

2.10 Digital input module



CAUTION

For external cable connectors corresponding to each pin of MIL connector A2, A3, B2 and B3, use pin-less ones for the digital input module that requires to assure insulation distance.

- **Outline**

- The number of inputs for ADIV01 and ADIV02 is 32 points per module, the number of ADIV03 inputs is 64 points, and the number of inputs of ADIV05 and ADIV06 are 16 points.
- The input voltage of ADIV01, ADIV02 and ADIV03 is 24V DC, ADIV05 input voltage is 100V to 120V AC, and ADIV06 input voltage is 200V to 240V AC.
- DI pulse counter function with bit display is available as an option. (ADIV01 is not provided with an option (ADIV01 is available only in basic type, and not provided with an option. ADIV03 is not provided with pulse count function).
- The modules other than ADIV01 are capable of duplexing.
- For external connections to ADIV01, ADIV05 and ADIV06, dedicated connector are used. For external ADIV02 and ADIV03 cable connections, MIL 50-pin connectors are used.

- **Appearance**

- Appearance of the digital input module is shown below.
- For external dimensions, see Chapter 8.

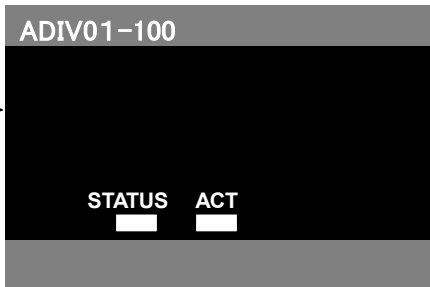


Fig. 2.10.1 LED display

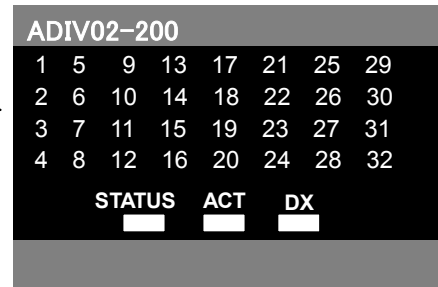


Fig. 2.10.2 LED display

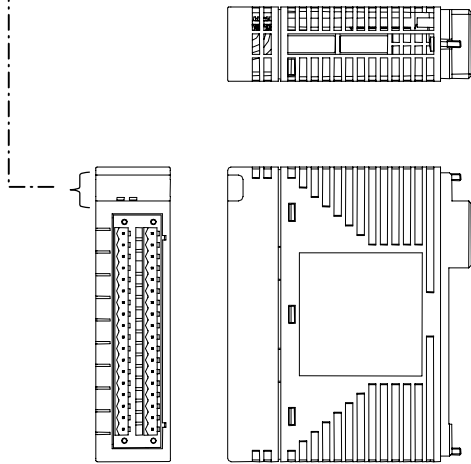


Fig. 2.10.3 Appearance of ADIV01

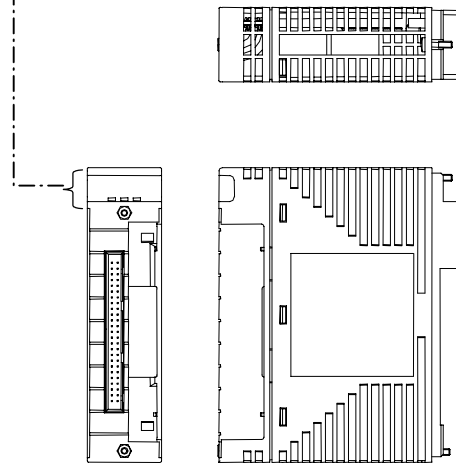


Fig. 2.10.4 Appearance of ADIV02

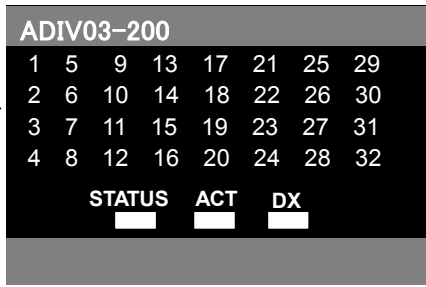


Fig. 2.10. 5 LED display

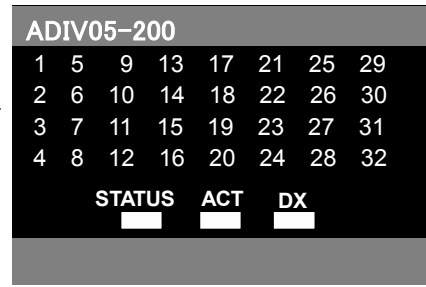


Fig. 2.10. 6 LED display

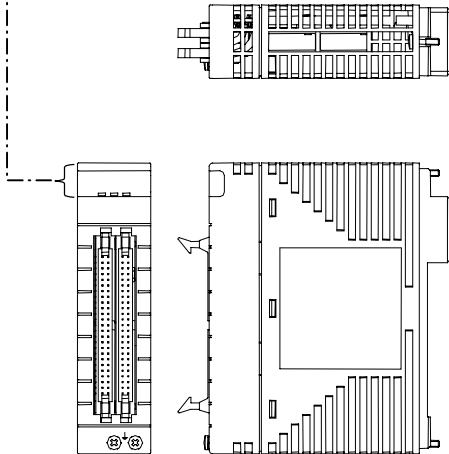


Fig. 2.10. 7 Appearance of ADIV03

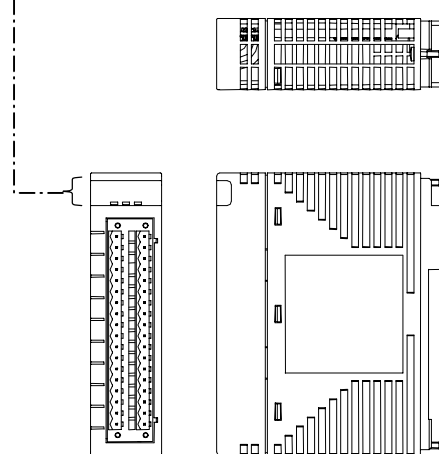


Fig. 2.10. 8 Appearance of ADIV05 and ADIV06

- Type name

Table 2.10.1 Digital input module

| Type name | | Description |
|--------------------|--------|---|
| Abbreviation | ADIV01 | Digital input module inputs: 32 points (24V DC, 4.1mA), single only |
| Specification code | -1□□ | Basic type |
| | -□0□ | Basic specifications |
| | -□1□ | G3 conformable: Corrosion resistant gas Class G3 (ISA: S71.04) (Note 1) |
| | -□□X | X is always set to 2. |

Note 1) Basic specification is Class G2 (ISA S71.04).

