

NH (H.R.C) Fuses



NHC00-FB 6A...100A

NH00-FB 6A...160A NH0-FB NH1-FB 40A...250A NH3-FB 125A...630A

i i i

25A...160A

NHC2-FB 40A...250A NH4-FB 800A...1250A

NHC1-FB 25A...160A NH2-FB 63A...400A

NH Fuse Base



BMC NH00-FA BMC

NH0-FA

BMC NH1-FA BMC NH2-FA

BMC NH3-FA BMC NH4-FA



STEATIT NH00-FA STEATIT NH1-FA STEATIT NH3-FA

STEATIT STEATIT NH0-FA NH2-FA

Solid Link



NH00 NH1 NH2 NH3

J Type Fuses

HRC Fuse Base & Fuse Carrier



FJF82030 63A...200A FJF82038 250A...315A

FJF92040 300A...400A



Cylindirical Fuses



FCF10-38 2A ... 25A

FCF14-51 2A ... 50A

FCF22-58 10A ... 100A

IEC / EN 60269-1/ 2 C€

Mounting Position
Altitude

: Vertical : 2000m (max)

Relative Humidity : %50 (40°C), %90 (20°C)
Ambient Temperature : between -25°C and +60°C

All these given information are general. We have always right to change them. $\,$

Cylindirical Fuses Bases



FCFB 32A ... 100A

Fuse is a protective device and it breaks current when the wire inside melts and protects its circuit against over current risks. Federal NH fuse and fuse base are manufactured in accordance with **C**.

NH body is produced as steatite and glazed ceramic according to customer and specification expectations. Glaze is protecting the surface of ceramic products and is used mostly in the field of fuses and insulators. Both spraying and immersion technologies are used.

Federal NH fuses are manufactured of steatite material and capable of breaking short circuit currents up to 120 kArms. Federal Electric NH fuses with rated voltages up to.

500V AC rated currents up to 1250A protect several devices and facilities such as transformer, cable, switch panel against overloading and short circuit safely.

Current-time characteristics of fuses are seen in Figure-6. These curves indicate opening duration (t) of the fuse depending on the load current. As current increases, fuse's opening duration decreases. Federal NH fuse have delayed characteristics. They are resistant to progress currents of asynchronous motors. They provide good protection against short circuits and over currents and open the circuit without delay.

"gL/gG" mark means line protection and NH fuses in this class are especially used for protection of cables and conductors.

lo : Passing current

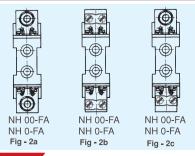
Ik(t): Expected short circuit current Ip: Peak value of short circuit current

ts : Melting duration

tl : Extinction duration

Fig - 1 Current and Voltage Changes Graphic at Breaking of Leakage Current by Fuse.

Order code	Size	Pertinax dimensions (mm) (mm)					
	0120	h x w					
8CB-A0000-0000	1	116 x 227					
8CB-A0000-0000	2	116 x 227					
8CB-A0000-0000	3	116 x 227					



As it can also be seen in the current-time curve, fuses operate at 1.6 times more of the nominal current and open the circuit within 5 seconds at a current of 5 x In. Melting wires used in NH fuses are manufactured in various types and forms depending on size of the fuse current. Same-sized cells (thin wires to melt) have been formed on melting wires. In case of overload and short circuit, melting partial arcs shall form at several points throughout the wire. Such a melting shall break the short circuit currents and temperature shall be dispersed throughout the whole fuse. Outer body of the fuses should be resistant to high pressure and temperature caused by broken current. Because, the fuse wire needs to melt in order to break the current; that is, it should form a heat energy on resistance of the fuse wire of the current to be broken. In case of melting temperature sized by the fuse wire is exceeded with this heat energy produced by the current to be broken during ts melting duration, current continues to flow through liquefied metal and metal steam. Current is in an arc form at this final stage of breaking operation (Figure-1). This arc causes increase in pressure and temperature in the fuse body during tl extinction duration. The fuse body needs to resist these two impacts. Damage to the fuse by heat amounts produced by these currents on the fuse resistance, where it is not certain whether fuse wire shall melt or not or where they shall flow for a long time even in case of melting, may be avoided by manufacturing the fuse body of materials resistant to high temperatures. Material used in Federal NH fuse is steatite material with high resistance to shock heats and dynamic forces. Contact knives of Federal fuses are made of special brass or copper material and coated with silver. Silver contacts with air and gets sulfured and dark in time. However, this is not important. Because, silver sulfur gets into conductive condition with the heat produced by the current passing through the circuit.

