FCN MODULE SPECIFICATIONS

ANALOG I/O MODULES

WTR : Wider temperature range (-20 °C to +70 °C), N/A: (0 °C to 55 °C), PCT : Pressure Clamp Terminal available

Model	Description	HART	WTR	PCT	MIL	Basic Specification	Specification
NFAI135	Analog Input • 4 to 20 mA • 8 ch. • Isolated ch.	✓	✓	✓	✓ 40 pins	• Withstanding voltage: 500 V AC between input and system, 500 V AC between channels • Transmitter power supply: 20.2 to 29.3 V (Output current limit: 25 mA) • Two wire and four wire transmitter setting per channel with connected terminal • Max current consumption: 360 mA (5 V DC), 450 mA (24 V DC) • Weight: 0.3 kg	• Accuracy: ±0.1 % of full scale • Data refresh cycle: 10 ms • Input step response time: 100 ms • Temperature drift: Max. ±0.01 % /°C
NFAI141	Analog Input • 4 to 20 mA • 16 ch. • Non-Isolated	✓	✓	✓	✓ 40 pins	• Transmitter power supply: 22.8 to 26.4 V (Output current limit: 27 mA) • Two wire and four wire transmitter setting per channel with pins • Max current consumption: 310 mA (5 V DC), 450 mA (24 V DC) • Weight: 0.2 kg	• Accuracy: ±0.1 % of full scale • Data refresh cycle: 10 ms • Input step response time: 100 ms • Temperature drift: Max. ±0.01 % /°C
NFAI143	Analog Input • 4 to 20 mA • 16 ch. • Isolated	✓	✓	✓	✓ 40 pins	• Withstanding voltage: 1500 V AC between input and system • Transmitter power supply: 24.0 to 25.5 V (Output current limit: 25 mA) • Two wire and four wire transmitter setting per channel with pins • Max current consumption: 230 mA (5 V DC), 540 mA (24 V DC) • Weight: 0.3 kg	• Accuracy: ±0.1 % of full scale • Data refresh cycle: 10 ms • Input step response time: 100 ms • Temperature drift: Max. ±0.01 % /°C
NFAV141	Analog Input • 1 to 5 V • 16 ch. • Non-Isolated	N/A	N/A	✓	✓ 40 pins	• Input: Differential input (allowable common mode viltage ±1 V or less) • Max current consumption: 350 mA (5 V DC) • Weight: 0.2 kg	• Accuracy: ±0.1 % of full scale • Data refresh cycle: 10 ms • Input step response time: 100 ms • Temperature drift: Max. ±0.01 % /°C
NFAV144	Analog Input • -10 to +10 V or 1 to 5 V • 16 ch. • Isolated	N/A	✓	✓	✓ 40 pins	• Input signal: 1 to 5 V or -10 to +10 V set for all channels • Withstanding voltage: 1500 V AC between input and system • Max current consumption: 500 mA (5 V DC) • Weight: 0.2 kg	• Accuracy: ±0.1 % of full scale • Data refresh cycle: 10 ms • Input step response time: 100 ms • Temperature drift: Max. ±0.01 % /°C
NFAT141	TC/mV Input • 16 ch. • Isolated	N/A	N/A	✓	✓ 40 pins (*1)	• Input signal: Thermocouple or mV set for each channel from CH1 to CH16 • Burn out detection: Possible (all channels together), Detection time: 60 s • Withstanding voltage: 1500 V AC between input and system • Max current consumption: 450 mA (5 V DC) • Weight: 0.2 kg	• TC input accuracy: ±0.03 % of full scale (-20 to 80 mV) • mV input accuracy: ±0.032 % of full scale (-100 to 150 mV) • Data refresh cycle: 1 s • TC input temperature drift: Max. ±30 ppm/°C • mV input temperature drift: Max. ±32 ppm/°C
NFAR181	RTD Input • 12 ch. • Isolated	N/A	✓ (*2)	✓	N/A	• Input signal: Set for each channel • Burn out detection: Possible (all channels together), Detection time: 60 s • Withstanding voltage: 1500 V AC between input and system • Max current consumption: 450 mA (5 V DC) • Weight: 0.2 kg	• Accuracy: ±0.03 % of full scale (0 to 400 Ω) • Data refresh cycle: 1 s • Temperature drift: Max. ±30 ppm/°C

*1 : Use a MIL connector cable only for mV input.
*2 : The module with suffix codes –S□4 or –S□5 are required for wide temperature range.