Table 2.10.2 Digital input module

| Type name | | Description |
|--------------------|--------|---|
| Type name | ADIV02 | Digital input module: 32 inputs (24V DC, 4.1mA) |
| | ADIV03 | Digital input module: 64 inputs (24V DC, 2.5mA) |
| | ADIV05 | Digital input module: 16 inputs (100V DC, 4.7mA) |
| | ADIV06 | Digital input module: 16 inputs (200V AC, 4.1mA) |
| Specification code | -1□□ | Basic type |
| | -2□□ | With bit display |
| | -3□□ | With DI pulse counter function |
| | -5□□ | With bit display and DI pulse counter function |
| | -□0□ | Basic specifications |
| | -□1□ | G3 conformable: Corrosion resistant gas Class G3 (ISA: S71.04) (Note 1) |
| | -□□X | X is always set to 2. |

Note 1) Basic specification is Class G2 (ISA S71.04).

- **Specifications**

Table 2.10.3 Specifications for digital input module (1/2)

| Module name | | Digital input module (32 inputs) for single only | Digital input module (32 inputs) | Digital input module (64 points) |
|--|-------------------------|--|---|---|
| Item | Type | ADIV01 | ADIV02 | ADIV03 |
| Operating ambient temperature | | 0 to 60°C | -20 to +70°C (Note 1) | 0 to 60°C |
| Number of inputs | | 32 | 32 | 64 (Note 2) |
| Common | | 16 points with P and N in common | 16 points with P and N in common (Note 9) | 16 points with P and N in common |
| Rated input voltage | | 24V DC | | |
| Range of operating voltage | | 20.4 to 26.4V DC | | |
| Allowable maximum input voltage | | 30.0V DC (Note 3) | | |
| Input ON voltage min. value | | 18V DC | 18V DC | 20V DC |
| Input OFF voltage max. value | | 5.0V DC | | |
| Input response time (Status mode) | | 4ms (no filter setting) | | |
| Withstand voltage between field – SG, and common | | 2000V AC 500V AC | | |
| Power consumption | | 5V DC: 350mA, max. | 5V DC: 350mA, max. 5V DC: 500mA, max. (Note 8) | 5V DC: 400mA, max. 5V DC: 550mA, max. (Note 8) |
| Mass | | 0.3 kg | 0.3 kg | 0.3 kg |
| Duplex | | — | Hardware standard conformable | Hardware standard conformable (Note 7) |
| Option | Environment conformable | G3 | G3 | G3 |

Table 2.10.3 Specifications for digital input module (2/2)

| Item | Module name | Digital input module (100V AC signal input) | Digital input module (200V AC signal input) |
|---|-------------------------|---|---|
| Type | | ADIV05 | ADIV06 |
| Operating ambient temperature | | -20 to +70°C (Note 1) | -20 to +70°C (Note 1) |
| Number of inputs | | 16 | 16 |
| Common | | 8 points together, in common (Note 9) | 8 points together, in common (Note 9) |
| Rated input voltage | | 100V to 120V AC (50/60 Hz) | 200 to 240V AC (50/60 Hz) |
| Range of operating voltage | | 80V to 132V AC | 160V to 264V AC |
| Allowable maximum input voltage | | — | — |
| Input ON voltage min. value | | 80V AC (Note 5) | 160V AC (Note 5) |
| Input OFF voltage max. value | | 20V AC (Note 6) | 40V AC (Note 6) |
| Input response time (preparation for higher level data) (Status mode) | | Within 150mS (no filter setting) | |
| Withstand voltage between field – SG, field - common | | 2000V AC 1350V AC | |
| Power consumption | | 5V DC: 500mA, max. (Note 8) | |
| Mass | | 0.3 kg | 0.3 kg |
| Duplex | | Hardware standard conformable (Note 7) | |
| Option | Environment conformable | G3 | |

Note 1) When using the module beyond the range of 0 to 60°C, refer to 5. Mounting limitations given in Chapter 4.

Note 2) When the ambient temperature is over 50°C, the simultaneous ON rate is limited to 50%.

Note 3) Application of transient voltage is only allowable. If transient voltage is continuously applied, it should be used within the range of operating voltage.

Note 4) Based on sine wave. Peak value should be 113V and 226V or higher.

Note 5) Based on sine wave. Peak value should be 28V and 56V or lower.

Note 6) When setting in the duplex mode, an external cable should be connected to both modules at the outside.

Note 7) In case of bit display

Note 8) A signal to the same module should be in phase.

Note 9) When a terminal block with surge absorbers is used, each common is connected.

- **LED display**

The meaning of LED to be display is given in Table below.

