Panasonic
INDUSTRY

## Power Relays ( Over 2 A )

# NC RELAYS

Product Catalog

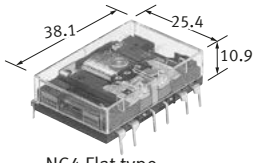
IN Your Future

2023.6

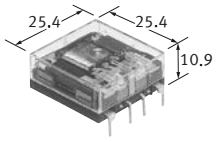
# NC RELAYS

## Transistor drive, 2 Form C/4 Form C, 5 A Slim power relays

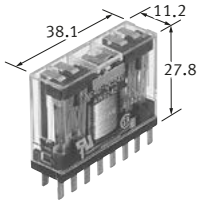
Protective construction：Dust cover type/Sealed type



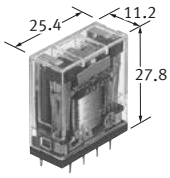

NC4 Flat type
(PC board type)




NC2 Flat type
(PC board type)




NC4 Slim type
(Plug-in type)




NC2 Slim type
(PC board type)

(Unit：mm)

### FEATURES

- Flat type: profile 10.9 mm
  Slim type: width 11.2 mm
- Twin ( bifurcated ) contact
- Plug-in terminal/PC board terminal
- Sockets and terminal sockets are available

### TYPICAL APPLICATIONS

- Electric power equipment
- Industrial equipment
- Measuring devices

## ORDERING INFORMATION ( PART NO. : Ordering part number for Japanese market )

**AW 8** □ □ □ □

- Terminal shape
  2：Slim type, Plug-in terminal
  4：Slim type, PC board terminal
  8：Flat type, PC board terminal
- Contact arrangement
  1：2 Form C Single side stable
  4：4 Form C Single side stable
- Rated coil voltage (DC)

| Part No. | 0 | 1 | 2 | 3 | 4 | 8 | 9 |
|---|---|---|---|---|---|---|---|
| Rated coil voltage (V) | 6 | 12 | 24 | 48 | 100 | 3 | 5 |

- Protective construction
  Nil：Dust cover type
  60：Sealed type

## ORDERING INFORMATION ( TYPE NO. : Ordering part number for non Japanese market )

**NC** □ □ **D** - □ □ □ - □

- Contact arrangement
  2：2 Form C
  4：4 Form C
- Protective construction
  Nil：Dust cover type
  EB：Sealed type
- Contact characteristics
  D：Twin (bifurcated) contact
- Relay shape
  Nil：Slim type
  J ：Flat type
- Terminal shape
  Nil：Plug-in type
  P ：PC board type
- Operating function
  Nil：Single side stable
- Rated coil voltage (DC)
  3, 5, 6, 12, 24, 48, 100V

## TYPES

" Type No. " is ordering part number for non Japanese market. " Part No. " is ordering part number for Japanese market.

### ■ Dust cover type

● Flat type

| Contact arrangement | Rated coil voltage | PC board terminal | | Standard packing | |
|---|---|---|---|---|---|
| | | Type No. | Part No. | Inner carton | Outer carton |
| 2 Form C | 3 V DC | NC2D-JP-DC3V | AW8818 | 20 pcs. | 200 pcs. |
| | 5 V DC | NC2D-JP-DC5V | AW8819 | | |
| | 6 V DC | NC2D-JP-DC6V | AW8810 | | |
| | 12 V DC | NC2D-JP-DC12V | AW8811 | | |
| | 24 V DC | NC2D-JP-DC24V | AW8812 | | |
| | 48 V DC | NC2D-JP-DC48V | AW8813 | | |
| | 100 V DC | NC2D-JP-DC100V | AW8814 | | |
| 4 Form C | 3 V DC | NC4D-JP-DC3V | AW8848 | | |
| | 5 V DC | NC4D-JP-DC5V | AW8849 | | |
| | 6 V DC | NC4D-JP-DC6V | AW8840 | | |
| | 12 V DC | NC4D-JP-DC12V | AW8841 | | |
| | 24 V DC | NC4D-JP-DC24V | AW8842 | | |
| | 48 V DC | NC4D-JP-DC48V | AW8843 | | |
| | 100 V DC | NC4D-JP-DC100V | AW8844 | | |

● Slim type

| Contact arrangement | Rated coil voltage | Plug-in terminal | | PC board terminal | | Standard packing | |
|---|---|---|---|---|---|---|---|
| | | Type No. | Part No. | Type No. | Part No. | Inner carton | Outer carton |
| 2 Form C | 3 V DC | NC2D-DC3V | AW8218 | NC2D-P-DC3V | AW8418 | 20 pcs. | 200 pcs. |
| | 5 V DC | NC2D-DC5V | AW8219 | NC2D-P-DC5V | AW8419 | | |
| | 6 V DC | NC2D-DC6V | AW8210 | NC2D-P-DC6V | AW8410 | | |
| | 12 V DC | NC2D-DC12V | AW8211 | NC2D-P-DC12V | AW8411 | | |
| | 24 V DC | NC2D-DC24V | AW8212 | NC2D-P-DC24V | AW8412 | | |
| | 48 V DC | NC2D-DC48V | AW8213 | NC2D-P-DC48V | AW8413 | | |
| | 100 V DC | NC2D-DC100V | AW8214 | NC2D-P-DC100V | AW8414 | | |
| 4 Form C | 3 V DC | NC4D-DC3V | AW8248 | NC4D-P-DC3V | AW8448 | | |
| | 5 V DC | NC4D-DC5V | AW8249 | NC4D-P-DC5V | AW8449 | | |
| | 6 V DC | NC4D-DC6V | AW8240 | NC4D-P-DC6V | AW8440 | | |
| | 12 V DC | NC4D-DC12V | AW8241 | NC4D-P-DC12V | AW8441 | | |
| | 24 V DC | NC4D-DC24V | AW8242 | NC4D-P-DC24V | AW8442 | | |
| | 48 V DC | NC4D-DC48V | AW8243 | NC4D-P-DC48V | AW8443 | | |
| | 100 V DC | NC4D-DC100V | AW8244 | NC4D-P-DC100V | AW8444 | | |

### ■ Sealed type

● Flat type

| Contact arrangement | Rated coil voltage | PC board terminal | | Standard packing | |
|---|---|---|---|---|---|
| | | Type No. | Part No. | Inner carton | Outer carton |
| 2 Form C | 3 V DC | NC2EBD-JP-DC3V | AW881860 | 20 pcs. | 200 pcs. |
| | 5 V DC | NC2EBD-JP-DC5V | AW881960 | | |
| | 6 V DC | NC2EBD-JP-DC6V | AW881060 | | |
| | 12 V DC | NC2EBD-JP-DC12V | AW881160 | | |
| | 24 V DC | NC2EBD-JP-DC24V | AW881260 | | |
| | 48 V DC | NC2EBD-JP-DC48V | AW881360 | | |
| | 100 V DC | NC2EBD-JP-DC100V | AW881460 | | |
| 4 Form C | 3 V DC | NC4EBD-JP-DC3V | AW884860 | | |
| | 5 V DC | NC4EBD-JP-DC5V | AW884960 | | |
| | 6 V DC | NC4EBD-JP-DC6V | AW884060 | | |
| | 12 V DC | NC4EBD-JP-DC12V | AW884160 | | |
| | 24 V DC | NC4EBD-JP-DC24V | AW884260 | | |
| | 48 V DC | NC4EBD-JP-DC48V | AW884360 | | |
| | 100 V DC | NC4EBD-JP-DC100V | AW884460 | | |

