Information Manual **1C96944H02**

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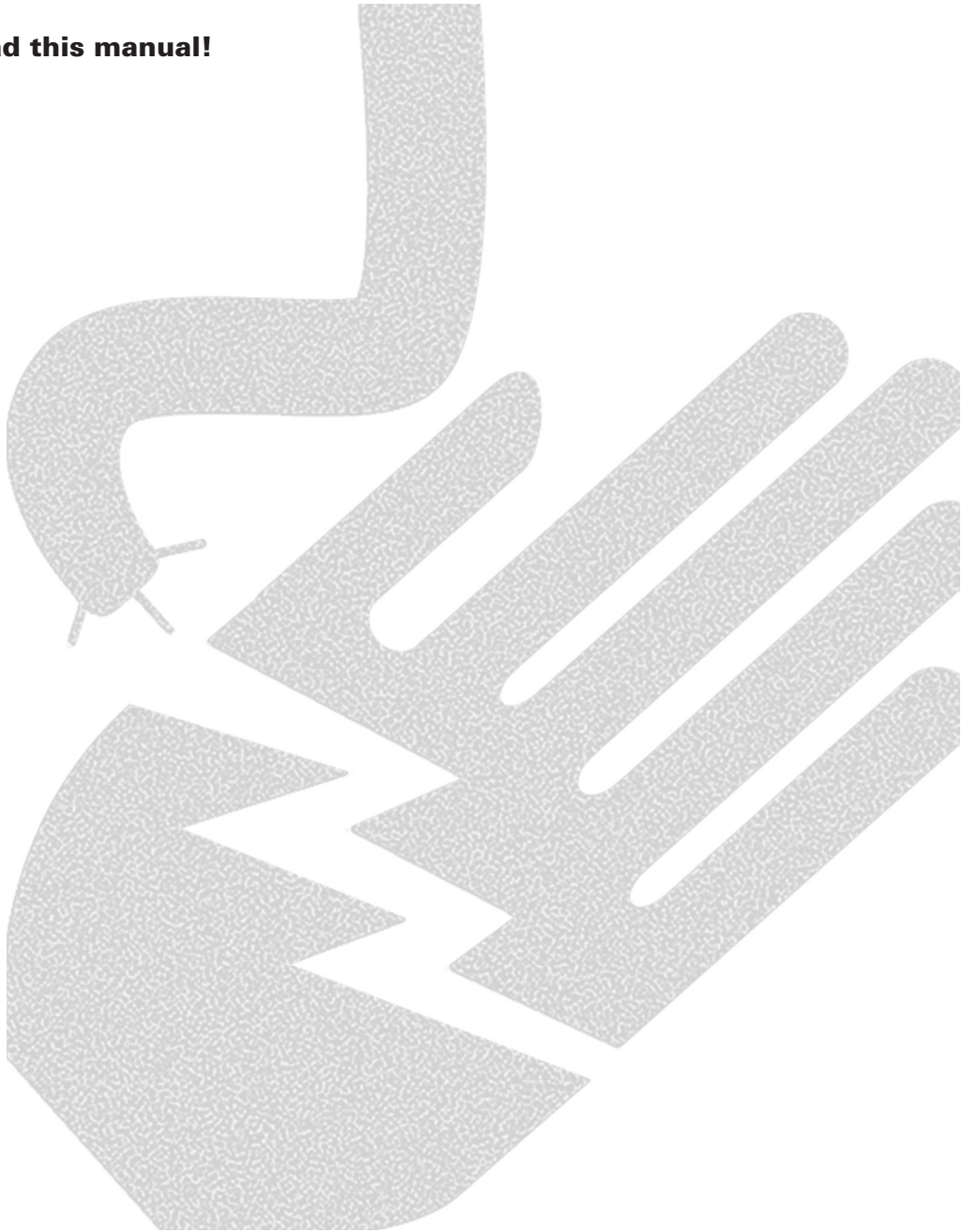
Panelboard and switchboard series rating information manual

Play it safe...read this manual!



Powering Business Worldwide

Panelboard and Switchboard Series Rating

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Introduction

The purpose of this publication is to explain the proper application of series ratings in Eaton's panelboards and switchboards.

Industry standards and NFPA® 70—the National Electrical Code® (NEC®) require protection of the entire electrical distribution system from damage due to short-circuit faults. NEC Article 110.10 states "The overcurrent protective devices… shall be selected and coordinated to permitthe circuit-protective devices used to clear a fault to do so without extensive damage to the electrical components of the circuit." The entire distribution system is required to meet this standard. Series rated systems have become an effective method of meeting these requirements.

There are three protection systems used to protect low voltage power distribution conductors and equipment. They are:

- Fully rated protection
- Fully rated, selectively coordinated protection
- Series rated protection

Fully Rated Protection: Where all overcurrent devices are rated for the full prospective short-circuit current at their line side terminals throughout the system.

Selectively Coordinated Protection: Is a fully rated system where the overcurrent device closest to the fault will open first, thus isolating the faulty circuit.

Series Rated Protection: A short-circuit interrupting rating assigned to a combination of two or more overcurrent protective devices that are connected in series and which the rating of the downstream device(s) in the combination is less than the series rating.

The short-circuit interrupting rating of the first device in the series must be equal to or greater than the available fault current. Downstream breakers, however, are not fully rated for the system's available fault current.

Series ratings are also known in the industry as integrated ratings, series combination ratings, and series connected ratings. The upstream overcurrent device in the series may be either internally or externally feeding downstream devices.

The latest revision of this document with up-to-date series ratings may be found at either of the following links:

- www.eaton.com/panelboards (>Instructions)
- www.eaton.com/switchboards (>Instructions)

UL Issues

In a series rated system, the overcurrent devices in series in the protective scheme must have been tested and listed by Underwriters Laboratories® (UL®), for series combination use in the system.

All of Eaton's series ratings are in full compliance with all applicable requirements of the latest editions of UL 489, 891, and 67.

The *UL Recognized Components Directory* (the Yellow Book) contains breaker manufacturers' series connected listings. These are intended only as a guideline for use by others who are responsible for their own testing, labeling, and listing. Therefore, the *UL Recognized Components Directory* can not be used to interpret series-connected ratings in equipment.

