Autonics

Screwless Relay Terminal Block (Common Type, 16/32-point)

ABL Series

PRODUCT MANUAL

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- Screwless push-in type connection for simple and easy connection
- Ideal for operating various loads using output signals from PLCs
- Space-saving design with 5 mm terminal pitch and 2-line relay arrangement
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient relay removal with ejector clip and release lever
- Relay protection cover

※ Autonics CH/CO series I/O terminal block cables are recommended for best performance

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

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

01. 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, economic loss or fire.

02. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.
Failure to follow this instruction may result in explosion or fire.

03. Do not connect, repair, or inspect the unit, remove connector, or change Relay while connected to a power source.
Failure to follow this instruction may result in fire or electric shock.

04. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire or electric shock.

⚠ Caution Failure to follow instructions may result in injury or product damage.

01. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.

02. Use a dry cloth to clean the unit, and do not use water or organic solvent.
Failure to follow this instruction may result in fire or electric shock.

03. Keep the product away from metal chip, dust, and wire residue which flow into the unit.
Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Check the polarity of power or COMMON before connecting PLC or other controllers.
- Do not touch the unit immediately after the load power is supplied or cut. It may cause burn by high temperature.
- 24VDC⎓ power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent surge and inductive noise. Do not use near the equipment which generates strong magnetic force or high frequency noise (transceiver, etc.). In case installing the product near the equipment which generates strong surge (motor, welding machine, etc.), use diode or varistor to remove surge.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation category II

Product Components

- Product
- Instruction manual
- Two Way Ejector

Sold Separately

- I/O cable CH/CO Series

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Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

ABL - ❶ ❷ ❸ ❹ - ❺ ❻

❶ Connector type
H: Hirose connector

❷ Wire connection
C: Common

❸ Number of relay
16: 16-point
32: 32-point

❹ Relay type
PA: APAN3124 [MATSUSHITA (Panasonic)]
TN:NYP24W-K [TAKAMISAWA (Fujitsu)]

❺ Input logic
N: NPN (+COM)
P: PNP (-COM)

❻ Varistor
N: None

Specifications

Model	ABL-HC16□-□N	ABL-HC32□-□N
Applied relay 01)	PA: APAN3124 [MATSUSHITA (Panasonic)] / TN: NYP24W-K [TAKAMISAWA (Fujitsu)]	
Output method	1a	1a
Power supply	≤ 24 VDC⎓ ±10 %	≤ 24 VDC⎓ ±10 %
Current consumption	PA: ≤ 7.4 mA 02) or ≤ 10.1 mA 03) TN: ≤ 7.8 mA 02) or ≤ 10.5 mA 03)	PA: ≤ 7.4 mA 02) or ≤ 10.1 mA 03) TN: ≤ 7.8 mA 02) or ≤ 10.5 mA 03)
Relay output rated spec.	250 VAC~ 50/60 Hz 2A (2A / 1-point, 8A / 1COM), 24 VDC⎓ 2A (2A / 1-point, 8A / 1COM)	250 VAC~ 50/60 Hz 2A (2A / 1-point, 8A / 1COM), 24 VDC⎓ 2A (2A / 1-point, 8A / 1COM)
No. of connector pins	20	40
Connector for controller side	20-pin Omron (XG4A-2031)	40-pin Omron (XG4A-4031)
No. of relay points	16	32
Output connection	8-point/1COM	8-point/1COM
Terminal type	Screwless	Screwless
Terminal pitch	≥ 5 mm	≥ 5 mm
Indicator	Power indicator: red, operating indicator: blue	Power indicator: red, operating indicator: blue
Varistor	None	None
Input logic	NPN / PNP model	NPN / PNP model
Material	CASE, BASE, COVER: PC, terminal pin: copper+PA66	CASE, BASE, COVER: PC, terminal pin: copper+PA66
Approval	CE EAC cULus	CE EAC cULus
Unit weight (packaged)	PA: ≈ 173 g (≈ 220 g), TN: ≈ 185 g (≈ 232 g)	PA: ≈ 345 g (≈ 438 g), TN: ≈ 370 g (≈ 463 g)

01) For the detailed information about each relay, please refer to 'Power Relay' or data sheet from the manufacturer.
02) It is current consumption per a relay including LED current.
03) It is current consumption including LED current for power part to 02).

