

General Specifications

Digital I/O Modules



GS 34P02Q35-01E

■ GENERAL

This GS covers the hardware specifications of digital input/output modules that can be installed in an FCN autonomous controller.

For connection with field equipment, refer to GS 34P02Q30-01E "Field Connection Specifications" and T1 34P02Q91-01E "FCN/FCJ Installation Guide."

■ STANDARD SPECIFICATIONS

● Digital Input Modules

The Digital Input Modules receive 32-channel or 64-channel 24 V DC ON/OFF signals.

Item	Specifications		
	Model	NFDV151	NFDV157
Number of input channels	32	32	64
Rated input voltage	24 V DC	24 V DC	24 V DC
Input ON voltage	18 to 26.4 V DC	18 to 26.4 V DC	20 to 26.4 V DC
Input OFF voltage	5.0 V DC or less	5.0 V DC or less	5.0 V DC or less
Input current (at rated input voltage)	4.1 mA ± 20 % / channel	4.1 mA ± 20 % / channel	2.5 mA ± 20 % / channel
Instantaneous allowable maximum input voltage	30.0 V DC	30.0 V DC	30.0 V DC
Withstanding voltage	Between input signal and system: 2 kV AC (*2) Between commons: 500 V AC, common minus (-) side every 16-channel		
Functions			
Status input	Function for detecting ON/OFF status	Function for detecting ON/OFF status	Function for detecting ON/OFF status
Push button input	Function for counting the push button edge	—	Function for counting the push button edge (*1)
Input response time	8 ms or less (for status input)		
Minimum ON detection time	20 ms (for push button input)		
Maximum ON/OFF cycle	25 Hz (for push button input)		
Maximum current consumption	500 mA (5 V DC)	350 mA (5 V DC)	550 mA (5 V DC)
Weight	0.3 kg	0.4 kg	0.3 kg
External connection	Pressure clamp terminal, MIL connector cable (*2)	Pressure clamp terminal	MIL connector cable (*2)

*1: Push button input is possible only for input channels from 1 to 32.

*2: The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

T01E.EPS

● AC Digital Input Modules

The AC Digital Input Modules receive 16-channel 100 V AC or 220 V AC ON/OFF signals.

Item	Specifications	
	NFDV141	NFDV142
Number of input channels	16	16
Rated input voltage (*1)	100 to 120 V AC, 50/60 Hz	200 to 240 V AC, 50/60 Hz
Input ON voltage (peak value)	80 V AC (113 V) to 132 V AC (187 V)	160 V AC (226 V) to 264 V AC (373 V)
Input OFF voltage (peak value)	20 V AC (28 V) or less	40 V AC (56 V) or less
Input current (TYP)	4.7 mA (@120 V/60 Hz) / channel	6.2 mA (@240 V/60 Hz) / channel
Input current (MAX)	7 mA / channel	9.3 mA / channel
Withstanding voltage	Between input signal and system: 2 kV AC Between commons: 1.35 kV AC, common minus (-) side every 8-channel	
Functions Status input Push button input	Function for detecting ON/OFF status Function for counting the push button edge	
Input response time	160 ms or less (for status input)	
Minimum ON detection time	200 ms (for push button input)	
Maximum ON/OFF cycle	2.5 Hz (for push button input)	
Maximum current consumption	500 mA (5 V DC)	500 mA (5 V DC)
Weight	0.3 kg	0.3 kg
External connection	Pressure clamp terminal	Pressure clamp terminal

T02E.EPS

*1: Input a sine wave for AC signals.

Note: AC input signals to the same common should be the same phase.

● Pulse Width Output Module

The Pulse Width Output Module outputs 4-channel pulse signals.

