General Specifications

Terminal Boards (for FIO)

CENTUM VP

GS 33K50H51-50E

[Release 5]

■ GENERAL

This document describes the specifications of terminal boards with DIN rail type used for FIOs of CENTUM VP systems.

■ STANDARD SPECIFICATIONS

About the installation and environmental conditions of the Terminal board, refer to “Safety Precautions” of “CENTUM VP installation Guidance(TI 33K01J10-50E),” which is common with the Terminal board.

Model	Description	Points	Terminals	Modules Connected	Connection Adapter	Connection Cable	Weight	Specifications
A1BA4D	For analog signals (single and dual-redundant modules)	8 pts x 1	Pressure clamp	AAI135 (*1) AAI835 (*1) AAP135 (*1)	ATK4A	KS1	0.3 kg	Insulation resistance: 10 MΩ or greater at 500 V DC Withstanding voltage: 500 V AC for 1 minute (*4)
		16 pts x 1	Pressure clamp	AAI141 AAV141 AAV142 AAV144 AAB841 AAI841 AAV542 AAV544 AAI143 AAI543				
A1BT4D	For thermocouple (single and dual-redundant modules)	16 pts x 1	Pressure clamp	AAT145	– (*3)	KS1	0.3 kg	Insulation resistance: 10 MΩ or greater at 200 V DC Withstanding voltage: 200 V AC for 1 minute (*4)
A1BR4D	For resistance temperature detectors (single and dual-redundant modules)	16 pts x 1	Pressure clamp	AAR145	– (*3)	AKB335	0.3 kg	Insulation resistance: 10 MΩ or greater at 200 V DC Withstanding voltage: 200 V AC for 1 minute (*4)
A1BD5D (*6) (*7)	For digital signals (single and dual-redundant modules)	32 pts x 1	Pressure clamp	ADV151 ADV551	ATD5A	AKB331	0.7 kg	Insulation resistance: 10 MΩ or greater at 500 V DC Withstanding voltage: 2.0 k V AC for 1 minute (*5)
				ADV161 (*2) ADV561 (*2)	– (*3)	AKB337		

Note: Be sure to leave the connector caps on connectors that are not used, in order to protect the connector pins and prevent dust from accumulating on them.

*1: For the combination of AAI135/AAI835/AAP135; ATK4A; A1BA4D, either 2-Wire Transmitter 2-Wire Input (transmitter power supply type) or 4-Wire Transmitter 2-Wire Input (without transmitter power supply) can be selected for each input channel.
*2: Two units of A1BD5D and two units of AKB337 are required for ADV161 or ADV561.
*3: A cable can be connected directly to the I/O module without using an adapter.
*4: Between channels
*5: Between power terminal and READY terminal
*6: The READY contact rating shows below.
125 V AC or less and 0.3 A or less
60 V DC or less and 1 A or less
*7: External supply voltage shows below.
24 V DC ±10 %

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GS 33K50H51-50E

4th Edition Feb. 1, 2015 (YK)

● Regulatory Compliance

For the detailed information of following standards, see “System Overview” (GS 33K01A10-50E).

Safety Standards
[CAN/CSA-C22.2] No.61010-1
[CE Marking] LVD
[EAC Marking] LVD

EMC Conformity Standards
[CE Marking] EMC
[RCM]
[KC Marking]
[EAC Marking] EMC

Standards for Hazardous Location Equipment
[CSA Non-Incendive]
[FM Non-Incendive]
[ATEX Type n]

■ CABLES

● A1BA4D, A1BD5D, A1BR4D

Applicable Cables
600 V polyvinyl chloride insulated wires (IV); JIS C3307/IEC 60227-3
Polyvinyl chloride insulated wires for electrical apparatus (KIV); JIS C3316/IEC 60227-3
600 V grade heat-resistant polyvinyl chloride insulated wires (HIV); JIS C3317/IEC 60227-3
Heatproof vinyl insulated wires VW-1 (UL1015/UL1007)
Control cables (vinyl insulated vinyl sheath cable) (CVV); JIS C3401

Temperature rating of Cables

Models	Cables	Temperature rating of Cables
A1BA4D, A1BR4D	Signal Cables	An ambient temperature plus 10 °C or more
A1BD5D	Signal Cables (including READY terminal)	An ambient temperature plus 10 °C or more
	Input Power Cables	An ambient temperature plus 20 °C or more

Recommended Wire nominal cross sectional area
• Pressure clamp terminals
Without a sleeve: 0.5 to 2 mm^2 (AWG20 to 14)

Cable Termination Process when Pressure Clamp Terminals are Used
• Without a Sleeve

Wire nominal cross sectional area (mm^2)	Peel-off length (mm)
0.5 to 2.5 (AWG20 to 14)	8

• With a Sleeve

Wire nominal cross sectional area (mm^2)	When using a sleeve with insulating cover					When using a sleeve without insulating cover			
	Peel-off length (mm)	Sleeve dimensions (mm)		Weidmuller model No.	Phoenix contact model No.	Peel-off length (mm)	Sleeve dimensions (mm)	Weidmuller model No.	Phoenix contact model No.
		Total length	Contact section length				Total length		
0.5	8	14	8	H0.5/14	AI 0,5-8 WH	8	6	H0.5/6	A 0,5-6
0.75	8	14	8	H0.75/14	AI 0,75-8 GY	8	6	H0.75/6	A 0,75-6
1.0	8	14	8	H1/14	AI 1-8 RD	8	6	H1/6	A 1-6
1.5	8	14	8	H1.5/14	AI 1,5-8 BK	8	7	H1.5.7	A 1,5-7
2.5	8	14	8	H2.5/14D	AI 2,5-8 BU	8	7	H2.5.7	A 2,5-7

