DRW161190AB

Autonics

4-Point 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

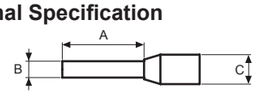
1. **Do not use the unit outdoors.**
   Failure to follow this instruction may result in shortening the life cycle of the unit, or electric shock.
2. **Use the unit within the rated specifications.**
   Failure to follow this instruction may result in shortening the life cycle of the unit, or fire.
3. **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.

▣ Ordering Information

AB L – L 04 PA – U N

Varistor installation	**N**	Not installed
	Y	Installed
Input logic	**U**	Universal
Relay type	**TN**	**N**YP TAKAMISAWA (Fujitsu)
	PA	MATSUSHITA (**P**anasonic) P**A**
	PQ	MATSUSHITA (**P**anasonic) P**Q**
	R6	OM**R**ON G6**B**
No. of relay points	**04**	4
Connector type	**L**	Screwless
Terminal type	**L**	Screwless
Model	**AB**	RELAY Terminal

▣ Crimp Terminal Specification



(unit: mm)

	A	B	C	Applicable wires
End Sleeve (ferrule terminal) crimp terminal	10 to 12.0	≤ 2.0	≤ 4.1	AWG22-16 (0.30 to 1.25mm²) (60℃ only)

※**The above specifications are subject to change and some models may be discontinued without notice.**
※**Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).**

▣ Specifications

Model	ABL-L04PA-UN	ABL-L04PA-UY	ABL-L04TN-UN	ABL-L04TN-UY	ABL-L04PQ-UN	ABL-L04PQ-UY※1	ABL-L04R6-UN	ABL-L04R6-UY※1
Power supply	24VDC⎓ ±10%							
Rated load voltage & current※2	250VAC~ 50/60Hz 3A, 30VDC⎓ 3A				250VAC~ 50/60Hz 5A, 30VDC⎓ 5A			
Current consumption※3	≤ 10mA		≤ 8mA		≤ 20mA			
Output type	1a contact relay output							
Applied relay	PA1a-24V [MATSUSHITA(Panasonic)]		NYP24W-K [TAKAMISAWA(Fujitsu)]		PQ1a-24V [MATSUSHITA(Panasonic)]		G6B-1174P-FD-US [OMRON]	
No. of relay points	4							
Terminal type	Screwless							
Terminal pitch	5.0mm				10.2mm			
Operation indicator	Blue LED							
Applied cable: Solid wire	Ø0.6 to Ø1.25mm (60℃ only)							
Applied cable: Stranded wire※4	AWG22-16 (0.3 to 1.25mm²) (60℃ only)							
Stripped wire length	8 to 10mm							
Insulation resistance	≥ 1,000MΩ (at 500VDC megger)							
Dielectric strength: Between coil-contact	2,000VAC 50/60Hz for 1 minute		3,000VAC 50/60Hz for 1 minute		4,000VAC 50/60Hz for 1 minute		3,000VAC 50/60Hz for 1 minute	
Dielectric strength: Between same contacts※5	1,000VAC 50/60Hz for 1 minute		750VAC 50/60Hz for 1 minute		1,000VAC 50/60Hz for 1 minute		1,000VAC 50/60Hz for 1 minute	
Vibration: Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours				1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours			
Vibration: Malfunction	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes				1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes			
Shock: Mechanical	1,000m/s² (approx. 100G) in each X, Y, Z direction for 3 times							
Shock: Malfunction	100m/s² (approx. 10G) in each X, Y, Z direction for 3 times							
Environment: Ambient temp.	-15 to 55℃, storage: -25 to 65℃							
Environment: Ambient humi.	35 to 85%RH, storage: 35 to 85%RH							
Material	Terminal block: polyamide 66, conducting plate: brass, case&base: poly phenylene sulfide				Terminal block: polyamide 66, conducting plate: brass, case&base: modified polyphenylene oxide			
Accessory	Jumper bar: 1							
Protection structure	IP20 (IEC standard)							
Approval	CE cULus							
Weight※6	Approx. 125g (approx. 72g)		Approx. 128g (approx. 75g)		Approx. 148g (approx. 92g)	Approx. 150g (approx. 94g)	Approx. 143g (approx. 87g)	Approx. 144g (approx. 88g)

※1: This is for load protection and it is recommend to use at the inductive load.
※2: Relay load capacity for resistive load.
Please connect to a load using the same power supply. Connecting to a load from a different power supply may cause safety issues.
※3: The current consumption including LED current by one relay.
※4: When using stranded wire, use End Sleeve (ferrule terminal) crimp terminals.
※5: **In case of ABL-L04□-UY (varistor installed type), this is 300VAC.**
※6: The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.

