



RoHS Directive compatibility information  
<http://www.nais-e.com/>

### FEATURES

- **Compact and high-capacity**  
1 Form C: 15A, 2 Form C: 10A high capacity controlled
- **Wide line-up**  
With LED indication type, built-in diode and CR for surge suppression type available
- **Cadmium-free contacts**
- **Conforms to the various safety standards**  
UL/C-UL, TÜV, approved

### TYPICAL APPLICATIONS

- Control panels
- Power supply units
- Molding machines
- Machine tools
- Welding equipment
- Agricultural equipment
- Office equipment
- Vending machines
- Communications equipment
- Amusement machines

## SPECIFICATIONS

### Contacts

Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		50mΩ
Contact material		AgSnO <sub>2</sub> type
Rating (resistive load)	Nominal switching capacity	1 Form C: 15A 125V AC 2 Form C: 10A 125V AC
	Min. switching capacity (Reference value) <sup>#1</sup>	100 mA, 5 V DC
Expected life (min. operations)	Mechanical (at 180 cpm)	AC type: 5×10 <sup>7</sup> DC type: 10 <sup>8</sup>
	Electrical (resistive load) (AC load)	1 Form C: 15A 125V AC (cosφ=1), 2×10 <sup>5</sup> 2 Form C: 10A 125V AC (cosφ=1), 5×10 <sup>5</sup>

#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.

### Remarks

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

### Characteristics

Max. operating speed		20 cpm (at max. rating)
Initial insulation resistance <sup>*1</sup>		Min. 100 MΩ at 500 V DC
Initial breakdown voltage <sup>*2</sup>	Between open contacts	1,000 Vrms for 1 min.
	Between contact sets	2,000 Vrms for 1 min.
	Between contact and coil	2,000 Vrms for 1 min.
Operate time <sup>*3</sup> (at 20°C) (at nominal voltage)		Max. 25 ms <sup>*4</sup>
Release time (without diode) <sup>*3</sup> (at 20°C)(at nominal voltage)		Max. 25 ms <sup>*4</sup>
Temperature rise, max. (at nominal voltage, nominal rating)		80°C
Shock resistance	Functional <sup>*5</sup>	Min. 196 m/s <sup>2</sup> {20 G}
	Destructive <sup>*6</sup>	Min. 980 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional <sup>*7</sup>	10 to 55 Hz at double amplitude of 1.0 mm
	Destructive	10 to 55 Hz at double amplitude of 2.0 mm
Conditions for operation, transport and storage <sup>*8</sup> (Not freezing and condensing at low temperature)	Ambient temp.	Without LED indication: -50°C to +70°C -58°F to +158°F With LED indication: -50°C to +60°C -58°F to +140°F
	Humidity	5 to 85% R.H.
Unit weight		Approx. 35g 1.23 oz

## ORDERING INFORMATION

Ex. AHK

Contact arrangement	Terminal arrangement	Type classification		Coil voltage
1: 1 Form C 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 4: With CR circuit 5: With LED indication, CR circuit	06: 6, 12: 12, 24: 24, 48: 48 V X0: 100/110 V AC, 100/110 V DC X1: 110/120 V AC Y0: 200/220 V AC, Y2: 220/240 V AC

Note: Products conform to UL/C-UL and TÜV, as standard.

# HK (AHK)

## TYPES

### 1. Plug-in type

Coil voltage	1 Form C	2 Form C
	Part No.	Part No.
6V DC	AHK12006	AHK22006
12V DC	AHK12012	AHK22012
24V DC	AHK12024	AHK22024
48V DC	AHK12048	AHK22048
100/110V DC	AHK120X0	AHK220X0
12V AC	AHK11012	AHK21012
24V AC	AHK11024	AHK21024
48V AC	AHK11048	AHK21048
100/110V AC	AHK110X0	AHK210X0
110/120V AC	AHK110X1	AHK210X1
200/220V AC	AHK110Y0	AHK210Y0
220/240V AC	AHK110Y2	AHK210Y2

### 2. Plug-in type (with LED indication)

Coil voltage	1 Form C	2 Form C
	Part No.	Part No.
6V DC	AHK12106	AHK22106
12V DC	AHK12112	AHK22112
24V DC	AHK12124	AHK22124
48V DC	AHK12148	AHK22148
100/110V DC	AHK121X0	AHK221X0
12V AC	AHK11112	AHK21112
24V AC	AHK11124	AHK21124
48V AC	AHK11148	AHK21148
100/110V AC	AHK111X0	AHK211X0
110/120V AC	AHK111X1	AHK211X1
200/220V AC	AHK111Y0	AHK211Y0
220/240V AC	AHK111Y2	AHK211Y2