● A1BT4D

Applicable Cables

600 V polyvinyl chloride insulated wires (IV); JIS C3307/IEC 60227-3
Polyvinyl chloride insulated wires for electrical apparatus (KIV); JIS C3316/IEC 60227-3
600 V grade heat-resistant polyvinyl chloride insulated wires (HIV); JIS C3317/IEC 60227-3
Heatproof vinyl insulated wires VW-1 (UL1015/UL1007)
Control cables (vinyl insulated vinyl sheath cable) (CVV); JIS C3401

Temperature rating of Cables

Models	Cables	Temperature rating of Cables
A1BT4D	Signal Cables	An ambient temperature plus 10 °C or more

Recommended Wire nominal cross sectional area

• Pressure clamp terminals
Without a sleeve: 0.5 to 2 mm^2 (AWG20 to 14)
With a sleeve: 0.5 to 1.5 mm^2 (AWG20 to 16)

Cable Termination Process when Pressure Clamp Terminals are Used

• Without a Sleeve

Wire nominal cross sectional area (mm^2)	Peel-off length (mm)
0.5 to 2 (AWG20 to 14)	11

• With a Sleeve

Wire nominal cross sectional area (mm^2)	When using a sleeve with insulating cover				When using a sleeve without insulating cover		
	Peel-off length (mm)	Sleeve dimensions (mm)		Weidmuller model No.	Peel-off length (mm)	Sleeve dimensions (mm)	Weidmuller model No.
		Total length	Contact section length			Total length	
0.5	11	16	10	H0.5/16	11	10	H0.5/10
0.75	11	16	10	H0.75/16	11	10	H0.75/10
1.0	11	16	10	H1/16	11	10	H1/10
1.25 to 1.5	11	16	10	H1.5/16	11	10	H1.5/10

■ TERMINAL BLOCK AND CONNECTOR CONNECTION SPECIFICATIONS

Please refer to the specifications shown below to connect signal cables with a proper terminal since some Analog I/O modules require to select a proper terminal dependent on the devices to be connected.

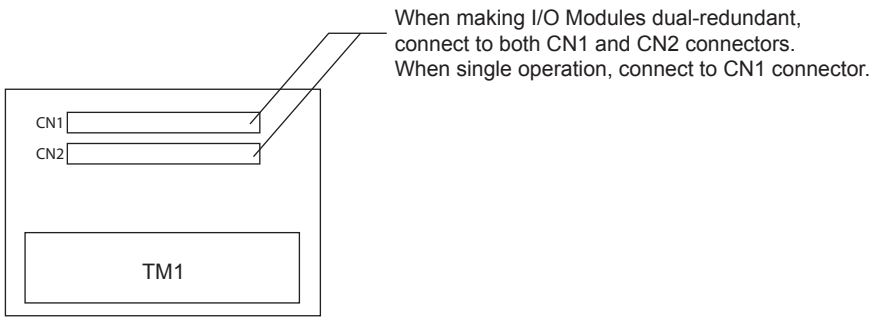
Models	Cable Connection Pris	Input Type		
AAI141 AAI143 AAI841 (*1)	IN□A	2-wire transmitter input +	Current input -	–
	IN□B	2-wire transmitter input - (setting pin: 2-wire input)	Current input + (setting pin: 4-wire input)	
AAI135 AAI835	IN□A	2-wire transmitter input +	–	–
	IN□B	2-wire transmitter input -	Current input +	
	IN□C	–	Current input -	
AAR145 (*2)	IN□A	RTD input A	POT input, 100 %	–
	IN□B	RTD input B	POT input, 0 %	
	IN□C	RTD input B	POT input, variable	
AAP135	IN□A	2-wire power supply (power)	–	3-wire power supply power supply
	IN□B	2-wire power supply (signal)	2-wire (voltage, contact) +	3-wire power supply +
	IN□C	–	2-wire (voltage, contact) -	3-wire power supply -

□ is channel number.
*1: When power of models AAI141, AAI143, AAI841, AAI135 and AAI835 is off or abnormal, current input loop is in the open state.
Do not use current signals with other receiving devices.When in use, also use an extarnal receiver resistance, in the voltage mode (Shunt resistant module part no.: A1080RZ 250 ohm).
*2: Wiring resistance for the signal cables of IN□A and IN□B must be identical.

■ TERMINAL BOARDS

The terminal N.C. in the figure is an unused terminal; wiring is not required.

● A1BA4D



F01E.ai

When connecting AAI141 or AAI143

TM1

Signal name	IN1A	IN2A	IN3A	IN4A	IN5A	IN6A	IN7A	IN8A	IN9A	IN10A	IN11A	IN12A	IN13A	IN14A	IN15A	IN16A
Terminal No.	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A
	1B	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B
Signal name	IN1B	IN2B	IN3B	IN4B	IN5B	IN6B	IN7B	IN8B	IN9B	IN10B	IN11B	IN12B	IN13B	IN14B	IN15B	IN16B

F02E.ai

When connecting AAV141, AAV142 or AAV144

TM1

Signal name	IN1+	IN2+	IN3+	IN4+	IN5+	IN6+	IN7+	IN8+	IN9+	IN10+	IN11+	IN12+	IN13+	IN14+	IN15+	IN16+
Terminal No.	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A
	1B	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B
Signal name	IN1-	IN2-	IN3-	IN4-	IN5-	IN6-	IN7-	IN8-	IN9-	IN10-	IN11-	IN12-	IN13-	IN14-	IN15-	IN16-

F03E.ai

When connecting AAV542, AAI543 or AAV544

TM1

Signal name	OUT1+	OUT2+	OUT3+	OUT4+	OUT5+	OUT6+	OUT7+	OUT8+	OUT9+	OUT10+	OUT11+	OUT12+	OUT13+	OUT14+	OUT15+	OUT16+
Terminal No.	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A
	1B	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B
Signal name	OUT1-	OUT2-	OUT3-	OUT4-	OUT5-	OUT6-	OUT7-	OUT8-	OUT9-	OUT10-	OUT11-	OUT12-	OUT13-	OUT14-	OUT15-	OUT16-

