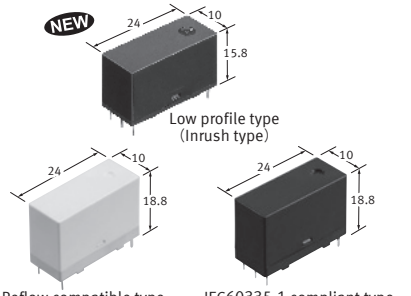
1 Form A 8A/16A, Small Polarized Power Relays (latching type)

DW RELAYS (ADW1)

Protective construction：Flux-resistant type



(Unit：mm)

FEATURES

1. Low profile type available (h = 15.8 mm .622 inch)
2. Inrush type available (TV-8 UL/C-UL approved)
3. IEC60335-1* compliant type available (PTI 325V VDE approved)
4. Reflow possible (pin-in-paste)
5. Certified by UL/C-UL, VDE

* Common safety standard for major electrical appliance

TYPICAL APPLICATIONS

1. Lighting control equipment
2. Smart meters
3. Industrial equipment
4. Security equipment
5. Home appliances
6. Various power supplies

ORDERING INFORMATION

ADW 1 ＿ ＿ ＿ ＿ W

- Contact arrangement
  1：1 Form A
- Operating function
  1：1 coil latching
  2：2 coil latching
- Nominal coil voltage (DC)
  03：3V, 05：5V, 06：6V
  09：9V, 12：12V, 24：24V
- Contact capacity
  Nil：Standard type (8A)
  H：Inrush type (16A, Inrush current 100A)
- Type classification
  Nil：Reflow compatible type
  L：Low profile type
  T：IEC60335-1 compliant type

Notes：1. "L" and "T" type are non-compliant reflow soldering.
2. Low profile type is available (inrush type only).
3. The suffix "W" on the part number is only displayed on the inner and outer packaging. It is not displayed on the relay.

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TYPES

1. Standard type (8A) (Reflow compatible type)

Contact arrangement	Nominal coil voltage	Part No.	
		1 coil latching type	2 coil latching type
1 Form A	3V DC	ADW1103W	ADW1203W
	5V DC	ADW1105W	ADW1205W
	6V DC	ADW1106W	ADW1206W
	9V DC	ADW1109W	ADW1209W
	12V DC	ADW1112W	ADW1212W
	24V DC	ADW1124W	ADW1224W

Standard packing: Carton: 100 pcs.; Case: 500 pcs.
Note: Carton packing is standard. Tube packing type is also available. Please consult us for details.

2. Standard type (8A) (IEC60335-1 compliant type)

Contact arrangement	Nominal coil voltage	Part No.	
		1 coil latching type	2 coil latching type
1 Form A	3V DC	ADW1103TW	ADW1203TW
	5V DC	ADW1105TW	ADW1205TW
	6V DC	ADW1106TW	ADW1206TW
	9V DC	ADW1109TW	ADW1209TW
	12V DC	ADW1112TW	ADW1212TW
	24V DC	ADW1124TW	ADW1224TW

Standard packing: Carton: 100 pcs.; Case: 500 pcs.
Note: Carton packing is standard. Tube packing type is also available. Please consult us for details.

3. Inrush type (16A, Inrush current 100A · IEC60335-1 compliant type)*1, *2

Contact arrangement	Nominal coil voltage	Part No.	
		1 coil latching type	2 coil latching type
1 Form A	3V DC	ADW1103HTW	ADW1203HTW
	5V DC	ADW1105HTW	ADW1205HTW
	6V DC	ADW1106HTW	ADW1206HTW
	9V DC	ADW1109HTW	ADW1209HTW
	12V DC	ADW1112HTW	ADW1212HTW
	24V DC	ADW1124HTW	ADW1224HTW

Standard packing: 100 pcs.; Case: 500 pcs.
Notes: *1. Carton packing is standard. Tube packing type is also available. Please contact us for details.
*2. Please contact us for the reflow compatible type of inrush type (16A, Inrush current 100A · IEC60335-1 compliant type).

4. Inrush type (16A, Inrush current 100A · Low profile type)

Contact arrangement	Nominal coil voltage	Part No.	
		1 coil latching type	2 coil latching type
1 Form A	3V DC	ADW1103HLW	ADW1203HLW
	5V DC	ADW1105HLW	ADW1205HLW
	6V DC	ADW1106HLW	ADW1206HLW
	9V DC	ADW1109HLW	ADW1209HLW
	12V DC	ADW1112HLW	ADW1212HLW
	24V DC	ADW1124HLW	ADW1224HLW

Standard packing: 100 pcs.; Case: 500 pcs.

