Switchboard/Panelboard Short-Circuit Current Ratings

Introduction

This document addresses Underwriters Laboratories (UL) short-circuit current rating (SCCR) requirements for switchboards and panelboards, along with three methods of system protection. It also provides circuit breaker interrupting ratings, series ratings tables, a fuse cross-reference table, and typical application examples.

UL requires that all UL Listed switchboards and panelboards be marked with a maximum SCCR. Testing switchboards and panelboards at the maximum SCCR evaluates the structure, bus, and overcurrent protective device (OCPD) as an entire system. The National Electrical Code® (NEC®) equipment requirements for SCCR are defined in Sections 110.9 and 110.10. The criteria for determining SCCR are found in UL Standard 891 for switchboards and UL Standard 67 for panelboards.

Three systems of short-circuit current protection are available:

- Fully-rated system
- Fully-rated, selectively-coordinated system
- Series-connected system

NOTE: The information contained in the tables of this data bulletin is correct at the time of printing; ratings may change without notice due to equipment design modifications. Refer to the series-connected ratings marked on the end-use equipment.

Fully-Rated System

In a fully-rated system, the interrupting rating of all OCPDs must be greater than or equal to the available fault current at the line side terminals of each device.

Fully-Rated, Selectively-Coordinated System

This is a fully-rated system with an additional design characteristic: within the range of selectivity, the OCPD closest to the fault opens the circuit, while the upstream OCPD remains closed. This limits unnecessary interruption of service to unaffected portions of the system. A system coordination study must be performed to ensure selectivity.

Series-Connected System

A series-rated system consists of a combination of OCPDs connected in series. The line side (main) device must have an interrupting rating equal to or greater than the available fault current at the line side terminals of the device. The load side (branch) circuit breaker has a lower interrupting rating that has been tested in combination with the line side device.

To comply with Sections 110.22 and 240.86 of the NEC, all applicable series combinations must be marked on the end-use equipment. The UL Recognized Component Directory (Yellow Book) must not be used as an application guide for series-connected ratings in end-use equipment.

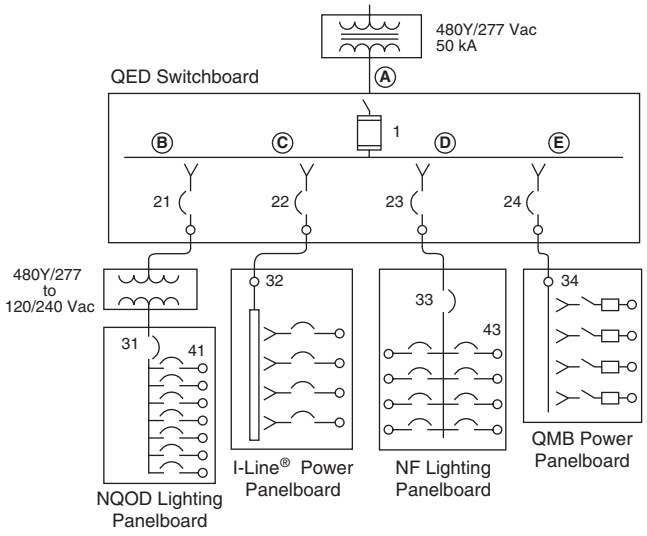
Section 240.86(B) further defines the use of series ratings with respect to motor contribution. This section requires that a calculation of the motor contribution be made if the motor(s) are connected to the load side of the higher rated device and to the line side of the lower rated device. If the sum of the motor full load current(s) is found to be higher than one percent of the interrupting rating of the lower rated device, then the series rating for that device cannot be used.

Examples

The examples are based on a 480Y/277 V system with 50 kA available at the service entrance.

NOTE: Series-rated systems must comply with NEC Article 240.86(B).

Figure 1: Series Rating Example



Legend:

Ⓐ A main may be series-rated with all the distribution circuit breakers (21, 22, 23, 24). Calculating the available fault current at the line terminals of the downstream circuit breakers may permit lower AIR rated circuit breakers. Series rating at this level typically is not as economical as series rating between the switchboard distribution circuit breakers (22, 23) and panelboards (32, 33).

Ⓑ A distribution circuit breaker (21) is not series-rated through a transformer to a lighting panelboard (31) because the voltage changes.

Ⓒ A 225 A KC circuit breaker (22) will series rate with FD and FG circuit breakers in an I-Line panelboard (32). Refer to Table 10 on page 14.

Ⓓ The 225 A KC feeder circuit breaker (23) in the switchboard must be fully rated. A 225 A main circuit breaker (33) in the panelboard must be fully rated for the available fault current, either calculated at the panelboard or the switchboard available fault rating if calculations are not done. The integral panelboard main circuit breaker must series rate with the branch EDB circuit breakers (43). Refer to Table 12 on page 17.

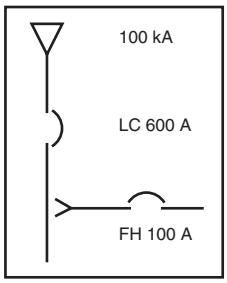
Ⓔ Fusible disconnects with Class R, J, T, or L (34) do not require series rating with a 225 A KC circuit breaker (24).

If a consultant specifies, based on a short-circuit study, that all switchboards are to be rated 50 kA, power panelboards 42 kA, and lighting panelboards 22 kA, the following procedure is permissible:

- Series rate the switchboard main fusible disconnect (1) with the switchboard feeder circuit breakers (21, 22, 23, 24) at 50 kA.
- Series rate the NQOD panelboard main circuit breaker (31) with the panelboard branch circuit breaker (41) at 22 kA.
- Series rate the NF panelboard main circuit breaker (33) with the lighting panelboard branch circuit breakers (43) at 22 kA.

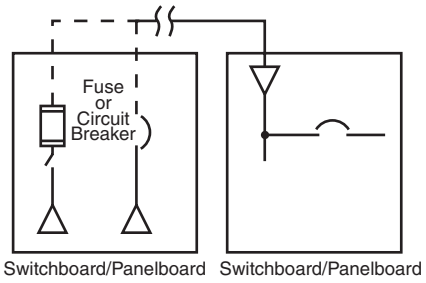
Example 1

A series-connected rating can be used *within* a single switchboard or panelboard enclosure.



Example 2

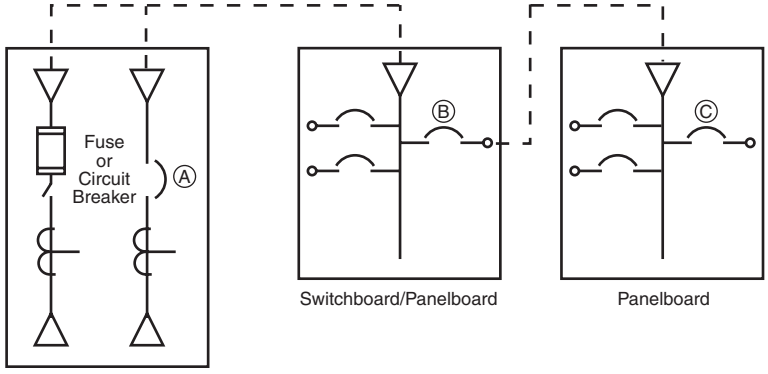
A series-connected rating can be accomplished outside a single enclosure using two switchboards, two panelboards, or a switchboard feeding a panelboard.



