HOPEWIND

Catalog VFD-HV500 Serise High Performance VFD

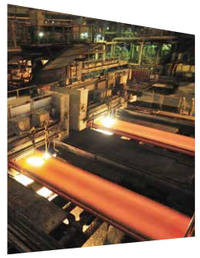
www.hopewind.com

HV500 –High Performance VFD

Product Overview

Based on the superior control performance of the HD2000 engineering VFD, the HV500 is a high-performance VFD with product concepts of “universal”, “easy to use” and “durable” for medium/high-end industrial and single-drive applications.

HV500 is widely used in metallurgy, lifting equipment, papermaking, chemical, mining, textile, shore power and energy storage industries.



Metallurgy

Textile

Lifting

Chemical

Papar Making

Description

HV500 - A0 4 T 00075 B +STO

VFD Name:
HV500: hopeVert Serise High Performance VFD

Circuit topology and cooling:
A0: Two-Quadrant Air-Cooling

Voltage:
2: 220V 4: 380V 6: 690V

Phase:
D: 1P/3P T: 3P

Power Rate:
00075: 7.5kW 00150: 15kW

Brake Unit:
B: With In-build Brake Unit
Blank: Without In-build Brake Unit

STO:
STO: With STO function
Blank: Without STO function

Technical Specification

General Specification

iInput/output Power	Input U_{in}	200V (-15%) ~240V (+10%) 3Phase , 380V (-15%) ~480V (+10%) 3Phase, 500V (-15%) ~690V (+10%) 3Phase
	Input Frequency	50Hz/60Hz±5%
	Unbalance Degree of U_{in}	≤3%
	Output U_{out}	0V~Input U_{in}
	Output Frequency	0Hz~500Hz
Control Performance	Motor Type	Asynchronous / Synchronous
	Control Method	V/F, OLVC (Open-Loop Vector Control), CLVC (Close-Loop Vector Control)
	Range of Speed Regulation	1:10 V/F, 1:100 OLVC, 1:1000 CLVC
	Start Torque	VF: 100% (0.5Hz), OLVC: 150% (0.5Hz), CLVC: 180% (0Hz)
	Torque Precision	≤5%, Vector Control
	Torque Pulsation	≤5%, Vector Control
	Speed Regulation Precision	OLVC 0.2%, CLVC 0.01%
	Torque Response	<5ms, Vector Control
	Dynamic Speed Reduction	OLVC<0.5%*s, CLVC<0.3%*s
	Acceleration and Deceleration Time	0.0s~3200.0s, 0.0min~3200.0min
	Torque Lifting	0.0%~30.0%
	Overload	Heavy Load Application 150% 1min/5min, Light Load Application 110% 1min/5min
	V/F Curve	Multiple ways: linear V/F curve, 5 kinds of torque reduction characteristic curve mode (2.0 power, 1.8 power, 1.6 power, 1.4 power, 1.2 power), user-defined VF curve
	Input Frequency Accuracy	Digital: 0.01Hz, Analog: 0.01Hz
Control Performance	Acceleration and Deceleration Curve	Straight, S Curve
	Multiple Speed-Steps Operation	16-Speed Steps Operation through control terminals
	Automatic VoltageAdjustment (AVR)	Keeping the output voltage constant automatically when the grid voltage changes within a certain range
	Fixed Length	Setted and Fixed Length Control
	In-build PID	It Can Easily Constructed Closed loop control system
	Enhencement Function	Free Function Block
iInput/output Power	Set Frequency	Keyboaed, UP/DOWN Terminals, Multiple Speed-Steps Operation, Terminals Pulsation, Com
	Analog Input Terminals	AI1: 0V~10V/-10V~10V, AI2: 0V~10V/0(4) mA~20mA
	Digital Input Terminals	DI1-DI6, 6 programmable digital input terminals, optocoupler isolation, compatible with drain/source input
	Digital Input/Output Terminals	DIO1: Fast pulse output, normal input/output; DIO2: fast pulse input, normal input/output
	Anolog Output Terminals	2 Strings 0V~10V/0 (4) mA~20mA
	Relay Output	2Strings Contact Type FormC
	Motor Temperature Detection	Support PT100/PT1000/KTY84
	STO Interface	SIL3/PLe Safe torque shutdown function
Com	Com Protocol	Modbus RTU (Standard), Pro ibus, CANopen, pro inet, Devicenet, Ethercat
Environment	Altitude	Without Derating Operation Within 2000m Altitude; 2000m~4000m, Each 100m lifting, Derating 1% (Current)
	Operation Temperature	-25℃~+40℃ (40℃~55℃ Derating)
	Humidity	15%~95%, Without Condensation
	Vibration	3M3, IEC60721-3-3
	Storage Temperature	-40℃~+70℃
	Operation Place	Indoor, Without direct sunlight, no flammable, corrosive gases, liquids and conductive particles
Accessory		Encoding card, communication expansion card, voltage detection card
Protection Function		Short circuit, over current, overload, over voltage, under voltage, phase loss, over temperature, external fault, etc.
Efficiency		5.5kW~22kW: ≥93%; Above 30kW: ≥95%
Installation Method		Cabinet
Protection Degree		IP20
Cooling		Forced Air Cooling

