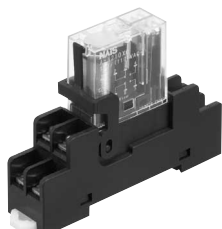


# NAIS

## SLIM AND COMPACT RELAY FOR WIDER APPLICATIONS

# HN-RELAYS



### FEATURES

- **Slim and compact size**  
20% more compact (width and height) than existing model\* (with the condition of screw terminal socket for DIN rail)  
\*Compared with our HJ relay.
- **High reliability and reasonable price**  
Uses gold-flashed contacts for highly reliable contact.
- **Environmentally friendly**  
In consideration of the environment, cadmium-free contacts are used. Also supports lead-free.  
(Both relays and screw terminal socket.)

- **Slim screw terminal socket**  
Utilizes relay-securing hook for easy relay removal.

### TYPICAL APPLICATIONS

**Control panels**  
**Machine tools**  
**Forming machines**  
**Commercial equipment**  
**Agricultural machines**  
**Vending machines**

### SPECIFICATIONS

#### Contacts

Contact arrangement		2 Form C
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		50mΩ
Contact material		Gold-flashed silver alloy
Rating (resistive load)	Nominal switching capacity	5A 250V AC, 5A 30V DC
	Max. switching power	1,250 VA, 150W
	Max. switching voltage	250V AC, 30V DC
	Max. switching current	5 A
	Min. switching current* <sup>9</sup>	1V 1 mA
Expected life (min. operations)	Mechanical (at 300 cpm)	AC: 10 <sup>7</sup> DC: 2×10 <sup>7</sup>
	Electrical (at 20 cpm) (resistive load)	10 <sup>5</sup>

#### Coil

Nominal operating power	0.53W 0.9VA
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#### Remarks

- \* Specifications will vary with foreign standards certification ratings.
- \*<sup>1</sup> Measurement at same location as "Initial breakdown voltage" section
- \*<sup>2</sup> Detection current: 10mA
- \*<sup>3</sup> Excluding contact bounce time
- \*<sup>4</sup> For the AC coil types, the operate/release time will differ depending on the phase.
- \*<sup>5</sup> Half-wave pulse of sine wave: 11ms; detection time: 10μs
- \*<sup>6</sup> Half-wave pulse of sine wave: 6ms
- \*<sup>7</sup> Detection time: 10μs
- \*<sup>8</sup> Refer to 4. Conditions for operation, transport and storage mentioned in NOTES
- \*<sup>9</sup> 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.

#### Characteristics

Max. operating speed		20 cpm (at max. rating)
Initial insulation resistance* <sup>1</sup>		Min. 1,000 MΩ at 500 V DC
Initial breakdown voltage* <sup>2</sup>	Between open contacts	1,000 Vrms for 1 min.
	Between contact sets	3,000 Vrms for 1 min.
	Between contact and coil	5,000 Vrms for 1 min.
Operate time* <sup>3</sup> (at nominal voltage)		Max. 15 ms* <sup>4</sup>
Release time (without diode)* <sup>3</sup> (at nominal voltage)		Max. 10 ms* <sup>4</sup>
Temperature rise, max. (at 70°C) (at nominal voltage)		60°C
Shock resistance	Functional* <sup>5</sup>	Min. 100 m/s <sup>2</sup> {10 G}
	Destructive* <sup>6</sup>	Min. 1,000 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional* <sup>7</sup>	10 to 55 Hz at double amplitude of 1.5 mm
	Destructive	10 to 55 Hz at double amplitude of 1.5 mm
Conditions for operation, transport and storage* <sup>8</sup> (Not freezing and condensing at low temperature)	Ambient temp.	−40°C to +70°C −40°F to +158°F
	Humidity	5 to 85% R.H.
Unit weight		Approx. 17g .60 oz

### ORDERING INFORMATION

Ex. AHN

Contact arrangement	Terminal arrangement	Type classification	Coil voltage
2: 2 Form C	1: AC plug-in type 2: DC plug-in type	0: Standard 1: With LED indication 2: With diode 3: With LED indication, diode	05: 5, 06: 6, 12: 12, 24: 24, 48: 48 V X0: 100/110 V AC, 100 V DC X1: 110/120 V AC, 110 V DC Y0: 200/220 V AC, Y2: 220/240 V AC

Note: Products conform to UL/C-UL and VDE, as standard (pending).

