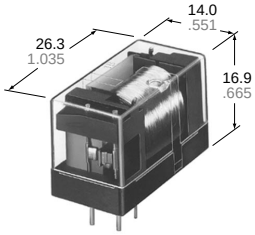
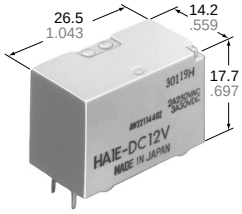
NAiS

COST SAVING SUBMINIATURE PC BOARD RELAYS

HA-RELAYS





HAE Amber Relays

mm inch

FEATURES

- **Compact construction**
- **Sensitive - very low operating power**
- **Soldering flux inflow prevented by molded construction**
- **Contact capacity - 3 A 250 V AC, 30 V DC**
- **Simple mechanism for stable quality - only 9 pieceparts**
- **Amber sealed types available**

SPECIFICATIONS

HA1 Standard type

Contacts

Arrangement			1 Form C
Contact material			Silver-nickel
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)			50 mΩ
Rating (resistive load)	Max. switching power		750 VA, 90 W
	Max. switching voltage		250 V AC, 30 V DC
	Max. switching current		3 A
Expected life (min. operations)	Mechanical		10^7
	Electrical (resistive)	3 A 250 V AC	10^5
		3 A 30 V DC	5×10^5

Coil

Minimum operating power	(AC) 0.58 VA, (DC) 230 mW
Nominal operating power	(AC) 0.9 VA, (DC) 360 mW

Characteristics

Maximum operating speed			20 cpm
Initial insulation resistance*1 (at 25°C, 50% R.H.)			Min. 100 MΩ at 500 V DC
Initial breakdown voltage*2	Between open contacts		750 Vrms for 1 min.
	Between contacts and coil		1,500 Vrms for 1 min.
Operate time*3 (at nominal voltage) (at 20°C)			Approx. 6 ms (AC), Approx. 5 ms (DC)
Release time (without diode)*3 (at nominal voltage)(at 20°C)			Approx. 6 ms (AC), Approx. 3 ms (DC)
Temperature rise (at 20°C)			Max. (AC) 60°C, (DC) 40°C with nominal coil voltage and at 3A switching current
Shock resistance		Functional	98 m/s² {10G}
		Destructive	980 m/s² {100G}
Vibration resistance		Functional	10 to 55Hz at double amplitude of 1mm
		Destructive	10 to 55Hz at switching of 2mm
Conditions for operation, transport and storage*4 (Not freezing and condensing at low temperature)		Ambient temp.	–40°C to +50°C –40°F to +122°F
		Humidity	5 to 85%R.H.
Unit weight			Approx. 15 g .53 oz

HA1E Amber sealed type

Contacts

Arrangement			1 Form C
Contact material			Gold-clad over silver-nickel
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)			50 mΩ
Rating (resistive load)	Max. switching power		500 VA, 90 W
	Max. switching voltage		250 V AC, 30 V DC
	Max. switching current		2 A AC, 3A DC
Expected life (min. operations)	Mechanical		10^7
	Electrical (resistive)	2 A 250 V AC	10^5
		3 A 30 V DC	2×10^5

Coil

Minimum operating power	(AC) 0.58 VA, (DC) 230 mW
Nominal operating power	(AC) 0.9 VA, (DC) 360 mW

Characteristics

Maximum operating speed			20 cpm
Initial insulation resistance*1 (at 25°C, 50% R.H.)			Min. 100 MΩ at 500 V DC
Initial breakdown voltage*2	Between open contacts		750 Vrms for 1 min.
	Between contacts and coil		1,500 Vrms for 1 min.
Operate time*3 (at nominal voltage) (at 20°C)			Approx. 6 ms (AC), Approx. 5 ms (DC)
Release time (without diode)*3 (at nominal voltage)(at 20°C)			Approx. 6 ms (AC), Approx. 3 ms (DC)
Temperature rise (at 50°C)			Max. (AC) 60°C, (DC) 40°C with nominal coil voltage and at 3A switching current
Shock resistance		Functional	98 m/s² {10G}
		Destructive	980 m/s² {100G}
Vibration resistance		Functional	10 to 55Hz at double amplitude of 1mm
		Destructive	10 to 55Hz at double amplitude of 2mm
Conditions for operation, transport and storage*4 (Not freezing and condensing at low temperature)		Ambient temp.	–40°C to +50°C –40°F to +122°F
		Humidity	5 to 85%R.H.
Unit weight			Approx. 15 g.53 oz

Remarks

* Specifications will vary with foreign standards certification ratings.
*1 Measurement at same location as "Intial breakdown voltage" section
*2 Detection current: 10 mA
*3 Excluding contact bounce time
*4 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61).

TYPICAL APPLICATIONS

Office machines, electrical home appliances, load management equipment.

ORDERING INFORMATION

Ex. HA 1 E DC6V

Contact arrangement	Type classification	Coil voltage
1: 1 Form C	Nil: Dust cover type E: Amber sealed type	DC 5, 6, 9, 12, 24 V AC 6, 12, 24, 48, 115V

Notes: 1. For UL/CSA recognized types, add suffix UL/CSA.
2. Standard packing Carton: 100 pcs., Case: 500 pcs. or 2,000 pcs.