### 3. Plug-in type (with diode)

Coil voltage	1 Form C	2 Form C
	Part No.	Part No.
6V DC	AHK12206	AHK22206
12V DC	AHK12212	AHK22212
24V DC	AHK12224	AHK22224
48V DC	AHK12248	AHK22248
100/110V DC	AHK122X0	AHK222X0

### 4. Plug-in type (with diode and LED indication)

Coil voltage	1 Form C	2 Form C
	Part No.	Part No.
6V DC	AHK12306	AHK22306
12V DC	AHK12312	AHK22312
24V DC	AHK12324	AHK22324
48V DC	AHK12348	AHK22348
100/110V DC	AHK123X0	AHK223X0

### 5. Plug-in type (with CR)

Coil voltage	1 Form C	2 Form C
	Part No.	Part No.
100/110V AC	AHK114X0	AHK214X0
110/120V AC	AHK114X1	AHK214X1
200/220V AC	AHK114Y0	AHK214Y0
220/240V AC	AHK114Y2	AHK214Y2

### 6. Plug-in type (with CR and LED indication)

Coil voltage	1 Form C	2 Form C
	Part No.	Part No.
100/110V AC	AHK115X0	AHK215X0
110/120V AC	AHK115X1	AHK215X1
200/220V AC	AHK115Y0	AHK215Y0
220/240V AC	AHK115Y2	AHK215Y2

Note) Packing quantity: 20pcs. (Inner carton), 200pcs. (Outer carton)

### 7. Accessories

Type	No. of channels	Item	Part No.
Terminal socket	1/2 channels (common)	HK screw terminal socket	AHKA21
		HK screw terminal socket (Finger protect type)	AHKA21P

Notes) 1. Packing quantity: 10pcs. (Inner carton), 100pcs. (Outer carton)

2. Use the retainer that is shipped with the terminal socket.

3. Products conform to UL, C-UL and TÜV, as standard.

4. In order to prevent breakage and disfiguring, the screw tightening torque for the terminal socket should be within the range of 0.784 to 0.98 N·m.

5. When attaching directly to a chassis, please use an M4 × 12 metric coarse screw thread, a spring washer, and a hexagonal nut.

## COIL DATA

### AC coils

Coil voltage, V AC	Nominal coil current, mA		Nominal operating power, V A		Pick-up voltage, V AC (max.) (at 20°C 68°F) (Initial)	Drop-out voltage, V AC (min.) (at 20°C 68°F) (Initial)	Inductance, H		Max. allowable voltage, V AC
	50Hz	60Hz	50Hz	60Hz			When drop-out	When operating	
12	111	100	1.3	1.2	9.6	3.6	0.312	0.295	13.2
24	56	50	1.3	1.2	19.2	7.2	1.243	1.181	26.4
48	28	25	1.3	1.2	38.4	14.4	4.974	4.145	52.8
100/110	13.4/14.7	12/13.2	1.3	1.2	80	33	23.75	20.63	121
110/120	12.2/13.5	10.9/11.9	1.3	1.2	88	36	27.19	25.57	132
200/220	6.7/7.4	6/6.6	1.3	1.2	160	66	85.98	81.76	242

- Notes) 1. The relay operates in a range of 80% to 110 % V of the voltage rating, but ideally, in consideration of temporary voltage fluctuations, it should be operated at the rated voltage. In particular, for AC operation, if the impressed voltage drops to 80% V or more below the rated voltage, humming will occur and a large current will flow leading possibly to coil burnout.
2. The maximum allowable voltage is the maximum voltage fluctuation value for the coil power supply. This value is not a permissible value for continuous operation. (This value differs depending on the ambient temperature. Please contact us for details.)