• Relay

1) Coil specifications

※The values are measured at 20ºC with a tolerance of ±10%.

Model	Rated voltage	Must operate voltage	Must release voltage	Rated current	Coil resistance	Power consumption	Model	Rated voltage	Must operate voltage	Must release voltage	Rated current	Coil resistance	Power consumption
PA1a-24V	24VDC⎓	≥ 70% of rated voltage	≤ 5% of rated voltage	7.5mA	3,200Ω	180mW	**PQ1a-24V**	24VDC⎓	≥ 75% of rated voltage	≤ 5% of rated voltage	8.3mA	2,880Ω	200mW
NYP24W-K	24VDC⎓	16.1V	2.4V	5mA	4,800Ω	120mW	**G6B-1174P-FD-US**	24VDC⎓	≥ 70% of rated voltage	≤ 10% of rated voltage	8.3mA	2,880Ω	200mW

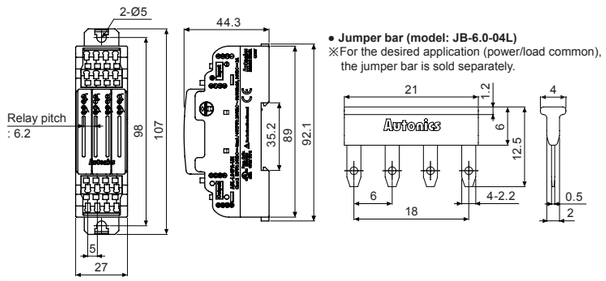
2) Contact specifications

Maker			MATSUSHITA (Panasonic)		TAKAMISAWA (Fujitsu)		MATSUSHITA (Panasonic)		OMRON	
Model			**PA1a-24V**		**NYP24W-K**		**PQ1a-24V**		**G6B-1174P-FD-US**	
Contact	Arrangement		1 Form A (SPST-1a)				1 Form A (SPST-1a)			
	Material		Au-clad AgNi type		Gold overlay silver alloy		Au-clad AgNi type		AgSnIn	
	Resistance (initial)		30mΩ (6VDC 1A)				50mΩ (6VDC 1A)		30mΩ (5VDC 1A)	
Rating	Rated load (resistive load)		5A 250VAC~	5A 30VDC⎓	3A 250VAC~	3A 30VDC⎓	5A 250VAC~	5A 30VDC⎓	5A 250VAC~	5A 30VDC⎓
	Max. switching power		1,250VA	150W	750VA	90W	1,250VA	150W	1,250VA	150W
	Max. switching voltage		250VAC~	110VDC⎓	270VAC~	150VDC⎓	250VAC~	110VDC⎓	380VAC~	125VDC⎓
	Max. switching current		5A							
Electrical characteristics	Insulation resistance		≥ 1,000MΩ (at 500VDC megger)							
	Dielectric strength	Coil and contacts	2,000VAC 50/60Hz for 1 minute		3,000VAC 50/60Hz for 1 minute		4,000VAC 50/60Hz for 1 minute		3,000VAC 50/60Hz for 1 minute	
		Open contacts	1,000VAC 50/60Hz for 1 minute		750VAC 50/60Hz for 1 minute		1,000VAC 50/60Hz for 1 minute		1,000VAC 50/60Hz for 1 minute	
	Surge voltage		4,000V		5,080V		8,000V		6,000V	
	Operate time		≤ 10ms				≤ 20ms		≤ 10ms	
	Release time		≤ 5ms				≤ 10ms			
Mechanical characteristics	Vibration	Mechanical	3.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour		5.0mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour		3.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour	
		Malfunction	2.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minute		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minute		2.0mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minute		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minute	
	Shock	Mechanical	980m/s² (approx. 100G) in each X, Y, Z direction for 3 times		1,000m/s² (approx. 100G) in each X, Y, Z direction for 3 times		980m/s² (approx. 100G) in each X, Y, Z direction for 3 times		1,000m/s² (approx. 100G) in each X, Y, Z direction for 3 times	
		Malfunction	147m/s² (approx. 15G) in each X, Y, Z direction for 3 times		100m/s² (approx. 10G) in each X, Y, Z direction for 3 times		294m/s² (approx. 30G) in each X, Y, Z direction for 3 times		100m/s² (approx. 10G) in each X, Y, Z direction for 3 times	
Life expectancy	Mechanical		≥ 20,000,000 operations (at 180 times/min)				≥ 20,000,000 operations (at 180 times/min)		≥ 50,000,000 operations (at 300 times/min)	
	Electrical		≥ 100,000 operations (3A 250VAC, 30VDC resistive load)※1				≥ 100,000 operations (5A 250VAC, 30VDC) ≥ 100,000 operations (5A 125VAC) (at 20 times/min)		≥ 100,000 operations (5A 250VAC, 30VDC) (at 30 times/min)	
Environment	Ambient temp.		-40 to 70℃		-40 to 90℃		-40 to 70℃		-25 to 70℃	
	Ambient humi.		5 to 85%RH		35 to 80%RH		5 to 85%RH			
Unit weight			Approx. 3g		Approx. 3.5g		Approx. 7g		Approx. 5g	