Code Issues

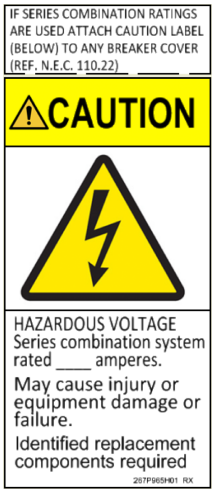
Requirements of NFPA 70—the National Electrical Code for series ratings may be met by equipment marked with ratings adequate for the available fault current at the point of application in the electrical system. Eaton's panelboards and switchboards are marked consistent with NEC Article 240.86 for tested combinations.

NEC 240.86 Motor Contribution. Series ratings shall not be used where:

1. Motors are connected on the load side of the higher-rated overcurrent device and on the line side of the lower-rated device.
2. The sum of the full-load currents exceeds 1% of the interrupting rating of the lower-rated breaker.

Note: NEC 240.86 is additive and both conditions must be met to apply.

Additionally, NEC Article 110.22 requires field marking on equipment where series ratings are used. This label is supplied with Eaton panelboards and switchboards using series combination ratings and reads "Caution—Series Combination System Rated _____ Amperes Available. Identified Replacement Component Required."



Note to Installing Electrician: NEC 110.22 requires the installer to properly apply and complete this label. Label(s) must be placed on all equipment where series ratings are used.

CAUTION: Do not apply fuses using the up-over-down method for sizing a current-limiting fuse that protects a downstream molded-case circuit breaker with a specified rms symmetrical interrupting rating. The method can lead to erroneous and unsafe conclusions and should not be used.

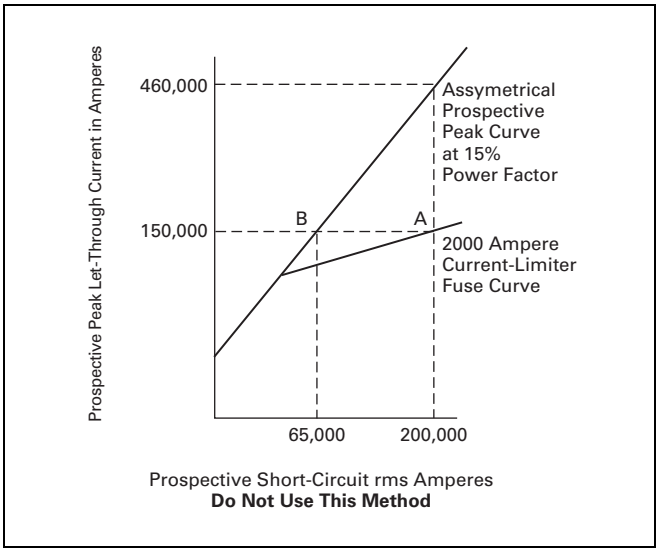


Figure 1.

Conclusion: This conclusion is wrong when the downstream service has a blow-open contact assembly, as does a molded-case circuit breaker or similar device. It may be valid when the current-limiting fuse is sized to protect a passive bus bar system.

The up-over-down method ignores dynamic impedance (the inherent current-limiting of the downstream molded-case circuit breaker). Such impedance is developed directly by the forces of the let-through current created when the contacts are blown open.

Some breakers rated 15 to 50 amperes, 120/240 volt maximum have been investigated and found suitable for use in panelboards from a different manufacturer. These are identified as "Classified" breakers. DO NOT USE SERIES RATINGS WITH "CLASSIFIED" BREAKERS! Series ratings apply ONLY to those Eaton breakers listed and published in this booklet.

WARNING **Use of other devices can cause explosion, severe injury, or death!**

Applying Series Ratings

The following is provided to use the series rating tables on the following pages:

Step 1. Determine the available system voltage and fault current.

Step 2. Select the appropriate table using the system voltage.

Step 3. Use the appropriate "Series Equipment Rating" column equal to, or greater than, the available fault current, to determine the allowable UL recognized combinations of main (upstream) and branch (downstream) overcurrent devices. Main devices are shown in bold/shaded areas. Respective branch breakers are shown directly below their associated main device. **If a rating is not initially found in a column, first look to the columns to the right for higher "Series Equipment Ratings" within the same table. If still not found, use ratings from table of a higher system voltage (higher numbered table).**

Example 1:

208Y/120 volt, 3-phase, 4-wire, AC system with available fault current of 26, 438 amperes. Main (upstream) device is a 3-pole, 225 ampere, EDS breaker. The branch (downstream) breakers are single- and 2-pole, 20, 30, and 60 amperes, 120 volt and 120/240 volt BAB breakers.

1. Go to the 120/240 volts table (**Table 1**).
2. Look down under the 22 kA column. This rating is not shown.
3. Look to the columns to the right. This combination rating is shown under the 42 kA column, and therefore is valid.

Example 2:

480Y/277 volt, 3-phase, 4-wire, AC system with available fault current of 62, 097 amperes. Main (upstream) device is a 3-pole 250 ampere, HJD breaker. The branch (downstream) breakers are 2- and 3-pole, 60, 70, and 100 ampere EHD breakers.

1. Go to the 480Y/277 volts table (**Table 4**).
2. Look down under the 65 kA column. This rating is not shown.
3. Look to the columns to the right. This rating is not shown.
4. Look at the table with the next higher system voltage. (480 volts, **Table 5**).
5. This combination rating is shown under the 65 kA column, and therefore is valid.

Example 3:

480Y/277 volt, 3-phase, 4-wire, AC system with available fault current of 24, 324 amperes. Main (upstream) device is a 3-pole, 225 ampere, FD breaker. The branch (downstream) breakers are single-pole, 20 ampere, GHQ; 2-pole, 30 ampere, GHB; and 3-pole, 50 ampere, GHB devices.

1. Go to the 480Y/277 volts table (**Table 4**).
2. Look under the 25 kA column. This rating is not shown. Look to the columns to the right. This rating is shown under the 35 kA column, and therefore is valid for combinations with the 2- and 3-pole GHB breakers.
3. Go to the 277 volts table (**Table 3**).
4. Look under the 25 kA column. This rating is not shown. Look to the columns to the right. This rating is shown under the 35 kA column, and therefore is valid for combinations with the single-pole GHQ breaker.