● Slim type

| Contact arrangement | Rated coil voltage | Plug-in terminal | | PC board terminal | | Standard packing | |
|---|---|---|---|---|---|---|---|
| | | Type No. | Part No. | Type No. | Part No. | Inner carton | Outer carton |
| 2 Form C | 3 V DC | NC2EBD-DC3V | AW821860 | NC2EBD-P-DC3V | AW841860 | 20 pcs. | 200 pcs. |
| | 5 V DC | NC2EBD-DC5V | AW821960 | NC2EBD-P-DC5V | AW841960 | | |
| | 6 V DC | NC2EBD-DC6V | AW821060 | NC2EBD-P-DC6V | AW841060 | | |
| | 12 V DC | NC2EBD-DC12V | AW821160 | NC2EBD-P-DC12V | AW841160 | | |
| | 24 V DC | NC2EBD-DC24V | AW821260 | NC2EBD-P-DC24V | AW841260 | | |
| | 48 V DC | NC2EBD-DC48V | AW821360 | NC2EBD-P-DC48V | AW841360 | | |
| | 100 V DC | NC2EBD-DC100V | AW821460 | NC2EBD-P-DC100V | AW841460 | | |
| 4 Form C | 3 V DC | NC4EBD-DC3V | AW824860 | NC4EBD-P-DC3V | AW844860 | | |
| | 5 V DC | NC4EBD-DC5V | AW824960 | NC4EBD-P-DC5V | AW844960 | | |
| | 6 V DC | NC4EBD-DC6V | AW824060 | NC4EBD-P-DC6V | AW844060 | | |
| | 12 V DC | NC4EBD-DC12V | AW824160 | NC4EBD-P-DC12V | AW844160 | | |
| | 24 V DC | NC4EBD-DC24V | AW824260 | NC4EBD-P-DC24V | AW844260 | | |
| | 48 V DC | NC4EBD-DC48V | AW824360 | NC4EBD-P-DC48V | AW844360 | | |
| | 100 V DC | NC4EBD-DC100V | AW824460 | NC4EBD-P-DC100V | AW844460 | | |

For the sockets, please refer to the " Sockets/DIN terminal sockets ".

## RATING

### ■ Coil data

- Operating characteristics such as " Operate voltage " and " Release voltage " are influenced by mounting conditions or 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.

| Contact arrangement | Rated coil voltage | Operate voltage*1 ( at 20 ℃ ) | Release voltage*1 ( at 20 ℃ ) | Rated operating current ( ±10 %, at 20 ℃ ) | Coil resistance ( ±10 %, at 20 ℃ ) | Rated operating power | Max. allowable voltage ( at 50 ℃ ) *2 |
|---|---|---|---|---|---|---|---|
| 2 Form C | 3 V DC | Max. 80 % V of rated coil voltage ( Initial ) | Min. 10 % V of rated coil voltage ( Initial ) | 120 mA | 25 Ω | 360 mW | 135 % V of rated coil voltage |
| | 5 V DC | | | 72 mA | 69.4 Ω | | |
| | 6 V DC | | | 60 mA | 100 Ω | | |
| | 12 V DC | | | 30 mA | 400 Ω | | |
| | 24 V DC | | | 15 mA | 1,600 Ω | | |
| | 48 V DC | | | 7.5 mA | 6,400 Ω | | |
| | 100 V DC | | | 7.4 mA | 13,500 Ω | 740 mW | 110 %V of rated coil voltage |
| 4 Form C | 3 V DC | Max. 80 % V of rated coil voltage ( Initial ) | Min. 10 % V of rated coil voltage ( Initial ) | 240 mA | 12.5 Ω | 720 mW | 110 % V of rated coil voltage |
| | 5 V DC | | | 144 mA | 34.7 Ω | | |
| | 6 V DC | | | 120 mA | 50 Ω | | |
| | 12 V DC | | | 60 mA | 200 Ω | | |
| | 24 V DC | | | 30 mA | 800 Ω | | |
| | 48 V DC | | | 15 mA | 3,200 Ω | | |
| | 100 V DC | | | 7.4 mA | 13,500 Ω | 740 mW | |

*1: Square, pulse drive
*2: At 20℃ ( Sealed type )

## ■ Specifications

| Item | | Specifications | |
|---|---|---|---|
| Contact data | Contact arrangement | 2 Form C | 4 Form C |
| | Contact resistance ( initial ) | Max. 50 mΩ ( by voltage drop 6 V DC 1 A ) | |
| | Contact material | Au-clad, AgNi type | |
| | Contact rating ( resistive ) | Dust cover: 5 A 250 V AC, 5 A 30 V DC<br>Sealed : 3 A 250 V AC, 5 A 30 V DC | Dust cover: 4 A 250 V AC, 5 A 30 V DC<br>Sealed : 2 A 250 V AC, 5 A 30 V DC |
| | Max. switching power ( resistive ) | Dust cover: 1,250 VA, 150 W<br>Sealed : 750 VA, 150 W | Dust cover: 1,000 VA, 150 W<br>Sealed : 500 VA, 150 W |
| | Max. switching voltage | 250 V AC, 220 V DC | |
| | Max. switching current | Dust cover: 5 A ( AC, DC )<br>Sealed : 3 A ( AC ), 5 A ( DC ) | Dust cover: 4 A ( AC ), 5 A ( DC )<br>Sealed : 2 A ( AC ), 5 A ( DC ) |
| | Min. switching load ( reference value )*1 | 100 μA 1 V DC | |
| Insulation resistance ( initial ) | | Min. 100 MΩ ( at 500 V DC, Measured portion is the same as the case of dielectric strength. ) | |
| Dielectric strength ( initial ) | Between open contacts | 1,000 Vrms for 1 min ( detection current: 10 mA ) | |
| | Between contact sets | 1,000 Vrms for 1 min ( detection current: 10 mA ) | |
| | Between contact and coil | 2,000 Vrms for 1 min ( detection current: 10 mA ) | |
| Time characteristics ( initial ) | Operate time | Max. 20 ms at rated coil voltage ( at 20 ℃, without bounce ) | |
| | Release time | Max. 10 ms at rated coil voltage ( at 20 ℃, without bounce, without diode ) | |
| Shock resistance | Functional | 98 m/s² ( half-sine shock pulse: 11 ms, detection time: 10 μs ) | |
| | Destructive | 980 m/s² ( half-sine shock pulse: 6 ms ) | |
| Vibration resistance | Functional | 10 to 55 Hz ( at double amplitude of 1 mm, detection time: 10 μs ) | |
| | Destructive | 10 to 55 Hz ( at double amplitude of 2 mm ) | |
| Expected life | Mechanical life | Min.50 × 10⁶ ope. ( switching frequency: at 180 times/min ) | |
| Conditions | Conditions for usage, transport and storage*2 | Ambient temperature: −40 to +70 ℃ ( Max. 48 V DC ),<br>−40 to +55 ℃ ( Min. 100 V DC )<br>Humidity: 5 to 85 % RH ( Avoid icing and condensation ) | Ambient temperature: −40 to +55 ℃<br>Humidity: 5 to 85 % RH ( Avoid icing and condensation ) |
| Unit weight | | Approx. 16 g | Slim type: Approx. 19 g<br>Flat type : Approx. 18 g |

*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: For ambient temperature, please read " GUIDELINES FOR RELAY USAGE ".