### DC coils (at 20°C 68°F)

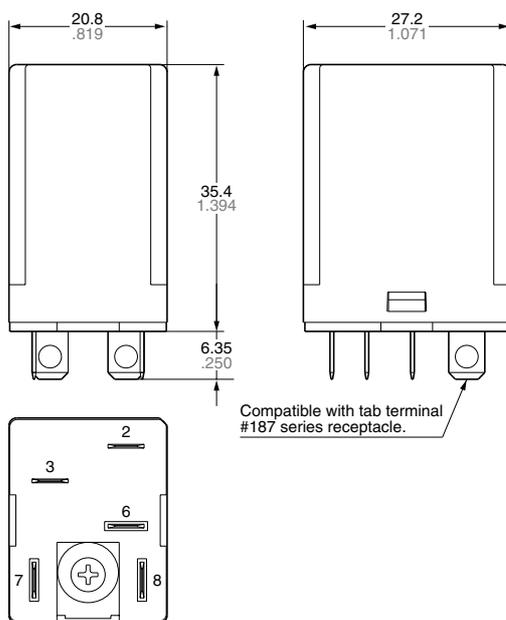
Coil voltage, V DC	Nominal coil current, mA	Nominal operating power, W	Coil resistance, Ω	Pick-up voltage, V DC (max.) (at 20°C 68°F) (Initial)	Drop-out voltage, V DC (min.) (at 20°C 68°F) (Initial)	Max. allowable voltage, V DC (at 70°C 158°F)
6	150	0.9	40	4.8	0.6	6.6
12	75	0.9	160	9.6	1.2	13.2
24	37	0.9	650	19.2	2.4	26.4
48	18.5	0.9	2,600	38.4	4.8	52.8
100/110	10/11	1.0	10,000	80	11	121

- Notes) 1. The rated excitation current is  $\pm 10\%$  (20°C 68°F).
2. The coil resistance for DC operation is the value measured when the coil temperature is 20°C 68°F. Compensate  $\pm 0.4\%$  for every  $\pm 1^\circ\text{C}$  change in temperature.
3. The relay operates in a range of 80% to 110 % V of the voltage rating, but ideally, in consideration of temporary voltage fluctuations, it should be operated at the rated voltage.
4. For use with 200 V DC, connect a 10 KΩ (5W) resistor, in series, to the 100 V DC relay.
5. The maximum allowable impress voltage is the maximum voltage fluctuation value for the coil power supply. This value is not a permissible value for continuous operation. (This value differs depending on the ambient temperature. Please contact us for details.)

## DIMENSIONS

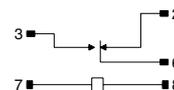
mm inch

### 1. Plug-in type 1 Form C (including diode/CR)

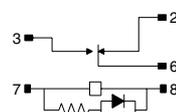


General tolerance:  $\pm 0.3 \pm .012$

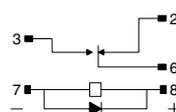
Schematic (Bottom view)  
Standard type



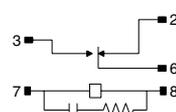
LED AC type



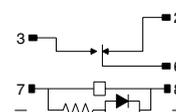
Diode DC type



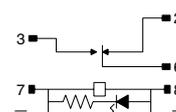
CR AC type



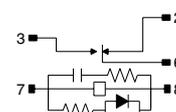
LED DC type



Diode/LED DC type



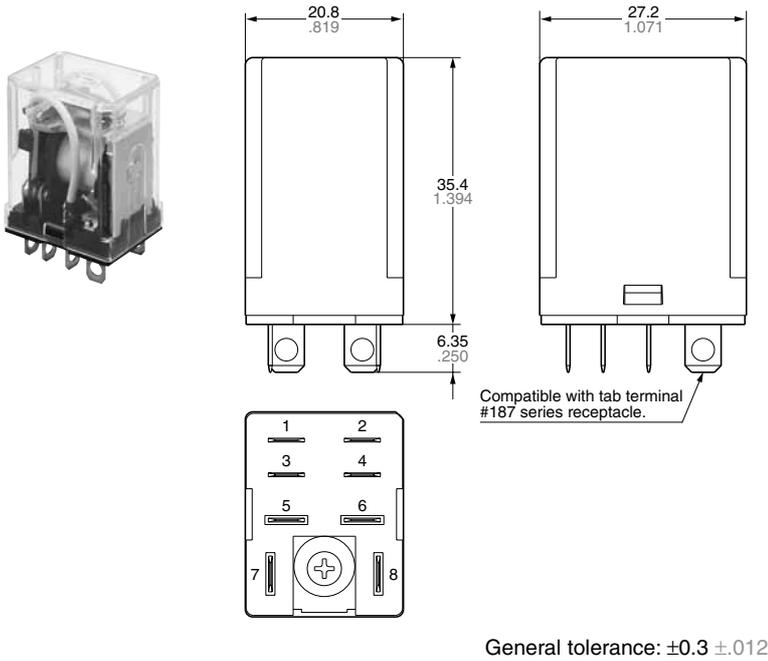
CR/LED AC type



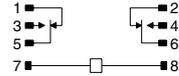
# HK (AHK)

