

AQ-N SOLID STATE RELAY

AQ-N RELAYS



FEATURES

- Five types available from 10 A to 40 A.
- Built-in varistor
- Includes operation LED (red)
- Dielectric voltage of 4,000 V
- 4 to 32 V DC input voltage.
- Zero-cross and Non zero-cross types are available.

TYPICAL APPLICATIONS

- Molding machine (heater control)
- Temperature controlled bath (heater control)
- Printing machines (heater control)
- Wrapping and packing machine (heater control)
- Machine tools (Motor control)

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

TYPES

1. Standard type

Type	Load current	Load voltage	Part No.
Zero-cross type	10A	75 to 250V AC	AQN111
	15A		AQN211
	20A		AQN311
	25A		AQN411
	40A		AQN611
Non zero-cross type	10A	75 to 250V AC	AQN121
	15A		AQN221
	20A		AQN321
	25A		AQN421
	40A		AQN621

2. With LED indication type

Type	Load current	Load voltage	Part No.
Zero-cross type	10A	75 to 250V AC	AQN111L
	15A		AQN211L
	20A		AQN311L
	25A		AQN411L
	40A		AQN611L
Non zero-cross type	10A	75 to 250V AC	AQN121L
	15A		AQN221L
	20A		AQN321L
	25A		AQN421L
	40A		AQN621L

3. With varistor type

Type	Load current	Load voltage	Part No.
Zero-cross type	10A	75 to 250V AC	AQN111V
	15A		AQN211V
	20A		AQN311V
	25A		AQN411V
	40A		AQN611V
Non zero-cross type	10A	75 to 250V AC	AQN121V
	15A		AQN221V
	20A		AQN321V
	25A		AQN421V
	40A		AQN621V

4. With varistor and LED indication type

Type	Load current	Load voltage	Part No.
Zero-cross type	10A	75 to 250V AC	AQN111VL
	15A		AQN211VL
	20A		AQN311VL
	25A		AQN411VL
	40A		AQN611VL
Non zero-cross type	10A	75 to 250V AC	AQN121VL
	15A		AQN221VL
	20A		AQN321VL
	25A		AQN421VL
	40A		AQN621VL

5. Accessories

Type	Part No.	Standard packing
Terminal cover	AQP-NPC	Carton: 2 pcs.; Case: 100 pcs.

ORDERING INFORMATION

Ex. AQN 1 1 1

Load current	Load voltage	Input voltage	Type
1: 10 A 2: 15 A 3: 20 A 4: 25 A 6: 40 A	1: 75 to 250 V AC (Zero-cross) 2: 75 to 250 V AC (Non zero-cross)	1: 4 to 32 V DC	Nil: None V: Built-in varistor L: With LED indication VL: Built-in varistor and with LED indication

RATINGS**1. Ratings (at 20°C 68°F, Input ripple: 1% or less)****1) Zero-cross type**

Item	Type	10A	15A	20A	25A	40A	Remarks
	Part No.	AQN111 AQN111L AQN111V AQN111VL	AQN211 AQN211L AQN211V AQN211VL	AQN311 AQN311L AQN311V AQN311VL	AQN411 AQN411L AQN411V AQN411VL	AQN611 AQN611L AQN611V AQN611VL	
Input side	Input voltage	4 to 32V					See REFERENCE DATA 3
	Input current	Max. 20mA					See REFERENCE DATA 3
	Drop-out voltage	Min. 1V					
Output side	Max. load current	10A	15A	20A	25A	40A	See REFERENCE DATA 1
	Load voltage	75V to 250V					
	Frequency	45Hz to 65Hz					
	Non-repetitive surge current	100A	150A	200A	250A	400A	In one cycle at 60Hz, See REFERENCE DATA 2
	Max. "OFF-state" leakage current	Max. 10mA					at 60Hz
	Max. "ON-state" voltage drop	Min. 1.6V					at Max. carrying current
	Min. load current	100mA					See CAUTIONS FOR USE (Using be below the specified load)

