

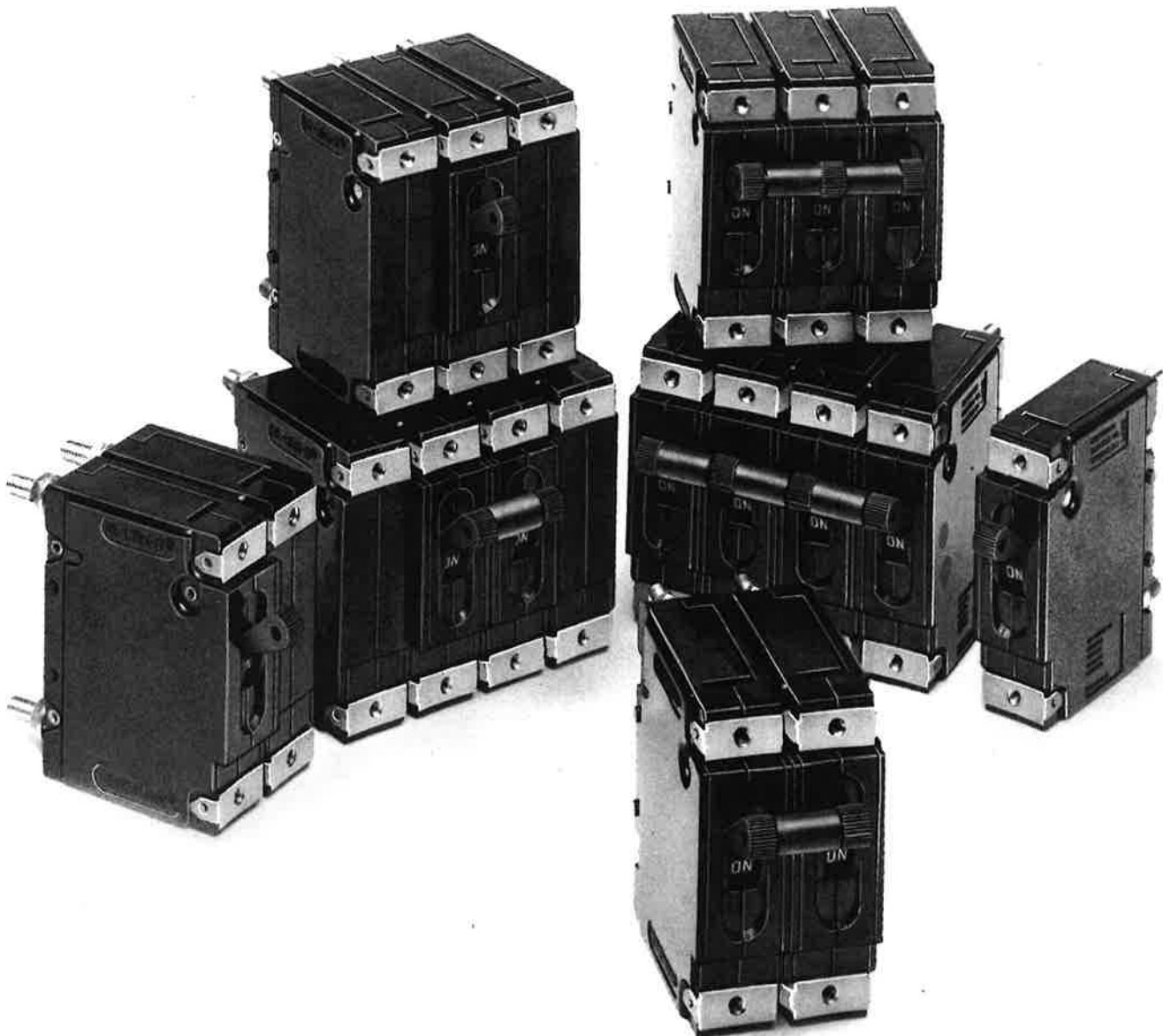
Heinemann®

Circuit Breakers

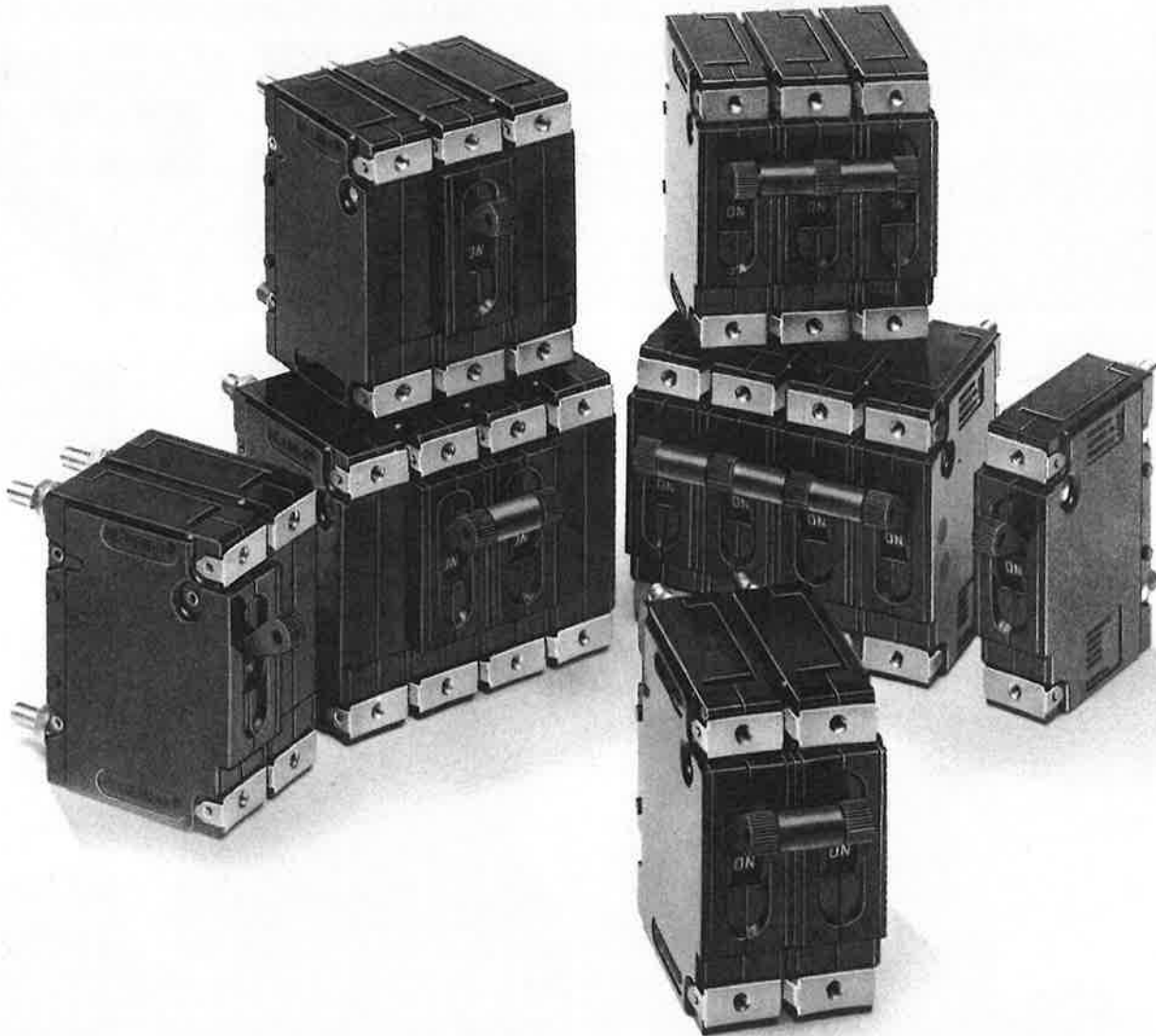
EATON

Series AM/S

- Small, lightweight
- Meets VDE 0730 requirements
- Rating: 0.02 to 100A



Bulletin AM/S



Series AM/S "world class" circuit breakers meet International Standard IEC 380 and German Standard VDE 0730. The 8-mm spacing requirement and dielectric-withstand specification are incorporated into the standard AM breaker housing without changes in size. Hence, AM/S breakers do not require modifications in mounting procedures or the use of adapter plates.

When properly installed as original equipment on AC circuits, the combination of Series AM/S and CD or CF breakers requires no additional protection. Series AM/S breakers rated at 65Vdc provide both overcurrent and short-circuit protection where circuit-interrupting capacity does not exceed 5000 amperes. Models with auxiliary switch or switches meet the VDE isolation requirement for safe, extra-low voltage secondary circuits with respect to primary or hazardous voltage circuits.

UL and CSA recognition

The AM breaker (Models AM1 through AM4) is recognized by Underwriters' Laboratories as a Supplementary Protector per UL Standard UL 1077 (UL File No. E-39309), and certified by the Canadian Standards Association under CSA File No. LR-9646-46. Recognition and certification covers all current ratings from 0.10 to 50 amperes at 250 Vac (50/60 and 400 Hz), at 415 V 50/60 Hz, and 100 amperes at 65 Vdc. Current ratings 0.10 to 30 amperes are UL recognized and CSA certified to 480 V, 50/60 Hz.

Recognition at 415 V and 480 V refers to 3- and 4-pole models used only in a 3-phase wye-connected circuit and backed up with a Heinemann® Series CD3 or CD4 480 V 100 A breaker as group controller, providing an interrupting capacity of 3000 amperes.

Features which account for the popularity and widespread use of Heinemann AM breakers are standard in the AM/S models:

- Current range up to 100A 50/60 Hz, 60A 400 Hz, 100A dc
- Available with ac/dc rating
- Available in one-, two-, three- and four-pole models
- Common trip on multipole breakers
- UL and CSA recognition
- Moisture and fungus resistant
- Low cost, lightweight

AM/S models also feature:

- Choice of one handle for each pole or single handles on 1-, 2- and 3-pole breakers; double handle on 4-pole model
- Handles knurled for positive grip

General Specifications

Electrical Ratings

