

Motor Circuit Protection Tables

NEC® Article 430 and Tables Explanation

Columns 1 & 2

Motor horsepower ratings are listed in Column 1. Full load amps from Tables 430.247 through 430.250 are provided in Column 2.

Column 3

Various fuse types are listed in Column 3. The LPJ_SP is a 600Vac, 0 - 600 amp, time-delay, Class J, "Low-Peak fuse, with a 300,000 amp interrupting rating. The TCF is a 600Vac, 1 - 100 amp dual-element, time-delay, IP-20 finger-safe fuse with Class J performance. The LP-CC is a 600Vac, 0 - 30 amp, time-delay, Class CC, Low-Peak fuse with a 200,000 amp interrupting rating. The LPS-RK_SP and LPN-RK_SP are 600 and 250Vac, 0 - 600 amp, time-delay, Class RK1, Low-Peak fuses with interrupting ratings of 300,000 amps. FRS-R and FRN-R are 600 and 250Vac, 0 - 600 amp, time-delay, Class RK5, Fusetron Dual-Element fuses with interrupting ratings of 200,000 amps. The KRP-C_SP is a 600Vac, 601 - 6000 amp, time-delay, Class L, Low-Peak fuse, with a 300,000 amp AC interrupting rating. The DC listed ratings for these fuses are:

LPJ	1 to 600SP	300Vdc	LPN-RK	0 to 60SP	125Vdc
TCF	1 to 100	300Vdc	LPN-RK	70 to 600SP	250Vdc
LP-CC	½ to 2%	300Vdc	LPS-RK	0 to 600SP	300Vdc
LP-CC	3 to 15	150Vdc	FRN-R	0 to 600	125Vdc
LP-CC	20 to 30	300Vdc	FRS-R	0 to 600	300Vdc

Column 4 - Optimal Branch Circuit Protection

There are two distinct levels of protection philosophy provided in this Column. LPS-RK_SP, LPN-RK_SP, FRS-R and FRN-R fuses are sized for motor running "back-up" protection and provide superb short circuit protection at the same time. LPJ_SP, TCF, and LP-CC fuses are sized a little larger but are even more current limiting, providing an even greater degree of short circuit protection for the motor circuit.

All the fuses selected from this column provide short circuit and ground-fault protection for motor branch circuits (430.52), but typically are not the maximum allowed. Fuses sized in accordance with Column 4 must be used in conjunction with properly sized motor overload protection such as overload relays or solid state motor controllers (430.32). This fuse sizing is normally large enough to allow the overload protective device to operate on overloads without opening the fuse. Yet for many cases, this fuse amp rating selection is smaller than the maximums allowed per Columns 5 or 6 (430.52). In some cases, this smaller amp rating selection may provide the benefits of a smaller size disconnect and better short circuit protection. If a motor has a long starting time, high starting current profile or is cycled frequently, it may be necessary to use Column 5 or 6.

The LPS-RK_SP, LPN-RK_SP, FRS-R and FRN-R fuses sized per this column provide short circuit and ground-fault protection for motor branch circuits (430.52) as discussed in the previous paragraph. In addition, these dual-element fuses exhibit longer time-delay characteristics and can therefore be sized to provide back-up motor overload protection. The fuse sizing in Column 4 for LPS-RK_SP, LPN-RK_SP, FRS-R and FRN-R fuses provides a degree of motor and circuit overload protection to back-up the normal motor overload protective device. Note: This level of protection requires a well-designed, true dual-element fuse. The Fusetron Fuses, FRS-R and FRN-R, and Low-Peak Fuses, LPS-RK_SP and LPN-RK_SP, are the industry leading dual-element fuses with excellent over-load time-delay characteristics and current-limiting short circuit ability. The Low-Peak Dual-Element Fuses have better current-limiting ability than Fusetron Dual-Element Fuses.

The amp ratings in Column 4 are determined by using Column 2 motor ampacity values and the following:

LPJ_SP & TCF: 150% or the next larger Cooper Bussmann amp rating if 150% does not correspond to a Cooper Bussmann fuse amp rating.

LP-CC ½ to 15A: 200% (150% for DC) or the next larger Cooper Bussmann size if 200% (150% for DC) does not correspond to a Cooper Bussmann fuse amp rating.

LP-CC 20 to 30A: 300% (150% for DC) or the next larger Cooper Bussmann size if 300% (150% for DC) does not correspond to a Cooper Bussmann fuse amp rating.

LPS-RK_SP and LPN-RK_SP: 130% or the next larger Cooper Bussmann amp rating if 130% does not correspond to a Cooper Bussmann fuse amp rating.

FRS-R and FRN-R: 125% or the next larger Cooper Bussmann amp rating if 125% does not correspond to a Cooper Bussmann fuse amp rating.

Column 5 - Branch Circuit Protection, Max. General Applications

Fuses selected from this column are intended to provide short circuit and ground-fault protection for motor branch circuits. Fuses sized in accordance with Column 5 must be used in conjunction with properly sized motor overload protection such as overload relays or solid state motor controllers (430.32). Column 5 fuse sizing provides the maximum NEC® Table 430.52 amp ratings for general purpose applications. It takes into account 430.52(C)(1) Exception No. 1, which allows the next standard amp rating fuse (per standard fuse amp ratings in 240.6) to be used if the maximum percentage in Table 430.52 does not correspond to a standard fuse amp rating. If this Column 5 fuse sizing does not allow the motor to start, then Column 6 may provide a larger amp rating.

The amp ratings in Column 5 are determined by using Column 2 motor ampacity values and the following:

LPJ_SP, TCF, LPS-RK_SP, LPN-RK_SP, FRS-R, FRN-R and KRP-C_SP: 175% (150% for DC motors) or the next larger **240.6 standard** fuse amp rating if 175% (150% for DC motors) does not correspond to a standard fuse amp rating.

LP-CC: 300% (150% for DC motors) or the next larger **240.6 standard** fuse amp rating if 300% (150% for DC motors) does not correspond to a standard fuse amp rating.

Sizes shown for the LP-CC can also be used for non-time delay fuses such as **JKS, KTN-R, KTS-R, JJJ, JJS, and KTK-R.**

Column 6 - Branch Circuit Protection, Max. Heavy Start

When the amp rating shown in Column 5 is not sufficient to start a motor, a larger amp rating is often available by utilizing 430.52(C)(1) Exception No. 2. The amp ratings in Column 6 are the larger of the amp rating allowed by 430.52(C)(1) Exception No. 1, or 430.52(C)(1) Exception No. 2. These amp ratings will often be required when acceleration times are greater than 5 seconds, when plugging or jogging applications exist, or where there are high inrush currents (such as Design E or energy efficient Design B motors). (In a few cases, the amp rating in Column 6 may be smaller than the maximum permitted due to the limitation of the fuse type, such as LP-CC, Class CC fuses that are only available in ratings up to 30 amps. In these cases, if the amp rating shown is not sufficient to start the motor, select a different family of fuses that meet the requirements.) The amp ratings in Column 6 are determined by using Column 2 motor ampacity values and the following:

LPJ_SP, TCF, LPS-RK_SP, LPN-RK_SP, FRS-R, and FRN-R: 225% or the next smaller Cooper Bussmann amp rating if 225% does not correspond to a Cooper Bussmann fuse amp rating.

LP-CC: 400% or the next smaller Cooper Bussmann amp rating if 400% does not correspond to a Cooper Bussmann fuse amp rating.

KRP-C_SP: 300% or the next smaller Cooper Bussmann amp rating, if 300% does not correspond to a Cooper Bussmann amp rating.

Sizes shown for the LP-CC can also be used for non-time delay fuses such as **JKS, KTN-R, KTS-R, JJJ, JJS, AND KTK-R.**

Column 7

Horsepower-rated switch sizes given in Column 7 are based on 115% (430.110) of Column 2. Switch sizes need to be increased when, because of starting requirements, the fuses are sized above the rating of the switch shown in this column.

Column 8

Sizes listed are for general-purpose magnetic controllers (single speed, full-volt-age for limited plugging and jogging-duty) as shown in NEMA Standards Publication ICS-2-2000.

