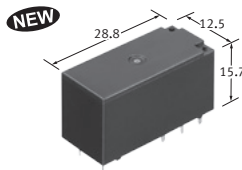




**EN60335-1 GWT compliant**  
**Low profile:**  
**15.7mm .618inch height**  
**1a/1c 16A power relay**

## LZ-N RELAYS(ALZN)

Protective construction : Flux-resistant type



(Unit : mm)

### FEATURES

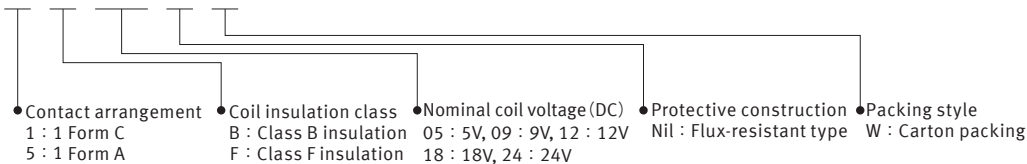
- 1. Low profile type with height of 15.7 mm .618 inch**  
 Slim, low profile type with dimensions of 12.5 (W)×28.8 (L)×15.7 (H) mm .492 (W)×1.134 (L)×.618 (H) inch.
- 2. High insulation resistance**  
 Superior insulation characteristics have been achieved by maintaining an insulation distance between coil and contacts of at least 10 mm for both creepage distance and clearances. Furthermore, anti-surge voltage is 10 kV and higher. (Supports European reinforced insulation requirement.)
- 3. Superior heat resistance**  
 Can be used in ambient temperatures up to 85°C 185°F for the class B and 105°C 221°F for the class F.
- 4. Superior heat resistance and tracking resistance**  
 EN60335-1 GWT compliant

### TYPICAL APPLICATIONS

1. Household electrical appliances
2. Office equipment
3. Industrial equipment

## ORDERING INFORMATION

### ALZN



Notes : 1. The "W" at the end of the part No. only appears on the inner and outer packaging. It does not appear on the relay itself.  
 2. Tube packing type is also available. Please consult us.

## TYPES

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		Class B insulation	Class F insulation	Carton	Case
1 Form C	5V DC	ALZN1B05W	ALZN1F05W	100 pcs.	500 pcs.
	9V DC	ALZN1B09W	ALZN1F09W		
	12V DC	ALZN1B12W	ALZN1F12W		
	18V DC	ALZN1B18W	ALZN1F18W		
	24V DC	ALZN1B24W	ALZN1F24W		
1 Form A	5V DC	ALZN5B05W	ALZN5F05W		
	9V DC	ALZN5B09W	ALZN5F09W		
	12V DC	ALZN5B12W	ALZN5F12W		
	18V DC	ALZN5B18W	ALZN5F18W		
	24V DC	ALZN5B24W	ALZN5F24W		

## 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.

Rated coil voltage	Operate voltage *1 (at 20°C 68°F)	Release voltage *1 (at 20°C 68°F)	Rated operating current ( $\pm 10\%$ , at 20°C 68°F)	Coil resistance ( $\pm 10\%$ , at 20°C 68°F)	Rated operating power	Max. allowable voltage
5V DC	70%V or less of rated coil voltage (Initial)	10%V or more of rated coil voltage (Initial)	80 mA	63 $\Omega$	400mW	120%V of rated coil voltage (at 85°C 185°F: Class B insulation, at 105°C 221°F: Class F insulation)
9V DC			44.4 mA	203 $\Omega$		
12V DC			33.3 mA	360 $\Omega$		
18V DC			22.2 mA	810 $\Omega$		
24V DC			16.7 mA	1440 $\Omega$		

\*1: Square, pulse drive

### 2. Specifications

Characteristics	Item	Specifications
Contact data	Arrangement	1 Form A, 1 Form C
	Contact resistance (initial)	Max. 100m $\Omega$ (By voltage drop 6V DC 1A)
	Contact material	AgSnO <sub>2</sub> type
	Contact rating (resistive)	16 A 250 V AC
	Max. switching power (resistive)	4,000 VA
	Max. switching voltage	440 V AC
	Max. switching current	16 A
	Min. switching load (reference value)*1	100 mA 5 V DC
Insulation resistance (initial)		Min. 1,000M $\Omega$ (at 500V DC) Measured portion is the same as the case of dielectric strength
Dielectric strength (initial)	Between open contacts	AC 1,000 Vrms for 1 min. (detection current: 10 mA)
	Between contact and coil	AC 5,000 Vrms for 1 min. (detection current: 10 mA)
Surge withstand voltage (initial)*2	Between contact and coil	10,000 V
Operate time (initial)		Max. 15 ms (at rated coil voltage, at 20°C 68°F, without bounce)
Release time (initial)		Max. 5 ms (at rated coil voltage, at 20°C 68°F, without bounce, without diode)
Shock resistance	Functional	100 m/s <sup>2</sup> (half-sine shock pulse: 11 ms; detection time: 10 $\mu$ s)
	Destructive	1,000 m/s <sup>2</sup> (half-sine shock pulse: 6 ms)
Vibration resistance	Functional	10 to 55 Hz at double amplitude of 1.5 mm (detection time: 10 $\mu$ s) (Only the NC contact of 1 Form C is 0.82mm)
	Destructive	10 to 55 Hz at double amplitude of 1.5 mm
Expected life	Mechanical	Min. 1 $\times 10^6$ (at 180 times/min.)
Conditions	Conditions for operation, transport and storage*3	Ambient temperature: -40 to +85°C -40 to +185°F (Class B insulation), -40 to +105°C -40 to +221°F (Class F insulation), Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)
Unit weight		Approx. 11 g .39 oz

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. For the ambient temperature, please refer to Usage, transport and storage conditions in NOTES.

