Type 'D' High Voltage HRC Fuse Links

With dimensions to DIN 43625

For use in air to protect Distribution Transformer Circuits

Voltage Range – 7.2kV to 34.5kV

Current Range – 6 Amp to 250 Amp

This range of high voltage HRC fuse links meets the dimensional requirements of DIN 43625, and is tested to IEC 282-1. In North America the relevant standard is ANSI C37.47, which is based upon IEC 282-1.

Suitable for both indoor and outdoor applications, these fuse links are widely used in distribution circuits at system voltages from 2.4kV to 34.5kV.

Performance Data

A.C. short circuit performance

Tests have been carried out by KEMA or ASTA at the breaking capacity indicated below. Certificates and Test Reports in accordance with IEC282-1 are available. The maximum values of breaking capacities quoted are test values which may be limited by test station capability or the economics of testing. Generally the fuse link capability will be considerably higher and no practical limit is imposed on these fuse links for maximum breaking capacity under service conditions.

Low overcurrent performance

Excellent performance is provided under low overcurrent conditions. The minimum breaking current for each rating is shown on the time/current characteristic on pages 3/6 to 3/15 as the point where the curve becomes discontinuous – for the majority of ratings the minimum breaking current is between 2 and 3 times the rated current of the fuse link.

Where an instantaneous trip-all-phase load break switch is used in conjunction with a striker pin fuse link, the combination will be self-protecting at fault currents below the minimum breaking current of the fuse link. This is made possible by the use of low melting point alloy which is applied to the centre of the elements thus ensuring that unacceptable temperatures are not reached during the prolonged pre-arcing period. The striker functions normally for all currents down to minimum melting current.

Where the HV fuse link is co-ordinated with an overcurrent protective device, for example, expulsion fuse or overload relay, then the minimum breaking current must be lower than the intersection of the prospective time/current characteristics.

Characteristics

These are shown on Pages 3/6 to 3/15.

The time/current characteristics relate to mean pre-arcing times and are accurate to within a manufacturing tolerance of ±10% related to current.

Where instantaneous striker operated tripping of HV fuse switch combinations is employed then the minimum breaking current of the HV fuse link must be less than the maximum interrupting current of the associated switch.

The cut-off current characteristics show the maximum peak current a given fuse link will permit for various fault currents.

The pre-arcing I^2t values given are for adiabatic conditions and in service pre-arcing values will normally be higher.

The total I^2t values given are obtained during tests under the most onerous conditions. They are particularly affected by applied voltage and in service the values will generally be much less than those quoted. Because the total I^2t/prospective current characteristics tend towards a constant value, the figures quoted will also apply to prospective current greater than the maximum tested breaking capacity.

Available ranges

Max. 3-Phase Service Voltage kV RMS	List No. Prefix	Current Rating Amp	Breaking Capacity* kA RMS SYM	3-Phase MVA Rating*
7.2	DSSAX	6,10,16,25,40,50,63,80,100	40	500
	DSSBX	125,160	40	500
	DSLBX	200, 250	45	560
12	DESAGX	6, 10, 16, 25, 40	25	520
	DESAX	40, 50, 63	25	520
	DESBX	80, 100	25	520
15.5	DFLBX	80, 100, 125	40	1100
17.5	DFSAX	6,10,16, 25, 32, 40	25	750
	DFLAX	6,10,16,20,25,32,40,50,63	40	1100
24.94	DTLAX	6,10,16,20,25,32,40,50	34	1500
	DTLBX	63, 80	34	1500
	DTMBX	100	25	1000
27.6	DWLAX	6, 10, 16, 20, 25, 32	40	2000
	DWLBX	40, 50	35	2000
	DWMBX	63, 80	20	1300
34.5	DHMBX	6,10,16,20,25,32,40,50,56	16	1000

** The breaking capacities and MVA values quoted are test values and apply at the maximum voltage rating.*

To establish list numbers for ordering purposes combine list number prefix with current rating, ie. DSLBX 250.