Quartz Sand:

Quartz sand, which has high purity and cleanness, no humidity and grain size of which is controlled strictly, is used as the extinction environment for the arc to be formed during current breaking operation. It is tried to have the sand, which is placed in the body via vibration, surround the current line completely and to reduce the air in the inner structure to the largest extent possible. Quartz sand, which gets a uniform structure via partial melting, helps both extinction of the arc and insulation of broken fuse wires by placing between broken fuse wires.

NH Fuse Base:

They are manufactured of steatite or

BMC materials, depending on the need, in five different sizes. Joints of base are manufactured as with connectors or bolts in 00 and 0 sizes, depending on customer request; and manufactured in a way to allow bolted connection in other sizes. Spring contacts of NH fuse base, which are made of electrolytic copper, are reinforced with special steel springs, as well as their own tightening and springiness features. Tightening power of the contacts is higher than other fuse base in the market; If the fuse base are assembled side by side, insulation among phases can be increased with Pertinax separators, which are provided as accessories upon request. While NH fuse are mounted to base, attention should be paid to secure the fuse knives on the base. Otherwise, poor contact resistance shall cause heat and power loss and accordingly failures. Another important issue is that conductors with sections in accordance with the standards should be connected to the NH base.

Three separate model connection types have been developed to easily connect busbars or cables to Federal 00 and 0 size NH base.

Two-side bolted: For cable shoe, thing, multi-wire cables or busbars (Figure-2a).

Two-side bridge connector: For single stranded cables (Figure-2b).

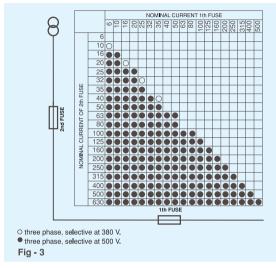
One-side bolted, other side bridge connector: For single stranded cables and busbars (Figure-2c).

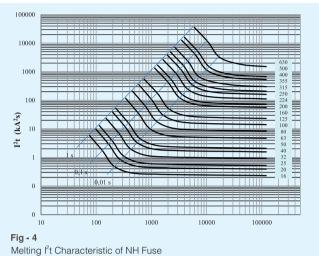
Steatit: It is used as NH fuse insulator in low voltage. It is a material resistant to high temperature. Steatit is a derivative of porcelain. With reflected of developing technology in quality of materials utilized in electrical industry, whereas normal porcelain materials are used in MV and LV bearers for insulating purposes; steatit materials are used in NH base, which has superior shock resistance and strength than porcelain materials.

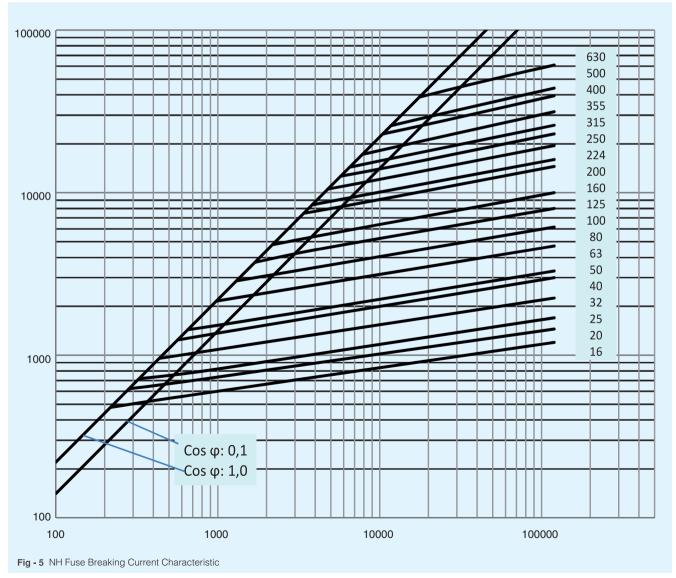
BMC (Bulk Molding Compound): It is a polyester molding material, which looks like dough and which is reinforced with long fiber, and it is a composite material capable of being adjusted by changing rates of additives. BMC is in thermoset plastics class and bears similar characteristics with bakelite and melamine. However, it has significant superiorities when considered in terms of process conditions as an end product. It is resistant to dynamic forces and thermal shocks.