Other Applications of Series Ratings

Series ratings can also be applied under the following guidelines:

- Any FULLY RATED breaker can be applied upstream, downstream, or in the middle of any of the series ratings stated in the tables
- Any series rating stated in the tables may have additional series rated branch breakers of the EXACT SAME TYPE further downstream in that rating

COMBINING SERIES RATINGS are allowed under certain conditions. Main and branch ratings may be combined if:

- Breakers A, B, and C are in series respectively from main to branch. Breakers A and B series rate together. Breakers A and C series rate at the same interrupting level (or higher). It is allowable to use A, B, and C together at the A-B series rating

It is improper to combine series ratings under the following condition:

- Breakers A, B, and C are in series respectively from main to branch. Breakers A and B series rate together. Breakers B and C series rate at the Breaker B interrupting rating level. It is not allowable to use A, B, and C together at the A-B series rating. However, combining multiple overcurrent devices as in this example, can be accomplished if all devices in the series combination have been tested together and listed in triple rating **Table 13**

Note: The information contained in this manual also applies to specifying the upstream overcurrent protective device for use with through-feed and sub-feed panelboards without an integral main.

Series Rating Tables

Table 1. 120/240 Volts AC—Breaker/Breaker Series Ratings

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below. For 240 Volts AC branch breakers, see Table 2.

Main Breaker Maximum Amperes	Series Equipment Rating—kA Symmetrical											
	18	22	42	65			100			200		
100	**EHD, PDG2xF ①**	**QBHW QPHW**		**GB, GHB**			**FB-P**			**FCL**		
	BAB ② BABRP BABRSP HQP ② QBGF QBAF QBAG QBGFT QBCAF	BAB ② HQP ② QBGF QPGF QBAF QBAG QBGFT QPGFT		BAB ② BABRP BABRSP HQP ② QBGF QPGF QBAF QBAG QBHW QPHW QBGFT QPGFT QBCAF			BAB ② BABRP BABRSP HQP ② QBGF QPGF QBAF QBAG QBHW ② QPHW ② EHD (15–100 A), PDG2yF (15–100 A) ③ FD (15–100 A), PDG2yG (15–100 A) ③ QBGFT QPGFT			BAB ② BABRP BABRSP HQP ② QBGF QPGF QBAF QBAG QBHW QPHW GB, GHB GHQ EHD (15–100 A), PDG2yF (15–100 A) ③ FD (15–100 A), PDG2yG (15–100 A) ③ HFD (15–100 A), PDG2yM (15–100 A) ③ QBGFT QPGFT QBCAF		
125				**BRX**			**EGH**					
				BAB HQP (2-pole only)			GHQ, GHB					
150	**FDB, PDG2xF ①**			**FDE, PDG2xG ①, PDD2xG ①**			**HFDE, PDG2xM ①**					
	BAB HQP QBGF QBAF QBAG QBGFT QBCAF			BAB HQP QBHW QPHW			BAB HQP GHB EHD (15–100 A), PDG2yF (15–100 A) ③ FD (15–100 A), PDG2yG (15–100 A) ③ QBHW QPHW					
200							**LA-P**					
							BAB ② HQP ② QBHW ② QPHW ② EHD FD (15–100 A), PDG2yF (15–100 A) ③ PDG2yG (15–100 A) ③					

① Where x = 2 or 3.
② Single-pole version is restricted to 15–70 A.
③ Where y = 1 or 2.
④ Not valid with CHKD or PDF3xM.

Table 1. 120/240 Volts AC—Breaker/Breaker Series Ratings (Continued)

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below. For 240 Volts AC branch breakers, see Table 2.

Main Breaker Maximum Amperes	Series Equipment Rating—kA Symmetrical									
	18	22	42	65			100			200
225		**EDB, PDD2xF** ①	**EDS, PDD2xG** ①	**ED, FD, PDD2xG,** ① **PDG2xG** ①	**FDE**	**HFDE, PDG2xM** ①	**EDH, EDC, PDD2xM,** ① **PDD2xP** ①	**HFD, PDG2xM** ①	**FDC, PDG2xP** ①	**FDC, FDCE, PDG2xP** ①
		BAB ② BABRP BABRSP HQP ② QBGF QPGF QBHGF QPHGF QBHW QPHW QBAF QBAG QBGFT QPGFT QBHGFT QPHGFT	BAB BABRP BABRSP HQP ② QBGF QPGF QBHGF QPHGF QBHW QPHW QBAF QBAG QBGFT QPGFT QBHGFT QPHGFT QBCAF	BAB ② BABRP BABRSP HQP (2-pole only) QBGF QPGF QBAF QBAG QBHW QBHGF QBGFT QPGFT QBHGFT QBCAF QPHW QPHGF	QBGF QPGF QBAF QBAG QBHGF QBGFT QPGFT QBHGFT QBCAF QPHGF QPHGFT	BAB ② HQP ② QBHW ② QPHW ②	BAB ② BABRP BABRSP HQP ② QBGF QPGF QBAF QBAG QBGFT QBCAF	BAB HQP QBGF QBAF QBAG QBHW QPHW QBHGF GB, GHB GHQ, GHQRSP EHD FD, EGS QBGFT QBHGFT QBCAF QPHGF PDG2yF (15–100 A) ③ PDG2yG (15–150 A) ③	BAB ② HQP ② QBHW ② QPHW ②	GB, GHB GHQ GHQRSP EHD FD, FDE (15–150 A) HFD, HFDE (15–150 A) EGS EGH HGHB PDG2yF (15–100 A) ③ PDG2yG (15–150 A) ③
							CVH	**HFDE, PDG2xM** ①		
							BAB ② HQP ② QBGF QPGF QBAF QBAG QBCAF	BAB HQP QBGF QBAF QBAG QBHW QPHW QBHGF GHB, EHD FD (15–150 A) QBGFT QBHGFT EGS FDE (15–150 A) QPGF QPHGF QBCAF QPGFT QPHGFT PDG2yF (15–100 A) ③ PDG2yG (15–150 A) ③		
250				**JD, JDB**	**HJD**	**JDC**	**HJD**	**JDC**		**JDC**
				BAB ② HQP ② QBHW ② QPHW ② EHD FD (15–150 A) PDG2yF (15–100 A) ③ PDG2yG (15–150 A) ③	BAB HQP QBHW ② QPHW ②	QBGF QPGF QBAF QBAG QPGFT QBCAF	GB, GHB EHD FD (15–150 A) EGS PDG2yF (15–100 A) ③ PDG2yG (15–150 A) ③	BAB ② HQP ② QBHW ② QPHW ②		GB, GHB EHD FD, FDE (15–150 A) HFD, HFDE (15–150 A) EGS EGH PDG2yF (15–100 A) ③ PDG2yG (15–150 A) ③ PDG2yM (15–150 A) ③