Performance Data

Arc voltage

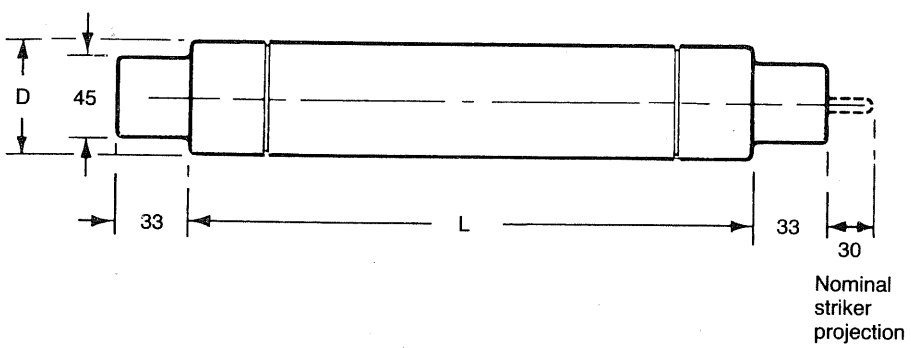
The overvoltage produced by the fuse link during the arcing period is limited by the values in Table IX of IEC Standard 282-1. Type 'D' fuse links have maximum values well within the standard and can thus generally be used at a voltage level at least one step down in Table IX. For example, the 17.5kV class may be used on 12kV systems. For further information, refer to GEC ALSTHOM Low Voltage Equipment Limited.

Striker pins

All fuse links are equipped with a striker pin which can be used to indicate fuse operation or to operate a trip mechanism where provided. The striker pin, which is activated by a small pyrotechnic device, has travel in accordance with the Medium Class requirements of Table XII in IEC 282-1. A lockout feature is incorporated with a minimum withstand force of 40 Newtons, which can be required to hold the trip bar of an associated switch in the locked out position. This prevents reclosure of the switch until the fuse links have been replaced.

Dimensions

(complying with dimensions of type I to IEC 282-1:1985)



Fuse Link Type	Dimensions *in millimetres*	
	L	D
DSSAX	292	65
DSSBX	292	86
DSLBX	442	86
DESAGX	292	65
DESAX	292	65
DESBX	292	86
DFLBX	442	86
DFSAX	292	65
DFLAX	442	65
DTLAX	442	65
DTLBX	442	86
DTMBX	537	86
DWLAX	442	65
DWLBX	442	86
DWMBX	537	86
DHMBX	537	86

Application Notes

Transformer circuit applications

The criteria for selection of fuse links for transformer circuit applications are covered in IEC 787-1983. The main requirements are shown in Fig. 1 and are:

1. The HV fuse link must withstand inrush current.

   For practical purposes this means that the time/current characteristic must be to the right of the point given by 12 times transformer full load current and 0.1 seconds.

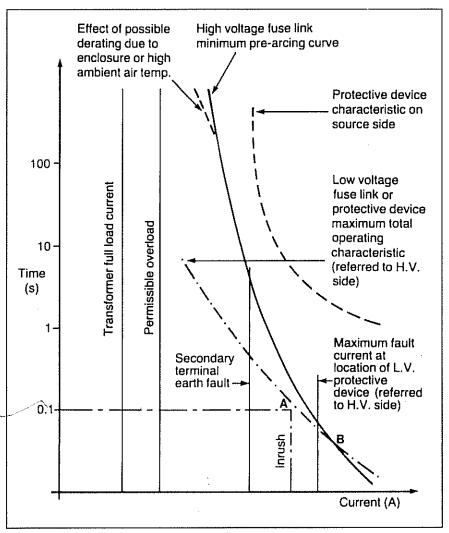
2. The in-unit HV fuse link current rating must be at least as high as the permissible overload current of the transformer, assumed to be 150% in the table (below).

3. For complete co-ordination between the HV fuse link and secondary side protective devices the minimum pre-arcing time/current characteristic of the HV fuse link and the total operating time/current characteristic of the secondary side protective device (referred to the primary side) should intersect at a higher value of current than the maximum fault current on the load side of the secondary protective device.

   In order to ensure adequate protection of the transformer the pre-arcing current of the HV fuse link should be as low as possible in the 10 second region of the time/current characteristic.

