TGRS3Z-D

Series Fuse Links for Semiconductor Equipment Protection

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

1 Overview

TGRS3Z-D series fuse links for semiconductor protection is used in the circuit system with the rated voltage DC1000V/AC1140V, and its rated breaking capacity can be up to 50 kA. It is widely used in many fields such as chemical industry, metallurgy, electric power, mining, and charging piles as short-circuit protection or backup protection for energy storage systems, power systems, wires and other devices and equipment.

The product complies with IEC 60269 and GB/T 13539.4 standards.

2. Basic Information

- Performance reference: IEC60269 and GB/T 13539.4
- Rated voltage: DC1000V 750V 500V; AC1140V 800V 690V
- Rated current: 32A-1250A
- Breaking capacity: DC50kA (L/R=10~15ms)
- Usage category: aR
- RoHS2.0 compliant

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

3 Type Designation

TG	RS	3	Z	-	1/2/3	DT
①	②	③	④		⑤	⑥

①	Enterprise code	
②	Fast fuse	
③	Design No.	
④	DC	
⑤	Fuse link frame	1 2 3
⑥	Voltage code and installation method	DT: 1000V, Hook bolt connection installation DQ DP

4 Main Technical Parameters

Table 1

No.	Model		Size code	Rated current	Power consumption W	Installation torque
1	TGRS3Z-1DT 32A	TGRS3Z-1DQ 32A	1	32A	13	M8 bolted connection
2	TGRS3Z-1DT 40A	TGRS3Z-1DQ 40A		40A	17	
3	TGRS3Z-1DT 50A	TGRS3Z-1DQ 50A		50A	21	
4	TGRS3Z-1DT 63A	TGRS3Z-1DQ 63A		63A	25	
5	TGRS3Z-1DT 80A	TGRS3Z-1DQ 80A		80A	30	
6	TGRS3Z-1DT 100A	TGRS3Z-1DQ 100A		100A	35	
7	TGRS3Z-1DT 125A	TGRS3Z-1DQ 125A		125A	43	
8	TGRS3Z-1DT 160A	TGRS3Z-1DQ 160A		160A	49	
9	TGRS3Z-1DT 200A	TGRS3Z-1DQ 200A		200A	54	
10	TGRS3Z-1DT 250A	TGRS3Z-1DQ 250A		250A	62	
11	TGRS3Z-1DT 300A	TGRS3Z-1DQ 300A		300A	67	
12	TGRS3Z-1DT 315A	TGRS3Z-1DQ 315A		315A	68	
13	TGRS3Z-1DT 350A	TGRS3Z-1DQ 350A		350A	72	
14	TGRS3Z-1DT 400A	TGRS3Z-1DQ 400A		400A	78	

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Table 1, continued

No.	Model		Size code	Rated current	Power consumption W	Installation torque
15	TGRS3Z-2DT 200A	TGRS3Z-2DQ 200A	2	200A	50	M8 bolted connection
16	TGRS3Z-2DT 250A	TGRS3Z-2DQ 250A		250A	62	
17	TGRS3Z-2DT 300A	TGRS3Z-2DQ 300A		300A	71	
18	TGRS3Z-2DT 315A	TGRS3Z-2DQ 315A		315A	73	
19	TGRS3Z-2DT 350A	TGRS3Z-2DQ 350A		350A	80	
20	TGRS3Z-2DT 400A	TGRS3Z-2DQ 400A		400A	85	
21	TGRS3Z-2DT 500A	TGRS3Z-2DQ 500A		500A	94	
22	TGRS3Z-2DT 630A	TGRS3Z-2DQ 630A		630A	107	

Notes:1. Default: Base indicator;
2. If no indicator is required, I is followed by the Model;
3. Recommended tightening torque for M8 bolts and nuts: 13±1 N.m.

Table 2

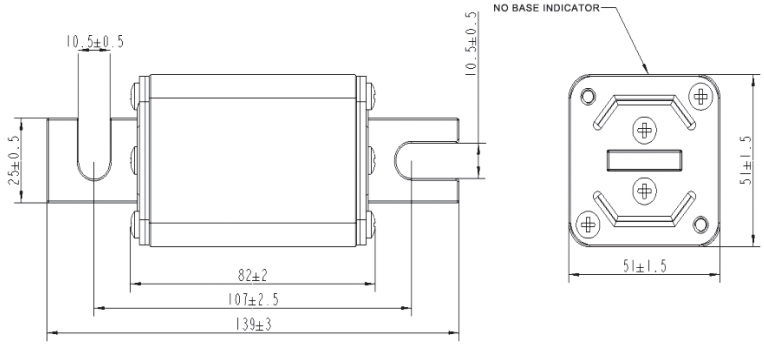
No.	Model			Size	Rated voltage V	Rated current A	$I^2t(A^2s)$		Power consumption W
							Pre-arcing	Fusing	
1	TGRS3Z-3DT-315A	TGRS3Z-3DQ-315A	TGRS3Z-3DP-315A	3	DC1000V /AC1140V	315	9688	55700	80
2	TGRS3Z-3DT-350A	TGRS3Z-3DQ-350A	TGRS3Z-3DP-350A			350	14000	798000	85
3	TGRS3Z-3DT-400A	TGRS3Z-3DQ-400A	TGRS3Z-3DP-400A			400	19800	110000	94
4	TGRS3Z-3DT-450A	TGRS3Z-3DQ-450A	TGRS3Z-3DP-450A			450	31000	160000	99
5	TGRS3Z-3DT-500A	TGRS3Z-3DQ-500A	TGRS3Z-3DP-500A			500	40000	220000	103
6	TGRS3Z-3DT-550A	TGRS3Z-3DQ-550A	TGRS3Z-3DP-550A			550	55000	310000	107
7	TGRS3Z-3DT-630A	TGRS3Z-3DQ-630A	TGRS3Z-3DP-630A			630	84000	480000	113
8	TGRS3Z-3DT-700A	TGRS3Z-3DQ-700A	TGRS3Z-3DP-700A			700	115000	680000	120
9	TGRS3Z-3DT-800A	TGRS3Z-3DQ-800A	TGRS3Z-3DP-800A			800	210000	980000	125
10	TGRS3Z-3DT-900A	TGRS3Z-3DQ-900A	TGRS3Z-3DP-900A			900	309000	1410000	130
11	TGRS3Z-3DT-1000A	TGRS3Z-3DQ-1000A	TGRS3Z-3DP-1000A			1000	456000	1970000	133
12	TGRS3Z-3DT-1100A	TGRS3Z-3DQ-1100A	TGRS3Z-3DP-1100A			1100	576000	2590000	138
13	TGRS3Z-3DT-1250A	TGRS3Z-3DQ-1250A	TGRS3Z-3DP-1250A			1250	806000	3958000	141

