Metal Enclosed Switchgear / Load Interrupter Switches

QUICK
SHIP
Available

Applications:

Spike's LIS medium-voltage load Interrupter switches provide safe, reliable switching and fault protection. The metal enclosed assembly - consisting of a 5kV - 38kV switch, bus and fuses - is designed to meet the requirements of a wide range of industries such as healthcare, data center, industrial, utility, mining and commercial.

Metal enclosed LIS Load Interrupter Switchgear Spike LIS Load Interrupter Switchgear is an integrated assembly of switches, bus and fuses that is constructed for medium voltage circuit protection. All major components are tested to the highest allowed voltage, establishing one source of responsibility for the equipment's performance and ensuring high standards in quality, coordination, reliability and service. A complete line from a single switch to multiple switches integrated together on a common bus are available.

Features:

Enclosures are available in both outdoor and indoor standard painted Ansi gray. Custom colors are available upon request. Standard standalone single switches do not come with modular expansion bus capabilities to connect future switches together.

- 5kV - 38 Kv voltage class
- 600A & 1200A continuous load interrupting ratings, custom switches up to 5000A.
- Main bus is rated for 600 amperes, 3000-ampere bus is also available
- Non-fused or fused with current limiting or boric acid-type fuses
- Manual or motor operated Indoor or outdoor non-walk-in enclosures
- Single switches and transformer primary switches
- Duplex load break switch arrangements for selection of alternate feeds
- Lineups with main bus
- Standard arrangements with automatic transfer control systems (two sources feeding one bus or two sources feeding two buses on a split bus with tie switch) Standard design configurations for:
- NEMA pads for cable lugs
- Kirk Key Interlock Provisions available
- Disc Handle with Lock Out Tag Out Provisions
- 8"x16" High Impact Viewing Window that permits full

Options:

- Custom compact footprint available
- Tin-plated copper bus bars
- Silver
- Motor-operated mechanism
- High-track resistance bus support
- Auxiliary switches (2 NO-2 NC)
- Mimic bus
- Ground studs
- Screens and filters (indoor)
- Special paint color
- Channel sills.
- Surge arresters
- Instrument transformers - current transformers (CTs) or voltage transformers (VTs)
- Control power transformer (CPT)
- Power meter
- Other auxiliary equipment
- Power expert
- Eaton
- SEL Relays

* Majority of these options will need clarification

Standards:

Spikes Medium Voltage Metal Enclosed Load Interrupter Switchgear are designed, manufactured, and tested in accordance with the latest standards as follows:

- ANSI/IEEEE C367.20.3
- ANSI/IEEEE C367.20.4

Documentation provided After Receipt of Order:

- One Line Diagram
- Master Drawing showing ISO Metric View Of Switch
- Front Elevation
- Floor Plan
- Top View
- Conduit entry/exit locations
- Name Plate Schedule
- Maintenance Manual

Name Plate Assembly Data Includes:

- Month and Year of Manufactured date
- Maximum Voltage Kv
- Amps
- Poles
- Impulse to withstand
- Norm. Freq. Withstand
- Frequency
- Constant Current
- Load Interrupting
- Momentary Current
- Short Time – Current
- Short Time - Time

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Metal Enclosed Switchgear / Load Interrupter Switches

SPIKE ELECTRIC CONTROLS

Catalog Number System - Non Fused

LISNF60037HITP

Load interrupter switch non fused 600A 3 phase 7.2 Kv high impulse to withstand 200 Kv BIL indoor rated with tin-plated copper bus bars

LISNF 600 3 7 H I TP

Non-Fused Catalog #
LISNF

AMPS
600
1200
2000
3000
4000
5000

Poles
3

Max Voltage Kv	
7	7.2 Kv
17	17.5 Kv
25	25.8 Kv
38	38 Kv

High Impulse to Withstand	
H	200 Kv BIL

Enclosure Environmental Rating	
I	Indoor
R	Outdoor Rain Tight
SS4	Outdoor Stainless Steel 304
SS6	Outdoor Stainless Steel 316
I12	Indoor Dust Resistant Nema 12
4X	Stainless Steel Wash Down Resistant

Option	
IB	Insulated Bus Bar
TP	Tin-plated copper bus bars
SP	Silver-Plated Copper bus bars
MO	Motor-operated mechanism
HR	High-track resistance bus support
AUX	Auxiliary switches (2 NO-2 NC)
MB	Mimic bus
G	Ground studs
F	Screens and filters (indoor)
CP	Special paint color
CS	Channel sills
SA	Surge arresters
IT	Instrument transformers
CT	Current transformers (CTs)
VT	Voltage Transformers (VTs)
CPT	Control power transformer (CPT)
PM	Eaton Power meter
RB	Rodent Barriers
VI	Voltage Indication Light

* Note: Duplex load break switch arrangements for selection of alternate feeds

NON FUSED

SPIKE PART #	MAXIMUM VOLTAGE KV	AMPS	POLES	IMPULSE TO WITHSTAND	NORM. FREQ. WITHSTAND	FREQUENCY	CONT. CURRENT	LOAD INTERRUPTING CURRENT	MOMENTARY CURRENT KAMP	SHORT TIME - CURRENT KAMP	SHORT TIME - TIME SEC.
LISNF60037	7.2 Kv	600	3	60 Kv BIL	20KV	60Hz	600 Amp	600 Amp	40 Kamp	25 Kamp	2 SEC
LISNF120037	7.2 Kv	1200	3	60 Kv BIL	20KV	60Hz	1200 Amp	1200 Amp	40 Kamp	25 Kamp	2 SEC
LISNF600317	17.5 Kv	600	3	95 Kv BIL	38KV	60Hz	600 Amp	600 Amp	40 Kamp	25 Kamp	2 SEC
LISNF1200317	17.5 Kv	1200	3	95 Kv BIL	38KV	60Hz	1200 Amp	1200 Amp	40 Kamp	25 Kamp	2 SEC
LISNF600325	25.8 Kv	600	3	125 Kv BIL	60KV	60Hz	600 Amp	600 Amp	40 Kamp	25 Kamp	2 SEC
LISNF1200325	25.8 Kv	1200	3	125 Kv BIL	60KV	60Hz	1200 Amp	1200 Amp	40 Kamp	25 Kamp	2 SEC
LISNF600338	38 Kv	600	3	150 Kv BIL	80KV	60Hz	600 Amp	600 Amp	40 Kamp	25 Kamp	2 SEC
LISNF1200338	38 Kv	1200	3	150 Kv BIL	80KV	60Hz	1200 Amp	1200 Amp	40 Kamp	25 Kamp	2 SEC
LISNF1200338H	38 Kv	1200	3	200 Kv BIL	80KV	60Hz	1200 Amp	1200 Amp	50 Kamp	31.5 Kamp	2 SEC

* R - Outdoor * I - Indoor * H - High Impulse to withstand 200 KU BIL

Metal Enclosed Switchgear / Load Interrupter Switches

SPIKE ELECTRIC CONTROLS

Catalog Number System - Fused

LISF60037HRTP - 15

Load interrupter switch fused 600A 3 phase 7.2 Kv high impulse to withstand 200 Kv BIL outdoor rain-tight rated with tin plated copper bus

LISF 600 3 7 H R TP - 15

Fused Catalog #
LISF

* Note: Duplex load break switch arrangements for selection of alternate feeds

AMPS
600
1200
2000
3000

Poles
3

Max Voltage Kv	
7	7.2 Kv
17	17.5 Kv
25	25.8 Kv
38	38 Kv

High Impulse to Withstand	
H	200 Kv BIL

Enclosure Environmental Rating	
I	Indoor
R	Outdoor Rain Tight
SS4	Outdoor Stainless Steel 304
SS6	Outdoor Stainless Steel 316
I12	Indoor Dust Resistant Nema 12
4X	Stainless Steel Wash Down Resistant

Option	
IB	Insulated Bus Bar
TP	Tin-plated copper bus bars
SP	Silver-Plated Copper bus bars
MO	Motor-operated mechanism
HR	High-track resistance bus support
AUX	Auxiliary switches (2 NO-2 NC)
MB	Mimic bus
G	Ground studs
F	Screens and filters (indoor)
CP	Special paint color
CS	Channel sills
SA	Surge arresters
IT	Instrument transformers
CT	Current transformers (CTs)
VT	Voltage Transformers (VTs)
CPT	Control power transformer (CPT)
PM	Eaton Power meter
RB	Rodent Barriers
VI	Voltage Indicator Light

Fused AMPS
10
15
20
25
30
40
50
65
80
100
125
150
175
200
225
250
270
280
300
325
350
365
400
450

FUSED

SPIKE PART #	MAXIMUM VOLTAGE KV	AMPS	POLES	IMPULSE TO WITHSTAND	NORM. FREQ. WITHSTAND	FREQUENCY	CONT. CURRENT	LOAD INTERRUPTING CURRENT	MOMENTARY CURRENT KAMP	SHORT TIME - CURRENT KAMP	SHORT TIME - TIME SEC.
LISF60037 - ___	7.2 Kv	600	3	60 Kv BIL	20KV	60Hz	600 Amp	600 Amp	40 Kamp	25 Kamp	2 SEC
LISF120037 - ___	7.2 Kv	1200	3	60 Kv BIL	20KV	60Hz	1200 Amp	1200 Amp	40 Kamp	25 Kamp	2 SEC
LISF600317 - ___	17.5 Kv	600	3	95 Kv BIL	38KV	60Hz	600 Amp	600 Amp	40 Kamp	25 Kamp	2 SEC
LISF1200317 - ___	17.5 Kv	1200	3	95 Kv BIL	38KV	60Hz	1200 Amp	1200 Amp	40 Kamp	25 Kamp	2 SEC
LISF600325 - ___	25.8 Kv	600	3	125 Kv BIL	60KV	60Hz	600 Amp	600 Amp	40 Kamp	25 Kamp	2 SEC
LISF1200325 - ___	25.8 Kv	1200	3	125 Kv BIL	60KV	60Hz	1200 Amp	1200 Amp	40 Kamp	25 Kamp	2 SEC
LISF600338 - ___	38 Kv	600	3	150 Kv BIL	80KV	60Hz	600 Amp	600 Amp	40 Kamp	25 Kamp	2 SEC
LISF1200338 - ___	38 Kv	1200	3	150 Kv BIL	80KV	60Hz	1200 Amp	1200 Amp	40 Kamp	25 Kamp	2 SEC
LISNF1200338H - ___	38 Kv	1200	3	200 Kv BIL	80KV	60Hz	1200 Amp	1200 Amp	50 Kamp	31.5 Kamp	2 SEC

* R - Outdoor * I - Indoor * H - High Impulse to withstand 200 KU

NOTE: Standard current limiting fuses supplied data sheets are in this catalog due to availability brands can change to Eaton, GE, or Square D equal.

Metal Enclosed Switchgear / Load Interrupter Switches - Fuses

General Description:

"AC" fuses are current limiting fuses of the backup type. These fuses can interrupt all currents from their maximum interrupting current (I1) to currents as low as the minimum interrupting current (I3) mentioned in the corresponding lists of each fuse model.

Its application is for protection against electrical failures of great magnitude. In the case of this type of failure, the fuse considerably reduces thermal and magnetic influences, providing excellent protection for electrical equipment, due to its current limiting effect.

For its application, the corresponding standards mentioned below must be taken into consideration. Mainly it is necessary to provide that the equipment to be protected also has secondary protections for those low-intensity electrical failures, which cannot be seen by a fuse, such as, for example, ground faults and / or any other fault in the area of the current I3. As these faults usually have their origin at the low voltage site of the transformer. It can be considered that the protection of the low voltage side will usually be enough to eliminate any type of low over currents at the primary site.

These fuses are used for the protection of transformers, potential transformers,control transformers, motors, capacitors, cables and distribution systems.

For proper coordination with other fuses of our brand in the same distribution network, a coordination factor of at least 1,6 times it's rated current is recommended. This means that a fuse of 100 A rated current requires a fuse of 63 A or less downstream and a fuse of 160 A or higher upstream.

Each fuse has a striker and indicator system,for which the company obtained the corresponding patent. The striker system differs from an indicating system, in the sense that it operates with a greater mechanical force.

When the fuse element operates, e. g. due to the influence of a fault current, of sufficient magnitude,the striker system is activated, making the striker pin exit by approximately 1.18in. with a mechanical force of at least 50 N (up to 120 N). The striker system has the purpose of activating the three-phase trip mechanism of the disconnector in the event of a failure in any of the three phases (fuses) carried by the disconnector, in order to prevent the electrical system from continuing to operate in two phases, provided the disconnector has such a three-phase trip mechanism that can be activated by the fuse striker system.

