

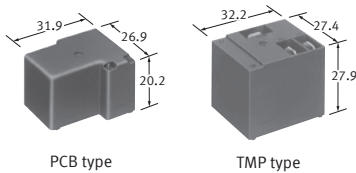


**! To Be Discontinued**  
Last time buy: September 30, 2021

**Surge withstand voltage:  
6kV  
1a/1c 30A power relays**

# JT-V RELAYS

Protective construction : Dust cover type/Sealed type



(Unit : mm)

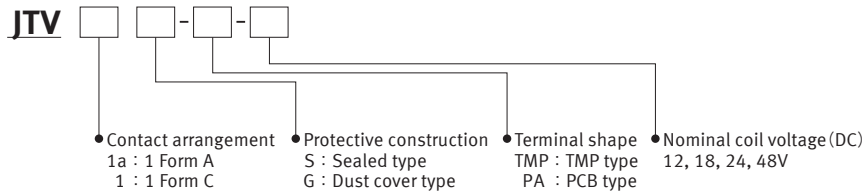
### FEATURES

- Surge breakdown voltage: 6,000 V
- High switching capacity:  
30 A for 1 Form A
- 2 contact arrangements:  
1 Form A or 1 Form C
- “TMP” types available
- UL/C-UL recognized
- Class F types standard

### TYPICAL APPLICATIONS

1. Home appliances  
Oven, Air heating equipment
2. Industrial equipment  
Lighting control, Power supply, Inverter

## ORDERING INFORMATION



Notes : 1. Certified by UL/C-UL  
2. 5, 6, 9V DC types are also available. Please contact us for details.

## TYPES

### 1. 1 Form A Dust cover type

Nominal coil voltage	Part No.	
	PCB type	TMP type
12V DC	JTV1aG-PA-12V	JTV1aG-TMP-12V
18V DC	JTV1aG-PA-18V	JTV1aG-TMP-18V
24V DC	JTV1aG-PA-24V	JTV1aG-TMP-24V
48V DC	JTV1aG-PA-48V	JTV1aG-TMP-48V

Standard packing: PCB type: Carton: 50 pcs.; Case: 500 pcs.  
TMP type: Carton: 50 pcs.; Case: 300 pcs.

### 2. 1 Form C Dust cover type

Nominal coil voltage	Part No.	
	PCB type	TMP type
12V DC	JTV1G-PA-12V	JTV1G-TMP-12V
18V DC	JTV1G-PA-18V	JTV1G-TMP-18V
24V DC	JTV1G-PA-24V	JTV1G-TMP-24V
48V DC	JTV1G-PA-48V	JTV1G-TMP-48V

Standard packing: PCB type: Carton: 50 pcs.; Case: 500 pcs.  
TMP type: Carton: 50 pcs.; Case: 300 pcs.

### 3. 1 Form A Sealed type

Nominal coil voltage	Part No.	
	PCB type	TMP type
12V DC	JTV1aS-PA-12V	JTV1aS-TMP-12V
18V DC	JTV1aS-PA-18V	JTV1aS-TMP-18V
24V DC	JTV1aS-PA-24V	JTV1aS-TMP-24V
48V DC	JTV1aS-PA-48V	JTV1aS-TMP-48V

Standard packing: PCB type: Carton: 50 pcs.; Case: 500 pcs.  
 TMP type: Carton: 50 pcs.; Case: 300 pcs.

### 4. 1 Form C Sealed type

Nominal coil voltage	Part No.	
	PCB type	TMP type
12V DC	JTV1S-PA-12V	JTV1S-TMP-12V
18V DC	JTV1S-PA-18V	JTV1S-TMP-18V
24V DC	JTV1S-PA-24V	JTV1S-TMP-24V
48V DC	JTV1S-PA-48V	JTV1S-TMP-48V

Standard packing: PCB type: Carton: 50 pcs.; Case: 500 pcs.  
 TMP type: Carton: 50 pcs.; Case: 300 pcs.

