	SPHM4RM0030

Continuous Current Ampere Rating	Single-Pole 250 Vac Catalog Number	Two-Pole 250 Vac Catalog Number	Three-Pole 250 Vac Catalog Number	Four-Pole 250 Vac Catalog Number
35	SPHM1RM0035 ②	SPHM2RM0035 ②	SPHM3RM0035 ②	SPHM4RM0035
40	SPHM1RM0040 ②	SPHM2RM0040 ②	SPHM3RM0040 ②	SPHM4RM0040
50	SPHM1RM0050 ②	SPHM2RM0050 ②	SPHM3RM0050 ②	SPHM4RM0050

Notes

① For stocking information: please contact Eaton for current stocking situation.

② To identify catalog number for other Inrush and Delay categories, replace underlined letters from Catalog Number Selection on **Page V4-T24-81**. Contact Eaton for availability and price.

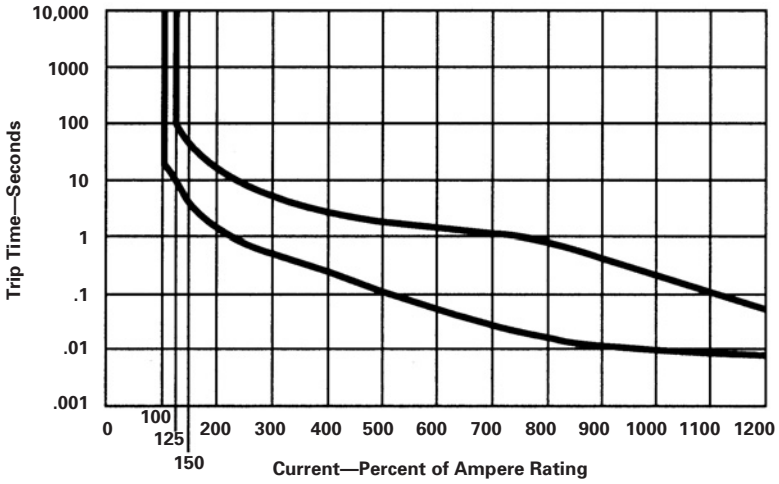
Technical Data and Specifications

Short-Circuit Capacity

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

Trip Curves

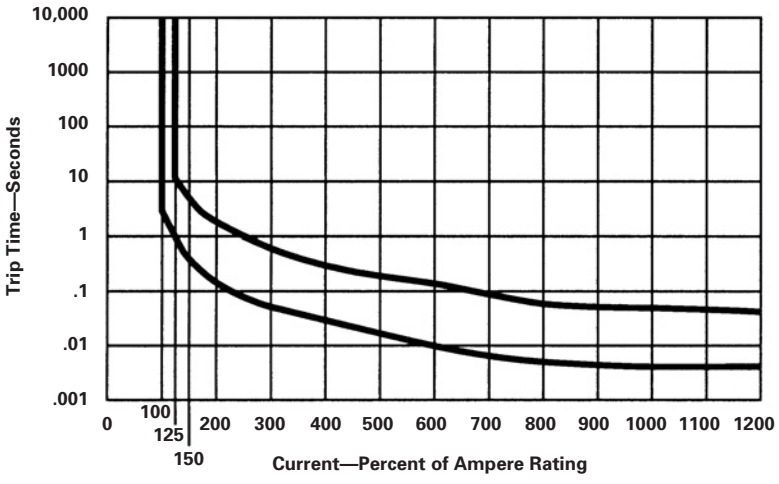
8X Continuous Current—Curve 2, Medium Delay, Option M



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	0.55
400	2.8	0.25
500	1.9	1.1
600	1.5	0.05
700	1.2	0.025
800	0.8	0.015
900	0.41	0.011
1000	0.2	0.01
1100	0.1	0.009
1200	0.05	0.008

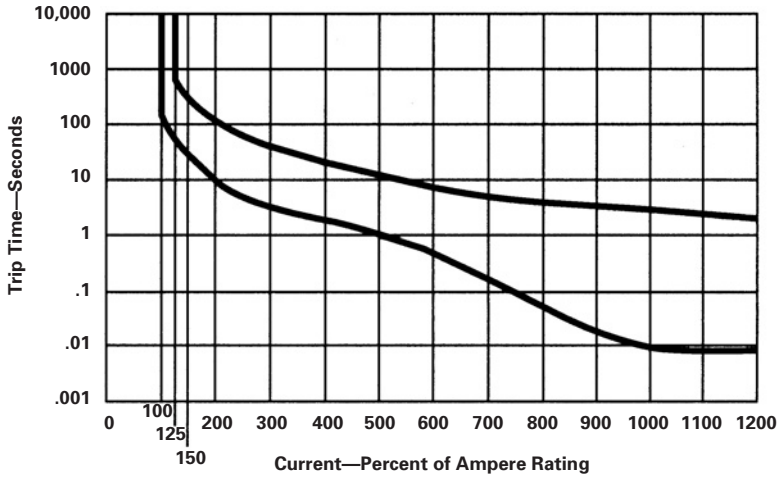
8X Continuous Current—Curve 3, Medium Delay, Option M



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	0.4
200	1.9	0.15
300	0.64	0.054
400	0.3	0.03
500	0.2	0.017
600	0.14	0.01
700	0.09	0.007
800	0.06	0.005
900	0.052	0.0044
1000	0.05	0.004
1100	0.046	0.004
1200	0.04	0.004

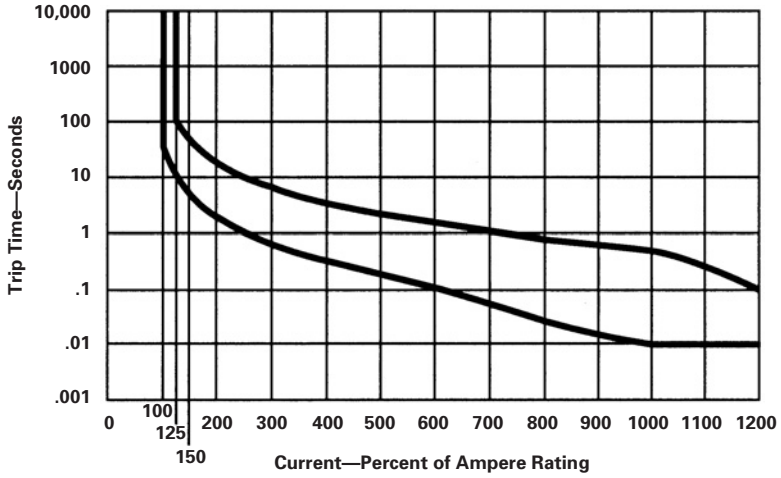
18X Continuous Current—Curve 10, Long Delay, Option L



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	0.5
700	5.2	0.17
800	4	0.05
900	3.4	0.02
1000	3	0.01
1100	2.5	0.0084
1200	2	0.008

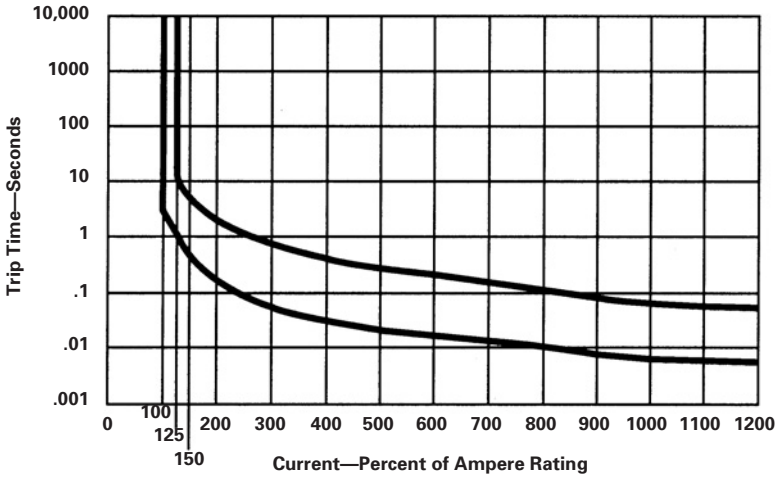
18X Continuous Current—Curve 20, Medium Delay, Option M



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	0.54
400	4	0.3
500	2.75	0.18
600	2	0.1
700	1.4	0.04
800	1	0.02
900	0.75	0.013
1000	0.5	0.01
1100	0.25	0.01
1200	0.1	0.01

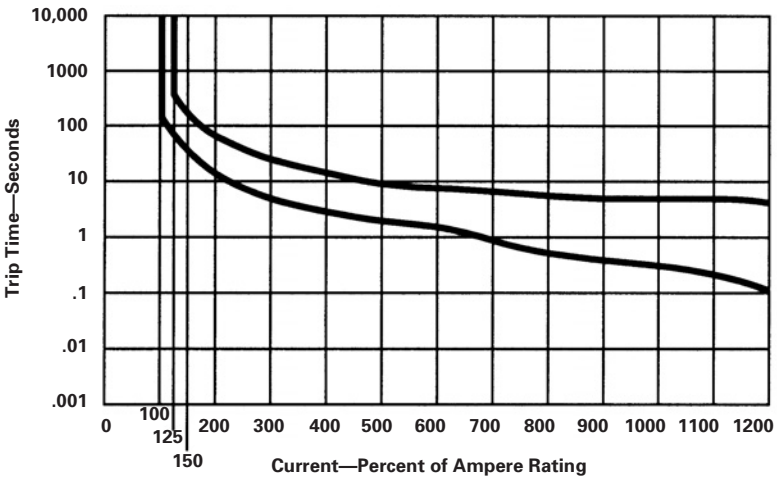
18X Continuous Current—Curve 10, Long Delay, Option L



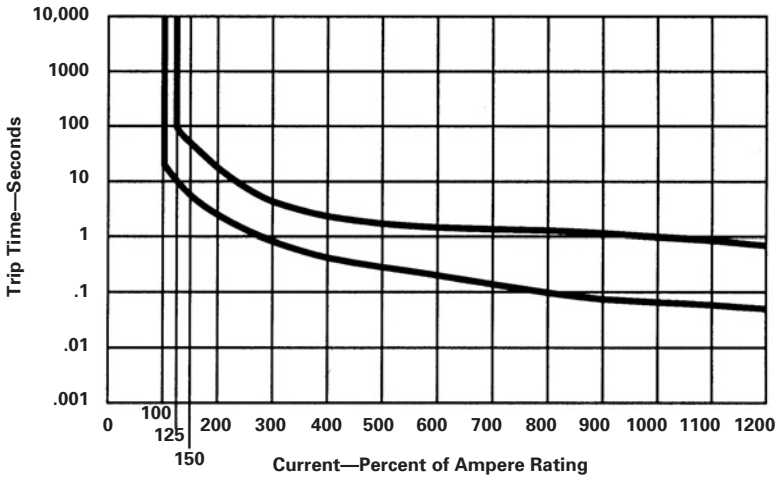
Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

