

**HANDOUK**

General Purpose Relay : GA Relay

GA**► FEATURE**

- General Purpose power relay
- 35mm DIN rail for plug-in socket
- UL,cUL,CQC approved
- LED and Diode can be installed
- Various sockets available



SIZE : (L x W x H) 28 x 21.5 x 36mm

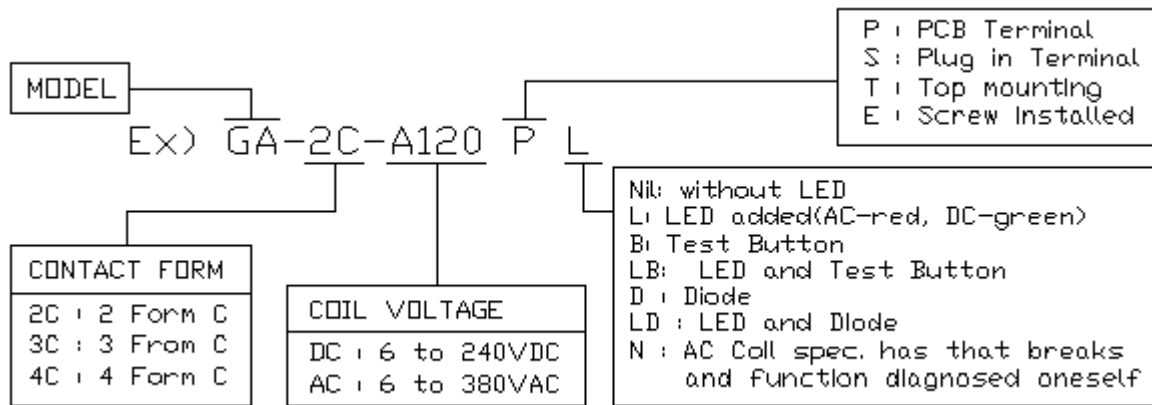
► PRODUCT PROPERTIES

Contact Form		2C	3C	4C
Contact Material		Ag alloy		
Contact Ratings		5A, 240VAC / 28VDC		3A, 240VAC / 28VDC
Max Switching Power		1,200VA / 140W		720VA / 140W
Contact Resistance		100mΩMax at 6VDC 1A		50mΩMax at 6VDC 1A
Life Expectancy	Electrical	100,000 Operations (at 30 Operations / minute)		
	Mechanical	10,000,000 Operations		
Pick-up voltage (At 25°C)		DC : ≤ 75 % Un., AC : ≤ 80 % Un.		
Drop-out voltage (At 25°C)		DC : ≥ 10 % Un., AC : ≥ 30 % Un.		
Max. allowable coil voltage		120 % Un. (At 25 °C)		
Insulation Resistance		500MΩ Min. at 500VDC		
Dielectric Strength Between	Open Contacts	1,000VAC(for one minute) (Leak current : 1mA)		
	Contact poles	1,000VAC(for one minute) (Leak current : 1mA)		
	Contacts and coil	1,500VAC(for one minute) (Leak current : 1mA)		
Operate Time		15ms		
Release Time		10ms		
Nominal coil power	DC(W)	0.9		
	AC(VA)	1.2		
Temperature Range		-55°C ~ +70°C		
Humidity		35% - 85% RH		
Atmospheric		86~106KPa		
Shock Resistance		10G (Malfunction)		
Vibration Resistance		10-55Hz, 1.0mm		
Weight		Approx 35g		
Safety Standard		E197546		

► COIL PARAMETER

Rated Voltage	Pick-up Voltage(Max)	Drop-out Voltage(Min)	Coil Resistance (Ω)+/-10%	Nominal Power	Max. V allowable
12VDC	9VDC	1.2VDC	160Ω	0.9W	110% of nominal voltage
24VDC	18VDC	2.4VDC	640Ω		
48VDC	36VDC	4.8VDC	2,560Ω		
110VDC	82.5VDC	11VDC	133,450Ω		
12VAC	9.6VAC	3.6VAC	42Ω	1.2VA	
24VAC	19.2VAC	7.2VAC	168Ω		
48VAC	38.4VAC	14.4VAC	672Ω		
220VAC	176VAC	66VAC	14,100Ω		

► ORDERING INFORMATION

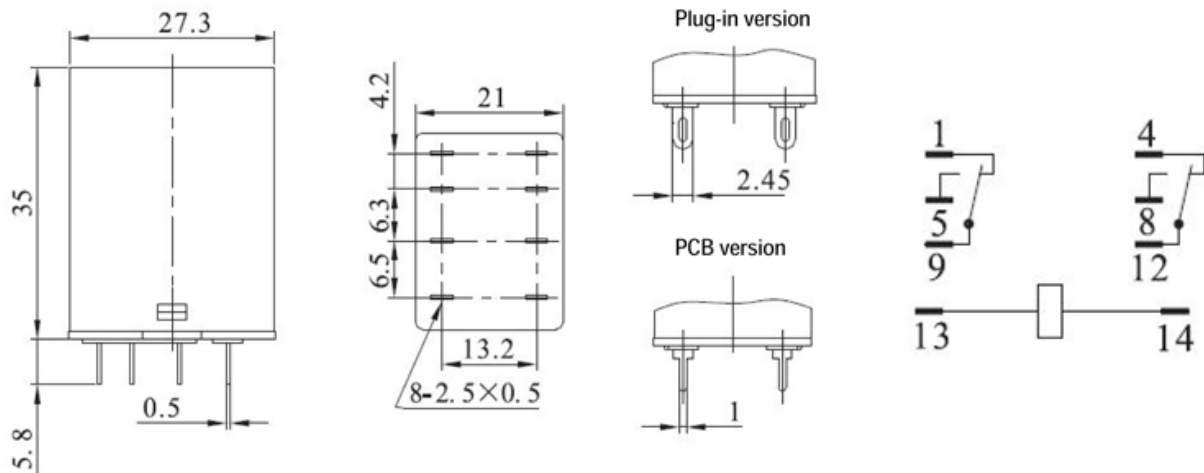


► DIMENSIONS (UNIT: MM)