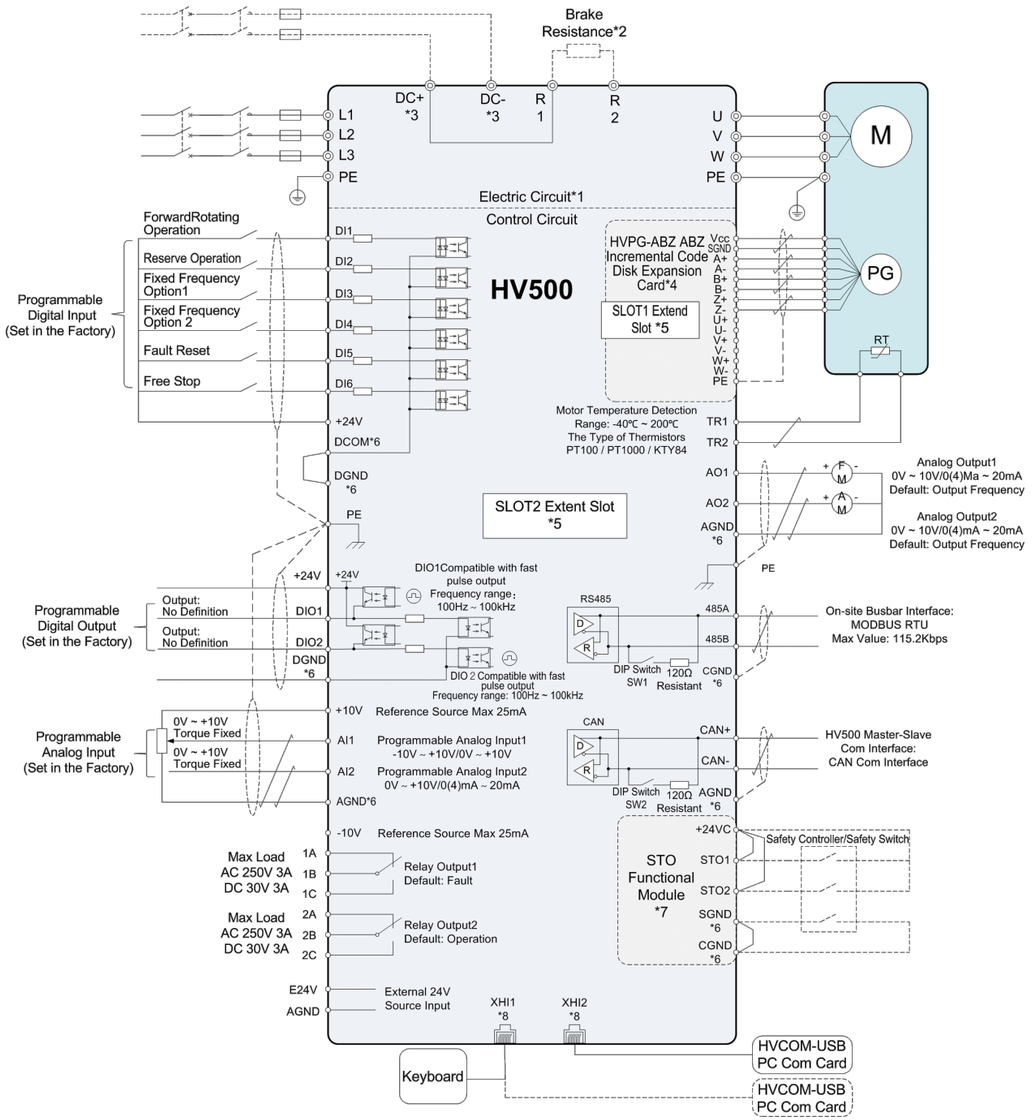
Module List of Product

Specification

Module	Heavy Load		Light Load		Size
	Power (kW)	Output Current (A)	Power (kW)	Output Current (A)	
Rated Voltage: 3Phase 220Vac					
HV500-A02T00022B	2.2	13	4	17	F3
HV500-A02T00040B	4	17	5.5	25	
HV500-A02T00055B	5.5	25	7.5	32	
HV500-A02T00075B	7.5	38	11	46	F4
HV500-A02T00110B	11	46	15	60	
HV500-A02T00150	15	60	18.5	75	F5
HV500-A02T00185	18.5	75	22	91	
HV500-A02T00220	22	91	30	125	F6
HV500-A02T00300	30	125	37	156	
HV500-A02T00370	37	156	45	180	
HV500-A02T00450	45	136	55	166	F7
HV500-A02T00550	55	166	75	226	
HV500-A02T00750	75	226	90	271	
Rated Voltage: 3Phase 380Vac					
HV500-A04T00055B	5.5	13	7.5	17	F3
HV500-A04T00075B	7.5	17	11	25	
HV500-A04T00110B	11	25	15	32	
HV500-A04T00150B	15	32	18.5	38	
HV500-A04T00185B	18.5	38	22	46	F4
HV500-A04T00220B	22	46	30	60	
HV500-A04T00300	30	60	37	75	F5
