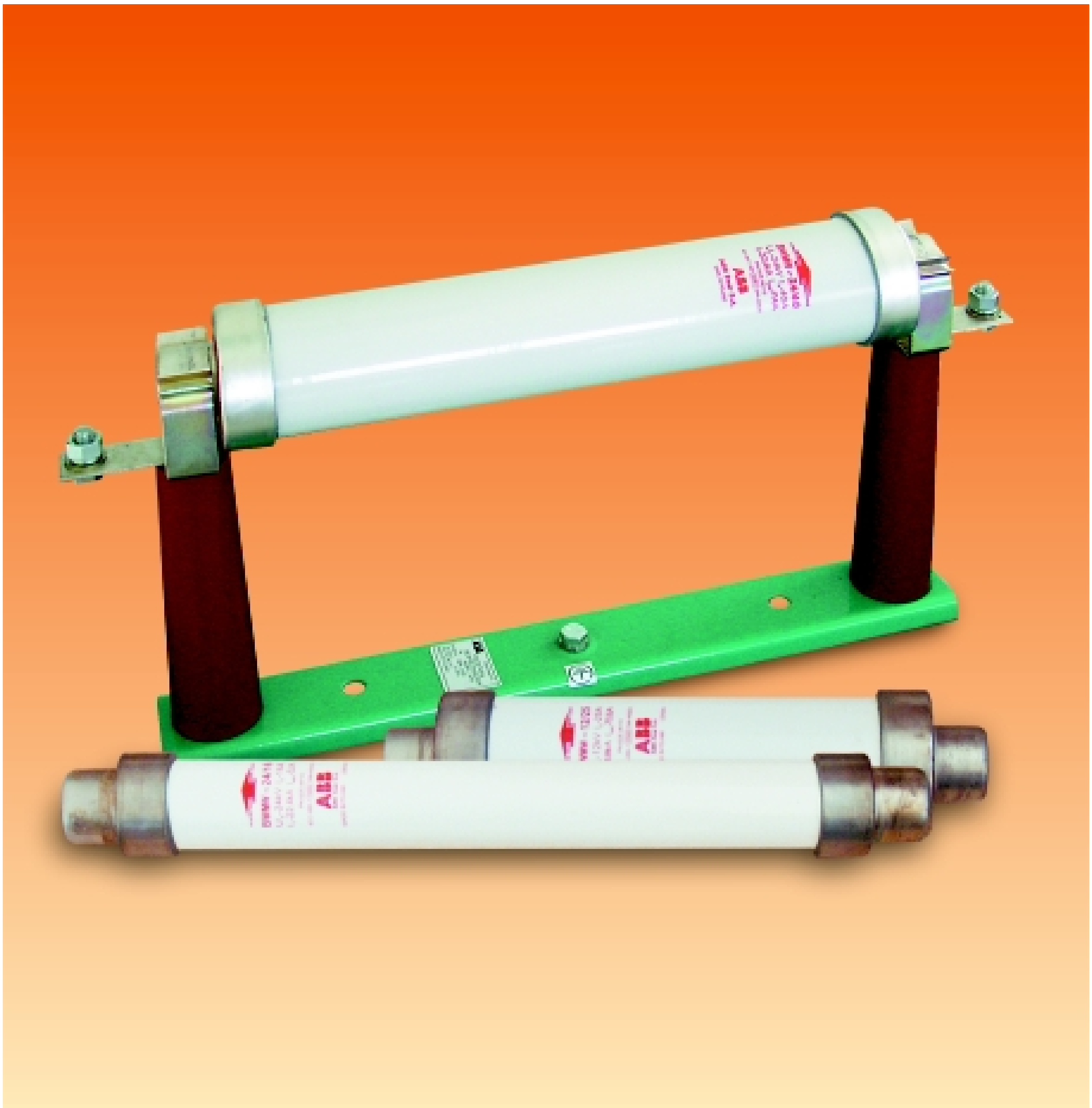
Medium Voltage HRC FUSES

Catalogue sheet B30/06.03e



1. FEATURES

– High rupturing capacity
– Short–circuit current limiting
– Low rated minimum breaking current (I_{min})
– Low switching overvoltages (U_m)
– Can be used with switch disconnector (it is fitted with a medium–size striker pin)
– Dimensions acc. to DIN and IEC Standards.

2. APPLICATIONS

The HRC (high rupturing capacity) fuse–links are used to protect transformers, capacitor banks, cable and overhead lines against short–circuits. They protect switchgears from thermal and electromagnetic effects of heavy short–circuit currents by limiting the peak current values (cut–off characteristic) and interrupting the currents in several milliseconds.

The type BWMW fuse–links interrupt overload currents greater than I_{min} (for the I_{min} values refer to Table 1).

In situations where overloads lower than I_{min} are to be interrupted by the protective system, a switch–disconnector fitted with an overcurrent protecting device is to be used together with the type BWMW fuse–links.

BWMW fuse–links can be used with type BWMP, BWMPE, BWMPNS, BWMPNW and BPS–01 fuse–bases as well as type OR5 or NALF switch–disconnectors.

3. ENVIRONMENTAL OPERATING CONDITIONS

BWMW fuse–links can be operated under the following environmental conditions:
– on indoor and outdoor equipment,
– at ambient temperatures of –30°C to +40°C,
– at relative humidity of ambient air of 100% at a temperature of +20°C.

4. DESIGNATIONS VERSIONS

4.1 BWMW–fuse–links numbering system

The numbering system for the BWMW fuse–links has four alphanumerical sections as shown in the diagram below.

BWMW	– 7,2	/ 100	– 1
Fuse–link type	**Rated voltage**	**Rated current**	**Additional designation:**
BWMW	**7,2–**7,2 kV **12–**12 kV **24–**24 kV **36–**36 kV	**3,15 A** **6,3 A** **10 A** **16 A** **20 A** **25 A** **31,5 A** **40 A** **56 A** **63 A** **80 A** **100 A**	Type BWMW 7,2 /63;80;100 A Fuse–links version that is 292 mm long

4.2 BWMP–fuse–base numbering system

The numbering system for the BWMP fuse–base has four alphanumerical sections as shown in the diagram below.

BWMP	E	– 7,2	/ 56
Fuse base type	**Insulator type**	**Rated voltage**	**Rated current**
BWMP	**E** – resin **NS** – outdoor porcelain standing–insulator **NW** – outdoor porcelain suspented insulator No designation – indoor porcelain insulator	**7,2**–7,2 kV **12**–12 kV **24**–24 kV **36**–36 kV	40 A 50 A 56 A 63 A 100 A (Refer to Table 2)

A fuse–link when mounted on its fuse–base makes a complete fuse. For a list of fuse bases refer to Table 2.

5. COMPLIANCE WITH STANDARDS

The fuse–links meet the requirements of the following Standards:
– Polish Standard PN–92/E–06110
– Polish Standard PN–86/E–06114
– International Standard IEC 282–1: 1994
– International Standard IEC 644 of 1979
– German Standard DIN 43625
– Russian Standard GOST 2213: 1979

The fuse–bases meet the requirements of the following Standards:
– Polish Standard PN–77/E–06110
– International Standard IEC 282–1: 1994
– German Standard DIN 43625

6. HOW TO ORDER

Order by specifying the product name, type symbol, rated voltage, rated current and quantity.

All additional demands which are not listed in this Catalogue should be agreed with the manufacturer by means of an Inquiry where the sources of requirements (regulations, standards, etc.) are to be specified.

6.1 Order example

1. Type BWMW–7.2/100 High Rupturing Capacity Fuse–link for a rated voltage of 7.2 kV, a rated current of 100 A
2. Type BWMPNW–12/56 Outdoor Fuse–base for a rated voltage of 12 kV, a rated current of 56 A. – 20 pcs
3. Type BWMW–36/20 High Rupturing Capacity Fuse–link for a rated voltage of 36 kV, a rated current of 20 A
4. Type BWMPNS–36/40 Outdoor–Standing Fuse–base for a rated voltage of 36 kV, a rated current of 40 A. – 20 pcs.

7. SPECIFICATIONS

7.1 Fuse–links specifications

Table 1.

