

DATA SHEET



AUTOMOTIVE RELAYS
HX1 SERIES

DESCRIPTION

The NEXEM HX1 series is PC-board mount type and suitable for wiper, pumps, CR circuits, heater controls and other applications for automobiles which require high quality and high performance.

The HX1 series have higher carrying current/switching performance than the current relay like EP1 and EX1 series.

FEATURE

- Large current capacity (35A fuse rating at 20°C)
- High heat resistance
- Flux tight housing
- Pb free
- Through-hole reflow soldering available

APPLICATION

- Motor control such as wiper and pumps
- Heater control
- CR circuit control
- Lamp control



For Proper Use of Miniature Relays

DO NOT EXCEED MAXIMUM RATING

Do not use relay under excessive conditions such as over ambient temperature, over voltage and over current. Incorrect use could result in abnormal heating and damage to the relay or other parts.

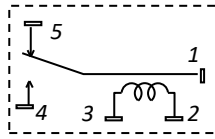
READ CAUTIONS IN THE SELECTION GUIDE

Read the cautions described in EM Devices' "Miniature Relays" before does designing your relay applications.

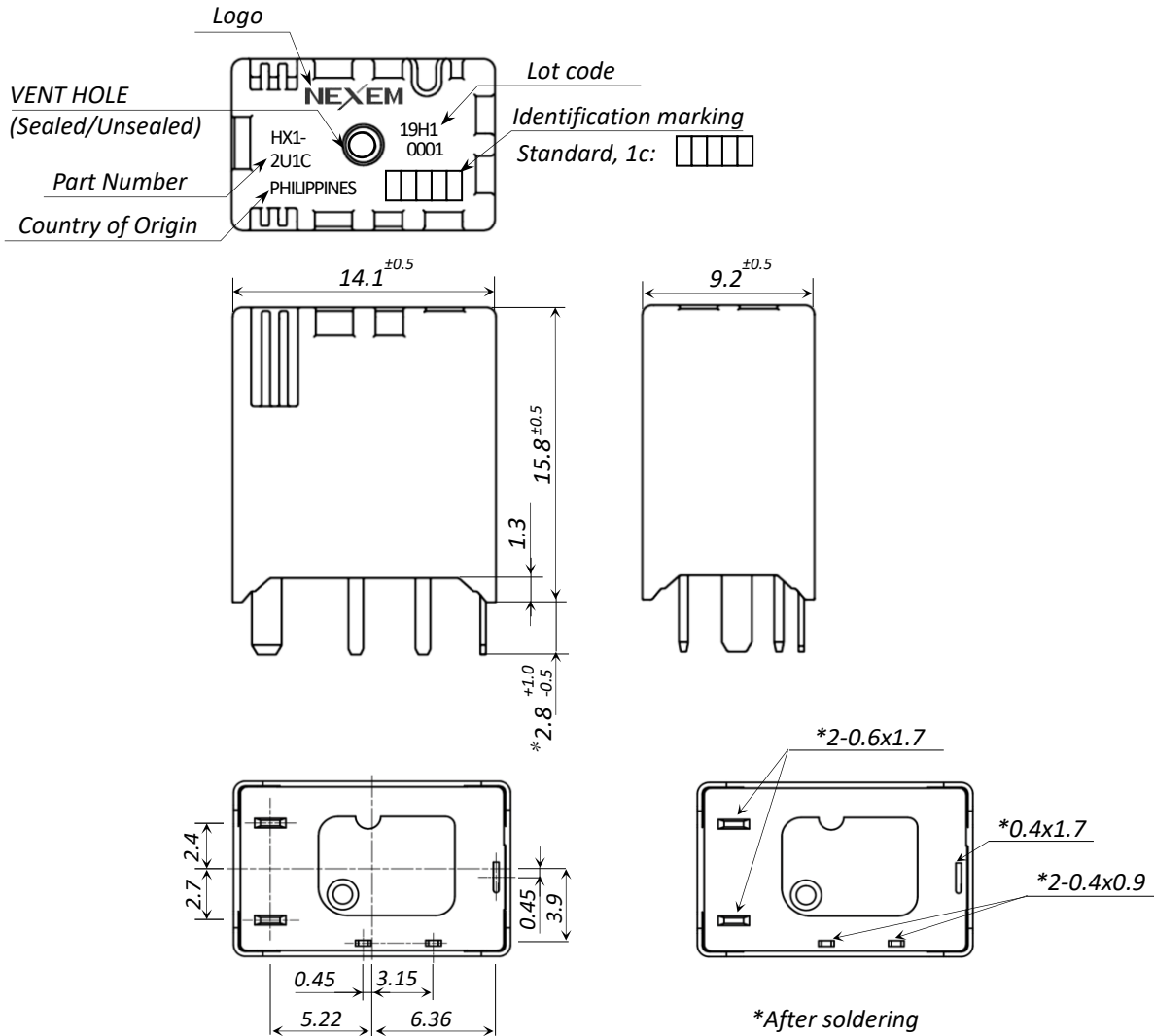
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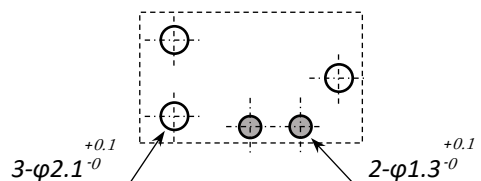
SCHEMATICS (BOTTOM VIEW)