AQ-N

2) Non zero-cross type

Item	Type	10A	15A	20A	25A	40A	Remarks
	Part No.	AQN121 AQN121L AQN121V AQN121VL	AQN221 AQN221L AQN221V AQN221VL	AQN321 AQN321L AQN321V AQN321VL	AQN421 AQN421L AQN421V AQN421VL	AQN621 AQN621L AQN621V AQN621VL	
Input side	Input voltage	4 to 32V					See REFERENCE DATA 3
	Input current	Max. 20mA					See REFERENCE DATA 3
	Drop-out voltage	Min. 1V					
Output side	Max. load current	10A	15A	20A	25A	40A	See REFERENCE DATA 1
	Load voltage	75V to 250V					
	Frequency	45Hz to 65Hz					
	Non-repetitive surge current	100A	150A	200A	250A	400A	In one cycle at 60Hz, See REFERENCE DATA 2
	Max. “OFF-state” leakage current	Max. 10mA					at 60Hz
	Max. “ON-state” voltage drop	Min. 1.6V					at Max. carrying current
	Min. load current	100mA					See CAUTIONS FOR USE (Using be below the specified load)

2. Characteristics (at 20°C 68°F, Input ripple: 1% or less)

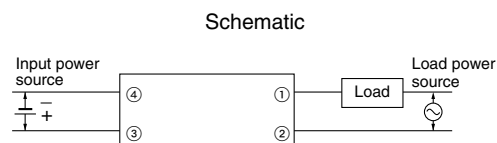
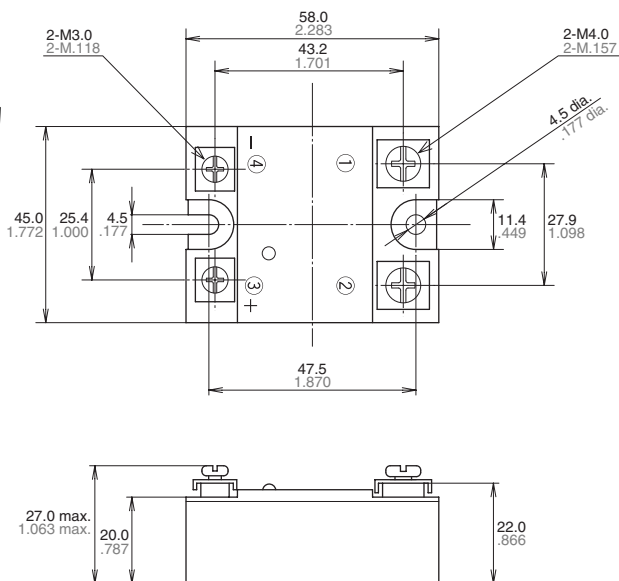
1) Zero-cross type

Type	10A	15A	20A	25A	40A	Remarks
Part No.	AQN111 AQN111L AQN111V AQN111VL	AQN211 AQN211L AQN211V AQN211VL	AQN311 AQN311L AQN311V AQN311VL	AQN411 AQN411L AQN411V AQN411VL	AQN611 AQN611L AQN611V AQN611VL	
Operate time, max.	(1/2 cycle of voltage sine wave) + 1ms					
Release time, max.	(1/2 cycle of voltage sine wave) + 1ms					
Insulation resistance, min.	100MΩ between input and output					Using 500 V DC megger
Breakdown voltage	4,000 Vrms between input and output 2,500 Vrms among input, output and case					for 1min.
Vibration resistance (Functional)	10 to 55Hz double amplitude of 1.5mm					X, Y, Z axes
Shock resistance (Functional)	Min. 980 m/s²					X, Y, Z axes
Ambient temperature	-20°C to +80°C -4°F to +176°F					Non-condensing at low temperatures
Storage temperature	-25°C to +85°C -13°F to +185°F					
Operational method	Zero-cross (Turn-ON and Turn-OFF)					

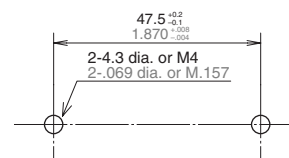
2) Non zero-cross type

Type	10A	15A	20A	25A	40A	Remarks
Part No.	AQN121 AQN121L AQN121V AQN121VL	AQN221 AQN221L AQN221V AQN221VL	AQN321 AQN321L AQN321V AQN321VL	AQN421 AQN421L AQN421V AQN421VL	AQN621 AQN621L AQN621V AQN621VL	
Operate time, max.	1ms					
Release time, max.	(1/2 cycle of voltage sine wave) + 1ms					
Insulation resistance, min.	100MΩ between input and output					Using 500 V DC megger
Breakdown voltage	4,000 Vrms between input and output 2,500 Vrms among input, output and case					for 1min.
Vibration resistance (Functional)	10 to 55Hz double amplitude of 1.5mm					X, Y, Z axes
Shock resistance (Functional)	Min. 980 m/s²					X, Y, Z axes
Ambient temperature	-20°C to +80°C -4°F to +176°F					Non-condensing at low temperatures
Storage temperature	-25°C to +85°C -13°F to +185°F					
Operational method	Random (Turn-ON), Zero-cross (Turn-OFF)					

* The right figure is the with LED indication type.
The standard type has the same dimensions.



