

DL500 Series

Vector Control Universal Inverter

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5 Regions

15 Oversea outlet

35 offices, network covering the whole country

Established in 2004, Shenzhen Simphoenix Electric Technology Co., Ltd. is committed to becoming an outstanding provider of automation products and solutions. The company specializes in the development, production, sales and service of industrial automation products, and the main products are servo drive, inverter, permanent magnet synchronous motor, PLC, HMI and so on.

After more than ten years of development, Simphoenix has become a well-known brand with complete product structure and strong R&D strength among domestic industrial automation brands.



Product Introduction

DL500 Series

Vector Control Universal Inverter

DL500 Series is a new-generation vector control universal inverter developed by Simphoenix Electric. It features higher stability, a more comprehensive range of functions, and a compact design, making it easier to install and ideal for customers with specific machine structure requirements. The DL500 series fully inherits the advanced vector and V/F control algorithms from our high-end inverters. It also offers flexible parameter configurations, diverse expansion interfaces, and hundreds of warning and alarm functions, making it a high-performance vector control inverter with comprehensive protection features.



Key Features

- ◆ Equipped with 8 one-to-one virtual input and output ports, enabling complex engineering applications without additional external wiring.
- ◆ Intuitive real-time monitoring of power consumption, runtime, input/output current and voltage, fault records, and hundreds of monitoring parameters.
- ◆ Hundreds of frequency, speed, and torque setting combinations for various application needs.
- ◆ Easily achieve multi-machine synchronous transmission with selectable options for coordinated control based on current, torque, and power.
- ◆ Users can freely prioritize various frequency/speed setting channels, making it suitable for diverse application scenarios.
- ◆ Exceptional operation experience with an ergonomically designed operation panel featuring parameter locking, unlocking, download, upload, and multiple panel options to meet different customer needs.



Application

Machine Tool , Cable Machinery, Packaging Machinery, Petrochemical Industry, Textile Industry, Washing and Dehydration Equipment, Centrifuges



Machine Tool



Cable



Packaging



Petrochemical



Textile



Washing and Dehydration

Product Upgrades and Changes



Enhanced Software Features

The DL500 series inverter has undergone significant software upgrades, with a maximum operating frequency of up to 1500Hz, meeting the needs of cutting, engraving, and other industries. New functions include: Application macro parameters, Virtual DI/DO terminals, Parameter mapping access, Built-in PID function, Frequency setting channels, Analog input disconnection detection, Strong starting current.

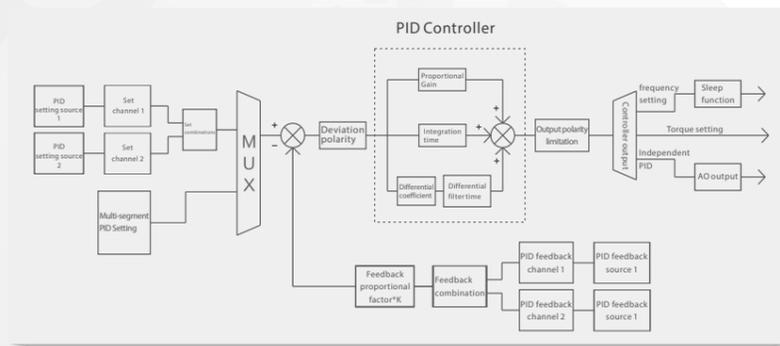
Application macro parameters

Conveniently set and solidify commonly used parameters for different industries to simplify parameter configuration for specific applications, such as two-wire control mode, three-wire control mode, and machine tool spindle drive mode.



