

Providing Electronic Solutions



EV Relay

Technical Data



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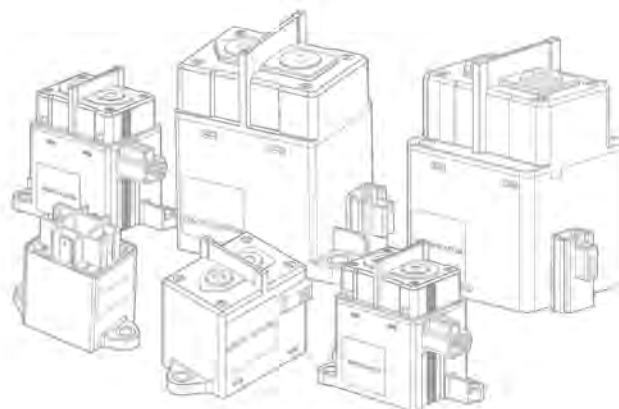
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Precautions

SAFETY PRECAUTIONS

Specification range

Use that exceeds the specification ranges such as the coil rating, contact rating and switching life should be avoided. Doing so may lead to abnormal heating, smoke, and fire.

Installation, maintenance

Never touch live parts when power is applied to a relay. Doing so may cause electrical shock. When installing, maintaining, or trouble shooting, the power of relays and connecting parts such as terminals and sockets must be turned off.

Connection

Be warned that an incorrect connection may lead to unexpected operation error, abnormal heating, and fire.

Fail-safe

If the possibility exists that faulty adhesion or contact could endanger assets or human life, take double safety precautions and make sure that operation is foolproof.

Right Connection of HV Terminal

GER-Relays' contacts have polarity. Make sure to perform connections with the correct polarity as indicated on the frame. If the contacts are connected with the reverse polarity, the switching characteristics specified in this document cannot be assured.

Tightening Torque

Below torque guide must be followed.

M4 screw: 1.8 to 2.7 N ·m

M5 screw: 3 to 4 N ·m

M6 screw: 6 to 8 N ·m

M8 screw: 10 to 12 N ·m

Wire Size for HV connection

Model	Recommendation
GER010	2mm ²
GER040	10mm ²
GER100	35mm ²
GER150	70mm ²
GER250	150mm ²
GER400	240mm ²

USAGE AMBIENT CONDITION

To maintain initial performance, do not drop or apply physical impact to the relay.

Under normal use, the relay is designed not to be detached. To maintain initial performance, the case should not be disassembled. Relay characteristics cannot be guaranteed if the case is removed.

Magnetism

If relays are proximately installed next to each other or installed near highly-magnetized parts such as motor or speaker, the operational characteristics might get changed or malfunction can happen. Hence, please verify this point in actual installation and operational condition.

Shock

It is ideal to mount the relay that the movement of the contacts and movable parts is perpendicular to the direction of the vibration or shock. Especially, note that the vibration and shock resistance of NC contacts while the coil is not excited is greatly affected by the mounting direction of the relay. Condensation could be formed when there is a sudden change in temperature under high temperature, high humidity conditions. Note that condensation may cause deterioration of the insulation, breaking of coil, and rusting.

STORAGE, TRANSPORTATION

Transportation

Relay's functional damage may occur if strong vibration, shock or heavy weight is applied to a relay during transportation of a device in which a relay is installed. Therefore, please pack them in a way, using shock-absorbing material, so that the allowable range for vibration and shock is not exceeded.

Storage

If the relay is stored for extended periods of time (including transportation period) at high temperatures or high humidity levels or in atmospheres with organic gas or sulfide gas, sulfide film or oxide film may be formed on surface of the contacts, which may cause contact instability, contact failure and functional failure. Please check the atmosphere in which the units are to be stored and transported.

Selection Guide

Features

- 1. Compact Design**
Achieved overall compact size with short gap cutoff, charged with Hydrogen and Nitrogen Gas.
- 2. Proven Safety**
High Short-time short circuit current with stand value.
- 3. Superior Reliability**
Excellent performance with electrical and mechanical endurances.
- 4. Customizable**
Relays are customizable to meet customers' requirements such as mounting position, etc.