DIMENSIONS (in mm)



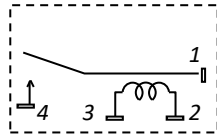
RECOMMENDED PCB PAD LAYOUT (BOTTOM VIEW) (in mm)



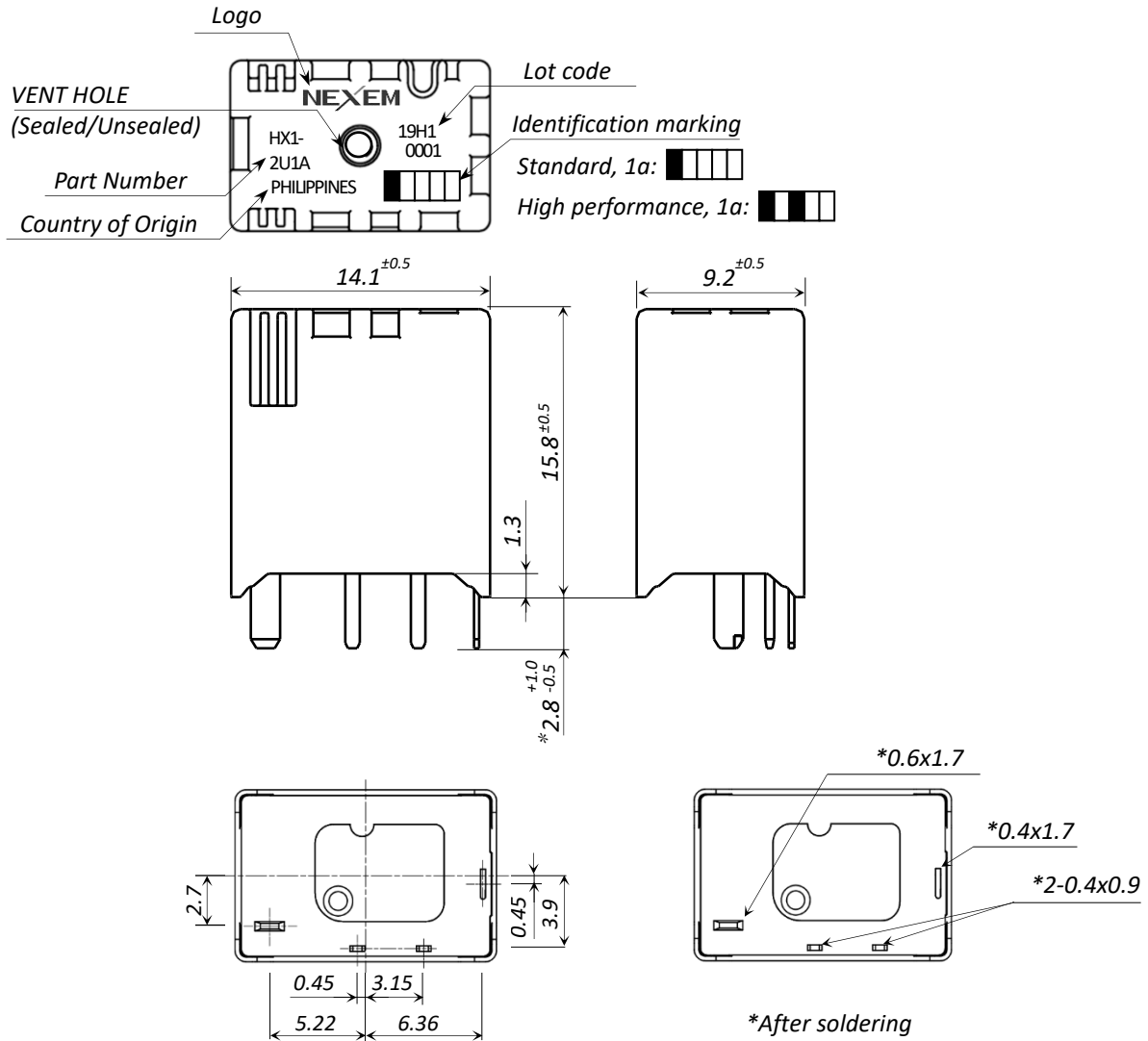
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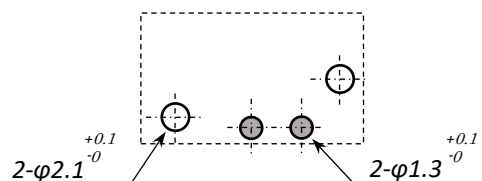
SCHEMATICS (BOTTOM VIEW)



