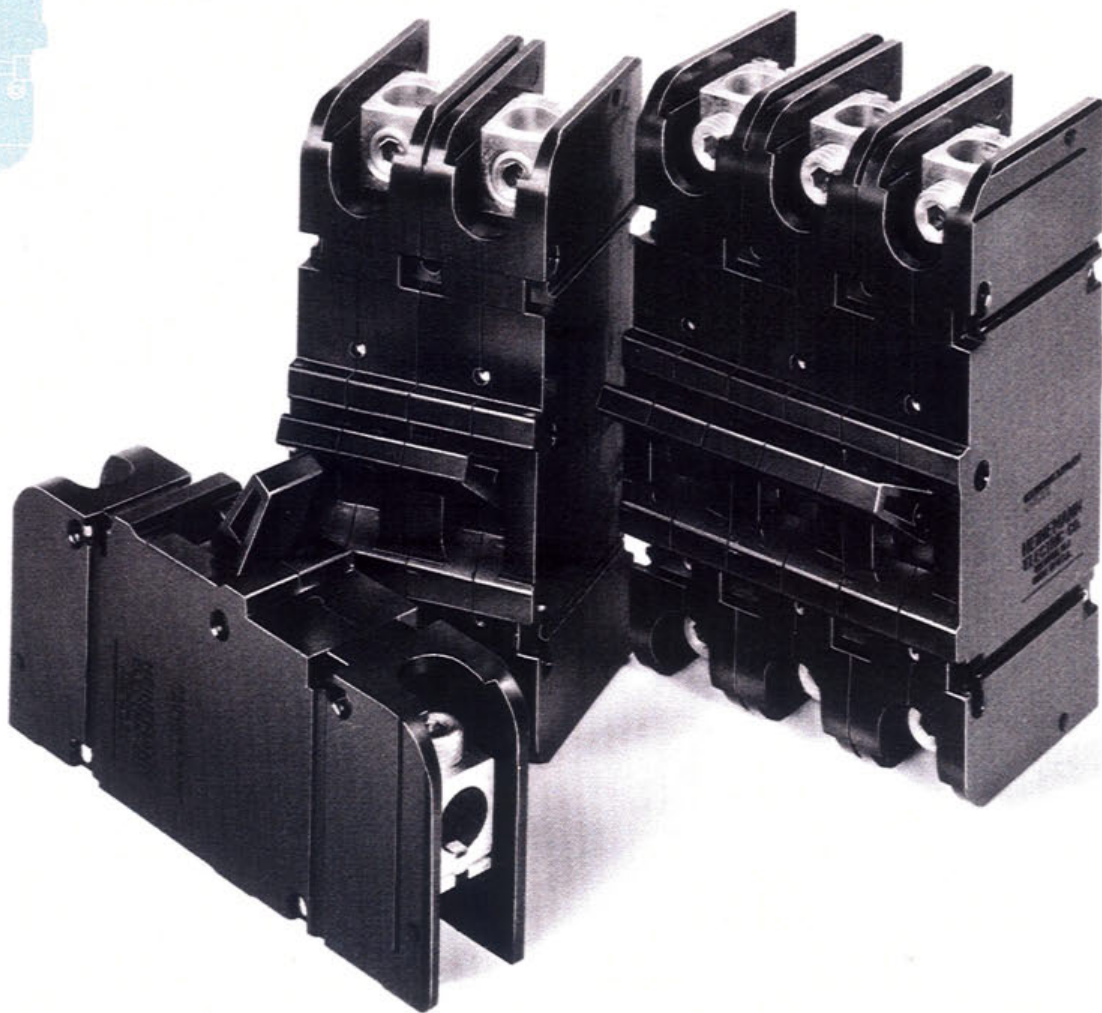


**Heinemann®**  
Circuit Breakers

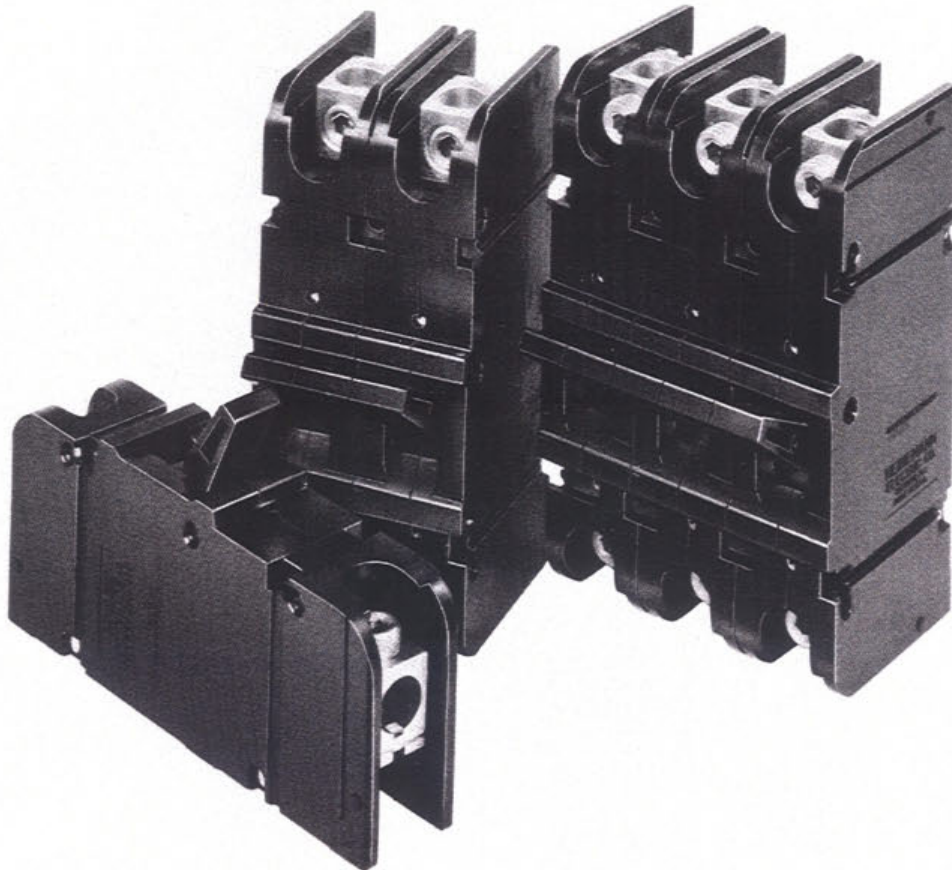
**EATON**

**Series GJ**  
High current fully magnetic  
rated at 100-250A



Bulletin GJ

## Versatile, compact circuit breakers for services up to 250 A at 240 Vac or 250 Vdc.



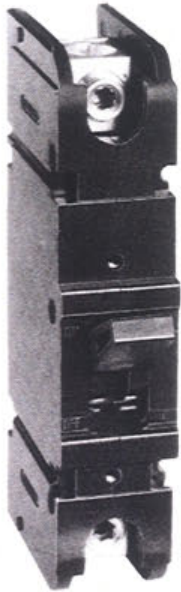
Heinemann® Series GJ circuit breakers are the logical choice for high quality service entrance and panelboard installations, as well as control and protection of commercial and industrial lighting, transformers, motors and power supplies. Their precisely tailored time delays, and ability to interrupt high currents makes them ideal for critical applications with inductive or other loads of up to 250 amperes. On overloads exceeding 1000-1400% of rating the time delay is bypassed, and the breaker operates instantly, interrupting currents of as much as 25,000 A at 65 Vdc or 18,000 A at 240 Vac.

The magnetic/hydraulic 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 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.

The UL-listed Series GJ (UL 489) is available in 1, 2 or 3-pole models, with a choice of fast, medium or slow response times to accurately match load conditions. It can be ordered with auxiliary switch for signaling, or with back-connected series-trip, relay or shunt options, in addition to the standard series-trip configuration.