Example 3

A series-connected rating can be accomplished using a switchboard OCPD (A) and a panelboard main disconnect (B) (two-tier), or using a panelboard main OCPD (B) and a panelboard branch OCPD (C) (two-tier). In order for all OCPDs (A, B, C) to be in a series combination (three-tier), the series combination would have to be marked on the panelboard housing OCPD (C).

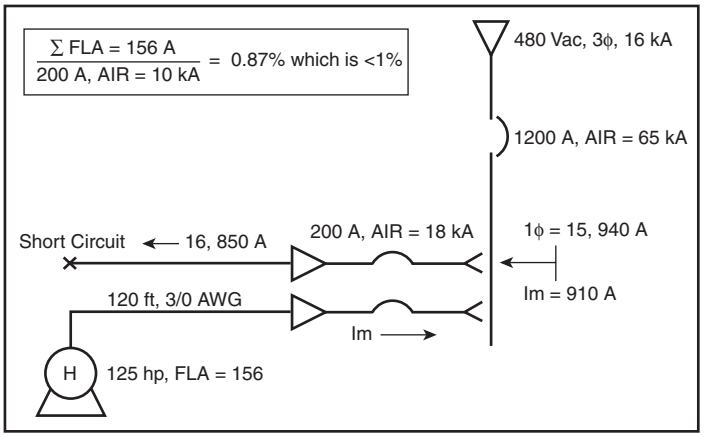
NOTE: Schneider Electric has three-tier ratings for multi-metering equipment. Multi-metering three-tier series ratings are not addressed in this bulletin. Applicable ratings appear on the appropriate equipment.



Example 4

Motor contribution in accordance with NEC 240.86 (B) must be considered before series ratings can be used.

NOTE: Use only the UL Listed SCCRs marked on the equipment. Standard interrupting circuit breakers cannot be substituted where high interrupting circuit breakers are indicated. Do not use the “up-over-down” method. It can lead to unsafe applications. Fuses chosen by the “up-over-down” method typically result in larger ampere ratings than the UL Listed fuse/circuit breaker series-connected short-circuit ratings shown in the tables. This simple method gives inaccurate results, partly because it ignores the dynamic impedance of molded case circuit breakers.



Interrupting and Series Ratings

Table 1 below and Table 2 on page 5 show the ratings of the OCPDs commonly furnished in Square D® brand switchboards and I-Line® panelboards. Devices are UL Listed for the interrupting ratings shown. Information given is correct at time of printing; ratings may change without notice due to modification in equipment design.

Table 1: Molded Case Circuit Breaker Interrupting Ratings (x 1000 RMS Symmetrical Amperes)

Circuit Breaker Type	Poles	Ampere Rating	240 Vac	277 Vac	480 Vac	600 Vac
FY	1	15–30	14	14	—	—
FA 240 V	1, 2, 3	15–100	10	—	—	—
FA 480 V	1	15–100	18	18	—	—
	2, 3	15–100	25	18	18	—
FA 600 V	2, 3	15–100	25	18	18	14
FH	1	15–30	65	65	—	—
	1	35–100	25	25	—	—
	2, 3	15–100	65	25	25	18
FC	2, 3	15–100	100	65	65	—
FI	2, 3	20–100	200	200	200	100
FD	1	15–70	18	18	18 [1]	—
	2, 3	15–100	25	18	18 [1]	—
FG	1	15–70	35	35	35 [1]	—
	2, 3	15–100	65	35	35 [1]	—
FJ	1	15–70	65	65	65 [1]	—
	2, 3	15–100	100	65	65 [1]	—
HD	2, 3	15–150	25	18	18	14
HG	2, 3	15–150	65	35	35	18
HJ	2, 3	15–150	100	65	65	25
HL	2, 3	15–150	125	100	100	50
QB	2, 3	70–225	10	—	—	—
QD	2, 3	70–225	25	—	—	—
QG	2, 3	70–225	65	—	—	—
QJ	2, 3	70–225	100 [2]	—	—	—
KA	2, 3	70–250	42	25	25	22
KH	2, 3	70–250	65	35	35	25
KC	2, 3	110–250	100	65	65	—
KI	2, 3	110–250	200	200	200	100
JD	2, 3	150–250	25	18	18	14
JG	2, 3	150–250	65	35	35	18
JJ	2, 3	150–250	100	65	65	25
JL	2, 3	150–250	125	100	100	50
LA	2, 3	125–400	42	30	30	22
LH	2, 3	125–400	65	35	35	25
LC	2, 3	300–600	100	65	65	35
LX	2, 3	100–600	100	65	65	35
LE	2, 3	100–600	100	65	65	35
LXI	2, 3	100–600	200	200	200	100
LI	2, 3	300–600	200	200	200	100
MA	2, 3	300–1200	42	30	30	22
MH	2, 3	300–1200	65	65	65	25
MX	2, 3	450–800	65	65	65	25
ME	2, 3	450–800	65	65	65	25

Continued on next page

1 FD, FG, and FJ circuit breakers are rated 480Y/277 Vac maximum.

2 QJ 3-pole circuit breaker is rated 100 kA, 208Y/120 Vac maximum.

Table 1: Molded Case Circuit Breaker Interrupting Ratings (x 1000 RMS Symmetrical Amperes) *(continued)*

Circuit Breaker Type	Poles	Ampere Rating	240 Vac	277 Vac	480 Vac	600 Vac
NA	2, 3	600–1200	100	50	50	25
NC	2, 3	600–1200	125	100	100	65
NX	2, 3	600–1200	125	100	100	65
NE	2, 3	600–1200	125	100	100	65
PA	2, 3	600–2000	65	50	50	42
PH	2, 3	600–2000	125	100	100	65
PC	2, 3	1600–2500	125	100	100	65
PX	3	600–2500	125	100	100	65
PE	3	600–2500	125	100	100	65
PG	2, 3	250–1200	65	35	35	18
PJ	2, 3	250–1200	100	65	65	25
PK	2, 3	250–1200	65	50	50	50
PL	2, 3	250–1200	125	100	100	—
RG	2, 3	600–2500	65	35	35	18
RJ	2, 3	600–2500	100	65	65	25
RK	2, 3	600–2500	65	65	65	65
RL	2, 3	600–2500	125	100	100	50
SE	3	200–4000	150	100	100	85

Table 2: Insulated Case Circuit Breaker Interrupting Ratings (x 1000 RMS Symmetrical Amperes)

Circuit Breaker Type	Poles	Ampere Rating	240 Vac	277 Vac	480 Vac	600 Vac
NT-N	3	100–1200	65	50	50	35
NT-H	3	100–1200	100	65	65	—
NT-L	3	100–1200	200	100	100	—
NW-N	3	100–2000	65	65	65	50
NW-H	3	100–6000	100	100	100	85
NW-L	3	100–6000	200	150	150	100

Table 3 shows the ratings of the OCPDs commonly furnished in Square D brand lighting and appliance panelboards. Devices are UL Listed for the interrupting ratings shown. Information given is correct at time of printing; ratings may change without notice due to equipment design modifications.