Notes:1. Default: Base indicator;
2. If no indicator is required, I is followed by the Model;
3. Installation method: For 3DT/3DQ, M8 bolted connection is used for 700A and below and M10 bolted connection is used for more than 700A. M12 bolted connection is used for 3DP.

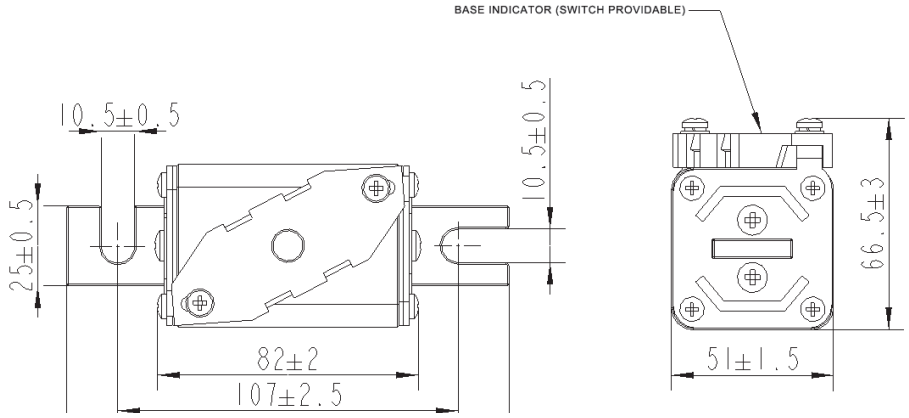
TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

5 Outline Dimensions (mm)

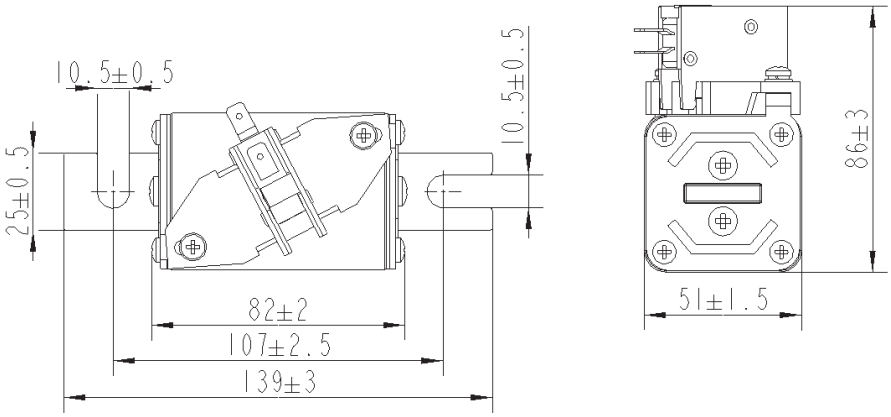
5.1 TGRS3Z-1DT Product Outline and Installation Dimensions



No indicator



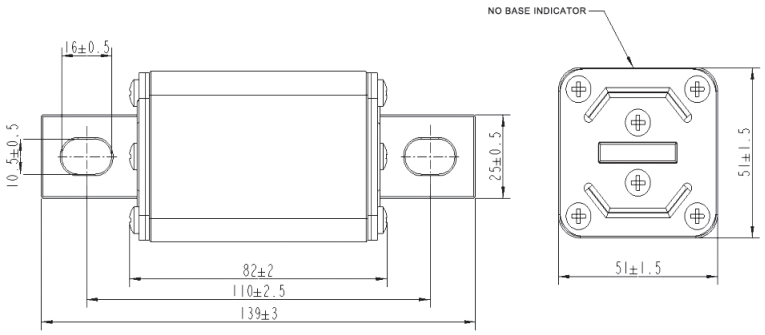
With an indicator (no a micro switch)