Fuse-link Type	Rated Voltage	Rated current	Rated Breaking Current	Min Breaking Current	Switching voltage	Resis-tance	Weight	Length
	U_n	I_n	I_{ws}	I_{min}	U_m	R± 10%		L
	kV	A	kA	A	kV	mΩ	kg	mm
BWMW-7.2/3.15		3.15		6		650		
BWMW-7.2/6.3		6.3		19.5		195		
BWMW-7.2/10		10		30		130	1.3	
BWMW-7.2/16		16		48		64		192-1
BWMW-7.2/20		20		54		52		
BWMW-7.2/25		25		67		39		
BWMW-7.2/31.5		31.5		80		31	2.6	
BWMW-7.2/40	7.2	40	40	94	<20	25		
BWMW-7.2/56		56		117		16		
BWMW-7.2/63 -1		63		200		15.5		
BWMW-7.2/80 -1		80		280		11	3.6	292-1
BWMW-7.2/100 -1		100		400		8.2		
BWMW-7.2/63		63		150		13.4		
BWMW-7.2/80		80		200		12.5	5.2	442-1
BWMW-7.2/100		100		330		9		
BWMW-12/3.15		3.15	46	7.4		920		
BWMW-12/6.3		63		17.8		300		
BWMW-12/10		10		30		200	1.7	
BWMW-12/16		16		50		100		
BWMW-12/20		20	48	64		76		292-1
BWMW-12/25	12	25		70.6		51		
BWMW-12/31.5		31.5		78	<30	45.5		
BWMW-12/40		40		88		37.2	3.6	
BWMW-12/56		56	40	172		22.5		
BWMW-12/63		63		188		21.6		
BWMW-12/80		80	46	355		16.7	6.1	537-1
BWMW-12/100		100		444		12		
BWMW-24/3.15		3.15		11		1500		
BWMW-24/6.3		6.3		15.5		500		
BWMW-24/10		10		30		340	2.6	
BWMW-24/16		16		52		160		
BWMW-24/20		20		66		120		442-1
BWMW-24/25	24&17.5	25	22.4	72	<55	90		
BWMW-24/31.5		31.5		91		75.5	5.2	
BWMW-24/40		40		114		60		
BWMW-24/56		56		152		45.5		
BWMW-24/63		63		172		36	6.1	537-1
BWMW-36/3.15		3.15		11.2	<108	2400		
BWMW-36/6.3		63		16.8		780	3.0	
BWMW-36/10		10		30		500		
BWMW-36/16	36	16		55		240		537-1
BWMW-36/20		20	20	72	<96	185		
BWMW-36/25		25		85		139	6.1	
BWMW-36/31.5		31.5		85		110		
BWMW-36/40		40		108		97		

The resistance are to be measured by a electrical bridge method or technical metod using measuring instrument with accuracy class not worse than 0.5% at an ambient temperature of t = 20ºC ±2ºC.

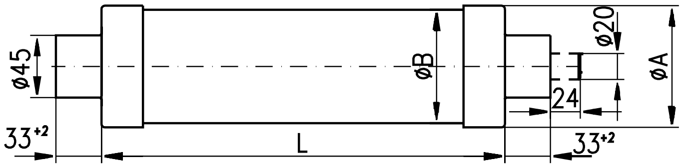
7.2 Fuse– bases specifications

Table 2

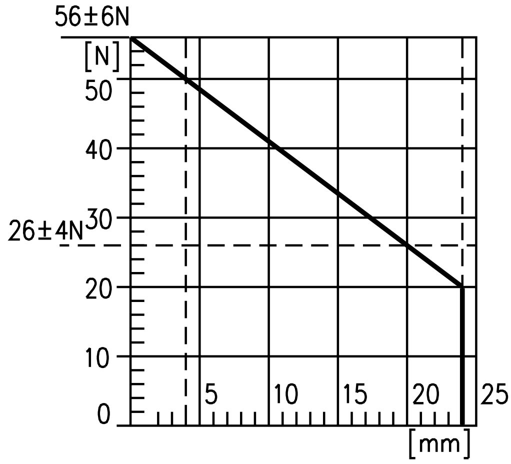
Fuse–base type	Rated voltage U_n kV	Rated current I_n A	Rated frequency f Hz	Weight kg	Related fuse–link
BWMP–7,2/56	7,2	56	50;60	5.4	**BWMW–7,2/3,15÷56**
BWMP–7,2/100		100		6.1	**BWMW–7,2/63÷100**
BWMP–12/56	12	56		5.6	**BWMW–12/3,15÷56**
BWMP–12/100		100		6.2	**BWMW–12/63÷100**
BWMP–24/50	24	50		8.7	**BWMW–24/3,15÷50**
BWMP–24/63		63		8.9	**BWMW–24/63**
BWMP–36/40	36	40		15.0	**BWMW–36/3,15÷40**
BWMPE–7,2/56	7,2	56	50;60	3.4	**BWMW–7,2/3,15÷56**
BWMPE–7,2/100		100		4.1	**BWMW–7,2/63÷100**
BWMPE–12/56	12	56		3.6	**BWMW–12/3,15÷56**
BWMPE–12/100		100		4.2	**BWMW–12/63÷100**
BWMPE–24/50	24	50		4.8	**BWMW–24/3,15÷50**
BWMPE–24/63		63		5.0	**BWMW–24/63**
BWMPE–36/40	36	40		6.2	**BWMW–36/3,15÷40**
BWMPNS–7,2/56	7,2	56	50;60		**BWMW–7,2/3,15÷56**
BWMPNS–7,2/100		100			**BWMW–7,2/63÷100**
BWMPNS–12/56	12	56			**BWMW–12/3,15÷56**
BWMPNS–12/100		100			**BWMW–12/63÷100**
BWMPNS–24/50	24	50		17.6	**BWMW–24/3,15÷50**
BWMPNS–24/63		63		18.1	**BWMW–24/63**
BWMPNS–36/40	36	40		27.4	**BWMW–36/3,15÷40**
BWMPNW–7,2/56	7,2	56	50;60		**BWMW–7,2/3,15÷56**
BWMPNW–7,2/100		100			**BWMW–7,2/63÷100**
BWMPNW–12/56	12	56			**BWMW–12/3,15÷56**
BWMPNW–12/100		100			**BWMW–12/63÷100**
BWMPNW–24/50	24	50		17.6	**BWMW–24/3,15÷50**
BWMPNW–24/63		63		18.1	**BWMW–24/63**
BWMPNW–36/40	36	40		27.4	**BWMW–36/3,15÷40**

BWMP An indoor fuse–base with porcelain insulators
BWMPE An indoor fuse–base with resin insulators
BWMPNS An outdoor fuse–base with porcelain insulators
BWMPNW An outdoor suspended fuse–base with porcelain insulators

Type BWMW high–rupturing–capacity fuse–link



Striker Pin free stroke is 4 mm



F–L Striker Pin Characteristic

Notes:
1. Contact End Caps: silver–plated brass
2. Deviations of dimensions with no tolerance specified shall be within ±3%.

Fuse-link Type	Dimensions (mm) ∅A	∅B	L	Fuse-link Type	Dimensions (mm) ∅A	∅B	L
BWMW-7,2/3,15	62	54	192-1	BWMW-12/56	88	82	292-1
BWMW-7,2/6,3				BWMW-12/63			537-1
BWMW-7,2/10				BWMW-12/80			
BWMW-7,2/16				BWMW-12/100			
BWMW-7,2/20				BWMW-24/3,15	62	54	442-1
BWMW-7,2/25	88	82		BWMW-24/6,3			
BWMW-7,2/31,5				BWMW-24/10			
BWMW-7,2/40				BWMW-24/16			
BWMW-7,2/56				BWMW-24/20			
BWMW-7,2/63 -1			292-1	BWMW-24/25	88	82	
BWMW-7,2/80 -1				BWMW-24/31,5			
BWMW-7,2/100 -1				BWMW-24/40			
BWMW-7,2/63			442-1	BWMW-24/50			
BWMW-7,2/80				BWMW-24/63			537-1
BWMW-7,2/100				BWMW-36/3,15	62	54	537-1
BWMW-12/3,15	62	54	292-1	BWMW-36/6,3			
BWMW-12/6,3				BWMW-36/10			
BWMW-12/10				BWMW-36/16			
BWMW-12/16				BWMW-36/20	88	82	
BWMW-12/20				BWMW-36/25			
BWMW-12/25	88	82		BWMW-36/31,5			
BWMW-12/31,5				BWMW-36/40			
BWMW-12/40							

8. CONSTRUCTION AND OPERATION

8.1 Construction and operation of fuse–links

A fuse–link consists of an insulation tube whose both ends are terminated with end caps. Fuse elements are made from specially profiled silver wire and are helically wound on a porcelain winding stick. Additional fusible element intended to control operation of the striker pin is located in a coaxial hole of the stick. The fuse interior is filled with arc–quenching material whose chemical composition and granularity have been appropriately chosen. The fuse–link is sealed at its both ends.