Table 3: Molded Case Circuit Breaker Interrupting Ratings (x 1000 RMS Symmetrical Amperes)

Circuit Breaker Type	Poles	Ampere Rating	120 Vac	120/240 Vac	240 Vac	277 Vac	480/277 Vac
QO	1	10–70	10	10	—	—	—
	2	10–125	10	10	—	—	—
	3	10–100	10	10	10	—	—
QO-H	2	15–100	10	10	10	—	—
QO-VH	1	15–30	22	22	—	—	—
	2	15–125	22	22	—	—	—
	3	15–100	22	22	22	—	—
QH	1	15–30	65	65	—	—	—
	2	15–30	65	65	—	—	—
	3	15–30	65	65	65	—	—
QO-GFI [1]	1	15–30	10	—	—	—	—
	2	15–60	10	10	—	—	—
QO-VHGFI	1	15–30	22	—	—	—	—
EDB	1	15–70	25	18	18	18	—
	2, 3	15–125	25	25	25	18	18
EGB	1	15–70	65	35	35	35	—
	2, 3	15–125	65	65	65	35	35
EJB	1	15–70	100	65	65	65	—
	2, 3	15–125	100	100	100	65	65

[1] 60 A QO-GFI is suitable only for feeding 120/240 Vac and 208 Vac 2-wire loads. It does not contain a load neutral connection.

Commercial Multi-Metering Switchboards (Class 2755 or Class 2756)

The OCPD within commercial metering switchboards, up to 100 kA, will be the *remote* line side main for the series combination. The load side circuit breaker will be in the panelboard, load center, or enclosed circuit breaker. This represents a typical two-tier system. All of the tables on the following pages apply.

NOTE: The marking will be on the downstream device, not on the commercial multi-metering switchboard; therefore, Tables 1–15 apply to series ratings with the devices in the commercial multi-metering switchboard. **Exception:** If a panelboard is installed within the commercial multi-metering switchboard, then the panelboard will be marked accordingly and per the tables listed in this bulletin.

Figure 2: UL Recognized Fuse/Circuit Breaker Series-Connected Rating

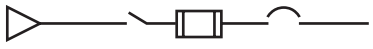


Figure 2 at left and Tables 5 and 6 on page 9 show the arrangement and ratings of 240 Vac (maximum) systems with line side fuses in series with load side circuit breakers for switchboards and panelboards.

NOTE: The line side fused switch may be in a separate enclosure or in the same enclosure as the load side circuit breaker. A line side fused switch may be integral or remote. A load side circuit breaker may be a branch or feeder. The series combination SCCR must not exceed that of the line side fused switch. The tables apply to Square D brand, load side circuit breakers only. However, the line side fuse ratings are independent of the fuse manufacturer. For fuse information, refer to Table 13 on page 19. UL fuse/circuit breaker series ratings are not applicable to corner-grounded systems.

Table 4: Main Fuse and Branch Circuit Breakers for I-Line Panelboards Only

Maximum System Voltage AC	Max. Short Circuit Current Rating (RMS Symm.)	Remote Main Fuse		Branch Circuit Breakers
		Maximum Amperage	Fuse Class [1]	Designation
120/240 1Ø 208Y/120	100,000	1200 A	L, T (300 V)	QD [2], QG [2]
		800 A	T (600 V)	
		600 A	J, RK5	
240	65,000	1200 A	L, T (300 V)	QD
		800 A	T (600 V)	
		600 A	J, RK5	
	100,000	1200 A	L, T (300 V)	QD, QG (2 Pole)
		800 A	T (600 V)	
		600 A	J, RK5	
			J, T (600 V)	FA, FH, KA, KH, KC, LA, LH, MA, MH, MX, PG
			RK5	FH, KA, KH, LA, LH, MA, MH, MX, PG, HD, HG, HJ, HL, JD, JG, JJ, JL
			J	HD, HG, HJ, HL, JD, JG, JJ, JL
		800 A	T (600 V)	FH, KA, KH, LA, LH, MA, MH, MX, PG
			T (300 V)	PG
			L	FH,KA,KH,LA,LH,MA,MH,MX,PG
		1200 A	L	FH, KH, LA, LH, MA, MH, MX, PG
			T (600 V)	HD, HG, HJ, HL, JD, JG, JJ, JL
		1200/2000 A	L	KH, MA, MH, MX, PG
		4000 A	L	HD, HG, HJ, HL, JD, JG, JJ, JL
	200,000	600 A	J, T (600V)	FA (3 pole only), FH, FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
			RK5	FH, FC, HD, HG, HJ, HL, JD, JG, JJ, JL, KH, KC, LA, LH, LC, MA, MH, MX, NC, NX, PG, PJ, PL
			J	HD, HG, HJ, HL, JD, JG, JJ, JL
		800 A	T (600V)	FH, FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
			T (300V)	PG, PJ, PL
			L	FH, FC, KH, KC, LA, LH, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
		1200 A	L	FC, KH, KC, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
			T (600V)	HD, HG, HJ, HL, JD, JG, JJ, JL
		1200/2000 A	L	NA, NC, NX, PJ, PL
		4000 A	L	HD, HG, HJ, HL, JD, JG, JJ, JL

Continued on next page

1 The fuse used in this UL test is an envelope (umbrella) fuse. This fuse is designed as a “worst case” fuse. Thus, no matter what manufacturer’s fuse is used, the Square D brand circuit breaker is protected.

The line side fused switch may be in a separate enclosure, or in the same enclosure as the load side circuit breaker. A line side fused switch may be a submain, integral main, or remote main. A load side circuit breaker may be a branch, submain, or an integral main used on the load side of a remote main. This series combination short circuit current rating shall not exceed that of the line side fused switch. The charts apply to Square D brand, load side circuit breakers only. However, the line side fuse ratings are independent of the fuse manufacturer.

Not applicable to corner-grounded systems.

Limiters used in Square D brand DSL and DSL II fused power circuit breakers are not class L fuses and do not have series ratings.