F04E.ai

When connecting AAI841

TM1

Signal name	IN1A	IN2A	IN3A	IN4A	IN5A	IN6A	IN7A	IN8A	OUT1+	OUT2+	OUT3+	OUT4+	OUT5+	OUT6+	OUT7+	OUT8+
Terminal No.	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A
	1B	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B
Signal name	IN1B	IN2B	IN3B	IN4B	IN5B	IN6B	IN7B	IN8B	OUT1-	OUT2-	OUT3-	OUT4-	OUT5-	OUT6-	OUT7-	OUT8-

F05E.ai

When connecting AAB841
TM1

Signal name	IN1+	IN2+	IN3+	IN4+	IN5+	IN6+	IN7+	IN8+	OUT1+	OUT2+	OUT3+	OUT4+	OUT5+	OUT6+	OUT7+	OUT8+
Terminal No.	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A
	1B	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B
Signal name	IN1-	IN2-	IN3-	IN4-	IN5-	IN6-	IN7-	IN8-	OUT1-	OUT2-	OUT3-	OUT4-	OUT5-	OUT6-	OUT7-	OUT8-

F06E.ai

When connecting AAI135 or AAP135
TM1

Signal name	IN1A	IN1B	IN2A	IN2B	IN3A	IN3B	IN4A	IN4B	IN5A	IN5B	IN6A	IN6B	IN7A	IN7B	IN8A	IN8B
Terminal No.	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A
	1B	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B
Signal name	N.C.	IN1C	N.C.	IN2C	N.C.	IN3C	N.C	IN4C	N.C.	IN5C	N.C.	IN6C	N.C.	IN7C	N.C.	IN8C

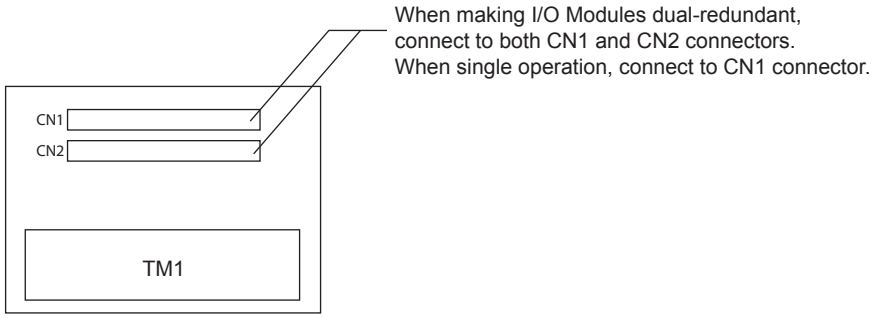
F07E.ai

When connecting AAI835
TM1

Signal name	IN1A	IN1B	IN2A	IN2B	IN3A	IN3B	IN4A	IN4B	N.C.	OUT1+	N.C.	OUT2+	N.C.	OUT3+	N.C.	OUT4+
Terminal No.	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A
	1B	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B
Signal name	N.C.	IN1C	N.C.	IN2C	N.C.	IN3C	N.C	IN4C	N.C.	OUT1-	N.C.	OUT2-	N.C.	OUT3-	N.C.	OUT4-

F08E.ai

● A1BT4D



F09E.ai

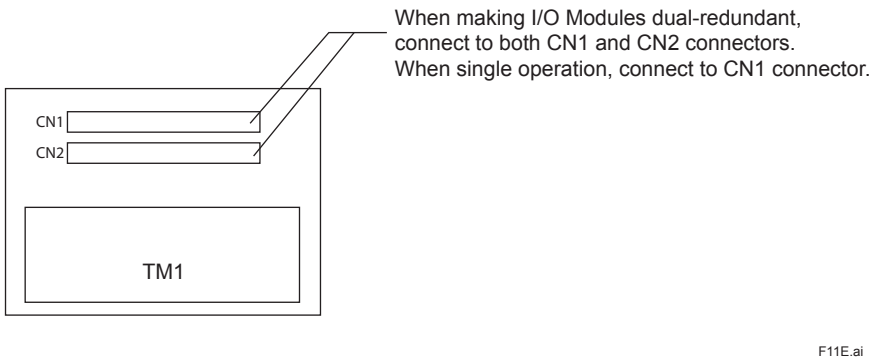
When connecting AAT145
TM1

Signal name	IN1+	IN2+	IN3+	IN4+	IN5+	IN6+	IN7+	IN8+	IN9+	IN10+	IN11+	IN12+	IN13+	IN14+	IN15+	IN16+	N.C.	N.C.
Terminal No.	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A	17A	18A
	1B	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B	17B	18B
Signal name	IN1-	IN2-	IN3-	IN4-	IN5-	IN6-	IN7-	IN8-	IN9-	IN10-	IN11-	IN12-	IN13-	IN14-	IN15-	IN16-	N.C.	N.C.

F10E.ai

Note: The A1BT4D has built-in RJC1 to RJC4.