ANALOG I/O MODULES

WTR : Wider temperature range (-20 °C to +70 °C), N/A: (0 °C to 55 °C), PCT : Pressure Clamp Terminal available

Model	Description	HART	WTR	PCT	MIL	Basic Specification	Specification
NFAP135	Pulse Input • 0 to 10kHz • 8 ch. • Isolated ch.	N/A	✓ (*3)	✓	✓ 40 pins	• Withstanding voltage: 500 V AC between input and system, 500 V AC between channels • Transmitter power supply: 24 V (30 mA) / 12 V (40 mA) Selectable • Max current consumption: 300 mA (5 V DC), 400 mA (24 V DC) • Weight: 0.3 kg	• Minimum input pulse width: 40 µs • Data refresh cycle: 2 ms • Input type: Dry contact pulse (Open collector contact) Dry contact pulse (Relay contact) Voltage pulse Current pulse (Two-wired transmitter) Voltage pulse (Three-wired transmitte)
NFAF135	Frequency Input • 0.1 Hz to 10 kHz • 8 ch. • Isolated ch.	N/A	N/A	✓	✓ 40 pins	• Withstanding voltage: 500 V AC between input and system, 500 V AC between channels • Transmitter power supply: 24 V (30 mA) / 12 V (40 mA) Selectable • Max current consumption: 300 mA (5 V DC), 400 mA (24 V DC) • Weight: 0.3 kg	• Minimum input pulse width: 40 µs • Data refresh cycle: 10 ms • Input type: Dry contact pulse (Open collector contact) Dry contact pulse (Relay contact) Voltage pulse
NFAI835	Analog I/O • 4 ch. input (4 to 20 mA) • 4 ch. output (4 to 20 mA) • Isolated ch.	✓	✓	✓	✓ 40 pins	• Withstanding voltage: 500 V AC between input/output and system, 500 V AC between channels • Output fallback: Set for each channel • Transmitter power supply: 20.2 to 29.3 V (Output current limit: 25 mA) • Two wire and four wire transmitter setting per channel with connected terminal • Max current consumption: 360 mA (5 V DC), 450 mA (24 V DC) • Weight: 0.3 kg	• Input accuracy: ±0.1 % of full scale • Output accuracy: ±0.3 % of full scale • Data refresh cycle: 10 ms • Input step response time: 100 ms, Output step response time: 100 ms • Temperature drift: Max. ±0.01 % /°C
NFAI841	Analog I/O • 8 ch. input (4 to 20 mA) • 8 ch. output (4 to 20 mA) • Non-Isolated	✓	✓	✓	✓ 40 pins	• Output fallback: Set for each channel • Transmitter power supply: 22.8 to 26.4 V (Output current limit: 27 mA) • Two wire and four wire transmitter setting per channel with pins • Max current consumption: 310 mA (5 V DC), 500 mA (24 V DC) • Weight: 0.3 kg	• Input accuracy: ±0.1 % of full scale • Output accuracy: ±0.3 % of full scale • Data refresh cycle: 10 ms • Input step response time: 100 ms, Output step response time: 40 ms • Temperature drift: Max. ±0.01 % /°C
NFAB841	Analog I/O • 8 ch. input (1 to 5 V) • 8 ch. output (4 to 20 mA) • Non-Isolated	N/A	N/A	✓	✓ 40 pins	• Input: Differential input (allowable common mode voltage is ±1 V or less) • Output fallback: Set for each channel • Max current consumption: 310 mA (5 V DC), 250 mA (24 V DC) • Weight: 0.3 kg	• Input accuracy: ±0.1 % of full scale • Output accuracy: ±0.3 % of full scale • Data refresh cycle: 10 ms • Input step response time: 100 ms, Output step response time: 40 ms • Temperature drift: Max. ±0.01 % /°C
NFAI543	Analog Output • 4 to 20 mA • 16 ch. • Isolated	✓	✓	✓	✓ 40 pins	• Withstanding voltage: 1500 V AC between output and system • Output fallback: Set for each channel • Max current consumption: 230 mA (5 V DC), 540 mA (24 V DC) • Weight: 0.4 kg	• Output accuracy: ±0.3 % of full scale • Data refresh cycle: 10 ms • Output step response time: 100 ms • Temperature drift: Max. ±0.01 % /°C
NFAV544	Analog Output • -10 to +10 V • 16 ch. • Isolated	N/A	N/A	✓	✓ 40 pins	• Withstanding voltage: 1500 V AC between output and system • Output fallback: Set for each channel • Max current consumption: 860 mA (5 V DC) • Weight: 0.2 kg	• Output accuracy: ±0.3 % of full scale • Data refresh cycle: 10 ms • Output step response time: 40 ms • Temperature drift: Max. ±0.01 % /°C