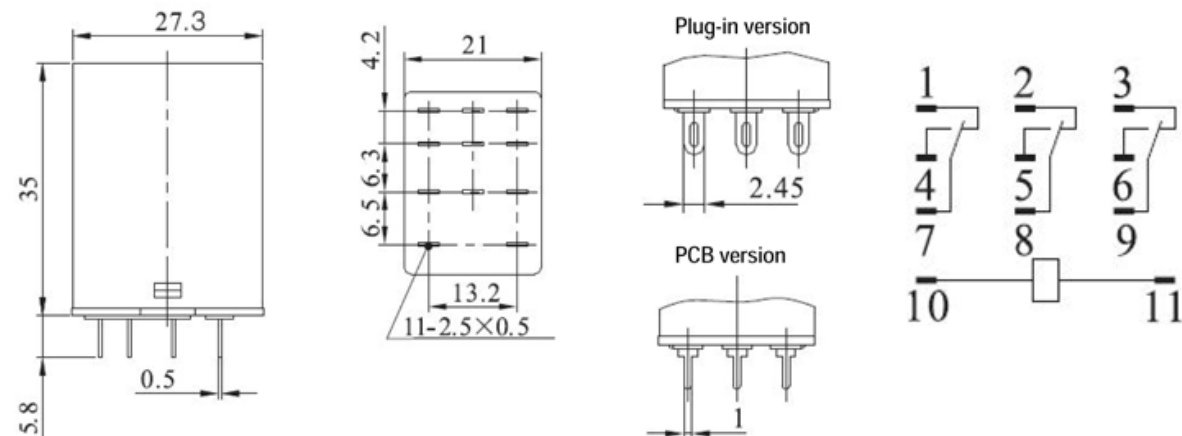
DIMENSIONS

Unit: mm

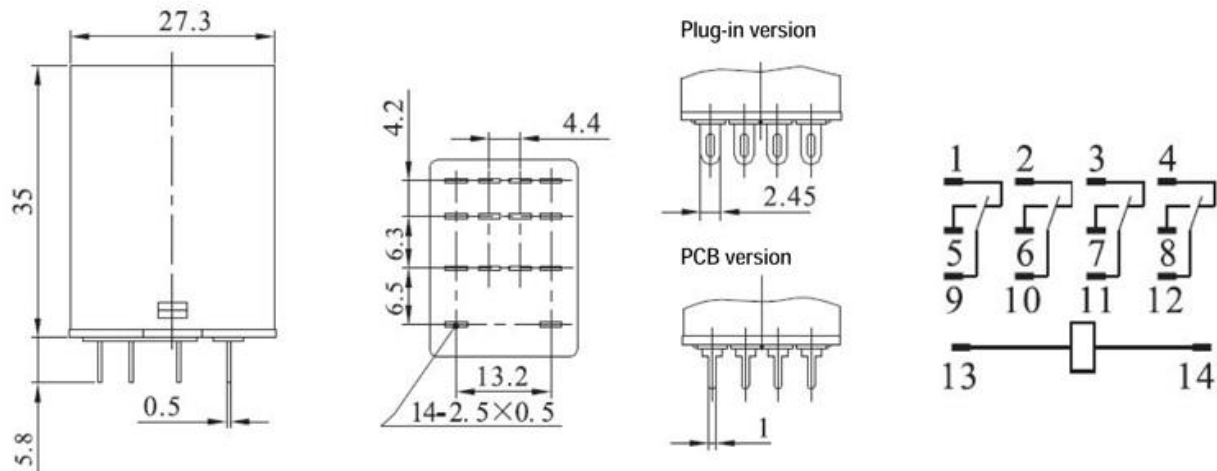
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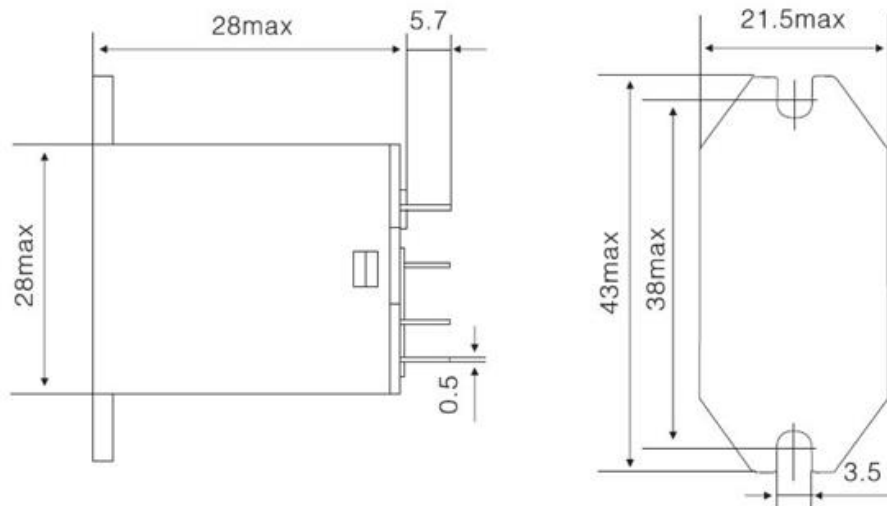
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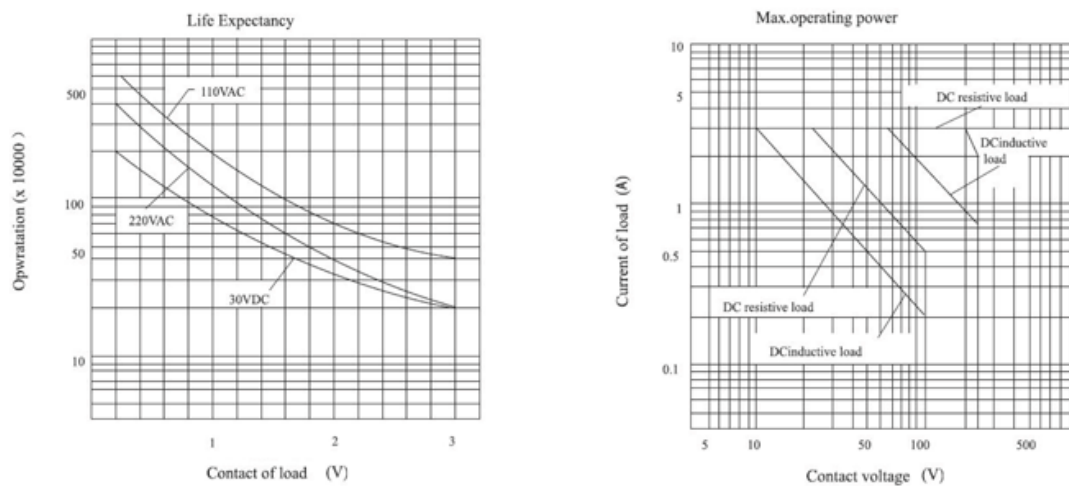
4PDT



FLANGE MOUNTED VERSION



REFERENCE CURVE





HANDOUK

General Purpose Relay : GB Relay

GB

► **FEATURE**

Small and high sensitivity
Rational structure
Various usages
Many kind specifications
Indicator lamp device available