Built-in PID function

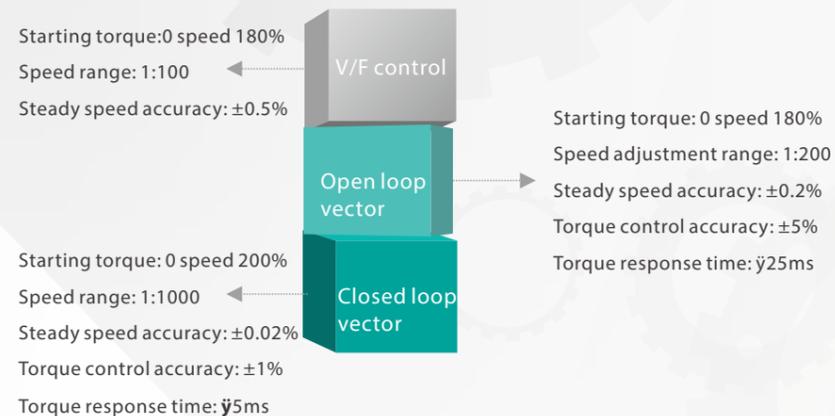
Built-in PID controller enables automatic process control adjustments for applications such as constant temperature, constant pressure, and tension control.



Better control performance

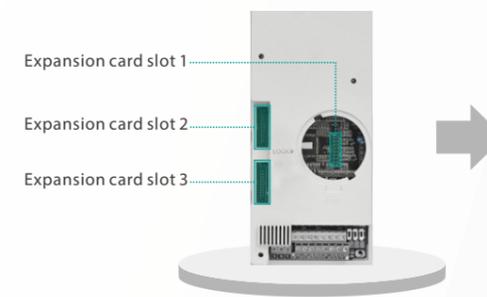
DL500 series inverter has more control algorithm, in starting torque, speed range, steady speed. There have been great improvements in important indicators such as accuracy, torque control accuracy, and torque response time.

(Note: Some models do not support closed-loop vector control)



Product Upgrades and Changes

Comprehensive I/O Interfaces for Industry 4.0



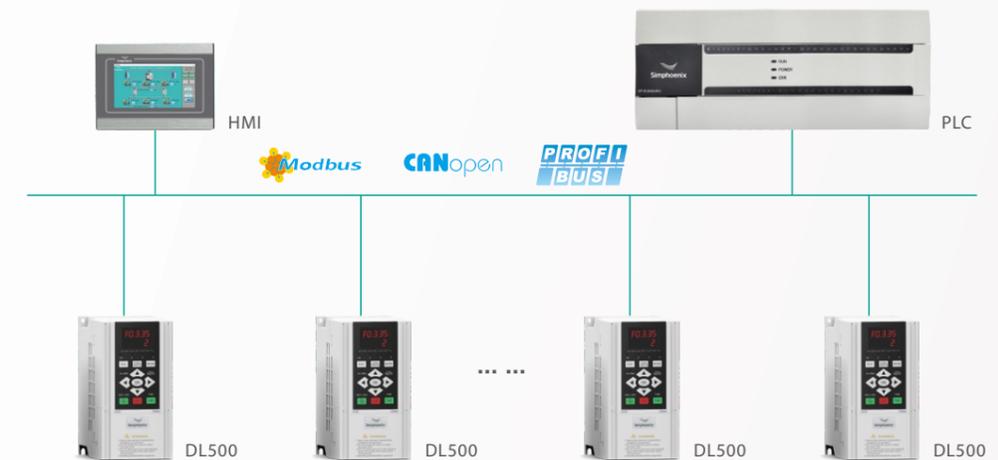
IO expansion card: IOV-D200、IOV-D201

Communication adapter card: IOV-D109、IOV-E108

PG card: PGV-C000、PGV-C001、PGV-C005

Industry expansion card: APV-F301、APV-E309、APV-E303、APV-A310、APV-I312 main card)、APV-J313 secondary card)

