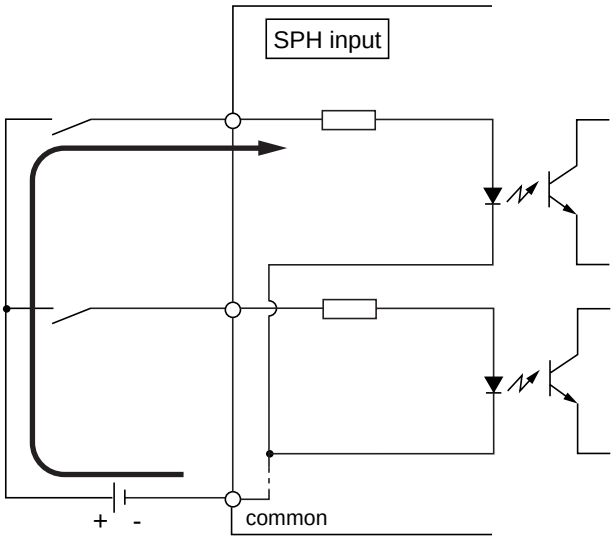
3-5-1 Sink and source

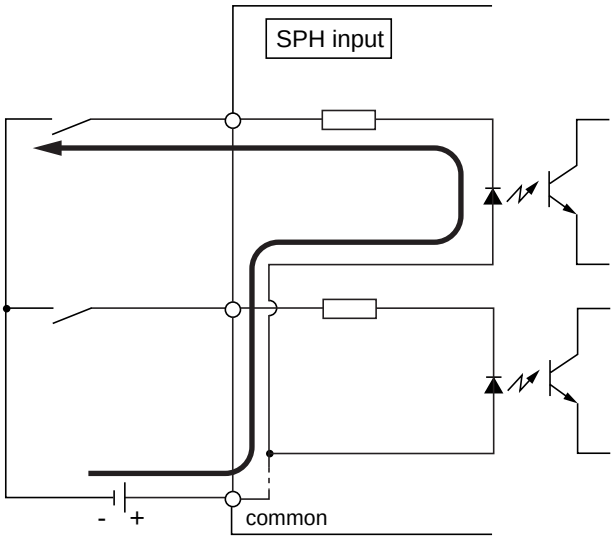
(1) Sink-type input

A sink-type input is where the signal current flows into a signal terminal of a input module.



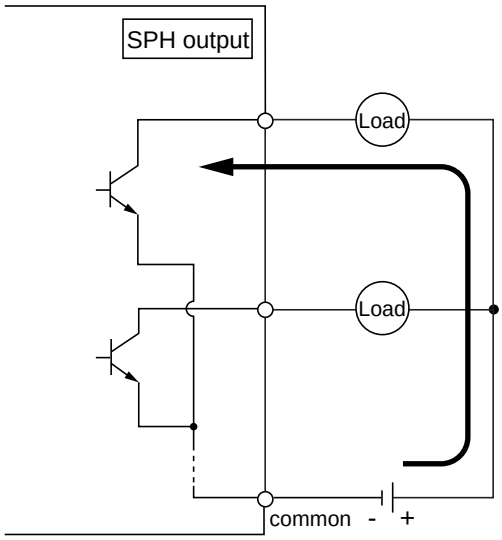
(2) Source-type input

A source-type input is where the signal current flows from a signal terminal of a input module.



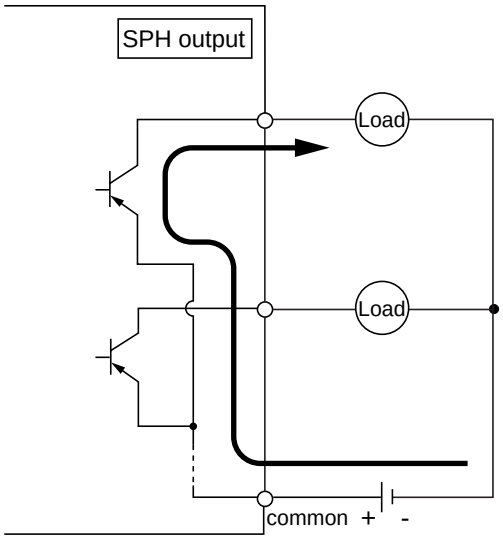
(3) Sink-type output

A sink-type output is where the signal current flows into a signal terminal of a output module.



(4) Source-type output

A source-type output is where the signal current flows from a signal terminal of a output module.



3-5-2 Life curve of relays

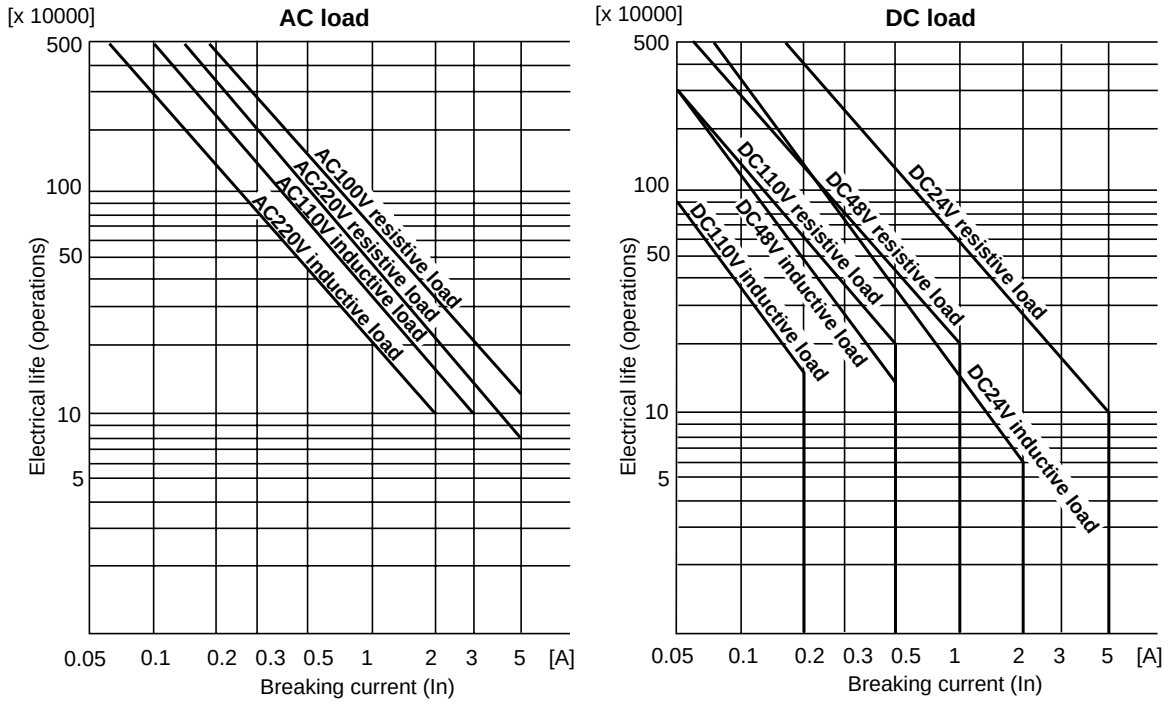
(1) Life curve of relays

The life expectancy of contacts depends on the voltage, current and the type of load connected. As the life expectancy of a relay output is severe for much times of on/off operation, use of a triac output is recommended. Determine the electrical life of contacts and replacement period of modules by taking the following graphs into account.

<Test conditions>

On/off frequency: 1800 times/hour
On load factor: 40%, Time constant L/R= 15ms (inductive load)

[Electrical life curve for relay output element]



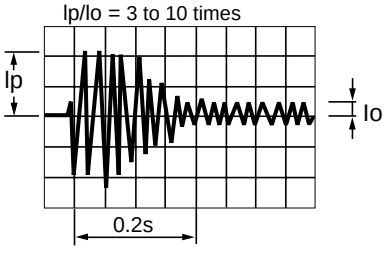
(2) Load types and inrush current

The load types and inrush current characteristics have remarkable effects on relay contacts. In particular, inrush current can cause contact welding, and must be taken into account together with the rated current.

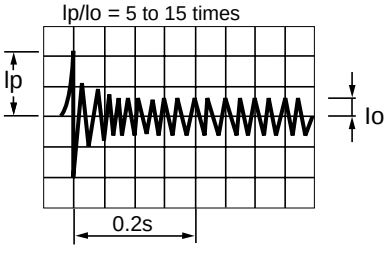
- **Motors, electromagnetic contactors, and solenoid value**
  With these loads, the value of inrush current is 3 to 10 times that of the rated current.
  In addition, when inrush current lasts for a long time, such as under a motor load, breaking of inrush current may cause contact welding.
- **Compact self-ballasted fluorescent lamp load**
  The compact self-ballasted fluorescent lamp load allows rush current flow that is about 100 times the steady current, which may contact melting. Therefore, it is recommended that you perform the confirmation test with a real load.
- **Lamp loads**
  With lamp loads, the value of inrush current is 5 to 15 times that of the rated current. Because the inrush current may cause contact welding, in particular when a lamp with a large current capacity is to be turned on and off, it is recommended that confirmation test be performed using the actual load.
  The figure as shown below are examples of the relationship between current waveform and time for each load. (Ip: Inrush current, Io: Rated current)

[Relationship between current waveform and time for each load]

• Motor loads



• Halogen lamp loads

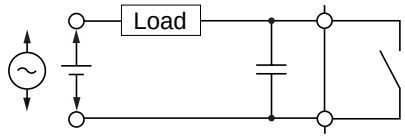
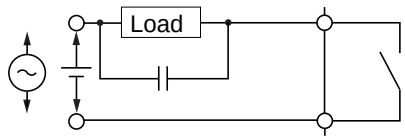
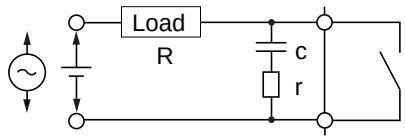
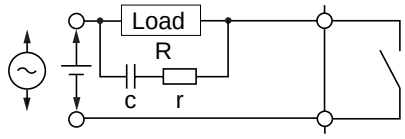
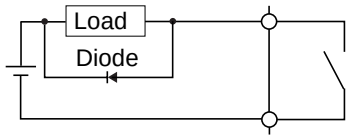
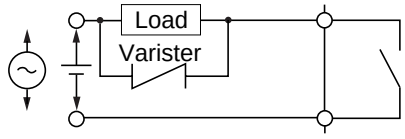


(3) Protection of contacts

When an inductive load such as motors, clutches, and solenoids is turned off, counter electromotive forces of several hundreds to thousands volts are generated, which may greatly shorten the electrical life of contacts. This is because the energy $1/2Li^2$ accumulated in the coil (L: inductance of coil) is consumed by discharge between contacts when an inductive load is turned off. Therefore, to absorb the counter electromotive force, use of a contact protection circuit is recommended. The following shows some examples of contact protection circuits; in each case AC or DC voltage must be used appropriately.

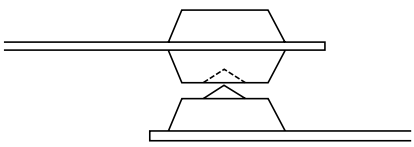
Note that using a contact protection circuit may slightly extend the recovery time.

Contact protection circuit

Example circuit	Judgment	Notes on use
	No good	(1) The contact tends to be welded when the contact is closed. (2) With AC voltage, leakage voltage may occur at the load.
	No good	(1) The contact tends to be welded when the contact is closed.
	Good	(1) C= 0.1 to 1μF, r nearly equals R (2) With AC voltage: · Not applicable if the load impedance (R) is larger than the impedance of c or r · Applicable if the load impedance (R) is sufficiently small compared with the impedance of c or r
	Good	(1) C= 0.1 to 1μF, r nearly equals R (2) AC and DC voltage applicable
	Good	(1) DC voltage only (2) AC voltage not applicable
	Good	(1) AC and DC voltage are applicable

(4) Contact transfer

Contact transfer refers to a phenomena in which one side of contact melts or evaporates and is transferred to the other side because of on/off operation of the DC load. As the number of on/off times increases, the protruded portion on one contact grows and the embossed portion on other contact becomes correspondingly large. Eventually the two contacts are locked as if contact melting occurred. This phenomena may occur within the ratings of relay contacts. In particular, when a relay is used to turn on and off a capacitive load, this phenomena may occur. In this case, use a resistor to suppress inrush current.



(5) Notes on relay output

When used in silicon gas atmosphere, contact failure of the relay contact may occur. To prevent this, avoid using silicon rubber, silicon oil, etc. which evaporate silicon gas or change relay output to transistor output, etc.

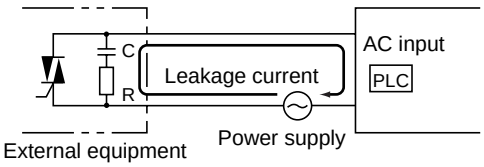
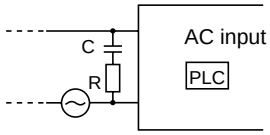
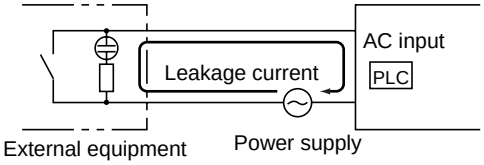
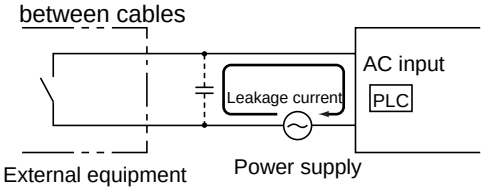
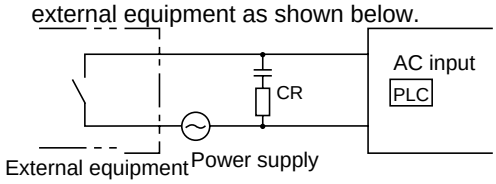
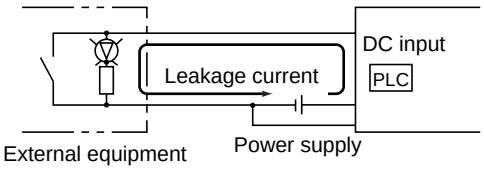
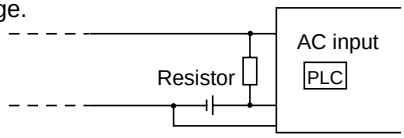
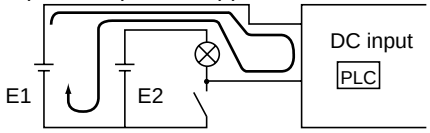
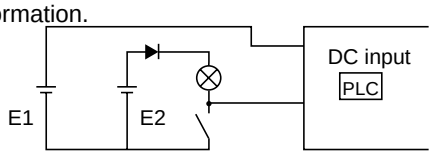
Tips for Preventing I/O Malfunctions

ONE-POINT ADVICE

Example of malfunction of I/O circuit and its countermeasure

When digital I/O is used, malfunction of the I/O circuit may occur. For example, even if an external input device (such as a sensor) is turned off, the PLC input remains turned on; or even if the PLC output is turned off, an external output device (such as a lamp) remains turned on.
The following table shows the causes and countermeasures for each case of malfunction, which should be taken into account in designing hardware.

(1) Input circuit malfunctions

Status	Cause	Countermeasures
—Case 1— The input signal does not go off.	· Leakage current from external equipment (driven by a proximity switch) 	· Connect an appropriate resistor and capacitor so that the voltage between terminals of the input module is lower than the recovery voltage value. (A capacitor is not necessarily for some circuit.)  · The CR value is determined by the leakage current value. Recommended value C: 0.1 to 0.47μF R: 47 to 120Ω (1/2W) · Alternatively, a display circuit is installed separately as an independent circuit.
—Case 2— The input signal does no go off. (The neon lamp remains on in some cases.)	· Leakage current from external equipment (driven by a limit switch with a neon lamp) 	
—Case 3— The input signal does not go off.	· Leakage current due to stray capacitance between cables 	· Same as case 1. · The power supply is installed outside the external equipment as shown below. 
—Case 4— The input signal does no go off.	· Leakage current from external equipment (driven by a switch with an LED indicator) 	· Connect an appropriate resistor so that the voltage between the input module terminal and the common line is lower than the OFF voltage. 
—Case 5— The input signal does not go off.	· Sneak-circuit formed by the use of two independent power supplies.  · When E1 > E2, a sneak-circuit is formed.	· Use only one power supply. · Connect a diode to prevent sneak-circuit formation. 

Tips for Preventing I/O Malfunctions

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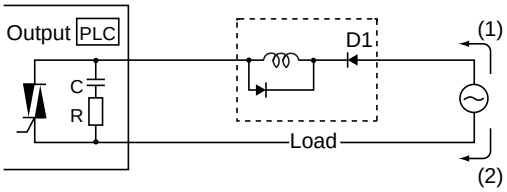
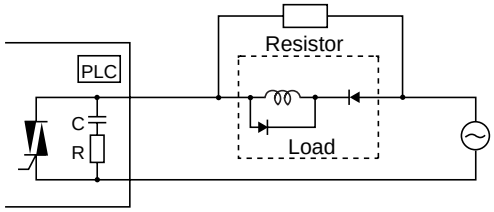
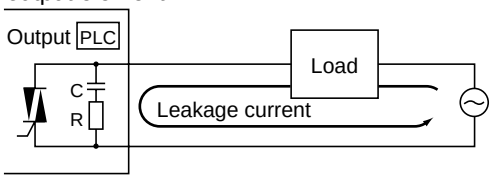
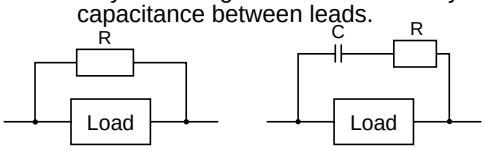
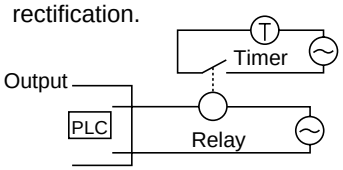
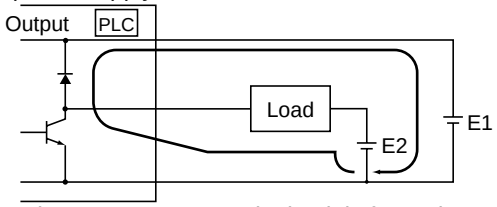
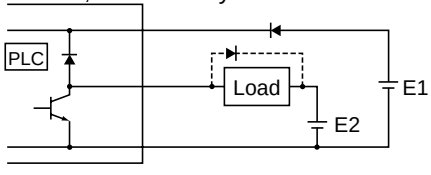
(2) Output circuit malfunctions

Status	Cause	Countermeasures
—Case 1— When the output circuit is turned off, excessive voltage is applied to the load.	· Half-wave rectification is made inside the load, as is the case with solenoids. · When the polarity of the power supply is as in (1) below, capacitor C is charged. When it is changed as in (2), the sum of the voltage charged and the power voltage is applied to both sides of diode D1. In this case the maximum voltage value is about $2\sqrt{2}$ E. Note: With this usage, the output element has no problem but the diode (D1) built into the load is deteriorated, which may cause burn or other failures. 	· Connect a resistor with several ten to hundred kΩ in parallel with the load. 
—Case 2— The load does not go off.	· Leakage current due to the surge absorbing circuit being connected in parallel with the output element. 	· Connect a resister of several ten kΩ or CR with the same impedance in parallel with the load. Note: When the wiring distance between the output module and load is long, there may be leakage current due to stray capacitance between leads. 
—Case 3— When the load is a CR timer, timer operates incorrectly.	Same as case 2.	· Drive the CR timer by means of a relay. · Use a timer of other than the CR type. Note: Follow the note in case 1, because some timers perform half-wave rectification. 
—Case 4— The load does not go off.	· Loop-back circuit formed by the use of two power supply units  · When E1 > E2, a sneak-circuit is formed. · When E1 is off and E2 is on, a sneak-circuit is also formed.	· Use only one power supply. · Connect a diode to prevent sneak-circuit formation. Note: When a relay is used as a load, connect a diode for absorbing counter electromotive force in parallel with the load, as shown by the dotted lines below. 

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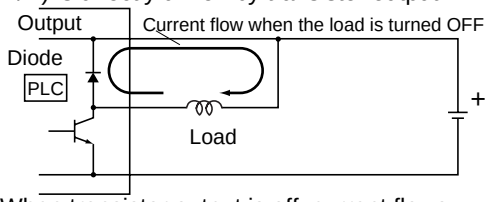
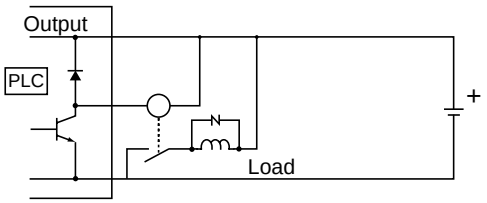
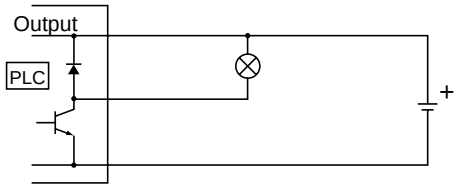
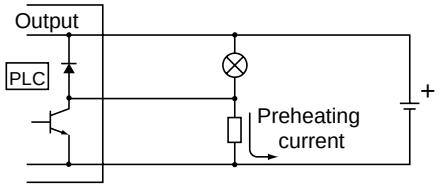
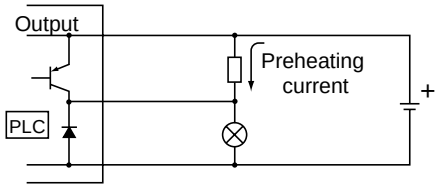
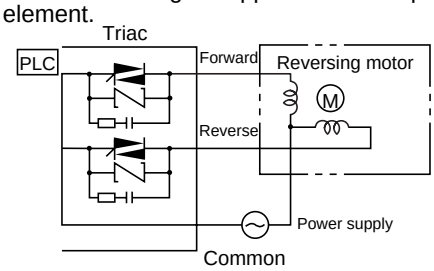
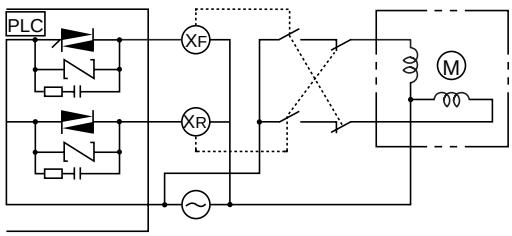
Status	Cause	Countermeasures
—Case 5— The off response time of the load is excessively long.	· Transient current when the load turned OFF. When a solenoid or other large current inductive load (with a large time constant L/R) is directly driven by transistor output.  · When transistor output is off, current flows through the diode and therefore the off response time may be delayed by 1 second or more.	· As shown below, connect a control relay or magnetic contactor having a short time constant to drive the load.  · Use the output module not having a free wheeling diode, and provide a countermeasure for the surge of the load.
—Case 6— The output transistor is destroyed. (Transistor output)	· Inrush current of an incandescent lamp  · When an incandescent lamp lights up, inrush current more than 10 times rated current may flow.	· To suppress inrush current, allow preheating current that is 1/5 to 1/3 times the rated current of the incandescent lamp to flow.  Sink-type transistor output  Source-type transistor output
—Case 7— The output triac is destroyed. (SSR output)	· Excessive voltage is applied to the output element.  · When the output of the forwarding coil side is on, voltage is induced in the reversing coil, and excessive voltage (induced voltage + power voltage) is applied to the output of the reversing coil side that is off. · Voltage almost two times the power supply voltage may be applied. · The surge absorber may burn out before the triac is damaged.	· Provide a relay or a magnetic contactor to drive the load.  · External interlock circuit is required.