While the tables below give standard and UL-recognized ratings, it is possible to obtain any integral or fractional continuous-current rating from 0.020 through 60 amperes, ac and dc and also ratings of 70 and 100 amperes. A complete list of ratings with interrupting capacities for each is given below.

Available Ratings

Maximum voltage	Current range (Amp)	Interrupting capacity (Amp)
125 V 50/60 Hz	0.020-60, 70, 100	2000
250 V 50/60 Hz	0.020-100	1000
250 V 400 Hz	0.020-60	1000
65 Vdc	0.020-100	5000

UL-Recognized Ratings

Maximum voltage	Current range (Amp)	Interrupting capacity (Amp)
250 V 50/60 Hz	0.1-50	5000*
250 V 50/60 Hz	0.1-100	1000***
277 V 50/60 Hz	0.1-50	5000*
415 V 3 ϕ Y 50/60 Hz	0.1-50	3000**
480 V 3 ϕ Y 50/60 Hz	0.1-30	3000**
250 V 400 Hz	0.1-50	1000*
65 Vdc	0.1-100	5000***

*AC units require 4 times rated back-up fusing, 15 A min.

**See details on page 2.

***Units do not require back-up fusing.

International Specifications. Series AM/S breakers are designed to meet the requirements of IEC-380, IEC-435, IEC-601, VDE-0730, VDE-0750, VDE-0804, VDE-0806.

Environmental Data. Designed to meet MIL-C-55629 as specified below.

Fungus- and Moisture-Resistance is provided by treating all ferrous parts with a special moisture-resistant finish and by using special springs and inherently fungus-resistant phenolic cases, covers and handles. Tested for moisture-resistance per MIL-STD-202, Method 106; tested for salt-spray resistance per MIL-STD-202, Method 101.

Humidity. Tested in accordance with MIL-STD-202, Method 103, test condition A.

Shock and Vibration. Tested for shock in accordance with MIL-STD-202, Method 213, test condition I (100 G's at 6 milliseconds). Tested for vibration in accordance with MIL-STD-202, Method 204: 10 to 500 Hz, 0.06" total excursion on three mutually perpendicular planes. Shock and vibration tests are conducted with breakers carrying full rated current. Shock and vibration specifications apply to time-delay breakers only.

Operating Temperature. -40°C to +85°C.

Dielectric Strength. Tested in accordance with MIL-STD-202, Method 301; 1500V at 50/60 or 400 Hz, 1100 Vdc (or twice rating plus 1000 V).

Insulation Resistance. 100 megohms minimum at 500 Vdc, per MIL-STD-202, Method 302.

Endurance. Breakers are subjected to an endurance test consisting of 10,000 on/off operations; 6000 at rated current and voltage, 4000 at no load.

Approximate Weights. AM1S, 3 oz; AM2S, 6.5 oz; AM3S, 9.5 oz; AM4S, 12.5 oz.

How to order standard Series AM/S circuit breakers

NOTE: Standard catalog number must have 18 digits including dashes. See How To Order non-standard when all poles of a multipole unit are not identical.