HV500-A04T00370	37	75	45	91	
HV500-A04T00450	45	91	55	125	F6
HV500-A04T00550	55	125	75	156	
HV500-A04T00750	75	156	90	180	
HV500-A04T00900	90	180	110	210	F7
HV500-A04T01100	110	210	132	256	
HV500-A04T01320	132	256	160	310	
HV500-A04T01600E	160	304	185	350	
HV500-A04T01600	160	310	200	387	GU
HV500-A04T02000	200	387	250	471	
HV500-A04T02500	250	471	315	610	HU
HV500-A04T03150	315	610	400	750	
HV500-A04T04000	400	750	450	815	
Rated Voltage: 3Phase 690Vac					
HV500-A06T00450	45	54	55	63	F6
HV500-A06T00550	55	63	75	86	
HV500-A06T00750	75	86	90	100	
HV500-A06T00900	90	100	110	131	F7
HV500-A06T01100	110	131	132	150	
HV500-A06T01320	132	150	160	175	
HV500-A06T01600	160	175	200	231	GU
HV500-A06T02000	200	231	250	274	
HV500-A06T02500	250	274	315	328	
HV500-A06T03150	315	328	400	426	HU
HV500-A06T04000	400	426	450	482	
HV500-A06T04500	450	482	560	558	

