The power of space

From the revolutionary Bussmann™ series CUBEFuse to its unique fuse holder or Compact Circuit Protector, we're continually innovating to give you products that help you go big, by going small.

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Bussmann series circuit protection solutions comply with major industrial standards and agency requirements such as: BS, IEC, DIN, UL, NEMA, CSA, CE, C-UL, etc. and are manufactured at facilities that are ISO 9000 certified.

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Selecting fused circuit protection

The following fuse selection tables are based on the 2017 NEC and provide fuse recommendations for the listed applications.

These are only suggestions. Final fuse selection should be performed by qualified personnel able to fully assess an application's circuit protection requirements.

If you need assistance in selecting a fuse, contact the Eaton Application Engineering team Monday through Friday, 7:00 a.m. — 5:00 p.m. Central time.

Application Engineering can be reached via phone (toll-free 855-287-7626) and email (FuseTech@Eaton.com).

To locate the recommended fuse product pages, use the index starting on page 16-4.

Ballasts

Location	Type	Notes	Fuse recommendation	Fuse holder recommendation
Indoor	Fluorescent	Consult fixture manufacturer for size and type	GLR, GMF, GRF	HLR
			GLQ, GMQ	HLQ
	All other (mercury, sodium, etc.)	Consult fixture manufacturer for size and type	BAF, KTK, FNM, FNQ	HPF, HPS
			KTK-R, FNQ-R, LP-CC	HPS-RR, HPF-RR
			BBS	HPS-L, HPF-L
			SC up to 15 amps	HPF-EE, HPS-EE
			SC 20 amp	HPF-JJ, HPS-JJ
			SC 25-30 amps	HPF-FF, HPS-FF
Outdoor	Mercury, sodium, etc.	Consult fixture manufacturer for size and type.	BAF, KTK, FNM, FNQ	HEB, HEX, HPC-D
			KTK-R, FNQ-R, LP-CC	HEY, HEZ

Capacitors (NEC 460)

Protected by	Sizing	Fuse/volt recommendation
Time-delay fuses	150% to 175% of Full Load Current (FLC)	Up to 250 V: LPN-RK_SP, FRN-R Up to 600 V: LPS-RK_SP, FRS-R, LPJ_SP, LP-CC, FNQ-R, TCF
Non time-delay fuses	250% to 300% of Full Load Current (FLC)	Up to 250 V: KTN-R Up to 300 V: JJN Up to 600 V: KTS-R, JKS, KTK-R, JJS, FCF_RN
On loadside of motor running overcurrent device	Protection recommended as shown, but not required	—

Electric heat (NEC 424)

Heating type	Sizing	Fuse/volt recommendation
Space heating	125% or next size larger but in no case larger than 60 amps for each subdivided load	Up to 250 V: LPN-RK_SP, FRN-R, NON Up to 300 V: JJN Up to 480 V; SC 25 to SC 60 Up to 600 V: LPS-RK_SP, FRS-R, NOS, JJS, LPJ_SP, LP-CC, FNQ-R, JKS, KTK-R, TCF, SC 1/2 to SC 20, FCF_RN
Boilers (ASME rated and stamped vessel)	125% or next size larger but in no case larger than 150 amps for each subdivided load	

Mains, feeders, branches (NEC 430)

Circuit type	Circuit loads	Sizing	Fuse/volt recommendation
Feeder circuits ≤ 600 A	No motor load	100% of non-continuous load plus 125% of continuous load	Up to 250 V: LPN-RK_SP, FRN-R Up to 300V: JJN Up to 600 V: LPS-RK_SP, FRS-R, JJS, LPJ_SP, LP-CC, JKS, KTK-R
	Combination motor and other loads	150% of the FLA of largest motor (if there are two or more motors of same size, one is considered to be the largest) plus the sum of all the FLA for all other motors plus 100% of non-continuous, non-motor load plus 125% of continuous, non-motor load. A maximum of 175% (or the next standard size if 175% does not correspond to a standard size) is allowed for all but wound rotor and all DC motors.	Up to 250 V: LPN-RK_SP, FRN-R Up to 600 V: LPS-RK_SP, FRS-R, LPJ- SP, LP-CC
	Motor loads	150% of the FLA of largest motor (if there are two or more motors of same size, one is considered to be the largest) plus the sum of all the FLA for all other motors. A maximum of 175% (or the next standard size if 175% does not correspond to a standard size) is allowed for all but wound rotor and all DC motors.	
Main, branch and feeder circuits (601-6000 A)	—	150% to 225% of full load current of largest motor plus 100% of full load current of all other motors plus 125% of continuous non-motor load plus 100% of non-continuous non-motor load	Up to 600 V: KRP-C_SP

Motor loads (NEC 430)

