

SPHM — Supplementary Protector



Single-Pole



2-Pole



3-Pole

Product Description

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

Application Description

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

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

Features, Benefits and Functions

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

Standards and Certifications

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

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Product Specifications

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

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

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

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

Technical Data and Specifications

Table 11-62. Short Circuit Capacity

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

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Approximate Dimensions

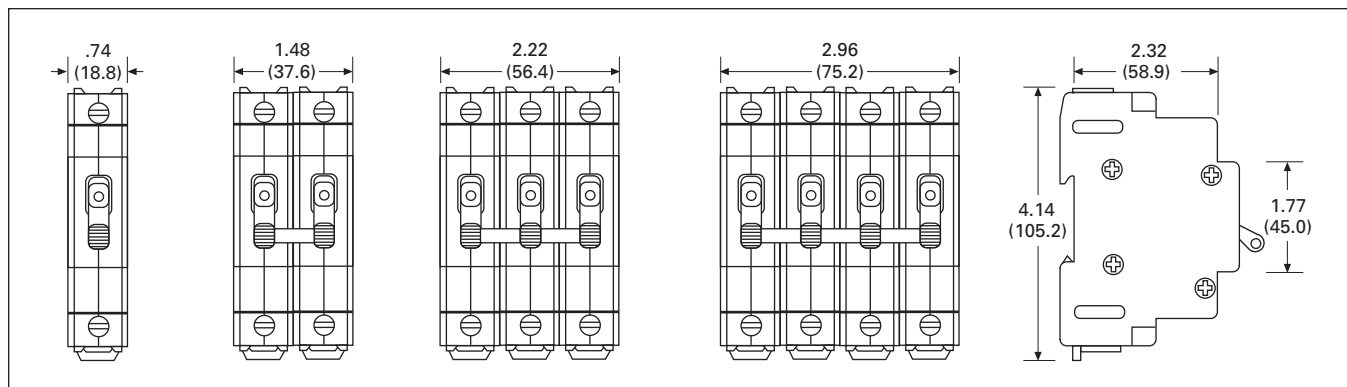


Figure 11-32. Approximate Dimensions in Inches (mm) — Not for Construction Purposes