Percent Overload	Delay Maximum (Seconds)	Delay Minimum (Seconds)
100	No trip	No trip
101–125	May trip	May trip
125	12	1
150	5	0.4
200	1.9	0.15
300	0.73	0.052
400	4	0.03
500	0.27	0.02
600	0.2	0.015
700	0.14	0.012
800	0.1	0.01
900	0.074	0.0076
1000	0.06	0.006
1100	0.053	0.0053
1200	0.05	0.005

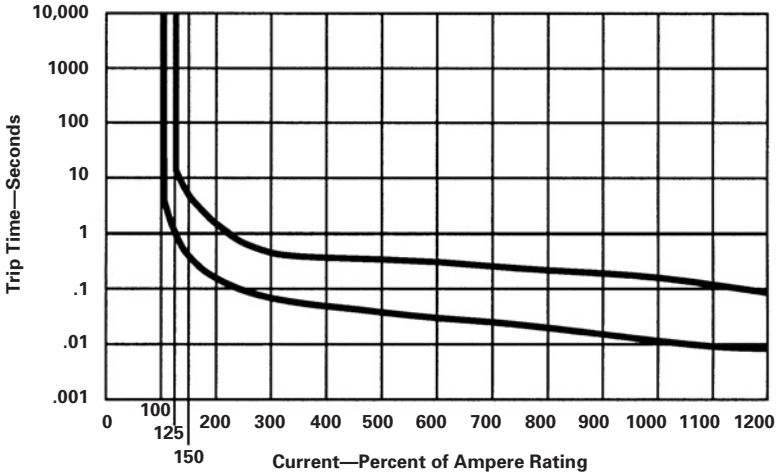
25X Continuous Current—Curve 251, Long Delay, Option L



25X Continuous Current—Curve 252, Medium Delay, Option M



25X Continuous Current—Curve 253, Short Delay, Option S



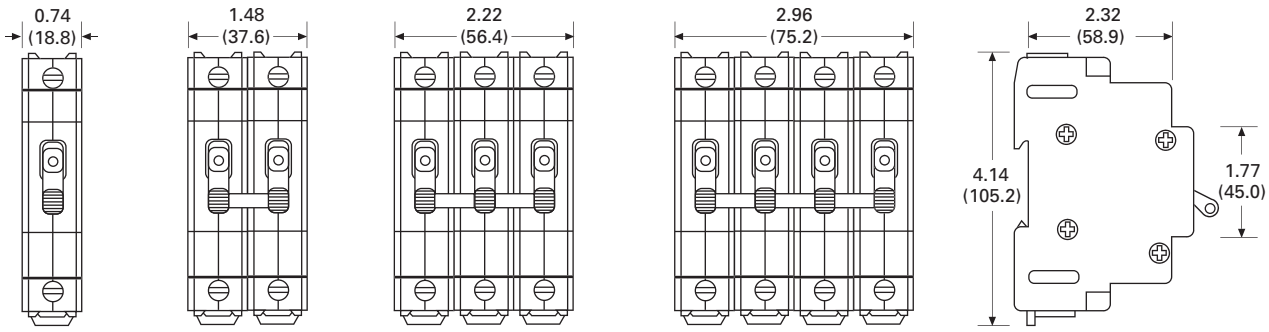
Dimensions

Approximate Dimensions in Inches (mm)

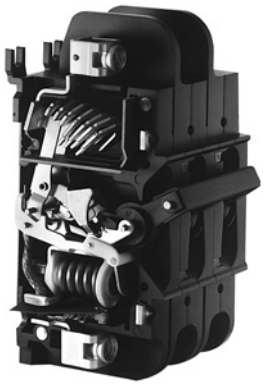
SPHM—Shipping Data

Pole Configuration	Pack Quantity	Pack Dimensions	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. (0.20)
2	1	2.05 x 3.94 x 5.12 (52.1 x 100.1 x 130.0)	12 oz. (0.34)
3	1	3.54 x 3.94 x 5.12 (89.9 x 100.1 x 130.0)	1 lb. 2 oz. (0.51)
4	1	3.54 x 3.94 x 5.12 (89.9 x 100.1 x 130.0)	1 lb. 7 oz. (0.65)

SPHM



Hydraulic-Magnetic Circuit Breaker



Contents

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 38,000V. Eaton offers product designers the broadest ranges of hydraulic-magnetic circuit breakers from 0.1 to 1200A.

Application Description

Shock and Vibration

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

Features, Benefits and Functions

Nuisance Tripping Eliminated

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 hydraulic-magnetic breaker rated at 20A, for example, will sustain 20A, 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, hydraulic-magnetic 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 hydraulic-magnetic 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, hydraulic-magnetic 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, Eaton 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.

Mission Control

With a variety of control and indicating options, the Eaton line of hydraulic-magnetic circuit breakers allows you to take control of your complex operations. Available with integral remote trip coils and indicating contacts, hydraulic-magnetic 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.

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

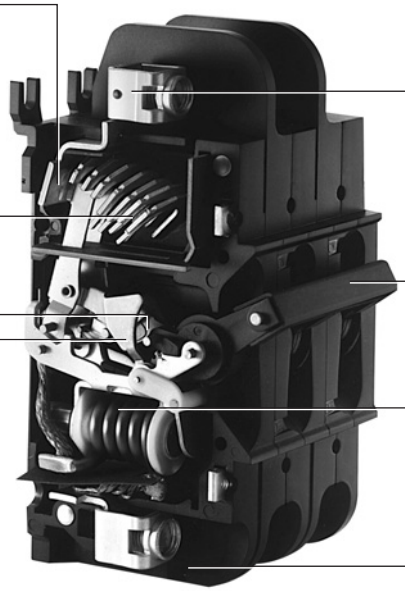
Inside an Eaton Hydraulic-Magnetic Circuit Breaker

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.

The Hydraulic Principal

The hydraulic-magnetic technology used in Eaton's 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, hydraulic-magnetic circuit breakers provide reliable, consistent protection characteristics in all environments.

The 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.

Core at End of Tube Opposite 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.)

Overload Subsides Before Core Reaches Pole Piece

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.

Armature Pulled In

Standards and Certifications

Global Ready

Eaton's hydraulic-magnetic breakers are tested to meet global certifications and standards including UL, CE, VDE and CSA.

Listed

Technical Data and Specifications

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

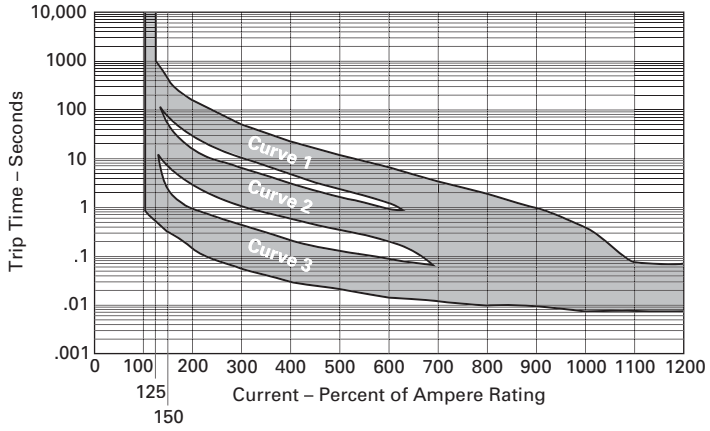
The curves shown indicate the magnitude and duration of overloads, which will be tolerated before tripping occurs. By selecting the proper curve, breaker response can be closely matched to safe operating limits of the equipment or circuitry. The following are standard curves for typical applications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

Curve 1
Allows the largest and most prolonged overload needed to prevent nuisance tripping on motor circuits.

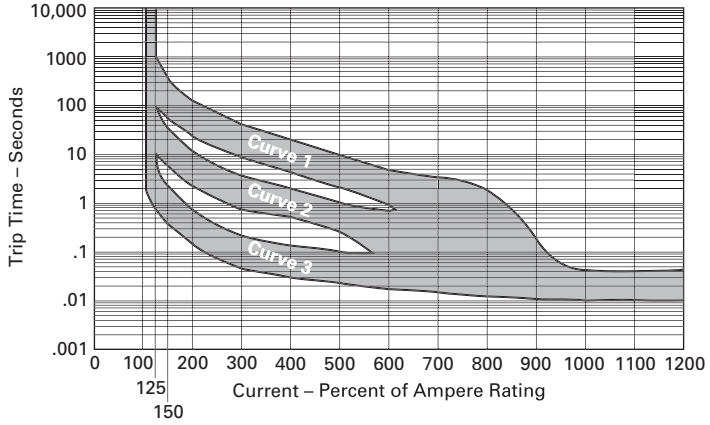
Curve 2
A medium delay accommodates mixed loads consisting of lights, motors and resistive heating, where the breaker is rated to the wiring instead of to any specific load.

Curve 3
Permits a very brief time delay period before tripping and is used for protection of transformers and electronic circuits.