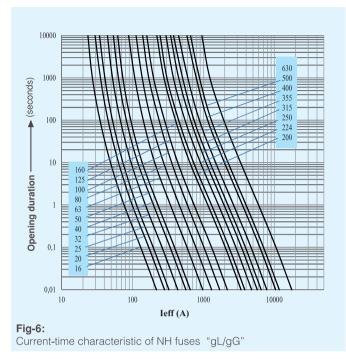
Selective protection (selectivity):

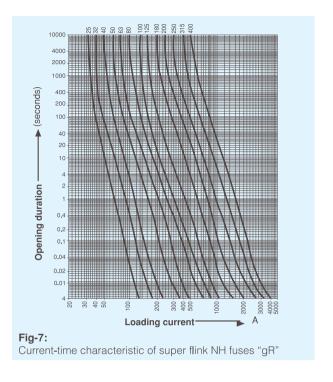
It is the method of design to ensure elimination of a failure (fault), which occurs at any point of the network, by the protection element on that faulty operating element and to allow other sections of the system to continue operation. NH fuse, which have a nominal current difference of 60% according to "gL/gG" operating class, should open the circuit selectively in high short circuit currents. NH fuses should be chosen according to the table in Figure-3 in order to ensure selectivity.











Super Flink NH Fuse:

These fuses are used in protection against over current and short circuits of AC and DC power circuits, where power electronic elements such as diode, thyristor are present. The most important feature discriminating super flink fuses from NH type fuses is the material type of the melting wire used inside the NH fuse. Pure silver material is used as the melting wire in super flink fuses. As it can be seen in current-time characteristic curves of super flink fuses, temperature increase is higher than protection devices with operating class "gL/gG" (Figure-7). In this way, sensitive protection is provided at rated current or values close to rated current via super flink fuses.

Operating characteristic : Super flink (fast)

Rated voltage : AC 500 V

Operating class : gR

Breaking capacity : 120 kA (rms)

Order Codes of Super Flink Fuses:

Туре	Size	Rated current	I ² T Total	I ² T Melting	Order code
NHG00-FB	00	25 A	300	80	9CB-BH000-0025
NHG00-FB	00	32 A	450	130	9CB-BH000-0032
NHG00-FB	00	40 A	1000	260	9CB-BH000-0040
NHG00-FB	00	50 A	1500	400	9CB-BH000-0050
NHG00-FB	00	63 A	2300	620	9CB-BH000-0063
NHG00-FB	00	80 A	3400	900	9CB-BH000-0080
NHG00-FB	00	100 A	5700	1500	9CB-BH000-0100
NHG00-FB	00	125 A	10000	2700	9CB-BH000-0125
NHG00-FB	00	160 A	21000	6000	9CB-BH000-0160
NHG1-FB	1	100 A	6100	1600	9CD-BH000-0100
NHG1-FB	1	125 A	10000	2400	9CD-BH000-0125
NHG1-FB	1	160 A	20000	5100	9CD-BH000-0160
NHG1-FB	1	200 A	30000	7800	9CD-BH000-0200
NHG1-FB	1	250 A	52000	14000	9CD-BH000-0250
NHG2-FB	2	200 A	30000	7800	9CE-BH000-0200
NHG2-FB	2	250 A	52000	14000	9CE-BH000-0250
NHG2-FB	2	315 A	82000	20000	9CE-BH000-0315
NHG2-FB	2	400 A	160000	40000	9CE-BH000-0400
NHG3-FB	3	315 A	80000	20000	9CF-BH000-0315
NHG3-FB	3	400 A	160000	40000	9CF-BH000-0400
NHG3-FB	3	500 A	270000	70000	9CF-BH000-0500
NHG3-FB	3	630 A	360000	90000	9CF-BH000-0630

