NANCAL Electric



Low Voltage Industrial AC Drives

NANCAL Electric

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Product Family

Medium Voltage AC Drives	Low Voltage Industrial AC Drives	Medium Voltage Soft Starters	Power Quality Products（APF/SVG）	Shore Power
				
Output Voltage			**Output Voltage**	
3 kV-18 kV	400 V, 480 V, 690 V	3 kV-13.8 kV	400 V, 480 V, 690 V	MV: 6 kV-11 kV LV: 380 V-690 V
Rated Value			**Rated Value**	
Air-cooling: 220 kVA-18 MVA Water-cooling: 7 MVA-180 MVA	37 kW-8 MW	70 A-600 A	30 A-1600 A	MV: 300 kVA-20 MVA LV: 40 kVA-8 MVA Frequency: 50 Hz/ 60 Hz
Specificities			**Specificities**	
- Speed sensorless vector control - Medium voltage IGBT (for water-cooling drives) - Main control system redundancy design, Power cell fast automatic bypass design, Torsional vibration and active suppression	- High Performance Vector Control - Common DC bus, multi-machine drive - High power density, high reliability	- Smooth motor starting and stopping, effective protection - Various curves available such as double slope, pulse, current limit, etc. - Multi-motor starting	- Harmonic suppression, reactive power compensation, three-phase unbalance compensation - Modular design for easy expansion	- Sine wave output - Inverse power suppression, nondisturbed switch - Classification Society Certification - Corrosion-proof grade C5

Shanghai Nancal Electrical Co., Ltd.

specializes in the research, development, production, and sales of power electronics products. This includes Medium Voltage AC drives, Low Voltage Industrial AC Drives, Medium Voltage Soft Starters, Power Quality Products such as Active Power Filters (APF) and Static Var Generators (SVG).

Glories

- National Specialized and Sophisticated Key"Little Giant" Enterprise
- High-Tech Enterprise
- Member of the National Technical Committee 518 on Variable Frequency Regulating Speed Equipment of Standardization Administration of China
- Shanghai Center for Enterprise Technology
- Shanghai Manufacturing Single Item Champion Demonstration Enterprise



NC EVFD Introduction

Introduction

NC EVFD series Low Voltage Industrial AC Drives are new generation high performance variable frequency drives, which have V/F control, speed sensorless vector control and close loop vector control. They can provide the solution for motor drive systems and satisfy the requirements of general industry and special application, the applications including rolling mill, crane, belt conveyor, internal mixer, pump, draught fan and etc. Application industries include metallurgy, oil, harbor, minng, testing bed, cement, marine, ocean platform, paper, pulping and etc.

Configuration

- Specifications: single drive/multi-drive, two-quadrant/ four-quadrant, power unit/cabinet-type
- Voltage class: 400V/480V/690V
- Power range: ⩽8MW
- Output power of Single Inverter Unit (INU): 45kW ～ 560kW
- Rectifier: Diode rectifier unit (DSU), IGBT PWM rectifier unit (ISU1), IGBT 6-pulse rectifier unit (ISU2)
- Motor: AC asynchronous motor, permanent magnet synchronous motor
- Control mode: V/F control, speed sensorless vector control and close loop vector control
- Various Interface: RS232, RS485, Profibus, Profinet, CAN, Ethernet and etc. (Option)

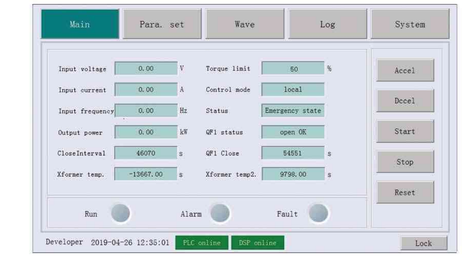
Product Features

- High performance vector control, motor parameter auto-tunning and online identification
- DSP+FPGA+ARM, high speed digital control
- High power density, high reliability
- Custom design for special application
- Applied film capacitor, no series connection of capacitors , no voltage-sharing device
- N8i power unit with output du/dt filter as standard (optional for N6i, N7i power units)
- Redundancy design, maximum 16 power units in parallel without paralleling reactor
- The distributed cooling design is suitable for heavy load and impact load, improving thermal performance
- Isolated air duct design, immunity to dust
- High reliability external rotor draught fan, low maintenance requirement
- Easy installation and maintenance
- Remote communication connection, facilitating remote debugging and maintenance
- Prognostic and healthmanagement (PHM): providing intelligent alerts for critical component maintenance, thereby extending equipment lifespan

Product Composition

HMI

- Intelligent touch panel, sophisticated interface
- High resolution LCD display
- English and other languages



Integrated Control Board

- 32 bit DSP+FPGA+ARM, high speed digital control
- High reliability full digital control board, compatible to various industrial network
- Fiber optic interface between core control and power unit, better EMC
- Abundant interface, such as digital I/O, analog I/O, field bus, encode, etc.



Power Unit

- High power density, 690V/1100kW as example, the width of inverter cabinet is 600mm
- Adopt the latest generation IGBT, high junction temperature (175°C), low loss and high reliability
- Castors at the bottom of power units for easy plug in/out, easy maintenance



▲ N5i power unit ▲ N7/N6i power unit ▲ N8i power unit

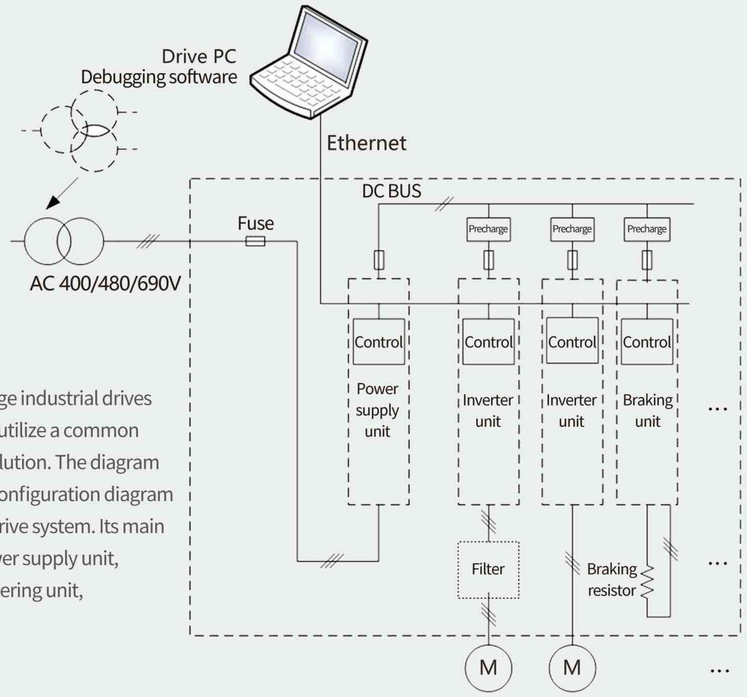
Fuse Disconnection Switch (optional)