Common Specification • LED: STATUS (Hardware normal), ACT (Operating) • Hot-Swap: Possible
*3 : The module with suffix codes –S□4 or –S□5 are required for wide temperature range.

Software Selection

Name		Model	Suffix Codes/Options Codes
Software media			
FCN/FCJ software media		NT203AJ	PC11E
FCN/FCJ APPF software media (*1)		NT205AJ	PC11E
FCN/FCJ engineering tool license (FCN/FCJ software media: NT203AJ)			
Logic Designer license	Run on PC	NT751FJ	LW11A
FCN/FCJ simulator license	Run on PC	NT752AJ	LW11A
FCN/FCJ Duolet AP Development Kit License (*)	Run on PC	NT755FJ	LW11A
FCN/FCJ OPC server license (FCN/FCJ software media: NT203AJ)			
FCN/FCJ OPC server for Windows	Run on PC	NT781AJ	LW11A
Duplexed network function license for FCN/FCJ OPC Server	Run on PC	NT783AJ	LW11A

* : Duolet functions enable Java applications run on the controller.

Hardware Selection (Non Explosion Model)

For the list of Explosion Protection Model, please refer to the General Specification.

Name		Model	Suffix Codes/Options Codes			
			Standard		with ISA standard G3 option	
FCN common modules			Standard func.	Extended func.	Standard func.	Extended func.
CPU module with 2 Ethernet port (*2)	Std temp.	NFCP501 -	S05	W05	S06	W06
	Exd temp.		S15	W15	S16	W16
CPU module with 4 Ethernet port (*2)	Std temp.	NFCP502 -	S05	W05	S06	W06
	Exd temp.		S15	W15	S16	W16
Power supply module	100 to 120 V AC	NFPW441 -	50		51	
Power supply module	220 to 240 V AC	NFPW442 -	50		51	
Power supply module	24 V DC	NFPW444 -	50		51	
		Installation	19 inch rack	DIN rail	19 inch rack	DIN rail
Base module (long)		NFBU200 -	S05	S15	S06	S16
Base module (short, for E2 bus)		N2BU051 -	N/A	S15	N/A	S16
Base module (compact)		N2BU030 -	N/A	S15	N/A	S16
			Standard		with ISA standard G3 option	
E2 bus interface module		N2EB100 -	50		51	
		Attachment	T-joint	T-joint with built-in terminator	T-joint	T-joint with built-in terminator
SB bus repeat module for FCN		NFSB100 -	S50/SBT01	S50/SBT02	S51/SBT01	S51/SBT02
		Cable Length	0.3 m	1 m / 2 m	4 m	8 m
SB bus cable		NFCB301 -	C030	C100 / C200	C400	C800

Communication modules		Pressure clamp terminal block with surge absorber (SA)	Standard		with ISA standard G3 option	
			non SA	SA	non SA	SA
FOUNDATION Fieldbus communication module (4-ports)	Std temp.	NFLF111 -	S50	S50/F9S00	S51	S51/F9S00
	Exd temp.		S54	S54/F9S00	S55	S55/F9S00
RS-232-C communication module (2-ports, 300 bps to 115.2 kbps)		NFLR111 -	S50	N/A	S51	N/A
RS-422/RS-485 communication module (2-ports, 300 bps to 115.2 kbps)		NFLR121 -	S50	N/A	S51	N/A
PROFIBUS-DP communication module		NFLP121 -	S00	N/A	S01	N/A
CANopen communication module		NFLC121 -	S00	N/A	S01	N/A

MIL connector cables	Cable Length	0.5 m	1.0 m	1.5 m	2.0 m	2.5 m	3.0 m (*5)
MIL connector cable for analog, NFCP050 built-in I/O (40 pole plug types) (*3)	KMS40 -	005	010	015	020	025	030
MIL connector cable (50 pole plug types) (*4) NFDV151, NFDV161, NFDV532, NFDV551, NFDV561	KMS50 -	005	010	015	020	025	030