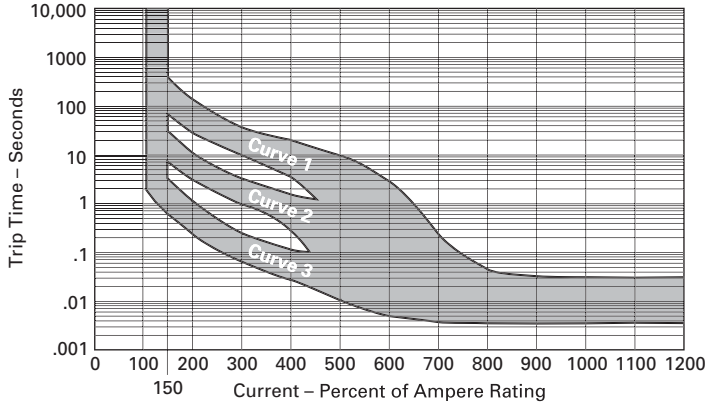
Curves 1, 2 and 3, DC



Curves 1, 2 and 3, 50/60 Hz



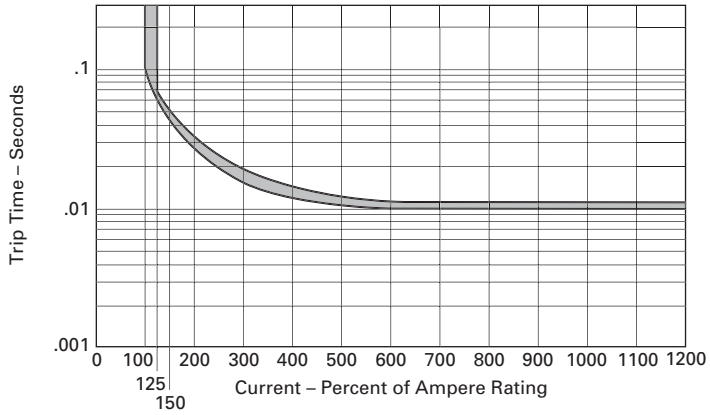
Curves 1, 2 and 3, 400 Hz



Curve P

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

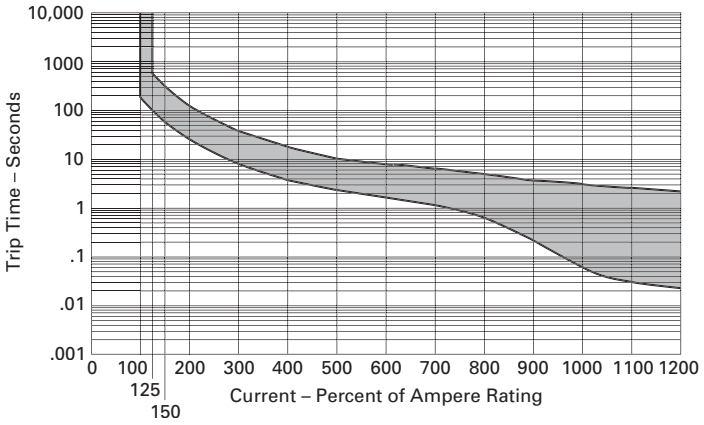
Curve P, Non-delay



Curve 10

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

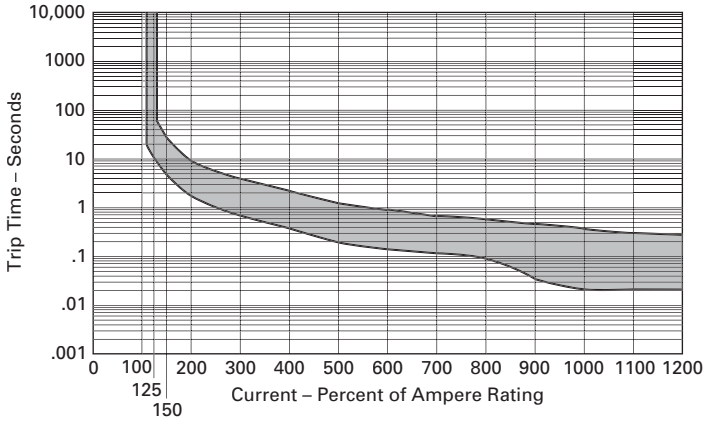
Curve 10



Curve 20

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

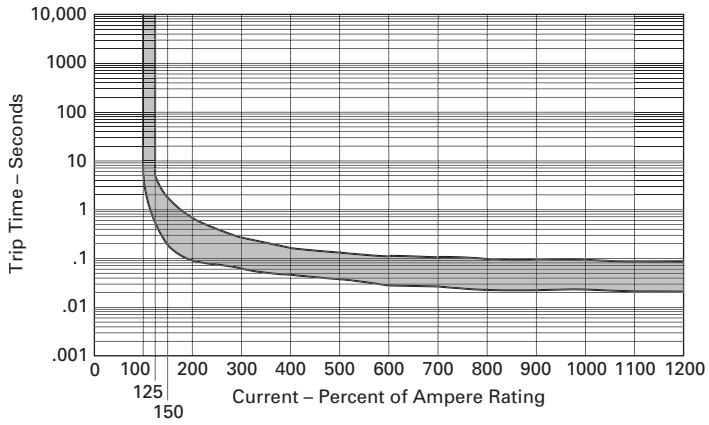
Curve 20



Curve 30

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

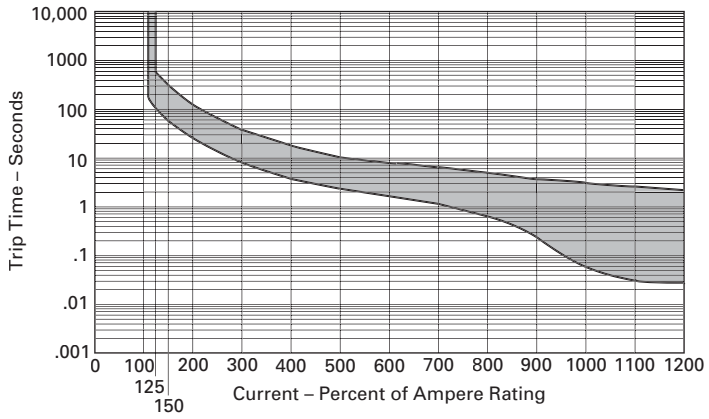
Curve 30



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.

Curve 100



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 wallmount position.

Hydraulic-Magnetic 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.

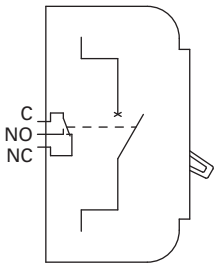
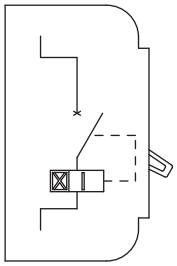
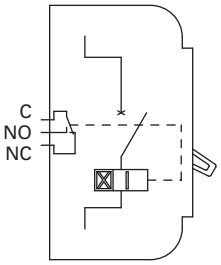
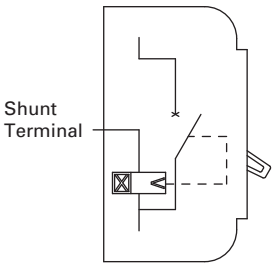
Note: These curves are presented for product selection purposes only. For detailed curve information by frame, please visit www.eaton.com/heinemann.

Eaton's hydraulic-magnetic 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.

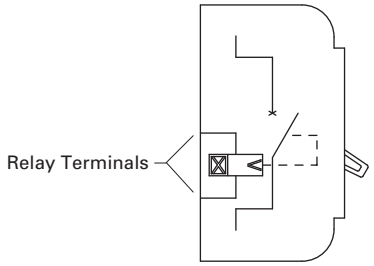
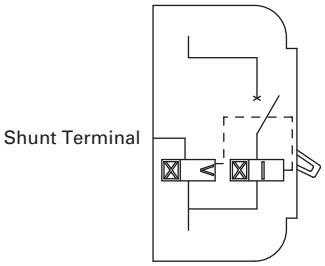
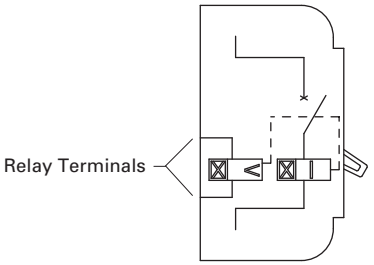
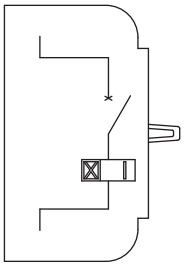
The most common configuration is "Series Trip," which means that the magnetic coil is in series with the main power circuit of the breaker, providing overcurrent protection. By configuring poles separately, you can design equipment that will work in multiple environments.

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.

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, 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.

Hydraulic-Magnetic Supplementary Protectors

Contents

Product Selection Guide

KD Series

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.

KD Series Pushbutton

PROPAK Series

Miniature single- or two-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.

PROPAK Series Circuit Breaker

KD Series Ratings

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

PROPAK Series Ratings

Technology	Number of Poles	Voltage	Current	Interrupting Capacity
Hydraulic-Magnetic	1	250 Vac	0.1–20A	1 kA
	2	50 Vdc	0.1–20A	1 kA
		72 Vdc	0.1–20A	1 kA

J Series

Small lightweight hydraulic-magnetic circuit breaker perfect for telecom and marine applications. Available in ratings from 0.1–50A, 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.

J Series Circuit Breaker

AMR Series

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.

AMR Series Circuit Breaker

J Series Ratings

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

AMR Series Ratings

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

SPHM Series

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.

SPHM Series Circuit Breaker

C Series

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.

C Series Circuit Breaker

SPHM Series Ratings

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

C Series Ratings

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

Notes

① 5 kA with series fuse.
② With series fuse.

GH Series

The GH Series offers all of the advantages of a completely magnetic three-pole breaker with a 14,000A 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.

GH Series Circuit Breaker

GJ Series

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

GH Series Circuit Breaker

GH Series Ratings

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

GJ Series Ratings

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

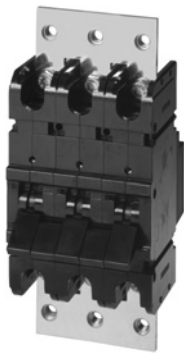
AM1P Series

The AM1P breaker is designed for telecommunication sites with high current demands and limited space. With a 250A 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.

AM1P Series Circuit Breaker

GJ1P Series

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



GJ1P Series Circuit Breaker

AM1P Series Ratings

Technology	Number of Poles	Voltage	Current	Interrupting Capacity
Hydraulic-Magnetic	Multiple	80 Vdc	100–250A	up to 50 kA

GJ1P Series Ratings

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

KD Series Pushbutton Circuit Protector

Contents

KD Series

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-inch 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-inch quick-connect terminals are solderable
- Resettable pushbutton circuit protector:
  - Provides basic thermal protection
  - Ratings from 0.25 to 20A
- 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 that 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. Eaton also carrries CSA approval for applications in Canada.

Listed

Product Selection

KD Series Pushbutton Circuit Protector

KD Series Standard Product Offering

Current Amperes	Catalog Number
0.25	**KD1-0R25**
0.50	**KD1-0R50**
0.75	**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**

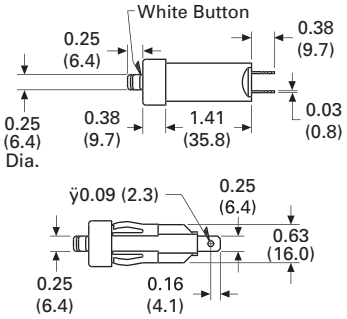
Note

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

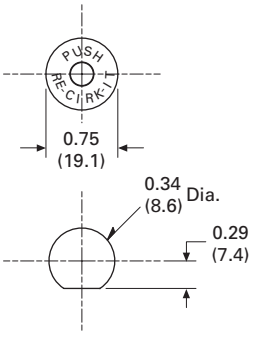
Dimensions

Approximate Dimensions in Inches (mm)

Dimensions with Front Mount Clip Installed



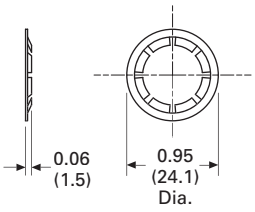
Panel Mounting Hole



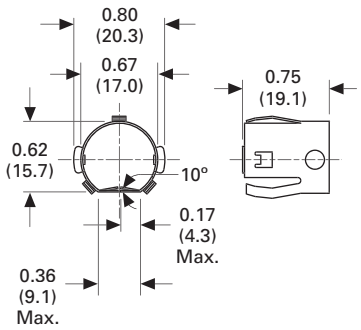
Panel Mtg. Hole
For Panel Thickness
1/32–1/8

Accessories

#006-10417 Retaining Ring



#006-10478 Front Mount Clip



PROPAK Hydraulic-Magnetic Breaker

Contents

PROPAK Series

Product Description

The PROPAK offers the performance of a hydraulic-magnetic breaker in a miniature package. Available in single- or two-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:
  - Single- or two-pole
  - 0.1 to 20A
  - 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.