Circuit voltage	Fuse type	Fuse sized for	Sizing	Fuse/volt recommendation
600 V and less	Time-delay fuses	Backup overload with motor starter and short-circuit protection	125% of motor FLA or next size larger	Up to 250 V: FRN-R Up to 600 V: FRS-R
			130% of motor FLA or next size larger	Up to 250 V: LPN-RK_SP Up to 600 V: LPS-RK_SP
		Short-circuit only	175% of motor FLA or next size larger. (If 175% does not correspond to a standard size). If this will not allow motor to start, due to higher than normal inrush currents or longer than normal acceleration times (5 seconds or greater), fuse may be sized up to 225% or next size smaller. **NOTE**: 150% for wound rotor and all DC motors.	Up to 250 V: LPN-RK_SP, FRN-R Up to 600 V: LPS-RK_SP, FRS-R, LPJ_SP, TCF
	Non-time delay and all Class CC fuses	Short-circuit only	Maximum of 300% of motor FLA or next size larger (if 300% does not correspond to a standard size). If this will not allow motor to start due to higher than normal inrush currents or longer than normal acceleration times (5 seconds or greater), fuses through 600 amps may be sized up to 400% or next size smaller. **Note**: 150% for wound rotor and all DC motors.	Up to 250 V: KTN-R Up to 300 V: JJN Up to 600 V: KTS-R, JJS, LP-CC, JKS, KTK-R, FCF_RN
Above 600 V	—	—	Compare the minimum melting time-current characteristics of the fuses with the time-current characteristics of the overload relay curve. The size fuse which is selected should be such that short-circuit protection is provided by the fuse and overload protection is provided by the controller overload relays.	Up to 2400 V: JCH, JCK, JCK-A, JCK-B, 2ACLS, 2BCLS, 2CLS, 2HCLS Up to 4800 V: JCL, JCL-A, JCL-B, 5ACLS, 5BCLS, 5CLS, 5HCLS Up to 7200 V: 7BCLS, 7.2WKMSJ, 8ACLS, 8CLS

Solenoids (coils)

Fuse type	Sizing	Fuse/volt recommendation
Branch circuit	Size at 125% or next size smaller	Up to 250 V: LPN-RK_SP, FRN-R (best) Up to 600 V: LPS-RK_SP, FRS-R, LPJ_SP, LP-CC, FNQ-R, TCF
Supplemental	Size at 125% or next size larger	Up to 32 V: MDL 9-30 A, FNM 20-30 A Up to 125 V: MDA 25-30 A, FNM 12-15 A Up to 250 V: MDL 1/16-8 A, MDA 2/10-20 A, FNM 1/10-10 A, MDQ 1/100-7 A Up to 500 V: FNQ 1/10-30 A

Transformers 600 V nominal or less (NEC 450.3)

Protection type	Thermal overload protection	Transformer impedance	Rated current	Optimum protection*	NEC maximums	Fuse/volt recommendation
Primary only (Note: components on the secondary still need overcurrent protection)	—	—	Primary < 2 amps	125% or next size larger	300% or next size smaller (see NEC 430.72(C) for control circuit transformer maximum of 500%)	Up to 250 V: LPN-RK_SP, FRN-R Up to 600 V: KRP-C_SP, LPJ_SP, LPS-RK_SP, FNQ-R, FRS-R, TCF
			Primary ≥ 2 amps but < 9 amps	125% or next size larger	167% or next size smaller	
			Primary ≥ 9 amps	125% or next size larger	125% or next size larger**	
Primary and secondary	Without	—	Secondary < 9 amps (see **A**)	Primary and secondary fuses at 125% of primary and secondary FLA or next size larger	**% of primary FLA (or next FLA size smaller)** **A** = 250% **B** = 250% **C** = 600% **D** = 600% **E** = 400% **F** = 400% **% of secondary FLA** **A** = 167% or next size smaller **B** = 125% or next size larger** **C** = 167% or next size smaller **D** = 125% or next size larger** **E** = 167% or next size smaller **F** = 125% or next size larger**	
			Secondary ≥ 9 amps (see **B**)			
	With	≤ 6%	Secondary < 9 amps (see **C**)			
			Secondary ≥ 9 amps (see **D**)			
		> 6% but < 10%	Secondary < 9 amps (see **E**)			
			Secondary ≥ 9 amps (see **F**)			

* When sizing the primary fuse for optimum protection, verify the inrush current with the transformer manufacturer and review fuse time-current characteristics.
**When 125% of FLA corresponds to a standard rating, the next larger size is not permitted.

Transformers over 600 V nominal (NEC 450.3)