Apart from this it gives a visual warning that the fuse has operated. It can also be used to indicate remotely that the fuse has operated, through use, e.g. of limit switches, ensuring that the contact between the striker system and the activation is not in a direct manner, but by using an insulated rod or other device, which guarantees the minimum insulating needs.

When installing the fuse in the corresponding fuse holder, care must be taken that the striker system is aligned with the eventual trip system of the disconnector and that this is sensitive enough for the striker system to operate.

Many times, the lack of maintenance or excessive contamination, causes the disconnector trip system not to operate or a greater mechanical force is required to activate it. In this case, the fuses with the striker system of the strongest mechanical force must be used.

"AC" type fuses exist in three different executions:

1. For protection of transformers, cables and distribution systems, using only the letter "D" (indoor service) or, where appropriate, the letter "W" (outdoor service), e.g.: AC / 5/6/40 / D, outdoors "W" instead of the "D".
2. For the protection of capacitors, identified with the letter "C", e.g. AC / 5/8/40 / DC.
3. For motor-starter protection, identified with the letter "M", e.g. AC / 5/8/40 / DM.

For the manufacture of these fuses we have developed internal standards, based on ANCE and IEC standards. Basically based on NMX-J-149/1 and IEC 282-1

Available Rated Currents:

For fuses manufactured on the basis of NMX / IEC standards, such as the "AC" type among others, the rated currents are governed according to these standards by the "preferred numbers", specifically, but not exclusively, by the "R10 Line". But because fuses are still required in the domestic market outside the regulations of Line R10, we have therefore adopted the following criteria:

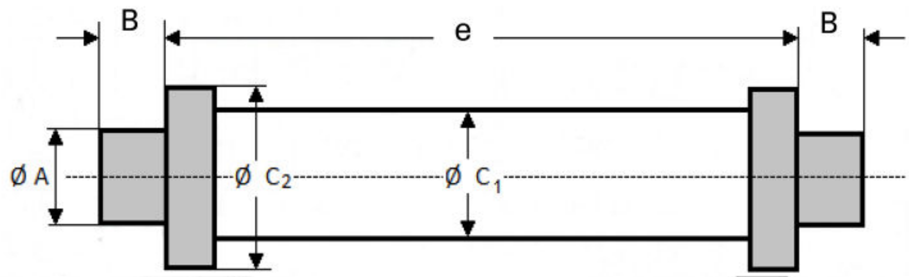
Metal Enclosed Switchgear / Load Interrupter Switches - Fuses

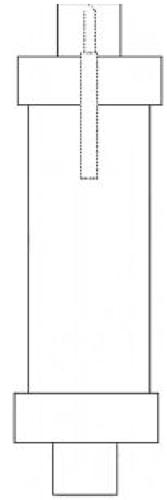
At the request of the user, the current assigned in the old currents will be mentioned on the corresponding label, always considering that this would be a transitory solution, until the market adapts to the standardized currents of the preferred numbers.

Rated Voltage in Reference to Dimension "E":

Ø A	B	Ø C_2 (min)	Ø C_{1Y} C_2 (man)	e± 0/1	Rated Voltage (Kv)
45 + 1	33+2/0	50	88	192	7,2
"	"	"	"	292	13,8
"	"	Discontinued Size		367	17,5
"	"	"	"	442	23
"	"	"	"	537	34,5

Dimensional Drawing:

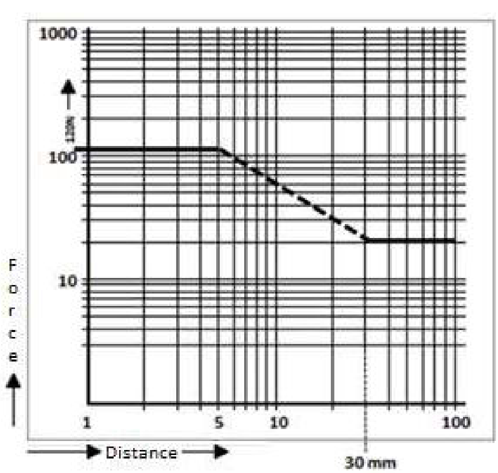




Striker system for "AC"type fuses.

Important Observations:

1. For installations 1000 m above sea level the lower air density must be considered. It is suggested to use fuses of the physical size of the next rated voltage, but with the fuse element for the rated voltage at which the fuse shall work.
2. AC fuses are "Current Limiting Fuses" of the "Backup" type.
3. These fuses are nationally manufactured.
4. The insulating tube can be made of porcelain or fiberglass.
5. From 50 A rated current and higher, the fuse tubes are thicker in diameter. This in order to increase the heat dissipation capability. The contacts remain the same size. The dimensions are according to standard. Based on the standard, these fuses are interchangeable with fuses with a smaller or thicker diameter of the insulating tube.
6. The drawings do not show the striker / indicator systems.
7. As a result of the increase in diameter (thickness), we offer a more efficient fuse, because we increase the heat dissipation intensity.



Striker System:

All "AC" type fuses normally have a striker system or an indicating system. The striker system has two functions:

- Provides a visual warning when the fuse has operated.
- Provokes a direct mechanical operation, for example, to activate a limit switch, or move a lever which in turn activates the three phase opening device of the disconnector.
- The indicating system provides a visual warning only when the fuse has operated transformers (VTs)

When the main fuse element operates, the fault current passes over the secondary element, which holds a compressed spring. The spring provides a force of up to 120 N for the striker

system (30N for the indicating system).

When this fault current passes over the secondary element, the element melts and the spring is released, in turn pushes the striker pin out of the fuse by approximately 1.18in. to now function as a fault indicator and mechanical drive device.

The striker system of the ACEMSA brand fuses, has a displacement of 1.18 to 1.30in. and a dynamic force of maximum 120 N. It should be noted that the standard in this regard only asks for 30 N for light execution and 50 N for heavy execution.

Due to the characteristics of the national market, which supplies disconnectors with three-phase trip system that do not operate with the force mentioned in the corresponding standard for disconnectors, we have reinforced our striker system to widely exceed what the fuse standard requires and guarantee in this way the correct operation of the three-phase trip device of the disconnector, even with the "heavy" operation disconnectors. For those users, who prefer a lighter striker system we can supply it.

Up to .2in. of output, at least 120 N is maintained, then decreasing steadily to 30 N. This means that if the disconnector trip system lever requires receiving the impact of 120 N, it should not be further away from the tip of the striker pin as about .2in.

Metal Enclosed Switchgear / Load Interrupter Switches - Fuses

Fuses Connected in Parallel:

Application:

The application of fuses, current limiting type, in parallel, is recommended in cases of higher rated currents, provided that the minimum distances between phases and / or between phase and earth can be guaranteed. In other cases it is the only solution to obtain a required protection, for example, when fuses are required, with rated currents greater than those available by the market.

The main advantage is that a larger area for heat dissipation is obtained, because, with two insulating tubes, twice the area for dissipation is available. The disadvantage is that normally the clips of a certain disconnector can only receive one fuse per phase, which requires adaptations to the disconnector or the use of specially modified fuses for this purpose.

Especially modified fuses would be two mechanically and electrically connected fuses (a double fuse), which fit into the existing clips, as long as the clips have the mechanical force to support the weight of a double fuse.

Therefore, special care must be taken regarding the clips that receive the fuses. When the clips are of sufficient mechanical and electrical force and are reinforced to support the weight of two fuses, even under conditions of vibration effects, the fuses described above would be the most comfortable solution.

Note of Prevention:

Normally, this situation is not present in the market. What is common in the market are disconnector with clips, which have adequate mechanical strength to accommodate but one fuse only per phase. Due to this, there is nothing left but the second option, to make a severe modification to the disconnector, possibly consulting the manufacturer for such purposes, in order to be able to mount two clips on a common electrically conducting bridge for each phase. As the fuse connection in parallel is being carried out by this common bridge for the clips, it is advisable not to make use of "special or double" fuses that are mechanically connected (e.g by welding as described above). If these special fuses (double) would be used, mounted on clips also connected together, an adequate electrical connection cannot be guaranteed, because no matter how precise the connections and fixings are made, a perfect parallel path between the double fuse and the alignment of the clips will never be achieved. Therefore, at some point in this connection, there will be an inadequate current conduction. The result would be an overheating and the possible self-destruction of the fuse.

Note for Suggestion:

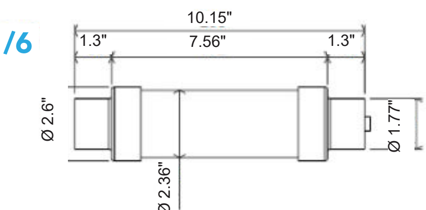
On the other hand, using individual fuses (two in parallel, without joining them together), and using two clips mounted on a common, electrically conducting bridge, any uneven alignment between the fuses or clips would be of little importance and would not influence the current path.

For the reasons mentioned above, we do not manufacture our “AC” and “FL” type fuses in a special way (connected together) for parallel mounting, except when it comes to our “FAM” or “FLT” type fuses, for which we ourselves manufacture clips with sufficient mechanical force to support two fuses in a single clip.

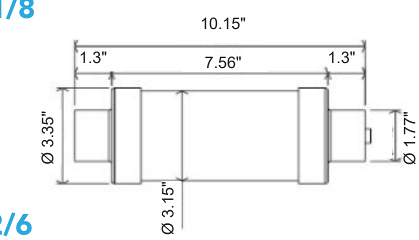
Remember, for the use of fuses type "AC" and "FL", it is necessary to mount two clips on a common bridge per phase and use individual fuses. For example, for a 400 A fuse use two individual fuses of 200 A each. In addition, check the minimum distances between phases and phase and ground. Where necessary, barriers and / or insulating materials must be installed.

General Dimensions:

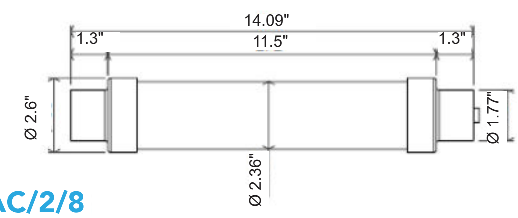
AC/1/6



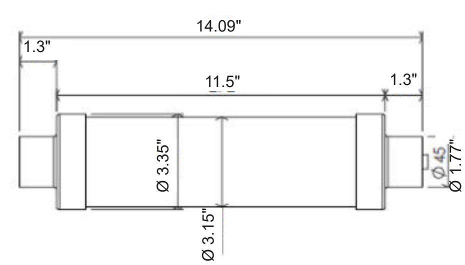
AC/1/8



AC/2/6



AC/2/8



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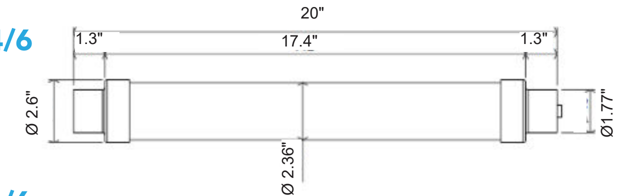
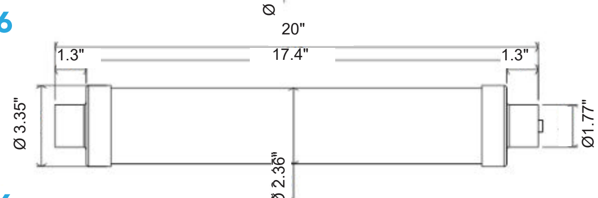
Metal Enclosed Switchgear / Load Interrupter Switches - Fuses

General Dimensions Cont:

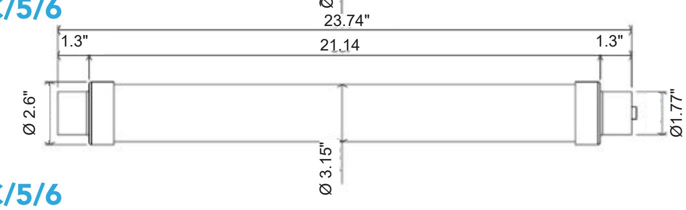
AC/4/6



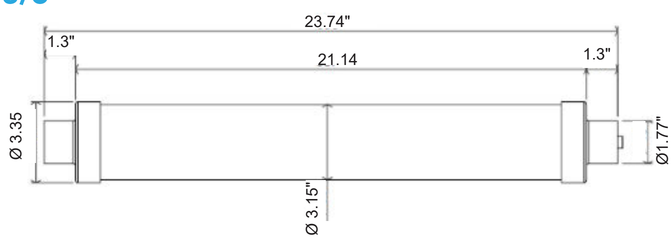
AC/4/6



AC/5/6



AC/5/6



Fuse Selection:

For a more precise selection, it is necessary to compare the magnetization curves of the transformer core with the current / time curves of the fuse.