Listed

Catalog Number Selection

PROPAK Series

PBB 1 A 3 SX22A 53 10 2

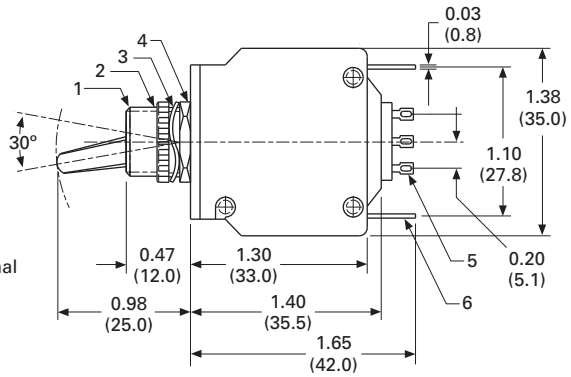
Model	Number of Poles	Voltage Code	Function Code	Auxiliary Switch	Handle Indication	Curve	Current Rating
PBB = PROPAK	**1** = Single-pole **2** = Two-pole	**A** = 250 Vac **B** = 72 Vdc	**3** = Series trip **2** = Series trip with aux. **6** = Relay trip	**53** = Auxiliary switch (Must also choose Function Code 2)	**SX22A** = Vertical mounting **SE22A** = Horizontal mounting	**P** = Instantaneous **2** = Medium delay **3** = Short delay	**0R1** = 0.1A, **0R5** = 0.5A, **01** = 1A, **02** = 2A, **03** = 3A, **04** = 4A, **05** = 5A, **7R5** = 7.5A, **10** = 10A, **12R5** = 12.5A, **15** = 15A, **20** = 20A

Dimensions

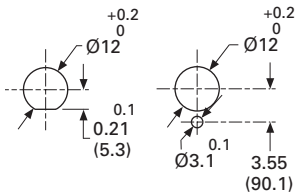
Approximate Dimensions in Inches (mm)

Type PBB Single-Pole

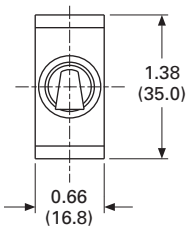
1. M12 x 1
2. Knurled Nut
3. Pressure Washer
4. Hexagon Nut
5. Auxiliary Contact Terminal
6. Main terminal: Fast-on 6.3 x 0.8



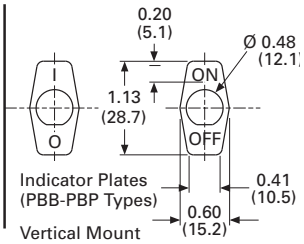
Panel Cutout



Type PBB Single-Pole

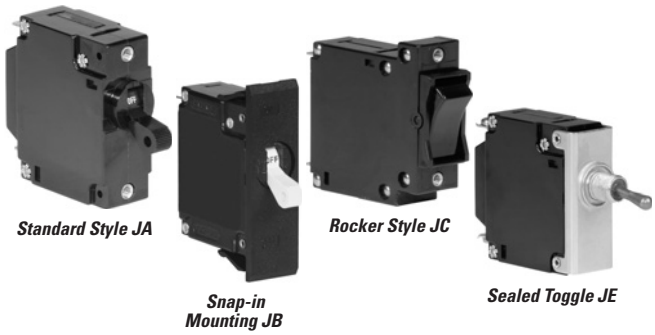


Indicator Plates



Ordering Ref.:
I/O 01650
ON/OFF 01651

J Series Hydraulic-Magnetic Breaker



Contents

J Series

Product Description

Eaton's J Series is one of the most versatile breakers offered in the hydraulic-magnetic product line. 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.

Application Description

The J Series can be used in a wide variety of applications including tele-com, rail, marine and mobile equipment.

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 except 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.

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.

Listed

Catalog Number Selection

J Series

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	38	Series trip
—	2	9	39	Series trip w/aux.
—	5	—	—	Shunt/tap
—	6	—	—	Relay trip

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

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

Notes

① Choose style and select from one to four poles, and enter the number in position 3 of the catalog number. For example, a JA1S would identify a single-pole JA Series breaker.

② Enter the four digit current rating. For example, use code "0015" for a 15A current rating. For fractional amperages, use an "R" to designate the decimal point. For 0.10A, enter the code "0R10."

③ Non-standard. Consult technical support 1-800-356-1243.

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 above. 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.

Standard Style JA

Standard Product Offering

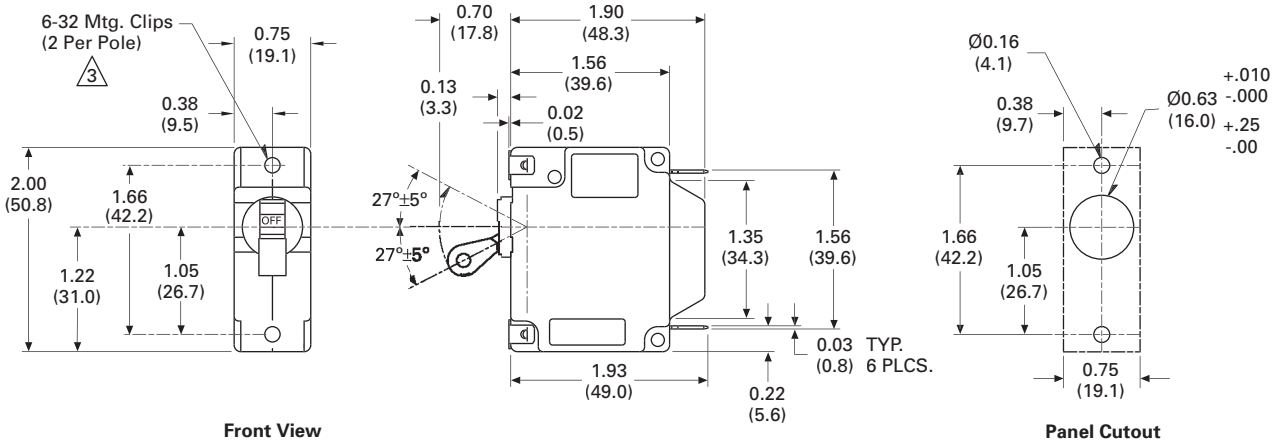
250 Vac/65 Vdc Push-on Terminals

Number of Poles	Current (Amperes)	Curve	Catalog Number
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**
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**

Dimensions

Approximate Dimensions in Inches (mm)

J Series Basic Dimensions



Front View **Panel Cutout**

24

SPHM Series Circuit Breaker

Contents

SPHM Series

Product Description

The SPHM Series Circuit Breaker line is designed to provide supplementary protection on AC circuits up to 250V or stand-alone overcurrent and short-circuit protection on DC circuits up to 80V.

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.

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.

Listed

Catalog Number Selection

SPHM Series

SPHM 3 H M 0030 ---

Type
Supplementary
Protector
Hydraulic
Magnetic

Number of Poles
1 = Single-pole
2 = Two-pole
3 = Three-pole
4 = Four-pole

Inrush	
Code	**Delay**
H	8X
R	18X
Y ①	25X
S	Switch

Time Delay		
Code	**Delay**	**Curve**
M	Medium	2
S	Short	3
L	Long	10
M	Medium	20
S	Short	30
L	Long	251
M	Medium	252
S	Short	253
W	Switch	—

Current Rating	
Code	**Current ② (Amperes)**
00R1	0.10
0R25	0.25
0R50	0.50
0R75	0.75
0001	1
02R5	2.5
0005	5
07RS	7.5
0100	10
0015	15
0020	20
0025	25
0030	30
0035 ②	35
0040 ②	40
0050 ②	50

Auxiliary Switch	
Code ③④	**Current** ③④
A	Normally Open
B	Normally Closed

Notes

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

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.

SPHM Series Circuit Breaker

SPHM Standard Product Offering

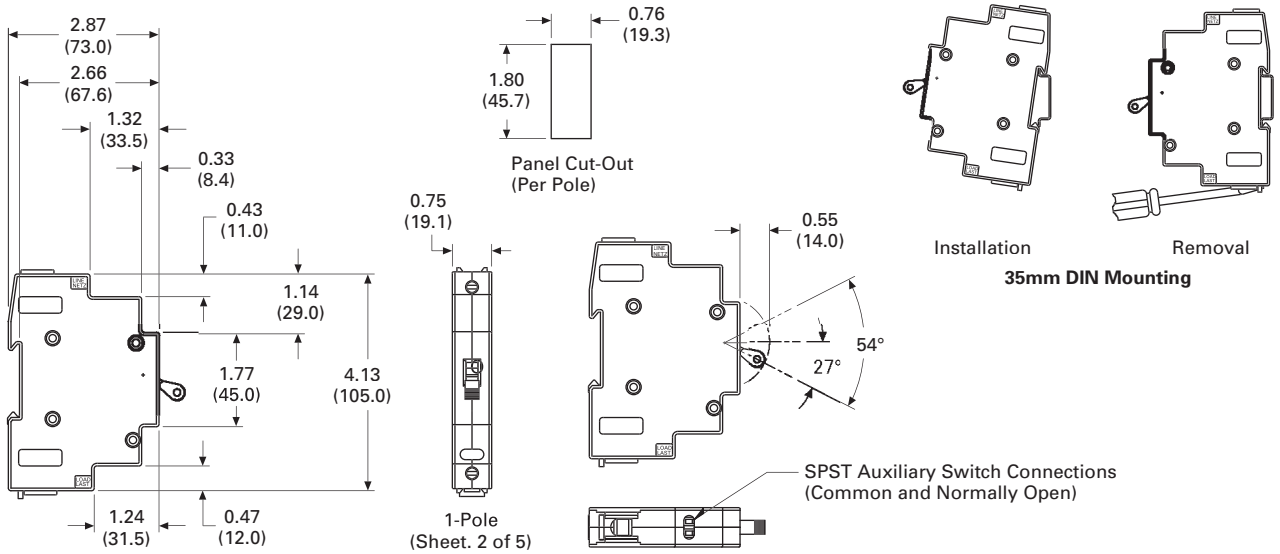
Number of Poles	Current (Amperes)	Curve	Catalog Number
1	0.10	2	**SPHM1RM00R1**
1	0.25	2	**SPHM1RM0R25**
1	0.50	2	**SPHM1RM0R50**
1	0.75	2	**SPHM1RM0R75**
1	1.00	2	**SPHM1RM0001**
1	2.50	2	**SPHM1RM02R5**
1	5.00	2	**SPHM1RM0005**
1	7.50	2	**SPHM1RM07R5**
1	10.0	2	**SPHM1RM0010**
1	15.0	2	**SPHM1RM0015**
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**

Number of Poles	Current (Amperes)	Curve	Catalog Number
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**

Dimensions

Approximate Dimensions in Inches (mm)

SPHM Series Basic Dimensions



AMR Series

Contents

AMR Series

Product Description

The 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 100A 50/60 Hz ac/125 Vdc, 60A 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
- Available with UL 1500 Ignition Protected for Marine Applications.
- 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 100A at 240 Vac or 80 Vdc. It is the solution for demanding applications requiring up to 50,000A interrupting capacity. The 50,000A 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.

