NVF7 Inverter

1. Overview

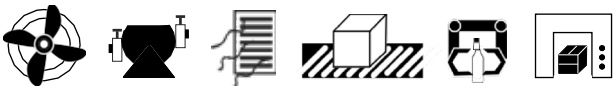
NVF7 series drive adopts open-loop and closed-loop magnetic flux vector control technology, with fast load response, large low-frequency torque, strong overload capacity, etc., to achieve accurate control of the equipment, the series of inverters have stable output, torque limit, speed tracking, simple PLC, process PID and other application functions, can meet the electrical drive needs of wire drawing, textile, machine tools, papermaking, packaging, food, plastic and fan pumps and a variety of automated production equipment.

2. Applications

There are two main types of applicable loads:

- Constant torque type and heavy load.
- Variable torque type and light load.

Applicable equipment of the product



Draught fan | Pump | Air conditioning | Conveyor belt | Food machinery | Packaging machinery

3. Technical features

Rated working voltage (V): three-phase 380~480V: 380V(-15%)~480V(+10%)

Power range: 0.4KW~280KW

Output frequency range (Hz): 0Hz-500Hz

Control method: PG vector control(FVC), non PG vector control(SVC), V/F control

Frequency resolution:

Digital setting: 0.01Hz; Analog setting: Maximum frequency x 0.5%

Overload capacity:

T type: 150% rated current for 1 minute, 180% rated current for 2 seconds;

P type: 120% rated current for 1 minute, 150% rated current for 2 seconds

Multi speed control: 16 speed control

4. Working conditions

Ambient temperature: (-10~+40) ° C. When using between 40 ° C and 50 ° C, it's necessary to consider derating. The capacity decreases by 1% for every 1 ° C increase in temperature;

Relative humidity: (5-90)% R H;

Storage temperature: -25 ° C ~+55 ° C,

If the altitude is above 1000 meters, please reduce the rating by 1% for every 100m increase, but it cannot exceed 3000m;

Indoor use, places that are not exposed to direct sunlight, dust, corrosive gases, lammable gases, oil mist, water vapor, dripping water, or salt,

5. Type designation

NVF7-	7.5T	/	11P	-	S4	-	B	1
Series Name	Motor power (KW) T: constant torque/heavy load type		Motor power (KW) P: variable torque/light load type		Phases: S: three phase Voltage level: 4: 380V~480V		Brake unit: B: built in Blank: no	Operation panel: 1: LCD Blank: LED