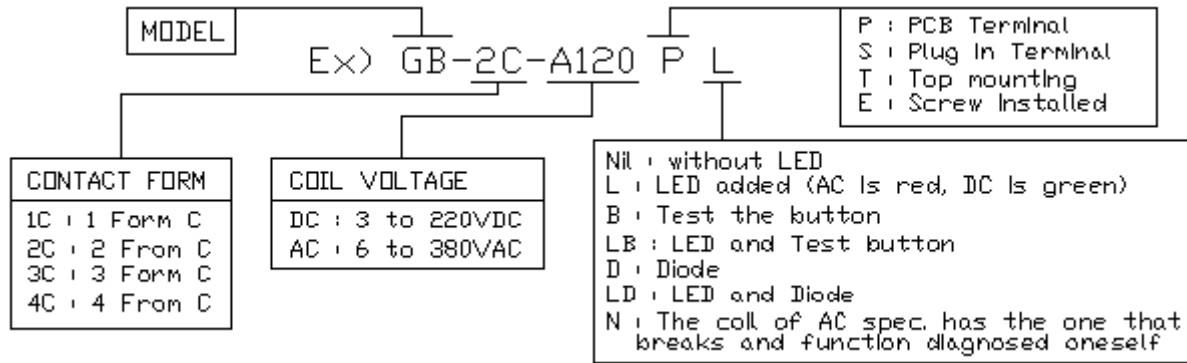


Size (L x W x H) : 1C,2C : 28x21.5x35mm, 3C : 28 x 31.5 x 36mm, 4C : 28 x 41.5 x 36mm 4C

► **PRODUCT PROPERTIES**

Contact Form		1C	2C	3C	4C
Contact Material		Ag alloy			
Contact Ratings		16A 250VAC / 28VDC	10A 250VAC / 28VDC		
Max Switching Voltage		4,000VA / 450W	2,500VA / 280W		
Contact Resistance		100mΩ Max. at 6VDC 1A			
Life Expectancy	Electrical	100,000 Operations (at 30 Operations / minute)			
	Mechanical	10,000,000 Operations			
Insulation Resistance		1000MΩ Min. at 500VDC			
Dielectric Strength Between	Open Contacts	1,200VAC(for one minute) (Leak current : 1mA)			
	Contact poles	1,200VAC(for one minute) (Leak current : 1mA)			
	Contacts and coil	2,000VAC(for one minute) (Leak current : 1mA)			
Pick-up voltage (At 25 °C)		DC : ≤ 75 % Un., AC : ≤ 80 % Un.			
Drop-out voltage (At 25 °C)		DC : ≥10 % Un., AC : ≥ 30 % Un.			
Temperature Range		-25°C ~ +75°C			
Max. coil allowable voltage		120% un. at 25 °C			
Humidity		35% ~ 85%RH			
Atmospheric		86~106KPa			
Nominal coil power	DC(W)	0.9	1.4	1.5	
	AC(VA)	1.2	2	2.5	
Humidity		35% ~ 85%RH			
Atmospheric		86~106KPa			
Shock resistance		10G (Malfunction)			
Vibration resistance		10-55Hz, 1.0mm			
Weight		35g	50g	65g	
UL Safety Standard		UL E197546			