- 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 mega-ohms minimum at 500 Vdc, per MIL-STD-202
- Flammability specifications of UL 94-VO case, UL 94-HB handle

UL 489 Ratings

Number of 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

Listed

Catalog Number Selection

AMR Series

AM2R A 9 LC 15 DDU 52 15 1

Number of Poles ①

1 = 1-Pole	**5** = 5-Pole
2 = 2-Pole	**6** = 6-Pole
3 = 3-Pole	**7** = 7-Pole
4 = 4-Pole	**8** = 8-Pole

Frequency ②

A = 50/60 Hz
B = DC
C = 400 Hz
D = 50/60 Hz/DC

Internal Circuit Type and Inrush Catalog Code ②

N/A	STD	18X	25X	Internal Circuit
0	—	—	—	Switch only
—	**2**	**9**	**39**	Series trip w/auxiliary
—	**3**	**8**	**38**	Series trip
—	**5**	**22**	**32**	Shunt/tap
—	**6**	**23**	**33**	Relay trip
—	**7**	**27**	**37**	Dual rating
—	**15**	**25**	—	DuCon
—	**16**	**26**	—	DuCon Series+relay
—	**98**	—	—	Mid-trip
—	**99**	—	—	Mid-trip w/alarm switch

Handle Location ③

AC = Single-pole breakers
LC = Multi-pole breakers

Auxiliary Switch Options

07= NO-NC 4.8 Fast-on
52= NO-NC 2.8 Fast-on
53= NO-NC 2.8 Fast-on

Approval Code

WNU = CE
TA = TUV/UL 1077
DA = UL 1077
DDU = UL 489 (up to 277 Vac)
DNU = None

Terminal/Mounting Catalog Code

Imperial	Metric	Terminals
07	**13**	10-32 threads (70A)
97	**14**	1/4-20 threads (100A)
08	**15**	M5 threads (70A)
98	**16**	M6 threads (70A)
21	**20**	Plug-in 7.77 x 16.6
23	**22**	Plug-in 6.25 x 21.6
25	**24**	Plug-in 6.25 x 15.4
31	**30**	Fuse clip

Curve ④

P = Instant
1 = Long delay 8X inrush
2 = Medium delay 8X inrush
3 = Short delay 8X inrush
4 = Long delay 18X inrush
5 = Medium delay 18X inrush
6 = Short delay 18X inrush
7 = Long delay 25X inrush
8 = Medium delay 25X inrush
9 = Short delay 25X inrush
S = Switch only

Current Rating ⑤

Code	Current (Amperes)
R02	0.02
R25	0.25
R50	0.50
1	1
2R5	2.5
5	5
7R5	7.5
10	10
15	15
20	20
25	25
30	30
50	50
60	60
80	80
100	100

Notes

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 three-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 15A current rating. For fractional amperages, use an "R" to designate the decimal point. For 0.10A, enter the code "R10." Current range up to 100A 50/60 Hz, 60A 400 Hz, 100A DC.

ACR

AC2R A 9 LC 15 DDU 52 15 4

Number of Poles ①	
1 = 1-Pole	**5** = 5-Pole
2 = 2-Pole	**6** = 6-Pole
3 = 3-Pole	**7** = 7-Pole
4 = 4-Pole	**8** = 8-Pole

Frequency ②
A = 50/60 Hz
B = DC
C = 400 Hz
D = 50/60 Hz/DC

Internal Circuit Type and Inrush Catalog Code ②				
N/A	**STD**	**18X**	**25X**	**Internal Circuit**
0	—	—	—	Switch only
—	**2**	**9**	**39**	Series trip w/auxiliary
—	**3**	**8**	**38**	Series trip
—	**5**	**22**	**32**	Shunt/tap
—	**6**	**23**	**33**	Relay trip
—	**7**	**27**	**37**	Dual rating
—	**15**	**25**	—	DuCon
—	**16**	**26**	—	DuCon Series+relay
—	**98**	—	—	Mid-trip
—	**99**	—	—	Mid-trip w/alarm switch

Handle Location ③
AC = Single-pole breakers
LC = Multi-pole breakers

Terminal/Mounting Catalog Code		
Imperial	**Metric**	**Terminal**
07	**13**	10-32 threads (70A)
97	**14**	1/4-20 threads (100A)
08	**15**	M5 threads (70A)
98	**16**	M6 threads (70A)
21	**20**	Plug-in 7.77 x 16.6
23	**22**	Plug-in 6.25 x 21.6
25	**24**	Plug-in 6.25 x 15.4
31	**30**	Fuse clip

Auxiliary Switch Options
07 = NO-NC 4.8 Fast-on
52 = NO-NC 2.8 Fast-on
53 = NO-NC 2.8 Fast-on

Approval Code
WNU = CE
TA = TUV/UL 1077
DA = UL 1077
DDU = UL 489 (up to 277 Vac)
DNU = None

Time Delay Curve ④
P = Instant
1 = Long delay std. inrush
2 = Medium delay std. inrush
3 = Short delay std. inrush
4 = Long delay 18X inrush
5 = Medium delay 18X inrush
6 = Short delay 18X inrush
7 = Long delay 25X inrush
8 = Medium delay 25X inrush
9 = Short delay 25X inrush
S = Switch only

Current Rating ⑤	
Code	**Current (Amperes)**
R02	0.02
R25	0.25
R50	0.50
1	1
2R5	2.5
5	5
7R5	7.5
10	10
15	15
20	20
25	25
30	30
50	50
60	60
80	80
100	100

Notes

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 three-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 15A current rating. For fractional amperages, use an "R" to designate the decimal point. For 0.10A, enter the code "R10." Current range up to 100A 50/60 Hz, 60A 400 Hz, 100A DC.

AML

AM3L A 2 AE 050 07 DDU 07 15 1

Number of Poles ①

1 = 1-Pole	**5** = 5-Pole
2 = 2-Pole	**6** = 6-Pole
3 = 3-Pole	**7** = 7-Pole
4 = 4-Pole	**8** = 8-Pole

Frequency ②

A = 50/60 Hz
B = DC
C = 400 Hz
D = 50/60 Hz/DC

Internal Circuit Type and Inrush Catalog Code ②

N/A	8X	18X	25X	Internal Circuit
0	—	—	—	Switch only
—	**2**	**9**	**39**	Series trip w/auxiliary
—	**3**	**8**	**38**	Series trip
—	**5**	**22**	**32**	Shunt/tap
—	**6**	**23**	**33**	Relay trip
—	**7**	**27**	**37**	Dual rating
—	**15**	**25**	—	DuCon
—	**16**	**26**	—	DuCon Series+relay
—	**98**	—	—	Mid-trip
—	**99**	—	—	Mid-trip w/alarm switch

Handle Location ③

AE = Single-pole breakers
DE = Multi-pole breakers

Approval Code

WNU = CE
TA = TUV/UL 1077
DA = UL 1077
DDU = UL 489 ④
DNU = None

Auxiliary Switch Options

07 = NO-NC 4.8 Fast-on
52 = NO-NC 2.8 Fast-on
53 = NO-NC 2.8 Fast-on

Terminal/Mounting Catalog Code

Imperial	Metric	Terminal
07	**13**	10–32 threads (70A)
97	**14**	1/4–20 threads (100A)
08	**15**	M5 threads (70A)
98	**16**	M6 threads (70A)
21	**20**	Plug-in 7.77 x 16.6
23	**22**	Plug-in 6.25 x 21.6
25	**24**	Plug-in 6.25 x 15.4
31	**30**	Fuse clip

Illumination Catalog Code

One-Position

Red	Green	Yellow	Blue	Position
050	051	052	053	OFF
054	055	056	057	ON
058	059	060	061	Mid -Trip

Two-Position

Green/ Red	Red/ Green	Yellow/ Blue	Blue/ Yellow	Position
062	063	064	065	ON/OFF

Two-Position

Yellow/ Green	Green/ Yellow	Red/ Yellow	Yellow/ Red	Position
066	067	068	069	ON/OFF

Current Rating ⑥

Code	Current (Amperes)
R02	0.02
R25	0.25
R50	0.50
1	1
2R5	2.5
5	5
7R5	7.5
10	10
15	15
20	20
25	25
30	30
50	50
60	60
80	80
100	100

Curve ⑤

P = Instant
1 = Long delay 8X inrush
2 = Medium delay 8X inrush
3 = Short delay 8X inrush
4 = Long delay 18X inrush
5 = Medium delay 18X inrush
6 = Short delay 18X inrush
7 = Long delay 25X inrush
8 = Medium delay 25X inrush
9 = Short delay 25X inrush
S = Switch only

Notes

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 three-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 15A current rating. For fractional amperages, use an "R" to designate the decimal point. For 0.10A, enter the code "R10."

Product Selection

The following catalog numbers can be ordered from stock.