- Combine isolation and protection, supporting both online maintenance, safe and reliable
- High breaking capacity, safety protection fuse with reliability improved

Multi-drive Solution

Multi-drive system is composed of industrial drive modules connected to a common DC bus. The common DC bus supplies DC voltage to the drive modules, which is provided by a rectifier unit within the system.

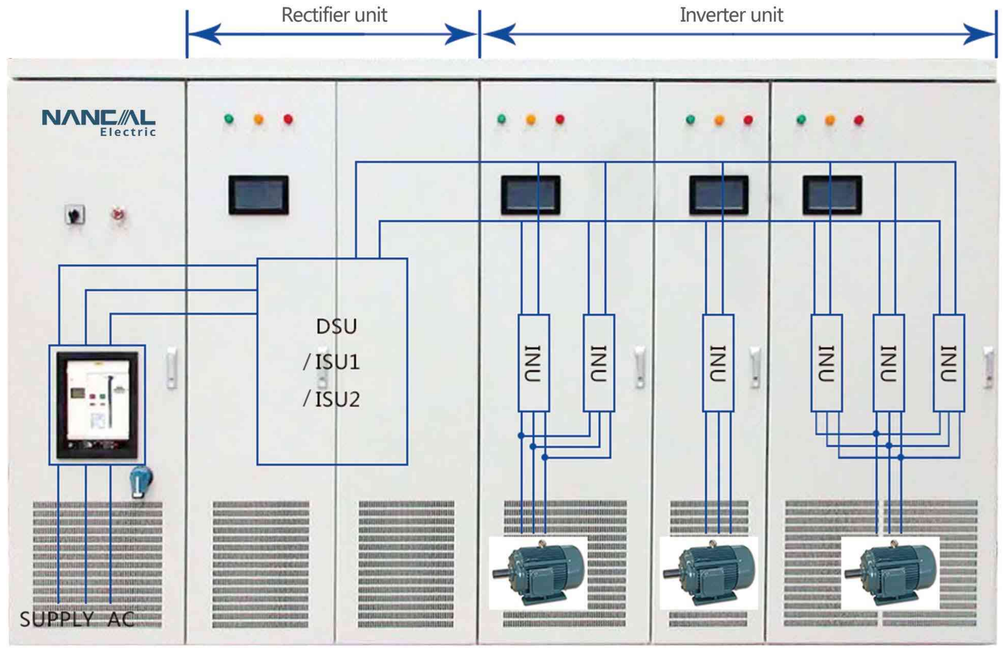
The rectifier unit can be selected as needed from a diode rectifier power supply unit, an IGBT PWM rectifier power supply unit, or an IGBT 6-pulse rectifier power supply unit. Depending on the motor power requirements, the system can be configured with a single inverter unit or multiple inverter units connected in parallel for output.



The NC EVFD series low voltage industrial drives adopt a modular design and utilize a common DC bus multi-drive system solution. The diagram on the right shows a typical configuration diagram of the NC EVFD series multi-drive system. Its main components include the power supply unit, inverter unit, braking unit, filtering unit, and control system.

Multi-drives structure has following strengths:

- Reducing cost of connection, installation and maintenance
- Saving space
- Less quantity of parts, high reliability
- Low line current and simple braking device
- Energy flow on commmon DC bus with balance between motors, no or less need for brake chopper or energy feedback unit
- Common rectifier unit of multi-drive ensures the safety of system and the diversity of control functions



Easy Integration

- Castors at the bottom of power units for easy installation and maintenance
- Rectifier unit and inverter unit can be paralleled directly for higher current
- Modular and compact design, reducing cabinet size and installation space

Performance Advantages

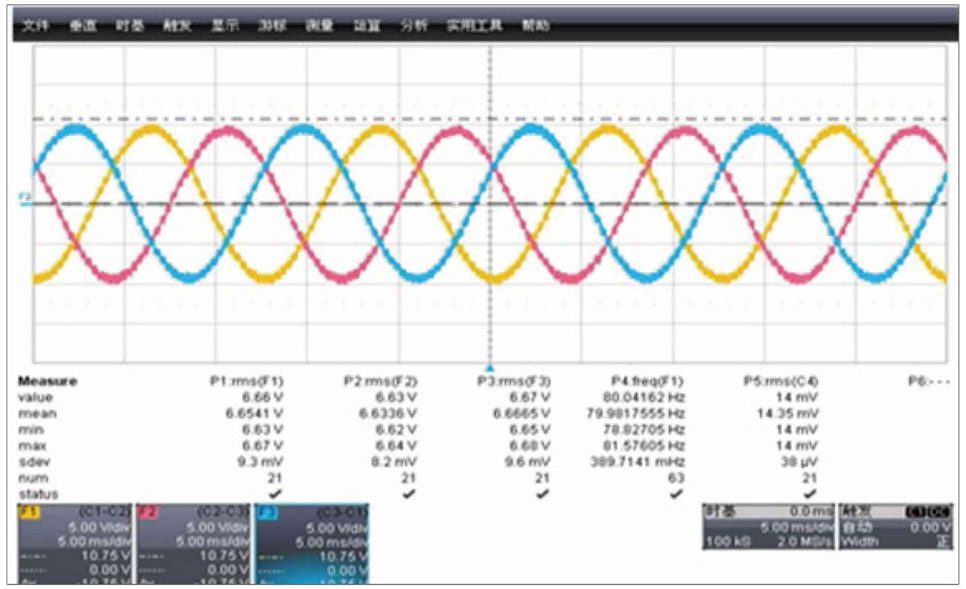
IGBT Rectifier Power Supply

Technical Features

- IGBT rectifier: four-quadrant regeneration, including IGBT PWM rectifier unit (ISU1), IGBT 6-pulse rectifier unit (ISU2)
- Consisting of rectifier unit and LCL/L filter
- ISU1 used for low harmonic and regeneration application; ISU2 for regeneration with low cost