2 Series rating valid for 2-pole circuit breakers @ 240 Vac and 3-pole circuit breakers@ 208Y/120 V.

Table 4: Main Fuse and Branch Circuit Breakers for I-Line Panelboards Only *(continued)*

Maximum System Voltage AC	Max. Short Circuit Current Rating (RMS Symm.)	Remote Main Fuse		Branch Circuit Breakers
		Maximum Amperage	Fuse Class [1]	Designation
480	100,000	400 A	J, T (600V)	HD, HG, HJ, HL, JD, JG, JJ, JL
		600 A	J, RK5	HJ, HL, JJ, JL
			J, T(600V)	FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, PG, PJ
			RK5	FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, PG, PJ
		800 A	L, T (600V)	FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, PG, PJ
		1200 A	L	FC, KH, KC, LA, LH, LC, MA, MH, MX, NA, PG, PJ
			T (600V)	HJ, HL, JJ, JL
		1600 A	L	KC, LC, MA, MH, MX, NA, PG, PJ
		2000 A	L	KC, LC, MH, MG, MJ, MX, NA, PG, PJ
		4000 A	L	HJ, HL, JJ, JL
	200,000	200 A	RK5	HJ, HL
		400 A	J	FA, FH, FC, HJ, HL, JJ, JL, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
			T(600V)	FA, FH, FC, HJ, HL, JJ, JL, KA, KH, KC, LA, LH, MA, MH, MX, NA, NC, NX
		600 A	J	FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, MG, MJ, NA, NC, NX, PG, PJ, PL
			T(600V)	KA, KH, KC, LA, LH, MA, MH, MX, NA, NC, NX
			RK5	KC, LA, LH, LC, MA, MH, MX, MG, MJ, NC, NX, PG, PJ,
		800 A	T(300V)	PG, PJ, PL
			T(600V)	KA, KH, KC, LA, LH, MA, MH, MX, MG, MJ, NA, NC, NX, PG, PJ, PL
			L	KC, LA, LH, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
		1200 A	L	KC, LC, MA, MH, MX, MG, MJ, NA, NC, NX, PG, PJ, PL
		1600/2000 A	L	NA, NC, NX
600	100,000	30 A	CC	HG, JG (Molded Case Switches)
		200 A	J	HD, HG, HJ, HL, JD, JG, JJ, JL
		400 A	J, T (600V)	HJ, HL, JJ, JL
		600 A	R	MG, MJ
		1200 A	L	MG, MJ
	200,000	600 A	J	MG, MJ
		800 A	T (600V)	MG, MJ

1 The fuse used in this UL test is an envelope (umbrella) fuse. This fuse is designed as a “worst case” fuse. Thus, no matter what manufacturer’s fuse is used, the Square D brand circuit breaker is protected.

The line side fused switch may be in a separate enclosure, or in the same enclosure as the load side circuit breaker. A line side fused switch may be a submain, integral main, or remote main. A load side circuit breaker may be a branch, submain, or an integral main used on the load side of a remote main. This series combination short circuit current rating shall not exceed that of the line side fused switch. The charts apply to Square D brand, load side circuit breakers only. However, the line side fuse ratings are independent of the fuse manufacturer.

Not applicable to corner-grounded systems.

Limiters used in Square D brand DSL and DSL II fused power circuit breakers are not class L fuses and do not have series ratings.

Table 5: 240 Vac Series-Connected Ratings (100 kA Maximum) [1]

Line Side		Load Side								
Fuse Class [2]	Fuse Class Amps	FA 15–100 A	FH 15–100 A	QD/QG [3] 70–225 A	KA 70–250 A	KH 70–250 A	LA/LH 125–400 A	MA/MH 300–800 A	MX 450–800 A	PG 250–1200 A
R	200 A	—	2, 3	2, 3	2, 3	2, 3	[4]	—	—	—
	400 A	—	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	—	2, 3
	600 A	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	2, 3
T 300 V	800 A	—	—	2, 3	—	—	—	—	—	2, 3
T 600 V	400 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	—	2, 3
	600 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
	800 A	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
J	200 A	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	—	—	—
	400 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	—	2, 3
	600 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	2, 3
L	800 A	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
	1200 A	—	2, 3	2, 3	—	2, 3	2, 3	2, 3	2, 3	2, 3
	1600 A	—	—	—	—	2, 3	—	2, 3	2, 3	2, 3
	2000 A	—	—	—	—	2, 3	—	2, 3	2, 3	2, 3

1 Ratings are not available for areas with a dash (—); 2, 3 indicates the number of poles.

2 The fuse used in this UL test is an envelope (umbrella) fuse. This fuse is designed as a “worst case” fuse. Therefore, no matter which manufacturer’s fuse is used, the Square D brand circuit breaker is protected.

3 A 3-pole circuit breaker can be used only on 208Y/120 Vac maximum.

4 Ratings are available, but not typically used with these combinations.

Table 6: 240 Vac Series-Connected Ratings (200 kA Maximum) [1]

Line Side		Load Side													
Fuse Class [2]	Fuse Class Amps	FA 15–100 A	FH 15–100 A	FC 15–100 A	KA 70–250 A	KH 70–250 A	KC 110–250 A	LA/LH 125–400 A	LC 300–600 A	LX 100–600 A	MA/MH 300–800 A	MX 450–800 A	NA/NC 600–1200 A	NX 600–1200 A	PG, PJ, PL 250–1200 A
R	200 A	—	2, 3	2, 3	—	2, 3	2, 3	[3]	[3]	[3]	[3]	[3]	[3]	[3]	—
	400 A	—	2, 3	2, 3	—	2, 3	2, 3	2, 3	[3]	2, 3	[3]	[3]	[3]	[3]	2, 3
	600 A	—	2, 3	2, 3	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	[3]	[3]	2, 3
T 300 V	800 A	—	—	—	—	—	—	—	—	—	—	—	—	—	2, 3
T 600 V	400 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	2, 3	[3]	—	—	—	2, 3
	600 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	[3]	[3]	2, 3
	800 A	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	[3]	2, 3
J	200 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	—	[3]	—	—	—	—	—
	400 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	2, 3	[3]	—	—	—	2, 3
	600 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	[3]	[3]	2, 3
L	800 A	—	2, 3 [4]	2, 3	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
	1200 A	—	—	2, 3	—	2, 3	2, 3	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
	1600 A	—	—	—	—	—	—	—	—	—	—	—	2, 3	2, 3	2, 3 [5]
	2000 A	—	—		—	—	—	—	—	—	—	—	2, 3	2, 3	2, 3 [5]

1 Ratings are not available for areas with a dash (—); 2, 3 indicates the number of poles.

2 The fuse used in this UL test is an envelope (umbrella) fuse. This fuse is designed as a “worst case” fuse. Therefore, no matter which manufacturer’s fuse is used, the Square D brand circuit breaker is protected.

3 Ratings are available, but not typically used with these combinations.

4 Not available in QED switchboard construction.

5 Rating not available with PG circuit breaker.

Figure 3: UL Recognized Fuse/Circuit Breaker Series-Connected Rating

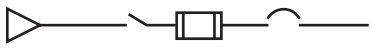


Figure 3 at left, Table 7 below, and Table 8 on page 11 show the arrangement and ratings of 480 Vac (maximum) systems with line side fuses in series with load side circuit breakers for switchboards and panelboards.

NOTE: The line side fused switch may be in a separate enclosure or in the same enclosure as the load side circuit breaker. A line side fused switch may be integral or remote. A load side circuit breaker may be a branch or feeder. The series combination SCCR must not exceed that of the line-side fused switch. The tables apply to Square D brand, load side circuit breakers only. However, the line side fuse ratings are independent of the fuse manufacturer. For fuse information, refer to Table 13 on page 19. UL fuse/circuit breaker series ratings are not applicable to corner-grounded systems.