MIL connector terminal blocks

MIL connector terminal block for analog I/O modules except for NFAR181 and NFCP050 built-in I/O (40 pole plug types) (*3)	TAS40
MIL connector terminal block for digital I/O modules (50 pole plug types) (*4)	TAS50

SB bus T-joint

SB bus T-joint	NFSBT01
SB bus T-joint with built-in terminator	NFSBT02

Cover

Dummy cover for I/O module slots	NFDCV01
Dummy cover for power supply module slots	NFDCV02
MIL cable connector cover	NFCCC01

Input output modules (*6)		Model	Suffix Codes/Options Codes					
			Standard			with ISA standard G3 option		
			Terminal Block	Pressure Clamp Terminal	MIL with cover	Pressure Clamp Terminal		MIL with cover
			Surge Absorber (SA)	non SA	SA		non SA	SA	
Analog Input module (4 to 20 mA, 8-channels, Isolated channels)		NFAI135 -		S50/13S00	S50/13S10	S50/CCC01	S51/13S00	S51/13S10	S51/CCC01
Analog Input module (4 to 20 mA, 16-channels, Non-Isolated)		NFAI141 -		S50/A4S00	S50/A4S10	S50/CCC01	S51/A4S00	S51/A4S10	S51/CCC01
Analog Input module (4 to 20 mA, 16-channels, Isolated)		NFAI143 -		S50/A4S00	S50/A4S10	S50/CCC01	S51/A4S00	S51/A4S10	S51/CCC01
Analog Input module (1 to 5 V, 16-channels, Non-Isolated)		NFAV141 -		S50/A4S00	S50/A4S10	S50/CCC01	S51/A4S00	S51/A4S10	S51/CCC01
Analog Input module (-10 to +10 V, 16-channels, Isolated)		NFAV144 -		S50/A4S00	S50/A4S10	S50/CCC01	S51/A4S00	S51/A4S10	S51/CCC01
TC/mV Input module (16-channels, Isolated)		NFAT141 -		S50/T4S00	S50/T4S10	S50/CCC01	S51/T4S00	S51/T4S10	S51/CCC01
RTD Input module (12-channels, Isolated)	Std temp.	NFAR181 -		S50/R8S00	S50/R8S10	N/A	S51/R8S00	S51/R8S10	N/A
	Exd temp.			S54/R8S00	S54/R8S10	N/A	S55/R8S00	S55/R8S10	N/A
Pulse Input module (Pulse Count, 0 ～ 10 kHz, 8-channels, Isolated channels)	Std temp.	NFAP135 -		S50/13S00	S50/13S10	S50/CCC01	S51/13S00	S51/13S10	S51/CCC01
	Exd temp.			S54/13S00	S54/13S10	S54/CCC01	S55/13S00	S55/13S10	S55/CCC01
Frequency Input module (Pulse Count, 0.1 Hz to 10 kHz, 8-channels, Isolated channels)		NFAF135 -		S50/13S00	S50/13S10	S50/CCC01	S51/13S00	S51/13S10	S51/CCC01
Analog I/O module (4 to 20 mA input/output, 4-channels input/output, Isolated channels)		NFAI835 -		S50/13S00	S50/13S10	S50/CCC01	S51/13S00	S51/13S10	S51/CCC01
Analog I/O module (4 to 20 mA input/output, 8-channels input/output, Non-Isolated)		NFAI841 -		S50/A4S00	S50/A4S10	S50/CCC01	S51/A4S00	S51/A4S10	S51/CCC01
Analog I/O module (1 to 5 V input, 4 to 20 mA output, 8-channels input/output, Non-Isolated)		NFAB841 -		S50/A4S00	S50/A4S10	S50/CCC01	S51/A4S00	S51/A4S10	S51/CCC01
Analog Output module (4 to 20 mA, 16-channels, Isolated)		NFAI543 -		S50/A4S00	S50/A4S10	S50/CCC01	S51/A4S00	S51/A4S10	S51/CCC01
Analog Output module (-10 to +10 V, 16-channels, Isolated)		NFAV544 -		S50/A4S00	S50/A4S10	S50/CCC01	S51/A4S00	S51/A4S10	S51/CCC01
Digital Input module (32-channels, 24 V DC, Isolated)		NFDV151 -		P60/B5S00	P60/B5S10	P60/CCC01	P61/B5S00	P61/B5S10	P61/CCC01
Digital Input module (64-channels, 24 V DC, Isolated)		NFDV161 -		N/A	N/A	P50	N/A	N/A	P51
Digital Output module (32-channels, 24 V DC, Isolated, Pressure Clamp Terminal only)		NFDV557 -		S50	N/A	N/A	S51	N/A	N/A
Digital Output module (64-channels, 24 V DC, Isolated)		NFDV561 -		N/A	N/A	P50	N/A	N/A	P51
Pulse Width Output module (4-channels, Up Pulse/Down Pulse, 24 V DC, Isolated)		NFDV532 -		P10/D5S00	P10/D5S10	P10/CCC01	P11/D5S00	P11/D5S10	P11/CCC01
Relay Output module (16-channels, 24 to 125 V DC/100 to 240 V AC, Isolated)		NFDR541 -		T50/C4S70	N/A	N/A	T51/C4S70	N/A	N/A