Therefore, it is up to each user to make use of this table.

NOTE: The values are approximate, because this table can only give general information, but not particularly accurate information for each type of transformer.

SELECTION TABLE												
kVA of the Transformer	From 2,4 to 2,75 kV		From 4,16 to 5,5 kV		From 6,6 to 8,25 kV		From 13,2 to 15 kV		From 23 to 25, 8 kV		From 34,5 to 36 kV	
	A	A	A	A	A	A	A	A	A	A	A	A
	I_{trafo}	I_{fus}	I_{trafo}	I_{fus}	I_{trafo}	I_{fus}	I_{trafo}	I_{fus}	I_{trafo}	I_{fus}	I_{trafo}	I_{fus}
45	11	20	6	10	4	8	2	4	1	2	1	2
75	18	31,5	10	20	7	12,5	3	5	2	4	1	2
112,5	27	50	16	31,5	10	20	5	10	3	5	2	4
150	36	63	21	40	13	25	6	12,5	4	8	3	5
225	54	100	31	63	20	40	9	16	6	12,5	4	8
300	72	125	42	80	26	50	13	25	8	16	5	10
350	84	160	49	100	31	63	15	31,5	9	16	6	12,5
500	120	250	69	125	44	80	21	40	13	25	8	16
600	145	250	83	160	53	100	25	50	15	31,5	10	20
750	181	315	104	200	66	125	31	63	19	40	13	25
1000	241	2x200	139	250	88	160	42	80	25	50	17	31,5
1500	361	2x315	208	2x200	131	250	63	125	38	80	25	50
2000	482	n/a	278	2x250	175	315	84	160	50	100	34	63
2500	602	n/a	347	2x315	219	2x200	105	200	63	125	42	80
3000	723	n/a	417	n/a	263	2x250	126	250	75	160	50	100

k V A = Kilo Volt Amper (Transformer size).

k V = Kilo Volt (Voltage of the system).

A = Amper (Current intensity).

I_{trafo} = Transformer current in A (Rated current of the transformer).

I_{fus} = Fuse current in A (Rated fuse current).

Formula to calculate I_{trafo} and I_{fus}

$$Itrafo = \frac{k V A \times 10^3}{\sqrt{3} \times Ur}$$

10^3 = 1000

Ur = Rated voltage of the transformer in Volts.

$\sqrt{3}$ = 1,73

I_{fus} = Rated fuse current is obtained by multiplying Itrafo by 1,8 (between 1,6 and 2). Applying this multiplication factor ensures that the fuse is not damaged during the magnetization of the core (inrush). Between 1,6 and 2, depending on the size of the transformer.

Note:

a) A factor less than 1,6 or greater than 2 should not be used.

b) * Example: I_{trafo} = 27 A x 1,8 = 48,6 A. The nearest immediate superior value (Ifus) would be 50 A.

c) Coordination factor (between any main protection and protection upstream or downstream based on this type of fuse): minimum – 1,6 x Ir –

d) As in this example it is a smaller transformer (112,5 kVA / 2,4 kv), a factor of 1,8 and not 1,6 was used.

Metal Enclosed Switchgear / Load Interrupter Switches - Fuses

Model Interpretation:

The fuse model is obtained following the sequence shown below.

AC / $\underbrace{\_\_}_{\text{length}}$ / $\underbrace{\_\_}_{\text{diameter}}$ / $\underbrace{\_\_}_{\text{rated current}}$ / $\underbrace{\_\_}_{\text{aplication}}$ - $\underbrace{\_\_}_{\text{voltage (kV)}}$

For the integration of the model, the length, diameter and application must be chosen according as shown below:

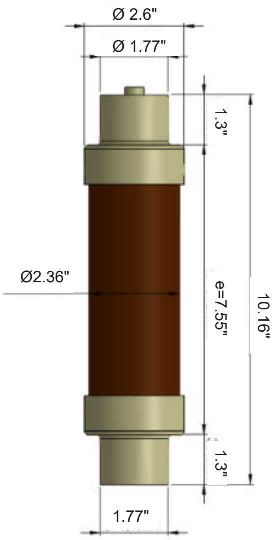
length in mm (according to dimension "e")	
1	192
2	292
3	367 (discontinued)
4	442
5	537
162	Example of special dimensions

For the "e" dimension, see the corresponding dimensional drawing on page 4.

Diameter in mm (of the insulator tube)	
5	50
6	60
8	80

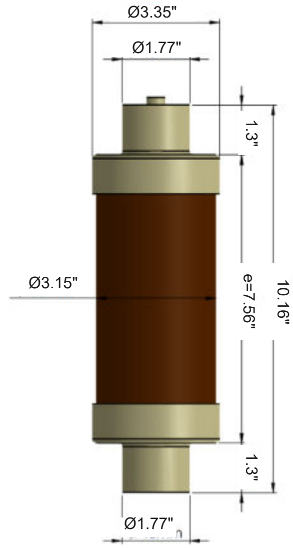
Aplicación	
D	Indoor service (general protection for example for distribution systems, cables (lines) and transformers)
W	Outdoor service (protection in general for example for distribution systems, cables (lines) and transformers)
C	Mainly capacitor protection
M	Mainly motor-starter protection

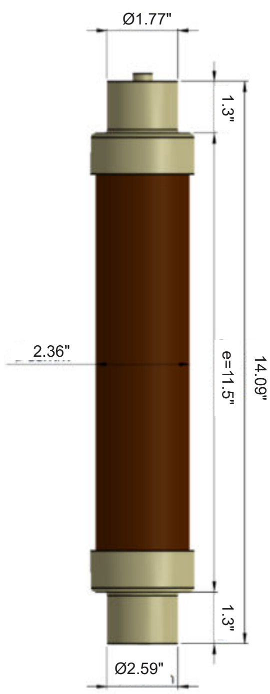
Metal Enclosed Switchgear / Load Interrupter Switches - Fuse Models



1) Voltage = 2,4 kv   L= 7.55 in

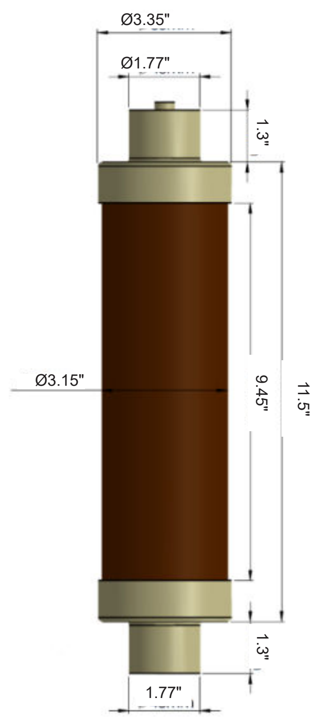
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/1/6/6,3/D-2,4	6,3	80	16	7.55	2.36
AC/1/6/8/D-2,4	8	80	20	7.55	2.36
AC/1/6/10/D-2,4	10	80	25	7.55	2.36
AC/1/6/12,5/D-2,4	12,5	80	32	7.55	2.36
AC/1/6/16/D-2,4	16	80	60	7.55	2.36
AC/1/6/20/D-2,4	20	80	65	7.55	2.36
AC/1/6/25/D-2,4	25	80	80	7.55	2.36
AC/1/6/31,5/D-2,4	31,5	80	95	7.55	2.36
AC/1/6/40/D-2,4	40	80	120	7.55	2.36
AC/1/8/50/D-2,4	50	80	150	7.55	3.14
AC/1/8/63/D-2,4	63	80	190	7.55	3.14
AC/1/8/80/D-2,4	80	80	260	7.55	3.14
AC/1/8/100/D-2,4	100	80	350	7.55	3.14
AC/1/8/125/D-2,4	125	40	440	7.55	3.14
AC/1/6/160/D-2,4	160	40	640	7.55	3.14
*2xAC/1/8/100/D-2,4	200	63	800	.07x7.55	3.14
*2xAC/1/8/125/D-2,4	250	63	1125	.07x7.55	3.14
*2xAC/1/8/160/D-2,4	315	40	1420	.07x7.55	3.14



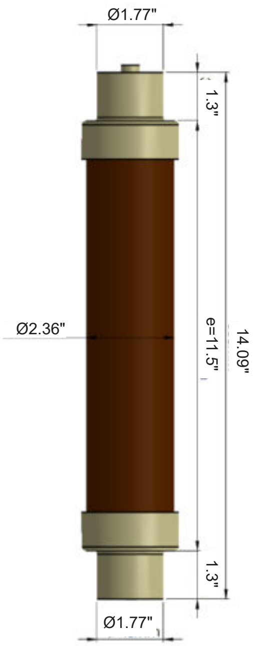


1 a) Voltage = 2,4 kv   L= 11.50 in

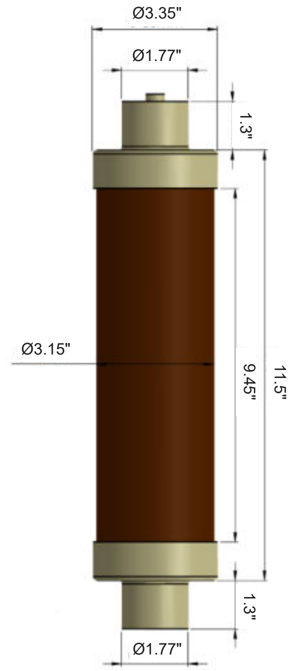
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/2/6/40/D-2,4	40	80	120	11.50	2.36
AC/2/8/50/D-2,4	50	80	150	11.50	3.14
AC/2/8/63/D-2,4	63	80	190	11.50	3.14
AC/2/8/80/D-2,4	80	80	260	11.50	3.14
AC/2/8/100/D-2,4	100	80	350	11.50	3.14
AC/2/8/125/D-2,4	125	63	440	11.50	3.14
AC/2/8/160/D-2,4	160	63	640	11.50	3.14
AC/2/8/200/D-2,4	200	63	800	11.50	3.14
AC/2/8/250/D-2,4	250	63	1125	11.50	3.14
AC/2/8/315/D-2,4	315	40	1420	11.50	3.14
*2xAC/2/8/200/D-2,4	400	40	2000	.07x11.50	3.14
*2xAC/2/8/250/D-2,4	500	40	2500	.07x11.50	3.14
*2xAC/2/8/315/D-2,4	630	40	3500	.07x11.50	3.14

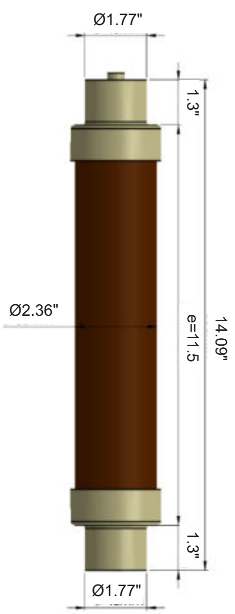


Metal Enclosed Switchgear / Load Interrupter Switches - Fuse Models

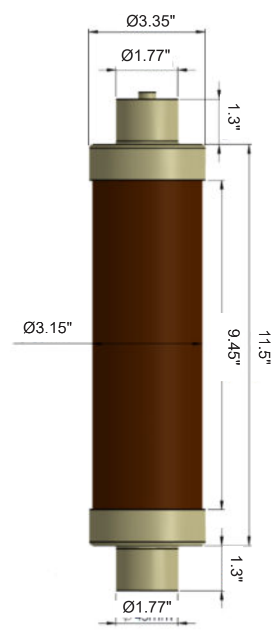


2) Voltage = 4,16 kv L= 7.55 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/1/6/6,3/D-4,16	6,3	63	16	7.55	2.36
AC/1/6/8/D-4,16	8	63	20	7.55	2.36
AC/1/6/10/D-4,16	10	63	25	7.55	2.36
AC/1/6/12,5/D-4,16	12,5	63	32	7.55	2.36
AC/1/6/16/D-4,16	16	63	60	7.55	2.36
AC/1/6/20/D-4,16	20	63	65	7.55	2.36
AC/1/6/25/D-4,1,6	25	63	80	7.55	2.36
AC/1/6/31,5/D-4,16	31,5	63	95	7.55	2.36
AC/1/6/40/D-4,16	40	63	120	7.55	2.36
AC/1/8/50/D-4,16	50	40	150	7.55	3.14
AC/1/8/63/D-4,16	63	40	190	7.55	3.14
AC/1/8/80/D-4,16	80	40	260	7.55	3.14
AC/1/8/100/D-4,16	100	40	350	7.55	3.14