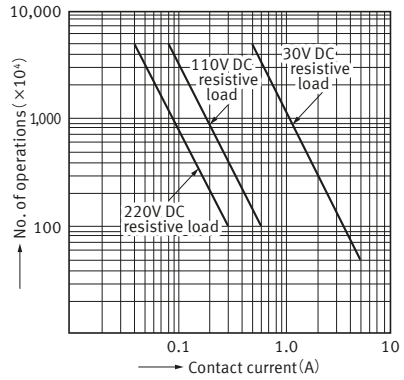
## ■ Expected electrical life

Conditions: Resistive load, switching frequency at 20 times/min

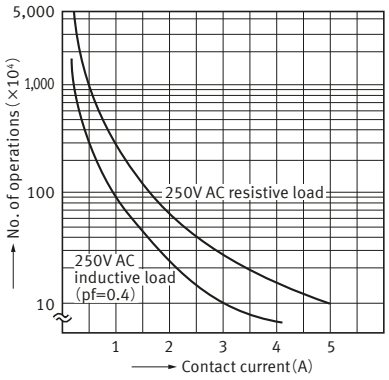
| Type | | Switching capacity | Number of operations |
|---|---|---|---|
| 2 Form C | Dust cover | 5 A 30 V DC | Min. 500 × 10³ ope. |
| | | 5 A 250 V AC | Min. 100 × 10³ ope. |
| | Sealed | 5 A 30 V DC | Min. 500 × 10³ ope. |
| | | 3 A 250 V AC | Min. 100 × 10³ ope. |
| 4 Form C | Dust cover | 5 A 30 V DC | Min. 500 × 10³ ope. |
| | | 4 A 250 V AC | Min. 100 × 10³ ope. |
| | Sealed | 5 A 30 V DC | Min. 500 × 10³ ope. |
| | | 2 A 250 V AC | Min. 100 × 10³ ope. |

## REFERENCE DATA

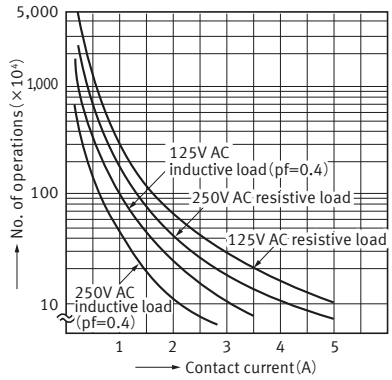
1-1. Switching life curve
( 2 Form C, 4 Form C )



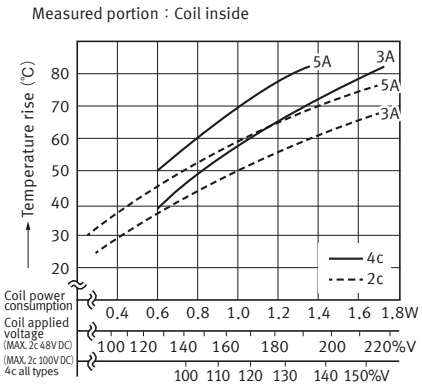

1-2. Switching life curve ( 2 Form C )



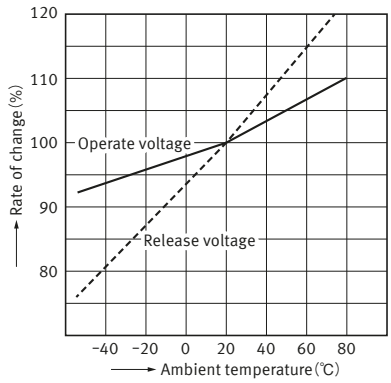

1-3. Switching life curve ( 4 Form C )



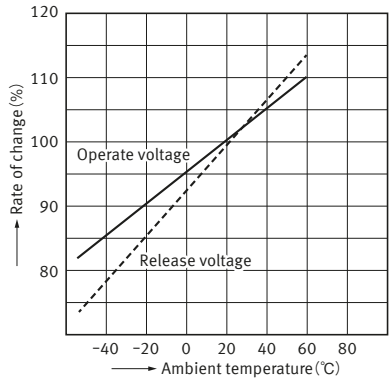

2. Coil temperature characteristics



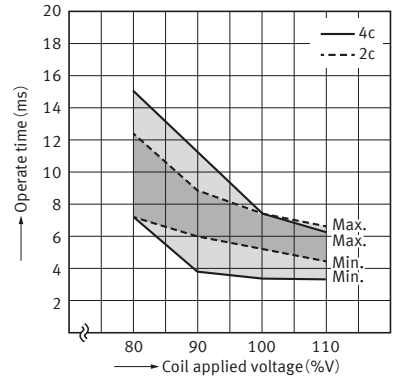

3-1. Ambient temperature characteristics
( 2 Form C )



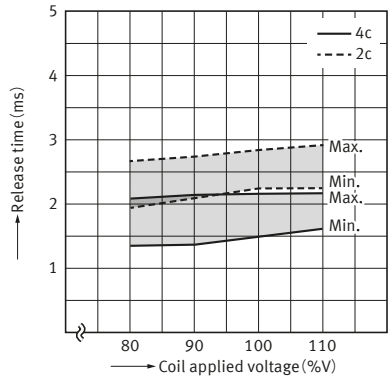

3-2. Ambient temperature characteristics
( 4 Form C )



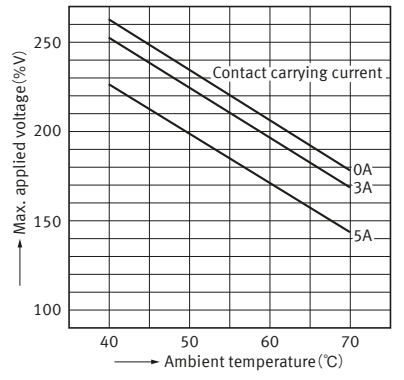

4. Operate time



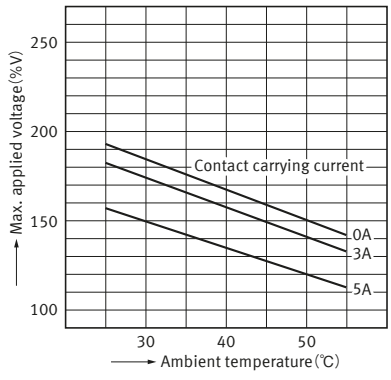

5. Release time




6-1. Ambient temperature vs Max. applied voltage
( 2 Form C: 3 to 48 V DC type )




6-2. Ambient temperature vs Max. applied voltage
(2 Form C: 100 V DC type, 4 Form C )



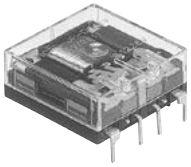
## DIMENSIONS ( Unit: mm )

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

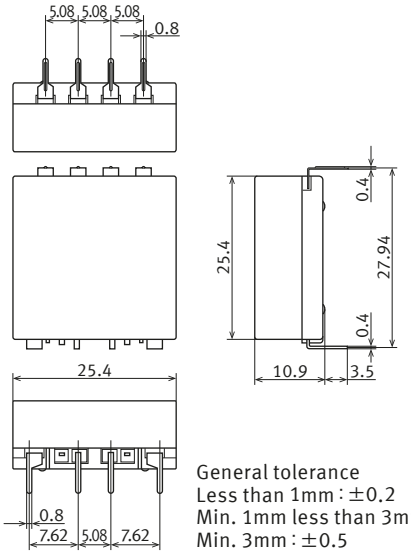
### ■ Dust cover: Flat type

● PC board terminal: 2 Form C

CAD

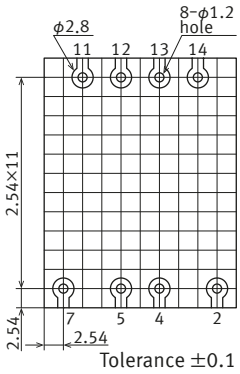


External dimensions



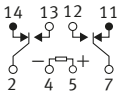

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Recommended PC board pattern ( BOTTOM VIEW )



