

# NVF7 Drive

## 1. Overview

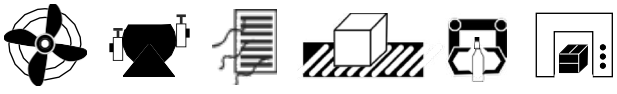
NVF7 series drive adopts open-loop and closed-loop magnetic flux vector control technology, with fast load response, large low-frequency torque, strong overload capacity, etc., to achieve accurate control of the equipment, the series of inverters have stable output, torque limit, speed tracking, simple 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)<br>T: constant torque/heavy load type | | Motor power (KW)<br>P: variable torque/light load type | | S: three phases<br>D: single phase<br>2: 230V<br>4:380~480V | | Brake unit:<br>B: built in<br>Blank: no | Operation panel:<br>1: LCD<br>Blank: LED |

## 6. Model selection

Table 2.2.1 Model and Specification of Three phase 380V Drive

| Model (standard built in LED) | power supply capacity kVA | Input current A | Heavy load rated current A | Light load rated current A | Motor power kW (Heavy load/light load) | ordering code |
|---|---|---|---|---|---|---|
| NVF7-0.4T/0.75P-S4-B | 2 | 1.8 | 1.5 | 2.5 | 0.4T/0.75P | 505309 |
| NVF7-0.75T/1.1P-S4-B | 2.8 | 2.4 | 2.5 | 3.1 | 0.75T/1.1P | 505310 |
| NVF7-1.1T/1.5P-S4-B | 4.1 | 3.7 | 3.1 | 3.7 | 1.1T/1.5P | 505311 |
| NVF7-1.5T/2.2P-S4-B | 3.0 | 4.6 | 3.7 | 5.0 | 1.5T/2.2P | 505312 |
| NVF7-2.2T/3.0P-S4-B | 3.0 | 6.3 | 5.0 | 7.2 | 2.2T/3.0P | 505313 |
| NVF7-3.0T/4.0P-S4-B | 5.0 | 9.0 | 7.2 | 9.5 | 3.0T/4.0P | 505314 |
| NVF7-4.0T/5.5P-S4-B | 5.9 | 10.5 | 9.5 | 12.2 | 4.0T/5.5P | 505315 |
| NVF7-5.5T/7.5P-S4-B | 8.6 | 14.6 | 12.2 | 16.2 | 5.5T/7.5P | 505316 |
| NVF7-7.5T/11P-S4-B | 13 | 19 | 16.2 | 24.6 | 7.5T/11P | 505317 |
| NVF7-11T/15P-S4-B | 18 | 26 | 24.6 | 31.4 | 11T/15P | 505318 |
| NVF7-15T/18.5P-S4-B | 25 | 34 | 31.4 | 37 | 15T/18.5P | 505319 |
| NVF7-18.5T/22P-S4-B | 29 | 38.5 | 37 | 45 | 18.5T/22P | 505320 |
| NVF7-22T/30P-S4-B | 34 | 46.5 | 45 | 60 | 22T/30P | 505321 |
| NVF7-30T/37P-S4<br>NVF7-30T/37P-S4-B | 46 | 62 | 60 | 75 | 30T/37P | 505322、505323 |
| NVF7-37T/45P-S4<br>NVF7-37T/45P-S4-B | 57 | 76 | 75 | 90 | 37T/45P | 505324、505325 |
| NVF7-45T/55P-S4<br>NVF7-45T/55P-S4-B | 69 | 92 | 90 | 110 | 45T/55P | 505324、505325 |
| NVF7-55T/75P-S4<br>NVF7-55T/75P-S4-B | 85 | 113 | 110 | 150 | 55T/75P | 505326、505327 |
| NVF7-75T/90P-S4<br>NVF7-75T/90P-S4-B | 114 | 157 | 150 | 176 | 75T/90P | 505330、505331 |
| NVF7-90T/110P-S4<br>NVF7-90T/110P-S4-B | 133 | 180 | 176 | 210 | 90T/110P | 505332、505333 |
| NVF7-110T/132P-S4<br>NVF7-110T/132P-S4-B | 160 | 214 | 210 | 253 | 110T/132P | 505334、505335 |
| NVF7-132T/160P-S4 | 195 | 256 | 253 | 300 | 132T/160P | 505336 |
| NVF7-160T/185P-S4 | 236 | 307 | 300 | 340 | 160T/185P | 505337 |
| NVF7-185T/200P-S4 | 267 | 345 | 340 | 380 | 185T/200P | 505338 |
| NVF7-200T/220P-S4 | 305 | 430 | 380 | 420 | 200T/220P | 505339 |
| NVF7-220T/250P-S4 | 350 | 477 | 420 | 470 | 220T/250P | 505340 |
| NVF7-250T/280P-S4 | 420 | 526 | 470 | 520 | 250T/280P | 505341 |
| NVF7-280T/315P-S4 | 450 | 605 | 520 | 600 | 280T/315P | 505342 |