① Where x = 2 or 3.
② Single-pole version is restricted to 15–70 A.
③ Where y = 1 or 2.
④ Not valid with CHKD or PDF3xM.

Table 1. 120/240 Volts AC—Breaker/Breaker Series Ratings (Continued)

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below. For 240 Volts AC branch breakers, see Table 2.

Main Breaker Maximum Amperes	Series Equipment Rating—kA Symmetrical								
	18	22	42	65		100		200	
400		**DK, KD, KDB, PDD3xG ①, PDG3xG ①**	**DK, KD, KDB, CKD, PDD3xG ①, PDG3xG ①, PDF3xG ①**	**HKD, CHKD, PDG3xM ①, PDF3xM ①**	**DK, KD, KDB, CKD, PDD3xG ①, PDG3xG ①, PDF3xG ①**	**KDC, PDG3xP ①**	**HKD, CHKD, PDG3xM ①, PDF3xM ①**	**KDC, PDG3xP ①**	**KDC, PDG3xP ①**	**LCL**
		BAB ② BABRP BABRSP HQP ② QBGF QPGF QBAF QBAG QBGFT QPGFT	BAB ② BABRP BABRSP HQP ② QBHW ② QPHW ②	BAB ② BABRP BABRSP HQP ② QBHW ② QPHW ②	EHD EDS EDB BAB ② HQP ② QBHW ② QPHW ② PDG2yF (15–100 A) ③ PDD2yF ③ PDD2yG ③	BAB ② HQP ②	GB, GHB EHD FD (15–150 A) EGS ④ PDG2yF (15–100 A) ③ PDG2yG (15–150 A) ③	QBHW ② QPHW ②	GB, GHB EHD FD, FDE (15–150 A) HFD, HFDE (15–150 A) EGS EGH PDG2yF (15–100 A) ③ PDG2yG (15–150 A) ③ PDG2yM (15–150 A) ③	BAB ② HQP ② QBGF QBHW ② QPHW ② GB, GHB EHD FD, FDE (15–150 A) HFD, HFDE (15–150 A) QBGFT QPGFT PDG2yF (15–100 A) ③ PDG2yG (15–150 A) ③ PDG2yM (15–150 A) ③
600							**CHLD, HLD**			
							FD PDG2yG ③			
800							**HMDL, CHMDL, PDG4xM ①, PDF4xM ①**			
							EHD FD PDG2yF (15–100 A) ③ PDG2yG ③			
1200							**HND, CHND, NGH, NGH-C, PDG5xM ①, PDF5xM ①**			
							EHD PDG2yF (15–100 A) ③			

① Where x = 2 or 3.
② Single-pole version is restricted to 15–70 A.
③ Where y = 1 or 2.
④ Not valid with CHKD or PDF3xM.

Table 2. 240 Volts AC—Breaker/Breaker Series Ratings

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below. For 120/240 Volts AC branch breakers, see Table 1.

Main Breaker Maximum Amperes	Series Equipment Rating – kA Symmetrical									
	18	22	42	65		100			200	
100	**EHD, PDG2xF** ①	**QBHW-H, QPHW-H**		**GB, GHB**		**FB-P**			**FCL**	
	BAB-H HQP-H	BAB-H HQP-H		BAB-H HQP-H QBHW-H QPHW-H		BAB-H HQP-H EHD FDB FD, FDE (15–100 A) QBHW QPHW PDG2xF (15–100 A) ① PDG2xG (15–100 A) ①			BAB-H HQP-H QBHW-H QPHW-H GB, GHB EHD FD, FDE (15–100 A) FDB HFD, HFDE (15–100 A) PDG2xF (15–100 A) ① PDG2xG (15–100 A) ① PDG2xM (15–100 A) ①	
125						**EGH**				
						GHB HQP-H				
150	**FDB, PDG2xF** ①									
	BAB-H HQP-H									
200						**LA-P**				
						BAB-H HQP-H QBHW-H QPHW-H EHD FDB FD, FDE (15–200 A) JD, JDB PDG2xF (15–200 A) ① PDG2xG (15–200 A) ①				
225		**EDB, PDD2xF** ①	**EDS, PDD2xG** ①	**ED, PDD2xG** ①	**FD, FDE, PDG2xG** ①	**EDH, EDC, PDD2xM** ①**, PDD2xP** ①	**HFD, HFDE, PDG2xM** ①	**FDC, PDG2xP** ①	**FDC, FDCE, PDG2xP** ①	
		HQP-H BAB-H QBHW-H QPHW-H	HQP-H BAB-H QBHW-H QPHW-H	BAB-H HQP-H QBHW-H QPHW-H	BAB-H HQP-H QBHW-H QPHW-H EHD ② FDB PDG2xF ①	**BAB-H** **HQP-H** **CVH** **BAB-H** **HQP-H**	BAB-H HQP-H QBHW-H QPHW-H GB, GHB EHD FDB FD, FDE EGS PDG2xF (15–150 A) ① PDG2xG ①	BAB-H HQP-H QBHW-H QPHW-H	GB, GHB EHD FDB FD, FDE HFD, HFDE PDG2xF ① PDG2xG ① PDG2xM ①	

① Where x = 2 or 3.

② Valid on 2- and 3-pole breakers only. Not valid for single-pole.

③ Not valid with CHKD or PDF3xM.