Table 7: 480 Vac Series-Connected Ratings (100 kA Maximum) [1]

Line Side		Load Side													
Fuse Class [2]	**Fuse Class Amps**	**FA 15–100 A**	**FH 15–100 A**	**FC 15–100 A**	**KA 70–250 A**	**KH 70–250 A**	**KC 110–250 A**	**LA/LH 125–400 A**	**LC 300–600 A**	**LX 100–600 A**	**MA/MH 300–800 A**	**MX 450–800 A**	**NA/NC 600–1200 A**	**NX 600–1200 A**	**PG, PJ, PL 250–1200 A**
R	200 A	—	—	2, 3	2, 3 [3]	2, 3	2, 3	[4]	—	[4]	—	—	—	—	—
	400 A	—	—	2, 3	2, 3 [3]	2, 3	2, 3	2, 3	[4]	2, 3	[4]	[4]	—	—	2, 3
	600 A	—	—	2, 3	2, 3 [3]	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	[4]	2, 3
T 600 V	400 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	2, 3	[4]	[4]	—	—	2, 3
	600 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	[4]	2, 3
	800 A	—	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
J	200 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	—	[4]	—	—	—	—	—
	400 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	2, 3	[4]	[4]	—	—	2, 3
	600 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[4]	[4]	2, 3
L	800 A	—	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
	1200 A	—	—	2, 3	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
	1600 A	—	—	2, 3	—	—	2, 3	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
	2000 A	—	—	2, 3	—	—	2, 3	—	2, 3	2, 3	—	2, 3	2, 3	2, 3	2, 3

1 Ratings are not available for areas with a dash (—); 2, 3 indicates the number of poles.

2 The fuse used in this UL test is an envelope (umbrella) fuse. This fuse is designed as a “worst case” fuse. Therefore, no matter which manufacturer’s fuse is used, the Square D brand circuit breaker is protected.

3 Not available in QED switchboard construction.

4 Ratings are available, but not typically used with these combinations.

Table 8: 480 Vac Series-Connected Ratings (200 kA Maximum) [1]

Line Side		Load Side													
Fuse Class [2]	Fuse Class Amps	FA 15–100 A	FH 15–100 A	FC 15–100 A	KA 70–250 A	KH 70–250 A	KC 110–250 A	LA/LH 125–400 A	LC 300–600 A	LX 100–600 A	MA/MH 300–800 A	MX 450–800 A	NA/NC 600–1200 A	NX 600–1200 A	PG, PJ, PL 250–1200 A
R	200 A	—	—	2, 3	—	—	2, 3	[3]	—	[3]	—	—	—	—	—
	400 A	—	—	2, 3	—	—	2, 3	2, 3	[3]	2, 3	[3]	—	—	—	2, 3
	600 A	—	—	2, 3	—	—	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	[3]	[3]	2, 3
T 300 V	800 A	—	—	—	—	—	—	—	—	—	—	—	—	—	2, 3
T 600 V	400 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	2, 3	[3]	—	—	—	—
	600 A	—	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	[3]	[3]	—
	800 A	—	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
J	200 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	—	[3]	—	—	—	—	—
	400 A	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	2, 3	[3]	—	—	—	2, 3
	600 A	—	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	[3]	[3]	[3]	2, 3
L	800 A	—	—	2, 3	—	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
	1200 A	—	—	2, 3	—	—	2, 3	—	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3	2, 3
	1600 A	—	—	—	—	—	—	—	—	—	—	—	2, 3	2, 3	—
	2000 A	—	—	—	—	—	—	—	—	—	—	—	2, 3	2, 3	—

1 Ratings are not available for areas with a dash (—); 2, 3 indicates the number of poles.

2 The fuse used in this UL test is an envelope (umbrella) fuse. This fuse is designed as a “worst case” fuse. Therefore, no matter which manufacturer’s fuse is used, the Square D brand circuit breaker is protected.

3 Ratings are available, but not typically used with these combinations.

Figure 4: UL Recognized Circuit Breaker/Circuit Breaker Series-Connected Rating

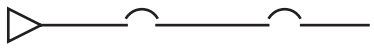


Figure 4 at left and Table 9 below show the arrangement and ratings of 240 or 277 Vac (maximum) systems with line side circuit breakers in series with load side circuit breakers for I-Line switchboards and panelboards.

NOTE: The line side circuit breaker may be in a separate enclosure or in the same enclosure as the load side circuit breaker. A line side circuit breaker may be integral or remote. A load side circuit breaker may be a branch or feeder. The series-connected SCCR must not exceed that of the line side circuit breaker. The tables apply to Square D brand, load side circuit breakers only. UL circuit breaker/circuit breaker series ratings are not applicable to corner-grounded systems.

Table 9: I-Line 240 Vac and 277 Vac Series Ratings—Switchboards/Panelboards

Maximum System Voltage AC	Maximum SCCR	Line Side		Load Side		
		Main Circuit Breaker	Maximum Circuit Breaker	Circuit Breakers [1]	Current Rating (A)	Poles
120	100 kA	FJ	100	FD	15–70	1
		QJ	225	FD	15–70	
		QJ	225	FA	15–100	
	65 kA	QG	225	FA	15–100	
				FD	15–70	
208Y/120	100 kA	QJ	225	FA, FD	15–100	2, 3
		QJ	225	QD, QG	70–225	2, 3
		PH	1600			
		PJ	1200			
		RJ	2000			
240	42 kA	KA	250	FD	15–100	1, 2, 3
		LA	400	QD	70–225	2, 3
		MA	1200			
	65 kA	FG, FH	100	FD	15–100	1, 2, 3
		MX	800			
		MH	1000			
		PJ	1200			
		FC	100	FD, FG		
		KC, KH	250			
		LH	400			
		LC	600			
		QG	225	FA, FD	15–100	2, 3
				QD	70–225	
		LH	400	QD	70–225	
		MH	1200			
		PA	1600			
		PG	1200			
		RG	2000			
	85 kA	RL	2500	FH	15–100	2, 3
			2500	KH	70–250	

Continued on next page

[1] FD, FG, and FJ circuit breaker ratings apply to both switchboards and panelboards. Ratings for all other circuit breakers apply only to switchboards.

Table 9: I-Line 240 Vac and 277 Vac Series Ratings—Switchboards/Panelboards *(continued)*

Maximum System Voltage AC	Maximum SCCR	Line Side		Load Side		
		Main Circuit Breaker	Maximum Circuit Breaker	Circuit Breakers [1]	Current Rating (A)	Poles
240	100 kA	FC	100	FD, FG, FJ	15–100	1
		KC	250			
		LC, LX	600			
		QJ	225	FD	15–100	2
		FC	100	FA, FD, FG, FH, FJ	15–100	2, 3
		PH	1600	QD, QG	70–225	
		RJ	1200			
		FJ	100	FD	15–100	
		KC	250	FA, FD, FG, FH, FJ		
		LC, LX	600	FD, FG, FH, FJ		
		KC	250	KA, KH	70–250	
		LC, LX	600			
		LC, LX	600	LA, LH	125–400	
	125 kA	RL	2500	RG	600–2500	
	200 kA	FI	100	FD, FG, FJ	15–100	1
		KI	250			
		LI, LXI	600			
		FI, KI	100, 250	FA, FC, FD, FG, FH, FJ	15–100	2, 3
		LI, LXI	600	FC, FD, FG, FH, FJ		
		KI	250	QD, QG, QJ	70–225	
		LI	600			
		LXI	600			
		KI	250	KA, KC, KH	70–250	
		LI, LXI	600	LA, LH, LC	125–400	
		LI, LXI	600	KA, KC, KH	70–250	
277	25 kA	FH	100	FD	15–70	1
		KA	250			
	35 kA	FG	100	FD	15–70	
		KH	250			
		LH	400			
	65 kA	FC	100	FA, FD, FG, FH, FY	15–30	
		FJ	100	FD		
		KC	250	FA, FD, FG, FH, FY	15–100	
					15–70	
		LC, LX (400 A, Max)	400	FH	15–30	
		LC, LX (600 A, Max)	600	FY	15–30	
				FD, FG	15–70	
	200 kA	FI	100	FA, FD, FG, FH, FJ, FY	15–30	
		KI	250		15–100	
					15–70	
		LI, LXI (400 A, Max)	400	FH	15–30	
		LI, LXI (600 A, Max)	600	FY	15–30	
				FD, FG, FJ	15–70	