A spring–type striker pin is located in one end–cap and its forced movement can be employed to trip an operating mechanism of a switch–disconnector or to trigger alarm and auxiliary circuits.

The fuse operation depends on automatic one–off interruption of the fault current in the protected circuit by melting of the fuse element and quenching the electric arc produced in the fuse–link interior. The operation is indicated by the striker pin which has now moved to its tripped position.

The fuse–link limits the peak value of the short–circuit current and in consequence effectively protects the circuit against thermal and electromagnetic effects of short–circuits.

8.2 Construction of fuse bases

The fuse–base consists of a steel beam fitted with a protective earthing terminal and two indoor support insulators. Two sets of contacts are mounted on the upper side of the insulator. The set of contacts consists of a contact spring, compression spring, and terminals.

9. PRINCIPLES OF FUSE–LINKS SELECTION

9.1 Selection of rated voltage

The rated voltage for a fuse–link is to be selected in the following way:

– if the fuse–link is to be operated in an earthed neutral three–phase network, the rated voltage for the fuse–link is to be equal to at least line–to–line voltage in the circuit to be protected,

– if the fuse–link is to be operated in a single–phase network, the rated voltage for the fuse–link is to be equal to at least 115% of the highest voltage in the circuit to be protected,

– if the fuse–link is to be operated in an insulated neutral three–phase network or a network compensated by means of earth fault neutraliser, the rated voltage for the fuse–link is to be equal to at least 115% of the line–to–line voltage in this network as double earth faults are possible.

It should be however noted that in situations where a fuse–link featuring an excessive rated voltage has been selected, excessively high voltages for the circuit under consideration might occur. Refer to Table 1 for the limiting overvoltage values for this family of fuse–links. Should it be necessary to obtain more detailed data on the overvoltages, please call the fuse manufacturer.

9.2 Selection of rated current

The rated current of a fuse–link is usually greater than a long–term load for the circuit under consideration. While selecting the rated current, the following should be taken into account.

– long–term current load and operating overloads for the circuit under consideration,

– transient overloads involved into such actions as switching power on and off for such equipment as transformers, electric motors, and capacitor banks,

– co–ordination with other devices intended to protect the circuit under consideration.

The rated current is determined by heating of a single fuse–link under free air conditions at an ambient temperature of +10°C to +40°C.

In situations where the fuse–links are to be used in enclosures, cabinets and at places and in a manner making heat transfer more difficult or if the fuse–links are to operate at an ambient temperature higher than +35°C, lowering of the rated current value can be required to take the actual conditions of heat transfer into account.

Refer to Table 3 for selection of fuse–links rated current recommended for protecting transformers.

The selection presented above has been developed for a transformer overloaded up to 1.5 In when a condition of

$$i_{f01} > 12\ I_n, \text{ is met, where:}$$

i_{f01} – minimum current value corresponding to a pre–arcing time of 0.1 sec.
I_n – rated voltage of the transformer
12 I_n; 0,1 sec. – parameters of the assumed making current for the transformer.

However, in situations where actual making current value and waveform are known the fuse–link is to be selected individually. Besides, when a transformer protecting system is designed, the recommendations of IEC 787 Publication of 1983 is to be taken into consideration.

It is suggested to test warm the equipment with fuses at a load of 1.5 In for the transformer to be protected particularly in cases where the correct selection is doubtful or the fuses are installed in a manner and at places (enclosures, cabinets, partitions, neat other heat sources, at higher ambient temperatures, and etc.) worsening the heat transfer. Section can be accepted as satisfactory if the produced steady state temperature–rise limits do not exceed the values permitted by respective standards.

Table 3. Selection of fuse–links rated current for transformers

Transformer rated power [kVA]	Rated voltage of the transformer [kV]				
	6	**10**	**15**	**20**	**30**
	Rated voltage for the fuse–link				
	7,2	**12**	**17,5**	**24**	**36**
	Fuse–link rated current [A]				
20	6,3	6,3	3,15	3,15	—
30	6,3	6,3	6,3	3,15	3,15
50	10	6,3	6,3	6,3	3,15
75	16	10	6,3	6,3	6,3
100	20	16	10	6,3	6,3
125	20 or 25	16	10 or 16	10	6,3
160	25	20	16	10	10
200	40	20	16	16	10
250	56	31,5	20	16	10
315	56	31,5 or 40	25	20	16
400	63	40 or 56	25 or 31,5	20	16
500	80	56	40	25	25
630	100	63	56	31,5	25
800	—	80	63	40	31,5
1000	—	100	63	50	40
1250	—	—	—	63	—

9.3. Selection of the fuse–link rated current for electric motors – protection coordination principles

9.3.1 Selection of the fuse–link rated current for electric motors in a direct–on–line starting arrangement

Electric motors by protected with switches (contactors, switch disconnectors) fitted with operating mechanisms and are additionally protected by fuses of specially selected characteristics. The fuse–link must be fitted with striker pin whose mechanical energy is used to trigger the switch disconnector.

Difficulty with selection of the rated current for fuse–links intended to protect electric motors in a direct–on–line starting arrangement consists in the necessary immunity of fuses to consecutive overload pulses of the motor–starting–up current.

For the fuse selection requirements, tests, and regulations concerned with motor protection systems refer to IEC 644 Standard: 1979 and its Polish equivalent PN–86/E–06114.

The Types BWMW for rated voltages of 7.2 kV and 12 kV and rated current range of 63 A to 100 A meet the requirements of the Standards mentioned above with respect to their time–current curves and are featured by their k–factors determined by tests for a pre–arcing time of 10 sec. with characteristic accuracy taken into consideration according to these Standards. For the values of k–factors refer to Table 4. The k–factor is to be used for determining the overload curve of fuse–link.

According to these Standards, the k–factor values determined for a pre–arcing time of 10 sec. is valid for motor starting–up periods of 5 to 60 sec if the rate of motor starts is not greater than 6 per hour and no more than two consecutive starts per hour are made provided that the peak value of the starting–up current is not greater than the full–load value multiplied by a factor of 6.

Table 4. k–factor Values

Fuse–link Fuse type	U_n	Dimension "L"	k–factor for particular I_n		
	kV	mm	63 A	80 A	100 A
BWMW – 7,2	7,2	292	0,56	0,55	0,56
		442	0,60	0,60	0,60
BWMW – 12	12	537	0,60	0,59	0,59

According to these Standards, the k–factor values determined for a pre–arcing time of 10 sec. is valid for motor starting–up periods of 5 to 60 sec if the rate of motor starts is not greater than 6 per hour and no more than two consecutive starts per hour are made provided that the peak value of the starting–up current is not greater than the full–load value multiplied by a factor of 6.

Thus,

$$I_r \leqslant k \cdot I_{f10} \qquad \text{and} \qquad I_{ns} \leqslant \frac{k \cdot I_{f10}}{6}$$

where:

I_r – motor starting–up current,

I_{ns} – motor full–load current

i_{f01} – fusing current as read in the fuse–link time–current characteristic for a pre–arcing time of 10 seconds.

If the actual starting–up period differs from 10 seconds, a value of i_f is to be read in the fuse–link time–current characteristic for a pre–arcing time equal to the actual starting–up period (within a range of 5 to 60 seconds) and substituted in the formula.