DIMENSIONS (in mm)



RECOMMENDED PCB PAD LAYOUT (BOTTOM VIEW) (in mm)



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SPECIFICATIONS

(Ambient temperature: 20°C)

Items		Specifications		
Contact form		1c (Standard)	1a (Standard)	1a (High performance)
Contact rating	Max. switching voltage	16Vdc		
	Min. switching current	1A at 5Vdc		
	Max. carrying current ⁽¹⁾	35A fuse rating at 20°C (30A fuse rating at 85°C)		
	Contact resistance	3mΩ typical, 25mΩ max. (6Vdc–7A voltage drop method, initial)		
	Rated load	30A-16Vdc, Motor load	30A-16Vdc, Resistive load	Inrush 90A/ Steady 10A-16Vdc, Capacitive load
Contact material		Silver oxide complex alloy		
Operate time ⁽²⁾		4ms typical, 10ms max.		
Release time ⁽²⁾		5ms typical, 10ms max.		
Insulation resistance		100MΩ min. at 500Vdc		
Breakdown voltage	Between open contacts	500Vac min. for 1minute		
	Between coil and contact	500Vac min. for 1minute		
Shock resistance	Misoperation	100m/s ²		
	Destructive failure	1000m/s ²		
Vibration resistance	Misoperation	10 to 300Hz, 50m/s ²		
	Destructive failure	10 to 500Hz, 50m/s ² for 200hours		
Ambient temperature		-40 to +125°C (no freezing)		
Life expectancy	Mechanical	1,000,000 cycles		
	Electrical	100,000 cycles (Rated load)		
Weight		5g typical		

(1) Copper thickness: 105µm, width: 10mm, 110% 100hours min., 135% 30minutes, 200% 5seconds.

(2) Excluding contact bounce, nominal voltage applied, with flywheel coil diode

(3) EM Devices recommends that the usage of the coating agent close to the relay is to be avoided.