[1] FD, FG, and FJ circuit breaker ratings apply to both switchboards and panelboards. Ratings for all other circuit breakers apply only to switchboards.

Figure 5: UL Recognized Circuit Breaker/Circuit Breaker Series-Connected Rating

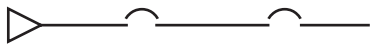


Figure 5 at left and Table 10 below show the arrangement and ratings of 480 Vac (maximum) systems with line side circuit breakers in series with load side circuit breakers for I-Line switchboards and panelboards.

NOTE: The line side circuit breaker may be in a separate enclosure or in the same enclosure as the load side circuit breaker. A line side circuit breaker may be integral or remote. A load side circuit breaker may be a branch or feeder. The series-connected SCCR must not exceed that of the line side circuit breaker. The tables apply to Square D brand, load side circuit breakers only. UL circuit breaker/circuit breaker series ratings are not applicable to corner-grounded systems.

Table 10: I-Line 480 Vac Series Ratings—Switchboards/Panelboards

Maximum System Voltage AC	Maximum SCCR	Line Side		Load Side		
		Main Circuit Breaker	Maximum Circuit Breaker	Circuit Breakers [1]	Current Rating (A)	Poles
480/277	25 kA	FH	100	FD	15–100	2, 3
		KA	250			
480	30 kA	KH	250	FH	15–100	2, 3
		LA	400			
		MA	1000			
		MX	800			
		PJ	1200			
		PA, PC	2000			
		PX	2500			
		LA	400	KA	70–250	
		MA	1000			
		MX	800			
		PA, PC	2000			
		PX	2500			
480/277	35 kA	FG	100	FD	15–100	2, 3
		KH	250			
		LH	400			
	65 kA	FJ	100	FD	15–100	
		FC, KC	100, 250	FD, FG		
480	65 kA	FC, KC	100, 250	FA, FH	15–100	2, 3
		LC, LX (400 A, Max)	400	FH	15–100	
480/277	65 kA	LC, LE, LX (600 A, Max)	600	FD, FG	15–100	2, 3
480	65 kA	KC	250	KA, KH	70–250	2, 3
		LC, LX	600			
		LC, LX	600	LA, LH	125–400	
	100 kA	LI, LXI (600 A, Max)	600	KA, KH	70–250	
		RL	2500	RG	600–2500	
	200 kA	FI, KI	100, 250	FA, FC, FH	15–100	
480/277	200 kA	FI, KI	100, 250	FD, FG, FJ	15–100	2, 3
480	200 kA	LI, LXI (400 A, Max)	400	FC, FH	15–100	2, 3
480/277	200 kA	LI, LXI (600 A, Max)	600	FD, FG, FJ	15–100	2, 3
480	200 kA	KI	250	KA, KC, KH	70–250	2, 3
		LI, LXI (400 A, Max)	400			
		LI, LXI (600 A, Max)	600	FC	15–100	
				KC	70–250	
		LI, LXI	600	LA, LH	125–400	
				LC	300–600	

[1] FD, FG, and FJ circuit breaker ratings apply to both switchboards and panelboards. Ratings for all other circuit breakers apply only to switchboards.

Figure 6: UL Recognized Circuit Breaker/Circuit Breaker Series-Connected Rating

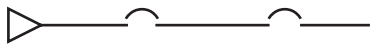


Figure 6 at left and Table 11 below show the arrangement and ratings of 240 Vac (maximum) systems with line side circuit breakers in series with load side circuit breakers for NQOD panelboards.

NOTE: Suffixes HID, SWD, and SWN may also be applied to the applicable branch circuit breakers shown above, with one exception: suffix SWN may not be applied in combination with LC main circuit breakers.

Table 11: NQ 240 Vac Series Short-Circuit Current Ratings—Panelboards

Maximum System Voltage AC [1]	Maximum Short Circuit Current Rating (RMS Symmetrical)	Integral or Remote Main Circuit Breakers and Remote Main Fuses	Branch Circuit Breaker Designations and Allowable Ampere Ranges [2][3][4]			
			Type	1-pole	2-pole	3-pole
120/240 1Ø	22k	MG	QO (B)	15–30 A	—	—
	42k	HD, JD	QO (B) PL	15–30 A	15–60 A	15–30 A
	65k	HG, JG	QO (B) PL	15–30 A	15–60 A	15–30 A
	100k	HJ, JJ	QO (B) PL	15–30 A	15–60 A	15–30 A
	125k	HL, JL	QO (B) PL	15–30 A	15–60 A	15–30 A
120/240 1Ø 208Y/120	100k	DJ 400 A	QO (B)	15–70 A	15–125 A	—
			QO (B) GFI	15–30 A	40–60 A	—
			QO (B) VH	—	150 A	15–150 A
			QO (B) AFI	15–20 A	—	—
		QJ	QO (B)	15–70 A	15–125 A	15–30 A
			QO (B) AS	15–30 A	15–30 A	15–30 A
			QO (B) GFI	15–30 A	15–60 A	—
			QO (B) PL	15–30 A	15–60 A	15–30 A
			QO (B) VH	—	150 A	35–150 A
			QO (B) AFI	15–20 A	—	—
208Y/120	18k	LA/LH (L) 34200MC LA/LH (L) 34225MC LA/LH (L) 34250MC LA/LH (L) 34400MC	QO (B)	15–30 A	15–30 A	15–30 A
240	22k	QO (B) VH	QO (B)	15–70 A	15–125 A	15–100 A
			QO (B) AS	15–30 A	15–30 A	15–30 A
			QO (B) GFI	15–30 A	15–60 A	—
			QO (B) PL	15–30 A	15–30 A	—
			QO (B) AFI	15–20 A	—	—
		Q2-H [5]	QO (B)	15–70 A	15–100 A	15–30 A
			QO (B) GFI	15–30 A	15–30 A	—
			QO (B) AFI	15–20 A	—	—
	25k	QD	QO (B)	15–70 A	15–125 A	15–30 A
			QO (B) AS	15–30 A	15–30 A	15–30 A
			QO (B) GFI	15–30 A	15–60 A	—
			QO (B) PL	15–30 A	15–60 A	15–30 A
			QO (B) VH	—	150 A	35–150 A
			QO (B) AFI	15–20 A	—	—
		ED, FD [5]	QO (B)	15–70 A	15–125 A	15–100 A
			QO (B) GFI	15–30 A	15–60 A	—
			QO (B) AFI	15–20 A	—	—
		KD [5]	QO (B)	15–70 A	15–125 A	15–100 A
			QO (B) AS	15–30 A	15–30 A	15–30 A
			QO (B) GFI	15–30 A	15–60 A	—
			QO (B) AFI	15–20 A	—	—
		HD, JD	QO (B)	15–70 A	15–125 A	15–100 A
			QO (B) VH	—	—	35–150 A
			QO (B) GFI	15–30 A	15–60 A	—
			QO (B) AFI	15–20 A	—	—
			QO (B) H	—	15–100 A	—
			QOB2150VH	—	150 A	—