Figure 1

Characteristics for HV/LV transformer circuit protection

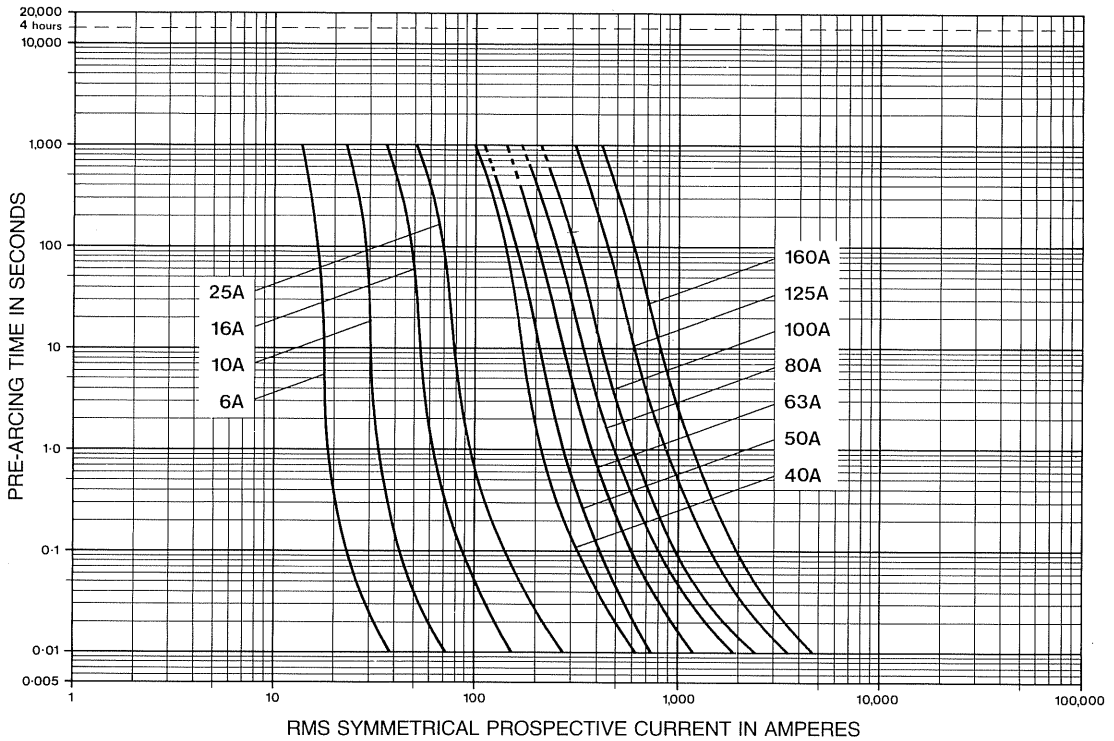


Transfer 3-phase rating	Voltage rating kV									
	3.3	6.9	10	12	12.47	15.5	20	24.94	27.6	34.5
	Fuse link type									
	DSSAX DSSBX DSLBX	DSSAX DSSBX DSLBX	DESAGX DESAX DESBX	DESAGX DESAX DESBX	DFSAX DFLAX DFLBX	DFSAX DFLAX DFLBX	DTLAX DTLBX DTMBX	DTLAX DTLBX DTMBX	DWLAX DWLBX DWMBX	DHMBX
kVA	Fuse link rating – Amp									
25	16	6	6	6	6	6	6	6	6	6
50	25	16	10	10	6	6	6	6	6	6
63	25	16	10	10	10	6	6	6	6	6
75	25	16	16	10	10	10	6	6	6	6
100	40	25	16	16	10	10	10	6	6	6
125	40	25	16	16	16	10	10	10	10	6
160	50	40	25	25	16	16	10	10	10	10
200	63	40	25	25	16	16	16	10	10	10
250	80	40	40	25	20	16	16	16	16	10
315	100	40	40	40	25	20	16	16	16	16
400	125	50	40	40	32	25	20	16	16	16
500	160	63	50	40	40	32	25	20	20	16
630	200	80	63	50	50	40	32	25	20	20
800	250	100	80	63	63	50	40	32	25	20
1000	–	125	100	80	80	63	50	40	32	25
1250	–	160	–	100	100	80	63	50	40	32
1600	–	200	–	–	125	125	80	63	50	40
2000	–	250	–	–	–	125	100	80	63	50
2500	–	–	–	–	–	–	–	100	80	–

The above recommendations are based on a transformer overload factor of 1.5 and the magnetising inrush requirements of IEC 787 – 1983.

Characteristics 7.2kV

Types 'DSSAX' & 'DSSBX'
Time/Current Characteristics
6 - 160 Amp



Type 'DSLBX'
Time/Current Characteristics
200 & 250 Amp