Table 11-63. SPHM — Shipping Data

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

Trip Curves

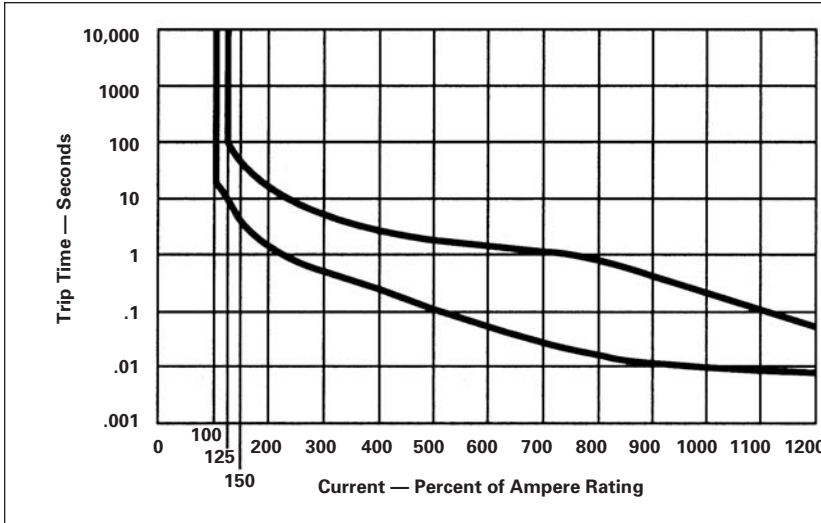


Table 11-64. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

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

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

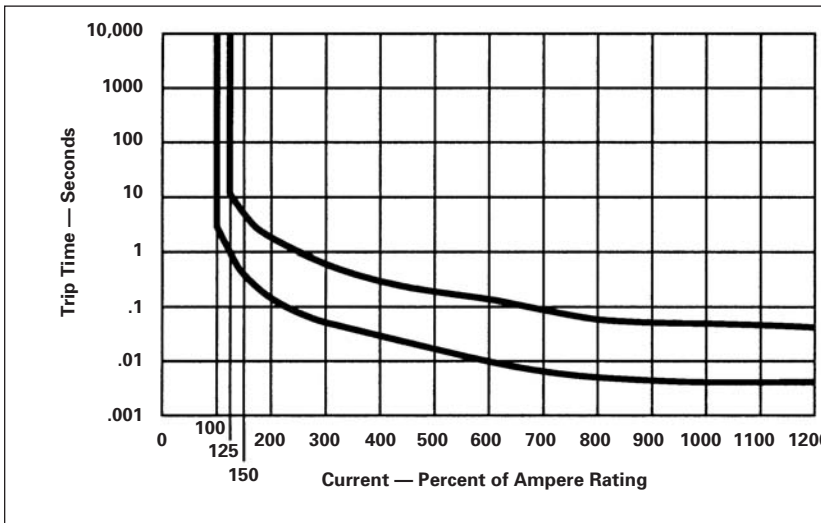


Table 11-65. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

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

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

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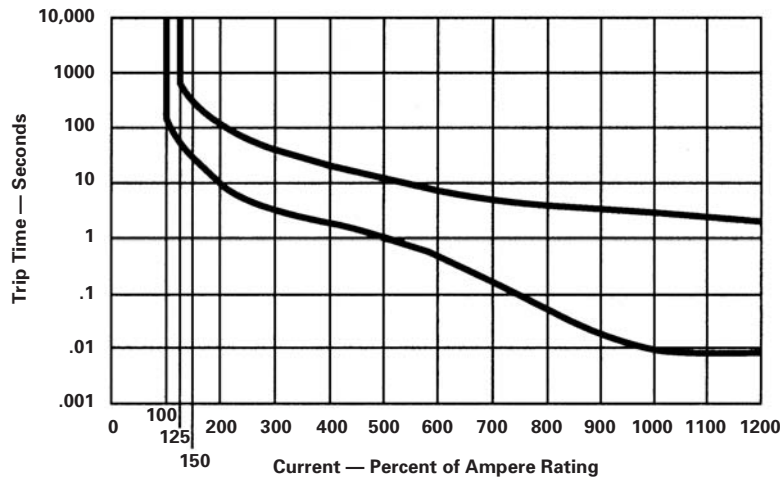


Table 11-66. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

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

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

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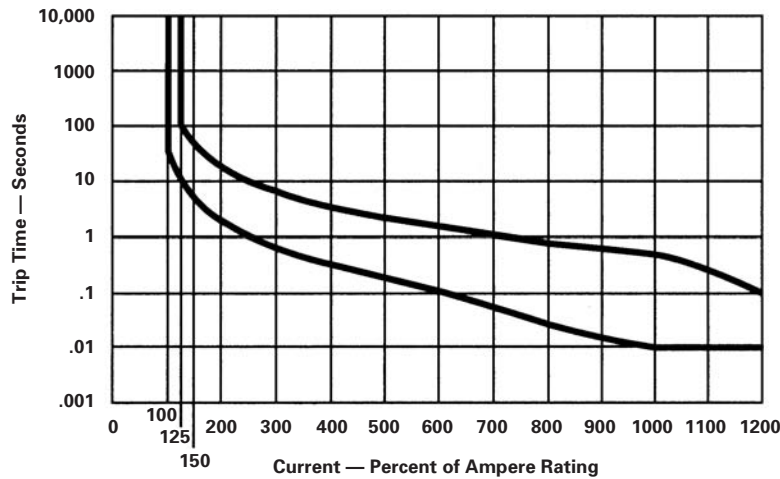


