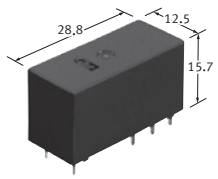
**Low profile:
15.7mm height
1a/1c 16A power relay**

LZ RELAYS(ALZ)

Protective construction：Flux-resistant type



(Unit：mm)

FEATURES

1. **Low profile type with height of 15.7 mm .**
   Slim, low profile type with dimensions of 28.8 (L)×12.5 (W)×15.7 (H) mm
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 for the class B and 105°C for the class F.
4. **Low operating power**
   Power saved with a nominal operating power of only 400 mW.
5. **Conforms to the various safety standards:**
   UL/C-UL, VDE approved.
6. **Superior heat resistance and tracking resistance**
   EN60335-1 GWT compliant (Tested by VDE) type available

TYPICAL APPLICATIONS

1. **Household electrical appliances**
   TV, CATV, Audio equipment, Microwave ovens, and Heaters, etc.
2. **Office equipment**
   Copy machines, Packaged air conditioners, and Vending machines
3. **Industrial equipment**
   Machine tools, Robots, and Temperature controllers

ORDERING INFORMATION

ALZ □ □ □ □ □ □

- Protective construction
  1：Flux-resistant type
  2：Sealed type
- Nominal coil voltage (DC)
  05：5V, 18：18V
  09：9V, 24：24V
  12：12V, 48：48V
- Packing style
  W：Carton packing
- Contact arrangement
  1：1 Form C
  5：1 Form A
  (New PC board terminal)
- Coil insulation class
  B：Class B insulation
  F：Class F insulation
- Flame resistance and tracking resistance
  Nil：—
  T ：EN60335-1 (Conform)

Notes： 1. Certified by UL/C-UL and VDE
2. Tube packing type is also available. Please consult us.

TYPES

Contact arrangement	Coil voltage	Flux-resistant type		Sealed type	
		Class B insulation	Class F insulation	Class B insulation	Class F insulation
		Part No.	Part No.	Part No.	Part No.
1 Form C	5 V DC	ALZ11B05W	ALZ11F05W	ALZ12B05W	ALZ12F05W
	9 V DC	ALZ11B09W	ALZ11F09W	ALZ12B09W	ALZ12F09W
	12 V DC	ALZ11B12W	ALZ11F12W	ALZ12B12W	ALZ12F12W
	18 V DC	ALZ11B18W	ALZ11F18W	ALZ12B18W	ALZ12F18W
	24 V DC	ALZ11B24W	ALZ11F24W	ALZ12B24W	ALZ12F24W
1 Form A	5 V DC	ALZ51B05W	ALZ51F05W	ALZ52B05W	ALZ52F05W
	9 V DC	ALZ51B09W	ALZ51F09W	ALZ52B09W	ALZ52F09W
	12 V DC	ALZ51B12W	ALZ51F12W	ALZ52B12W	ALZ52F12W
	18 V DC	ALZ51B18W	ALZ51F18W	ALZ52B18W	ALZ52F18W
	24 V DC	ALZ51B24W	ALZ51F24W	ALZ52B24W	ALZ52F24W

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

Notes: 1. Tube packing type is also available. Please consult us.
2. Carton packing symbol “W” is not marked on the relay.
3. EN60335-1 GWT compliant types available. When ordering, please add suffix “T”.
Ex. ALZ51F12TW

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.

Nominal coil voltage	Pick-up voltage (at 20°C)	Drop-out voltage (at 20°C)	Nominal operating current [±10%] (at 20°C)	Coil resistance [±10%] (at 20°C)	Nominal operating power (at 20°C)	Max. applied voltage (at 20°C)
5 V DC	Max. 70%V nominal voltage (Initial)	Min. 10%V nominal voltage (Initial)	80 mA	63Ω	400 mW	130%V of nominal voltage
9 V DC			44.4 mA	203Ω		
12 V DC			33.3 mA	360Ω		
18 V DC			22.2 mA	810Ω		
24 V DC			16.7 mA	1,440Ω		