Table 2.10.4 Digital input module LED display

| Display LED | Color of display | Meaning |
|---------------------------|------------------|--|
| STATUS | Green | ON: Normal or minor fault OFF: Major fault (For the cause, see 3. 4). |
| ACT | Green | ON: Input/Output activating OFF: Input/Output stop status |
| DX (Except for ADIV01) | Green | ON: Set as duplex module OFF: Set as single module |

Table 2.10.5 Digital input module LED display

| Name | Color of display | Contents | Remarks |
|---|------------------|--|----------|
| LED for each point (Except for ADIV01) | Green | ON: Input ON OFF: Input ON | (Figure) |
| Display selector switch (ADIV03 only) | - | Left (CN1): IN01 to IN32 are displayed Right (CN2): IN33 to IN64 are displayed. | |

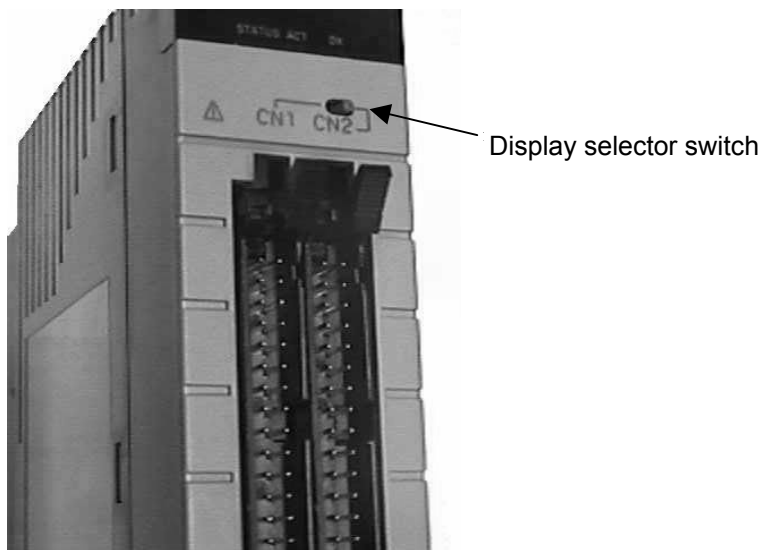


Fig. 2.10. 9 Display selector switch for ADIV03

- **External cable connection and terminal assignment**

- ◆ External cable connection and terminal assignment for digital input module (ADIV01)

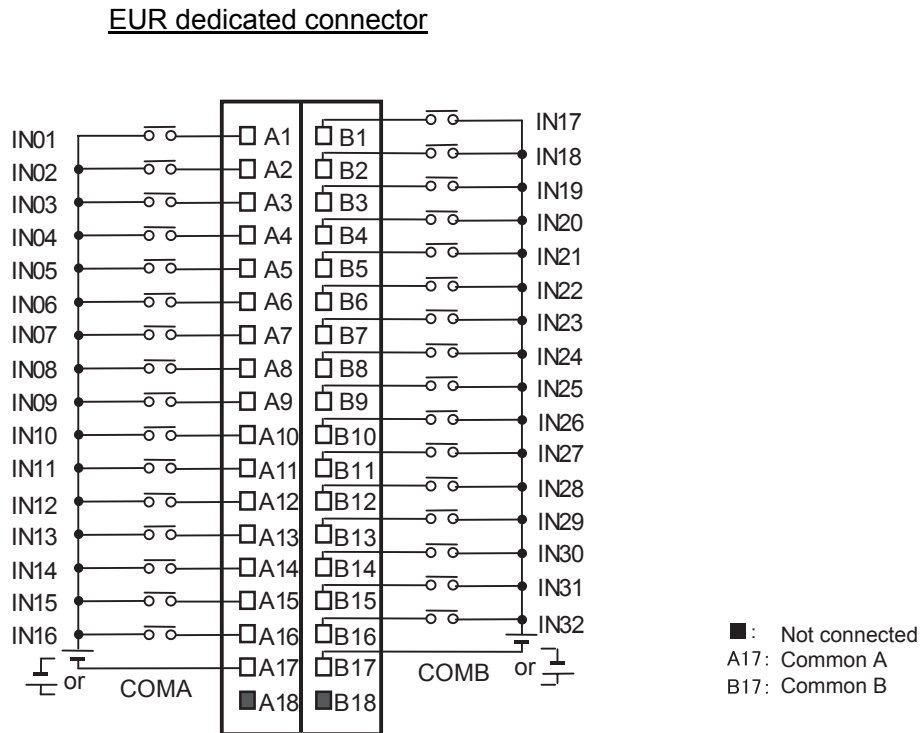


Fig. 2.10.10 External cable connection for digital input module (ADIV01)

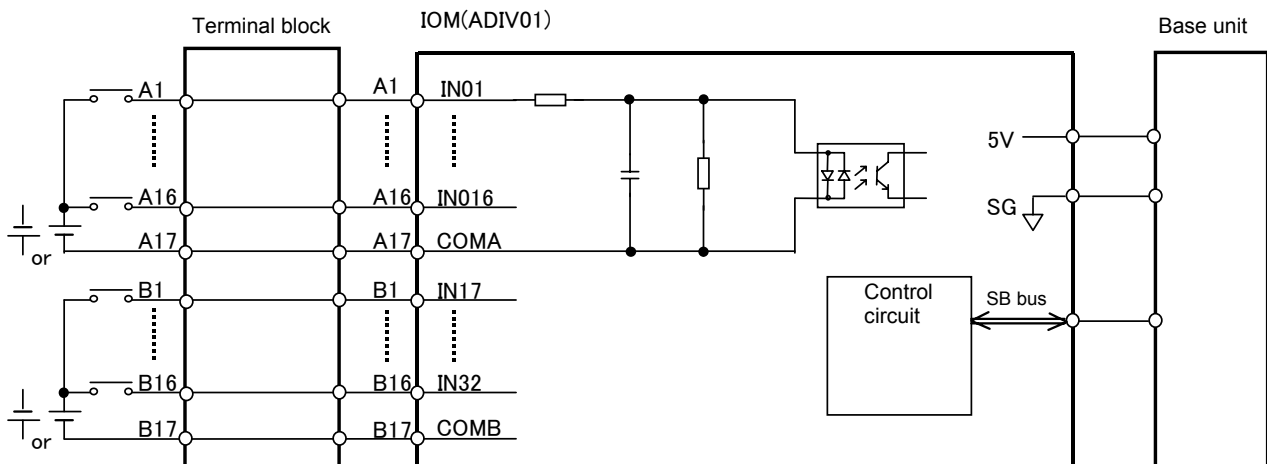


Fig. 2.10.11 External cable connection circuit for digital input module (ADIV01)