COIL RATING

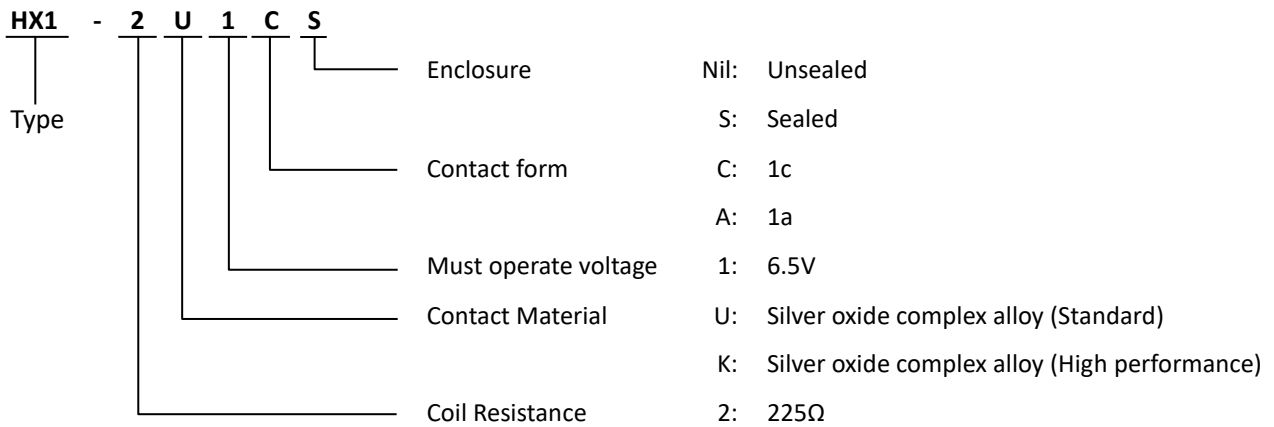
(Ambient temperature: 20°C)

Nominal Voltage (VDC)	Coil Resistance (Ω)±10%	Must Operate Voltage ⁽⁴⁾ (VDC)	Must Release Voltage ⁽⁴⁾ (VDC)	Nominal Operating Power (W)
12	225	6.5	0.9	0.64

(4) Test by pulse voltage

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PART NUMBER SYSTEM

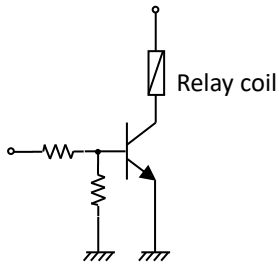


Contact form	Contact material	Coil Nominal voltage	Coil Resistance	Sealed type	Unsealed type
1c	Standard	12VDC	225Ω	HX1-2U1CS	HX1-2U1C
1a	Standard	12VDC	225Ω	HX1-2U1AS	HX1-2U1A
	High performance	12VDC	225Ω	HX1-2K1AS	HX1-2K1A

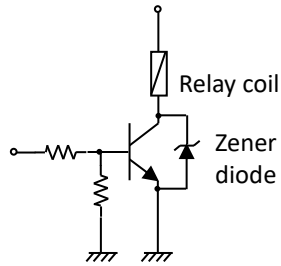
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COIL DRIVE CIRCUIT

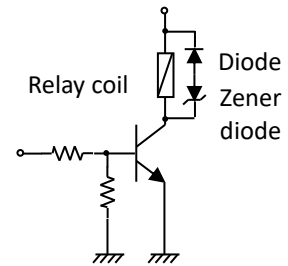
Recommended Circuit



(a)

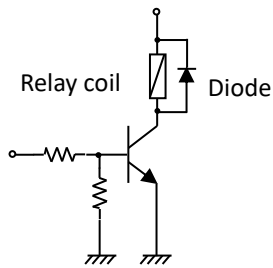


(b)



(c)