NEC® Article 430 and Tables Explanation

Column 9

Copper wire sizes are based upon 125% (430.22) of values shown in Column 2 and ampacities listed in Table 310.16 for 75°C terminals. Although the NEC® allows 60°C terminations for equipment rated 100 amp or less, most equipment terminations have been rated for 75°C conductors. If equipment terminations are rated for 60°C conductors only, the 60°C ampacities must be utilized and therefore larger conductor sizes may be required than those shown in this column. See 110.14(C) (1)(a)(4).

Column 10

These rigid metallic conduit sizes are based upon copper conductors with THWN or THHN insulation, Table C8 of Annex C, and 75°C equipment terminals.

Conduit sizes are for three conductors per circuit for three phase motors and two conductors per circuit for single phase and DC motors. Conduit sizes may need to be increased if equipment grounding conductors or neutrals are also installed in the conduit.

If equipment terminations are rated for 60°C conductors only, the 60°C ampacities must be utilized and therefore larger conductor sizes and conduit sizes may be required.

Conductors operated in a high ambient temperature may need to be derated. (See correction factor table at the bottom of Table 310.16.)

200Vac Three-Phase Motors & Circuits

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ^f	5 NEC® Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ^f	6 NEC® Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ^f	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
½	2.5	LPJ_SP	J	4	6	6	30	00	14	½
		TCF	J/	6	6	6				
		LP-CC	CC	5	10	10				
		LPN-RK_SP	RK1	3 ½	6	6				
¾	3.7	FRN-R	RK5	3 ¾	6	6	30	00	14	¾
		LPJ_SP	J	5 ½	10	10				
		TCF	J/	6	10	10				
		LP-CC	CC	7 ½	15	15				
1	4.8	LPN-RK_SP	RK1	5	10	10	30	00	14	1
		FRN-R	RK5	5	10	10				
		LPJ_SP	J	8	10	10				
		TCF	J/	10	10	10				
1 ½	6.9	LP-CC	CC	10	15	15	30	00	14	1 ½
		LPN-RK_SP	RK1	6 ¼	10	10				
		FRN-R	RK5	6	10	10				
		LPJ_SP	J	12	15	15				
2	7.8	TCF	J/	15	15	15	30	0	14	2
		LP-CC	CC	15	25	25				
		LPN-RK_SP	RK1	12	15	17 ½				
		FRN-R	RK5	10	15	17 ½				
3	11	LPJ_SP	J	17 ½	20	20	30	0	14	3
		TCF	J/	17 ½	20	20				
		LP-CC	CC	25	–	–				
		LPN-RK_SP	RK1	15	20	20				
5	17.5	FRN-R	RK5	15	20	20	30*	1	12	5
		LPJ_SP	J	30	35	35				
		TCF	J/	30	35	35				
		LPN-RK_SP	RK1	25	35	35				
7 ½	25.3	FRN-R	RK5	25	35	35	60	1	10**	7 ½**
		LPJ_SP	J	40	45	50				
		TCF	J/	40	45	50				
		LPN-RK_SP	RK1	35	45	50				
10	32.2	FRN-R	RK5	35	45	50	60*	2	8**	10**
		LPJ_SP	J	50	60	70				
		TCF	J/	50	60	–				
		LPN-RK_SP	RK1	45	60	70				
15	48.3	FRN-R	RK5	45	60	70	100	3	6**	15**
		LPJ_SP	J	80	90	100				
		TCF	J/	80	90	100				
		LPN-RK_SP	RK1	70	90	100				
20	62.1	FRN-R	RK5	70	90	100	100*	3	4**	20**
		LPJ_SP	J	100	110	125				
		TCF	J/	100	–	–				
		LPN-RK_SP	RK1	90	110	125				
		FRN-R	RK5	80	110	125				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

1 Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

^f Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables

200Vac Three-Phase Motors & Circuits continued

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
25	78.2	LPJ_SP	J	125	150	175	100*	3	3**	1**
		LPN-RK_SP	RK1	110	150	175				
		FRN-R	RK5	100	150	175				
30	92	LPJ_SP	J	150	175	200	200	4	2**	1**
		LPN-RK_SP	RK1	125	175	200				
		FRN-R	RK5	125	175	200				
40	120	LPJ_SP	J	200	225	250	200*	4	1/0	1 ¼
		LPN-RK_SP	RK1	175	225	250				
		FRN-R	RK5	150	225	250				
50	150	LPJ_SP	J	225	300	300	200*	5	3/0	1 ½
		LPN-RK_SP	RK1	200	300	300				
		FRN-R	RK5	200	300	300				
60	177	LPJ_SP	J	300	350	350	400	5	4/0	2
		LPN-RK_SP	RK1	250	350	350				
		FRN-R	RK5	225	350	350				
75	221	LPJ_SP	J	350	400	450	400*	5	300	2
		LPN-RK_SP	RK1	300	400	450				
		FRN-R	RK5	300	400	450				
		KRP-C_SP	L	-	-	650				
100	285	LPJ_SP	J	450	500	600	400*	6	500	3
		LPN-RK_SP	RK1	400	500	600				
		FRN-R	RK5	400	500	600				
		KRP-C_SP	L	-	-	800				
125	359	LPJ_SP	J	600	-	-	600*	6	4/0 2/PHASE	(2)2
		LPN-RK_SP	RK1	500	-	-				
		FRN-R	RK5	450	-	-				
		KRP-C_SP	L	-	700	1000				
150	414	LPN-RK_SP	RK1	600	-	-	600*	6	300 2/PHASE	(2)2
		FRN-R	RK5	600	-	-				
		KRP-C_SP	L	-	800	1200				
		KRP-C_SP	L	-	1000	1600				
200	552	KRP-C_SP	L	-	1000	1600	1200	72	500 2/PHASE	(2)3

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

1 Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

2 These sizes are typical. They are not shown in NEMA ICS 2-2000.

208Vac Three-Phase Motors & Circuits

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
½	2.4	LPJ_SP	J	4	6	6	30	00	14	½
		TCF	J/	6	6	6				
		LP-CC	CC	5	10	10				
		LPN-RK_SP	RK1	3 ½	6	6				
		FRN-R	RK5	3	6	6				
¾	3.5	LPJ_SP	J	5 ½	10	10	30	00	14	½
		TCF	J/	6	10	10				
		LP-CC	CC	7	15	15				
		LPN-RK_SP	RK1	5	10	10				
		FRN-R	RK5	4 ½	10	10				
1	4.6	LPJ_SP	J	7	10	10	30	00	14	½
		TCF	J/	10	10	10				
		LP-CC	CC	10	15	15				
		LPN-RK_SP	RK1	6	10	10				
		FRN-R	RK5	6	10	10				
1 ½	6.6	LPJ_SP	J	10	15	15	30	00	14	½
		TCF	J/	10	15	15				
		LP-CC	CC	15	20	25				
		LPN-RK_SP	RK1	9	15	15				
		FRN-R	RK5	9	15	15				

*Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

1 Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

**If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

2 These sizes are typical. They are not shown in NEMA ICS 2-2000.

† Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables



208Vac Three-Phase Motors & Circuits continued

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2- 2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
2	7.5	LPJ_SP	J	12	15	15	30	0	14	½
		TCF	J/	15	15	15				
		LP-CC	CC	15	25	30				
		LPN-RK_SP	RK1	10	15	15				
3	10.6	FRN-R	RK5	10	15	15	30	0	14	½
		LPJ_SP	J	17 ½	20	20				
		TCF	J/	17 ½	20	20				
		LPN-RK_SP	RK1	15	20	20				
5	16.7	FRN-R	RK5	15	20	20	30*	1	12	½
		LPJ_SP	J	30	30	35				
		TCF	J/	30	30	35				
		LPN-RK_SP	RK1	25	30	35				
7 ½	24.2	FRN-R	RK5	25	30	35	60	1	10**	½
		LPJ_SP	J	40	45	50				
		TCF	J/	40	45	50				
		LPN-RK_SP	RK1	35	45	50				
10	30.8	FRN-R	RK5	35	45	50	60	2	8	½**
		LPJ_SP	J	50	60	60				
		TCF	J/	50	60	60				
		LPN-RK_SP	RK1	45	60	60				
15	46.2	FRN-R	RK5	40	60	60	60*	3	6**	¾**
		LPJ_SP	J	70	90	100				
		TCF	J/	70	90	100				
		LPN-RK_SP	RK1	70	90	100				
20	59.4	FRN-R	RK5	60	90	100	100*	3	4**	1
		LPJ_SP	J	90	110	125				
		TCF	J/	90	-	-				
		LPN-RK_SP	RK1	80	110	125				
25	74.8	FRN-R	RK5	80	110	125	100*	3	3**	1**
		LPJ_SP	J	125	150	150				
		LPN-RK_SP	RK1	100	150	150				
		FRN-R	RK5	100	150	150				
30	88	LPN-RK_SP	RK1	150	175	175	200	4	2**	1**
		FRN-R	RK5	125	175	175				
		LPJ_SP	J	110	175	175				
		LPN-RK_SP	RK1	175	200	250				
40	114	FRN-R	RK5	150	200	250	200*	4	1/0	1 ¼
		LPJ_SP	J	225	300	300				
		LPN-RK_SP	RK1	200	300	300				
		FRN-R	RK5	200	300	300				
50	143	LPN-RK_SP	RK1	200	300	300	200*	5	3/0	1 ½
		FRN-R	RK5	200	300	300				
		LPJ_SP	J	300	300	350				
		LPN-RK_SP	RK1	225	300	350				
60	169	FRN-R	RK5	225	300	350	400	5	4/0	2
		LPJ_SP	J	300	300	350				
		LPN-RK_SP	RK1	300	400	450				
		FRN-R	RK5	300	400	450				
75	211	KRP-C_SP	L	-	-	601	400*	5	300	2
		LPJ_SP	J	350	400	450				
		LPN-RK_SP	RK1	300	400	450				
		FRN-R	RK5	300	400	450				
100	273	LPN-RK_SP	RK1	450	500	600	400*	6	500	3
		FRN-R	RK5	400	500	600				
		KRP-C_SP	L	-	-	800				
		LPJ_SP	J	600	-	-				
125	343	LPN-RK_SP	RK1	450	-	-	600*	6	4/0 2/PHASE	(2)2
		FRN-R	RK5	450	-	-				
		KRP-C_SP	L	-	601	1000				
		LPJ_SP	J	600	-	-				
150	396	LPN-RK_SP	RK1	600	-	-	600*	6	250 2/PHASE	(2)2
		FRN-R	RK5	600	-	-				
		KRP-C_SP	L	-	700	1100				
		LPJ_SP	J	600	-	-				
200	528	KRP-C_SP	L	-	1000	1500	1200*	7	400 2/PHASE	(2)2-2 ½

*Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

1 Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

**If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

2 These sizes are typical. They are not shown in NEMA ICS 2-2000.

/ Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables

230Vac Three-Phase Motors & Circuits (220-240Vac Systems)

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
½	2.2	LPJ_SP	J	3 ½	6	6	30	00	14	½
		TCF	J ^f	6	6	6				
		LP-CC	CC	4 ½	10	10				
		LPN-RK_SP	RK1	3	6	6				
		FRN-R	RK5	2 8/10	6	6				
¾	3.2	LPJ_SP	J	5	6	7	30	00	14	¾
		TCF	J ^f	6	6	6				
		LP-CC	CC	7	10	12				
		LPN-RK_SP	RK1	4 ½	6	7				
		FRN-R	RK5	4	6	7				
1	4.2	LPJ_SP	J	7	10	10	30	00	14	1
		TCF	J ^f	10	10	10				
		LP-CC	CC	9	15	15				
		LPN-RK_SP	RK1	5 ½	10	10				
		FRN-R	RK5	5 ½	10	10				
1 ½	6	LPJ_SP	J	9	15	15	30	00	14	1 ½
		TCF	J ^f	10	15	15				
		LP-CC	CC	12	20	20				
		LPN-RK_SP	RK1	8	15	15				
		FRN-R	RK5	7 ½	15	15				
2	6.8	LPJ_SP	J	12	15	15	30	0	14	2
		TCF	J ^f	15	15	15				
		LP-CC	CC	15	25	25				
		LPN-RK_SP	RK1	9	15	15				
		FRN-R	RK5	9	15	15				
3	9.6	LPJ_SP	J	15	20	20	30	0	14	3
		TCF	J ^f	15	20	20				
		LP-CC	CC	30	30	30				
		LPN-RK_SP	RK1	15	20	20				
		FRN-R	RK5	12	20	20				
5	15.2	LPJ_SP	J	25	30	30	30	1	14	5
		TCF	J ^f	25	30	30				
		LPN-RK_SP	RK1	20	30	30				
		FRN-R	RK5	20	30	30				
7 ½	22	LPJ_SP	J	35	40	45	30*	1	10	7 ½
		TCF	J ^f	34	40	45				
		LPN-RK_SP	RK1	30	40	45				
		FRN-R	RK5	30	40	45				
10	28	LPJ_SP	J	45	50	60	60	2	10**	10
		TCF	J ^f	45	50	60				
		LPN-RK_SP	RK1	40	50	60				
		FRN-R	RK5	35	50	60				
15	42	LPJ_SP	J	70	80	90	60*	2	6	15
		TCF	J ^f	70	80	90				
		LPN-RK_SP	RK1	60	80	90				
		FRN-R	RK5	60	80	90				
20	54	LPJ_SP	J	90	100	110	100*	3	4	20
		TCF	J ^f	90	100	-				
		LPN-RK_SP	RK1	80	100	110				
		FRN-R	RK5	70	100	110				
25	68	LPJ_SP	J	110	125	150	100*	3	4**	25
		LPN-RK_SP	RK1	90	125	150				
		FRN-R	RK5	90	125	150				
30	80	LPJ_SP	J	125	150	175	100*	3	3**	30
		LPN-RK_SP	RK1	110	150	175				
		FRN-R	RK5	100	150	175				
40	104	LPJ_SP	J	175	200	225	200*	4	1**	40
		LPN-RK_SP	RK1	150	200	225				
		FRN-R	RK5	150	200	225				
50	130	LPJ_SP	J	200	250	250	200*	4	2/0	50
		LPN-RK_SP	RK1	175	250	250				
		FRN-R	RK5	175	250	250				
60	154	LPJ_SP	J	250	300	300	200*	5	3/0	60
		LPN-RK_SP	RK1	225	300	300				
		FRN-R	RK5	200	300	300				

*Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

**If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

² These sizes are typical. They are not shown in NEMA ICS 2-2000.

^f Class J performance, special finger-safe dimensions.

⁴ Limited by 600 amp being the largest amp rating for FRN-R and LPN-RK_SP.

Motor Circuit Protection Tables

230Vac Three-Phase Motors & Circuits (220-240Vac Systems) continued

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
75	192	LPJ_SP	J	300	350	400	400	5	250	2
		LPN-RK_SP	RK1	250	350	400				
		FRN-R	RK5	250	350	400				
100	248	LPJ_SP	J	400	450	500	400*	5	350	2 ½
		LPN-RK_SP	RK1	350	450	500				
		FRN-R	RK5	350	450	500				
		KRP-C_SP	L	—	—	700				
125	312	LPJ_SP	J	500	600	—	400*	6	3/0 2/PHASE	(2) 1 ½
		LPN-RK_SP	RK1	450	600	—				
		FRN-R	RK5	400	600	—				
		KRP-C_SP	L	—	—	900				
150	360	LPJ_SP	J	600	—	—	600*	6	4/0 2/PHASE	(2) 2
		LPN-RK_SP	RK1	500	6004	—				
		FRN-R	RK5	450	6004	—				
		KRP-C_SP	L	—	—	1000				
200	480	FRN-R	RK5	600	—	—	600*	6	350 2/PHASE	(2) 2-2 ½
		KRP-C_SP	L	—	—	1000				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

² These sizes are typical. They are not shown in NEMA ICS 2-2000.

⁴ Limited by 600 amp being the largest amp rating for FRN-R and LPN-RK_SP.