► ORDERING INFORMATION

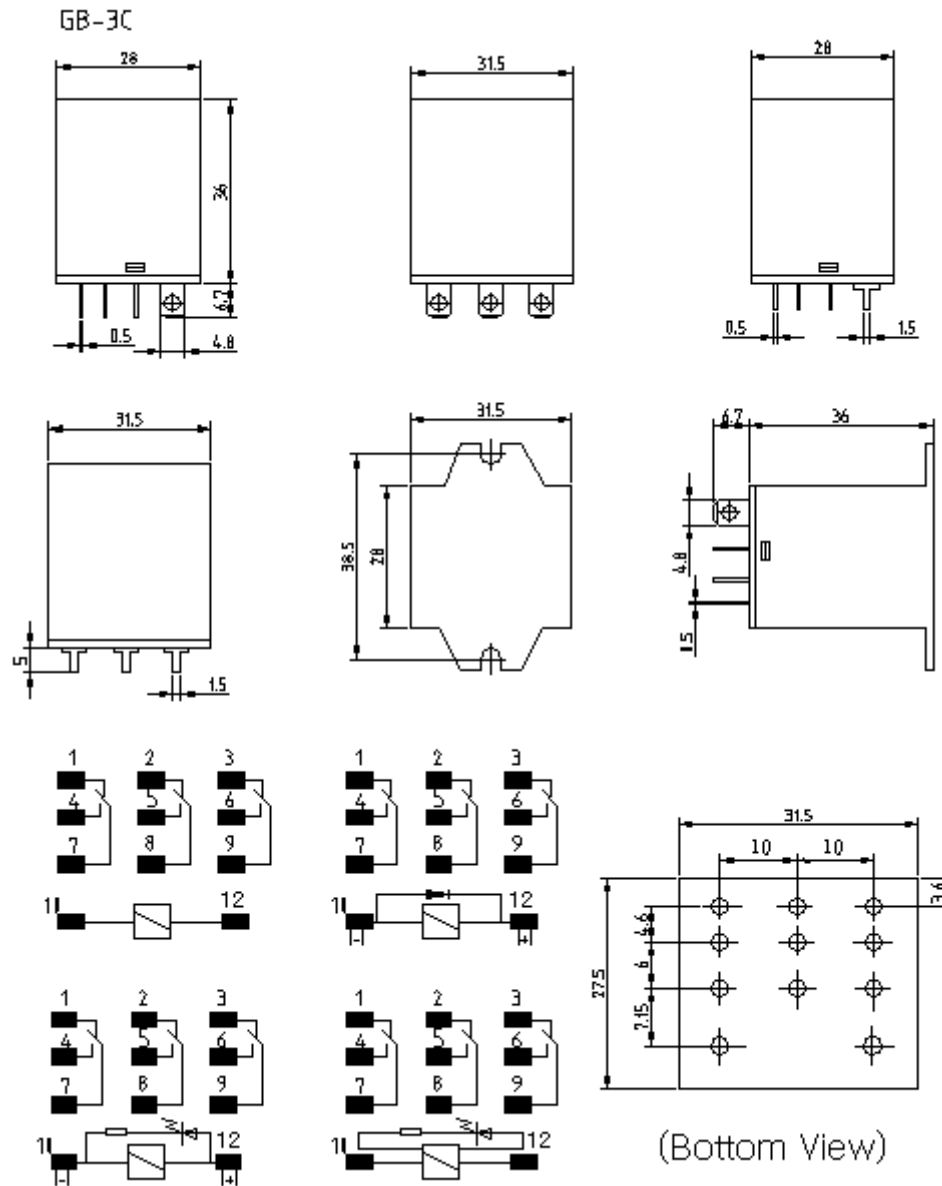


Additional T : M-Contact Material : AgSnO₂In₂O₃, S-Contact : AgSnO₂In₂O/Cu

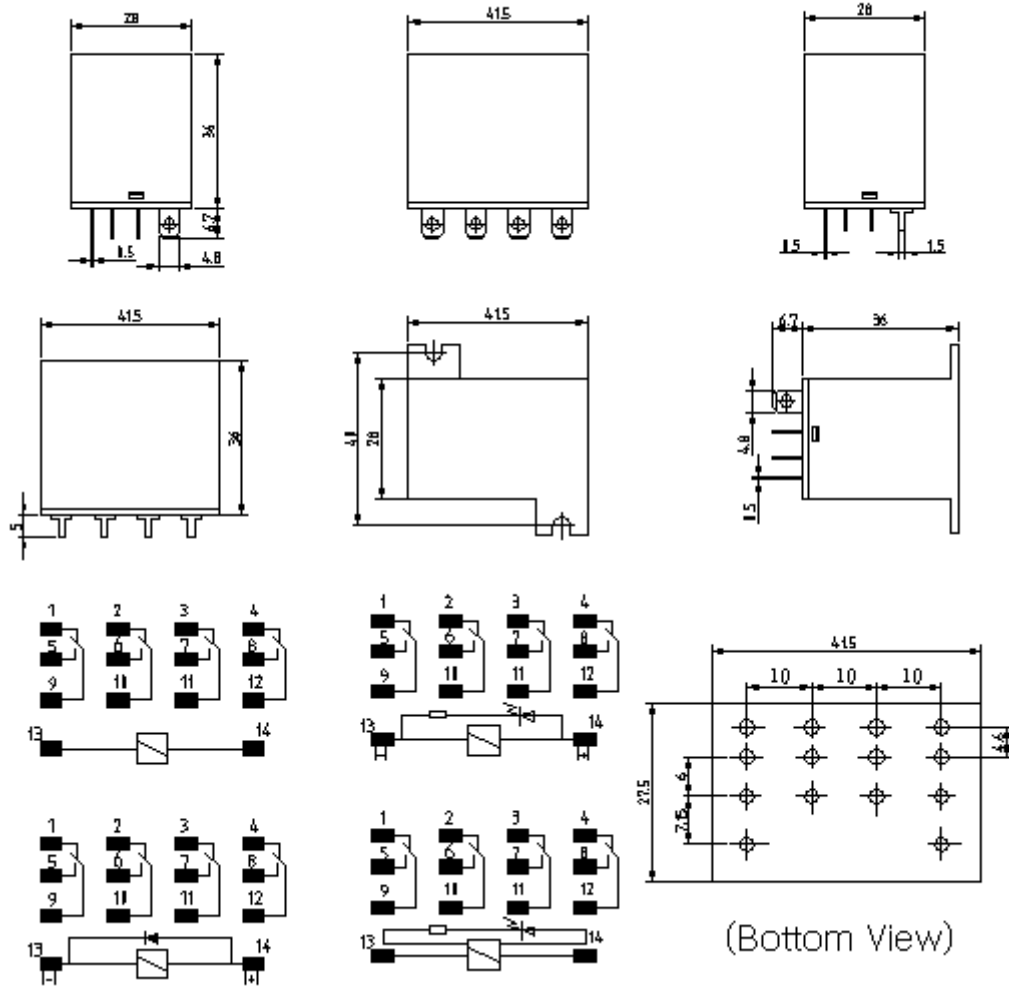
► COIL PARAMETER

GB-1C, GB-2C					
Coil Voltage (VDC)	6V	9V	12V	24V	36V
Coil Resistance Ω (±10%)	40Ω	90Ω	160Ω	650Ω	1,500Ω
	48V	100V	110V	220V	240V
	2,600Ω	11,000Ω	11,000Ω	42,000Ω	64,000Ω
Coil Voltage (VAC)	6V	12V	24V	36V	48V
Coil Resistance Ω (±10%)	11.5Ω	40Ω	160Ω	370Ω	600Ω
	110V	120V	220V	240V	380V
	3,750Ω	3,900Ω	13,000Ω	18,790Ω	42,000Ω

GB-3C				GB-4C			
Coil Voitage (VDC)	Coil Resistance Ω (±10%)	AC Coil Voltage (VAC)	Coil Resistance Ω (±10%)	Coil Voitage (VDC)	Coil Resistance Ω (±10%)	AC Coil Voltage (VAC)	Coil Resistance Ω (±10%)
6	25	6	6.5	6	24	6	5
9	56	12	25.5	9	54	12	24
12	100	24	102	12	96	24	80
24	400	36	230	24	350	36	180
36	900	48	410	36	865	48	320
48	1,600	110	2,300	48	1,540	100/110	1,680
110	8,400	120	2,700	110	6,800	120	2,000
		220	8,500			200/220	6,700
220	33,000	240	10,000	220	29,000	240	8,000
		380	27,500			380	29,000



GB-4C





Industrial & Electrical Components

General Purpose
Power Relay

Part No.

GB-**-B



- General purpose power relay
- For plug-in socket, 35mm DIN rail
- Mechanical indicator + lockable test button
- LED option

CONTACT

Arrangement	2A, 2B, 2C
Contact Material	Silver Alloy
Contact Resistive	Max.: 100 mΩ
Rating	
Resistive load (cosφ=1)	10A 240VAC/28VDC
Max. Switching Voltage	277VAC/28VDC
Min. Breaking Capacity	0.3W
Expected life	
Mechanical	1×10 ⁷
Electrical	1×10 ⁵

CHARACTERISTICS

Operate Time	20msec. Max.
Release Time	20msec. Max.
Initial breakdown voltage	
Between Coil & Contact	1500VAC (50/60Hz) for 1 min.
Between Open Contacts	1000VAC (50/60Hz) for 1 min.
Insulation Resistance	Min.100MΩ (500 VDC)
Shock: Endurance	10G
Damage	100G
Vibration Endurance	10 to 55Hz, 1.0mm D.A.
Damage	10 to 55Hz, 1.0mm D.A.
Ambient temperature	-55°C ~ +70°C
Unit weight	35g