Supports Modbus-RTU, Profibus-DP, and CANopen bus protocols



Naming rules

DL500 -4 T 0015 G

Product serial number	
DL500	AC drive

Voltage level	
4	380V
2	220V

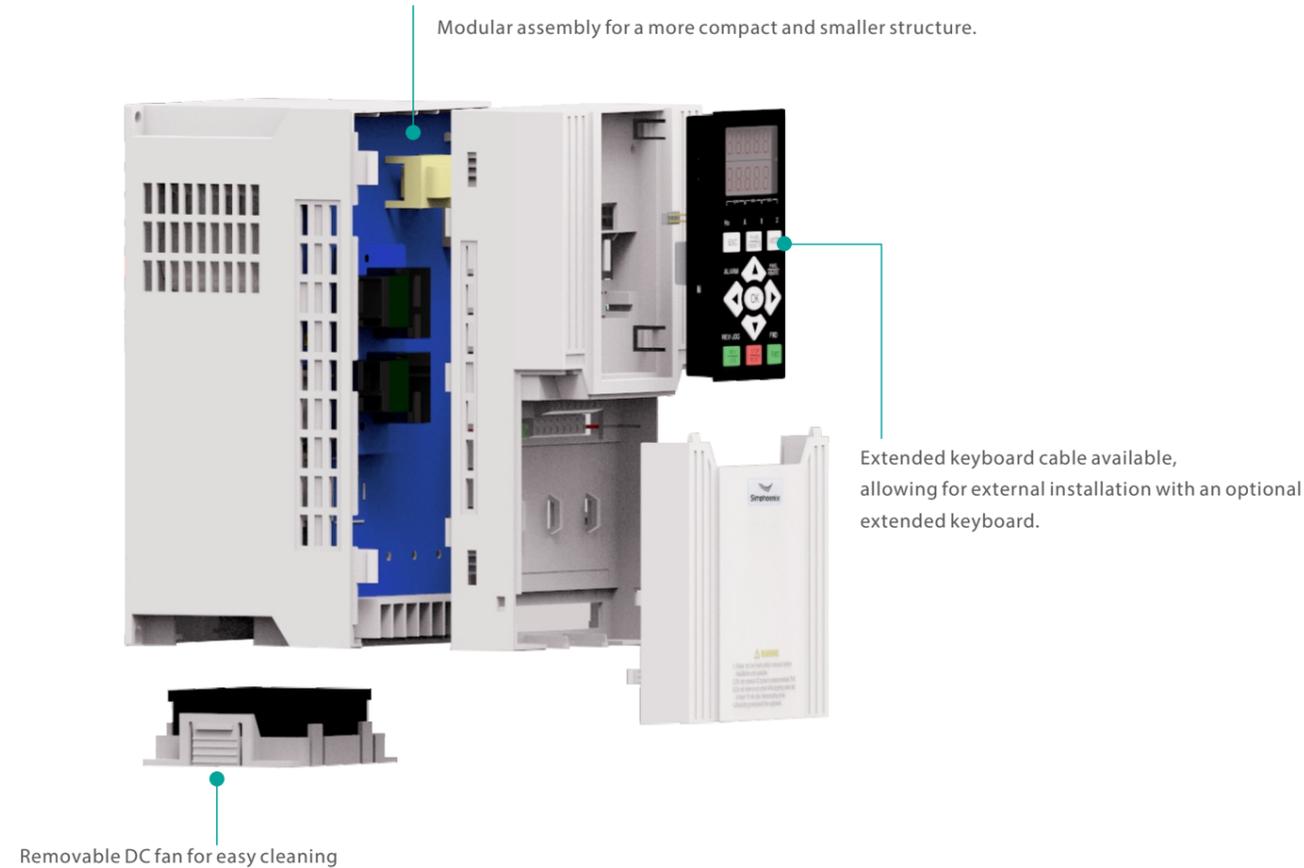
Power phases	
T	Three phase
S	single phase

Load Type	
G	Heavy Load
P	Light Load

Adaptive motor power (kW)	
0011	1.1
0015	1.5
...	...
4000	400.0

Product Architecture

- Uses a removable DC fan for better heat dissipation, stable performance, and easy cleaning.
- Enhanced dual-layer conformal coating process ensures circuit safety and reliability.