Table 2. 240 Volts AC—Breaker/Breaker Series Ratings (Continued)

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below. For 120/240 Volts AC branch breakers, see Table 1.

Main Breaker Maximum Amperes	Series Equipment Rating – kA Symmetrical									
	18	22	42	65		100			200	
250				**JD, JDB** BAB-H (15–70 A) HQP-H (15–70 A) QBHW-H QPHW-H EHD FDB PDG2xF (15–150 A) ①	**HJD** BAB-H (15–70 A) HQP-H (15–70 A) QBHW-H QPHW-H	**HJD** GB, GHB EHD FD, FDE FDB ED JD, JDB EGS PDG2xF ① PDG2xG ① PDD2xG ①	**JDC** BAB-H HQP-H QBHW-H QPHW-H		**JDC** GB, GHB EHD FD, FDE FDB HFD, EDB, EDS ED, HFDE EDH JD, JDB HJD, EGS, EGH PDG2xF ① PDG2xG ① PDG2xM ① PDD2xF ① PDD2xG ① PDD2xM ①	
400				**DK, KD, KDB, CKD, PDD3xG ①, PDG3xG ①, PDF3xG ①** BAB-H HQP-H QBHW-H QPHW-H EHD FDB EDS EDB PDG2xF (15–150 A) ① PDD2xF ① PDD2xG ①		**HKD, CHKD, PDG3xM ①, PDF3xM ①** QBHW-H QPHW-H GB, GHB EHD FDB FD, FDE ED, EDB, EDS JD, JDB DK, KD, KDB, CKD EGS ③ PDG2xF ① PDG2xG ① PDD2xF ① PDD2xG ① PDD3xG ① PDG3xG ① PDF3xG ①	**KDC, PDG3xP ①** QBHW-H QPHW-H		**KDC, PDG3xP ①** GB, GHB EHD FDB FD, FDE HFD, HFDE ED, EDB, EDS, EDH JD, JDB HJD DK, KD, KDB HKD EGS, EGH PDG2xF ① PDG2xG ① PDG2xM ① PDD2xF ① PDD2xG ① PDD2xM ① PDD3xG ① PDG3xG ① PDG3xM ①	**LCL** BAB-H HQP-H QBHW-H QPHW-H GB, GHB EHD FDB FD, FDE HFD, HFDE ED, EDB, EDS, EDH JD, JDB HJD DK, KD, KDB HKD PDG2xF ① PDG2xG ① PDG2xM ① PDD2xF ① PDD2xG ① PDD2xM ① PDD3xG ① PDG3xG ① PDG3xM ①
500						**NB-P** JD, JDB DK, KD, KDB, CKD PDD3xG ① PDG3xG ① PDF3xG ①				
600						**HLD, HLDB, CHLD** GB ②, GHB ② EHD FD, FDE ED, EDB, EDS JD, JDB DK, KD, KDB, CKD LD, LDB, CLD PDG2xF (15–100 A) ① PDG2xG ① PDD2xF ① PDD2xG ① PDD3xG ① PDG3xG ① PDF3xG ①			**LDC** ED, EDB, EDS, EDH PDD2xF ① PDD2xG ① PDD2xM ①	

① Where x = 2 or 3.

② Valid on 2- and 3-pole breakers only. Not valid for single-pole.

③ Not valid with CHKD or PDF3xM.

Table 2. 240 Volts AC—Breaker/Breaker Series Ratings (Continued)

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below. For 120/240 Volts AC branch breakers, see Table 1.

Main Breaker Maximum Amperes	Series Equipment Rating – kA Symmetrical									
	18	22	42	65	100				200	
800						**NB-P**	**HMDL, CHMDL, PDG4xM ①, PDF4xM ①**			
						DK, KD, KDB, CKD PDD3xG ① PDG3xG ① PDF3xG ①	EHD FD, FDE PDG2xF (15–100 A) ① PDG2xG ①			
1200						**HND, CHND, NGH, NGH-C, PDG5xM ①, PDF5xM ①**			**NDC, NGC, PDG5xP ①**	
						EHD ED, EDB, EDS PDG2xF (15–100 A) ① PDD2xF ① PDD2xG ①			ED, EDB, EDS, EDH PDD2xF ① PDD2xG ① PDD2xM ①	
2500						**RD, RG, PDG6xM ①**			**RDC, RGC, PDG6xP ①**	
						ED, EDB, EDS PDD2xF ① PDD2xG ①			ED, EDB, EDS, EDH PDD2xF ① PDD2xG ① PDD2xM ①	

① Where x = 2 or 3.
② Valid on 2- and 3-pole breakers only. Not valid for single-pole.
③ Not valid with CHKD or PDF3xM.

Table 3. 277 Volts AC—Breaker/Breaker Series Ratings

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below.
All ratings in this table apply to single-pole branch devices only. For 277/480 Volts AC branch breakers, see Table 4.

Main Breaker Maximum Amperes	Series Equipment Rating—kA Symmetrical						
	22	**25**	**35**	**65**	**100**		**150**
100							**FCL** GHB GHQ, GHQRSP EHD FD (15–100 A) HFD (15–100 A) PDG2yF (15–100 A) ① PDG2yG (15–100 A) ① PDG2yM (15–100 A) ①
125			**EGS** GHQ GHB	**EGH** GHB GHQ			
225			**FD, FDE, PDG2xG ②** GHB GHQ GHQRSP GHBGFEP ③	**HFD, HFDE, PDG2xM ②** GHB GHQ GHQRSP GHBGFEP EHD FD (15–150 A) PDG2yF (15–100 A) ① PDG2yG (15–150 A) ①	**FDC, FDCE, PDG2xP ②** GHB EHD FD (15–150 A) HFD (15–150 A) PDG2yF (15–100 A) ① PDG2yG (15–150 A) ① PDG2yM (15–150 A) ①		
250	**JD, JDB** GHB		**JD, JDB** GHB GHBGFEP ④	**HJD** GHB GHBGFEP EHD FD (15–150 A) PDG2yF (15–100 A) ① PDG2yG (15–150 A) ①	**LCL** GHBS CHQRSP	**JDC** GHB EHD FD (15–150 A) HFD (15–150 A) PDG2yF (15–100 A) ① PDG2yG (15–150 A) ① PDG2yM (15–150 A) ①	
400	**KD, KDB, CKD, PDG3xG ②, PDF3xG ②** GHB	**KD, KDB, CKD, HKD, CHKD, PDG3xG ②, PDG3xM ②, PDF3xG ②, PDF3xM ②** GHB ⑤	**KD, KDB, CKD, PDG3xG ②, PDF3xG ②** GHB EHD FD (15–150 A) PDG2yF (15–100 A) ① PDG2yG (15–150 A) ①	**HKD, CHKD, PDG3xM ②, PDF3xM ②** GHB GHQ (15–20 A) EHD FD (15–150 A) PDG2yF (15–100 A) ① PDG2yG (15–150 A) ①	**KDC, PDG3xP ②** GHB EHD FD (15–150 A) HFD (15–150 A) PDG2yF (15–100 A) ① PDG2yG (15–150 A) ① PDG2yM (15–150 A) ①		**LCL** GHB EHD FD (15–150 A) HFD (15–150 A) PDG2yF (15–100 A) ① PDG2yG (15–150 A) ① PDG2yM (15–150 A) ①