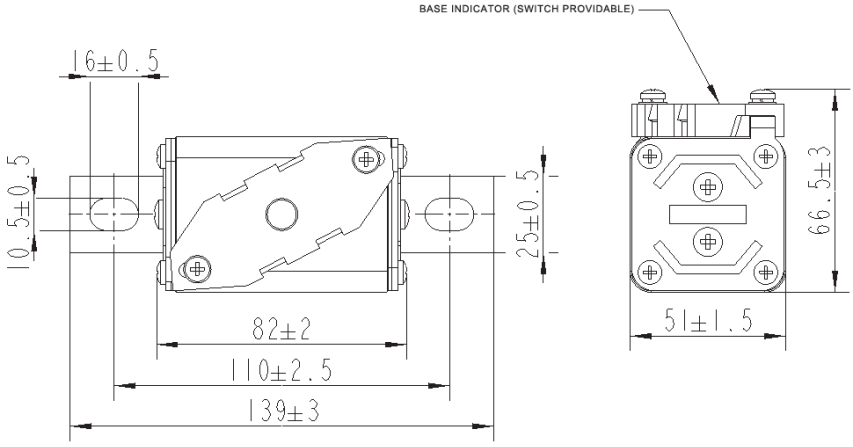
With a micro switch

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

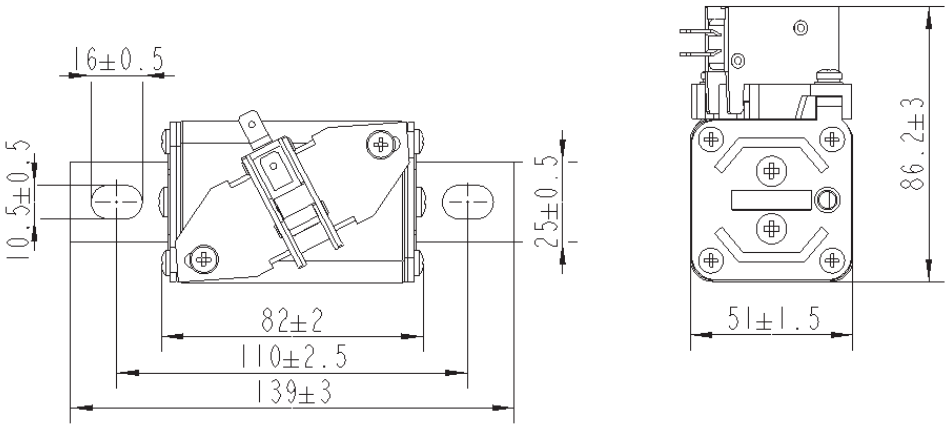
5.2 TGRS3Z-1DQ Product Outline and Installation Dimensions



No indicator



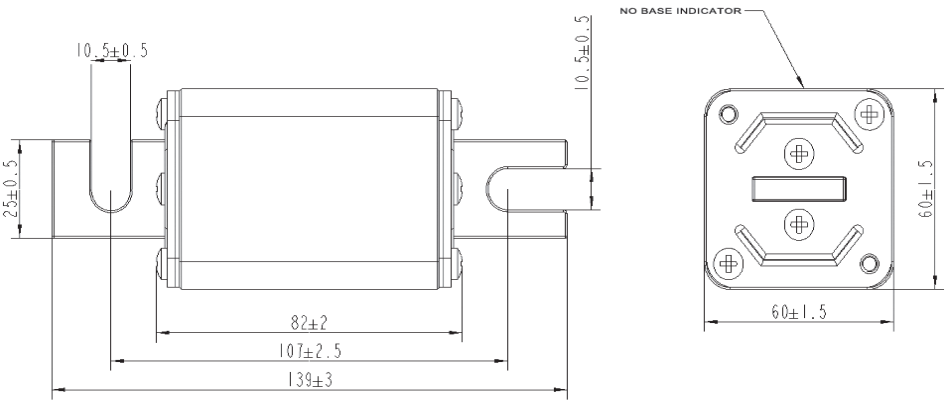
With an indicator (no a micro switch)



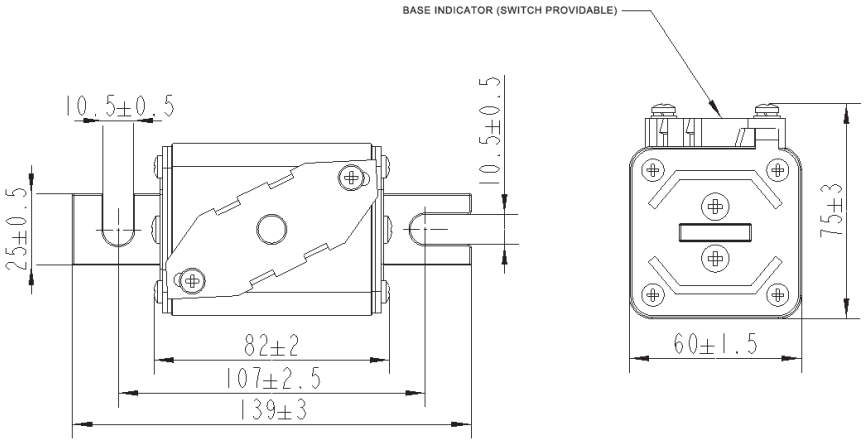
With a micro switch

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

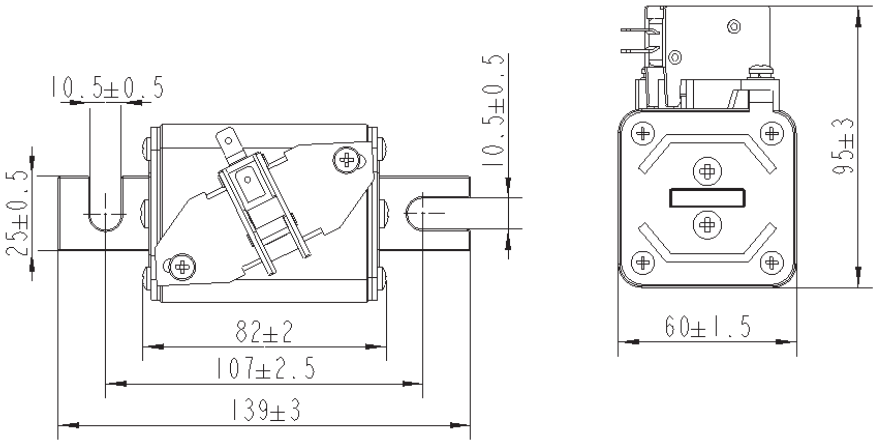
5.3 TGRS3Z-2DT Product Outline and Installation Dimensions



No indicator



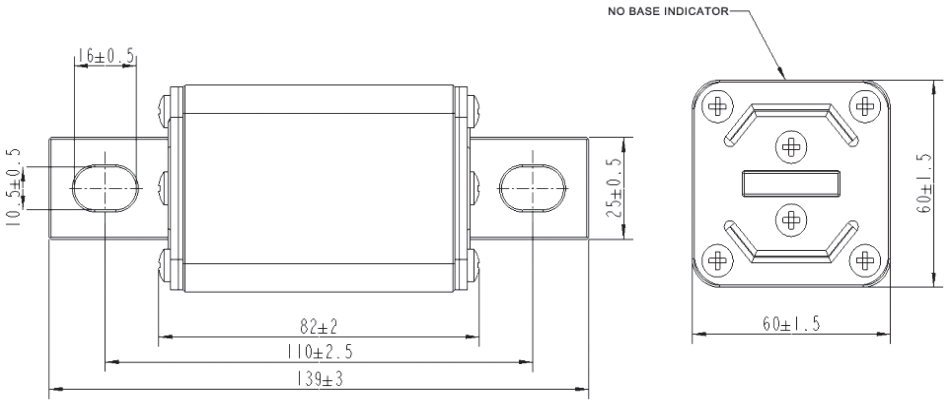
With an indicator (no a micro switch)