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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 ± 5% of rated coil voltage.
- 'Initial' means the condition of products at the time of delivery.

1) 1 coil latching type

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
3V DC	*80%V or less of nominal voltage (Initial)	*80%V or less of nominal voltage (Initial)	66.7mA	45Ω	200mW	110%V of nominal voltage
5V DC			40.0mA	125Ω		
6V DC			33.3mA	180Ω		
9V DC			22.2mA	405Ω		
12V DC			16.7mA	720Ω		
24V DC			8.3mA	2,880Ω		

2) 2 coil latching type

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)		Coil resistance [±10%] (at 20°C 68°F)		Nominal operating power		Max. applied voltage (at 20°C 68°F)
			Set coil	Reset coil	Set coil	Reset coil	Set coil	Reset coil	
3V DC	*80%V or less of nominal voltage (Initial)	*80%V or less of nominal voltage (Initial)	133.3mA	133.3mA	22.5Ω	22.5Ω	400mW	400mW	110%V of nominal voltage
5V DC			80.0mA	80.0mA	62.5Ω	62.5Ω			
6V DC			66.7mA	66.7mA	90 Ω	90 Ω			
9V DC			44.4mA	44.4mA	202.5Ω	202.5Ω			
12V DC			33.3mA	33.3mA	360 Ω	360 Ω			
24V DC			16.7mA	16.7mA	1,440 Ω	1,440 Ω			

*Square, pulse drive

2. Specifications

Characteristics	Item		Specifications	
			Standard type	Inrush type
Contact	Arrangement		1 Form A	
	Contact resistance (Initial)		Max. 100 mΩ (By voltage drop 6 V DC 1A)	
	Contact material		$AgSnO_2$ type	
Rating	Nominal switching capacity (resistive load)		8A 250V AC	16A 277V AC
	Max. switching power (resistive load)		2,000VA	4,432VA
	Max. switching voltage		250V AC	277V AC
	Max. switching current		8A AC	16A AC
	Nominal operating power		200mW (1 coil latching type), 400mW (2 coil latching type)	
	Min. switching capacity (Reference value)*1		100mA 5 V DC	
Electrical characteristics	Insulation resistance (Initial)		Min. 1,000MΩ (at 500V DC, Measurement at same location as "Breakdown voltage" section)	
	Breakdown voltage (Initial)	Between open contacts	1,000 Vrms for 1min. (Detection current: 10mA)	
		Between contact and coil	5,000 Vrms for 1min. (Detection current: 10mA)	
	Surge breakdown voltage*2 (Between contact and coil)		12,000 V (Initial)	
	Set time (at 20°C 68°F) (Initial)		Max. 15 ms (Nominal voltage applied to the coil, excluding contact bounce time)	
	Reset time (at 20°C 68°F) (Initial)		Max. 15 ms (Nominal voltage applied to the coil, excluding contact bounce time)	
Mechanical characteristics	Shock resistance	Functional	100 m/s^2 (Half-wave pulse of sine wave: 11 ms; detection time: 10μs)	
		Destructive	1,000 m/s^2 (Half-wave pulse of sine wave: 6 ms)	
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 2 mm (Detection time: 10μs)	
		Destructive	10 to 55 Hz at double amplitude of 3 mm	
Expected life	Mechanical		Min. 10^6 (at 180 times/min.)	
	Electrical	Resistive load	Min. 5×10^4 (at 8A 250V AC, at 20 times/min.) Min. 10^5 (at 5A 250V AC, at 20 times/min.) (IEC60335-1 type only)	Min. 2×10^4 (at 16A 277V AC, ON:OFF = 1s:5s) Min. 5×10^4 (at 8A 250V AC, at 20 times/min.)
		Inrush current	—	Min. 2.5×10^4 [Inrush 100A 600W (120V AC) Tungsten] Cycle rate ON:OFF = 1s:59s
Conditions	Conditions for operation, transport and storage*3 *4		Temperature: –40°C to +85°C –40°F to +185°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)	Temperature: –40°C to +85°C –40°F to +185°F (8A or less), –40°C to +70°C –40°F to +158°F (Over 8A to 16A) Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)
Unit weight			Approx. 8 g .28 oz (Low profile type: Approx. 7.5 g .26 oz)	

Notes: *1. Minimum switching load is a guide to the lower current limit of switching under the micro-load. This parameter is changed by the condition, such as switching times, environment condition, and expected reliability. Therefore, Panasonic Corporation cannot assure the reliability. When the relay is used lower than minimum switching load, reliability is attrition. Please use the relay over minimum switching load.