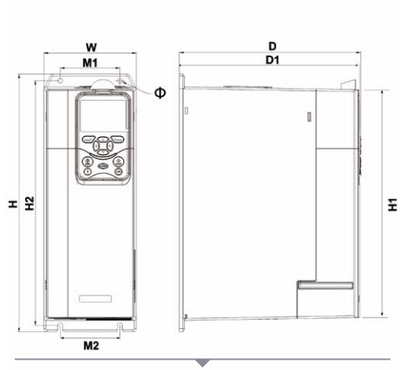
Note:
1. Size F3 and F4 are equipped with built-in brake unit. For other size, if you need a brake unit, you need to add “B” at the end of the model to purchase.
2. Size F5, F6, F7 VFDs are equipped with DC reactors. F3 and F4 VFDs are not equipped with DC reactors. Users can use DC reactors according to actual conditions. GU and HU do not have DC reactors. The user need to equiped an external input reactor.
3. 150% periodic overload under heavy load rated conditions; 110% periodic overload under light load rated conditions. Overload period is defined as 1min overload every 5min Operaton.

Power & Control Connection

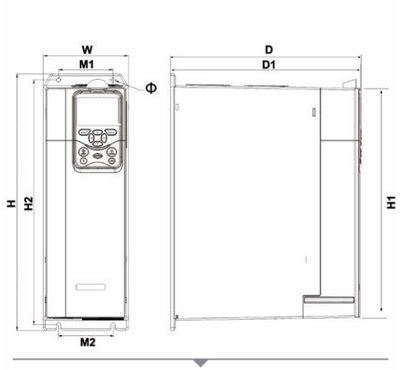


1. F3 and F4 frame size inverters are equipped with a braking unit and without a DC reactor; F5, F6, and F7 frame size inverters are equipped with a DC reactor, and GU and HU frame size inverters are without. The user needs to configure an additional input reactor, and the braking unit is optional before delivery.
2. Before using the braking unit, set the "brake unit installation enable" bit to 1 to be effective.
3. The positive and negative bus terminals are reserved for some common bus applications. There is no soft start circuit in the subsequent circuit, and the soft start must base on customers’s circuit.
4. No code disc control circuit wiring is required when no code disc is controlled. The standard wiring diagram only shows the commonly used ABZ incremental code disc card wiring. Different types of code disc expansion cards can be selected according to the type of code disc.
5. The expansion card slot can be connected to different types of expansion cards such as code disk expansion card, communication expansion card, IO expansion card, etc. The expansion card does not require the location of the installation slot (SLOT1 and SLOT2).
6. DCOM is the common terminal of DI input, and the DI terminal can be configured as source input or sink input by changing DCOM to +24V, DGND or other external power supply.
7. STO function module can reach SIL3/PLe level, which is optional before delivery.
8. AGND, DGND and CGND are isolated from each other, AGND and DGND are ELV, CGND is SELV, SGND and CGND are the same safety level, if the users’ STO interface uses external power supply, the safety level is lower than SELV, CGND safety level will reduce as well.
9. XHI1 is keyboard/PC interface and XHI2 is PC interface. XHI1 can be used for PC communication when XHI1 does not connect with the keyboard and XHI2 does not connected with the PC communication card.