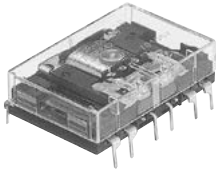

Tolerance ±0.1

Schematic ( TOP VIEW ) ( De-energize )

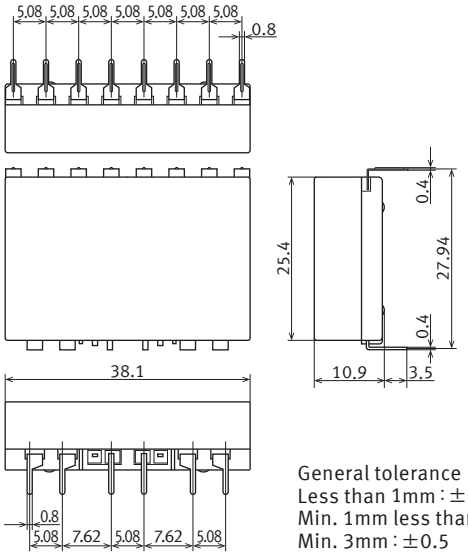



● PC board terminal: 4 Form C

CAD

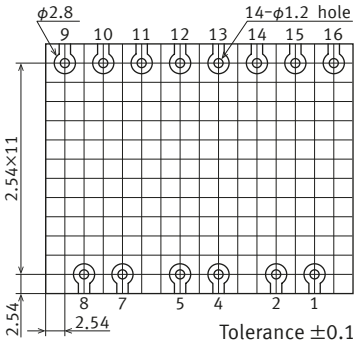


External dimensions



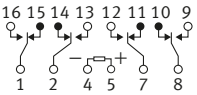

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Recommended PC board pattern ( BOTTOM VIEW )




Tolerance ±0.1

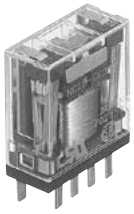
Schematic ( TOP VIEW ) ( De-energize )



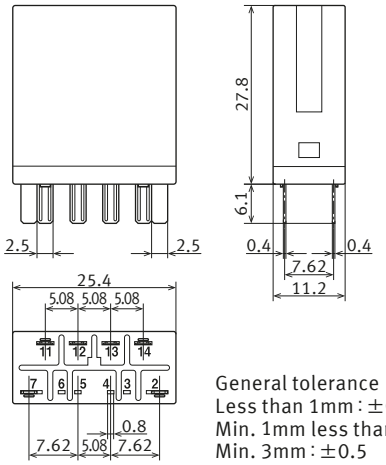
## ■ Dust cover: Slim type

### ● Plug-in terminal: 2 Form C

CAD

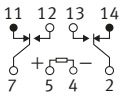


External dimensions



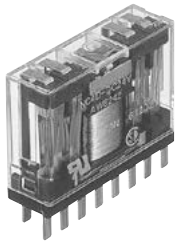

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Schematic
( BOTTOM VIEW )
( De-energize )

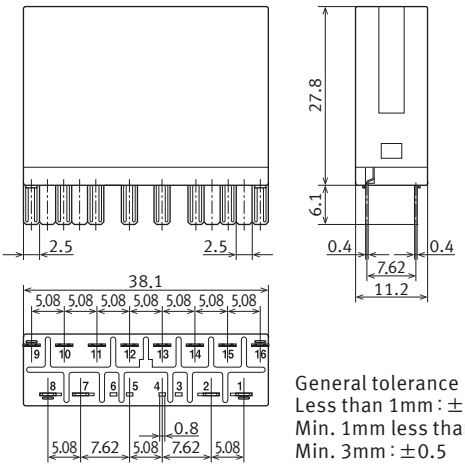



### ● Plug-in terminal: 4 Form C

CAD

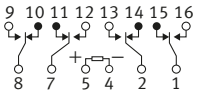


External dimensions



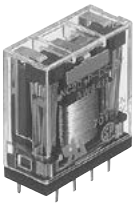

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Schematic
( BOTTOM VIEW )
(De-energize)

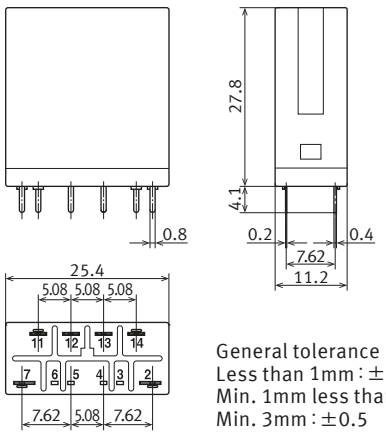



### ● PC board terminal: 2 Form C

CAD

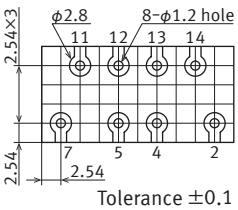


External dimensions



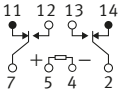

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Recommended
PC board pattern
( BOTTOM VIEW )




Tolerance ±0.1

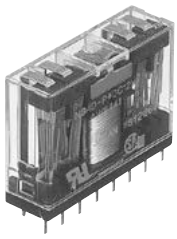
Schematic
( BOTTOM VIEW )
( De-energize )

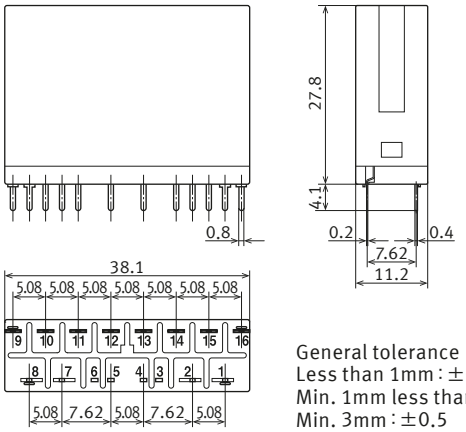


● PC board terminal: 4 Form C

CAD

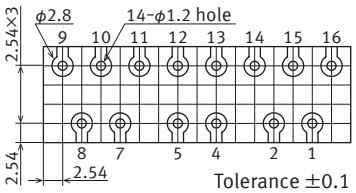
External dimensions





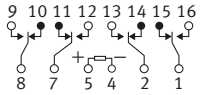

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Recommended PC board pattern (BOTTOM VIEW)




Tolerance ±0.1

Schematic (BOTTOM VIEW) (De-energize)

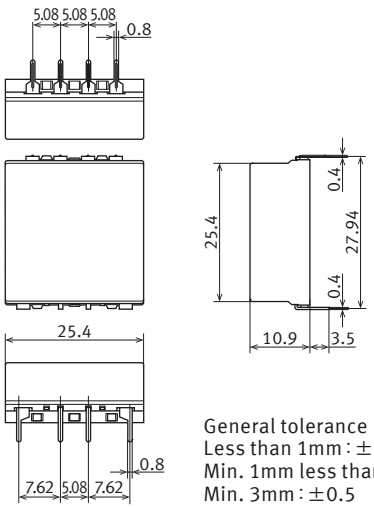



## ■ Sealed: Flat type

● PC board terminal: 2 Form C

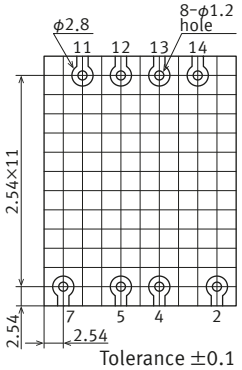
CAD

External dimensions



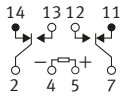

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Recommended PC board pattern ( BOTTOM VIEW )