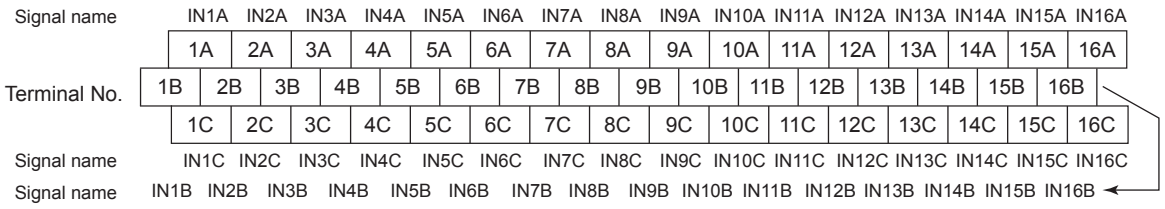
● A1BR4D



F11E.ai

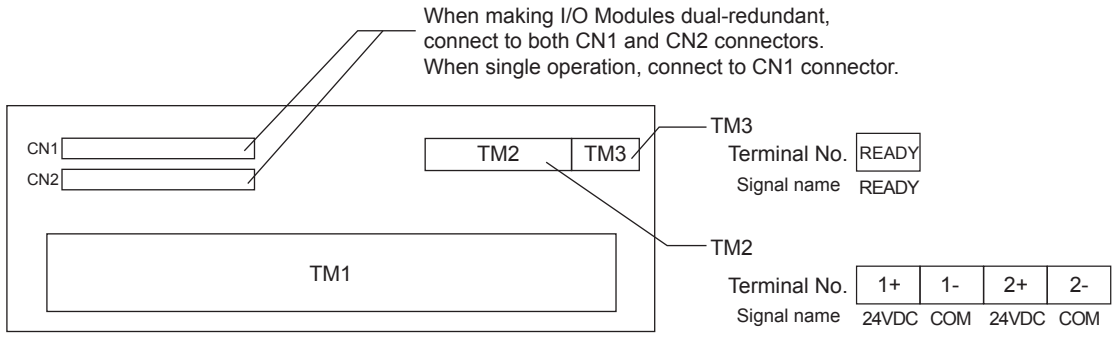
When connecting AAR145

TM1



F12E.ai

● A1BD5D



F13E.ai

Input type of Digital Input Module

Model name	Signal name	Input Type	
ADV151 ADV161	VP24☐	voltage-free contact input connection+	–
	IN☐	voltage-free contact input connection-	voltage input connection+
	COM☐	–	voltage input connection-

☐ is channel number

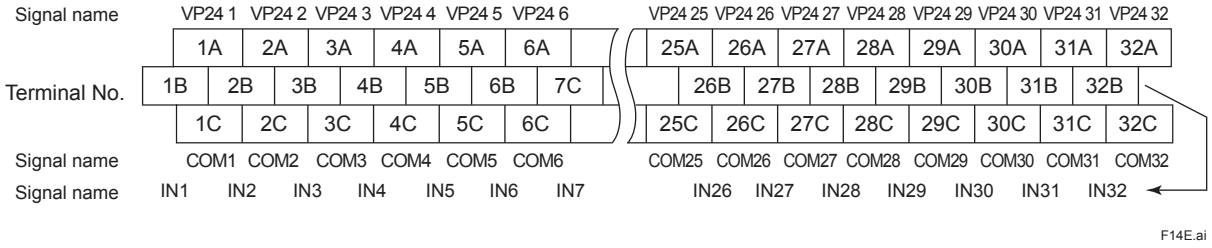
Output type of Digital Input Module

Model name	Signal name	Output Type	
ADV551 ADV561	VP24☐	voltage output connection+	–
	OUT☐	voltage output connection-	transistor output connection+
	COM☐	–	transistor output connection-