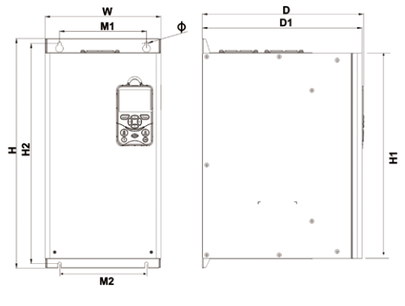
Product Size



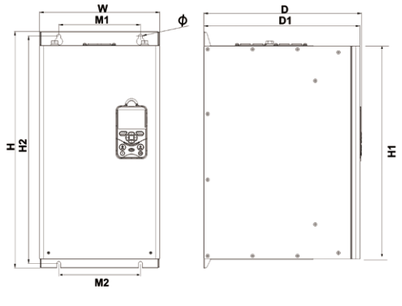
F3 Module



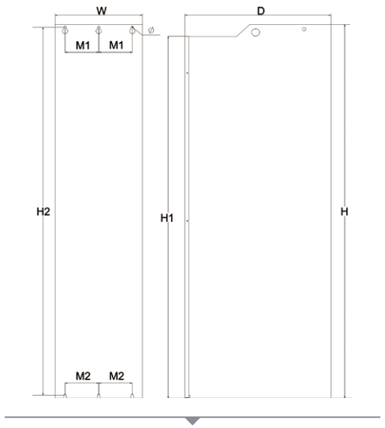
F4 Module



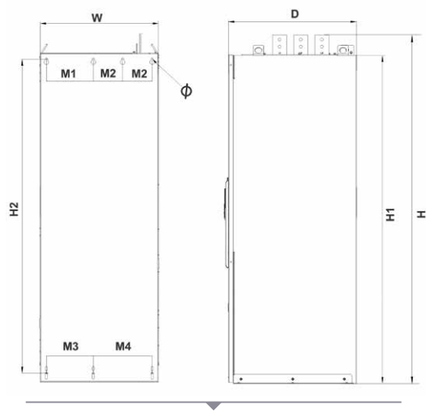
F5 Module



F6、F7 Module



GU Module



HU Module

HV500 Size Specification

Code	Structure Size (mm)					Installation Size (mm)							Weight (kg)
	W	H	D	H1	D1	H2	M1	M2	M3	M4	M5	Φ	
F3	132	393	258	348	256	373	85	85	-	-	-	7	5.6
F4	132	441	298	394	296	421	85	85	-	-	-	7	7.7
F5	240	501	334	447	331	480	180	180	-	-	-	7	26.7
F6	295	593	386	534	383	570	200	200	-	-	-	9.5	50
F7	340	724	405	664	402	700	250	250	-	-	-	9.5	75
GU	325	1530	543	1482	-	1506	125	125	-	-	-	9	168
HU	502	1487	545	1400	-	1341	200	125	200	250	-	9	289

Input and Output Inductor

Module	Input Inductor		Output Reactor	
	Inductor (uH)	Current (A)	Inducotr (uH)	Current (A)
220V VFDs				
HV500-A02T00022B	976	9	325	13
HV500-A02T00040B	537	16	249	17
HV500-A02T00055B	390	22	169	25
HV500-A02T00075B	286	30	111	38
HV500-A02T00110B	195	43	92	46
HV500-A02T00150	187	45	70	60
HV500-A02T00185	152	56	56	75
HV500-A02T00220	128	66	46	91
HV500-A02T00300	94	90	34	125
HV500-A02T00370	76	112	27	156
HV500-A02T00450	62	136	27	156
HV500-A02T00550	51	166	23	180
HV500-A02T00750	37	226	20	210
380V VFDs				
HV500-A04T00055B	1065	13	537	13
HV500-A04T00075B	781	18	411	17
HV500-A04T00110B	533	26	279	25
HV500-A04T00150B	391	36	218	32
HV500-A04T00185B	317	44	184	38
HV500-A04T00220B	266	52	152	46
HV500-A04T00300	255	55	116	60
HV500-A04T00370	207	67	93	75
HV500-A04T00450	170	82	77	91

Module	Input Inductor		Output Reactor	
	Inductor (uH)	Current (A)	Inducotr (uH)	Current (A)
380V VFDs				
HV500-A04T00550	139	100	56	125
HV500-A04T00750	102	137	45	156
HV500-A04T00900	85	164	39	180
HV500-A04T01100	70	201	33	210
HV500-A04T01320	58	241	27	256
HV500-A04T01600E	48	292	23	304
HV500-A04T01600	48	292	23	310
HV500-A04T02000	38	365	18	387
HV500-A04T02500	31	456	15	471
HV500-A04T03150	24	575	11	610
HV500-A04T04000	19	730	9	750
690V VFDs				
HV500-A06T00450	561	45	235	54
HV500-A06T00550	459	55	201	63
HV500-A06T00750	337	75	148	86
HV500-A06T00900	281	90	127	100
HV500-A06T01100	230	110	97	131
HV500-A06T01320	191	133	85	150
HV500-A06T01600	158	161	72	175
HV500-A06T02000	126	201	55	231
HV500-A06T02500	101	251	46	274
HV500-A06T03150	80	316	39	328
HV500-A06T04000	63	402	30	426
HV500-A06T04500	56	452	26	482