Table 2.10.6 Terminal assignment for digital input (ADIV01)

| Terminal block | | | | ADIV01 connector | | | |
|-----------------------|----------------|---------|----------------|-----------------------|----------------|---------|----------------|
| EUR terminal (Note 1) | | | | (Dedicated connector) | | | |
| Pin No. | Name of signal | Pin No. | Name of signal | Pin No. | Name of signal | Pin No. | Name of signal |
| A1 | IN01 | B1 | IN17 | A1 | IN01 | B1 | IN17 |
| A2 | IN02 | B2 | IN18 | A2 | IN02 | B2 | IN18 |
| A3 | IN03 | B3 | IN19 | A3 | IN03 | B3 | IN19 |
| A4 | IN04 | B4 | IN20 | A4 | IN04 | B4 | IN20 |
| A5 | IN05 | B5 | IN21 | A5 | IN05 | B5 | IN21 |
| A6 | IN06 | B6 | IN22 | A6 | IN06 | B6 | IN22 |
| A7 | IN07 | B7 | IN23 | A7 | IN07 | B7 | IN23 |
| A8 | IN08 | B8 | IN24 | A8 | IN08 | B8 | IN24 |
| A9 | IN09 | B9 | IN25 | A9 | IN09 | B9 | IN25 |
| A10 | IN10 | B10 | IN26 | A10 | IN10 | B10 | IN26 |
| A11 | IN11 | B11 | IN27 | A11 | IN11 | B11 | IN27 |
| A12 | IN12 | B12 | IN28 | A12 | IN12 | B12 | IN28 |
| A13 | IN13 | B13 | IN29 | A13 | IN13 | B13 | IN29 |
| A14 | IN14 | B14 | IN30 | A14 | IN14 | B14 | IN30 |
| A15 | IN15 | B15 | IN31 | A15 | IN15 | B15 | IN31 |
| A16 | IN16 | B16 | IN32 | A16 | IN16 | B16 | IN32 |
| A17 | COMA | B17 | COMB | A17 | COMA | B17 | COMB |
| A18 | NC | B18 | NC | A18 | NC | B18 | NC |

NC: Not connected

- Note 1) Connect terminal block ATES07 to the dedicated connector.
 ATES07 requires both A and B per module.
 ATES07 consists of A (A1 to A18) and B (B1 to B18) of the dedicated connector, which are provided with a means of preventing wrong insertion.
 On the dedicated connector "A" for the IO module, terminal block "A" should be provided.

- ◆ External cable connection and terminal assignment for digital input module (ADIV02)
 - In case of EUR terminal and MIL connector

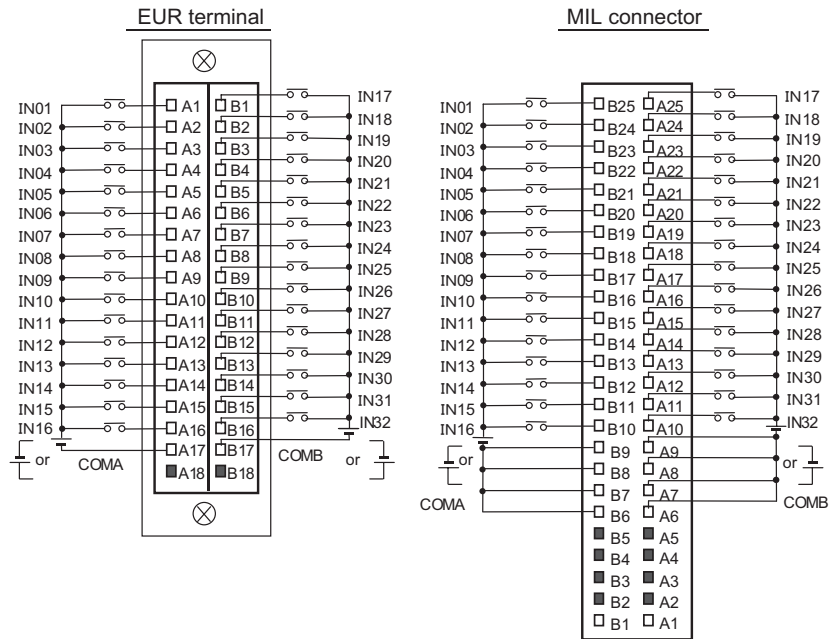
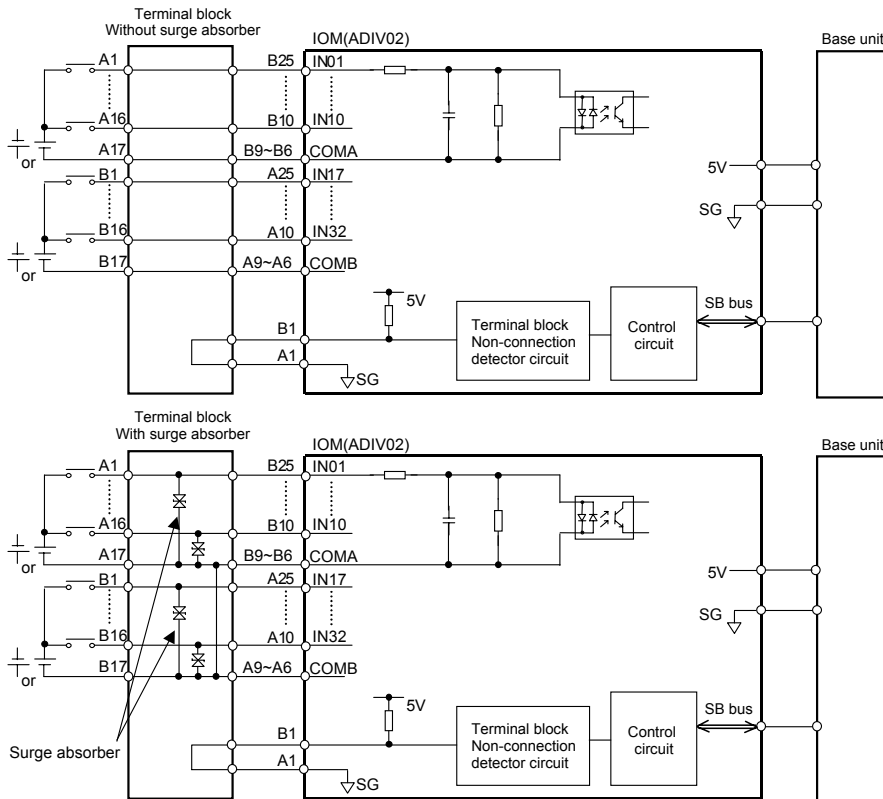


Fig. 2.10.12 External cable connection for digital input module (ADIV02)



When a terminal block with surge absorbers is used, each common is connected.