Model	NFDV532
Number of output channels	4-channel : Up Pulse/Down Pulse
Rated applied voltage	24 V DC
Load voltage (*1)	24 V DC, 25 mA
Field power supply voltage range	20.4 to 26.4 V DC
Output ON voltage maximum value	2 V DC
Leak current maximum value when output OFF	0.1 mA
Output format	Current sink
Maximum load current (*2)	100 mA/1channel, 26.4 V
Withstanding voltage	Between output signal and system : 2 kV AC (*5)
Output fallback (*3) (*4)	HOLD : Reset all the output channels after outputting all pulse signals when a fallback is detected. OFF : Resets all the output channels immediately to off when the fallback action is triggered. NO : Performs no fallback action.
Pulse output accuracy	2 ms Min., 2 ms increments (error: ±1 ms Max.)
Maximum current consumption	550 mA (5 V DC) 25 mA (24 V DC, field power supply)
Weight	0.2 kg
External connection	Pressure clamp terminal, MIL connector cable (*5)

T16E.EPS

- *1: An external field power supply (24 V DC) is required for each module.
 *2: Connect a spark killer diode when driving DC relay.
 *3: The fallback detection time is 4 seconds.
 *4: HOLD, OFF, or NO should be chosen for all channels commonly.
 *5: The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

● Digital Output Modules

The Digital Output Modules output 32-channel or 64-channel transistor contact signals.

Item	Specifications			
	Model	NFDV551	NFDV557	NFDV561
Number of output channels	32	32	64	
Rated applied voltage	24 V DC	24 V DC	24 V DC	24 V DC
Load voltage (*1)	24 V DC, 50 mA	24 V DC, 50 mA	24 V DC, 50 mA	24 V DC, 100 mA
Field power supply voltage range	20.4 to 26.4 V	20.4 to 26.4 V	20.4 to 26.4 V	20.4 to 26.4 V
Output ON voltage maximum value	2 V DC	2 V DC	2 V DC	2 V DC
Leak current maximum value when output OFF	0.1 mA	0.1 mA	0.1 mA	0.1 mA
Output format	Current sink	Current sink	Current sink	Current sink
Maximum load current (*2)	100 mA/channel, 26.4 V	100 mA/channel, 26.4 V	100 mA/channel, 26.4 V	100 mA/channel, 26.4 V
Withstanding voltage	Between output signal and system: 2 kV AC (*5) Between commons: 500 V AC, common minus (-) side every 16-channel			
Functions Status output	ON/OFF status output function	ON/OFF status output function	ON/OFF status output function	ON/OFF status output function
Output fallback (*3) (*4)	HOLD: Holds the current states when the fallback action is triggered. OFF: Resets all the output channels to off when the fallback action is triggered. NO: Performs no fallback action.			
Output response time	3 ms or less (for status output)			
Maximum current consumption	700 mA (5 V DC) 60 mA (24 V DC, field power supply)	550 mA (5 V DC) 60 mA (24 V DC, field power supply)	700 mA (5 V DC) 120 mA (24 V DC, field power supply)	
Weight	0.2 kg	0.3 kg	0.3 kg	
External connection	Pressure clamp terminal, MIL connector cable (*5)	Pressure clamp terminal	MIL connector cable (*5)	

T03E.EPS

*1: An external field power supply (24 V DC) is required for each module.

*2: Connect a spark killer diode when driving DC relay.

*3: The fallback detection time is 4 seconds.

*4: HOLD, OFF, or NO should be chosen for all channels commonly.

*5: The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

● Relay Output Module

The Relay Output Module outputs the 16-channel relay contact signals.

Item	Specifications
Model	NFDR541
Number of output channels	16
Rated applied voltage	24 to 110 V DC, 100 to 240 V AC, 50/60Hz
Maximum load current (*1)	Resistive load: 24 V DC: 2.0 A/channel, 110 V DC: 0.4 A/channel 100 V AC: 2.0 A/channel, 220 V AC: 2.0 A/channel Inductive load: 24 V DC: 0.6 A/channel, 110 V DC: 0.1 A/channel 100 V AC: 1.0 A/channel, 220 V AC: 1.0 A/channel
Withstanding voltage	Between output signal and system: 2 kV AC Between commons: 1.35 kV AC, common minus (–) side every 8-channel
Functions Status output	ON/OFF status output function
Output fallback (*2) (*3)	HOLD: Holds the current states when the fallback action is triggered. OFF: Resets all the output channels to off when the fallback action is triggered. NO: Performs no fallback action.
Output response time	12 ms or less (for status output)
Maximum current consumption	780 mA (5 V DC)
Weight	0.3 kg
External connection	Pressure clamp terminal

T04E.EPS

*1: Maximum 8 A is allowed per common. Connect a spark killer diode when driving DC relay.

