

## VFD System catalogue V2.7



- AC servo
- Stepping drive motor
- Induction asynchronous servo
- Linear motor drive
- Industry-specific servo
- Control product integration customization
- VFD

# Serving customers and adding value to customers

## Company Profile

Hangzhou Bergerda Automation Technology Co., Ltd. is located in a beautiful paradise on earth - Hangzhou, China. It is a high-tech enterprise that provides global customers with servo, stepping, frequency conversion, brushless motor drive control products, and industrial drive control solutions. Excellence in product development, efficient and high-quality production, enthusiastic and caring service. Always take the customer's needs as its responsibility.

Bergerda's motor control products include AC servo drives and servo motors, stepping drives and stepping motors, inductive asynchronous servo drives and motors, Brushless motor and drive, and custom control solutions for all types of industries. Widely used in textile packaging, CNC machine tools, printing, embroidery, sculpture, advertising, laser, electronics and other automated machinery. At present, there are twelve types of stepping systems, including B D E F four series, nearly 30 kinds of specifications servo systems, NS digital series and LS closed loop series. S series induction asynchronous servo, Brushless motor and drive (B L D C), T-series CNC turret-dedicated servos and P-series plastic machinery-specific servos and so on which include control and control integrated industrial solutions. We have become a professional company with a complete product line in Chinese motion control industry. Perfect pre-sale, sales, after-sales service, from customer design machine selection, equipment debugging, post-maintenance, always with patience, enthusiasm, professional service to return customers.

The company fully implements the concept of "professional, quality, and service". With high-tech products, excellent quality, and high-quality services, customers can be assured of their ease of use, adding value to customers and realizing the long-term development of the company.

Based in the domestic market, Bergerda has established sales and service networks in Zhejiang, Jiangsu, Guangdong, Fujian, Shandong, Hunan and Guangxi. In foreign markets, products are exported to the United States, Brazil, Colombia, Russia and other countries and regions.



## ES230 Mini Economy VFD



Es230 is a newly designed smart variable frequency drive, featuring compact structure, easy-to-use, excellent performance and various functions. It can be widely used in woodworking, textile, food, printing and packaging, plastics, machine tools, transportation equipment industries etc.