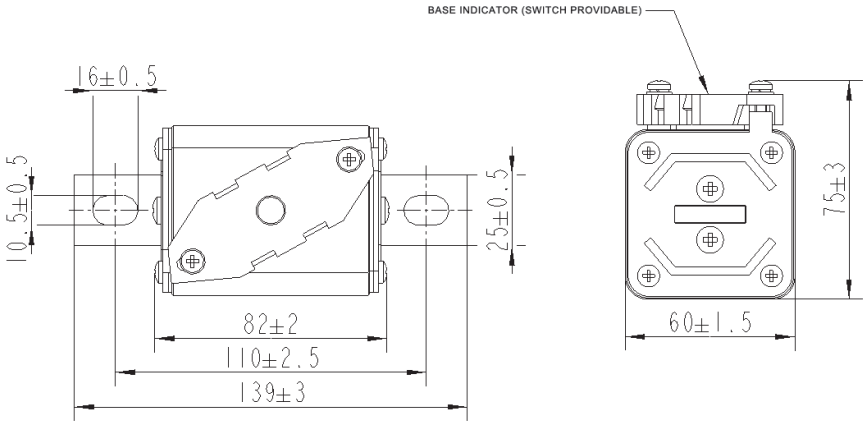
With a micro switch

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

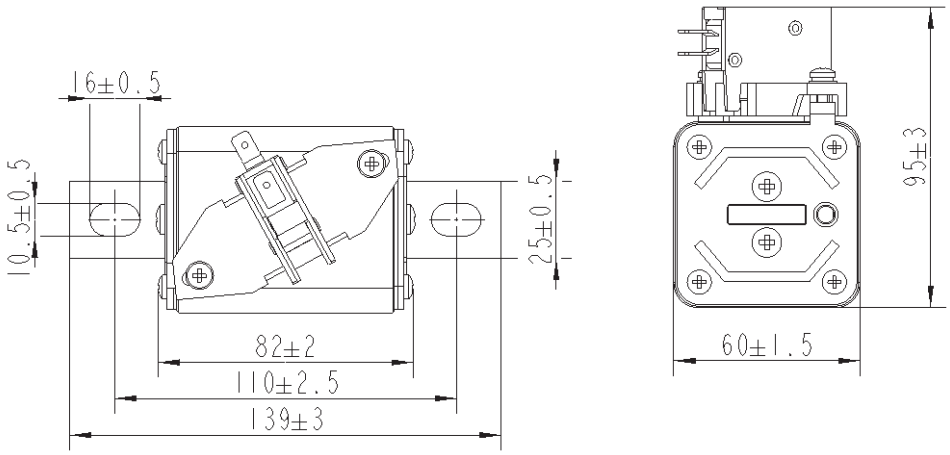
5.4 TGRS3Z-2DQ Product Outline and Installation Dimensions



No indicator



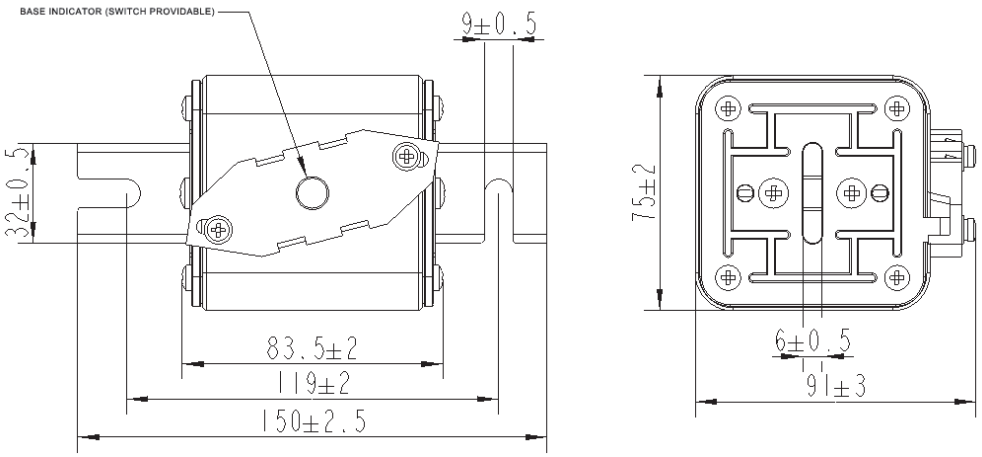
With an indicator (no a micro switch)