TYPES AND COIL DATA (at 20°C 68°F)

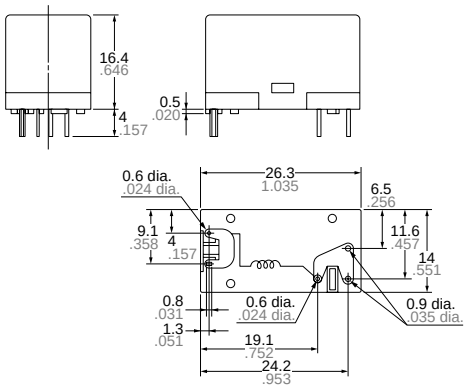
Part No.	Nominal voltage	Pick-up voltage, (max.)	Drop-out voltage, (min.)	* Nominal operating current, mA	Nominal operating power	Coil resistance, Ω (±10%)	Maximum allowable voltage
HA1-AC6V HA1E-AC6V	6 V AC	4.8 V AC	1.2 V AC	150	0.9 VA	—	6.6 V AC
HA1-AC12V HA1E-AC12V	12 V AC	9.6 V AC	2.4 V AC	76	0.9 VA	—	13.2 V AC
HA1-AC24V HA1E-AC24V	24 V AC	19.2 V AC	4.8 V AC	37	0.9 VA	—	26.4 V AC
HA1-AC48V HA1E-AC48V	48 V AC	38.4 V AC	9.6 V AC	19	0.9 VA	—	52.8 V AC
HA1-AC115V HA1E-AC115V	115 V AC	92.0 V AC	23.0 V AC	8	0.9 VA	—	126.5 V AC
HA1-DC5V HA1E-DC5V	5 V DC	4.0 V DC	0.5 V DC	72	360 mW	69	6.0 V DC
HA1-DC6V HA1E-DC6V	6 V DC	4.8 V DC	0.6 V DC	60	360 mW	100	7.2 V DC
HA1-DC9V HA1E-DC9V	9 V DC	7.2 V DC	0.9 V DC	40	360 mW	225	10.8 V DC
HA1-DC12V HA1E-DC12V	12 V DC	9.6 V DC	1.2 V DC	30	360 mW	400	14.4 V DC
HA1-DC24V HA1E-DC24V	24 V DC	19.2 V DC	2.4 V DC	15	360 mW	1,600	28.8 V DC

Note: The range of coil current — AC type: ±15% at 60 Hz, DC type: ±10% at 20°C 68°F coil temperature.

DIMENSIONS

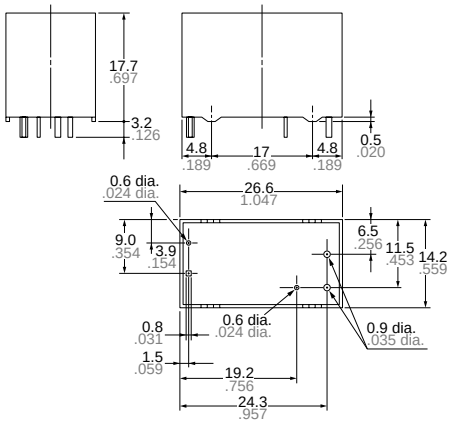
mm inch

HA1



General tolerance: ±0.5 ±.020

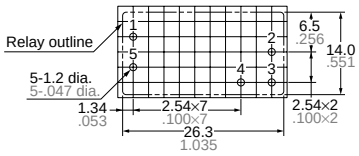
HA1E



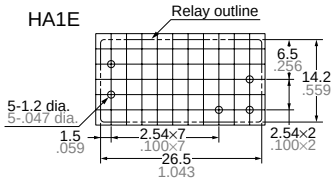
General tolerance: ±0.5 ±.004

PC board pattern (Copper-side view)

HA1

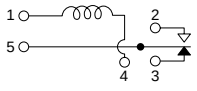


HA1E



Tolerance: ±0.1 ±.004

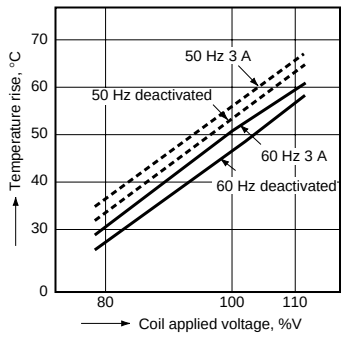
Schematic (Bottom view)



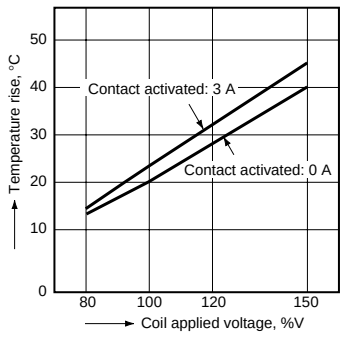
REFERENCE DATA

1.-(1) Coil temperature rise (AC PC board type)

Point measured: Inside the coil

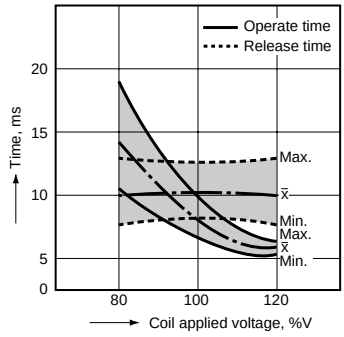


1.-(2) Coil temperature rise (DC PC board type)

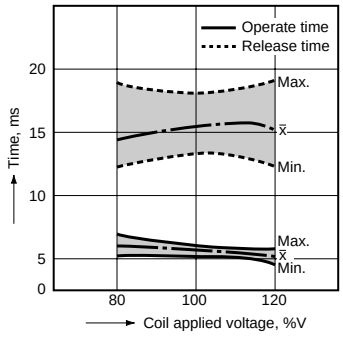


Operate and release time

Sample: HA1-DC12V



Sample: HA1-AC115V



For Cautions for Use, see Relay Technical Information (Page 48 to 76).

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