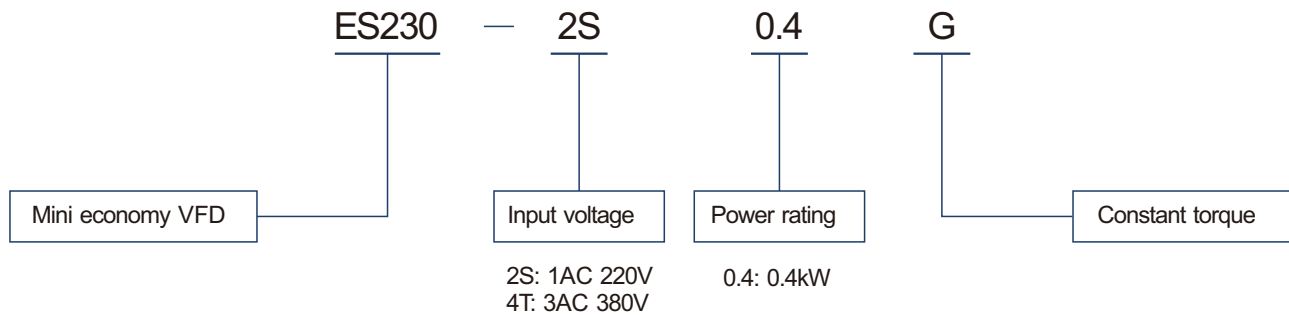
### Series features

- Next-generation motor control platform, Capable of driving asynchronous and permanent magnet synchronous motors, supporting FVC, SVC and V/F control modes
- Refined design with significant size reduction; With next-generation power device technology, it features high junction temperature, high power density and smaller dimension, reducing size up to 30% and installation area of 70%.
- Optimized vector control technology, bringing breakthrough in motor control performance; SVC speed control ratio is increased to 1:1000; SVC replaces FVC when the output torque is greater than 10%; SVC winding and unwinding torque accuracy is  $\leq 5\%$ .
- Fast current limiting; When exceeding the limit, the current can be quickly limited to within the limit, avoiding frequent overcurrent alarms caused by sudden loads or disturbances.
- Unique speed tracking; Requiring no special hardware detection circuit, it can track the motor speed and direction quickly without any impact. It is especially suitable for fans, pumps and other equipment that requires speed tracking.
- Overexcitation function; Rapid braking effect can be achieved without adding external brake resistors and other accessories; It can suppress the rise of bus voltage during deceleration to avoid frequent over-voltage fault alarms. Additionally, it can brake quickly, meeting the requirement of quick stopping at shutdown.
- Stable, reliable and long product life; Independent air duct design and standard coated PCB prevent dust and oil from entering the VFD and fully protect the electronic components on the PCB, thus ensuring longer service life and reliability.
- Powerful upper computer monitoring software; Extensive background monitoring functions which facilitate on-site data collection and debugging online oscilloscope function; batch uploading and downloading parameters; displaying Group U0 parameters in real time; and monitoring and diagnosis functions.

### Applications

Woodworking, textile, food, printing and packaging, plastics, machine tools, cable, transportation equipment industries etc.

## Model Description



## Specification sheet for order

Model	Motor		Rated Input Current (A)	Rated output Current (A)
	KW	HP		
1AC 220~240V±15%				
ES230-2T0.4G	0.4	0.5	5.4	2.3
ES230-2T0.75G	0.75	1	8.2	4.0
ES230-2T1.5G	1.5	2	14	7.0
ES230-2T2.2G	2.2	3	20	9.6
ES230-2T3.7G	3.7	5	35	17
ES230-2T5.5G	5.5	7.5	50	25
3AC 380~415V±15%				
ES230-4T0.75G	0.75	1	2.4	2.1
ES230-4T1.5G	1.5	2	4.6	3.8
ES230-4T2.2G	2.2	3	6.3	5.1
ES230-4T4.0G	4	5	11.4	9
ES230-4T5.5G	5.5	7.5	16.7	13
ES230-4T7.5G	7.5	10	21.9	17
ES230-4T11G	11	15	32.2	25