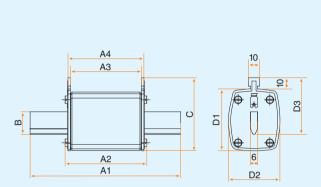
Temperature effect on NH fuses:

The thermal overload protection characteristics change with the effect of the temperature of NH fuses. Fuses are manufactured according to ambient temperature of 20 ° C. If it operates in a warmer environment, it will trip earlier than the nominal value. If it works in a cooler environment, it will open later.

The table below shows the operating currents for different ambient temperatures. The operating current at 50 $^\circ$ C of the 100A NH fuse is found on the table as 91A.

Calibration Temperature	Im (A)		Compensat	tion Factor Ad	ccording to A	mbient Temp	perature (k)	
(°C)	In (A)	10 °C	20 °C	30 °C	40 °C	50 °C	55 °C	60 °C
20	6	6,2	6,0	5,8	5,6	5,5	5,4	5,3
20	10	10,3	10,6	9,7	9,4	9,1	9,0	8,8
20	16	16,5	16,0	15,5	15,0	14,6	14,3	14,1
20	20	20,6	20,0	19,4	18,8	18,2	17,9	17,6
20	25	25,8	25,0	24,3	23,5	22,8	22,4	22,0
20	32	33,0	32,0	31,0	30,1	29,1	28,6	28,2
20	40	41,2	40,0	38,8	37,6	36,4	35,8	35,2
20	50	51,5	50,0	48,5	47,0	45,5	44,8	44,0
20	63	64,9	63,0	61,1	59,2	57,3	56,4	55,4
20	80	82,4	80,0	77,6	75,2	72,8	71,6	70,4
20	100	103,0	100,0	97,0	94,0	91,0	89,5	88,0
20	125	128,8	125,0	121,3	117,5	113,8	111,9	110,0
20	160	164,8	160,0	155,2	150,4	145,6	143,2	140,8
20	200	206,0	200,0	194,0	188,0	182,0	179,0	176,0
20	250	257,5	250,0	242,5	235,0	227,5	223,8	220,0
20	315	324,5	315,0	305,6	296,1	286,7	281,9	277,0
20	400	412,0	400,0	388,0	376,0	364,0	358,0	352,0
20	500	515,0	500,0	485,0	470,0	455,0	447,5	440,0
20	630	648,9	630,0	611,1	592,2	573,3	563,9	554,4

	Order code	Size	Rated Current (A)	Pcs Box	kg. Box
NH00-FB	9CB-BG☆00-0□□□	00	6 - 160	10	1.760
NHC00-FB	9CA-BG☆00-0□□□	000	6 - 100	10	1.305
NH0-FB	9CC-BG☆00-0□□□	0	25 - 160	5	1.225
NH1-FB	9CD-BG☆00-0□□□	1	40 - 250	3	1.300
NHC1-FB	9CI-BG☆00-0□□□	1/0	25 - 160	5	2.000
NH2-FB	9CE-BG☆00-0□□□	2	63 - 400	3	2.005
NHC2-FB	9CH-BG☆00-0□□□	2/1	40 - 250	3	1.440
NH3-FB	9CF-BG☆00-0□□□	3	125 - 630	1	0.980
NH4-FB	9CG-BG000-0	4	800-1250	1	1.992



Tuna				Dimer	nsions	s (mm)		
Туре	A 1	A2	А3	A 4	В	С	D1	D2	D3
NH00-FB	78,5	54	45	50	15	58	48	29,5	45
NHC00-FB	78,5	54	45	49	15	47	36	21	45
NH0-FB	125	71	62	68	15	58	48	29,5	45
NH1-FB	135	72,5	62	68	20	64	52	46	50
NHC1-FB	135	71	62	68	15	58	48	29,5	45
NH2-FB	150	73,5	62	68	25	70	60	59	58
NHC2-FB	150	72,5	62	68	20	64	52	46	50
NH3-FB	150	73,5	62	68	32	85,5	75	69,5	70
NH4-FB	200	84,5	61,5	76	50	113	103	86	84

^{□:} Ple ase enter amper value.
☆: 0 for unglazed nh, 1 for glazed nh.