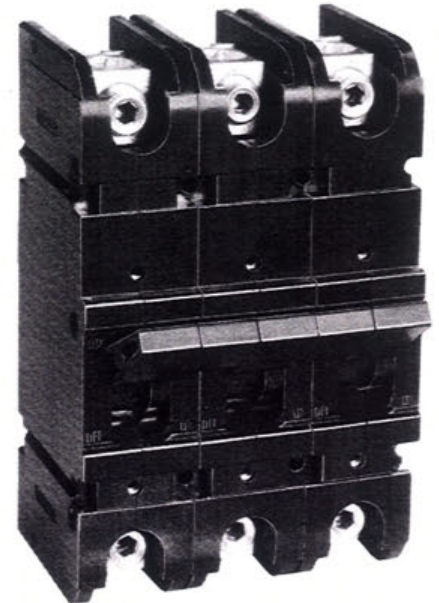
# Electrical ratings and specifications



Single-Pole  
Catalog No. GJ1



Two-Pole  
Catalog No. GJ2



Three-Pole  
Catalog No. GJ3

### Model Numbers

Single-pole breakers: GJ1. Two-pole breaker: GJ2. Three-pole breaker: GJ3. Four-pole breaker GJ4 (consult factory).

### Standard Current Ratings

100, 125, 150, 175, 200, 225 and 250 amperes.

### Standard Maximum Voltages

GJ1, GJ2, and GJ3: 240 Vac, 50/60 Hz, or 240 V, 400 Hz. GJ1: 125 Vdc, GJ2: 125/250 Vdc.

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

### Special Current Ratings

Any integral rating between 100 and 250 A, ac or dc. Contact the factory for ratings below 100 amps.

### Interrupting Capacities

AC (1-pole): 10,000 A at 240 Vac, 50/60 Hz.  
 AC (2- and 3-pole): 18,000 A at 240 Vac, 50/60 Hz.  
 DC (1-pole): 10,000 A at 125 Vdc and 160 Vdc.  
 DC (1-pole): 25,000 A at 65 Vdc.  
 DC (2-pole): 10,000 A at 125/250 Vdc.

### UL Listing

Any integral rating between 100 and 250 A; single, two and three-pole 240 Vac. Any integral rating between 100 and 250 A, single-pole 125 Vdc, two-pole 125/250 Vdc. For CSA Listings consult factory.

### Terminal Types

Standard: Front-connected, pressure-wire terminals accepting copper or aluminum wire in sizes from 6 to 250 MCM. Back-connected and many special terminals are available. Consult factory.

### Multi-Pole Trip Construction

Multi-pole breakers (2- and 3-pole) incorporate true common trip construction. When an overload condition occurs on any pole, the mechanism of that pole actuates an internal tripper bar which is connected to and operates all poles simultaneously. Thus an overload condition on any pole causes all poles to trip.

# Time delay curves and 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 the safe operating limits of the equipment or circuitry.

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

## Curves 10, 20 and 30

**High-inrush** – Time delays similar to Curves 1, 2 and 3 with high-inrush surge capabilities. Contact the factory for high-inrush applications.

## Curve 100

**High-inrush** – For ferro-resonant 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 millisecond (long enough to get the equipment on line without tripping), high-inrush models are available. Contact the factory for high-inrush applications.

**Non-time-delay** breakers have no deliberately imposed delay, and will trip instantaneously at any load above 125% of rated current.

## Ambient Effect on Time Delay

Breakers will hold 100% of rated current regardless of ambient temperature.