Continued on next page

1 For shown circuit breakers rated less than this maximum voltage, the indicated short circuit current rating also applies, but at the voltage rating of the circuit breaker.

2 Suffixes HID, SWD, and SWN may also be applied to the applicable branch circuit breakers shown above, with one exception: suffix SWN may not be applied in combination with LC main circuit breakers.

3 Where QO® (B) circuit breakers are shown above, QO (B) H, QO (B) VH, and QH (B) circuit breakers may also be used.

4 Where QO(B) GFI circuit breakers are shown above, QO (B) EPD circuit breakers may also be used.

5 Obsolescent. Contact your local Schneider Electric representative for the replacement circuit breaker. One-pole FJ circuit breakers are still available.

Table 11: NQ 240 Vac Series Short-Circuit Current Ratings—Panelboards *(continued)*

Maximum System Voltage AC [1]	Maximum Short Circuit Current Rating (RMS Symmetrical)	Integral or Remote Main Circuit Breakers and Remote Main Fuses	Branch Circuit Breaker Designations and Allowable Ampere Ranges [2][3][4]			
			Type	1-pole	2-pole	3-pole
240	42k	LA, MA	Q2L-H	—	110–225 A	110–225 A
			QDL	—	70–225 A	70–225 A
		LC 400 A	QO (B)	15–70 A	—	—
			QO (B) VH	15–30 A	15–125 A	15–100 A
			QOBVH	—	150 A	—
			QO (B) GFI	15–30 A	15–60 A	—
			QO (B) AFI	15–20 A	—	—
		LC 600 A	QO (B) VH	15–30 A	15–125 A	15–100 A
			QOBVH	—	150 A	—
			QO (B) GFI	—	15–60 A	—
			QO (B) AFI	15–20 A	—	—
		MG	QO (B) VH	15–30 A	15–30 A	15–30 A
		HD, JD	QO (B) PL	15–30 A	15–60 A	15–30 A
	65k	LC 400 A	QO (B)	15–30 A	—	—
			QO (B) VH	15–30 A	15–125 A	15–100 A
			QOBVH	—	150 A	—
			QO (B) GFI	15–30 A	—	—
			QO (B) AFI	15–20 A	—	—
		LC 600 A	QO (B) VH	15–30 A	15–125 A	35–100 A (3P 208 V Max.) 15–30 A (3P 240 V Max.)
			QOBVH	—	150 A	—
			QO (B) GFI	—	—	—
			QO (B) AFI	15–20 A	—	—
		DJ 400 A	QO (B)	15–70 A	15–125 A	—
			QO (B) VH	—	150 A	15–150 A
			QO (B) H	—	15–100 A	—
		EG, FG, KG	QO (B)	15–70 A	15–125 A	15–100 A
			QO (B) GFI	15–30 A	15–60 A	—
			QO (B) AFI	15–20 A	—	—
		QG	QO (B)	15–70 A	15–125 A	15–30 A
			QO (B) AS	15–30 A	15–30 A	15–30 A
			QO (B) VH	—	150 A	35–150 A
		QG, HG, JG	QO (B) GFI	15–30 A	15–60 A	—
			QO (B) PL	15–30 A	15–60 A	15–30 A
			QO (B) AFI	15–20 A	—	—
		HG, JG	QO (B)	15–70 A	15–125 A	15–100 A
			QO (B) VH	—	—	35–150 A
			QO (B) H	—	15–100 A	—
			QOB2150VH	—	150 A	—
		FC22__ KC22__ FC32__ KC32__	QO (B)	15–70 A	15–100 A	15–100 A
			QO (B) AS	15–30 A	15–30 A	15–30 A
			QO (B) GFI	15–30 A	15–30 A	—
			QO (B) AFI	15–20 A	—	—
		400 A Max. Class J or T6 Fuses	QO (B) VH	15–30 A	15–125 A	15–100 A
			QOB-VH	—	150 A	—
			QO (B) AFI	15–20 A	—	—

Continued on next page

1 For shown circuit breakers rated less than this maximum voltage, the indicated short circuit current rating also applies, but at the voltage rating of the circuit breaker.

2 Suffixes HID, SWD and SWN may also be applied to the applicable branch circuit breakers shown above, with one exception: suffix SWN may not be applied in combination with LC main circuit breakers.

3 Where QO (B) circuit breakers are shown above, QO (B) H, QO (B) VH, and QH (B) circuit breakers may also be used.

4 Where QO(B) GFI circuit breakers are shown above, QO (B) EPD circuit breakers may also be used.

Table 11: NQ 240 Vac Series Short-Circuit Current Ratings—Panelboards *(continued)*

Maximum System Voltage AC [1]	Maximum Short Circuit Current Rating (RMS Symmetrical)	Integral or Remote Main Circuit Breakers and Remote Main Fuses	Branch Circuit Breaker Designations and Allowable Ampere Ranges [2][3][4]			
			Type	1-pole	2-pole	3-pole
240	100k	FC24__ KC24__ FC34__ KC34__	QO (B) QO (B) AS QO (B) GFI QO (B) AFI	15–70 A 15–30 A 15–30 A 15–20 A	15–100 A 15–30 A 15–30 A —	15–100 A 15–30 A — —
		200 A Max. Class T3 Fuses	QO (B) AFI	15–20 A	—	—
		EJ, FJ	QO (B) QO (B) GFI QO (B) AFI	15–70 A 15–30 A 15–20 A	15–125 A 15–60 A —	15–100 A — —
		HJ, JJ	QO (B) QO (B) VH QO (B) GFI	15–70 A — 15–30 A	15–125 A — 15–60 A	15–100 A 35–150 A —
	125k	HL. JL	QO (B) PL QO (B) AFI QO (B) H QOB2150VH	15–30 A 15–20 A — —	15–60 A — 15–100 A 150 A	15–30 A — — —
	200k	FI, KI	QO (B) QO (B) AS QO (B) GFI QO (B) AFI	15–70 A 15–30 A 15–30 A 15–20 A	15–125 A 15–30 A 15–60 A —	15–100 A 15–30 A — —
		200 A max., Class J or T6 fuses and 400 A max., Class T3 fuses	QO (B) QO (B) AS QO (B) GFI	15–70 A 15–30 A 15–30 A	15–125 A 15–30 A 15–60 A	15–100 A 15–30 A —

1 For shown circuit breakers rated less than this maximum voltage, the indicated short circuit current rating also applies, but at the voltage rating of the circuit breaker.