## 2. Plug-in type 2 Form C (including diode/CR)

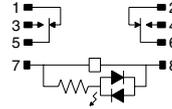
mm inch



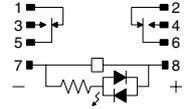
Schematic (Bottom view)  
Standard type



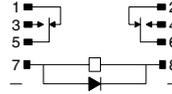
LED AC type



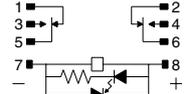
LED DC type



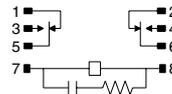
Diode DC type



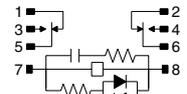
Diode/LED DC type



CR AC type



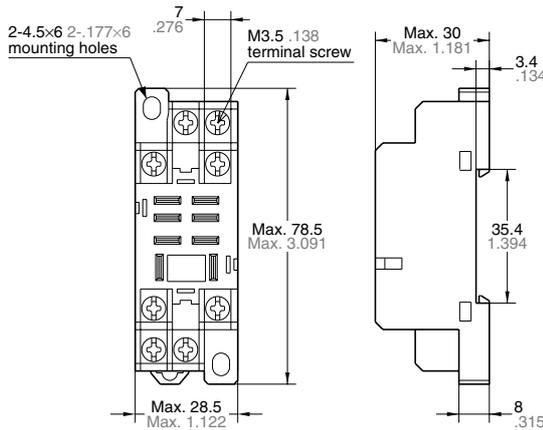
CR/LED AC type



General tolerance:  $\pm 0.3 \pm 0.12$

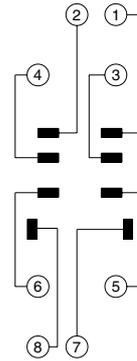
## 3. Screw terminal socket

### HK screw terminal socket

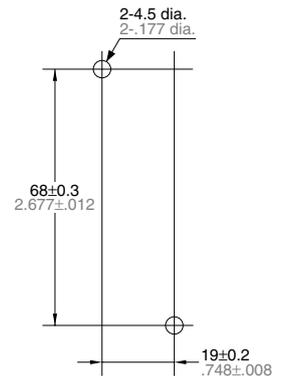


General tolerance:  $\pm 0.5 \pm 0.020$

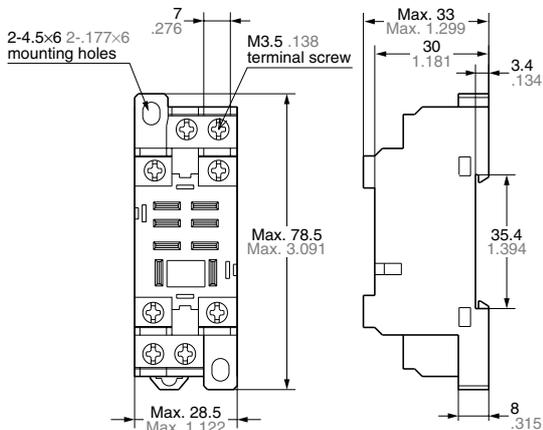
Schematic (Bottom view)



Mounting hole dimensions

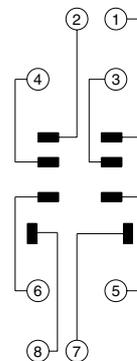


### HK screw terminal socket (Finger protect type)

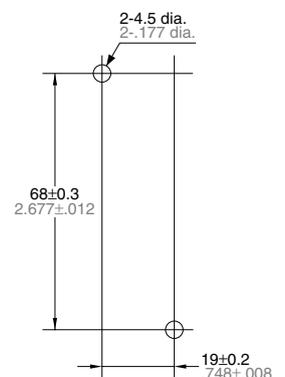


General tolerance:  $\pm 0.5 \pm 0.020$

Schematic (Bottom view)



Mounting hole dimensions

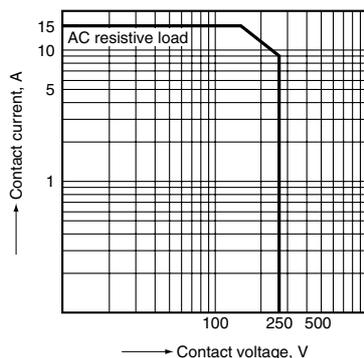


Note) Round type terminal is unable to attach.

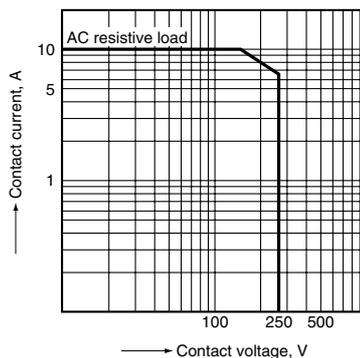
Plug-in type socket and PC board type socket are also available by request. Please consult us for details.