6. Model selection

Table 2.2.1 Model and Specification of Three phase 380V Inverter

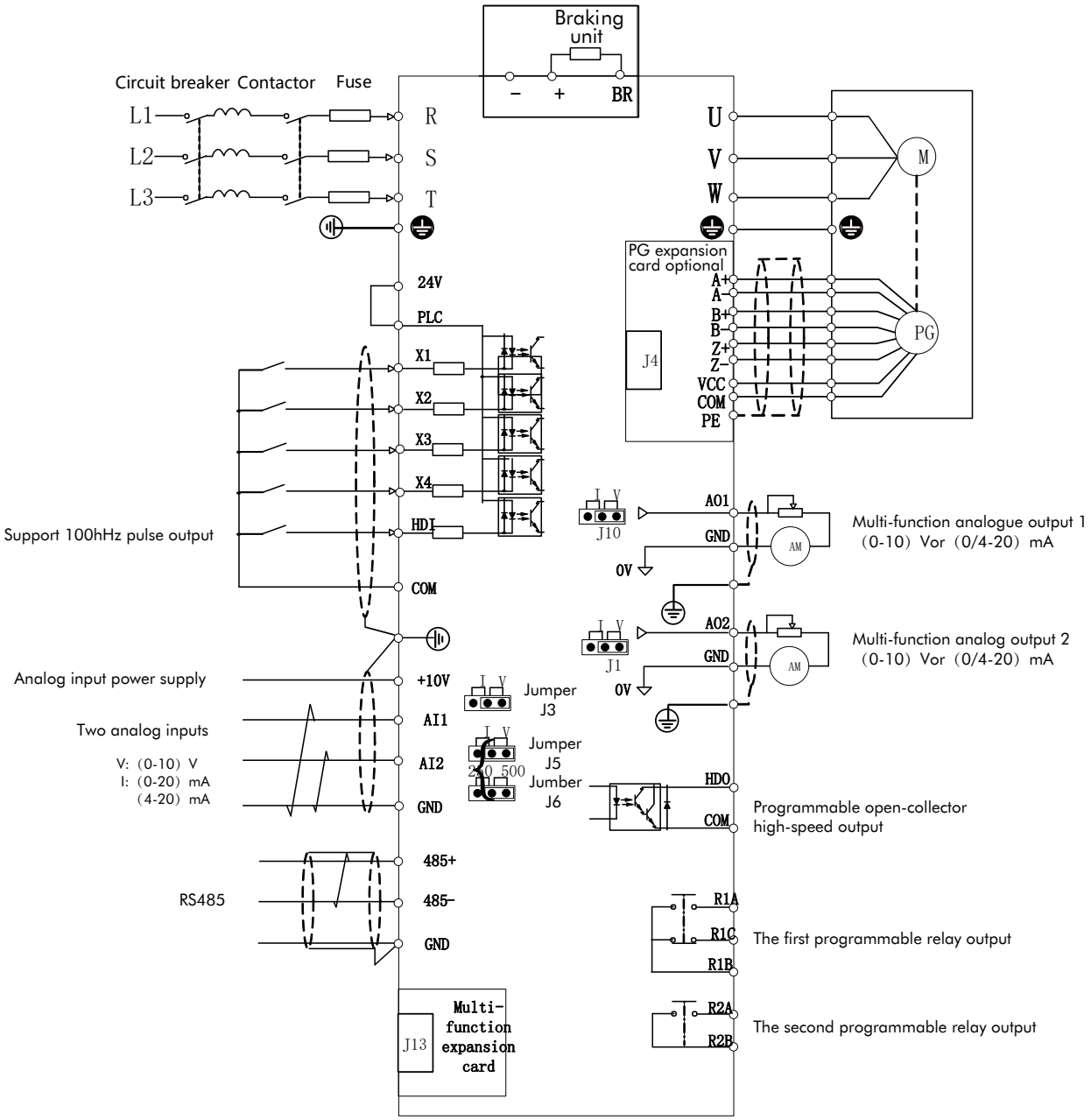
Model (standard built in LED)	Model (standard built in LCD)	power supply capacity kVA	Input current A	Heavy load rated current A	Light load rated current A	Motor power kW (Heavy load/light load)
NVF7-0.4T/0.75P-S4-B	NVF7-0.4T/0.75P-S4-B1	2	1.8	1.5	2.5	0.4T/0.75P
NVF7-0.75T/1.1P-S4-B	NVF7-0.75T/1.1P-S4-B1	2.8	2.4	2.5	3.1	0.75T/1.1P
NVF7-1.1T/1.5P-S4-B	NVF7-1.1T/1.5P-S4-B1	4.1	3.7	3.1	3.7	1.1T/1.5P
NVF7-1.5T/2.2P-S4-B	NVF7-1.5T/2.2P-S4-B1	3.0	4.6	3.7	5.0	1.5T/2.2P
NVF7-2.2T/3.0P-S4-B	NVF7-2.2T/3.0P-S4-B1	3.0	6.3	5.0	7.2	2.2T/3.0P
NVF7-3.0T/4.0P-S4-B	NVF7-3.0T/4.0P-S4-B1	5.0	6.1	7.2	9.5	3.0T/4.0P
NVF7-4.0T/5.5P-S4-B	NVF7-4.0T/5.5P-S4-B1	5.9	10.5	9.5	12.2	4.0T/5.5P
NVF7-5.5T/7.5P-S4-B	NVF7-5.5T/7.5P-S4-B1	8.6	14.6	12.2	16.2	5.5T/7.5P
NVF7-7.5T/11P-S4-B	NVF7-7.5T/11P-S4-B1	13	19	16.2	24.6	7.5T/11P
NVF7-11T/15P-S4-B	NVF7-11T/15P-S4-B1	18	26	24.6	31.4	11T/15P
NVF7-15T/18.5P-S4-B	NVF7-15T/18.5P-S4-B1	25	34	31.4	37	15T/18.5P
NVF7-18.5T/22P-S4-B	NVF7-18.5T/22P-S4-B1	29	38.5	37	45	18.5T/22P
NVF7-22T/30P-S4-B	NVF7-22T/30P-S4-B1	34	46.5	45	60	22T/30P
NVF7-30T/37P-S4 NVF7-30T/37P-S4-B	NVF7-30T/37P-S4-1 NVF7-30T/37P-S4-B1	46	62	60	75	30T/37P
NVF7-37T/45P-S4 NVF7-37T/45P-S4-B	NVF7-37T/45P-S4-1 NVF7-37T/45P-S4-B1	57	76	75	90	37T/45P
NVF7-45T/55P-S4 NVF7-45T/55P-S4-B	NVF7-45T/55P-S4-1 NVF7-45T/55P-S4-B1	69	92	90	110	45T/55P
NVF7-55T/75P-S4 NVF7-55T/75P-S4-B	NVF7-55T/75P-S4-1 NVF7-55T/75P-S4-B1	85	113	110	150	55T/75P
NVF7-75T/90P-S4 NVF7-75T/90P-S4-B	NVF7-75T/90P-S4-1 NVF7-75T/90P-S4-B1	114	157	150	176	75T/90P
NVF7-90T/110P-S4 NVF7-90T/110P-S4-B	NVF7-90T/110P-S4-1 NVF7-90T/110P-S4-B1	133	180	176	210	90T/110P
NVF7-110T/132P-S4 NVF7-110T/132P-S4-B	NVF7-110T/132P-S4-1 NVF7-110T/132P-S4-B1	160	214	210	253	110T/132P
NVF7-132T/160P-S4	NVF7-132T/160P-S4-1	195	256	253	300	132T/160P
NVF7-160T/185P-S4	NVF7-160T/185P-S4-1	236	307	300	340	160T/185P
NVF7-185T/200P-S4	NVF7-185T/200P-S4-1	267	345	340	380	185T/200P
NVF7-200T/220P-S4	NVF7-200T/220P-S4-1	305	430	380	420	200T/220P
NVF7-220T/250P-S4	NVF7-220T/250P-S4-1	350	477	420	470	220T/250P
NVF7-250T/280P-S4	NVF7-250T/280P-S4-1	420	526	470	520	250T/280P
NVF7-280T/315P-S4	NVF7-280T/315P-S4-1	450	605	520	600	280T/315P