Performance Characteristics

HV500 VFDs Feature

Durability

· Satisfy 3M3 mechanical vibration during the load operation, and improve the durability of the product in the harsh situation of vibration such as the car, metallurgy, etc.

Mechanical vibration level 3M3

· Independent air duct design, seperated from sensitive components, and improve the adaptability to harsh environment.

· Built-in dynamic junction temperature model,unique short circuit and other protection technology, enhence the safety of the products

· Three anti-paint and automatic spraying, single board and complete machine are fully automatic measurement100% aging testing, Comprehensive protection of product quality.

Performance characteristics

HV500 VFD characteristics

Versatility

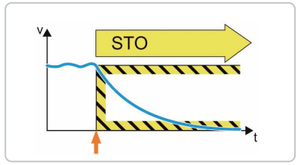
· CE、cULus、STO International Certification Standard, Conform with RoHS.

· Support Open Loop V/F、Open loop vector control (OLVC) Close loop vector control (CLVC).

· Support asynchronous motor, permanent magnet synchronization motor , electric excitati synchronization motor and other motor drive control.

· Wide range of input voltage, Support 220V (200~240V)、380V (380~480V) and 690V (500~690V).

· Support industrial application buses such as Profibus DP, CANopen, Profinet IO, Modbus RTU, EtherCAT, ControlNet and DeviceNet, and easily realize the interconnection of various industrial equipment.



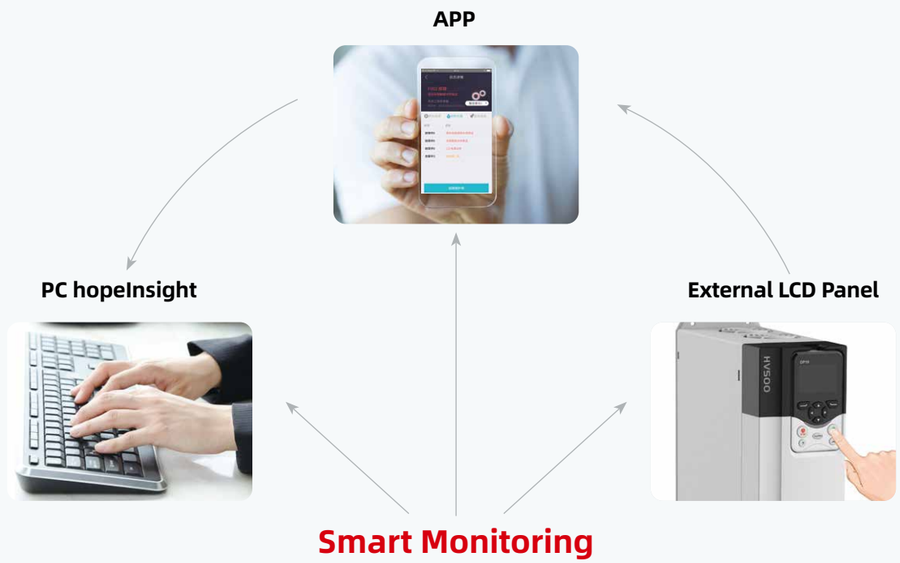
Feasibility

· Support external 24V DC input power, safe and fast debugging and application.

· Built-in brake units for easy wiring and saving installation space.

· "Book" type design, seamless side-by-side installation, saving installation space.