To make the selection of fuse easier, Table 5 lists fusing current values, i_f, and corresponding motor starting–up current values, i_{rmax} against starting–up periods 5, 10, 20, 30, 40, and 60 seconds.

Table 5. i_f and i_{rmax}, values against s–up periods

U_n	I_n	Dimension "L"		Starting–up periods in seconds					
kV	A	mm	A	5	10	20	30	40	60
7,2	63	292	I_f	210	190	170	160	155	145
			$I_{r\,max} = k \cdot I_f$	118	106	95	90	87	81
	80		I_f	300	270	240	230	215	205
			$I_{r\,max}$	165	148	132	126	118	113
	100		I_f	400	360	320	300	285	270
			$I_{r\,max}$	224	201	179	168	159	151
	63	442	I_f	220	200	180	170	165	160
			$I_{r\,max}$	132	120	108	102	99	96
	80		I_f	300	270	240	230	215	205
			$I_{r\,max}$	180	162	144	138	129	123
	100		I_f	370	330	300	280	265	250
			$I_{r\,max}$	222	198	180	168	159	150
12	63	557	I_f	220	200	180	170	165	160
			$I_{r\,max}$	132	120	108	102	99	96
	80		I_f	300	270	240	230	215	205
			$I_{r\,max}$	177	159	142	136	127	121
	100		I_f	380	340	305	285	275	260
			$I_{r\,max}$	224	200	180	168	162	153

Example

„Select a fuse–link of 12 kV rated voltage to protect a motor having a starting–up current of I_r = 190 A and a starting–up period t_r = 12 seconds for a rate of motor starts not greater than 6 per hour".

First, you should compare the value of Ir to respective ones listed in Table 4. In our case these are 10 s and 20 s. By comparing the respective values it can be seen that the proper fuse–link is that having a current rating of 100 A because

$$I_{r\ max\ 10}(200) > I_r\ (190) > I_{r\ max\ 20}(180)$$

Accurate check can be done by calculating:

$$I_f = \frac{I_r}{k} = \frac{190}{0{,}59} = 322\ \text{A}$$

(Where the value of k–factor has been read in Table 2 for 12 kV/100 A)

and reading the pre–arcing time amounting to 14 s (thus, greater than t_r = 12 s) from the appropriate time–current curve (here 12 kV/100 A).

The full–load of the motor for the selected fuse–link should not exceed a value of

$$I_{ns} \leqslant \frac{I_r}{6} \leqslant \frac{190}{6} \leqslant 31{,}7\ \text{A}$$

Note: The Types BWMW–7,2 kV / 63–100 A are available in two sizes of dimension „L" = 292 mm and 442 mm. Those longer ones (442 mm) should be selected if smaller rated minimum fusing current I min offers a special attraction while by selecting the shorter ones (292 mm) the fuses can be installed at a location of smaller space.

The fuse–links selected in this way are intended for operating under standard environmental conditions specified for the types BWMW. Should it be necessary to install the fuse–links together with other devices in a closed enclosure it is necessary to check whether the ambient temperature of the enclosure interior does not exceed the permissible value of +35°C and, if necessary, a fuse–link of successive higher level of the rated current should then be selected.

9.3.2 How to select the rated current of fuse–link Intended to protect electric motors in an indirect starting arrangement

Because the fuse–links intended to protect electric motors in an indirect starting arrangement are overloaded with excessive pulses of the motor–starting–up current, their rated current may be lower than that for the motor protection in a direct–on–line starting arrangement.

Provision for keeping fuse–link temperature permanently within the permissive temperature–rise limits in long–term duty of the motor to be protected irrespectively of the operating overloads is a decisive selection factor.

To provide satisfactory operation without simultaneous fast deterioration of the fuse–links in the motor circuit in an indirect starting arrangement, the fuse–link rated current should be always greater than the most severe load with operating overloads being taken into account. Therefore, it is recommended to select a rated current equal to the motor full–load current multiplied by a factor of 1.5 to 2.

9.4 How to select the rated breaking current (I_{ws}) of a fuse–link

The rated breaking current (I_{ws}) of a fuse–link is to be equal to at least an initial fault current (I_p) at the location the fuse–link is installed.

9.5 How to Select the Rated Peak Current (determining the required electromagnetic strength of the devices protected by means of fuse–links)

According to the requirements of Polish Standard PN–74/E–05002, the rated peak current i_{nsz} should fulfil the following inequality condition

$$i_{nsz} \geqslant i_u$$

where: i_u – (prospective) impulse short circuit current.

In situations where the fuse limits the value of prospective impulse short circuit current, a product $I_{ogr} \times h$ is to be substituted instead of i_u in the relation presented above.

Where:

I_{ogr} – fuse cut–off current for the prospective impulse short circuit current.– I_u corresponding to the largest designed fuse–link.

h – a factor depending on the fuse cut–off current characteristic band width. In situations where no accurate data is available, a h–factor = 1.5 is to be accepted.

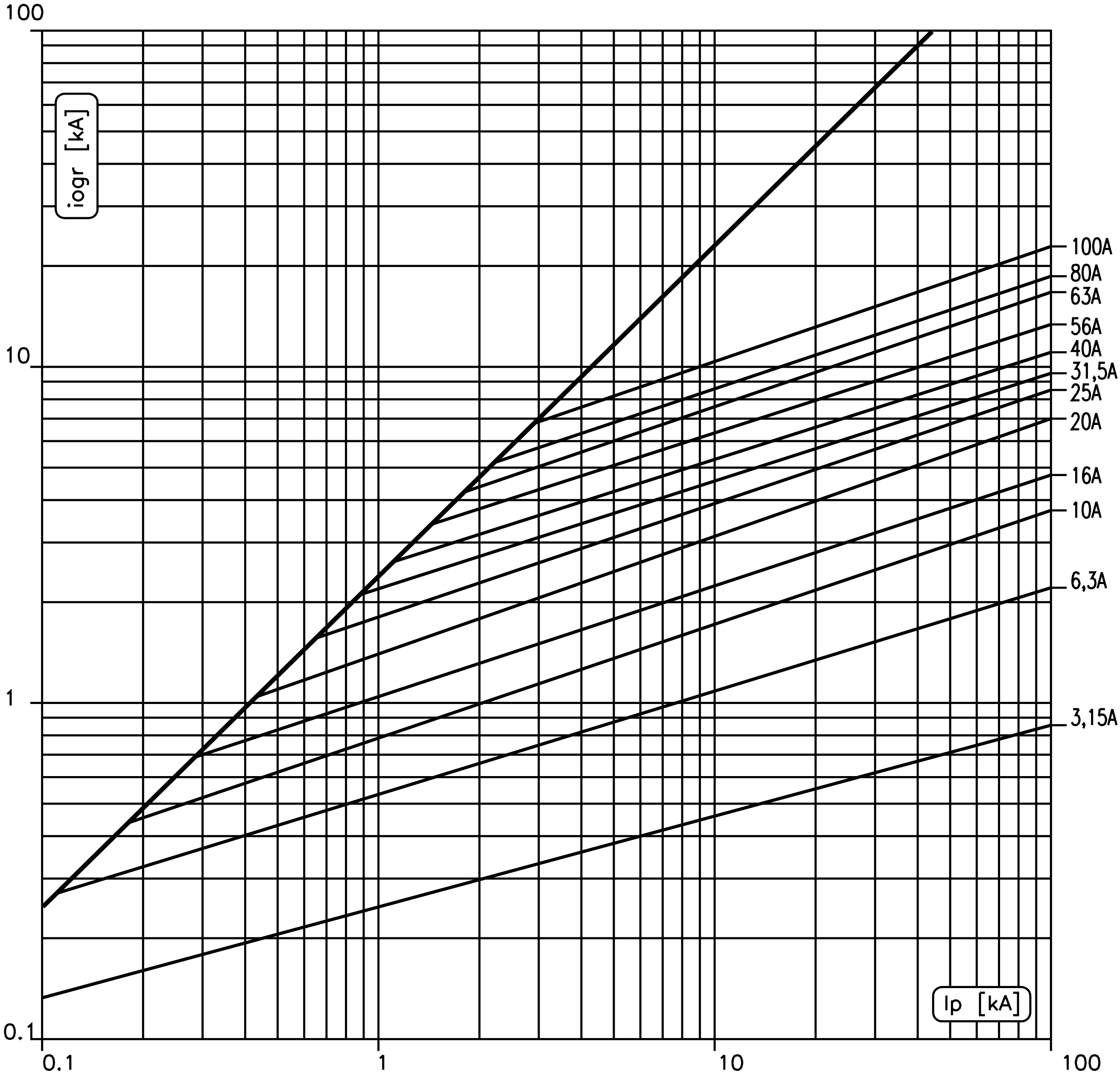


Fig. 1 Cut−off current characteristics for the types BWMW−7,2; 12; 24; 36 kV high rupturing capacity fuse−links