7. Main technical parameters and performance

Output	Voltage	0 ~ rated input voltage
	Frequency	(0-500) Hz
	overload capacity	Type T: 150% rated current for 1 minute, 180% rated current for 2 seconds Type P: 120% rated current for 1 minute, 150% rated current for 1 second
Main Controls Performance	control mode	PG free vector control (SVC); PG vector control (FVC); V/F control;
	modulation mode	Space vector PWM modulation
	Starting torque	SVC: 150% rated torque at 0.25Hz FVC: 180% rated torque at 0Hz 150% rated torque at V/F: 0.5Hz
	frequency resolution	Digital setting: 0.01Hz; Analog setting: maximum frequency x 0.5%
	Torque boost	Automatic Torque Boost, Manual Torque Boost
	V/F curve	Straight V/F curve, VF full separation mode, VF semi separation mode, multi-point V/F curve mode
	acceleration and deceleration curves	Linear acceleration and deceleration (4 types)
	Automatic current limiting	Automatic limitation of current during operation to prevent frequent overcurrent fault tripping
Customization features	Tap	Jog frequency range: (0.10~50.00) Hz Jog acceleration/deceleration time (0.1-6000.0) s
	Multi-stage speed operation	Multi-speed operation via control terminals
Peripheral Interface Characteristics	Run the command channel	Operator panel setting, control terminal setting and communication control setting can be switched in various ways
	digital inputs	5 channels of multi-function digital programmable input, including 1 channel of HDI high-speed pulse input
	Digital Output	1 multi-function digital programmable output, which can be set as high-speed pulse output or open collector output
	Analog Input	2 analog signal inputs Optional (0~20) mA, (4~20) mA current signal input or (0-10) V voltage signal input
	Analog Output	2 analog signal outputs Selectable (0~20) mA, (4~20) mA current output or (0~10) V voltage output respectively, which can realize the output of physical quantities such as set frequency and output frequency
	Relay Output	2-channel relay output, including 1-channel normally open and normally closed conversion output, 1-channel normally open output. Contact capacity: NO 5A, NC 3A, 250V (AC)
	RS485 communication interface	1 channel, supporting Modbus protocol
LED operation panel	LED display	It can display more than 20 kinds of parameters such as setting frequency, output frequency, output voltage, output current and so on
	Key lock	To realize full or partial locking of the keys
	function selection	Define the scope of action of some keys to prevent misuse
LCD operation panel	LCD display	2.4 inch, resolution 320*240
	Language	Chinese, English display (default English)
	Indicator light	1 status indicator
(optional)		
protection functions	With over-current protection, over-voltage protection, under-voltage protection, over-heating protection, overload protection, phase loss protection and other protection functions	
Structure	protection class	IP20
	Cooling method	axial DC fan cooling
mounting method		Wall-mounted, flange-mounted lamps
Efficiency		37kW and below ≥ 93%; 45 kW and above ≥ 95%