※1: 50,000 operations - 5A 250VAC, 30VDC resistive load. (per 20 operations/min)
※Environment resistance is rated at no freezing or condensation.

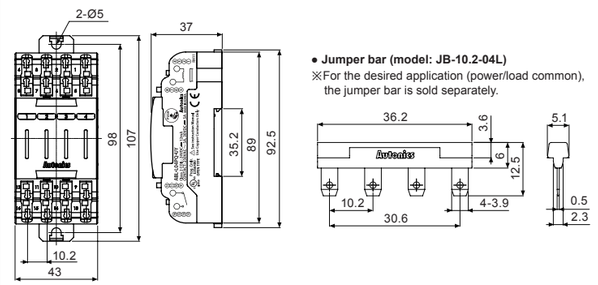
▣ Dimensions

• ABL-L04TN/PA-□



• Jumper bar (model: JB-6.0-04L)
※For the desired application (power/load common), the jumper bar is sold separately.

• ABL-L04PQ/R6-□



• Jumper bar (model: JB-10.2-04L)
※For the desired application (power/load common), the jumper bar is sold separately.

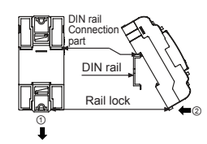
▣ Installation

※The example is based on ABL-L04PQ/R6-□.
Installation of ABL-L04TN/PA-□ is also same.

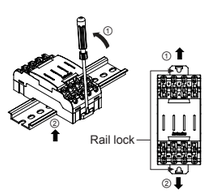
1. Mounting and removal at DIN rail

• Mounting
1) Pull the rail lock towards direction ①.
2) Attach the DIN rail connection part onto the DIN rail.
3) Push the unit towards direction ②, then push the rail lock in to lock toward the unit.

• Removal
1) Insert a screwdriver into the rail lock hole and push 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 1.0 to 1.5N·m.

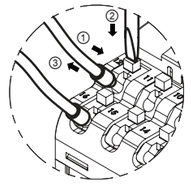


▣ Connecting Crimp Terminals

• Connecting and removing end sleeve (ferrule terminal) crimp terminal at screwless type terminal block

• Connecting
1) Push the end sleeve (ferrule terminal) 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 terminal) crimp terminal towards direction ③.