Fig. 2.10.13 External cable connection circuit for digital input module (ADIV02)

Table 2.10.7 Terminal assignment for digital input module (ADIV02)

| Terminal block | | | | ADIV02 connector | | | |
|----------------|----------------|---------|----------------|------------------------|----------------|-------------|----------------|
| EUR terminal | | | | MIL connector (Note 1) | | | |
| Pin No. | Name of signal | Pin No. | Name of signal | Pin No. | Name of signal | Pin No. | Name of signal |
| A1 | IN01 | B1 | IN17 | B25 | IN01 | A25 | IN17 |
| A2 | IN02 | B2 | IN18 | B24 | IN02 | A24 | IN18 |
| A3 | IN03 | B3 | IN19 | B23 | IN03 | A23 | IN19 |
| A4 | IN04 | B4 | IN20 | B22 | IN04 | A22 | IN20 |
| A5 | IN05 | B5 | IN21 | B21 | IN05 | A21 | IN21 |
| A6 | IN06 | B6 | IN22 | B20 | IN06 | A20 | IN22 |
| A7 | IN07 | B7 | IN23 | B19 | IN07 | A19 | IN23 |
| A8 | IN08 | B8 | IN24 | B18 | IN08 | A18 | IN24 |
| A9 | IN09 | B9 | IN25 | B17 | IN09 | A17 | IN25 |
| A10 | IN10 | B10 | IN26 | B16 | IN10 | A16 | IN26 |
| A11 | IN11 | B11 | IN27 | B15 | IN11 | A15 | IN27 |
| A12 | IN12 | B12 | IN28 | B14 | IN12 | A14 | IN28 |
| A13 | IN13 | B13 | IN29 | B13 | IN13 | A13 | IN29 |
| A14 | IN14 | B14 | IN30 | B12 | IN14 | A12 | IN30 |
| A15 | IN15 | B15 | IN31 | B11 | IN15 | A11 | IN31 |
| A16 | IN16 | B16 | IN32 | B10 | IN16 | A10 | IN32 |
| A17 | COMA | B17 | COMB | B9 | COMA | A9 | COMB |
| A18 | NC | B18 | NC | B8 | COMA | A8 | COMB |
| | | | | B7 | COMA | A7 | COMB |
| | | | | B6 | COMA | A6 | COMB |
| | | | | B5 | NC | A5 | NC |
| | | | | B4 | NC | A4 | NC |
| | | | | B3 (Note 2) | NC | A3 (Note 2) | NC |
| | | | | B2 (Note 2) | NC | A2 (Note 2) | NC |
| | | | | B1 (Note 1) | CBSE | A1 (Note 2) | GND |

NC: Not connected

CBSE: Signal for detection circuit not connected to terminal block

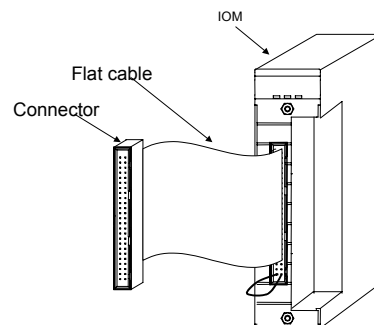
Note 1) To detect any external cable that is not connected to the MIL connector, short-circuit between A1 and B1 at the external side. When using EUR terminal block, it is shorted in the EUR terminal block.



CAUTION

Note 2) For external cable connectors corresponding to each pin of MIL connector A2, A3, B2 and B3, use pin-less connectors for the digital input module that requires for assuring insulation distance.

The cable between A1 and B1 is already connected to SG in the internal circuit. Withstand voltage should be 2000V AC as measured for 1 minutes between cable and other flat cable.



■ In case of screw terminals

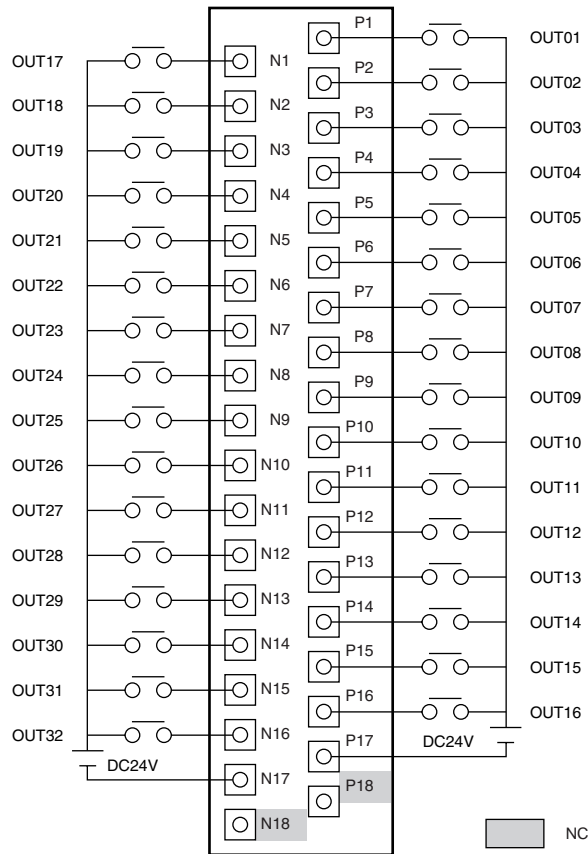


Fig. 2.10.14 External cable connection

Table 2.10.8 Digital input module (ADIV02) terminal assignment

| Pin No. | Name of signal | Pin No. | Name of signal |
|---------|----------------|---------|----------------|
| N1 | IN17 | P1 | IN01 |
| N2 | IN18 | P2 | IN02 |
| N3 | IN19 | P3 | IN03 |
| N4 | IN20 | P4 | IN04 |
| N5 | IN21 | P5 | IN05 |
| N6 | IN22 | P6 | IN06 |
| N7 | IN23 | P7 | IN07 |
| N8 | IN24 | P8 | IN08 |
| N9 | IN25 | P9 | IN09 |
| N10 | IN26 | P10 | IN10 |
| N11 | IN27 | P11 | IN11 |
| N12 | IN28 | P12 | IN12 |
| N13 | IN29 | P13 | IN13 |
| N14 | IN30 | P14 | IN14 |
| N15 | IN31 | P15 | IN15 |
| N16 | IN32 | P16 | IN16 |
| N17 | COMB | P17 | COMA |
| N18 | NC | P18 | NC |

◆ External cable connection and terminal assignment for digital input module (ADIV03)

No terminal block that conforms to ADIV03 is provided.