8. Wiring diagram

NVF7



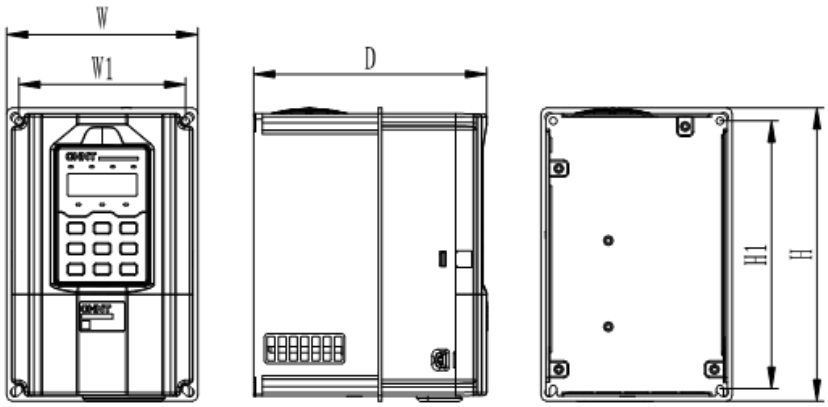
9. Notes of main circuit terminals

terminal symbol	terminal name	Functional Description	Wiring Precautions
R、S、T	Main circuit power input	Three-phase AC voltage input, connected to the grid	1. must be wired according to the terminal function, otherwise there is a risk of damage to the inverter, or even lead to fire. 2. The wiring length of the braking unit shall not exceed 10m, and shall use twisted pair or close double wire parallel wiring; 3. When external braking resistor is connected, do not connect the braking resistor directly to the DC bus, otherwise there is a danger of damaging the inverter, or even lead to fire.
U、V、W	Inverter output	Three-phase AC voltage output, generally connected to the motor	
⏚	Ground terminal	The safety grounding terminal must be reliably grounded, and the cross-sectional area of the grounding wire must not be smaller than the cross-sectional area of the input power line of the frequency converter	
⊕、⊖	positive and negative power terminals	positive and negative power terminals of the DC bus of the inverter	
Ⓑ	Brake resistor connection terminals	Brake resistor connection terminals	