Standard Style (AMR)

AMR Standard Black Toggle Current

Current (Amperes)	Curve	Single-Pole Catalog Number	Two-Pole Catalog Number	Three-Pole 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**

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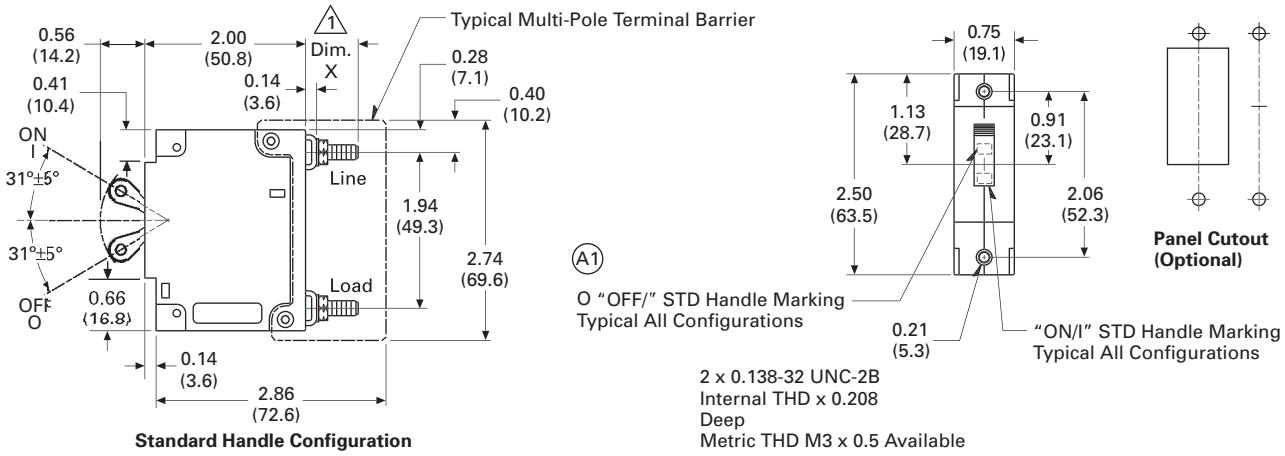
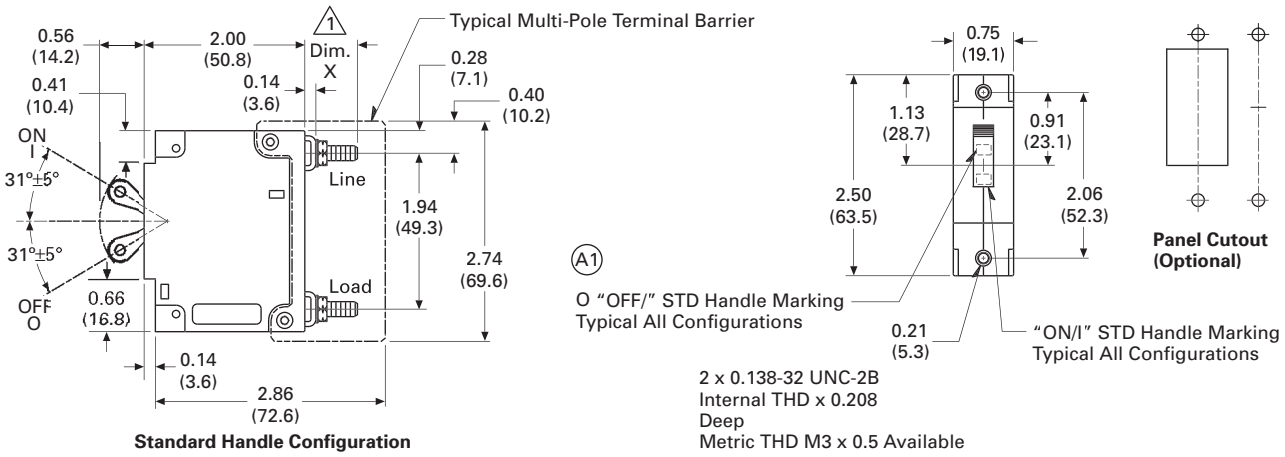
Dimensions

Approximate Dimensions in Inches (mm)

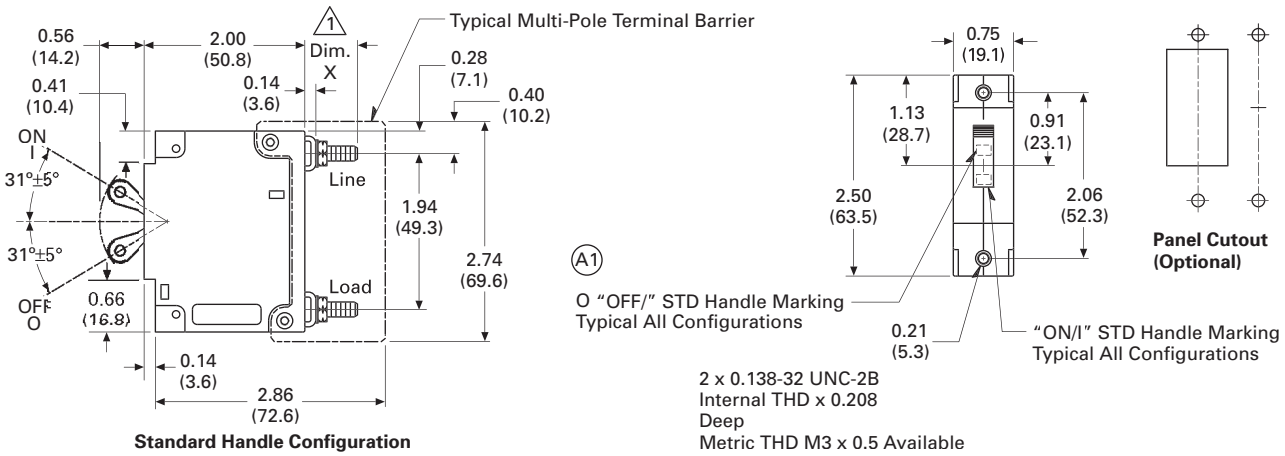
AMR Handle Configuration and Typical Dimensions



ACR Typical Dimensions



AML Typical Dimensions



C Series

CD Rear Connection Front Mounting

CF Front Connected Back Panel Mounting

Contents

C Series

Product Description

Eaton's hydraulic-magnetic 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

Listed

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Catalog Number Selection

C Series

CD 3 G 3 DU 0015 02 A

Style
CD = Front mount
CF = Back mount

Number of Poles ①②
1 = 1-Pole
2 = 2-Pole
3 = 3-Pole
4 = 4-Pole
5 = 5-Pole
6 = 6-Pole

Voltage and Frequency Code

Code	Frequency	Terminal Location
A	50/60 Hz	Back
B	DC	Back
G	50/60 Hz	Front
H	AC/DC	Front

Internal Circuit Type and Inrush Catalog Code

N/A	STD	25X	Internal Circuit
0	—	—	Switch only
—	**2**	**9**	Series trip w/auxiliary switch
—	**3**	**8**	Series trip

Approval Code
DU = UL 489—240 Vac or 125 Vac maximum
AB = UL 508—480 Vac maximum
AE = UL 508—600 Vac maximum

Current Rating ③

Voltage Rating
A = 0–250 Vac
B = 251–600 Vac
C = 0–125 Vac
D = 126–160 Vac

Time Delay Curve
01 = Long delay std. inrush
02 = Medium delay std. inrush
03 = Short delay std. inrush
100 = Motor start curve
10 = Long delay 25X inrush
20 = Medium delay 25X inrush
30 = Short delay 25X inrush

Notes

① Select from one to six poles, and enter the number in position 3 of the catalog number. For example, a CD3 would identify a three-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 15A current rating. For fractional amperages use an "R" to designate the decimal point. For 0.10A, enter the code "0R10." Available from 0.10 to 50A.

Product Selection

Standard Catalog Numbers

Standard C Series breakers are UL listed for applications at 240V 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 below. 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.

CD Rear Connection Front Mounting

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.

Number of Poles	Current (Amperes)	Curve	Catalog Number
1	15	2	**CD1A3U001502A**
1	15	3	**CD1A3U001503A**
1	15	2	**CD1A3U001502A**
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**

Number of Poles	Current (Amperes)	Curve	Catalog Number
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**

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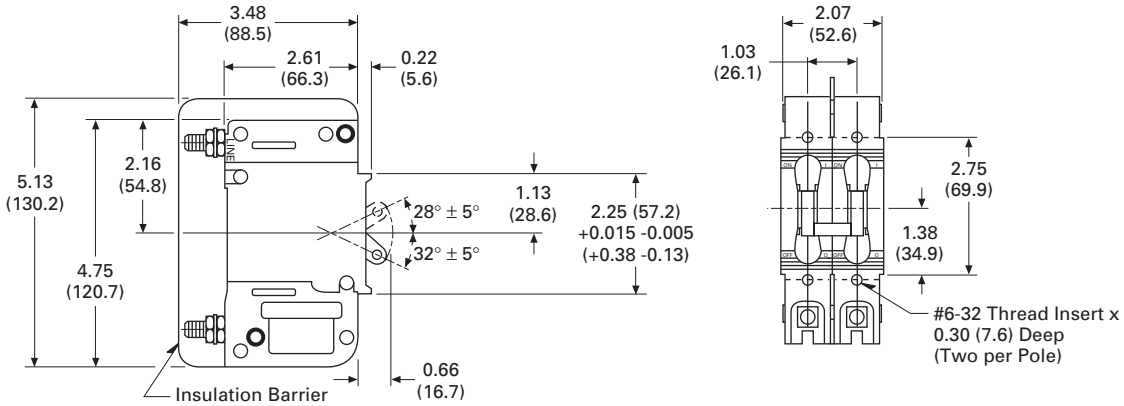
Dimensions

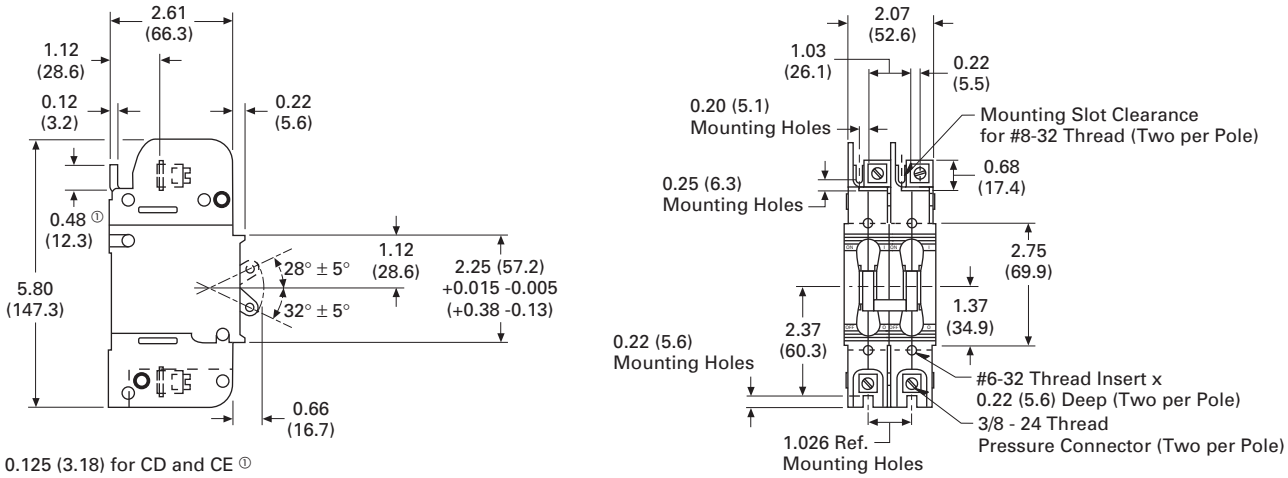
Approximate Dimensions in Inches (mm)