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| 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) | ordering code |
|---|---|---|---|---|---|---|
| NVF7-0.4T/0.75P-S4-B1 | 2 | 1.8 | 1.5 | 2.5 | 0.4T/0.75P | 505343 |
| NVF7-0.75T/1.1P-S4-B1 | 2.8 | 2.4 | 2.5 | 3.1 | 0.75T/1.1P | 505344 |
| NVF7-1.1T/1.5P-S4-B1 | 4.1 | 3.7 | 3.1 | 3.7 | 1.1T/1.5P | 505345 |
| NVF7-1.5T/2.2P-S4-B1 | 3.0 | 4.6 | 3.7 | 5.0 | 1.5T/2.2P | 505346 |
| NVF7-2.2T/3.0P-S4-B1 | 3.0 | 6.3 | 5.0 | 7.2 | 2.2T/3.0P | 505347 |
| NVF7-3.0T/4.0P-S4-B1 | 5.0 | 9.0 | 7.2 | 9.5 | 3.0T/4.0P | 505348 |
| NVF7-4.0T/5.5P-S4-B1 | 5.9 | 10.5 | 9.5 | 12.2 | 4.0T/5.5P | 505349 |
| NVF7-5.5T/7.5P-S4-B1 | 8.6 | 14.6 | 12.2 | 16.2 | 5.5T/7.5P | 505350 |
| NVF7-7.5T/11P-S4-B1 | 13 | 19 | 16.2 | 24.6 | 7.5T/11P | 505351 |
| NVF7-11T/15P-S4-B1 | 18 | 26 | 24.6 | 31.4 | 11T/15P | 505352 |
| NVF7-15T/18.5P-S4-B1 | 25 | 34 | 31.4 | 37 | 15T/18.5P | 505353 |
| NVF7-18.5T/22P-S4-B1 | 29 | 38.5 | 37 | 45 | 18.5T/22P | 505354 |
| NVF7-22T/30P-S4-B1 | 34 | 46.5 | 45 | 60 | 22T/30P | 505355 |
| NVF7-30T/37P-S4-1<br>NVF7-30T/37P-S4-B1 | 46 | 62 | 60 | 75 | 30T/37P | 505356、505357 |
| NVF7-37T/45P-S4-1<br>NVF7-37T/45P-S4-B1 | 57 | 76 | 75 | 90 | 37T/45P | 505358、505359 |
| NVF7-45T/55P-S4-1<br>NVF7-45T/55P-S4-B1 | 69 | 92 | 90 | 110 | 45T/55P | 505360、505361 |
| NVF7-55T/75P-S4-1<br>NVF7-55T/75P-S4-B1 | 85 | 113 | 110 | 150 | 55T/75P | 505362、505363 |
| NVF7-75T/90P-S4-1<br>NVF7-75T/90P-S4-B1 | 114 | 157 | 150 | 176 | 75T/90P | 505364、505365 |
| NVF7-90T/110P-S4-1<br>NVF7-90T/110P-S4-B1 | 133 | 180 | 176 | 210 | 90T/110P | 505366、505367 |
| NVF7-110T/132P-S4-1<br>NVF7-110T/132P-S4-B1 | 160 | 214 | 210 | 253 | 110T/132P | 505334、505335 |
| NVF7-132T/160P-S4-1 | 195 | 256 | 253 | 300 | 132T/160P | 505370 |
| NVF7-160T/185P-S4-1 | 236 | 307 | 300 | 340 | 160T/185P | 505371 |
| NVF7-185T/200P-S4-1 | 267 | 345 | 340 | 380 | 185T/200P | 505372 |
| NVF7-200T/220P-S4-1 | 305 | 430 | 380 | 420 | 200T/220P | 505373 |
| NVF7-220T/250P-S4-1 | 350 | 477 | 420 | 470 | 220T/250P | 505374 |
| NVF7-250T/280P-S4-1 | 420 | 526 | 470 | 520 | 250T/280P | 505375 |
| NVF7-280T/315P-S4-1 | 450 | 605 | 520 | 600 | 280T/315P | 505376 |

