

Cooper Bussmann

Industrial Fuses - North American Standard



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Class J fuses - 1-600 A, time delay/fast acting/high speed fuses

Technical data



Applications	Branch circuit protection according to NEC 240, motor protection according to NEC 430, current limiting
Material	Glass fibre body, copper ferrules/contact blades
Design	Time delay, dual element, sep. elements for overload/short circuit protection Fast acting/high speed, single element
Rated voltage	LPJ: 600 VAC/300 VDC, JKS 600 VAC, DJF 600 VAC/450 VDC
Breaking capacity	LPJ: 300 kA (CSA 200 kA), other 200 kA at 600 VAC, 100 kA at 450/300 VDC
Standard	JKS/DJF: UL 248-8, LPJ: Special Purpose/UL 248-8, CSA 22.2 No. 248.8
Approvals	LPJ: UL listed guide JFHR, file E56412, JKS/DJF: UL listed guide JDDZ, file E4273 CSA class 1422-02 file E53787
Certificate	CE
Fuse holders, disconnectors	See page 4

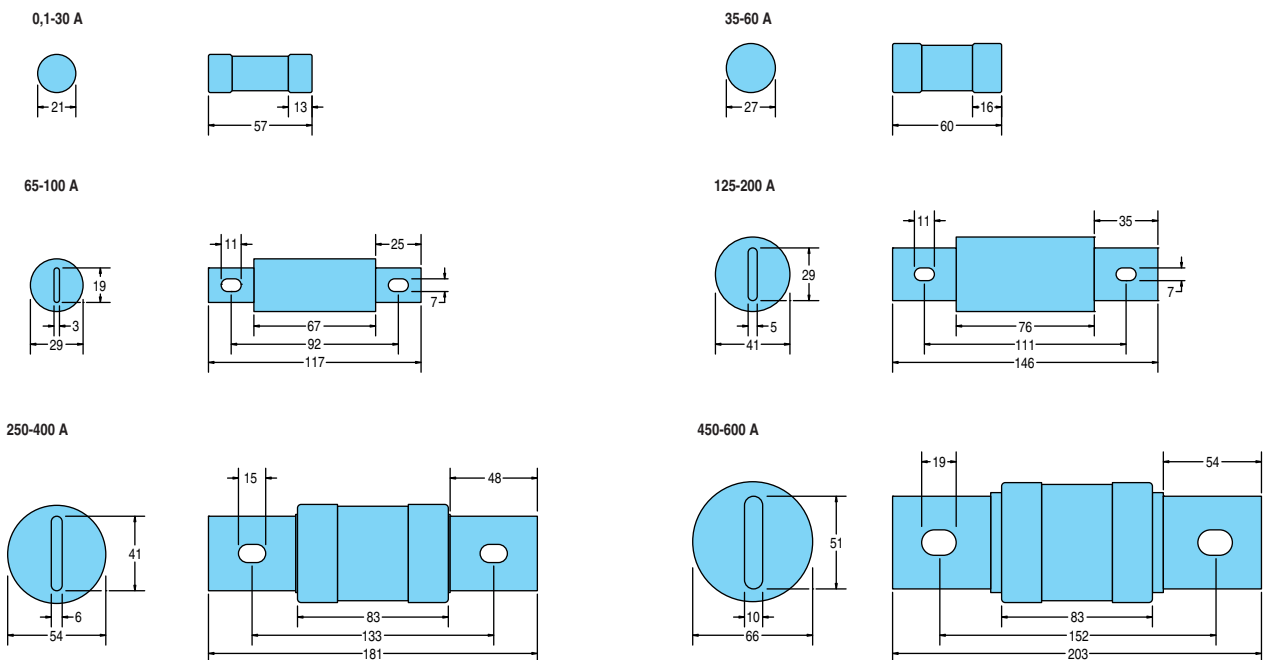
Catalogue numbers - Class J fuses

Rated current, A	Catalogue numbers		JKS - fast acting fuses	DJF - high speed fuses	Weight each, g	Packing size
	LPJ - time delay fuses	LPJ - time delay fuses with visual indication				
1	CBLPJ-1SP		CBJKS-1	CBDFJ-1	43	10
1,25	CBLPJ-1-1-4SP				43	10
1,6	CBLPJ-1-6-10SP				43	10
1,8	CBLPJ-1-8-10SP				43	10
2	CBLPJ-2SP		CBJKS-2	CBDFJ-2	43	10
2,25	CBLPJ-2-1-4SP				43	10
2,5	CBLPJ-2-1-2SP				43	10
2,8	CBLPJ-2-1-8SP				43	10
3	CBLPJ-3SP		CBJKS-3	CBDFJ-3	43	10
3,2	CBLPJ-3-2-10SP				43	10
3,5	CBLPJ-3-1-2SP				43	10
4	CBLPJ-4SP		CBJKS-4	CBDFJ-4	43	10
4,5	CBLPJ-4-1-2SP				43	10
5	CBLPJ-5SP		CBJKS-5	CBDFJ-5	43	10
5,6	CBLPJ-5-6-10SP				43	10
6	CBLPJ-6SP	CBLPJ-6SPI	CBJKS-6	CBDFJ-6	43	10
7	CBLPJ-7SP	CBLPJ-7SPI			43	10
8	CBLPJ-8SP	CBLPJ-8SPI	CBJKS-8	CBDFJ-8	43	10
9	CBLPJ-9SP	CBLPJ-9SPI			43	10
10	CBLPJ-10SP	CBLPJ-10SPI	CBJKS-10	CBDFJ-10	43	10

Catalogue numbers - Class J fuses

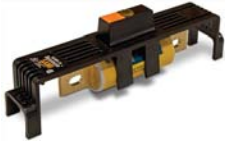
Rated current, A	Catalogue numbers		JKS - fast acting fuses	DJF - high speed fuses	Weight each, g	Packing size
	LPJ - time delay fuses	LPJ - time delay fuses with visual indication				
12	CBLPJ-12SP	CBLPJ-12SPI	CBJKS-12	CBDFJ-12	43	10
15	CBLPJ-15SP	CBLPJ-15SPI	CBJKS-15	CBDFJ-15	43	10
17,5	CBLPJ-17-1-2SP	CBLPJ-17-1-2SPI			43	10
20	CBLPJ-20SP	CBLPJ-20SPI	CBJKS-20	CBDFJ-20	43	10
25	CBLPJ-25SP	CBLPJ-25SPI	CBJKS-25	CBDFJ-25	43	10
30	CBLPJ-30SP	CBLPJ-30SPI	CBJKS-30	CBDFJ-30	43	10
35	CBLPJ-35SP	CBLPJ-35SPI	CBJKS-35	CBDFJ-35	53	10
40	CBLPJ-40SP	CBLPJ-40SPI	CBJKS-40	CBDFJ-40	53	10
45	CBLPJ-45SP	CBLPJ-45SPI	CBJKS-45	CBDFJ-45	53	10
50	CBLPJ-50SP	CBLPJ-50SPI	CBJKS-50	CBDFJ-50	53	10
60	CBLPJ-60SP	CBLPJ-60SPI	CBJKS-60	CBDFJ-60	53	10
70	CBLPJ-70SP	CBLPJ-70SPI	CBJKS-70	CBDFJ-70	76	5
80	CBLPJ-80SP	CBLPJ-80SPI	CBJKS-80	CBDFJ-80	76	5
90	CBLPJ-90SP	CBLPJ-90SPI	CBJKS-90	CBDFJ-90	76	5
100	CBLPJ-100SP	CBLPJ-100SPI	CBJKS-100	CBDFJ-100	76	5
110	CBLPJ-110SP	CBLPJ-110SPI	CBJKS-110	CBDFJ-110	390	1
125	CBLPJ-125SP	CBLPJ-125SPI	CBJKS-125	CBDFJ-125	390	1
150	CBLPJ-150SP	CBLPJ-150SPI	CBJKS-150	CBDFJ-150	390	1
175	CBLPJ-175SP	CBLPJ-175SPI	CBJKS-175	CBDFJ-175	390	1
200	CBLPJ-200SP	CBLPJ-200SPI	CBJKS-200	CBDFJ-200	390	1
225	CBLPJ-225SP	CBLPJ-225SPI	CBJKS-225	CBDFJ-225	810	1
250	CBLPJ-250SP	CBLPJ-250SPI	CBJKS-250	CBDFJ-250	810	1
300	CBLPJ-300SP	CBLPJ-300SPI	CBJKS-300	CBDFJ-300	810	1
350	CBLPJ-350SP	CBLPJ-350SPI	CBJKS-350	CBDFJ-350	810	1
400	CBLPJ-400SP	CBLPJ-400SPI	CBJKS-400	CBDFJ-400	810	1
450	CBLPJ-450SP	CBLPJ-450SPI	CBJKS-450	CBDFJ-450	1390	1
500	CBLPJ-500SP	CBLPJ-500SPI	CBJKS-500	CBDFJ-500	1390	1
600	CBLPJ-600SP	CBLPJ-600SPI	CBJKS-600	CBDFJ-600	1390	1

Dimensions - Class J fuses, mm



Fuse covers for class J fuses - 100 A

Technical data



Material	Thermoplastic, flammability rating according to UL 94V2
Rated voltage	600 V
Indication	Version with lamp indication, neon lamp, for fuse trip indication, 90-600 VAC/115-600 VDC
Approvals	UL listed guide JDVS file E58836, CSA certified Class 6225-01, file LR47235
Certificate	CE

Catalogue numbers - Fuse covers for class J fuses - mounted on the fuse

Description	Catalogue numbers	Weight each,g	Packing size
Fuse cover for one fuse, 65-100 A	CBSAMI-3N	75	3
Fuse cover for one fuse, 65-100 A, fuse trip indication, lamp	CBSAMI-3I	75	3

Class J off-load fuse disconnectors, fuseholders

Technical data



Material	Thermoplastic, flammability rating according to UL 94V0
Rated voltage	600 V
Rated current	30-600 A, short circuit current rating (SCCR) 200 kA
Fuse trip ind.	Lamp indication, neon lamp 90-600 VAC/115-600 VDC
Standard	UL 4248, CSA 22.2 No 4248
Approvals	UL listed guide IZLT file E14853, CSA class 6225-01 file 47235
Certificate	Fuseholders marked * are UL recognized (UR), fuseholders marked ** are not UL/CSA approved CE

Catalogue numbers - Class J off-load fuse disconnectors, fuseholders see note 1

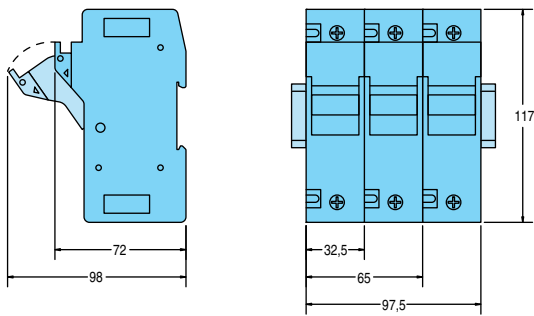
Fuse size	Rated current, A	Terminal type	Wire range AWG/kcmil	Catalogue numbers			Weight g/pole	Packing size
				1 pole	2 pole	3 pole		
Off-load fuse disconnectors, ingress protection IP 20 - installation on 35 mm DIN rail or panel mount <small>see note 1</small>								
1-30 A	30	Box terminal	18-1	CBCH30J1	CBCH30J2	CBCH30J3	205	6/3/2
1-30 A, lamp indication	30	Box terminal	18-1	CBCH30J1I	CBCH30J2I	CBCH30J3I	205	6/3/2
35-60 A	60	Box terminal	18-1	CBCH60J1	CBCH60J2	CBCH60J3	257	6/3/2
35-60 A, lamp indication	60	Box terminal	18-1	CBCH60J1I	CBCH60J2I	CBCH60J3I	257	6/3/2
Fuse holders, ingress protection IP 20 - installation on 35 mm DIN rail or panel mount								
1-30 A	30	Box terminal	2x18-8	CBJT60030			100	12
1-30 A, lamp indication	30	Box terminal	2x18-8	CBJTN60030			100	12
35-60 A	60	Box terminal	14-4	CBJT60060			100	12
35-60 A, lamp indication	60	Box terminal	14-4	CBJTN60060			100	12
Fuse holders, ingress protection IP 00 - panel mount								
70-100 A	100	Box terminal	8-1/0	CBJ60100-1CR		CBJ60100-3CR	300	1
110-200 A	200	Box terminal	6-250	CBJ60200-1CR		CBJ60200-3CR	1170	1
225-400 A	400	Box terminal	4-500	CBJ60400-1CR*		CBJ60400-3CR*	2060	1
450-600 A	600	Box terminal	2x4/0-500	CBJ60600-1CR		CBJ60600-3CR**	3700	1

Note

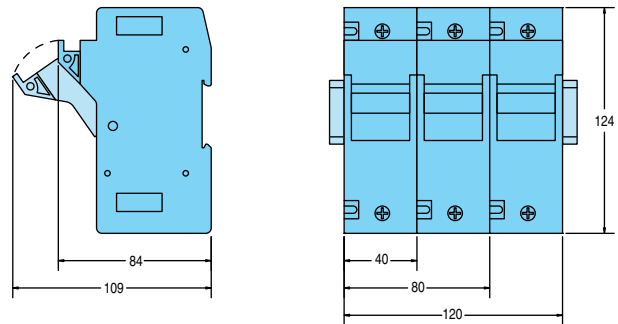
1 Packing size, first value applies for 1 pole fuse disconnectors, second value for 2 pole fuse disconnectors, third value for 3 pole fuse disconnectors.

Dimensions - Class J off-load fuse disconnectors, fuseholders, mm

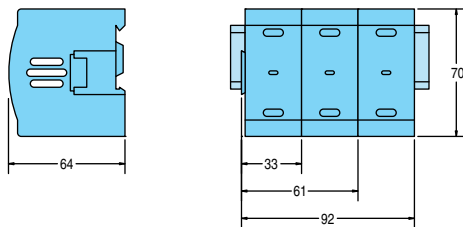
30 A, 1-3 pole off load fuse disconnecter



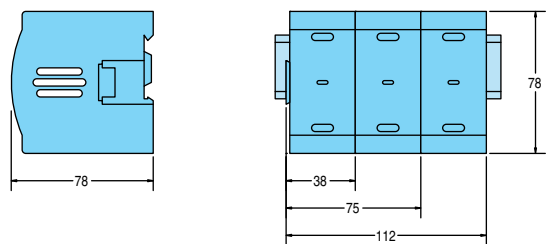
60 A, 1-3 pole off-load fuse disconnecter



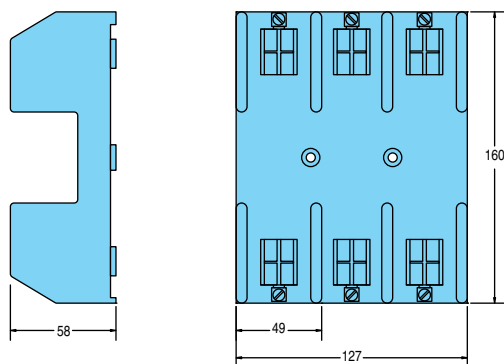
30 A, 1 pole fuse holder



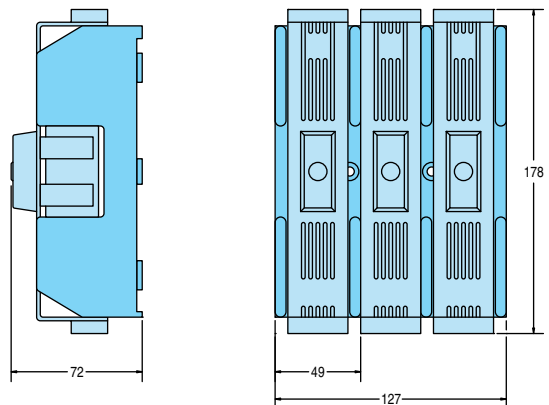
60 A, 1 pole fuseholder



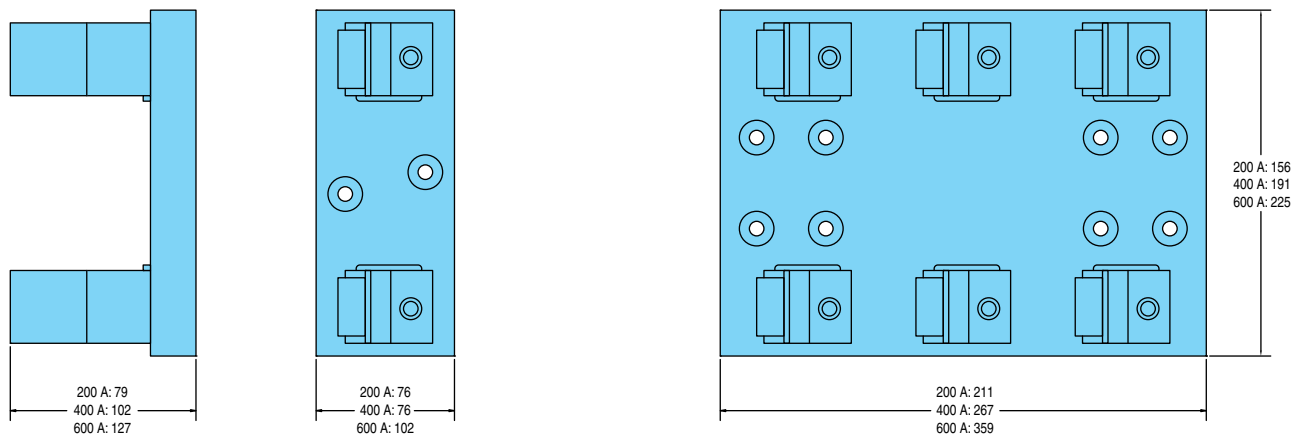
100 A, 1 and 3 pole fuseholders



100 A, 1 and 3 pole fuseholders, fuse equipped with fuse cover installed



200/400/600 A, 1 and 3 pole fuseholders



Class CC fuses - 0,1-30 A, time delay/fast action

Technical data



Applications	Branch circuit protection according to NEC 240, motor protection according to NEC 430, current limiting
Material	Melamine body, nickel plated brass ferrules, rejection type
Design	Single element
Rated voltage	600 VAC, LP-CC 300 VDC (3-15 A 150 VDC). FNQ-R 15-20 A 300 VDC
Breaking capacity	200 kA at 600 VAC, 20 kA vid 150/300 VDC
Standard	UL 248-4, CSA 22.2 No. 248.4
Approvals	UL listed guide JDDZ, file E4273, CSA class 1422-02 file 53787
Certificate	CE
Fuse disconnectors/switches	See side 7-8