**HN RELAY**  
**ASCT1B263E '03.4**

**New**

HN(AHN2)

TYPES

1. Plug-in type

Coil voltage	2 Form C
	Part No.
5V DC	AHN22005
6V DC	AHN22006
12V DC	AHN22012
24V DC	AHN22024
48V DC	AHN22048
100V DC	AHN220X0
110V DC	AHN220X1
12V AC	AHN21012
24V AC	AHN21024
100/110V AC	AHN210X0
110/120V AC	AHN210X1
200/220V AC	AHN210Y0
220/240V AC	AHN210Y2

Note: Packing quantity; Inner carton: 50 pcs, Outer carton: 500 pcs.

2. Plug-in with LED indication type

Coil voltage	2 Form C
	Part No.
5V DC	AHN22105
6V DC	AHN22106
12V DC	AHN22112
24V DC	AHN22124
48V DC	AHN22148
100V DC	AHN221X0
110V DC	AHN221X1
12V AC	AHN21112
24V AC	AHN21124
100/110V AC	AHN211X0
110/120V AC	AHN211X1
200/220V AC	AHN211Y0
220/240V AC	AHN211Y2

Note: Packing quantity; Inner carton: 50 pcs, Outer carton: 500 pcs.

3. Plug-in with diode type

Coil voltage	2 Form C
	Part No.
5V DC	AHN22205
6V DC	AHN22206
12V DC	AHN22212
24V DC	AHN22224
48V DC	AHN22248
100V DC	AHN222X0
110V DC	AHN222X1

Note: Packing quantity; Inner carton: 50 pcs, Outer carton: 500 pcs.

4. Plug-in with diode and LED indication type

Coil voltage	2 Form C
	Part No.
5V DC	AHN22305
6V DC	AHN22306
12V DC	AHN22312
24V DC	AHN22324
48V DC	AHN22348
100V DC	AHN223X0
110V DC	AHN223X1

Note: Packing quantity; Inner carton: 50 pcs, Outer carton: 500 pcs.

5. Screw terminal socket

Type	No. of channels	Item	Part No.
For DIN rail assembly	2 channels	HN2 screw terminal socket	AHNA21

- Notes) 1. Packing quantity: 10pcs. (Inner carton), 100pcs. (Outer carton)  
2. Products conform to UL, C-UL, as standard.  
3. In order to prevent breakage and disfiguring, the screw tightening torque for the terminal socket should be within the range of 0.5 to 0.8 N·m.  
4. When attaching directly to a chassis, please use an M3 × 16 metric coarse screw thread.  
5. To prevent damage and deformity, please use the relay-securing hook at 10 N or less.

COIL DATA (at 20°C 68°F)

DC coils

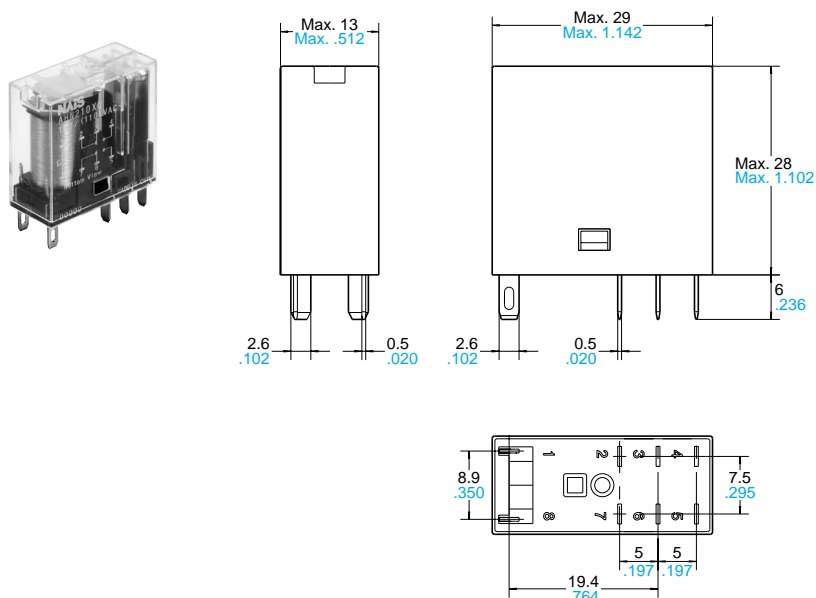
Coil voltage V DC	Pick-up voltage, V DC (max.) (Initial)	Drop-out voltage, V DC (min.) (Initial)	Nominal coil current, mA (±20%)	Coil resistance, Ω (±10%)	Nominal operating power, W	Max. allowable voltage, V DC
5	3.5	0.5	105.9	47	0.53	8.5
6	4.2	0.6	88.4	68		10.2
12	8.4	0.12	44.2	270		20.4
24	16.8	0.24	22.1	1,090		40.8
48	33.6	0.48	11	4,350		81.6
100	70	10	5.3	18,870		170
110	77	11	4.8	22,830		187