Competitive Advantage

- Accurate phase-locked loop technology and current control, which is robust to disturbance on grid
- ISU1 uses vector control and LCL filter to minimize harmonic, current THD≤5%
- Reactive compensation capacity, unity power factor
- Controllable DC bus voltage (ISU1), less impact by power supply instability
- IGBT rectifier in parallel directly, power range up to 8000kW, voltage range from 400V ~ 690V



Input Current Waveform: ISU1 (IGBT PWM rectifier unit)

Seamless Transfer when Speed Sensor Failure in Vector Control Mode

Technical Features

Control system estimates motor speed in real time in close loop vector control mode, it can transfer to speed sensorless vector control mode seamlessly in case speed sensor fails.

Competitive Advantages

- Minimizing loss of motor shut down by speed sensor fault
- Quick and stable transfer, no impact on motor current
- Encoder hardware failure monitoring

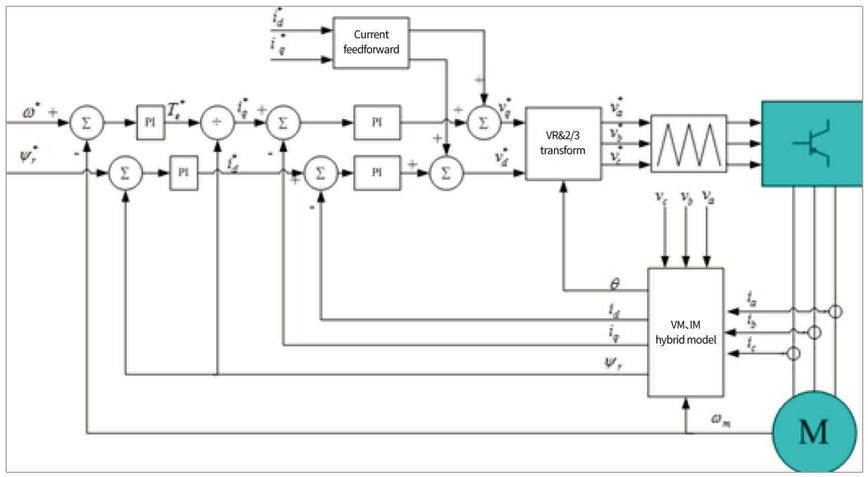
Vector Control for PMSM

Technical Features

- Advanced motor flux model, higher torque response and wider flux weakening speed range
- Multiple control strategies: maximum torque/current (MTPA), unity power factor, maximum efficiency and etc.
- Control modes: close loop vector control, speed sensorless vector control

Competitive Advantages

- Rotor initial position automatic detection function, more accurate positioning



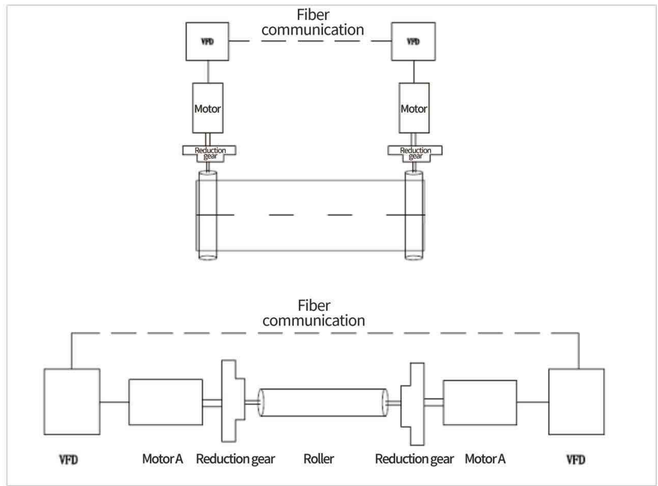
Multi-motor Synchronous Control and Load Distribution (Option)

Technical Features

Used for multi-motor driving one load, with synchronous drive and ratio synchronous drive. Satisfying the synchronous drive demand of gear, chain, belt and so on. The applications include rolling mill, winch, spinning machine, papermaking machine, crane, belt conveyor, ship lifting, etc.

Competitive Advantages

- Prevent torsional vibration and slip, high accuracy speed synchronous control and load distribution



Braking Technology

Technical Features

- **Dual-frequency braking**: Adding controllable high frequency component on output voltage vector. Parts of rotation energy dissipate via motor winding, generating a high reverse torque and thereby enhancing the braking effect
- **Magnetic increased braking**: Enhancing the braking torque by increasing motor flux
- **DC braking**: Adding controllable DC voltage at low speed, eliminating "creeping phenomenon" of drive system

Competitive Advantages

- Even in diode rectifier unit configuration, the motor deceleration time can be shortened to meet the stringent deceleration requirement of many sites

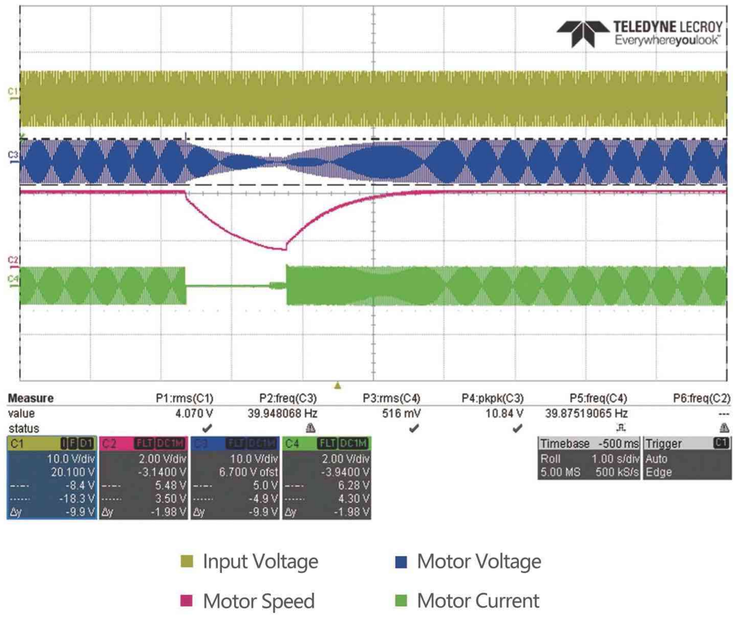
Spinning-load Pick Up

Technical Features

VFD can automatically search motor speed and recover to normal condition according to set time of acceleration and deceleration (i.e. speed tracking technology). During a main power supply transfer, the system can continue to operate.