Catalogue numbers - Class CC fuses

Rated current, A	Catalogue numbers - class CC fuses			Weight each, g	Packing size
	LP-CC, time delay motor protection	FNQ-R, time delay transformer protection	KTK-R fast acting		
0,1			CBKTK-R-1/10	9	10
0,125			CBKTK-R-1-8	9	10
0,2			CBKTK-R-2/10	9	10
0,25		CBFNQ-R-1-4	CBKTK-R-1-4	9	10
0,3		CBFNQ-R-3-10	CBKTK-R-3-10	9	10
0,4		CBFNQ-R-4-10	CBKTK-R-4-10	9	10
0,5	CBLP-CC-1-2	CBFNQ-R-1-2	CBKTK-R-1-2	9	10
0,6	CBLP-CC-6-10	CBFNQ-R-6-10	CBKTK-R-6-10	9	10
0,75		CBFNQ-R-3-4	CBKTK-R-3-4	9	10
0,8	CBLP-CC-8-10	CBFNQ-R-8-10		9	10
1	CBLP-CC-1	CBFNQ-R-1	CBKTK-R-1	9	10
1,125	CBLP-CC-1-1-8	CBFNQ-R-1-1-8		9	10
1,25	CBLP-CC-1-1-4	CBFNQ-R-1-1-4		9	10
1,3		CBFNQ-R-1-3-10		9	10
1,4	CBLP-CC-1-4-10	CBFNQ-R-1-4-10		9	10
1,5	CBLP-CC-1-1-2	CBFNQ-R-1-1-2	CBKTK-R-1-1-2	9	10
1,6	CBLP-CC-1-6-10	CBFNQ-R-1-6-10		9	10
1,8	CBLP-CC-1-8-10	CBFNQ-R-1-8-10		9	10
2	CBLP-CC-2	CBFNQ-R-2	CBKTK-R-2	9	10
2,25	CBLP-CC-2-1-4	CBFNQ-R-2-1-4		9	10
2,5	CBLP-CC-2-1-2	CBFNQ-R-2-1-2	CBKTK-R-2-1-2	9	10
2,8	CBLP-CC-2-8-10	CBFNQ-R-2-8-10		9	10
3	CBLP-CC-3	CBFNQ-R-3	CBKTK-R-3	9	10
3,2	CBLP-CC-3-2-10	CBFNQ-R-3-2-10		9	10
3,5	CBLP-CC-3-1-2	CBFNQ-R-3-1-2	CBKTK-R-3-1-2	9	10
4	CBLP-CC-4	CBFNQ-R-4	CBKTK-R-4	9	10
4,5	CBLP-CC-4-1-2	CBFNQ-R-4-1-2		9	10
5	CBLP-CC-5	CBFNQ-R-5	CBKTK-R-5	9	10
5,6	CBLP-CC-5-6-10	CBFNQ-R-5-6-10		9	10
6	CBLP-CC-6	CBFNQ-R-6	CBKTK-R-6	9	10
6,25	CBLP-CC-6-1-4	CBFNQ-R-6-1-4		9	10
7	CBLP-CC-7	CBFNQ-R-7	CBKTK-R-7	9	10
7,5	CBLP-CC-7-1-2	CBFNQ-R-7-1-2		9	10
8	CBLP-CC-8	CBFNQ-R-8	CBKTK-R-8	9	10

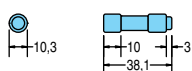
Note

1 Packing size, first value applies for 1 pole fuse disconnectors, second value for 2 pole fuse disconnectors, third value for 3 pole fuse disconnectors.

Catalogue numbers - Class CC fuses

Rated current, A	Catalogue numbers - class CC fuses			Weight each, g	Packing size
	LP-CC, time delay motor protection	FNQ-R, time delay transformer protection	KTK-R fast acting		
9	CBLP-CC-9	CBFNQ-R-9	CBKTK-R-9	9	10
10	CBLP-CC-10	CBFNQ-R-10	CBKTK-R-10	9	10
12	CBLP-CC-12	CBFNQ-R-12	CBKTK-R-12	9	10
15	CBLP-CC-15	CBFNQ-R-15	CBKTK-R-15	9	10
17,5		CBFNQ-R-17-1-2		9	10
20	CBLP-CC-20	CBFNQ-R-20	CBKTK-R-20	9	10
25	CBLP-CC-25	CBFNQ-R-25	CBKTK-R-25	9	10
30	CBLP-CC-30	CBFNQ-R-30	CBKTK-R-30	9	10

Dimensions - Class CC fuses, mm



Class CC off-load fuse disconnectors type CH and Optima

Technical data



Material	Polyester/Thermoplastic, flammability rating according to UL 94V0/UL 94V2
Rated voltage	600 V
Rated current	30 A, short circuit current rating (SCCR) 200 kA
Terminal type	Type CH: box terminal, AWG 18-8, Optima: pressure plate AWG 14-2
Fuse trip indication	Lamp indication, neon lamp, 90-600 V
Ingress protection, IEC 60529	IP 20
Standards	UL 4248, CSA 22.2 No 4248
Approvals	UL listed guide IZLT file E14853, CSA class 6225-01 file 47235
Certificate	CE, RoHS

Catalogue numbers - Class CC off-load fuse disconnecter type CH, installation on 35 mm DIN rail see note 1

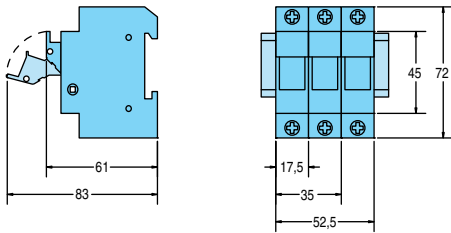
Description	Catalogue numbers - off-load fuse disconnecter			Weight g/pole	Packing size
	1 pole	2 pole	3 pole		
Off-load fuse disconnectors	CBCHCC1D	CBCHCC2D	CBCHCC3D	50	12/6/4
Off-load fuse disconnectors, lamp indication	CBCHCC1DI	CBCHCC2DI	CBCHCC3DI	50	12/6/4

Catalogue numbers - Class CC off-load fuse disconnecter type Optima, inst. on 35 mm DIN rail, accessories

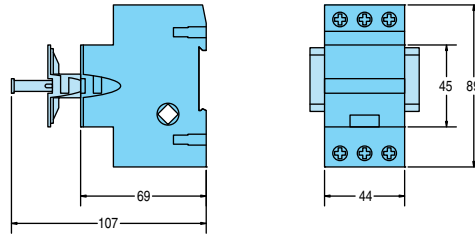
Description	Catalogue numbers	Weight each, g	Packing size
3 pole off-load fuse disconnecter	CBOPT-NG-SC3	192	1
Auxiliary contact NO-NC, 240 V/5 A, indicates the fuse disconnecter pos.	CBOPMNGSAAUX11	54	5
Auxiliary contact 2NO, 240 V/5 A, indicates the fuse disconnecter position	CBOPMNGSAAUX20	54	5
Input terminal block, busbar system 63 A	CBOPMNGSA009	68	5
Through-feed input terminal block, busbar system 63 A	CBOPMNGSA005	131	5
Busbar 63 A, 2 units, cc=45 mm/same phase	CBOPMNGSA245	40	1
Busbar 63 A, 3 units, cc=45 mm/same phase	CBOPMNGSA345	65	1
Busbar 63 A, 4 units, cc=45 mm/same phase	CBOPMNGSA445	85	1
Busbar 63 A, 2 units, cc=54 mm/same phase	CBOPMNGSA254	45	1
Busbar 63 A, 3 units, cc=54 mm/same phase	CBOPMNGSA354	70	1
Busbar 63 A, 4 units, cc=54 mm/same phase	CBOPMNGSA454	90	1
Protective cover for unused terminals on busbar	CPOPNGSA010	5	5

Dimensions - Class CC off-load fuse disconnectors, mm

CH 1-3 pole off-load fuse disconnectors



Optima 3 pole off-load fuse disconnecter



Class CC compact fuse disconnect switches type CCP

Technical data



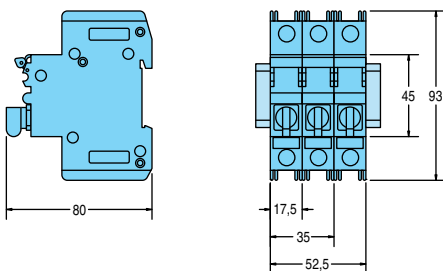
Material	Polyester, flammability rating according to UL 94V0
Rated voltage	600 VAC/80 VDC
Rated current	30 A, kortslutningsström (SCCR) 200 kA
Motor data, 3-pole switch	600 VAC-7,5 Hp, 480 VAC-5 Hp, 240 VAC, 3 Hp
Terminal type	Box terminal AWG18-6
Tripped fuse indication	Lamp indication, separate remote trip indication system, 24 VDC
Auxiliary contact	240 V/5 A, indicates switch position, wire range AWG 20-16
Ingress protection, IEC 60529	IP 20, installed conductor AWG 10 or larger
Standards	UL 98, CSA 22.2 No 4-04
Approval	cUL listed guide WHTY, file E302370, auxiliary contact/remote trip ind. UR
Certificates	CE, RoHS

Catalogue no. - Class CC compact fuse disconnect switch type CCP, installation on 35 mm DIN rail see note 1

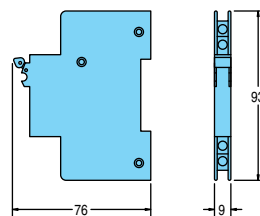
Description	Catalogue numbers - fuse disconnect switches			Weight g/pole	Packing size
	1 pole	2 pole	3 pole		
Fuse disconnecting switch, 600 VAC	CBCCP-1-30CC	CBCCP-2-30CC	CBCCP-3-30CC	108	12/6/4
Fuse disconnection switch, 80 VDC	CBCCP-1-30DCC			108	12/6/4
Aux. contact NO-NC, indicate switch pos.	CBCCP-AUX	CBCCP-AUX	CBCCP-AUX	50	1
Remote indication, tripped fuse	CBCCP-PLC-IND	CBCCP-PLC-IND	CBCCP-PLC-IND	100	1

Dimensions - Class CC compact fuse disconnect switches type CCP, mm

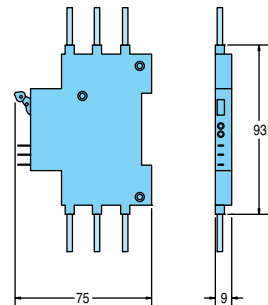
1-3 pole fuse disconnect switches



Auxiliary contact



Remote trip indication system



Note

1 Packing size, first value applies for 1 pole fuse disconnectors, second value for 2 pole fuse disconnectors, third value for 3 pole fuse disconnectors.

Class CF fuse system - CUBEFuse, 6-100 A, time delay

Technical data



<p>Applications</p> <p>Material</p> <p>Design</p> <p>Rated voltage</p> <p>Breaking capacity</p> <p>Rated current fuseholders</p> <p>Standards</p> <p>Approvals</p> <p>Certificate</p> <p>Fuse disconnect switches</p>	<p>Branch circuit protection according to NEC 240, motor protection according to NEC 430, current limiting</p> <p>Fuse PES thermoplastic, fuseholder PTB polymer, tinned copper connection</p> <p>Dual element, separate elements for overload/short circuit protection</p> <p>600 VAC, 300 VDC</p> <p>600 VAC: UL 300 kA/CSA 200 kA; 300 VDC: 100 kA</p> <p>30-100 A, short circuit current rating (SCCR) 200 kA</p> <p>UL 248-17, CSA 1422-02</p> <p>Fuse: UL listed guide JDDZ, file E4273, CSA class 1422-02 file 53787</p> <p>Fuseholder: UL listed guide IZND, file E214079, CSA class 6225-01 file 47235</p> <p>CE</p> <p>See page 10</p>
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Catalogue numbers - Class CF fuses - CUBEFuse

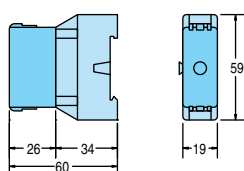
Rated current, A	Catalogue numbers		Weight each, g	Packing size
	Time delay	Time delay with visual indication		
6	CBTCF6RN	CBTCF6	53	12
10	CBTCF10RN	CBTCF10	53	12
15	CBTCF15RN	CBTCF15	53	12
17,5	CBTCF17-1-2RN	CBTCF17-1-2	53	12
20	CBTCF20RN	CBTCF20	53	12
25	CBTCF25RN	CBTCF25	53	12
30	CBTCF30RN	CBTCF30	53	12
35	CBTCF35RN	CBTCF35	55	12
40	CBTCF40RN	CBTCF40	55	12
45	CBTCF45RN	CBTCF45	55	12
50	CBTCF50RN	CBTCF50	55	12
60	CBTCF60RN	CBTCF60	55	12
70	CBTCF70RN	CBTCF70	132	6
80	CBTCF80RN	CBTCF80	132	6
90	CBTCF90RN	CBTCF90	132	6
100	CBTCF100RN	CBTCF100	132	6

Catalogue numbers - Class CF fuseholders, CUBEFuse, installation on 35 mm DIN rail or panel mount

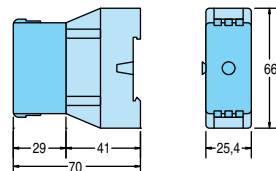
Rated current, A	Terminal type	Wire range AWG	Catalogue numbers		Weight each, g	Packing size
			1 pole fuseholder, ingress protection IP 20			
1-30	Pressure plate	18-8 alternative 2x18-10	CBTCFH30N		93	12
1-60	Pressure plate	18-4 alternative 2x18-6	CBTCFH60N		97	12
1-100	Pressure plate	18-1 alternative 2x6	CBTCFT100N		105	6

Dimensions - Class CF fuse system, CUBEFuse, mm

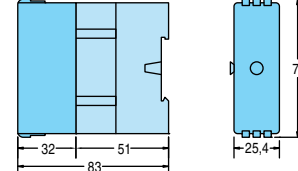
1-30 A fuse and fuseholder



3-60 A fuse and fuseholder



70-100 A fuse and fuseholder



Class CF CUBEFuse compact fuse disconnect switches type CCP

Technical data



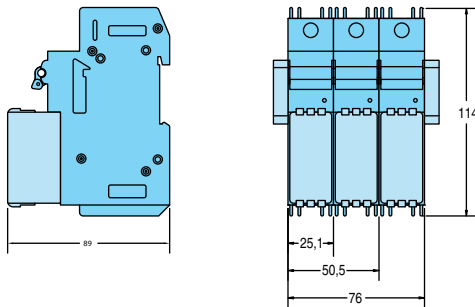
Material	Polyester, flammability rating according to UL 94V0
Rated voltage	600 VAC
Rated current	30/60/100 A, short circuit current rating (SCCR) 200 kA
Motor data, 3-pol, 30/60/100A	600 VAC-10/10/50/ Hp, 480 VAC-15/20/50 Hp, 240 VAC, 5/7,5/20 Hp
Terminal type	Box terminal, 30/60 A: AWG 18-4, 100 A: AWG 18-1
Tripped fuse indication	Lamp indication, separate remote trip indication system, 24 VDC
Auxiliary contact	240 V/5 A, indicates switch position, wire range AWG 20-16
Ingress protection, IEC 60529	IP 20, installed conductor AWG 10 or larger
Standards	UL 98, CSA 22.2 No 4-04
Approvals	cUL listed guide WHTY, file E302370, auxiliary contact/remote trip indication UR
Certificates	CE, RoHS