Applications

High DC voltage applications such as

- * Electric Vehicle
- * Hybrid Vehicle
- * Renewable Energy Storage
- * Battery Charging System
- * Fuel Cell & Solar System
- * General-purpose Industrial Equipments

Model Number Structure

GER □ – □ □ □ □

Component	Contact Rating	Coil Voltage	Customer	Model	Mount Type
G : Global	010 : 10A	12 : 12V DC	LS	ST	SM : Side Mount BM : Bottom Mount PI : Plug-In type
E : Electric	040 : 40A	24 : 24V DC			
Vehicle	100 : 100A				
R : Relay	150 : 150A				
	250 : 250A				
	400 : 400A				

GER010 / 040 / 100 / 150 / 250 / 400



Model	GER010	GER040	GER100	GER150	GER250	GER400
Rating	DC450V 10A	DC450V 40A	DC450V 100A	DC450V 150A	DC450V 250A	DC450V 400A
Cut-off Cut-rent	-	-	DC450V 1000A 10ps.	DC450V 1500A 10ps.	DC450V 2500A 10ps.	DC450V 3200A 10ps.

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Specifications



Model		GER010	GER040	
Width(W) x Height(H) x Depth(D)		34 x 44.3 x 28	67 x 47 x 35.3	
Characteristics	Item	Specifications		
Contact	Contact Form	SPST-NO		
	Contact Structure	Double Break, Single		
	Contact Resistance	Max. 50m Ω	Max. 10m Ω	
	Short-time Current	15A(2min, 2mm ²) 30A(30sec, 2mm ²)	65A(15min.) 100A(2min.)	
	Max. Cut-off Current	-	400A 450V(1Cycle)	
	Overload Opening/Closing Rating	30A 400VDC(50 Cycles)	120A 450VDC(100 Cycles)	
Coil	Rated Voltage	12V		
	Pick-up Voltage(@20 $\%$)	75% Max. of Rated Voltage		
	Drop-out Voltage(@20 $\%$)	10% Min. of Rated Voltage		
	Nominal Operating Current(@20 $\%$)			
	Power Consumption	2.5W	3W	
	Max. Allowable Voltage	16VDC		
Mechanical Characteristics	Operating Time(@20 $\%$)	Max. 30ms		
	Release Time(@20 $\%$)	Max. 10ms		
	Bounce Time(@20 $\%$)	Max. 1ms	Max. 1.5ms	
	Insulation Resistance	Between Coil and Contacts	Min. 1,000M Ω (@500VDC)	
		Between Contacts of the Same Polarity		
	Dielectric Strength	Between Coil and Contacts	2,500Vrms/min.	
		Between Contacts of the Same Polarity		
Impulse Withstand Voltage	4,500V			
Mechanical Characteristics	Shock Resistance	Functional	Min. 196m/s ² (20G)	
		Destructive	Min. 490m/s ² (50G)	
	Vibration Resistance	Functional	10 to 200 to 10, Min. 4.5G(Detection Time : 10us)	
		Destructive	10 to 200Hz, Min. 4.5G (Time of vibration for each direction : X, Y, Z Direction : 4hours)	
Expected Life	Mechanical	Min. 200,000ops.	Min. 200,000ops.	
	Electrical(Resistive Load)	Cut-off: 400VDC 15A, 10,000ops.	450VDC 40A, 7,000ops.	
		- 400VDC 15A, 75,000ops. (only Making)	450VDC 30A, 10,000ops. 450VDC 30A, 80,000ops. (only Making)	
Ambient Operating Temp.	-40 ~ 85°C			
Ambient Operating Humidity	5~95%R.H.			
Weight	77g		140g	