Optional keyboard:

External installation	Optional according to user needs			
Local installation	Applicable to DL500-4T0150G/4T0185P and below power range	Applicable to DL500-4T0185G/4T0220P and above power range		
	 Dual row LED small potentiometer panel DPNL350EN	 Dual row LED small panel DPNL350EM (standard)	 English Chinese bilingual LCD shuttle panel DPNL360CB	 English Chinese bilingual LCD panel DPNL360CA
			 Dual row LED shuttle panel DPNL360EB	 Dual row LED panel DPNL360EA (standard)

Product Guarantee

- All DL500 series products undergo rigorous EMC testing, environmental reliability testing, and standard inspections before leaving the factory.



- CS test
- CE test
- Voltage drop, short interruption
- Voltage fluctuation test
- Power line lightning surge test
- RS test
- RE test
- Harmonic test, fast pulse group test
- Communication line lightning surge test
- Harmonic tes

- Single wing drop test
- Salt spray experiment
- Constant temperature and humidity and high and low temperature gradient experiments
- Aging test
- Low temperature working experiment
- Hot and cold shock test
- Sine sweep experiment
- Random vibration experiment
- Classic impact experiment

- Single board test
- Temperature rise test
- Acceleration and deceleration shock test
- Load shock test
- Motor speed accuracy
- Overheat protection test
- Efficiency test
- Overvoltage or undervoltage protection test
- Current side voltage sampling accuracy and linearity test
- ...
- Routine inspection test
- Short circuit test
- Starting resistance impact test
- Power factor test
- Overload performance test

Technical Parameters

Input and Output	Input voltage U1, frequency	Three-phase (4T# series) 380~415V (±10%) 50/60Hz (±5%)			
	Output voltage U2	0~U1			
	Output frequency	Low frequency operation mode: 0.00~300.00Hz High frequency operation mode: 0.00~1500.00Hz			
	Digital Input	Standard configuration 5 digital inputs (DI) DL500-4T0185G/4T0220P and above models: can be expanded to 16 channels (optional expansion components)			
	Digital Output	Standard configuration 2-way digital output (DO)			
	Pulse input	DL500-4T0185G/4T0220P and above models: 0 ~ 100.0KHz pulse input, connected to NPN type OC output (optional)			
	Pulse output	DL500-4T0185G/4T0220P and above models: 0 ~ 100.0KHz pulse NPN type OC output (optional), PWM output mode can be selected to expand analog output port			
	Analog Input	Standard configuration: 0 ~ 10V voltage input / 0 ~ 20mA current input Optional configuration: -10 ~ 10V input (DL500-4T0185G/4T0220P and above)			
	Analog Output	1 channel 0 ~ 10V analog output signal (can be selected as 0 ~ 20mA current output mode)			
	Contact output	Standard one set of AC 250V/2A normally open and normally closed contacts, can be expanded to 1~6 sets of normally open and normally closed contacts			
	RS485	Standard Configuration			
	Control Characteristics	Control method	Closed loop vector control	Open loop vector control	V/F control
		Starting torque	0 speed 200%	0 speed 180%	0 speed 180%
Speed range		1: 1000	1: 200	1: 100	
Steady speed accuracy		±0.02%	±0.2%	±0.5%	
Torque control accuracy		±1%	±5%	--	
Torque response time		≦5ms	≦25ms	--	
Frequency resolution		Low frequency operation mode: 0.01Hz; High frequency operation mode: 0.1Hz			
Frequency accuracy		· Low frequency operation mode: Digital setting—0.01Hz, analog setting—maximum frequency×0.1% · High frequency operation mode: Digital setting—0.1Hz, analog setting—maximum frequency×0.1%			
Load Capacity		· General load mode: 110%--long term; 150%--60 seconds; 180%--2.5 seconds · Steady load mode: 105%--long term			
Carrier frequency		· Three-phase voltage vector synthesis mode: 1.5~8KHz; · Two-phase voltage vector synthesis mode: 1.5~12KHz The specific carrier frequency is related to the power level.			
Acceleration and deceleration time		0.01~600.00Sec. / 0.01~600.0Min.			
Flux Braking		By increasing the motor flux (30~120% adjustable), the motor can be quickly decelerated and braked.			
DC braking/brake		DC braking/holding brake starting frequency: 0.0~upper limit frequency, braking/holding brake injection current 0.0~100.0%			
Start frequency	0.0~50.0Hz				