Competitive Advantages

- Reducing the impact of momentary power outages on production
- Minimizing disturbances to both the power grid and mechanical loads



Motor Parameter Auto-Tunning and Online Identification

Technical Features

The technology automatically tunes the motor' s main parameters before running and continuously identifies key parameters online as they change with working conditions during operation.

Competitive Advantages

It accurately calculates motor parameters for vector control and automatically optimizes regulator parameters, making it particularly suitable for retrofitting projects involving older motors.

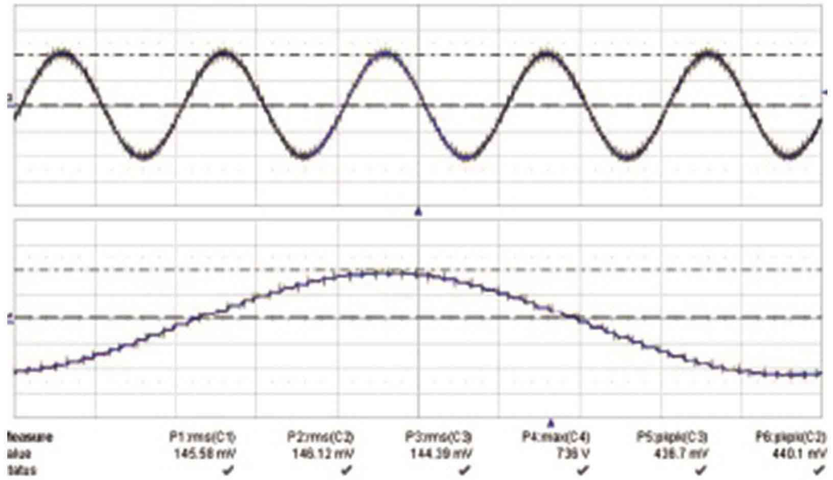
Current Sharing in Parallel Operation

Technical Features

When power units operate in parallel, the advanced algorithm enables real-time current sharing without the need for a sharing reactor.

Competitive advantages

- Multiple power units in parallel operation
- Derating operation when one power unit fails



Output current waveform



VFD Auto-Diagnosis

Technical Features

Auto-diagnosis on the IGBT modules before VFD running, identifying any failed components to ensure operational safety.

Competitive Advantages

- Protecting VFD
- Quick fault locating

Factory Acceptance Test

System testing

- Self-developed test station for EVFD, all drives will have hundreds of checking items and burn-in test with full load
- The full load operation can support 400V, 480V, 690V, and four-quadrant regeneration





Other Technical Features

Protection of Motor (option)

- Temperature of motor winding
- Temperature of motor bearings
- Motor vibration

Thermal Design

- Advanced draught fan, high reliability
- High reliability external rotor draught fan, without dismantling power units for maintenance
- Large cooling capacity to ensure thermal performance

Self-adaption of Input Voltage

- Closed-loop regulation in real time, ensuring stable output voltage during input voltage fluctuation
- Less impact on motor by power supply fluctuation
- Full load operation when fluctuation range of input voltage is -10% (-15%/1 min) ~ +10%

Various Interface

- Communication: Ethernet, Modbus, CAN, Profibus, Profinet, and etc.
- Speed sensor: incremental encoder, absolute value encoder, resolver

Tools for Start and Maintenance

User Friendly Operation Panel

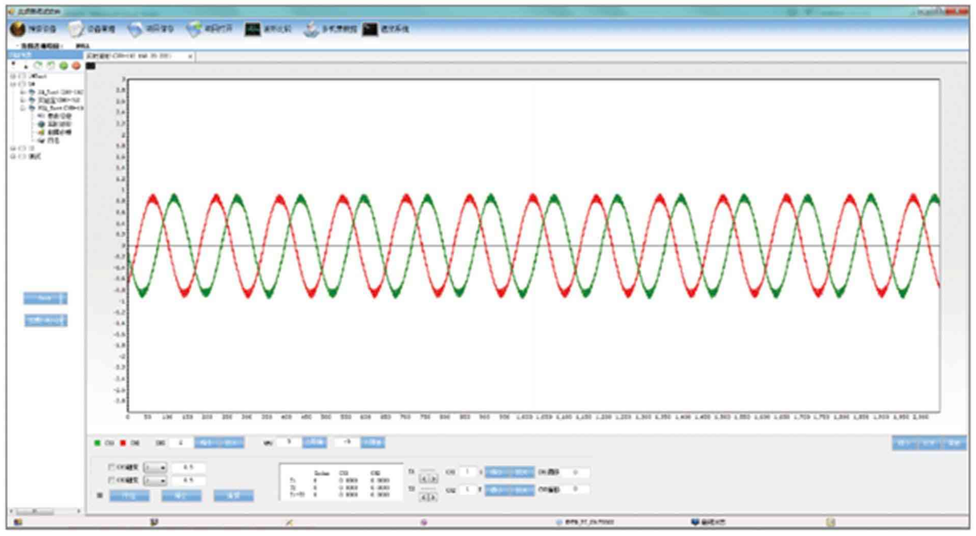
- Color touch screen HMI, abundant interface, supporting both single-drive and multi-drive
- Assistant type operation, easy navigation
- High resolution display
- Displaying operation condition and fault in real time, describing fault reason and proposed solution
- Minimizing time of debugging and maintenance
- Parameters back up and copy, which is suitable for multi-drive system

Drive PC Software (Option)

Drive PC is a windows based software with advanced graphic user interface, it can support fault diagnosis, system maintenance, service and training.

A large number of data can be saved in PC storage through history buffer, Drive PC software can read those data and display by graphs. There is a fault recorder in drive, it records fault and alarm automatically, and those information can be uploaded to user' s computer.

User can collect the actual values of multiple drives for monitoring simultaneously. Data and information can be uploaded to computer and be downloaded to drive.