Tolerance ±0.1

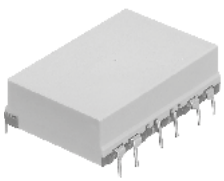
Schematic ( TOP VIEW ) ( De-energize )

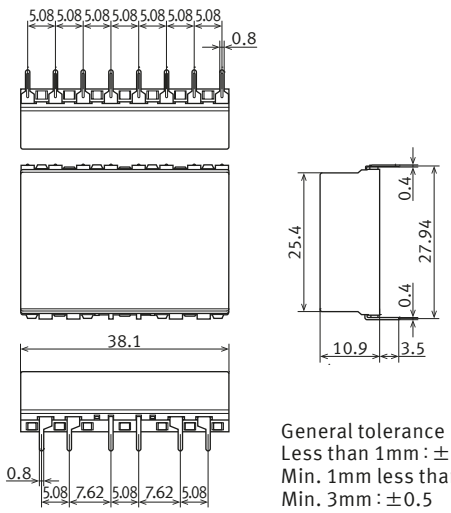



● PC board terminal: 4 Form C

CAD

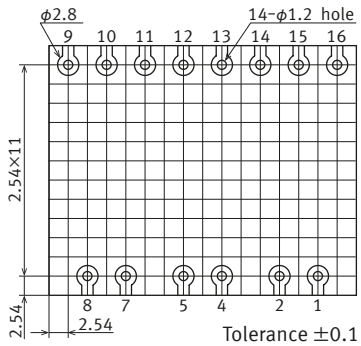
External dimensions





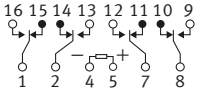

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Recommended PC board pattern ( BOTTOM VIEW )




Tolerance ±0.1

Schematic ( TOP VIEW ) ( De-energize )

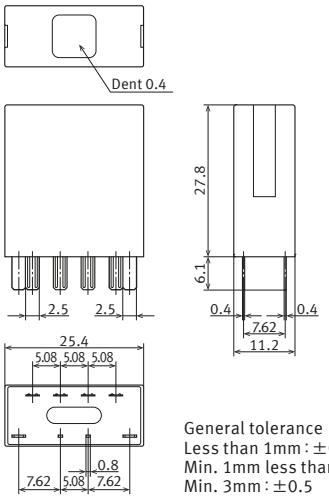


## ■ Sealed: Slim type

### ● Plug-in terminal: 2 Form C

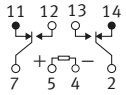
CAD

External dimensions




General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

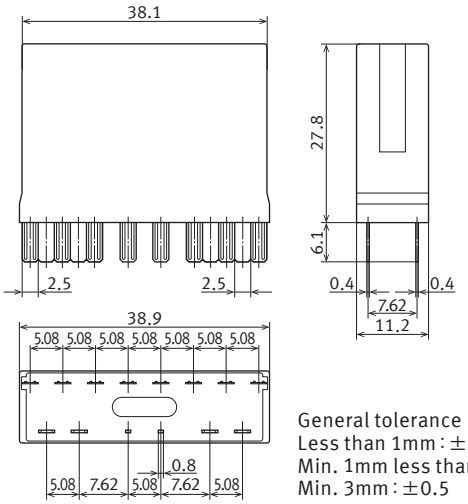
Schematic
( BOTTOM VIEW )
( De-energize )




### ● Plug-in terminal: 4 Form C

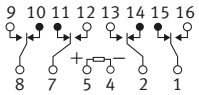
CAD

External dimensions




General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

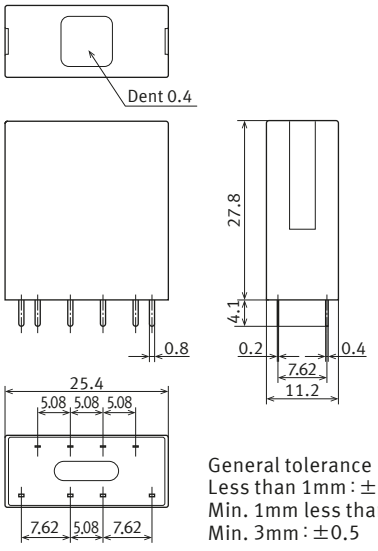
Schematic
( BOTTOM VIEW )
( De-energize )



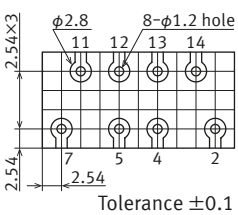

### ● PC board terminal: 2 Form C

CAD

External dimensions



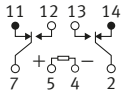

Recommended
PC board pattern
( BOTTOM VIEW )




Tolerance ±0.1

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

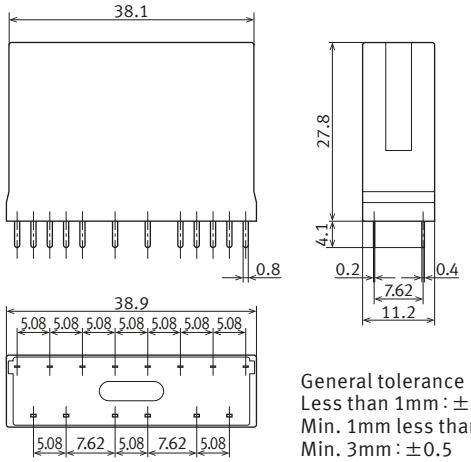
Schematic
( BOTTOM VIEW )
( De-energize )



● PC board terminal: 4 Form C

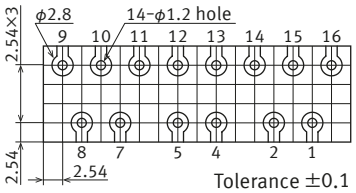
CAD

External dimensions

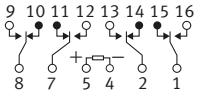



General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Recommended
PC board pattern
( BOTTOM VIEW )




Schematic
( BOTTOM VIEW )
( De-energize )




## SAFETY STANDARDS

Each standard may be updated at any time, so please check our Website for the latest information.

### ■ UL ( Approved )

● Dust cover

2 Form C

| File No. | Contact rating | Operations |
|---|---|---|
| E43028 | 5 A 250 V AC | 100 × 10³ |
| | 5 A 30 V DC | 100 × 10³ |
| | 1/10 HP 125, 250 V AC | — |

4 Form C

| File No. | Contact rating | Operations |
|---|---|---|
| E43028 | 5 A 30 V DC | 100 × 10³ |
| | 4 A 250 V AC | 100 × 10³ |
| | 1/10 HP 125, 250 V AC | — |

● Sealed

2 Form C

| File No. | Contact rating | Operations |
|---|---|---|
| E43028 | 5 A 30 V DC | 100 × 10³ |
| | 3 A 250 V AC | 100 × 10³ |
| | 1/20 HP 125, 250 V AC | — |

4 Form C

| File No. | Contact rating | Operations |
|---|---|---|
| E43028 | 5 A 30 V DC | 100 × 10³ |
| | 2 A 250 V AC | 100 × 10³ |
| | 1/20 HP 125, 250 V AC | — |

### ■ CSA ( Approved )

● Dust cover

2 Form C

| File No. | Contact rating | Operations |
|---|---|---|
| 1440474 | 5 A 250 V AC | 100 × 10³ |
| | 5 A 30 V DC | 100 × 10³ |
| | 1/10 HP 125, 250 V AC | — |

4 Form C

| File No. | Contact rating | Operations |
|---|---|---|
| 1440474 | 5 A 30 V DC | 100 × 10³ |
| | 4 A 250 V AC | 100 × 10³ |
| | 1/10 HP 125, 250 V AC | — |

● Sealed

2 Form C

| File No. | Contact rating | Operations |
|---|---|---|
| 1440474 | 5 A 30 V DC | 100 × 10³ |
| | 3 A 250 V AC | 100 × 10³ |
| | 1/20 HP 125, 250 V AC | — |

4 Form C

| File No. | Contact rating | Operations |
|---|---|---|
| 1440474 | 5 A 30 V DC | 100 × 10³ |
| | 2 A 250 V AC | 100 × 10³ |
| | 1/20 HP 125, 250 V AC | — |

## GUIDELINES FOR USAGE

### ■ For cautions for use, please read " GUIDELINES FOR RELAY USAGE ".
https://industrial.panasonic.com/ac/e/control/relay/cautions_use/index.jsp

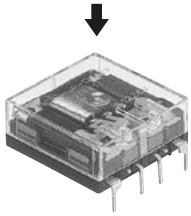
### ■ Cautions for usage of NC relay

- Because the NC relay is polarized, the positive ( + ) and negative ( − ) connections to the coil should be done as indicated on the wiring diagram. If connected incorrectly, it may malfunction or fail to operate.

