

# 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				(Panasonic) PQ	(universal)	Installed
ABL-L04R6-UN				OMRON G6B		Not installed
ABL-L04R6-UY				G6B		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 cable	Solid wire Ø0.6 to Ø1.25mm									
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>									
Vibration	Mechanical	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours								
	Malfunction	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								
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each X, Y, Z direction for 3 times								
Envi-ron-ment	Ambient temp.	-15 to 55°C, Storage: -25 to 65°C								
	Ambient humi.	35 to 85%RH, Storage: 35 to 85%RH								
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. 92g)		Approx. 150g (approx. 94g)		Approx. 143g (approx. 87g)		Approx. 144g (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.

##### 1) Relay

※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	
Contact	Arrangement	1 Form A (SPST-1a)		
	Material	Au-clad AgNi type	AgSnIn	
	Resistance (initial)	30mΩ (6VDC 1A)	30mΩ (5VDC 1A)	
Rating	Rated load (resistive load)	5A 250VAC	5A 30VDC	5A 250VAC
	Max. switching power	1,250VA	150W	1,250VA
	Max. switching voltage	250VAC	110VDC	380VAC
	Max. switching current	5A		125VDC

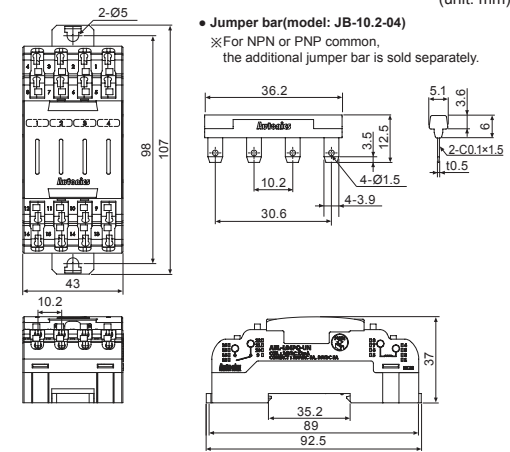
Electrical characteristics	Insulation resistance	Min. 1,000MΩ (at 500VDC megger)	
	Dielectric strength	Coil and contacts 4,000VAC 50/60Hz for 1 min	3,000VAC 50/60Hz for 1 min
		Open contacts 1,000VAC 50/60Hz for 1 min	1,000VAC 50/60Hz for 1 min
	Surge voltage	8,000V	6,000V
Mechanical characteristics	Operate time	Max. 20ms	
	Release time	Max. 10ms	
	Vibration	3.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour	

Life expectancy	Mechanical	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 direction for 3 times
	Electrical	Min. 20,000,000 operations (at 180 times/min)	Min. 50,000,000 operations (at 18,000 times/hour)

Environment	Ambient temp.	-40 to 70°C	-25 to 70°C
	Ambient humi.	5 to 85%RH	
	Unit weight	Approx. 7g	Approx. 5g

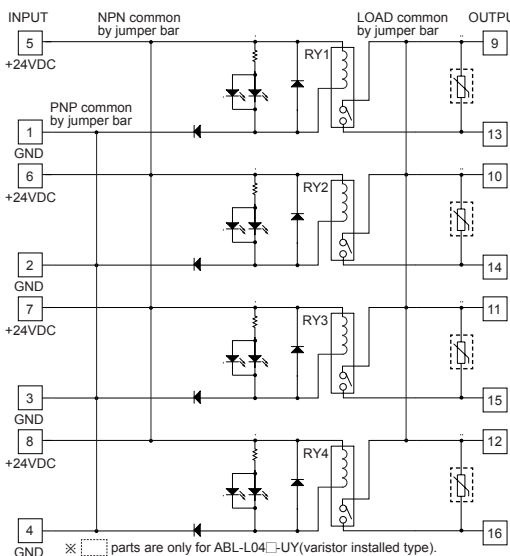
※Environment resistance is rated at no freezing or condensation.

#### ■ 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

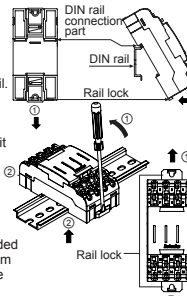
- 1) Pull the rail lock towards direction ①.
- 2) Attach the DIN rail connection hook onto the DIN rail.
- 3) Push the unit towards direction ②, then push the rail lock to lock into position.

###### ● 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

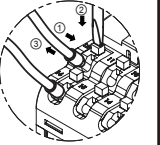
- 1) The unit can be mounted on panels using the rear rail locks.
- 2) Pull the rail locks towards directions ① and ②.
- 3) M4 × 10mm spring washer screws are recommended for installation. When using flat washers, use Ø9mm diameter washers. The tightening torque should be between 10.2 to 15.3 kgf·cm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



#### ■ Connecting Crimp Terminals

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

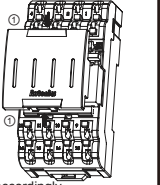
- Connecting
- 1) Push the end sleeve (ferrule) crimp terminal towards direction ① to complete the connection.
- Removing
- 1) Press and hold the catch above the terminal in direction ② with a flathead screwdriver.
- 2) Pull and remove the end sleeve (ferrule) crimp terminal towards direction ③.



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

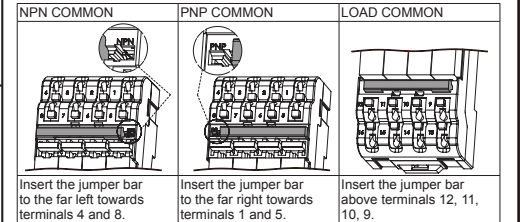
###### ● Removing the protection cover

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



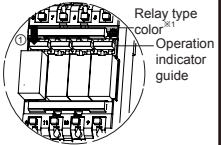
###### ● Using jumper bars

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



###### ● 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
- Door Sensors
- Door Side Sensors
- Connector/Sockets
- Timers
- Panel Meters
- Sensor Controllers
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters

**Autonics Corporation**  
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