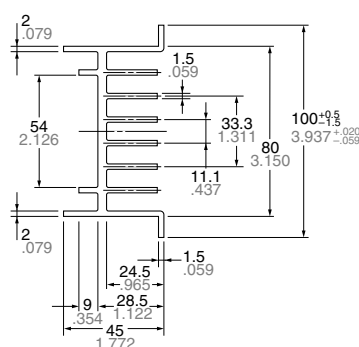
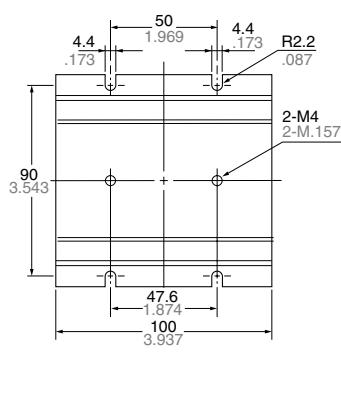
Mounting dimensions



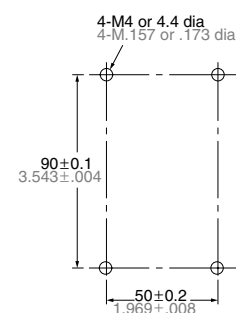
Heat sink (For 10A, 15A, 20A)



AQP-HS-20A



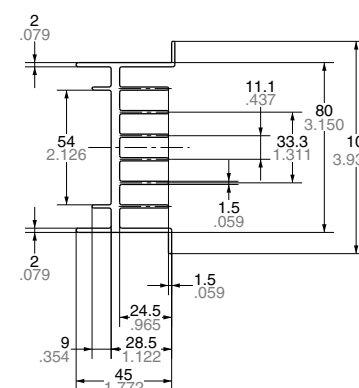
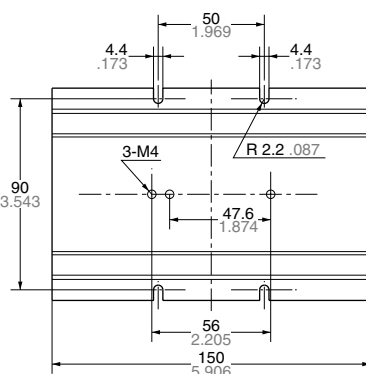
Mounting dimensions



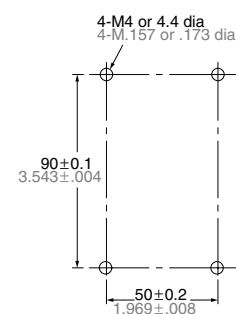
General tolerance: $\pm 0.5 \pm .020$



AQP-HS-30/40A



Mounting dimensions



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

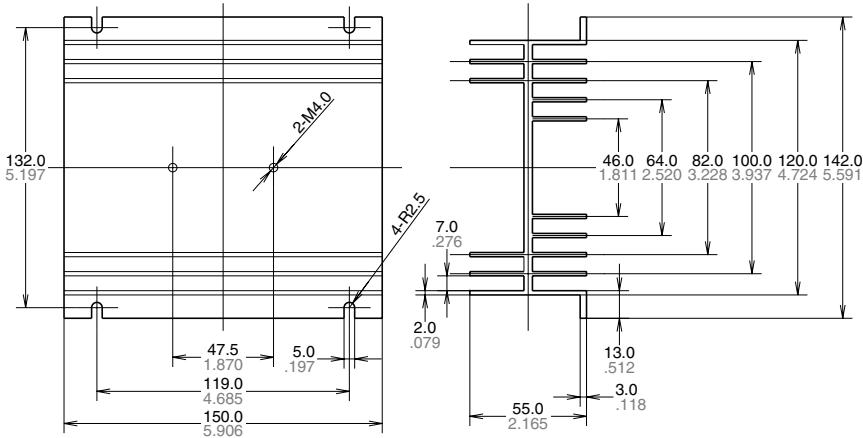
AQ-N

Heat sink (For 40A)