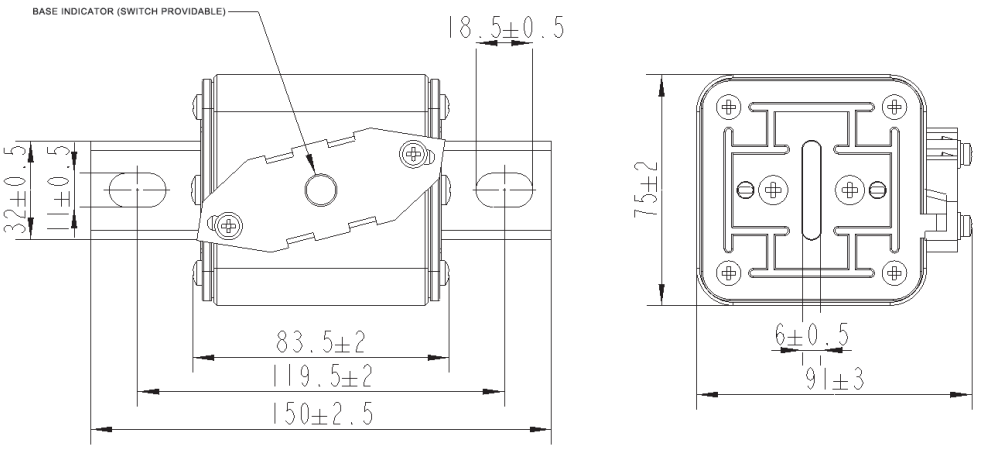
With a micro switch

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

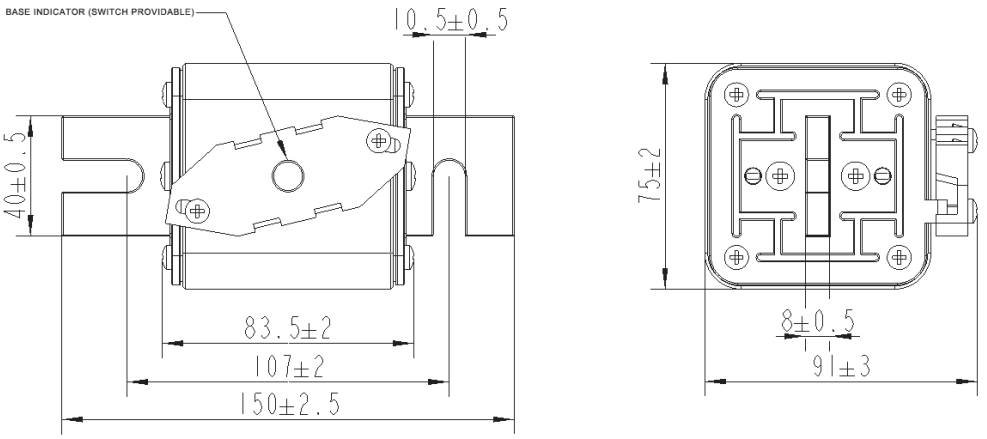
5.5 TGRS3Z-3DT Product Outline and Installation Dimensions



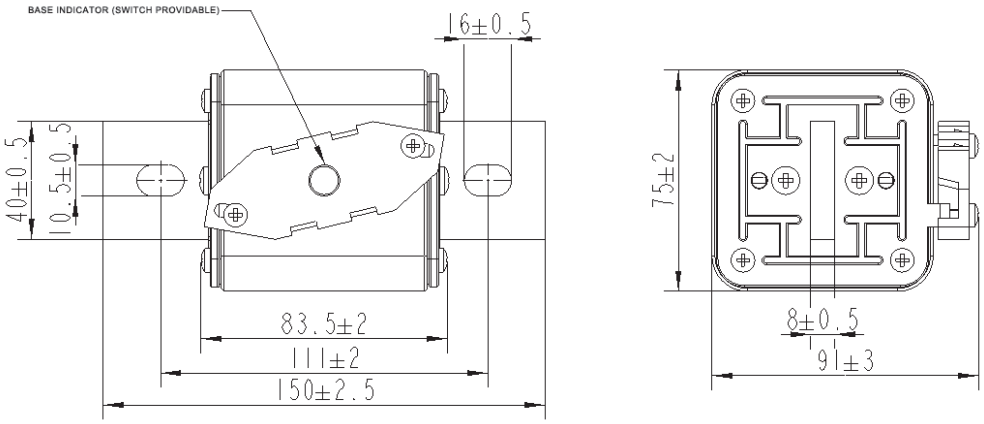
5.6 TGRS3Z-3DQ Product Outline and Installation Dimensions



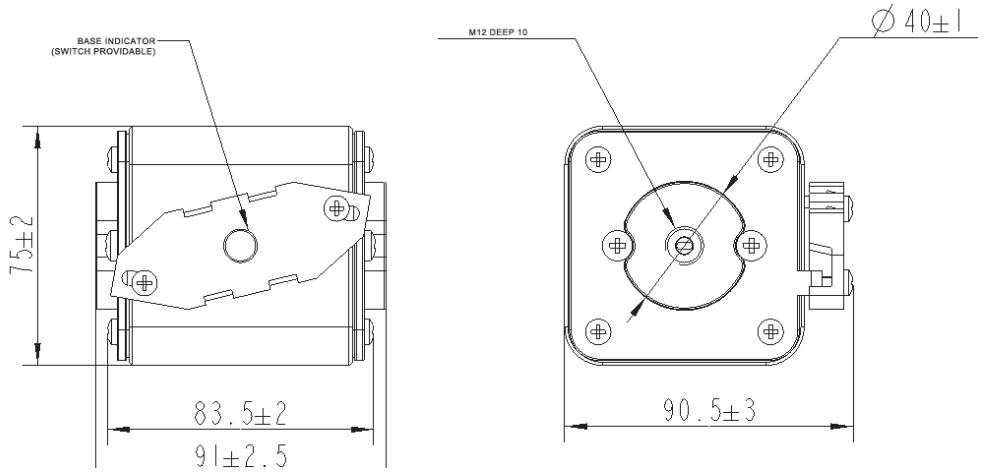
5.7 TGRS3Z-3DT (700A and above) Product Outline and Installation Dimensions



5.8 TGRS3Z-3DQ (700A and above) Product Outline and Installation Dimensions



5.7 TGRS3Z-3DP Product Outline and Installation Dimensions



Installation

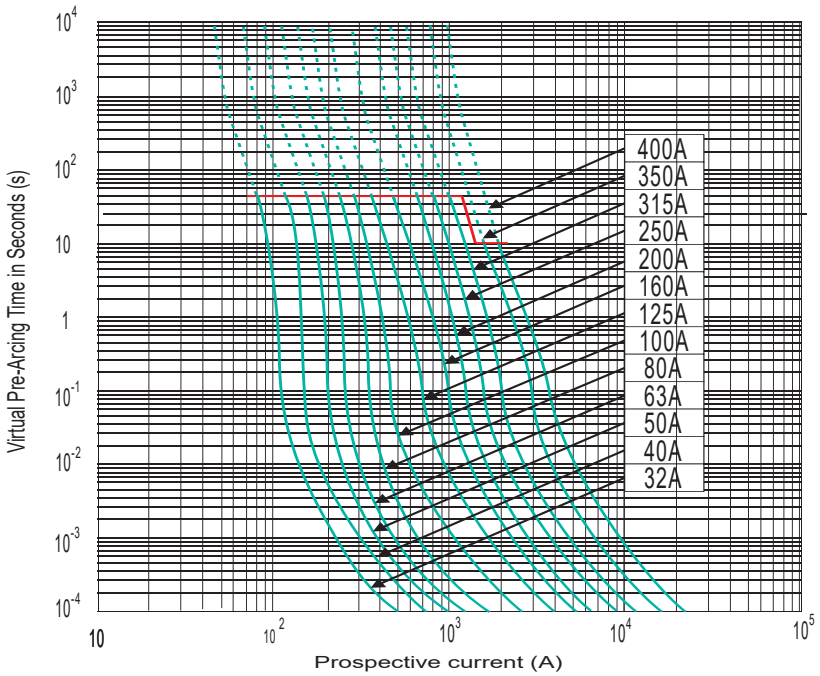
a) When installation, the screw size of the stud should not exceed 9mm (8m is recommended, below 1mm than the thread depth);

b) No rotation of the stud shall be kept when tightening nuts;