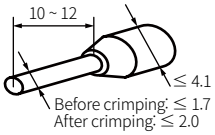
Insulation resistance	≥ 1,000 MΩ (500 VDC⎓ megger)
Dielectric strength (coil-contact)	3,000 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact)	PA: 1,000 VAC~ 50/60 Hz for 1 minute TN: 750 VAC~ 50/60 Hz for 1 minute
Vibration	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 min
Shock	300 m/s² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	150 m/s² (≈ 15 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)

Applicable wire - solid 01)	Ø 0.6 to 1.25 mm
Applicable wire - stranded 01) 02)	AWG 22-18 (0.30 to 0.80 mm²)
Stripped length	8 to 10 mm

01) Use the cable of copper conductor in 60 °C temperature class.
02) When using the stranded wire, use End Sleeve (wire ferrule).

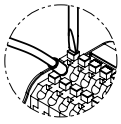
Wire Ferrule Specifications

• Unit: mm, Use the UL approved wire ferrule.



Wiring

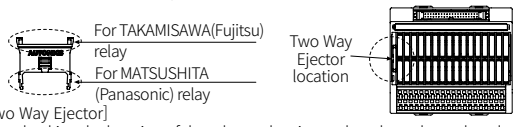
• Connecting
Insert the wire ferrule into the terminal hole.



• Removing
1. Put the (-) screwdriver at the groove on the clamp lever and press it.
2. Pull the cable to disassemble.

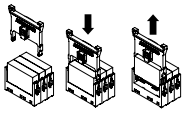
Replacing Relay

1. Disassemble a relay by using Two Way Ejector for relay replacement inside the product.

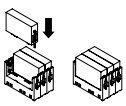


[Two Way Ejector]

2. After checking the location of the relay socket, insert the relay to be replaced.



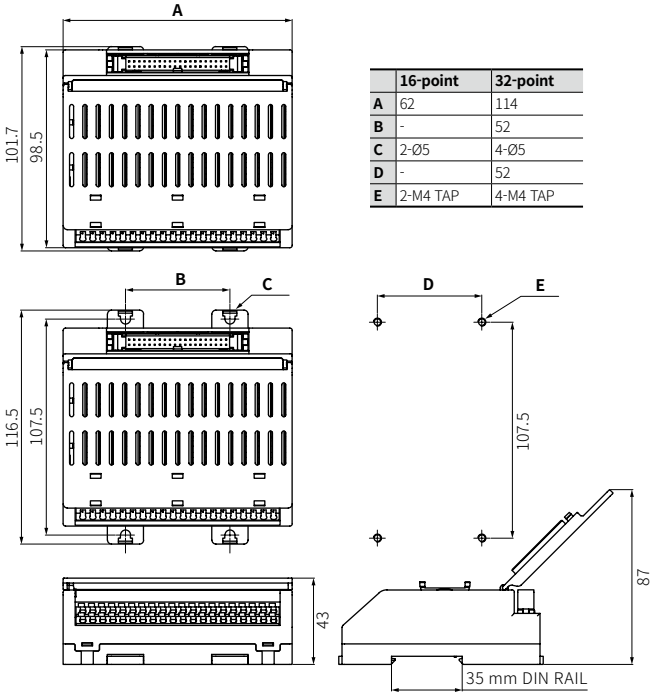
[Disassembling relay using Two Way Ejector]



[Inserting relay]

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.