*2: Fallback detection time is 4 seconds.

*3: HOLD, OFF, or NO should be chosen for all channels commonly.

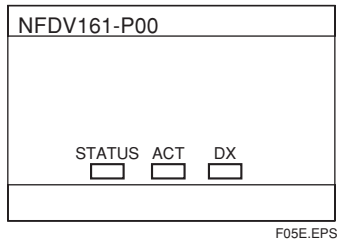
Note: The signals connected the same common should be the same phase when applying AC voltage.

■ LEDs

● Status Indicators

LED Indicator	Color	Description
STATUS	Green	Lights when the hardware is normal
ACT	Green	Lights when input/output actions are carried out
DX	Green	Not used

T05E.EPS



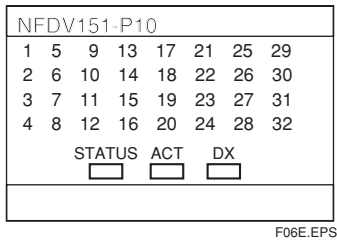
F05E.EPS

● Individual Channels' Status Indicators (NFDV151, NFDV532, NFDV551)

LED Indicator	Color	Description
1 to 32 (*1)	Green	Lights when the respective channels are on

T06E.EPS

*1: For the NFDV532, the LED only indicates the state from channel 1 to channel 8.