Table 11-67. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

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

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

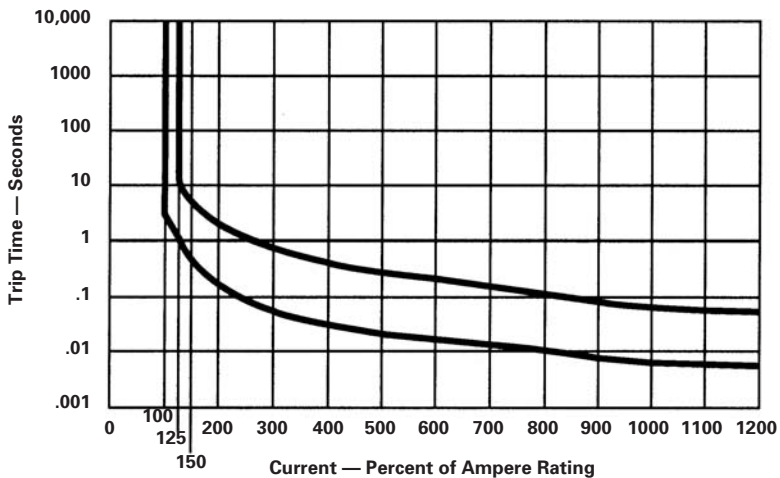


Table 11-68. Percent of Rated Current vs. Trip Delay at 25°C; Breakers Not Preloaded

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

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

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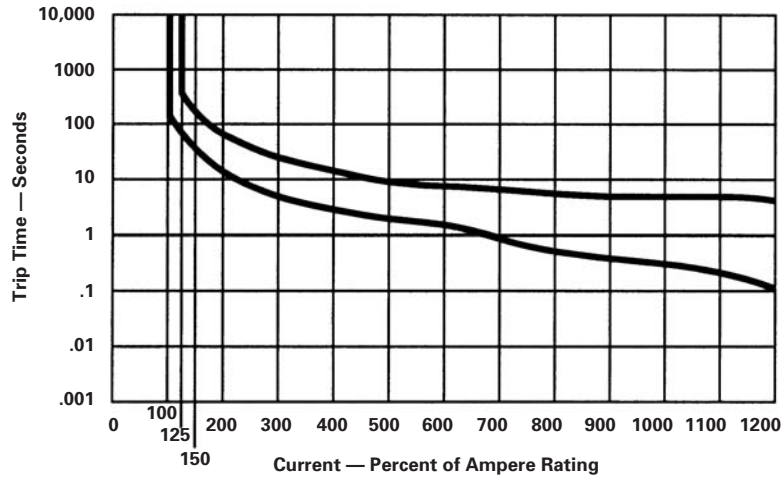