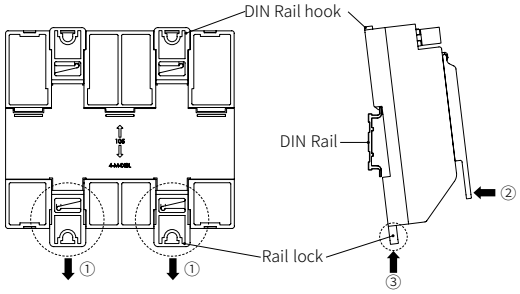


	16-point	32-point
A	62	114
B	-	52
C	2-Ø5	4-Ø5
D	-	52
E	2-M4 TAP	4-M4 TAP

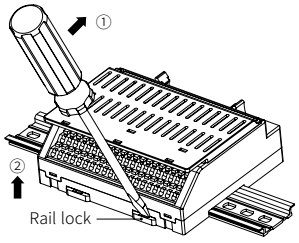
Installation

■ DIN Rail

• Mounting
1. Pull the Rail lock on the rear of the product to the direction ①.
2. Hang DIN rail hook on the rear of the product onto DIN rail.
3. Push the product to the direction ②, and push the Rail lock to the direction ③ to fix onto the DIN rail.

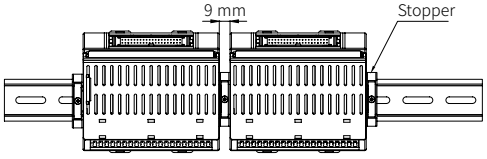


• Removing
1. Insert a tool such as screwdriver into the hole of Rail lock.
2. Push the tool to the direction ① and pull the Rail lock.
3. Lift bottom of the product to the direction ② and remove the product from DIN rail.



■ Example

• When two or more terminal blocks are installed
: Use a stopper (sold separately) to make space between devices.



■ Panel

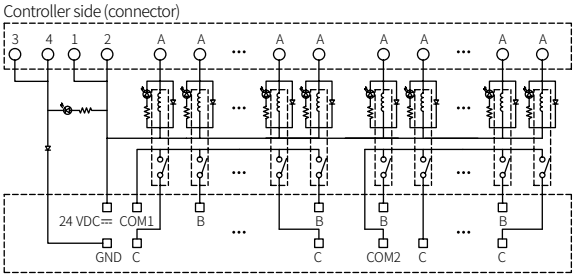
With the DIN rail lock at the top/bottom of the body, the product can be installed on panel with screw.
It is recommended to use M4×10 mm of spring washer screws.
If you use flat washer, its diameter should be Ø 9 mm.
Tighten the screw with the tightening torque of 1.0 to 1.5 N·m.

Wire Connection

■ Wire connection

• 16-point NPN

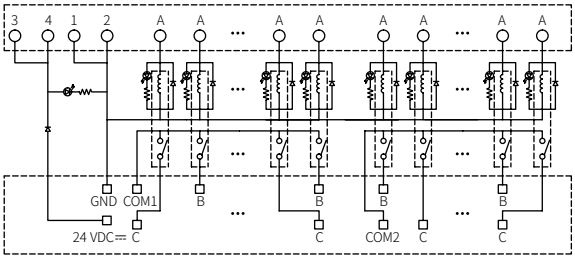
Controller side (connector)



Terminal side

• 16-point PNP

Controller side (connector)

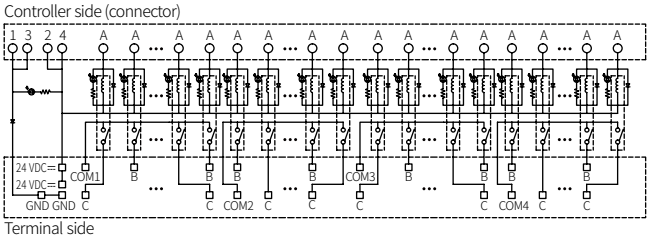


Terminal side

A	Pin	20	18	16	14	12	10	8	6	19	17	15	13	11	9	7	5
COM	COM	COM1								COM2							
B	Upper terminal	-	01	-	03	-	05	-	07	08	-	0A	-	0C	-	0E	-
		-	R2	-	R4	-	R6	-	R8	R9	-	R11	-	R13	-	R15	-
C	Low terminal	00	-	02	-	04	-	06	-	-	09	-	0B	-	0D	-	0F
		R1	-	R3	-	R5	-	R7	-	-	R10	-	R12	-	R14	-	R16