## RATING

### 1. Coil data

- Operating characteristics such as 'Operate voltage' and 'Release voltage' are influenced by mounting conditions, ambient temperature, etc. Therefore, please use the relay within  $\pm 5\%$  of rated coil voltage.
- 'Initial' means the condition of products at the time of delivery.

Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [ $\pm 10\%$ ] (at 20°C 68°F)	Coil resistance [ $\pm 10\%$ ] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
12V DC	75%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	83.3mA	144 $\Omega$	1,000mW	120%V of nominal voltage
18V DC			55.6mA	324 $\Omega$		
24V DC			41.7mA	576 $\Omega$		
48V DC			20.8mA	2,304 $\Omega$		

### 2. Specifications

Characteristics	Item	Specifications	
Contact	Contact material	AgSnO <sub>2</sub> type	
	Arrangement	1 Form A   1 Form C	
	Contact resistance (Initial)	Max. 50 m $\Omega$ (By voltage drop 6 V DC 1A)	
Rating	Nominal switching capacity (resistive load)	20A 277V AC   N.C.: 10A 277V AC, N.O.: 20A 277V AC	
	Max. switching power (resistive load)	8,310VA (30A 277V AC)   N.C.: 2,770VA, N.O.: 5,540VA	
	Max. switching voltage	277V AC	
	Max. switching current	30A   N.C.: 10A, N.O.: 20A	
	Nominal operating power	Approx. 1,000mW	
	Min. switching capacity (reference value)*1	100mA, 5V DC	
Electrical characteristics	Insulation resistance (Initial)	Min. 100M $\Omega$ (at 500V DC) Measurement at same location as "Breakdown voltage" section.	
	Breakdown voltage (Initial)	Between open contacts	1,200 Vrms for 1 min. (Detection current: 10 mA)
		Between contact and coil	3,500 Vrms for 1 min. (Detection current: 10 mA)
	Surge breakdown voltage*2 (Between contact and coil) (Initial)	6,000 V	
	Operate time (at nominal voltage) (at 20°C 68°F) (Initial)	Max. 15 ms (excluding contact bounce time.)	
Release time (at nominal voltage) (at 20°C 68°F) (Initial)	Max. 10 ms (excluding contact bounce time) (Without diode)		
Mechanical characteristics	Shock resistance	Functional	Min. 98 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10 $\mu$ s.)
		Destructive	Min. 980 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms.)
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 1.5 mm (Detection time: 10 $\mu$ s.)
		Destructive	10 to 55 Hz at double amplitude of 2 mm
Expected life	Mechanical	Min. 1 $\times 10^7$	
	Electrical (at 20 times/min.)*3	Min. 1 $\times 10^5$ (20A 277V AC at resistive load)   N.O.: Min. 1 $\times 10^5$ (20A 277V AC at resistive load)   N.C.: Min. 1 $\times 10^5$ (10A 277V AC at resistive load)	
Conditions	Conditions for operation, transport and storage*4	Ambient temperature: -55°C to +85°C -67°F to +185°F, Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)	
	Max. operating speed	20 times/min. (at nominal switching capacity)	
Unit weight		PCB type: Approx. 25 g .88 oz TMP type: Approx. 30 g 1.06 oz	

\* Specifications will vary with foreign standards certification ratings.

Notes: \*1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

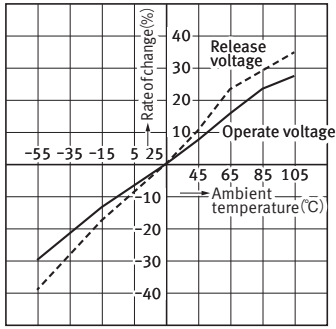
\*2. Wave is standard shock voltage of  $\pm 1.2 \times 50\mu$ s according to JEC-212-1981

\*3. In order to obtain the full rated life cycles, the relay should be properly vented by removing the vent nib. More detail, please look at caution for NOTES.