MIL50 - pin x 2

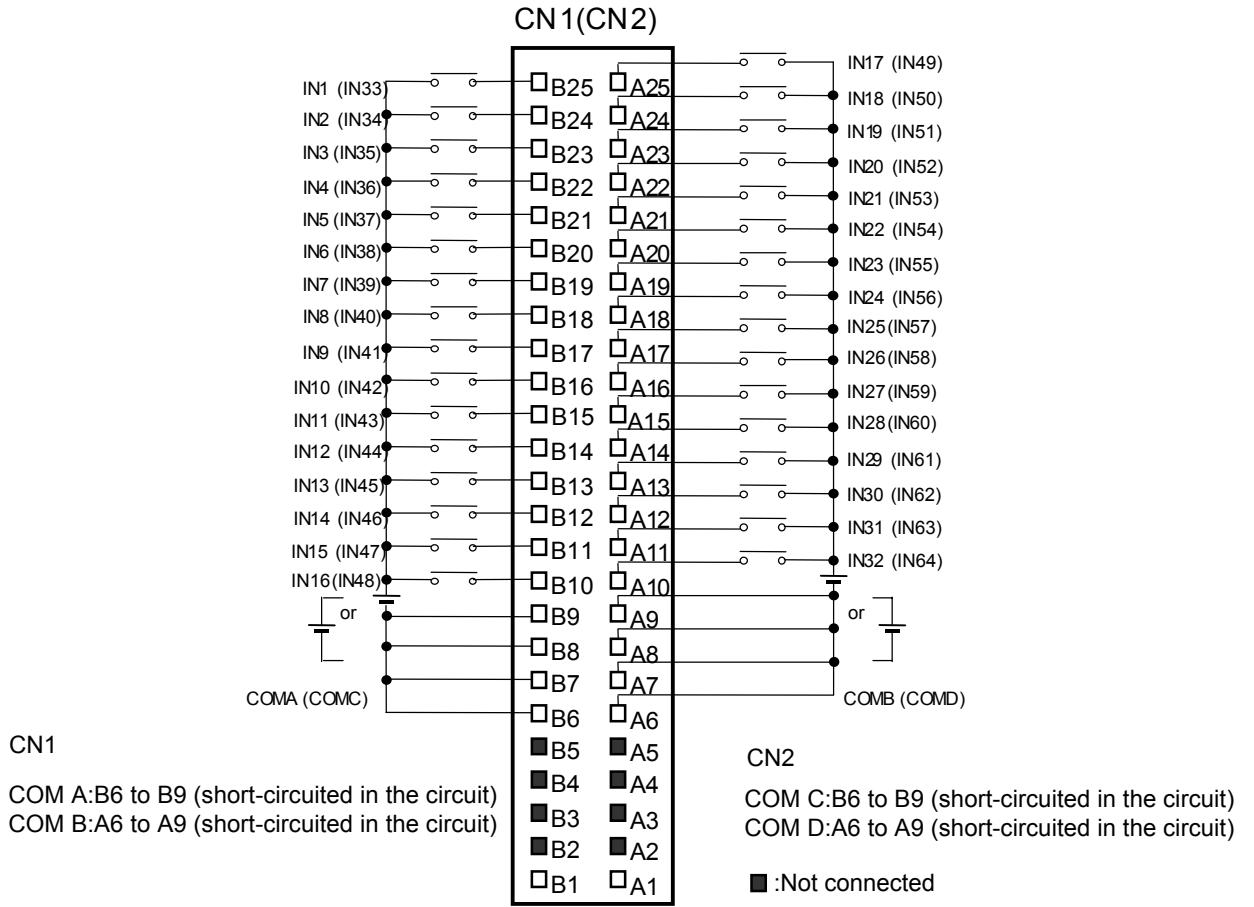


Fig. 2.10.15 External cable connection for digital input module (ADIV03)

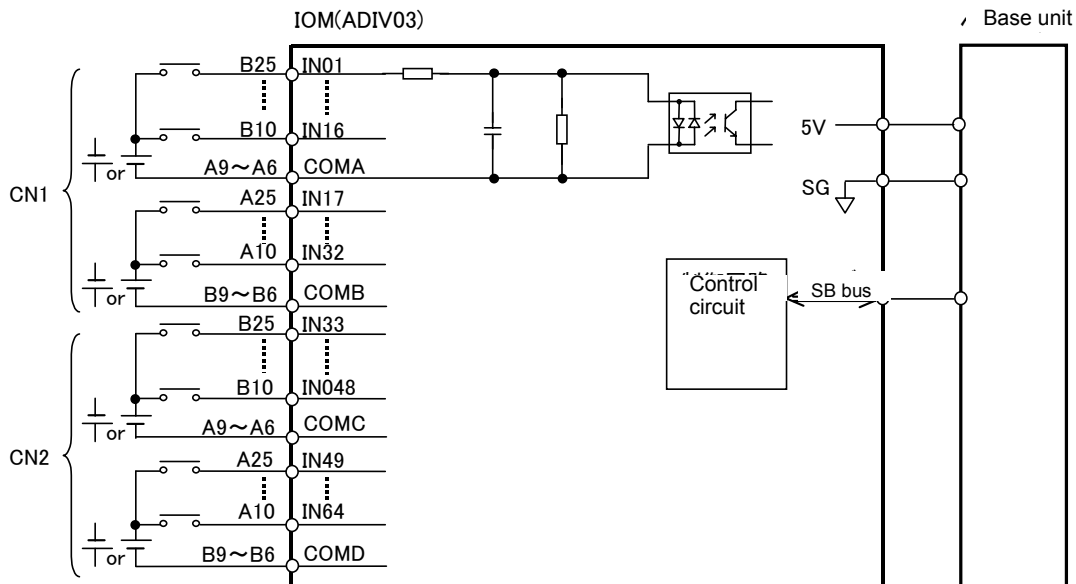


Fig. 2.10.16 External cable connection circuit for digital input module (ADIV03)