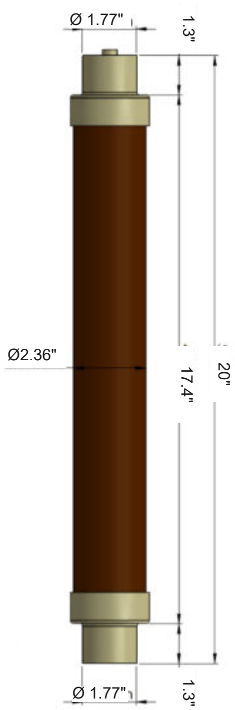




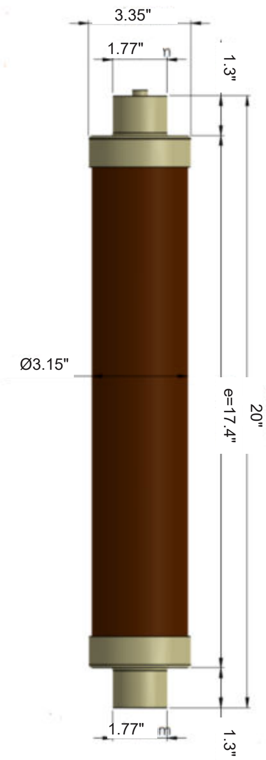
2a) Voltage = 4,16 kv L= 11.50 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/2/6/40/D-2,4	40	80	120	11.5	2.36
AC/2/8/50/D-2,4	50	80	150	11.5	3.14
AC/2/6/6,3/D-4,16	6,3	63	16	11.5	2.36
AC/2/6/8/D-4,16	8	63	20	11.5	2.36
AC/2/6/10/D-4,16	10	63	25	11.5	2.36
AC/2/6/12,5/D-4,16	12,5	63	32	11.5	2.36
AC/2/6/16/D-4,16	16	63	60	11.5	2.36
AC/2/6/20/D-4,16	20	63	65	11.5	2.36
AC/2/6/25/D-4,16	25	63	80	11.5	2.36
AC/2/6/31,5/D-4,16	31,5	63	95	11.5	2.36
AC/2/6/40/D-4,16	40	63	120	11.5	2.36
AC/2/8/50/D-4,16	50	63	150	11.5	3.14
AC/2/8/63/D-4,16	63	63	190	11.5	3.14
AC/2/8/80/D-4,16	80	63	260	11.5	3.14
AC/2/8/100/D-4,16	100	63	350	11.5	3.14
AC/2/8/125/D-4,16	125	40	440	11.5	3.14
AC/2/8/160/D-4,16	160	40	640	11.5	3.14
AC/2/8/200/D-4,16	200	25	800	11.5	3.14
AC/2/8/250/D-4,16	250	20	1125	11.5	3.14
AC/2/8/315/D-4,16	315	20	1420	11.5	3.14
*2XAC/2/8/63/D-4,16	125	63	440	2X11.5	3.14
2XAC/2/8/80/D-4,16	160	63	640	2X11.5	3.14
*2XAC/2/8/100/D-4,16	200	63	800	2X11.5	3.14



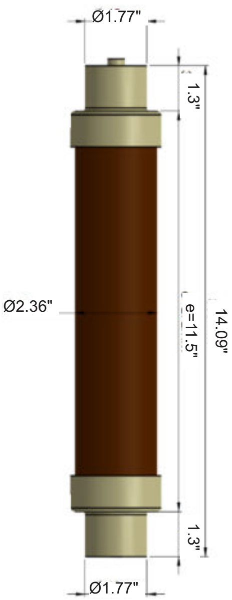
Metal Enclosed Switchgear / Load Interrupter Switches - Fuse Models



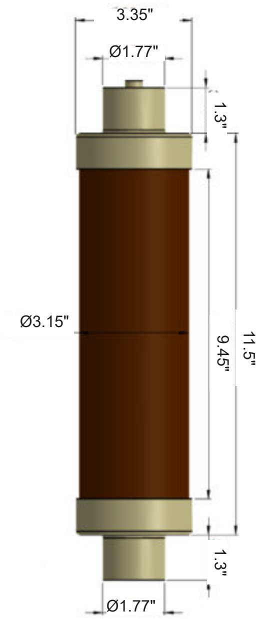
2 b) Voltage = 4,16 kv L = 17.4 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/4/6/6,3/D-4,16	6,3	80	16	17.4	2.36
AC/4/6/8/D-4,16	8	80	20	17.4	2.36
AC/4/6/10/D-4,16	10	80	25	17.4	2.36
AC/4/6/12,5/D-4,16	12,5	80	32	17.4	2.36
AC/4/6/16/D-4,16	16	80	60	17.4	2.36
AC/4/6/20/D-4,16	20	80	65	17.4	2.36
AC/4/6/25/D-4,16	25	80	80	17.4	2.36
AC/4/6/31,5/D-4,16	31,5	80	95	17.4	2.36
AC/4/6/40/D-4,16	40	80	120	17.4	2.36
AC/4/6/50/D-4,16	50	80	150	17.4	2.36
AC/4/8/50/D-4,16	50	80	150	17.4	3.14
AC/4/6/63/D-4,16	63	80	190	17.4	2.36
AC/4/8/63/D-4,16	63	80	190	17.4	3.14
AC/4/6/80/D-4,16	80	80	260	17.4	2.36
AC/4/8/80/D-4,16	80	80	260	17.4	3.14
AC/4/6/100/D-4,16	100	80	350	17.4	2.36
AC/4/8/100/D-4,16	100	80	350	17.4	3.14
AC/4/8/125/D-4,16	125	63	440	17.4	3.14
AC/4/8/160/D-4,16	160	63	640	17.4	3.14
AC/4/8/200/D-4,16	200	63	800	17.4	3.14
AC/4/8/250/D-4,16	250	40	1125	17.4	3.14
AC/4/8/315/D-4,16	315	40	1420	17.4	3.14
AC/4/8/355/D-4,16	355	40	1600	17.4	3.14
AC/4/8/400/D-4,16	400	30	2000	17.4	3.14
AC/4/8/500/D-4,16	500	30	2500	17.4	3.14
*2xAC/4/8/160/D-4,16	315	63	1420	2x17.4	3.14
*2xAC/4/8/200/D-4,16	400	63	2000	2x17.4	3.14



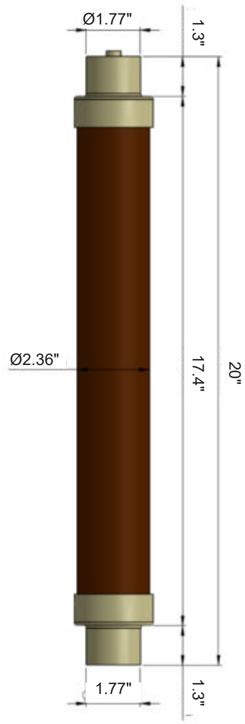
Metal Enclosed Switchgear / Load Interrupter Switches - Fuse Models



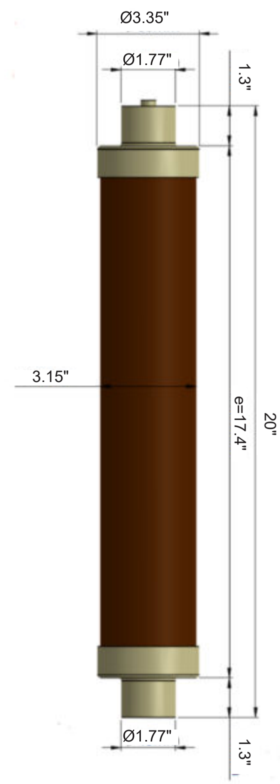
3) Voltage = 7,2 kv L = 11.5 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/2/6/8/D-7,2	8	63	20	11.5	2.36
AC/2/6/10/D-7,2	10	63	25	11.5	2.36
AC/2/6/12,5/D-7,2	12,5	63	32	11.5	2.36
AC/2/6/16/D-7,2	16	63	60	11.5	2.36
AC/2/6/20/D-7,2	20	63	65	11.5	2.36
AC/2/6/25/D-7,2	25	63	80	11.5	2.36
AC/2/6/31,5/D-7,2	31,5	63	95	11.5	2.36
AC/2/6/40/D-7,2	40	63	120	11.5	2.36
AC/2/8/50/D-7,2	50	40	150	11.5	3.14
AC/2/8/63/D-7,2	63	40	190	11.5	3.14
AC/2/8/80/D-7,2	80	40	260	11.5	3.14
AC/2/8/100/D-7,2	100	40	350	11.5	3.14
AC/2/8/125/D-7,2	125	25	440	11.5	3.14
AC/2/8/160/D-7,2	160	25	640	11.5	3.14
AC/2/8/200/D-7,2	200	25	800	11.5	3.14
*2XAC/2/8/125/D-7,2	250	25	1125	2x11.5	3.14
*2XAC/2/8/160/D-7,2	315	25	1420	2x11.5	3.14
*2XAC/2/8/200/D-7,2	400	25	2000	2x11.5	3.14

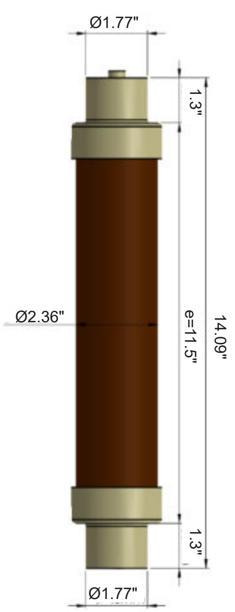


Metal Enclosed Switchgear / Load Interrupter Switches - Fuse Models

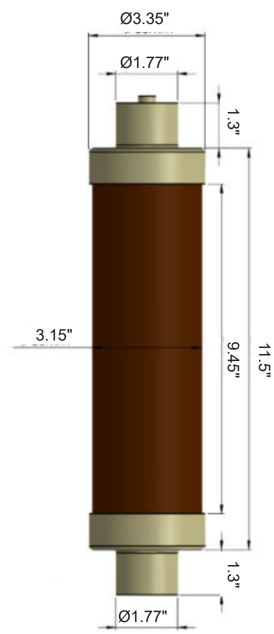


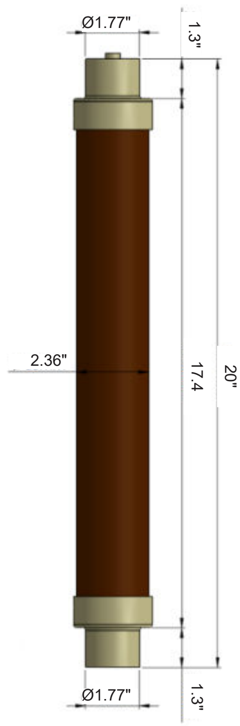
3 a) Voltage = 7,2 kv L = 17.4 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/4/6/6,3/D-7,2	6,3	40	16	17.4	2.36
AC/4/6/8/D-7,2	8	40	20	17.4	2.36
AC/4/6/10/D-7,2	10	40	25	17.4	2.36
AC/4/6/12,5/D-7,2	12,5	40	32	17.4	2.36
AC/4/6/16/D-7,2	16	40	2.36	17.4	2.36
AC/4/6/20/D-7,2	20	40	65	17.4	2.36
AC/4/6/25/D-7,2	25	40	3.14	17.4	2.36
AC/4/6/31,5/D-7,2	31,5	40	95	17.4	2.36
AC/4/6/40/D-7,2	40	40	120	17.4	2.36
AC/4/8/50/D-7,2	50	63	150	17.4	2.36
AC/4/6/50/D-7,2	50	63	150	17.4	3.14
AC/4/8/63/D-7,2	63	63	190	17.4	2.36
AC/4/6/63/D-7,2	63	63	190	17.4	3.14
AC/4/6/3.14/D-7,2	3.14	63	22.36	17.4	2.36
AC/4/8/3.14/D-7,2	3.14	63	22.36	17.4	3.14
AC/4/6/100/D-7,2	100	40	350	17.4	2.36
AC/4/8/100/D-7,2	100	40	350	17.4	3.14
AC/4/8/125/D-7,2	125	40	440	17.4	3.14
AC/4/8/12.36/D-7,2	12.36	40	640	17.4	3.14
AC/4/8/200/D-7,2	200	40	3.14	17.4	3.14
AC/4/8/250/D-7,2	250	40	1125	17.4	3.14
AC/4/8/315/D-7,2	315	40	1420	17.4	3.14