• 32-point NPN

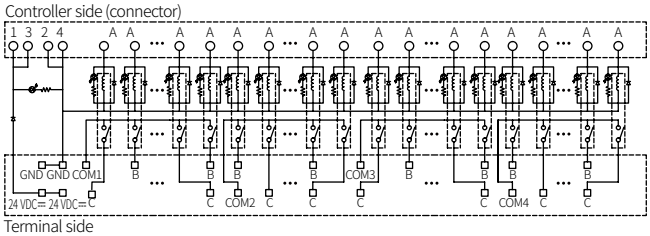
Controller side (connector)



Terminal side

• 32-point PNP

Controller side (connector)



Terminal side

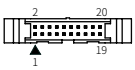
A	Pin	40	38	36	34	32	30	28	26	24	22	20	18	16	14	12	10
COM	COM	COM1								COM2							
B	Upper terminal	-	01	-	03	-	05	-	07	08	-	0A	-	0C	-	0E	-
		-	R2	-	R4	-	R6	-	R8	R9	-	R11	-	R13	-	R15	-
C	Low terminal	00	-	02	-	04	-	06	-	-	09	-	0B	-	0D	-	0F
		R1	-	R3	-	R5	-	R7	-	-	R10	-	R12	-	R14	-	R16

A	Pin	39	37	35	33	31	29	27	25	23	21	19	17	15	13	11	9
COM	COM	COM3								COM4							
B	Upper terminal	-	11	-	13	-	15	-	17	18	-	1A	-	1C	-	1E	-
		-	R18	-	R20	-	R22	-	R24	R25	-	R27	-	R29	-	R31	-
C	Low terminal	10	-	12	-	14	-	16	-	-	19	-	1B	-	1D	-	1F
		R17	-	R19	-	R21	-	R23	-	-	R26	-	R28	-	R30	-	R32

■ Hirose connector pin arragement

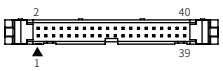
• 20-pin connector

Omron (XG4A-2031)



• 40-pin connector

Omron (XG4A-4031)



Relay: APAN3124 [MATSUSHITA (Panasonic)]

■ Coil specifications

All values in the table are measured at 20 °C with a tolerance of ±10 %.

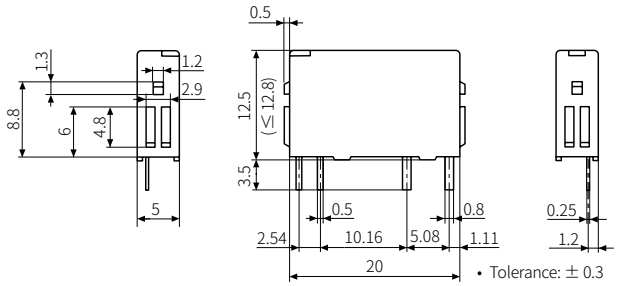
Rated voltage	Operate voltage	Release voltage	Rated current	Coil resistance	Power consumption
24 VDC⎓	≥ 70 % of rated voltage	≤ 5 % of rated voltage	7.5 mA	3,200 Ω	180 mW

■ Contact specifications

Manufacture	MATSUSHITA (Panasonic)	
Contact arrangement	1 Form A (SPST-1a)	
Contact material	Au-clad AgNi type	
Contat resistance (initial)	30 mΩ (6 VDC⎓ 1 A)	
Rated load	5 A 250 VAC∼	5 A 30 VDC⎓
Max. switching capacity	1,250 VA	150 W
Min. switching capacity	100 mVDC⎓ 100 uA	
Max. switching voltage	250 VAC∼	110 VDC⎓
Max. switching current	5 A	
Insulation resistance	≥ 1,000 MΩ (500 VDC⎓ megger)	
Dielectric strength (contact-coil)	3,000 VAC∼ 50/60 Hz for 1 minute	
Dielectric strength (open contacts)	1,000 VAC∼ 50/60 Hz for 1 minute	
Surge voltage	6,000 V	
Operate time	≤ 10 ms	
Release time	≤ 5 ms	
Vibration	3.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	2.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minute	
Shock	980 m/s² (≈ 100 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	147 m/s² (≈ 15 G) in each X, Y, Z direction for 3 times	
Mechanical life expectancy	≥ 20,000,000 operations (at 180 operations/min)	
Electrical life expectancy	≥ 100,000 operations (3 A 250 VAC∼, 30 VDC⎓ resistive load)or ≥ 50,000 operations (5 A 250 VAC∼, 30 VDC⎓ resistive load, at 20 operations/min)	
Ambient temperature	-40 to 90 °C (a non freezing or condensation environment)	
Ambient humidity	5 to 85 %RH (a non freezing or condensation environment)	
Weight	≈ 3 g	