Product Models

Power Unit Model

NC EVFD—INU—06—600A (/L) (-C)

- Suffix for options
- Cooling: no suffix—air cooling
  /L—water cooling
- Rated current
  Rated input current for rectifier unit
  Rated output current for other power units
- Voltage class:
  04-400V AC
  05-480V AC
  06-690V AC
- Power unit type
  INU： Inverter unit
  DSU: Diode rectifier
  ISU1: IGBT PWM rectifier
  ISU2: IGBT 6-pulse rectifier
  DBU: Braking unit
  LCL: LCL unit
  L: Reactor unit
  BKR: Braking resistor
- Product series

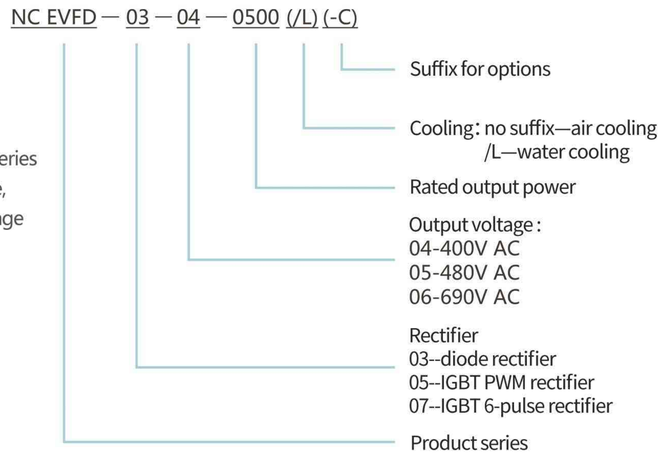
E.g.

NC EVFD-INU-06-600A represents NC EVFD series Low Voltage Industrial AC Drives,
INU unit, air cooling, rated output voltage is 690V and rated output current is 600A.



INU inverter unit

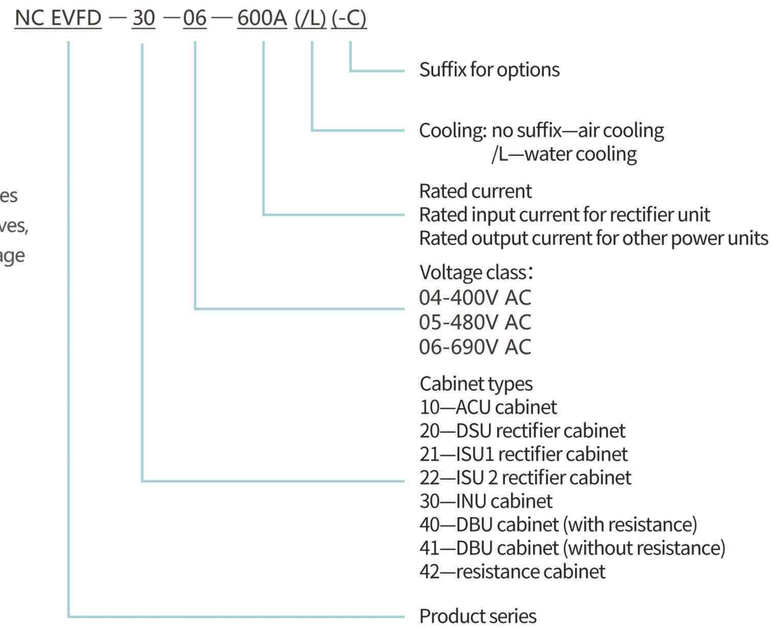
Single-drive Model



E.g.

NC EVFD-03-04-0500 represents NC EVFD series Low Voltage Industrial AC Drives single drive, air cooling, diode rectifier, rated output voltage is 400V, rated output power is 500kW when drive asynchronous motor.

Multi-drives Model



E.g.

NC EVFD-30-06-600A states NC EVFD series Low Voltage Industrial AC Drives multi-drives, INU cabinet, air cooling, rated output voltage is 690V, and rated output current is 600A.

Technical Specifications

Basic information

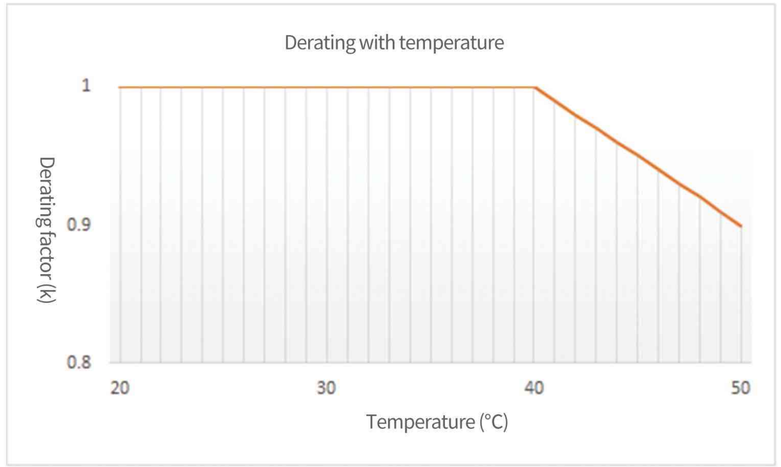
Items		Parameters
Input	Input voltage	Three-phase, 400V: 380 ～ 415V +10%/-10%, (-15%/1 min) Three-phase, 480V: 380 ～ 480V +10%/-10%, (-15%/1 min) Three-phase, 690V: 500 ～ 690V +10%/-10%, (-15%/1 min)
	Input power factor	ISU1: 1 (fundamental), 0.99 (total) DSU, ISU2: 0.98 (fundamental), 0.93-0.95 (total)
	Efficiency (rated power)	with ISU1: 97% with DSU, ISU2: 98%
	Input frequency	48 ～ 63Hz
Output	Output voltage	400VAC/480VAC/690VAC
	Output frequency	0 ～ 500Hz
	Noise	≤75dBA (1 meter)
	Color	Cabinet RAL7035 (standard)
	Enclosure	IP21 (standard)
	Control mode	Close loop vector control/speed sensorless vector control/VF control
	Motor	AC asynchronous motor, Permanent magnet synchronous motor
	Speed range	1000:1 (with speed sensor)/100:1 (sensorless)
	Torque response	<3ms
	Speed accuracy	<0.01% rated speed (with speed sensor)/<10% rated slip (sensorless)
	HMI	7-inch LCD color touch screen
Interface	Cable entry	Bottom (standard)/top
	Encoder	Encoder, resolver
	Communication	RS232/RS485/Profibus-DP/Profinet/CAN/Ethernet
	DI	7 channel, 24VDC 1A (1 channel can be configured as high-speed pulse input 10k ～ 100kHz)
	DO	3-channel, dry contact relay output (24VDC 1A or 125VAC 0.5A) 3-channel, OC output, 24 VDC (1 channel can be configured as high-speed pulse output 10k ～ 100kHz)
	AI	2-channel, 0 ～ 10V or 0 ～ 20mA, configurable
	AO (option)	4-channel, 0 ～ 10V or 0 ～ 20mA, configurable
Environment	Storage temperature	-40°C～ +70°C
	Operation temperature	-5°C～ +50°C (derating when exceed 40°C)
	Using place	Indoor, free from explosive or corrosive gases, conductive dust and oil mist
	Humidity	<90% non-condensing
	Altitude	<1000m (derating when exceed 1000m, 4000m maximum with custom design)