## REFERENCE DATA

1-(1). Max. switching capacity (1 Form C type)

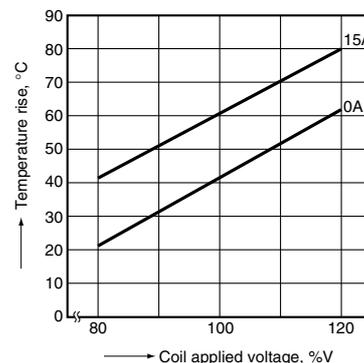


1-(2). Max. switching capacity (2 Form C type)



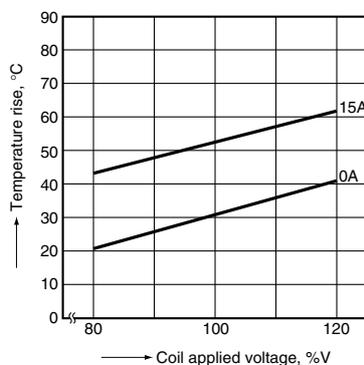
2-(1). Coil temperature rise (1 Form C/AC type)

Measured portion: Inside the coil  
Ambient temperature: 70°C 158°F



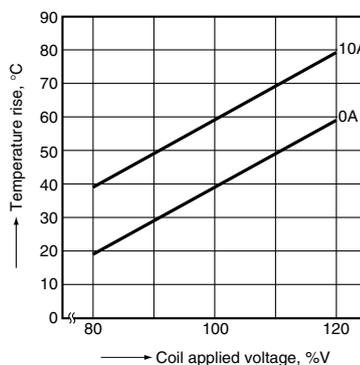
2-(2). Coil temperature rise (1 Form C/DC type)

Measured portion: Inside the coil  
Ambient temperature: 70°C 158°F



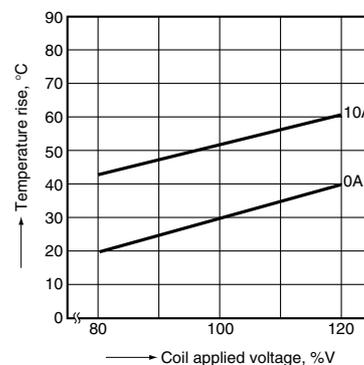
2-(3). Coil temperature rise (2 Form C/AC type)

Measured portion: Inside the coil  
Ambient temperature: 70°C 158°F

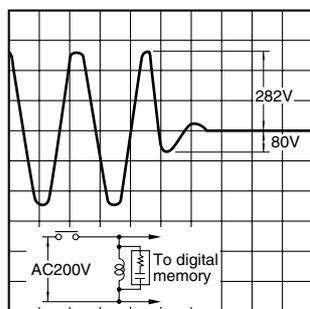


2-(4). Coil temperature rise (2 Form C/DC type)

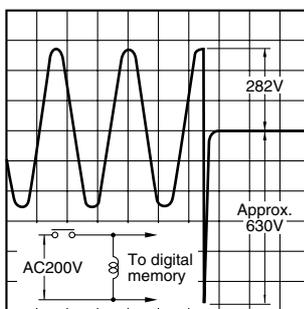
Measured portion: Inside the coil  
Ambient temperature: 70°C 158°F



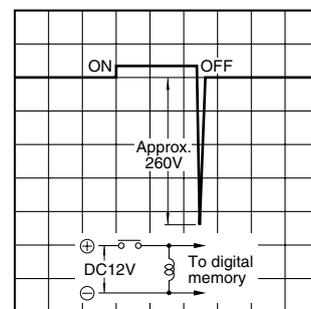
3-(1). AC coil surge voltage waveform (With CR)



3-(2). AC coil surge voltage waveform (Without CR)

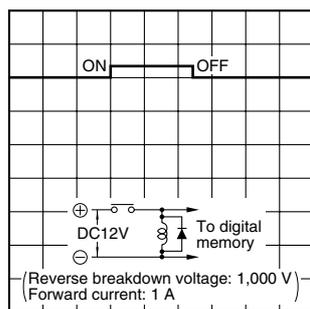


4-(1). DC coil surge voltage waveform (Without diode)



4-(2). DC coil surge voltage waveform (With diode)

Diode characteristics:  
Reverse breakdown voltage: 1,000 V  
Forward current: 1 A



## NOTES

### 1. Diode characteristics

- Reverse breakdown voltage: 1,000 V
- Forward current: 1 A

### 2. Diode and CR built-in type

Since the diode and CR 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 and CR.

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

**For Cautions for Use, see Relay Technical Information**