

# Autonics

## RELAY TERMINAL BLOCK (screwless type)

### ABL Series

#### INSTRUCTION MANUAL



Thank you for choosing our Autonics product.

Please read the following safety considerations before use.

#### ■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.

※Safety considerations are categorized as follows.

▲Warning Failure to follow these instructions may result in serious injury or death.

▲Caution Failure to follow these instructions may result in personal injury or product damage.

※The symbols used on the product and instruction manual represent the following

▲Symbol represents caution due to special circumstances in which hazards may occur.

#### ▲Warning

1. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.) Failure to follow this instruction may result in personal injury, fire, or economic loss.

2. **Do not repair, or inspect the unit while connected to a power source.** Failure to follow this instruction may result in fire or electric shock.

3. **Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat, vibration, or impact may be present.** Failure to follow this instruction may result in fire or explosion.

4. **Do not disassemble or modify the unit. Please contact us if necessary.** Failure to follow this instruction may result in electric shock, fire, or product damage.

#### ▲Caution

1. **Do not use the unit outdoors.**

Failure to follow this instruction may result in shortening the life cycle of the unit, or electric shock.

2. **Use the unit within the rated specifications.**

Failure to follow this instruction may result in shortening the life cycle of the unit, or fire.

3. **Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.**

Failure to follow this instruction may result in electric shock or product damage.

4. **Keep dust and wire residue from flowing into the unit.**

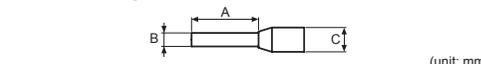
Failure to follow this instruction may result in fire or product damage.

#### ■ Model

Model	Terminal type	Connector type	No. of relay points	Relay type <sup>※1</sup>	Input logic	Varistor installation
ABL-L04PQ-UN	Screwless	Screwless	4EA	MATSUSHITA (Panasonic) PQ	COM	Not installed
ABL-L04PQ-UY				OMRON G6B	(universal)	Installed
ABL-L04R6-UN				OMRON G6B	(universal)	Not installed
ABL-L04R6-UY				OMRON G6B	(universal)	Installed

※1: The color of inserting part of jumper bar represents the relay type of the model. (green: MATSUSHITA (Panasonic) PQ, navy blue: OMRON G6B)

#### ■ Terminal Specification



	A	B	C	Applicable wires
End Sleeve (Ferrule Terminal) crimp terminal	10 to 12.0	Max. 2.0	Max. 4.1	AWG 22-16 (0.30 to 1.25mm <sup>2</sup> )

※The above specifications are subject to change and some models may be discontinued without notice.

#### ■ Specifications

##### ● ABL Series

Model	ABL-L04PQ-UN	ABL-L04PQ-UY <sup>※1</sup>	ABL-L04R6-UN	ABL-L04R6-UY <sup>※1</sup>
Power supply	24VDC±10%			
Rated load voltage & current	250VAC 5A, 30VDC 5A <sup>※2</sup>			
Current consumption	Max. 20mA <sup>※3</sup>			
Output type	1a contact relay output			
Applied relay	PQ1a-24V [MATSUSHITA (Panasonic)]		G6B-1174P-FD-US [OMRON]	
No. of relay points	4points			
Terminal type	Screwless			
Terminal pitch	10.2mm			
Ap-plied wire	Solid wire Ø0.6 to Ø1.25mm			
Stranded cable	AWG22-16 (0.3 to 1.25mm <sup>2</sup> )			
Stripped wire length	8 to 10mm			
Insulation resistance	Min. 1,000MΩ (at 500VDC megger)			
Dielectric strength	2,000VAC 50/60Hz for 1 min (between coil-contacts) <sup>※5</sup>			
	1,000VAC 50/60Hz for 1 min (between contacts of same polarity) <sup>※6</sup>			
	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours			
Vibration	Mechanical			
	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes			
Shock	Mechanical			
	1000m/s <sup>2</sup> (approx. 100G) in each X, Y, Z direction for 3 times			
Environment	Ambient temp.			
	-15 to 55°C, Storage: -25 to 65°C			
Material	Terminal block: Polyamide 66, Conducting plate: Brass, CASE&BASE: Modified Polyphenylene Oxide			
	Accessory Jumper bar 1EA			
Protection structure	IP20			
Weight <sup>※7</sup>	Approx. 148g	Approx. 150g	Approx. 143g	Approx. 144g
	(approx. 92g)	(approx. 94g)	(approx. 87g)	(approx. 88g)
	※1: This is for contact protection and it is recommend to use at the inductive load.			
	※2: Relay contact capacity for resistive load.			
※3: The current consumption including LED current by one relay.				
※4: When using stranded wire, use End Sleeve (ferrule terminal) crimp terminals.				
※5: OMRON relay is 3,000VAC.				
※6: In case of ABL-L04□-UY (varistor installed type), this is 300VAC.				
※7: The weight includes packaging. The weight in parentheses is for unit only.				
※Environment resistance is rated at no freezing or condensation.				