Tips for Preventing I/O Malfunctions

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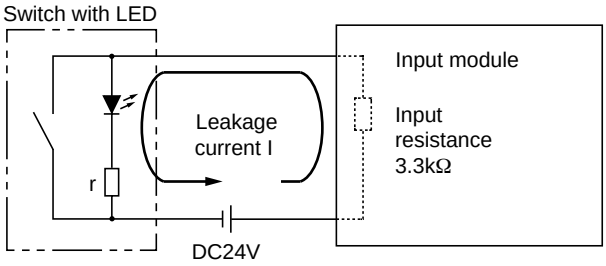
* Continued from preceding page

(3) Example of calculating bleeder resistance

The following is example of calculating bleeder resistance, which is provided as a countermeasure for input malfunction due to leakage current of the LED circuit.

1) Example malfunction



When r = 2.6kΩ, leakage current I is as follows:

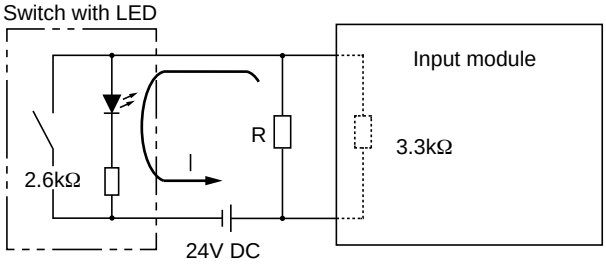
$$I = \frac{24}{(2.6 + 3.3) \times 10^3} \fallingdotseq 4.1 \times 10^{-3}\,(A)\ (= 4.1mA)$$

In this case, the voltage given by the following expression is applied between input terminals of theinput module.

$$4.1 \times 10^{-3} \times 3.3 \times 10^3 \fallingdotseq 14\ (V)$$

Because the voltage exceeds the OFF voltage of the input module (5.0V), if a switch with LED is turned off, the input module remain on.

2) Countermeasure



Insert a bleeder resistor (R) between the input terminals of input module so that the voltage applied between them is reduced to 5.0V or less.

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3) Example calculation

· When the voltage applied to the bleeder resistor is 5.0V, the current given by the following expression flows.

$$I = \frac{24 - 5.0}{2.6 \times 10^{3}} = 7.3 \times 10^{-3}\ (A)\ \ (= 7.3mA)$$

· R can be obtained from the following expression, by taking into account the input resistance and the bleeder resistance.

$$\frac{5.0}{R} > 7.3 \times 10^{-3} - \frac{5.0}{3.3 \times 10^{3}} \Rightarrow R < 860(\Omega)$$

· When R= 820 (Ω), the capacity (P) of the bleeder resistor can be obtained from the following expression. (When a switch with LED is turned on, 24V DC is applied to the bleeder resistor.)

$$P = \frac{24^{2}}{820} \fallingdotseq 0.702\ (W)$$

Assuming a margin that is normally 3 to 4 times the above value, the capacity of the resistor is determined to be 3W.

Conclusion: Connect a bleeder resistor with 820Ω/3W.

MEMO

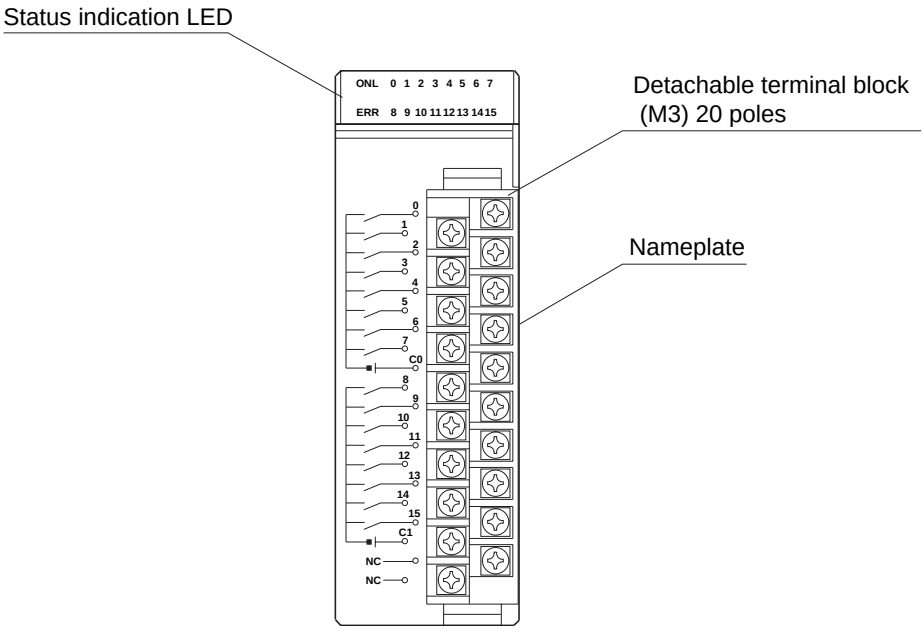
3-5-3 Digital input

(1) Input 24V DC 16 points (NP1X1606-W)

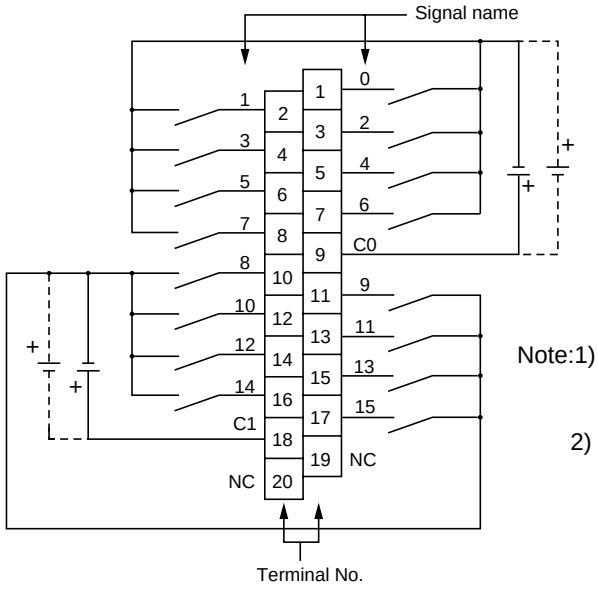
Item			Specification
Type			NP1X1606-W
No. of input points			16 points (8 points common x 2 circuits)
Input signal condition	Rated voltage		24V DC (24V AC can also be input)
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source, sink common
	Input current		7mA (24V DC)
	Input impedance		3.3kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type 1
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Input indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between input terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between input terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 75% (at 30V DC/55° C)
External power supply			For signal: 24V DC
Internal current consumption			24V DC, 35mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 150g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>

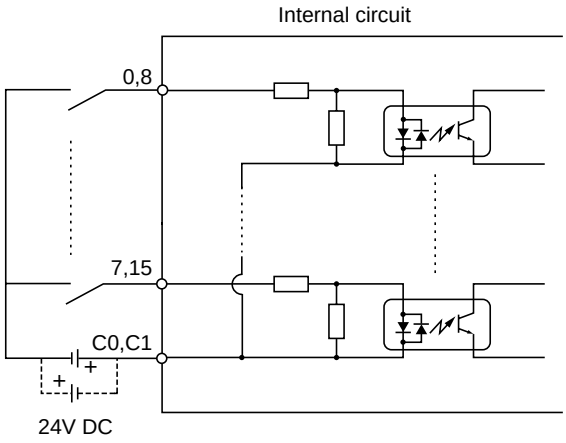


<External wiring>



Note:1) Common terminals C0 and C1 are electrically separated and isolated from each other.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

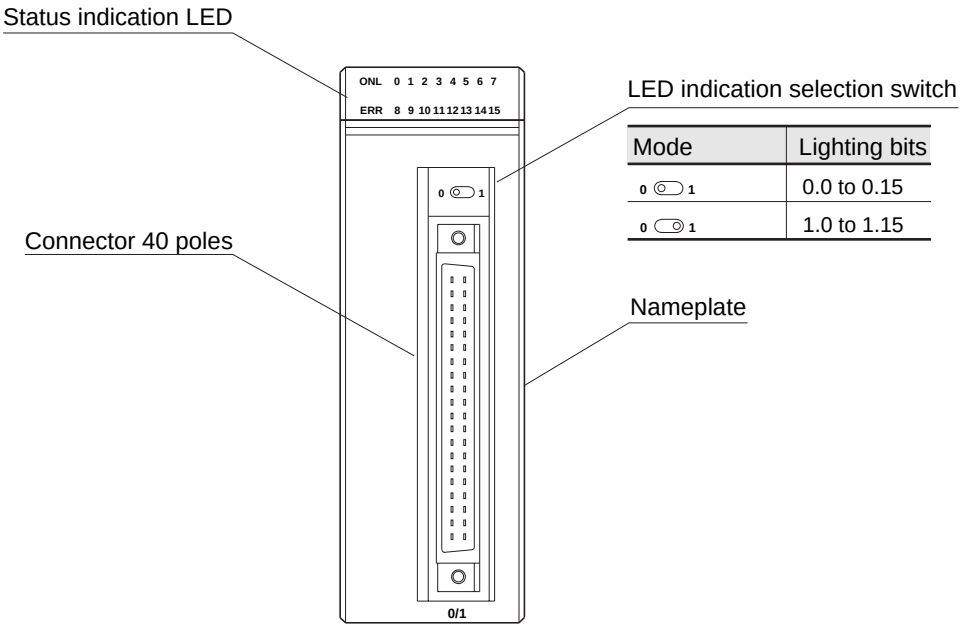


(2) Input 24V DC 32 points (NP1X3206-W)

Item			Specification
Type			NP1X3206-W
No. of input points			32 points (32 points common x 1 circuit)
Input signal condition	Rated voltage		24V DC
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source, sink common
	Input current		4mA (24V DC)
	Input impedance		5.6kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Input indication			For selected points by the switch, LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between input terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between input terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 75% (at 30V DC/55° C)
External power supply			For signal: 24V DC
Internal current consumption			24V DC, 50mA or less (when all points are turned ON)
Occupied words			2 words
Mass			Approx. 130g

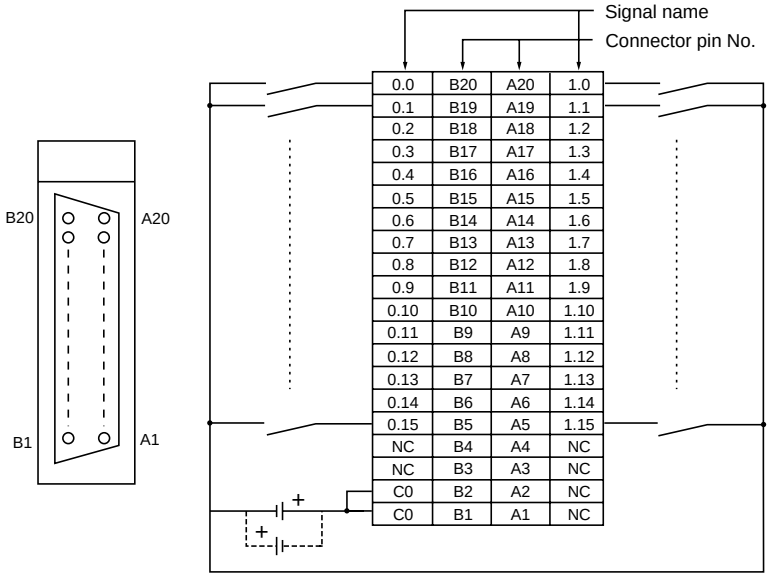
Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



Mode	Lighting bits
0 ⊙ 1	0.0 to 0.15
0 ⊙ 1	1.0 to 1.15

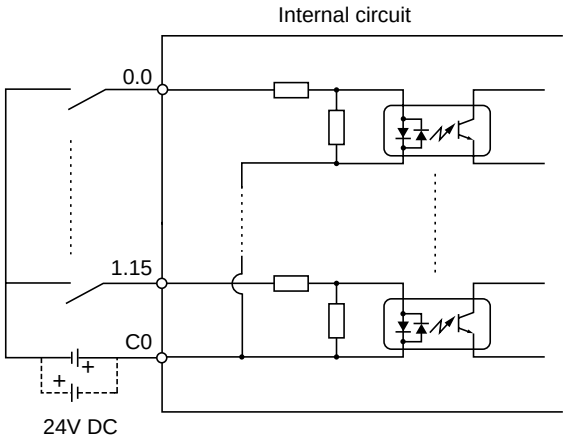
<External wiring>



0.0	B20	A20	1.0
0.1	B19	A19	1.1
0.2	B18	A18	1.2
0.3	B17	A17	1.3
0.4	B16	A16	1.4
0.5	B15	A15	1.5
0.6	B14	A14	1.6
0.7	B13	A13	1.7
0.8	B12	A12	1.8
0.9	B11	A11	1.9
0.10	B10	A10	1.10
0.11	B9	A9	1.11
0.12	B8	A8	1.12
0.13	B7	A7	1.13
0.14	B6	A6	1.14
0.15	B5	A5	1.15
NC	B4	A4	NC
NC	B3	A3	NC
C0	B2	A2	NC
C0	B1	A1	NC

Note: NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

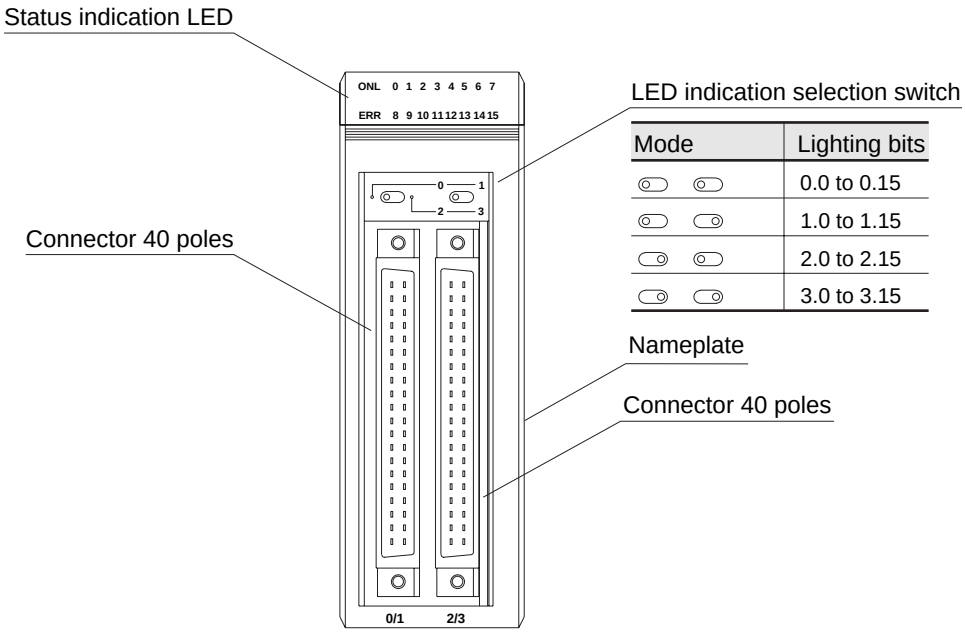


(3) Input 24V DC 64 points (NP1X6406-W)

Item			Specification
Type			NP1X6406-W
No. of input points			64 points (32 points common x 2 circuits)
Input signal condition	Rated voltage		24V DC
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source, sink common
	Input current		4mA (24V DC)
	Input impedance		5.6kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 2 pieces
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Input indication			For selected points by the switch, LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between input terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between input terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 60% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 45% (at 30V DC/55° C)
External power supply			For signal: 24V DC
Internal current consumption			24V DC, 85mA or less (when all points are turned ON)
Occupied words			4 words
Mass			Approx. 180g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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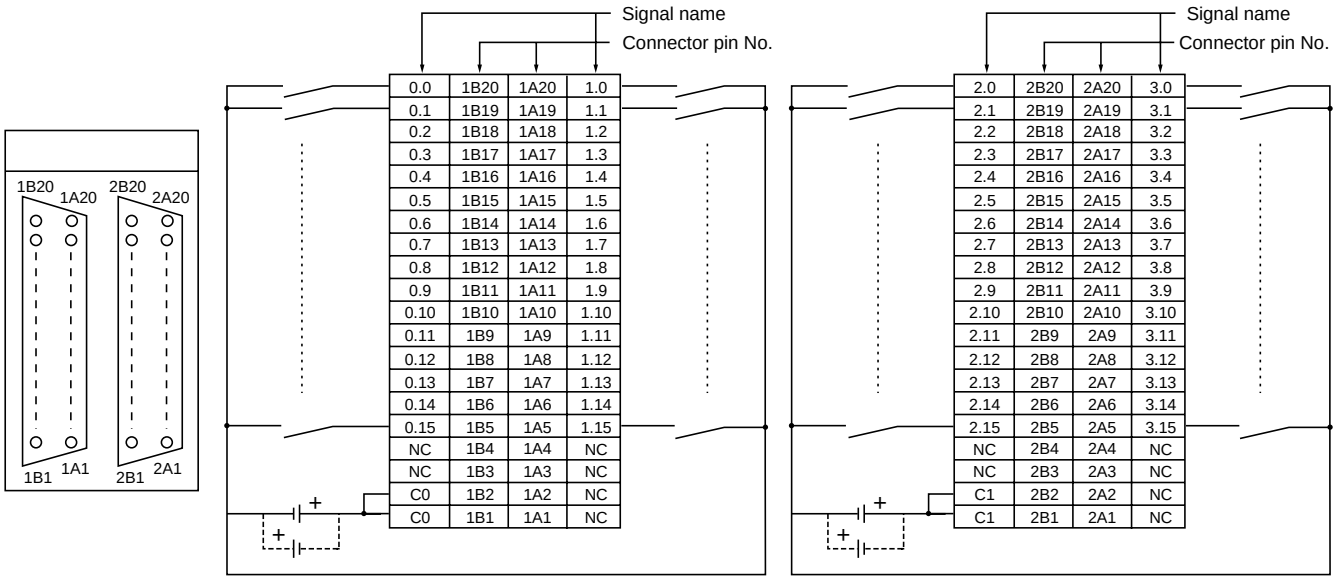
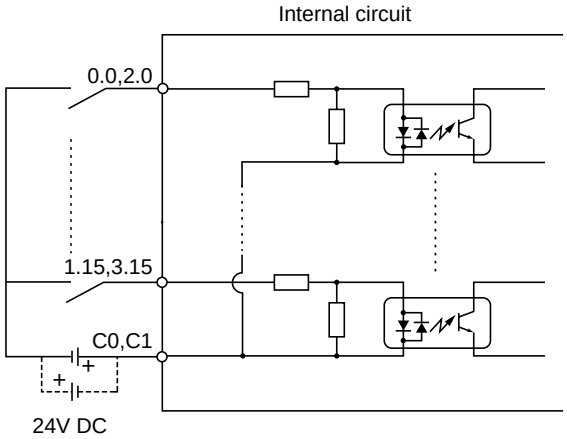


Note:1) Common terminals C0 and C1 are electrically separated and isolated from each other.
2) NC indicates a terminal not connected to an internal circuit.
Do not use NC terminals as repeating terminals.

<Circuit configuration>

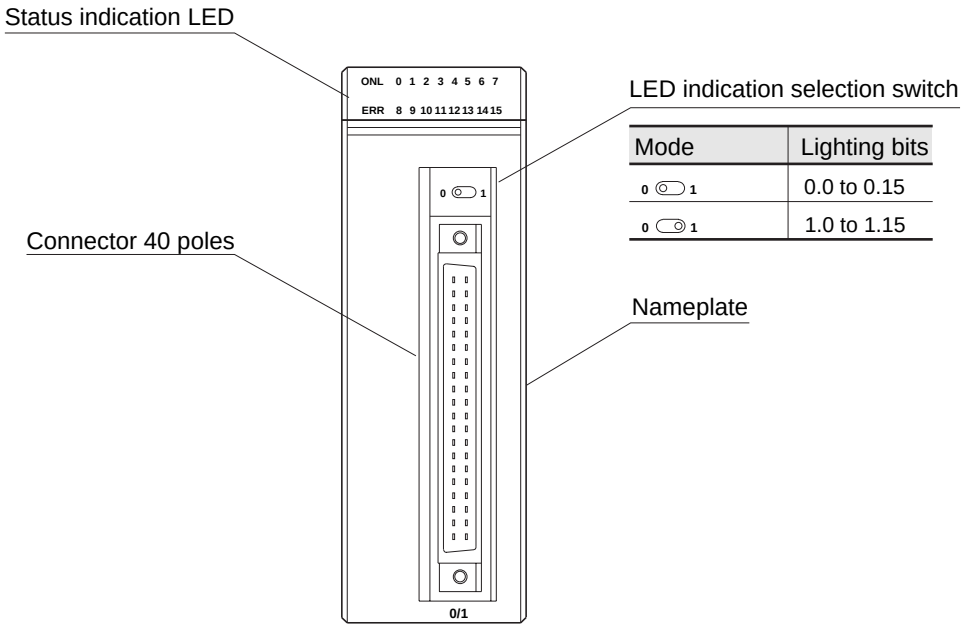


(4) Input 5 to 12V DC 32 points (NP1X3202-W)

Item			Specification
Type			NP1X3202-W
No. of input points			32 points (32 points common x 1 circuit)
Input signal condition	Rated voltage		5 to 12V DC
	Rated voltage (tolerance)		13.2V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source, sink common
	Input current		3mA (5V DC), 9mA (12V DC)
	Input impedance		1.2kΩ
	Operating voltage	OFF to ON	3.5 to 13.2V
		ON to OFF	0 to 1V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Input indication			For selected points by the switch, LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between input terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between input terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 13.2V DC/55° C) Simultaneous ON rate: Max. 75% (at 15V DC/55° C)
External power supply			For signal: 5 to 12V DC
Internal current consumption			24V DC, 50mA or less (when all points are turned ON)
Occupied words			2 words
Mass			Approx. 130g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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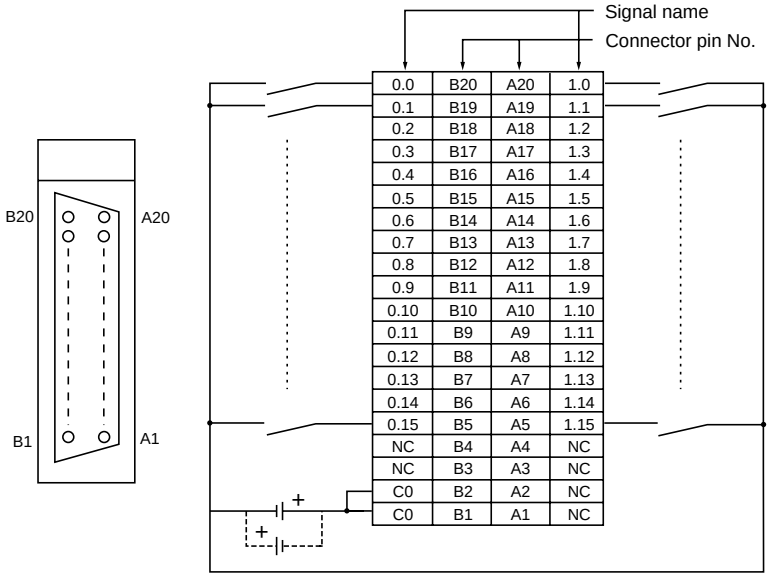
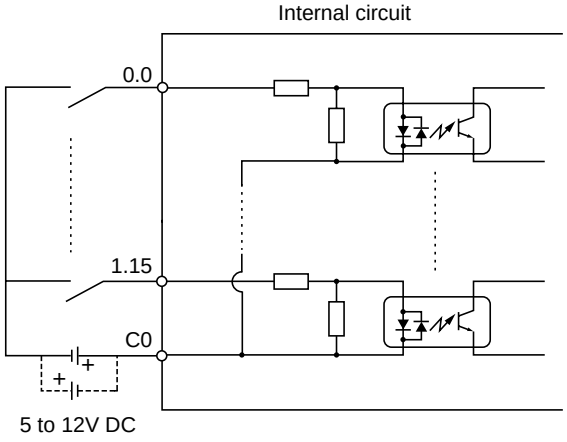