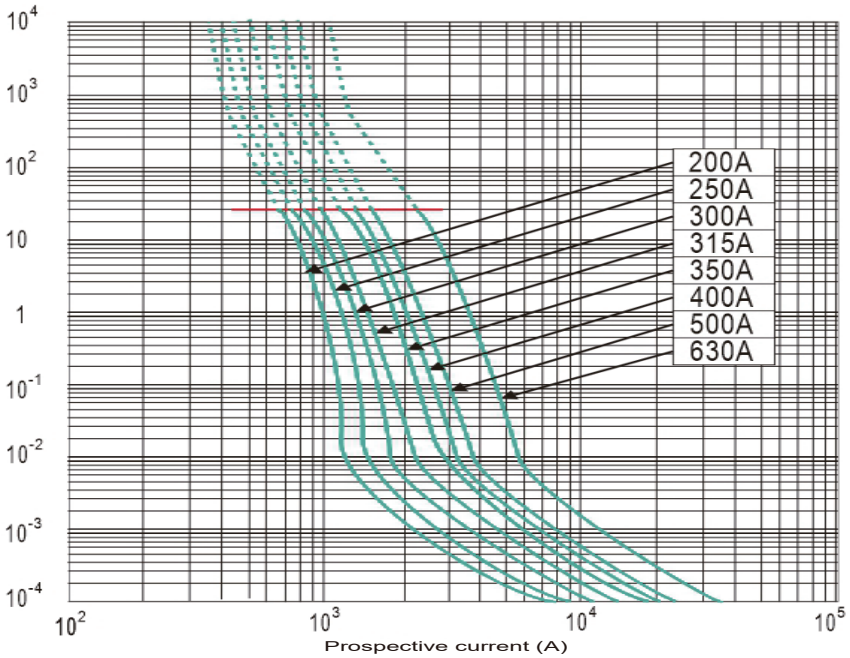
c) Stud installation is recommended, and there is no recommended torque for studs; nut M12: Tightening torque 40±5N.m

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

6 Characteristic curves

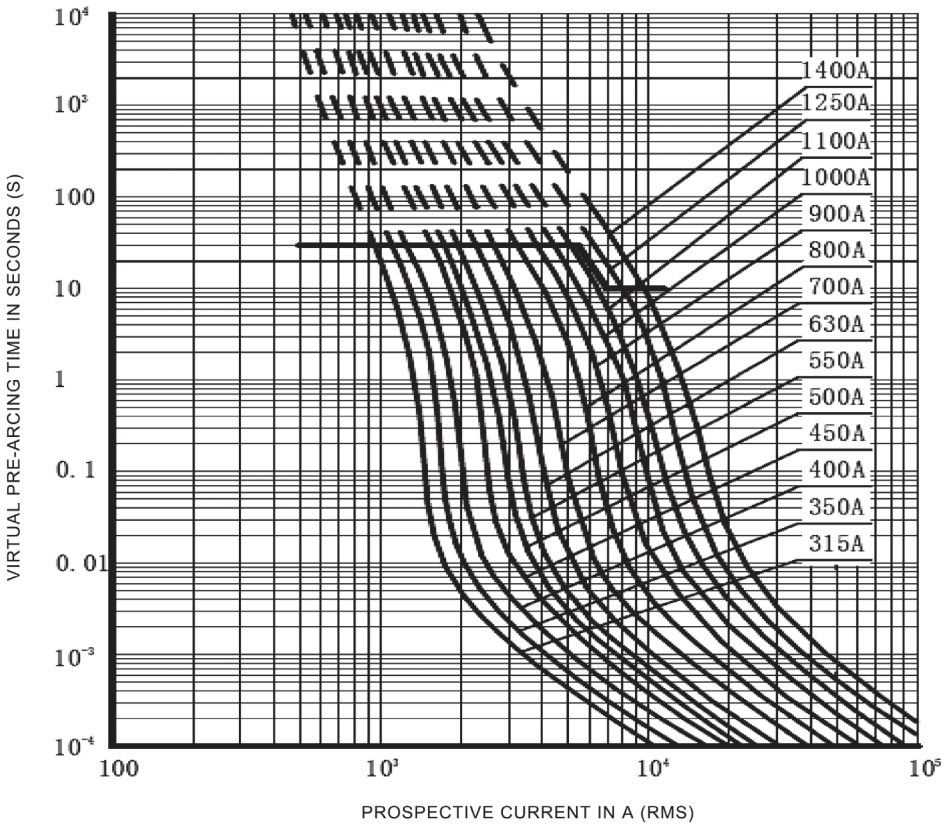


TGRS3Z-1DT(Q)