*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981

*3. 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.

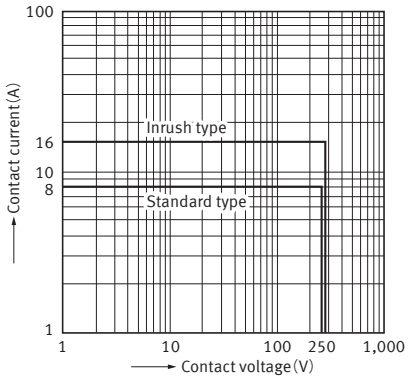
*4. Allowable range when in original packaging is –40°C to +70°C –40°F to +158°F.

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REFERENCE DATA

■ Standard type and Inrush type

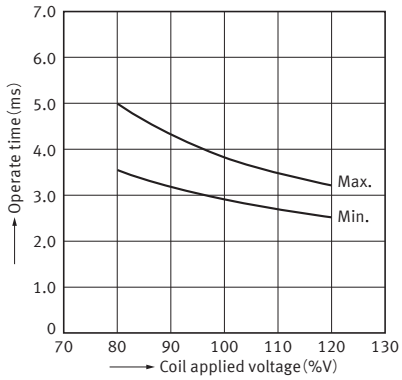
1. Max. switching capacity (AC resistive load)



■ Standard type

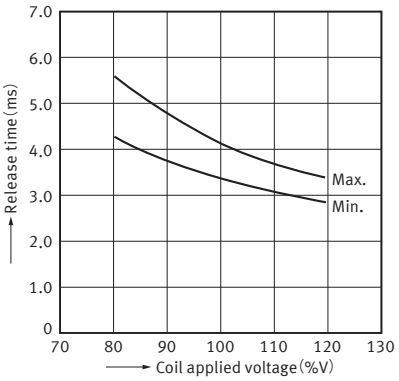
1. Set time (1 coil latching type)

Tested sample : ADW1106, 15 pcs.
Ambient temperature : 28℃
Contact load : 5V DC, 10mA



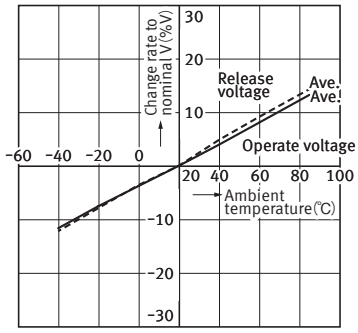
2. Reset time (1 coil latching type)

Tested sample : ADW1106, 15 pcs.
Ambient temperature : 28℃
Contact load : 5V DC, 10mA



3.Ambient temperature characteristics

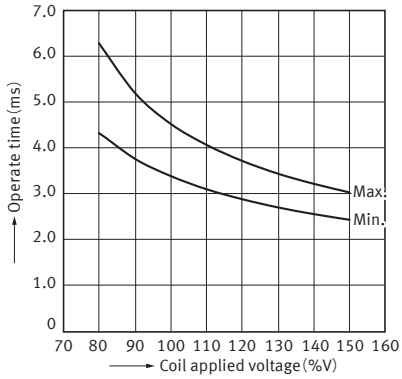
Tested sample : ADW1105HL, 6 pcs.
Ambient temperature : −40 to +85℃



■ Inrush type

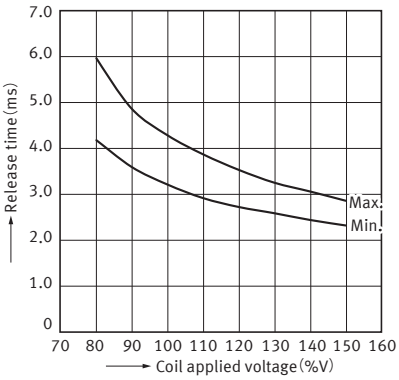
1. Set time (1 coil latching type)

Tested sample : ADW1112HL, 30 pcs.
Ambient temperature : 28℃
Contact load : 5V DC, 10mA