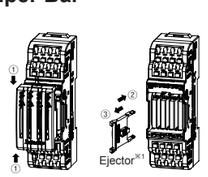


▣ Replacing Relay and Using Jumper Bar

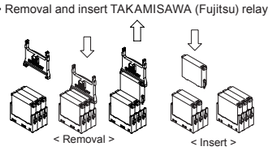
◎ ABL-L04PA/TN-□

• Replacing relays
1) Pull the protection cover towards direction ①.
2) Insert the ejector as proper side to ② direction and pull it to ③ direction to remove.
3) Insert a new relay to the case.

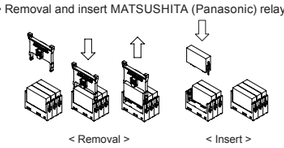
※1: Two way ejector position for relay replacement
Replacing for TAKAMISAWA (Fujitsu) relay
Replacing for MATSUSHITA (Panasonic) relay



• Removal and insert TAKAMISAWA (Fujitsu) relay



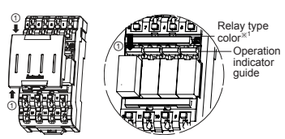
• Removal and insert MATSUSHITA (Panasonic) relay



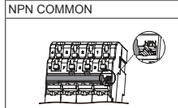
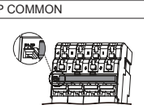
◎ ABL-L04PQ/R6-□

• Replacing relays
1) Remove the protection cover.
2) Push the operation indicator guide in direction 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.

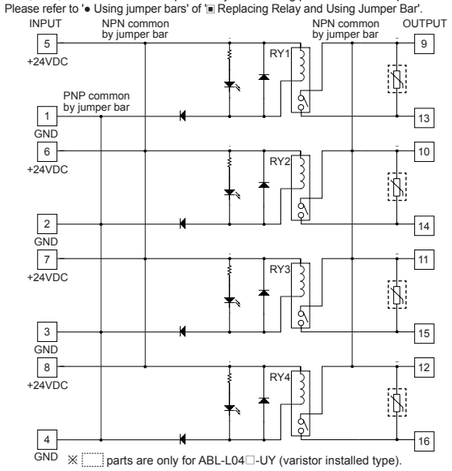


• Using jumper bars
Remove the protection cover and use the jumper bars accordingly.
(The example is based on ABL-L04PQ/R6-□. Using method of jumper bar for ABL-L04TN/PA-□ is also same.)

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.

▣ Wire Connections

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



※ ⬚ parts are only for ABL-L04□-UY (varistor installed type).

▣ Cautions during Use

1. Use the unit within the rated environment of specification.
2. Supply power within the rated allowable voltage range.
3. Check the polarity of power or COMMON before connecting PLC or other controllers.
4. When connecting the power input, use AWG22-16 (0.3 to 1.25mm²).
   For using crimp terminals, refer to '▣ Crimp Terminal Specifications'.
5. Do not connect wire, remove connector, or replace relays while connected to a power source.
6. Do not touch the unit immediately after the load power is supplied or cut.
   It may cause burn by high temperature.
7. Power supply should be insulated and limited voltage/current or Class 2 SELV power supply device.
8. Do not use the unit at below places.
   ① Environments with high vibration or shock.
   ② Environments where strong alkali or acids are used.
   ③ Environments with exposure to direct sunlight.
   ④ Near machinery which produce strong magnetic force or electric noise
9. This unit may be used in the following environments.
   ① Indoors
   ② Altitude max. 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
■ Area Sensors
■ Proximity Sensors
■ Pressure Sensors
■ Rotary Encoders
■ Connector/Sockets
■ Switching Mode Power Supplies
■ Control Switches/Lamps/Buzzers
■ I/O Terminal Blocks & Cables
■ Stepper Motors/Drivers/Motion Controllers
■ Graphic/Logic Panels
■ Field Network Devices
■ Laser Marking System (Fiber, Co_2, Nd: YAG)
■ Laser Welding/Cutting System
■ Temperature Controllers
■ Temperature/Humidity Transducers
■ SSRs/Power Controllers
■ Counters
■ Timers
■ Panel Meters
■ Tachometer/Pulse(Rate)Meters
■ Display Units
■ Sensor Controllers

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