



MINGRONG
ELECTRICAL PROTECTION

Professional + Manufacturing

Fuse Product catalogue

H.V. Fuse Links, L.V. Fuse Links, Fuse Bases, Fuse Carriers
Fusegears, Fuse Alarms, Automobiles Fuse



Product Catalogue

English Version

MINGRONG
ELECTRICAL PROTECTION

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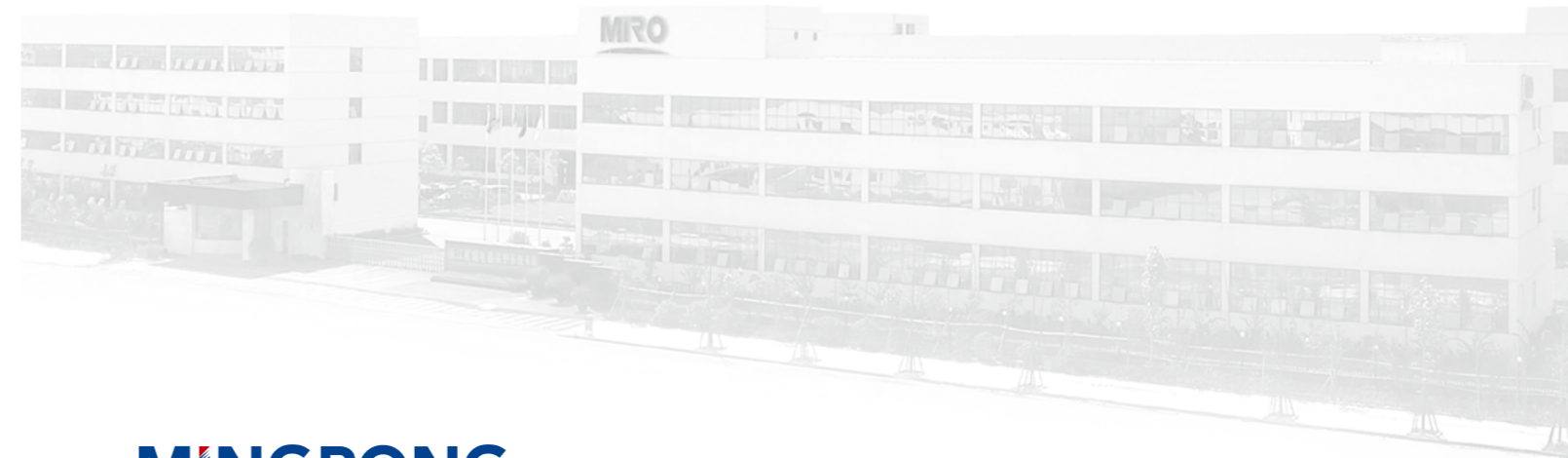
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ZHEJIANG MINGRONG ELECTRICAL PROTECTION CO., LTD, the foreign-invested enterprise, is one of the most famous and professional manufacturers of high-voltage and low-voltage fuse and fusegear. Company covers an area of 93,400 m², with building area of 66,000 m² and employs 480 people.

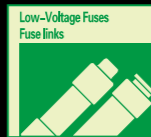
Company has strong technical capabilities, professional know-how, and advanced manufacturing equipments. With the standard quality control, the advanced check-out facility, the first-class surveillance and measure method, we continuously pursuit highest standard of product quality and make 'MRO' a well-known and trustworthy brand in extensive customers. We have got ISO9001 and ISO14000 approval, CE and UL certificates as well as CCC on many products. The products are widely applied in lots of industries: electric power, petrochemical, machinery, metallurgy, building, telecom, traction and so on. With 28 series and 1000 more varieties, our products are popular throughout China and overseas.

We have gained excellent reputation from customers both in the domestic and the overseas markets for the well established quality system and reliable services. Meeting customers' demands and offering the best product and service will always be our goal continuously. And it will be also our great pleasure at your requests at any time.

Brief Introduction

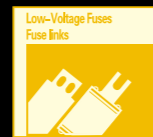
Leading speciality Superexcellent quality





1 Fuse links

- 4-7 Cylindrical fuse links
- 8-10 Round cartridge fuse links with knife contacts
- 11-16 Screw base type fuse links
- 17-26 Square pipe fuse links with knife contacts
- 27-28 Non-filler renewable fuse links



2 Bolt connected fuse links

- 30-37 Bolt connected fuse links
- 38-43 Bolt connected round cartridge type fast-acting fuse links for semiconductor protection
- 44-53 Bolt connected square pipe type fast-acting fuse links for semiconductor protection



3 Fuse bases

- 55-62 Cylindrical fuse holders
- 63-70 Screw fuse bases
- 71-81 Fuse bases for square pipe fuses with knife contacts
- 82-87 Special fuse bases/holders