AM1S -A3- A- 0015 -02 E
 Step 1 Step 2a & b Step 3 Step 4 Step 5 Step 6

Step 1 AM1S

Series prefix (AM) and number of poles (1-4) followed with an S. A standard catalog number will have a black handle with ON/OFF on each pole. Mounting inserts are 6-32 UNC Thread. VDE Labeled breakers will have I/O Handle Markings. If part number being specified does not meet the above parameters, see pages 6 and 7 for non-standard numbers.

Step 2a Table A -A3-

Code	Frequency	Terminal Location	Maximum Voltage
A	60 Hz	Back	250
B	dc (Note 1)	Back	65
D	60 Hz/DC	Back	250 AC/ 65 DC

Add a dash before the code letter

Note: Positive polarity should always be connected to the terminal marked "Line."

Step 2b Table B -A3-

Inrush Code NA Std. 18x 25x	Internal Circuit Construction	VDE Approval
0	Switch only (no coil)	Yes
2 9 39	*Series trip with SPDT aux. switch	Yes
3 8 38	Series trip	Yes
5	Shunt trip (current rated)	Yes
6	**Relay-trip (current rated)	No

Step 3 Table C A-

Suffix code for UL Applications	
A-	250 VAC, 50/60 Hz; 65 VDC
	250 VAC, 400 Hz
--	Non UL (—)

Single digit codes are followed by a dash as shown.
 See page 3 for UL-Recognized ratings.
 Consult factory for additional UL codes.

Single letter code – Add a dash after code (ex. 3-)

Double letter code – Move frequency code selected in Step 2a (Table A) to the left, add a dash after construction code (ex. AM1SA38)

Consult factory for non-standard constructions available.

*On multipole units one aux. switch is supplied. It is located in the left pole when viewed from the front of the breaker. Auxiliary switch rated for 10.1 amps, 125/250 VAC. See page 6 for non-standard part number when additional switches or pole locations are required.

**Relay trip construction does not meet spacing requirements for World Market Applications. Consult factory for construction alternatives.

Step 4 Table D
0015

Standard Current Ratings

Current		Current	
Code	Ampere	Code	Ampere
OR10	0.10	0010	10.00
OR25	0.25	0015	15.00
OR50	0.50	0020	20.00
OR75	0.75	0025	25.00
0001	1.00	0030	30.00
02R5	2.50	0035	35.00
0005	5.00	0040	40.00
07R5	7.50	0050	50.00

For other current ratings consult factory.

Step 5 Table E
-02

Code	Time Delay Curves		
	Inrush Codes		
	Std.	18x	25x
-0P	X		
-01	X		
-02	X		
-03	X		
-10		X	
-20		X	
-30		X	
251			X
252			X
253			X

See time delay curves on pages 11-13 for required delay.

Step 6 Table F
E

Code Voltage Rating

E	0-250 VAC
N	0-65 VDC
H	VDE 380 VAC/65 VDC

VDC 0660 approval applies to DC and 50/60 Hz constructions listed under VDE column in Step 2b, Table B.

How to order non-standard Series AM/S circuit breakers*

*Non-standard part numbers may require a factory assigned part number.

AM2S— Step 1	A3A2— Step 2a & b	L Step 3	A— Step 4	02— Step 5	H— Step 6	A— Step 7	52— Step 8	PN— Step 9	30— Step 10	02 Step 11
-----------------	----------------------	-------------	--------------	---------------	--------------	--------------	---------------	---------------	----------------	---------------

Step 1 AM2S—

Series prefix (AM) and number of poles (1-4) followed by an S.

Step 2a A3A2—

Voltage, frequency and internal circuit for first pole on left as viewed from front of panel, or for all poles if identical, from Tables A and B.

Table A

Code	Frequency	Terminal Location	Maximum Voltage
A	60 Hz	Back	250
A	60 Hz	Back	480
A	60 Hz	Back	415
B	dc (Note 5)	Back	65
C	400 Hz	Back	250
D	60 Hz/DC	Back	250 AC/ 65 DC

Table B

Inrush Code	Internal Circuit Construction	VDE
— Std. 18x 25x		
0	Switch (no overload coil)	Yes
2 9 39	Series trip with SPDT aux. switch (Note 8)	Yes
3 8 38	Series trip	Yes
5	Shunt/Tap	Yes
6	Relay-trip*	No
15 25	Du-Con with Shunt/Tap voltage coil	Yes
16 26	Du-Con with relay-trip voltage coil*	No

*Relay trip constructions do not meet spacing requirements for World Market Applications. Consult factory for construction alternatives. Consult factory for other internal circuits that are available.

Step 2b A3A2—

Repeat Step 2 for second and third poles and subsequent poles if different from first. Repeat aux. switch codes when more than one switch is specified (ex. AM2S-A2A2).

Notes:

1. Specify voltage-rated coils separately. Example: Catalog Number AM1-A5. Voltage coil, intermittent-duty, trips on 250 V, 50/60 Hz AC, Curve P. **2. Relay-trip poles.** Always specify load values for coil and contacts separately. Example: Catalog Number AM1-B6. Coil: 5 amp, 65 Vdc, Curve 3; contacts: 10 amp, 250 V 50/60 Hz. **3. UL/CSA models** are labeled with the UL/CSA-recognized voltage (page 3). The catalog number of the breaker label will contain a special suffix indicating UL/CSA recognition. See Table E. **4.** If voltage is rectifier-produced dc, furnish separately: (a) Full- or half-wave rectification, (b) Number of phases, (c) Filtered or unfiltered. If filtered, give ripple factor or percent filter factor. **5.** Positive polarity should always be connected to the terminal marked "Line." **6.** Voltage rated shunt/tap coils provide tripping on line voltage. **7.** Du-Con voltage coils require 30 VA minimum power to trip instantaneously. **8.** Auxiliary switch rated for 10.1 amps, 125/250 VAC.

Step 3 Table C

L

Number of handles and handle position from Table C.

- A – Single pole unit.
 - B – Two pole unit. Handle on left pole only.
 - D – Three pole unit. Handle on center pole only.
 - L – Handle on each pole.
 - R – Four pole unit. Handle on left center and right center poles only.
- Other configurations available; consult factory.

Step 4 Table D

A—

Handle color and marking from Table D.

	*On/Off	*I-O
Black	A	I
White	B	J
Red	D	L

Other colors available; consult factory

* Standard Color for Marking is White except Black is used on White.

