Panasonic

Automation Controls Catalog





FEATURES

1. Slim and compact size 20% smaller (width and height) than existing model* (with the condition of screw terminal socket for DIN rail) *Compared with our HC/HJ relay.

2. High-capacity

Max. switching current: 16 A (for 1 Form C type at AC load) 3. Slim screw terminal sockets and PC board terminal sockets are available

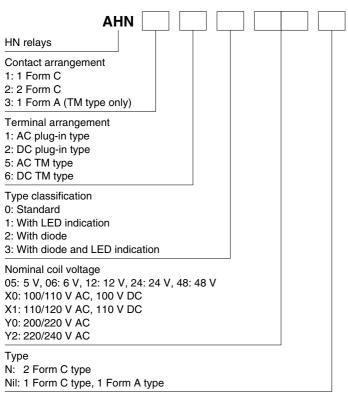
TYPICAL APPLICATIONS

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



RoHS compliant

ORDERING INFORMATION



Notes: 1. Certified by UL/C-UL and VDE (Please consult us for VDE approved TM type.)

2. The LED indication color is green.

TYPES 1. Plug-in type

Naminal anil valtara	1 Form C	2 Form C
Nominal coil voltage	Part No.	Part No.
5V DC	AHN12005	AHN22005N
6V DC	AHN12006	AHN22006N
12V DC	AHN12012	AHN22012N
24V DC	AHN12024	AHN22024N
48V DC	AHN12048	AHN22048N
100V DC	AHN120X0	AHN220X0N
110V DC	AHN120X1	AHN220X1N
12V AC	AHN11012	AHN21012N
24V AC	AHN11024	AHN21024N
100/110V AC	AHN110X0	AHN210X0N
110/120V AC	AHN110X1	AHN210X1N
200/220V AC	AHN110Y0	AHN210Y0N
220/240V AC	AHN110Y2	AHN210Y2N

2. Plug-in type (with LED indication)

1 Form C	2 Form C
Part No.	Part No.
AHN12105	AHN22105N
AHN12106	AHN22106N
AHN12112	AHN22112N
AHN12124	AHN22124N
AHN12148	AHN22148N
AHN121X0	AHN221X0N
AHN121X1	AHN221X1N
AHN11112	AHN21112N
AHN11124	AHN21124N
AHN111X0	AHN211X0N
AHN111X1	AHN211X1N
AHN111Y0	AHN211Y0N
AHN111Y2	AHN211Y2N
	Part No. AHN12105 AHN12106 AHN12112 AHN12124 AHN12148 AHN121X0 AHN121X1 AHN11112 AHN11112 AHN11112 AHN11112 AHN11112 AHN11112 AHN11124 AHN11124 AHN11124 AHN11124 AHN11120 AHN11120 AHN11120

Standard packing: Carton: 50 pcs.; Case: 500 pcs.

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

	1 Form C	2 Form C
Nominal coil voltage	Part No.	Part No.
5V DC	AHN12205	AHN22205N
6V DC	AHN12206	AHN22206N
12V DC	AHN12212	AHN22212N
24V DC	AHN12224	AHN22224N
48V DC	AHN12248	AHN22248N
100V DC	AHN122X0	AHN222X0N
110V DC	AHN122X1	AHN222X1N

Naminal asil valtage	1 Form C	2 Form C		
Nominal coil voltage	Part No.	Part No.		
5V DC	AHN12305	AHN22305N		
6V DC	AHN12306	AHN22306N		
12V DC	AHN12312	AHN22312N		
24V DC	AHN12324	AHN22324N		
48V DC	AHN12348	AHN22348N		
100V DC	AHN123X0	AHN223X0N		
110V DC	AHN123X1	AHN223X1N		
		•		

Standard packing: Carton: 50 pcs.; Case: 500 pcs.

5. TM type

1 Form A			
Part No.			
AHN36005			
AHN36006			
AHN36012			
AHN36024			
AHN36048 AHN360X0 AHN360X1			
			AHN35012
			AHN35024
AHN350X0			
AHN350X1			
AHN350Y0			
AHN350Y2			

Standard packing: Carton: 50 pcs.; Case: 500 pcs.