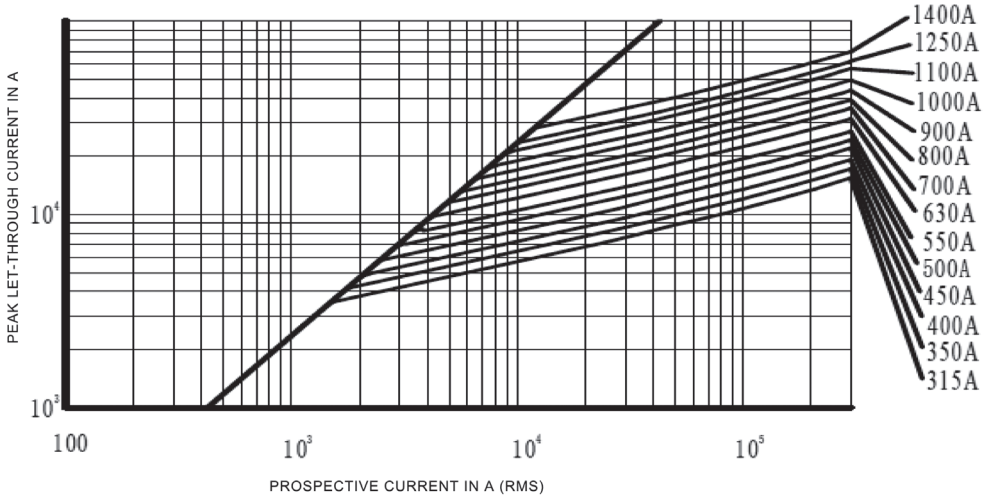


TGRS3Z-2DT(Q)

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection



TGRS3Z-3DT(DQ/DP) Pre-arcing prospective current



TGRS3Z-3DT(DQ/DP) Fusing prospective current

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

7 Working Conditions

7.1 Working Conditions and Parameters Correction

It is recommended that the current for long-term flow is not more than 80% of the rated current.

No additional corrections are required when the fuse works in the 20°C ambient temperature at an altitude of 2000m.

If out of the normal working conditions, some parameters may be corrected within the allowable working conditions or contact the company for consultation. If out of the allowable working conditions, please consult our company, and the work suitability assessment and testing of the conditions should be carried out.

7.1.1 Normal working conditions: -5°C ~ 40°C; the air is kept clean, and its relative humidity does not exceed 50% at the maximum temperature of 40°C.

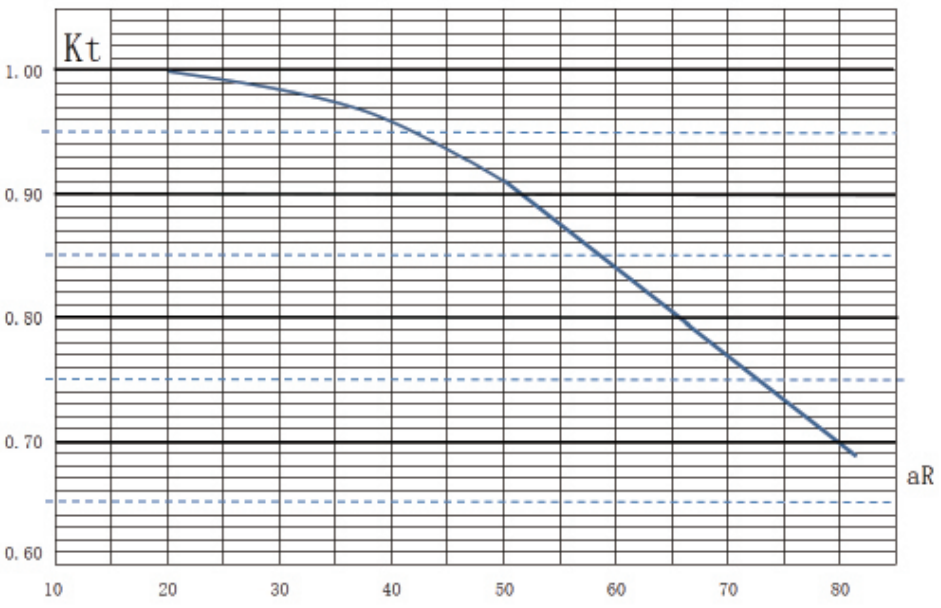
A higher relative humidity can be allowed at lower temperatures, for example, the relative humidity can reach 90% at 20°C.

Moderate condensation may occur occasionally due to temperature changes under those conditions.

7.1.2 Allowable working conditions: -40°C ~ 85°C; the relative humidity can be up to 95% if there is no obvious condensation.

Parameter correction for changes in ambient air temperature: The virtual pre-arcing time of the low overload overcurrent is extended and the rated current is slightly increased when the product is working under the temperature below -5°C. However, unless -5°C and above is not within the working temperature range, increasing the rated current of the fuse is generally not considered.

When the fuse is working at 40°C and above, the rated current shall be corrected additionally, and the correction factor is -Kt.



Ambient air temperature of fuse link, °C

Note 1: The value of Kt is taken by considering the influence of the rated current safety margin of the fuse under normal working conditions.
Note 2: There may a significant influence only after the ambient air temperature shall be last for more than 1~2 hours.

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

7.1.3 Normal working conditions

The altitude does not exceed 2000 m.

7.1.4 Allowable working conditions

Not exceed 4500 m.

Parameter correction for altitude change: The high altitude mainly causes insulation deterioration, heat dissipation condition deterioration, and air pressure changes.