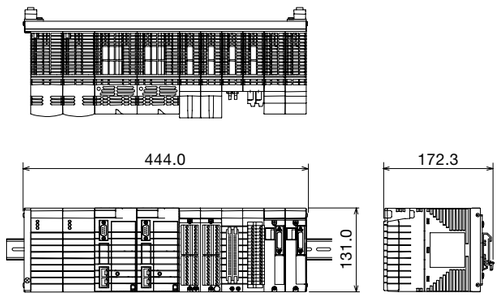
Pressure clamp terminal blocks

	Surge Absorber (SA)	non SA	SA
Pressure clamp terminal block for analog (16-channels): NFAI141,NFAV142,NFAV144, NFAI143,NFAI841,NFAB841, NFAI543	NFTA4S -	00	10
Pressure clamp terminal block for thermocouple/mV 16-channels) NFAT141	NFTT4S -	00	10
Pressure clamp terminal block for RTD (12-channels) NFAR181	NFTR8S -	00	10
Pressure clamp terminal block for digital input (32-channels) NFDV151	NFTB5S -	00	10
Pressure clamp terminal block for digital output (32-channels) NFDV532, NFDV551	NFTD5S -	00	10
Pressure clamp terminal block for analog isolated channels (8-channels): NFAI135, NFAP135, NFAI835	NFTI3S -	00	10
Pressure clamp terminal block for relay output (16-channels) NFDR541	NFTC4S -	70	N/A
Pressure clamp terminal block for FOUNDATION Fieldbus NFLF111	NFTF9S -	00	N/A

*1: Please refer to the detailed applicable portfolios in FCN/FCJ APPF software media on "Engineering: Application Portfolio" page.
*2: Two suffix codes specifying the applicable portfolios are prepared for NFCP501 and NFCP502.
Please refer to the detailed applicable portfolios for each suffix (-S: with Standard functions, -W: with Extended functions) on "Engineering: Application Portfolio" page.
*3 : mV input is only applicable for NFAT141.
*4 : Two terminal blocks can be connected with NFDV161 or NFDV561 (64-channels type).
*5 : Cable length to 25.0 m is available. Extention unit is 1 m.
*6 : Suffix Code for the following HART module is changed from "S□□" to "H□□": NFAI135, NFAI835, NFAI141, NFAI143, NFAI543, NFAI841

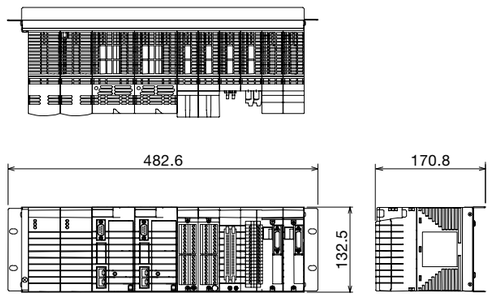
FCN (Long type, DIN rail-mounted)

Base module: NFBU200-S1 □



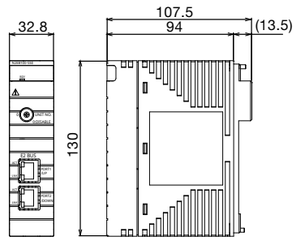
FCN (Long type, 19 inch rack-mounted)