Step 5

02-

Mounting Information:
 02-#6-32 UNC Thread Mounting
 05-M3-0.5 Metric Thread Mounting

Step 7 Table E

A-

Suffix Code, if for UL application, from Table E.
Suffix Code for UL Applications
 A – 250 VAC, 50/60 Hz; 65 VDC; 250V, 400 Hz
 L – 277 VAC, 50/60 Hz
 AD – 415 VAC, 50/60 Hz
 NU – Non-UL Recognized
 AB – 480 VAC, 50/60 Hz
 See page 3 for UL approved ratings.
 Consult factory for additional UL codes.

Step 9

PN-

Customer part number to be marked on breaker.

Step 11 Table H

02

Time delay curve.

Time Delay Curves

Code	Inrush Codes		
	Std.	18x	25x
-0P	X		
-01	X		
-02	X		
-03	X		
-10		X	
-20		X	
-30		X	
251			X
252			X
253			X

See time delay curves on pages 11-13 for required delay.

Step 6

H- or D-

VDE approved (H). Available as shown in Table B.
 (H) voltage – 380 VAC 50/60 Hz, 65 VDC
 or 240 VAC – 400 Hz.
 (D) domestic – no VDE label.

Step 8 Table F

52-

Auxiliary switch information from Table F.
 52 – SPDT 10 Amp .110 Quick Connect Terminals
 54 – SPDT 0.1 Amp .110 Quick Connect Terminals
 Other auxiliary switches available; consult factory.

Step 10 Table G

30-

Current rating in amperes.

Standard Ampere Ratings

0.10	2.5	20	50
0.25	5	25	60
0.50	7.5	30	70
0.75	10	35	100
1	15	40	

Other non-listed ratings are available.
 Consult factory for availability and lead times.

Precise overload protection – with Heinemann Hydraulic-Magnetic circuit breakers

Heat-induced nuisance tripping eliminated

Heinemann hydraulic-magnetic circuit breakers offer three major advantages over thermal devices:

1. 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.
2. Assurance that 100% of the rated current will be carried. There is no such assurance with thermal devices, which may fail to carry rated current when subjected to above-normal ambient temperatures. A Heinemann breaker rated at 20 A, for example, will sustain 20 A, even at elevated temperatures. Derating and other forms of temperature compensation are unnecessary.
3. Immediate reset. Since there are no thermal elements, heat build-up is not a factor. Therefore, no "cooling off" period is required after fault interruption.

Time delay eliminates breaker tripping due to transient current surges

Elimination of transient current surges as a cause of nuisance tripping is accomplished through the creation of a controlled time delay. In any installation where a power supply or compressor motor is on the line,

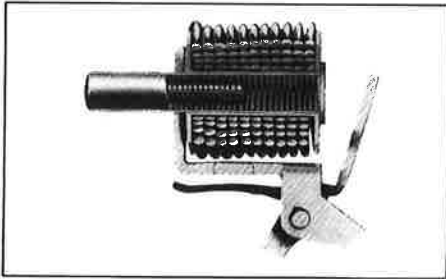
an inrush of current occurs when the equipment is first turned on. The bigger the equipment, the larger the surge. Although inrush surges are, in fact, transient overloads, they usually pose no threat of damage to the line or to the equipment. So, it is not necessary or even desirable to interrupt the power when they occur.

The hydraulically-controlled time-delay mechanism of a Heinemann breaker eliminates nuisance tripping without lessening 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. Except in special high-inrush models, heavy overload and short-circuit currents of greater than 10 times the breaker's rating provide instantaneous response. (An instantaneous-trip breaker is available for use on, for example, modern medical and communication equipment, which can not tolerate even brief overloads.)

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

The Hydraulic-Magnetic principle

How the breaker works



1. The Heinemann hydraulic-magnetic circuit breaker operates on load-current-produced magnetic-flux variations in a solenoid. The coil is wound around a hermetically-sealed, non-magnetic tube containing a spring-loaded, movable iron core in a special-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, so it remains at the end of the tube opposite the armature.



2. With excessive current, the magnetic-flux force increases, pulling the iron core 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 special 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.)



3. 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 alone, regardless of core position, is sufficient to pull in the armature. This circuit interruption occurs with no intentional delay – a highly desirable response characteristic.

Tripping Specifications

Time-Delay-Trip Ranges

Breakers (in standard wall-mount position) shall hold 100% rated load.

60 Hz and DC

Breakers may trip between 101% and 125% rated load; must trip at 125% rated load and above, as shown on time-delay curve selected.

AC/DC

Breakers may trip between 101% and 135% rated load; must trip at 135% rated load and above.

400 Hz

Breakers may trip between 101% and 150%, must trip at 150% and above.

Non-Time Delay Trip Ranges

Breakers have no deliberately imposed delay and will trip instantaneously as specified.

Breakers shall hold 100% load.

Breakers for 50/60 Hz or dc service may trip between 101% and 125% rated load, must trip at 125% rated load and above.

Breakers for 400 Hz service may trip between 101% and 150% rated load, must trip at 150% rated load and above.

Note: All the curves shown describe breaker response with no pre-loading. (Breakers do not carry current prior to application of overload for calibration testing.) Curves are plotted at an ambient temperature of 77°F (25°C), with breakers in the standard wall-mount position. For nonstandard mounting, consult factory.

Time Delay Curve Selection

1. Determine required frequency.
2. Determine required high inrush tolerance (tolerance to starting surges caused by high-reactance loads such as ferro-resonant power supplies which may last up to 8 milliseconds). Select lowest high inrush tolerance compatible with application.
3. Determine required curve characteristics based on application:

Long Time Delay Curve – Motor starting, locked rotor tolerance, general purpose applications.

Medium Time Delay Curve – Transformer protection, capacitor loads, special incandescent lamp loads, general purpose applications (most widely used curve).

Short Time Delay Curve – Electronic equipment.

Instantaneous Curve (no deliberate time delay provided) – Unusual circumstances in electronic equipment and other special applications.