Non-recommended Circuit



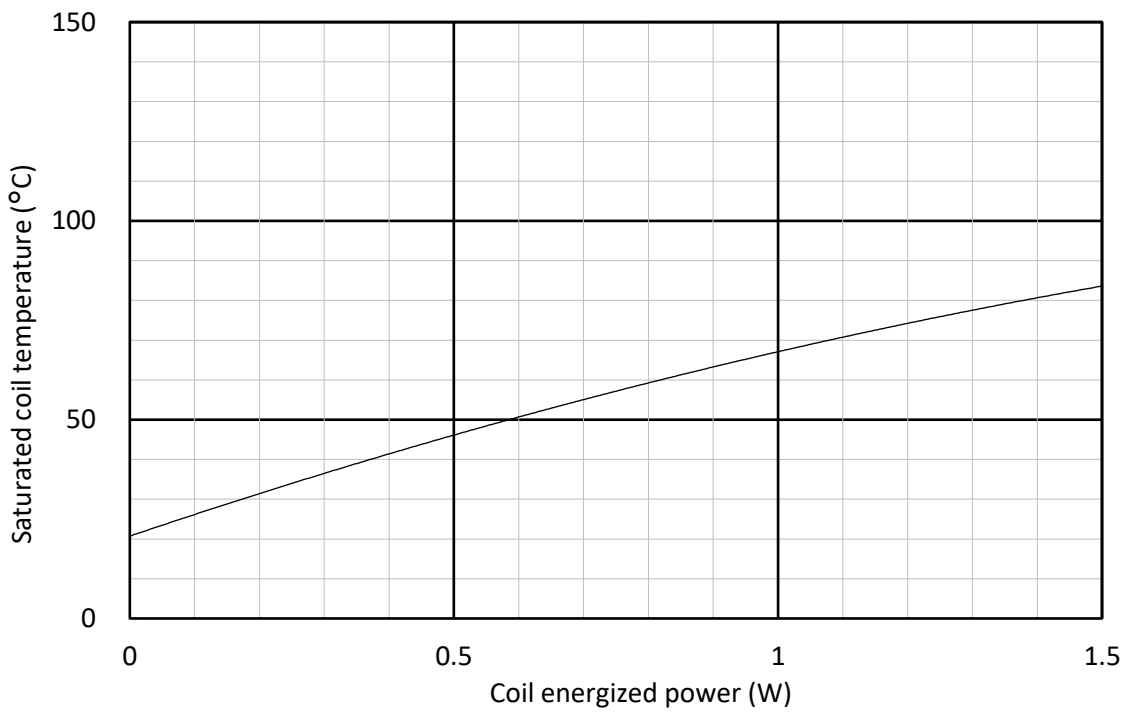
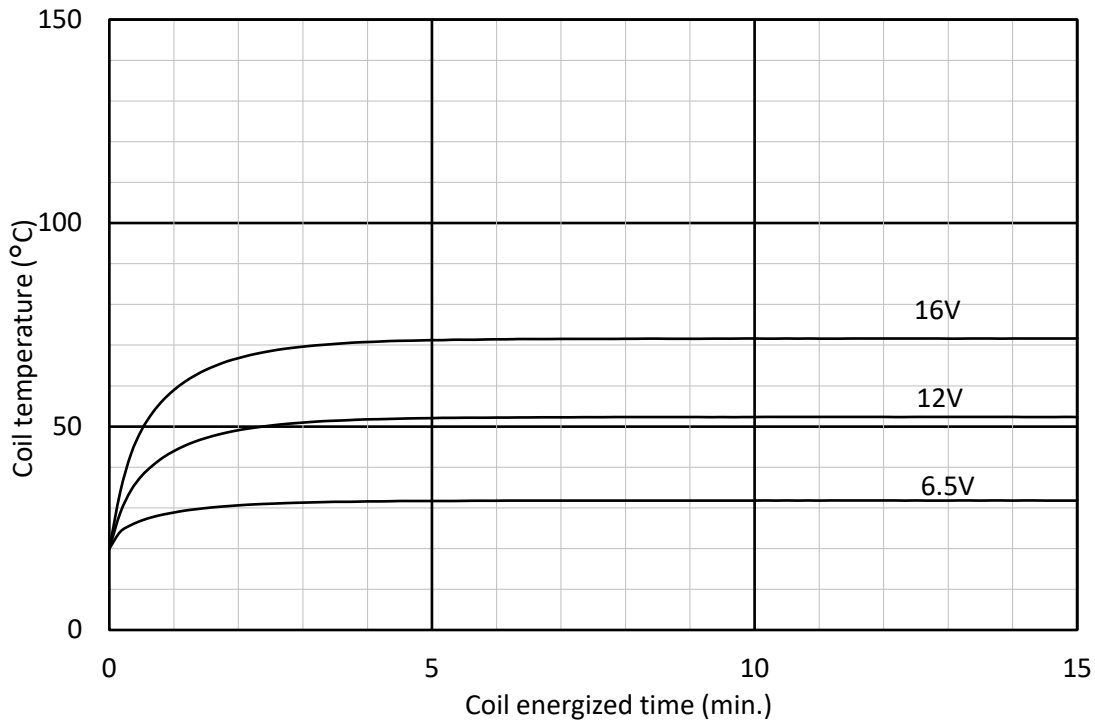
(d)

(Note)

EM Devices recommends coil drive circuit (b) and (c) for coil fly back suppression, but does not recommend the circuit (d) because the performance of the HX1 relay does not appear enough.