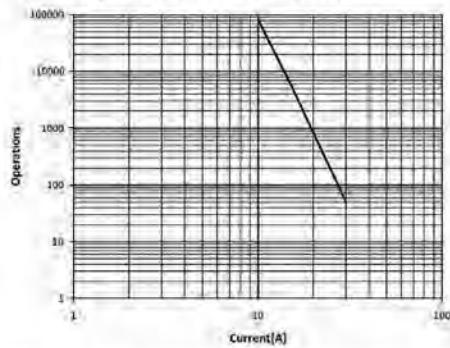
GER100	GER150	GER250	GER400
80.7 x 70 x 39	80.7 x 70 x 39	91.5 x 89 x 45	111 x 63 x 74.7
Specifications			
SPST-NO			
Double Break, Single			
Max. 2m Ω	Max. 2m Ω	Max. 1m Ω	Max. 1m Ω
150A(15min, 35mm ²)	225A(10min, 50mm ²)	350A(10min, 100mm ²)	600A(10min, 150mm ²)
225A(2min, 35mm ²)	320A(2min, 50mm ²)	500A(2min, 100mm ²)	900A(2min, 150mm ²)
1,000A 450VDC(1cycle)	1,500A 450VDC(1cycle)	2,500A 450VDC(1cycle)	3,200A 450VDC(1cycle)
200A 450VDC(100cycles)	300A 450VDC(100cycles)	400A 450VDC(100cycles)	800A 450VDC(300cycles)
12V		12V(24V)	
75% Max. of Rated Voltage			
10% Min. of Rated Voltage			
4.5W	6W	4W(*Inrush current : 2.5A for 12V)	5W(*Inrush current : 3A for 12V)
16VDC			
Max. 30ms			
Max. 10ms			
Max. 3ms	Max. 2ms	Max. 3ms	Max. 3ms
Min. 1,000M Ω (@500VDC)			
2,500Vrms/min.			
4,500V			
Min.196m/s ² (20G)			
Min.490m/s ² (50G)			
10 to 200 to 10, Min. 4.5G(Detection Time : 10us)			
10 to 200Hz, Min.4.5G			
(Time of vibration for each direction ; X, Y, Z Direction : 4hours)			
Min. 250,000ops.	Min. 300,000ops.	Min. 300,000ops.	Min. 300,000ops.
450VDC 100A 2,000ops.	450VDC 150A 1,500ops.	450VDC 250A 3,000ops.	450VDC 400A 2,000ops. 450VDC 200A 10,000ops.
450VDC 40A 30,000ops.	-	-	-
450VDC 120A 80,000ops. (only Making)	-	-	-
-40 ~ 85°C			
5~95%R.H.			
350g	380g	500g	700g

Detailed Information

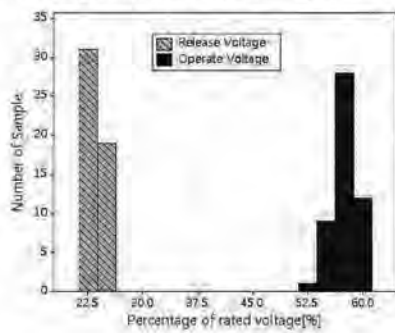
GER010

Engineering Data

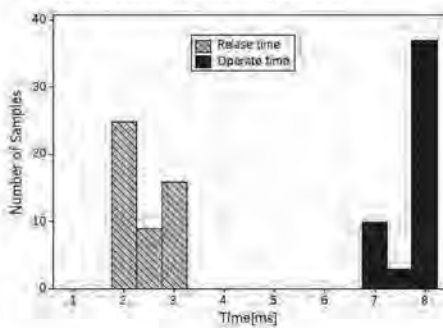
Switching Life(450V Resistive Load)