Liual Indicator		_		_											
Dual Indicator	Order code	Size	Rated Current (A)	Pcs Box	kg. Box										
Ilejink)	9CB-BG☆10-0□□□	00	6 - 160	10	1.760										
NH00-FB															
NH0-FB	9CC-BG삵10-0□□□	0	25-160	5	1.225										
NH1-FB	9CD-BG☆10-0□□□	1	40-250	3	1.300	-		A4 A3	—			<u> </u>	(D3
NHC1-FB	9CI-BG☆10-0□□□	1/0	25-160	5	2.000			A2 A1			O	D1		6	
V 302- 3	9CE-BG☆10-0□□□	2	63-400	3	2.005										
11000										Dimer	neione	(mm)	1		
The state of the s						Туре		40		Dimer		• •		Do	Do
						Туре	A 1	A2	А3	Dimer A4	nsions B	(mm)	D1	D2	D3
Aleson's						Type NH00-FB	A1 78,5	A2 54				• •		D2 29,5	D3
NH2-FB						NH00-FB	78,5	54	A3 45	A4 50	B 15	C 58	D1 48	29,5	45
	9CH-BG☆10-0□□□	2/1	40-250	3	1.440	NH00-FB NHC00-FB	78,5 78,5	54 54	A3 45 45	A4 50 49	B 15 15	C 58 47	D1 48 36	29,5 21	45 45
	9CH-BG☆10-0□□□	2/1	40-250	3	1.440	NH00-FB NHC00-FB NH0-FB	78,5 78,5 125	54 54 71	A3 45 45 62	A4 50 49 68	B 15 15 15	C 58 47 58	D1 48 36 48	29,5 21 29,5	45 45 45
	9CH-BG☆10-0□□□	2/1	40-250	3	1.440	NH00-FB NHC00-FB	78,5 78,5	54 54	A3 45 45	A4 50 49	B 15 15	C 58 47	D1 48 36	29,5 21	45 45
NH2-FB	9CH-BG☆10-0□□□	2/1	40-250	3	1.440	NH00-FB NHC00-FB NH0-FB	78,5 78,5 125	54 54 71	A3 45 45 62	A4 50 49 68	B 15 15 15	C 58 47 58	D1 48 36 48	29,5 21 29,5	45 45 45
						NH00-FB NHC00-FB NH0-FB NH1-FB	78,5 78,5 125 135	54 54 71 72,5	A3 45 45 62 62	A4 50 49 68	B 15 15 15 20	58 47 58 64	D1 48 36 48 52	29,5 21 29,5 46	45 45 45 50
NH2-FB NHC2-FB	9CH-BG☆10-0□□□ 9CF-BG☆10-0□□□		40-250 125-630		0.980	NH00-FB NHC00-FB NH0-FB NH1-FB NHC1-FB	78,5 78,5 125 135 135	54 54 71 72,5 71	45 45 62 62 62	A45049686868	15 15 15 20 15	58 47 58 64 58	D1 48 36 48 52 48	29,5 21 29,5 46 29,5	45 45 45 50 45
NH2-FB NHC2-FB						NH00-FB NHC00-FB NH0-FB NH1-FB NHC1-FB NH2-FB	78,5 78,5 125 135 135 150	54 54 71 72,5 71 73,5 72,5	A345456262626262	A4504968686868	15 15 15 20 15 25	58 47 58 64 58 70	D1 48 36 48 52 48 60	29,5 21 29,5 46 29,5 59	45 45 45 50 45 58
NH2-FB						NH00-FB NHC00-FB NH0-FB NH1-FB NHC1-FB NH2-FB NHC2-FB	78,5 78,5 125 135 135 150	54 54 71 72,5 71 73,5 72,5	A345456262626262626262	68 68 68 68 68	B 15 15 15 20 15 25 20	58 47 58 64 58 70 64	D1 48 36 48 52 48 60 52	29,5 21 29,5 46 29,5 59 46	45 45 45 50 45 58 50
NH2-FB NHC2-FB						NH00-FB NHC00-FB NH0-FB NH1-FB NHC1-FB NH2-FB NHC2-FB NH3-FB	78,5 78,5 125 135 135 150 150	54 54 71 72,5 71 73,5 72,5 73,5	A345456262626262626262	68 68 68 68 68 68	B 15 15 15 20 15 25 20 32	58 47 58 64 58 70 64 85,5	D1 48 36 48 52 48 60 52 75	29,5 21 29,5 46 29,5 59 46 69,5	45 45 45 50 45 58 50 70
NH2-FB NHC2-FB						NH00-FB NHC00-FB NH0-FB NH1-FB NHC1-FB NH2-FB NHC2-FB NH3-FB	78,5 78,5 125 135 135 150 150	54 54 71 72,5 71 73,5 72,5 73,5	A345456262626262626262	68 68 68 68 68 68	B 15 15 15 20 15 25 20 32	58 47 58 64 58 70 64 85,5	D1 48 36 48 52 48 60 52 75	29,5 21 29,5 46 29,5 59 46 69,5	45 45 45 50 45 58 50 70
NH2-FB NHC2-FB				1		NH00-FB NHC00-FB NH0-FB NH1-FB NHC1-FB NH2-FB NHC2-FB NH3-FB	78,5 78,5 125 135 135 150 150	54 54 71 72,5 71 73,5 72,5 73,5	A345456262626262626262	68 68 68 68 68 68	B 15 15 15 20 15 25 20 32	58 47 58 64 58 70 64 85,5	D1 48 36 48 52 48 60 52 75	29,5 21 29,5 46 29,5 59 46 69,5	45 45 45 50 45 58 50 70