☐ is channel number

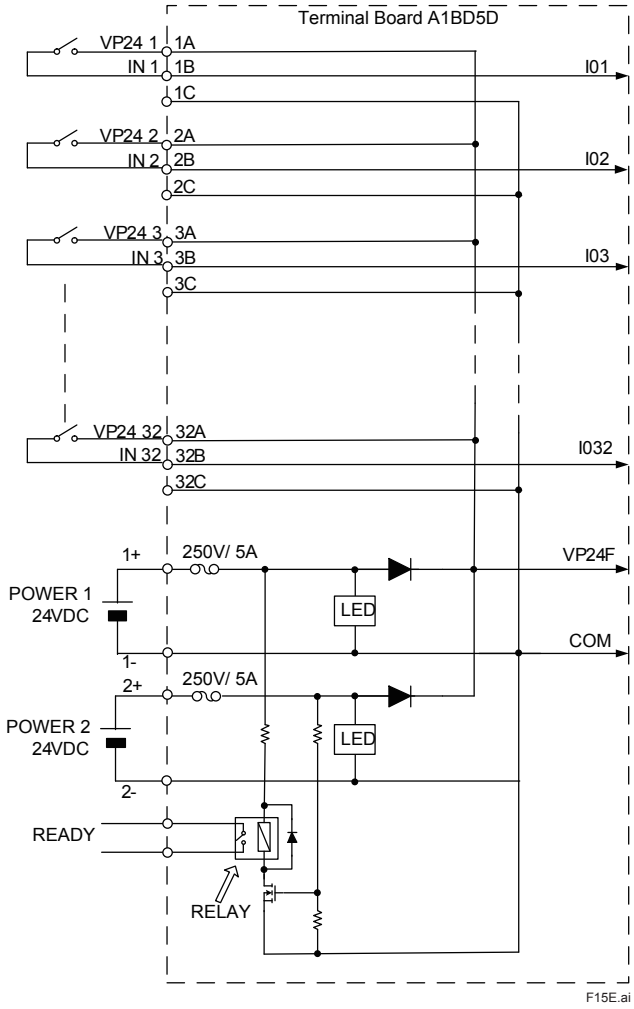
When connecting ADV151

TM1



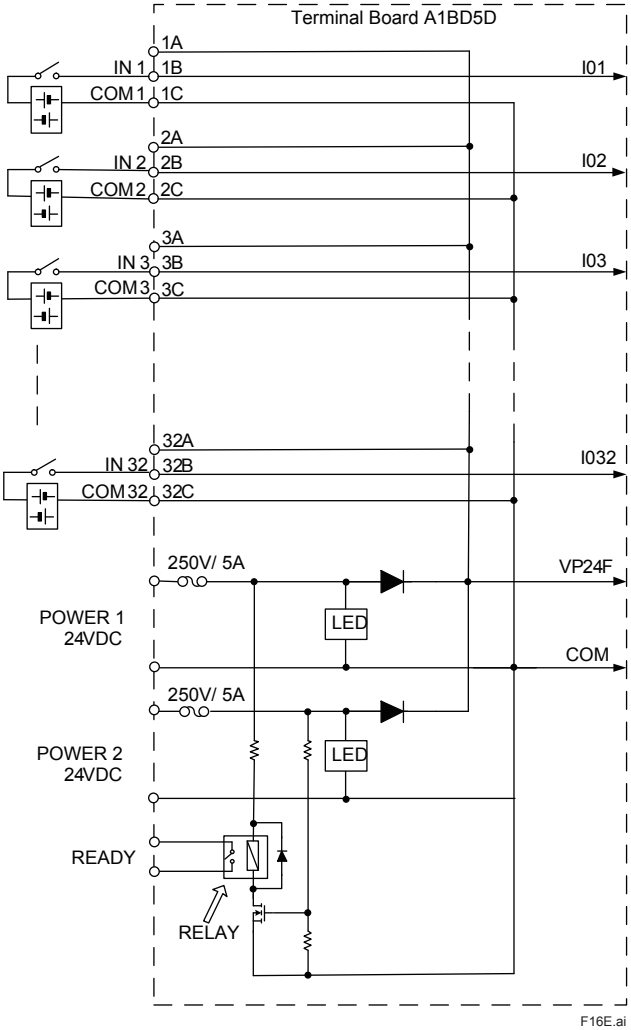
F14E.ai

Voltage-free contact input connection



F15E.ai

Voltage input connection



F16E.ai

Note: All voltage input connect signals must be the same polarity.
Note: External power supply Power 1 and Power 2 are not need for connection.

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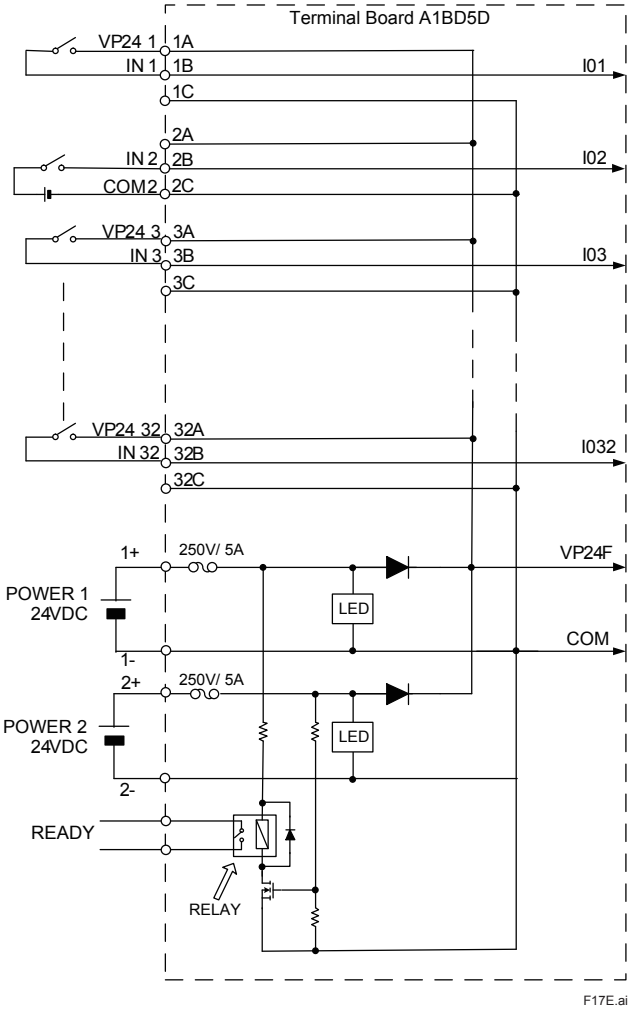
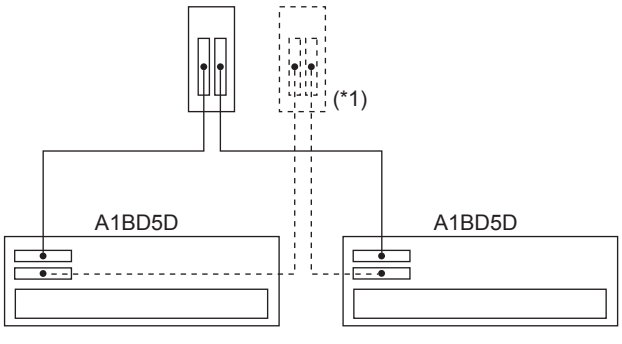
Mixture of voltage-free contact input connection and voltage input connection



Note: When a voltage-free contact input connection and voltage input connection are intermingled, please unify the polarity of the voltage input signals with an external power supply (Power 1, Power 2).

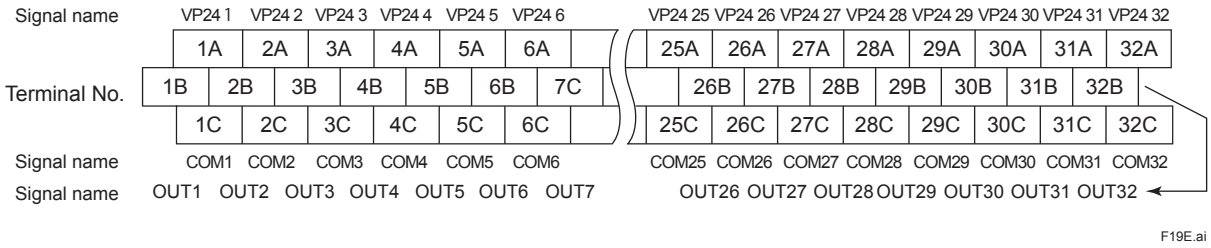
When connecting ADV161



Note: When connecting ADV161 with a terminal board, two units of A1BD5D are required.
*1: The dashed line indicates for dual-redundant configuration.