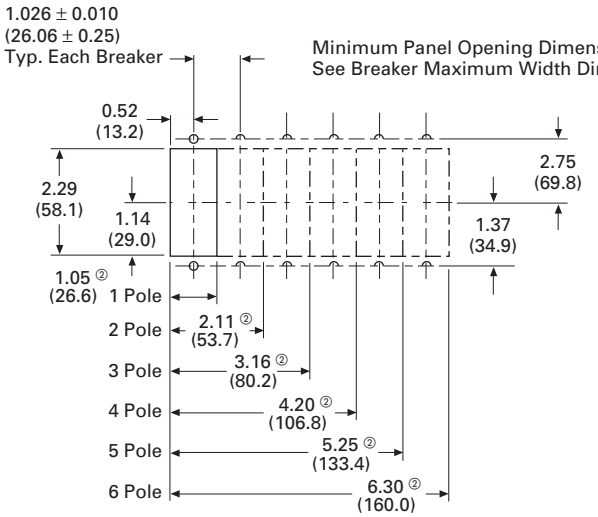
C Series Typical Dimensions

Front Mounted—Back Connected (CD)



Back Mounted—Front Connected (CF)





GH Series

Contents

GH Series

Product Description

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

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
- 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

Standards and Certifications

- Shock—Tested in accordance with MIL-STD-202, Method 213, Test Condition I (100G 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

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Catalog Number Selection

GH Series

GH3 G 3 U 0015 02 B

Number of Poles ①
3 = Three-pole

Voltage and Frequency Code

Code	Frequency	Terminal Location
A	50/60 Hz	Back
B	DC	Back
C	400 Hz	Back
G	50/60 Hz	Front
H	DC	Front
J	400 Hz	Front

Approval Code
U = UL 489—480 Vac or 250 Vac maximum
AB = UL 508—480 Vac maximum
AE = UL 508—600 Vac maximum
A = UL 1077

Internal Circuit Type and Inrush Catalog Code

N/A	STD	25X	Internal Circuit
0	—	—	Switch only
—	**2**	**9**	Series trip w/auxiliary switch
—	**3**	**8**	Series trip
—	**5**	—	Shunt/tap
—	**6**	—	Relay trip

Current Rating ②

Voltage Rating
B = 251–600 Vac
D = 160–250 Vac

Time Delay Curve
01 = Long delay std. inrush
02 = Medium delay std. inrush
03 = Short delay std. inrush
100 = Motor start curve
10 = Long delay 25X inrush
20 = Medium delay 25X inrush
30 = Short delay 25X inrush

Notes
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 15A current rating. GH Series breakers are available from 15 to 100A.

Product Selection

Standard Breaker Configurations
The GH Series can be ordered in a number of standard configurations utilizing the table above. 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.

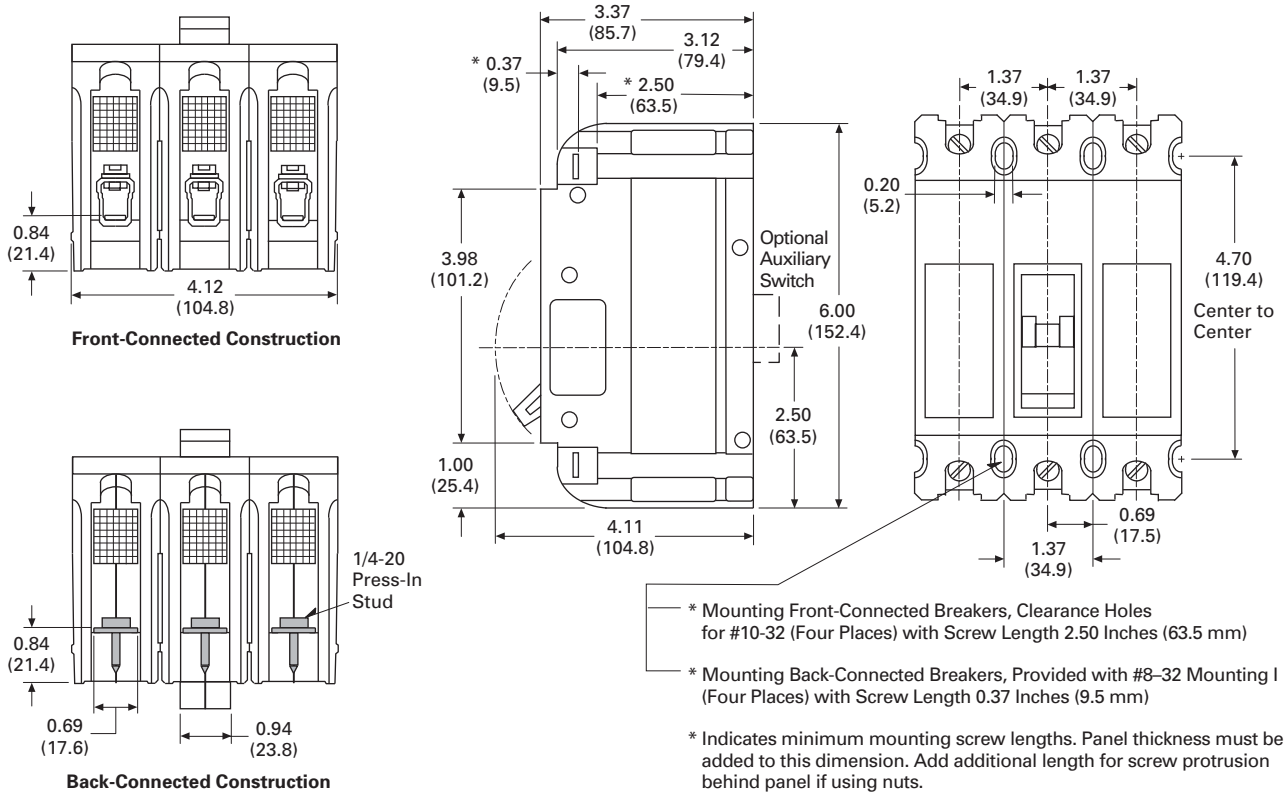
Standard Product Offering

Number of Poles	Current (Amperes)	Curve	Catalog Number
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**

Dimensions

Approximate Dimensions in Inches (mm)

GH Series Basic Dimensions



* Mounting Front-Connected Breakers, Clearance Holes for #10-32 (Four Places) with Screw Length 2.50 Inches (63.5 mm)

* Mounting Back-Connected Breakers, Provided with #8–32 Mounting I (Four Places) with Screw Length 0.37 Inches (9.5 mm)

* Indicates minimum mounting screw lengths. Panel thickness must be added to this dimension. Add additional length for screw protrusion behind panel if using nuts.

AM1P Series

Contents

AM1P Series

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.

Application Description

With a 250A current rating and 50,000A 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 200A in a two-pole design and 250A in a three-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 250A
- Plug-in, screw and stud terminals
- Operating temperature –40°C to +85°C
- Minimum life of 10,000 on/off operations, with 6,000 at rated current and voltage, and 4,000 at no load

Standards and Certifications

The AM1P Series is UL 489A listed.

- Shock-tested 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
- Dielectric strength tested in accordance with MIL-STD-202, Method 1500V at 50/60 Hz, 1100 Vdc (or twice rating plus 1000V)
- Flammability specifications of UL 94-VO Case, UL 94-HB Handle
- Insulation resistance of 100 Mega-ohms minimum at 500 Vdc, per MIL-STD-202, Method 302

UL Listed

Catalog Number Selection

AM1 Series

AM1P B9 LC 97 DDU 07 200 1

Breaker Family
AM1P

Handle Location/Color ①
LC = Multi-pole breakers

Internal Circuit Type and Inrush Catalog Code			
N/A	**18X**	**25X**	**Internal Circuit**
B2	**B9**	**B39**	Series trip w/auxiliary
B3	**B8**	**B38**	Series trip
B5	**B22**	**B32**	Shunt/tap
B15	**B25**	—	DuCon
B16	**B26**	—	DuCon Series+relay
B98	—	—	Mid-trip
B99	—	—	Mid-trip w/alarm switch

Terminal/Mounting Catalog Code		
Imperial	**Metric**	**Terminal**
97	**14**	1/4-20 threads (100A)
98	**16**	M6 threads (100A)
21	**20**	Plug-in 7.77 x 16.6
23	**22**	Plug-in 6.25 x 21.6
25	**24**	Plug-in 6.25 x 15.4
46	**42**	M6 screw
47	**43**	1/4-20 screw

Approval Code
DGU = UL 489A (65 Vac–50 kA)
DAU = UL 489A (80 Vac–10 kA)
DNU = None

Auxiliary Switch Options
07 = NO-NC 4.8 Fast-on
52 = NO-NC 2.8 Fast-on
53 = NO-NC 2.8 Fast-on

Current Rating ②

Curve ③
P = Instant
1 = Long delay 8X inrush
2 = Medium delay 8X inrush
3 = Short delay 8X inrush
4 = Long delay 15X inrush
5 = Medium delay 15X inrush
6 = Short delay 15X inrush
7 = Long delay 22X Inrush
8 = Medium delay 22X inrush
9 = Short delay 22X inrush

Notes

① Specify LC for multi-pole breakers with common trip handle as standard.

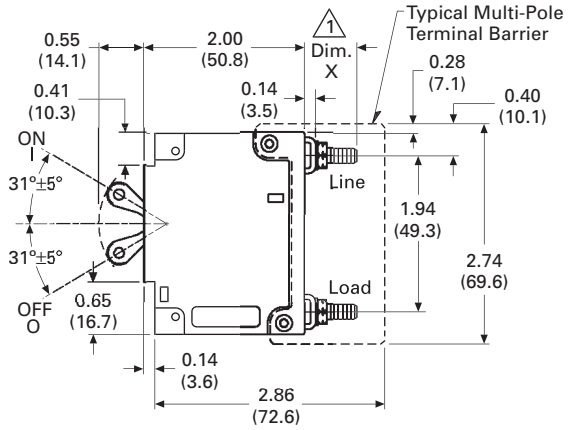
② Enter the three digit current rating from 101 to 250A. 101–200A is configured as two poles in parallel, 201–250A as three poles in parallel.

③ Specific data on trip curves can be found on the Web at www.eaton.com/heinemann.