① Where y = 1 or 2.
② Where x = 2 or 3.
③ Not valid with FDE.
④ Not valid with JDB.
⑤ Valid on 2- and 3-pole breakers only. Not valid for single-pole.

Table 4. 277/480 Volts AC—Breaker/Breaker Series Ratings

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below.
For 277 Volts AC branch breakers, see Table 3.

Main Breaker Maximum Amperes	Series Equipment Rating—kA Symmetrical					
	22	**25**	**35**	**65**	**100**	**150**
100						**FCL** GHB GHQRSP EHD FD (15–100 A) HFD (15–100 A) PDG2yF (15–100 A) ① PDG2yG (15–100 A) ① PDG2yM (15–100 A) ①
125			**EGS** GHB	**EGH** GHB		
225			**FD, FDE, PDG2xG** ② GHB, GHQRSP	**HFD, HFDE, PDG2xM** ② GHB, GHQRSP	**FDC, FDCE, PDG2xP** ② GHB	
250	**JD, JDB** GHB		**JD, JDB** GHB (15–50 A)	**HJD** GHB (15–50 A)	**JDC** GHB	
400	**KD, KDB, CKD, PDG3xG** ②**, PDF3xG** ② GHB	**KD, KDB, CKD, HKD, CHKD, PDG3xG** ②**, PDG3xM** ②**, PDF3xG** ②**, PDF3xM** ② GHB	**KD, KDB, CKD, PDG3xG** ②**, PDF3xG** ② GHB (15–50 A)	**HKD, CHKD, PDG3xM** ②**, PDF3xM** ② GHB (15–50 A)	**KDC, PDG3xP** ② GHB	**LCL** GHB

① Where y = 1 or 2.
② Where x = 2 or 3.

Table 5. 480 Volts AC—Breaker/Breaker Series Ratings

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below. All ratings in this table apply to 2- and 3-pole branch devices only. For 277/480 Volts AC branch breakers, see Table 4.

Main Breaker Maximum Amperes	Series Equipment Rating—kA Symmetrical					
	25	35	65	100		150
100				**FB-P** EHD FDB FD, FDE (15–100 A) HFD, HFDE (15–100 A) PDG2xF (15–100 A) ① PDG2xG (15–100 A) ① PDG2xM (15–100 A) ①		**FCL** EHD FDB FD, FDE (15–100 A) HFD, HFDE (15–100 A) PDG2xF (15–100 A) ① PDG2xG (15–100 A) ① PDG2xM (15–100 A) ①
200				**LA-P** EHD FDB FD, FDE (15–200 A) HFD, HFDE (15–200 A) JD, JDB HJD PDG2xF (15–200 A) ① PDG2xG (15–200 A) ① PDG2xM (15–200 A) ①		
225		**FD, FDE, PDG2xG** ① EHD FDB PDG2xF (15–150 A) ①	**HFD, HFDE, PDG2xM** ① EHD FDB FD, FDE EGS PDG2xF (15–150 A) ① PDG2xG ①	**FDC, FDCE, PDG2xP** ① EHD FDB FD HFD, HFDE EGS, EGH ② PDG2xF (15–150 A) ① PDG2xG ① PDG2xM ①		
250	**JD, JDB** FDB PDG2xF (15–150 A) ①		**HJD** EHD FDB FD, FDE JD, JDB EGS PDG2xF ① PDG2xG ①	**JDC** EHD FDB FD, FDE HFD, HFDE JD, JDB HJD EGS, EGH PDG2xF ① PDG2xG ① PDG2xM ①		**LCL** EHD FDB FD, FDE HFD, HFDE FDC, FDCE JD, JDB HJD PDG2xF ① PDG2xG ① PDG2xM ① PDG2xP ①

① Where x = 2 or 3.
② Not valid with FDCE.
③ Not valid with CHKD or PDF3xM.

Table 5. 480 Volts AC—Breaker/Breaker Series Ratings (Continued)

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below. All ratings in this table apply to 2- and 3-pole branch devices only. For 277/480 Volts AC branch breakers, see Table 4.