\*4. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

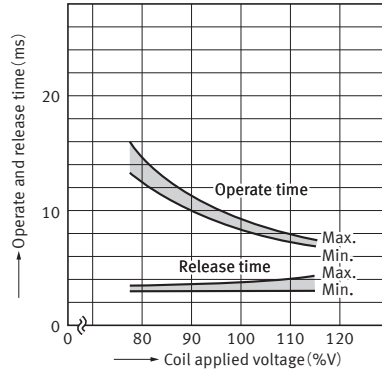
## REFERENCE DATA

1.-(1) Coil temperature rise (400mW type)  
voltage (at 20°C 68°F)  
Tested sample : JTV1S-TMP-24V, 6 pcs.



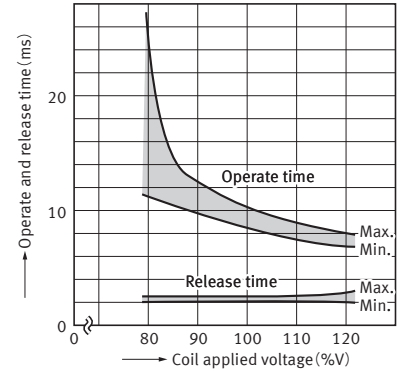
2. Operate/release time

Tested sample : JTV1S-TMP-24V



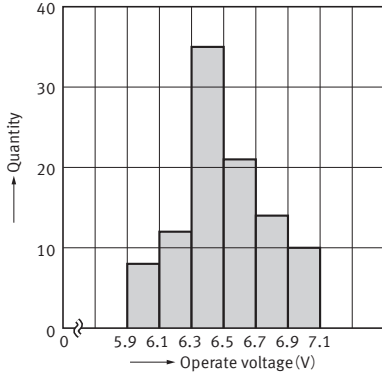
3. Operate/release time

Tested sample : JTV1aS-PA-24V



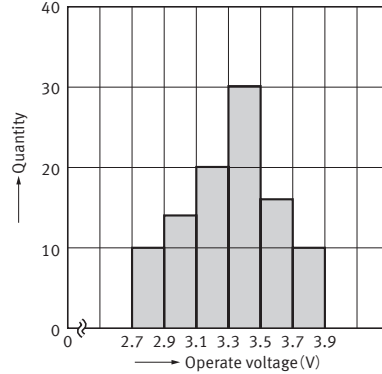
4. Distribution frequency of pick-up voltage  
(at 20°C 68°F)

Tested sample : JTV1S-TMP-12V, 100 pcs.



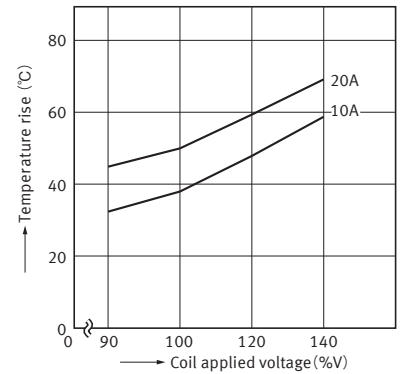
5. Distribution frequency of drop-out voltage  
(at 20°C 68°F)

Tested sample : JTV1S-TMP-12V, 100 pcs.



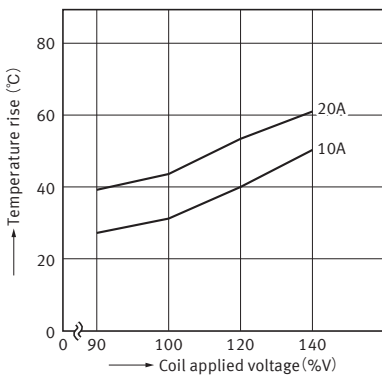
6.-(1) Coil temperature rise (TMP type)\*