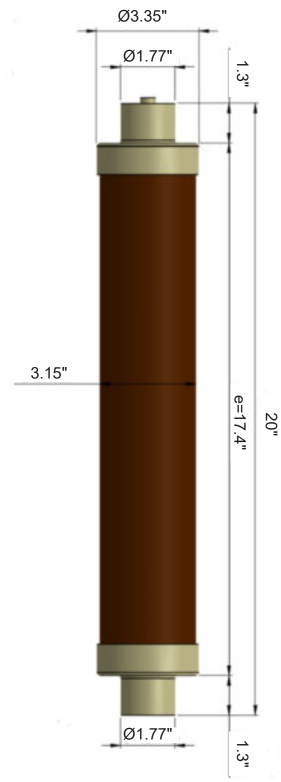


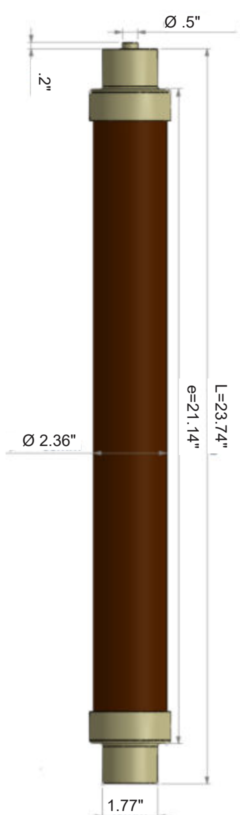
4) Voltage = 13,8 kv L = 11.5 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/2/6/6,3/D-13,8	6,3	40	16	11.5	2.36
AC/2/6/8/D-13,8	8	40	20	11.5	2.36
AC/2/6/10/D-13,8	10	40	25	11.5	2.36
AC/2/6/12,5/D-13,8	12,5	40	32	11.5	2.36
AC/2/6/16/D-13,8	16	40	60	11.5	2.36
AC/2/6/20/D-13,8	20	40	65	11.5	2.36
AC/2/6/25/D-13,8	25	40	80	11.5	2.36
AC/2/6/31,5/D-13,8	31,5	40	95	11.5	2.36
AC/2/6/40/D-13,8	40	40	120	11.5	2.36
AC/2/8/50/D-13,8	50	25	150	11.5	3.14
AC/2/8/63/D-13,8	63	20	190	11.5	3.14
AC/2/8/80/D-13,8	80	20	260	11.5	3.14
AC/2/8/100/D-13,8	100	20	350	11.5	3.14
*2XAC/2/8/63/D-13,8	125	20	440	2x11.5	3.14
*2XAC/2/8/80/D-13,8	160	20	640	2X11.5	3.14
*2XAC/2/8/100/D-13,8	200	20	800	2x11.5	3.14



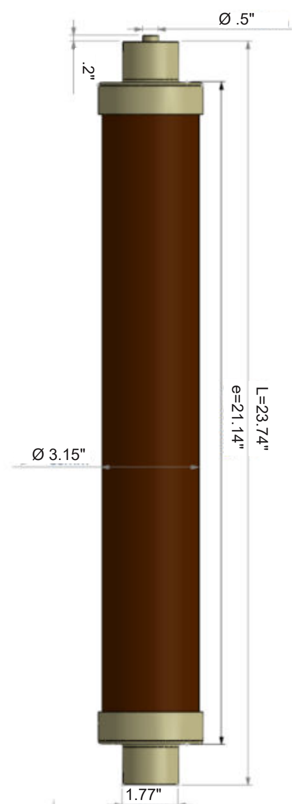


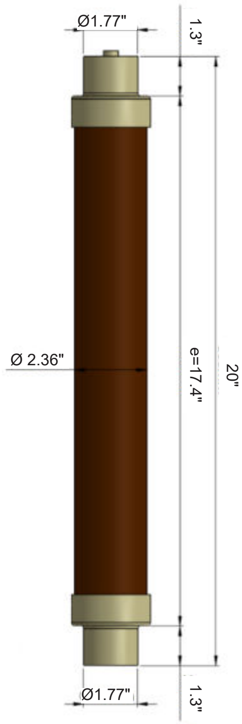
5) Voltage = 15 kv L = 17.4 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/4/6/6,3/D-15	6,3	40	16	17.4	2.36
AC/4/6/8/D-15	8	40	20	17.4	2.36
AC/4/6/10/D-15	10	40	25	17.4	2.36
AC/4/6/12,5/D-15	12,5	40	32	17.4	2.36
AC/4/6/16/D-15	16	40	60	17.4	2.36
AC/4/6/20/D-15	20	40	65	17.4	2.36
AC/4/6/25/D-15	25	40	80	17.4	2.36
AC/4/6/31,5/D-15	31,5	40	95	17.4	2.36
AC/4/6/40/D-15	40	40	120	17.4	2.36
AC/4/6/50/D-15	50	40	150	17.4	2.36
AC/4/8/50/D-15	50	40	150	17.4	3.14
AC/4/6/63/D-15	63	40	190	17.4	2.36
AC/4/8/63/D-15	63	40	190	17.4	3.14
AC/4/6/80/D-15	80	40	260	17.4	2.36
AC/4/8/80/D-15	80	40	260	17.4	3.14
AC/4/6/100/D-15	100	40	350	17.4	2.36
AC/4/8/100/D-15	100	40	350	17.4	3.14
AC/4/8/125/D-15	125	25	440	17.4	3.14
AC/4/8/160/D-15	160	25	640	17.4	3.14
AC/4/8/200/D-15	200	25	800	17.4	3.14
*2XAC/4/8/125/D-15	250	25	1125	2x17.4	3.14
*2XAC/4/8/160/D-15	315	25	1420	2x17.4	3.14
*2XAC/4/8/200/D-15	400	25	2000	2x17.4	3.14
*2XAC/5/8/200/D-15	400	30	2000	2x21.14	3.14



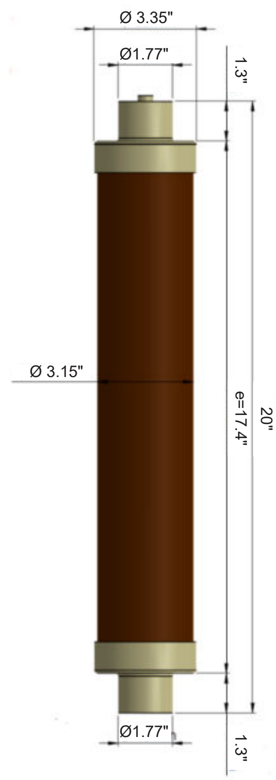


5 a) Voltage=15 kv L = 21.14 mm					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/5/6/6,3/D-15	6,3	40	16	21.14	2.36
AC/5/6/8/D-15	8	40	20	21.14	2.36
AC/5/6/10/D-15	10	40	25	21.14	2.36
AC/5/6/12,5/D-15	12,5	40	32	21.14	2.36
AC/5/6/16/D-15	16	40	60	21.14	2.36
AC/5/6/20/D-15	20	40	65	21.14	2.36
AC/5/6/25/D-15	25	40	80	21.14	2.36
AC/5/6/31,5/D-15	31,5	40	95	21.14	2.36
AC/5/6/40/D-15	40	40	120	21.14	2.36
AC/5/8/50/D-15	50	40	150	21.14	3.14
AC/5/8/63/D-15	63	40	190	21.14	3.14
AC/5/8/80/D-15	80	40	260	21.14	3.14
AC/5/8/100/D-15	100	40	350	21.14	3.14
AC/5/8/125/D-15	125	25	440	21.14	3.14
AC/5/8/160/D-15	160	25	640	21.14	3.14
AC/5/8/200/D-15	200	25	800	21.14	3.14

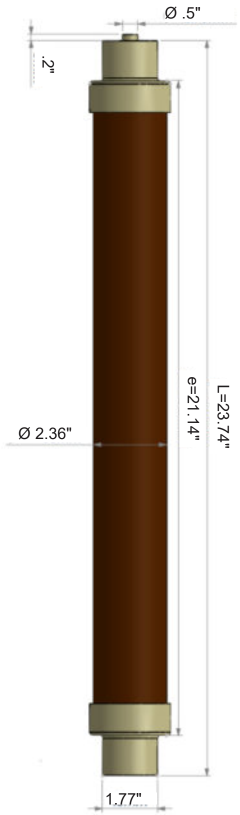




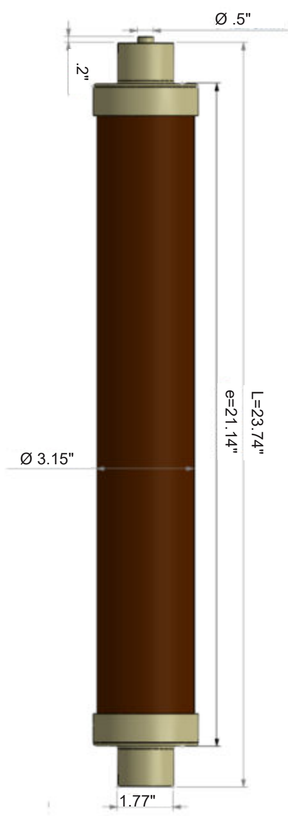
6) Voltage = 23 kv L = 17.4 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/4/6/6,3/D-23	6,3	40	16	17.4	2.36
AC/4/6/8/D-23	8	40	20	17.4	2.36
AC/4/6/10/D-23	10	40	25	17.4	2.36
AC/4/6/12,5/D-23	12,5	40	32	17.4	2.36
AC/4/6/16/D-23	16	40	60	17.4	2.36
AC/4/6/20/D-23	20	40	65	17.4	2.36
AC/4/6/25/D-23	25	40	80	17.4	2.36
AC/4/6/31,5/D-23	31,5	40	95	17.4	2.36
AC/4/6/40/D-23	40	40	120	17.4	2.36
AC/4/6/50/D-23	50	32	150	17.4	2.36
AC/4/8/50/D-23	50	32	150	17.4	3.14
AC/4/6/63/D-23	63	32	190	17.4	2.36
AC/4/8/63/D-23	63	32	190	17.4	3.14
AC/4/6/80/D-23	80	32	260	17.4	2.36
AC/4/8/80/D-23	80	32	260	17.4	3.14
AC/4/6/100/D-23	100	32	350	17.4	2.36
AC/4/8/100/D-23	100	32	350	17.4	3.14
AC/4/8/125/D-23	125	25	440	17.4	3.14
AC/4/8/160/D-23	160	25	640	17.4	3.14
*2XAC/4/8/100/D-23	200	25	800	2x17.4	3.14
*2XAC/4/8/125/D-23	250	25	1125	2x17.4	3.14
*2XAC/4/8/160/D-23	315	25	1420	2x17.4	3.14



Metal Enclosed Switchgear / Load Interrupter Switches - Fuse Models



6 a) Voltage = 23 kv L = 21.14 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/5/6/6,3/D-23	6,3	40	16	21.14	2.36
AC/5/6/8/D-23	8	40	20	21.14	2.36
AC/5/6/10/D-23	10	40	25	21.14	2.36
AC/5/6/12,5/D-23	12,5	40	32	21.14	2.36
AC/5/6/16/D-23	16	40	60	21.14	2.36
AC/5/6/20/D-23	20	40	65	21.14	2.36
AC/5/6/25/D-23	25	40	80	21.14	2.36
AC/5/6/31,5/D-23	31,5	40	95	21.14	2.36
AC/5/6/40/D-23	40	40	120	21.14	2.36
AC/5/8/50/D-23	50	40	150	21.14	3.14
AC/5/8/63/D-23	63	40	190	21.14	3.14
AC/5/8/80/D-23	80	40	240	21.14	3.14
AC/5/8/100/D-23	100	40	350	21.14	3.14
AC/5/8/125/D-23	125	25	440	21.14	3.14
AC/5/8/160/D-23	160	25	640	21.14	3.14
AC/5/8/200/D-23	200	25	800	21.14	3.14
*2XAC/5/8/125/D-23	250	25	1125	2x21.14	3.14
*2XAC/5/8/160/D-23	315	25	1420	2x21.14	3.14
*2XAC/5/8/200/D-23	400	25	2000	2x21.14	3.14



7) Voltage = 34,5 kv L = 21.14 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/5/6/6,3/D-34,5	6,3	40	16	21.14	2.36
AC/5/6/8/D-34,5	8	40	20	21.14	2.36
AC/5/6/10/D-34,5	10	40	25	21.14	2.36
AC/5/6/12,5/D-34,5	12,5	40	32	21.14	2.36
AC/5/6/16/D-34,5	16	40	60	21.14	2.36
AC/5/6/20/D-34,5	20	40	65	21.14	2.36
AC/5/6/25/D-34,5	25	40	80	21.14	2.36
AC/5/6/31,5/D-34,5	31,5	40	95	21.14	2.36
AC/5/6/40/D-34,5	40	40	120	21.14	2.36
AC/5/8/50/D-34,5	50	40	150	21.14	3.14
AC/5/8/63/D-34,5	63	40	190	21.14	3.14
AC/5/8/80/D-34,5	80	40	260	21.14	3.14
AC/5/8/100/D-34,5	100	40	350	21.14	3.14
*2xAC/5/8/63/D-34,5	125	40	440	2x21.14	3.14
*2XAC/5/8/80/D-34,5	160	40	640	2x21.14	3.14
*2XAC/5/8/100/D-34,5	200	40	800	2x21.14	3.14

Metal Enclosed Switchgear / Load Interrupter Switches - Fuses

NOTES:

The AC / 4/8/400 / D-4,16 and AC / 4/8/500 / D-4,16 models represent fuses of a relatively high rated current. Although we manufacture them, due to occasional market requirements, it should be mentioned informatively, that these are fuses with a lower maximum interrupting current.