2 Suffixes HID, SWD and SWN may also be applied to the applicable branch circuit breakers shown above, with one exception: suffix SWN may not be applied in combination with LC main circuit breakers.

3 Where QO (B) circuit breakers are shown above, QO (B) H, QO (B) VH, and QH (B) circuit breakers may also be used.

4 Where QO(B) GFI circuit breakers are shown above, QO (B) EPD circuit breakers may also be used.

Figure 7: UL Recognized Circuit Breaker/Circuit Breaker Series-Connected Rating

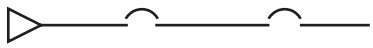


Figure 7 at left and Table 12 below show the arrangement and ratings of systems with line side circuit breakers in series with load side circuit breakers for NF panelboards.

NOTE: The line side circuit breaker may be in a separate enclosure or in the same enclosure as the load side circuit breaker. A line side circuit breaker may be integral or remote. A load side circuit breaker may be a branch or feeder. The series-connected SCCR must not exceed that of the line side circuit breaker. The table applies to Square D brand, load side circuit breakers only. UL circuit breaker/circuit breaker series ratings are not applicable to corner-grounded systems.

Table 12: NF Series Ratings

Maximum System Voltage AC	Maximum Short Circuit Current Rating (RMS Symmetrical)	Main Type	Branch Type	Poles
240	65,000	EG, FH, FG [1], KH, LH, MH, MX, HG, JG	EDB, EDB-EPD	1, 2, 3
		EG	ECB-G3	
	100,000	EJ, FC, FJ [1], KC, LC, LX, HJ, JJ	EDB, EDB-EPD, EGB	
		EJ, FC, KC, HJ, JJ	ECB-G3	
	125,000	HL, JL	EDB, EDB-EPD, EGB, ECB-G3	
	200,000	FI, KI, LI, LXI	EDB, EDB-EPD, EGB, EJB	
		FI, KI	ECB-G3	
480Y/ 277	35,000	EG, FG [1], KH, LH, HG, JG	EDB, EDB-EPD	1, 2, 3
		EG, HG, JG	ECB-G3	
	65,000	EJ, FC, FJ, KC, LC, LX, HJ, JJ	EDB, EDB-EPD, EGB	
		EJ, FC, KC, HJ, JJ	ECB-G3	
	100,000	HL,JL	EDB, EDB-EPD, EGB	
	200,000	FI, KI, LI, LXI	EDB, EDB-EPD, EGB, EJB	
		FI, KI	ECB-G3	
600Y/ 347	18,000	HG, JG, MG	EDB, EDB-EPD	1, 2, 3
	25,000	EJ, FI, KH, KI, LC, LE, LX, LI, LXI, HJ, JJ	EDB, EDB-EPD, EGB	
		LH	EDB (15–70 A), EGB	
	35,000	LC, LE	EDB, EGB, EJB	
	50,000	HL, JL	EDB, EGB	
	65,000	FI, KI	EDB, EGB, EJB	
		LI, XI	EJB	
Remote Main Fuse				
240	200,000	200 A max., Class J or T 600 V fuses	ECB-G3	1, 2, 3
480Y/ 277	100,000	400 A max. fuses	EDB, EDB-EPD, EGB, EJB	1, 2, 3
	200,000	200 A max. fuses	EDB, EDB-EPD, EGB, EJB, ECB-G3	
600Y/ 347	200,000	200 A max., Class J or T 600 V fuses	EDB, EGB, EJB	1, 2, 3

[1] Obsolescent. Contact your local Schneider Electric representative for the replacement circuit breaker. One-pole FJ circuit breakers are still available.

Table 13: Fuse Cross Reference [1]

UL Class	Voltage Rating (V)	Ampere Rating (A)	Interrupting Rating in RMS Symmetrical Amperes (kA)	Gould Shawmut	Reliance (Economy)	Bussman	Application
H	250 600	1–600	10	RF RFS	ERN ERS	REN RES	General purpose, renewable.
H or K5 [2]	250 600	1–600	10	OT OTS	KON KOS	NON NOS	General purpose.
RK5	250 600	1–600	200	TR-R TRS-R	ECNR ECNS	FRN-R FRS-R	Main, feeder, and branch circuits. Especially recommended for motors, welders, and transformers.
RK1	250 600	1–600	200	A2K-R A6K-R	NCLR SCLR	KTN-R KTS-R	Main, feeder, and branch circuits. Especially recommended for circuit breaker protection (high degree of current limitation).
RK1	250 600	1–600	200	A2D A6D	LENRK LESRK	LPN-RK LPS-RK	Main, feeder, and branch circuits. Circuit breaker protection.
J	600	1–600	200	A4J	JCL	LPJ	Main, feeder, and branch circuits. Circuit breaker protection.
T	300 600	1–1200	200	A3T	—	JJN JJS	Main, feeder, and branch circuits. Circuit breaker protection, small physical dimensions. Non-motor loads (no heavy inrush currents).
L	600	601–6000	200	A4BT	LCL	KRP-C [3]	High interrupting capacity main, feeder, and branch circuits; large motor circuit breaker.
L	600	601–6000	200	A4BY	LCU	KTU	High interrupting capacity main, feeder, and branch circuits; large motor circuit breaker.

1 This listing is intended as a comparative reference only. Some fuse characteristics may not be equal in all aspects to other fuses named. If necessary, check catalog data or request factory verification of specific features.

2 Some ampere ratings in the range of 60 A and smaller are available as UL Class K5 with a 50 kA interrupting rating, but are not current limiting.

3 Has more time delay than standard Class L.

Speed-D® Service Section Switchboards (Class 2710)

The main or distribution device within these switchboards, up to 200 kA, will be the *remote* line side main for the series combination. Additional ratings are shown in Tables 14 and 15 for circuit breakers located within the service section.

Table 14: Type SF Service Section Switchboards: Fusible Main with I-Line or NQOD Distribution

Maximum System Voltage AC	Maximum SCCR	Line Side Class T Fuse Maximum Current Rating (A)	Load Side	
			Circuit Breaker	Poles
120/240	42 kA	400 (600 V)	QO-VH, QOB-VH	1
240	42 kA	800 (600 V)	QO-VH, QOB-VH	2, 3
			FA	
			Q4	
			Q2-H, QD	2
480	50 kA		FA, FH	2, 3
	65 kA		KA, KH	
			LA,LH	

Table 15: Type SB Service Section Switchboard: Main Circuit Breaker with I-Line or NQOD Distribution

Maximum System Voltage AC	Maximum SCCR	Line Side Circuit Breaker	Load Side	
			Circuit Breaker	Poles
120	42 kA	LH	FY	1
		MH		
240	42 kA	LH	Q2-H, QD	2,. 3
			Q4	
		MH	Q2-H, QD	
			Q4	
480	30 kA	LH	FA	
			KA	
		MH	FH	
			KH	

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