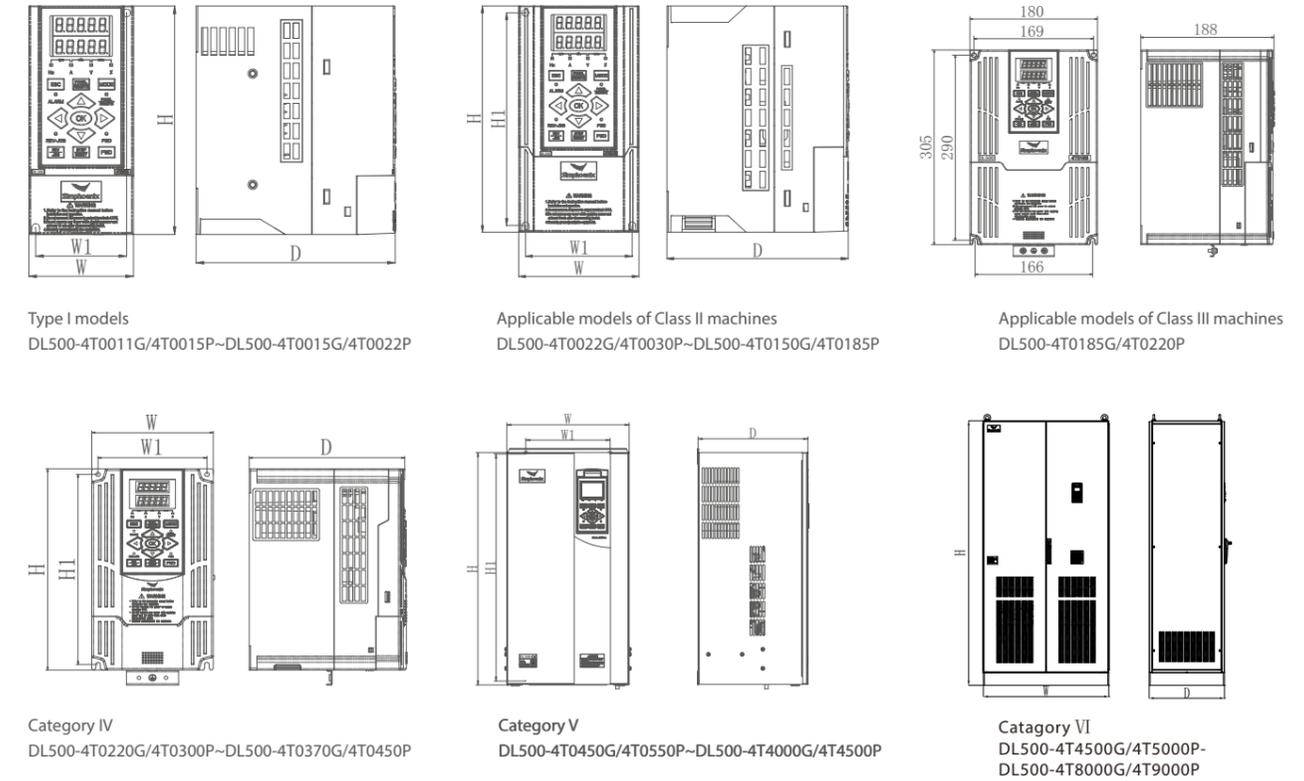
Features	Multi-stage operation	16-segment frequency/speed operation, each segment has independent settings for running direction, time, acceleration and deceleration; 7-segment process PID setting
	Built-in PID	Built-in PID controller, can be used independently by external devices
	Wake up from sleep	Built-in PID with simple sleep and wake-up functions
	MODBUS Communication	Standard MODBUS communication protocol, flexible parameter read and write mapping function
	Dynamic braking	Action voltage: 340~400/650~800V, braking rate: 50~100%
Typical functions	General Features	Power failure restart, fault self-recovery, motor parameter dynamic/static self-identification, start permission enable, operation permission enable, start delay, overcurrent suppression, overvoltage/undervoltage suppression, V/F custom curve, analog input curve correction, wire break detection, textile machinery disturbance (swing frequency) operation
	Virtual I/O Ports	With 8 one-to-one virtual output and input ports, complex engineering field applications can be easily realized without external wiring
	Communication linkage synchronization	Easily realize multi-machine synchronous transmission and freely choose to achieve multi-machine linkage balance according to current, torque and power
	Load dynamic balancing	It can also realize dynamic balancing of multi-machine loads (not limited to communication linkage) and realize torque motor characteristics
	Strong starting torque	For loads with large inertia and static friction, a super strong starting torque can be set for a certain period of time.
	Setting Priorities	Users can freely select the priority order of various frequency/speed setting channels, suitable for combined applications in various occasions
	Set combination	Hundreds of frequency, speed, torque and other setting combinations
	Timer	3 built-in timers: 5 clocks, 5 types of start triggering methods, multiple gating signals and working modes, 7 output signals