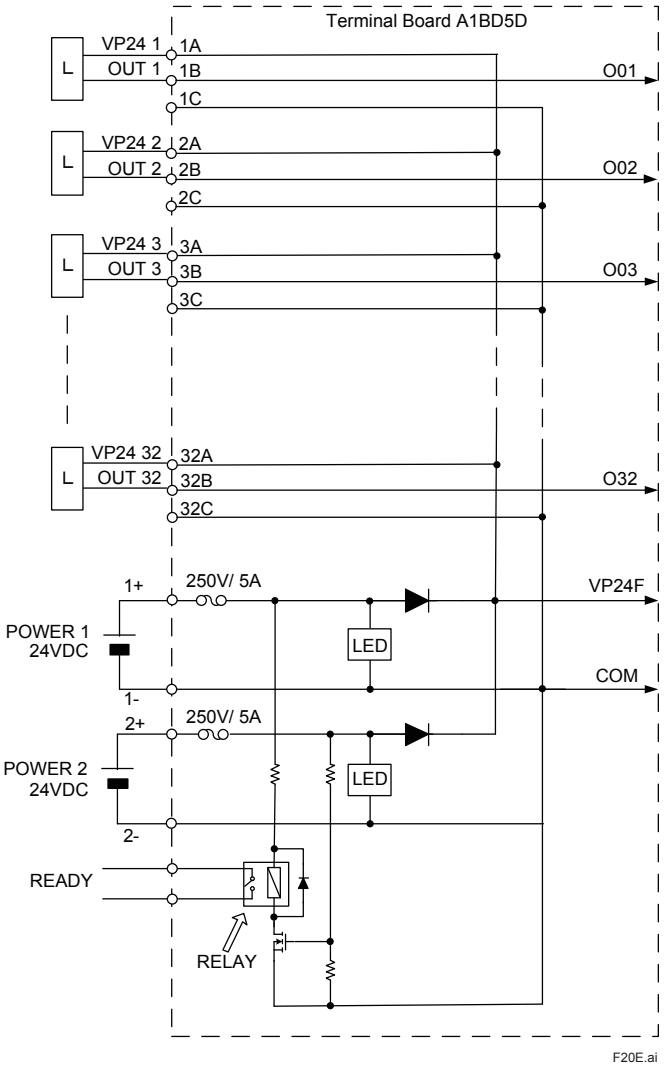
When connecting ADV551

TM1



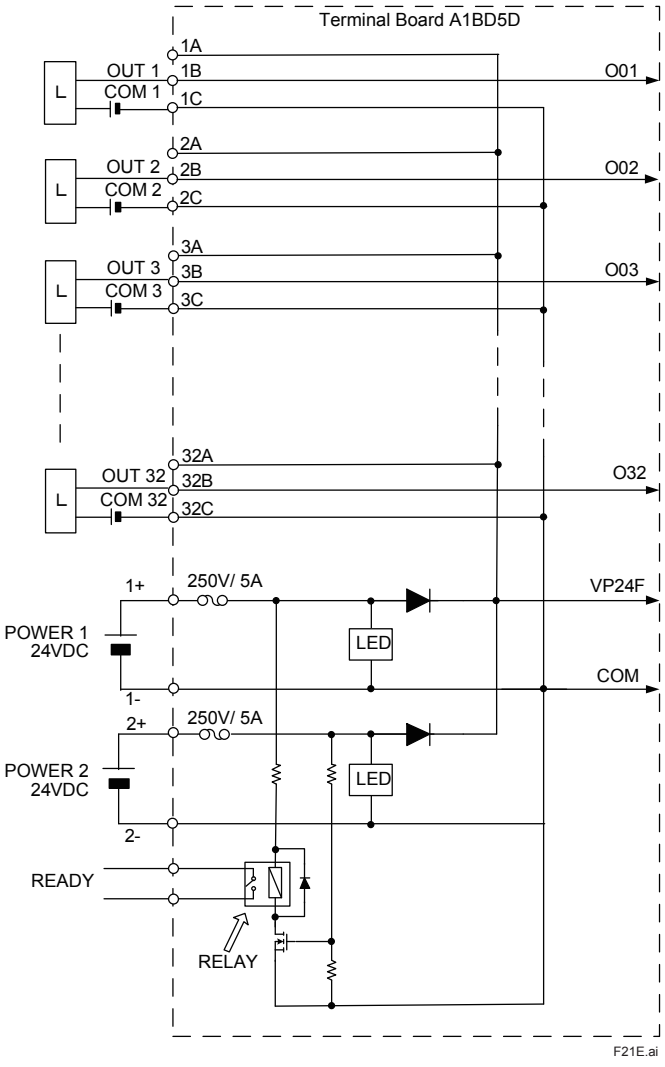
F19E.ai

Voltage output connection



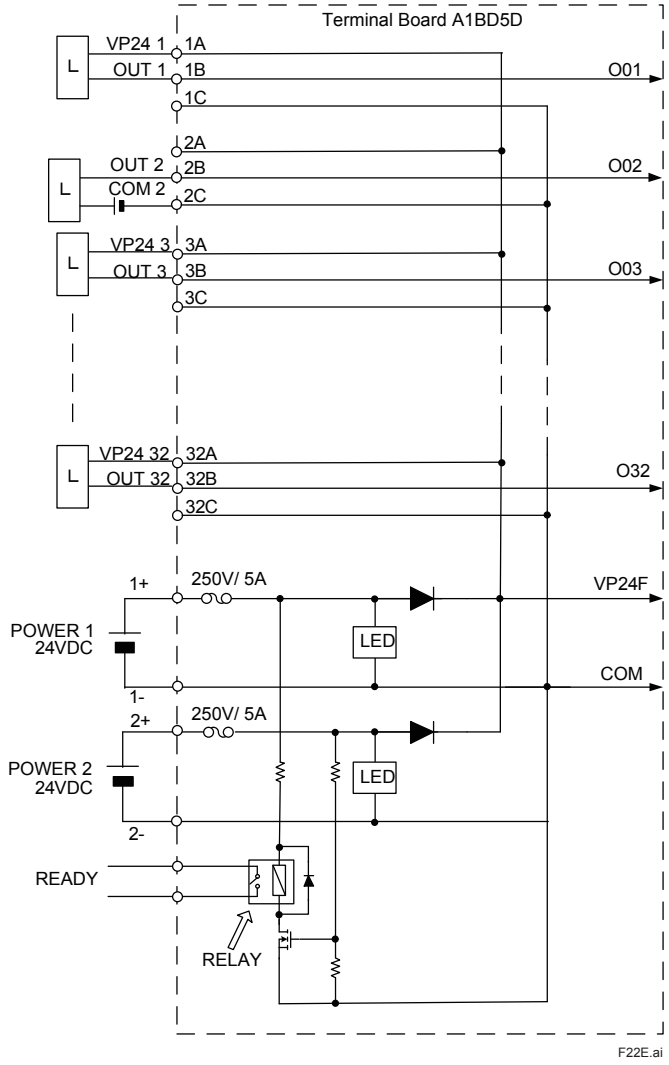
F20E.ai

Transistor output connection

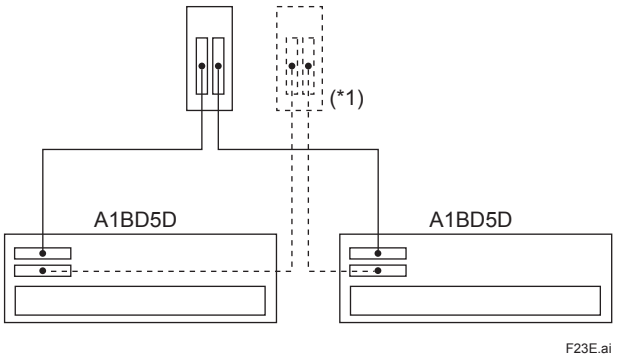


F21E.ai