● **When designing top and bottom view schematic diagrams, note that:**

1) " Top view " wiring diagram is indicated for the flat type because terminals can be seen from above.

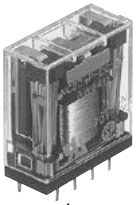
TOP VIEW



Flat type

2) " Bottom view " schematic diagram is indicated for the slim type because terminals cannot be seen from above.

Slim type



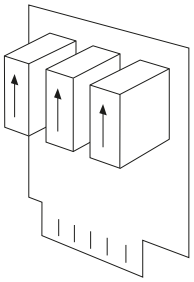
BOTTOM VIEW

- While NC relays can be used with any transmission-wave current to their operation, due to slight weakening of the force of magnetic attraction, decreased resistance to vibration and shock should be taken into account.

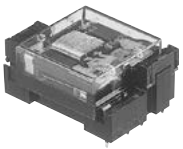
● **Cautions for close proximity mounting**

When using slim series in close proximity, mount all relays facing the same direction. Different mounting directions may cause change in the relay characteristics because NC relays are polarized.

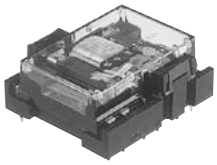
Same direction



# Sockets/DIN terminal sockets

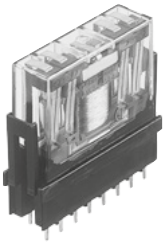


NC2 Flat type socket



NC4 Flat type socket

NC2 Slim type socket



NC4 Slim type socket

NC2 DIN terminal socket

## TYPES

| Type | Product name | Terminal connection method | Type No. | Part No. | Main Part No. to be installed | Standard packing | |
|---|---|---|---|---|---|---|---|
| | | | | | | Inner carton | Outer carton |
| Flat type socket | NC2-flat type PC board socket | PC board | NC2-JPS | AW4920 | AW881 series | 20 pcs. | 200 pcs. |
| | NC4-flat type PC board socket | PC board | NC4-JPS | AW4940 | AW884 series | | |
| Slim type DIN terminal socket | NC2-DIN terminal socket | DIN rail | NC2-SFD | AW4928 | AW821 series | 20 pcs. | 100 pcs. |
| Slim type socket | NC2-slim type soldering socket | Solder terminal | NC2-SS | AW4922 | AW821 series | 20 pcs. | 200 pcs. |
| | NC2-slim type PC board socket | PC board | NC2-PS | AW4924 | | | |
| | NC2-slim type wrapping socket | Lead wire | NC2-WS | AW4926 | | | |
| | NC4-slim type soldering socket | Solder terminal | NC4-SS | AW4942 | AW824 series | | |
| | NC4-slim type PC board socket | PC board | NC4-PS | AW4944 | | | |
| | NC4-slim type wrapping socket | Lead wire | NC4-WS | AW4946 | | | |

## RATING

| Item | Specifications |
|---|---|
| Dielectric strength ( initial ) | Each between terminals: 2,000 Vrms for 1 min ( detection current: 10 mA ) |
| Insulation resistance ( initial ) | Each between terminals: Min. 100 MΩ<br>( at 500 V DC, Measured portion is the same as the case of dielectric strength. ) |
| Max. continuous carrying current | Slim type: 5 A 250 V AC<br>Flat type : 5 A 250 V AC |
| Conditions for usage, transport and storage | Ambient temperature: −50 to +50 ℃ ( AW4924, AW4926, AW4928, AW4944, AW4946 )<br>−40 to +70 ℃ ( AW4920, AW4922, AW4940, AW4942 )<br>Humidity: 5 to 85 % RH ( Avoid icing and condensation ) |

## DIMENSIONS ( Unit: mm )

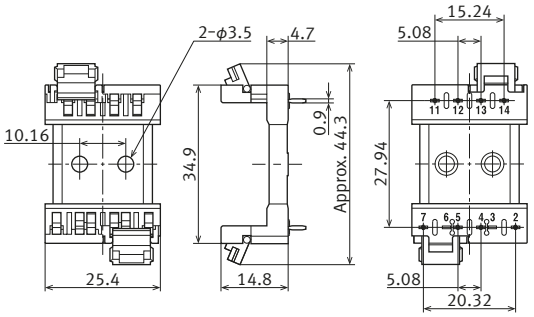
CAD The CAD data of the products with a " CAD " mark can be downloaded from our Website.

### ■ Flat type PC board socket

● NC2 ( AW4920 )

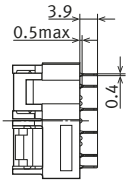
CAD

External dimensions



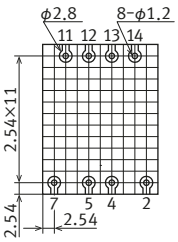

General tolerance ±0.5

Terminal portion dimensions




General tolerance ±0.5

Recommended PC board pattern

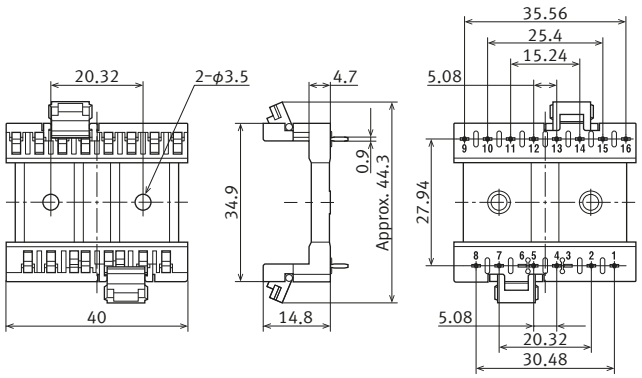



Tolerance ±0.1

● NC4 ( AW4940 )

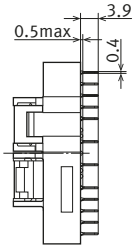
CAD

External dimensions



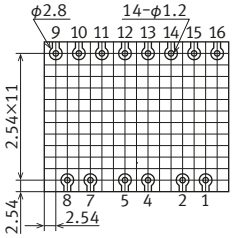

General tolerance ±0.5

Terminal portion dimensions




General tolerance ±0.5

Recommended PC board pattern

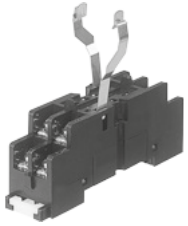



Tolerance ±0.1

### ■ Slim type DIN terminal socket

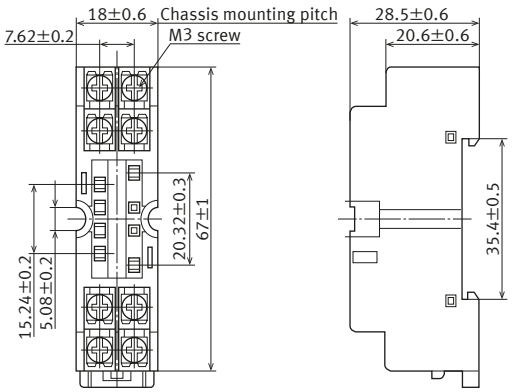
● NC2 ( AW4928 )

CAD



Note: Fastening brackets are included with the DIN terminal socket.