Note: NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>



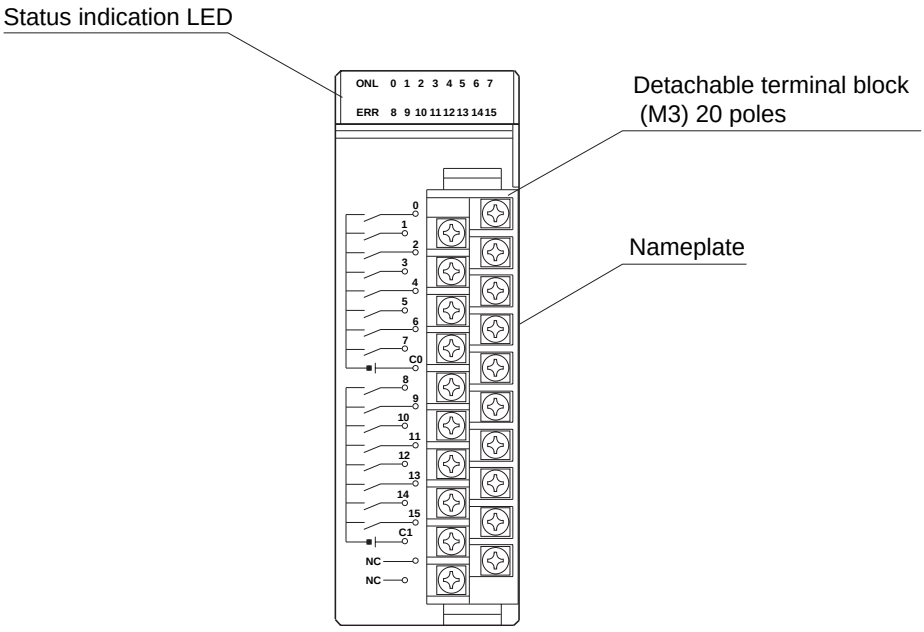
3-5 I/O Specifications

(5) Input 48V DC 16 points (NP1X1607-W)

Item			Specification
Type			NP1X1607-W
No. of input points			16 points (8 points common x 2 circuits)
Input signal condition	Rated voltage		48V DC
	Rated voltage (tolerance)		60V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source, sink common
	Input current		5mA
	Input impedance		10kΩ
	Operating voltage	OFF to ON	34 to 60V
		ON to OFF	0 to 10V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type 1
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Input indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between input terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between input terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 48V DC/55° C) Simultaneous ON rate: Max. 90% (at 52.8V DC/55° C) Simultaneous ON rate: Max. 60% (at 60V DC/55° C)
External power supply			For signal: 48V DC
Internal current consumption			24V DC, 35mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 150g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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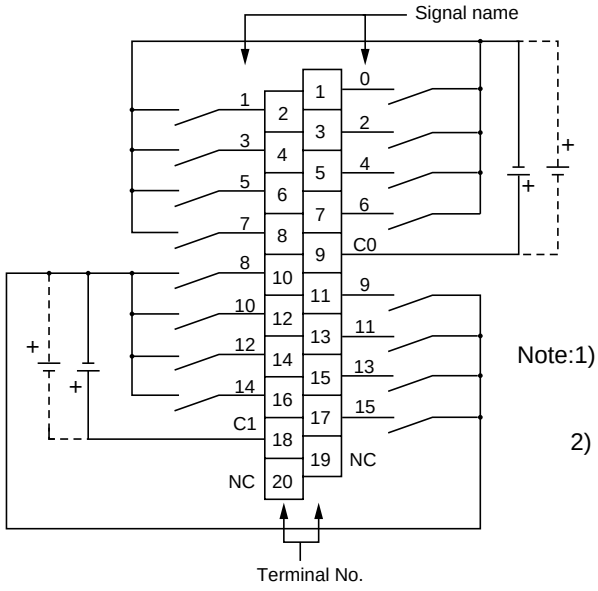
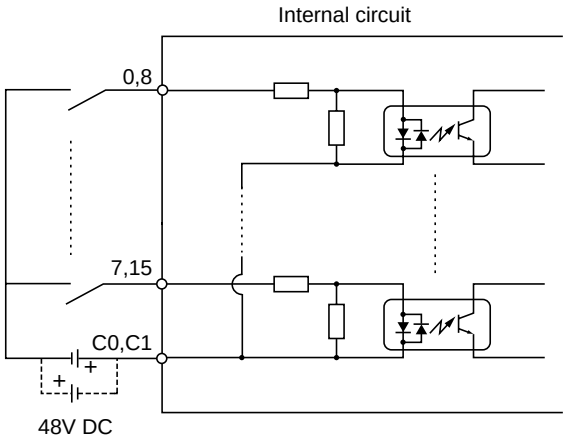


Note:1) Common terminals C0 and C1 are electrically separated and isolated from each other.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

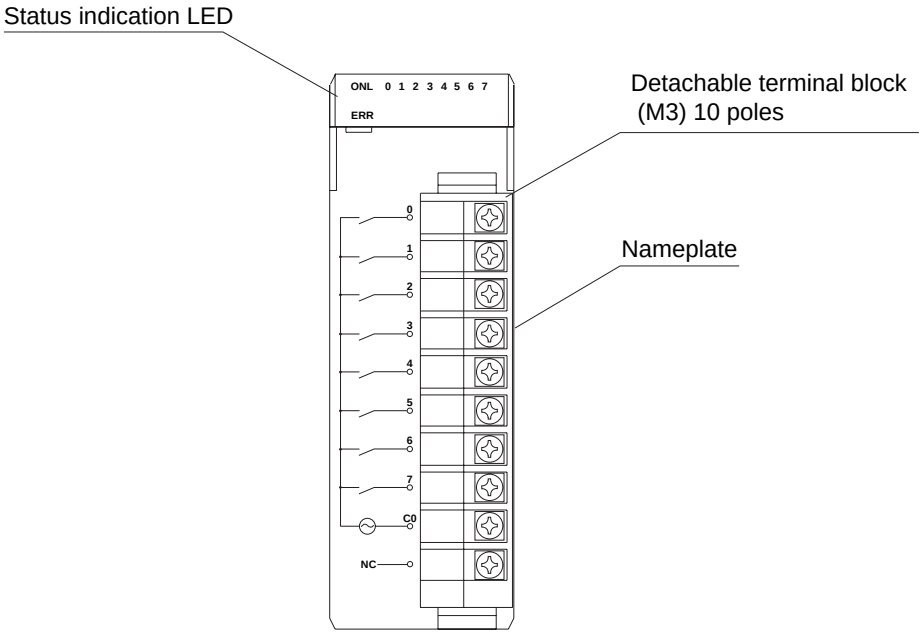


(6) Input 100V AC 8 points (NP1X0810)

Item			Specification
Type			NP1X0810
No. of input points			8 points (8 points common x 1 circuit)
Input signal condition	Input type		AC Input
	Rated voltage		100 to 120V AC
	Rated voltage (tolerance)		132V AC
	Ripple percentage		5% or less
	Rated frequency		50/60Hz
	Rated frequency (tolerance)		47 to 63Hz
	Inrush current		Max. 150mA
Characteristics of input circuit	Input current		10mA
	Input impedance		10kΩ (50Hz), 9kΩ (60Hz)
	Operating voltage	OFF to ON	80 to 132V
		ON to OFF	0 to 20V
	Input delay time	OFF to ON	Approx. 10ms
		ON to OFF	Approx. 10ms
	Input type		AC type1
Wire connections	External wire connections		Detachable screw terminal (M3) 10 poles
	Applicable wire size		AWG #22 to 18 (Note)
Input indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between input terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between input terminals and frame ground)
Derating condition			None
External power supply			For signal: 100 to 120V AC
Internal current consumption			24V DC, 35mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 130g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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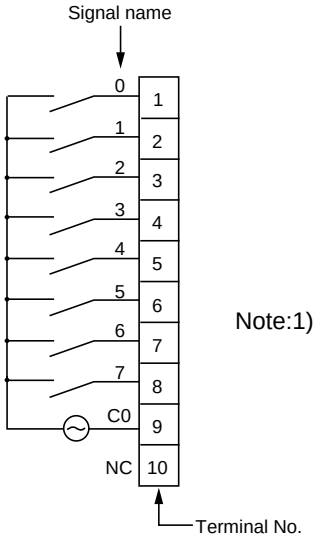
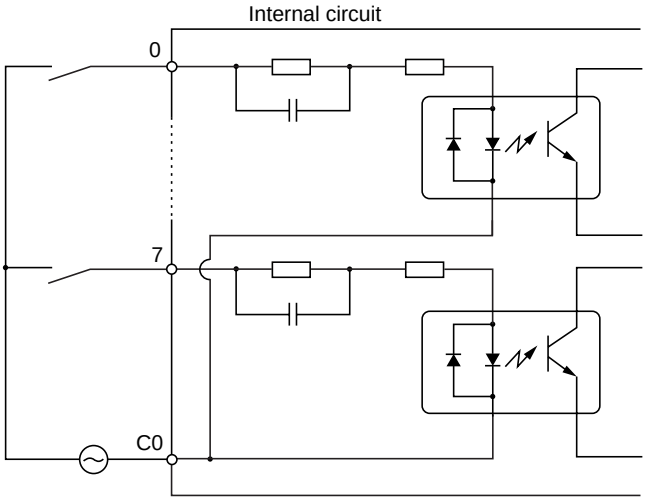


Note:1) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

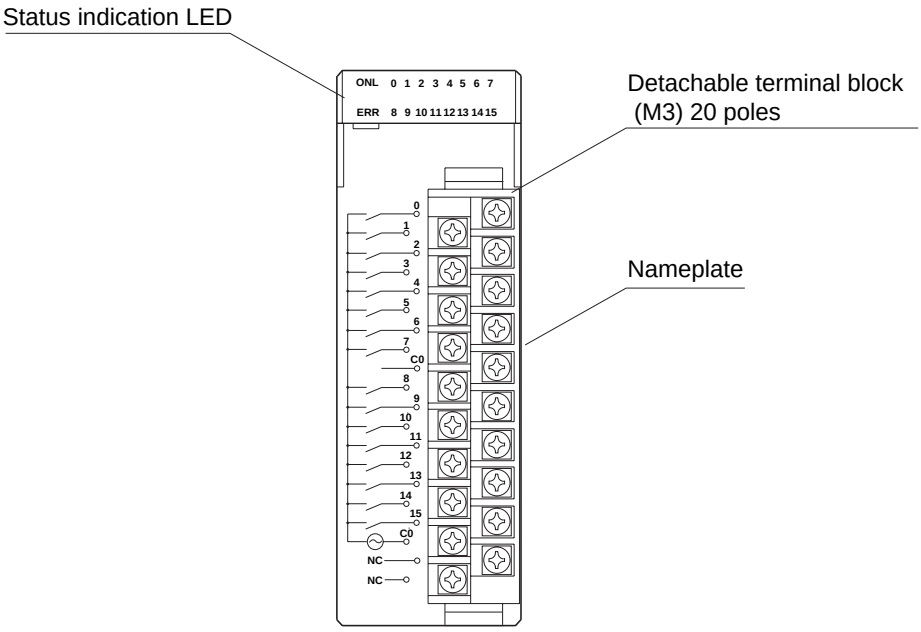


(7) Input 100V AC 16 points (NP1X1610)

Item			Specification
Type			NP1X1610
No. of input points			16 points (16 points common x 1 circuit), 2 common terminals
Input signal condition	Input type		AC Input
	Rated voltage		100 to 120V AC
	Rated voltage (tolerance)		132V AC
	Ripple percentage		5% or less
	Rated frequency		50/60Hz
	Rated frequency (tolerance)		47 to 63Hz
	Inrush current		Max. 150mA
Characteristics of input circuit	Input current		10mA/point (100 to 120V AC)
	Input impedance		10kΩ (50Hz), 9kΩ (60Hz)
	Operating voltage	OFF to ON	80 to 132V
		ON to OFF	0 to 20V
	Input delay time	OFF to ON	Approx. 10ms
		ON to OFF	Approx. 10ms
	Input type		AC type1
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Input indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between input terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between input terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 80% (at 100V AC/55° C) Simultaneous ON rate: Max. 60% (at 132V AC/55° C)
External power supply			For signal: 100 to 120V AC
Internal current consumption			24V DC, 40mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 170g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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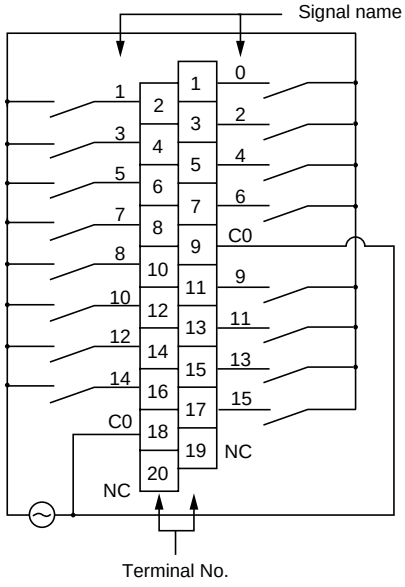
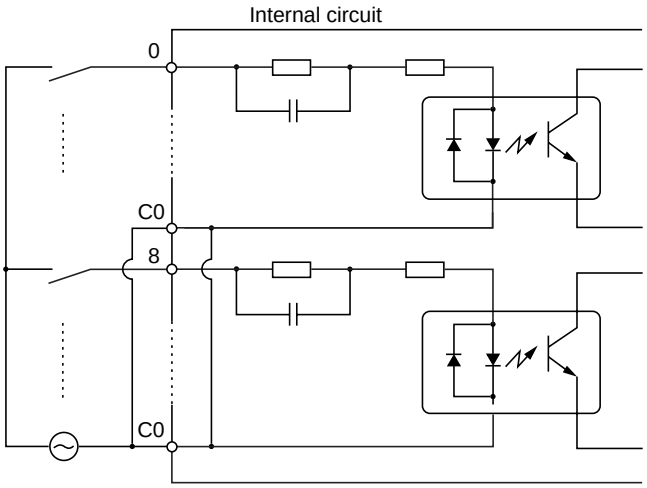


Note:1) Common terminals 9 and 18 are connected internal.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

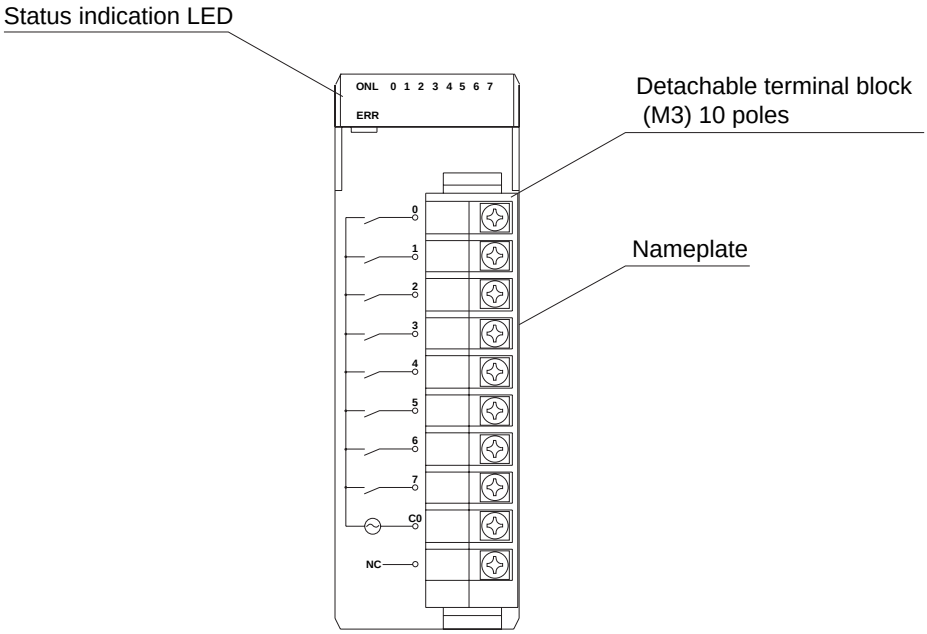


(8) Input 200V AC 8 points (NP1X0811)

Item			Specification
Type			NP1X0811
No. of input points			8 points (8 points common x 1 circuit)
Input signal condition	Input type		AC Input
	Rated voltage		200 to 240V AC
	Rated voltage (tolerance)		264V AC
	Ripple percentage		5% or less
	Rated frequency		50/60Hz
	Rated frequency (tolerance)		47 to 63Hz
	Inrush current		Max. 300mA
Characteristics of input circuit	Input current		10mA/point (200 to 240V AC)
	Input impedance		22kΩ (50Hz), 18kΩ (60Hz)
	Operating voltage	OFF to ON	160 to 264V
		ON to OFF	0 to 40V
	Input delay time	OFF to ON	Approx. 10ms
		ON to OFF	Approx. 10ms
	Input type		AC type1
Wire connections	External wire connections		Detachable screw terminal (M3) 10 poles
	Applicable wire size		AWG #22 to 18 (Note)
Input indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			2830V AC 1 minute (between input terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between input terminals and frame ground)
Derating condition			Simultaneous ON rate: Max 80% (at 200V AC/55° C) Simultaneous ON rate: Max 50% (at 264V AC/55° C)
External power supply			For signal: 200 to 240V AC
Internal current consumption			24V DC, 35mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 130g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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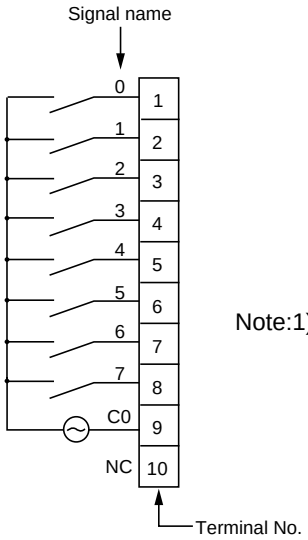
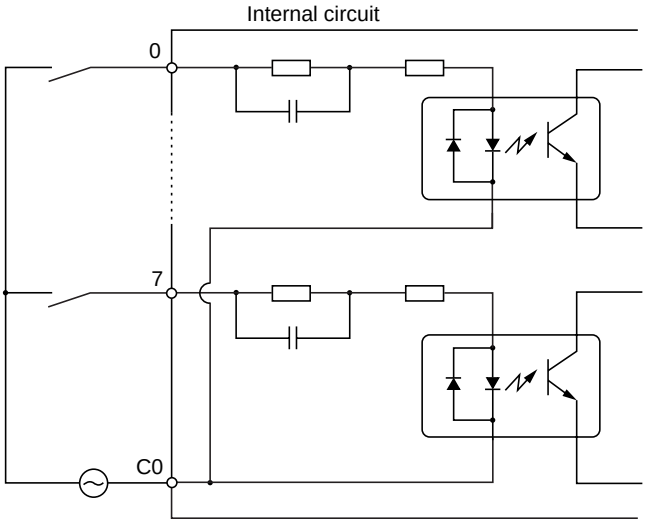


Note:1) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>



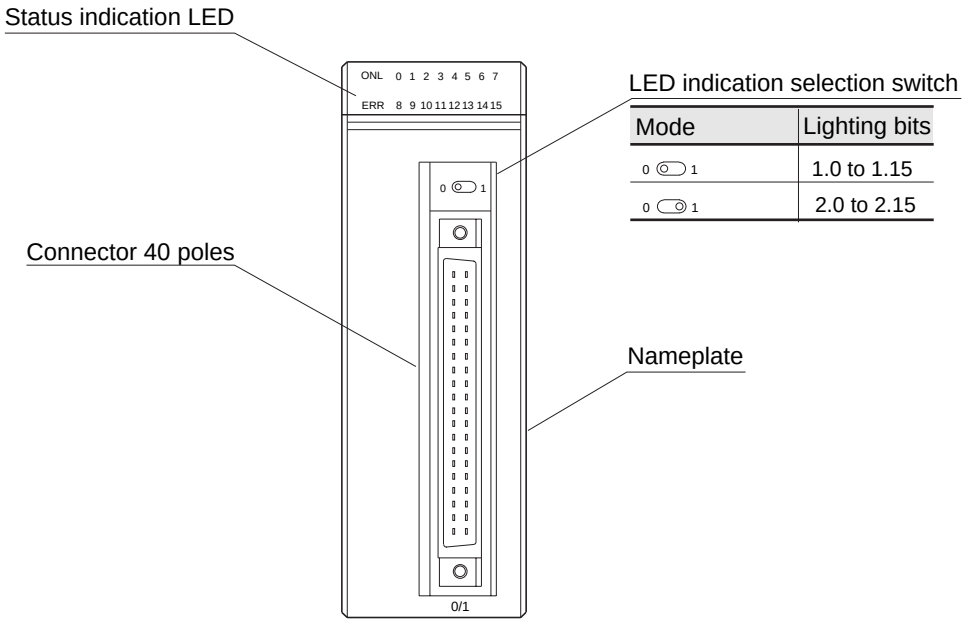
(9) High-speed input 24V DC 32 points (NP1X3206-A)

Item			Specification
Type			NP1X3206-A
No. of input points			32 points (32 points common x 1 circuit)
Input signal condition	Rated voltage		24V DC
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source
	Input current		4mA (24V DC)
	Input impedance		5.6kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter tim (Note 1) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connecto (Note 2)
Input indication			For selected points by the switch, LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between input terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between input terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 75% (at 30V DC/55° C)
External power supply			For signal: 24V DC
Internal current consumption			24V DC, 50mA or less (when all points are turned ON)
Occupied words			14 words (Input: 9 words, Output: 5 words)
Mass			Approx. 130g

Note: 1) Hard filter time depends on used port. Time is 20μs for port 1 to 8, 100μs for port 9 to 32.
2) Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”
And when the counter function is used, no software filter time can be set.

* For more information about this module, refer to the “User’s Manual Digital High-speed Input Module” (FEH211).

<Names>



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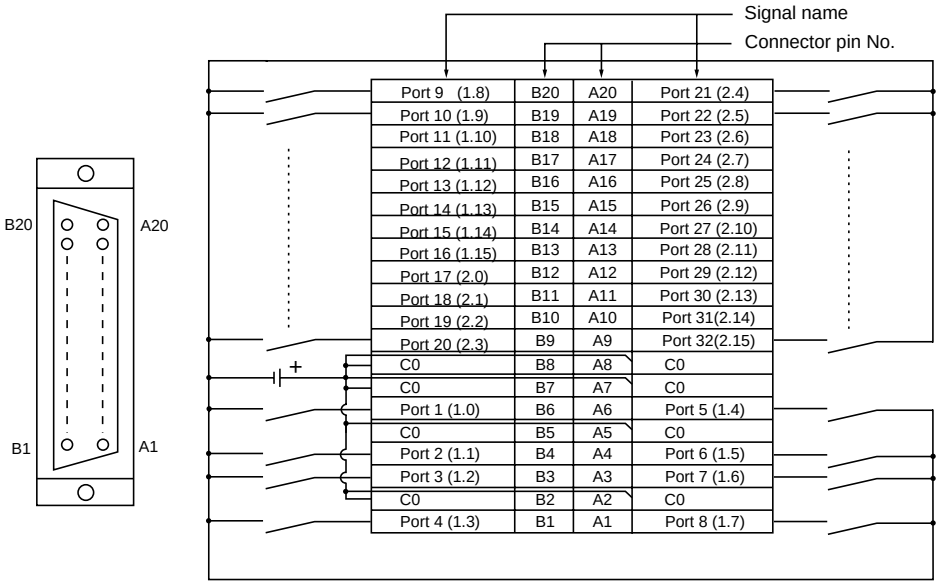


Note:1) Common pins C0s are connected internal.
2) ( ) of signal name indicates an offset address and a bit position.
3) For detail specifications and operations, refer to the manual (FEH211).