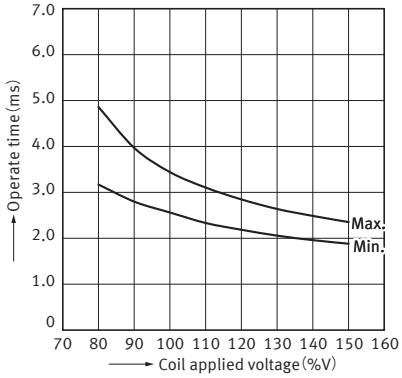
2. Reset time (1 coil latching type)

Tested sample : ADW1112HL, 30 pcs.
Ambient temperature : 28℃
Contact load : 5V DC, 10mA



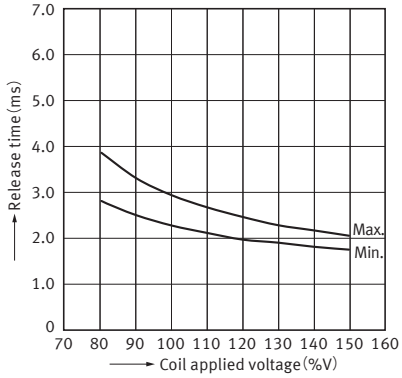
3. Set time (2 coil latching type)

Tested sample : ADW1212HL, 30 pcs.
Ambient temperature : 28℃
Contact load : 5V DC, 10mA



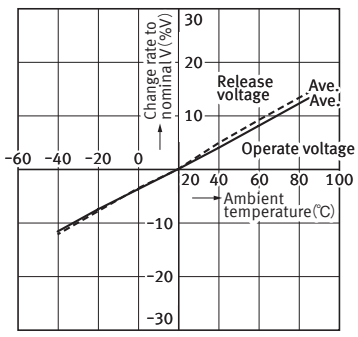
4. Reset time (2 coil latching type)

Tested sample : ADW1212HL, 30 pcs.
Ambient temperature : 28℃
Contact load : 5V DC, 10mA



5. Reset time (2 coil latching type)

Tested sample : ADW1105HL, 6 pcs.
Ambient temperature : −40 to +85℃



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DIMENSIONS (mm)

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

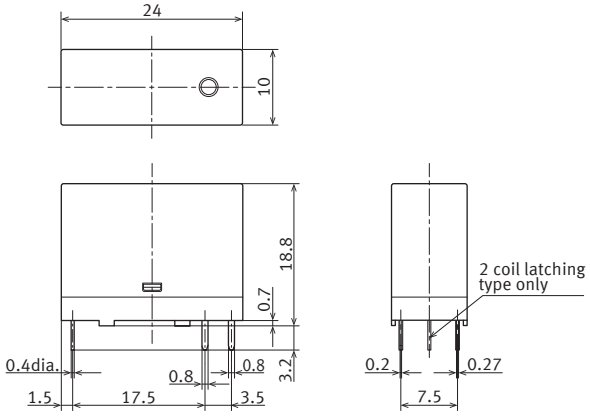
1. Standard height type

CAD



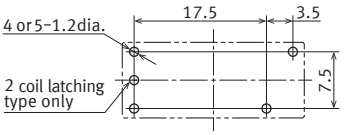


External dimensions



General tolerance ±0.3

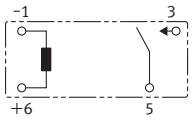
PC board pattern (Bottom view)



Tolerance ±0.1

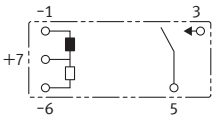
Schematic (Bottom view)

1 coil latching type



(Reset condition)

2 coil latching type



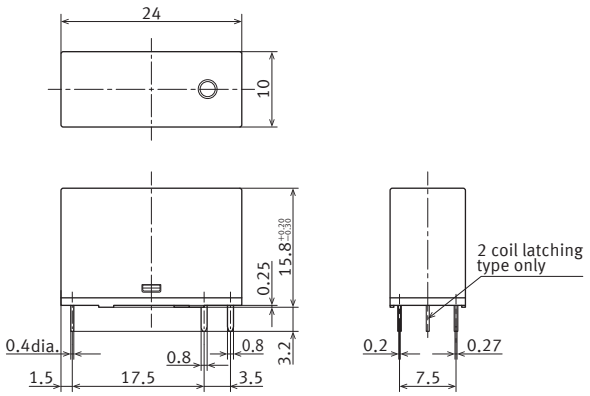
(Reset condition)