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

## Tripping Specifications

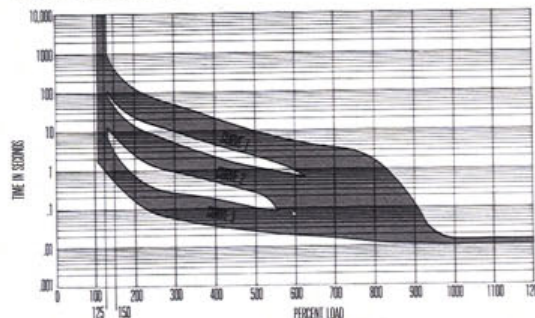
All time-delay curves shown are based on the fact that circuit breakers are not preloaded. (Breakers do not carry current prior to application of overload for calibration testing.) Curves are plotted at an ambient temperature of 77°F (25°C), with breakers in the standard wall-mount position.

All circuit breakers shall hold 100% rated load continuously. Breakers for 400 Hz operation may trip between 101% and 150% of rated load; must trip at 150% and above.

Other 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.

Non-time-delay circuit breakers may trip instantaneously between 101% and 125% of rated load; must trip instantaneously at 125% and above. Non-time-delay 400Hz breakers may trip instantaneously between 101% and 150% of rated load; must trip instantaneously at 150% and above.

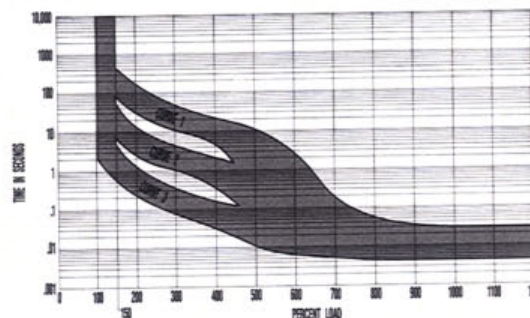
## 50/60 Hz Curves



Percent of rated current vs. trip delay at 25° C

| %               | Curve # | 125% | 150% | 200% | 400% | 600% | 800% | 1000% |
|-----------------|---------|------|------|------|------|------|------|-------|
| Delay Max (sec) | 1       | 1000 | 330  | 120  | 20   | 5    | 1.7  | .05   |
| Delay Min (sec) | 1       | 100  | 48   | 20   | 4    | .9   | .013 | .010  |
| Delay Max (sec) | 2       | 95   | 38   | 12   | 2    | .7   | .2   | .05   |
| Delay Min (sec) | 2       | 13   | 6    | 2.1  | .46  | .03  | .013 | .010  |
| Delay Max (sec) | 3       | 7.2  | 2.5  | .65  | .17  | .08  | .055 | .045  |
| Delay Min (sec) | 3       | .8   | .4   | .15  | .032 | .019 | .013 | .010  |

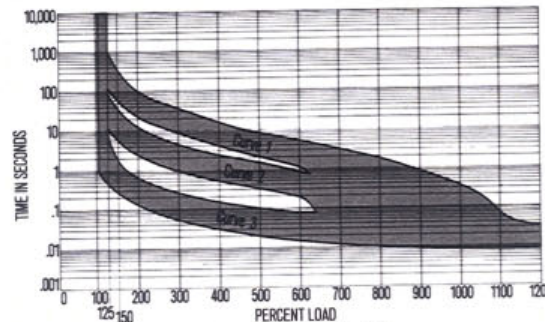
## 400 Hz Curves



Percent of rated current vs. trip delay at 25° C

| %               | Curve # | 150% | 200% | 400% | 600% | 800% | 1000% |
|-----------------|---------|------|------|------|------|------|-------|
| Delay Max (sec) | 1       | 480  | 170  | 20   | 2.7  | .05  | .028  |
| Delay Min (sec) | 1       | 80   | 30   | 4.3  | .03  | .008 | .004  |
| Delay Max (sec) | 2       | 60   | 15   | 2    | .40  | .045 | .028  |
| Delay Min (sec) | 2       | 7    | 2.5  | .35  | .02  | .008 | .004  |
| Delay Max (sec) | 3       | 5    | 1.4  | .15  | .05  | .033 | .028  |
| Delay Min (sec) | 3       | .6   | .23  | .03  | .006 | .004 | .004  |