460Vac Three-Phase Motors & Circuits (440-480Vac Systems)

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
½	1.1	LPJ_SP	J	1 ¾	3	3	30	00	14	½
		TCF	J/	3	3	3				
		LP-CC	CC	2 ¾	6	6				
		LPS-RK_SP	RK1	1 1 ½	3	3				
		FRS-R	RK5	1 ¾	3	3				
¾	1.6	LPJ_SP	J	2 ½	3	3 ½	30	00	14	½
		TCF	J/	3	3	3				
		LP-CC	CC	3 ¾	6	6 ¾				
		LPS-RK_SP	RK1	2 ¾	3	3 ½				
		FRS-R	RK5	2	3	3 ½				
1	2.1	LPJ_SP	J	3 ¾	6	6	30	00	14	½
		TCF	J/	6	6	6				
		LP-CC	CC	4 ½	10	10				
		LPS-RK_SP	RK1	2 ¾	6	6				
		FRS-R	RK5	2 ¾	6	6				
1 ½	3	LPJ_SP	J	4 ½	6	6	30	00	14	½
		TCF	J/	6	6	6				
		LP-CC	CC	6	10	12				
		LPS-RK_SP	RK1	4	6	6 ¾				
		FRS-R	RK5	4	6	6 ¾				
2	3.4	LPJ_SP	J	5 ¾	6	7	30	00	14	½
		TCF	J/	6	6	6				
		LP-CC	CC	7 1	5	15				
		LPS-RK_SP	RK1	4 ½	6	7				
		FRS-R	RK5	4 ½	6	7 ½				
3	4.8	LPJ_SP	J	8	10	10	30	0	14	½
		TCF	J/	10	10	10				
		LP-CC	CC	10	15	15				
		LPS-RK_SP	RK1	6 ¾	10	10				
		FRS-R	RK5	6	10	10				
5	7.6	LPJ_SP	J	12	15	15	30	0	14	½
		TCF	J/	15	15	15				
		LP-CC	CC	25	25	30				
		LPS-RK_SP	RK1	10	15	15				
		FRS-R	RK5	10	15	15				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

^f Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables

460Vac Three-Phase Motors & Circuits (440-480Vac Systems) continued

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
7 ½	11	LPJ_SP TCF LPS-RK_SP FRS-R	J Jf RK1 RK5	17 ½ 17 ½ 15 15	20 20 20 20	20 20 20 20	30	1	14	½
10	14	LPJ_SP TCF LPS-RK_SP FRS-R	J Jf RK1 RK5	25 25 20 17 ½	25 25 25 25	30 30 30 30	30	1	14	½
15	21	LPJ_SP TCF LPS-RK_SP FRS-R	J Jf RK1 RK5	35 35 30 30	40 40 40 40	45 45 45 45	30*	2	10	½
20	27	LPJ_SP TCF LPS-RK_SP FRS-R	J Jf RK1 RK5	45 45 40 35	50 50 50 50	60 60 60 60	60	2	10**	½
25	34	LPJ_SP TCF LPS-RK_SP FRS-R	J Jf RK1 RK5	60 60 45 45	60 60 60 60	70 70 70 70	60*	2	8**	½**
30	40	LPJ_SP TCF LPS-RK_SP FRS-R	J Jf RK1 RK5	60 60 60 50	70 70 70 70	90 90 90 90	60*	3	8**	½**
40	52	LPJ_SP TCF LPS-RK_SP FRS-R	J Jf RK1 RK5	80 80 70 70	100 100 100 100	110 - 110 110	100*	3	6**	¾**
50	65	LPJ_SP TCF LPS-RK_SP FRS-R	J Jf RK1 RK5	100 100 90 90	125 - 125 125	125 - 125 125	100*	3	4**	1
60	77	LPJ_SP LPS-RK_SP FRS-R	J RK1 RK5	125 110 100	150 150 150	150 150 150	100*	4	3**	1**
75	96	LPJ_SP LPS-RK_SP FRS-R	J RK1 RK5	150 125 125	175 175 175	200 200 200	200	4	1**	1 ¼**
100	124	LPJ_SP LPS-RK_SP FRS-R	J RK1 RK5	200 175 175	225 225 225	250 250 250	200*	4	2/0	1 ½
125	156	LPJ_SP LPS-RK_SP FRS-R	J RK1 RK5	250 225 200	300 300 300	350 350 350	200*	5	3/0	1 ½
150	180	LPJ_SP LPS-RK_SP FRS-R	J RK1 RK5	300 250 225	350 350 350	400 400 400	400	5	4/0	2
200	240	LPJ_SP LPS-RK_SP FRS-R KRP-C_SP	J RK1 RK5 L	400 350 300 -	450 450 450 -	500 500 500 700	400*	5	350	2 ½
250	302	LPJ_SP LPS-RK_SP FRS-R KRP-C_SP	J RK1 RK5 L	500 400 400 -	600 600 600 -	- - - 900	400*	6	3/0 2/PHASE	(2) 1 ½
300	361	LPJ_SP LPS-RK_SP FRS-R KRP-C_SP	J RK1 RK5 L	600 500 500 -	- 6004 6004 700	- - - 1000	600*	6	4/0 2/PHASE	(2) 2
350	414	LPS-RK_SP FRS-R KRP-C_SP	RK1 RK5 L	600 600 -	- 800 -	- 1200 -	600*	6	300 2/PHASE	(2) 2
400	477	KRP-C_SP FRS-R	L RK5	- 600	1000 -	1400 -	600*	6	350 2/PHASE	(2) 2 ½
450	515	KRP-C_SP	L	-	1000	1500	1200*	7	400 2/PHASE	(2) 2 ½
500	590	KRP-C_SP	L	-	1200	1600	1200*	7	500 2/PHASE	(2) 3

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

⁴ Limited by 600 amp being the largest amp rating for FRS-R and LPS-RK_SP.

^f Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables



575Vac Three-Phase Motors & Circuits (550-600Vac Systems)

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2- 2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
½	0.9	LPJ_SP	J	1%	3	3	30	0	14	½
		TCF	J/	3	3	3				
		LP-CC	CC	1%	3	3 ½				
		LPS-RK_SP	RK1	1 ½	3	3				
		FRS-R	RK5	1 ½	3	3				
¾	1.3	LPJ_SP	J	2	3	3	30	0	14	½
		TCF	J/	3	3	3				
		LP-CC	CC	2%	6	6				
		LPS-RK_SP	RK1	1%	3	3				
		FRS-R	RK5	1%	3	3				
1	1.7	LPJ_SP	J	2 ½	3	3 ½	30	0	14	½
		TCF	J/	3	3	3				
		LP-CC	CC	3 ½	6	6 ½				
		LPS-RK_SP	RK1	2 ½	3	3 ½				
		FRS-R	RK5	2 ½	3	3 ½				
1 ½	2.4	LPJ_SP	J	4	6	6	30	0	14	½
		TCF	J/	6	6	6				
		LP-CC	CC	5	10	10				
		LPS-RK_SP	RK1	3 ¾	6	6				
		FRS-R	RK5	3	6	6				
2	2.7	LPJ_SP	J	4 ½	6	6	30	0	14	½
		TCF	J/	6	6	6				
		LP-CC	CC	5 ½	10	10				
		LPS-RK_SP	RK1	4	6	6				
		FRS-R	RK5	3 ½	6	6				
3	3.9	LPJ_SP	J	6	10	10	30	0	14	½
		TCF	J/	6	10	10				
		LP-CC	CC	5	15	15				
		LPS-RK_SP	RK1	5 ½	10	10				
		FRS-R	RK5	5	10	10				
5	6.1	LPJ_SP	J	10	15	15	30	0	14	½
		TCF	J/	10	15	15				
		LP-CC	CC	15	20	20				
		LPS-RK_SP	RK1	8	15	15				
		FRS-R	RK5	8	15	15				
7 ½	9	LPJ_SP	J	15	20	20	30	1	14	½
		TCF	J/	15	20	20				
		LP-CC	CC	30	30	30				
		LPS-RK_SP	RK1	12	20	20				
		FRS-R	RK5	12	20	20				
10	11	LPJ_SP	J	17 ½	20	20	30	1	14	½
		TCF	J/	17 ½	20	20				
		LPS-RK_SP	RK1	15	20	20				
		FRS-R	RK5	15	20	20				
15	17	LPJ_SP	J	30	30	35	30*	2	12	½
		TCF	J/	30	30	35				
		LPS-RK_SP	RK1	25	30	35				
		FRS-R	RK5	25	30	35				
20	22	LPJ_SP	J	35	40	45	30*	2	10	½
		TCF	J/	35	40	45				
		LPS-RK_SP	RK1	30	40	45				
		FRS-R	RK5	30	40	45				
25	27	LPJ_SP	J	45	50	60	60	2	10**	½**
		TCF	J/	45	50	60				
		LPS-RK_SP	RK1	40	50	60				
		FRS-R	RK5	35	50	60				
30	32	LPJ_SP	J	50	60	70	60*	3	8	½
		TCF	J/	50	60	70				
		LPS-RK_SP	RK1	45	60	70				
		FRS-R	RK5	40	60	70				
40	41	LPJ_SP	J	70	80	90	60*	3	6	¾
		TCF	J/	70	80	90				
		LPS-RK_SP	RK1	60	80	90				
		FRS-R	RK5	60	80	90				
50	52	LPJ_SP	J	80	100	110	100*	3	6**	¾**
		TCF	J/	80	100	-				
		LPS-RK_SP	RK1	70	100	110				
		FRS-R	RK5	70	100	110				

*Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

**If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

² These sizes are typical. They are not shown in NEMA ICS 2-2000.

[†] Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables

575Vac Three-Phase Motors & Circuits (550-600Vac Systems) continued

1 Motor Size Table 430.250 HP	2 Motor FLA Table 430.250 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2- 2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
60	62	LPJ_SP	J	100	110	125	100*	4	4**	1
		LPS-RK_SP	RK1	90	110	125				
		FRS-R	RK5	80	110	125				
75	77	LPJ_SP	J	125	150	150	100*	4	3**	1**
		LPS-RK_SP	RK1	110	150	150				
		FRS-R	RK5	100	150	150				
100	99	LPJ_SP	J	150	175	200	200	4	1**	1 ½**
		LPS-RK_SP	RK1	150	175	200				
		FRS-R	RK5	125	175	200				
125	125	LPJ_SP	J	200	225	250	200*	5	2/0	1 ½
		LPS-RK_SP	RK1	175	225	250				
		FRS-R	RK5	175	225	250				
150	144	LPJ_SP	J	225	300	300	200*	5	3/0	1 ½
		LPS-RK_SP	RK1	200	300	300				
		FRS-R	RK5	200	300	300				
200	192	LPJ_SP	J	300	350	400	400	5	250	2
		LPS-RK_SP	RK1	250	350	400				
		FRS-R	RK5	250	350	400				
250	242	LPJ_SP	J	400	450	500	400*	6	350	2 ½
		LPS-RK_SP	RK1	350	450	500				
		FRS-R	RK5	350	450	500				
300	289	KRP-C_SP	L	-	-	700	400*	6	500	3
		LPJ_SP	J	450	600	600				
		LPS-RK_SP	RK1	400	600	600				
		FRS-R	RK5	400	600	600				
350	336	KRP-C_SP	L	-	-	1000	600*	6	4/0 2/PHASE	(2) 2
		LPJ_SP	J	600	600	-				
		LPS-RK_SP	RK1	450	600	-				
		FRS-R	RK5	450	600	-				
400	382	KRP-C_SP	L	-	-	1100	600*	6	250 2/PHASE	(2) 2
		LPJ_SP	J	600	-	-				
		LPS-RK_SP	RK1	500	-	-				
		FRS-R	RK5	500	-	-				
450	412	KRP-C_SP	L	-	800	1200	600*	7	300 2/PHASE	(2) 2
		LPS-RK_SP	RK1	600	-	-				
		FRS-R	RK5	600	-	-				
500	472	KRP-C_SP	L	-	1000	1400	600*	7	350 2/PHASE	(2) 2 ½
		FRS-R	RK5	600	-	-				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

² These sizes are typical. They are not shown in NEMA ICS 2-2000.

Motor Circuit Protection Tables



115Vac Single-Phase Motors & Circuits (110-120Vac Systems)

1 Motor Size Table 430.248 HP	2 Motor FLA Table 430.248 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
1/8	4.4	LPJ_SP	J	8	10	10	30	00	14	1/2
		TCF	J ^f	10	10	10				
		LP-CC	CC	9	15	15				
		LPN-RK_SP	RK1	6	10	10				
		FRN-R	RK5	5 6/10	10	10				
1/4	5.8	LPJ_SP	J	9	15	15	30	00	14	1/2
		TCF	J ^f	10	15	15				
		LP-CC	CC	12	20	20				
		LPN-RK_SP	RK1	8	15	15				
		FRN-R	RK5	7 1/2	15	15				
3/8	7.2	LPJ_SP	J	12	15	15	30	00	14	1/2
		TCF	J ^f	15	15	15				
		LP-CC	CC	15	25	25				
		LPN-RK_SP	RK1	10	15	15				
		FRN-R	RK5	9	15	15				
1/2	9.8	LPJ_SP	J	15	20	20	30	0	14	1/2
		TCF	J ^f	15	20	20				
		LP-CC	CC	30	30	30				
		LPN-RK_SP	RK1	15	20	20				
		FRN-R	RK5	15	20	20				
3/4	13.8	LPJ_SP	J	25	25	30	30	0	14	1/2
		TCF	J ^f	25	25	30				
		LPN-RK_SP	RK1	20	25	30				
		FRN-R	RK5	17 1/2	25	30				
1	16	LPJ_SP	J	25	30	35	30*	0	14	1/2
		TCF	J ^f	25	30	35				
		LPN-RK_SP	RK1	25	30	35				
		FRN-R	RK5	20	30	35				
1 1/2	20	LPJ_SP	J	30	35	45	30*	1	12	1/2
		TCF	J ^f	30	35	45				
		LPN-RK_SP	RK1	30	35	45				
		FRN-R	RK5	25	35	45				
2	24	LPJ_SP	J	40	45	50	30*	1	10	1/2
		TCF	J ^f	40	45	50				
		LPN-RK_SP	RK1	35	45	50				
		FRN-R	RK5	30	45	50				
3	34	LPJ_SP	J	60	60	70	60*	2	8**	1/2**
		TCF	J ^f	60	60	70				
		LPN-RK_SP	RK1	45	60	70				
		FRN-R	RK5	45	60	70				
5	56	LPJ_SP	J	90	100	125	100*	3	4	3/4**
		TCF	J ^f	90	100	-				
		LPN-RK_SP	RK1	80	100	125				
		FRN-R	RK5	70	100	125				
7 1/2	80	LPJ_SP	J	125	150	175	100*	3	3**	1**
		LPN-RK_SP	RK1	110	150	175				
		FRN-R	RK5	100	150	175				
10	100	LPJ_SP	J	150	175	225	200*	42	1	1 1/4
		LPN-RK_SP	RK1	150	175	225				
		FRN-R	RK5	125	175	225				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

² These sizes are typical. They are not shown in NEMA ICS 2-2000.