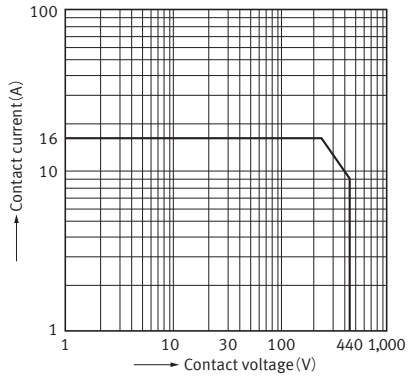
2. Specifications

Characteristics	Item		Specifications
Contact	Arrangement		1 Form C, 1 Form A
	Contact resistance (Initial)		Max. 100 mΩ (By voltage drop 6V DC 1A)
	Contact material		$AgSnO_2$ type
Rating	Nominal switching capacity (resistive load)		16A 250V AC
	Max. switching power (resistive load)		4,000V A
	Max. switching voltage		440V AC
	Max. switching current		16A
	Nominal operating power		400mW
	Min. switching capacity (reference value)*1		100mA 5V DC
Electrical characteristics	Insulation resistance (Initial)		Min. 1,000 MΩ (at 500V DC) Measurement at same location as “Breakdown voltage” section.
	Breakdown voltage (Initial)	Between open contacts	1,000 Vrms for 1 min. (Detection current: 10mA)
		Between contacts and coil	5,000 Vrms for 1 min. (Detection current: 10mA)
	Temperature rise (coil)		Max. 55°C [with nominal coil voltage and at 16A contact carrying current (resistance method) at 20°C]
	Surge breakdown voltage*2 (Between contacts and coil) (Initial)		10,000 V
	Operate time (at nominal voltage) (at 20°C)		Max. 15ms (excluding contact bounce time)
	Release time (at nominal voltage) (at 20°C)		Max. 5ms (excluding contact bounce time, without diode)
Mechanical characteristics	Shock resistance	Functional	100 m/s^2 (Half-wave pulse of sine wave: 11ms; detection time: 10μs)
		Destructive	1,000 m/s^2 (Half-wave pulse of sine wave: 6ms)
	Vibration resistance	Functional	10 to 55Hz at double amplitude of 1.5mm (Detection time: 10μs) (Only the N.C. side of 1 Form C is 0.8mm)
		Destructive	10 to 55Hz at double amplitude of 1.5mm
Expected life	Mechanical (at 180 times/min.)		Min. 10^7
	Electrical (at 20 times/min.)*3		N.O.: Min. 10^5, N.C.: Min. 5×10^4
Conditions	Conditions for operation, transport and storage*4, *5		Ambient temperature: –40°C to +85°C (Class B), 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			Approx. 12 g

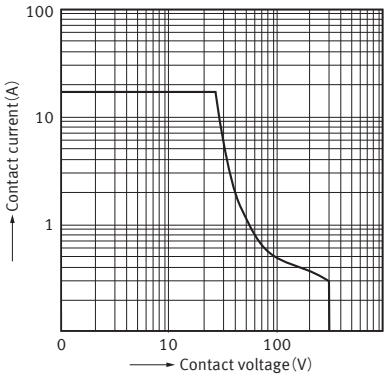
Notes: *1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.
*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981.
*3. In order to obtain the full rated life cycles, the relay should be properly vented by removing the vent nib. More detail, please look at caution for NOTES.
*4. Class F type is ambient temperature 105°C.
*5. 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.
*Please note that some of the specifications listed above may not comply with overseas standards.

REFERENCE DATA

1. Max. switching power (AC resistive load)

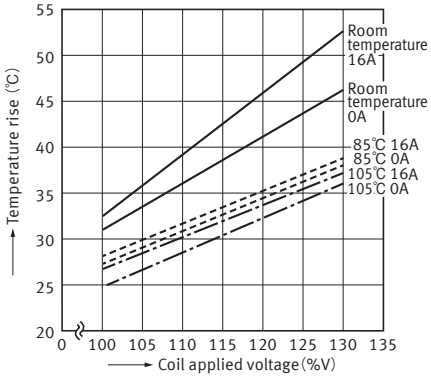


2. Max. switching power (DC resistive load)



3. Coil temperature rise

Tested sample : ALZ11F12, 5 pcs.
Measured portion : Coil inside
Contact current : 0A, 16A