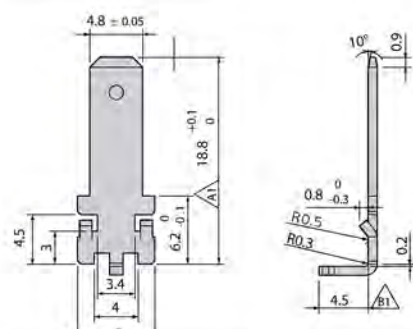
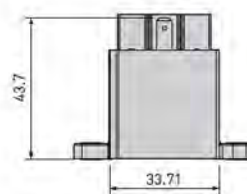
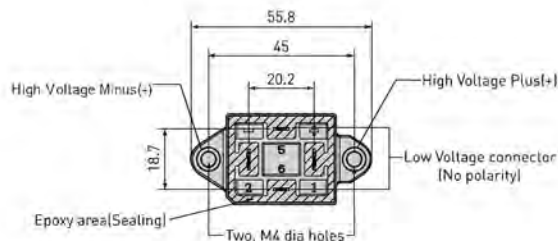
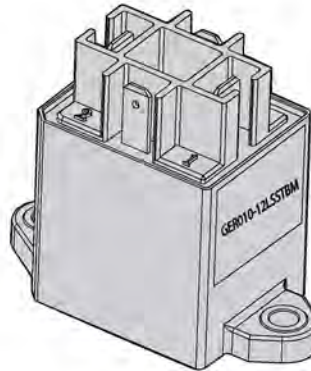
Low Voltage Distribution(# of Sample = 50)



Time Distribution(# of Sample = 50)



Dimensions



Terminal Information

Pin Type Features:

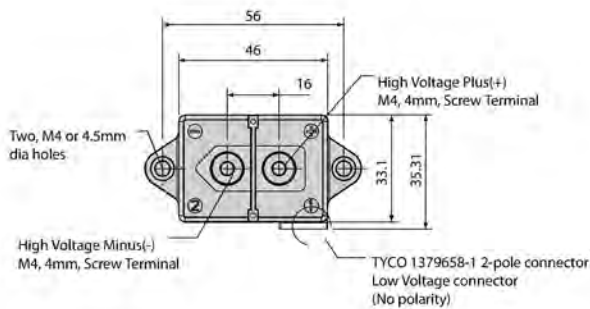
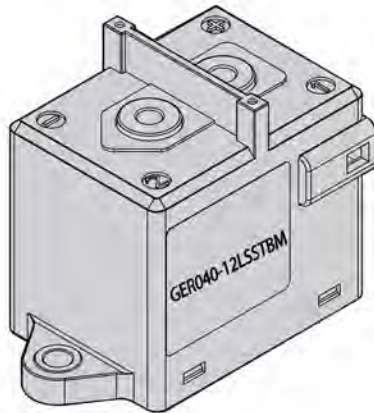
- * Terminal Type = Tab
- * Mating Area Interface Dimensions (mm) = 4.8 x 0.50
- * Material = Brass

Applicable Connector:

- * Terminal Type = Receptacle
- * Tyco 9-160481-x Series
- * Tyco 1-160477-x Series

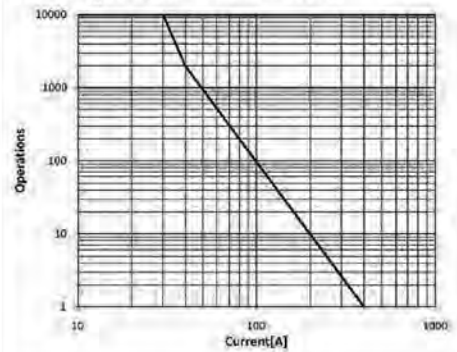
GER040

Dimensions

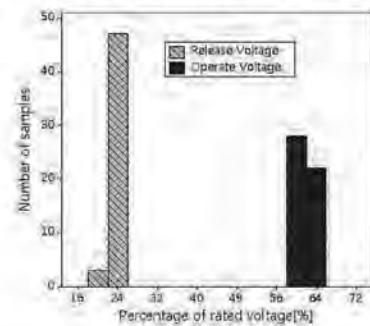


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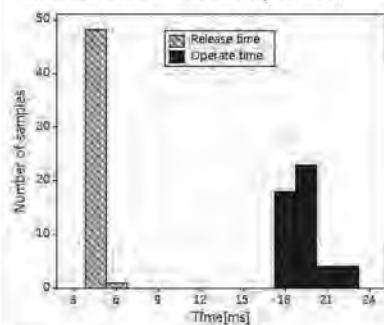
Switching Life(450V Resistive Load)