Catalogue no. - Class CF CUBEFuse compact fuse disconnect switches type CCP, inst. on 35 mm DIN rail

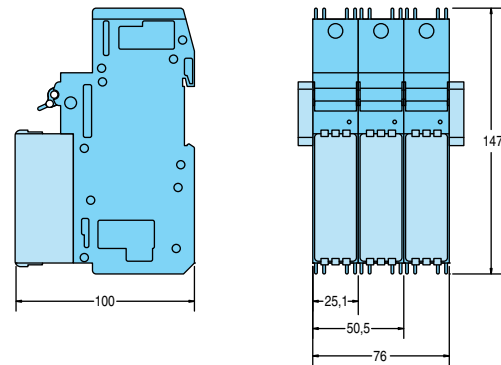
Description	Catalogue numbers - fuse disconnect switches			Weight g/pole	Packing size
	1 pole	2 pole	3 pole		
Fuse disconnect switch, 30 A	CBCCP-1-30CF	CBCCP-2-30CF	CBCCP-3-30CF	155	6
Fuse disconnect switch, 60 A	CBCCP-1-60CF	CBCCP-2-60CF	CBCCP-3-60CF	155	6
Fuse disconnect switch, 100 A	CBCCP-1-100CF	CBCCP-2-100CF	CBCCP-3-100CF	155	6
Aux. contact NO-NC, ind. switch pos.	CBCCP-AUX	CBCCP-AUX	CBCCP-AUX	50	1
Remote indication, tripped fuse	CBCCP-PLC-IND	CBCCP-PLC-IND	CBCCP-PLC-IND	100	1

Dimensions - Class CF CUBEFuse fuse disconnect switches type CCP, mm

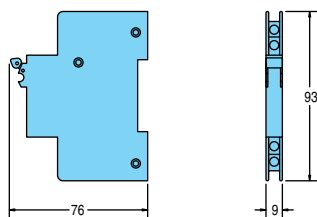
30/60 A, 1-3 pole fuse disconnect switches, fuse installed



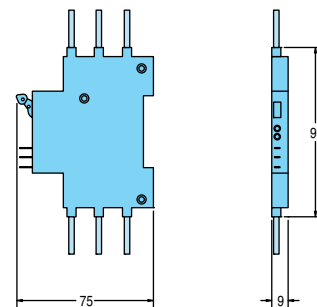
100 A, 1-3 pole fuse disconnect switches, fuse installed



Auxiliary contact



Remote trip indication system



Instrument protection fuses - Protection of multimeters 0,1-30 A, fast action

Technical data



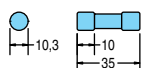
Applications	Protection of metering instruments, multimeter
Material	Melamine/glass fibre body, nickel plated brass ferrules
Design	Single element
Rated voltage	BBS: 48-600 VAC, see catalogue number table DMM-B: 1000 VAC/VDC
Breaking capacity	BBS: 10 kA DMM-B 0,44 A: 10 kA, DMM-B 11 A: 20 kA
Approvals	BBS 0,1-10 A: UL listed guide JDYX, file E19180, CSA class 1422-01 file 53787 DDM-B: UR file E19180
Certificate	CE

Catalogue numbers - Instrument protection fuses

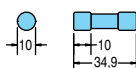
Rated current, A	BBS - Fast acting fuses		DMM-B - fast acting, 1000 VAC/VDC Catalogue numbers	Weight each, g	Packing size
	Rated voltage, VAC	Catalogue numbers			
0,1	600	CBBBS-1-10		9	10
0,2	600	CBBBS-2-10		9	10
0,25	600	CBBBS-1-4		9	10
0,4	600	CBBBS-4-10		9	10
0,44			CBDMM-B-44-100	9	10
0,5	600	CBBBS-1-2		9	10
0,6	600	CBBBS-6-10		9	10
0,75	600	CBBBS-3-4		9	10
0,8	600	CBBBS-8-10		9	10
1		CBBBS-1		9	10
1,5	600	CBBBS-1-1-2		9	10
1,6	600	CBBBS-1-6-10		9	10
1,8	600	CBBBS-1-8-10		9	10
2	600	CBBBS-2		9	10
3	600	CBBBS-3		9	10
4	600	CBBBS-4		9	10
5	600	CBBBS-5		9	10
6	250	CBBBS-6		9	10
7	250	CBBBS-7		9	10
8	250	CBBBS-8		9	10
10	250	CBBBS-10		9	10
11			CBDMM-B-11	9	10
12	48	CBBBS-12		9	10
15	48	CBBBS-15		9	10
20	48	CBBBS-20		9	10
25	48	CBBBS-25		9	10
30	48	CBBBS-30		9	10

Dimensions - Instrument protection fuses, mm

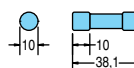
BBS fuses



CBDMM-B-44-100



CBDMM-B-11



Midget fuses - 0,1-30 A, time delay/fast acting

Technical data



Applications	Supplementary protection according to NEC 240
Material	Melamine body, nickel plated brass ferrules
Design	Single element, Type FNM dual element, separate for overload/short circuit prot.
Rated voltage	600-250 VAC/VDC, see catalogue numbers
Breaking capacity	DCM - 600 VAC: 100 kA, 600 VDC: 50 kA BAF - 250 VAC: 35-750A: 125 VAC: 10 kA FNM - 250 VAC: 35 A-10 kA, 125 VAC 10 kA
Standards	UL 248-14, CSA 22.2 No. 248.14
Approvals	UL listed guide JDYX, file E19180, CSA class 1422-01 file 53787
Certificate	CE
Fuse disconnecter	See page 13

Cooper Bussmann recommends upgrading type KTK and FNQ to class CC type LP-CC, see page 6

Catalogue numbers - Midget fuses

Rated current, A	Catalogue numbers			Weight each, g	Packing size
	600 VAC/VDC DCM - fast acting	250 VAC BAF - fast acting	250 VAC FNM - time delay		
0,1	CBDCM-1-10		CBFNM-1-10	9	10
0,125	CBDCM-1-8		CBFNM-1-8	9	10
0,15			CBFNM-15-100	9	10
0,2	CBDCM-2-10	CBBAF-2-10	CBFNM-2-10	9	10
0,25	CBDCM-1-4	CBBAF-1-4	CBFNM-1-4	9	10
0,3	CBDCM-3-10		CBFNM-3-10	9	10
0,4			CBFNM-4-10	9	10
0,5	CBDCM-1-2	CBBAF-1-2	CBFNM-1-2	9	10
0,6		CBBAF-6-10	CBFNM-6-10	9	10
0,75	CBDCM-3-4		CBFNM-3-4	9	10
0,8		CBBAF-8-10	CBFNM-8-10	9	10
1	CBDCM-1	CBBAF-1	CBFNM-1	9	10
1,125			CBFNM-1-1-8	9	10
1,25	CBDCM-1-1-4		CBFNM-1-1-4	9	10
1,4			CBFNM-1-4-10	9	10
1,5	CBDCM-1-1-2	CBBAF-1-1-2	CBFNM-1-1-2	9	10
1,6			CBFNM-1-6-10	9	10
1,8		CBBAF-1-8-10	CBFNM-1-8-10	9	10
2	CBDCM-2	CBBAF-2	CBFNM-2	9	10
2,25			CBFNM-2-1-4	9	10
2,5	CBDCM-2-1-2	CBBAF-2-1-2	CBFNM-2-1-2	9	10
2,8			CBFNM-2-8-10	9	10
3	CBDCM-3	CBBAF-3	CBFNM-3	9	10
3,2			CBFNM-3-2-10	9	10
3,5			CBFNM-3-1-2	9	10
4	CBDCM-4	CBBAF-4	CBFNM-4	9	10
4,5			CBFNM-4-1-2	9	10
5	CBDCM-5	CBBAF-5	CBFNM-5	9	10
5,6			CBFNM-5-6-10	9	10
6	CBDCM-6	CBBAF-6	CBFNM-6	9	10

Catalogue numbers - Midget fuses

Rated current, A	Catalogue numbers			Weight each, g	Packing size
	600 VAC/VDC DCM - fast acting	250 VAC BAF - fast acting	250 VAC FNM - time delay		
6,25		CBBAF-6-1-4	CBFNM-6-1-4	9	10
7	CBDCM-7	CBBAF-7	CBFNM-7	9	10
8	CBDCM-8	CBBAF-8	CBFNM-8	9	10
9	CBDCM-9	CBBAF-9	CBFNM-9	9	10
10	CBDCM-10	CBBAF-10	CBFNM-10	9	10
12	CBDCM-12	CBBAF-12	CBFNM-12	9	10
15	CBDCM-15	CBBAF-15	CBFNM-15	9	10
20	CBDCM-20	CBBAF-20	CBFNM-20	9	10
25	CBDCM-25	CBBAF-25	CBFNM-25	9	10
30	CBDCM-30	CBBAF-30	CBFNM-30	9	10

Dimensions - Midget fuses, mm



Midget off-load fuse disconnectors type CHM

Technical data

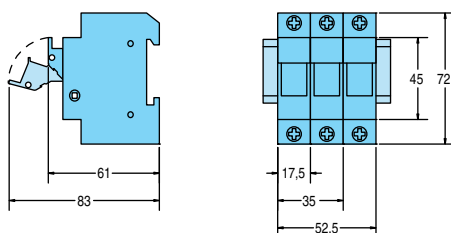


Material	Polyester, flammability rating according to UL94V0
Rated voltage	UL :600 V, IEC 690 V
Rated current	30 A, 32 A for IEC class gG/aM fuses
Terminal type	Box terminal, AWG 18-8/0,8-10 mm ²
Fuse trip indication	Lamp indication, neon lamp 90-690 V
Ingress prot., IEC 60529	IP 20
Standards	UL 4248, CSA C22.2 No 4248
Approvals	UL listed guide IZLT file E14853, CSA class 6225-01 file 47235
Certificates	CE, RoHS

Catalogue numbers - Midget off-load fuse disconnectors type CHM, installation on 35 mm DIN rail see note 1

Description	Catalogue numbers - off-load fuse disconnectors			Weight each, g	Packing size
	1 pole	2 pole	3 pole		
Off-load fuse disconnecter	CBCHM1D	CBCHM2D	CBCHM3D	68	12/6/4
Off-load fuse disconnecter with lamp indication	CBCHM1DI	CBCHM2DI	CBCHM3DI	68	12/6/4

Dimensions - Off-load fuse disconnectors type CHM



Note

1 Packing size, first value applies for 1 pole fuse disconnectors, second value for 2 pole fuse disconnectors, third value for 3 pole fuse disconnectors.

Class RK1 fuses - 0,1-600 A, time delay

Technical data



Applications	Branch circuit protection according to NEC 240, motor protection according to NEC 430 current limiting
Material	Glass fibre body, copper ferrules/contact blades, rejection type
Design	Dual element, separate elements for overload/short circuit protection
Rated voltage	250 VAC, 0-60 A 125VDC, 70-600 A 250 VDC 600 VAC/300 VDC
Breaking capacity	250/600 VAC: 300 kA (CSA 200 kA), 125/250/300 VDC: 100 kA
Standards	Special Purpose/UL 248-12, CSA 22.2 No. 248.12
Approvals	UL listed guide JFHR, file E56412, CSA class 1422-02 file E53787
Certificate	CE
Fuseholders	See page 20

Cooper Bussmann recommends upgrading fast acting type KTN-R/KTS-R to LPN-RK/LPS-RK

Catalogue numbers - Class RK1 fuse, time delay see note 2

Rated current, A	250 V fuses	Weight each, g	Packing size	600 V fuses	Weight each, g	Packing size
	Catalogue numbers LPN-RK - time delay			Catalogue numbers LPS-RK - time delay		
0,1	CBLPN-RK-1-10SP	22	10	CBLPS-RK-1-10SP	73	10
0,15	CBLPN-RK-15-100SP	22	10			
0,2	CBLPN-RK-2-10SP	22	10	CBLPS-RK-2-10SP	73	10
0,3	CBLPN-RK-3-10SP	22	10	CBLPS-RK-3-10SP	73	10
0,4	CBLPN-RK-4-10SP	22	10	CBLPS-RK-4-10SP	73	10
0,5	CBLPN-RK-1-2SP	22	10	CBLPS-RK-1-2SP	73	10
0,6	CBLPN-RK-6-10SP	22	10	CBLPS-RK-6-10SP	73	10
0,8	CBLPN-RK-8-10SP	22	10	CBLPS-RK-8-10SP	73	10
1	CBLPN-RK-1SP	22	10	CBLPS-RK-1SP	73	10
1,125	CBLPN-RK-1-1-8SP	22	10	CBLPS-RK-1-1-8SP	73	10
1,25	CBLPN-RK-1-1-4SP	22	10	CBLPS-RK-1-1-4SP	73	10
1,4	CBLPN-RK-4-10SP	22	10	CBLPS-RK-4-10SP	73	10
1,5				CBLPS-RK-1-1-2SP	73	10
1,6	CBLPN-RK-6-10-SP	22	10	CBLPS-RK-1-6-10SP	73	10
1,8	CBLPN-RK-8-10-SP	22	10	CBLPS-RK-1-8-10SP	73	10
2	CBLPN-RK-2SP	22	10			
2,25	CBLPN-RK-2-1-4SP	22	10	CBLPS-RK-2-1-4SP	73	10
2,5	CBLPN-RK-2-1-2SP	22	10	CBLPS-RK-2-1-2SP	73	10
2,8	CBLPN-RK-2-8-10SP	22	10	CBLPS-RK-2-8-10SP	73	10
3	CBLPN-RK-3SP	22	10	CBLPS-RK-3SP	73	10
3,2	CBLPN-RK-3-2-10SP	22	10	CBLPS-RK-3-2-10SP	73	10
3,5	CBLPN-RK-3-1-2SP	22	10	CBLPS-RK-3-1-2SP	73	10
4	CBLPN-RK-4SP	22	10	CBLPS-RK-4SP	73	10
4,5	CBLPN-RK-4-1-2SP	22	10	CBLPS-RK-4-1-2SP	73	10
5	CBLPN-RK-5SP	22	10	CBLPS-RK-5SP	73	10
5,6	CBLPN-RK-5-6-10SP	22	10	CBLPS-RK-5-6-10SP	73	10
6	CBLPN-RK-6SP	22	10	CBLPS-RK-6SP*	73	10
6,25	CBLPN-RK-6-1-4SP	22	10	CBLPS-RK-6-1-4SP*	73	10
7				CBLPS-RK-7SP*	73	10
8	CBLPN-RK-8SP	22	10	CBLPS-RK-8SP*	73	10

Note

2 Fuses marked with * are also available in versions with visual trip indication. For versions with visual trip indication, add "I" last in the catalogue number. Example: CBLPS-RK-30SP will be CBLPS-RK-30SPI.