4 Fuse alarms

- 89-90 Fuse alarms



5 Fuse carriers

- 92-93 Fuse carrier (handle)



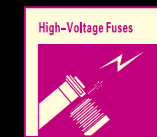
6 Combining electric of fuse

- 95-107 Fuse disconnecting switches



7 Automobile Fuse

- 109-111 Vehicle fuse



8 High voltage fuse

- 113-133 H.V. HRC current-limiting fuse
- 134-137 H.V. Drop-out fuse

Professional High Voltage And Low Voltage **FUSE** Manufacturer





We dedicate in pursuing high quality and perfect brand.
In the field of the fuse manufacture, we insist on keeping up with the international standards, being unique on the production technique and the design of the product.
We are the first fuse company in this field obtaining UL certification, which is the high recognize to the quality of MIRO product, making MIRO competitive in the international market.

Low-voltage Fuse Links Selection Guide

The purpose of using fuses is to cut off the line safely and correctly to protect discrete components or the whole line in case of circuit errors. The following are the necessary conditions to be considered when selecting fuses:

► Usual Service Conditions And Installation Conditions

Ambient temperature: -5°C ~+40°C

Height above sea level: not more than 2000m

Atmospheric condition: humidity: the installation site's relative air humidity does not exceed 50% while the maximum temperature is +40°C, And it can allow to have higher relative humidity under lower temperature. The average temperature does not exceed +25°C while in the wettest month, and the maximum relative humidity does not exceed 90% in this month. We must take measures when there is condensation on the products which due to the changed temperature.

Class of pollution: third class

Sort of installation: III

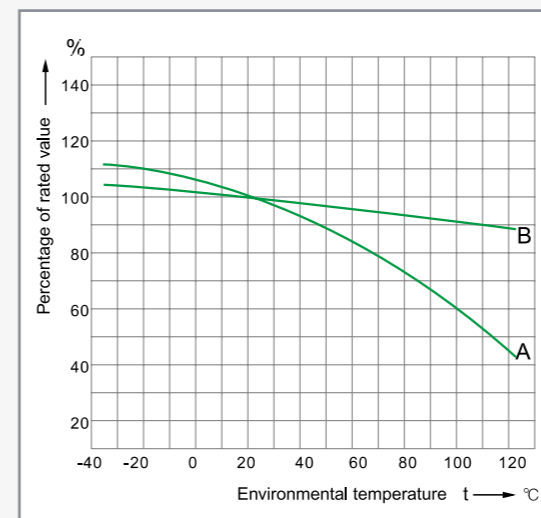
► Ambient Temperature

Ambient temperature means the air temperature directly around the fuse, and should not be understood as the room temperature. In many application cases, the fuses are at rather high temperature as they are installed with supporting devices or bases in different structures and they are closed in the distributing or controlling boxes.

► Derating

We recommend that the actual working current of a fuse should not exceed its rated current under the ambient temperature of 20°C. While selecting the fuses, environment and working conditions should be considered. Such as the variation of situation of closing, air flow, wire sizes (length and section) and instantaneous peak value etc. The current load capability of fuse links are tested under the ambient temperature of 20°C, However the actual load capability is affected by the ambient temperature. The higher the ambient temperature, the higher the working temperature and the shorter the service life of a fuse will be. On the other hand, the service life of a fuse can be longer when working under a lower ambient temperature.

The following is the typical curve showing the affection to the current load capability by the ambient temperature.



Environmental temperature-----Bearing capacity curve

e.g. when gG type fuse of 63A rating is used under ambient temperature of 20°C, reduction in working current is necessary when the ambient temperature is changed to 70°C. The ambient temperature-load capacity curve. A shows that the rating should be 78% at 70°C, and the new rating should be determined as:

$$I_n = \frac{63A}{0.78} = 80.77A$$

So fuse links of 80A rating should be selected for the new ambient temperature.

Note: A:(gG) type for line protection

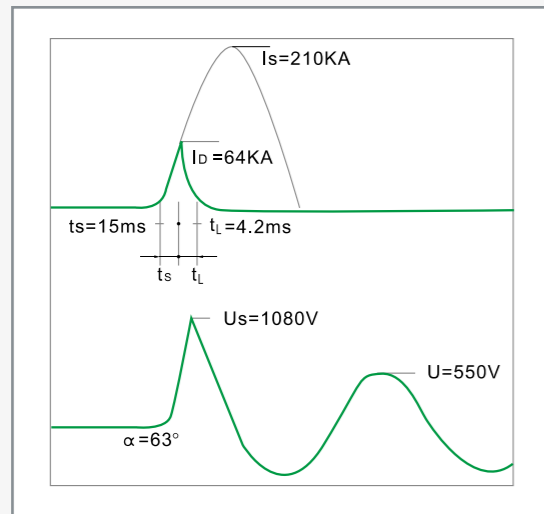
B: (aR) type for semi-conductor protection

► Malfunction

Malfunction is usually a result of incomplete analysis on the design of circuit, Special attention should be given to 1) normal rated current, 3) Ambient temperature, and 6) overload increment of factors to be considered for selection of fuses listed below. For example, frequent reasons for malfunction under normal working conditions are insufficient consideration to the start current of capacitor circuit and the ambient temperature around the fuse link.