· LCD Display Panel, Support APP and hopeInsight software, Smart interconnection and monitoring, On - Line Commissioning and Debugging.



Excellent Control

Master-Slave Control

The master-slave control function is primarily designed for multi-machine applications and it supports rigid and flexible connections of the drive actuator. In the rigid connection, the master control the speed and the slave control the torque. In the flexible connection, the master and the slave both can control the speed. In master-slave control mode, the external control signal is only connected to the master, which controls the slave via a serial communication link.

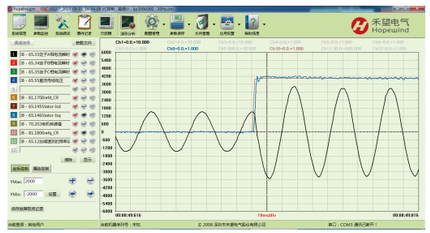
Torque Response

Technical

· Increase the torque under the torque control mode, Current response time 2ms.

Compatible

· Excitation current and torque current highly decoupled, high load capacity wide range of speed regulation, excellent dynamic response.

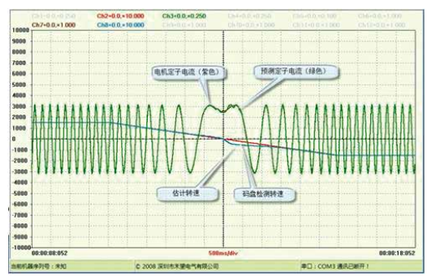


Support English and optional Russian

Key technical points for magnetic chain observation and speed estimation

· Using a full-order closed-loop magnetic chain observer, the motor speed and stator resistance are identified adaptively according to the estimated error of the stator current and the estimate of the rotor magnetic chain.

· Accurate magnetic chain observation and speed estimation model, guaranteed 0.5HZ 150% high starting torque in OLVC control mode, as well as open ring zero-speed hover function.