Catalogue numbers - Class RK1 fuse, time delay see note 2

Rated current, A	250 V fuses		600 V fuses		Weight each, g	Packing size
	Catalogue numbers LPN-RK - time delay	Weight each, g	Catalogue numbers LPS-RK - time delay	Weight each, g		
9	CBLPN-RK-9SP	22	10	CBLPS-RK-9SP*	73	10
10	CBLPN-RK-10SP	22	10	CBLPS-RK-10SP*	73	10
12	CBLPN-RK-12SP	22	10	CBLPS-RK-12SP*	73	10
15	CBLPN-RK-15SP	22	10	CBLPS-RK-15SP*	73	10
17,5	CBLPN-RK-17-1-2SP	22	10	CBLPS-RK-17-1-2SP*	73	10
20	CBLPN-RK-20SP	22	10	CBLPS-RK-20SP*	73	10
25	CBLPN-RK-25SP	22	10	CBLPS-RK-25SP*	73	10
30	CBLPN-RK-30SP	22	10	CBLPS-RK-30SP*	73	10
35	CBLPN-RK-35SP*	54	10	CBLPS-RK-35SP*	118	10
40	CBLPN-RK-40SP*	54	10	CBLPS-RK-40SP*	118	10
45	CBLPN-RK-45SP*	54	10	CBLPS-RK-45SP*	118	10
50	CBLPN-RK-50SP*	54	10	CBLPS-RK-50SP*	118	10
60	CBLPN-RK-60SP*	180	5	CBLPS-RK-60SP*	118	10
70	CBLPN-RK-70SP*	180	5	CBLPS-RK-70SP*	220	5
80	CBLPN-RK-80SP*	180	5	CBLPS-RK-80SP*	220	5
90	CBLPN-RK-90SP*	180	5	CBLPS-RK-90SP*	220	5
100	CBLPN-RK-100SP*	180	5	CBLPS-RK-100SP*	220	5
110	CBLPN-RK-110SP*	400	1	CBLPS-RK-110SP*	500	1
125	CBLPN-RK-125SP*	400	1	CBLPS-RK-125SP*	500	1
150	CBLPN-RK-150SP*	400	1	CBLPS-RK-150SP*	500	1
175	CBLPN-RK-175SP*	400	1	CBLPS-RK-175SP*	500	1
200	CBLPN-RK-200SP*	900	1	CBLPS-RK-200SP*	500	1
225	CBLPN-RK-225SP*	900	1	CBLPS-RK-225SP*	1100	1
250	CBLPN-RK-250SP*	900	1	CBLPS-RK-250SP*	1100	1
300	CBLPN-RK-300SP*	900	1	CBLPS-RK-300SP*	1100	1
350	CBLPN-RK-350SP*	900	1	CBLPS-RK-350SP*	1100	1
400	CBLPN-RK-400SP*	900	1	CBLPS-RK-400SP*	1100	1
450	CBLPN-RK-450SP*	1400	1	CBLPS-RK-450SP*	1500	1
500	CBLPN-RK-500SP*	1400	1	CBLPS-RK-500SP*	1500	1
600	CBLPN-RK-600SP*	1400	1	CBLPS-RK-600SP*	1500	1

Class RK5 fuses - 0,1-600 A, time delay

Technical data



Applications	Branch circuit protection according to NEC 240, motor protection according to NEC 430 current limiting
Material	Glass fibre body, copper ferrules/contact blades, rejection type
Design	Dual element, separate elements for overload/short circuit protection
Rated voltage	250 VAC, 0,1-60 och 110-200 A: 125 VDC, 225-600 A: 250 VDC 600 VAC/300 VDC
Breaking capacity	250/600 VAC: 200 kA, 125/250/300 VDC: 20 kA
Standards	UL 248-12, CSA 22.2 No. 248.12
Approvals	UL listed guide JDDZ, file E4273, CSA class 1422-01 file 53787
Certificate	CE
Fuseholders	See page 20

Note

2 Fuses marked with * are also available in versions with visual trip indication. For versions with visual trip indication, add "I" last in the catalogue number. Example: CBLPS-RK-30SP will be CBLPS-RK-30SPI.

Catalogue numbers - Class RK5 fuses, time delay

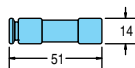
Rated current, A	250 V fuses		600 V fuses		Weight each, g	Packing size
	Catalogue numbers	Weight each, g	Catalogue numbers	Weight each, g		
	FRN-R - time delay		FRS-R - time delay			
0,1	CBFRN-R-1-10	22	10	CBFRS-R-1-10	73	10
0,125	CBFRN-R-1-8	22	10	CBFRS-R-1-8	73	10
0,15	CBFRN-R-15-100	22	10	CBFRS-R-15-100	73	10
0,2	CBFRN-R-2-10	22	10	CBFRS-R-2-10	73	10
0,25	CBFRN-R-1-4	22	10	CBFRS-R-1-4	73	10
0,3	CBFRN-R-3-10	22	10	CBFRS-R-3-10	73	10
0,4	CBFRN-R-4-10	22	10	CBFRS-R-4-10	73	10
0,5	CBFRN-R-1-2	22	10	CBFRS-R-1-2	73	10
0,6	CBFRN-R-6-10	22	10	CBFRS-R-6-10	73	10
0,8	CBFRN-R-8-10	22	10	CBFRS-R-8-10	73	10
1	CBFRN-R-1	22	10	CBFRS-R-1	73	10
1,125	CBFRN-R-1-1-8	22	10	CBFRS-R-1-1-8	73	10
1,25	CBFRN-R-1-1-4	22	10	CBFRS-R-1-1-4	73	10
1,4	CBFRN-R-1-4-10	22	10	CBFRS-R-1-4-10	73	10
1,5	CBFRN-R-1-1-2	22	10	CBFRS-R-1-1-2	73	10
1,6	CBFRN-R-1-6-10	22	10	CBFRS-R-1-6-10	73	10
1,8	CBFRN-R-1-8-10	22	10	CBFRS-R-1-8-10	73	10
2	CBFRN-R-2	22	10	CBFRS-R-2	73	10
2,25	CBFRN-R-2-1-4	22	10	CBFRS-R-2-1-4	73	10
2,5	CBFRN-R-2-1-2	22	10	CBFRS-R-2-1-2	73	10
2,8	CBFRN-R-2-8-10	22	10	CBFRS-R-2-8-10	73	10
3	CBFRN-R-3	22	10	CBFRS-R-3	73	10
3,2	CBFRN-R-3-2-10	22	10	CBFRS-R-3-2-10	73	10
3,5	CBFRN-R-3-1-2	22	10	CBFRS-R-3-1-2	73	10
4	CBFRN-R-4	22	10	CBFRS-R-4	73	10
4,5	CBFRN-R-4-1-2	22	10	CBFRS-R-4-1-2	73	10
5	CBFRN-R-5	22	10	CBFRS-R-5	73	10
5,6	CBFRN-R-5-6-10	22	10	CBFRS-R-5-6-10	73	10
6	CBFRN-R-6	22	10	CBFRS-R-6	73	10
6,25	CBFRN-R-6-1-4	22	10	CBFRS-R-6-1-4	73	10
7	CBFRN-R-7	22	10	CBFRS-R-7	73	10
7,5	CBFRN-R-7-1-2	22	10	CBFRS-R-7-1-2	73	10
8	CBFRN-R-8	22	10	CBFRS-R-8	73	10
9	CBFRN-R-9	22	10	CBFRS-R-9	73	10
10	CBFRN-R-10	22	10	CBFRS-R-10	73	10
12	CBFRN-R-12	22	10	CBFRS-R-12	73	10
15	CBFRN-R-15	22	10	CBFRS-R-15	73	10
17,5	CBFRN-R-17-1-2	22	10	CBFRS-R-17-1-2	73	10
20	CBFRN-R-20	22	10	CBFRS-R-20	73	10
25	CBFRN-R-25	22	10	CBFRS-R-25	73	10
30	CBFRN-R-30	22	10	CBFRS-R-30	73	10
35	CBFRN-R-35	54	10	CBFRS-R-35	118	10
40	CBFRN-R-40	54	10	CBFRS-R-40	118	10
45	CBFRN-R-45	54	10	CBFRS-R-45	118	10
50	CBFRN-R-50	54	10	CBFRS-R-50	118	10
60	CBFRN-R-60	180	10	CBFRS-R-60	118	10
70	CBFRN-R-70	180	5	CBFRS-R-70	220	5
75	CBFRN-R-75	180	5	CBFRS-R-75	220	5
80	CBFRN-R-80	180	5	CBFRS-R-80	220	5
90	CBFRN-R-90	180	5	CBFRS-R-90	220	5

Catalogue numbers - Class RK5 fuses, time delay

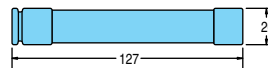
Rated current, A	250 V fuses		Weight each, g	Packing size	600 V fuses		Weight each, g	Packing size
	Catalogue numbers	FRN-R - time delay			Catalogue numbers	FRS-R - time delay		
100	CBFRN-R-100		180	1	CBFRS-R-100		220	5
110	CBFRN-R-110		400	1	CBFRS-R-110		500	1
125	CBFRN-R-125		400	1	CBFRS-R-125		500	1
150	CBFRN-R-150		400	1	CBFRS-R-150		500	1
175	CBFRN-R-175		400	1	CBFRS-R-175		500	1
200	CBFRN-R-200		900	1	CBFRS-R-200		500	1
225	CBFRN-R-225		900	1	CBFRS-R-225		1100	1
250	CBFRN-R-250		900	1	CBFRS-R-250		1100	1
300	CBFRN-R-300		900	1	CBFRS-R-300		1100	1
350	CBFRN-R-350		900	1	CBFRS-R-350		1100	1
400	CBFRN-R-400		900	1	CBFRS-R-400		1100	1
450	CBFRN-R-450		1400	1	CBFRS-R-450		1500	1
500	CBFRN-R-500		1400	1	CBFRS-R-500		1500	1
600	CBFRN-R-600		1400	1	CBFRS-R-600		1500	1

Dimensions - Class RK1/RK5 fuses, mm

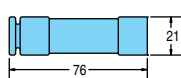
250 V - 0,1-30 A



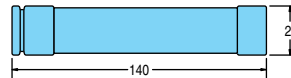
600 V - 0,1-30 A



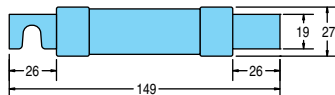
250 V - 35-60 A



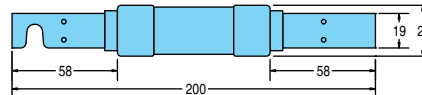
600 V - 35-80 A



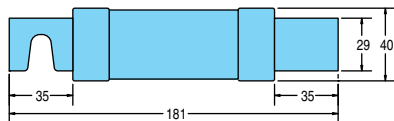
250 V - 65-100 A



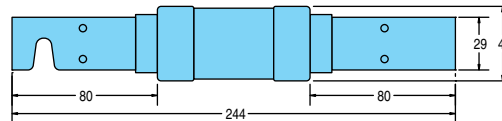
600 V - 65-100 A



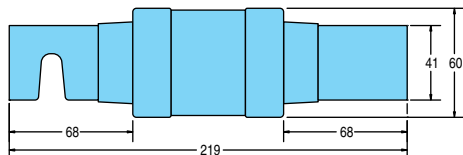
250 V - 110-200 A



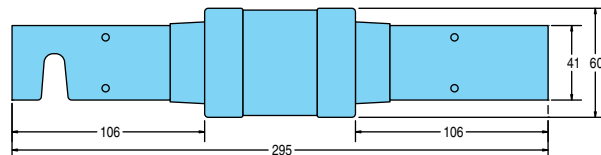
600 V - 110-200 A



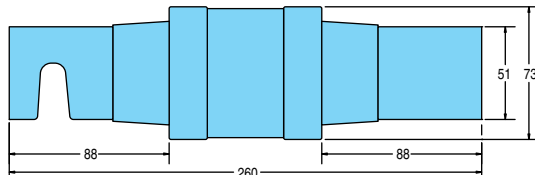
250 V - 225-400 A



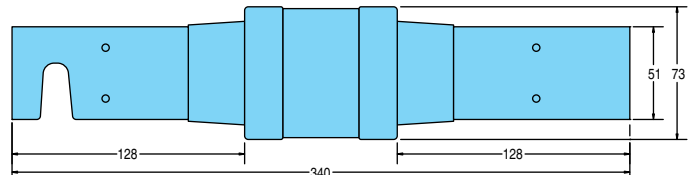
600 V - 225-400 A



250 V - 450-600 A



600 V - 450-600 A



Class H/K5 fuses - 0,1-600 A, fast acting

Technical data



Applications	Branch circuit protection according to NEC 240, motor protection according to NEC 430
Material	Glass fibre body, copper ferrules/contact blades
Design	Single element
Rated voltage	250 VAC, 0,125-100 A: 125 VDC 600 VAC
Breaking capacity	0,125-60 A: 50 kA, others 10 kA
Standards	0,125-60 A: class K5, UL 248-9, CSA 22.2 No. 248.9 65-600 A: class H, UL 248-6, CSA 22.2 No. 248.6
Approvals	UL listed guide JDDZ, file E4273 CSA class 1422-01 file 53787, fused marked * are not CSA approved
Certificate	CE
Fuseholders	See page 20

Cooper Bussmann recommends upgrading type NON/NOS to LPN-RK/LPS-RK or FRN-R/FRS/R, see page 14.
Not for use in industrial machinery according to NFPA 79.

Catalogue numbers - Class H/K5 fuses, fast acting

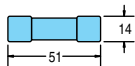
Rated current, A	250 fuses	Weight each, g	Packing size	600 V fuses	Weight each, g	Packing size
	Catalogue numbers NON - fast acting			Catalogue numbers NOS - fast acting		
0,125	CBNON-1-8	22	10			
0,5	CBNON-1-2	22	10			
0,75	CBNON-3-4	22	10			
0,8	CBNON-8-10	22	10			
1	CBNON-1	22	10	CBNOS-1	73	10
1,25	CBNON-1-1-4	22	10			
1,5	CBNON-1-1-2	22	10			
1,6	CBNON-6-10	22	10			
2	CBNON-2	22	10	CBNOS-2	73	10
2,5	CBNON-2-1-2	22	10			
3	CBNON-3	22	10	CBNOS-3	73	10
3,2	CBNON-3-2-10	22	10			
4	CBNON-4	22	10	CBNOS-4	73	10
5	CBNON-5	22	10	CBNOS-5	73	10
6	CBNON-6	22	10	CBNOS-6	73	10
6,25	CBNON-6-1-4	22	10			
7	CBNON-7	22	10	CBNOS-7	73	10
8	CBNON-8	22	10	CBNOS-8	73	10
9	CBNON-9	22	10	CBNOS-9	73	10
10	CBNON-10	22	10	CBNOS-10	73	10
12	CBNON-12	22	10	CBNOS-12	73	10
15	CBNON-15*	22	10	CBNOS-15	73	10
20	CBNON-20*	22	10	CBNOS-20	73	10
25	CBNON-25*	22	10	CBNOS-25	73	10
30	CBNON-30*	22	10	CBNOS-30	73	10
35	CBNON-35*	54	10	CBNOS-35	118	10
40	CBNON-40*	54	10	CBNOS-40	118	10
45	CBNON-45*	54	10	CBNOS-45	118	10
50	CBNON-50*	54	10	CBNOS-50	118	10
60	CBNON-60*	180	5	CBNOS-60	118	10

Catalogue numbers - Class H/K5 fuses, fast acting

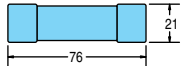
Rated current, A	250 fuses		600 V fuses	
	Catalogue numbers	Weight	Catalogue numbers	Weight
	NON - fast acting	each, g	NOS - fast acting	each, g
65	CBNON-65	180	CBNOS-65	220
70	CBNON-70	180	CBNOS-70	220
75	CBNON-75	180	CBNOS-75	220
80	CBNON-80	180	CBNOS-80	220
90	CBNON-90	180	CBNOS-90	220
100	CBNON-100	180	CBNOS-100	220
110	CBNON-110	400	CBNOS-110	500
125	CBNON-125	400	CBNOS-125	500
150	CBNON-150	400	CBNOS-150	500
175	CBNON-175	400	CBNOS-175	500
200	CBNON-200	900	CBNOS-200	500
225	CBNON-225	900	CBNOS-225	1100
250	CBNON-250	900	CBNOS-250	1100
300	CBNON-300	900	CBNOS-300	1100
350	CBNON-350	900	CBNOS-350	1100
400	CBNON-400	900	CBNOS-400	1100
450	CBNON-450	1400	CBNOS-450	1500
500	CBNON-500	1400	CBNOS-500	1500
600	CBNON-600	1400	CBNOS-600	1500