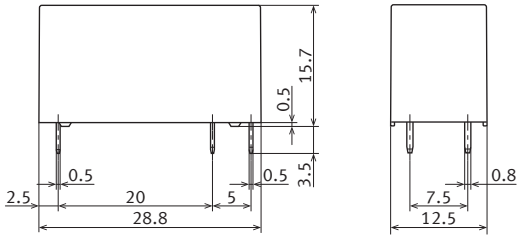
DIMENSIONS (mm)

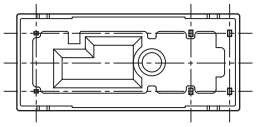
CAD The CAD data of the products with a "CAD" mark can be downloaded from our Website.

1 Form A type

CAD

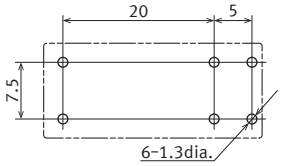
External dimensions





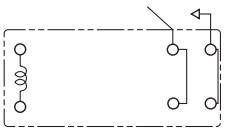
General tolerance
Less than 1mm : ±0.1
Min. 1mm less than 3mm : ±0.2
Min. 3mm : ±0.3

PC board pattern



Tolerance ±0.1

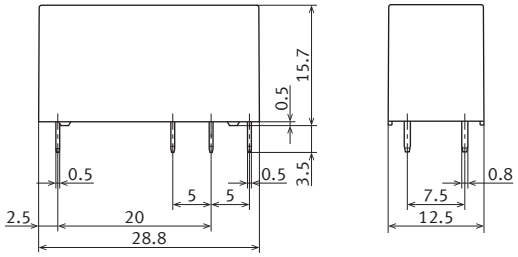
Schematic (Bottom view)

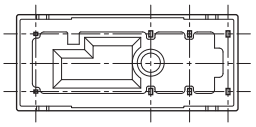


2. 1 Form C type

CAD

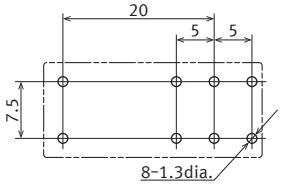
External dimensions





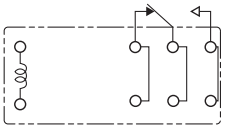
General tolerance
Less than 1mm : ±0.1
Min. 1mm less than 3mm : ±0.2
Min. 3mm : ±0.3

PC board pattern



Tolerance ±0.1

Schematic (Bottom view)



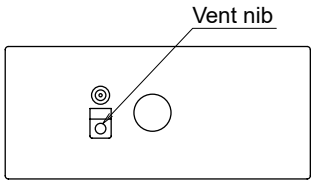
SAFETY STANDARDS

UL/C-UL (Recognized)		VDE (Certified)		TV rating (UL/CSA)	
File No.	Contact rating	File No.	Contact rating	File No.	Rating
E43149	16A 277V AC, 34.8LRA/7.2FLA/120V AC, 15LRA/3FLA/120V AC 10LRA/3FLA 240V AC, 20A 240V AC (N.O. only) 16A 30V DC, 25A 240V AC, 15A 240V AC Resistive load 105°C (N.O. only)	40000380	16A 250V AC (cosφ =1.0)	C-UL E43149	TV-5

* CSA standard: Certified by C-UL

NOTES

1. **For cautions for use, please read "GENERAL APPLICATION GUIDELINES" on page B-1.**
2. **Electrical life (Sealed type)**
   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.



Please refer to **"the latest product specifications"** when designing your product.
•Requests to customers:
https://industrial.panasonic.com/ac/e/salespolicies/

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

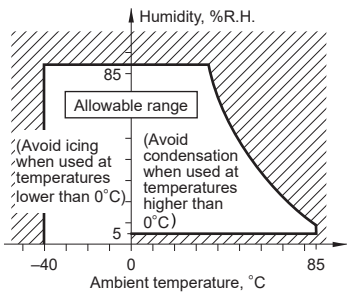
•Usage, Transport, and Storage Conditions

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.

●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/

Please contact .....

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