Mixture of voltage output connection and transistor output connection



When connecting ADV561



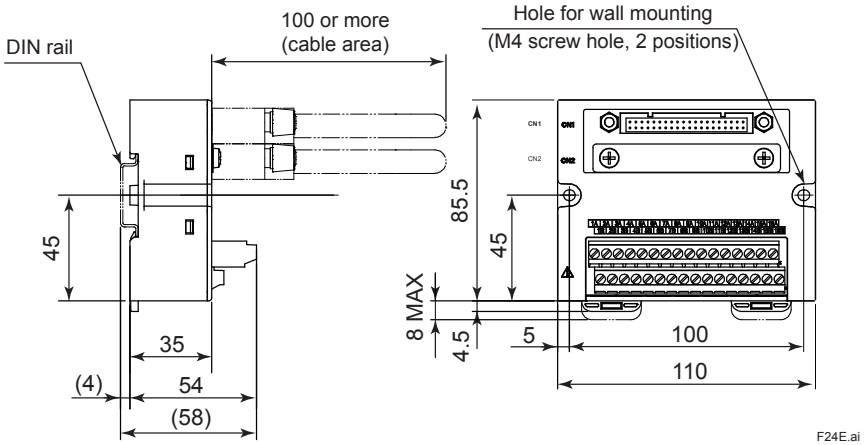
Note: When connecting ADV561 with a terminal board, two units of A1BD5D are required.
*1: The dashed line indicates for dual-redundant configuration.