Base module: NFBU200-S0 □



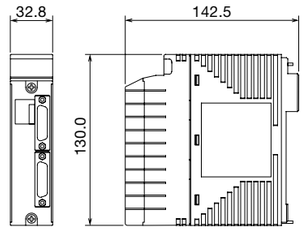
E2 bus interface module

Model: N2EB100



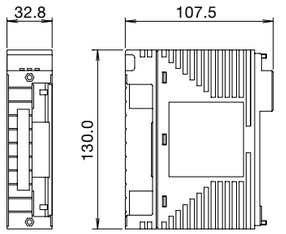
SB bus repeat module

Model: NFSB100



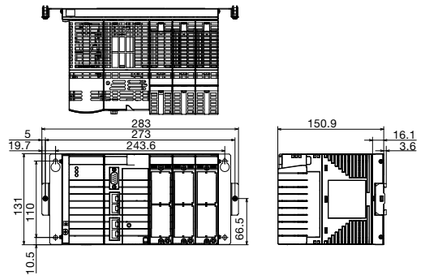
Analog I/O module

Model: NFAI135/NFAI141/NFAI143/NFAV141/
NFAV144/NFAT141/NFAR181/
NFAP135/NFAF135/NFAI835/
NFAI841/NFAB841/NFAI543/NFAV544



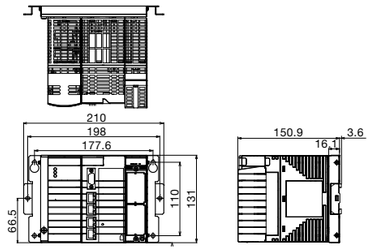
FCN (Short type, DIN rail mounted)

Base module: NFBU050, N2BU051 (for E2 bus)



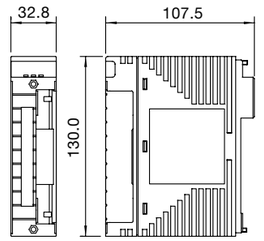
FCN (Compact type, DIN rail-mounted)

Base module: N2BU030

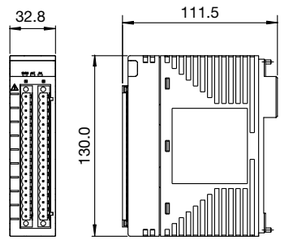


Digital I/O module

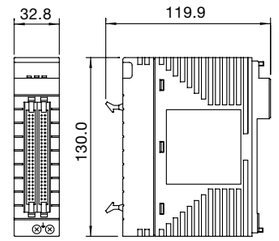
Model: NFDV151/NFDV551/NFDV532



Model: NFDR541-T

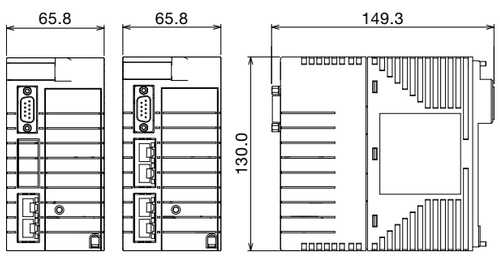


Model: NFDV161/NFDV561



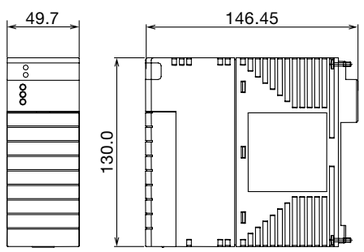
CPU module

FCN model: NFCP501/NFCP502



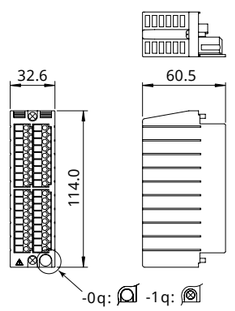
Power supply module

Model: NFPW441/NFPW442/NFPW444

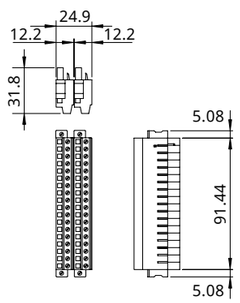


Terminal block

Model: NFTA4S/NFTT4S/NFTR8S/NFTB5S/
NFTD5S/NFTI3S



Model: NFTC4S



Model: NFCCC01