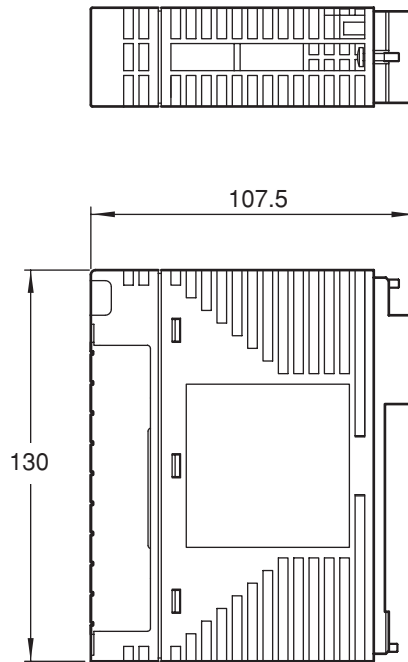


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EXTERNAL DIMENSIONS

● NFDV151, NFDV532, NFDV551 Digital I/O Module

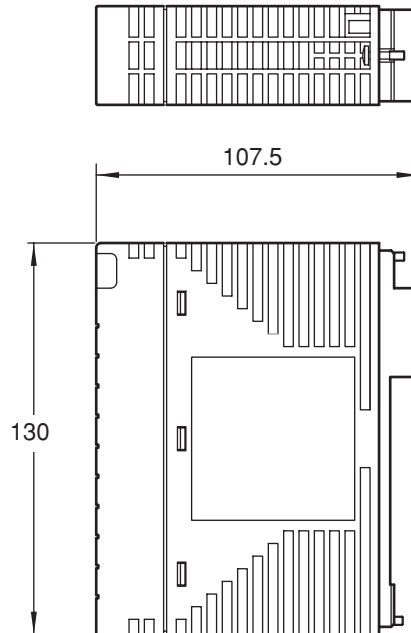
Unit: mm



F01E.EPS

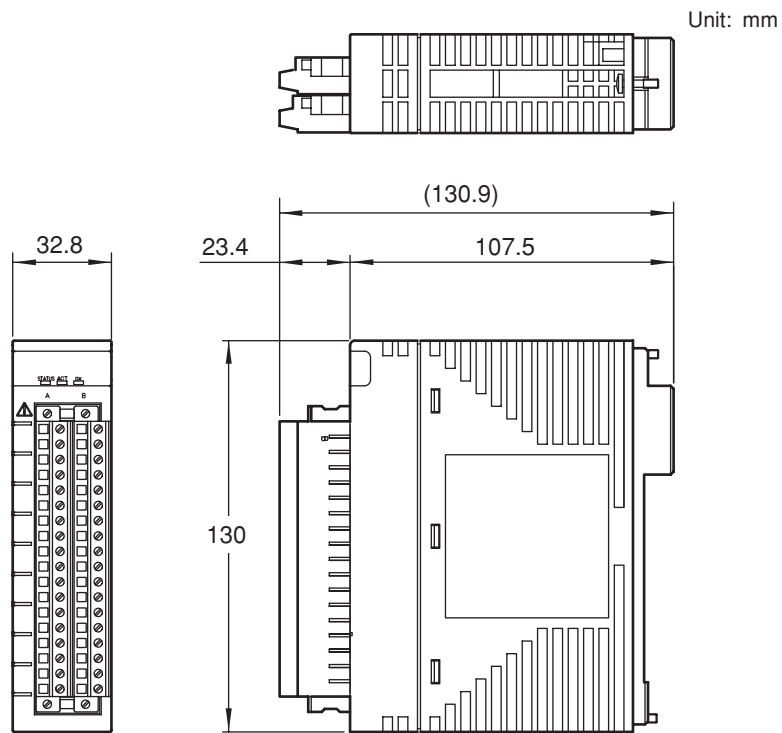
● NFDV141, NFDV142, NFDR541 Digital I/O Module

Unit: mm



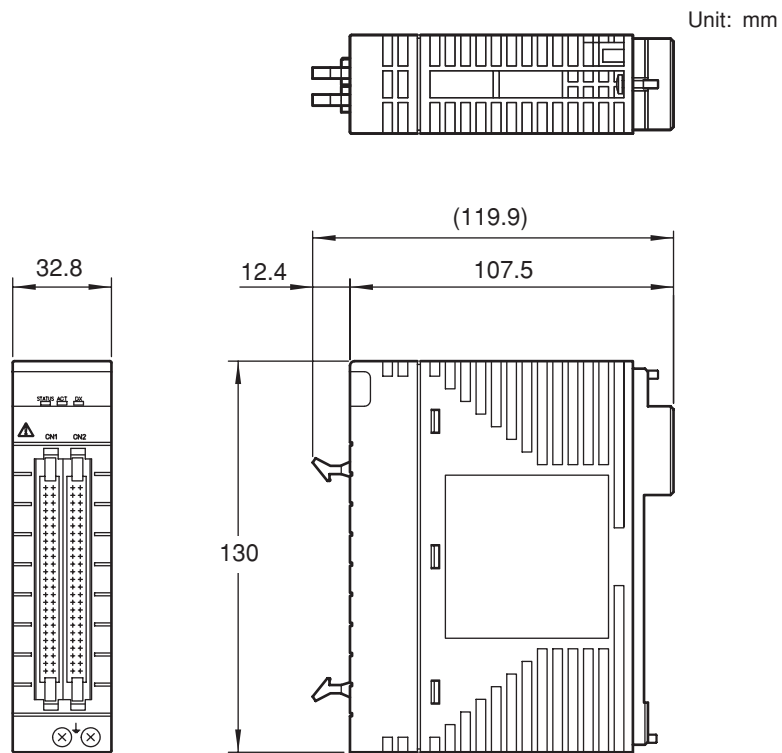
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● NFDV157, NFDV557 Digital I/O Module