As a consequence of this, although the fuse is still capable of interrupting the normal fault currents of the system, they do not represent the current limitation levels as fuses of smaller denomination.

In those cases, where fuses with these currents are required, we suggest whenever possible, to use, instead of a single fuse, two fuses in parallel, each at half the desired rated current.

Due to the small size of the 11.5in. long fuses and 13,8 kv voltage, it should be taken into consideration, for the mentioned voltage, that the voltage in question is the maximum voltage at sea level, in which these fuses shall be used. For higher altitudes, it is recommended to use fuses of a length of 17.4in. and 15 kv fuses

* For all fuses in this catalogue marked with an asterisk, we offer two individual fuses per phase, for example, for a 400 A fuse two 200 A fuses connected in parallel will be used (see also article on fuses in parallel).

When parallel fuses are used, only one striker system is required, therefore, having one of the two fuses without the striker system, the price of the set of the two parallel fuses is reduced, as is the total weight. When fuses without a striker system are required, they must be specifically requested. This is the reason why two fuses in parallel are mentioned with a lower price as a normal set of fuses with a striker system each.

From 50 A rated current and above fuse for capacitor protection and motor-starter fuses, we manufacture our fuse type "AC" with a diameter of approximately 3.15in.

As a consequence of the increase in diameter (thickness), we offer a more efficient fuse, because we increase the heat dissipation intensity.

New Design:

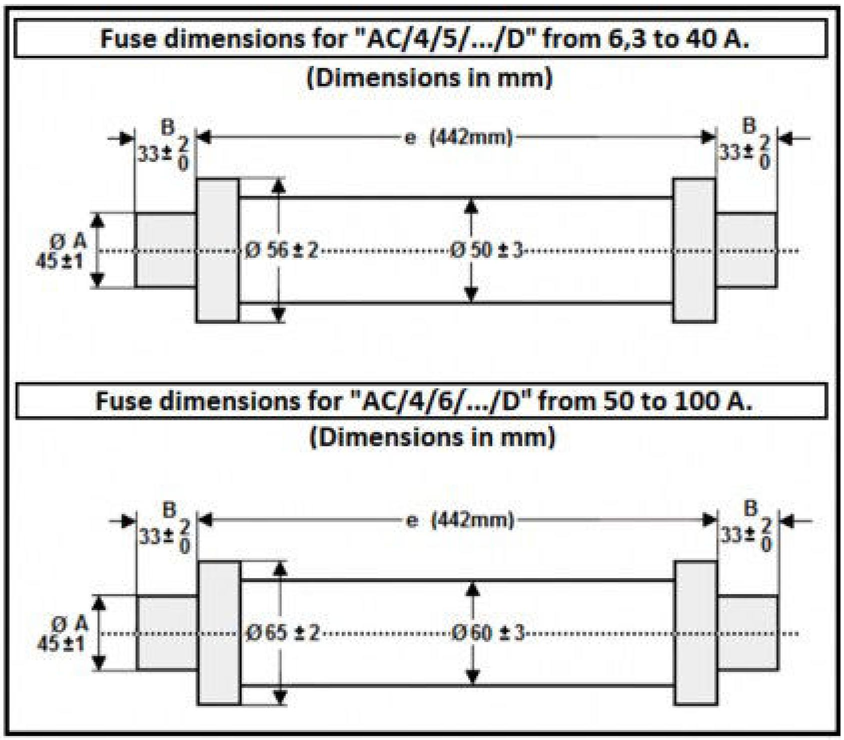
Since some time ago we have begun to design a new, cheaper fuse, because our porcelain supplier presented us with an improved type of porcelain. This new material is denser, more mechanically resistant and with a greater heat dissipation factor. Considering these advantages, the possibility of manufacturing fuses of a smaller diameter was just natural.

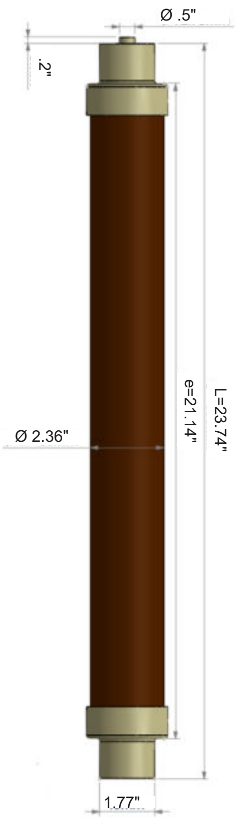
At a smaller diameter, the porcelain tube will cost less, and other costs are reduced too, such as the cost for copper. Because the new material is mechanically more resistant, the thickness of the wall can also be reduced. Similarly, the smaller diameter of the tube also helps in increasing the mechanical resistance of the fuse and at the same time, due to the use of a thinner wall, the heat dissipation factor will be further improved.

Even considering that the tube is smaller in diameter, not much volume is lost to accommodate the means of extinguishing material (the silica sand) to extinguish the electric arc, because the wall is thinner. Thanks to these advantages, we maintain the same technical characteristics that our well-known fuses have, handling the same maximum interrupting current, as always

The new model would be: AC / 4/5 /… / D-15 (23) (for 15 or 23 kv) for fuses from 6,3 to 40 A rated current and AC 4/6 /… / D-15 (23) (for 15 or 23 kv) for fuses from 50 to 100 A rated current.

Note: These fuses are supplied, at the moment, only with a length of 17.4in. and up to a maximum rated current of 100 A. The dimensions are valid until further notice.





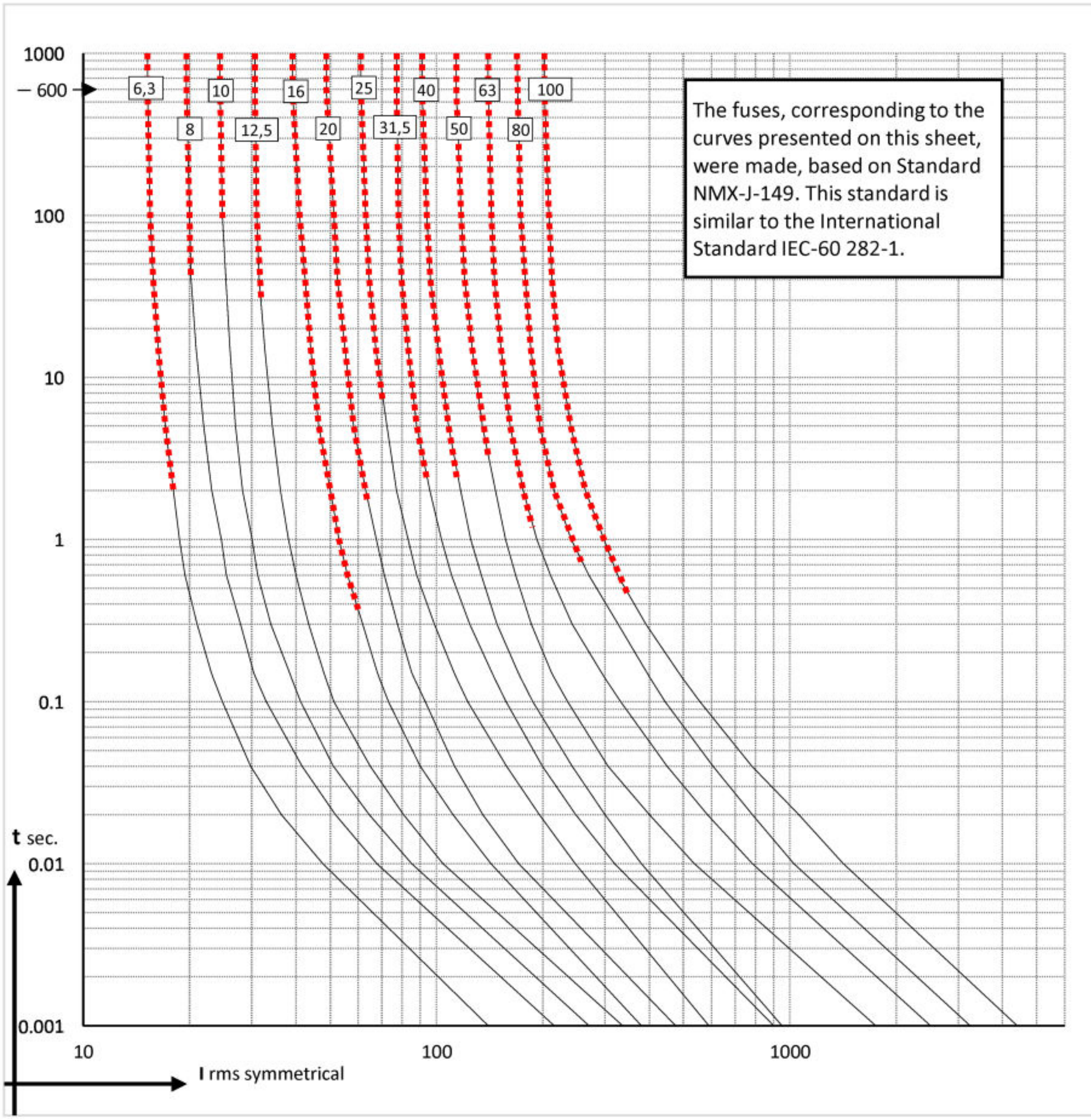
8) Voltage = 15 kv L = 17.4 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	length (in)	Ø (in)
AC/4/5/6,3/D-15	6,3	40	16	17.4	1.97
AC/4/5/8/D-15	8	40	20	17.4	1.97
AC/4/5/10/D-15	10	40	25	17.4	1.97
AC/4/5/12,5/D-15	12,5	40	32	17.4	1.97
AC/4/5/16/D-15	16	40	60	17.4	1.97
AC/4/5/20/D-15	20	40	65	17.4	1.97
AC/4/5/25/D-15	25	40	80	17.4	1.97
AC/4/5/31,5/D-15	31,5	40	95	17.4	1.97
AC/4/5/40/D-15	40	40	120	17.4	1.97
AC/4/6/50/D-15	50	40	150	17.4	2.36
AC/4/6/63/D-15	63	40	190	17.4	2.36
AC/4/6/80/D-15	80	40	260	17.4	2.36
AC/4/6/100/D-15	100	40	350	17.4	2.36

9) Voltage = 23 kv L = 17.4 in					
ACEMSA	Ir (A)	I_1 (kA)	I_3 (A)	Length (in)	Ø (in)
AC/4/5/6,3/D-23	6,3	40	16	17.4	1.97
AC/4/5/8/D-23	8	40	20	17.4	1.97
AC/4/5/10/D-23	10	40	25	17.4	1.97
AC/4/5/12,5/D-23	12,5	40	32	17.4	1.97
AC/4/5/16/D-23	16	40	60	17.4	1.97
AC/4/5/20/D-23	20	40	65	17.4	1.97
AC/4/5/25/D-23	25	40	80	17.4	1.97
AC/4/5/31,5/D-23	31,5	40	95	17.4	1.97
AC/4/5/40/D-23	40	40	120	17.4	1.97
AC/4/6/50/D-23	50	32	150	17.4	2.36
AC/4/6/63/D-23	63	32	190	17.4	2.36
AC/4/6/80/D-23	80	32	240	17.4	2.36
AC/4/6/100/D-23	100	32	350	17.4	2.36

Operating Curves

(CURRENT - TIME)