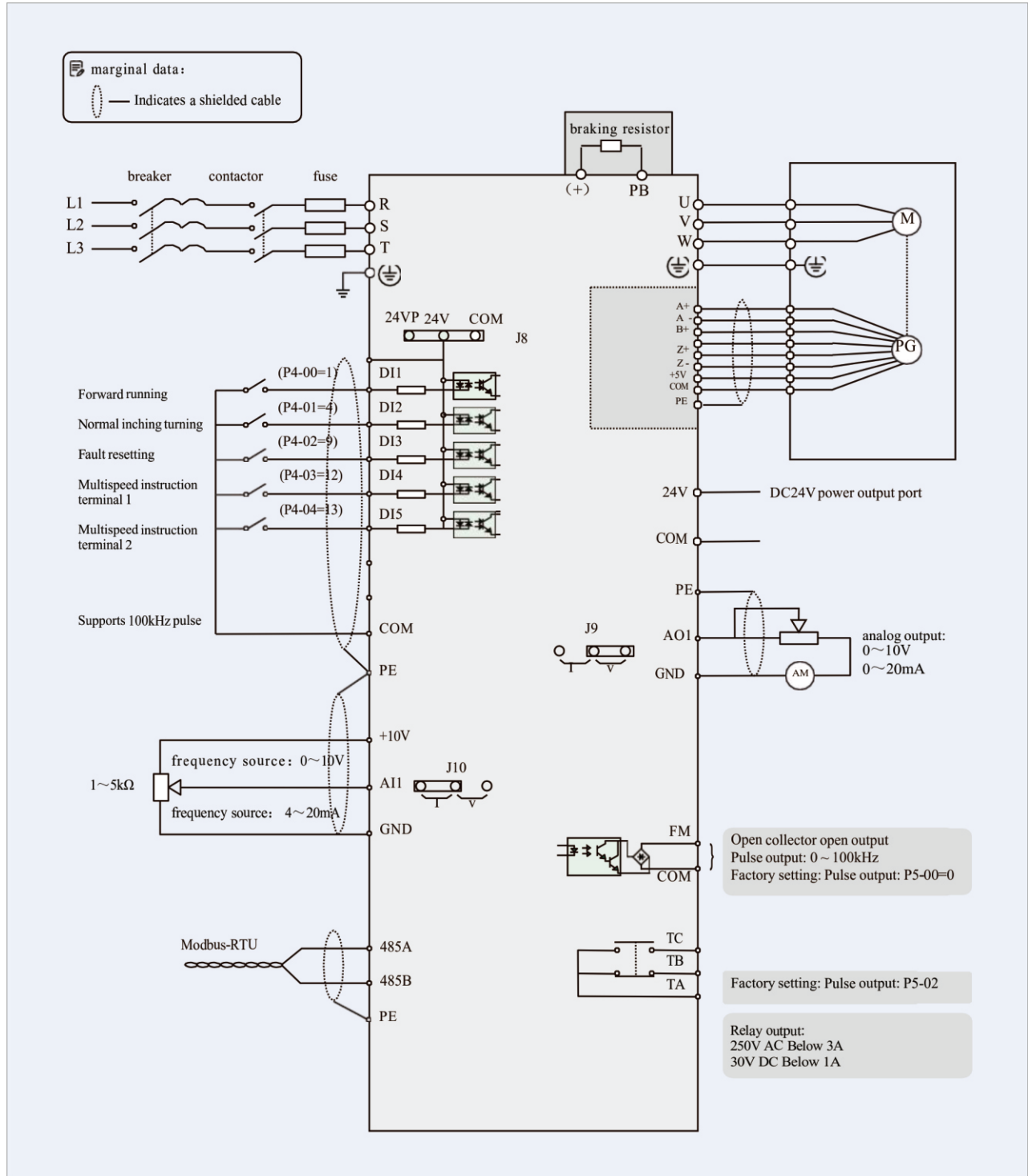
## Technical Specifications

	Technical Item	Specification
Basic function	Output frequency	Vector control: 0~500Hz V/f control: 0~3200Hz
	Control mode	V/f control Sensorless vector control (SVC) Close-loop vector control (FVC)
	Carrier frequency	0.8kHz~12kHz, automatically adjusted based on the load characteristics
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: maximum frequency * 0.025%
	Starting torque	G type: 0.5Hz/150%
	Speed adjustment range	1:100 (SVC), 1:1000 (FVC)
	Speed stability accuracy	±0.5% (SVC), ±0.02% (FVC)
	Torque control response & precision	Response time: 5ms, precision: ±5% (FVC)
	Overload capacity	G type: 150% 60s; 180% 3s
	Torque boost	Automatic torque boost; manual torque boost 0.1%~30.0%
	V/f curve	Three types: linear, multiple point and square type (1.2 power, 1.4 power, 1.6 power, 1.8 power, square)
	V/f separation	2 modes: complete separation, half separation
	Acceleration/deceleration mode	Straight line/S curve; four kinds of acceleration/deceleration time, range: 0.1s~6500.0s
	DC braking	DC braking frequency: 0.00Hz~maximum frequency Braking time: 0.0s~36.0s Braking action current value: 0.0%~100.0%
	Jog control	Jog frequency range: 0.00Hz~50.00Hz Jog acceleration/deceleration time: 0.0s~6500.0s
	Simple PLC & multi-step speed operation	It can realize up to 16 steps speed via the built-in PLC function or control terminal
	Built-in PID	Built-in PID control to easily realize the close loop control of the process parameters (such as pressure, temperature, flow, etc.)
	Automatic voltage Regulation (AVR)	Automatically maintain a constant output voltage when grid voltage changes
	Common DC bus	Common DC bus for several inverters, energy balanced automatically
Overvoltage & overcurrent stall control	Automatically limit the current and voltage during the operation, prevent frequent overcurrent and overvoltage trip	