RATING

1. Coil data 1) DC coils

Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal coil current [±20%]	Coil resistance (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)	
5V DC			106.4mA	47Ω [±10%]			
6V DC			88.2mA	68Ω [±10%]	1		
12V DC	70%V or less of	15%V or more of	44.4mA	270Ω [±10%]]	1700/14	
24V DC	nominal voltage (Initial)	oltage nominal voltage	nominal voltage	22.0mA	1,090Ω [±10%]	0.53W	170%V of nominal voltage
48V DC			11.0mA	4,350Ω [±10%]]	nominal voltage	
100V DC			5.3mA	18,870Ω [±10%]]		
110V DC			4.8mA	22,830Ω [±10%]]		

2) AC coils (50/60Hz)

Nominal coil	Pick-up voltage	p voltage Drop-out voltage Nominal coil current [±20%] No		Nominal ope	erating power	Max. applied voltage		
voltage	(at 20°C 68°F)	(at 20°C 68°F)	50Hz	60Hz	50Hz	60Hz	(at 20°C 68°F)	
12V AC			93mA	75mA				
24V AC			46.5mA	37.5mA				
100/110V AC	80%V or less of	30%V or more of	11.0/13.0mA	9.0/10.6mA	Approx. 1.1 to 1.4 V A	Approx. 0.9 to 1.2 V A	140%V of	
110/120V AC	nominal voltage (Initial)	nominal voltage (Initial)	10.0/11.8mA	8.2/9.7mA			0.9 to 1.2 V A	nominal voltage
200/220V AC	(Initial)	(1111121)	5.5/6.5mA	4.5/5.3mA				
220/240V AC			5.0/5.9mA	4.1/4.8mA				

2. Specifications (Plug-in Standard type and TM type)

Characteristics		Item	Specifications				
	Arrangement		1 Form C	2 Form C	1 Form A (TM type)		
Contact	Contact resistance (Initial)		Max. 100 m Ω (By voltage drop 6 V DC 1A)	Max. 50 m Ω (By voltage drop 6 V DC 1A)	Max. 100 m Ω (By voltage drop 6 V DC 1A)		
	Contact material		AgSnO ₂ type	AgNi type	AgSnO ₂ type		
	Nominal switching ca	apacity (resistive load)	10A 250V AC, 10A 30V DC	5A 250V AC, 5A 30V DC	16A 250V AC, 16A 30V DC		
	Max. switching powe	r (resistive load)	4,000VA, 300W	1,250VA, 150W	4,000VA, 480W		
	Max. switching voltage	je	250V AC, 30V DC				
Rating	Max. switching curre	nt	16A (at AC load), 10A (at DC load)	5A	16A		
	Nominal operating p	ower	0.53W, 0.9VA	•			
	Min. switching capac	ity (Reference value)*1	100mA 5V DC	10mA 5V DC	100mA 5V DC		
	Insulation resistance	(Initial)	Min. 1,000MΩ (at 500V DC) Me	asurement at same location as "	Breakdown voltage" section.		
		Between open contacts	1,000 Vrms for 1min. (Detection current: 10mA.)				
	Breakdown voltage (Initial)	Between contact sets	-	3,000 Vrms for 1min. (Detection current: 10mA.)	_		
Electrical characteristics		Between contact and coil	5,000 Vrms for 1min. (Detection current: 10mA.)				
Characteristics	Temperature rise (co	il) (at 70°C 158°F)	Max. 60°C 140°F (By resistive r	nethod, nominal coil voltage)			
	Operate time (at 20°	C 68°F)*2	Max. 15ms (Nominal coil voltage	e applied to the coil, excluding co	ontact bounce time.)		
Release time (at 20°		C 68°F)*2	Max. 5ms (Nominal coil voltage applied to the coil, excluding contact bounce time.) (without diode)/Max. 20ms (with diode)				
	Shock resistance	Functional	Min. 100 m/s ² (Half-wave pulse of sine wave: 11 ms; detection time: 10µs.)				
Mechanical	SHOCK TESISLATICE	Destructive	Min. 1,000 m/s ² (Half-wave pulse of sine wave: 6 ms.)				
characteristics	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 1.5 mm (Detection time: 10µs.)				
	VIDIALIOITTESISLATICE	Destructive	10 to 55 Hz at double amplitude	e of 1.5 mm			
Exported life	Expected life Mechanical Electrical (at nominal switching capacity)		AC: Min. 107; DC: Min. 2×107 (at	300 times/min.)			
Expected life			Min. 10 ⁵ (at 20 times/min.) Min. 10 ⁵ (at 10 times/min.)				
Conditions	Conditions for operation, transport and storage*3 (Not freezing and condensing at low temperature)		Ambient temperature: -40°C to +70°C -40°F to +158°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)				
Conditions	Max. Operating spee	d	20 times/min. (at nominal switch	10 times/min. (at nominal switching capacity)			
Unit weight			Approx. 19 g .67 oz	Approx. 17 g .60 oz	Approx. 19 g .67 oz		