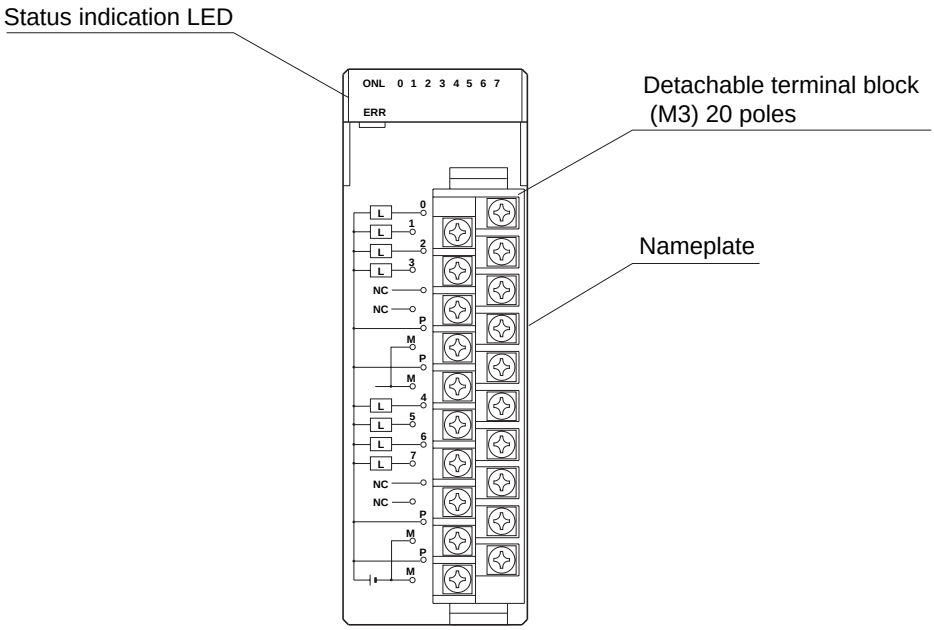
3-5-4 Digital output

(1) Transistor (sink type) output 8 points (NP1Y08T0902)

Item			Specification
Type			NP1Y08T0902
No. of output points			8 points (8 points common x 1 circuit) No. of common terminals P and M is four respectively.
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Sink type
	Max. load current		2.4A/point, 8A/common
	Voltage drop		2V or less (at 2.4A load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		9A 10ms
Output protection method	Built-in fuse		125V, 15A 2 fuses, not changeable
	Surge absorption circuit		Varistor
	Others		None
On/off times			Max. 1800 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 85% (at 30V DC/55° C)
External power supply			12 to 24V DC, 20mA (for transistor drive)
Internal current consumption			24V DC, 20mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 150g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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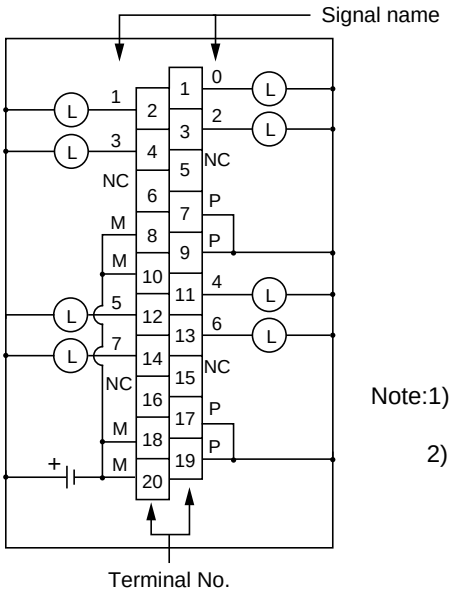
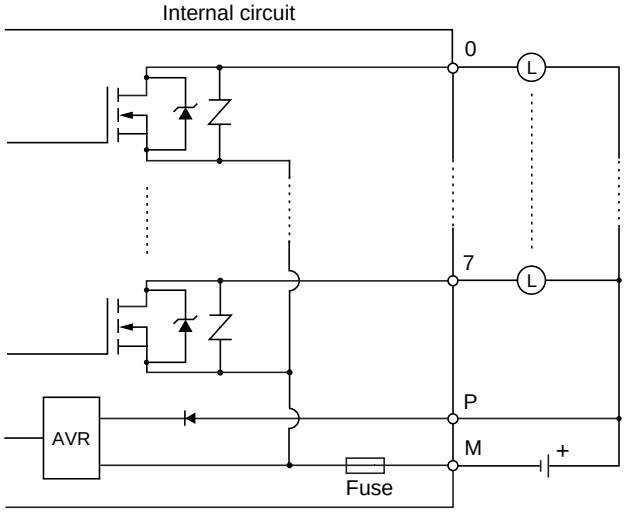


Note:1) Common terminals (P: 7, 9, 17, 19, M: 8, 10, 18, 20) are connected internal.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

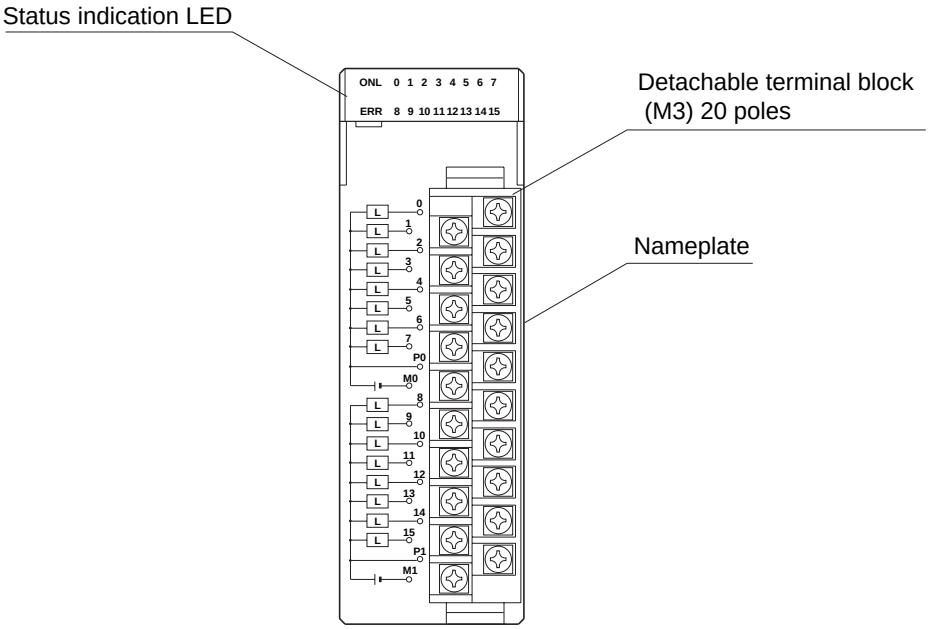


(2) Transistor (sink type) output 16 points (NP1Y16T09P6)

Item			Specification
Type			NP1Y16T09P6
No. of output points			16 points (8 points common x 2 circuits)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Sink type
	Max. load current		0.6A/point, 4A/common
	Voltage drop		1.5V or less (at 0.6A load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		2A 10ms
Output protection method	Built-in fuse		125V, 7A 2 fuses, not changeable
	Surge absorption circuit		Varistor
	Others		None
On/off times			Max. 1800 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 - 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 85% (at 30V DC/55° C)
External power supply			12 to 24V DC, 30mA (for transistor drive)
Internal current consumption			24V DC, 42mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 160g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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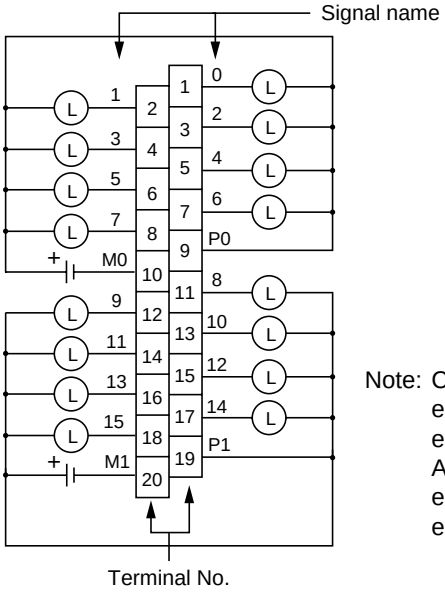
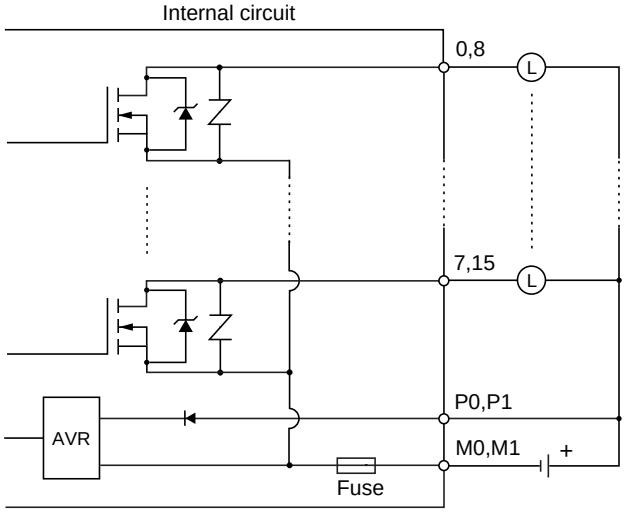


Note: Common terminals P0 and P1 are electrically separated and isolated from each other.
And common terminals M0 and M1 are electrically separated and isolated from each other.

<Circuit configuration>

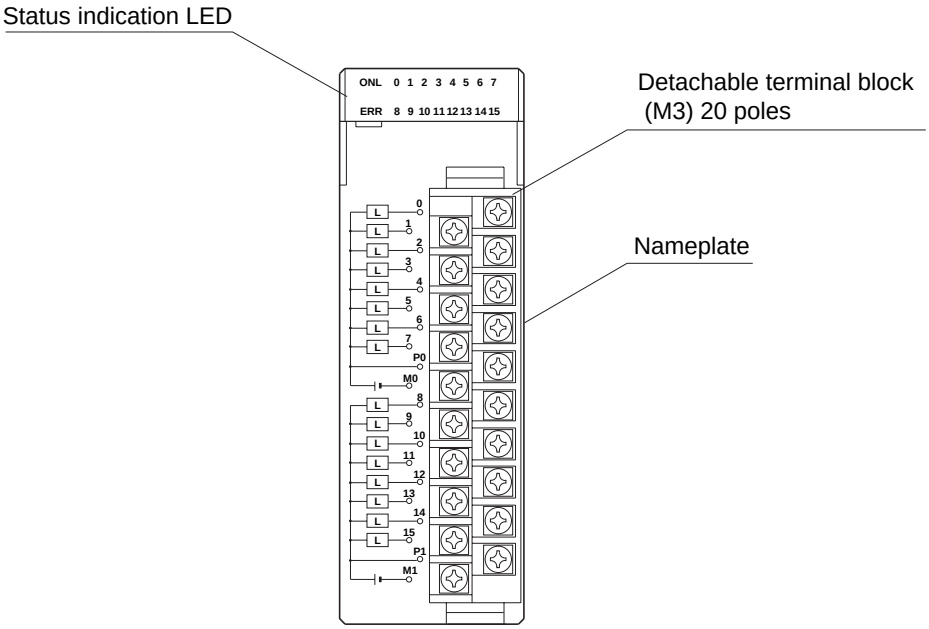


(3) Transistor (sink type) output 16 points (NP1Y16T10P2)

Item			Specification
Type			NP1Y16T10P2
No. of output points			16 points (8 points common x 2 circuits)
Output power supply condition	Rated voltage		48V DC
	Tolerance		38 to 60V DC
Characteristics of output circuit	Output type		Sink type
	Max. load current		0.2A/point, 1.6A/common
	Voltage drop		1.5V or less (at 0.2A load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		1A 10ms
Output protection method	Built-in fuse		125V, 2.5A, not changeable
	Surge absorption circuit		Varistor
	Others		None
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 - 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 48V DC/55° C) Simultaneous ON rate: Max. 90% (at 60V DC/55° C)
External power supply			48V DC, 30mA (for transistor drive)
Internal current consumption			24V DC, 42mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 160g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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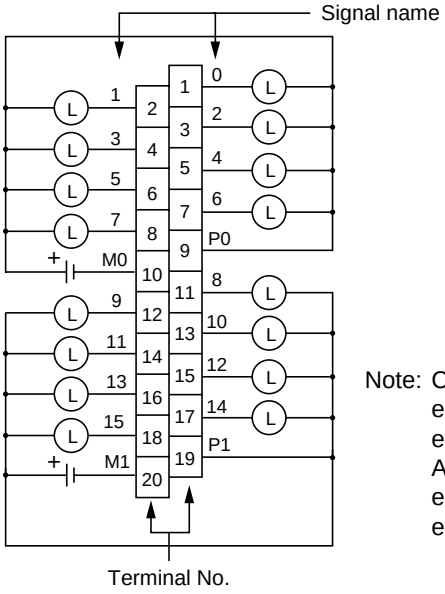
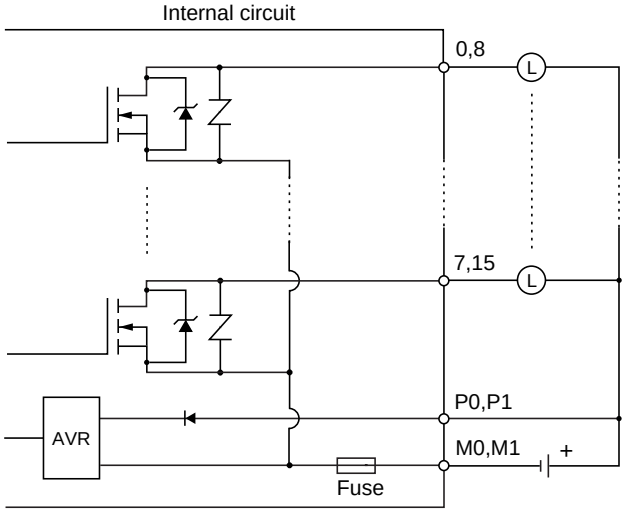


Note: Common terminals P0 and P1 are electrically separated and isolated from each other.
And common terminals M0 and M1 are electrically separated and isolated from each other.

<Circuit configuration>

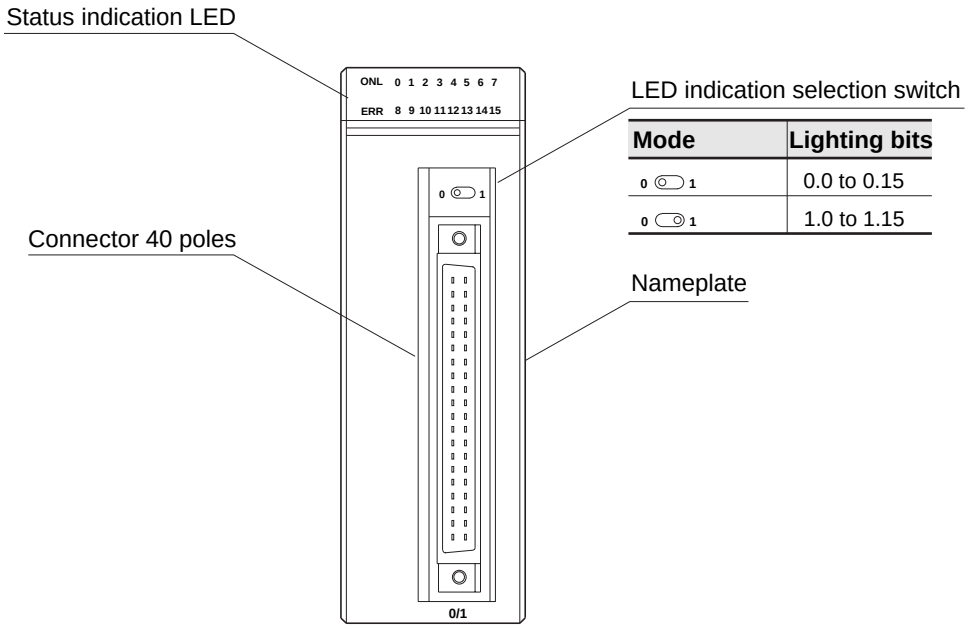


(4) Transistor (sink type) output 32 points (NP1Y32T09P1)

Item			Specification
Type			NP1Y32T09P1
No. of output points			32 points (32 points common x 1 circuit)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Sink type
	Max. load current		0.12A/point (30V DC), 3.2A/common
	Voltage drop		1.5V or less (at 0.12A load)
	Response time	OFF to ON	1ms or less
		ON to OFF	1ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		0.3A 10ms
Output protection method	Built-in fuse		125V, 5A, not changeable
	Surge absorption circuit		Zener diode
	Others		None
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Output indication			For selected points by the switch, LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 80% (at 24V DC/55° C) Simultaneous ON rate: Max. 75% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 65% (at 30V DC/55° C)
External power supply			12 to 24V DC, 52mA (for transistor drive)
Internal current consumption			24V DC, 45mA or less (when all points are turned ON)
Occupied words			2 words
Mass			Approx. 130g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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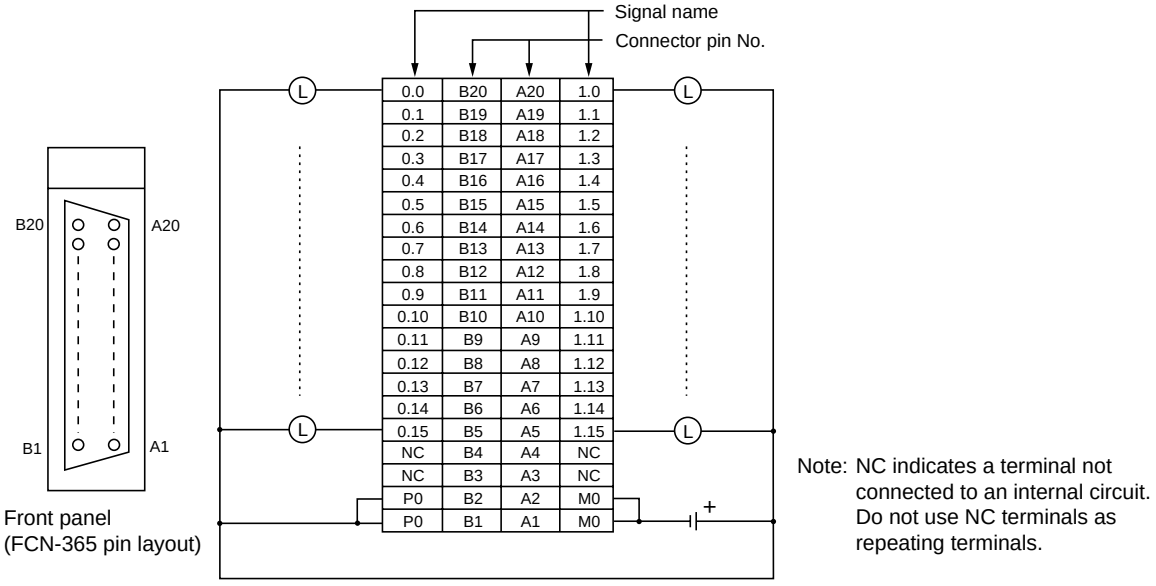
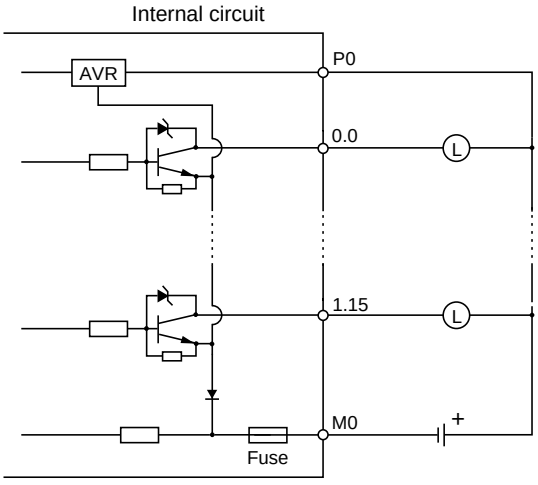


Note: NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

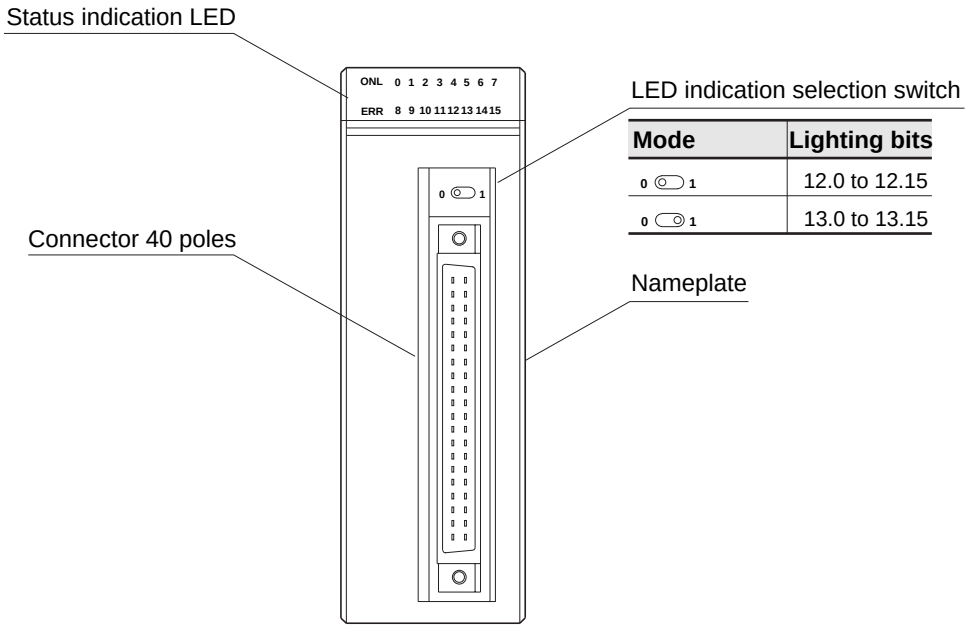


(5) Transistor (sink type) output 32 points with pulse output function (NP1Y32T09P1-A)

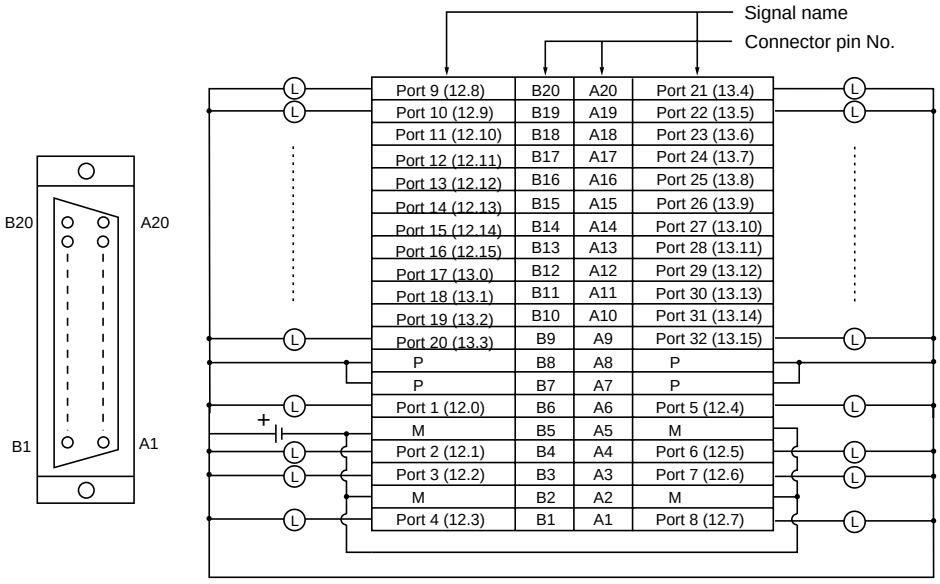
Item			Specification
Type			NP1Y32T09P1-A
No. of output points			32 points (32 points common x 1 circuit)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Sink type
	Max. load current		0.12A/point, 3.2A/common
	Voltage drop		1.5V or less (at 0.12A load)
	Response time	OFF to ON	Part 1 to 8: 20μs or less (at over 20mA) : 25μs (at 10 to 20mA)
		ON to OFF	Part 9 to 32: 1μs or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		0.3A 10ms
Output protection method	Built-in fuse		125V, 5A, not changeable
	Surge absorption circuit		Zener diode
	Others		None
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Output indication			For selected points by the switch, LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 80% (at 24V DC/55° C) Simultaneous ON rate: Max. 75% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 65% (at 30V DC/55° C)
External power supply			12 to 24V DC, 40mA (for transistor drive)
Internal current consumption			24V DC, 50mA or less (when all points are turned ON)
Occupied words			14 words (Input: 6 words, Output: 8 words)
Mass			Approx. 200g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”
* For more information about this module, refer to the “User’s Manual Digital High-speed Output Module” (FEH212).