Dimensions - Class H/K5 fuses, mm

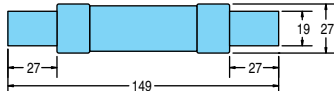
250 V - 0,125-30 A



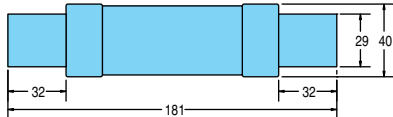
250 V - 35-60 A



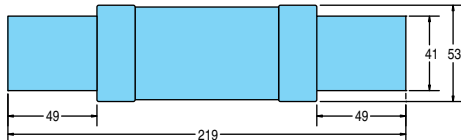
250 V - 65-100 A



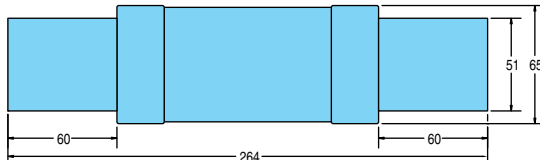
250 V - 110-200 A



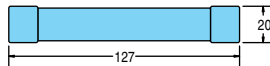
250 V - 225-400 A



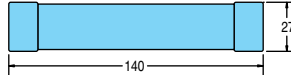
250 V - 450-600 A



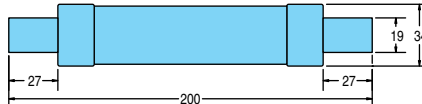
600 V - 1-30 A



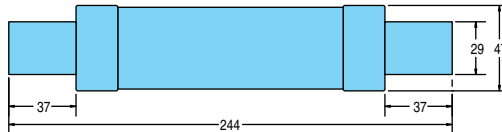
600 V - 35-60 A



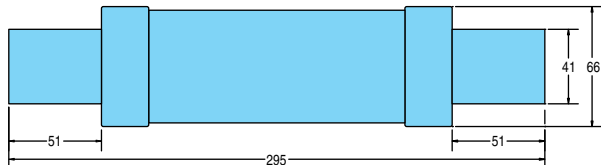
600 V - 65-100 A



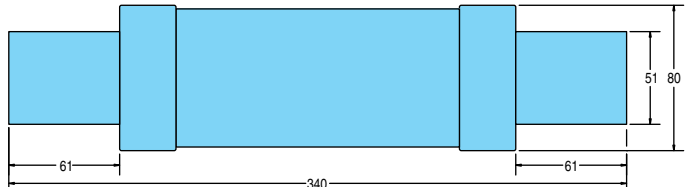
600 V - 110-200 A



600 V - 225-400 A



600 V - 450-600 A



Fuse covers for class RK1/RK5/H/K5 fuses - 30-100 A

Technical data



Material	Thermoplastic, flammability rating according to UL 94V2
Rated voltage	250/600 V
Indication	Version with lamp indication, neon lamp, for fuse trip indication, 90-600 VAC/115-600 VDC
Approvals	UL listed guide JDVS file E58836, CSA certified Class 6225-01, file LR47235
Certificate	CE

Catalogue numbers - Fuse covers for class RK1/RK5/H/K5 fuses - mounted on the fuse

Description	Catalogue numbers - fuse covers for one fuse		Weight each, g	Packing size
	250 V fuses	600 V fuses		
Fuse cover for 0,1-30 A fuses	CBSAMI-9N	CBSAMI-2N	60	3
Fuse cover for 0,1-30 A fuses, lamp indication	CBSAMI-9I	CBSAMI-2I	60	3
Fuse cover for 35-60 A fuses	CBSAMI-1N	CBSAMI-5N	80	3
Fuse cover for 35-60 A fuses, lamp indication	CBSAMI-1I	CBSAMI-5I	80	3
Fuse cover for 65-100 A fuses	CBSAMI-4N	CBSAMI-8N	100	3
Fuse cover for 65-100 A fuses, lamp indication	CBSAMI-4I	CBSAMI-8I	100	3

Class RK1/RK5 fuseholders

Technical data



Material	Thermoplastic, flammability rating according to UL 94V0
Rated voltage	250/600 V
Rated current	30-600 A, short circuit current rating (SCCR) 200 kA
Standards	UL 4248, CSA 22.2 No 4248
Approvals	UL listed guide IZLT file E14853, CSA class 6225-01 file 47235 Fuseholders marked * are UL recognized (UR), fuseholders marked ** are not UL/CSA approved
Certificate	CE

Catalogue numbers - Class RK1/RK5 fuseholders, panel mount

Fuse size	Rated current, A	Terminal type	Wire range AWG/kcmil	Catalogue numbers			Weight g/pole	Packing size
				1 pole	2 pole	3 pole		
Fuseholders for 250 V fuses - ingress protection IP 00								
0,1-30 A	30	Box terminal	14-2	CBR25060-1CR	CBR25030-2CR	CBR25030-3CR	91	1
35-60 A	60	Box terminal	14-2	CBR25060-1CR	CBR25060-2CR	CBR25060-3CR	104	1
70-100 A	100	Box terminal	8-1/0	CBR25100-1CR		CBR25100-3CR	225	1
110-200 A	200	Box terminal	6-250	CBR25200-1CR		CBR25200-3CR	700	1
225-400 A	400	Box terminal	4/0-500	CBR25400-1CR*		CBR25400-3CR**	1300	1
450-600 A	600	Box terminal	4/0-500	CBR25600-1CR		CBR25600-3CR**	2950	1
Fuseholders for 600 V fuses - ingress protection IP 00								
0,1-30 A	30	Box terminal	14-2	CBR60060-1CR	CBR60030-2CR	CBR25030-3CR	110	1
35-60 A	60	Box terminal	14-2	CBR60060-1CR	CBR60060-2CR	CBR25060-3CR	130	1
70-100 A	100	Box terminal	8-1/0	CBR60100-1CR		CBR60100-3CR	500	1
110-200 A	200	Box terminal	6-250	CBR60200-1CR		CBR60200-3CR	740	1
225-400 A	400	Box terminal	4-500	CBR60400-1CR*		CBR60400-3CR**	1920	1
450-600 A	600	Box terminal	2x4/0-500	CBR60600-1CR		CBR60600-3CR**	3110	1

Class H/K5 fuseholders

Technical data



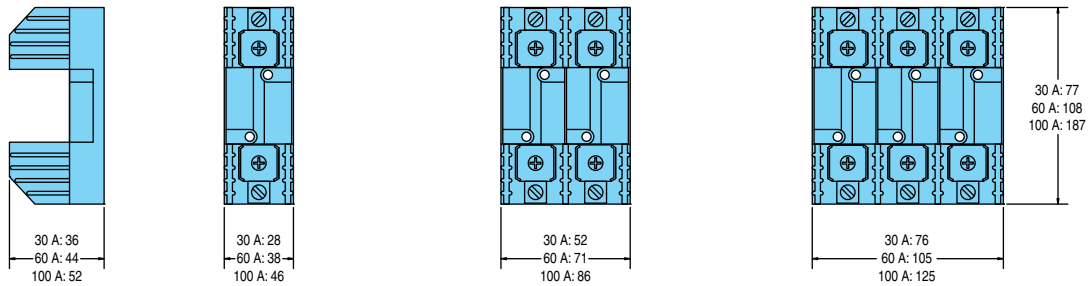
Material	Termoplastic, flammability rating according to UL 94V0
Rated voltage	250/600 V
Rated current	30-600 A, short circuit current rating (SCCR) 200 kA
Standards	UL 4248, CSA 22.2 No 4248
Approvals	UL listed guide IZLT file E14853, CSA class 6225-01 file 47235 Fuseholders marked * are UL recognized (UR), fuseholders marked ** are not UL/CSA approved
Certificate	CE

Catalogue numbers - Class H/K5 fuseholders, panel mount

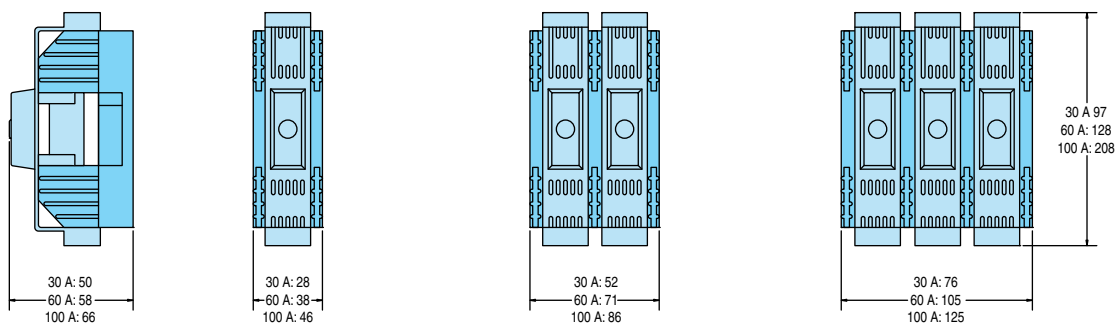
Fuse size	Rated current, A	Terminal type	Wire range AWG/kcmil	Catalogue numbers			Weight g/pole	Packing size
				1 pole	2 pole	3 pole		
Fuseholders for 250 V fuses - ingress protection IP 00								
0,1-30 A	30	Box terminal	14-2	CBH25060-1CR	CBH25030-2CR	CBH25030-3CR	91	1
35-60 A	60	Box terminal	14-2	CBH25060-1CR	CBH25060-2CR	CBH25060-3CR	104	1
70-100 A	100	Box terminal	8-1/0	CBH25100-1CR		CBH25100-3CR	225	1
110-200 A	200	Box terminal	6-250	CBH25200-1CR		CBH25200-3CR	700	1
225-400 A	400	Box terminal	4/0-500	CBH25400-1CR*		CBH25400-3CR**	1300	1
450-600 A	600	Box terminal	4/0-500	CBH25600-1CR		CBH25600-3CR**	2950	1
Fuseholders for 250 V fuses - ingress protection IP 00								
0,1-30 A	30	Box terminal	14-2	CBH60060-1CR	CBH60030-2CR	CBH25030-3CR	110	1
35-60 A	60	Box terminal	14-2	CBH60060-1CR	CBH60060-2CR	CBH25060-3CR	130	1
70-100 A	100	Box terminal	8-1/0	CBH60100-1CR		CBH60100-3CR	500	1
110-200 A	200	Box terminal	6-250	CBH60200-1CR		CBH60200-3CR	740	1
225-400 A	400	Box terminal	4-500	CBH60400-1CR*		CBH60400-3CR**	1920	1
450-600 A	600	Box terminal	2x4/0-500	CBH60600-1CR		CBH60600-3CR**	3110	1