ORDERING INFORMATION

e.g

GB - 2C - A220 SB

① ② ③ ④

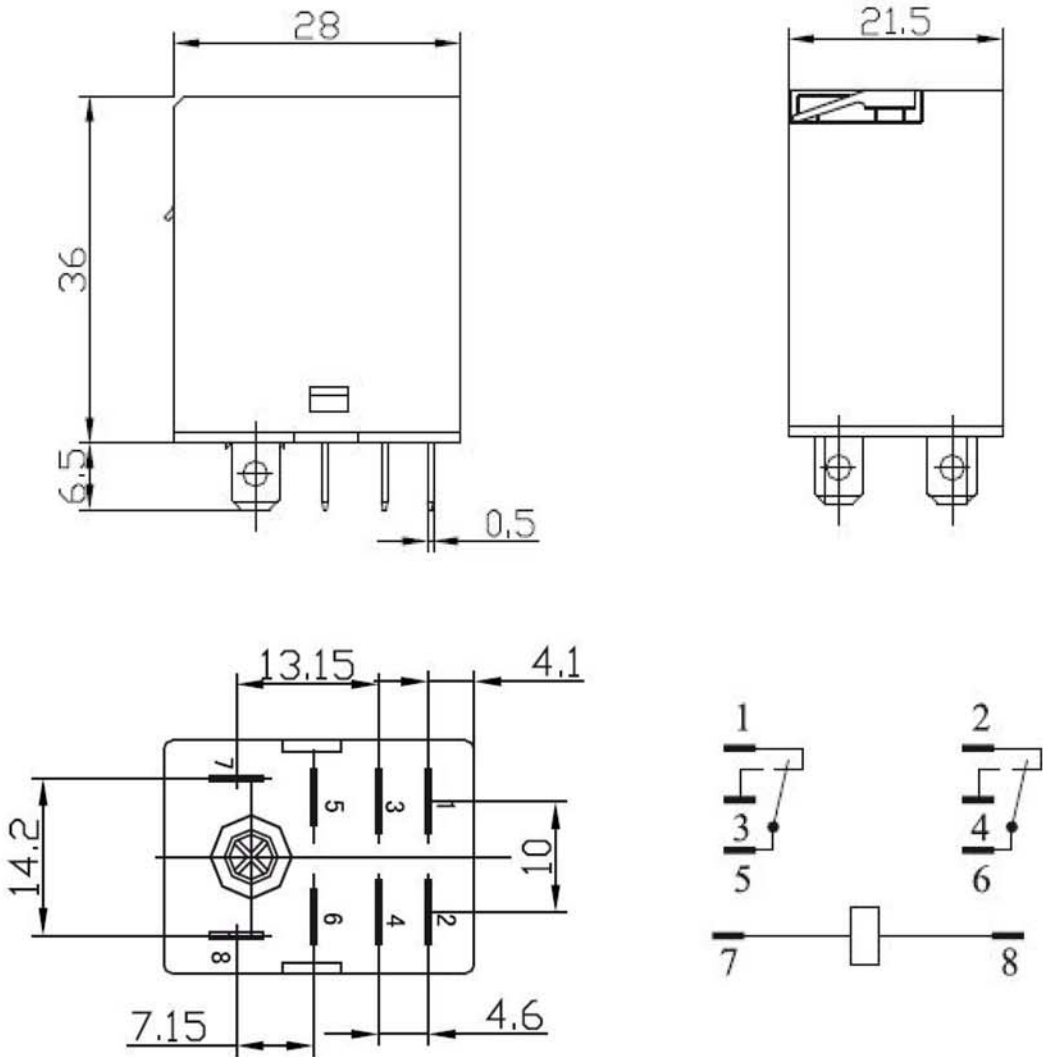
- ① Model
- ② Contact Form
- ③ Coil Voltages
- ④ Structure

COIL DATA (at 20°C)

Rated Voltage	Pick-up Voltage VDC (Max)	Drop-out Voltage VDC (Min)	Coil Resistance (Ω) ± 10%	Nominal operating Power	Max.Allowable Voltage (VDC)
12VDC	9.00	1.20	160.00	0.9W	110% of nominal voltage
24VDC	18.00	2.40	640.00		
48VDC	36.00	4.80	2560.00		
110VDC	82.50	11.00	13450.00		
12VAC	9.60	3.60	42.00	1.2VA	
24VAC	19.20	7.20	168.00		
48VAC	38.40	14.40	672.00		
220VAC	176.00	66.00	14100.00		

DIMENSIONS

Unit: mm



- Exceptionally reliable general purpose relay
- Long life (minimum 100,000 electrical operations)
- DPDT and 3PDT configurations
- Industry standard octal-type termination
- Various sockets available



► CONTACT DATA

Contact Form		2 Form C	3 Form C
Contact Rating		10A 250VAC 10A 30VDC	
Max Switching Power		300W / 2,500VA	
Contact Resistance		50MΩ (Initial Max. at 1A 6VDC)	
Contact Material		Silver Alloy	
Life Expectancy	Electrical	100,000 (1 sec. on, 1 sec. off)	
	Machanical	10,000,000 (300 times a min.)	