AC coils (50/60Hz)

Coil voltage V AC	Pick-up voltage, V AC (max.) (Initial)	Drop-out voltage, V AC (min.) (Initial)	Nominal coil current, mA (±20%)		Nominal operating power, VA		Max. allowable voltage, V AC
			50Hz	60Hz	50Hz	60Hz	
12	9.6	3.6	93	75	Approx. 1.1 to 1.4	Approx. 0.9 to 1.2	16.8
24	19.2	7.2	46.5	37.5			33.6
100/110	80/88	30/33	11.0/13.0	9.0/10.6			140/154
110/120	88/96	33/36	10.0/11.8	8.2/9.7			154/168
200/220	160/176	60/66	5.5/6.5	4.5/5.3			280/308
220/240	176/192	66/72	5.0/5.9	4.1/4.8			308/336

## DIMENSIONS

### 1. Plug-in type 2 Form C



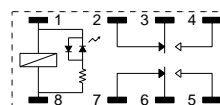
Dimension :	Tolerance
Max. 1mm .039 inch:	$\pm 0.1 \pm .004$
1 to 3mm .039 to .118 inch:	$\pm 0.2 \pm .008$
Min. 3mm .118 inch:	$\pm 0.3 \pm .012$

Schematic (Bottom view)

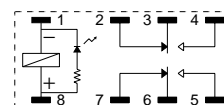
Standard type



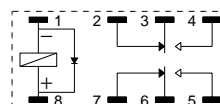
With LED AC type



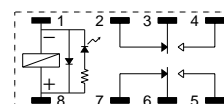
With LED DC type



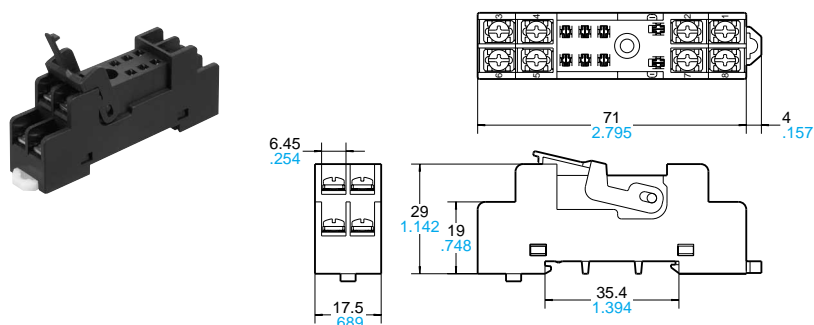
With Diode type



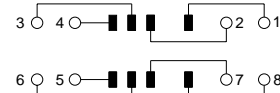
With Diode and LED type



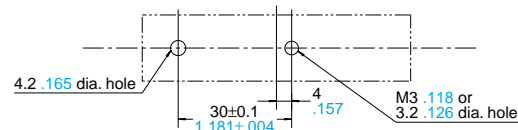
### 2. Screw terminal socket

General tolerance:  $\pm 0.5 \pm .020$ 

Schematic (Top view)

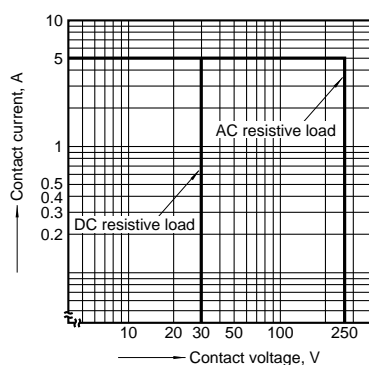


Mounting hole dimensions



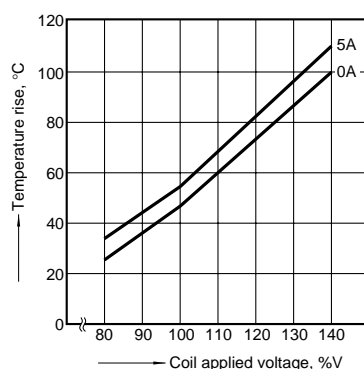
## REFERENCE DATA

### 1. Max. switching capacity



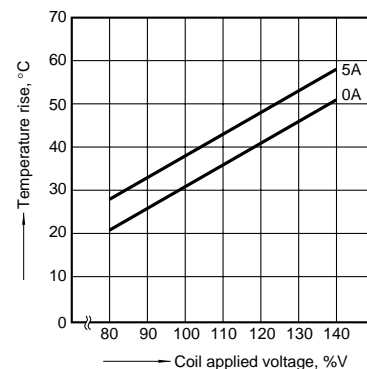
### 2-(1). Coil temperature rise (AC type)