Dimensions - Class RK1/RK5/H/K5 fuseholders, 250 V, mm

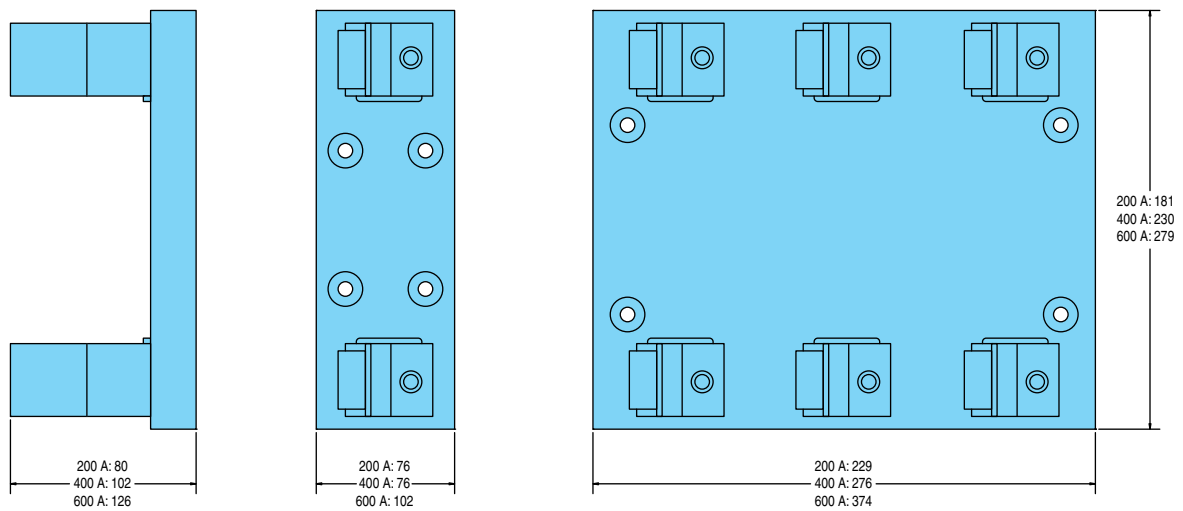
30/60/100 A, 1-3 pole fuseholders



30/60/100 A, 1-3 pole fuseholders, fuse equipped with fuse cover installed

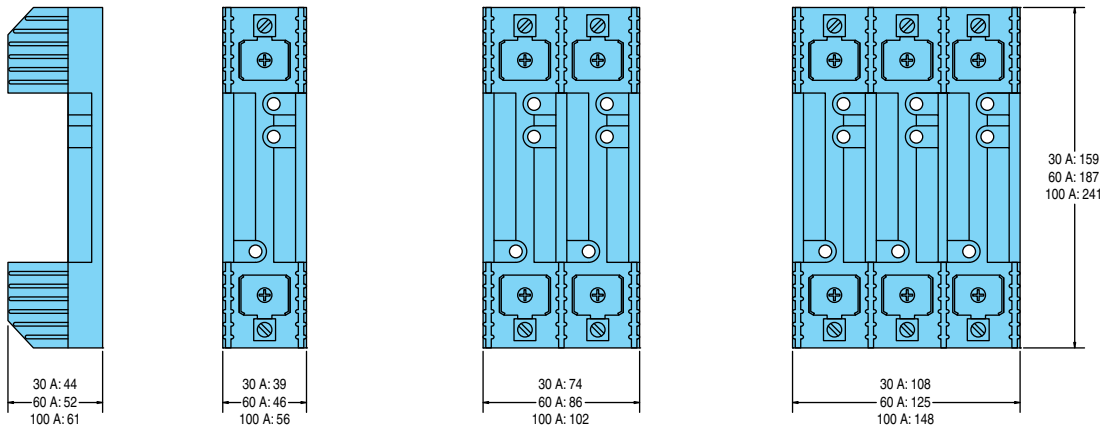


200/400/600 A, 1 and 3 pole fuseholders

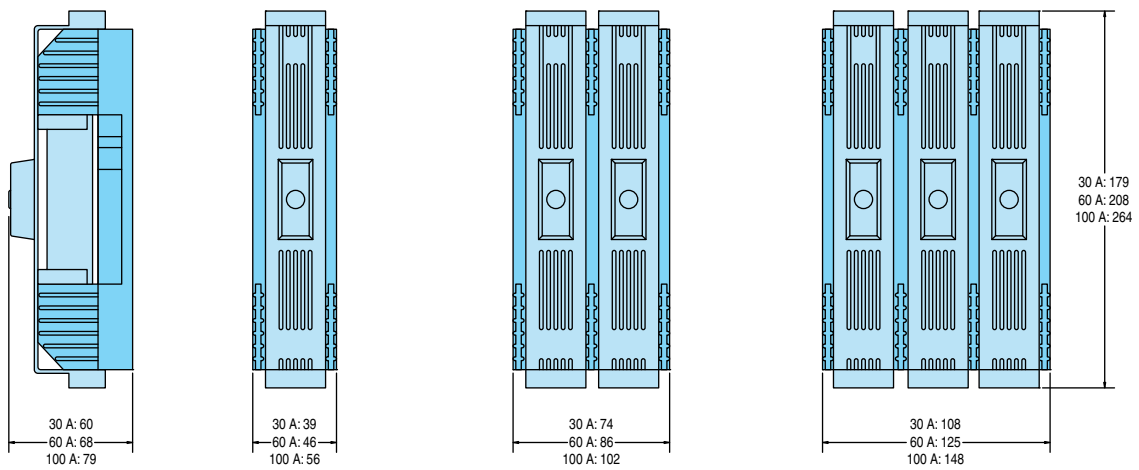


Dimensions - Class RK1/RK5/H/K5 fuseholders, 600 V, mm

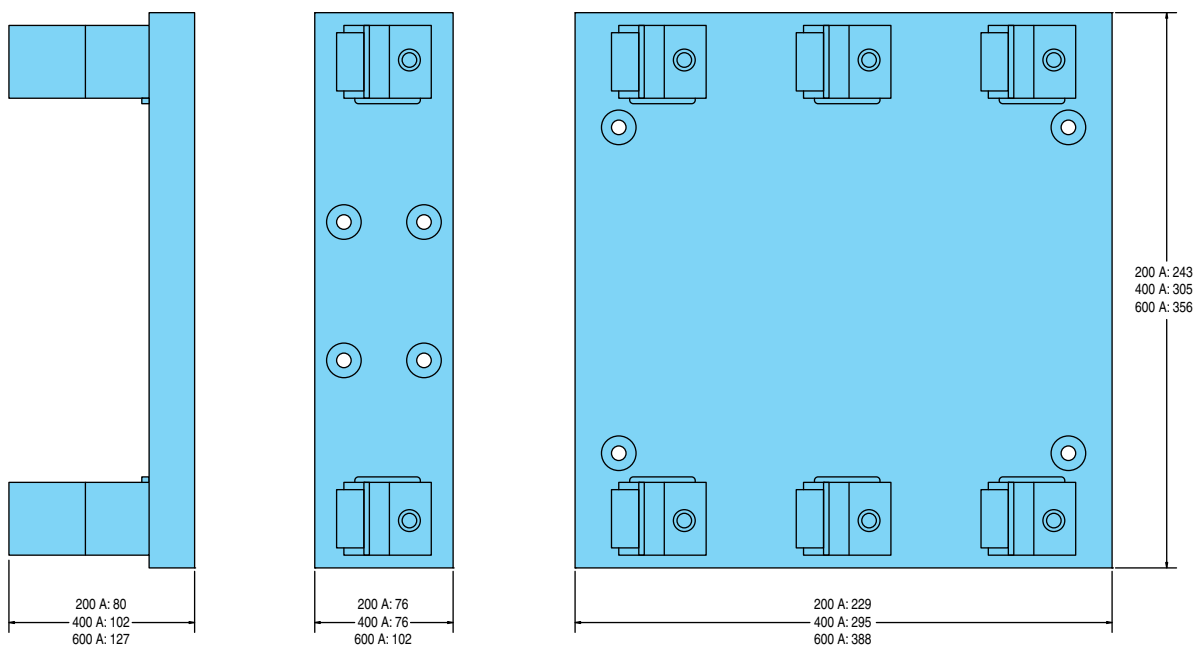
30/60/100 A, 1-3 pole fuseholders



30/60/100 A, 1-3 pole fuseholders, fuse equipped with fuse cover installed



200/400/600 A, 1 and 3 pole fuseholders



Class T fuses - 1-600 A, fast acting

Technical data

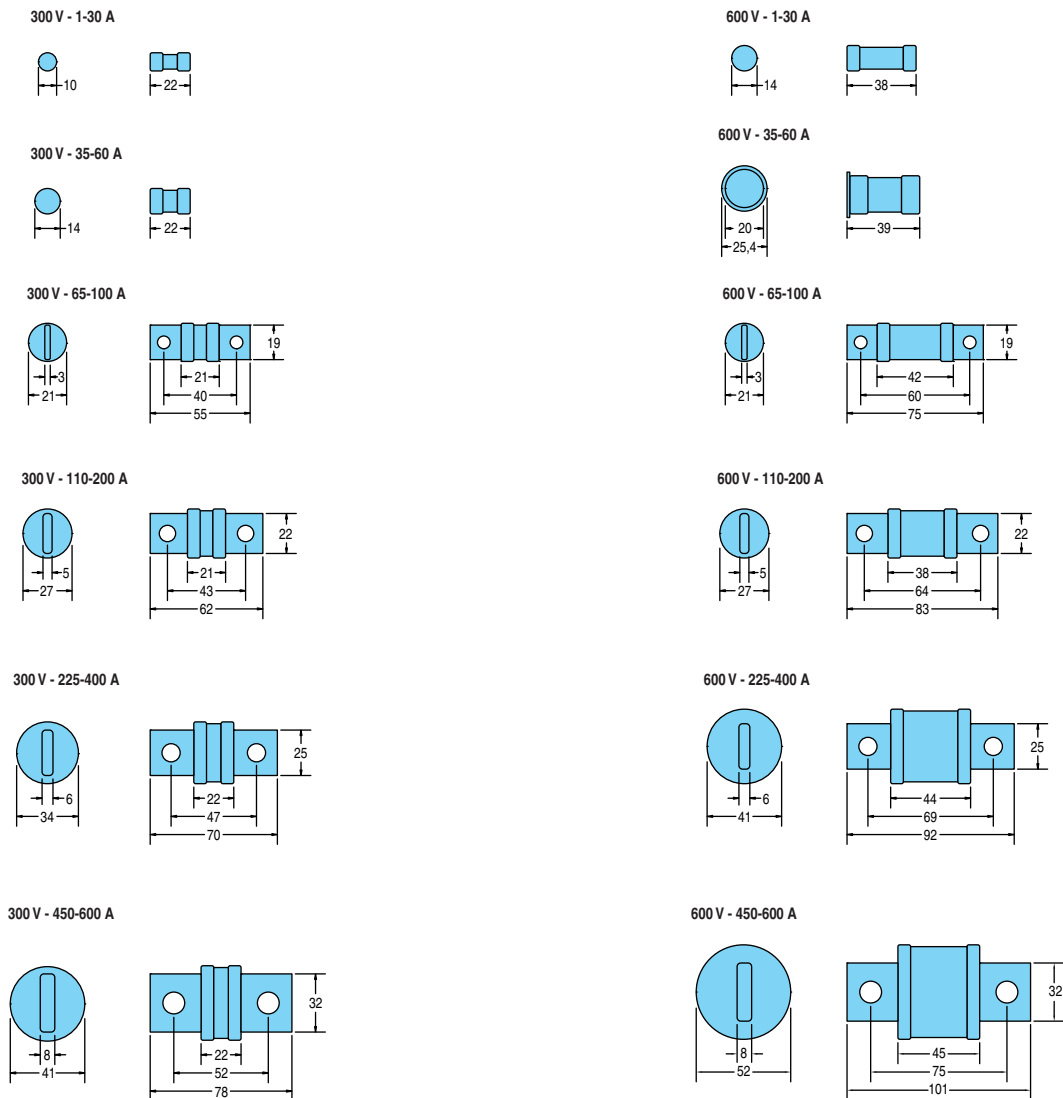


Applications	Branch circuit protection according to NEC 240, motor protection according to NEC 430 current limiting
Material	Glass fibre body, silver plated copper ferrules/contact blades
Design	Single element
Rated voltage	300 VAC/160 VDC 600 VAC
Breaking capacity Standarda	300/600 VAC: 200 kA, 160 VDC: 20 kA UL 248-15, CSA 22.2 No. 248.15
Approvals	UL listed guide JDDZ, file E4273 CSA class 1422-02 file 53787
Certificate	CE
Fuseholders	See page 26

Catalogue numbers - Class T fuses

Rated current, A	300 V fuses		600 V fuses		Weight each, g	Packing size
	Catalogue numbers	JJN - fast acting	Catalogue numbers	JJS - fast acting		
1	CBJJN-1	6	10	CBJJS-1	15	10
2	CBJJN-2	6	10	CBJJS-2	15	10
3	CBJJN-3	6	10	CBJJS-3	15	10
6	CBJJN-6	6	10	CBJJS-6	15	10
10	CBJJN-10	6	10	CBJJS-10	15	10
15	CBJJN-15	6	10	CBJJS-15	15	10
20	CBJJN-20	6	10	CBJJS-20	15	10
25	CBJJN-25	6	10	CBJJS-25	15	10
30	CBJJN-30	6	10	CBJJS-30	15	10
35	CBJJN-35	11	10	CBJJS-35	37	10
40	CBJJN-40	11	10	CBJJS-40	37	10
45	CBJJN-45	11	10	CBJJS-45	37	10
50	CBJJN-50	11	10	CBJJS-50	37	10
60	CBJJN-60	11	10	CBJJS-60	37	10
70	CBJJN-70	33	5	CBJJS-70	46	5
80	CBJJN-80	33	5	CBJJS-80	46	5
90	CBJJN-90	33	5	CBJJS-90	46	5
100	CBJJN-100	33	5	CBJJS-100	46	5
110	CBJJN-110	63	1	CBJJS-110	87	1
125	CBJJN-125	63	1	CBJJS-125	87	1
150	CBJJN-150	63	1	CBJJS-150	87	1
175	CBJJN-175	63	1	CBJJS-175	87	1
200	CBJJN-200	63	1	CBJJS-200	87	1
225	CBJJN-225	113	1	CBJJS-225	87	1
250	CBJJN-250	113	1	CBJJS-250	208	1
300	CBJJN-300	113	1	CBJJS-300	208	1
350	CBJJN-350	113	1	CBJJS-350	208	1
400	CBJJN-400	113	1	CBJJS-400	208	1
450	CBJJN-450	200	1	CBJJS-450	385	1
500	CBJJN-500	200	1	CBJJS-500	385	1
600	CBJJN-600	200	1	CBJJS-600	385	1

Dimensions - Class T fuses, mm



Fuse covers for 600 V class T fuses - 30 A

Technical data



Material	Thermoplastic, flammability rating according to UL 94V2
Rated voltage	600 V
Indication	Version with lamp indication, neon lamp, for fuse trip indication, 90-600 VAC/115-600 VDC
Approvals	UL listed guide JDVS file E58836, CSA certified Class 6225-01, file LR47235
Certificate	CE

Catalogue numbers - Fuse covers for 600 V class T fuses - mounted on the fuse

Description	Catalogue number Fuse cover	Fuse cover with lamp indication	Weight each, g	Packing size
Fuse cover for one fuse, 600 V, 1-30 A	CBSAMI-9N	CBSAMI-9I	60	3

Class T fuseholders

Technical data

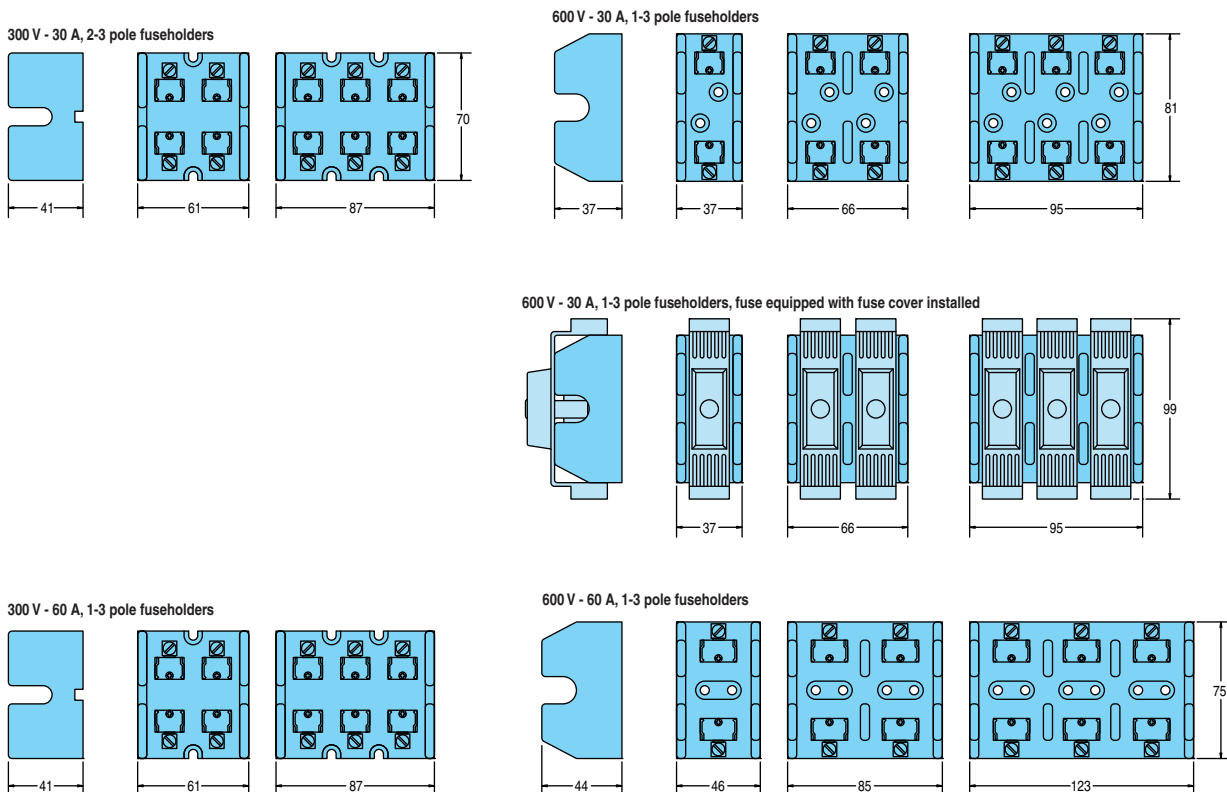


Material	Thermoplastic, flammability rating according to UL 94V0
Rated voltage	300/600 V
Rated current	30-600 A, short circuit current rating (SCCR) 200 kA
Standards	UL 4248, CSA 22.2 No 4248
Approvals	UL listed guide IZLT file E14853, CSA class 6225-01 file 47235
Certificate	CE

Catalogue numbers - Class T fuseholders, panel mount

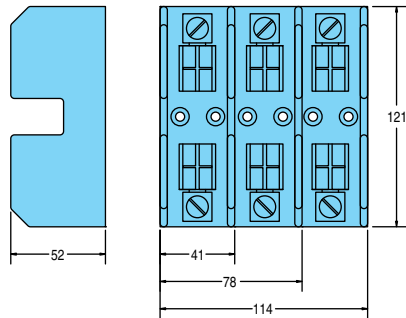
Fuse size	Rated current, A	Terminal type	Wire range AWG/kcmil	Catalogue numbers			Weight g/pole	Packing size
				1 pole	2 pole	3 pole		
Fuseholders for 300 V fuses - ingress protection IP 00								
0,1-30 A	30	Box terminal	14-6		CBT30030-2CR	CBT30030-3CR	75	1
35-60 A	60	Box terminal	14-2		CBT30060-2CR	CBT30060-3CR	75	1
70-100 A	100	Box terminal	8-1/0	CBT30100-1CR	CBT30100-2CR	CBT30100-3CR	322	1
110-200 A	200	Box terminal	6-250	CBT30200-1CR		CBT30200-3CR	454	1
225-400 A	400	Box terminal	2/0-600	CBT30400-1CR			545	1
450-600 A	600	Box terminal	2x4/0-600	CBT30600-1CR			1200	1
Fuseholders for 600 V fuses - ingress protection IP 00								
0,1-30 A	30	Box terminal	14-2	CBT60060-1CR	CBT60030-2CR	CBT60030-3CR	91	1
35-60 A	60	Box terminal	14-2	CBT60060-1CR	CBT60060-2CR	CBT60060-3CR	141	1
70-100 A	100	Box terminal	14-2/0	CBT60100-1C	CBT60100-2C	CBT60100-3C	322	1
110-200 A	200	Box terminal	6-250	CBT60200-1C			454	1
225-400 A	400	Box terminal	2/0-600	CBT60400-1C			545	1
450-600 A	600	Box terminal	2x4/0-600	CBT60600-1C			1200	1

Dimensions - Class T fuseholders, mm

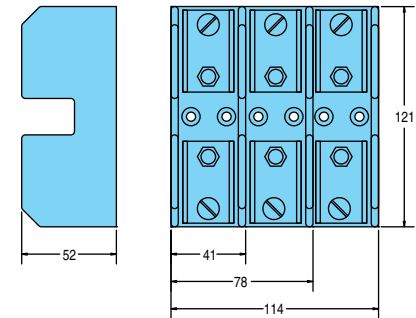


Dimensions - Class T fuseholders, mm

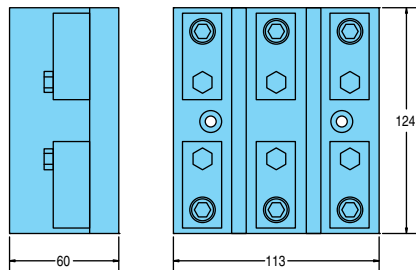
300 V - 100 A, 1-3 pole fuseholders



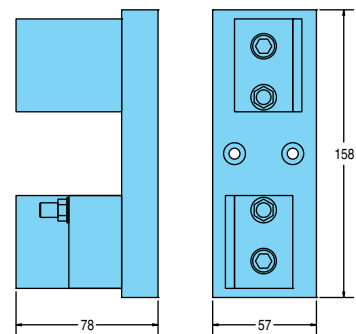
600 V - 100 A, 1-3 pole fuseholders



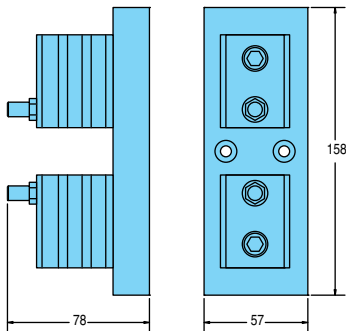
300 V - 200 A, 3 pole fuseholder



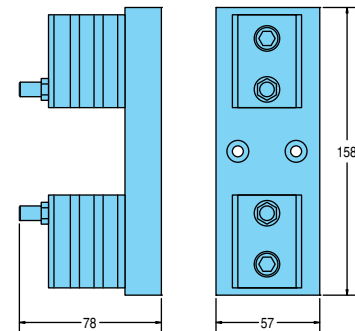
300/600 V - 200 A, 1 pole fuseholder



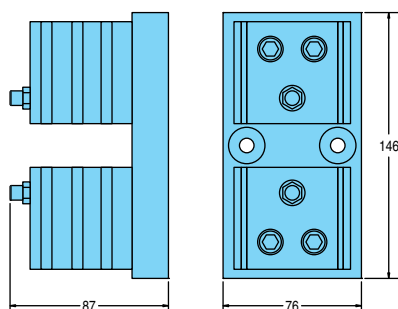
300 V - 400 A, 1 pole fuseholder



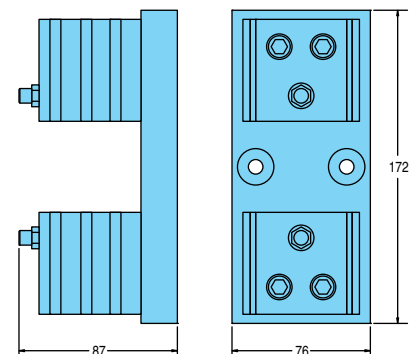
600 V - 400 A, 1 pole fuseholder



300 V - 600 A, 1 pole fuseholder



600 V - 600 A, 1 pole fuseholder



Class G fuses - 0,5-60 A, time delay/fast acting

Technical data



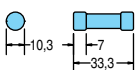
Applications	Branch circuit protection according to NEC 240, motor protection according to NEC 430 current limiting
Material	Glass fibre body, nickel plated brass ferrules
Design	Single element
Rated voltage	0,5-20 A: 600 VAC/170 VDC, others 480 VAC, 20 and 60 A: 300 VDC
Breaking capacity	480/600 VAC: 100 kA, 170/300 VDC: 10 kA
Standards	UL 248-5, CSA 22.2 No. 248.5
Approvals	UL listed guide JDDZ, file E4273, CSA class 1422-01 file 53787
Certificate	CE
Fuseholders	See page 29