For higher output frequency, other communication interface, extended I/O interfaces, please contact us.

Derating

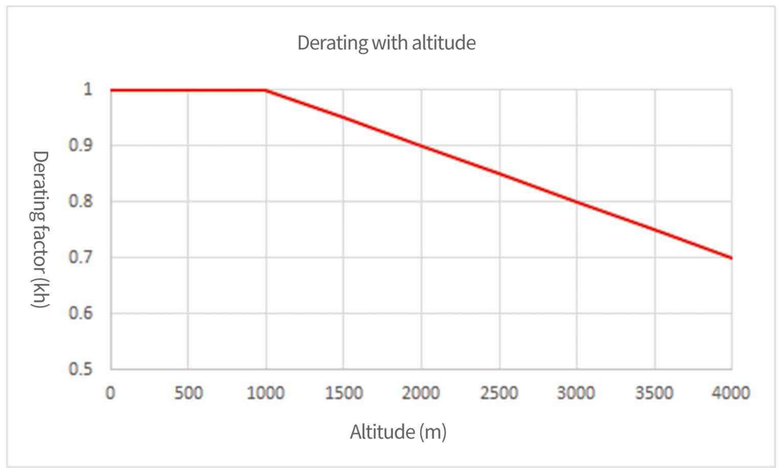
• Environmental temperature

For temperature range of +40℃ ~ +50 ℃(+104℉ ~ +122℉), rated output current will derate 1% along each degree (1℃,1.8℉) increase. Output current can be calculated by multiplying rated current by derating factor(k).



• High Altitude

For altitude range of 1000m ~ 4000m, the rated output current is derated by 1% for every 100-meter increase in elevation.



Invert Unit INU

The inverter unit converts DC to three-phase AC, to control asynchronous motor or permanent magnet synchronous motor. Power range of single INU is 45kW ~ 560kW, maximum 16 same type power units can be paralleled for expansion.

Rated Parameters of Single INU

INU models NC EVFD-INU	Outline (width*depth*height) mm	Rated output			Light overload		Heavy overload		Frame
		In	Imax	Pn	ILd	PLd	IHd	PHd	
		A	A	kW	A	kW	A	kW	
Un=400V AC									
-04-095A	440*550*230	95	143	45	91	45	75	37	N5i
-04-105A	189*440*903	105	147	55	101	55	79	37	N6i
-04-145A		145	203	75	139	75	109	55	N6i
-04-170A		170	238	90	163	90	128	55	N6i
-04-210A		210	294	110	202	110	158	75	N6i
-04-250A		250	350	132	240	132	188	90	N6i
-04-300A		300	420	160	288	160	225	110	N7i
-04-350A		350	490	200	336	160	263	132	N7i
-04-470A	239*587*1405	470	610	250	451	250	353	200	N8i
-04-560A		560	730	300	538	300	420	250	N8i
-04-650A		650	845	355	624	355	488	250	N8i
-04-750A		750	975	400	720	400	563	315	N8i
Un=690V AC									
-06-65A	189*440*903	65	91	55	62	55	49	45	N6i
-06-85A		85	119	75	82	75	64	55	N6i
-06-100A		100	140	90	96	90	75	75	N6i
-06-125A		125	175	110	120	110	94	90	N6i
-06-145A		145	203	132	139	132	109	110	N6i
-06-195A		195	273	160	187	160	146	132	N6i
-06-220A		220	308	200	211	200	165	160	N7i
-06-270A		270	378	250	259	250	203	200	N7i
-06-335A	239*587*1405	335	500	315	322	315	250	250	N8i
-06-430A		430	645	400	413	400	322	315	N8i
-06-530A		530	800	500	509	450	396	355	N8i
-06-600A		600	900	560	576	500	448	400	N8i

Notes

- Rated value in the 40℃ (104℉) condition
- To achieve the rated motor power mentioned above, rated output current of drive must be higher or equal to rated current of motor
- For parallel INU application, please contact us
- For parameter of 480V drive, please contact us

Definition

Un: rated output voltage
In: rated output current (continuously and no overload)
Imax: maximum output current, it can last 10s when startup; length of time depends on the drive' s temperature in other situation
Pn: power of asynchronous motor with no overload
ILd: RMS output current permits a 110% overload for 1 minute within every 5-minute period
PLd: motor power with light overload
IHd: RMS output current permits a 150% overload for 1 minute within every 5-minute period
PHd: motor power with heavy overload

Rectifier unit

Rectifier unit converts three-phase AC to DC and supplies DC power to INU. There are three types of rectifier unit: DSU (diode rectifier), IGBT PWM rectifier ISU1 and IGBT 6-pulse rectifier ISU2.

• Diode Rectifier DSU

DSU adopts three-phase diode rectifier topology, no regeneration function, with simple structure and high reliability, is suitable for application with no four-quadrant requirement. The core of DSU is 6-pulse diode bridge, and the diode can convert three-phase AC to DC in DC bus and supply power to INU, both single INU and multiple INU can connect to DC bus. AC input line reactor of DSU can smooth the input current and DC bus voltage.