►Coil Data

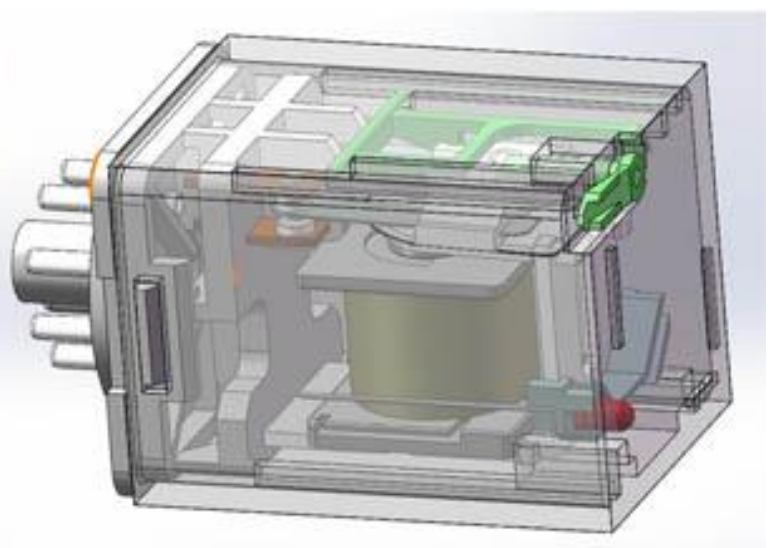
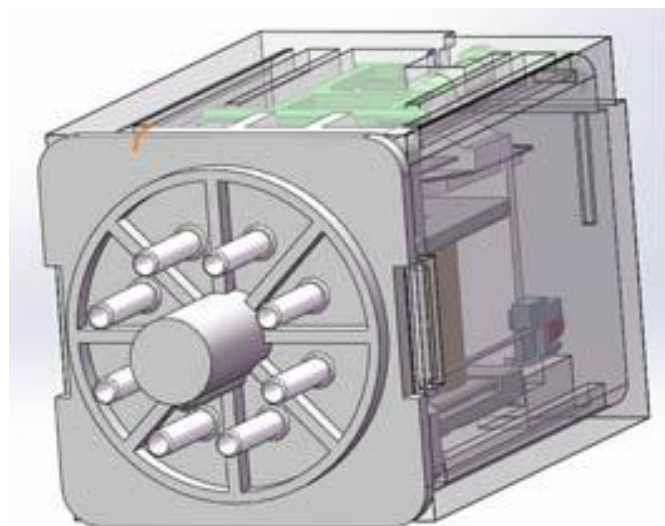
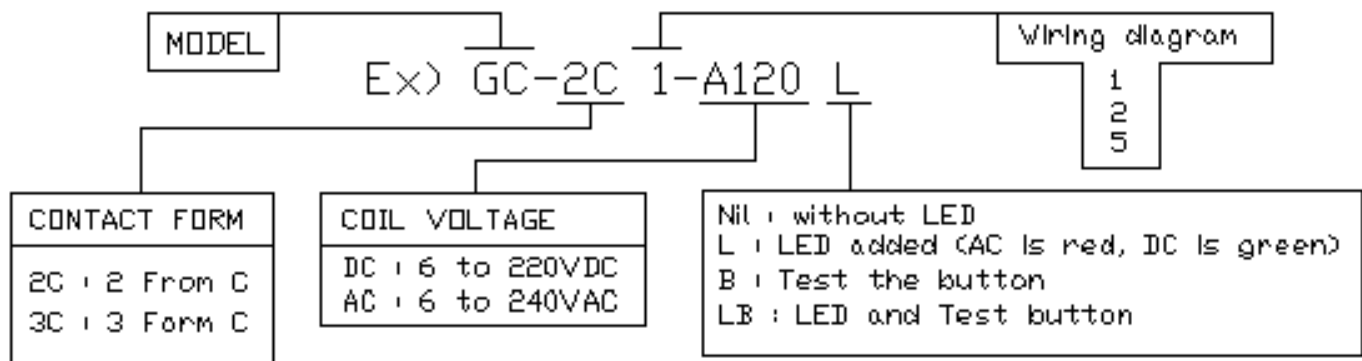
Insulation Resistance		500MΩ 500VDC .Min
Dielectric Strength Between	Open Contacts	1,200VAC / 1 min.
	Contacts circuits	1,200VAC / 1 min
	Coil and contacts	1,500VAC / 1 min.
Pick-up voltage		≤80%
Drop-out voltage		DC:≥15%, AC:≥30%
Operate Time(at nominal voltage)		20ms
Release Time(at nominal voltage)		15ms
Temperature Range		-30 °C ~ 75 °C
Shock Resistance		10G
Vibration Resistance (functional)		1.5mm, 10~50Hz,
Humidity		35% ~ 85% RH
Atmospheric		86~10kKPa
Max. continuous voltage		110%
Coil nominal power	DC	1.5W
	AC	2.7W

Weight	Approx. 75g
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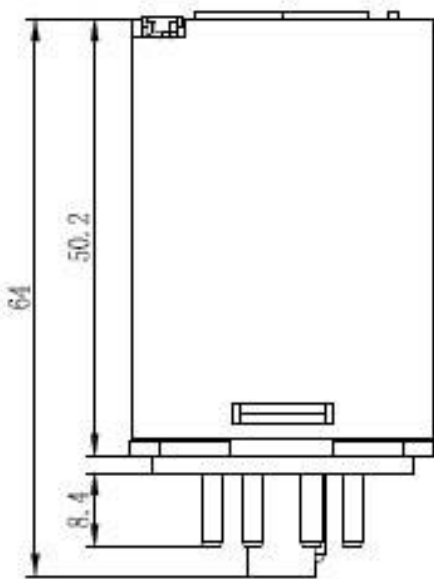
► COIL DATA Coil spec. (25 °C)

Coil Voltage(VDC)	6V	12V	24V	48V	100V
Coil Resistance $\Omega(\pm 10\%)$	18 Ω	72 Ω	288 Ω	1,152 Ω	5,000 Ω
	110V				
	6,050 Ω				
AC Coil Voltage(VAC)	6V	9V	12V	24V	36V
Coil Resistance Ω ($\pm 10\%$)	3.6 Ω	801 Ω	14.4 Ω	57.6 Ω	129.6 Ω
	48V	110V	127V	220V	380V
	230.4 Ω	1,210 Ω	1,600 Ω	4,480 Ω	14,400 Ω

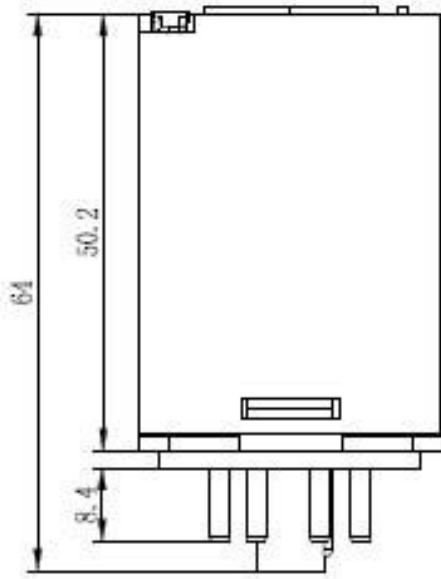
► ORDERING CODE



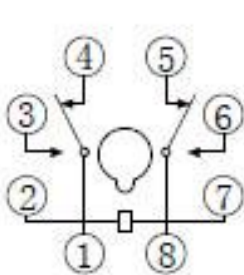
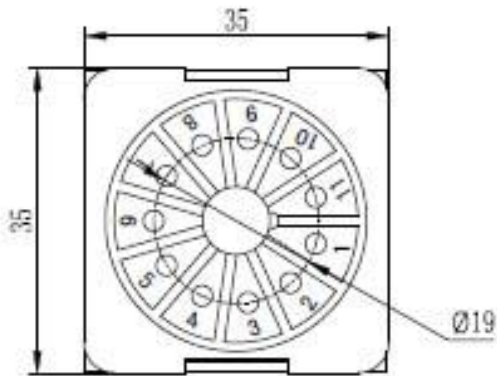
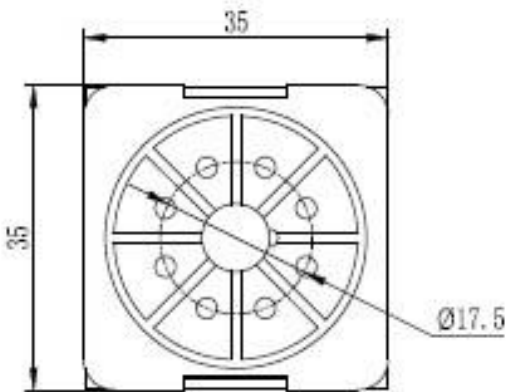
OVERALL AND MOUNTING DIMENSIONS