## DC Curves



Percent of rated current vs. trip delay at 25° C

| %               | Curve # | 125% | 150% | 200% | 400% | 600% | 800% | 1000% |
|-----------------|---------|------|------|------|------|------|------|-------|
| Delay Max (sec) | 1       | 1100 | 360  | 150  | 20   | 6    | 1.7  | .065  |
| Delay Min (sec) | 1       | 110  | 60   | 22   | 4    | 1.1  | .01  | .008  |
| Delay Max (sec) | 2       | 110  | 40   | 15   | 3    | .8   | .28  | .055  |
| Delay Min (sec) | 2       | 12   | 6    | 2.5  | .5   | .18  | .01  | .008  |
| Delay Max (sec) | 3       | 10   | 2    | .8   | .19  | .08  | .047 | .038  |
| Delay Min (sec) | 3       | .44  | .25  | .13  | .03  | .015 | .01  | .008  |

# How to order standard Series GJ 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.

GJ3—    —G3—    U—    0100    —01    A  
 Step 1    Step 2    Step 3    Step 4    Step 5    Step 6

## Step 1 GJ3

Series prefix (GJ) and number of poles (1-3) include a dash as shown.

## Step 2a Table A —G3—

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

Add a dash before the code letter.

## Step 2b Table B —G3—

| Inrush Code |      |     |          | Internal Circuit Construction      | See Notes |
|-------------|------|-----|----------|------------------------------------|-----------|
| N/A         | Std. | 25x | VDE App. |                                    |           |
| 0           |      |     | No       | Switch only (no coil)              | —         |
|             | 2    | 9   | No       | *Series trip with SPDT aux. switch | 1,3       |
|             | 3    | 8   | Yes      | Series trip                        | 2,3       |

\*On multipole units one aux. switch is supplied. It is located in the left pole when viewed from the front of the breaker. See page 6 for non-standard part number when additional switches or pole locations are required. See Note 1.

**Notes:**

- Auxiliary switch is rated for 10.1 amps, 125/250 VAC. Low level switches rated at 0.1 amps, 125 VAC are available under factory assigned part number.
- VDE approval, 150 amp maximum. Inrush construction code 3 is VDE approved. Code 8 is not approved.
- Maximum rating for code 8 and 9 is 150 amps.

## Step 3 Table C U—

Add a dash after single digit UL codes.

| Code | UL Standard | Type Approval                    | Maximum | Voltage |
|------|-------------|----------------------------------|---------|---------|
| U    | UL-489      | Branch Circuit – General Purpose | 240AC   | 125DC   |
| DU   | UL-489      | Branch Circuit – Special Purpose | 240AC   | 125DC   |

Breakers will be marked with the maximum UL approved voltage.

**Note:** Code G and H (Table A) use Code U.

## Step 4 Table D 0100

| Standard Current Ratings |        | Current      |        |
|--------------------------|--------|--------------|--------|
| Current Code             | Ampere | Current Code | Ampere |
| 0100                     | 100    | 0200         | 200    |
| 0125                     | 125    | 0225         | 225    |
| 0150                     | 150    | 0250         | 250    |
| 0175                     | 175    |              |        |

For other current ratings consult factory.

## Step 5 Table E —0

| Time Delay Curves |      |              |             |
|-------------------|------|--------------|-------------|
| Code              | Std. | Inrush Level |             |
|                   |      | 25x          | Time Delay  |
| —01               | X    |              | Long        |
| —02               | X    |              | Medium      |
| —03               | X    |              | Short       |
| 100               |      | X            | Motor Start |
| —10               |      | X            | Long        |
| —20               |      | X            | Medium      |
| —30               |      | X            | Short       |

See time delay curves on page 4 for required delay.

## Step 6 Table F A

| Code | Voltage Rating                   |
|------|----------------------------------|
| A    | 0-240 VAC                        |
| C    | 0-125 Vdc                        |
| H    | VDE 125 Vdc or 380 VAC, 50/60 Hz |

VDE 0660 approval applies to DC and 50/60 Hz constructions listed under VDE column in Table B.