Rated Parameters of Single DSU

DSU models NC EVFD-DSU-	Outline (width*depth*height) mm	Rated					Light overload		Heavy overload		Frame
		In_{AC}	In_{DC}	Imax	Sn	Pn	ILd	PLd	IHd	PHd	
		A(AC)	A(DC)	A(AC)	kVA	kW	A(AC)	kW	A(AC)	kW	
Un=400V AC											
-04-420A	239*587*1405	420	512	588	291	278	403	267	336	222	N8i
-04-580A		580	708	812	402	384	557	368	464	307	N8i
-04-640A		640	781	896	443	424	614	406	512	338	N8i
Un=690V AC											
-06-420A	239*587*1405	420	512	588	502	479	403	460	336	383	N8i
-06-580A		580	708	812	693	662	557	635	464	530	N8i
-06-640A		640	781	896	765	730	614	701	512	584	N8i

Notes

- Rated value in the 40℃ (104℉) condition
- For parallel DSU application, please contact us

Definition

Un: rated input voltage
In_{AC} : rated input AC current (continually and no overload)
In_{DC} : rated output DC current (continually and no overload)
Imax: maximum input current, it can last 10s when startup; length of time depends on the drive' s temperature in other situation
Sn: rated apparent power with no overload
Pn: rated output power with no overload
ILd: RMS input current permits a 110% overload for 1 minute within every 5-minute period
PLd: output power with light overload
IHd: RMS input current permits a 150% overload for 1 minute within every 5-minute period
PHd: output power with heavy overload

• IGBT PWM rectifier ISU1

IGBT PWM rectifier has regeneration function and supports four-quadrant operation, satisfying the demand of low input current harmonic and regeneration application. The hardware structure of IGBT PWM ISU1 with four-quadrant is same as INU, which converts power grid three-phase AC to DC by PWM control mode. LCL filter is the core component of ISU1 to support running. ISU1 uses filter to eliminate AC current harmonic, and removes majority high frequency ripple current, the input waveform is almost sinusoidal.

Rated Parameters of Single ISU1

ISU1 models NC EVFD-ISU1-	Outline (width*depth*height) mm	Rated					Light overload		Heavy overload		Frame
		In_{AC}	In_{DC}	Imax	Sn	Pn	ILd	PLd	IHd	PHd	
		A(AC)	A(DC)	A(AC)	kVA	kW	A(AC)	kW	A(AC)	kW	
Un=400V AC											
-04-210A	189*440*903	210	255	273	145	144	202	138	158	108	N7i
-04-250A	239*587*1405	250	303	325	173	171	240	165	188	129	N8i
-04-500A		500	606	650	346	343	480	329	375	257	N8i
-04-675A		675	818	878	468	463	648	444	506	347	N8i
Un=690V AC											
-06-300A	239*587*1405	300	364	390	359	355	288	341	225	266	N8i
-06-400A		400	485	520	478	473	384	454	300	355	N8i
-06-450A		450	545	585	538	532	432	511	338	399	N8i

Notes

- Rated value in the 40℃ (104℉) condition
- For parallel ISU1 application, please contact us
- For information of LCL filter, please contact us

Definition

Un: rated input voltage
In_{AC} : rated input AC current (continually and no overload)
In_{DC} : rated output DC current (continually and no overload)
Imax: maximum input current, it can last 10s when startup; length of time depends on the drive' s temperature in other situation
Sn: rated apparent power with no overload
Pn: rated output power with no overload
ILd: RMS input current permits a 110% overload for 1 minute within every 5-minute period
PLd: output power with light overload
IHd: RMS input current permits a 150% overload for 1 minute within every 5-minute period
PHd: output power with heavy overload

• IGBT 6-pulse rectifier ISU2

IGBT 6-pulse rectifier has regeneration function and supports four-quadrant operation, satisfying the demand of low cost and regeneration application. The hardware structure of IGBT PWM ISU2 with four-quadrant is same as INU and ISU1, which convert three-phase AC to DC by 6-pulse control mode. ISU2 is cost-effective than ISU1, because IGBT only switches once during half cycle of power grid voltage, resulting low switching loss and higher rated current. Also, high reliability under grid fault in regeneration mode since IGBT can turn off anytime. While input current harmonic is similar to DSU, input reactor L in the input terminal is needed.

Rated Parameters of Single ISU2

ISU2 models NC EVFD-ISU2-	Outline (width*depth*height) mm	Rated					Light overload		Heavy overload		Frame
		In_{AC}	In_{DC}	Imax	Sn	Pn	ILd	PLd	IHd	PHd	
		A(AC)	D(DC)	A(AC)	kVA	kW	A(AC)	kW	A(AC)	kW	
Un=400V AC											
-04-500A	239*587*1405	500	610	650	346	343	480	329	375	257	N8i
-04-750A		750	915	975	520	514	720	494	563	386	N8i
Un=690V AC											
-06-400A	239*587*1405	400	488	520	478	473	384	454	300	355	N8i
-06-500A		500	610	650	597	590	480	567	375	443	N8i
-06-600A		600	732	780	717	710	576	681	450	532	N8i

Notes

- Rated value in the 40℃ (104℉) condition
- For parallel ISU2 application, please contact us
- For information of input line reactor, please contact us

Definition

Un: rated input voltage

In_{AC} : rated input AC current (continually and no overload)

In_{DC} : rated output DC current (continually and no overload)

Imax: maximum input current, it can last 10s when startup; length of time depends on the drive' s temperature in other situation

Sn: rated apparent power with no overload

Pn: rated output power with no overload

ILd: RMS input current permits a 110% overload for 1 minute within every 5-minute period

PLd: output power with light overload

IHd: RMS input current permits a 150% overload for 1 minute within every 5-minute period

PHd: output power with heavy overload

Braking Unit DBU

Braking unit consumes energy through braking resistance to prevent the pumping up of DC bus voltage caused by INU regeneration, it is used in demand of motor braking operation without four-quadrant rectifier unit. Braking unit consists of DBU and braking resistor (R). When DC bus voltage exceeds the set value, DBU will connect braking resistance to DC bus via IGBT switch on, and power dissipation on braking resistor will decrease DC bus voltage continually until IGBT switch off. In fact, DBU is similar to three-phase INU, input terminal connects to DC bus, and output terminal connects individual braking resistor.