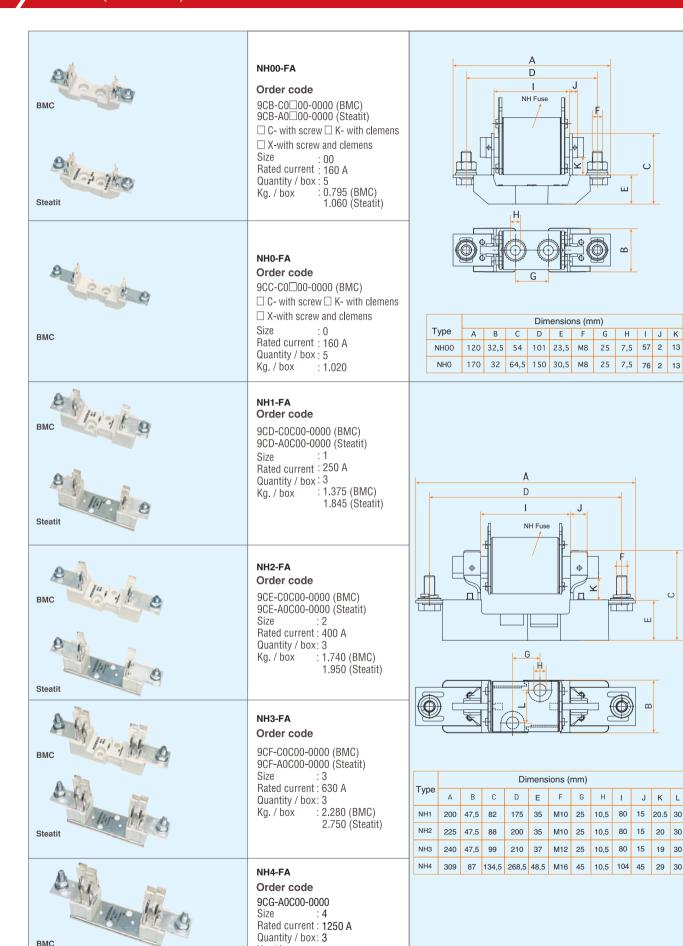
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SOLID LINK

Туре	NH00	NH1	NH2	NH3
Order Code	9SL-C0000-0000	9SL-C0000-0001	9SL-C0000-0002	9SL-C0000-0003

Note: Solid Link is used by NH Fuses for direct connection of contacts without fuse link. It's non-isolated type.