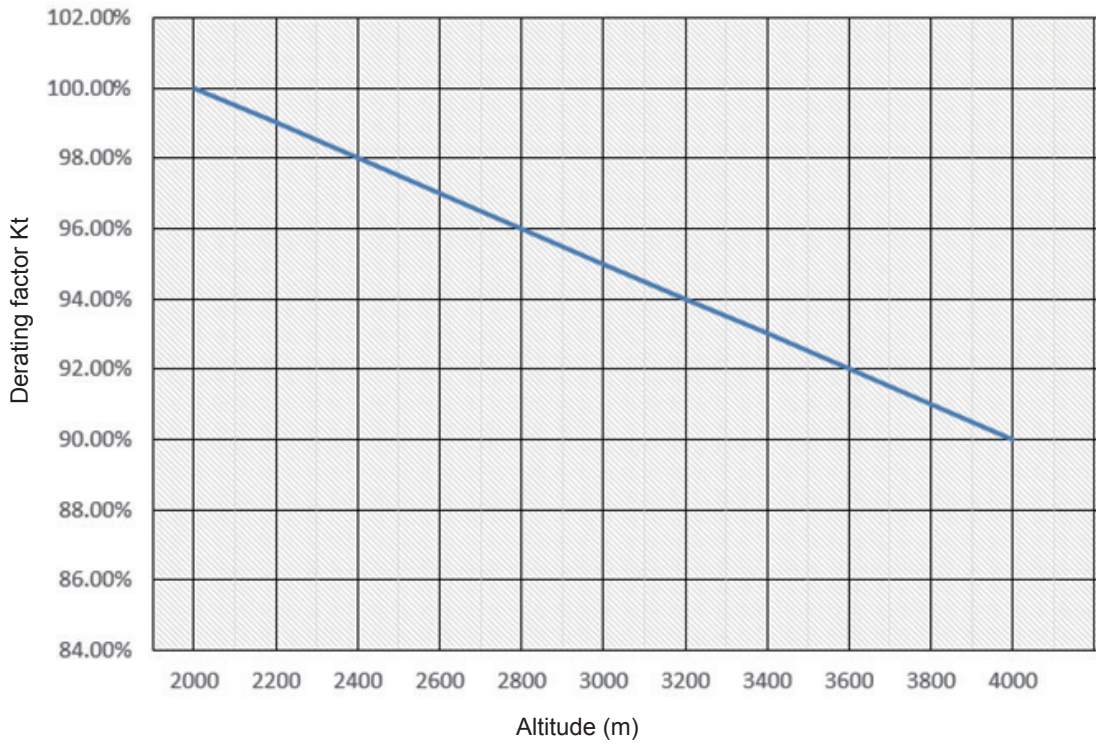
- The temperature of the fuse will rise by 0.1-0.5k for every 100 m increase of the altitude.
- The ambient temperature decreases by about 0.5k on average for every 100 m increase of the altitude.
- Under normal circumstances, the influence of the altitude on the rated current can be ignored for fuses used in the open environment, so that the fuse can be selected according to the standard conditions.
- For fuses used in closed environments, the rated current shall be decreased if the ambient air temperature of the box or the temperature inside the box does not drop with the increase of the altitude, and can still reach 40°C and above. The rated current is decreased by 2% - 5% for every 1000 m increase of the altitude.

Note: In the same size series, a higher derating ratio is adopted for maximum rated current, and a lower derating ratio is adopted for low rated current.

Influence of the altitude on the insulation strength of air (breakdown strength)

- As the altitude increases, the insulation strength of air will drop. Within 2000-4500 meters, the insulation strength is reduced by 12-15% for every 1000 m increase of the altitude. The insulation gap should be corrected accordingly with reference to GB/T16935.1.
- The insulation distance between the terminals of the fuse is generally much greater than the value required in Table A1 and Table A2 of GB/T16935.1 standard. No verification of the insulation gap is required except for small fuse links.
- The influence of the altitude on the insulation gap between the fuse and other live structure and between the fuse to the earth shall be considered by users.

Specific allowable current data are listed in the table below



TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

7.1.5 Pollution Degree

The pollution degree is Level III.

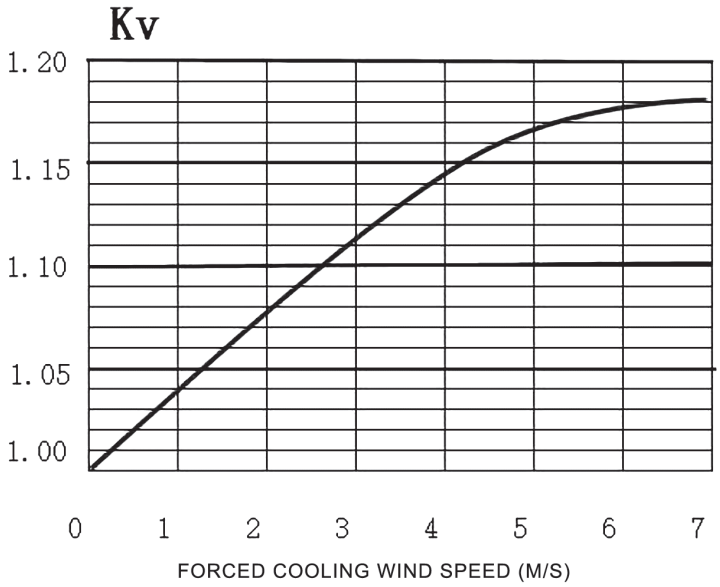
7.2 Installation Conditions

7.2.1 Normal working conditions

- The fuse is installed separately in the natural air without ventilation, and there are no other heating parts or heat dissipation parts within 1m except for connecting wires.
- The terminal block of the fuse shall ensure stable and reliable electrical contact. The contact resistance should not significantly affect the operation of the fuse.
- The fuse can be installed vertically, horizontally or obliquely. If the fuse is electrically connected by spring pressure, an appropriate position shall be selected when installation to avoid adverse effect of the gravity and vibration on the electrical connection.

7.2.2 Forced air cooling

The use of forced air cooling can improve the heat dissipation of the fuse, and increase the rated current of the fuse. Correction factor of wind speed and rated current -Kv.



8 Safe Operation and Maintenance

- When the fuse is installed, the minimum gap between the live parts of two adjacent fuses shall meet the insulation requirements, and an insulating baffle shall be provided between the fuses if necessary to prevent interphase short circuit when the energized fuse is replaced.
- The inspection and maintenance are carried out during the regular maintenance of the electrical equipment to remove dust and oxide layer in contact with conductive parts.
- Fuses with mechanical damage must be replaced.
- Unless allowed by the working requirements, such as fuse-type load switch, do not replace the fuse with load.
- There is no any exhaust gas, dust, and noise that affect the environment during the service life of the product.
- At the end of the service life of the product expires, metal parts can be recycled, and non-metallic parts can be disposed of as general industrial waste after being crushed without causing secondary pollution to the environment.

TGRS3Z-D Series Fuse Links for Semiconductor Equipment Protection

9 Ordering Notice

9.1 All requirements must be indicated when ordering

9.1.1 Please specify the product model, rated current, breaking capacity and quantity of the fuse link;

9.1.2 There is no base for this series, and the fuse link is directly connected and fixed to the copper bar through bolts.

9.2 Order Example

For example, TGRS3Z-1DT/80A 100 sets, indicating to order 100 sets of TGRS3Z-1DT fuse link with a rated current of 80A.