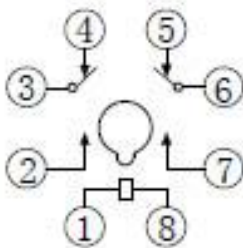
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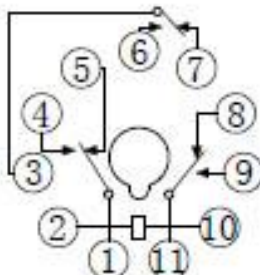
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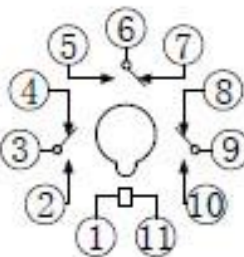
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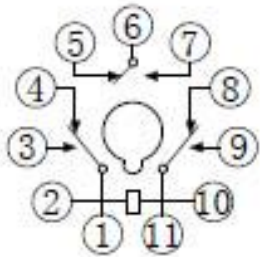
GC-2C2



GC-3C1



GC-3C2



GC-3C5



► FEATURES

- Semi-multi power supply voltage
- Exclusive C-MOS IC permits miniaturization and assures high performance
- High repeat accuracy : $\pm 5\%$ including the initial value
- Short resetting time : 0.1 second max. including the time when the timer resets in operation
- Large transparent time setting knob facilitates time setting
- Equipped with a LED power-ON indicator
- Environmental friendly product (RoHs compliant)
- Outline Dimensions: 28.0 x 21.5 x 52.0mm



► CHARACTERISTICS

Accuracy of operating time(Max)		$\pm 5\%$
Setting error (Max.) ¹⁾		$\pm 10\% \pm 50\text{ms}$
Reset time (Max.)		0.1ms(Including halfway reset)
Reset voltage (Max.)		10% of rated supply voltage
Influence of Voltage (Max.) ¹⁾		$\pm 2\%$
Influence of temperature (Max.) ¹⁾		$\pm 2\%$
Insulation resistance (Min.)		100M ohm (at 500VDC)
Dielectric Strength Between	contacts	1,500VAC 1min
	circuits	1,500VAC 1min
	contact sets	1,000VAC 1min
Vibration resistance	Destruction	10 to 55Hz, 0.75mm single amplitude
	Malfunction	10 to 55Hz, 0.50mm single amplitude
Shock resistance	Destruction	1,000 m/s ² (100g)
	Malfunction	100 m/s ² (10g)
Ambient temperature	Operating	-10°C to 50°C (with no icing)
	Storage	-25°C to 65°C (with no icing)
Ambient humidity		35% to 85% RH
Malchancial life (Min)		1x10 ⁷ ops (under no load at 1,800 ops/h)
Electrical life (Min.)		ST-2 : 1x10 ⁵ ops (7A 250VAC/30VDC. Res. load)
		ST-4 : 1x10 ⁵ ops (5A 250VAC/30VDC. Res. load)
Enclosure rating		IP40
Weight		50g

Notes: 1) Add $\pm 10\text{ms}$ to above value for the 1s range model

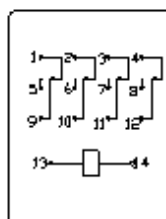
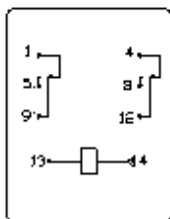
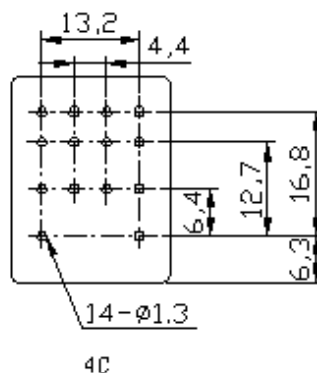
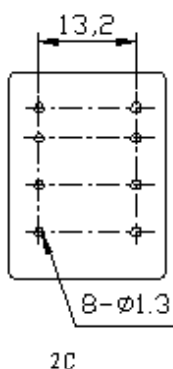
► TIME RANGE

Code	Rated time	Time setting range	Code	Rated time	Time setting range
A	1 second	0.05 to 1s (Scale:0.05)	F	3 min	0.1 to 3min(Scale:0.1)
B	6 seconds	0.37 to 6s (Scale:0.2)	G	6 min	0.2 to 6min(Scale:0.2)
C	12seconds	0.5 to 12s (Scale:0.4)	H	12 min	0.4 to 12min(Scale:0.4)
D	30seconds	1.5 to 30s (Scale:1)	I	30 min	1 to 30min(Scale:1)
E	60seconds	2.3 to 60s (Scale:2)	J	60 min	2 to 60min(Scale:2)

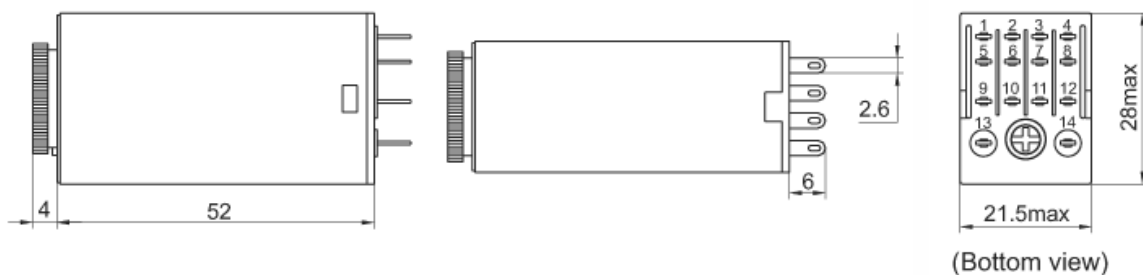
► ORDERING INFORMATION

	ST-2	A	24VDC	XXX
Type	ST-2 : 7A 250VAC/30VDC, 2pole ST-4 : 5A 250VAC/30VDC, 4pole			
Timing range	A to L (Show in the timing range table)			
Control voltages	12, 24, 48VDC, 110, 220, 240VAC			
Customer special code	Only for special requirements			