2. Low profile type

CAD

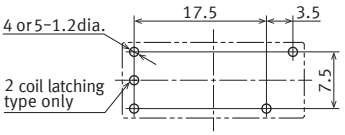


External dimensions



General tolerance ±0.3

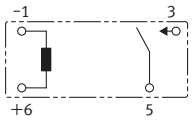
PC board pattern (Bottom view)



Tolerance ±0.1

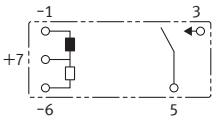
Schematic (Bottom view)

1 coil latching type



(Reset condition)

2 coil latching type



(Reset condition)

SAFETY STANDARDS

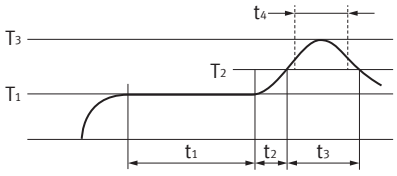
Item	UL/C-UL (Recognized)		VDE (Recognized)		TV rating (UL/C-UL)	
	File No.	Contact rating	File No.	Contact rating	File No.	Contact rating
Standard type (8A)	E43149	8A 250V AC R 85°C 185°F 5×10^4 5A 30V DC R 85°C 185°F 5×10^4	40032254	8A 250V AC (cosφ =1.0) 85°C 185°F 5×10^4 5A 30V DC (0ms) 85°C 185°F 5×10^4	—	—
Inrush type (16A)	E43149	16A 277V AC R 60°C 140°F 5×10^4 8A 250V AC R 85°C 185°F 5×10^4 5A 30V DC R 85°C 185°F 5×10^4 1200W Standard ballast 277V AC 50°C 122°F 6×10^3 1200W Tungsten, 240V AC 50°C 122°F 6×10^3 600W Tungsten, 120V AC 50°C 122°F 2.5×10^4 5A 347V AC R 85°C 185°F (UL standards only) 5×10^4	40032254	16A 277V AC (cosφ =1.0) 70°C 158°F 5×10^4 8A 250V AC (cosφ =1.0) 85°C 185°F 5×10^4 5A 30V DC (0ms) 85°C 185°F 5×10^4	E43149	TV-8 rating 240V AC 40°C 104°F 2.5×10^4

Notes: 1. CSA standards: Certified by C-UL
2. CQC standard: Application pending, Please contact us.

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NOTES

1. **For cautions for use, please read "GENERAL APPLICATION GUIDELINES".**
2. **Solder and cleaning conditions**
   1) Flow solder mounting conditions
      Please obey the following conditions when soldering automatically.
      (1) Preheating: within 120°C 248°F (solder surface terminal portion) and within 120 seconds
      (2) Soldering iron: 260°C±5°C 500°F±41°F (solder temperature) and within 6 seconds (soldering time)
      *Furthermore, because the type of PC board used and other factors may influence the relays, test that the relays function properly on the actual PC board on which they are mounted.
   2) Reflow solder mounting (Pin-in-Paste mounting) conditions
   3) Since this is not a sealed type relay,



t1=60 to 120 seconds
t2=within 20 seconds
t3=within 30 seconds
t4=within 10 seconds (245～250℃)
T1=150 to 180℃
T2=230℃
T3=250℃

• Cautions to observe when mounting temperature increases in the relay are greatly dependent on the way different parts are located a PC board and the heating method of the reflow device. Therefore, please conduct testing on the actual device beforehand after making sure the parts soldered on the relay terminals and the top of the relay case are within the temperature conditions given above.

do not clean it as is. Also, be careful not to allow flux to overflow above the PC board or enter the inside of the relay.

3. **Max. applied voltage**
   It is not allowed to apply the continuous maximum voltage to the coil.
   In order to obtain the specified performance, please apply nominal coil voltage.
4. **Set/reset pulse time of latching type relay**
   Regarding the set/reset pulse time of the latching type relay, it is recommended to apply nominal coil voltage for minimum 30ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

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

For cautions for use, please read "GUIDELINES FOR RELAY USAGE".
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

(Hot start)
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

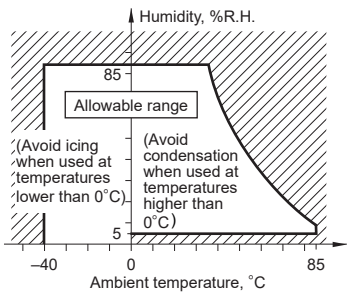
●Usage, Transport, and Storage Conditions

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.

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●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

1) 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.
2) 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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