# How to order non-standard Series GJ circuit breakers

GJ3— Step 1      —A2A3A3— Step 2      DU Step 3      —100 Step 4      —02 Step 5

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

## Step 1 GJ3

Series prefix (GJ) and number of poles (1-3) include a dash as shown.

## Step 2a Table A A2A3A3

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.

| 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             |

## Step 2b Table B A2A3A3

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. GJ2-B2B2).

| Circuit Codes | Inrush |      | VDE App. | Internal Circuit Construction                       | See Notes |
|---------------|--------|------|----------|---|-----------|
|               | N/A    | Std. |          |   |           |
| 0             |        |      | No       | Switch (no overload coil)                           | —         |
|               | 2      | 9    | No       | Series trip with standard enclosed SPDT aux. switch | 4         |
|               | 3      | 8    | Yes      | Series trip   | 5, 6      |
|               | 5      |      | No       | Shunt/Tap   | 1, 2      |
|               | 6      |      | No       | Relay-trip  | 2         |
| 12            |        |      | No       | Switch with standard enclosed SPDT aux. switch      | 4         |
|               | 15     | 25   | No       | Du-Con with Shunt/Tap voltage coil                  | 3, 7      |
|               | 16     | 26   | No       | Du-Con with relay-trip voltage coil                 | 3, 7      |

**Notes:**

1. Voltage rated shunt coils trip on line voltage.
2. Contact rating for shunt and relay is 250 amps.
3. Du-Con voltage coils require 30 VA to operate and are rated for intermittent duty. Specify Du-Con voltage rating after part number. A factory assigned part number is required.
4. Auxiliary switch is rated for 10.1 amps, 125/250 VAC. Low level switches are rated at 0.1 amps, 125 VAC are available under factory assigned part number.
5. VDE approval 150 amp maximum. Inrush construction code 3 is VDE approved. Code 8 is not approved.
6. VDE breakers require a factory assigned part number.
7. Maximum rating for codes 8, 9, 15, 16, 25 and 26 is 150 amps.

## Step 3 Table C DU

Add a dash after single digit UL codes.

| Code | UL Standard | Type Approval                    | Maximum Voltage |       |
|------|-------------|----------------------------------|-----------------|-------|
| U    | UL-489      | Branch Circuit – General Purpose | 240AC           | 125DC |
| DU   | UL-489      | Branch Circuit – Special Purpose | 240AC           | 125DC |
| A    | UL-1077     | Supplementary Protector          | 240AC           | 125DC |
| A    | UL-1087     | Molded Case Switch               | 240 AC          | 125DC |

Breakers will be marked with the maximum UL approved voltage.

**Note:** Code G and H (Table A) use Code U.

## Step 4 Table D -100

### Standard Current Ratings

| Ampere | Ampere |
|--------|--------|
| 100    | 200    |
| 125    | 225    |
| 150    | 250    |
| 175    |        |

Other non-listed ratings are available.

Consult factory for availability and lead times.

## Step 5 Table E -02

### Time Delay Curves

| Code | Std. | Inrush Level |     | Time Delay  |
|------|------|--------------|-----|-------------|
|      |      | Std.         | 25x |             |
| -0P  | X    |              |     | None        |
| -01  | X    |              |     | Long        |
| -02  | X    |              |     | Medium      |
| -03  | X    |              |     | Short       |
| 100  |      |              | X   | Motor Start |
| -10  |      |              | X   | Long        |
| -20  |      |              | X   | Medium      |
| -30  |      |              | X   | Short       |