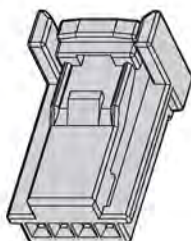
Low Voltage Distribution(# of Sample = 50)



Time Distribution(# of Sample = 50)



Connector Information



1379658-1 Product Details
0.025 Series and Hybrid Connector and Contacts (TYCO)

- Product Highlights
- * Product Type : Connector
 - * Connector Type : Housing
 - * Connector Style : Receptacle
 - * Contact Type : Pin
 - * Receptacle Configuration = 025



1123343-1 Product Details
Multilock Connectors and Contacts

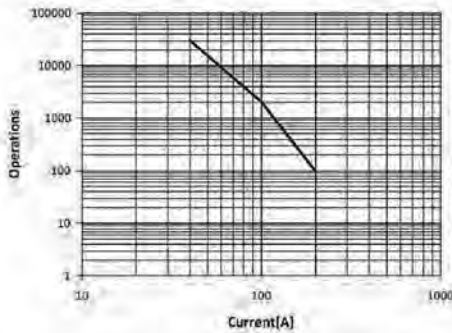
- Product Highlights
- * Product Type : Contact
 - * Contact Type : Receptacle
 - * Applies To : Wire
 - * Wire/Cable Type : Discrete Wire
 - * Wire Range = 0.20-0.60 [24-20]mm[AWG]

Detailed Information

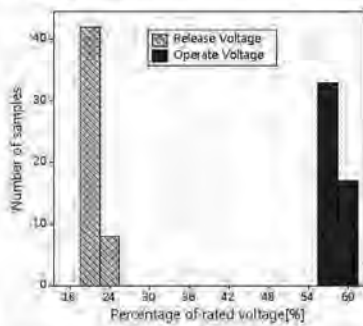
GER100

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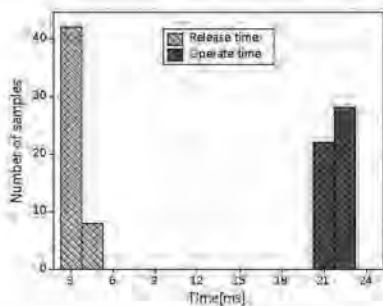
Switching Life(450V Resistive Load)



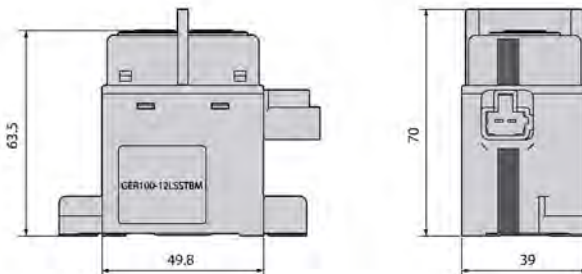
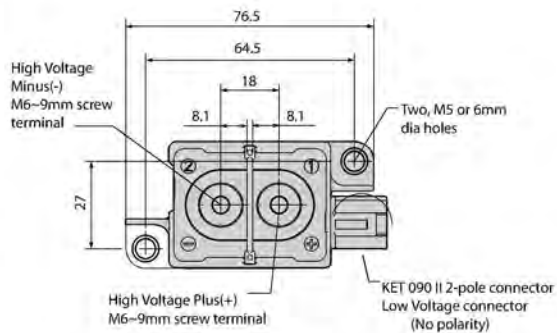
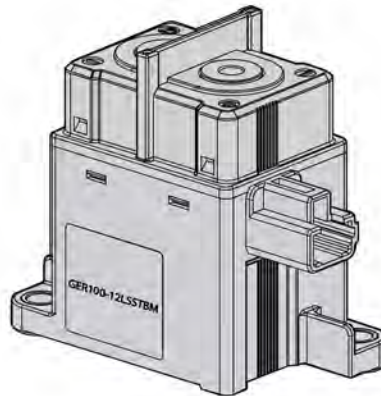
Low Voltage Distribution(# of Sample = 50)