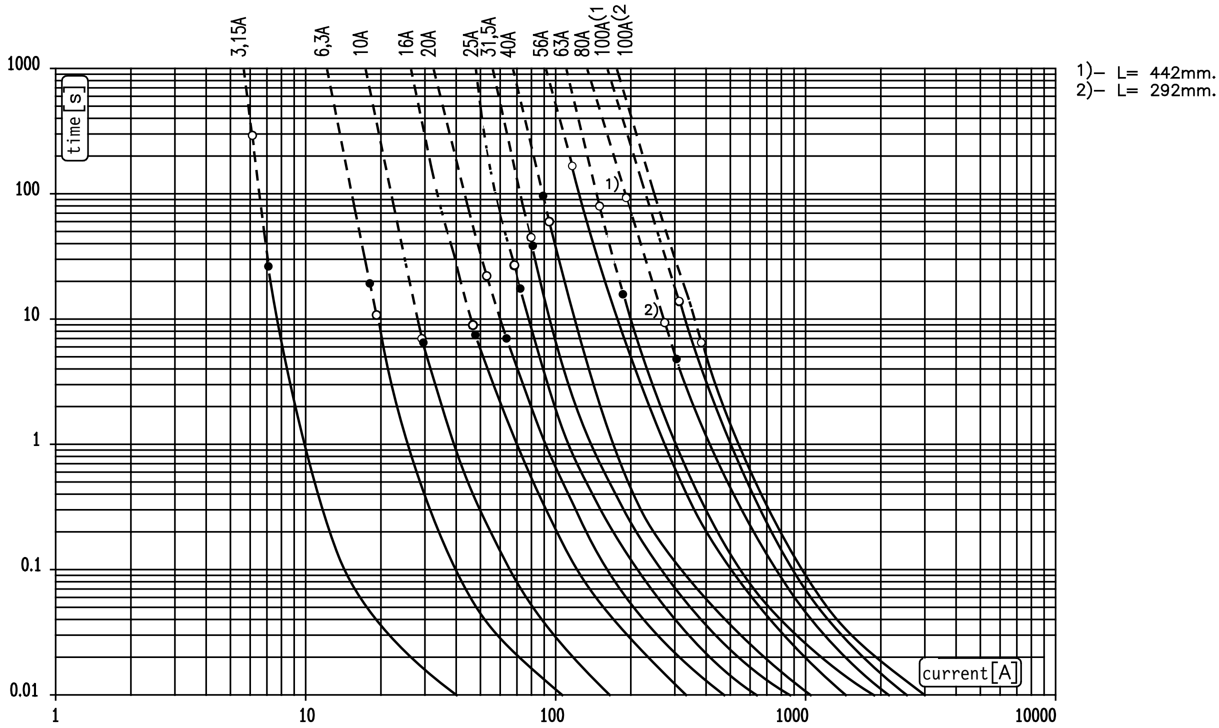


Fig. 2 Time–current characteristics for the types BWMW–7,2/3.15–100 A
(63 A excluded; dimension L = 292 mm); BWMW–12/3,15–40A and 63 A and 80 A Fuse–links

I_3 Current Designations:

❍ – BWMW–7.2 kV Fuse–links

● – BWMW–12 kV Fuse–links

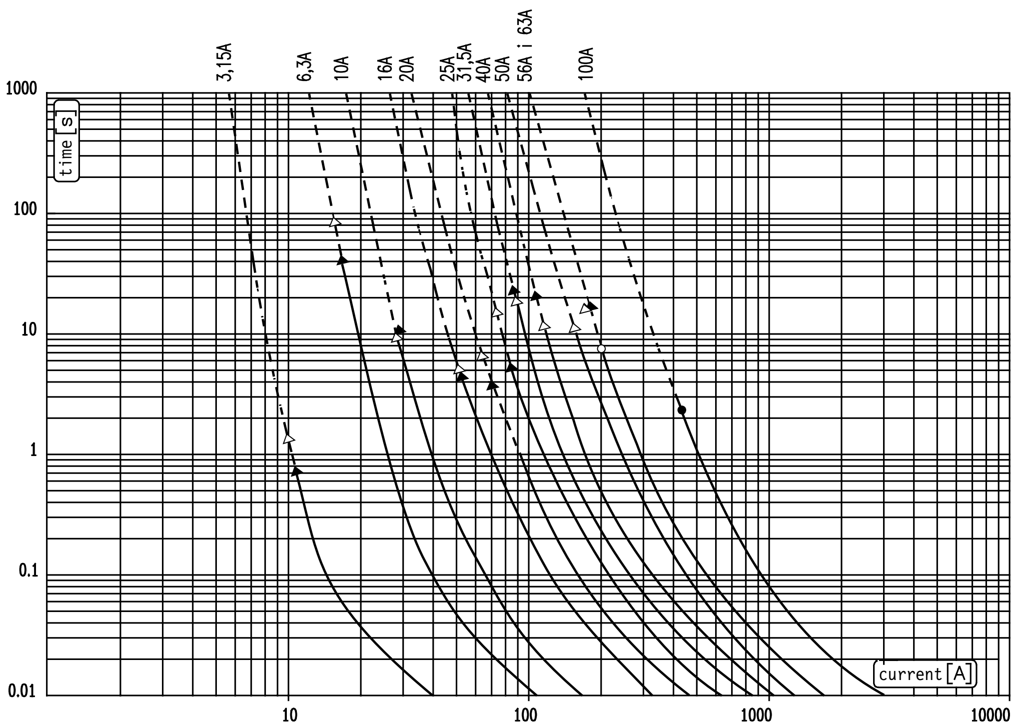


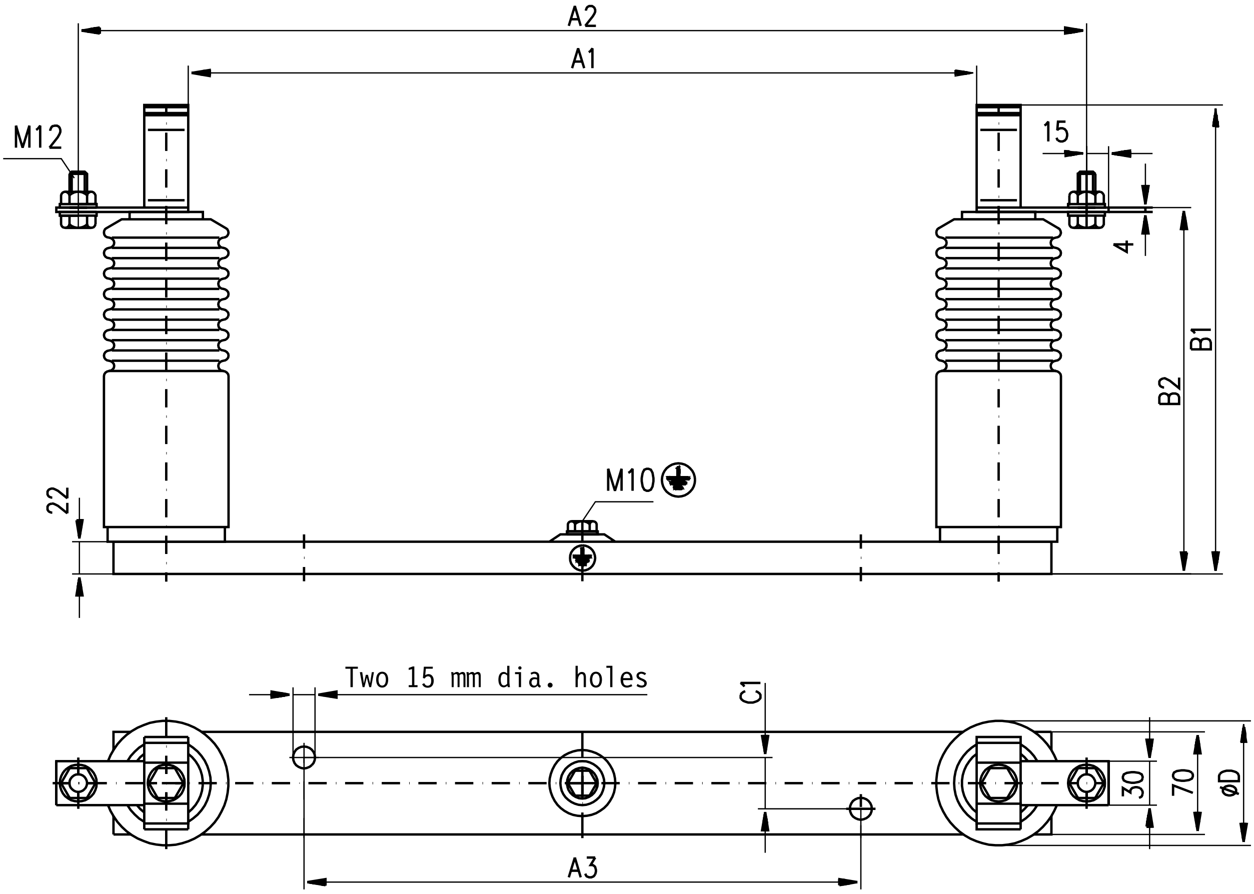
Fig. 3 Time–current characteristics for the types BWMW–7,2/63A (dimension L = 292 mm);
BWMW–24/3,15–63A; BWMW–12/56 and 100 A; and BWMW–36/3,15–40 A Fuse–links

I_3 Current Designations:

❍ – BWMW–7.2 kV Fuse–links   Δ – BWMW–24 kV Fuse–links

● – BWMW–12 kV Fuse–links   ▲ – BWMW–36 kV Fuse–links

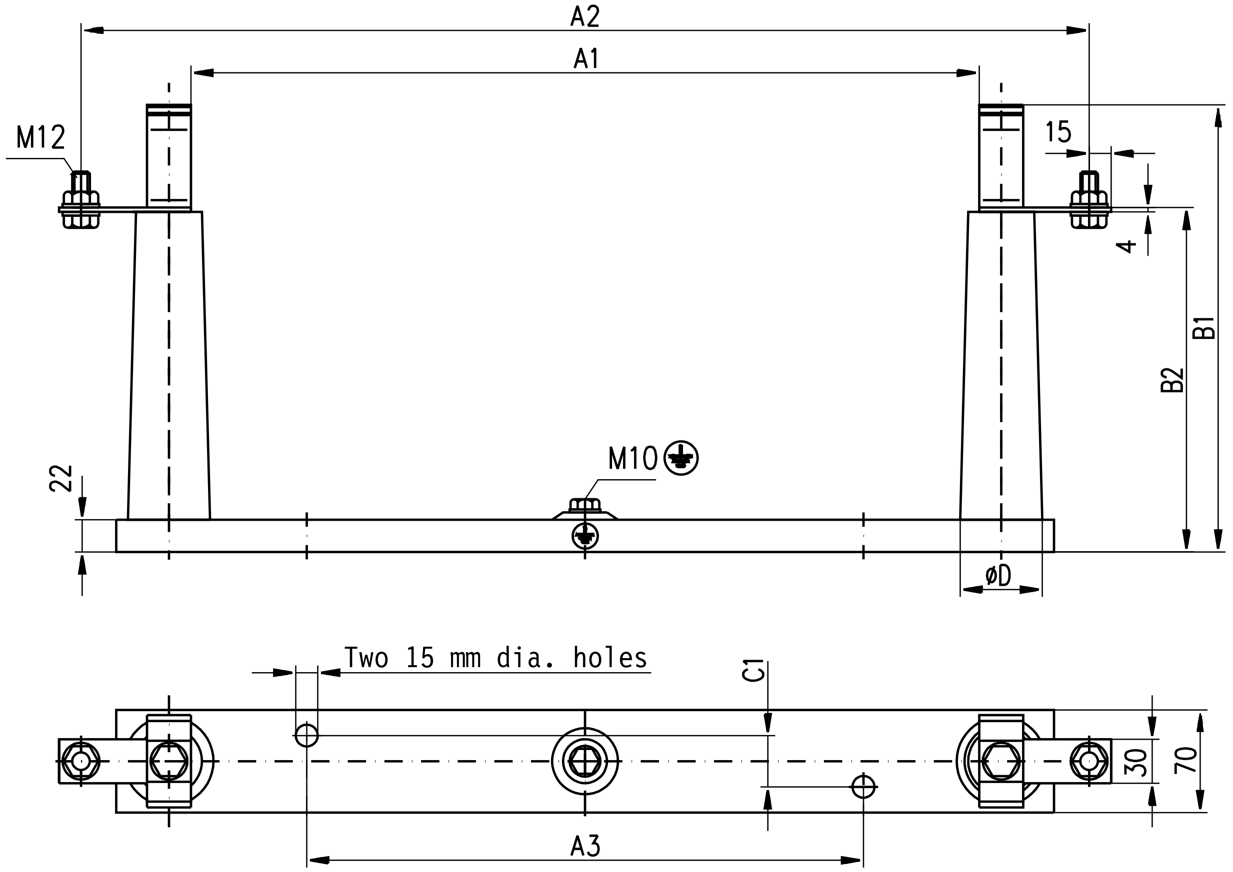
Type BWMP indoor high-rupturing-capacity fuse-base



Notes:
1. Earthing Terminal; tinned steel.
2. Connections: silver-plated brass
3. Contact Springs: silver-plated brass
4. Deviations of dimensions with no tolerance specified shall be within ±3%.

Fuse-base type	Dimensions						
	A3	A2	A1	B2	B1	C1	∅D
BWMP-36/40	380±1	688±1	538±1	329±1	394±1	0	105
BWMP-24/63				239±1	304±1		85
BWMP-24/50	300±1	593±1	443±1				
BWMP-12/100	380±1	688±1	538±1	159±1	224±1		75
BWMP-7,2/100	300±1	593±1	443±1				
BWMP-12/56	180±1	445±1	293±1				
BWMP-7,2/56	55±1	345±1	193±1			35±1	