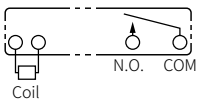
■ Dimensions

• unit: mm

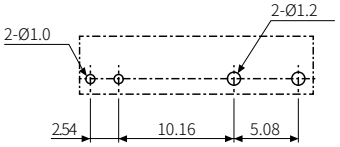


• Tolerance: ± 0.3

• Circuit diagram (bottom view)



• PCB pattern



It was written based on the data provided by each manufacturer, but there is room for change, so be sure to check the manufacturer's data.

Relay: NYP24W-K [TAKAMISAWA (Fujitsu)]

■ Coil specifications

All values in the table are measured at 20 °C with a tolerance of ±10 %.

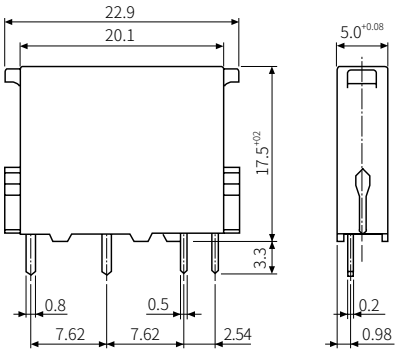
Rated voltage	Operate voltage	Release voltage	Rated current	Coil resistance	Power consumption
24 VDC⎓	16.1 VDC⎓	2.4 VDC⎓	5 mA	4,800 Ω	120 mW

■ Contact specifications

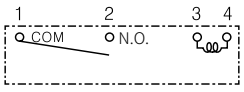
Manufacture	TAKAMISAWA (Fujitsu)	
Contact arrangement	1 Form A (SPST-1a)	
Contact material	Gold overlay silver alloy	
Contat resistance (initial)	≤ 30 mΩ (6 VDC⎓ 1 A)	
Rated load	3 A 250 VAC~	3 A 30 VDC⎓
Max. switching capacity	750 VA	90 W
Min. switching capacity	5 VDC⎓ 1 mA	
Max. switching voltage	270 VAC~	150 VDC⎓
Max. switching current	5 A	
Insulation resistance	≥ 1,000 MΩ (500 VDC⎓ megger)	
Dielectric strength (contact-coil)	3,000 VAC~ 50/60 Hz for 1 minute	
Dielectric strength (open contacts)	750 VAC~ 50/60 Hz for 1 minute	
Surge voltage	5,080 V	
Operate time	≤ 10 ms	
Release time	≤ 5 ms	
Vibration	5.0 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	1.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minute	
Shock	1,000 m/s^2 (≈ 100 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s^2 (≈ 10 G) in each X, Y, Z direction for 3 times	
Mechanical life expectancy	≥ 20,000,000 operations (at 180 operations/min)	
Electrical life expectancy	≥ 100,000 operations (3 A 250 VAC~, 30 VDC⎓ resistive load)or ≥ 50,000 operations (5 A 250 VAC~, 30 VDC⎓ resistive load, at 20 operations/min)	
Ambient temperature	-40 to 90 °C (a non freezing or condensation environment)	
Ambient humidity	35 to 80 %RH (a non freezing or condensation environment)	
Weight	≈ 3.5 g	

■ Dimensions

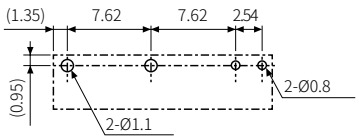
• unit: mm



• Circuit diagram (bottom view)



• PCB pattern



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