Tested sample : JTV1aS-TMP-12V, 6 pcs.  
Ambient temperature : 25°C



6.-(2) Coil temperature rise (TMP type)\*

Tested sample : JTV1aS-TMP-12V, 6 pcs.  
Ambient temperature : 85°C



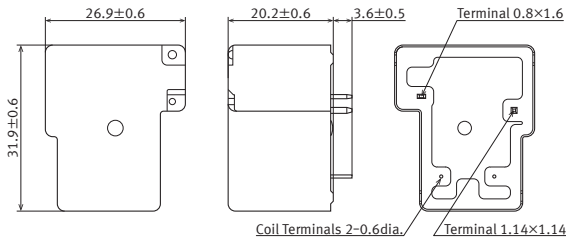
**DIMENSIONS (mm)**

**CAD** The CAD data of the products with a "CAD" mark can be downloaded from our Website.

**1. PCB type**

**CAD**

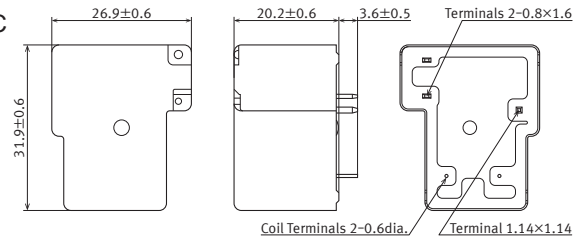
**1 Form A**



General tolerance  
Less than 1mm : ±0.1  
Min. 1mm less than 3mm : ±0.2  
Min. 3mm : ±0.3

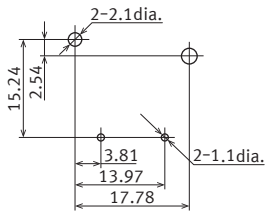
**CAD**

**1 Form C**



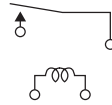
General tolerance  
Less than 1mm : ±0.1  
Min. 1mm less than 3mm : ±0.2  
Min. 3mm : ±0.3

**PC board pattern (Bottom view)**

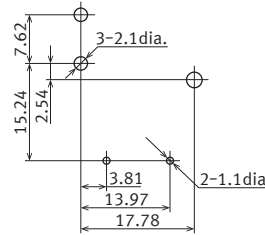


Tolerance ±0.1

**Schematic (Bottom view)**

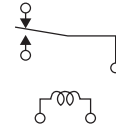


**PC board pattern (Bottom view)**



Tolerance ±0.1

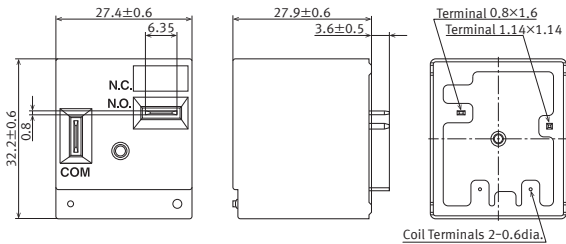
**Schematic (Bottom view)**



**2. TMP type**

**CAD**

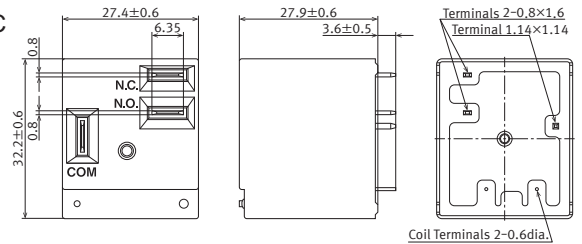
**1 Form A**



General tolerance  
Less than 1mm : ±0.1  
Min. 1mm less than 3mm : ±0.2  
Min. 3mm : ±0.3

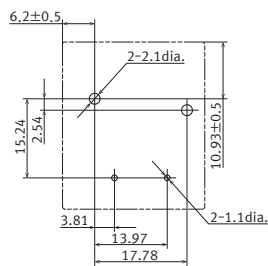
**CAD**

**1 Form C**



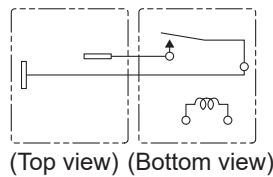
General tolerance  
Less than 1mm : ±0.1  
Min. 1mm less than 3mm : ±0.2  
Min. 3mm : ±0.3

**PC board pattern (Bottom view)**



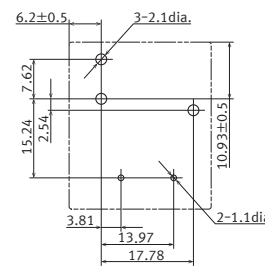
Tolerance ±0.1

**Schematic**



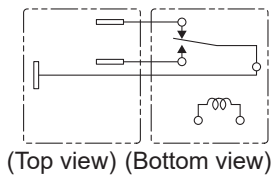
(Top view) (Bottom view)