^f Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables

230Vac Single-Phase Motors & Circuits (220-240Vac Systems)

1 Motor Size Table 430.248 HP	2 Motor FLA Table 430.248 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
1/8	2.2	LPJ_SP	J	3 1/2	6	6	30	00	14	1/2
		TCF	J/	6	6	6				
		LP-CC	CC	4 1/2	10	10				
		LPN-RK_SP	RK1	3	6	6				
		FRN-R	RK5	2 3/4	6	6				
1/4	2.9	LPJ_SP	J	4 1/2	6	6	30	00	14	1/2
		TCF	J/	6	6	6				
		LP-CC	CC	6	10	10				
		LPN-RK_SP	RK1	4	6	6 1/4				
		FRN-R	RK5	4	6	6 1/4				
3/8	3.6	LPJ_SP	J	5 3/4	10	10	30	00	14	1/2
		TCF	J/	6	10	10				
		LP-CC	CC	7	15	15				
		LPN-RK_SP	RK1	5	10	10				
		FRN-R	RK5	4 1/2	10	10				
1/2	4.9	LPJ_SP	J	8	10	10	30	00	14	1/2
		TCF	J/	10	10	10				
		LP-CC	CC	10	15	15				
		LPN-RK_SP	RK1	8	10	10				
		FRN-R	RK5	6 1/4	10	10				
3/4	6.9	LPJ_SP	J	12	15	15	30	00	14	1/2
		TCF	J/	15	15	15				
		LP-CC	CC	15	25	25				
		LPN-RK_SP	RK1	9	15	15				
		FRN-R	RK5	9	15	15				
1	8	LPJ_SP	J	12	15	17 1/2	30	00	14	1/2
		TCF	J/	15	15	17 1/2				
		LP-CC	CC	25	25	30				
		LPN-RK_SP	RK1	12	15	17 1/2				
		FRN-R	RK5	10	15	17 1/2				
1 1/2	10	LPJ_SP	J	15	20	20	30	0	14	1/2
		TCF	J/	15	20	20				
		LP-CC	CC	30	30	30				
		LPN-RK_SP	RK1	15	20	20				
		FRN-R	RK5	15	20	20				
2	12	LPJ_SP	J	20	25	25	30	0	14	1/2
		TCF	J/	20	25	25				
		LP-CC	CC	25	-	-				
		LPN-RK_SP	RK1	17 1/2	25	25				
		FRN-R	RK5	15	25	25				
3	17	LPJ_SP	J	30	30	35	30*	1	12	1/2
		TCF	J/	30	30	35				
		LPN-RK_SP	RK1	25	30	35				
		FRN-R	RK5	25	30	35				
5	28	LPJ_SP	J	45	50	60	60	2	10**	1/2
		TCF	J/	45	50	60				
		LPN-RK_SP	RK1	40	50	60				
		FRN-R	RK5	35	50	60				
7 1/2	40	LPJ_SP	J	60	70	90	60*	2	8**	1/2**
		TCF	J/	60	70	90				
		LPN-RK_SP	RK1	60	70	90				
		FRN-R	RK5	50	70	90				
10	50	LPJ_SP	J	80	90	110	100*	3	6**	1/2**
		TCF	J/	80	90	-				
		LPN-RK_SP	RK1	70	90	110				
		FRN-R	RK5	70	90	110				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

[†] Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables



90Vdc³ Motors & Circuits

1 Motor Size Table 430.257 HP	2 Motor FLA Table 430.257 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2- 2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
¼	4.0	LPJ_SP	J	6	6	6	30	1	14	½
		TCF	J/	6	6	6				
		LPC_CC	CC	6	6	15				
		LPN-RK_SP	RK1	6	6	9				
		FRN-R	RK5	5	6	9				
¼	5.2	LPJ_SP	J	8	10	10	30	1	14	½
		TCF	J/	10	10	10				
		LP-CC	CC	10	10	20				
		LPN-RK_SP	RK1	8	10	10				
		FRN-R	RK5	7	10	10				
¼	6.8	LPJ_SP	J	12	15	15	30	1	14	½
		TCF	J/	15	15	15				
		LP-CC	CC	15	15	25				
		LPN-RK_SP	RK1	9	15	15				
		FRN-R	RK5	9	15	15				
¼	9.6	LPJ_SP	J	15	15	20	30	1	14	½
		TCF	J/	15	15	20				
		LP-CC	CC	15	15	30				
		LPN-RK_SP	RK1	15	15	20				
		FRN-R	RK5	12	15	20				

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

² These sizes are typical. They are not shown in NEMA ICS 2-2000.

³ All equipment manufacturers should be consulted about DC voltage ratings of their equipment.

^f Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables

120Vdc³ Motors & Circuits

1 Motor Size Table 430.257 HP	2 Motor FLA Table 430.257 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
1/8	3.1	LPJ_SP	J	5	6	6	30	1	14	1/2
		TCF	J/	6	6	6				
		LP-CC	CC	6	6	12				
		LPN-RK_SP	RK1	4 1/2	6	6 1/2				
		FRN-R	RK5	4	6	6 1/2				
1/8	4.1	LPJ_SP	J	7	10	10	30	1	14	1/2
		TCF	J/	10	10	10				
		LP-CC	CC	9	10	15				
		LPN-RK_SP	RK1	5%	10	10				
		FRN-R	RK5	5%	10	10				
1/8	5.4	LPJ_SP	J	9	10	12	30	1	14	1/2
		TCF	J/	10	10	10				
		LP-CC	CC	10	10	20				
		LPN-RK_SP	RK1	7 1/2	10	12				
		FRN-R	RK5	7	10	12				
1/8	7.6	LPJ_SP	J	12	15	15	30	1	14	1/2
		TCF	J/	15	15	15				
		LP-CC	CC	15	15	30				
		LPN-RK_SP	RK1	10	15	15				
		FRN-R	RK5	10	15	15				
1	9.5	LPJ_SP	J	15	15	20	30	1	14	1/2
		TCF	J/	15	15	20				
		LP-CC	CC	15	15	30 ⁵				
		LPN-RK_SP	RK1	15	15	20				
		FRN-R	RK5	12	15	20				
1 1/2	13.2	LPJ_SP	J	20	20	25	30	1	14	1/2
		TCF	J/	20	20	25				
		LP-CC	CC	20	20	30 ⁵				
		LPN-RK_SP	RK1	17 1/2	20	25				
		FRN-R	RK5	17 1/2	20	25				
2	17	LPJ_SP	J	30	30	35	30*	1	12	1/2
		TCF	J/	30	30	35				
		LP-CC	CC	30	30	30 ⁵				
		LPN-RK_SP	RK1	25	30	35				
		FRN-R	RK5	25	30	35				
3	25	LPJ_SP	J	40	40	50	60	1	10**	1/2
		TCF	J/	40	40	50				
		LPN-RK_SP	RK1	35	40	50				
		FRN-R	RK5	35	40	35				
5	40	LPJ_SP	J	60	60	90	60*	2	8**	1/2**
		TCF	J/	60	60	60				
		LPN-RK_SP	RK1	60	60	90				
		FRN-R	RK5	50	60	90				
7 1/2	58	LPJ_SP	J	90	90	125	100*	3	4**	3/4**
		TCF	J/	90	90	-				
		LPN-RK_SP	RK1	80	90	125				
		FRN-R	RK5	80	90	125				
10	76	LPJ_SP	J	125	125	150	100*	3	3**	1
		LPN-RK_SP	RK1	100	125	150				
		FRN-R	RK5	100	125	150				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

1 Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

2 Reduced voltage magnetic controller ratings

3 All equipment manufacturers should be consulted about DC voltage ratings of their equipment.

5 Largest LP-CC Fuse 30 amp. With other type fuse, could use larger amp rating in this application.

/ Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables

180Vdc³ Motors & Circuits

1 Motor Size Table 430.257 HP	2 Motor FLA Table 430.257 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
¼	2.0	LPJ_SP	J	3	3	4 ½	30	1	14	¼
		TCF	J ^f	3	3	3				
		LPS-RK_SP	RK1	2 ¾	3	4 ½				
		FRS-R	RK5	2 ½	3	4 ½				
⅕	2.6	LPJ_SP	J	4	6	6	30	1	14	¼
		TCF	J ^f	6	6	6				
		LPS-RK_SP	RK1	3 ½	6	6				
		FRS-R	RK5	3 ½	6	6				
⅙	3.4	LPJ_SP	J	5 ¾	6	6	30	1	14	¼
		TCF	J ^f	6	6	6				
		LPS-RK_SP	RK1	4 ½	6	6 ¼				
		FRS-R	RK5	4 ½	6	7 ½				
¾	4.8	LPJ_SP	J	8	10	10	30	1	14	¼
		TCF	J ^f	10	10	10				
		LPS-RK_SP	RK1	6 ¼	10	10				
		FRS-R	RK5	6	10	10				
1	6.1	LPJ_SP	J	10	10	12	30	1	14	¼
		TCF	J ^f	10	10	10				
		LPS-RK_SP	RK1	8	10	12				
		FRS-R	RK5	8	10	12				
1 ½	8.3	LPJ_SP	J	15	15	17 ½	30	1	14	¼
		TCF	J ^f	15	15	15				
		LP-CC	CC	—	—	30				
		LPS-RK_SP	RK1	12	15	17 ½				
FRS-R	RK5	12	15	17 ½						
2	10.8	LPJ_SP	J	15	20	20	30	1	14	¼
		TCF	J ^f	15	20	20				
		LP-CC	CC	20	20	30				
		LPS-RK_SP	RK1	15	20	20				
FRS-R	RK5	15	20	20						
3	16	LPJ_SP	J	25	25	35	30*	1	14	¼
		TCF	J ^f	25	25	35				
		LP-CC	CC	25	25	30				
		LPS-RK_SP	RK1	20	25	35				
FRS-R	RK5	20	25	35						
5	27	LPJ_SP	J	40	45	60	60	2	10**	¼
		TCF	J ^f	40	45	60				
		LPS-RK_SP	RK1	40	45	60				
		FRS-R	RK5	35	45	60				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

² These sizes are typical. They are not shown in NEMA ICS 2-2000.