Table 2.2.2 Model and Specification of Three phase 230V Drive

| Model (standard built in LED) | power supply capacity kVA | Input current A | Heavy load rated current A | Light load rated current A | Motor power kW (Heavy load/ light load) | ordering code |
|---|---|---|---|---|---|---|
| NVF7-0.4T/0.75P-S2-B | 1.1 | 2.4 | 2.3 | 4.0 | 0.4T/0.75P | 512455 |
| NVF7-0.75T/1.1P-S2-B | 2.1 | 4.6 | 4.0 | 5.1 | 0.75T/1.1P | 512456 |
| NVF7-1.1T/1.5P-S2-B | 2.9 | 6.3 | 5.1 | 7.0 | 1.1T/1.5P | 512457 |
| NVF7-1.5T/2.2P-S2-B | 4.2 | 9 | 7.0 | 9.6 | 1.5T/2.2P | 512458 |
| NVF7-2.2T/3.0P-S2-B | 5.3 | 11.4 | 9.6 | 12.2 | 2.2T/3.0P | 512459 |
| NVF7-3.0T/4.0P-S2-B | 10.2 | 22 | 12.2 | 16.2 | 3.0T/4.0P | 512460 |
| NVF7-4.0T/5.5P-S2-B | 14.8 | 32 | 16.2 | 24.6 | 4.0T/5.5P | 512461 |
| NVF7-5.5T/7.5P-S2-B | 19.1 | 39 | 24.6 | 31.4 | 5.5T/7.5P | 512462 |
| NVF7-7.5T/9.5P-S2-B | 13 | 44 | 31.4 | 37 | 7.5T/11P | 512463 |
| NVF7-9.5T/11P-S2-B | 20 | 51 | 37 | 45 | 9.5T/11P | 512464 |
| NVF7-11T/15P-S2-B | 27 | 59 | 45 | 60 | 11T/15P | 512465 |
| NVF7-15T/18.5P-S2<br>NVF7-15T/18.5P-S2-B | 32 | 89 | 60 | 75 | 15T/18.5P | 512466、512467 |
| NVF7-18.5T/22P-S2<br>NVF7-18.5T/22P-S2-B | 41 | 106 | 75 | 90 | 18.5T/22P | 512468、512469 |
| NVF7-22T/30P-S2<br>NVF7-22T/30P-S2-B | 51 | 139 | 90 | 110 | 22T/30P | 512470、512471 |
| NVF7-30T/37P-S2<br>NVF7-30T/37P-S2-B | 65 | 144 | 110 | 152 | 30T/37P | 512472、512473 |
| NVF7-37T/45P-S2<br>NVF7-37T/45P-S2-B | 75 | 164 | 152 | 176 | 37T/45P | 512474、512475 |
| NVF7-45T/55P-S2<br>NVF7-45T/55P-S2-B | 90 | 202 | 176 | 210 | 45T/55P | 512476、512477 |