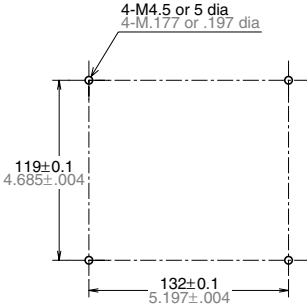
mm inch



AQP-HS-N40



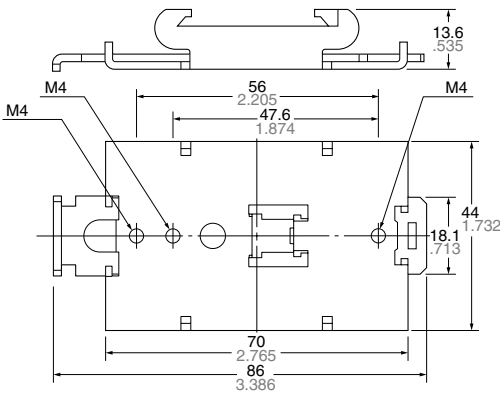
Mounting dimensions



DIN rail mounting plate



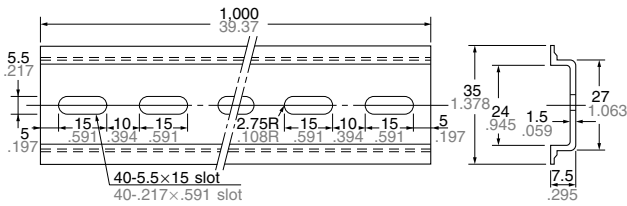
AQP-DP



Mounting rail



AT8-DLA1



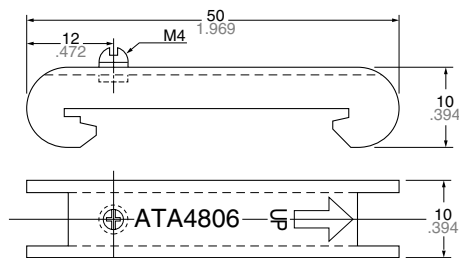
Fastening plate

Terminal cover

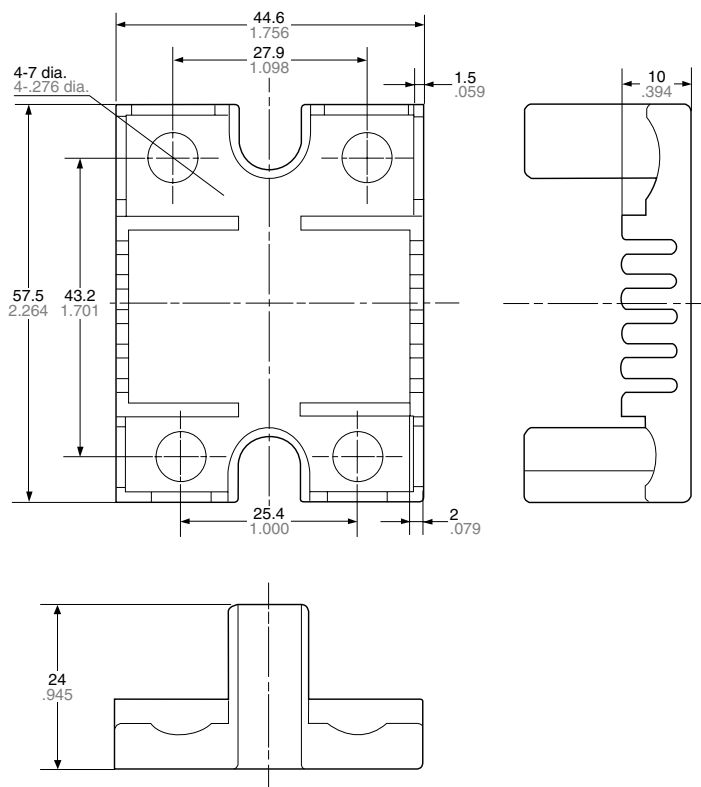
mm inch



ATA4806



AQP-NPC



REFERENCE DATA

1. Load current vs. ambient temperature

Use load current within range specified in the figure below.