## Technical Specifications

	Technical Item	Specification
Basic function	Rapid current limit	Minimizing overcurrent fault, protect the normal operation of inverter
	Torque limit & control	"Excavator" characteristics, automatically limit the torque during the operation, prevent frequent overcurrent trip; torque control can be achieved on close-loop vector control mode.
	Fault protection function	Overcurrent, overvoltage, under-voltage, overheating, default phase, overload, short-circuit, etc., can record the detailed running status during failure & has fault automatic reset function
Individualized function	High performance	Can control the asynchronous motor and synchronous motor based on the high-performance current vector control technology
	Non-stop when instantaneous power off	The load feedback energy compensates the voltage reduction when instantaneous power off, so that the AC drive can continue to run for a short time
	Virtual IO	Five groups of virtual DI/DO can realize simple logic control
	Timing control	Time range: 0.0min~6500.0min
	Multi-motor switching	2 groups of motor parameters, arbitrary switching between 2 motors
	Communication protocol	Standard MODBUS (RS-485) and optional CANopen communication
	Multiple encoder support	It supports various encoders such as differential encoder, open-collector encoder and also support rotary transformer
Operation	Running command source	Keypad control Terminal control Serial communication control
	Frequency source	Digital setting, analog setting, pulse frequency setting, serial communication setting, multi-step speed setting & simple PLC, PID setting, etc. These frequency settings can be combined & switched in various modes
	Auxiliary frequency source	There are ten auxiliary frequency sources It can implement fine tuning and frequency synthesis
	Input terminal	5 digital input (DI1~DI5), DI5 supports max. 100 kHz high-speed pulse input 1 analog input: AI1: 0~10V or 4~20mA
	Output terminal	1 output (FM), optional for open collector output or high-speed pulse output (0~100kHz) 1 relay output 1 analog output: AO1: 0~10V or 0/4~20mA
Environment	Altitude	Less than 1000m; rises each 1000m, derates 10% to use
	Ambient temperature	-10 ~+40 (if 40 ~50 , please derate to use)
	Humidity	Less than 95%RH, no water condenses
	Storage temperature	-20 ~+60

## Typical application wiring diagram



## ES500 High Performance VFD



Es500 is a versatile high-performance VFD of Epsivo with optimized vector variable-frequency technology. With its high-performance current vector technology, it can easily drive a wide range of asynchronous and permanent magnet synchronous motors. The technical and performance problems encountered in applications such as cable, machine tool, metal product, petrochemical, natural gas, lifting equipment, papermaking, textiles, printing and dyeing, and ceramics can be easily solved.