Table 2.2.3 Single-phase 230V Drive Model Specification Table

| Model (standard built in LED) | power supply capacity kVA | Input current A | Heavy load rated current A | Light load rated current A | Motor power kW (Heavy load/ light load) | ordering code |
|---|---|---|---|---|---|---|
| NVF7-0.4T-D2-B | 1.1 | 5.0 | 2.3 | - | 0.4T | 512501 |
| NVF7-0.75T-D2-B | 2.1 | 9.5 | 4.0 | - | 0.75T | 512502 |
| NVF7-1.5T-D2-B | 2.9 | 15.5 | 7.0 | - | 1.5T | 512503 |
| NVF7-2.2T-D2-B | 5.3 | 20 | 9.6 | - | 2.2T | 512504 |
| NVF7-3.0T-D2-B | 6.5 | 26 | 12.2 | - | 3.0T | 512505 |
| NVF7-4.0T-D2-B | 7.5 | 32 | 16.2 | - | 4.0T | 512506 |

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| Model | Standard built | ordering code |
|---|---|---|
| NVF7- LED VA7KEY01 | Operator panel LED | 513138 |
| NVF7- LCD VA7KEY02 | Operator panel LCD | 513139 |
| NVF7-VA7KEY03 | Mounting bracket | 513140 |
| NVF7-VA7CB02 | Extension cable 2 meters | 513141 |
| NVF7-VA7CB04 | Extension cable 4 meters | 513142 |

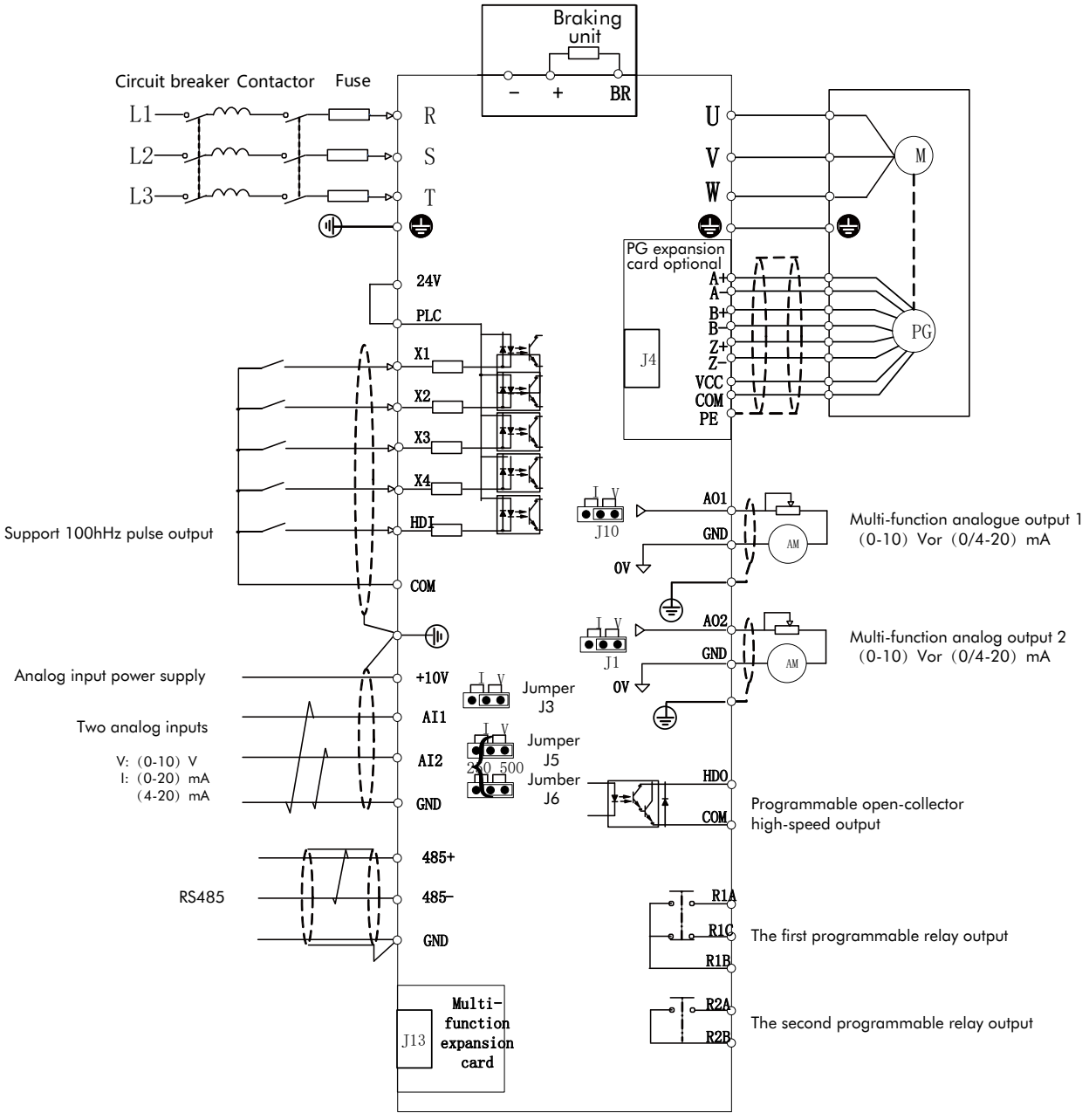
## 7. Main technical parameters and performance