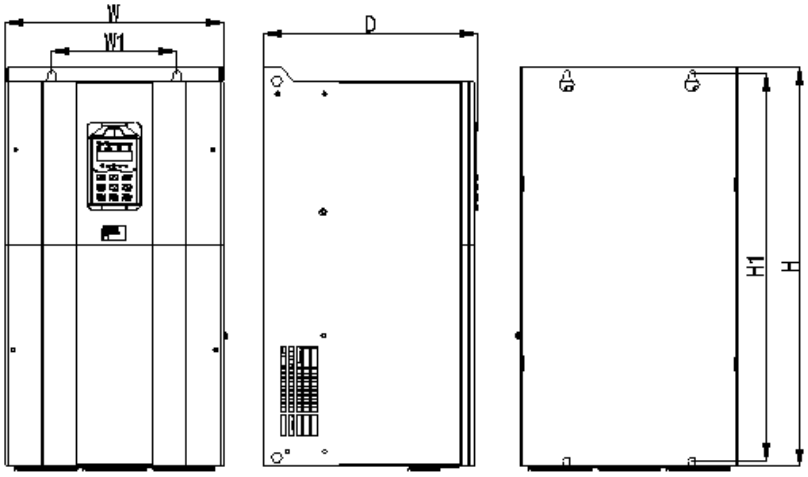
10. Control terminals description

Category	Terminals	Name	terminal function description	
Power supply	+10V	+10V power supply	External+10V power supply, maximum output current: 10mA It is generally used as the working power supply of the external potentiometer, and the resistance range of the potentiometer is 1k Ω~5k Ω	
	GND	+10V power supply ground		
	+24V	+24V power supply	Provide+24V power supply to the outside, which is generally used as the working power supply of digital input and output terminals and the power supply of external sensors Maximum output current: 200mA	
	COM	+24V power supply common terminal		
	PLC	External power input terminals	Factory default connection with+24V through short connector When using external power supply to drive X1~X4 and HDI, PLC needs to be connected to external power supply and disconnected from+24V power supply terminal	
analog inputs	AI1	Analog single ended input AI1	Voltage input range: 0Vdc~10Vdc, Current input range: 0mA~20mA or 4mA~20mA Decided by jumper J3 jumper selection Input impedance: 22k Ω for voltage input and 500 Ω for current input.	
	AI2	Analog single ended input AI2	Voltage input range: 0Vdc~10Vdc, Current input range: 0mA~20mA or 4mA~20mA Decided by jumper J5 jumper selection Input impedance: 22k Ω for voltage input, 500 Ω or 250 Ω for current input via J6 jumper	
analog output	AO1	Analog Output	The voltage or current output is determined by the selection of J10 and J1 jumpers on the control board Output voltage range: 0V~10V Output current range: 0mA~20mA or 4mA~20mA	
	AO2	Analog Output		
Communications	485+	RS485 communication interface 288	485 differential signal positive	Standard RS485 communication interface Please use twisted pair or shielded cable
	485-		485 differential signal negative	
digital input terminals	X1	Multi-function input terminal 1	Optical coupling isolation, compatible with bipolar inputs Input impedance: 1.39k Ω Voltage range for effective level input: 18V~30V Programmable multi-function switch input terminal, see function codes F5-00~F5-03	
	X2	Multi-function input terminal 2		
	X3	Multi-function input terminal 3		
	X4	Multi-function input terminal 4		
	HDI	High speed input terminal HDI	In addition to the characteristics of X1~X4, it can also be used as a high-speed pulse input channel Maximum input frequency: 100kHz Input impedance: 1.03k Ω	
digital output terminals	HDO	High-speed pulse output terminal	Constrained by parameter F6-00HDO terminal output mode selection When it is output as high-speed pulse, the highest frequency is 100kHz (set by F6-09) When it is used as collector open circuit output, it can program multiple function pulse signal output terminals, see function code F6-01	
Relay output terminal 1	R1B-R1A	normally open terminal contacts	For programmable multi-function relay output terminal, see function code F6-02 Contact driving capacity: 5A 250V (AC) 30Vdc,1A	
	R1B-R1C	Normally closed terminal contacts		
Relay output terminal 2	R2B-R2A	normally open terminal contacts	For programmable multi-function relay output terminal, see function code F6-04 Contact driving capacity: 5A 250V (AC) 30Vdc,1A	

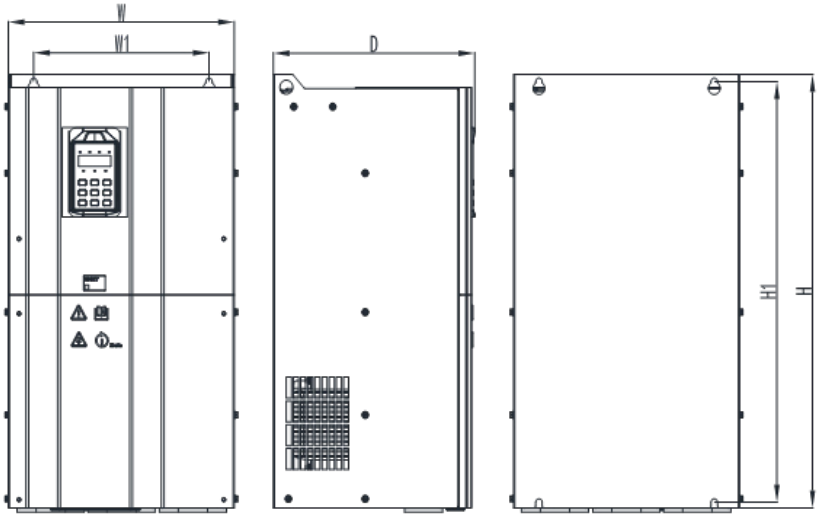
11. Mounting dimensions (mm) & weight (kg)



T2~T5



T6~T7



T8~T11

Terminal No.	W	H	D	W1	H1	Weight (Kg)
NVF7-0.4T/0.75P	136.9	207.5	166.8	119.4	189.4	2.5
NVF7-0.75T/1.1P						
NVF7-1.1T/1.5P						
NVF7-1.5T/2.2P						
NVF7-2.2T/3.0P						
NVF7-3.0T/4.0P						
NVF7-4.0T/5.5P						
NVF7-5.5T/7.5P						
NVF7-7.5T/11P	152	262	186.4	129	239	3.7
NVF7-11T/15P						
NVF7-15T/18.5P	187	288	185.9	169	269	5.5
NVF7-18.5T/22P	218.4	358.5	223.6	189.2	335.5	11
NVF7-22T/30P						
NVF7-30T/37P	270	466	268.1	233	443	21
NVF7-37T/45P						
NVF7-45T/55P	313	580	309.6	180	562	38
NVF7-55T/75P						
NVF7-75T/90P	348	620	310.3	270	604	49
NVF7-90T/110P						
NVF7-110T/132/P						
NVF7-132T/160P	400	915	331.7	320	891	84
NVF7-160T/185P						
NVF7-185T/200P	400	915	361.7	320	891	90
NVF7-200T/220P						
NVF7-220T/250P	550	1100	418.5	400	1070	118
NVF7-250T/280P						
NVF7-280T/315P						