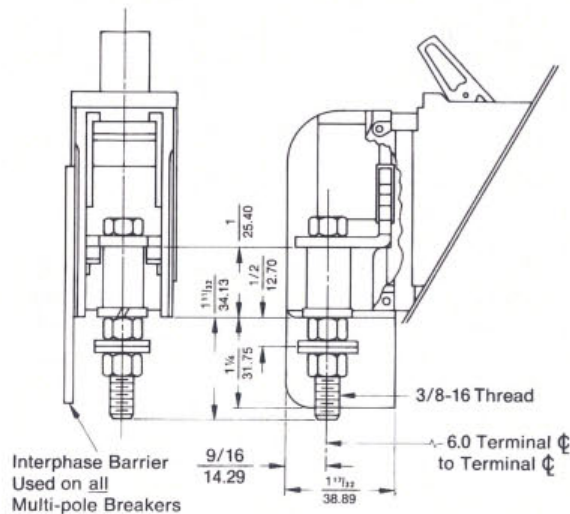
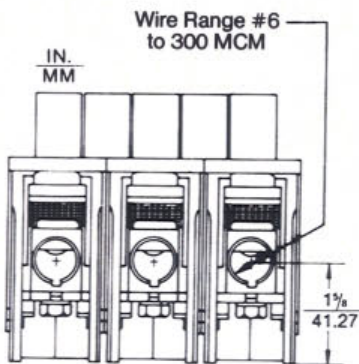
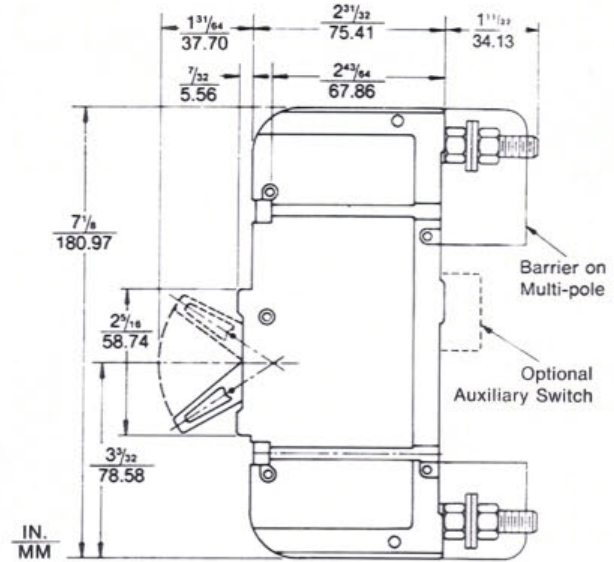
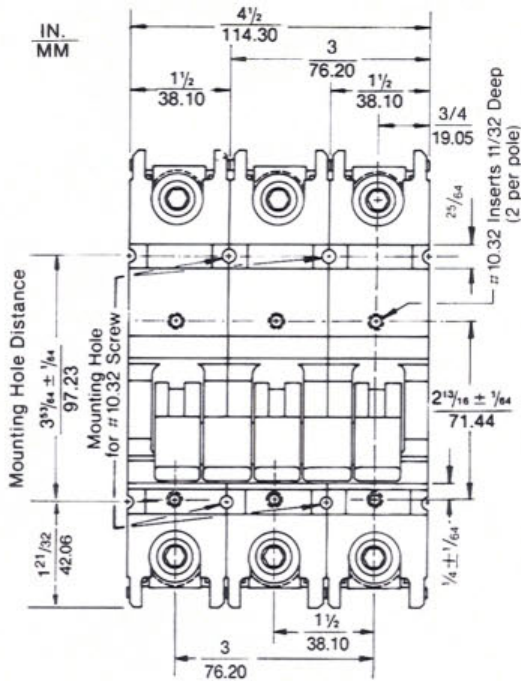
See time delay curves on page 4 for required delay.

# Dimensions

For metric threads, consult factory.