	counter	2 built-in counters: clock edge selection, 4 types of start triggering modes, 7 output signals
	Macro Parameters	Application macro: conveniently set and partially solidify a variety of commonly used group parameters, simplifying the parameter settings for general applications System macro: conveniently switch the working mode of the equipment (such as high and low frequency operation mode switching) and automatically redefine local parameters
	Parameter debugging	Any unsaved parameters during on-site debugging can be stored or abandoned and restored to their original values with one click
	Parameter display	Automatically hide parameters of unused function modules, or selectively display modified, stored, or changed parameters
	Protection features	Power supply
Operation protection		Overcurrent protection, overvoltage protection, inverter overheat protection, inverter overload protection, motor overload protection, output phase loss protection, IGBT driver protection
Device abnormality		Abnormal current detection, abnormal EEPROM memory, abnormal control unit, motor overheating, temperature acquisition circuit failure
Motor connection		The motor is not connected, the motor three-phase parameters are unbalanced, and the parameter identification is wrong
Expansion Cards		Detect and protect expansion cards for compatibility or conflict
Environment	Installation Environment	Vertical installation indoors, away from direct sunlight, dust, corrosive, flammable gas, oil mist, water vapor, dripping water or salt
	altitude	0~1000m; 1000~3000m recommended to use with derating, output current capacity derated by 10% for every 1000m increase
	Ambient temperature	Working environment temperature: -10ÿ ~ +45ÿ (45ÿ~50ÿ derating)
	Storage temperature	-20°C ~ +60 °C
	humidity	Below 95%, no condensation
	shock	< 6m/s ²
	Environmental pollution level	2
Protection level	IP20	