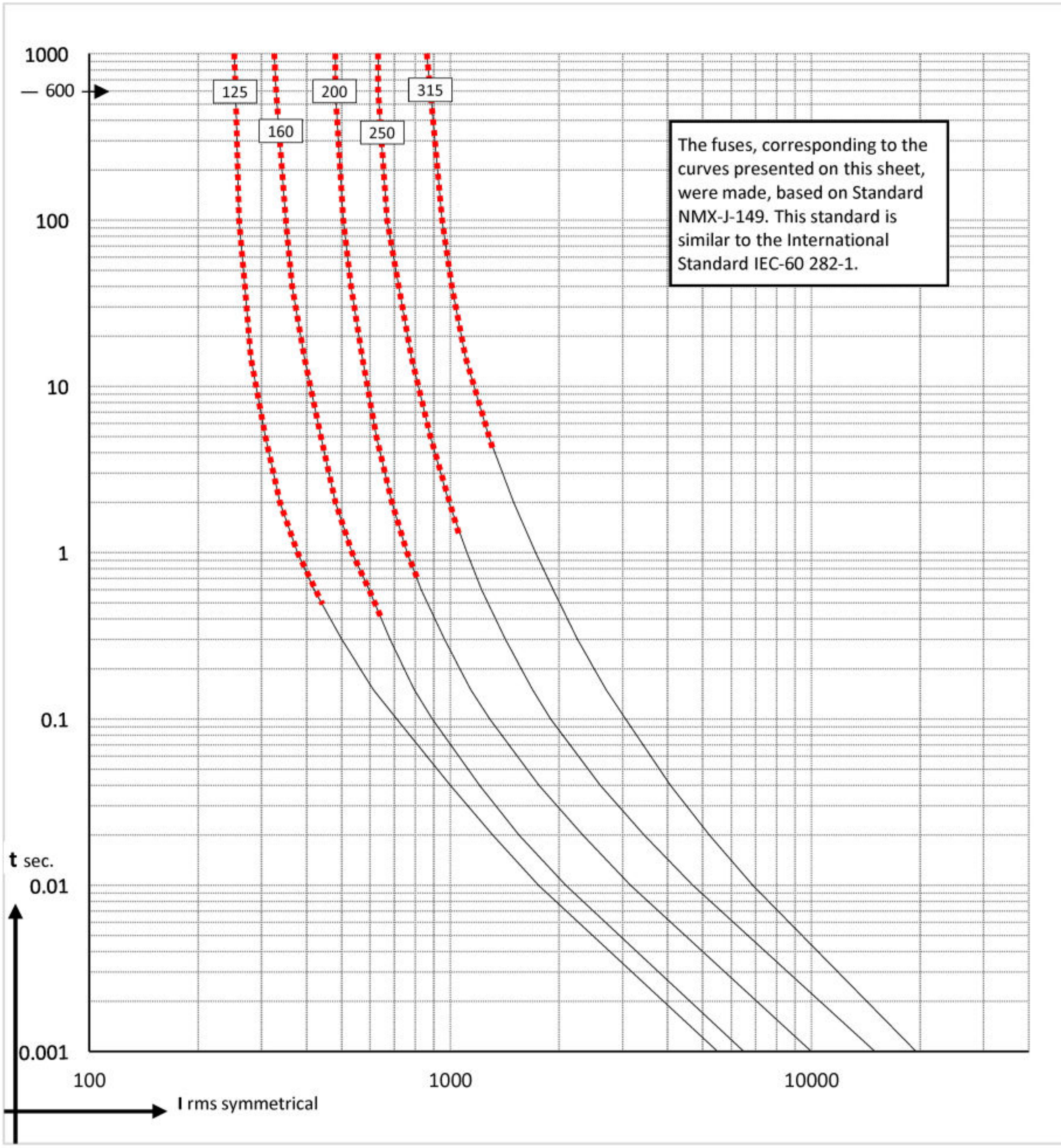
(I_r = 6,3 till 100 A)



Operating Curves

(CURRENT - TIME)

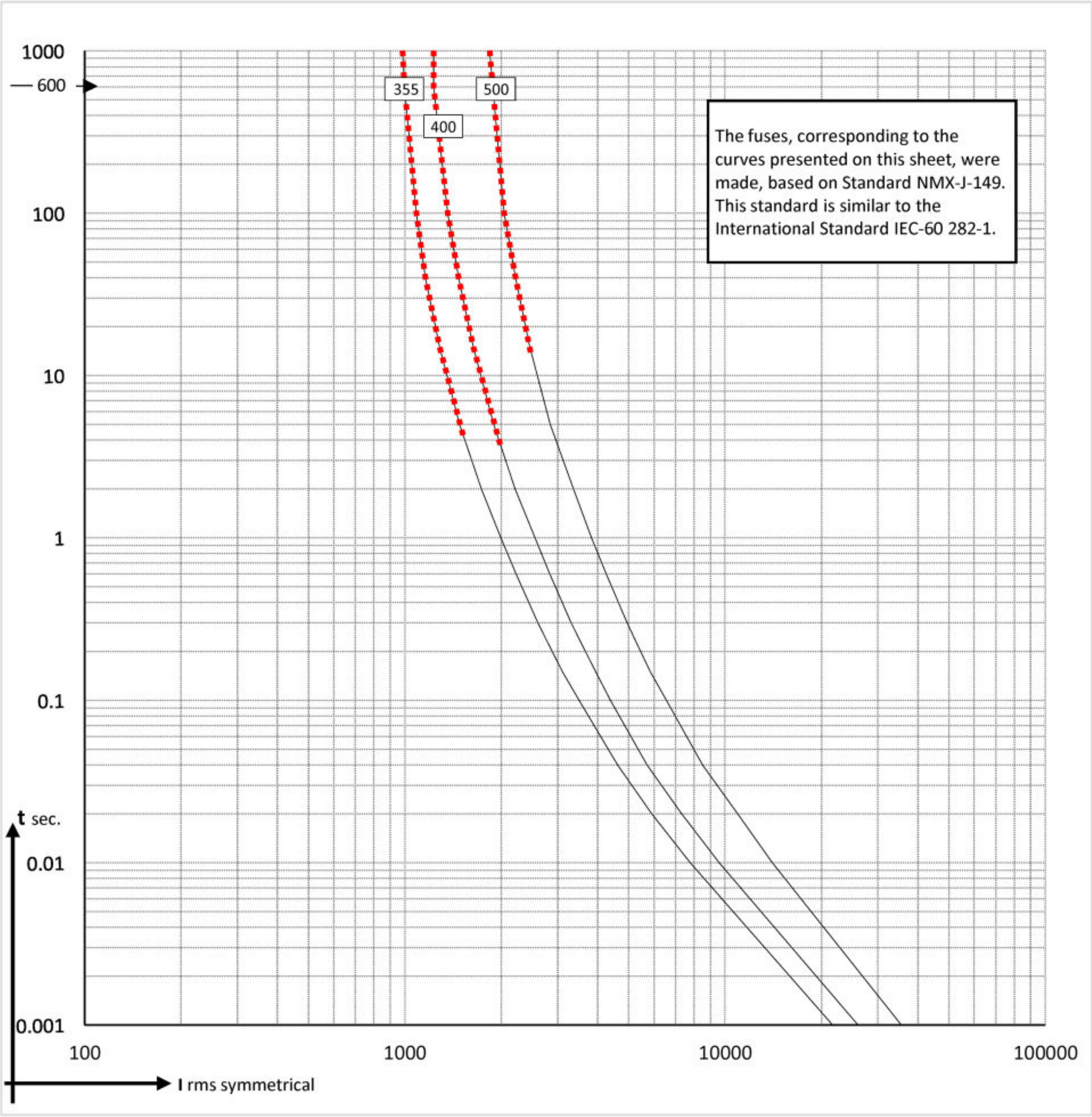
(I_r = 125 till 315 A)



Operating Curves

(CURRENT - TIME)

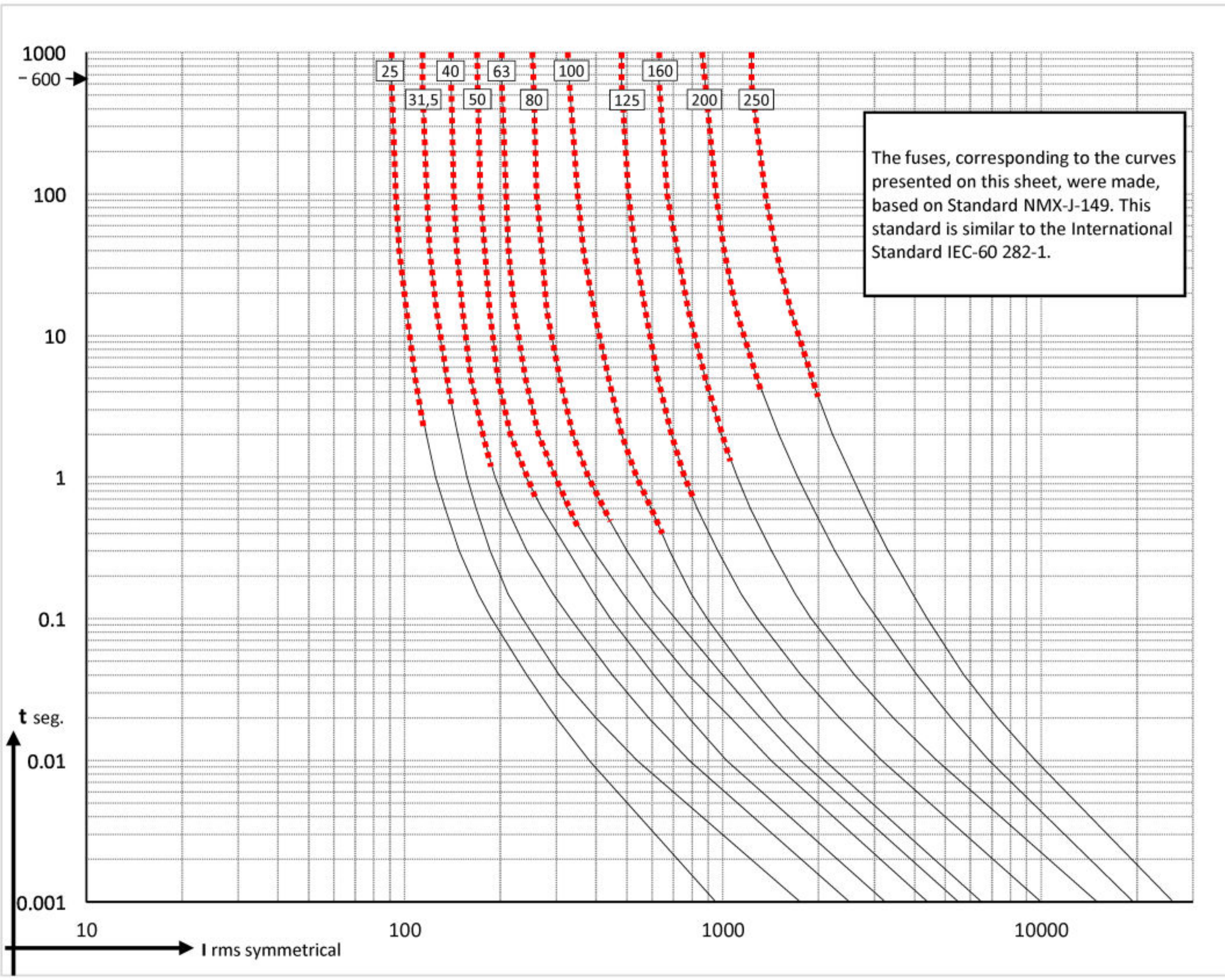
(I_r = 355 till 500 A)