### Approximate Weights

|     |          |
|-----|----------|
| GJ1 | 1.8 lbs. |
| GJ2 | 3.6 lbs. |
| GJ3 | 5.4 lbs. |

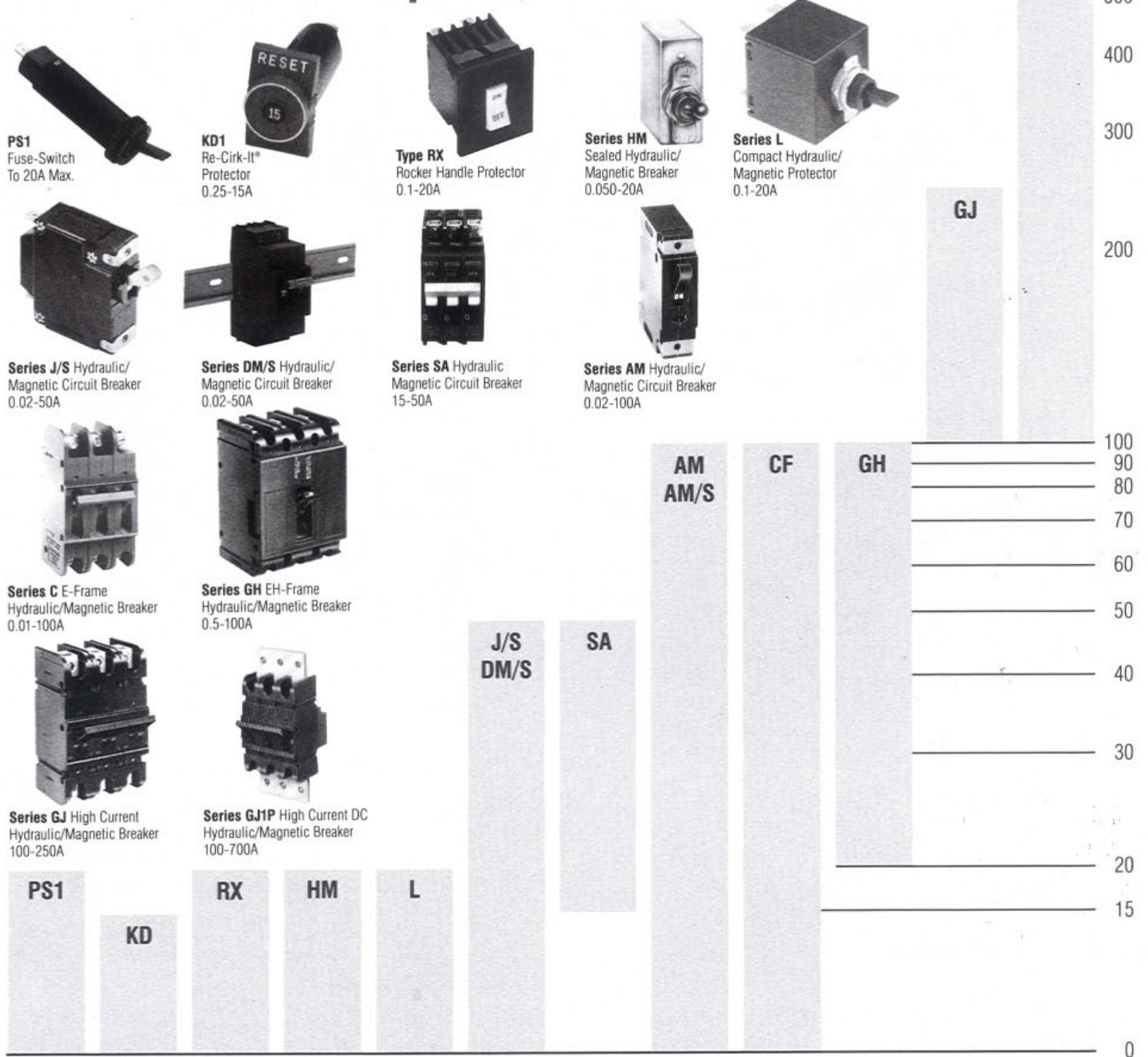


Standard Back-Connected Construction

All dimensions are in inches/mm, tolerance  $\pm 1/32"$  except where noted. Dimensions are given here only as a preliminary guide to specifying. Final engineering drawings should be made from the latest Heinemann factory drawings, available on request.

# Heinemann Circuit Breakers Series GJ

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



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.



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