F03E.EPS

● NFDV161, NFDV561 Digital I/O Module



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MODELS AND SUFFIX CODES

Digital Input Module

		Description
Model	NFDV151	Digital Input Module (32-channel, 24 V DC, Isolated)
Suffix Codes	-P	With function for counting the push button edge
	1	With status display
	0	Basic type
	1	With ISA Standard G3 option
Option Codes	/B5S00	With Pressure Clamp Terminal Block for Digital [Model: NFTB5S-00]
	/B5S10	With Pressure Clamp Terminal Block for Digital (surge absorber) [Model: NFTB5S-10]
	/CCC01	With Connector Cover for MIL Cable [Model: NFCCC01]

T07E.EPS

		Description
Model	NFDV141	Digital Input Module (16-channel, 100V - 120 V AC, Isolated)
Suffix Codes	-P	With function for counting the push button edge
	0	General-purpose type
	0	Basic type
	1	With ISA Standard G3 option
Option Code	/C4S50	With Pressure Clamp Terminal Block for Digital [Model : NFTC4S-50]

T08E.EPS

		Description
Model	NFDV142	Digital Input Module (16-channel, 200 V - 240 V AC, Isolated)
Suffix Codes	-P	With function for counting the push button edge
	0	General-purpose type
	0	Basic type
	1	With ISA Standard G3 option
Option Code	/C4S60	With Pressure Clamp Terminal Block for Digital [Model : NFTC4S-60]

T09E.EPS

		Description
Model	NFDV157	Digital Input Module (32-channel, 24V DC, Pressure Clamp Terminal support only, Isolated)
Suffix Codes	-S	Standard type
	0	Always 0
	0	Basic type
	1	With ISA Standard G3 option

T10E.EPS

		Description
Model	NFDV161	Digital Input Module (64-channel, 24V DC, Isolated)
Suffix Codes	-P	With function for counting the push button edge
	0	General-purpose type
	0	Basic type
	1	With ISA Standard G3 option

T11E.EPS

Digital Output Module

		Description
Model	NFDV532	Pulse Width Output Module (4-channel : Up Pulse/Down Pulse, 24 V DC, Isolated)
Suffix Codes	-P	Standard type
	1	With status display
	0	Basic type
	1	With ISA Standard G3 option
Option Codes	/D5S00	With Pressure Clamp Terminal Block for Digital Output [Model : NFTD5S-00]
	/D5S10	With Pressure Clamp Terminal Block for Digital Output (surge absorber) [Model : NFTD5S-10]
	/CCC01	With Connector Cover for MIL Cable [Model : NFCCC01]

T17E.EPS

		Description
Model	NFDV551	Digital Output Module (32-channel, 24 V DC, Isolated)
Suffix Codes	-P	Standard type
	1	With status display
	0	Basic type
	1	With ISA Standard G3 option
Option Codes	/D5S00	With Pressure Clamp Terminal Block for Digital Output [Model : NFTD5S-00]
	/D5S10	With Pressure Clamp Terminal Block for Digital Output (surge absorber) [Model : NFTD5S-10]
	/CCC01	With Connector Cover for MIL Cable [Model : NFCCC01]

T12E.EPS

		Description
Model	NFDR541	Relay Output Module (16-channel, 24 to 110 V DC/100 to 240 V AC, Isolated)
Suffix Codes	-P	Standard type
	0	General-purpose type
	0	Basic type
	1	With ISA Standard G3 option
Option Code	/C4S70	With Pressure Clamp Terminal Block for Digital Input [Model : NFTC4S-70]

T13E.EPS

		Description
Model	NFDV557	Digital Output Module (32-channel, 24V DC, Pressure Clamp Terminal support only, Isolated)
Suffix Codes	-S	Standard type
	0	Always 0
	0	Basic type
	1	With ISA Standard G3 option

T14E.EPS

		Description
Model	NFDV561	Digital Output Module (64-channel, 24V DC, Isolated)
Suffix Codes	-P	Standard type
	0	General-purpose type
	0	Basic type
	1	With ISA Standard G3 option

T15E.EPS

■ ORDERING INSTRUCTIONS

Specify the model and suffix codes.

■ TRADEMARK

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