^{☆: 0} for unglazed nh, 1 for glazed nh.



Kg. / box

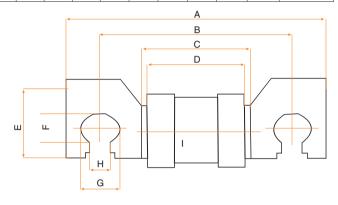
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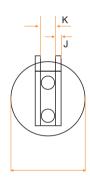
J TYPE FUSE - LINKS

J type feeder pillar fuse links are designed to be used with wedge type fuse carriers. Type J fuse links are to be used in a.c. electricity supply networks. They are installed in distribution boards, feeder pillars, link boxes, pole mounted cut-outs and heavy duty service intakes, open type substation boards and underground connection boxes. They can also be fitted in pole or wall mounted outdoor service fuse links.

· M	Туре	Current	A	В	С	D	Е	F	G	н	I	J	К
AS	FJF82030	63A - 200A	110	82	45.2	40.5	30	14.5	17.5	9.8	30.9	2.4	6.45/6.53
100	FJF82038	250A - 315A	110	82	45.2	40.5	30	14.5	17.5	9.8	38	2.4	6.45/6.53
18.	FJF92040	300A - 400A	131	92	46.7	40.3	38	14.5	20	10	40	3.1	8.05/8.75

Rated Voltage	415V AC
Breaking Capacity	80kA
Function Level	gU
Cartridge	Ceramic
Conncection	Bolted
Standard	IEC60269

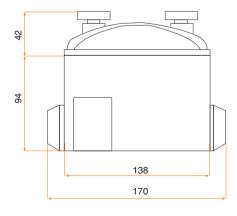


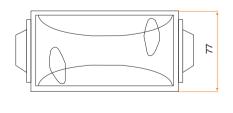


HRC Fuse Base & Fuse Carrier



- -Maximum rating 300A
- -Fuse carrier with 83mm centers
- -Moulded in white glass filled polyester thermoset material
- -All contacts manufactured from solid brass
- -Fuse Holder to use with J type fuse links
- -Cable entry and exits through PVC grommet
- -Maximum cable size 185mm²
- -Refer to rage 14 for fuse bases, contacts and fuse handles





CYLINDIRICAL FUSES and BASES

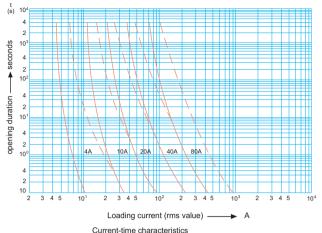
Cylindrical fuse link with cylindrical contact caps is designed for protecting electrical distribution in rated current up to 125A. Against damage due to overload and short circuit. Fuse link with the striker is supplied for the purpose of protecting against motor single phasing operation when fitted in fuse-isolators. This product conforms with IEC269 and CDE0636 standards.