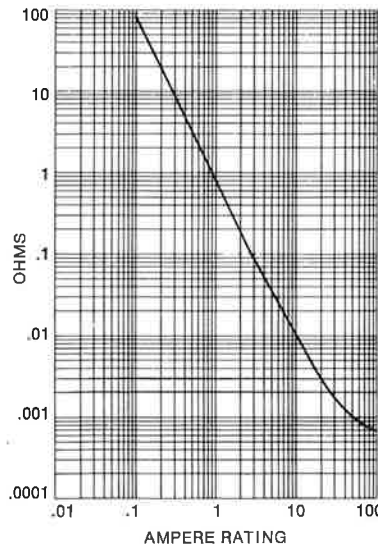
Frequency	High-Inrush Tolerance*			Curve Characteristics			Curve No.				
	50/60 Hz	400 Hz	DC	8X	18X	25X		Long	Medium	Short	Inst.
•	•	•	•	•			•				1
•	•	•	•	•				•			2
•	•	•	•	•					•		3
•		•			•		•				10
•		•			•			•			20
•		•			•				•		30
•		•				•	•				251
•		•				•		•			252
•		•				•			•		253
										•	P

*Multiples of Breaker "Must Hold" Rating

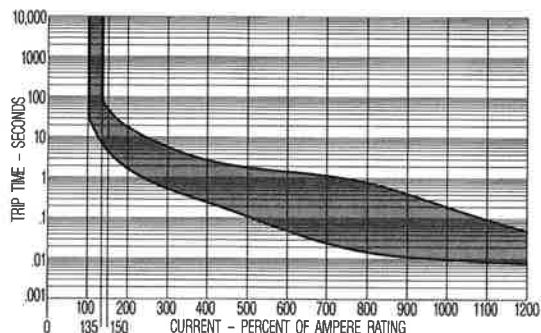
Resistance and Impedance Values

Tolerance Limits

Current (amps)	Tolerance (%)
0.1 to 19.9	± 25
20 to 100	± 35



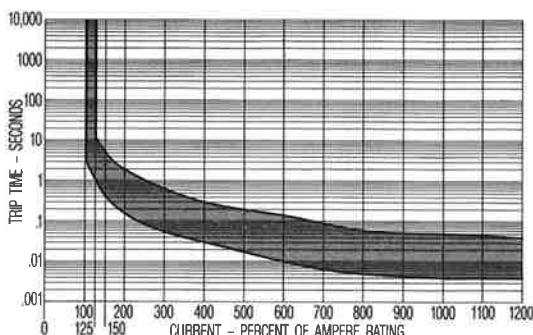
**Curve 2, dc 50/60 Hz
Medium Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	135%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	80	18	2.8	1.5	.8	.2
Delay Minimum (seconds)	no trip	7	1.7	.25	.05	.015	.01

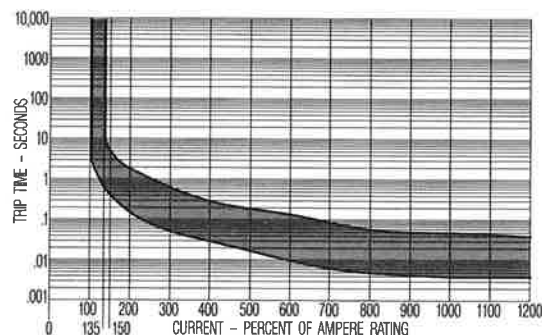
**Curve 3, 50/60 Hz
Short Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	12	1.9	.3	.14	.06	.05
Delay Minimum (seconds)	no trip	1	.15	.03	.01	.005	.004

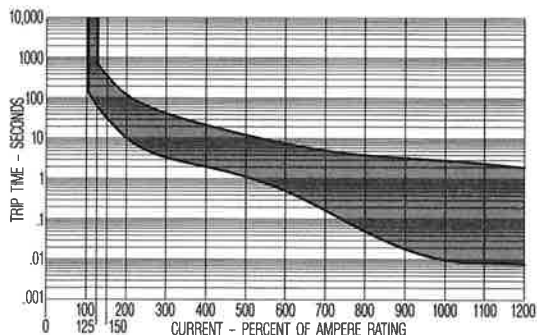
**Curve 3, dc 50/60 Hz
Short Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	135%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	9	1.9	.3	.14	.06	.05
Delay Minimum (seconds)	no trip	.6	.15	.03	.01	.005	.004

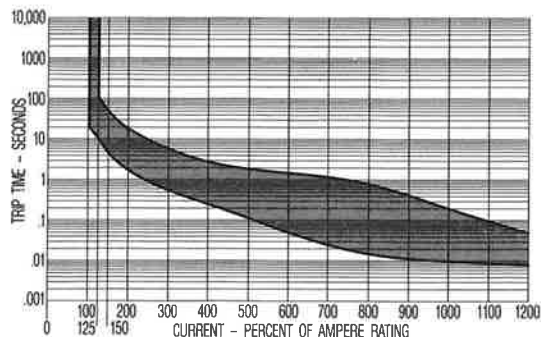
**Curve 10, 50/60 Hz
Long Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	700	120	22	8	4	3
Delay Minimum (seconds)	no trip	60	10	2	.5	.05	.01

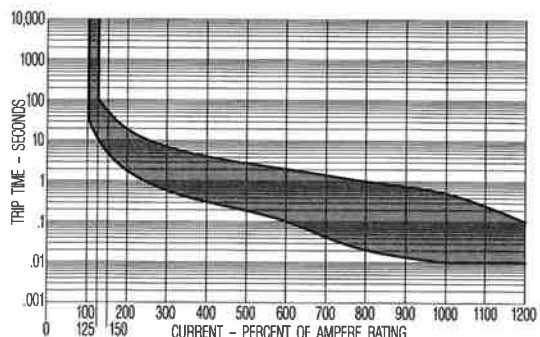
**Curve 2, dc 50/60 Hz
Medium Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	110	18	2.8	1.5	.8	.2
Delay Minimum (seconds)	no trip	10	1.7	.25	.05	.015	.01

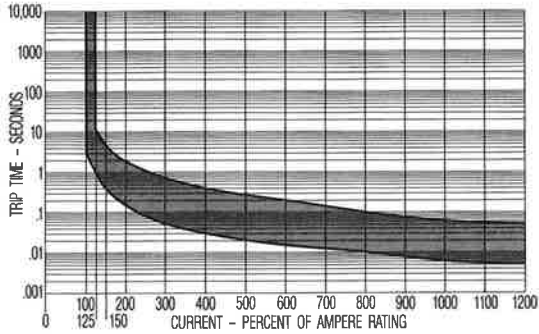
**Curve 20, 50/60 Hz
Medium Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	110	18	4	2	1	.5
Delay Minimum (seconds)	no trip	10	1.7	.3	.1	.02	.01

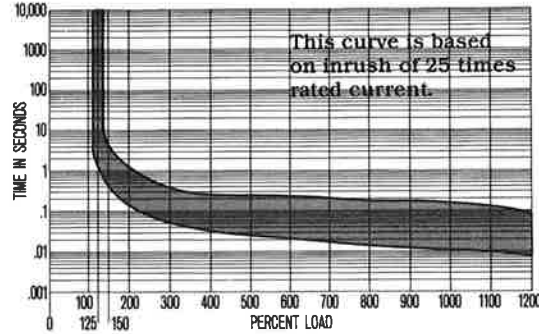
Curve 30, 50/60 Hz Short Delay



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	12	1.9	.4	.2	.1	.06
Delay Minimum (seconds)	no trip	1	.15	.03	.015	.01	.006