TECHNICAL DATA

Coil Temperature Rise



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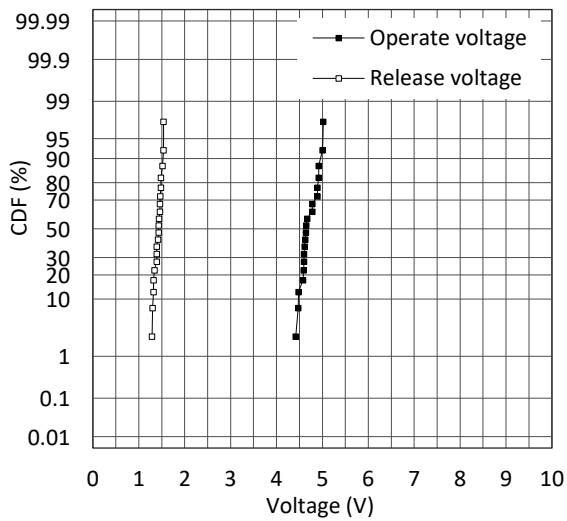
RELAY CHARACTERISTICS DISTRIBUTION (INITIAL)

Specimen: HX1-2U1CS

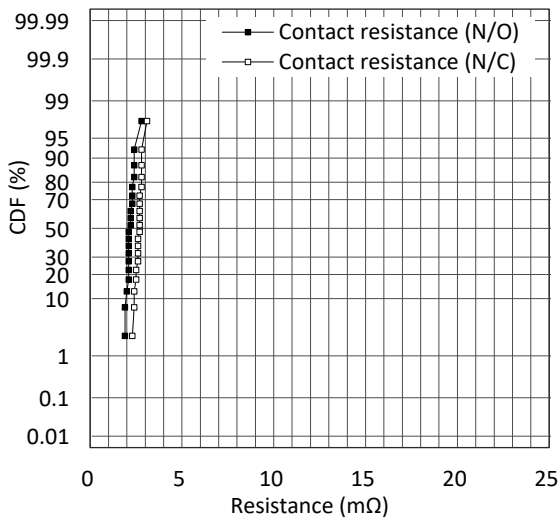
Ambient Temperature: 20°C

Quantity: 20pcs.