Tested condition

(1) With external heat sink

1) (a) 10A, 15A, 20A type

Shown with standard heat sink
(AQP-HS-20A)

(b) Shown with 25A type standard heat sink
(AQP-HS-30/40A)

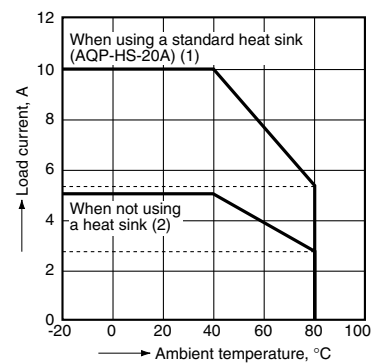
(c) Shown with 40A type standard heat sink
(AQP-HS-N40)

2) If attached to a heat sink, use a heat conductive compound (Ex. Toshiba silicone YG6111 or TSK5303) of similar coating to improve cooling.

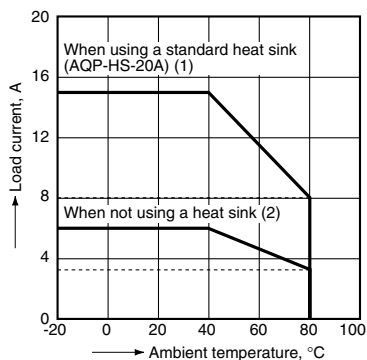
(2) Without external heat sink

If the mounting surface is not metallic and a heat sink is not used, expose the bottom surface and plate surface to improve heat dissipation.

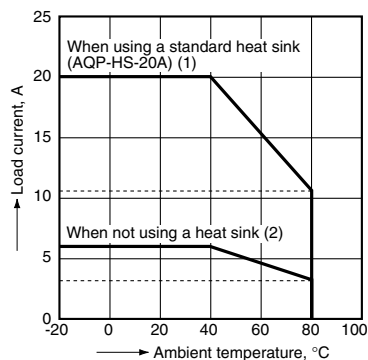
(1) 10 A type



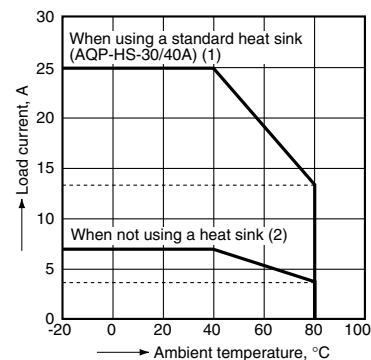
(2) 15 A type



(3) 20 A type

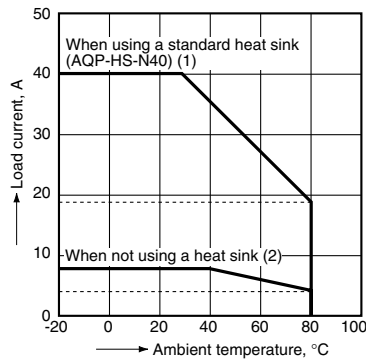


(4) 25 A type

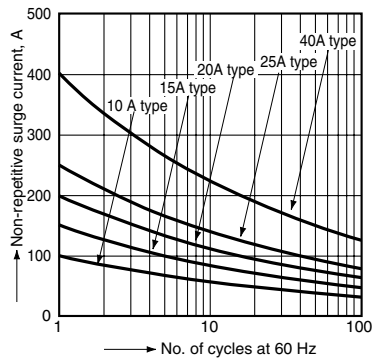


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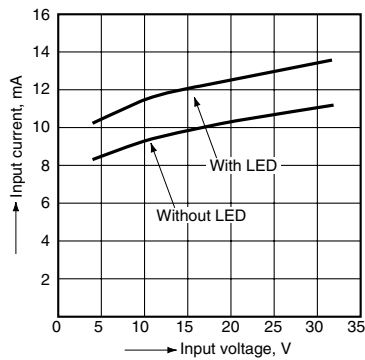
(5) 40 A type



2. Non-repetitive surge current vs. carrying time



3. Input current vs. input voltage
10A, 15A, 20A, 25A, 40A common



For Cautions for Use