**PC board pattern (Bottom view)**



Tolerance ±0.1

**Schematic**



(Top view) (Bottom view)

Tolerance: ±0.1 ±0.04

**SAFETY STANDARDS**

Item	UL/C-UL (Recognized)	
	File No.	Contact rating
1 Form A	E43028	30A 277V AC, 30A 28V DC, 2HP 250V AC
1 Form C	N.O.	20A 277V AC, 20A 28V DC, 2HP 250V AC
	N.C.	10A 277V AC, 10A 28V DC, 1/2HP 250V AC

\* CSA standard: Certified by C-UL

Please refer to **"the latest product specifications"** when designing your product.

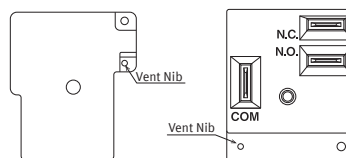
• Requests to customers :  
<https://industrial.panasonic.com/ac/e/salespolicies/>

**NOTES**

**1. Electrical life**

In order to obtain the full rated life cycles, the relay should be properly vented by removing the vent nib after the soldering/washing process.

- PCB type
- TMP type



# GUIDELINES FOR POWER, HIGH-CAPACITY DC CUT OFF AND SAFETY RELAYS USAGE

■ For cautions for use, please read “GUIDELINES FOR RELAY USAGE”.  
[https://industrial.panasonic.com/ac/e/control/relay/cautions\\_use/index.jsp](https://industrial.panasonic.com/ac/e/control/relay/cautions_use/index.jsp)

## Precautions for Coil Input

### ■ Long term current carrying

A circuit that will be carrying a current continuously for long periods without relay switching operation. (circuits for emergency lamps, alarm devices and error inspection that, for example, revert only during malfunction and output warnings with form B contacts)  
Continuous, long-term current to the coil will facilitate deterioration of coil insulation and characteristics due to heating of the coil itself. For circuits such as these, please use a magnetic-hold type latching relay. If you need to use a single stable relay, use a sealed type relay that is not easily affected by ambient conditions and make a failsafe circuit design that considers the possibility of contact failure or disconnection.

### ■ DC Coil operating power

Steady state DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5%.

However, please check with the actual circuit since the electrical characteristics may vary. The rated coil voltage should be applied to the coil and the set/reset pulse time of latching type relay differs for each relays, please refer to the relay's individual specifications.

### ■ Coil connection

When connecting coils of polarized relays, please check coil polarity (+,-) at the internal connection diagram (Schematic). If any wrong connection is made, it may cause unexpected malfunction, like abnormal heat, fire and so on, and circuit do not work. Avoid impressing voltages to the set coil and reset coil at the same time.

### ■ Maximum allowable voltage and temperature rise

Proper usage requires that the rated coil voltage be impressed on the coil. Note, however, that if a voltage greater than or equal to the maximum continuous voltage is impressed on the coil, the coil may burn or its layers short due to the temperature rise. Furthermore, do not exceed the usable ambient temperature range listed in the catalog.

### ■ Operate voltage change due to coil temperature rise

In DC relays, after continuous passage of current in the coil, if the current is turned OFF, then immediately turned ON again, due to the temperature rise in the coil, the pick-up voltage will become somewhat higher. Also, it will be the same as using it in a higher temperature atmosphere. The resistance/temperature relationship for copper wire is about 0.4% for 1°C, and with this ratio the coil resistance increases. That is, in order to operate of the relay, it is necessary that the voltage be higher than the pick-up voltage and the pick-up voltage rises in accordance with the increase in the resistance value. However, for some polarized relays, this rate of change is considerably smaller.

## Ambient Environment

### ■ Usage, Transport, and Storage Conditions

During usage, storage, or transportation, avoid locations subjected to direct sunlight and maintain normal temperature, humidity and pressure conditions.