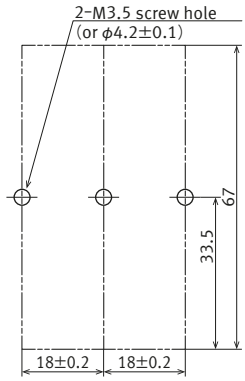
External dimensions



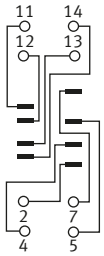

note :
To prevent damage or distortion, when tightening fixing screws, the optimum torque range should be 0.49 to 0.69 N·m, (5 to 7 kgf·cm) .

General tolerance
Less than 1mm : ±0.2
Min. 1mm less than 3mm : ±0.3
Min. 3mm : ±0.5

Mounting hole pattern



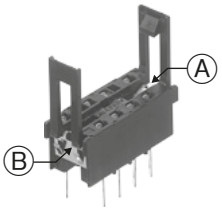

Schematic



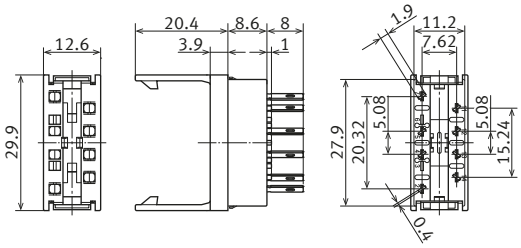
## ■ Slim type soldering socket

● NC2 ( AW4922 )

CAD

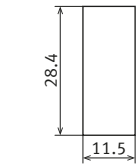



External dimensions




General tolerance ±0.5

Chassis cutout

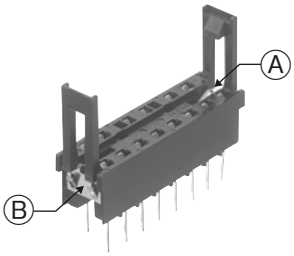



Tolerance ±0.1

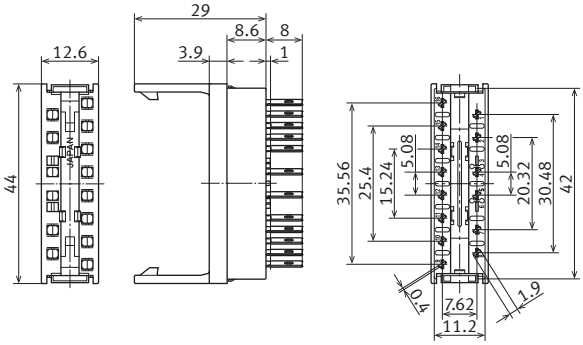
Notes :
1.Suitable chassis thickness is 1.0 to 2.0mm.
2.Once the socket is inserted from above into the mounting holes, the relay will snap in to clips rising from either side at (A) and (B) by pushing.

● NC4 ( AW4942 )

CAD

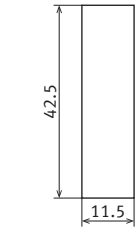



External dimensions




General tolerance ±0.5

Chassis cutout




Tolerance ±0.1

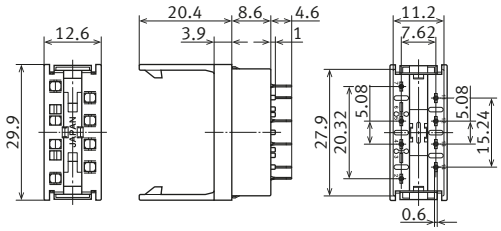
Notes :
1.Suitable chassis thickness is 1.0 to 2.0mm.
2.Once the socket is inserted from above into the mounting holes, the relay will snap in to clips rising from either side at (A) and (B) by pushing.

## ■ Slim type PC board socket

● NC2 ( AW4924 )

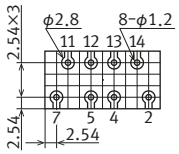
CAD

External dimensions




General tolerance ±0.5

Recommended PC board pattern

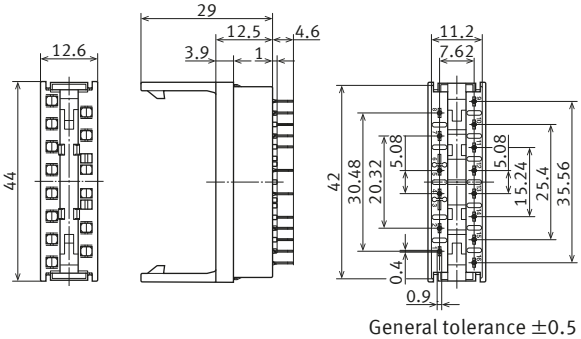



Tolerance ±0.1

● NC4 ( AW4944 )

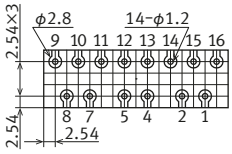
CAD

External dimensions




General tolerance ±0.5

Recommended PC board pattern




Tolerance ±0.1

## ■ Slim type wrapping socket

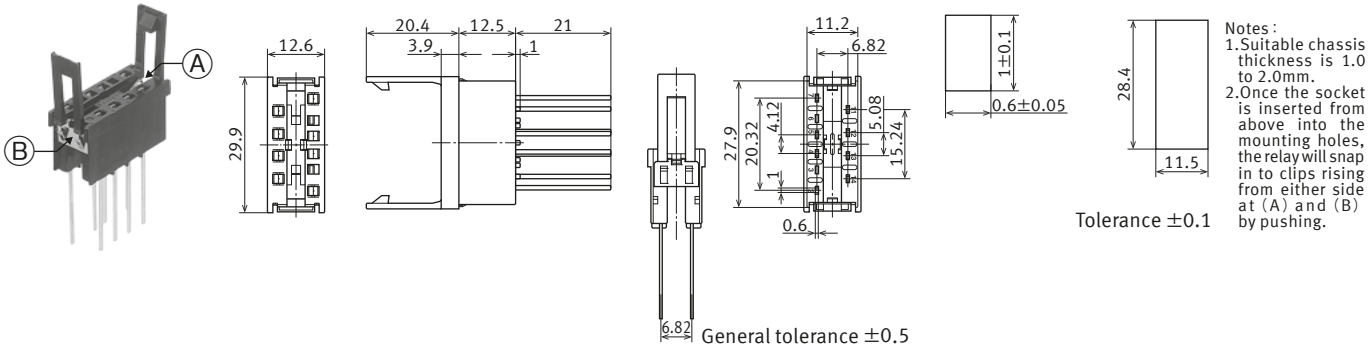
● NC2 ( AW4926 )