\*Please note that some of the specifications listed above may not comply with overseas standards.

### 3. Expected electrical life

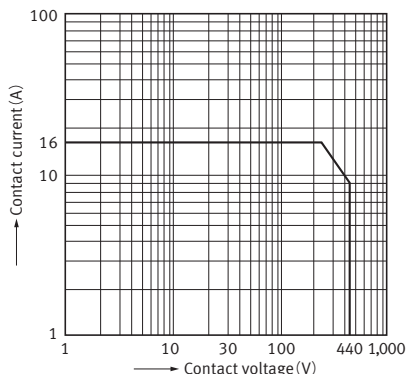
Condition: Resistive, at 20°C 68°F

Type		Switching capacity	Number of operations
1 Form A		16A 250V AC	Min. 1 $\times 10^5$ (ON:OFF = 1.5s:1.5s)
1 Form C	NO contact	16A 250V AC	Min. 5 $\times 10^4$ (ON:OFF = 1.5s:1.5s)
	NC contact	16A 250V AC	Min. 1 $\times 10^4$ (ON:OFF = 1.5s:1.5s)

For the operating ambient temperature, please read the notes

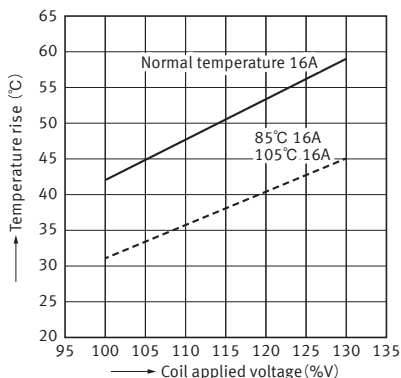
## REFERENCE DATA

### 1. Max. switching capacity (AC resistive load)



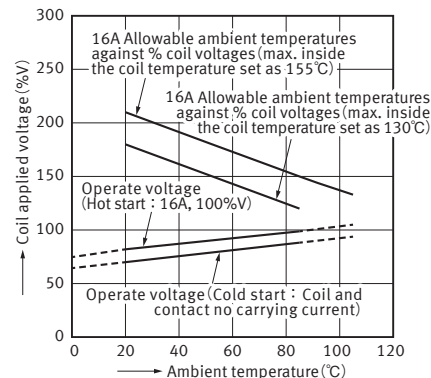
### 2. Coil temperature rise (Ave.)

Tested sample : ALZN1F12, 6 pcs.  
 Measured portion : Coil inside  
 Contact current : 16A  
 Ambient temperature : Normal temperature, 85°C, 105°C



### 3. Ambient temperature characteristics (Ave.)

Tested sample : ALZN1F12, 6 pcs.  
 Measured portion : Coil inside  
 Contact carrying current : 0A, 16A



## DIMENSIONS (mm)

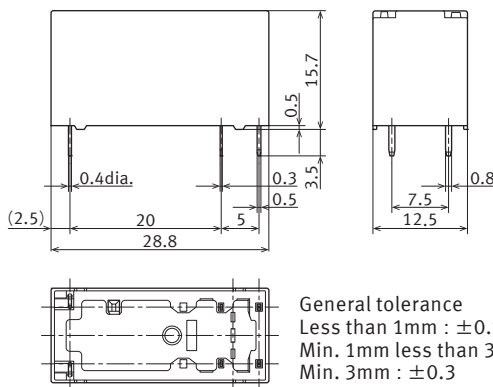
**CAD** The CAD data of the products with a "CAD" mark can be downloaded from our Website.