### ● Temperature/Humidity/Pressure

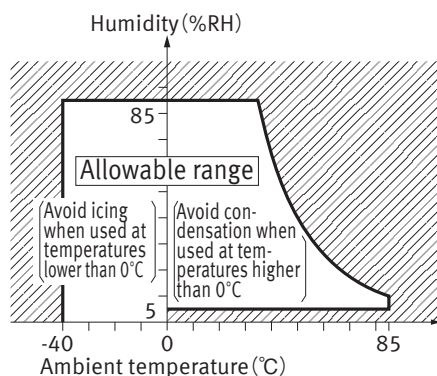
When transporting or storing relays while they are tube packaged, there are cases the temperature may differ from the allowable range. In this case be sure to check the individual specifications. Also allowable humidity level is influenced by temperature, please check charts shown below and use relays within mentioned conditions. (Allowable temperature values differ for each relays, please refer to the relay's individual specifications.)

#### 1) Temperature:

The tolerance temperature range differs for each relays, please refer to the relay's individual specifications

#### 2) Humidity: 5 to 85 % RH

#### 3) Pressure: 86 to 106 kPa



### ● Dew condensation

Condensation occurs when the ambient temperature drops suddenly from a high temperature and humidity, or the relay is suddenly transferred from a low ambient temperature to a high temperature and humidity. Condensation causes the failures like insulation deterioration, wire disconnection and rust etc. Panasonic Corporation does not guarantee the failures caused by condensation.

The heat conduction by the equipment may accelerate the cooling of device itself, and the condensation may occur.

Please conduct product evaluations in the worst condition of the actual usage. (Special attention should be paid when high temperature heating parts are close to the device. Also please consider the condensation may occur inside of the device.)

### ● Icing

Condensation or other moisture may freeze on relays when the temperature become lower than 0°C. This icing causes the sticking of movable portion, the operation delay and the contact conduction failure etc. Panasonic Corporation does not guarantee the failures caused by the icing.

The heat conduction by the equipment may accelerate the cooling of relay itself and the icing may occur. Please conduct product evaluations in the worst condition of the actual usage.

### ● Low temperature and low humidity

The plastic becomes brittle if the switch is exposed to a low temperature, low humidity environment for long periods of time.

### ● High temperature and high humidity

Storage for extended periods of time (including transportation periods) at high temperature or high humidity levels or in atmospheres with organic gases or sulfide gases may cause a sulfide film or oxide film to form on the surfaces of the contacts and/or it may interfere with the functions. Check out the atmosphere in which the units are to be stored and transported.

## ● Package

In terms of the packing format used, make every effort to keep the effects of moisture, organic gases and sulfide gases to the absolute minimum.

## ● Silicon

When a source of silicone substances (silicone rubber, silicone oil, silicone coating materials and silicone filling materials etc.) is used around the relay, the silicone gas (low molecular siloxane etc.) may be produced.

This silicone gas may penetrate into the inside of the relay. When the relay is kept and used in this condition, silicone compound may adhere to the relay contacts which may cause the contact failure.

Do not use any sources of silicone gas around the relay (Including plastic seal types).

## ● NOx Generation

When relay is used in an atmosphere high in humidity to switch a load which easily produces an arc, the NOx created by the arc and the water absorbed from outside the relay combine to produce nitric acid.

This corrodes the internal metal parts and adversely affects operation.

Avoid use at an ambient humidity of 85%RH or higher (at 20°C). If use at high humidity is unavoidable, please contact our sales representative.

## Others

### ■ Cleaning

• Although the environmentally sealed type relay (plastic sealed type, etc.) can be cleaned, avoid immersing the relay into cold liquid (such as cleaning solvent) immediately after soldering. Doing so may deteriorate the sealing performance.

• Cleaning with the boiling method is recommended(The temperature of cleaning liquid should be 40°C or lower ).

Avoid ultrasonic cleaning on relays. Use of ultrasonic cleaning may cause breaks in the coil or slight sticking of the contacts due to ultrasonic energy.

Please refer to **"the latest product specifications"** when designing your product.

•Requests to customers:

<https://industrial.panasonic.com/ac/e/salespolicies/>

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Please contact .....

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