▶ Rated Breaking Capacity

Rated breaking capacity is the maximum short-circuit current allowed for the fuse link to cutout reliably under rated voltage. The instantaneous current loaded to the fuse link is much larger than the normal working current when short-circuit occurs. The fuse link is supported to cutout the line in an undamaged condition i.e. without bursting. The rated breaking capacity of MIRO fuses is up to 120ka and the excellent current limiting characteristics reliably protect the equipment from damages by electric power.



Wave curve of current limiting characteristics of fuse link
 Where: I_s -peak value of maximum asymmetric current at 100KA perspective current I_p (The impulse factor of a short circuit should be 1.5).
 I_D - the actual current at breaking (limiting current)
 U_s -Arc voltage
 U - Voltage
 t_s - melting time
 t_l - Arcing time
 α - Burning corner of arc after zero voltage.

▶ Fuse Supporter (Fuse Base)

In many application cases, fuse links are installed on fuse supporters/fuse bases. They are not to be used as switches for connection and disconnection of the load.

▶ Factors To Be Considered For Selection Of Fuses

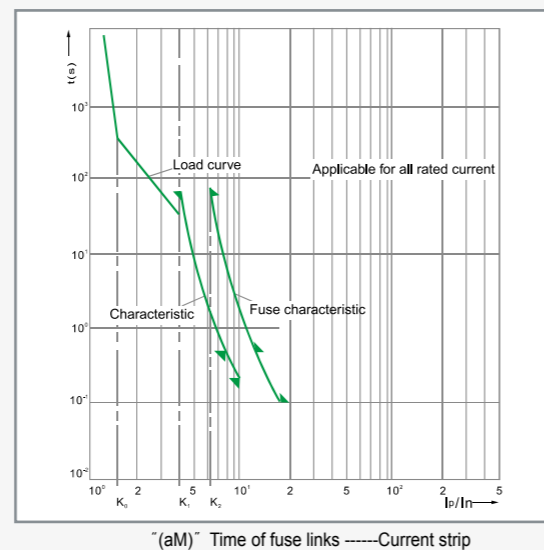
1. normal working current
2. working voltage
3. ambient temperature
4. overload current and cutout time
5. possible malfunction current
6. impulse current, surge current, starting current and transient value of the line
7. size and dimensions, connection methods, indicators, etc.

▶ Threshold Values Of aM Fuses

Gate limit of "aM" type fuse links:

$I_p(I_n)$	4	6.3	8	10	12.5	19
$t_{Fuse} \leq$ (s)	-	60	-	-	0.5	0.10
$t_{Before\ arc} \geq$ (s)	60	-	0.5	0.2	-	-

Note: I_p -Perspective current
 I_n -Rate current of fuse link



Low Voltage Fuse

Professional High Voltage And Low Voltage Fuse Manufacturer

Fuse Links



Cylindrical Fuse Links



► Applications

Protection against overload and short circuit in electric lines (type gG), also available for protection of semiconductor parts and equipments against short-circuit (type aR) and protection of motors (type aM).

Rated voltage up to 660V; Rated current up to 125A; Working frequency 50Hz AC; Rated breaking capacity up to 100KA. Compliant with GB13539 and IEC269.

► Basic Data

The models, dimensions, ratings are shown in Figures 1.1~1.4 and Table 1 .

► Design Features

Variable cross-section fuse element made from pure metal sealed in cartridge made from high-duty ceramic or epoxy glass. Fuse tube filled with chemically treated high-purity quartz sand as arc-extinguishing medium. Dot-welding of fuse element ends to the caps ensures reliable electric connection; Striker may be attached to the fuse link to provide immediate activation of micro- switch to give various signals or cut the circuit automatically.

Special fuse as per Figure 1.2~1.4 can be supplied according to customers requirements.