Model List

Model	General load mode			Teady light load mode		
	Rated capacity (kVA)	Rated current (A)	Applicable (kW)	Rated capacity (kVA)	Rated current (A)	Applicable (kW)
DL500-4T0011G/4T0015P	2.0	3.0	1.1	2.4	3.7	1.5
DL500-4T0015G/4T0022P	2.4	3.7	1.5	3.6	5.5	2.2
DL500-4T0022G/4T0030P	3.6	5.5	2.2	4.9	7.5	3.0
DL500-4T0030G/4T0040P	4.9	7.5	3.0	6.3	9.5	4.0
DL500-4T0040G/4T0055P	6.3	9.5	4.0	8.6	13	5.5
DL500-4T0055G/4T0075P	8.6	13	5.5	11.2	17	7.5
DL500-4T0075G/4T0110P	11.2	17	7.5	16.5	25	11
DL500-4T0110G/4T0150P	16.5	25	11	21	32	15
DL500-4T0150G/4T0185P	21	32	15	24.3	37	18.5
DL500-4T0185G/4T0220P	24.3	37	18.5	29.6	45	22
DL500-4T0220G/4T0300P	29.6	45	22	39.5	60	30
DL500-4T0300G/4T0370P	39.5	60	30	49.4	75	37
DL500-4T0370G/4T0450P	49.4	75	37	62.5	95	45
DL500-4T0450G/4T0550P	62.5	95	45	75.7	115	55
DL500-4T0550G/4T0750P	75.7	115	55	98.7	150	75
DL500-4T0750G/4T0900P	98.7	150	75	116	176	90
DL500-4T0900G/4T1100P	116	176	90	138	210	110
DL500-4T1100G/4T1320P	138	210	110	171	260	132
DL500-4T1320G/4T1600P	171	260	132	204	310	160
DL500-4T1600G/4T1850P	204	310	160	237	360	185
DL500-4T1850G/4T2000P	237	360	185	253	385	200
DL500-4T2000G/4T2200P	253	385	200	276	420	220
DL500-4T2200G/4T2500P	276	420	220	313	475	250
DL500-4T2500G/4T2800P	313	475	250	352	535	280
DL500-4T2800G/4T3150P	352	535	280	395	600	315
DL500-4T3150G/4T3500P	395	600	315	428	650	350
DL500-4T3500G/4T4000P	428	650	350	480	730	400
DL500-4T4000G/4T4500P	480	730	400	527	800	450
DL500-4T4500G/4T5000P	527	800	450	592	900	500
DL500-4T5000G/4T5600P	592	900	500	658	1000	560
DL500-4T5600G/4T6300P	658	1000	560	737	1120	630
DL500-4T6300G/4T7000P	737	1120	630	823	1225	700
DL500-4T7000G/4T8000P*	823	1225	700	955	1450	800
DL500-4T8000G/4T9000P*	955	1450	800	1053	1600	900

Note: Maximum power of 800kW, * represents planned

Installation Dimensions



Inverter Model	W1 (mm)	W (mm)	H1 (mm)	H (mm)	D (mm)	Screw specifications
DL500-4T0011G/4T0015P	59	68	139	148	130	M4
DL500-4T0015G/4T0022P						
DL500-4T0022G/4T0030P						
DL500-4T0030G/4T0040P	78	88	155	165	133	M4
DL500-4T0040G/4T0055P						
DL500-4T0055G/4T0075P	99	109	199	209	155	M4
DL500-4T0075G/4T0110P						
DL500-4T0110G/4T0150P	134	146	235	249	180	M5
DL500-4T0150G/4T0185P						
DL500-4T0185G/4T0220P	169 166	180	290	305	188	M5

Installation Dimensions

Inverter Model	W1 (mm)	W (mm)	H1 (mm)	H (mm)	D (mm)	Screw specifications
DL500-4T0220G/4T0300P	160	210	387	405	211	M6
DL500-4T0300G/4T0370P						
DL500-4T0370G/4T0450P	160	250	428	445	216	M8
DL500-4T0450G/4T0550P						
DL500-4T0550G/4T0750P	200	290	525	545	260	M8
DL500-4T0750G/4T0900P						
DL500-4T0900G/4T1100P	230	330	603	625	280	M10
DL500-4T1100G/4T1320P						
DL500-4T1320G/4T1600P	280	380	760	785	300	M10
DL500-4T1600G/4T1850P						
DL500-4T1850G/4T2000P	320	450	919	945	300	M10
DL500-4T2000G/4T2200P						
DL500-4T2200G/4T2500P	350	480	1022	1050	300	M12
DL500-4T2500G/4T2800P						
DL500-4T2800G/4T3150P	480	550	1116	1145	300	M12
DL500-4T3150G/4T3500P						
DL500-4T3500G/4T4000P	500	670	1173	1200	350	M12
DL500-4T4000G/4T4500P						
DL500-4T4500G/4T5000P	/	800	/	2100	600	/
DL500-4T5000G/4T5600P						
DL500-4T5600G/4T6300P	/	1000	/	2100	600	/
DL500-4T6300G/4T7000P						
DL500-4T7000G/4T8000P*	/	1200	/	2100	600	/
DL500-4T8000G/4T9000P*						

System Wiring Diagram