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#### ● Relay

1) Coil ratings ※The values are measured at ±20°C with a tolerance of ±10%.

Model	Rated voltage	Must operate voltage	Must release voltage	Rated current	Coil resistance	Power consumption
PQ1a-24V	24VDC	75% min. of rated voltage	5% max. of rated voltage	8.3mA	2,880Ω	200mW
G6B-1174P-FD-US	24VDC	70% min. of rated voltage	10% max. of rated voltage	8.3mA	2,880Ω	200mW

#### 2) Contact ratings

Maker	MATSUSHITA (Panasonic)	OMRON
Model	PQ1a-24V	G6B-1174P-FD-US
Arrangement	1 Form A (SPST-1a)	
Material	Au-clad AgNi type	
Resistance (initial)	30mΩ (6VDC 1A)	
Rated load (resistive load)	5A 250VAC	5A 30VDC
	5A 250VAC	5A 30VDC
Max. switching power	1,250VA	150W
	1,250VA	150W
Max. switching voltage	250VAC	110VDC
	250VAC	110VDC
Max. switching current	5A	380VAC
	5A	125VDC

Electrical characteristics	Coil and contacts	AgSnIn
Insulation resistance	Min. 1,000MΩ (at 500VDC megger)	
Dielectric strength	Coil and contacts	3,000VAC 50/60Hz for 1 min
	Open contacts	1,000VAC 50/60Hz for 1 min
Surge voltage	8,000V	
Operate time	Max. 20ms	
Release time	Max. 10ms	

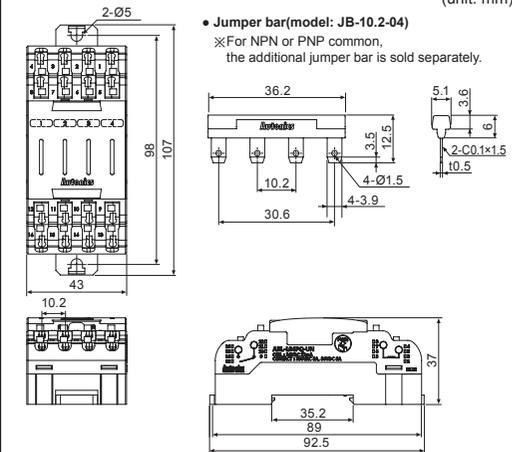
Mechanical characteristics	Mechanical	Mechanical
Vibration	3.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour	2.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 min
	2.0mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 min	2.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 min
Shock	980m/s <sup>2</sup> (approx. 100G) in each X, Y, Z direction for 3 times	1,000m/s <sup>2</sup> (approx. 10G) X, Y, Z in each X, Y, Z direction for 3 times
	294m/s <sup>2</sup> (approx. 30G) in each X, Y, Z direction for 3 times	100m/s <sup>2</sup> (approx. 10G) X, Y, Z in each X, Y, Z direction for 3 times
Life expectancy	Min. 20,000,000 operations (at 180 times/min.)	Min. 50,000,000 operations (at 18,000 times/hour)
	Min. 100,000 operations (5A 250VAC, 30VDC) Min. 200,000 operations (5A 125VAC) (at 20 times/min)	Min. 100,000 operations (5A 250VAC, 30VDC) (at 30 times/min)

Environment	Ambient temp.	Ambient humi.
Environment	-40 to 70°C	5 to 85%RH
	-40 to 70°C	5 to 85%RH

Unit weight	Approx. 7g	Approx. 5g
Unit weight	Approx. 7g	Approx. 5g

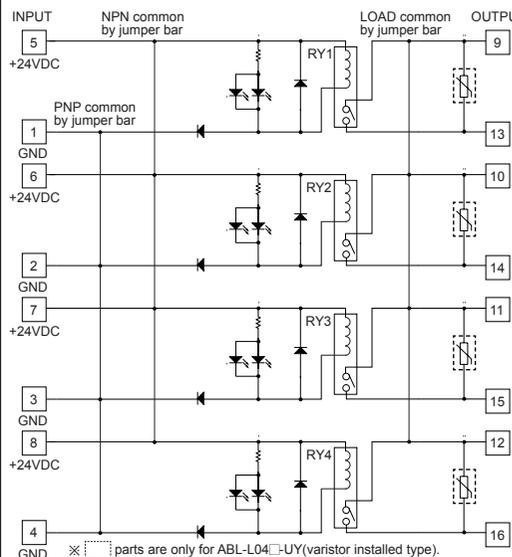
※Environment resistance is rated at no freezing or condensation.