### 1 Form A type

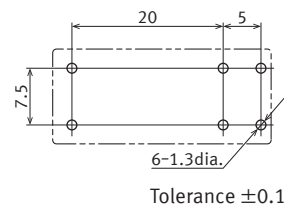
**CAD**



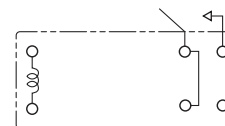
#### External dimensions



#### PC board pattern



#### Schematic (Bottom view)

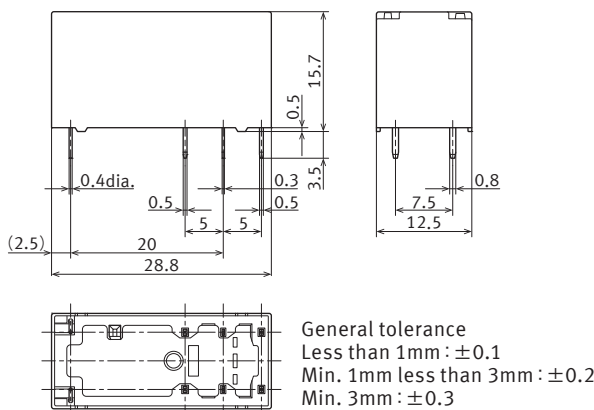


### 2. 1 Form C type

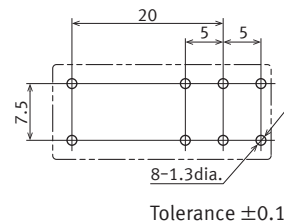
**CAD**



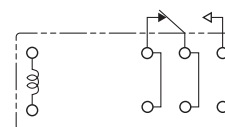
#### External dimensions



#### PC board pattern



#### Schematic (Bottom view)



## SAFETY STANDARDS

### ■ UL/C-UL (Recognized)

#### 1 Form A Class B Insulation

File No.	Contact	Contact rating	Cycles	Temperature
E43149	N.O.	16A 277V AC Resistive	10 <sup>5</sup>	85°C

#### 1 Form A Class F Insulation

File No.	Contact	Contact rating	Cycles	Temperature
E43149	N.O.	25A 277V AC Resistive (Carry only)	10 <sup>5</sup>	105°C
		17A 277V AC Resistive	10 <sup>5</sup>	105°C
		16A 277V AC Resistive	10 <sup>5</sup>	85°C
		16A 277V AC Resistive	3 × 10 <sup>4</sup>	105°C

### ■ CSA (Certified)

CSA standard certified by C-UL

### ■ VDE (Certified)

#### Class B Insulation

File No.	Contact	Contact rating	Cycles	Temperature
40047387	N.O.	16A 250V AC (cosφ=1.0)	10 <sup>5</sup>	25°C
		16A 250V AC (cosφ=1.0)	5 × 10 <sup>4</sup>	85°C
		13A 250V AC (cosφ=1.0)	10 <sup>5</sup>	85°C
	N.C.	16A 250V AC (cosφ=1.0)	10 <sup>4</sup>	25°C

#### Class F Insulation

File No.	Contact	Contact rating	Cycles	Temperature
40047387	N.O.	16A 250V AC (cosφ=1.0)	10 <sup>5</sup>	25°C
		16A 250V AC (cosφ=1.0)	5 × 10 <sup>4</sup>	85°C
		16A 250V AC (cosφ=1.0)	3 × 10 <sup>4</sup>	105°C
		13A 250V AC (cosφ=1.0)	10 <sup>5</sup>	85°C
		10A 250V AC (cosφ=1.0)	10 <sup>5</sup>	105°C
	N.C.	16A 250V AC (cosφ=1.0)	10 <sup>4</sup>	25°C

## NOTES

1. For cautions for use, please read "GENERAL APPLICATION GUIDELINES".

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

• Requests to customers :

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

#### 1 Form C Class B Insulation

File No.	Contact	Contact rating	Cycles	Temperature
E43149	N.O.	16A 277V AC Resistive	10 <sup>5</sup>	85°C
	N.C.	16A 277V AC Resistive	10 <sup>4</sup>	40°C
		16A 277V AC Resistive	6 × 10 <sup>3</sup>	85°C

#### 1 Form C Class F Insulation

File No.	Contact	Contact rating	Cycles	Temperature
E43149	N.O.	16A 277V AC Resistive	10 <sup>5</sup>	85°C
		16A 277V AC Resistive	3 × 10 <sup>4</sup>	105°C
		13A 277V AC Resistive	10 <sup>5</sup>	85°C
		10A 277V AC Resistive	10 <sup>5</sup>	105°C
		16A 277V AC Resistive	10 <sup>4</sup>	40°C
	N.C.	16A 277V AC Resistive	6 × 10 <sup>3</sup>	85°C
		16A 277V AC Resistive (Carry only)	10 <sup>5</sup>	105°C

### ■ TV rating

#### 1 Form A

File No.	Rating
UL/C-UL: E43149	TV-5

#### 1 Form C (N.O.)

File No.	Rating
UL/C-UL: E43149	TV-5

# 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](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.

## 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:

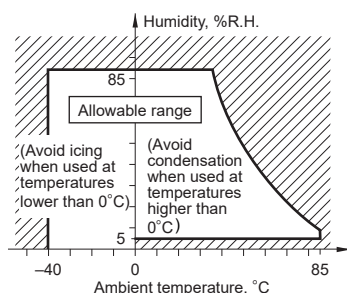
The tolerance temperature range differs for each relays, please refer to the relay's individual specifications

#### 2) Humidity:

5 to 85 % RH

#### 3) Pressure:

86 to 106 kPa



### ■ 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.

### ● 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.

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

## ●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 .....

**Panasonic Corporation**

Electromechanical Control Business Division

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