CAD

External dimensions

Terminal cross section

Chassis cutout




General tolerance ±0.5

Tolerance ±0.1

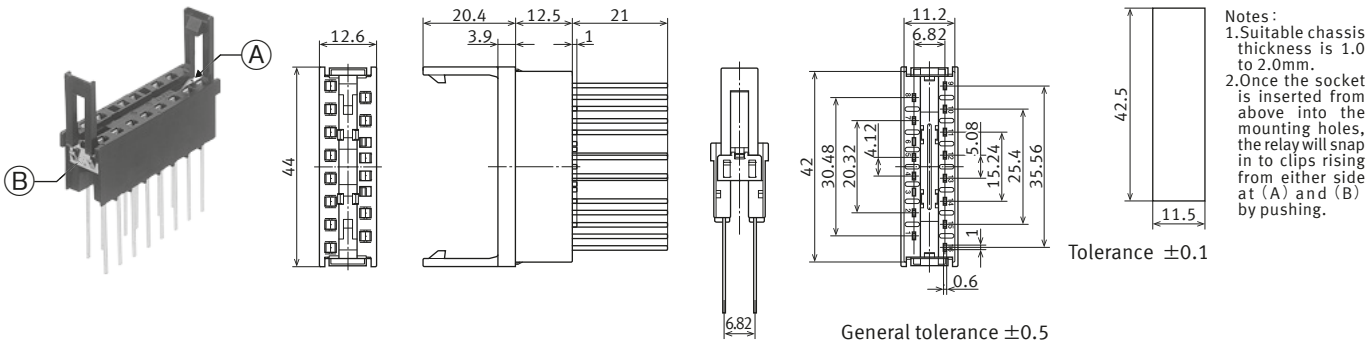
Notes :
1.Suitable chassis thickness is 1.0 to 2.0mm.
2.Once the socket is inserted from above into the mounting holes, the relay will snap in to clips rising from either side at (A) and (B) by pushing.

● NC4 ( AW4946 )

CAD

External dimensions

Chassis cutout




General tolerance ±0.5

Tolerance ±0.1

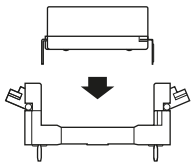
Notes :
1.Suitable chassis thickness is 1.0 to 2.0mm.
2.Once the socket is inserted from above into the mounting holes, the relay will snap in to clips rising from either side at (A) and (B) by pushing.

# HANDLING

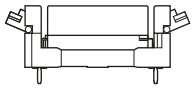
## ■ Flat type socket

### ● Mounting method of relay

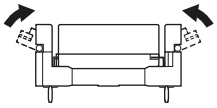
1) Match the direction of relay and socket.



2) Insert both ends of the relay firmly, all the way in.

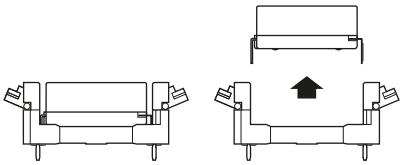


3) Press the hooks in the direction of the arrows to attach the relay securely.



### ● Removing method of relay

1) Pull out the relay after fully releasing both hooks.



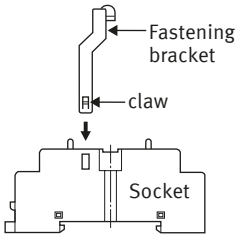
2) Take care not to push or spread the hooks more than necessary when installing or removing the relay, because doing so may cause deformation which will prevent the hooks from engaging with the relay, or the hooks may break.

## ■ Slim type DIN terminal socket

Install the fastening bracket before mounting the relay.

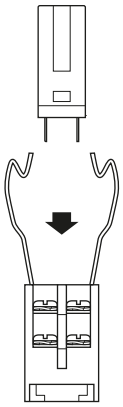
● Mounting method of fastening bracket

- Press the fastening bracket into the terminal socket until it stops and check that the claw has engaged with the terminal socket.

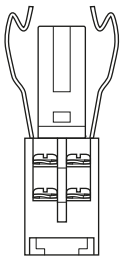



● Mounting method of relay

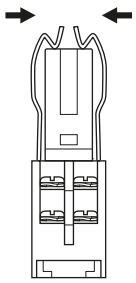
1) Match the direction of relay and terminal socket.



2) Insert both ends of the relay firmly, all the way in.

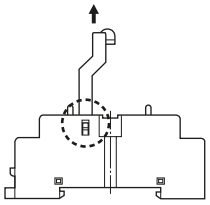


3) With the included fastening bracket, securely attach the relay.



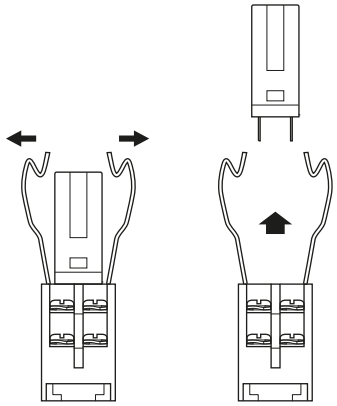
● Removing method of fastening bracket

- Pull out the fastening bracket while pressing the tab with a screwdriver or similar.



● Removing method of relay

1) Pull out the relay after fully releasing fastening bracket.

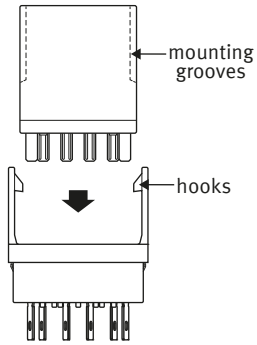


2) Take care not to push or spread the hooks more than necessary when installing or removing the relay, because doing so may cause deformation which will prevent the hooks from engaging with the relay, or the hooks may break.

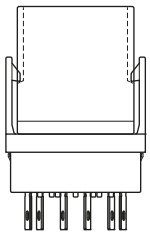
## ■ Slim type socket

● Mounting method of relay

1) Match the direction of relay and socket.

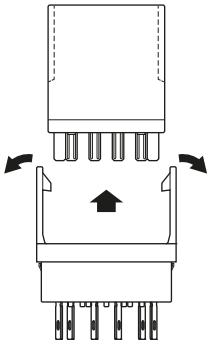



2) Insert both ends of the relay securely and all the way until both hooks engage with the mounting grooves.



● Removing method of relay

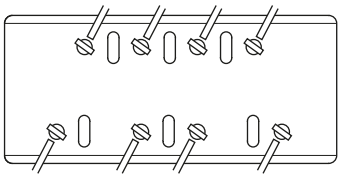
1) Pull out the relay while pressing and spreading the hooks.



2) Take care not to push or spread the hooks more than necessary when installing or removing the relay, because doing so may cause deformation which will prevent the hooks from engaging with the relay, or the hooks may break.

## GUIDELINES FOR USAGE

- For solder terminal types, connect terminals as shown in the diagram to maintain insulation distance.



■ 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

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 operate 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 ℃, 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 operate voltage and the operate 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.

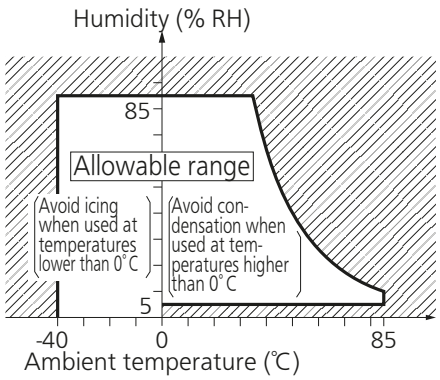
●Temperature/Humidity/Pressure

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 Industry Co., Ltd. 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 ℃.This icing causes the sticking of movable portion, the operation delay and the contact conduction failure etc. Panasonic Industry Co., Ltd. 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 relay 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 sealed 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 ℃ ). 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 ℃ 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/

■ Global Sales Network Information: industrial.panasonic.com/ac/e/salesnetwork

Panasonic
INDUSTRY

Panasonic Industry Co., Ltd.
Electromechanical Control Business Division
■1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8506, Japan
industrial.panasonic.com/ac/e/



Specifications are subject to change without notice.
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