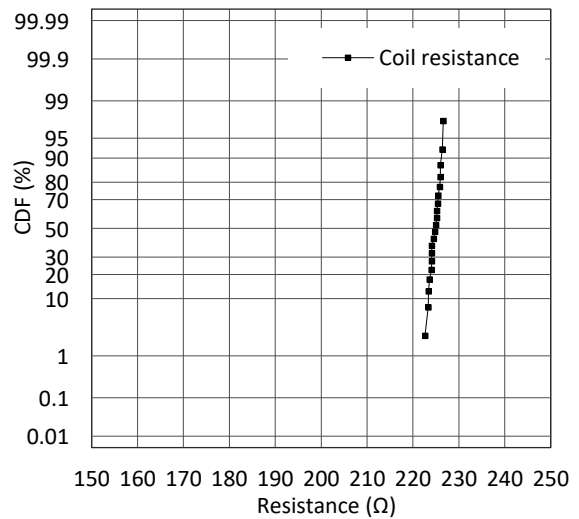
Operate / Release voltage



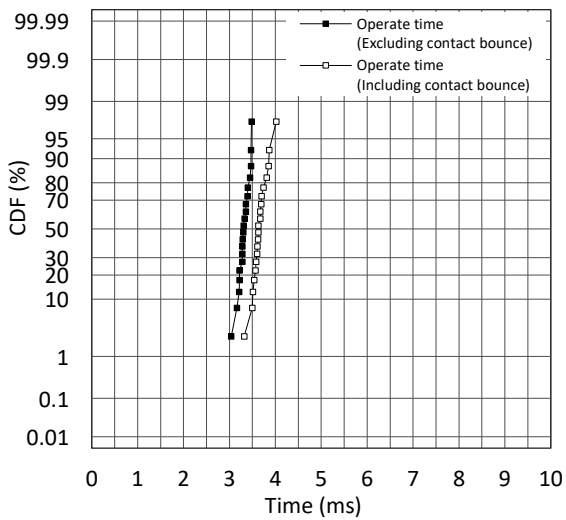
Contact resistance



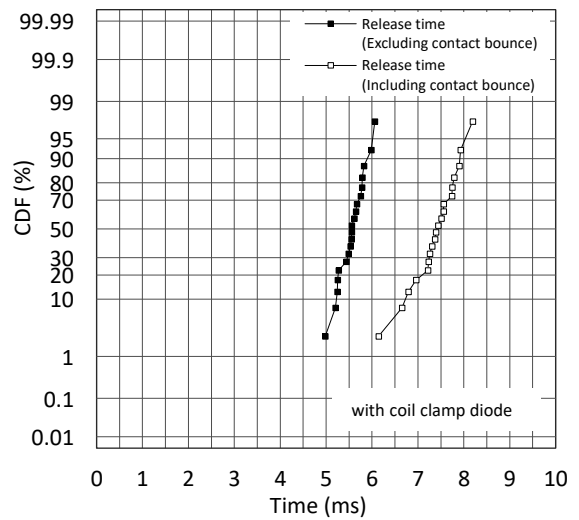
Coil resistance



Operate time



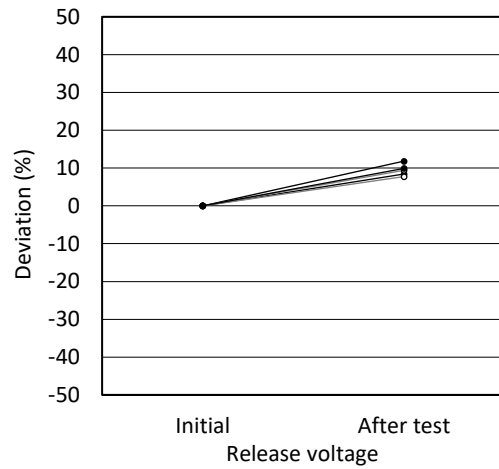
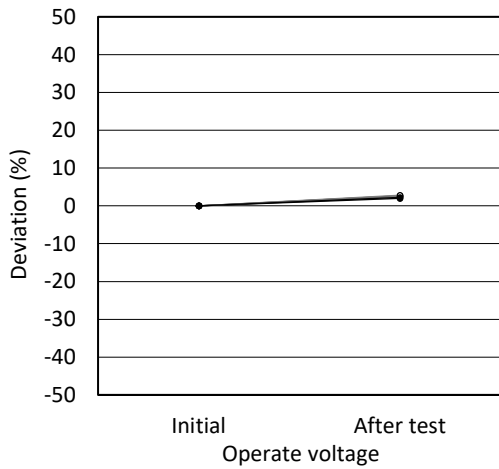
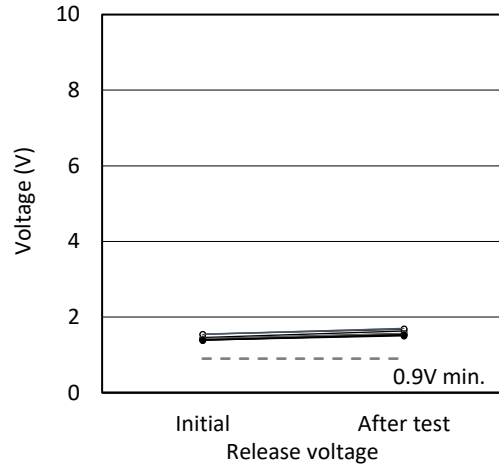
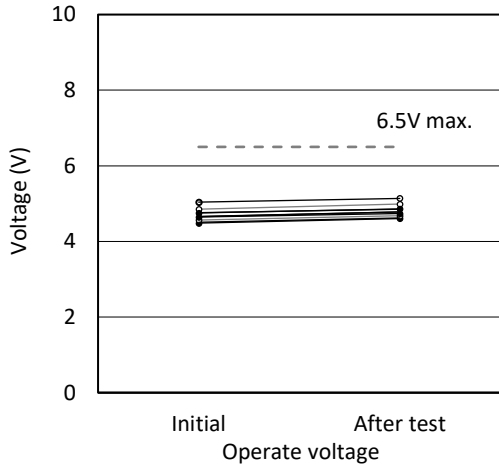
Release time