Time Distribution(# of Sample = 50)



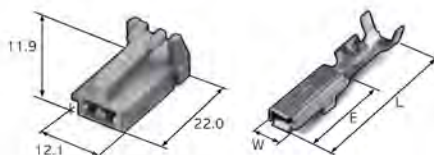
Dimensions



Connector Information

MG651026(L)

ST730676-3

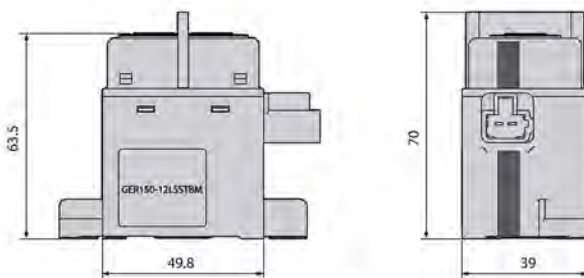
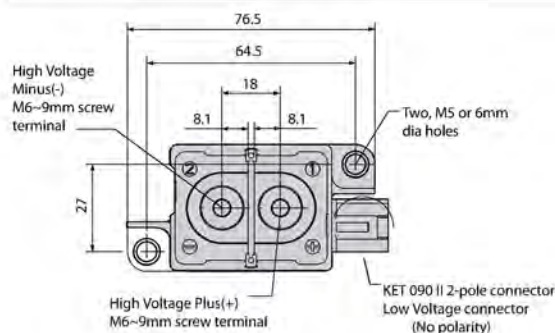
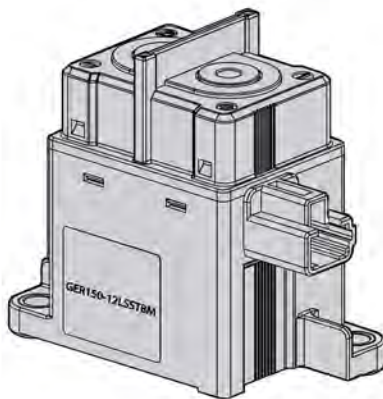


Terminal

Part No.	Wire Range		Tab Thick	Material		Dimension(mm)		
	AWG	mm ²		Thick	Finish	L	E	W
ST30676-3	18-16	AVSS(CAVS) 0.85~1.25	0.64	0.25	Copper Alloy Pre-Tin	18.0	9.0	2.9

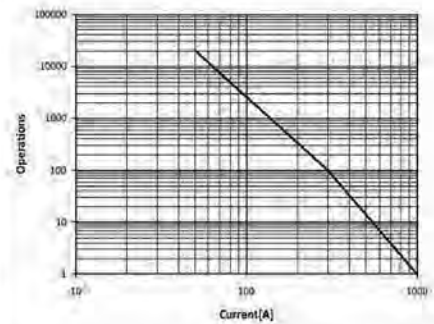
GER150

Dimensions

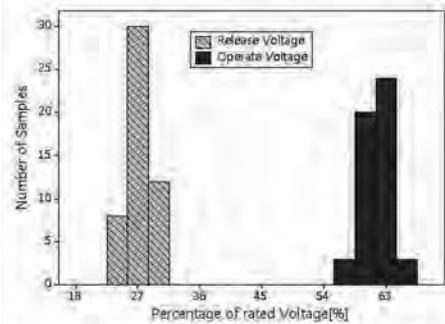


Engineering Data

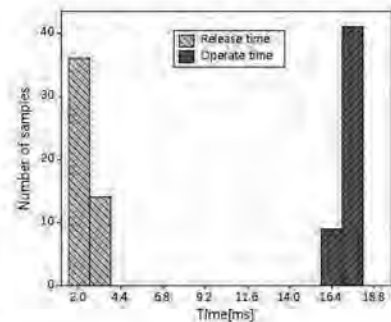
Switching Life(450V Resistive Load)



Low Voltage Distribution(# of Sample = 50)