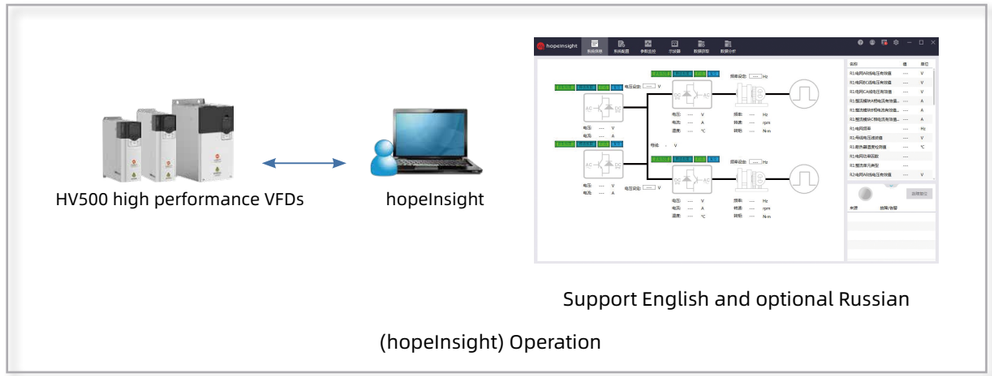


Support English and optional Russian

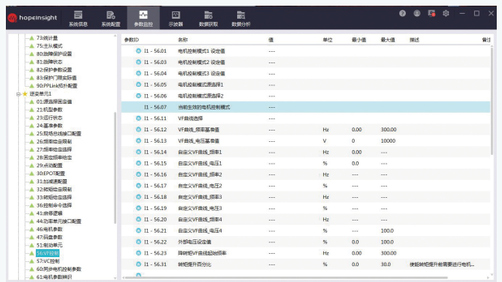
Specification

■ Quick debugging software hopeInsight

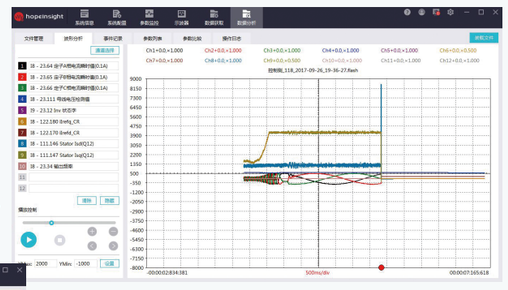
hopeInsight is a debug tool for the drive system design provided by Hopewind Electric, the VFDs are connected to the PC via optical fiber. The software has a large number of professional debugging functions, such as batch parameter settings, fault data download and waveform analysis, high-speed oscilloscope and a large number of editing functions. The software supports serial communication, and the inverter can be maintained through serial communication. Its working diagram is as follows:



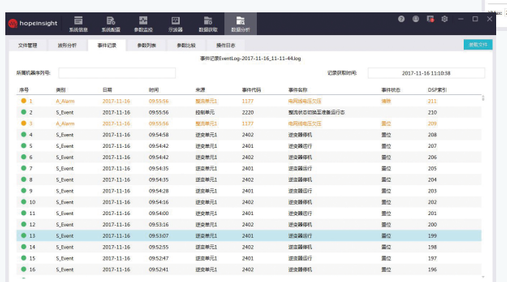
▼ batch parameter settings



▼ 12-channel high-speed software oscilloscope



▼ Powerful fault recording function, detailed event recording, greatly facilitate troubleshooting

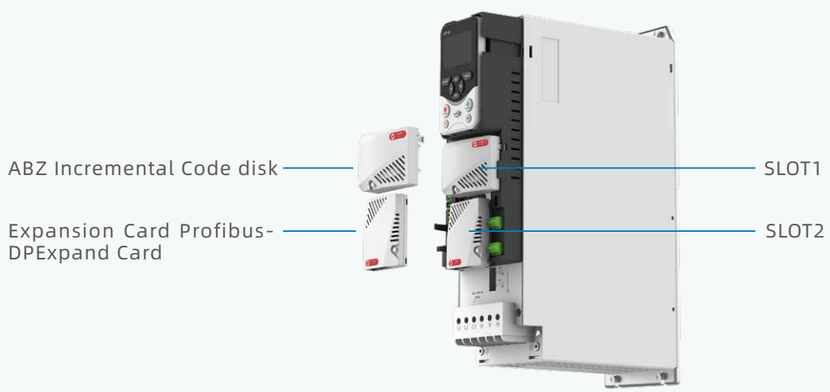


◎ Operation panel

HIC200-OP-10-W is a smart operator panel developed independently for high-performance transmission products, which is informative, friendly and easy to use, and according to the different configurations of the panel, it is divided into two kinds: WiFi function and without WiFi function, which are conveniently applied to high-performance, single transmission, multi-VFDs system, it can monitor and adjust the system.

◎ Accessory

Optional	Module	Function	
Keyboard Base	HVKMB	Depending on the situation, the base can be installed in the specified position and the drive can be operated by operating the keyboard	
Communication Adapter	HVCOM-USB	The drive can achieve high-speed communication with the computer via this option	
Expansion Card of ABZ Incremental Code Disk	HVPG-ABZ	Cxpansion card of code disks, it applied to ABZ signal output of incremental code disk, programmable power supply and it is compatible with single/bipolar output code disc	
Three-phase voltage detection module	HVVMU	Detect three-phase voltage and provide information to system control, it can be used for soft start and grid connection of permanent magnet synchronous motor, speed tracking and other functions	
Communication expansion card	HVCOM-DP	Support PROFIBUS DP communication	Used to realize the control, monitoring and diagnosis functions of the inverter by the master station
	HVCOM-PN	Support PROFINET IO communication	
	HVCOM-CA	Support CANopen communication	
	HVCOM-CN	Support ControlNet communication	
	HVCOM-DN	Support DeviceNet communication	
	HVCOM-EC	Support EtherCAT bus commnication	



HV500 Optional accessory

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