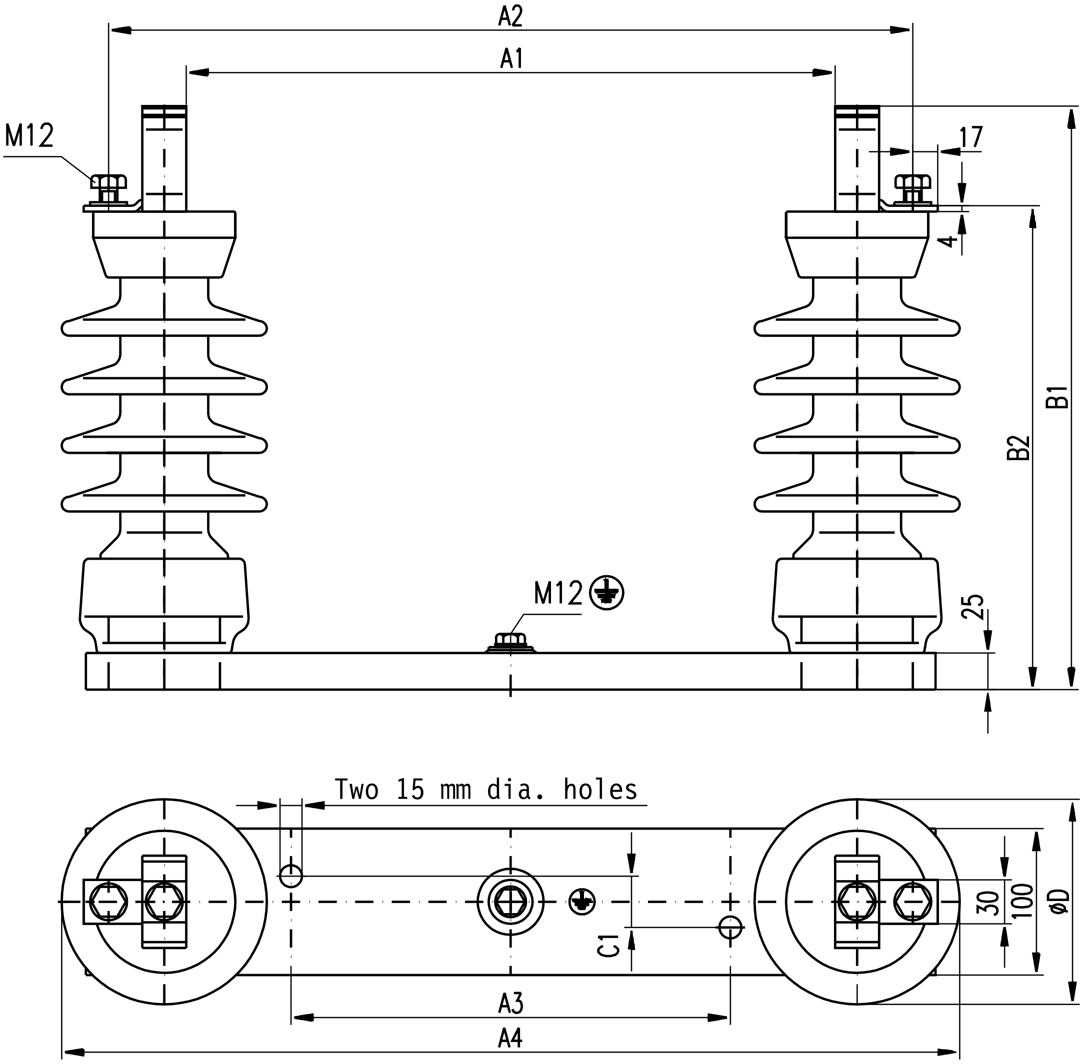
Type BWMPE indoor high–rupturing–capacity fuse–base



Notes:
1. Earthing Terminal; tinned steel.
2. Connections: silver–plated brass
3. Contact Springs: silver–plated brass
4. Deviations of dimensions with no tolerance specified shall be within ±3%.

<table>
<tr><th rowspan="2">Fuse–base type</th><th colspan="7">Dimensions</th></tr>
<tr><th>A3</th><th>A2</th><th>A1</th><th>B2</th><th>B1</th><th>C1</th><th>∅D</th></tr>
<tr><td>BWMPE–36/40</td><td rowspan="2">380±1</td><td rowspan="2">688±1</td><td rowspan="2">538±1</td><td>326±1</td><td>398±1</td><td rowspan="6">0</td><td>70</td></tr>
<tr><td>BWMPE–24/63</td><td rowspan="2">236±1</td><td rowspan="2">308±1</td><td rowspan="6">56</td></tr>
<tr><td>BWMPE–24/50</td><td>300±1</td><td>593±1</td><td>443±1</td></tr>
<tr><td>BWMPE–12/100</td><td>380±1</td><td>688±1</td><td>538±1</td><td rowspan="4">156±1</td><td rowspan="4">228±1</td></tr>
<tr><td>BWMPE–7,2/100</td><td>300±1</td><td>593±1</td><td>443±1</td></tr>
<tr><td>BWMPE–12/56</td><td>180±1</td><td>445±1</td><td>293±1</td></tr>
<tr><td>BWMPE–7,2/56</td><td>55±1</td><td>345±1</td><td>193±1</td><td>35±1</td></tr>
</table>

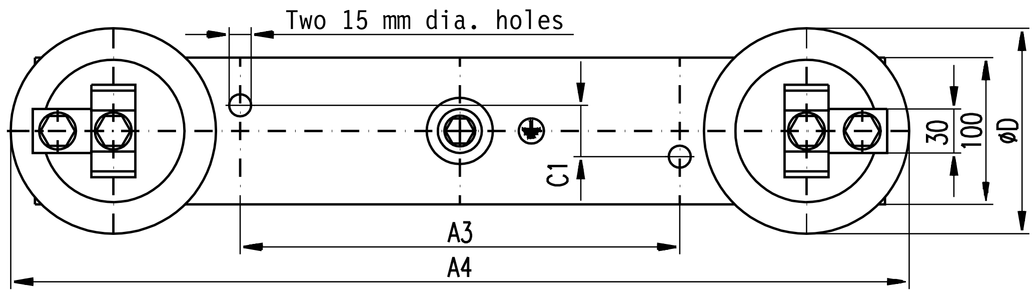
Type BWMPNS outdoor–standing high–rupturing–capacity fuse–base

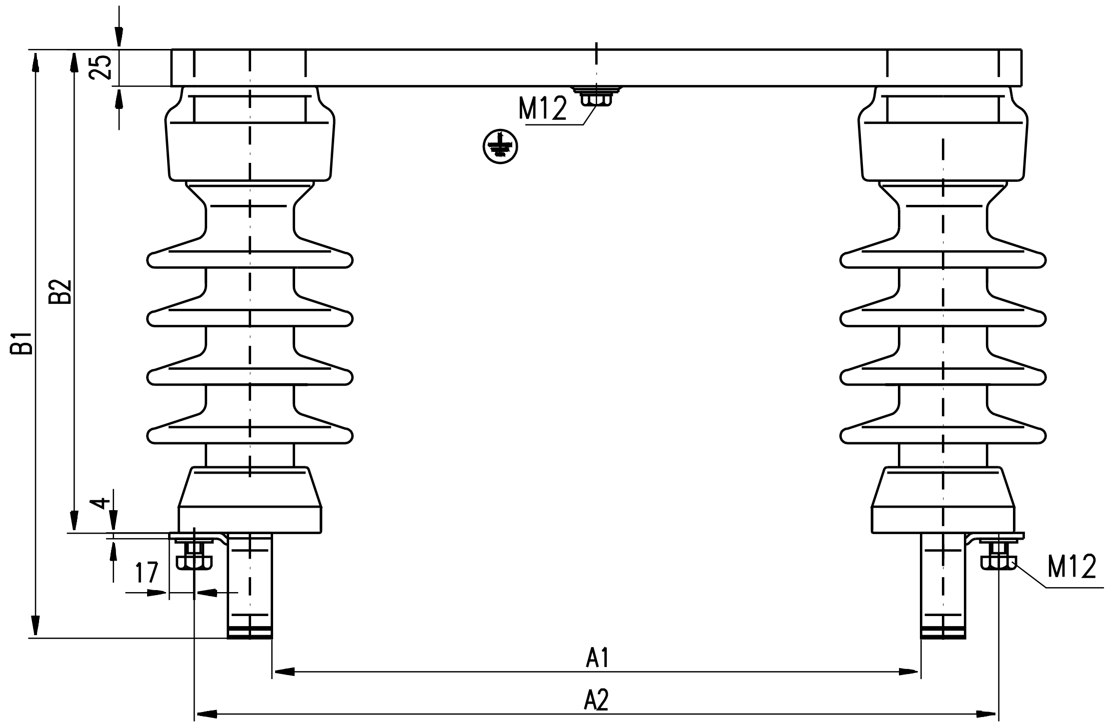


Notes:
1. Earthing Terminal; tinned steel.
2. Connections: silver–plated brass
3. Contact Springs: silver–plated brass
4. Deviations of dimensions with no tolerance specified shall be within ±3%.