Main Breaker Maximum Amperes	Series Equipment Rating—kA Symmetrical					
	25	**35**	**65**	**100**		**150**
400		**KD, KDB, CKD, PDG3xG ①, PDF3xG ①**	**HKD, CHKD, PDG3xM ①, PDF3xM ①**	**KDC, PDG3xP ①**	**LA-P**	**LCL**
		EHD FDB FD, FDE PDG2xF ① PDG2xG ①	EHD FDB FD, FDE JD, JDB KD, KDB CKD EGS ③ PDG2xF ① PDG2xG ① PDG3xG ① PDF3xG ①	EHD FDB FD, FDE HFD, HFDE JD, JDB HJD KD, KDB HKD EGS, EGH CKD CHKD PDG2xF ① PDG2xG ① PDG2xM ① PDG3xG ① PDG3xM ① PDF3xG ① PDF3xM ①	JD, JDB HJD KD, KDB HKD CKD CHKD PDG3xG ① PDG3xM ① PDF3xG ① PDF3xM ①	EHD FDB FD, FDE HFD, HFDE FDC, FDCE JD, JDB HJD KD, KDB HKD CKD CHKD PDG2xF ① PDG2xG ① PDG2xM ① PDG2xP ① PDG3xG ① PDG3xM ① PDF3xG ① PDF3xM ①
500				**NB-P**		
				JD, JDB HJD KD, KDB HKD CKD CHKD PDG3xG ① PDG3xM ① PDF3xG ① PDF3xM ①		
600		**LD, LDB, CLD**	**HLD, HLDB, CHLD, PDG3xG ①, PDG3xK ①**			
		FD, FDE JD, JDB PDG2xG ①	KD, KDB LD, LDB CKD CLD PDG3xG ① PDF3xG ①			
		PDG3xG ①, PDG3xK ①, PDG3xM ①	**PDG3xM ①**			
		PDG2xG ① JD, JDB	JD, JDB LD, LDB CLD PDG2xF ① PDG2xG ① PDG3xG ① PDF3xG ①			

① Where x = 2 or 3.
② Not valid with FDCE.
③ Not valid with CHKD or PDF3xM.

Table 6. 600 Volts AC—Breaker/Breaker Series Ratings

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below.
All ratings in this table apply to 2- and 3-pole branch devices only.

Main Breaker Maximum Amperes	Series Equipment Rating—kA Symmetrical					
	18	**25**	**35**	**42**	**50**	**100**
150		**FD, FDE, PDG2xG** ①				
		FDB PDG2xF (15–150 A) ①				
225	**FD, FDE, PDG2xG** ①		**FDC, PDG2xP** ①			
	FDB PDG2xF (15–150 A) ①		FDB FD, FDE HFD, HFDE PDG2xF (15–150 A) ① PDG2xG ① PDG2xM ①			
250	**JD, JDB**	**JD, JDB**	**JDC**			**LCL**
	FDB PDG2xF (15–100 A) ①	FDB PDG2xF (15–100 A) ①	FDB FD, FDE (15–150 A) HFD, HFDE (15–150 A) JD, JDB HJD PDG2xF (15–150 A) ① PDG2xG (15–150 A) ① PDG2xM (15–150 A) ①			FDB FD, FDE HFD, HFDE FDC JD, JDB HJD PDG2xF ① PDG2xG ① PDG2xM ① PDG2xP ①
			HJD			
			FDB FD (15–150 A) JD, JDB PDG2xF (15–150 A) ① PDG2xG (15–150 A) ①			

① Where x = 2 or 3.

Table 6. 600 Volts AC—Breaker/Breaker Series Ratings (Continued)

Main devices shown in shaded area, centered at top. Respective branch devices shown directly below.
All ratings in this table apply to 2- and 3-pole branch devices only.

Main Breaker Maximum Amperes	Series Equipment Rating—kA Symmetrical					
	18	**25**	**35**	**42**	**50**	**100**
400			**HKD, CHKD, PDG3xM ①, PDF3xM ①**	**KDC, PDG3xP ①**	**KDC, PDG3xP ①**	**LCL**
			FDB FD, FDE (15–150 A) HFD, HFDE (15–150 A) JD, JDB HJD PDG2xF (15–150 A) ① PDG2xG (15–150 A) ① PDG2xM (15–150 A) ①	FDB FD, FDE (15–150 A) HFD, HFDE (15–150 A) PDG2xF (15–150 A) ① PDG2xG (15–150 A ① PDG2xM (15–150 A) ①	FD, FDE HFD, HFDE JD, JDB HJD KD, KDB HKD CKD CHKD PDG2xG ① PDG2xM ① PDG3xG ① PDG3xM ① PDF3xG ① PDF3xM ①	FDB FD, FDE HFD, HFDE FDC JD, JDB HJD JDC KD, KDB HKD KDC CKD CHKD PDG2xF ① PDG2xG ① PDG2xM ① PDG2xP ① PDG3xG ① PDG3xM ① PDG3xP ① PDF3xG ① PDF3xM ①
			KD			
			JD, JDB			
600		**CLD**	**HLD, HLDB, CHLD**			
		JD, JDB KD CKD PDF3xG ①	KD, KDB CKD LD, LDB CLD PDG3xG ① PDF3xG ①			
			PDG3xG ①, PDF3xG ①			
			JD, JDB			
			PDG3xM ①, PDG3xP ①			
			PDG3xG ① PDF3xG ①			

① Where x = 2 or 3.

Table 7. 120/240 Volts AC—Fuse/Breaker Series Ratings

Main fuse class shown in shaded area, centered at top. Respective branch devices shown directly below.

Main Fuse Maximum Amperes	Series Equipment Rating—kA Symmetrical					
	100			**200**		
100						**R**
						BAB HQP QBHW QPHW GB GHB
200			**R**	**J**	**T**	
			GB GHB	BAB HQP QBHW QPHW	BAB HQP QBHW QPHW	
400	**J**	**T**		**J**	**T**	
	BAB HQP QBHW QPHW	BAB HQP QBHW QPHW		GB GHB	GB GHB	

Table 8. 240 Volts AC—Fuse/Breaker Series Ratings

Main fuse class shown in shaded area, centered at top. Respective branch devices shown directly below.
For 120/240 Volts AC branch breakers, see Table 7.

Main Fuse Maximum Amperes	Series Equipment Rating—kA Symmetrical					
	100			200		
100						**R** BAB-H HQP-H QBHW-H QPHW-H GB GHB
200			**R** GB GHB	**J** BAB-H HQP-H QBHW-H QPHW-H	**T** BAB-H HQP-H QBHW-H QPHW-H	**R** GB ① GHB ①
400	**J** BAB-H HQP-H QBHW-H QPHW-H	**T** BAB-H HQP-H QBHW-H QPHW-H		**J** GB GHB	**T** GB GHB	
4000			**L** EHD FDB FD, FDE (15–150 A) JD, JDB DK, KD, KDB PDG2xF (15–100 A) ② PDG2xG (15–150 A) ② PDG3xG ② PDD3xG ②			

① Valid on 2- and 3-pole breakers only. Not valid for single-pole.
② Where x = 2 or 3.