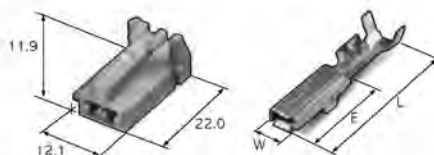
Time Distribution(# of Sample = 50)



Connector Information

MG651026(L)

ST730676-3



Terminal

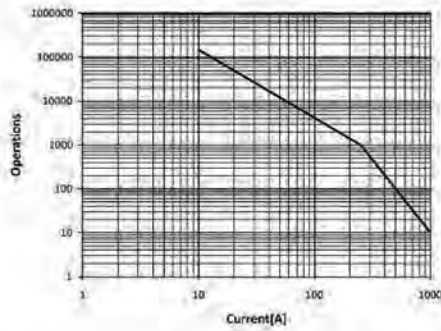
Part No.	Wire Range		Tab Thick	Material		Dimension(mm)		
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Detailed Information

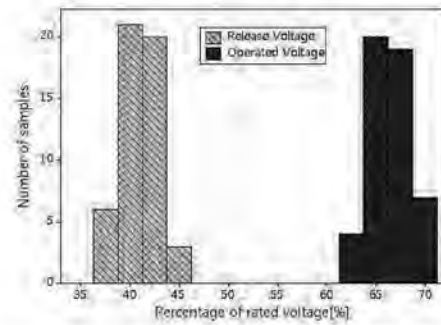
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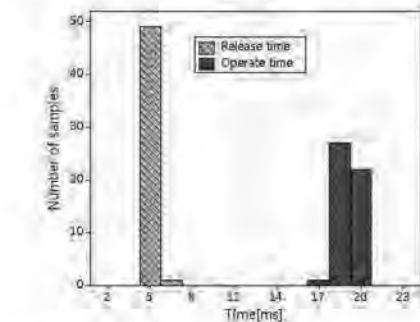
Switching Life(450V Resistive Load)



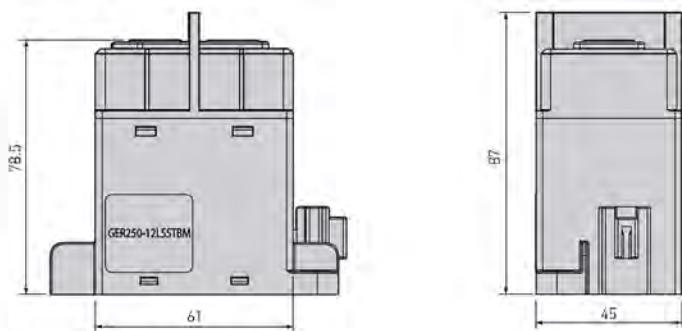
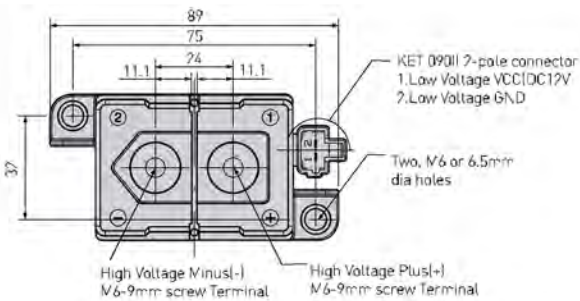
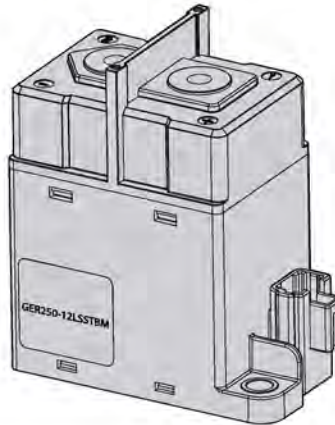
Low Voltage Distribution(# of Sample = 50)



Time Distribution(# of Sample = 50)