■ EXTERNAL DIMENSIONS

● Terminal Boards

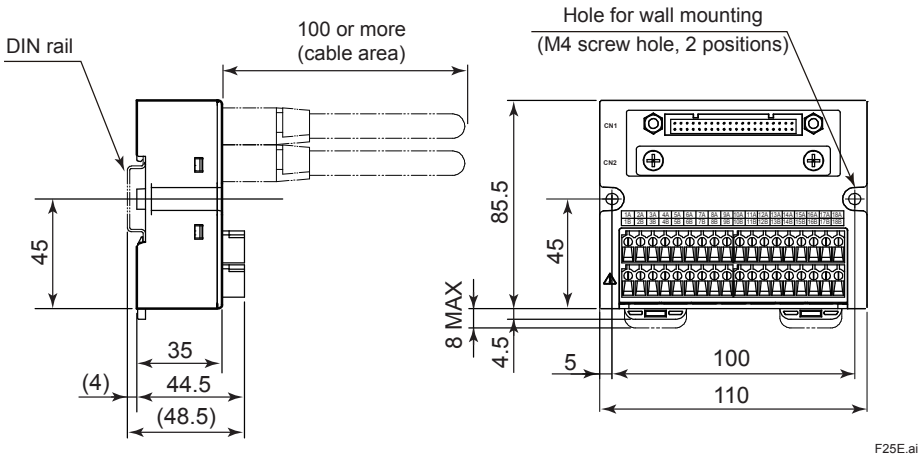
A1BA4D

Unit: mm



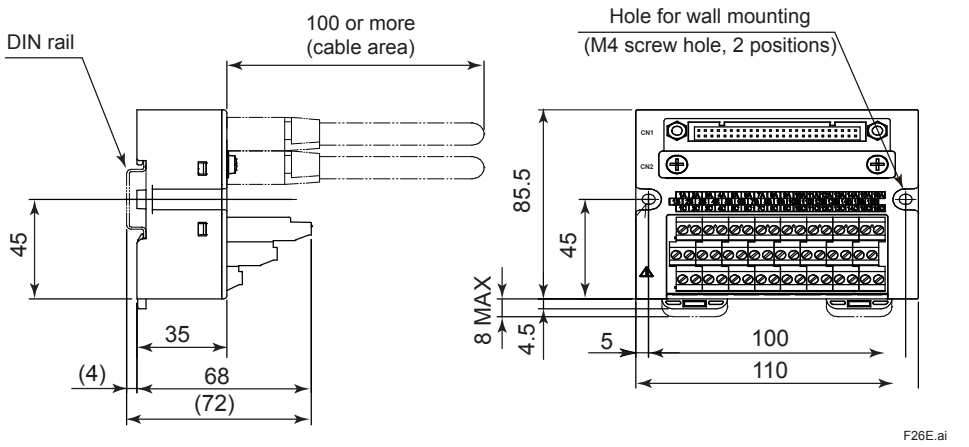
A1BT4D

Unit: mm



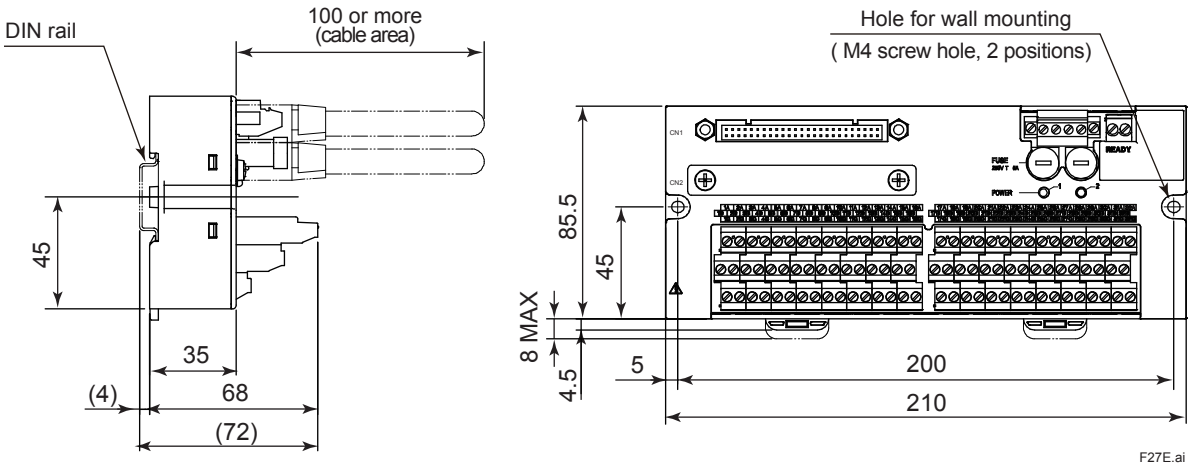
A1BR4D

Unit: mm



A1BD5D

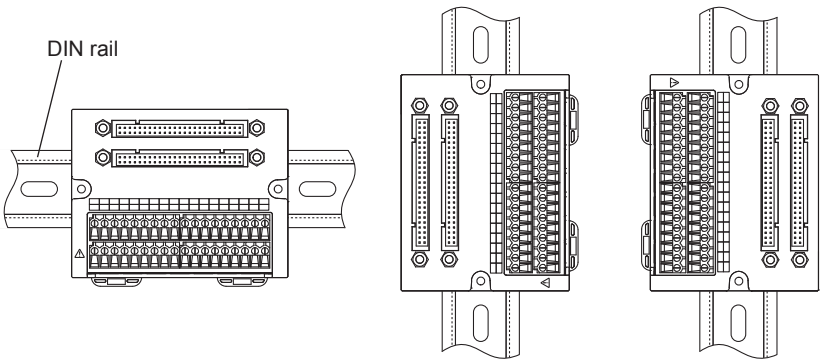
Unit: mm



■ PRECAUTIONS DURING INSTALLATION

● Terminal board installation direction

Install the terminal board in the direction shown in the following figure.



● Cautions for mounting

Prevent the terminal board from being influenced by the ambient temperature in order to keep the reference junction compensation accuracy, as detailed conditions are shown below.

The reference junction compensation accuracy is specified when the ambient temperature is stable.

When the temperature fluctuates, the accuracy may vary until it becomes stable.

Mounting a terminal board by itself

Install all the heat sources above the terminal board or terminal board wiring.

Provide a heat shield in case installation of the heat sources below or sideway of the terminal board is unavoidable.

Installing terminal board in a cabinet

Install all the heat sources above the terminal board or terminal board wiring when those are mounted in a cabinet.

Provide a heat shield in case installation of the heat sources below or sideway of the terminal board is unavoidable.

■ REPLACEMENT PARTS ON TERMINAL BOARD

The following table shows the replacement parts on terminal board.

Model	Part Name	Part Number (*1)	Remark
A1BD5D	Fuse	A1513EF	250 V/5 A

*1: Parts must be purchased and replaced in accordance with the laws and regulations of each country or region.

■ MODELS AND SUFFIX CODES

Terminal Board for Analog (single and dual-redundant)

		Description
Model	A1BA4D	Terminal Board for Analog (single and dual-redundant, 16-channel x 1 or 8-channel x 1, DIN rail mount type)
Suffix Codes	-0	Always 0
	5	Basic type with no explosion protection
	6	With ISA Standard G3 option and no explosion protection
	E	Basic type with explosion protection
	F	With ISA Standard G3 option and explosion protection

Terminal Board for Thermocouple (single and dual-redundant)

		Description
Model	A1BT4D	Terminal Board for Thermocouple (single and dual-redundant, 16-channel x 1, DIN rail mount type)
Suffix Codes	-0	Always 0
	5	Basic type with no explosion protection
	6	With ISA Standard G3 option and no explosion protection
	E	Basic type with explosion protection
	F	With ISA Standard G3 option and explosion protection

Terminal Board for Resistance Temperature Detectors (single and dual-redundant)

		Description
Model	A1BR4D	Terminal Board for RTD input (single and dual-redundant, 16-channel x 1, DIN rail mount type)
Suffix Codes	-0	Always 0
	5	Basic type with no explosion protection
	6	With ISA Standard G3 option and no explosion protection
	E	Basic type with explosion protection
	F	With ISA Standard G3 option and explosion protection

Terminal Board for Digital (single and dual-redundant)

		Description
Model	A1BD5D	Terminal Board for Digital (single and dual-redundant, 32-channel x 1, DIN rail mount type)
Suffix Codes	-0	Always 0
	5	Basic type with no explosion protection
	6	With ISA Standard G3 option and no explosion protection
	E	Basic type with explosion protection
	F	With ISA Standard G3 option and explosion protection

■ ORDERING INFORMATION

Specify model and suffix codes.

■ TRADEMARK

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