Table 2.10.9 Terminal assignment for digital input module (ADIV03)

| ADIV03 connector | | | | | | | |
|------------------------------|----------------|-------------|----------------|------------------------------|----------------|-------------|----------------|
| MIL connector (CN1) (Note 1) | | | | MIL connector (CN2) (Note 1) | | | |
| Pin No. | Name of signal | Pin No. | Name of signal | Pin No. | Name of signal | Pin No. | Name of signal |
| AB25 | IN01 | A25 | IN17 | B25 | IN33 | A25 | IN49 |
| AB24 | IN02 | A24 | IN18 | B24 | IN34 | A24 | IN50 |
| AB23 | IN03 | A23 | IN19 | B23 | IN35 | A23 | IN51 |
| B22 | IN04 | A22 | IN20 | B22 | IN36 | A22 | IN52 |
| B21 | IN05 | A21 | IN21 | B21 | IN37 | A21 | IN53 |
| B20 | IN06 | A20 | IN22 | B20 | IN38 | A20 | IN54 |
| B19 | IN07 | A19 | IN23 | B19 | IN39 | A19 | IN55 |
| B18 | IN08 | A18 | IN24 | B18 | IN40 | A18 | IN56 |
| B17 | IN09 | A17 | IN25 | B17 | IN41 | A17 | IN57 |
| B16 | IN10 | A16 | IN26 | B16 | IN42 | A16 | IN58 |
| B15 | IN11 | A15 | IN27 | B15 | IN43 | A15 | IN59 |
| B14 | IN12 | A14 | IN28 | B14 | IN44 | A14 | IN60 |
| B13 | IN13 | A13 | IN29 | B13 | IN45 | A13 | IN61 |
| B12 | IN14 | A12 | IN30 | B12 | IN46 | A12 | IN62 |
| B11 | IN15 | A11 | IN31 | B11 | IN47 | A11 | IN63 |
| B10 | IN16 | A10 | IN32 | B10 | IN48 | A10 | IN64 |
| B9 | COMA | A9 | COMB | B9 | COMB | A9 | COMD |
| B8 | COMA | A8 | COMB | B8 | COMB | A8 | COMD |
| B7 | COMA | A7 | COMB | B7 | COMB | A7 | COMD |
| B6 | COMA | A6 | COMB | B6 | COMB | A6 | COMD |
| B5 | NC | A5 | NC | B5 | NC | A5 | NC |
| B4 | NC | A4 | NC | B4 | NC | A4 | NC |
| B3 (Note 2) | NC | A3 (Note 2) | NC | B3 (Note 2) | NC | A3 (Note 2) | NC |
| B2 (Note 2) | NC | A2 (Note 2) | NC | B2 (Note 2) | NC | A2 (Note 2) | NC |
| B1 (Note 1) | CBSE | A1 (Note 1) | GND | B1 (Note 1) | CBSE | A1 (Note 1) | GND |

NC: Not connected

CBSE: Signal for detection circuit not connected to terminal block

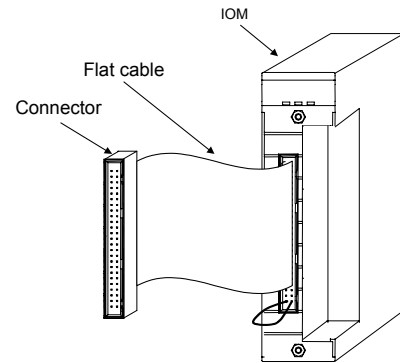
Note 1) To detect any external cable that is not connected to the MIL connector, short-circuit between A1 and B1 at the external side.



CAUTION

Note 2) For external cable connectors corresponding to each pin of MIL connector A2, A3, B2 and B3, use pin-less connectors for the digital input module that is required to assure insulation distance.

The cable between A1 and B1 is already connected to SG in the internal circuit. Withstand voltage should be 2000V AC as measured for 1 minutes between cable and other flat cable.



◆ External cable connection and terminal assignment for digital input module (ADIV05, ADIV06)