#### ■ Dimensions



#### ■ Wire Connections

※ NPN, PNP, LOAD common are operated by the inserting position of the Jumper bar. Please refer to 'Using Jumper Bars' of 'Using Jumper Bar and Replacing Relay'.



#### ■ Installation

##### 1. Mounting and removal at DIN rail

###### ● Mounting

- 1) Pull the rail lock towards direction ①.
- 2) Attach the DIN rail connection hook onto the DIN rail.
- 3) Push the unit towards direction ②, then push the rail lock in to lock into position.

###### ● Removal

- 1) Insert a screwdriver into the rail lock hole and pull it towards direction ①.
- 2) Remove the unit by pulling the unit towards direction ②.

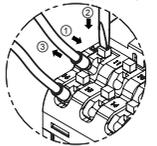
##### 2. Mounting with screws

- 1) The unit can be mounted on panels using the rear rail locks.
- 2) Pull the rail locks towards directions ① and ②.
- 3) M4 × 10mm spring washer screws are recommended for installation. When using flat washers, use Ø9mm diameter washers. The tightening torque should be between 10.2 to 15.3 kgf·cm (1.0 to 1.5N·m).

#### ■ Connecting Crimp Terminals

##### 1. Connecting and removing end sleeve (ferrule terminal) crimp terminal at screwless type terminal block

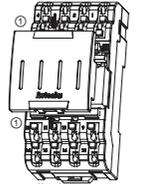
- Connecting
- 1) Push the end sleeve (ferrule) crimp terminal towards direction ① to complete the connection.
- Removing
- 1) Press and hold the catch above the terminal in direction ② with a flathead screwdriver.
- 2) Pull and remove the end sleeve (ferrule) crimp terminal towards direction ③.



##### ■ Using Jumper Bar and Replacing Relay

###### ● Removing the protection cover

- 1) Pull the protection cover towards direction ① to insert jumper bars or replace relays.



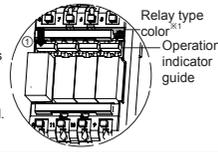
###### ● Using jumper bars

- 1) Remove the protection cover and use the jumper bars accordingly.

NPN COMMON	PNP COMMON	LOAD COMMON
Insert the jumper bar to the far left towards terminals 4 and 8.	Insert the jumper bar to the far right towards terminals 1 and 5.	Insert the jumper bar above terminals 12, 11, 10, 9.

###### ● Replacing relays

- 1) Remove the protection cover.
- 2) Push the operation indicator guide in direction ① to remove the relay.
- 3) Insert a new relay to the case.
- ※1: The color of the jumper bar insertion holes indicate the relay types of the model. (green: MATSUSHITA (Panasonic) PQ, navy blue: OMRON G6B)
- ※Only insert designated relays for each model.
- ※Execute above directions only for replacing relays. If not, it may cause relay damage.



#### ■ Caution During Use

1. Do not use the product outside of rated temperature and humidity.
  2. Make sure that voltage fluctuation in the power supply is within the rated range.
  3. When connecting PLC or other controllers, check the polarity of power and COMMON before wiring.
  4. Use AWG22-16 (0.3 to 1.25mm<sup>2</sup>) wire for power and use appropriate crimp connectors for the terminals.
  5. Turn OFF the power supply before wiring.
  6. Turn OFF the power supply before replacing relays.
  7. Do not use the unit in the following environments.
    - ① Environments with high vibration or shock.
    - ② Environments where strong alkalis or acids are used.
    - ③ Environments with exposure to direct sunlight.
    - ④ Near machinery which produces strong magnetic force or electric noise.
  8. This unit may be used in the following environments.
    - ① It shall be used indoor
    - ② Altitude up to 2,000m
    - ③ Pollution degree 2
    - ④ Installation category II
- ※Failure to follow these instructions may result in product damage.

#### ■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Proximity Sensors
- Door Sensors
- Door Side Sensors
- Connector/Sockets
- Timers
- Panel Meters
- Tachometer/Pulse(Rate)Meters
- Display Units
- Sensor Controllers
- Switching Module Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers
- Temperature Controllers
- Proximity Sensors
- Pressure Sensors
- SSRs/Power Controllers
- Rotary Encoders
- Counters

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