Table 1

Cat. No.	Models		Cross-reference		Dimensions/sizes (mm) Fig. $\phi D \times L$	Rated voltage (V)	Rated current (A)	Weight (g)
	MIRO		gG(Normal)	aR(Fast)				
0101	RO06	RS06	-	-	1.1 $\phi 12.7 \times 29$	250/380	1~32	6.5
0102	RO07	RS07	-	-	1.1 $\phi 30 \times 57$	600	10~100	75
0103	RO09	RS09	-	-	1.1 $\phi 18 \times 37$	500	2~63	17.4
0104	RO10	RS10	-	-	1.1 $\phi 18 \times 50$	500	2~63	23.5
0105	RO11	RS11	AJT JKS LPJ	ACL	1.1 $\phi 21 \times 58$	600	2~32	51.5
0106	RO12	RS12	AJT JKS LPJ	ACL	1.1 $\phi 27 \times 60$	600	35~100	90
0107	RO13	RS13	-	-	1.1 $\phi 15 \times 50$	500	2~40	23.2
0108	RO14	RS14	RT19-16 gF1	-	1.1 $\phi 8.5 \times 31.5$	500	0.5~20	4.4
0109	RO14A	RS14A	-	-	1.1 $\phi 8.5 \times 23$	250	0.5~20	3.5
0110	RO14B	RS14B	-	-	1.1 $\phi 8.5 \times 36$	380/500	0.5~20	5.0
0111	RO15	RS15	RT14-20 gF2 RT18-32 RT19-25	KTK KLM	1.1 $\phi 10.3 \times 38$	500/690	0.5~32	7.7
0112	RO15A	RS15A	-	-	1.1 $\phi 10.3 \times 25.8$	250	0.5~16	4.8
0113	RO15B	RS15B	-	-	1.1 $\phi 10.3 \times 31.5$	250/500	0.5~25	5.8
0114	RO15C	RS15C	-	-	1.1 $\phi 10.3 \times 34$	380/500	0.5~32	6.2
0115	RO15D	RS15D	-	-	1.1 $\phi 10.3 \times 57$	600	2~32	11
0116	RO16	RS16	RT14-32 gF3 RT18-63 RT19-40	FWP	1.1 $\phi 14.3 \times 51$	500/690	2~50	20.5
0117	RO16A	RS16A	-	-	1.1 $\phi 14.3 \times 38$	500	2~50	15.6
0118	RO16B	RS16B	-	-	1.1 $\phi 14.3 \times 45$	500	2~50	18.5
0119	RO16C	RS16C	-	-	1.1 $\phi 14.3 \times 67$	500	2~50	27.5
0120	RO17	RS17	RT14-63 gF4 RT18-125 RT19-100	URE2263	1.1 $\phi 22.2 \times 58$	500/690	10~125	58
0121	RO18	RS18	-	-	1.1 $\phi 9.6 \times 30$	380	0.5~25	4.8
0122	RO19	RS19	-	-	1.1 $\phi 20.5 \times 127$	600	0.5~32	91.2
0123	RO19A	RS19A	-	-	1.1 $\phi 20.5 \times 76$	250/500	0.5~63	63
0124	RO19B	RS19B	-	-	1.1 $\phi 20.5 \times 114$	600	0.5~32	85
0125	RO19C	RS19C	-	-	1.1 $\phi 27 \times 139$	600	32~63	172.4
0126	RO19D	RS19D	-	-	1.1 $\phi 27 \times 147$	600	32~63	160
0127	RO54	RS54	-	-	1.1 $\phi 5 \times 20$	250	0.5~16	1
0128	RO55	RS55	-	-	1.1 $\phi 5 \times 25$	250	0.5~16	1.3
0129	RO56	RS56	-	-	1.1 $\phi 6 \times 20$	250	0.5~16	1.7
0130	RO57	RS57	-	-	1.1 $\phi 6.3 \times 25$	250	0.5~16	2.1
0131	RO58	RS58	-	-	1.1 $\phi 6.3 \times 31.5$	250/500	0.5~16	2.5

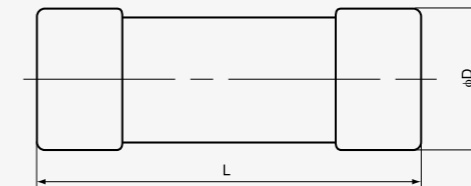


Fig 1.1

Table 1 (Cont.)

Cat. No.	Models		Cross-reference		Dimensions/sizes (mm) Fig. $\phi D \times L$	Rated voltage (V)	Rated current (A)	Weight (g)
	MIRO		gG(Normal)	aR(Fast)				
0132	RO08	RS08	-	JJS	1.2 $\phi 20.5 \times 40$	600	2~63	40

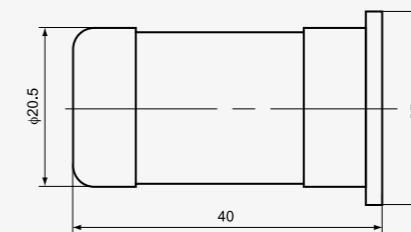


Fig 1.2