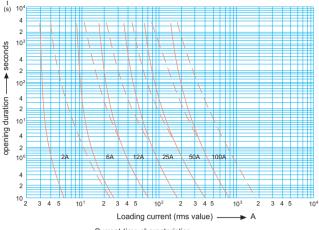
	Туре	Dimensions mmxmm	Rated Voltage U _n (V AC)	Rated Current I _n (A)	Order Code
	FCF10-38	10x38	500	2	9CF-1038-0002
	FCF10-38	10x38	500	4	9CF-1038-0004
	FCF10-38	10x38	500	6	9CF-1038-0006
	FCF10-38	10x38	500	8	9CF-1038-0008
	FCF10-38	10x38	500	10	9CF-1038-0010
	FCF10-38	10x38	500	12	9CF-1038-0012
200	FCF10-38	10x38	500	16	9CF-1038-0016
10AgG	FCF10-38	10x38	500	20	9CF-1038-0020
	FCF10-38	10x38	500	25	9CF-1038-0025
	FCF14-51	14x51	500	2	9CF-1451-0002
	FCF14-51	14x51	500	4	9CF-1451-0004
	FCF14-51	14x51	500	6	9CF-1451-0006
a	FCF14-51	14x51	500	8	9CF-1451-0008
III .	FCF14-51	14x51	500	10	9CF-1451-0010
	FCF14-51	14x51	500	16	9CF-1451-0016
28	FCF14-51	14x51	500	20	9CF-1451-0020
Por No.	FCF14-51	14x51	500	25	9CF-1451-0025
	FCF14-51	14x51	500	32	9CF-1451-0032
	FCF14-51	14x51	500	40	9CF-1451-0040
	FCF14-51	14x51	500	50	9CF-1451-0050
	FCF22-58	22x58	500	10	9CF-2258-0010
	FCF22-58	22x58	500	16	9CF-2258-0016
	FCF22-58	22x58	500	20	9CF-2258-0020
	FCF22-58	22x58	500	25	9CF-2258-0025
OG-WOL	FCF22-58	22x58	500	32	9CF-2258-0032
000	FCF22-58	22x58	500	40	9CF-2258-0040
100	FCF22-58	22x58	500	50	9CF-2258-0050
	FCF22-58	22x58	500	63	9CF-2258-0063
	FCF22-58	22x58	500	80	9CF-2258-0080
	FCF22-58	22x58	500	100	9CF-2258-0100

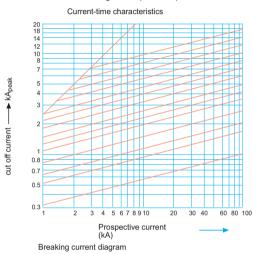
Cylindirical Fuses Bases

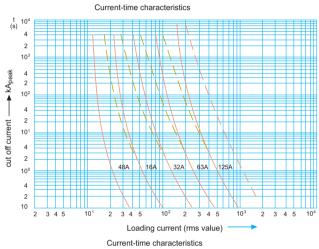
	Туре	Dimensions mmxmm	Number of Pole	Rated Current I _n (A)	Order Code
	FCFB10-38	10x38	1	32	9CF-1038-A001
	FCFB10-38	10x38	1+N	32	9CF-1038-A010
· ·	FCFB10-38	10x38	3	32	9CF-1038-A003
0	FCFB14-51	14x51	1	50	9CF-1451-A001
- Q	FCFB14-51	14x51	1+N	50	9CF-1451-A010
0	FCFB14-51	14x51	3	50	9CF-1451-A003
	FCFB22-58	22x58	1	100	9CF-2258-A001
	FCFB22-58	22x58	1+N	100	9CF-2258-A010
	FCFB22-58	22x58	3	100	9CF-2258-A003
E73	FCFB22-58	22x58	3+N	100	9CF-2258-A030

CYLINDIRICAL FUSES and BASES

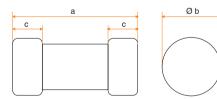








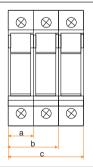
Cylindirical Fuses

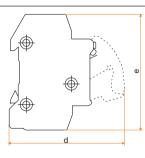


Dimensions

Туре	FCF10	FCF14	FCF22
a (mm)	38	51	58
b (Ø)	10,3	14,3	22,2
c (mm)	10	12	14

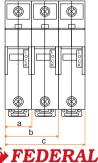
Cylindirical Fuses Bases

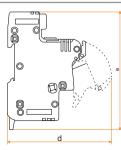




Dimensions

Туре	а	b	С	d	е
FCFB 10-38	17	34	51	79,5	78,3





Dimensions

Туре	а	b	С	d	е
FCFB 14-51	26,7	53,4	80,1	95	97
FCFB 22-58	34,7	69,4	104,1	104	127