Operating Curves For Motor Application

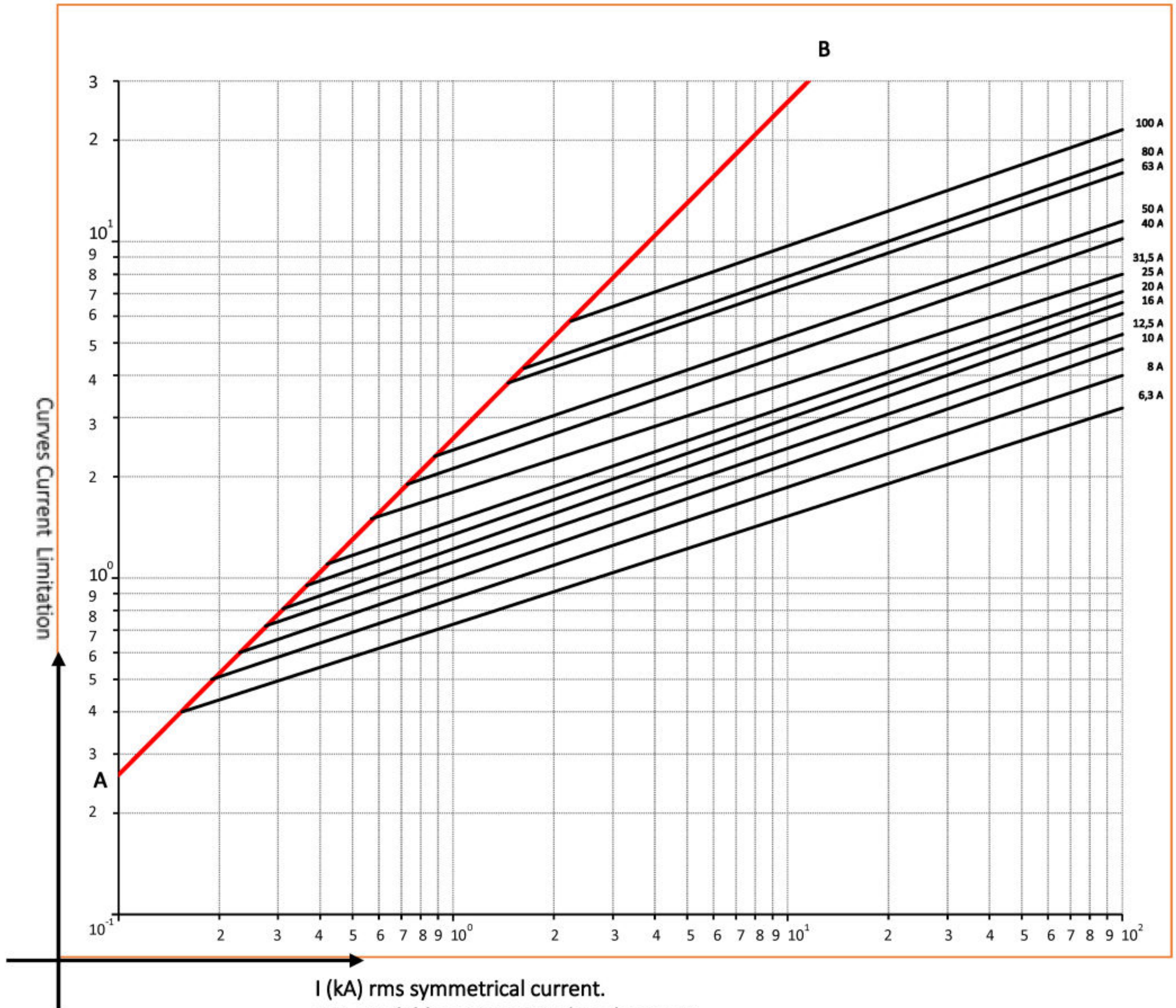
(CURRENT - TIME)

(I_r = 25 till 250 A)



CURVES CURRENT LIMITATION

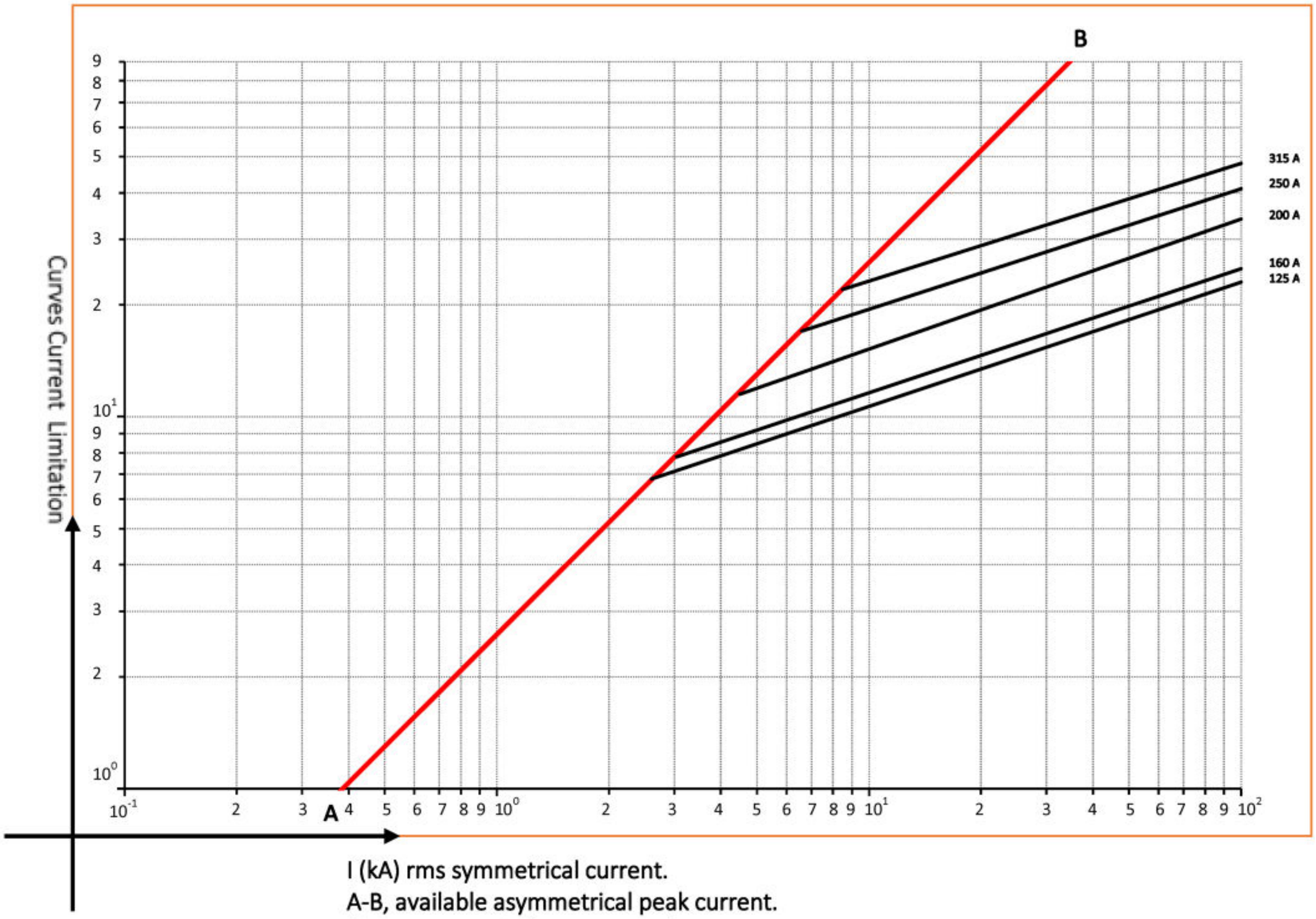
(I_r = 6,3 till 100 A)



I (kA) rms symmetrical current.
A-B, available asymmetrical peak current.
(2,6 x symmetrical rms current).

CURVES CURRENT LIMITATION

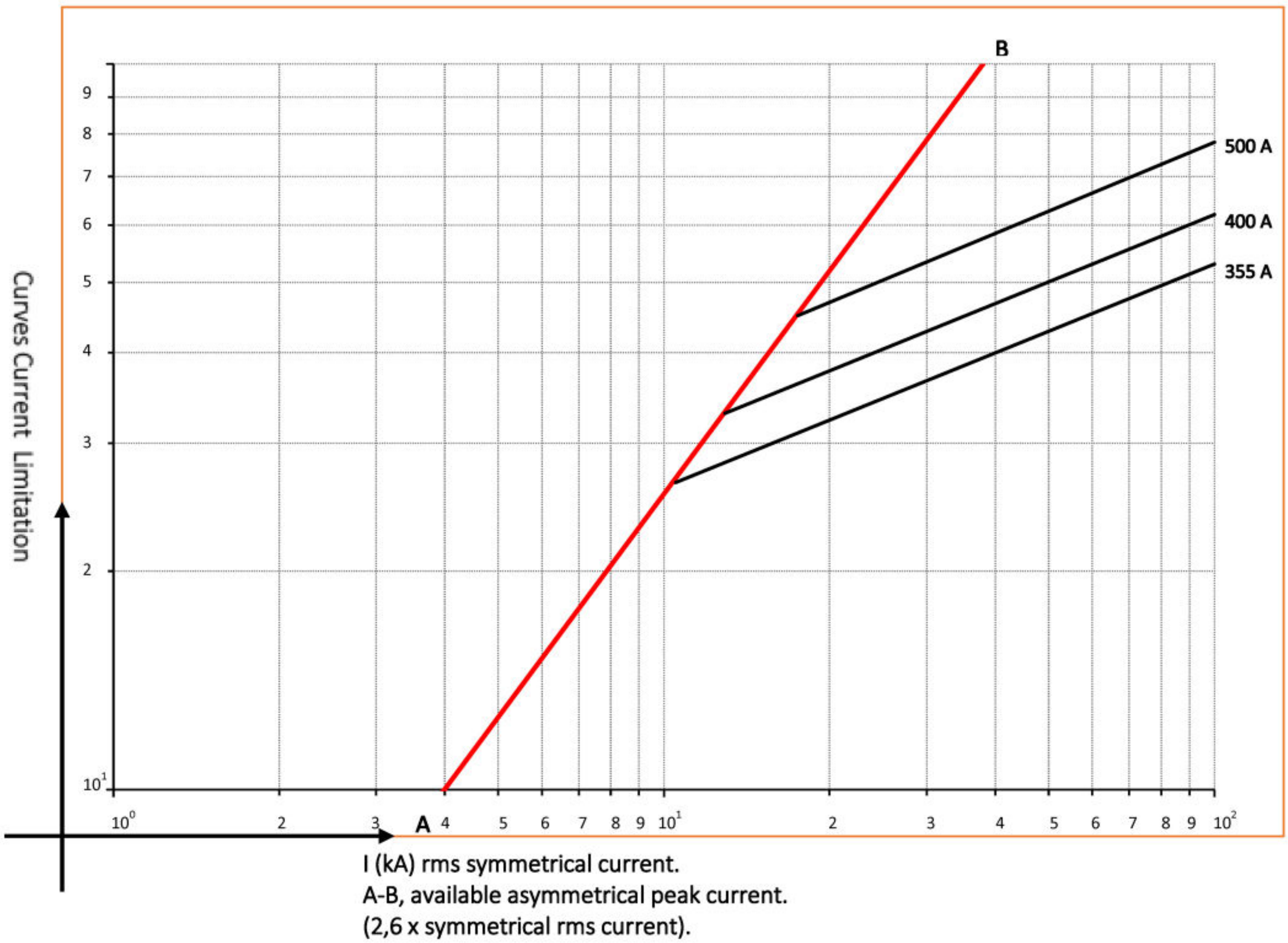
(I_r = 125 till 315 A)



I (kA) rms symmetrical current.
A-B, available asymmetrical peak current.
(2,6 x symmetrical rms current).

CURVES CURRENT LIMITATION

(I_r = 355 till 500 A)



Bus Spacing Medium Voltage Switchgear						
VOLTAGES			**AIR CLEARANCE**		**SURFACE CLEARANCE**	
Rated Maximum	Low-Frequency Withstand	Impulse Withstand	Insulated Conductors	Bare Conductors	Insulatd Conductors	Bare Conductors
635 V	2.2 kV	N/A	N/A	1"	N/A	2"
4.76 kV	19 kV	60 kV	2"	3 1/2"	3"	5"
15 kV	36 KV	95 KV	3'	6'	5'	7"
27 kV	60 KV	125 KV	6'	9"	9"	14"
38 kV	80 kV	150 kV	7 1/2'	10 1/2"	11:	17"

Metal Enclosed Switchgear / Load Interrupter Switches

Routine Yearly Maintenance Instructions.

- Register the contacts resistance upon arrival with a ducter before energizing the switchgear.
- Keep it in record for further reference.
- Check regularly for hot spots with an infrared camera.
- When the switch enters maintenance check the contacts resistance. If the new value is larger than 50% than the original, tighten the springs on the blades.

SWITCH

- The switch does not require an extensive routine maintenance.
- All you must do is to clean the accumulated dust and lubricate the conducting parts. (Hinge and closing contacts and blades)
- Use a lubricating grease for electric contacts for -20°c+40°c temperature with no content of metals.
- In case the switch is not frequently operated, lubrication should be performed when the switchgear enters maintenance.

SWITCHGEAR

- When the switchgear enters maintenance all the screws, bolts and nuts should be checked for tightness and tighten with a moderate torque force to avoid fractures if needed.
- When the switch enters maintenance check the contacts resistance. If the new value is larger than 50% more than the original value, tighten the springs on the blades.

See figure:

- Apply a small amount of lubricating grease on the conducting parts
- Lubricate all mechanical parts indicated in the drawing with regular grease for temperatures -20°c +40°c.
- Apply a small amount of lubricating grease on the conducting parts, use a lubricating grease for electric contacts for -20°c+40°c temperature with no content of metals.
- In case that the switch is not frequently operated the lubrication should be performed when the switchgear enters maintenance.