<Names>



<External wiring>



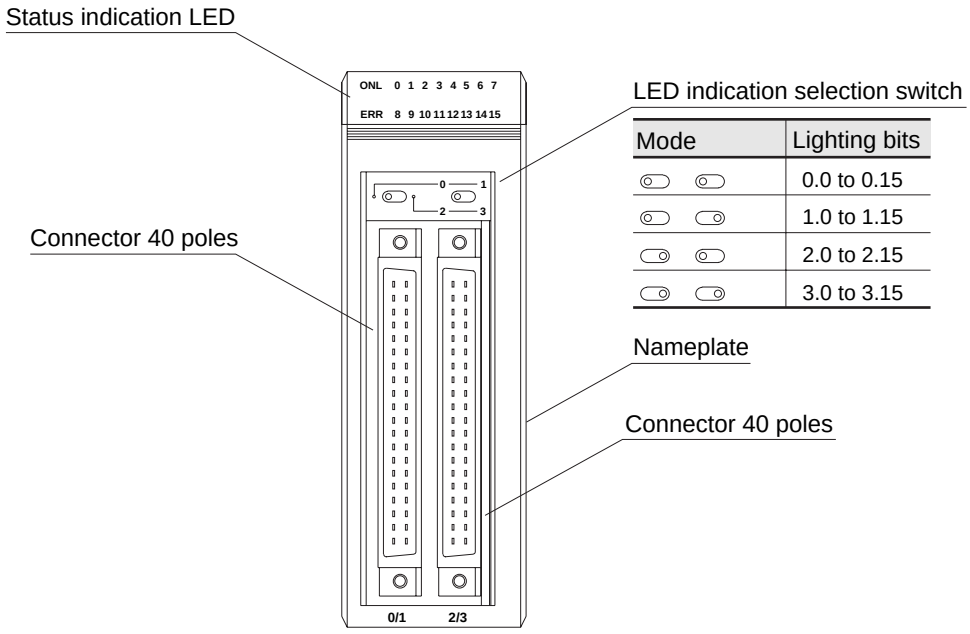
Note: 1) ( ) of signal name indicates an offset address and a bit position.
2) Port 1 to 8 are used for dual-purpose of a pulse train output.
3) For detail specifications and operations, refer to the manual (FEH212).

(6) Transistor (sink type) output 64 points (NP1Y64T09P1)

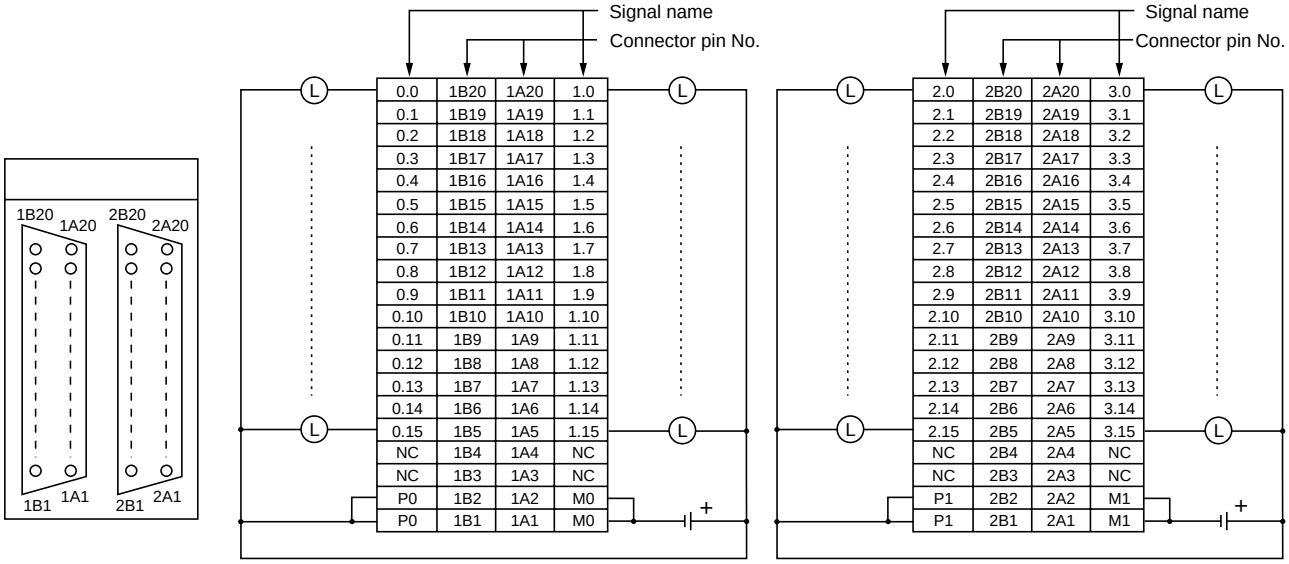
Item			Specification
Type			NP1Y64T09P1
No. of output points			64 points (32 points common x 2 circuits)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Sink type
	Max. load current		0.12A/point, 3.2A/common
	Voltage drop		1.5V or less (at 0.12A load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		0.3A 10ms
Output protection method	Built-in fuse		125V, 5A 2 fuses, not changeable
	Surge absorption circuit		Zener diode
	Others		None
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 2 pieces
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Output indication			For selected points by the switch, LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 90% (at 24V DC/55° C) Simultaneous ON rate: Max. 85% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 85% (at 30V DC/55° C)
External power supply			12 to 24V DC, 80mA (for transistor drive)
Internal current consumption			24V DC, 90mA or less (when all points are turned ON)
Occupied words			4 words
Mass			Approx. 180g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>

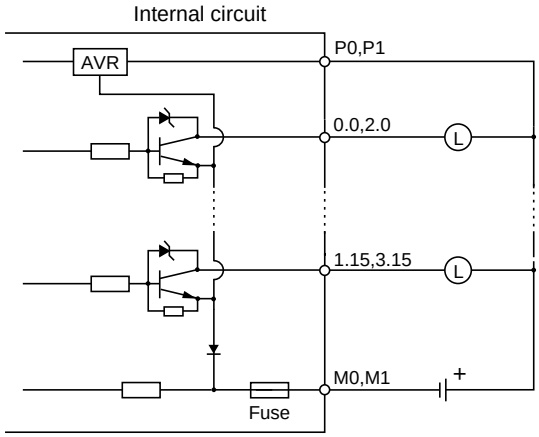


<External wiring>



Note:1) Common terminals P0 and P1 are electrically separated and isolated from each other.
And common terminals M0 and M1 are electrically separated and isolated from each other.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

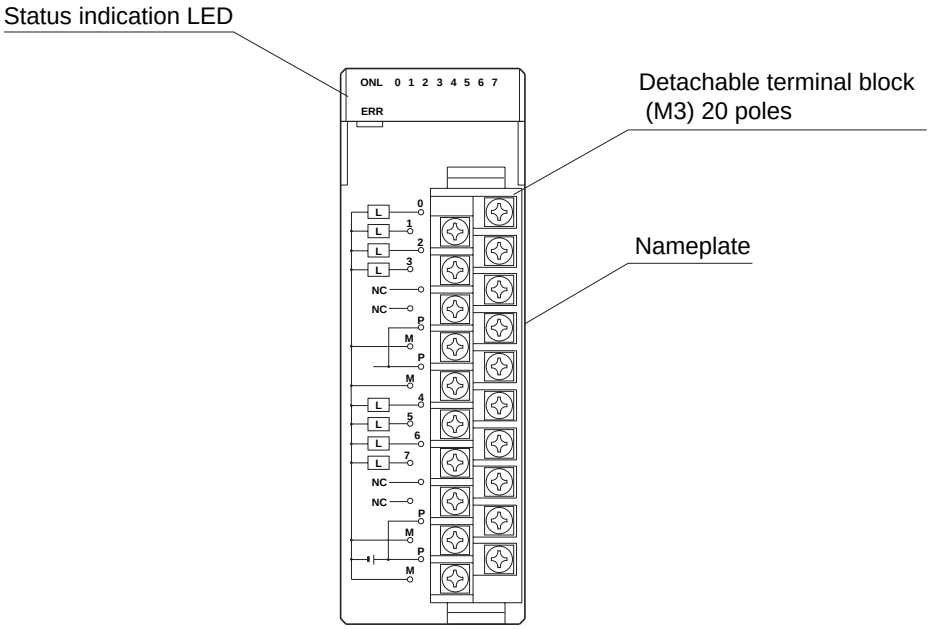


(7) Transistor (source type) output 8 points (NP1Y08U0902)

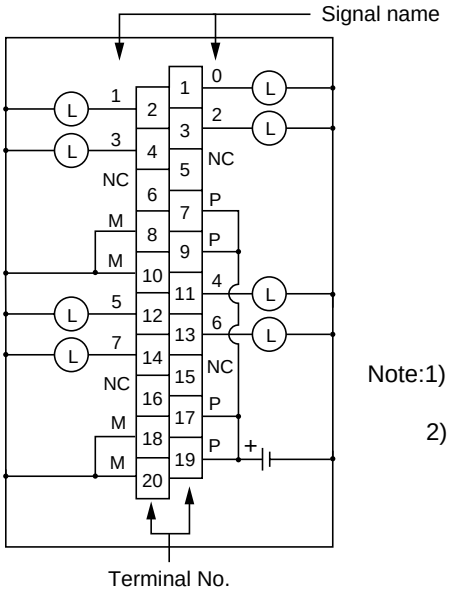
Item			Specification
Type			NP1Y08U0902
No. of output points			8 points (8 points common x 1 circuit) No. of common terminals P and M is four respectively.
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Source type
	Max. load current		2.4A/point, 8A/common
	Voltage drop		2V or less (at 2.4A load)
	Response time	OFF to ON	1ms or less
		ON to OFF	1ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		6A 10ms
Output protection method	Built-in fuse		125V, 15A 2 fuses, not changeable
	Surge absorption circuit		Varistor
	Others		None
On/off times			Max. 1800 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 85% (at 30V DC/55° C)
External power supply			12 to 24V DC, 33mA (for transistor drive)
Internal current consumption			24V DC, 20mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 150g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>

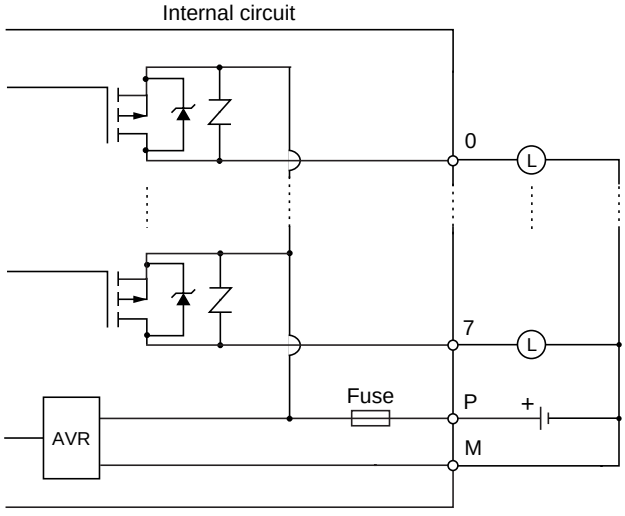


<External wiring>



Note:1) Common terminals (P: 7, 9, 17, 19, M: 8, 10, 18, 20) are connected internal.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

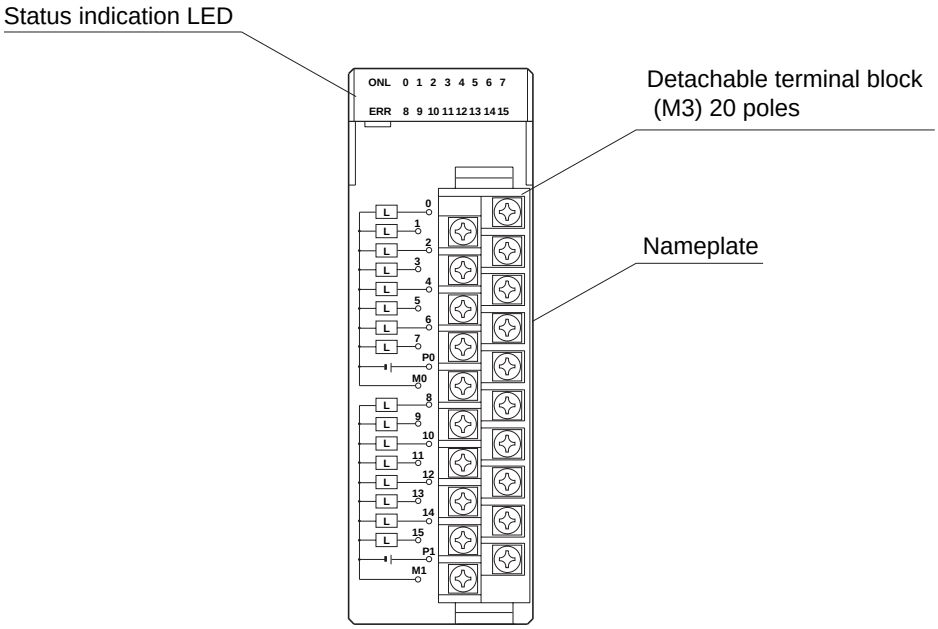


(8) Transistor (source type) output 16 points (NP1Y16U09P6)

Item			Specification
Type			NP1Y16U09P6
No. of output points			16 points (8 points common x 2 circuits)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Source type
	Max. load current		0.6A/point, 4A/common
	Voltage drop		1.5V or less (at 0.6A load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		3A 10ms
Output protection method	Built-in fuse		125V, 7A 2 fuses, not changeable
	Surge absorption circuit		Varistor
	Others		None
On/off times			Max. 1800 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 - 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 24V DC/55° C) Simultaneous ON rate: Max. 90% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 75% (at 30V DC/55° C)
External power supply			12 to 24V DC, 30mA (for transistor drive)
Internal current consumption			24V DC, 43mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 160g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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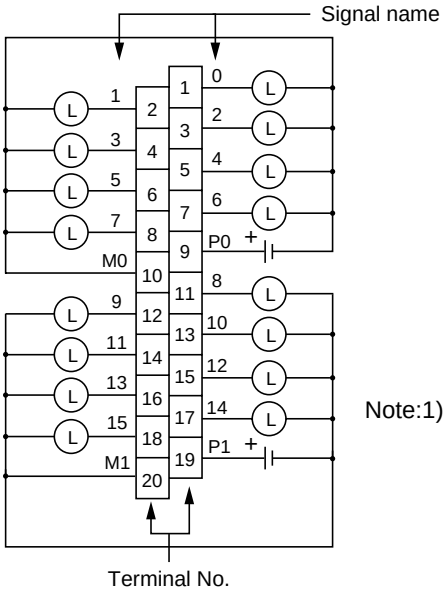
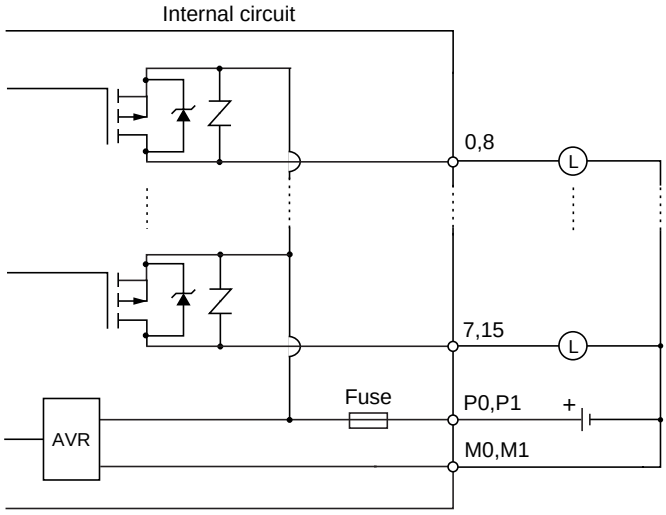


Note:1) Common terminals P0 and P1 are electrically separated and isolated from each other.
And common terminals M0 and M1 are electrically separated and isolated from each other.

<Circuit configuration>

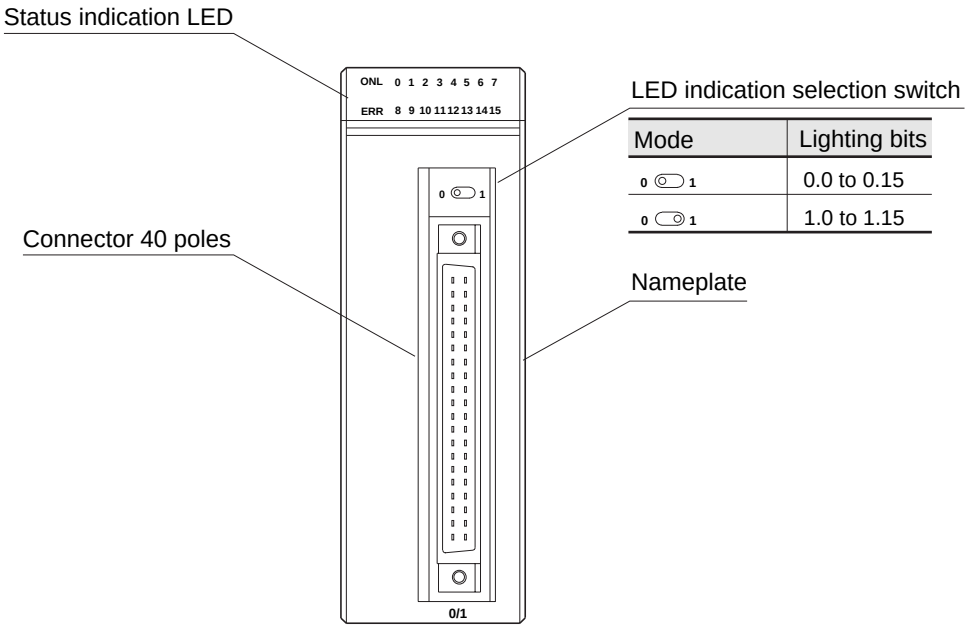


(9) Transistor (source type) output 32 points (NP1Y32U09P1)

Item			Specification
Type			NP1Y32U09P1
No. of output points			32 points (32 points common x 1 circuit)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Source type
	Max. load current		0.12A/point, 3.2A/common
	Voltage drop		1.5V or less (at 0.12A load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		0.8A 10ms
Output protection method	Built-in fuse		125V, 2.5A 2 fuses, not changeable
	Surge absorption circuit		Zener diode
	Others		None
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Output indication			For selected points by the switch, LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 70% (at 24V DC/55° C) Simultaneous ON rate: Max. 65% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 55% (at 30V DC/55° C)
External power supply			12 to 24V DC, 40mA (for transistor drive)
Internal current consumption			24V DC, 45mA or less (when all points are turned ON)
Occupied words			2 words
Mass			Approx. 140g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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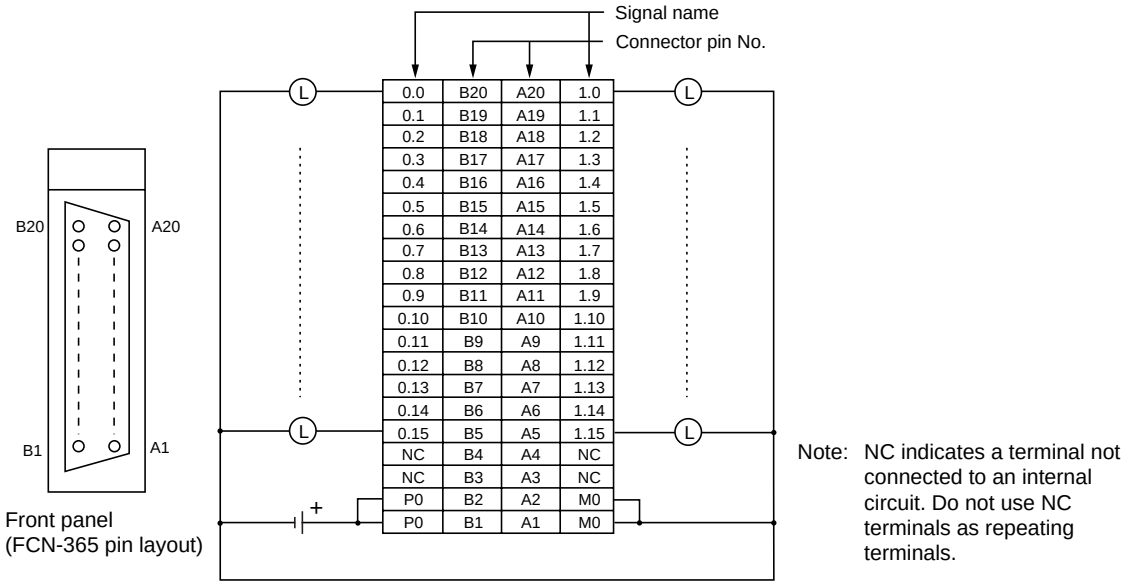
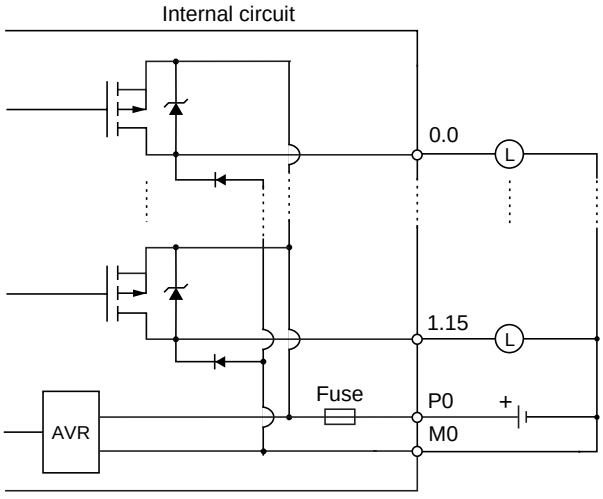