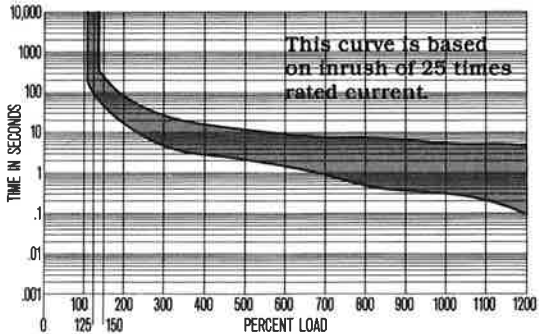
Curve 253, high-inrush 50/60 Hz Short Delay



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	17	1.6	0.40	0.30	0.22	0.15
Delay Minimum (seconds)	no trip	1	0.16	0.05	0.03	0.020	0.012

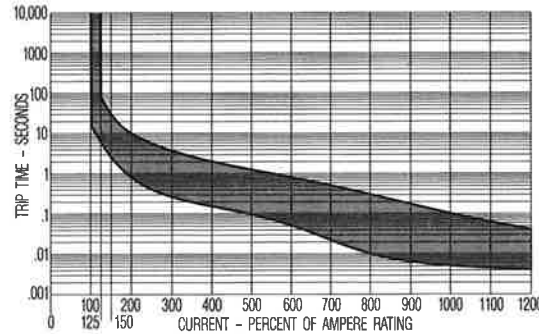
Curve 251, high-inrush 50/60 Hz Long Delay



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	400	70	15	8	6	5
Delay Minimum (seconds)	no trip	75	15	3	1.5	0.5	0.3

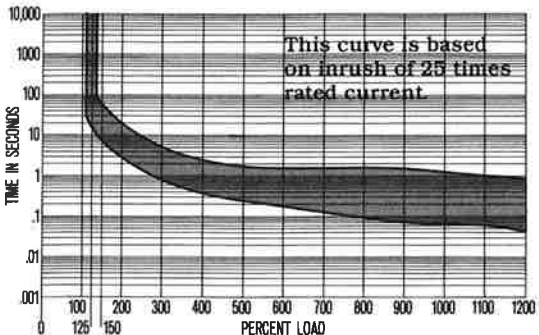
Curve 2, dc Medium Delay



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	80	10	2	8	3	.1
Delay Minimum (seconds)	no trip	6	8	.15	.05	.01	.005

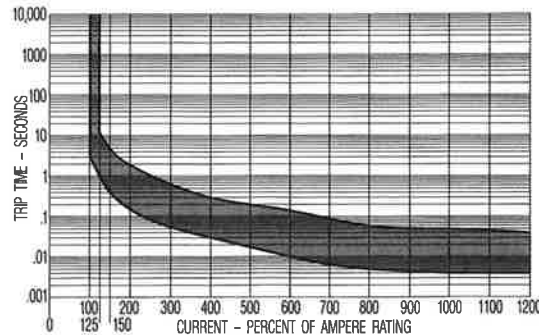
Curve 252, high-inrush 50/60 Hz Medium Delay



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	100	20	2.5	1.6	1.4	1.0
Delay Minimum (seconds)	no trip	10	2.5	0.45	0.22	0.10	0.07

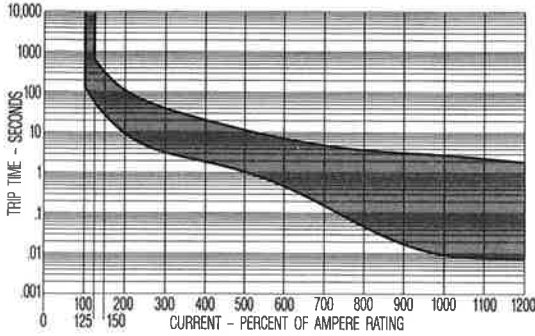
Curve 3, dc Short Delay



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	12	1.9	.3	.14	.06	.05
Delay Minimum (seconds)	no trip	1	.15	.03	.01	.005	.004

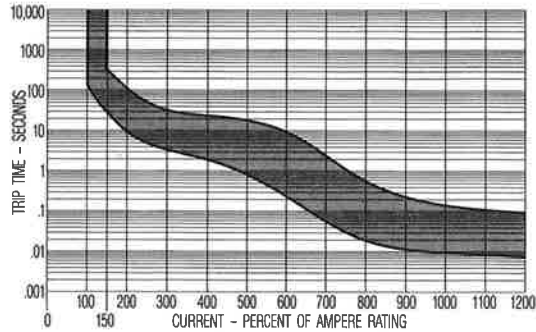
**Curve 10, dc
Long Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	700	120	22	8	4	3
Delay Minimum (seconds)	no trip	60	10	2	.5	.05	.01

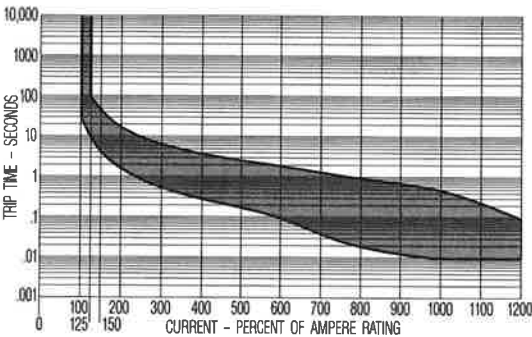
**Curve 1, 400 Hz
Long Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	150%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	350	120	25	10	.6	.15
Delay Minimum (seconds)	no trip	30	10	2	.25	.02	.01

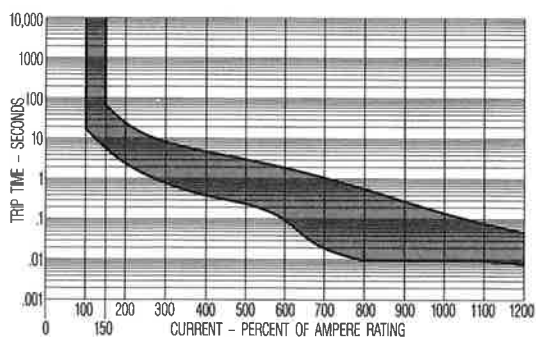
**Curve 20, dc
Medium Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	110	18	4	2	1	.5
Delay Minimum (seconds)	no trip	10	1.7	.3	.1	.02	.01