Figure 11-38. 25X Continuous Current — Curve 251, Long Delay, Option L

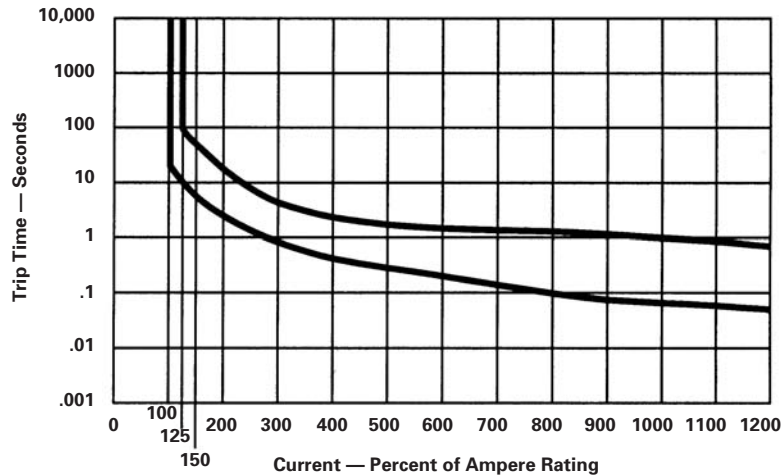


Figure 11-39. 25X Continuous Current — Curve 252, Medium Delay, Option M

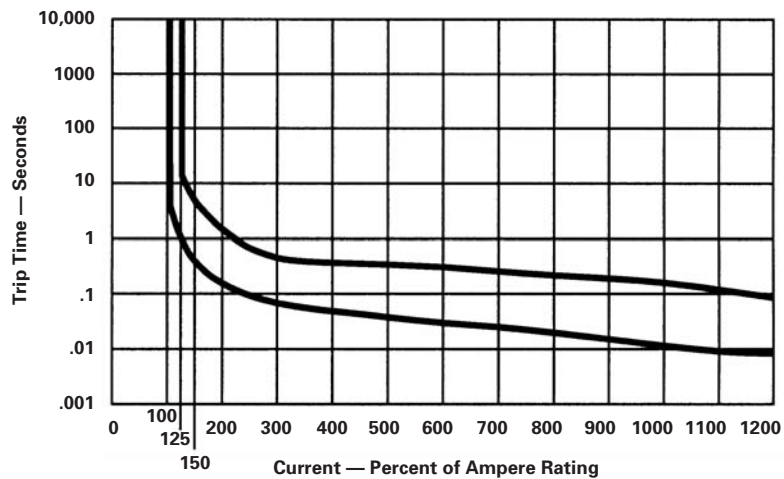
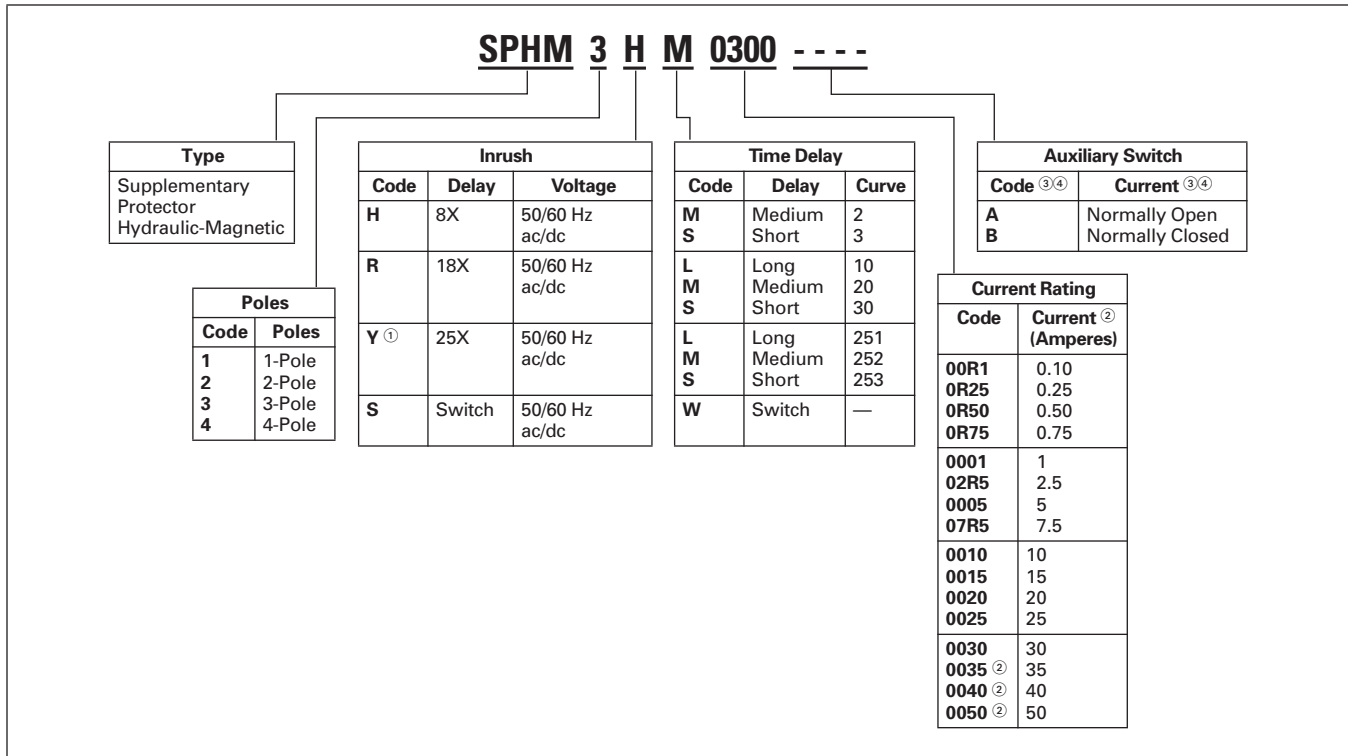


Figure 11-40. 25X Continuous Current — Curve 253, Short Delay, Option S

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Product Selection

Table 11-69. SPHM Catalog Numbering System



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

Table 11-70. SPHM Product Selection ^⑤

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

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

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

Discount Symbol SP-1