Note: NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

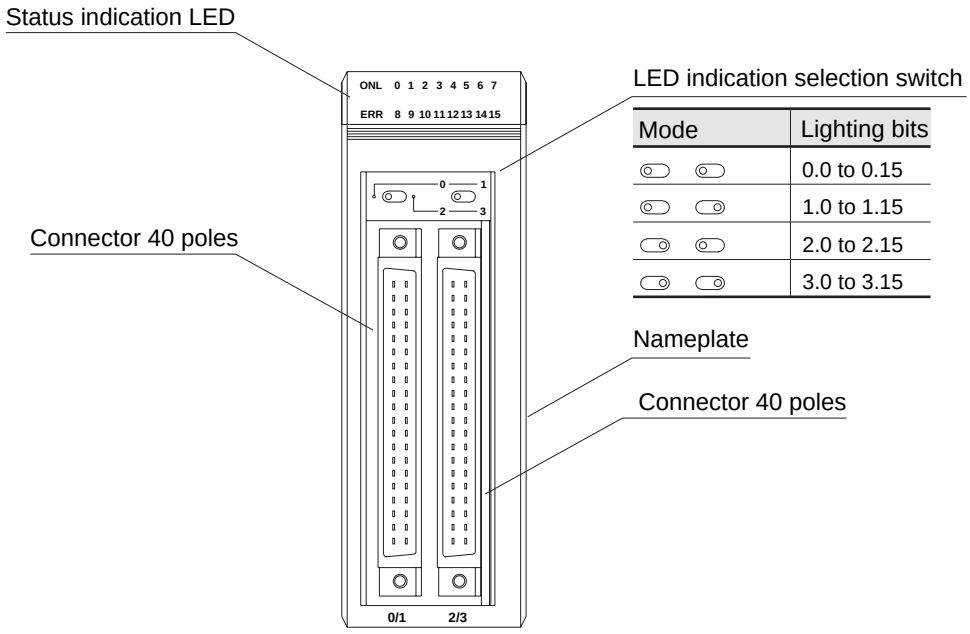


(10) Transistor (source type) output 64 points (NP1Y64U09P1)

Item			Specification
Type			NP1Y64U09P1
No. of output points			64 points (32 points common x 2 circuits)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Source type
	Max. load current		0.12A/point, 3.2A/common
	Voltage drop		1.5V or less (at 0.12A load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		0.8A 10ms
Output protection method	Built-in fuse		125V, 2.5A 2 fuses, not changeable
	Surge absorption circuit		Zener diode
	Others		None
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 2 pieces
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Output indication			For selected points by the switch, LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 90% (at 24V DC/55° C) Simultaneous ON rate: Max. 85% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 85% (at 30V DC/55° C)
External power supply			12 to 24V DC, 80mA (for transistor drive)
Internal current consumption			24V DC, 90mA or less (when all points are turned ON)
Occupied words			4 words
Mass			Approx. 180g

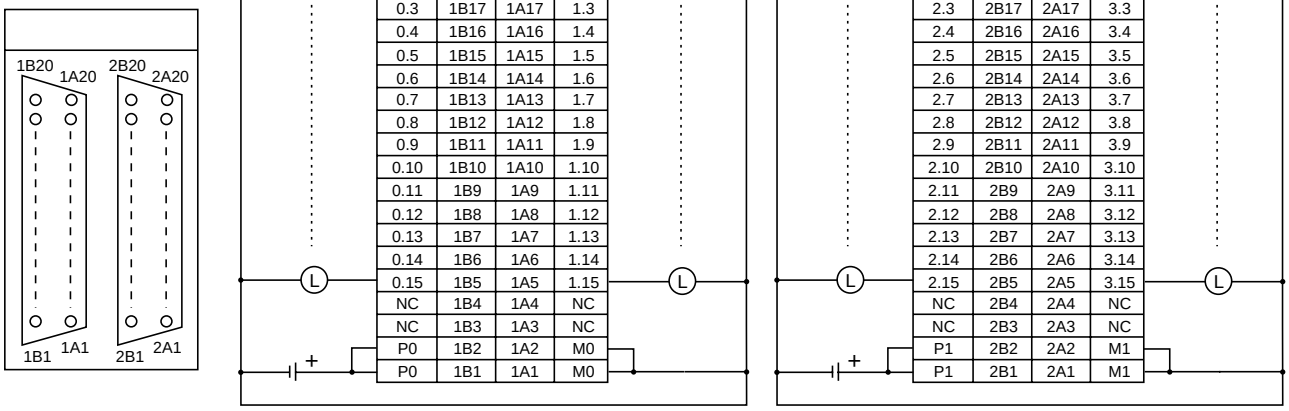
Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



Mode	Lighting bits
	0.0 to 0.15
	1.0 to 1.15
	2.0 to 2.15
	3.0 to 3.15

<External wiring>

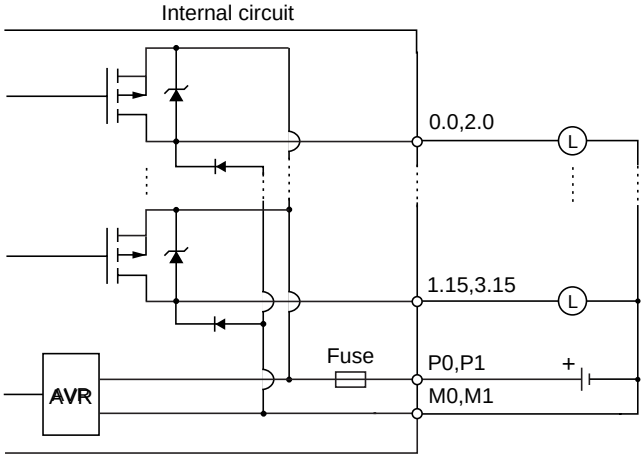


0.0	1B20	1A20	1.0
0.1	1B19	1A19	1.1
0.2	1B18	1A18	1.2
0.3	1B17	1A17	1.3
0.4	1B16	1A16	1.4
0.5	1B15	1A15	1.5
0.6	1B14	1A14	1.6
0.7	1B13	1A13	1.7
0.8	1B12	1A12	1.8
0.9	1B11	1A11	1.9
0.10	1B10	1A10	1.10
0.11	1B9	1A9	1.11
0.12	1B8	1A8	1.12
0.13	1B7	1A7	1.13
0.14	1B6	1A6	1.14
0.15	1B5	1A5	1.15
NC	1B4	1A4	NC
NC	1B3	1A3	NC
P0	1B2	1A2	M0
P0	1B1	1A1	M0

2.0	2B20	2A20	3.0
2.1	2B19	2A19	3.1
2.2	2B18	2A18	3.2
2.3	2B17	2A17	3.3
2.4	2B16	2A16	3.4
2.5	2B15	2A15	3.5
2.6	2B14	2A14	3.6
2.7	2B13	2A13	3.7
2.8	2B12	2A12	3.8
2.9	2B11	2A11	3.9
2.10	2B10	2A10	3.10
2.11	2B9	2A9	3.11
2.12	2B8	2A8	3.12
2.13	2B7	2A7	3.13
2.14	2B6	2A6	3.14
2.15	2B5	2A5	3.15
NC	2B4	2A4	NC
NC	2B3	2A3	NC
P1	2B2	2A2	M1
P1	2B1	2A1	M1

Note:1) Common terminals P0 and P1 are electrically separated and isolated from each other.
And common terminals M0 and M1 are electrically separated and isolated from each other.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

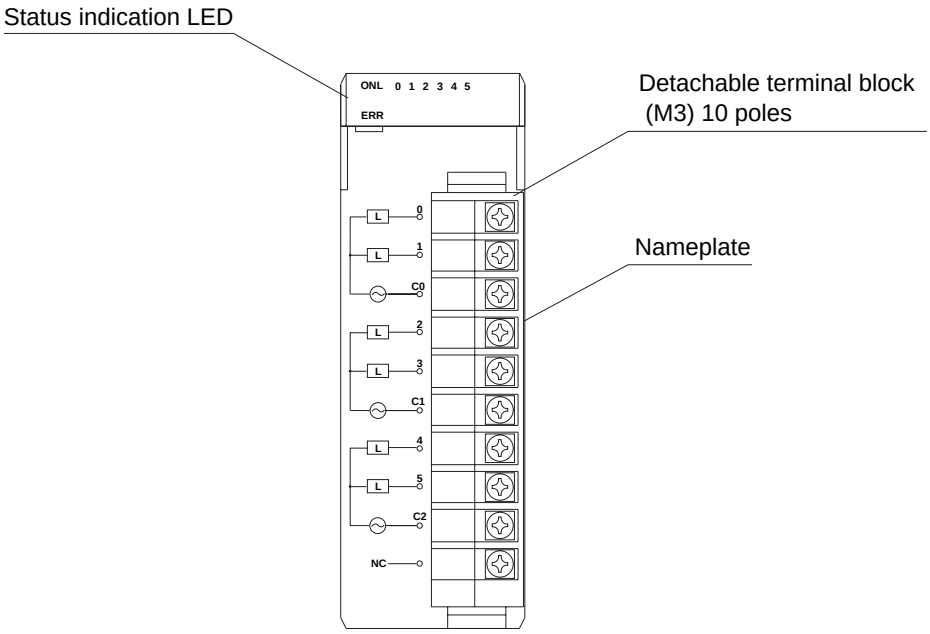


(11) SSR output 6 points (NP1Y06S)

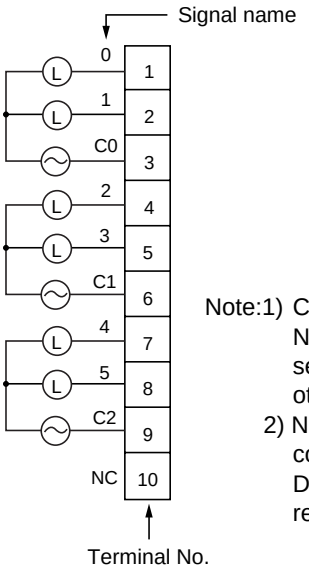
Item			Specification
Type			NP1Y06S
No. of output points			6 points (2 points common x 3 circuits)
Output power supply condition	Rated voltage		100 to 240V AC
	Tolerance		85 TO 264V AC
	Rated frequency		50/60Hz
	Rated frequency (tolerance)		47 to 63Hz
Characteristics of output circuit	Output type		AC output
	Max. load current		2.2A/point, 4.4A/common
	Voltage drop		2V or less (at 2.2A load)
	Response time	OFF to ON	10ms or less
		ON to OFF	10ms or less
	Leakage current in OFF state		Max. 0.1mA (at 200V AC 60Hz)
	Min. make/break current		10mA/100V AC
	Output element		Triac
	Surge current strength		20A 1 cycle
Output protection method	Surge absorption circuit		CR absorber and Varistor
	Others		None
On/off times			Max. 1800 times/hour
Wire connections	External wire connections		Detachable screw terminal (M3) 10 poles
	Applicable wire size		AWG #22 to 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			2830V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 33% (at 132V AC/55° C) Simultaneous ON rate: Max. 16% (at 264V AC/55° C)
External power supply			For signal: 100 to 240V AC
Internal current consumption			24V DC, 60mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 190g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>

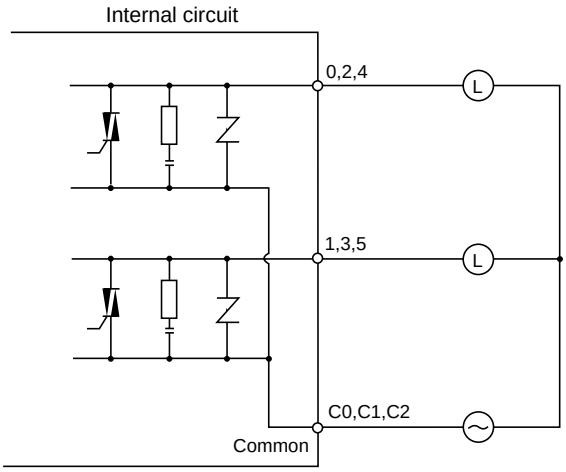


<External wiring>



Note:1) Common terminals (Terminal No.3, No.6, No9) are electrically separated and isolated from each other.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

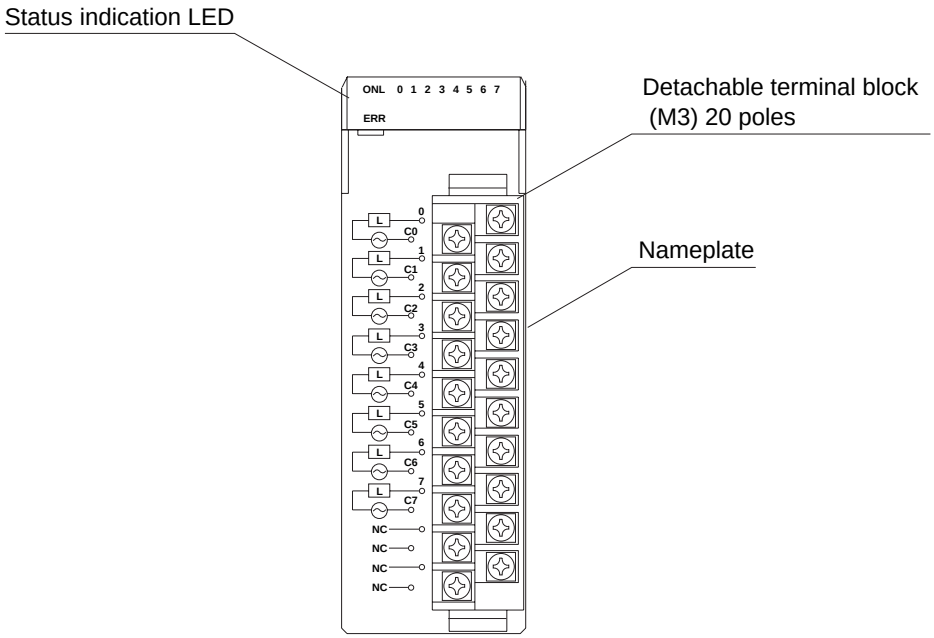


(12) SSR output 8 points (NP1Y08S)

Item			Specification
Type			NP1Y08S
No. of output points			8 points (all points are independent)
Output power supply condition	Rated voltage		100 to 240V AC
	Tolerance		85 TO 264V AC
	Rated frequency		50/60Hz
	Rated frequency (tolerance)		47 to 63Hz
Characteristics of output circuit	Output type		AC output
	Max. load current		2.2A/point
	Voltage drop		2V or less (at 2.2A load)
	Response time	OFF to ON	10ms or less
		ON to OFF	10ms or less
	Leakage current in OFF state		Max. 0.1mA (at 200V AC 60Hz)
	Min. make/break current		10mA/100V AC
	Output element		Triac
	Surge current strength		20A 1 cycle
Output protection method	Surge absorption circuit		CR absorber and Varistor
	Others		None
On/off times			Max. 1800 times/hour
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			Simultaneous ON rate: Max. 25% (at 132V AC/55° C) Simultaneous ON rate: Max. 12% (at 264V AC/55° C)
External power supply			For signal: 100 to 240V AC
Internal current consumption			24V DC, 80mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 200g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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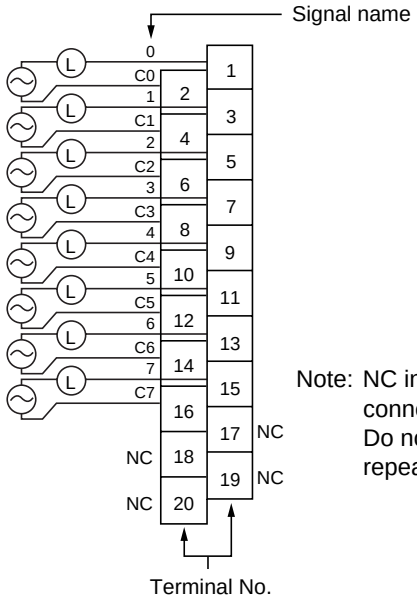
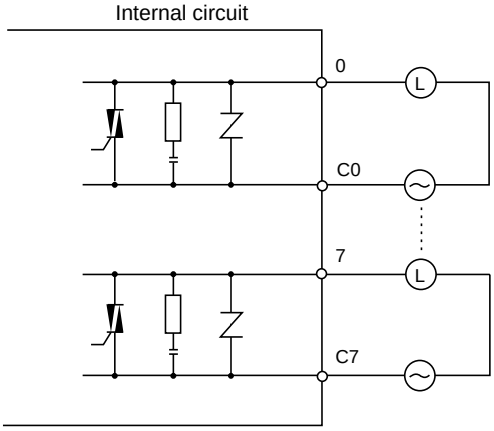


Note: NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

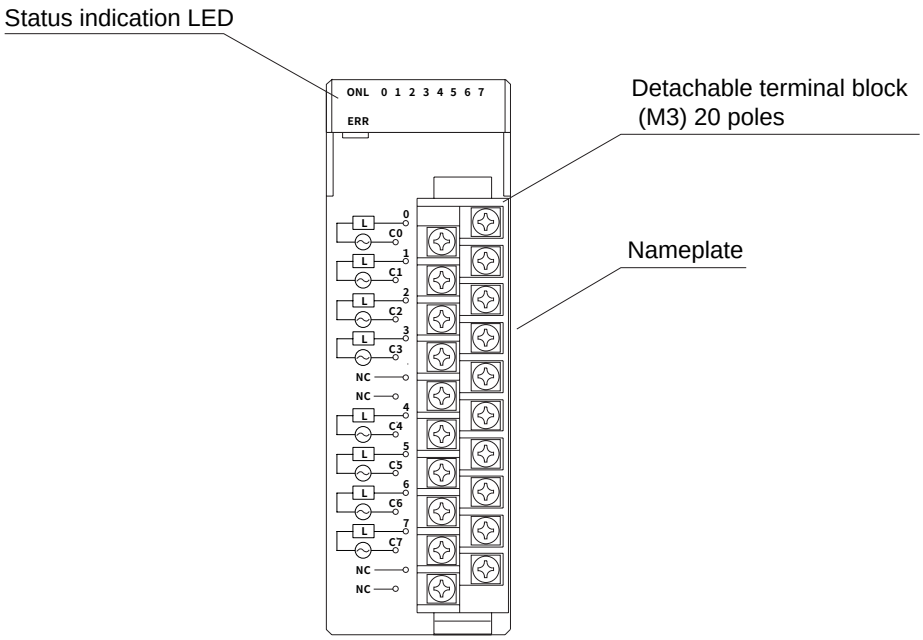


(13) Relay output 8 points (NP1Y08R-00)

Item			Specification
Type			NP1Y08R-00
No. of output points			8 points (all independent output)
Output power supply condition	Rated voltage		240V AC, 110V DC
	Tolerance		264V AC or less, 140V DC or less
	Rated frequency		50/60Hz
	Rated frequency (tolerance)		47 to 63 Hz
Characteristics of output circuit	Max. load current		30V DC/264V AC: 2.2A/point 110V DC: 0.2A/point
	Min. make/break current		5V DC, 1mA
	Response time	OFF to ON	10 ms or less
		ON to OFF	10 ms or less
	Leakage current in OFF state		Max. 0.1mA (at 200V AC 60Hz)
Output protection method	Built-in fuse		None
	Output element		Relay (AC, DC)
	Surge absorption circuit		Varistor
	Others		None
On/off times			Max. 1800 times/hour
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Relay
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			None
External power supply			For signal: 240V AC, 110V DC
Internal current consumption			24V DC, 100mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 170g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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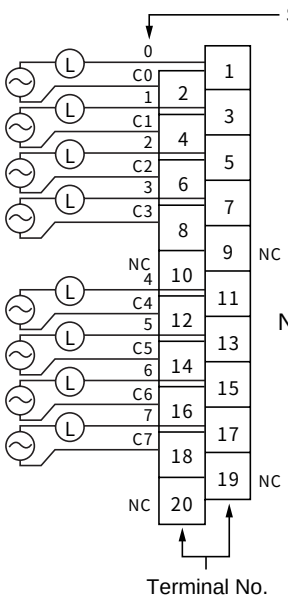
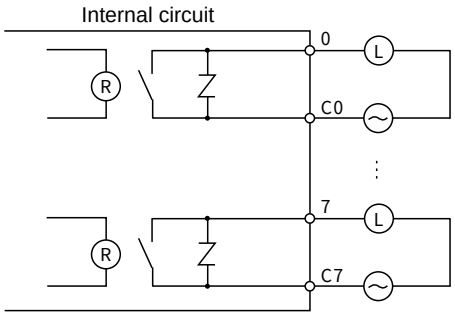


Note: NC Indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

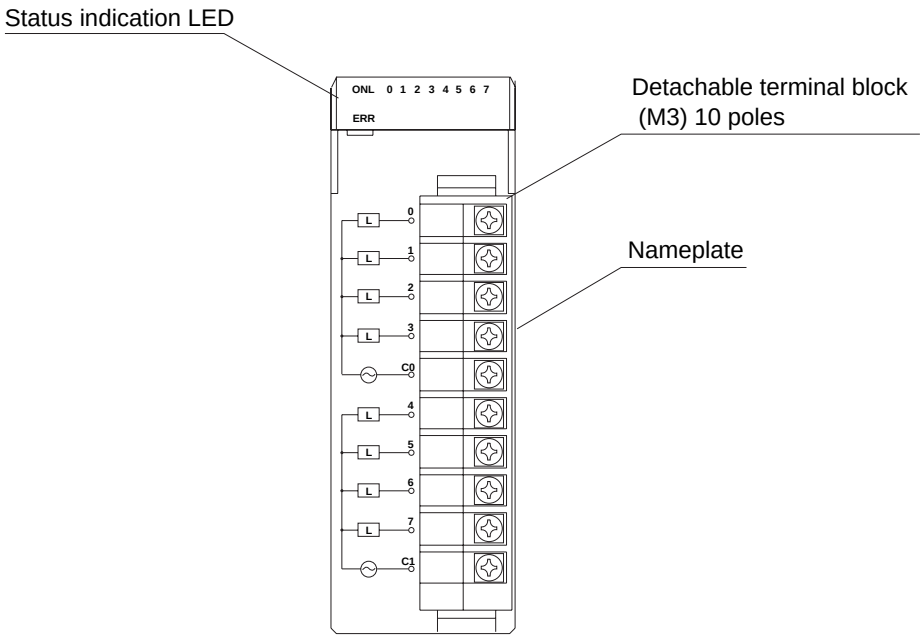


(14) Relay output 8 points (NP1Y08R-04)

Item			Specification
Type			NP1Y08R-04
No. of output points			8 points (4 points/common x 2 circuits)
Output power supply condition	Rated voltage		240V AC, 110V DC
	Tolerance		264V AC or less, 140V DC or less
	Rated frequency		50/60Hz
	Rated frequency (tolerance)		47 to 63Hz
Characteristics of output circuit	Max. load current		30V DC/264V AC: 2.2A/point, 4A/common 110V DC: 0.2A/point, 0.8A/common
	Min. make/break current		5V DC, 1mA
	Response time	OFF to ON	10 ms or less
		ON to OFF	10 ms or less
	Leakage current in OFF state		Max. 0.1mA (at 200V AC 60Hz)
Output protection method	Built-in fuse		None
	Output element		Relay (AC, DC)
	Surge absorption circuit		Varistor
	Others		None
On/off times			Max. 1800 times/hour
Wire connections	External wire connections		Detachable screw terminal (M3) 10 poles
	Applicable wire size		AWG #22 to 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Relay
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			None
External power supply			For signal: 240V AC, 110V DC
Internal current consumption			24V DC, 80mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 150g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



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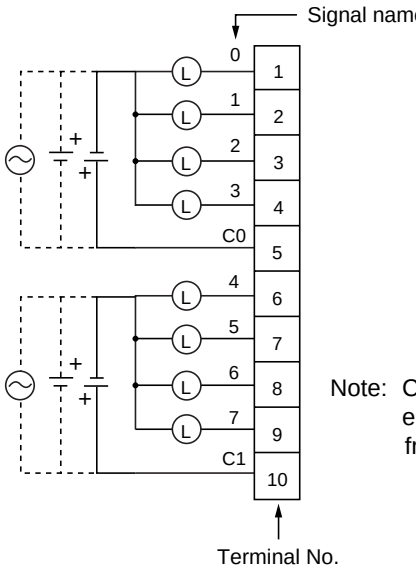
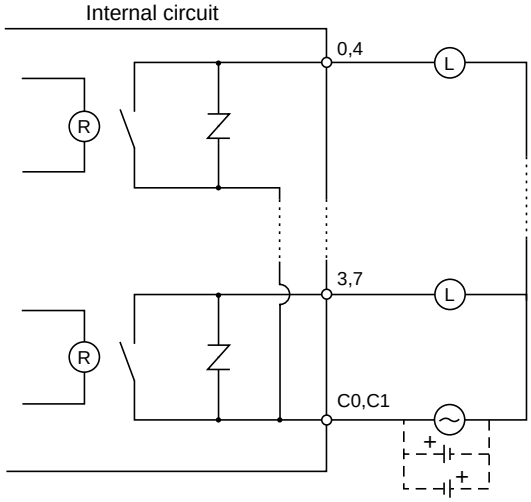


Note: Common terminals C0 and C1 are electrically separated and isolated from each other.