Rated Parameters of Single DBU

DBU models NC EVFD-DBU-	Outline (width*depth*height) mm	Resistor	No overload			Periodic overload (1min every 5mins)		Frame
		Rmin	Irms at Rmin	Imax	Pn	Irms at Rmin	Pbr at Rmin	
		Ω	A(DC)	A(DC)	kW	A(DC)	kW	
Un=400V AC								
-04-260A	239*587*1405	2.1	260	312	421	294	539	N8i
-04-390A		1.4	390	468	632	441	809	N8i
Un=690V AC								
-06-260A	239*587*1405	3.6	260	312	727	294	930	N8i
-06-470A		2.0	470	564	1313	531	1681	N8i

Notes

- For parallel DBU application, please contact us
- For information of braking resistor R, single phase DBU, please contact us

Definition

Un: input voltage for VFD

Rmin: minimum resistor value of each phase

No overload

Irms: output DC current of each phase (continually and no overload)

Imax: maximum current of each phase of DBU

Pn: maximum continually braking power

Periodic overload

Irms: each phase DC current in 1minute at braking power of Pbr

Pbr: short-time braking power for 1 minute within every 5-minute period

Applications

Industries and Loads


Metallurgical cold rolling


Metallurgical hot rolling


Metallurgical rod and wire


Oil drilling machine


Top drive drilling rig


Electrical submersible pump


Mine hoist


Marine propulsion


Harbor belt conveyor


Papermaking


AC power source


Marine


Port crane


Test bed


Rubber and plastics


Pump and fan


Cement


Extruder/compressor/centrifuge

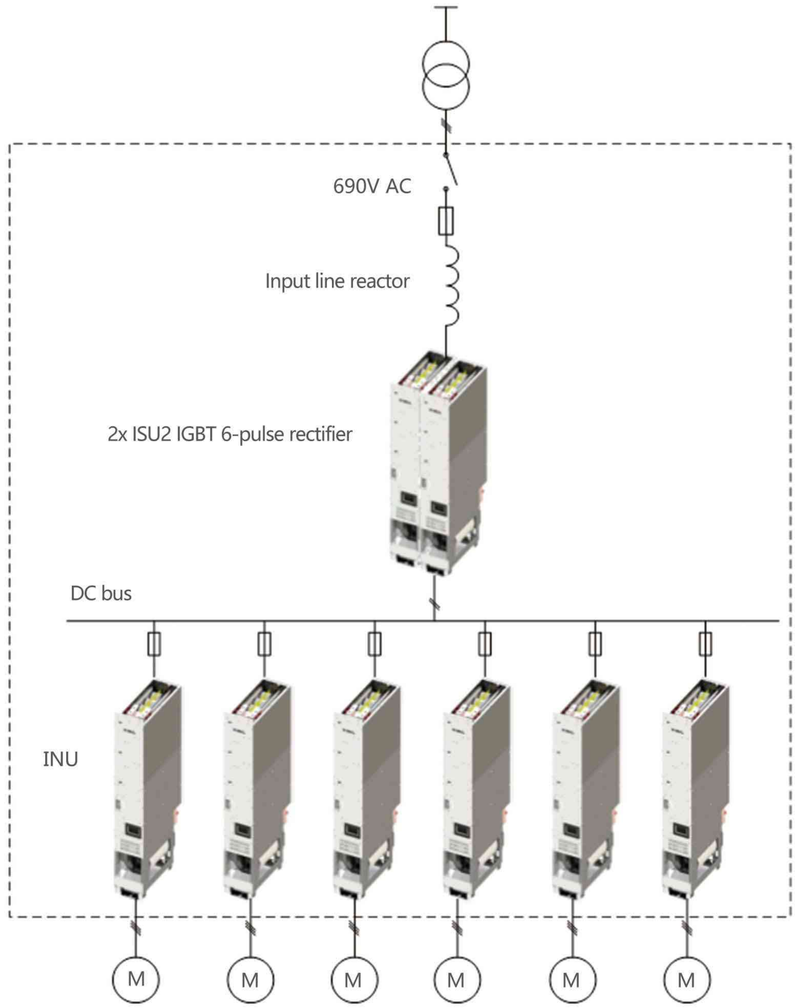

Mine electrical shovel


Ocean platform

Case Study

Nancal Electric provides total solution and project implementation of low voltage industrial drive and automatic control system for reversible cold rolling mill in Ningbo, China.

The project includes 2 sets of main rolling machine, 2 sets of main winding/unwinding machine and 2 sets of small winding/unwinding machine, while main winding motor and small winding motor adopts coaxial drive. And all motors are driven by NC EVFD series Low Voltage Industrial AC Drives. The input voltage of EVFD is 690V, using IGBT 6-pulse rectifier ISU2 with regeneration function, common DC bus, saving costs and space. High performance vector control provides excellent performance of speed and tension control.





• Low Voltage Industrial AC Drive



• Rectifier Units



• Rolling mill in operation



• Wide thin-strip rolling



• Recoiling machine in operation

References

20-Roll Mill in Jieyang

PWM 4-Quadrant
Rectifier Power: 6150 kW

Main Mill Power: 1900 kW

Main Mill Speed: 403/1120 r/min

Unwinder Power: 250 kW

Unwinder Speed: 233/600 r/min

Left/Right Winder Power: 2000 kW

Winder Speed: 286/950 r/min

Mill Model: SY-22-B42

Mill Line Speed: 600 m/min

4-Roll Mill in Jieyang

PWM 4-Quadrant
Rectifier Power: 1650 kW

Main Mill Power: 750 kW

Main Mill Speed: 549/1500 r/min

Unwinder & Winder Power: 450 kW

Unwinder & Winder Speed: 468/1200 r/min

Mill Model: SG-650

Mill Line Speed: 270 m/min

Screw Compressor at Xinjiang Oilfield

Rated Voltage: 380 V

Rated Power: 400 kW

Screw Comp. Model: LGM80-400

Screw Comp. Torque: 1200 N·m

Screw Comp. Speed: 3000 r/min

Screw Comp. Maximum
Flow: 50 Nm^3/min

Qualifications

- High-Tech Enterprise
- ISO 9001/ ISO 14001/ ISO 45001
- Type Test Reports
- Patents for Invention