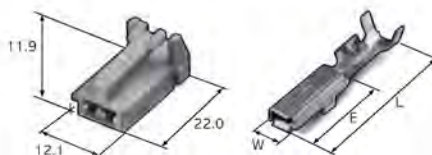
Dimensions



Connector Information

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ST730676-3

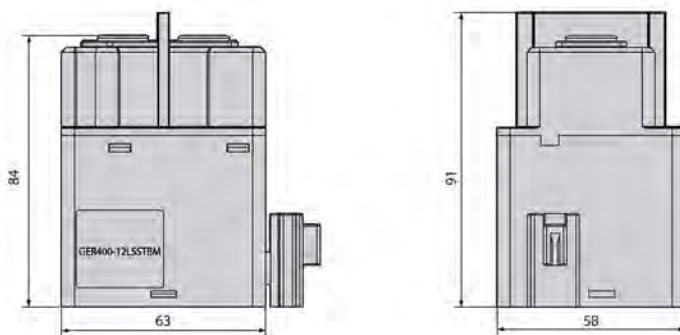
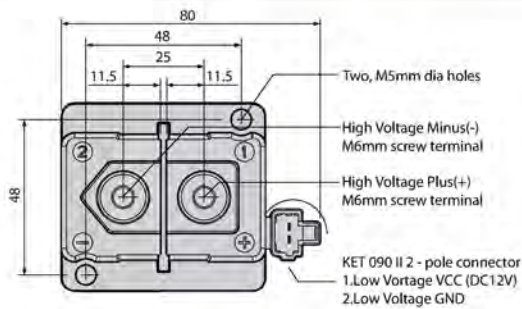
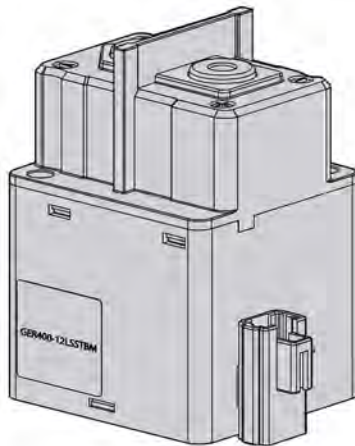


Terminal

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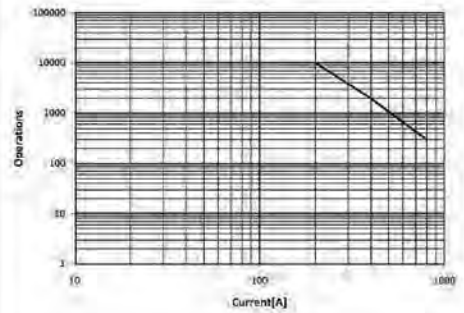
GER400

Dimensions

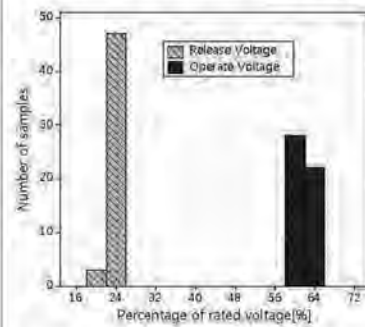


Engineering Data

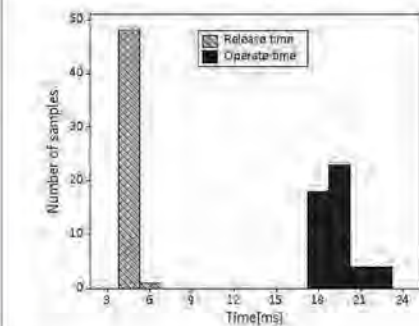
Switching Life(450V Resistive Load)



Low Voltage Distribution(# of Sample = 50)



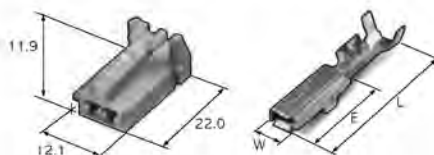
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MG651026(L)

ST730676-3



Terminal

Part No.	Wire Range		Tab Thick	Material		Dimension(mm)		
	AWG	mm ²		Thick	Finish	L	E	W
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