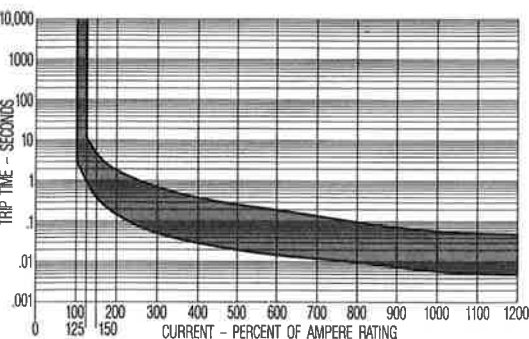
**Curve 2, 400 Hz
Medium Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	150%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	70	26	5	2	.6	.15
Delay Minimum (seconds)	no trip	6	2.5	.4	.1	.01	.01

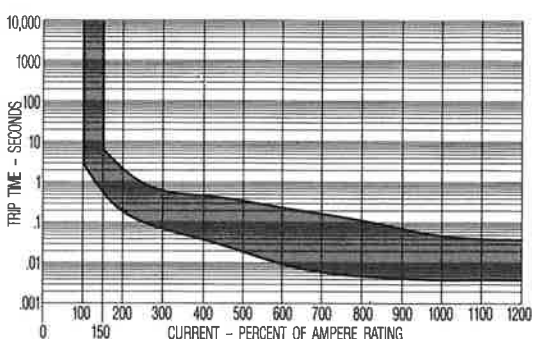
**Curve 30, dc
Short Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

% Overload	100%	125%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	12	1.9	.4	.2	.1	.06
Delay Minimum (seconds)	no trip	1	.15	.03	.015	.01	.006

**Curve 3, 400 Hz
Short Delay**



Percent of rated current vs. trip delay at 25° C; Breakers not preloaded

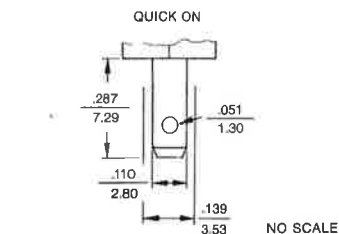
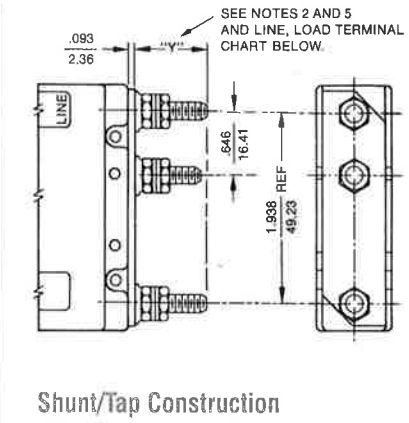
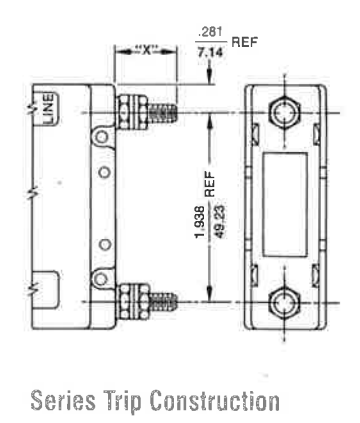
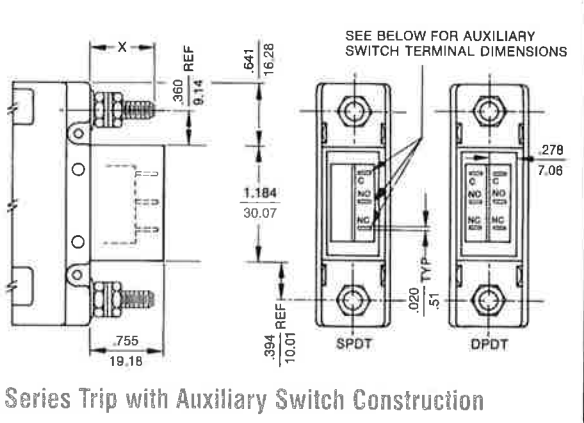
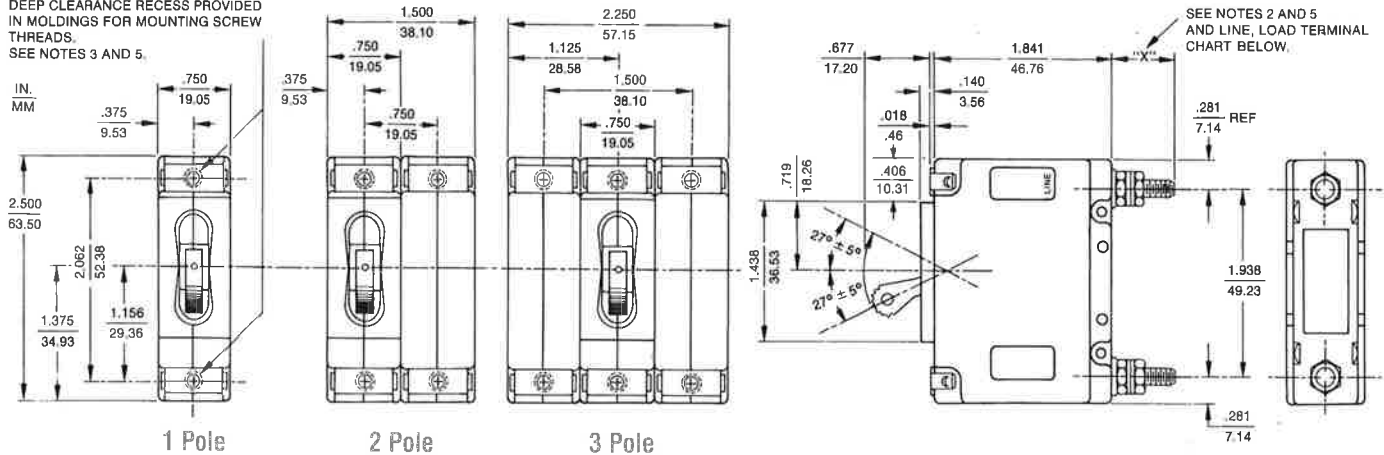
% Overload	100%	150%	200%	400%	600%	800%	1000%
Delay Maximum (seconds)	no trip	7	2.3	.5	.25	.12	.05
Delay Minimum (seconds)	no trip	.6	.2	.04	.01	.005	.004

Dimensions

All dimensions are in inches/mm. tolerance $\pm .020/.51$ except where noted. Dimensions are given here only as preliminary guide to specifying. Final engineering drawings should be made from the latest Heinemann factory drawings, available on request.