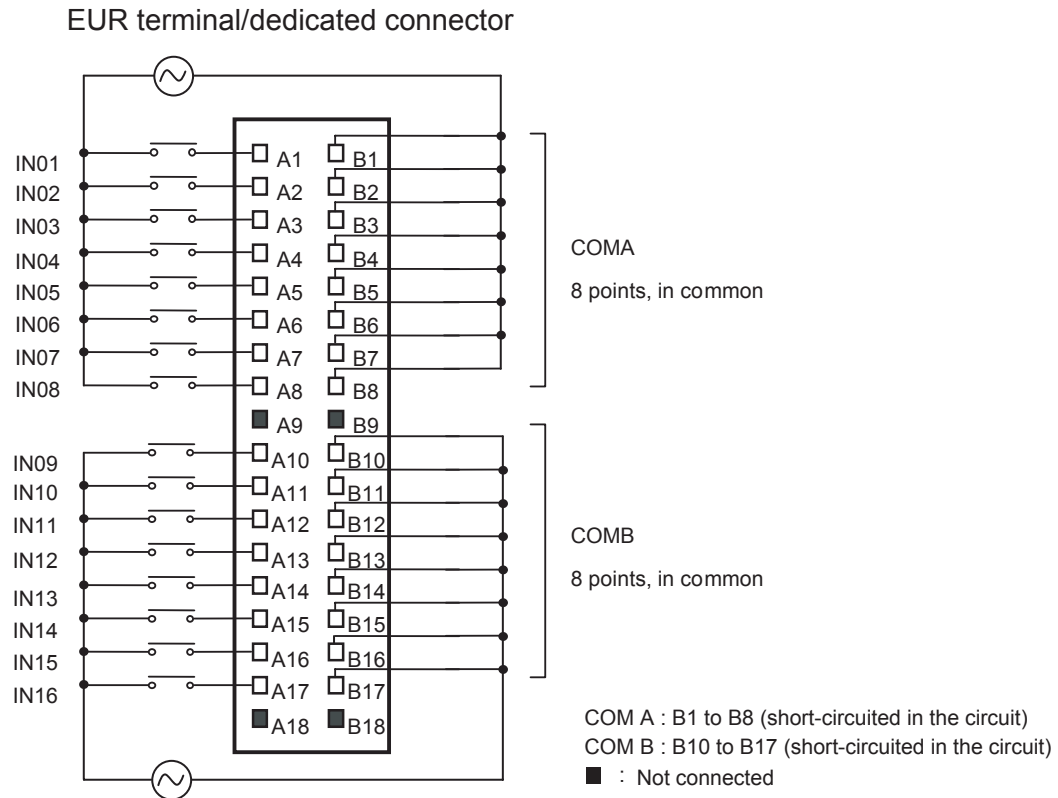


Fig. 2.10.17 External cable connection for digital input module (ADIV05, ADIV06)

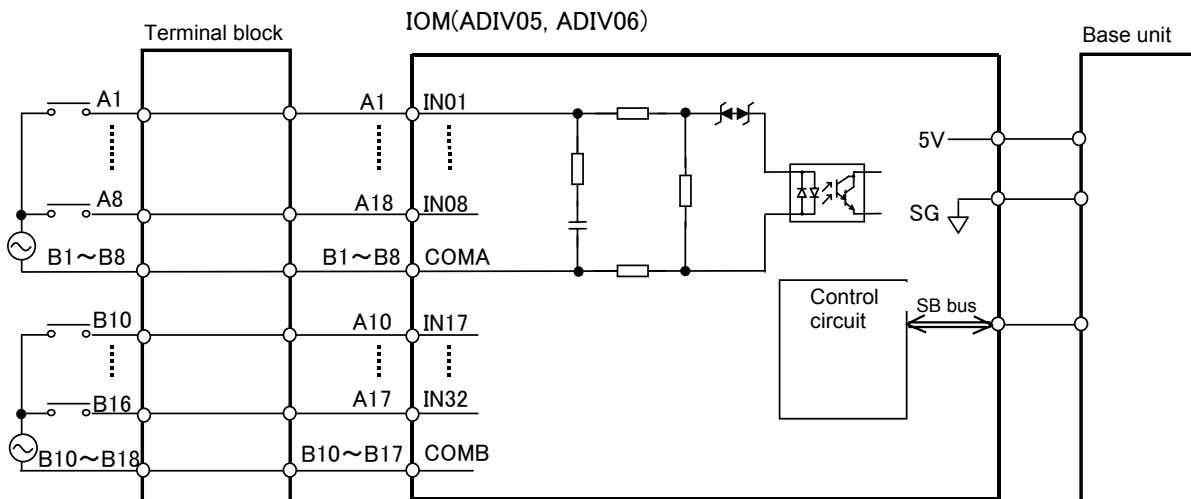


Fig. 2.10.18 External cable connection circuit for digital input module (ADIV05, ADIV06)

Table 2.10.10 Terminal assignment for digital input module (ADIV05, ADIV06)

| Terminal block | | | | ADIV05, ADIV06 connector | | | |
|-----------------------|----------------|---------|----------------|--------------------------|----------------|---------|----------------|
| EUR terminal (Note 1) | | | | (Dedicated connector) | | | |
| Pin No. | Name of signal | Pin No. | Name of signal | Pin No. | Name of signal | Pin No. | Name of signal |
| A1 | IN01 | B1 | COMA | A1 | IN01 | B1 | COMA |
| A2 | IN02 | B2 | COMA | A2 | IN02 | B2 | COMA |
| A3 | IN03 | B3 | COMA | A3 | IN03 | B3 | COMA |
| A4 | IN04 | B4 | COMA | A4 | IN04 | B4 | COMA |
| A5 | IN05 | B5 | COMA | A5 | IN05 | B5 | COMA |
| A6 | IN06 | B6 | COMA | A6 | IN06 | B6 | COMA |
| A7 | IN07 | B7 | COMA | A7 | IN07 | B7 | COMA |
| A8 | IN08 | B8 | COMA | A8 | IN08 | B8 | COMA |
| A9 | NC | B9 | NC | A9 | NC | B9 | NC |
| A10 | IN09 | B10 | COMB | A10 | IN09 | B10 | COMB |
| A11 | IN10 | B11 | COMB | A11 | IN10 | B11 | COMB |
| A12 | IN11 | B12 | COMB | A12 | IN11 | B12 | COMB |
| A13 | IN12 | B13 | COMB | A13 | IN12 | B13 | COMB |
| A14 | IN13 | B14 | COMB | A14 | IN13 | B14 | COMB |
| A15 | IN14 | B15 | COMB | A15 | IN14 | B15 | COMB |
| A16 | IN15 | B16 | COMB | A16 | IN15 | B16 | COMB |
| A17 | IN16 | B17 | COMB | A17 | IN16 | B17 | COMB |
| A18 | NC | B18 | NC | A18 | NC | B18 | NC |

NC: Not connected

Note 1) Connect terminal block ATES06 to the dedicated connector.
 ATES06 requires both A and B per module.
 ATES06 consists of A (A1 to A18) and B (B1 to B18) of the dedicated connector, which are provided with a means of preventing wrong insertion. On the dedicated connector “A” for the IO module, terminal block “A” should be provided.

● **AC signal connection**

Both ADIV05 and ADIV06 are used for the driving signal input from the field circuit that is connected to an external AC power source.



Since high voltage is applied to the input terminals for ADIV05 and ADIV06, don't touch it or bring inductive materials into contact with it to avoid shock hazards.