<Circuit configuration>

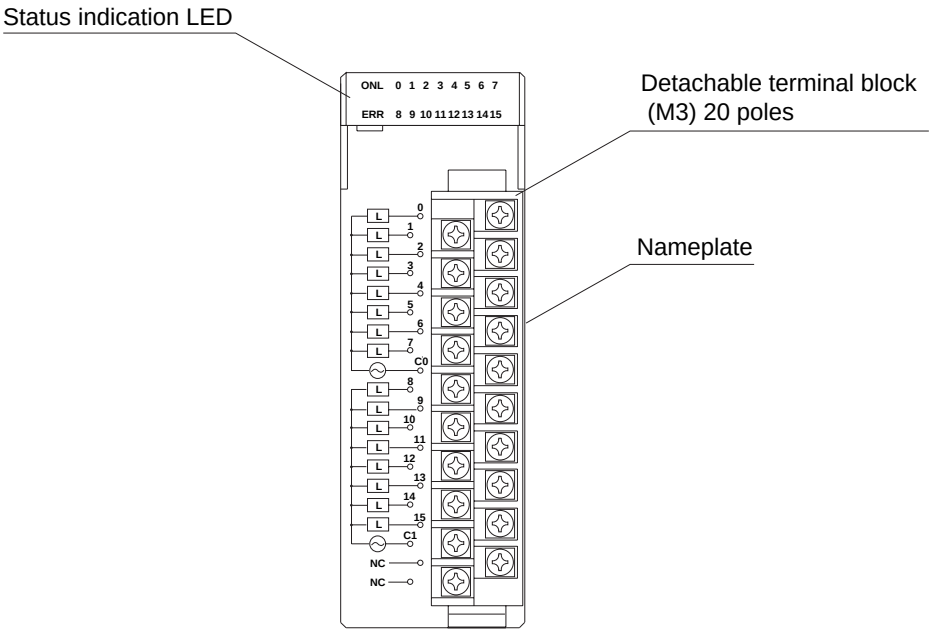


(15) Relay output 16 points (NP1Y16R-08)

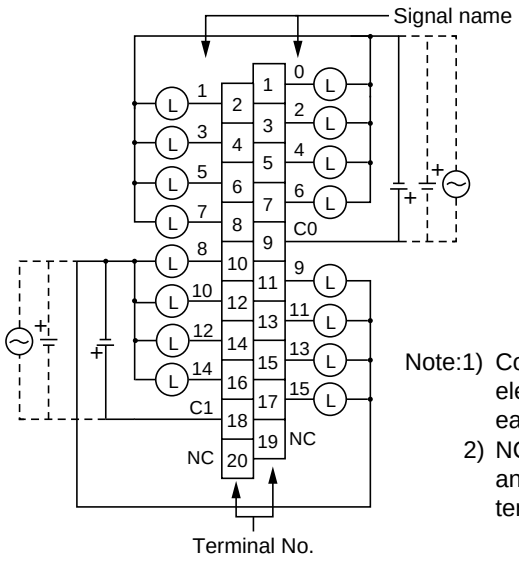
Item			Specification
Type			NP1Y16R-08
No. of output points			16 points (8 points/common x 2 circuits)
Output power supply condition	Rated voltage		240V AC, 110V DC
	Tolerance		264V AC or less, 140V DC or less
	Rated frequency		50/60Hz
	Rated frequency (tolerance)		47 to 63Hz
Characteristics of output circuit	Output type		Relay output
	Max. load current		30V DC/264V AC: 2.2A/point, 8A/common 110V DC: 0.2A/point, 1.6A/common
	Min. make/break current		5V DC, 1mA
	Response time	OFF to ON	10ms or less
		ON to OFF	10ms or less
	Leakage current in OFF state		Max. 0.1mA (at 200V AC 60Hz)
Output protection method	Built-in fuse		None
	Output element		Relay (AC, DC)
	Surge absorption circuit		Varistor
	Others		None
On/off times			Max. 1800 times/hour
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Output indication			LED indicator lights up when output is ON (Logic side), ONL: normal (Green LED), ERR: abnormal (Red LED)
Isolation method			Relay
Dielectric strength			1500V AC/minute (between output terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between output terminals and ground)
Derating condition			None
External power supply			For signal: 240V AC, 10V DC
Internal current consumption			24V DC, 176mA or less (when all points are turned ON)
Occupied word			Directly connected to the SX bus: 2 words On the remote I/O link: 1 word
Mass			Approx. 190g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



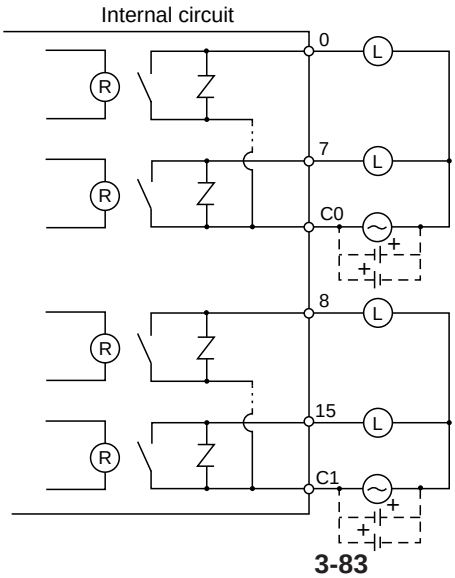
<External wiring>



Note:1) Common terminals C0 and C1 are electrically separated and isolated from each other.

2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>



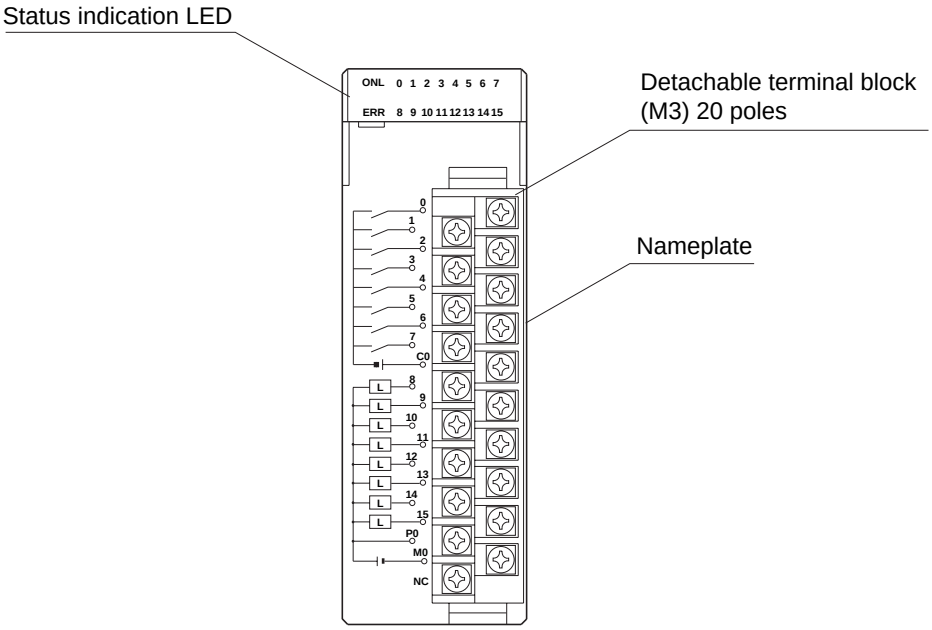
3-5-5 Digital input / output

(1) Transistor (source type) input 24V DC 8 points / Transistor (sink type) output 8 points (NP1W1606T)

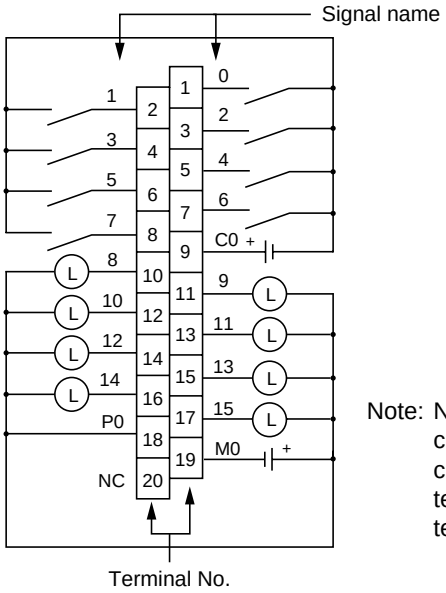
Item			Specification
Type			NP1W1606T
No. of input points			8 points (8 points common x 1 circuit)
Input signal condition	Rated voltage		24V DC
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source type
	Input current		7mA (24V DC)
	Input impedance		3.3kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
No. of output points			8 points (8 points common x 1 circuit)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Sink type
	Max. load current		0.6A/point, 4A/common
	Voltage drop		1.5V or less
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		2A 10ms
Output protection method	Built-in fuse		125V, 7A, not changeable
	Surge absorption circuit		Varistor
	Others		None
On/off times			Max. 1800 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Input/output indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between I/O terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between I/O terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 75% (at 30V DC/55° C)
External power supply			For input signal: 24V DC, For transistor drive: 12 to 24V DC, 20mA
Internal current consumption			24V DC, 35mA or less (when all points are turned ON)
Occupied words			2 words
Mass			Approx. 150g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>

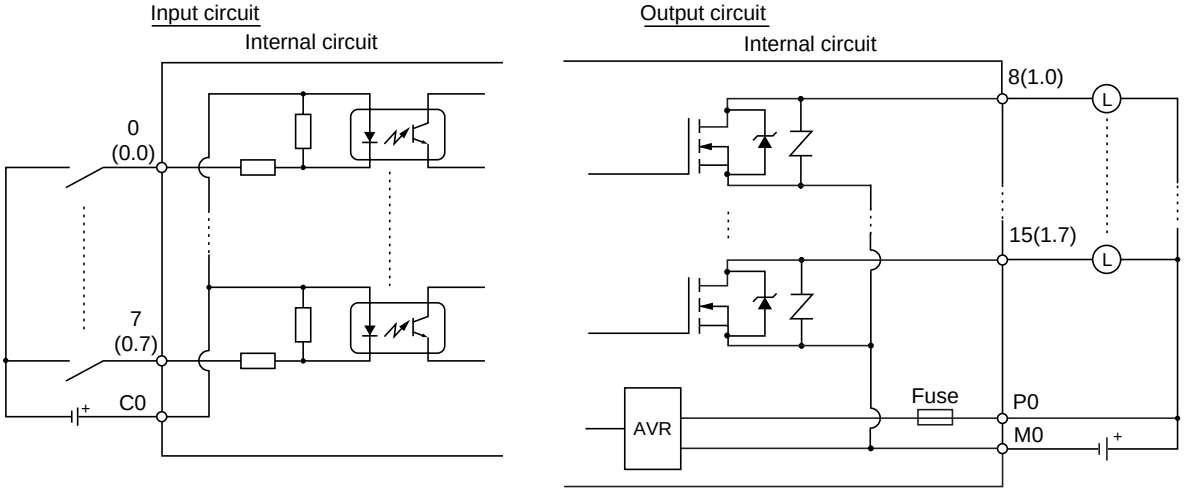


<External wiring>



Note: NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

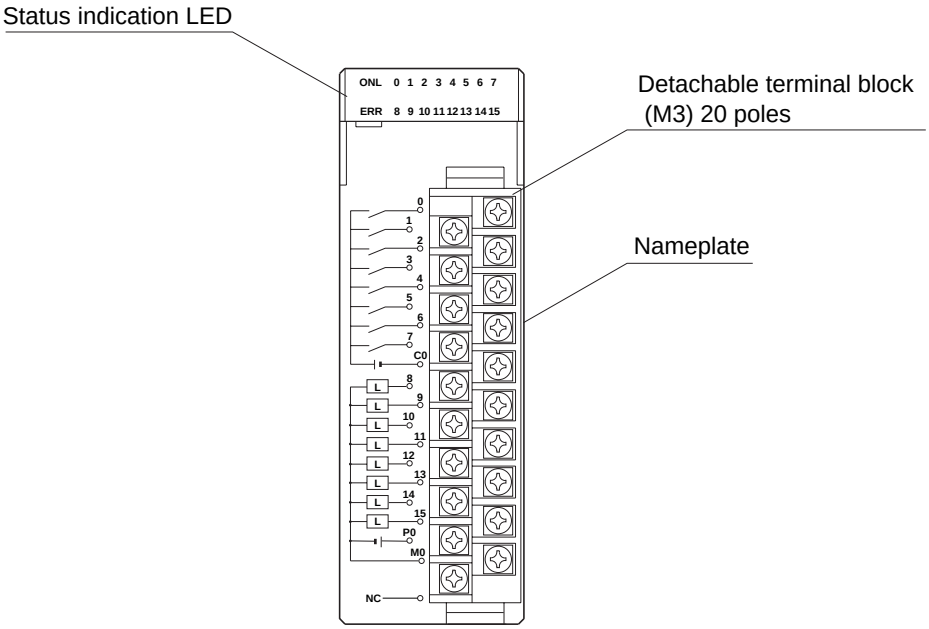


(2) Transistor (sink type) input 24V DC 8 points / Transistor (source type) output 8 points (NP1W1606U)

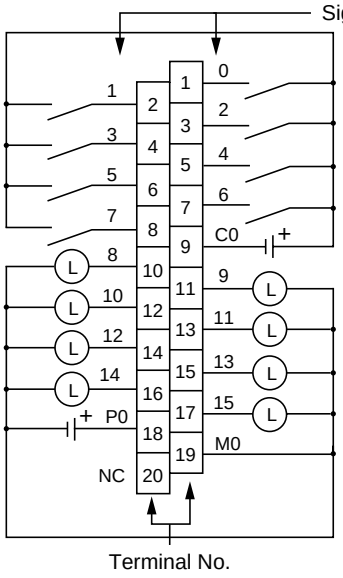
Item			Specification
Type			NP1W1606U
No. of input points			8 points (8 points common x 1 circuit)
Input signal condition	Rated voltage		24V DC
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Sink type
	Input current		7mA (24V DC)
	Input impedance		3.3kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
No. of output points			8 points (8 points common x 1 circuit)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Source type
	Max. load current		0.6A/point, 4A/common
	Voltage drop		1V or less
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		3A 10ms
On/off times			Max. 1800 times/hour (inductive load), No limit (resistor load)
Output protection method	Built-in fuse		125V, 7A, not changeable
	Surge absorption circuit		Varistor
	Others		None
Wire connections	External wire connections		Detachable screw terminal (M3) 20 poles
	Applicable wire size		AWG #22 to 18 (Note)
Input indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between I/O terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between I/O terminals and frame ground)
Derating condition			Simultaneous ON rate: Max.100% (at 24V DC/55° C) Simultaneous ON rate: Max. 90% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 75% (at 30V DC/55° C)
External power supply			For input signal: 24V DC, For transistor drive: 12 to 24V DC, 20mA
Internal current consumption			24V DC, 35mA or less (when all points are turned ON)
Occupied words			2 words
Mass			Approx. 150g

Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>

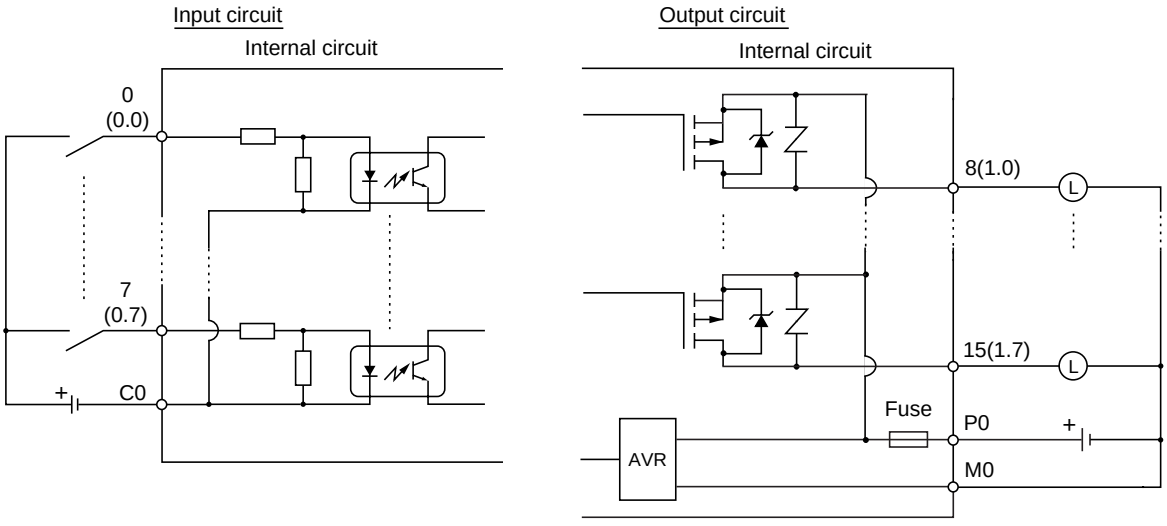


<External wiring>



Note: NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

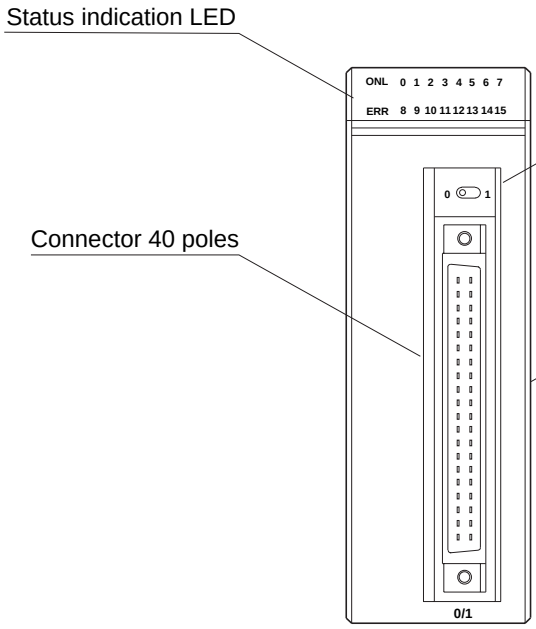


(3) Transistor (source type) input 24V DC 16 points / Transistor (sink type) output 16 points (NP1W3206T)

Item			Specification
Type			NP1W3206T
No. of input points			16 points (16 points common x 1 circuit)
Input signal condition	Rated voltage		24V DC
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source type
	Input current		4mA (24V DC)
	Input impedance		5.6kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
No. of output points			16 points (16 points common x 1 circuit)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Sink type
	Max. load current		0.12A/point, 1.6A/common
	Voltage drop		1.5V or less (at 2.4V load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		0.3A 10ms
Output protection method	Built-in fuse		125V, 2.5A, not changeable
	Surge absorption circuit		Zener diode
	Others		None
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Input indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between I/O terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between I/O terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 75% (at 30V DC/55° C)
External power supply			For input signal: 24V DC, For transistor drive: 12 to 24V DC, 20mA
Internal current consumption			24V DC, 50mA or less (when all points are turned ON)
Occupied words			2 words
Mass			Approx. 140g

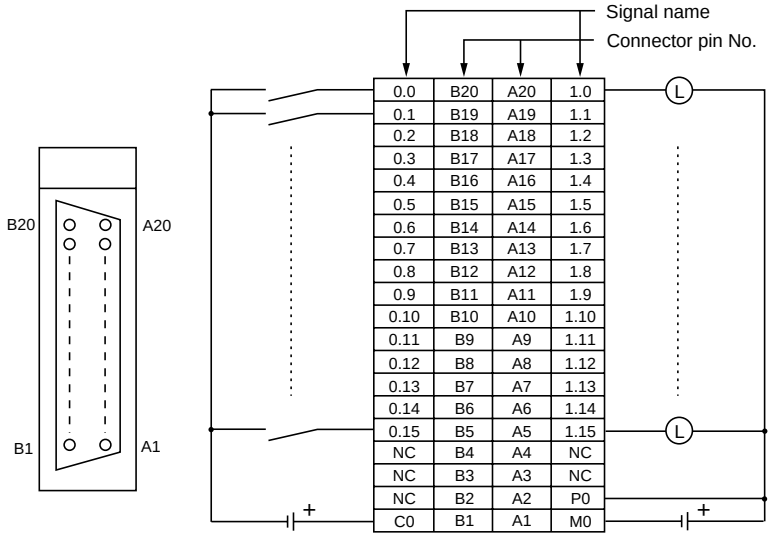
Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



Mode	Lighting bits
0 ⬭ 1	0.0 to 0.15 (Input)
0 ⬭ 1	1.0 to 1.15 (Output)

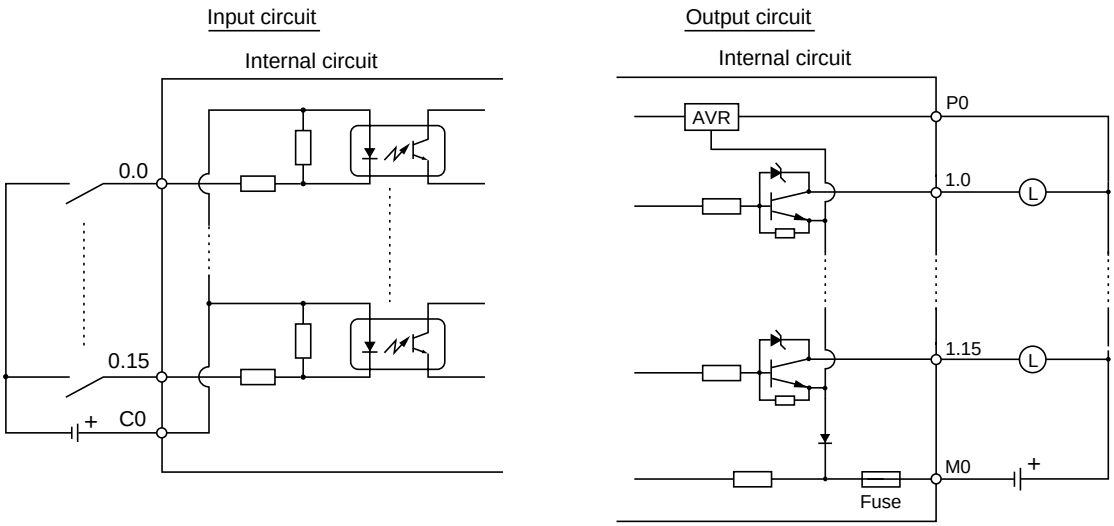
<External wiring>



0.0	B20	A20	1.0
0.1	B19	A19	1.1
0.2	B18	A18	1.2
0.3	B17	A17	1.3
0.4	B16	A16	1.4
0.5	B15	A15	1.5
0.6	B14	A14	1.6
0.7	B13	A13	1.7
0.8	B12	A12	1.8
0.9	B11	A11	1.9
0.10	B10	A10	1.10
0.11	B9	A9	1.11
0.12	B8	A8	1.12
0.13	B7	A7	1.13
0.14	B6	A6	1.14
0.15	B5	A5	1.15
NC	B4	A4	NC
NC	B3	A3	NC
NC	B2	A2	P0
C0	B1	A1	M0