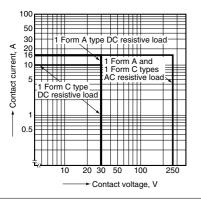
Notes: *1. This value can change due to the switching frequency, environmental conditions and desired reliability level, therefore it is recommended to check this with the

*2. For the AC coil types, the operate/release time will differ depending on the phase.
*3. 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.

-3-

REFERENCE DATA

1-(1). Max. switching capacity (1 Form C and 1 Form A)



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

1 Form A/DC types)

60

50

40

30

20

10

0

80 90

ő

Femperature rise

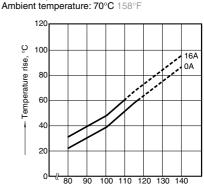
Measured portion: Inside the coil Ambient temperature: 70°C 158°F

10 F Contact current, A 0.5 0.4 0.3 0.2 ЪĊ 20 30 50 100 Contact voltage, V

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

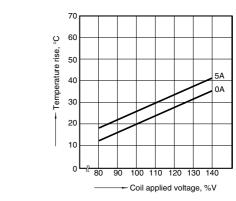
2-(3). Coil temperature rise (2 Form C/AC type) Measured portion: Inside the coil Ambient temperature: 70°C 158°F

2-(1). Coil temperature rise (1 Form C/AC and 1 Form A/AC types) Measured portion: Inside the coil



Coil applied voltage, %V

2-(4). Coil temperature rise (2 Form C/DC type) Measured portion: Inside the coil Ambient temperature: 70°C 158°F



Schematic (Bottom view)

Standard type

3

5

DIMENSIONS (mm inch) 1. Plug-in type 1 Form C

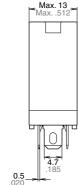
100 110 120

- Coil applied voltage, %V

130 140

CAD Data





External dimensions

120

80

60

40

20

0

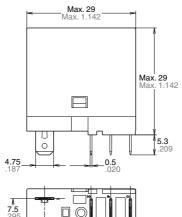
80 90 100 110

ů 100

Temperature rise,

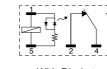
16/

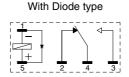
0A



5.2 5.2 17.5

5 With LED AC type







3

With LED DC type

2 4

With Diode and LED type

3

3

Less than 1mm .039inch: Min. 1mm .039inch less than 3mm .118 inch: ±0.2 ±.008 Min. 3mm .118 inch:

±0.1 ±.004

±0.3 ±.012

5A

0A

120 130

- Coil applied voltage, %V

140

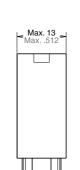
The CAD data of the products with a CAD Data mark can be downloaded from: http://industrial.panasonic.com/ac/e/

-4-

Dimension:

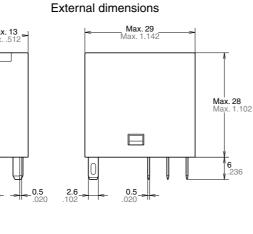
2. Plug-in type 2 Form C CAD Data

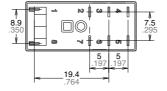




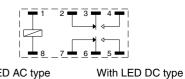
4.75

2.6

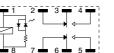




Schematic (Bottom view) Standard type



With LED AC type



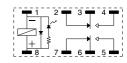
4

With Diode type

2 3 7 5

3 4

With Diode and LED type

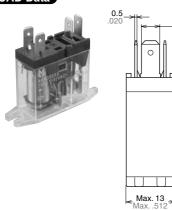


Tolerance

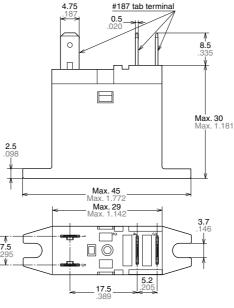
Dimension:

Less than 1mm .039inch: ±0.1 ±.004 Min. 1mm .039inch less than 3mm .118 inch: ±0.2 ±.008 Min. 3mm .118 inch: **±0.3** ±.012

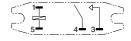
3. TM type 1 Form A CAD Data



External dimensions



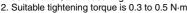
Schematic



Mounting hole dimensions



Notes: 1. When mounting the TM type, since the cover is made from polycarbonate, please use a washer in order to prevent damage, deformation, and loosening.2. Suitable tightening torque is 0.3 to 0.5 N·m.



Dimension:	Tolerance
Less than 1mm .039inch:	±0.1 ±.004
Min. 1mm .039inch less than 3mm .118 inch:	$\pm 0.2 \pm .008$
Min. 3mm .118 inch:	$\pm 0.3 \pm .012$

SAFETY STANDARDS

	File No.	Certification authority: UL/C-UL	File No.	Certification authority: VDE
1 Form C	E43149*	10A 277V AC, 10A 30V DC, TV-5	40012003	10A 250V AC (cos \$\phi=1.0\$), 10A 30V DC (0ms)
2 Form C	E43149*	5A 277V AC, 5A 30V DC, TV-3	40012003	5A 250V AC (cos <i>q</i> =1.0), 5A 30V DC (0ms)
1 Form A (TM type)	E43149*	16A 277V AC, 16A 30V DC	_	**

CSA standard: Certified by C-UL

** Please consult us.

-5-

NOTES

1. For cautions for use, please read "General Application Guidelines" on page B-1.

2. Coil applied voltage

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 dropout voltages will fluctuate depending on the ambient temperature and operating conditions.

3. LED indications

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

4. Switching lifetime

The switching lifetime is defined under the standard test condition specified in the JIS C 5442(*2) standard (temperature 15 to 35° C 59 to 95° F, humidity 25 to 75% R.H.). 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 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

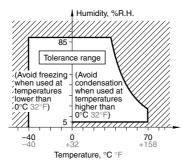
5. Direct mount type (TM type)

If the current to the connection terminal will exceed 10 A, we recommend connecting with solder. If you are going to use a tab terminal when the current will exceed 10 A, make sure to verify the temperature rise on the receptacle side under actual conditions before using. Please be careful, because excessive stress on the TM terminal can cause fluctuations in characteristics and damage.

6. Conditions for operation, transport and storage

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

-40 to $+70^{\circ}$ C -40 to $+158^{\circ}$ 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. Temperature and humidity range for usage, transport, and storage



(3) Atmospheric pressure: 86 to 106 kPa2) 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.

7. Diode characteristics

1) Reverse breakdown voltage: Min. 1,000V (with diode type) Min. 400V (with diode and LED indication type)

8. 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. 9. Please connect DC coil types with LED and built-in diode correctly by verifying the coil polarity ("+" and "-"). Connecting with reverse polarity will cause the LED not to light and damage the built-in diode due to its specification.

10. Installation

If you will be installing adjacent to other relays, please keep a distance of at least 5 mm from the relay.

Please contact

Panasonic Corporation Electromechanical Control Business Division

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