Table 9. 277 Volts AC—Fuse/Breaker Series Ratings

Main fuse class shown in shaded area, centered at top. Respective branch devices shown directly below.
All ratings in this table apply to single-pole branch breakers only. For 2- and 3-pole branch breakers, consult other tables.

Main Fuse Maximum Amperes	Series Equipment Rating—kA Symmetrical						
	65		100			200	
100			**J** GHBS GHQ GHQRSP	**T** GHBS GHQ GHQRSP		**R** GHB	
200	**J** GHBS GHQ GHQRSP	**T** GHBS GHQ GHQRSP	**J** EHD FD, FDE (15–150 A) HFD, HFDE (15–150 A) FDC, FDCE (15–150 A) PDG2xF (15–100 A) ① PDG2xG (15–150 A) ① PDG2xM (15–150 A) ① PDG2xP (15–150 A) ①	**T** EHD FD, FDE (15–150 A) HFD, HFDE (15–150 A) FDC, FDCE (15–150 A) PDG2xF (15–100 A) ① PDG2xG (15–150 A) ① PDG2xM (15–150 A) ① PDG2xP (15–150 A) ①	**R** GHB		
400						**J** GHB	**T** GHB

① Where x = 2 or 3.

Table 10. 277/480 Volts AC—Fuse/Breaker Series Ratings

Main fuse class shown in shaded area, centered at top. Respective branch devices shown directly below.
All ratings in this table apply to 2- and 3-pole branch devices only. For single-pole, 277 Volts AC branch breakers, see Table 9.

Main Fuse Maximum Amperes	Series Equipment Rating—kA Symmetrical						
	65		100		200		
100			J GHBS	T GHBS			R GHB
200	J GHBS	T GHBS		R GHB			
400					J GHB	T GHB	
600			J EHD FD, FDE (15–150 A) HFD, HFDE (15–150 A) FDC, FDCE (15–150 A) PDG2xF (15–100 A) ① PDG2xG (15–150 A) ① PDG2xM (15–150 A) ① PDG2xP (15–150 A) ①	T GHB EHD FD, FDE (15–150 A) HFD, HFDE (15–150 A) FDC, FDCE (15–150 A) JD HJD JDC PDG2xF (15–100 A) ① PDG2xG (15–150 A) ① PDG2xM (15–150 A) ① PDG2xP (15–150 A) ①			

① Where x = 2 or 3.

Table 11. 480 Volts AC—Fuse/Breaker Series Ratings

Main fuse class shown in shaded area, centered at top. Respective branch devices shown directly below.
All ratings in this table apply to 2- and 3-pole branch breakers only. Not valid for single-pole branch breakers.

Main Fuse Maximum Amperes	Series Equipment Rating—kA Symmetrical					
	100			200		
100	R EHD PDG2xF (15–100 A) ①					
200	J EHD PDG2xF (15–100 A) ①	T EHD PDG2xF (15–100 A) ①				

① Where x = 2 or 3.

Table 12. 600 Volts AC—Fuse/Breaker Series Ratings

Main fuse class shown in shaded area, centered at top. Respective branch devices shown directly below.
All ratings in this table apply to 2- and 3-pole branch devices only.

Main Fuse Maximum Amperes	Series Equipment Rating—kA Symmetrical					
	100			200		
100	**R** FD, FDE (15–150 A) HFD, HFDE (15–150 A) FDC (15–150 A) PDG2xG (15–150 A) ① PDG2xM (15–150 A) ① PDG2xP (15–150 A) ①					
200	**J** FD, FDE (15–150 A) HFD, HFDE (15–150 A) FDC (15–150 A) PDG2xG (15–150 A) ① PDG2xM (15–150 A) ① PDG2xP (15–150 A) ①	**T** FD, FDE (15–150 A) HFD, HFDE (15–150 A) FDC (15–150 A) PDG2xG (15–150 A) ① PDG2xM (15–150 A) ① PDG2xP (15–150 A) ①	**R** JD HJD JDC			
400	**J** JD HJD JDC	**T** JD HJD JDC	**R** KD HKD KDC PDG3xG ① PDG3xM ① PDG3xP ①			
600				**J** KD HKD KDC PDG3xG ① PDG3xM ① PDG3xP ①	**T** KD HKD KDC PDG3xG ① PDG3xM ① PDG3xP ①	

① Where x = 2 or 3.

Table 13. Triple Series Ratings

Main Fuse Class and Maximum Amperes	Tenant Main Type	Branch Type	System Voltage	Short-Circuit Series Rating (kA, Sym.)
L-6000	DK, KD, KDB	EHD ①, PDG2xF (15–100 A) ②	240	100
L-6000	DK, KD, KDB, PDD3xG ②, PDG3xG ②	GB, GHB	120/240	100
L-6000	DK, KD, KDB, PDD3xG ②, PDG3xG ②	FD ①, FDE ①, FDB ①, PDG2xF (15–100 A) ②, PDG2xG (15–150 A) ②	240	100
L-6000	DK, KD, KDB, PDD3xG ②, PDG3xG ②	JD, JDB	240	100
L-6000	JD, JDB	GB, GHB	240	100
L-6000	JD, JDB	GB, GHB	120/240	100
L-6000	FD (15–150 A)	GB, GHB	240	100
L-6000	FD (15–150 A), PDG2xG (15–150 A) ②	GB, GHB	120/240	100
L-6000	FD (15–150 A)	BAB-H, HQP-H, QBHW-H, QPHW-H	240	100
L-6000	FDB	BAB-H, HQP-H	240	100
L-6000	FD (15–150 A), PDG2xG (15–150 A) ②	BAB ③, HQP ③, QBHW ③, QPHW ③	120/240	100
L-6000	FDB, PDG2xF (15–100 A) ②	BAB ③, HQP ③	120/240	100
L-6000	EHD	BAB-H, HQP-H	240	100
L-6000	EHD, PDG2xF (15–100 A) ②	BAB, HQP ③	120/240	100

① Valid on 2- and 3-pole breakers only. Not valid for single-pole.
② Where x = 2 or 3.
③ 1-pole restricted to 15–70 A.

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