³ All equipment manufacturers should be consulted about DC voltage ratings of their equipment.

^f Class J performance, special finger-safe dimensions.

240Vdc³ Motors & Circuits

1 Motor Size Table 430.257 HP	2 Motor FLA Table 430.257 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
¼	1.6	LPJ_SP	J	2 ½	3	3 ½	30	1	14	¼
		TCF	J ^f	3	3	3				
		LPN-RK_SP	RK1	2 ¼	3	3 ½				
		FRS-R	RK5	2	3	3 ½				
⅕	2.0	LPJ_SP	J	3	3	4 ½	30	1	14	¼
		TCF	J ^f	3	3	3				
		LPS-RK_SP	RK1	2 ¾	3	4 ½				
		FRS-R	RK5	2 ½	3	4 ½				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

¹ Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

² Reduced voltage magnetic DC controller ratings.

³ All equipment manufacturers should be consulted about DC voltage ratings of their equipment.

^f Class J performance, special finger-safe dimensions.

Motor Circuit Protection Tables

240Vdc³ Motors & Circuits continued

1 Motor Size Table 430.257 HP	2 Motor FLA Table 430.257 AMPS	3 Fuse		4 Optimal Branch Ckt Protection AMPS ¹	5 NEC [®] Max for Gen. Applic 430.52(C)(1) Exc. No. 1 AMPS ¹	6 NEC [®] Max for Heavy Start 430.52(C)(1) Exc. No. 2 AMPS ¹	7 Minimum Switch Size 430.110 AMPS	8 Minimum NEMA Starter NEMA ICS 2-2000 Size ²	9 Minimum Copper Wire THWN or THHN AWG or KCMIL Table 310.16 Size	10 Minimum Rigid Metallic Conduit Annex C Table C8 Inches
		Type	Class							
½	2.7	LPJ_SP	J	4 ½	6	6	30	1	14	½
		TCF	J _f	6	6	6				
		LPS-RK_SP	RK1	4	6	6				
		FRS-R	RK5	3 ½	6	6				
¾	3.8	LPJ_SP	J	6	6	8	30	1	14	¾
		TCF	J _f	6	6	6				
		LP-CC	CC	—	—	15				
		LPS-RK_SP	RK1	5	6	8				
1	4.7	LPJ_SP	J	8	10	10	30	1	14	1
		TCF	J _f	10	10	10				
		LPS-RK_SP	RK1	6 ½	10	10				
		FRS-R	RK5	6	10	10				
1 ½	6.6	LPJ_SP	J	10	10	12	30	1	14	1 ½
		TCF	J _f	10	10	10				
		LPS-RK_SP	RK1	9	10	12				
		FRS-R	RK5	9	10	12				
2	8.5	LPJ_SP	J	15	15	17 ½	30	1	14	2
		TCF	J _f	15	15	15				
		LPS-RK_SP	RK1	12	15	17 ½				
		FRS-R	RK5	12	15	17 ½				
3	12.2	LPJ_SP	J	20	20	25	30	1	14	3
		TCF	J _f	20	20	25				
		LP-CC	CC	20	20	30				
		LPS-RK_SP	RK1	17 ½	20	25				
5	20	LPJ_SP	J	30	30	45	30*	1	12	5
		TCF	J _f	30	30	45				
		LP-CC	CC	30	30	30				
		LPS-RK_SP	RK1	30	30	45				
7 ½	29	LPJ_SP	J	45	45	60	60	2	8	7 ½
		TCF	J _f	45	45	60				
		LPS-RK_SP	RK1	40	45	60				
		FRS-R	RK5	40	45	60				
10	38	LPJ_SP	J	60	60	80	60*	2	8**	10
		TCF	J _f	60	60	60				
		LPS-RK_SP	RK1	50	60	80				
		FRS-R	RK5	50	60	80				
15	55	LPJ_SP	J	90	90	110	100*	3	4	15
		TCF	J _f	90	90	—				
		LPN-RK_SP	RK1	80	90	110				
		FRS-R	RK5	70	90	110				
20	72	LPJ_SP	J	110	110	150	100*	3	3**	20
		LPN-RK_SP	RK1	100	110	150				
		FRS-R	RK5	90	110	150				
		LPJ_SP	J	150	150	200				
25	89	LPN-RK_SP	RK1	125	150	200	200	3	2**	25
		FRS-R	RK5	125	150	200				
		LPJ_SP	J	175	175	225				
		LPN-RK_SP	RK1	150	175	225				
30	106	FRS-R	RK5	150	175	225	200*	4	1/0**	30
		LPJ_SP	J	225	225	300				
		LPN-RK_SP	RK1	200	225	300				
		FRS-R	RK5	175	225	300				
40	140	LPJ_SP	J	300	300	350	200*	4	2/0**	40
		LPN-RK_SP	RK1	225	300	350				
		FRS-R	RK5	225	300	350				
		LPJ_SP	J	350	350	450				
50	173	LPN-RK_SP	RK1	225	300	350	400	5	4/0**	50
		FRS-R	RK5	225	300	350				
		LPJ_SP	J	350	350	450				
		LPN-RK_SP	RK1	300	350	450				
60	206	FRS-R	RK5	300	350	450	400*	5	300**	60
		LPJ_SP	J	400	400	500				
		LPN-RK_SP	RK1	350	400	500				
		FRS-R	RK5	350	400	500				
75	255	LPJ_SP	J	400	400	500	400*	5	400**	75
		LPN-RK_SP	RK1	350	400	500				
		FRS-R	RK5	350	400	500				
		LPJ_SP	J	600	600	—				
100	341	LPN-RK_SP	RK1	450	600	—	600	6	4/0 2/PHASE	(2) 1 ½**
		FRS-R	RK5	450	600	—				
		LPJ_SP	J	600	600	—				
		LPN-RK_SP	RK1	450	600	—				

* Switch size must be increased if the amp rating of the fuse exceeds the amp rating of the switch.

1 Per 430.52(C)(2), if the motor controller manufacturer's overload relay tables state a maximum branch circuit protective device of a lower rating, that lower rating must be used in lieu of the sizes shown in Columns 4, 5, or 6.

** If equipment terminations are rated for 60°C conductors only, the 60°C conductor ampacities must be utilized and therefore larger conductor sizes or conduit sizes may be required.

2 Reduced voltage magnetic DC controller ratings.

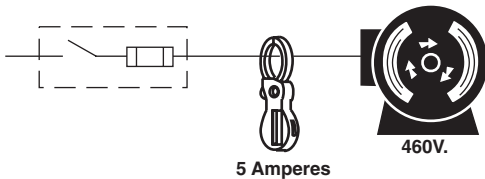
3 All equipment manufacturers should be consulted about DC voltage ratings of their equipment.

f Class J performance, special finger-safe dimensions.