Catalogue numbers - Class G fuses

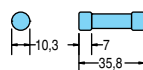
Rated current, A	Catalogue numbers Fast acting	Catalogue numbers Time delay	Weight each, g	Packing size
0,5	CBSC-1-2		5	10
1	CBSC-1		5	10
1,5	CBSC-1-1-2		5	10
2	CBSC-2		5	10
2,5	CBSC-2-1-2		5	10
3	CBSC-3		5	10
4	CBSC-4		5	10
5	CBSC-5		5	10
6	CBSC-6		5	10
7		CBSC-7	5	10
8		CBSC-8	5	10
9		CBSC-9	5	10
10		CBSC-10	5	10
12		CBSC-12	5	10
15		CBSC-15	5	10
20		CBSC-20	8	10
25		CBSC-25	12	10
30		CBSC-30	12	10
35		CBSC-35	17	10
40		CBSC-40	17	10
45		CBSC-45	17	10
50		CBSC-50	17	10
60		CBSC-60	17	10

Dimensions - Class G fuses, mm

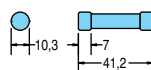
0,5-15 A



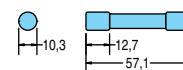
20 A



25-30 A



35-60 A



Class G fuseholders

Technical data



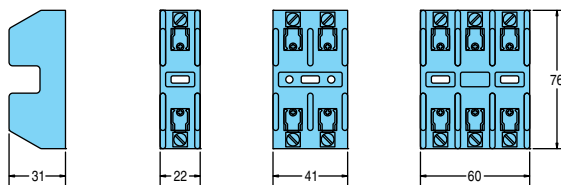
Material	Thermoplastic, flammability rating according to UL 94V0
Rated voltage	0,5-20 A: 600 V, 25-60 A: 480 V
Rated current	30/60 A, short circuit current rating (SCCR) 100 kA
Standards	UL 512, CSA 22.2 No 39
Approvals	0,5-30 A: UR guide IZLT2 file E14853, 35-60 A: UL listed guide IZLT file E14853 CSA class 6225-01 file 47235
Certificate	CE

Catalogue numbers - Class G fuseholders, panel mount see note 3

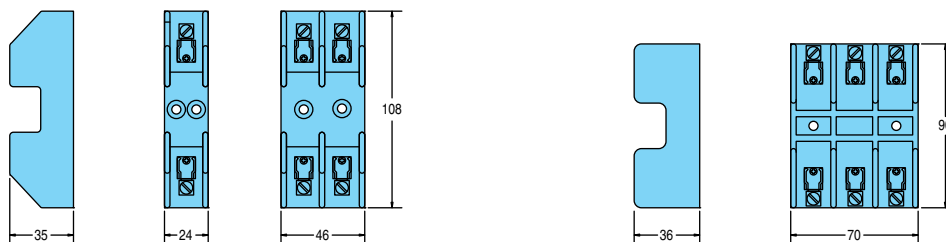
Fuse size	Rated current, A	Terminal type	Wire range AWG/kcmil	Catalogue numbers			Weight g/pole	Packing size
				1 pole	2 pole	3 pole		
0,5-15 A	20	Box terminal	14-6	CBBG3011B	CBBG3012B	CBBG3013B	35	10/8/6
20 A	20	Box terminal	14-6	CBBG3021B	CBBG3022B	CBBG3023B	35	10/8/6
25-30 A	30	Box terminal	14-6	CBBG3031B	CBBG3032B	CBBG3033B	35	10/8/6
35-60 A	60	Box terminal	14-2	CBG30060-1CR	CBG30060-2CR	CBG30060-3CR	91	1

Dimensions - Class G fuseholders, mm

600 V - 0,1-20 A, 1-3 pole fuseholders



480 V - 35-60 A, 1-3 pole fuseholders



Note

3 Packing size, first value applies for 1 pole fuseholders, second value for 2 pole fuseholders, third value for 3 pole fuseholders.

Fuse reducers, neutral links, neutral blades

Technical data



Material	Copper
Rated current	250/600 V
Standard	UL 248
Approval	Fuse reducers class RK1/RK5/H/K5: UL listed file 12853
Certificate	CE

Catalogue numbers - Fuse reducers for class RK1/RK5/J fuses see note 4

Description	Catalogue numbers - kit for one fuse			Weight each, g	Packing size
	Class RK1/RK5 250 V	Class RK1/RK5 600 V	Class J 600 V		
For installation of 1-30 A fuse in 60 A fuseholder	CBNO263-R	CBNO663-R	CBJ-63	40	1
For installation of 1-30 A fuse in 100 A fuseholder	CBNO213-R	CBNO613-R	CBJ-13	50	1
For installation of 35-60 A fuse in 100 A fuseholder	CBNO216-R	CBNO616-R	CBJ-16	50	1
For installation of 35-60 A fuse in 200 A fuseholder	CBNO226-R	CBNO626-R	CBJ-26***	70	1
For installation of 70-100 A fuse in 200 A fuseholder	CBNO2621-R*	CBNO2621-R	CBJ-21***	65	1
For installation of 70-100 A fuse in 400 A fuseholder	CBNO2641-R	CBNO2641-R	CBJ-41***	80	1
For installation of 70-100 A fuse in 600 A fuseholder	CBNO2661-R	CBNO2661-R		150	1
For installation of 110-200 A fuse in 400 A fuseholder	CBNO242-R	CBNO642-R	CBJ-42***	75	1
For installation of 110-200 A fuse in 600 A fuseholder	CBNO2662-R	CBNO2662-R	CBJ-62***	150	1
For installation of 225-400 A fuse in 600 A fuseholder	CBNO2664-R**	CBNO2664-R**	CBJ-64***	150	1

Catalogue numbers - Fuse reducers for class H/K5 fuses

Description	Catalogue numbers - kit for one fuse		Weight each, g	Packing size
	250 V	600 V		
For installation of 1-30 A fuse in 60 A fuseholder	CBNO263	CBNO663	40	1
For installation of 1-30 A fuse in 100 A fuseholder	CBNO213	CBNO613	50	1
For installation of 35-60 A fuse in 100 A fuseholder	CBNO216	CBNO616	50	1
For installation of 35-60 A fuse in 200 A fuseholder	CBNO226	CBNO626	70	1
For installation of 70-100 A fuse in 200 A fuseholder	CBNO2621	CBNO2621	65	1
For installation of 70-100 A fuse in 400 A fuseholder	CBNO2641	CBNO2641	80	1
For installation of 110-200 A fuse in 400 A fuseholder	CBNO242	CBNO642	75	1

Catalogue numbers - neutral links, neutral blades

Description	Catalogue numbers		Weight each, g	Packing size
	250 V	600 V		
Neutral link 30 A, Midget fuses 10,3x38,1 mm		CBNB	12	10
Neutral link 30 A, class CC		CBNB-R	12	10
Neutral link 30 A, class R/H/K5	CBNTN-R-30	CBNTS-R-30	60	10
Neutral link 60 A, class R/H/K5	CBNTN-R-60	CBNTS-R-60	80	10
Neutral blade 100 A, class R/H/K5	CBNTN-R-100	CBNTS-R-100	100	10
Neutral blade 200 A, class R/H/K5	CBNTN-R-200	CBNTS-R-200	315	10
Neutral blade 400 A, class R/H/K5	CBNTN-R-400	CBNTS-R-400	650	10
Neutral blade 600 A, class R/H/K5	CBNTN-R-600	CBNTS-R-600	950	10

Note

4 * Fuse reducer CBNO2621-R cannot be used with CBLPN-RK70SP to CBLPN-RK100SP fuses.

** The kit consists of one reducer, a pair is not required.

*** Not to be used in bolt-on applications, only to be used when the fuse is installed in a fuseholder.

Fuse technology - fuses according to North American standards

Deliveries to North America require compliance with National Electrical Code (NEC) and Canadian Electrical Code (CEC) and/or equivalent local legislation. Fuse standard in North America differs considerably from the fuse types that are commonly used in Europe, the dimensions and characteristics differ considerably. Cooper Bussmann offers a complete range of fuses and accessories according to North American standards.

Fuse construction

North American fuses differ from corresponding European types in several respects.

- The fuse body is normally manufactured of glass fibre/melamine, not of ceramic, which is most common for European fuses.
- The fuse element design is partly different, there are two main designs, "Single Element" fuses and "Dual Element" fuses.
- Dimensions and shape differ.
- Standard current ratings differ.

Single Element fuses

A similar design compared to European fuses, one or more fuse elements (the name single element is partially misleading, it is based on that the fuse has one element in series) is provided with a number of restrictions - shape, size and location determine the fuse characteristics. The element is also provided with a metal restriction with lower melting point - the M-effect and therefore protects both overload and short circuit conditions. The short circuit/overload increases the temperature and the fuse element is melting - the circuit is interrupted, see Figure 1. This type of fuses is normally fast acting.

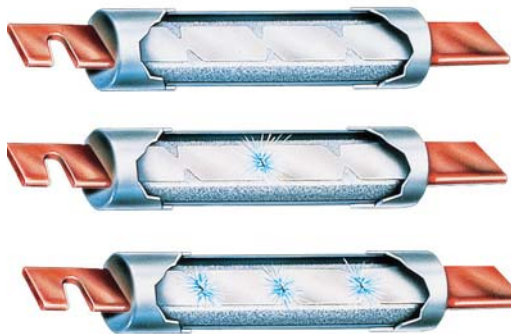


Fig 1. Single element fuse. Top illustration shows a cutaway view of the fuse, middle illustration shows the fuse during overload conditions, bottom illustration shows the fuse during short circuit conditions.

Dual Element, Time Delay Fuses

A dual element fuse has separate series connected elements protecting for overload respectively short circuit conditions. The short circuit protection element has a similar design as for single element fuses but the M-effect melting point is missing. The overload protection element is spring loaded and fixed to the short circuit element by a special calibrated melting alloy. The melting alloy fractures during overload condition, the spring is released and separates the overload protection element from the short circuit protection element, the circuit is interrupted. A dual element fuse works at the same way as a single element fuse during short circuit condition, see figure 2. Dual element fuses are time delay fuses.

Dual element fuse design is more sophisticated compared to traditional fuse designs and offers several benefits.

- Higher degree of time delay in the overload current range, can be sized closer to the operating current.
- More exact time/current characteristic, less sensitive to aging.
- Lower power losses.

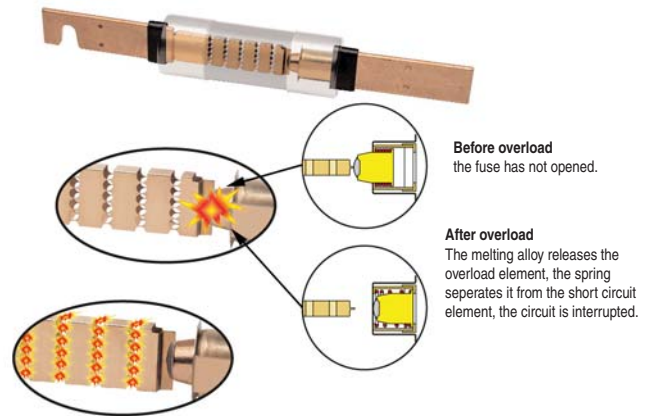


Fig 2. Dual element fuse. Top illustration shows the element design - the real fuse has no transparent body and is sand filled. Middle illustration shows the fuse during overload condition, bottom illustration shows the fuse during short circuit condition.

UL 248 and CSA C22.2 No 248 - Low Voltage Fuses

UL 248 and CSA C22.2 No. 248 is the main standard for low voltage fuses in North America. The standard is to a big extent based on the requirements of the National Electrical Code (NEC) and Canadian Electrical Code (CEC). The fuses are divided into different classes, each class has usually two voltage levels 600/250 or 600/300 VAC. The physical dimensions differ between the classes and the respective voltage level - all to prevent wrong type of fuse to be installed in the circuit. Also time/current characteristics are partly different between the classes.

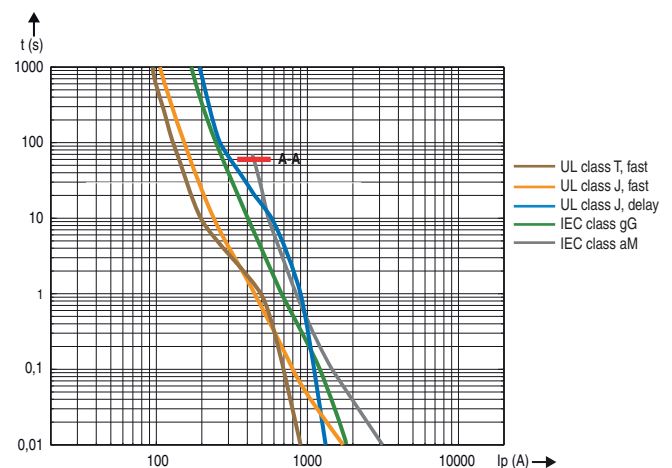


Fig 3. Time/current characteristics for 100 A fuses, from left UL class T fast acting, UL class J fast acting, IEC class gG, UL class J time delay and IEC class aM. IEC class aM is a partial range protection fuse and will not protect for faults above A-A line.

Overcurrent Protective Device (OCPD) according to NEC

NEC defines different types of overcurrent protective devices - OCPD.

- Branch circuit OCPD - general use according to NEC.
- Application limited - the device is suitable for specific branch circuit applications under limited conditions, specified in NEC. Examples are high speed fuses and motor protection products.
- Supplementary protective device - limited use according to NEC, for example to protect a certain device. A supplementary protective device can never replace a branch circuit OCPD.

Branch circuit OCPD

Fuses class J, CF, RK1, RK5, T, CC, L, G, K and H5 are UL listed according to UL 248 and suitable for general use. The fuses are available as fast acting and as time delay. Class K and H5 are older types, have lower breaking capacity, 10 kA, and are not recommended for new design, not approved for use in industrial machinery according to NFPA 79. Branch circuit OCPD can be used to protect mains, feeders and branch circuits.

Class CC fuses are available in current ratings up to 30 A, class G up to 60 A, class CF up to 100 A, class J/RK1/RK5 up to 600 A while class T fuses are available in current ratings up to 1200/800 A. Class L fuses are normally used as main fuses for currents above 600 A and are available in current ratings up to 6000 A. Contact CHS Controls for information about class L fuses.



Fig 5. Left side fuse is rejection type class CC, right side fuse is a Midget fuse. The dimensions are the same for both types, 10,3x38,1 mm. One of the contact ferrules on the class CC fuse is equipped with a rejection key, in this case a tap. The design prevents installation of a Midget fuse in a fuseholder intended for class CC fuses.

Standard current ratings

NEC 240.6 defines the following standard current ratings for fuses: 1, 3, 6, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1600, 2000, 2500, 3000, 4000, 5000 and 6000 A. Fuses with other rated currents are also permitted.

Current limiting

All modern fuses are more or less current limiting. Some fuse types are specifically marked "current limiting". These fuses satisfy certain requirements in UL 248 regarding energy let through (I^2t) and peak current. Fuses class J, CF, CC, T, L, RK1, RK5 and G are marked "Current limiting" while fuses class H and K5 are not considered to be current limiting.

Current limiting fuses class J, CF, G and T have specific dimensions and cannot be installed in a fuseholder not designed for respectively fuse type.