<table>
<tr><th rowspan="2">Fuse–base type</th><th colspan="8">Dimensions</th></tr>
<tr><th>A4</th><th>A3</th><th>A2</th><th>A1</th><th>B2</th><th>B1</th><th>C1</th><th>∅D</th></tr>
<tr><td>BWMPNS–36/40</td><td>723±1</td><td rowspan="2">380±1</td><td rowspan="2">644±1</td><td rowspan="2">538±1</td><td>474±1</td><td>542±1</td><td rowspan="6">0</td><td>155</td></tr>
<tr><td>BWMPNS–24/63</td><td>708±1</td><td rowspan="2">334±1</td><td rowspan="2">402±1</td><td rowspan="6">140</td></tr>
<tr><td>BWMPNS–24/50</td><td>613±1</td><td>300±1</td><td>549±1</td><td>443±1</td></tr>
<tr><td>BWMPNS–12/100</td><td>708±1</td><td>380±1</td><td>644±1</td><td>538±1</td><td rowspan="4">244±1</td><td rowspan="4">312±1</td></tr>
<tr><td>BWMPNS–7,2/100</td><td>613±1</td><td>300±1</td><td>549±1</td><td>443±1</td></tr>
<tr><td>BWMPNS–12/56</td><td>463±1</td><td>180±1</td><td>399±1</td><td>293±1</td></tr>
<tr><td>BWMPNS–7,2/56</td><td>363±1</td><td>55±1</td><td>299±1</td><td>193±1</td><td>35±1</td></tr>
</table>

Type BWMPNW outdoor–suspension high–rupturing–capacity fuse–base





Notes:
1. Earthing Terminal; tinned steel.
2. Connections: silver–plated brass
3. Contact Springs: silver–plated brass
4. Deviations of dimensions with no tolerance specified shall be within ±3%.

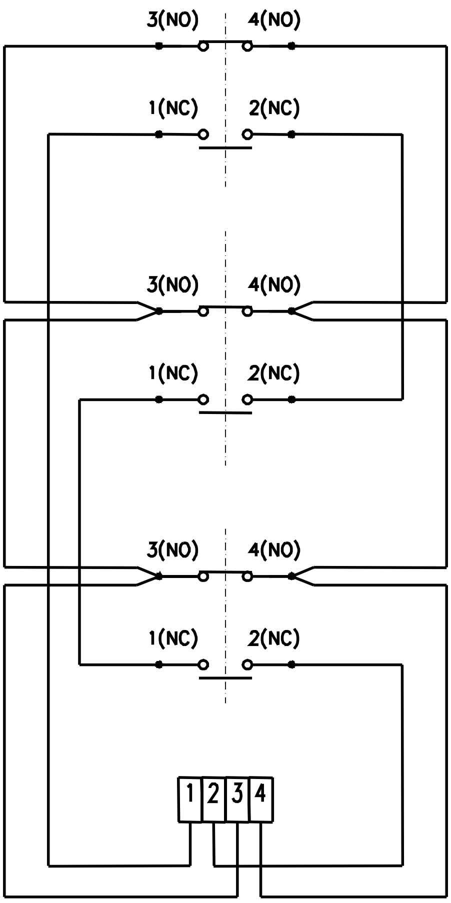
<table>
<tr><th rowspan="2">Fuse–base type</th><th colspan="8">Dimensions</th></tr>
<tr><th>A4</th><th>A3</th><th>A2</th><th>A1</th><th>B2</th><th>B1</th><th>C1</th><th>∅D</th></tr>
<tr><td>BWMPNW–36/40</td><td>723±1</td><td rowspan="2">380±1</td><td rowspan="2">644±1</td><td rowspan="2">538±1</td><td>474±1</td><td>542±1</td><td rowspan="6">0</td><td>155</td></tr>
<tr><td>BWMPNW–24/63</td><td>708±1</td><td rowspan="2">334±1</td><td rowspan="2">402±1</td><td rowspan="6">140</td></tr>
<tr><td>BWMPNW–24/50</td><td>613±1</td><td>300±1</td><td>549±1</td><td>443±1</td></tr>
<tr><td>BWMPNW–12/100</td><td>708±1</td><td>380±1</td><td>644±1</td><td>538±1</td><td rowspan="4">244±1</td><td rowspan="4">312±1</td></tr>
<tr><td>BWMPNW–7,2/100</td><td>613±1</td><td>300±1</td><td>549±1</td><td>443±1</td></tr>
<tr><td>BWMPNW–12/56</td><td>463±1</td><td>180±1</td><td>399±1</td><td>293±1</td></tr>
<tr><td>BWMPNW–7,2/56</td><td>363±1</td><td>55±1</td><td>299±1</td><td>193±1</td><td>35±1</td></tr>
</table>

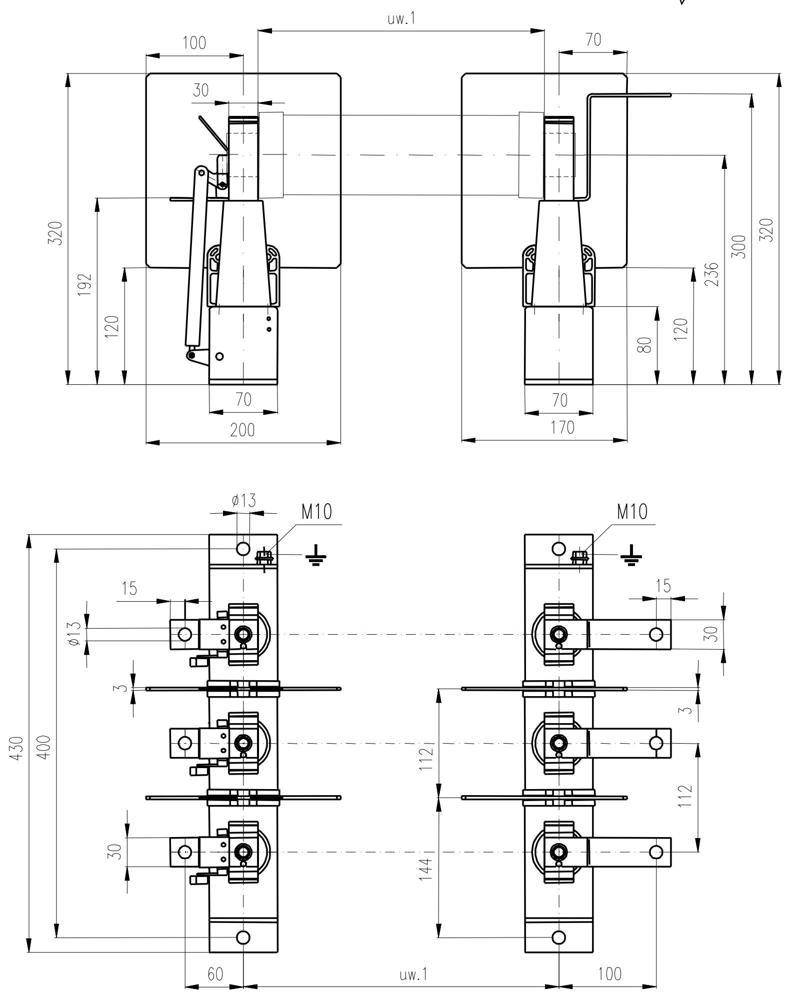
Type BPS–01 indoor high–rupturing–capacity fuse–base

Fuse–base type BPS–01 is intended for indoor use with MV fuse–links rated at up to 7.2 kV / 200 A. The fuse–base fitted with fuse–links may be used for protecting transformers or electric motors. The BPS–01 fuse–base is equipped with auxiliary circuitry which, when the fuse operates, may be used to trigger other switchgear equipment or indicate fuse operation at a distance, for example in the control room. Another advantage of the fuse–base is such that it may be used with fuses of different lengths. The dimensions of the fuse–link, to be used with the BPS–01 fuse–base, must comply with the DIN 43625 standard and the fuse–link must be fitted with a striker pin to ensure proper operation of the fuse–base auxiliary circuitry. The BPS–01 fuse–base is particularly recommended for use with the BWMW, CEF and CMF type of fuse–links.

Fuse-base type	Rated voltage	Rated frequency	Rated current	Fuse-link types which may be used with the fuse-base
	U_n	f	I_n	
	kV	Hz	A	
BPS-01	7,2	50 lub 60	max. 200	**BWMW-7,2/ 3,15 ÷100** (transformer protection) **CEF-7.2/6 ÷200** **CMF-7.2/63 ÷315**

New Type





Note: Due to the introduction of improvements, the right is reserved to modify the products.

Information given in this publication is generally applicable to equipment described. Changes may be made in future without notice.

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