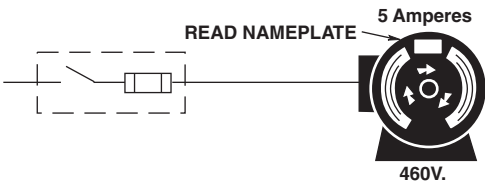
Tips For Electricians & Maintenance Crews

Recommendations for Electrician and Maintenance Crews

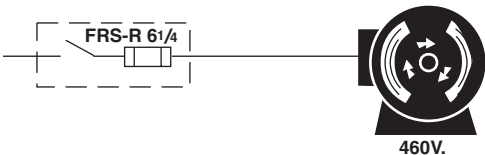
Often, for various reasons, motors are oversized for applications. For instance, a 5Hp motor is installed when the load demand is only 3Hp. In these cases a much higher degree of protection can be obtained by sizing the overload relay elements and/or Fusetron and Low-Peak dual-element, time-delay fuses based on the actual full-load current draw.



1. Preferable – With a clamp-on meter, determine running RMS current when the motor is at normal full-load. (Be sure this current does not exceed nameplate current rating.) The advantage of this method is realized when a lightly loaded motor (especially those over 50 HP) experiences a single-phase condition. Even though the relays and fuses may be sized correctly based on motor nameplate, circulating currents within the motor may cause damage.



Alternate – if unable to meter the motor current, then take the current rating off the nameplate.



2. Then size the overload relay elements and Fusetron FRS-R and FRN-R or Low-Peak LPS-RK_SP and LPN-RK_SP dual-element fuses based on this current. For optimum motor circuit protection offering a high degree of “back-up overload” protection, use the table that follows to assist in sizing dual-element fuses. The other fuses in the table LPJ_SP, TCF and LP-CC can provide excellent short circuit protection when sized for Optimum Motor Circuit Protection. However, they typically can not be sized close enough to provide motor back-up overload protection.
3. Use a labeling system to mark the type and amp rating of the fuse that should be in the fuse clips, such as FRS-R 6 1/4. This simple step makes it easy to run spot checks for proper fuse replacement. When installing the proper fuses in the switch to give the desired level of protection, it often is advisable to leave spare fuses on top of the disconnect, the starter enclosure or in a cabinet adjacent to the motor control center. In this way, should the fuses open, the problem can be corrected and proper size fuses easily reinstalled.

* Abnormal installations may require Fusetron or Low-Peak dual-element fuses of a larger size than shown providing only short circuit protection. These applications include:

- (a) Fusetron or Low-Peak dual-element fuses in high ambient temperature environments.
- (b) A motor started frequently or rapidly reversed.
- (c) Motor is directly connected to a machine that cannot be brought up to full speed quickly (large fans, centrifugal machines such as extractors and pulverizers, machines having large fly wheels such as large punch presses.)
- (d) Motor has a high Code Letter (or possibly no Code Letter) with full voltage start.
- (e) WYE delta open transition start.
- (f) Motor has a large inrush current, such as a Design B.

Selection of Fusetron or Low-Peak Dual-Element Fuses based upon Motor FLA for Optimum Motor Circuit Protection*

Fusetron or Low-Peak Dual-Element Fuse Size	Motor Current			
	FRN-R FRS-R Class RK5	LPN-RK_SP LPS-RK_SP Class RK1	LPJ_SP Class J	LP-CC Class CC
1/10	0-0.08	0.0000-0.0769	—	—
1/8	0.09-0.10	0.0770-0.0961	—	—
3/100	0.11-0.12	0.0962-0.1153	—	—
3/10	0.13-0.16	0.1154-0.1538	—	—
1/4	0.17-0.20	0.1539-0.1923	—	—
3/10	0.21-0.24	0.1924-0.2307	—	—
1/2	0.25-0.32	0.2308-0.3076	—	—
1/2	0.33-0.40	0.3077-0.3846	—	0.0000-0.2500
3/10	0.41-0.48	0.3847-0.4615	—	0.2501-0.3000
3/10	0.49-0.64	0.4616-0.6153	—	0.3001-0.4000
1	0.65-0.80	0.6154-0.7692	0.0-0.6666	0.4001-0.5000
1 1/4	0.81-0.90	0.7693-0.8653	0.6667-0.7500	0.5001-0.5625
1 1/4	0.91-1.00	0.8654-0.9615	0.7501-0.8333	0.5626-0.6250
1 3/10	1.01-1.12	0.9616-1.076	0.8334-0.9333	0.6251-0.7000
1 1/2	1.13-1.20	1.077-1.153	0.9334-1.000	0.7001-0.7500
1 3/10	1.21-1.28	1.154-1.230	1.001-1.066	0.7501-0.8000
1 3/10	1.29-1.44	1.231-1.384	1.067-1.200	0.8001-0.9000
2	1.45-1.60	1.385-1.538	1.201-1.333	0.9001-1.000
2 1/4	1.61-1.80	1.539-1.730	1.334-1.500	1.001-1.125
2 1/2	1.81-2.00	1.731-1.923	1.501-1.666	1.126-1.250
2 3/10	2.01-2.24	1.924-2.153	1.667-1.866	1.251-1.400
3	2.25-2.40	2.154-2.307	1.867-2.000	1.401-1.500
3 3/10	2.41-2.56	2.308-2.461	2.001-2.133	1.501-1.600
3 1/2	2.57-2.80	2.462-2.692	2.134-2.333	1.601-1.750
4	3.81-3.20	2.693-3.076	2.334-2.666	1.751-2.000
4 1/2	3.21-3.60	3.077-3.461	2.667-3.000	2.001-2.250
5	3.61-4.00	3.462-3.846	3.001-3.333	2.251-2.500
5 3/10	4.01-4.48	3.847-4.307	3.334-3.733	2.501-2.800
6	4.49-4.80	4.308-4.615	3.734-4.000	2.801-3.000
6 1/4	4.81-5.00	4.616-4.807	—	3.001-3.125
7	5.01-5.60	4.808-5.384	4.001-4.666	3.126-3.500
7 1/2	5.61-6.00	—	—	3.501-3.750
8	6.01-6.40	5.385-6.153	4.667-5.333	3.751-4.000
9	6.41-7.20	6.154-6.923	5.334-6.000	4.001-4.500
10	7.21-8.00	6.924-7.692	6.001-6.666	4.501-5.000
12	8.01-9.60	7.693-9.230	6.667-8.000	5.001-6.000
15	9.61-12.00	9.231-11.53	8.001-10.00	6.001-7.500
17 1/2	12.01-14.00	11.54-13.46	10.01-11.66	7.501-8.750
20	14.01-16.00	13.47-15.38	11.67-13.33	8.751-10.00
25	16.01-20.00	15.39-19.23	13.34-16.66	10.01-12.50
30	20.01-24.00	19.24-23.07	16.67-20.00	12.51-15.00
35	24.01-28.00	23.08-26.92	20.01-23.33	—
40	28.01-32.00	26.93-30.76	23.34-26.66	—
45	32.01-36.00	30.77-34.61	26.67-30.00	—
50	36.01-40.00	34.62-38.46	30.01-33.33	—
60	40.01-48.00	38.47-46.15	33.34-40.00	—
70	48.01-56.00	46.16-53.84	40.01-46.66	—
75	56.01-60.00	—	—	—
80	60.01-64.00	53.85-61.53	46.67-53.33	—
90	64.01-72.00	61.54-69.23	53.34-60.00	—
100	72.01-80.00	69.24-76.92	60.01-66.66	—
110	80.01-88.00	76.93-84.61	66.67-73.33	—
125	88.01-100.00	84.62-96.15	73.34-83.33	—
150	100.01-120.00	96.16-115.3	83.34-100.0	—
175	120.01-140.00	115.4-134.6	100.1-116.6	—
200	140.01-160.00	134.7-153.8	116.7-133.3	—
225	160.01-180.00	153.9-173.0	133.4-150.0	—
250	180.01-200.00	173.1-192.3	150.1-166.6	—
300	200.01-240.00	192.4-230.7	166.7-200.0	—
350	240.01-280.00	230.8-269.2	200.1-233.3	—
400	280.01-320.00	269.3-307.6	233.4-266.6	—
450	320.01-360.00	307.7-346.1	266.7-300.0	—
500	360.01-400.00	346.2-384.6	300.1-333.3	—
600	400.01-480.00	384.7-461.5	333.4-400.0	—