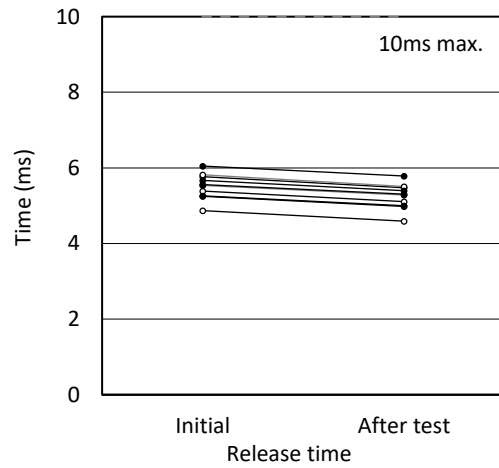
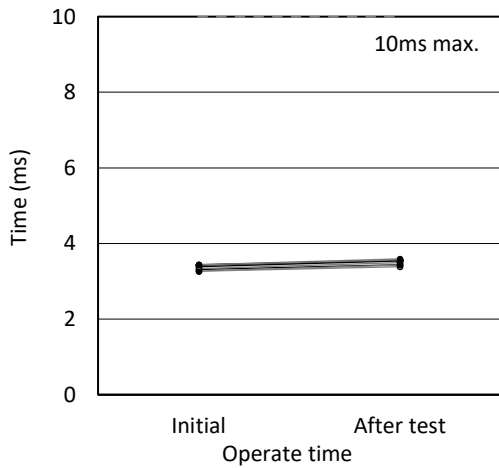
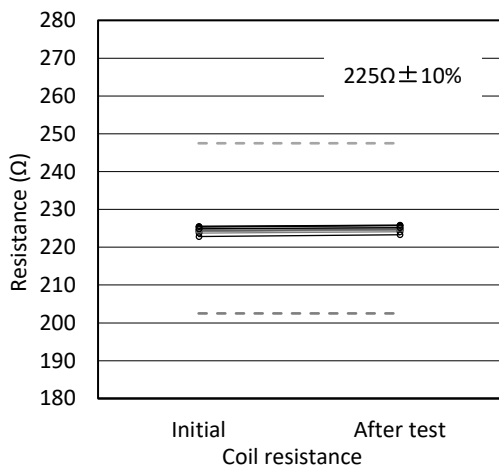
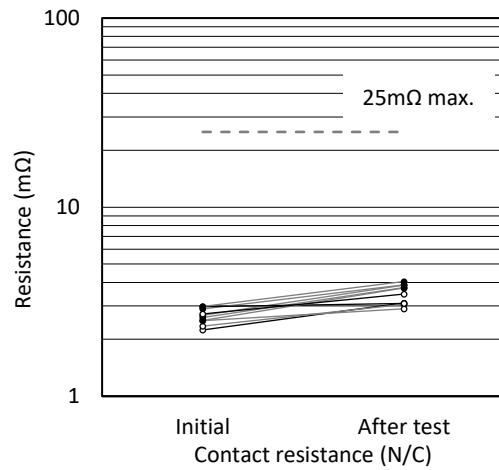
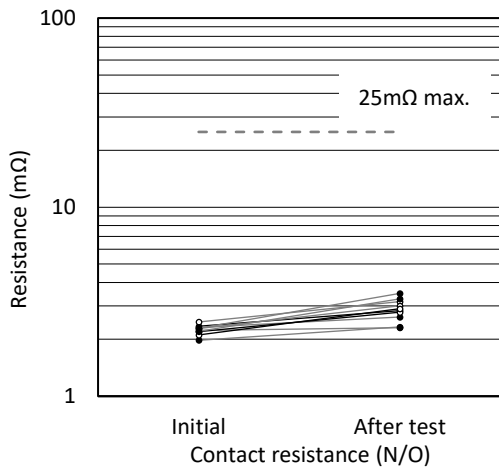
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ELECTRICAL LIFE TEST (30A-16Vdc, Motor, Lock)

Test items	Test conditions	Samples
1. Operate voltage	Temperature: 20°C Frequency: 0.1Hz (0.2s ON, 9.8s OFF) Contact load: 30A-16Vdc, Motor, Lock Number of operations: 100 x 10 ³	HX1-2U1CS 10 pcs
2. Release voltage		
3. Contact resistance		
4. Coil resistance		
5. Operate time		
6. Release time (with coil clamp diode)		



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