Note: NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

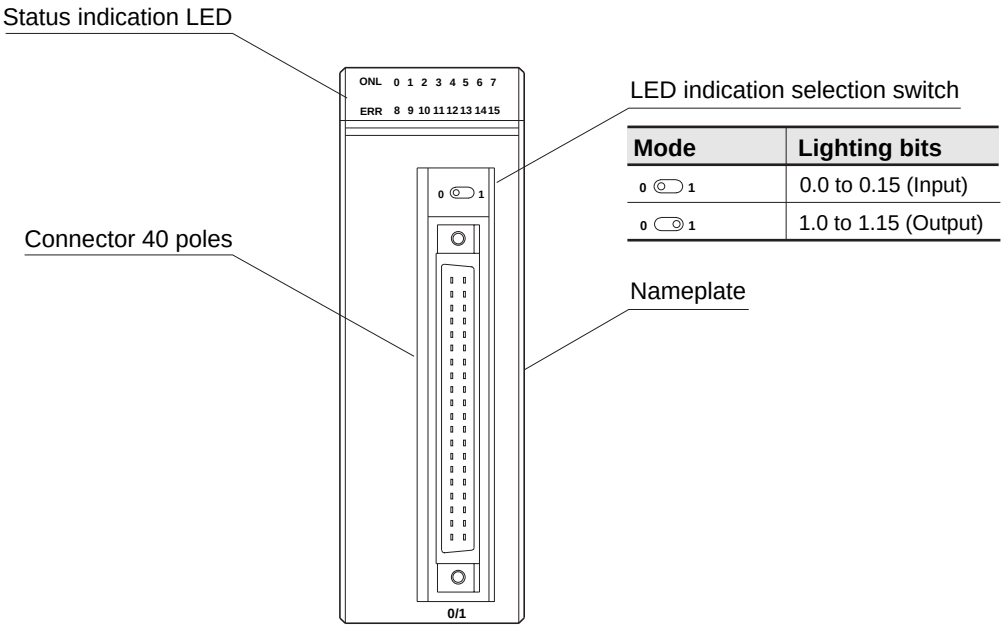


(4) Transistor (sink type) input 24V DC 16 points / Transistor (source type) output 16 points (NP1W3206U)

Item			Specification
Type			NP1W3206U
No. of input points			16 points (16 points common x 1 circuit)
Input signal condition	Rated voltage		24V DC
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Sink type
	Input current		4mA (24V DC)
	Input impedance		5.6kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
No. of output points			16 points (16 points common x 1 circuit)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Source type
	Max. load current		0.12A/point, 1.6A/common
	Voltage drop		1.5V or less
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		0.8A 10ms
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Output protection method	Built-in fuse		125V, 2.5A, not changeable
	Surge absorption circuit		Zener diode
	Others		None
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Input indication			For selected points by the switch, LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between I/O terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between I/O terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 100% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 75% (at 30V DC/55° C)
External power supply			For input signal: 24V DC, For transistor drive: 12 to 24V DC, 20mA
Internal current consumption			24V DC, 50mA or less (when all points are turned ON)
Occupied words			2 words
Mass			Approx. 140g

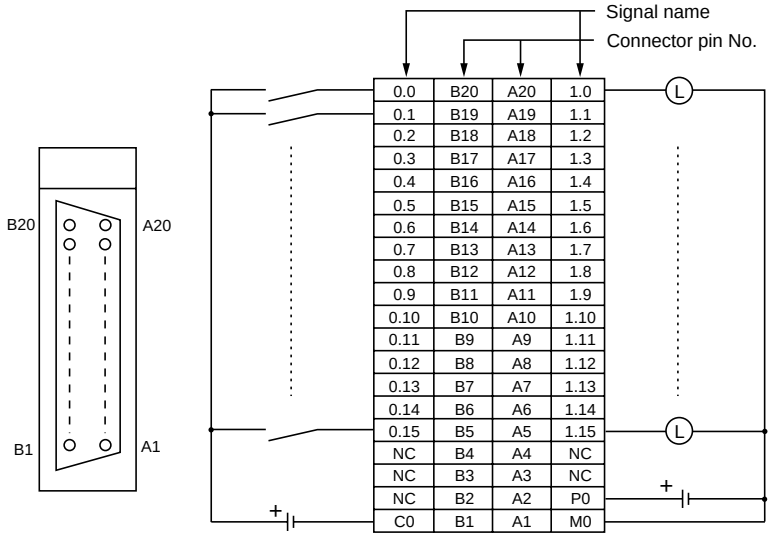
Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



Mode	Lighting bits
0 ⬭ 1	0.0 to 0.15 (Input)
0 ⬭ 1	1.0 to 1.15 (Output)

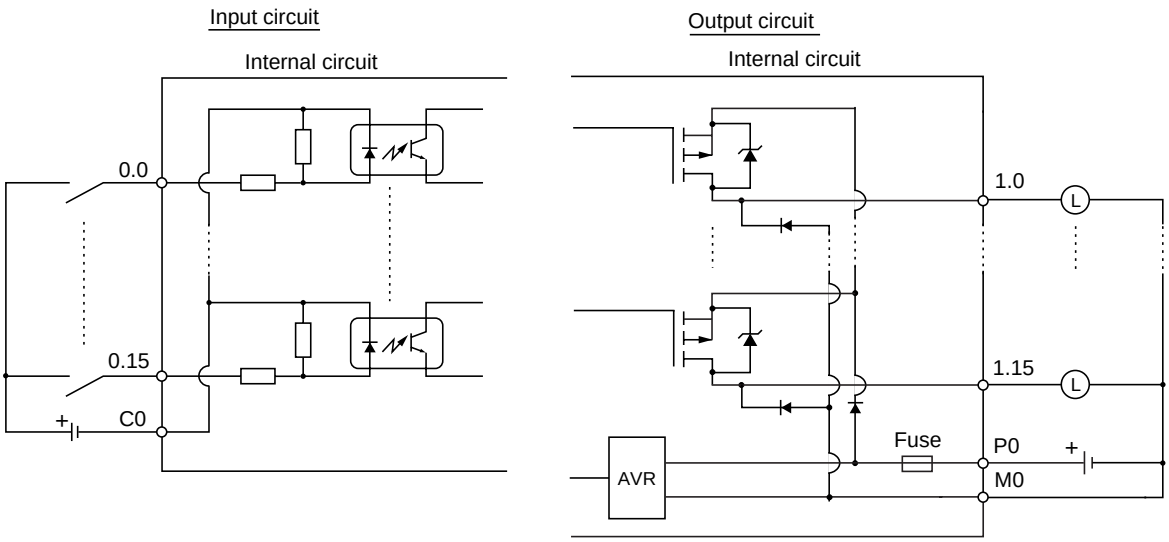
<External wiring>



0.0	B20	A20	1.0
0.1	B19	A19	1.1
0.2	B18	A18	1.2
0.3	B17	A17	1.3
0.4	B16	A16	1.4
0.5	B15	A15	1.5
0.6	B14	A14	1.6
0.7	B13	A13	1.7
0.8	B12	A12	1.8
0.9	B11	A11	1.9
0.10	B10	A10	1.10
0.11	B9	A9	1.11
0.12	B8	A8	1.12
0.13	B7	A7	1.13
0.14	B6	A6	1.14
0.15	B5	A5	1.15
NC	B4	A4	NC
NC	B3	A3	NC
NC	B2	A2	P0
C0	B1	A1	M0

Note: NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

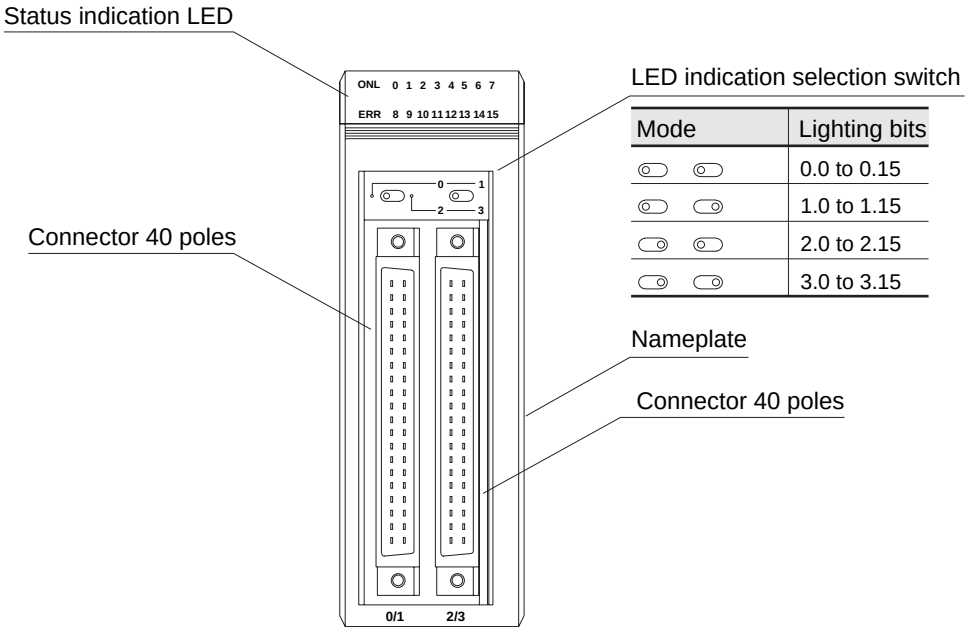


(5) Input 24V DC 32 points / Transistor (sink type) output 32 points (NP1W6406T)

Item			Specification
Type			NP1W6406T
No. of input points			32 points (32 points common x 1 circuit)
Input signal condition	Rated voltage		24V DC
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source, sink common
	Input current		4mA (24V DC)
	Input impedance		5.6kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
No. of output points			32 points (32 points common x 1 circuit)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Sink type
	Max. load current		0.12A/point, 3.2A/common
	Voltage drop		1.5V or less (at 0.12A load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		0.3A 10ms
Output protection method	Built-in fuse		125V, 5A, not changeable
	Surge absorption circuit		Zener diode
	Others		None
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Input indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between I/O terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between I/O terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 90% (at 24V DC/55° C) Simultaneous ON rate: Max. 80% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 65% (at 30V DC/55° C)
External power supply			For input signal: 24V DC, For transistor drive: 12 to 24V DC, 52mA
Internal current consumption			24V DC, 90mA or less (when all points are turned ON)
Occupied words			4 words
Mass			Approx. 180g

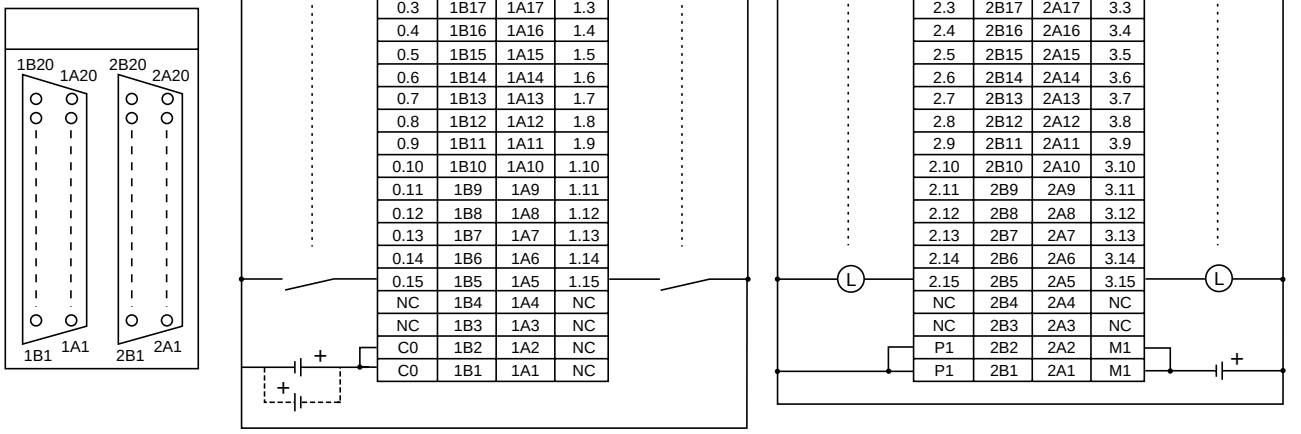
Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



Mode	Lighting bits
	0.0 to 0.15
	1.0 to 1.15
	2.0 to 2.15
	3.0 to 3.15

<External wiring>

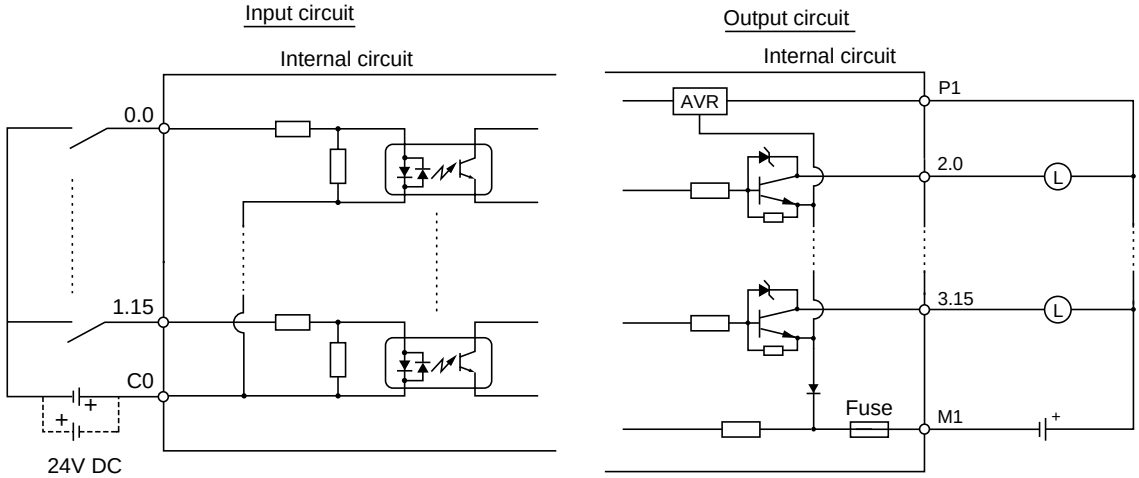


0.0	1B20	1A20	1.0
0.1	1B19	1A19	1.1
0.2	1B18	1A18	1.2
0.3	1B17	1A17	1.3
0.4	1B16	1A16	1.4
0.5	1B15	1A15	1.5
0.6	1B14	1A14	1.6
0.7	1B13	1A13	1.7
0.8	1B12	1A12	1.8
0.9	1B11	1A11	1.9
0.10	1B10	1A10	1.10
0.11	1B9	1A9	1.11
0.12	1B8	1A8	1.12
0.13	1B7	1A7	1.13
0.14	1B6	1A6	1.14
0.15	1B5	1A5	1.15
NC	1B4	1A4	NC
NC	1B3	1A3	NC
C0	1B2	1A2	NC
C0	1B1	1A1	NC

2.0	2B20	2A20	3.0
2.1	2B19	2A19	3.1
2.2	2B18	2A18	3.2
2.3	2B17	2A17	3.3
2.4	2B16	2A16	3.4
2.5	2B15	2A15	3.5
2.6	2B14	2A14	3.6
2.7	2B13	2A13	3.7
2.8	2B12	2A12	3.8
2.9	2B11	2A11	3.9
2.10	2B10	2A10	3.10
2.11	2B9	2A9	3.11
2.12	2B8	2A8	3.12
2.13	2B7	2A7	3.13
2.14	2B6	2A6	3.14
2.15	2B5	2A5	3.15
NC	2B4	2A4	NC
NC	2B3	2A3	NC
P1	2B2	2A2	M1
P1	2B1	2A1	M1

Note:1) Common terminals (C0), P1 and M1 are electrically separated and isolated from each other.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>

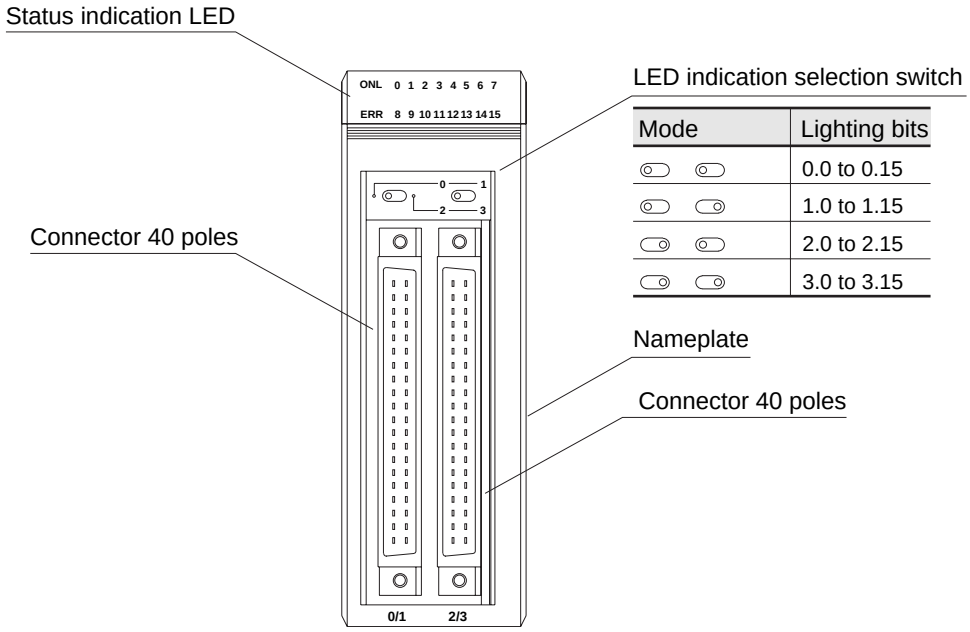


(6) Input 24V DC 32 points / Transistor (source type) output 32 points (NP1W6406U)

Item			Specification
Type			NP1W6406U
No. of input points			32 points (32 points common x 1 circuit)
Input signal condition	Rated voltage		24V DC
	Rated voltage (tolerance)		30V DC
	Ripple percentage		5% or less
Characteristics of input circuit	Input type		Source, sink common
	Input current		4mA (24V DC)
	Input impedance		5.6kΩ
	Operating voltage	OFF to ON	15 to 30V
		ON to OFF	0 to 5V
	Input delay time	OFF to ON	0.7ms (hard filter time) + (soft filter time) Whole soft filter time is variable by parameter setting. (OFF to ON) to (ON to OFF) 1 to 1ms, 3 to 3ms (default), 3 to 10ms, 10 to 10ms, 30 to 30ms, 100 to 100ms
		ON to OFF	
	Input type		DC type1
No. of output points			32 points (32 points common x 1 circuit)
Output power supply condition	Rated voltage		12 to 24V DC
	Tolerance		10.2 to 30V DC
Characteristics of output circuit	Output type		Source type
	Max. load current		0.12A/point, 3.2A/common
	Voltage drop		1.5V or less (at 0.12A load)
	Response time	OFF to ON	1 ms or less
		ON to OFF	1 ms or less
	Leakage current in OFF state		Max. 0.1mA
	Output element		Transistor
	Surge current strength		0.3A 10ms
Output protection method	Built-in fuse		125V, 5A, not changeable
	Surge absorption circuit		Zener diode
	Others		None
On/off times			Max. 3600 times/hour (inductive load), No limit (resistor load)
Wire connections	External wire connections		40-pin connector (FCN-365P040-AU) x 1 piece
	Applicable wire size		AWG #23 or less (at soldered connector) (Note)
Input indication			LED indicator lights up when input is ON. (Logic side) ONL: normal (Green LED), ERR: abnormal and the fuse blown out (Red LED)
Isolation method			Photocoupler
Dielectric strength			1500V AC 1 minute (between I/O terminals and frame ground)
Insulation resistance			10MΩ or more with 500V DC megger (between I/O terminals and frame ground)
Derating condition			Simultaneous ON rate: Max. 90% (at 24V DC/55° C) Simultaneous ON rate: Max. 80% (at 26.4V DC/55° C) Simultaneous ON rate: Max. 65% (at 30V DC/55° C)
External power supply			For input signal: 24V DC, For transistor drive: 12 to 24V DC, 40mA
Internal current consumption			24V DC, 90mA or less (when all points are turned ON)
Occupied words			4 words
Mass			Approx. 180g

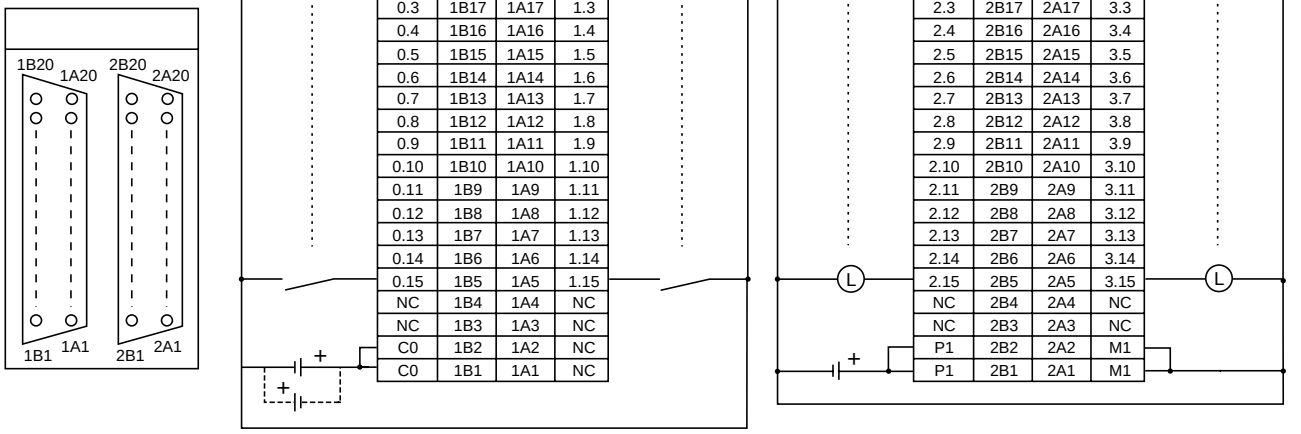
Note: Applicable wire size depends on a crimp terminal. For details, refer to “4-4-3 Wiring.”

<Names>



Mode	Lighting bits
	0.0 to 0.15
	1.0 to 1.15
	2.0 to 2.15
	3.0 to 3.15

<External wiring>



0.0	1B20	1A20	1.0
0.1	1B19	1A19	1.1
0.2	1B18	1A18	1.2
0.3	1B17	1A17	1.3
0.4	1B16	1A16	1.4
0.5	1B15	1A15	1.5
0.6	1B14	1A14	1.6
0.7	1B13	1A13	1.7
0.8	1B12	1A12	1.8
0.9	1B11	1A11	1.9
0.10	1B10	1A10	1.10
0.11	1B9	1A9	1.11
0.12	1B8	1A8	1.12
0.13	1B7	1A7	1.13
0.14	1B6	1A6	1.14
0.15	1B5	1A5	1.15
NC	1B4	1A4	NC
NC	1B3	1A3	NC
C0	1B2	1A2	NC
C0	1B1	1A1	NC

2.0	2B20	2A20	3.0
2.1	2B19	2A19	3.1
2.2	2B18	2A18	3.2
2.3	2B17	2A17	3.3
2.4	2B16	2A16	3.4
2.5	2B15	2A15	3.5
2.6	2B14	2A14	3.6
2.7	2B13	2A13	3.7
2.8	2B12	2A12	3.8
2.9	2B11	2A11	3.9
2.10	2B10	2A10	3.10
2.11	2B9	2A9	3.11
2.12	2B8	2A8	3.12
2.13	2B7	2A7	3.13
2.14	2B6	2A6	3.14
2.15	2B5	2A5	3.15
NC	2B4	2A4	NC
NC	2B3	2A3	NC
P1	2B2	2A2	M1
P1	2B1	2A1	M1

Note:1) Common terminals (C0), P1 and M1 are electrically separated and isolated from each other.
2) NC indicates a terminal not connected to an internal circuit. Do not use NC terminals as repeating terminals.

<Circuit configuration>