Dimensions

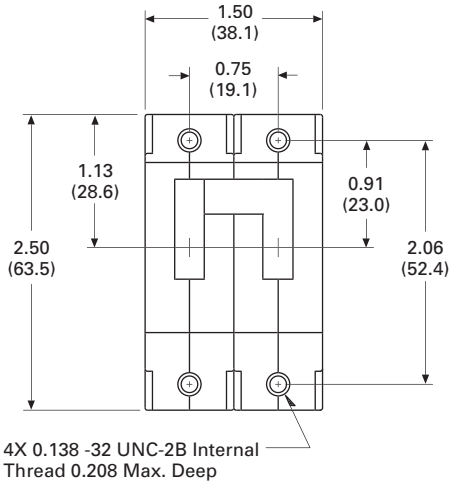
Approximate Dimensions in Inches (mm)

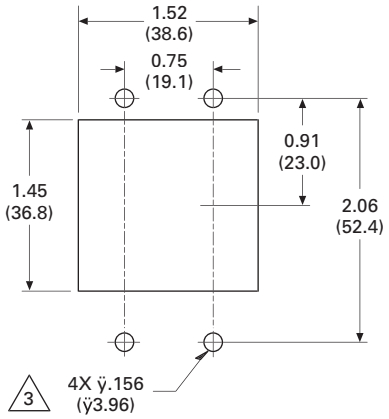
Standard Handle Configuration



Approximate Dimensions in Inches (mm)

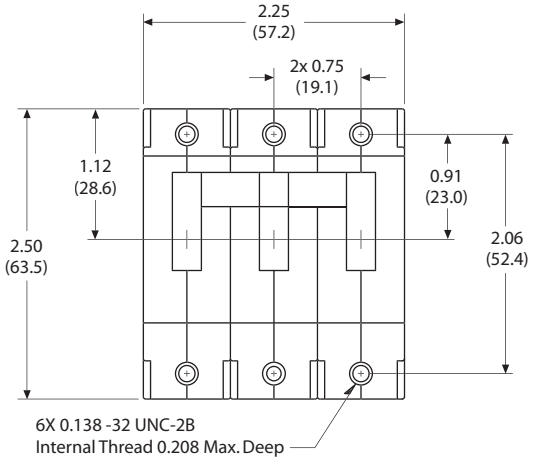
Two-Pole Configuration (101–200A)

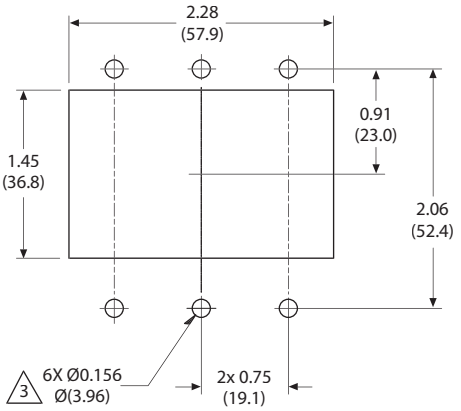




Panel Cutout

Three-Pole Configuration (201–250A)





Panel Cutout

GJ Series

Contents

GJ Series

Product Description

Series GJ hydraulic-magnetic 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 280A.

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

Terminal Types

Standard: front-connected, pressure-wire terminals accepting copper or aluminum wire sizes from 78 to 37 mm^2 (6 to 300 kcmil). Back-connected and many special terminals are available. Consult Customer Service Center.

- Fungus and humidity resistance—MIL-STD-202, Ferrous parts incorporate special moisture-resistant finish. Springs, cases and handles are made from fungus-resistant materials

Optional Features

- Single-, two- or three-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)

Standards and Certifications

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

- 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

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Catalog Number Selection

GJ Series

GJ2 A 3 U 0015 02 A

Number of Poles ①②
1 = Single-pole
2 = Two-pole
3 = Three-pole

Voltage and Frequency Code		
Code	**Frequency**	**Terminal Location**
A	50/60 Hz	Back
B	DC	Back
C	400 Hz	Back
G	50/60 Hz	Front
H	DC	Front
J	400 Hz	Front

Internal Circuit Type and Inrush Catalog Code			
N/A	**STD**	**25X**	**Internal Circuit**
0	—	—	Switch only
—	**2**	**9**	Series trip w/auxiliary switch
—	**3**	**8**	Series trip
—	**5**	—	Shunt/tap
—	**6**	—	Relay trip

Approval Code
U = UL Applications

Current Rating ③

Voltage Rating
A = 0–250 Vac
C = 0–125 Vac

Time Delay Curve
01 = Long delay std. inrush
02 = Medium delay std. inrush
03 = Short delay std. inrush
100 = Motor start curve
10 = Long delay 25X inrush
20 = Medium delay 25X inrush
30 = Short delay 25X inrush
0P = None

Notes

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 two-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 15A current rating. Breakers are available from 100 to 280A.

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.

Technical Data and Specifications

- Standard maximum voltages:
  - GJ1, GJ2 and GJ3: 240 Vac, 50/60/400 Hz
  - GJ1: 125 Vdc
  - GJ2: 125/250 Vdc
- 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
- Operating temperature range: 40°C to +85°C

GJ Series

Contents

GJ1P Series

Product Description

Eaton's GJ1P breakers offer high-quality circuit protection for DC applications from 100 to 200A.

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 100,000A at 65 Vdc up to 1200A.

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 1200A 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.

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Catalog Number Selection

GJ1P Series

GJ1P B 3 P EDU 0700 02

Number of Poles ①②
1 = Single-pole
2 = Two-pole
3 = Three-pole

Terminal Location
B = Back
H = Front

Internal Circuit Type
0 = Switch only
2 = Series trip w/auxiliary switch
3 = Series trip
98 = Series/mid trip
98 = Series/mid/alarm switch

Metering Shunt
P = None
M = 25 mV
N = 50 mV

Terminal Configuration
DDU = Solderless connector
EDU = Bus bar connection

Current Rating ③

Time Delay Curve
01 = Long delay std. inrush
02 = Medium delay std. inrush
03 = Short delay std. inrush
0P = Instant

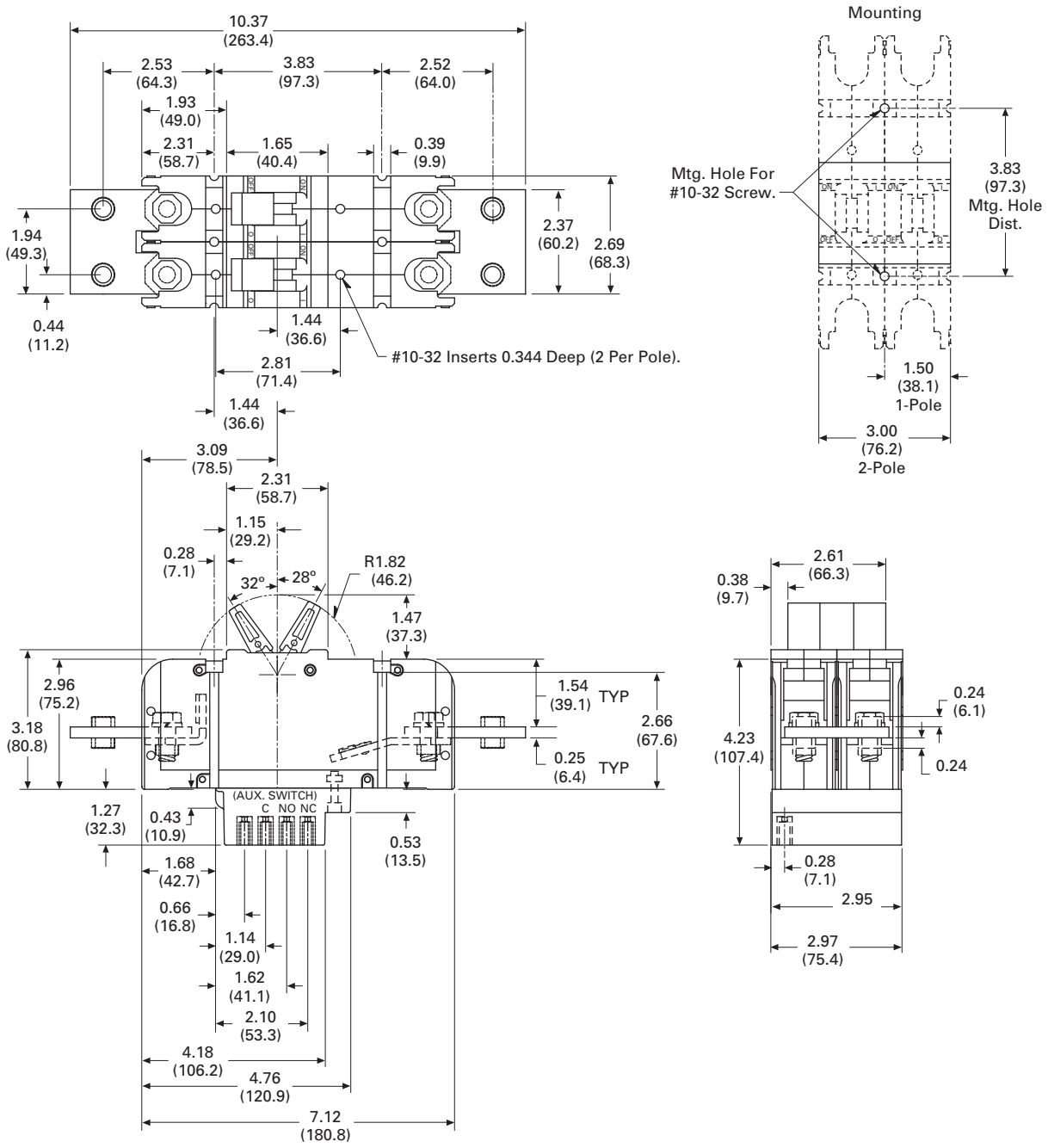
Notes

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 single-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 15A current rating. Breakers are available from 100 to 280A.

Dimensions

Approximate Dimensions in Inches (mm)

GJ1P Typical Dimensions



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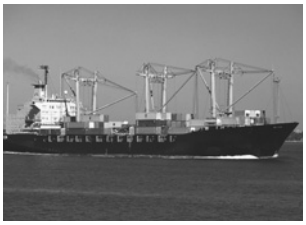
Industrial Solutions

Marine Industry



Eaton Breakers for Marine Craft

Where there is a need for small, lightweight, low-cost reliable circuit breakers, boat designers have found Eaton's hydraulic-magnetic breakers an excellent choice. Long a standard in the industry, they 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 an Eaton circuit 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 hydraulic-magnetic 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 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.

AMR Series

Sealed Toggle JE

DC Circuit Breaker Panel

Telecommunications

Powering Wireless Telecommunications

Eaton's hydraulic-magnetic 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 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 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 other Eaton products.

At Eaton, 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.

Intergrated Distribution Module

DC Busbar System for 0U Space