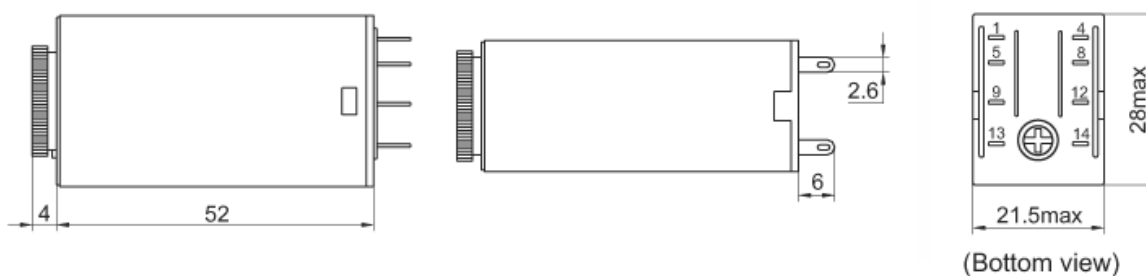
► OUTLINE DIMENSIONS



ST-4

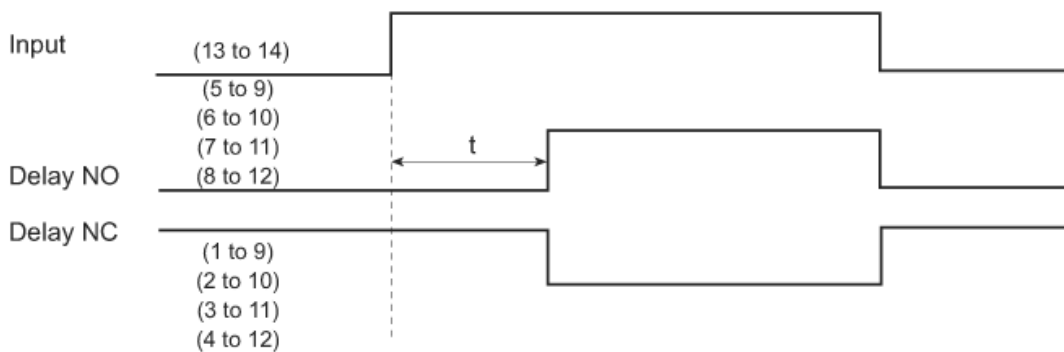


ST-2

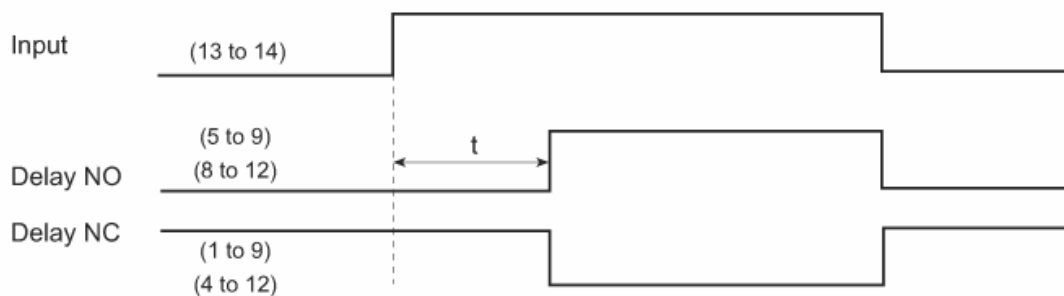


DELAY OSCILLOGRAM

ST-4



ST-2



Features

High reliability for using C² MOS IC CHIP

High precision design not affected by temperature and electric voltage.

2pcs Timer Unit in 1pcs compact Unit.

Identify operation from Signal Lamp.
Minimized power consumption.

SET-T N-TYPE

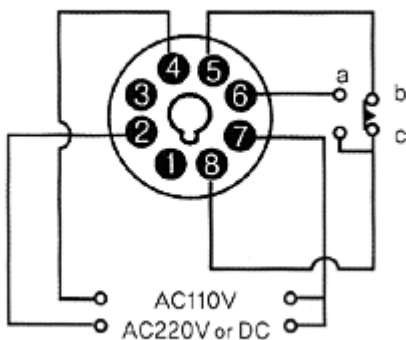


SET-T Y-TYPE

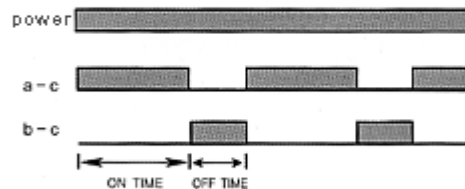


SET-T N-TYPE AND Y-TYPE

Connection Drawing

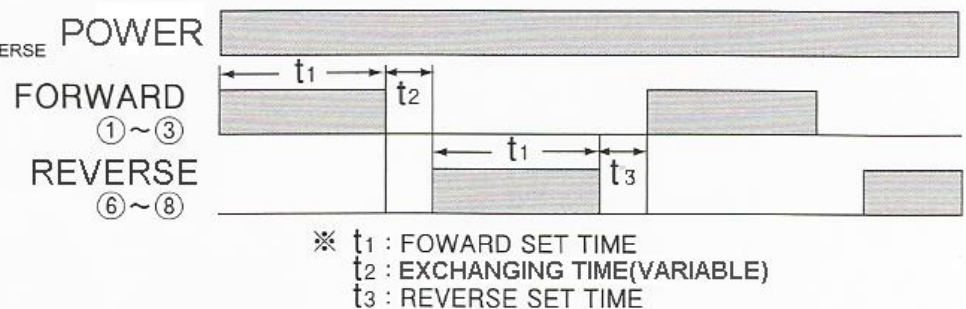
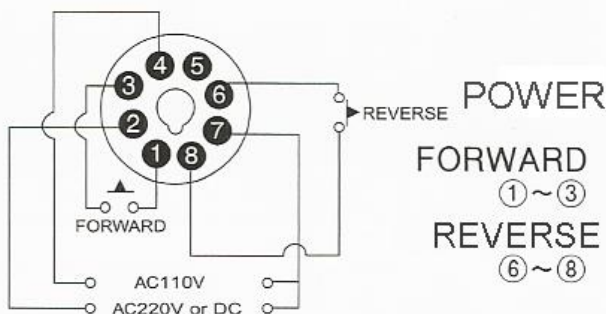


Timing Chart



SET-T FR TYPE

SET-T FR TIMING CHART



TYPES

Available Type	Divided	Operation
SET-T N-TYPE	Din Rail shape	Contact configuration (1A,1B)
SET-T Y-TYPE	Embedded shape	
SET-T FR TYPE	Motor forward and reverse	

PERFORMANCE

Rated Coil Voltage	AC:110V, 220V DC:24V, 100V, 110V
Range of voltage variation	AC: 85~115% of Rated Voltage DC: 85~115% of Rated Voltage
Power Consumption	1.2VA(AC), 1.2W(DC)
Contact Rating	5A 250VAC

CHARACTERISTICS

Repeat Tolerance	$\pm 0.3\%$ (Maximum)
Set Tolerance	$\pm 0.5\%$ (Maximum)
Release Time	0.1 second
Insulation Resistance	Min. 100M Ω (500V DC)
Dielectric Strangth	AC 1500V for I minute Between Input part and output part
	AC 1000V for 1minute between contact and contact
Operating temperature range	-10~55℃
Operating humidity	35~38% RH
Life expectancy	Mechanical – 5,000,000cycles(Min.)
	Electrical – 100,000cycles(Min.)
	COS ϕ =0.4 3A 250V AC
Vibration Resistance	Destructive 10~55Hz 1mm DA
	Functional 10~55Hz 0.5mm DA
Shock Resistance	Destructive 1,000m/S ² (100g),
	Functional 1,00m/S ² (10G)
Unit Weight	Approx. 120g