| | | |
|---|---|---|
| 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<br>Type P: 120% rated current for 1 minute, 150% rated current for 1 second |
| Main Controls Performance | control mode | PG free vector control (SVC);<br>PG vector control (FVC);<br>V/F control; |
| | modulation mode | Space vector PWM modulation |
| | Starting torque | SVC: 150% rated torque at 0.25Hz<br>FVC: 180% rated torque at 0Hz<br>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<br>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<br>Optional (0~20) mA, (4~20) mA current signal input or (0-10) V voltage signal input |
| | Analog Output | 2 analog signal outputs<br>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.<br>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% |

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## 8. Wiring diagram

NVF7



## 9. Notes of main circuit terminals

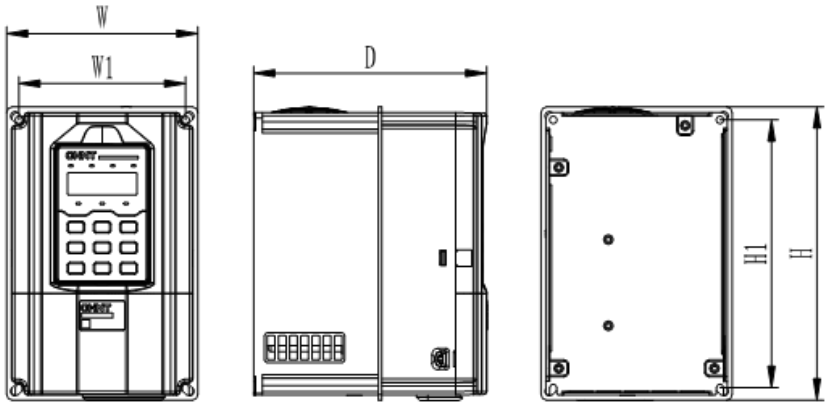
| terminal symbol | terminal name | Functional Description | Wiring Precautions |
|---|---|---|---|
| R、S、T | Main circuit power input | Three-phase AC voltage input, connected to the grid | 1. must be wired according to the terminal function, otherwise there is a risk of damage to the inverter, or even lead to fire.<br>2. The wiring length of the braking unit shall not exceed 10m, and shall use twisted pair or close double wire parallel wiring;<br>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 | |