Supervised installations

Protection for	Transformer impedance	Primary Sizing	Secondary volts	Secondary sizing	Fuse/volt recommendation
Primary only	N/A	Code maximum of 250% or next standard size if 250% does not correspond to a standard rating Note: Components on the secondary still need overcurrent protection	N/A	N/A	Up to 250 V: LPN-RK_SP, FRN-R Up to 600 V: LPS-RK_SP, LPJ-_SP, KRP-C_SP, FRS-R, FNQ-R, TCF Up to 2.475 kV: 2NCLPT, 2CLPT Up to 2.75 kV: 2CLE, 2HLE Up to 2750/5500 V: JCW Up to 5.5 kV: 5HLE, 5CLE, 5HCL, 5BHCL, 5BHLE, 5AHLE, JCY, MV05, 5.5 ABWNA, 5.5 AMWNA, 5.5 FFN 7 Up to 7.2 kV:.2 AMWNA, 7.2 TDLSJ, 7.2 TFLSJ Up to 8.3 kV: 8HLE, 8CLE, 8BHLE, 8AHLE, 8CLPT, 8NCLPT, 8HCL, 8.25 FFN Up to 15.5 kV: 15CLPT, 15NCLPT, 15CLE, 15HLE, 15BHLE, 15LHLE, 15HCL, 15BHCL, MV155, 15.5 CAVH Up to 17.5 kV: 17.5 CAV, 17.5 TDM Up to 24 kV: 24 TDM, 24 TFM, 24 FFM Up to 36 kV: 36 CAV, 36 TDQ, 36 TFQ Up to 38 kV: 38CLPT, 38 CAV
Primary and secondary	≤ 6%	At code maximum of 300%	> 600 V	At code maximum of 250%	
			≤ 600 V	At code maximum of 250%	
	> 6% but < 10%	At code maximum of 300%	> 600 V	At code maximum of 225%	
			≤ 600 V	At code maximum of 250%	

Unsupervised installations

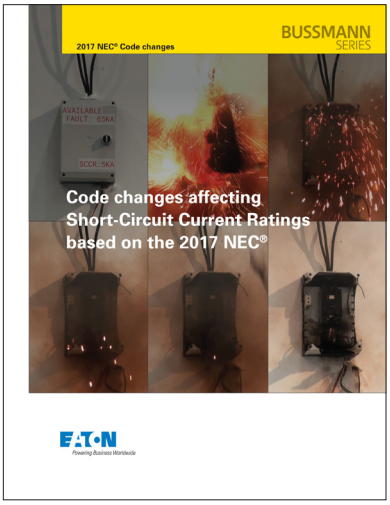
Transformer impedance	Primary Sizing	Secondary volts	Secondary sizing	Fuse/volts recommendation
≤ 6%	At code maximum of 300% or next standard size if 300% does not correspond to a standard rating	> 600 V	At code maximum of 250% or next standard size if 250% does not correspond to a standard rating	Up to 250 V: LPN-RK_SP, FRN-R Up to 600 V: LPS-RK_SP, LPJ-_SP, KRP-C_SP, FRS-R, FNQ-R, TCF Up to 2475 V: 2NCLPT, 2CLPT Up to 2.75 kV: 2CLE, 2HLE Up to 2750/5500 V: JCW Up to 5.5 kV: 5HLE, 5CLE, 5HCL, 5BHCL, 5BHLE, 5AHLE, JCY, MV05, 5.5 ABWNA, 5.5 AMWNA, 5.5 FFN Up to 7.2 kV: 7.2 AMWNA, 7.2 TDLSJ, 7.2 TFLSJ Up to 8.3 kV: 8HLE, 8CLE, 8BHLE, 8AHLE, 8CLPT, 8NCLPT, 8HCL, 8.25 FFN Up to 15.5 kV: 15CLPT, 15NCLPT, 15CLE, 15HLE, 15BHLE, 15LHLE, 15HCL, 15BHCL, MV155, 15.5 CAVH Up to 17.5 kV: 17.5 CAV, 17.5 TDM Up to 24 kV: 24 TDM, 24 TFM, 24 FFM Up to 36 kV: 36 CAV, 36 TDQ, 36 TFQ Up to 38 kV: 38CLPT, 38 CAV
		≤ 600 V	At code maximum of 125% or next standard size if 125% does not correspond to a standard rating	
> 6% but < 10%	At code maximum of 300% or next standard size if 300% does not correspond to a standard rating	> 600 V	At code maximum of 225% or next standard size if 225% does not correspond to a standard rating	
		≤ 600 V	At code maximum of 125% or next standard size if 125% does not correspond to a standard rating	

Solid state devices (diodes, SCRs, triacs, transistors)

Protection type	Sizing	Fuse/volts recommendation
Short-circuit only	F, S, K, and 170M fuse families sized up to several sizes larger than full load RMS or DC rating of device	Up to 130 V: FWA Up to 250 V: FWX Up to 500 V: FWH Up to 600 V: FWC, KAC, KBC Up to 700 V: FWP, 170M_, SPP Up to 1000 V: FWJ, 170M_, SPJ

BUSSMANN SERIES

Do you know about the new 2017 NEC® SCCR requirements?



Finding out is easy.

Eaton's Bussmann™ series handbook *Code changes affecting Short-Circuit Current Ratings based on the 2017 NEC* will help you:

Know why SCCR is important.

Understand hazards associated with insufficient SCCR.

Know what specific NEC chapters, articles, parts and sections are involved.

Comply with Code requirements for marking and documenting SCCR.

If you're designing, installing or inspecting equipment, download your copy at **Eaton.com/nec2017sccr**.

Or, check out our comprehensive SCCR resources at **Eaton.com/bussmannseries/SCCR**.

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