Measured portion: Inside the coil  
Ambient temperature: 23°C 73°F



### 2-(2). Coil temperature rise (DC type)

Measured portion: Inside the coil  
Ambient temperature: 30°C 86°F



## NOTES

### 1. Coil operating power

To ensure proper operation, the voltage applied to both terminals of the coil should be  $\pm 5\%$  (at 20°C 68°F) the rated operating voltage of the coil. Also, be aware that the pick-up and drop-out voltages will fluctuate depending on the ambient temperature and operating conditions.

### 2. LED indications

The light of the light emitting diode is what displays operation. If voltage remains after relay dropout, the LED might illuminate briefly.

### 3. Switching lifetime

The switching lifetime is defined under the standard test condition specified in the JIS\* C 5442-1996 standard (temperature 15 to 35°C 59 to 95°F, humidity 25 to 75%). Check this with the real device as it is affected by coil driving circuit, load type, activation frequency, activation phase, ambient conditions and other factors.

Also, be especially careful of loads such as those listed below.

(1) When used for AC load-operating and the operating phase is synchronous. Rocking and fusing can easily occur due to contact shifting.

(2) High-frequency load-operating  
When high-frequency opening and closing of the relay is performed with a load that causes arcs at the contacts, nitrogen and oxygen in the air is fused by the arc energy and  $\text{HNO}_3$  is formed. This can corrode metal materials. Three countermeasures for these are listed here.

1. Incorporate an arc-extinguishing circuit.
2. Lower the operating frequency
3. Lower the ambient humidity

### 4. Conditions for operation, transport and storage

1) Ambient temperature, humidity, and atmospheric pressure during usage, transport, and storage of the relay:

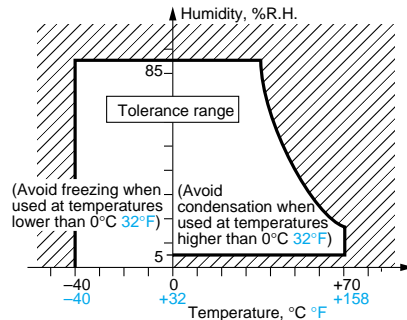
(1) Temperature:

–40 to +70°C –40 to +158°F

(2) Humidity: 5 to 85% RH

(Avoid freezing and condensation.)

The humidity range varies with the temperature. Use within the range indicated in the graph below.



(3) Atmospheric pressure: 86 to 106 kPa

Temperature and humidity range for usage, transport, and storage:

2) Condensation

Condensation forms when there is a sudden change in temperature under high temperature and high humidity conditions. Condensation will cause deterioration of the relay insulation.

3) Freezing

Condensation or other moisture may freeze on the relay when the temperatures is lower than 0°C 32°F.

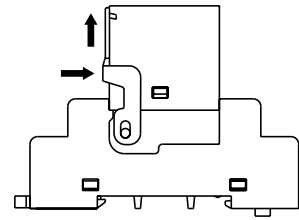
This causes problems such as sticking of movable parts or operational time lags.

4) Low temperature, low humidity environments

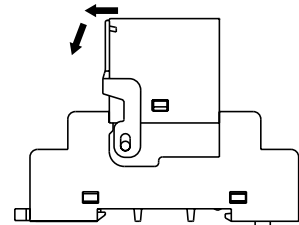
The plastic becomes brittle if the relay is exposed to a low temperature, low humidity environment for long periods of time.

### 5. About the relay-securing hook

1) Installation of the securing hook is easily performed by pressing upward in the direction of the arrows.



2) Removal of the securing hook is easily performed by releasing the hook and pressing down, as shown in the figure.



### 6. Diode characteristics

1) Reverse breakdown voltage:

90V (5 to 48V DC type)

250V (100, 110V DC type)

### 7. Diode type

Since the diode inside the relay coil are designed to absorb the counter emf, the element may be damaged if a large surge, etc., is applied to the diode.

If there is the possibility of a large surge voltage from the outside, please implement measures to absorb it.

These materials are printed on ECF pulp.

These materials are printed with earth-friendly vegetable-based (soybean oil) ink.



Please contact .....

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