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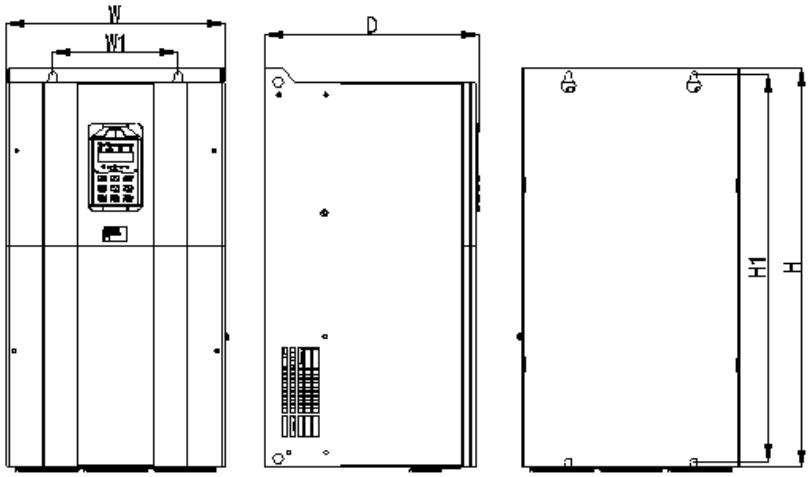
## 10. Control terminals description

| Category | Terminals | Name | terminal function description | |
|---|---|---|---|---|
| Power supply | +10V | +10V power supply | External+10V power supply, maximum output current: 10mA<br>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<br>Maximum output current: 200mA | |
| | COM | +24V power supply common terminal | | |
| | PLC | External power input terminals | Factory default connection with+24V through short connector<br>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,<br>Current input range: 0mA~20mA or 4mA~20mA<br>Decided by jumper J3 jumper selection<br>Input impedance: 22k Ω for voltage input and 500 Ω for current input. | |
| | AI2 | Analog single ended input AI2 | Voltage input range: 0Vdc~10Vdc,<br>Current input range: 0mA~20mA or 4mA~20mA<br>Decided by jumper J5 jumper selection<br>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<br>Output voltage range: 0V~10V<br>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<br>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<br>Input impedance: 1.39k Ω<br>Voltage range for effective level input: 18V~30V<br>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<br>Maximum input frequency: 100kHz<br>Input impedance: 1.03k Ω | |
| digital output terminals | HDO | High-speed pulse output terminal | Constrained by parameter F6-00HDO terminal output mode selection<br>When it is output as high-speed pulse, the highest frequency is 100kHz (set by F6-09)<br>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<br>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<br>Contact driving capacity: 5A 250V (AC) 30Vdc,1A | |

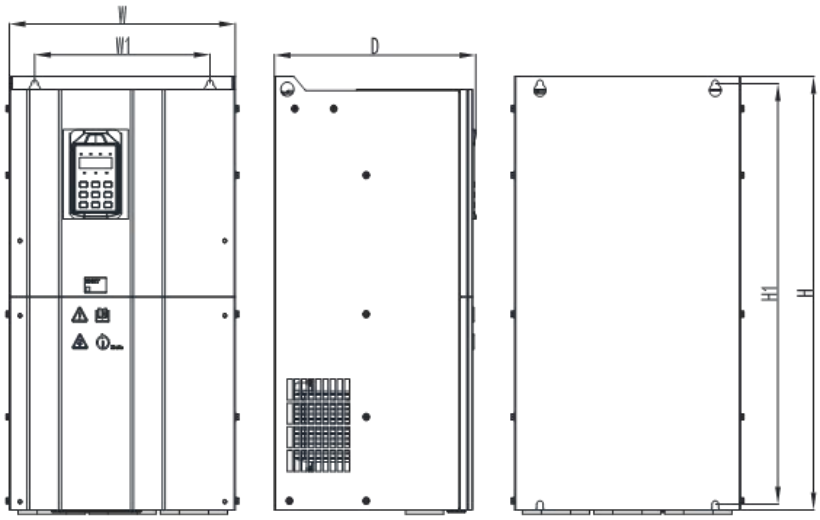
## 11. Mounting dimensions (mm) & weight (kg)




T2~T5




T6~T7




T8~T11

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| 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 | | | | | | |