Note: Two and three pole units shown with non-standard single handle construction. Standard is handle each pole.

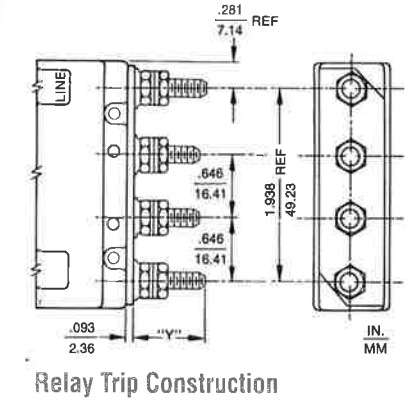
6-32 MOUNTING CLIPS, 2 PER POLE, 5/32 DEEP CLEARANCE RECESS PROVIDED IN MOLDINGS FOR MOUNTING SCREW THREADS.
SEE NOTES 3 AND 5.



	0-70 AMPS	71-100 AMPS
"X" LENGTH	.640/16.26	.695/17.65
"X" DIA/Ø	10-32/M5x0.8	¼-20/M6x1
"Y" LENGTH	.812/20.63	.852/21.64
"Y" DIA/Ø	10-32/M5x0.8	¼-20/M6x1

Terminal length tol. $\pm .062/1.57$

Line Load Terminal Chart

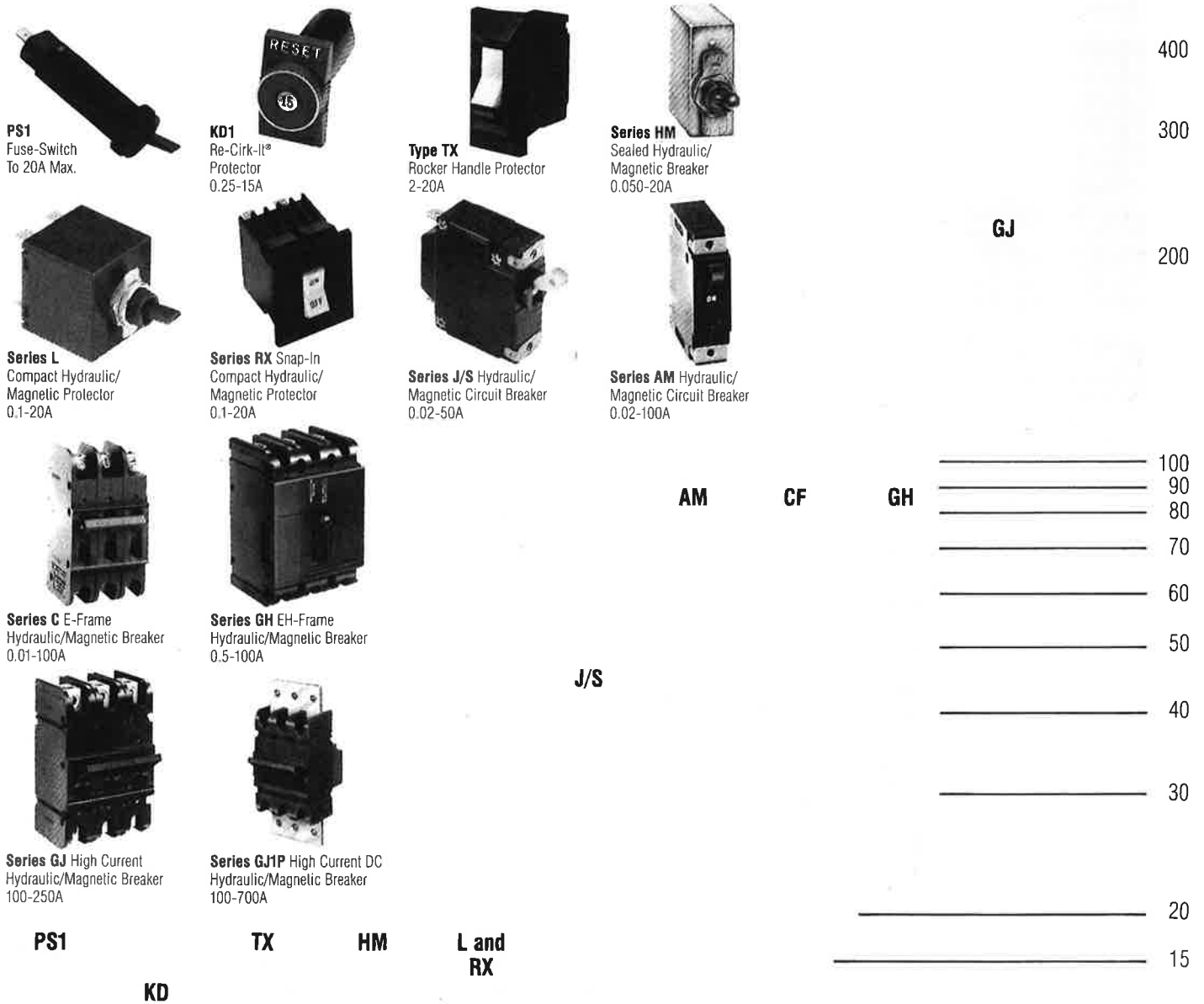


- Notes:**
- Handles are marked "On" "Off." Handles marked "I" "O" are available.
 - 10-32 to 70 amps, ¼-20 above 70 amps, also available, M5x0.8 up to 70 amps, M6x1 above 70 amps.
 - M3x0.5 pitch mounting clips are available.
 - On dc breakers, the positive (+) polarity is always to be connected to the terminal marked "LINE."
 - Tightening torque specifications:

Thread size	Torque
#6-32, M3	5-7 in-lbs
#10-32, M5	15-20 in-lbs
¼-20, M6	30-35 in-lbs

Heinemann Circuit Breakers Series AM/S

For the widest selection of circuit protection, from 0.01 to 700 amperes, look to Heinemann.



Eaton Corporation
Heinemann Products
 P. O. Box 13
 Salisbury, MD 21801
 Phone: (410) 546-9778, Fax: (410) 546-2116



For warranty information, see CMCO Bulletin C-C7.0.

Products described by this catalog are covered by one or more United States of America patents and appropriate foreign patents, where applicable.

Printed in U.S.A.
 DI-131