A current limiting class CC fuse has the same dimensions as many Midget fuses. To prevent installation of incorrect fuse, one of the ferrules is keyed - rejected type, see figure 5. It is not possible to install a Midget fuse in a class CC fuseholder. However it is possible to upgrade the protection by installing a class CC fuse in a fuseholder designed for 10,3x38,1 mm Midget fuses.

The same applies for current limiting class RK1/RK5 fuses versus class H/K5 fuses, same dimensions but class RK1/RK5 has keyed ferrule/contact blade - rejected type.

Discrimination

Discrimination in a distribution system means that fuses installed in series are coordinated in a way that only the fuse immediately upstream the fault trips. The condition for discrimination is that clearing time (melting+arcing time) of the smaller fuse is shorter compared to the melting time of the larger fuse further upstream.

Table 1 shows discrimination ratio between Cooper Bussmann fuses for 480/600 V applications. The ratio 2:1, like for LPJ-SP, means that upstream fuse must be 2 times larger compared to the downstream fuse. Contact CHS Controls for discrimination ratios for other types of fuses.

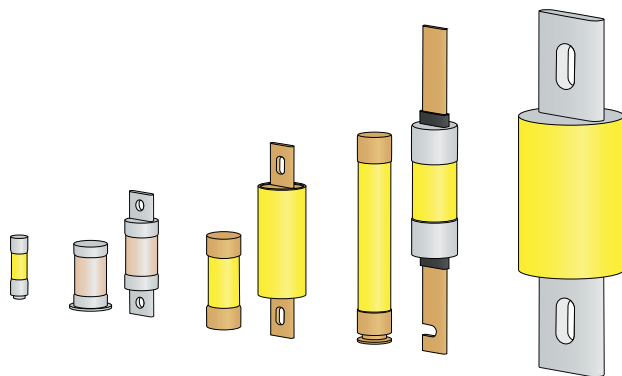


Fig 4. Current limiting fuses approved for Branch Circuit Protection. From the left class CC, class T, class J, class RK1 and class L.

Application limited OCPD

This type of fuses is generally not approved for branch circuit protection, but permitted for some specific applications. One example is that high speed fuses are permitted for short circuit protection in motor circuits using electronic starters (softstarters, adjustable frequency drives), see NEC 430.52(C)(5).

Supplementary protective device

Midget fuses are intended for supplementary protection. This type of fuse has limited use in accordance with NEC 240.10. Supplementary protective device can only be used as additional protection on the load side of a branch circuit OCPD. Midget fuses can be used for example to protect the individual luminaries, on the secondary side of a control circuit transformer and to give additional protection for sensitive equipment type PLC.

Note, Midget fuses can never replace a branch circuit OCPD.

Table 1, Discrimination ratio guide

Downstream fuse class/fuse type	Upstream fuse, class/fuse type					
	J LPJ-SP	CF TCF	RK1 LPS-RK	RK5 FRS-R	T JJS	CC LP-CC
Class J/LPJ-SP	2:1	2:1	2:1	1,5:1	3:1	
Class RK1/LPS-RK	2:1	2:1	2:1	1,5:1	3:1	
Class RK5/FRS-R	8:1	8:1	8:1	2:1	8:1	
Class CF/TCF	2:1	2:1	2:1	1,5:1	3:1	
Class T/JJS	3:1	3:1	3:1	1,5:1	3:1	
Class CC/LP-CC	2:1	2:1	2:1	2:1		2:1

Short Circuit Current Rating, SCCR

Assembly short-circuit current rating (SCCR) is required for industrial control panels. The requirement is included in UL 508A and was clarified in NEC 2008.

The assembly short circuit current rating should not be confused with the breaking capacity of the overcurrent protective device - the fuse. The breaking capacity is the maximum overcurrent the fuse can break during applicable standard test conditions. The short circuit current rating is the max overcurrent the complete assembly can withstand without damage. The assembly short-circuit current rating is dependent on all installed components. Generally, the short circuit current rating for the assembly cannot be higher than that of the device with the lowest breaking capacity/short circuit current rating.

Modern fuses like class J/CC/CF/RK1/T are very current limiting and also have high breaking capacity 200/300 kA at 600 VAC according to UL. The levels are significantly higher compared to most circuit breakers/minature circuit breakers.

Most manufacturers have combination ratings for contactors, overload relays and short circuit protective devices - circuit breakers/fuses. Short circuit current rating for combinations with current limiting fuses, class CC/J/CF/RK1 usually gives a short circuit current rating of 100 kA at 600 VAC. Contact CHS Controls for more information.

Fuses for cable protection - sizing

NEC Article 240.4 states that overcurrent protective device - the fuse should be sized so that the rated current is not higher than the current carrying capacity of the conductor. Next higher standard current rating can be used up to a maximum of 800 A during specific conditions specified in NEC 240.4 (B).

Small conductors

Minimum conductor size for power circuits is normally AWG 14 (2,1 mm²). Smaller conductors, AWG 16 (1,3 mm²) and AWG 18 (0,81 mm²) can be used for some specific applications, see NEC 240.4(D) to 240.4(E). The overcurrent protective device - the fuse is sized as follows

- AWG 18: 7 A, continuous load not exceeding 5,6 A, approved fuses are class CC, J or T.
- AWG 16: 10 A, continuous load not exceeding 8 A, approved fuses are class CC, J or T.
- AWG 14: copper conductor 15 A.
- AWG 12: copper conductor 20 A, aluminium conductor 15 A.
- AWG 10: copper conductor 30 A, aluminium conductor 25 A.

Fuses for motor protection - sizing

Both overload and short circuit protection shall be provided for motor circuits. NEC Article 430.52 and 430.53 covers motor protection, including sizing of fuses.



Fig 6. Cooper Bussmann Optima off-load fuse disconnecter with class CC type LP-CC fuses installed offers reliable protection for both motors and starters in a compact design.

Motor protection

Time delay fuses are most commonly used for motor circuit short circuit protection. Traditionally, class RK5/RK1 have been most commonly used but class CC and J gain in popularity since they are considerably smaller, the equipment will be more compact.

NEC Table 430.52 specifies a maximum fuse size. For standard three-phase motors protected by time delay fuses, maximum fuse size is 175% of motor full load current. For heavy starts, the fuse size can be increased to max 225% of the motor full load current. Note, time delay class CC fuses can be sized up to 300% of full load current, 400% for heavy starts.

Some types, for example class RK1/RK5/J can be sized so close to the motor full load current that they also provide overload protection, a separate overload relay is not required. The method is approved but not common, in most cases the fuses are sized only to provide short circuit protection.

Time delay fuses, only intended to provide short circuit protection, are normally sized to 125-130% of the full load current for normal starting conditions. Table 2 and 3 on page 34 shows recommended fuse size for three phase motors, 460 respectively 575 VAC. The fuses are only intended for short circuit protection, the values are based on the assumption that separate overload protection is provided. Recommended fuse size is lower compared to max permitted values according to NEC table 430.52 and are based on normal starting conditions. A larger fuse may be required for heavy starts.

Starter protection

Also starters may already at a moderate short circuit be seriously damaged. Overload relays is especially sensitive, check the rating plate regarding max fuse size.

IEC 60947-4-1 has for a long time differed between Type 1 and Type 2 coordination, this difference is now also introduced in UL 508E. For Type 1 coordination shall the fuse protect against injury and equipment damage, but the starter may have to be replaced. For Type 2 coordination no damage is allowed on the starter, light contact welding is allowed. In most cases, class CC/J/CF/RK1 provide sufficient current limiting to achieve Type 2 coordination. Cooper Bussmann have performed coordination tests, to verify Type 2 coordination compliance with several manufacturer's starters, including Eaton Cutler-Hammer, General Electric, Rockwell Automation/Allen-Bradley, Schneider Electric/Square D and Siemens. Contact CHS Controls for fuse sizing.

Table 2, Recommended fuse size for protection of 480 V three phase motors - short circuit protection

Motor data, NEC table 430.250			Recommended rated current - time delay fuses, A					Max rated current, A, NEC 430.52(C)(1)			
Rated power	Full load	Full load current, A	Class CC	Class J	Class CF	Class RK1	Class RK5	Generic start		Heavy start	
Hp	kW		LP-CC	LPJ-SP	TCF	LPS-RK	FRS-R	Class CC	Other	Class CC	Other
0,5	0,37	1,1	2,25	1,8	3	1,5	1,4	6	3	6	3
0,75	0,55	1,6	3,2	2,5	3	2,25	2	6,25	3	3,5	6,25
1	0,75	2,1	4,5	3,2	6	2,8	2,8	10	6	10	6
1,5	1,1	3	6	4,5	6	4	4	10	6	12	6
2	1,5	3,4	7	5,6	6	4,5	4,5	10	6	10	6
3	2,2	4,8	10	8	10	6,25	6	15	10	15	10
5	4	7,6	25	12	15	10	10	25	15	30	15
7,5	5,5	11		17,5	17,5	15	15		20		20
10	7,5	14		25	25	20	17,5		25		30
15	11	21		35	35	30	30		40		45
20	15	27		45	40	40	35		50		60
25	18,5	34		60	60	45	45		60		70
30	22,5	40		60	60	60	50		70		90
40	30	52		80	80	70	70		100		110
50	37	65		100	100	90	90		125		125
60	45	77		125		110	100		150		150
75	55	96		150		125	125		175		200
100	75	124		200		175	175		225		250
125	90	156		250		225	200		300		350
150	110	180		300		250	225		350		400
200	150	240		400		350	300		450		500
250	185	302		500		400	400		600		
300	225	361		600		500	500		600		

Table 3, Recommended fuse size for protection of 575 V three phase motors - short circuit protection

0,5	0,37	0,9	1,8	1,8	3	1,25	1,125	3	3	3,5	3
0,75	0,55	1,3	2,8	2,5	3	1,8	1,8	6	3	6	3
1	0,75	1,7	3,5	3,2	3	2,25	2,25	6	3	6,25	3,5
1,5	1,1	2,4	5	4,5	6	3,2	3	10	6	10	6
2	1,5	2,7	5,6	5,6	6	4	3,5	10	6	10	6
3	2,2	3,9	8	8	6	5,6	5	15	10	15	10
5	4	6,1	15	12	10	8	8	20	15	20	15
7,5	5,5	9	30	17,5	15	12	12	30	20	30	20
10	7,5	11		17,5	17,5	15	15		20		20
15	11	17		30	30	25	25		30		35
20	15	22		35	35	30	30		40		45
25	18,5	27		45	45	40	35		50		60
30	22,5	32		50	50	45	40		60		70
40	30	41		70	70	60	60		80		90
50	37	52		80	80	70	70		100		110
60	45	62		100		90	80		110		110
75	55	77		125		110	100		150		150
100	75	99		150		150	125		175		175
125	90	125		200		175	175		225		225
150	110	144		225		200	200		300		300
200	150	192		300		250	250		350		350
250	185	242		400		350	350		450		450
300	225	289		450		400	400		600		600

Electronic starters

Adjustable frequency drives and softstarters may have special requirements on fuses, check with the manufacturer. High speed class J fuses may be an alternative, contact CHS Controls for more information.

Several motors using the same short circuit protective device

NEC 450.53 permits that several motors can be connected to the same short circuit protective device under certain conditions, contact CHS Controls for more information.

Fuses for transformer protection - sizing

NEC Article 450 deals with transformers, including the sizing of over current protection. In practice, compliance with other parts of NEC is also required, such as NEC 240, conductor protection.

Three phase transformer protection

Max fuse size for 600 V three phase transformers and below are covered by NEC table 450.3(B). Normally time delay fuses class RK1/RK5/J are used.

Table 4, Three phase transformer protection, NEC 450.3(B), % of full load current

Full load curr., A	Max size primary fuse	Max size secondary fuse
Primary fuse only		
9 A or higher	125% or next higher standard current rating	
2 - 9 A	167%	
< 2 A	300%	
Primary and secondary fuses		
9 A or higher	250%	125% or next standard rating
< 9 A	250%	167%

Single phase control power transformer protection

Control circuit transformers that are part of a motor control circuit, the transformer is connected at the load side motor circuit short circuit protective device can be sized according to NEC 430.72(C). Main difference compared to NEC 450.3(B) is that the primary fuses that protect the transformers with full load current less than 2 A can be sized up to 500% of full load current. NEC 430.72(C) allows Supplementary Protection under certain conditions. We always recommend that fuses approved for Branch Circuit Protection are used.

If the transformer is connected at the load side of the main switch, fuses should be approved for Branch Circuit Protection, such as time delay class CC, and sized in accordance with NEC 450.3(B). Secondary fuse can however be of Supplementary Protection type.



Fig 7. Eaton Cutler-Hammer control power transformer with built-on fuseholders. The transformer is protected by Cooper Bussmann fuses, primary by class CC type FNQ-R, and secondary by Midget Type FNM. Protective cover for fuses and terminals are available as accessories.

The transformer is normally protected by two primary fuses and one secondary fuse. Secondary fuse can however be of Supplementary Protection type. Several control power transformer manufacturers offer those with built-on fuseholder for Class CC fuses on the primary side and Midget fuse on the secondary side, see figure 7.

Due to the very high current inrush for smaller transformers, 25-40 times the full load current, it is recommended that the primary fuses can carry 40 times the full load current for 0,01 s. Secondary side full load current less than 9 A, the fuse is sized to max 167% of full load current. Secondary side full load current 9 A or more, the fuse is sized to 125% of full load current or next higher standard rating. Table 5 shows the recommended size for primary and secondary fuses per NEC 430.72(C) and 450.3(B).

Table 5, Control power transformer protection

Power VA	Primary fuse, time delay Type FNQ-R, rated current A			Sec. fuse, time delay Type FNM, current, A	
	240 VAC	480 VAC	600 VAC	24 VAC	120 VAC
Sizing according to NEC 430.72(C) - part of a motor circuit					
50	1	0,5	0,4	2,5	0,6
100	2	1	0,6	5	1,25
250	5	2,5	2	15	3
500	3,2	5	4	30	6
750	5	6,25	6,25		7
1000	6,25	3,2	8		10
2000	20	6,25	5		25
Sizing according to NEC 450.3(B) - general					
50	0,6	0,3	0,25	2,5	0,6
100	1,25	0,6	0,5	5	1,25
250	3	1,5	1,3	15	3
500	3,2	3	2,5	30	6
750	5	4,5	3,5		7
1000	6,25	3,2	5		10
2000	20	6,25	5		25

Fuses for capacitor protection - sizing

NEC Article 460 covers capacitors and requires that each capacitor shall be provided with individual overcurrent protection. NEC states that overcurrent protective device must be set as low as practicable. Normally time delay fuses class RK1/RK5/J/CC/CF are used and sized between 150-175% of the capacitor rated current.

For capacitors connected on the load side of a motor short circuit protective device, separate capacitor protection is not required but most often recommended, check with equipment manufacturer.

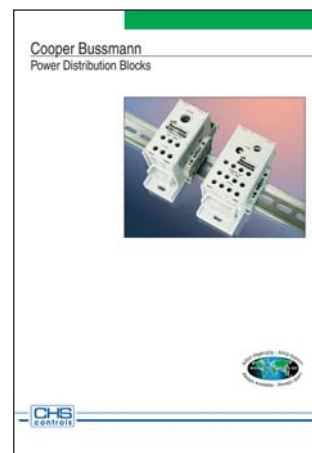
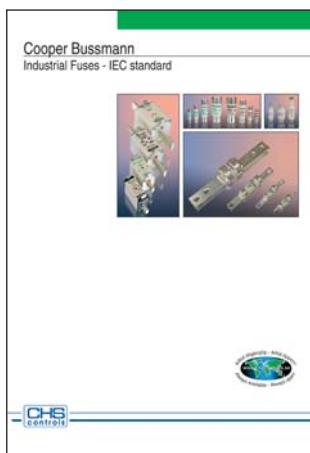
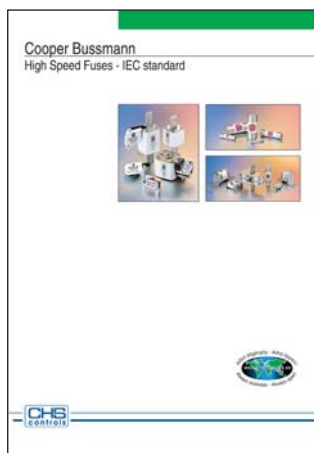
DC circuits

Compared to AC circuits, the absence of natural voltage zero in a DC circuit makes it more difficult for a fuse to interrupt the current at fault. It is especially notable in circuits with high time constant. Several fuse types are also approved for DC circuit protection, see technical data. Contact CHS Controls for application assistance.

Environmental factors

High ambient temperature, above 30°C, altitudes above 2000 m, cyclical loading, temporary overloads etc must be taken into consideration, contact CHS Controls for correction factors.

Other Cooper Bussmann products...



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