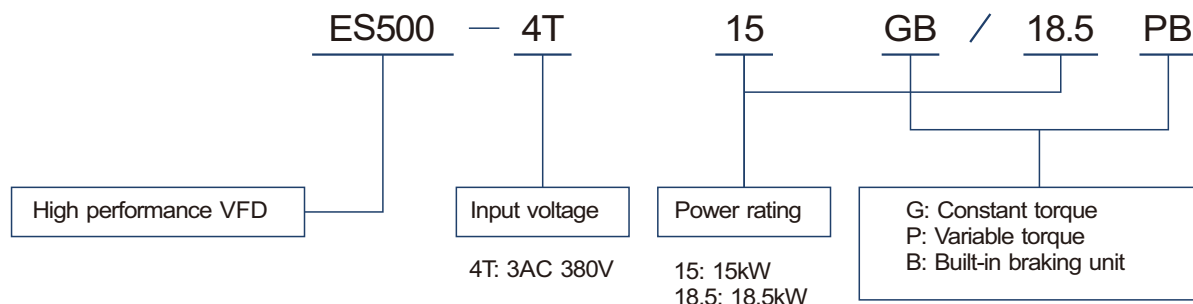
### Series features

- Driving various motors; It supports vector control of AC asynchronous motors and synchronous motors, and supports vector control of permanent magnet synchronous motors without position feedback.
- Excellent permanent magnet synchronous motor control performance; It drives permanent magnet synchronous motors smoothly and efficiently (including the PMSM without speed or rotor position sensors) to achieve higher energy efficiency; Direct drive is possible on low-speed control industrial equipment, achieving higher energy efficiency and better control performance.
- Optimized vector control technology, bringing breakthrough in motor control performance; SVC speed control ratio is increased to 1:1000; SVC replaces FVC when the output torque is greater than 10%; SVC winding and unwinding torque accuracy is  $\leq 5\%$ .
- High-performance vector control, improving equipment accuracy; The maximum output frequency of 500Hz achieved with vector control enables high-precision speed output within 10 times the weak magnetic speed regulation range.
- Large torque at low speeds, improving the low-speed control performance; In the closed-loop vector mode, the linearity deviation of the torque line is within 3%; the torque output is stable, the low-frequency torque is large, and stable loaded operation at ultra-low speed and 0.01Hz can be achieved. The torque mode and speed mode can be easily switched.
- Instantaneous power loss without shutdown; In the event of a momentary power failure or sudden voltage drop, the VFD reduces the output speed and compensates for the voltage drop by feeding energy back through the load, so as to maintain the drive in operation for a short period of time.
- Built-in adaptive PID function module; Two built-in PID parameter groups can be automatically switched according to deviations, DI terminals and frequency conditions. The given and feedback sources are various and practical. The PID feedback loss detection function facilitates user to perform fault diagnosis.
- Extensive expansion function cards; With modular design concept, ES500A has superb expansion functions. Users are free to select different communication cards, PG cards and other expansion cards according to their needs, for example, ModBUS /CANopen /EtherCAT communication card, differential / rotary / open collector PG card.
- Industry application macro function; Designed for the special requirements for performance functions in industry applications, such as winding machines, winches, cranes, extruders and presses, the industry application macro function realizes the one-key initialization function, reducing the workload and technical requirements of the front-line debugging personnel.
- Powerful upper computer monitoring software; Extensive background monitoring functions which facilitate on-site data collection and debugging; online oscilloscope function; batch uploading and downloading parameters; displaying Group U0 parameters in real time; and monitoring and diagnosis functions.

### Applications

Papermaking, lifting machinery, elevators, CNC machine tool, precision injection molding, metallurgy, mining, electric power, petroleum and chemical industry, which highly require speed control for synchronous motor driving or asynchronous motor driving.

## Model Description



## Specification sheet for order

Model	Motor		Rated Input Current (A)	Rated output Current (A)
	kW	HP		
3AC 380~415V±15%				
ES500A-4T0.75GB/1.5PB	0.75/1.5	1/2	3.4/5.0	2.1/3.8
ES500A-4T1.5GB/2.2PB	1.5/2.2	2/3	5.0/5.8	3.8/5.1
ES500A-4T2.2GB/3.7PB	2.2/3.7	3/5	5.8/10.5	5.1/9.0
ES500A-4T3.7GB/5.5PB	3.7/5.5	5/7.5	10.5/14.6	9.0/13
ES500A-4T5.5GB/7.5PB	5.5/7.5	7.5/10	14.6/20.5	13/17
ES500A-4T7.5GB/11PB	7.5/11	10/15	20.5/26	17/25
ES500A-4T11GB/15PB	11/15	15/20	26/35	25/32
ES500A-4T15GB/18.5PB	15/18.5	20/25	35/38.5	32/37
ES500A-4T18.5GB/22PB	18.5/22	25/30	38.5/46.5	37/45
ES500A-4T22GB/30PB	22/30	30/40	46.5/62.5	45/60
ES500A-4T30G/37P	30/37	40/50	62.5/76.0	60/75
ES500A-4T37G/45P	37/45	50/60	76.0/92.0	75/91
ES500A-4T45G/55P	45/55	60/75	92.0/113	91/112
ES500A-4T55G/75P	55/75	75/100	113/157	112/150
3AC 380~415V±15%				
ES500A-4T90G/110P	90/110	125/150	180/214	176/210
ES500A-4T110G/132P	110/132	150/175	214/256	210/253
ES500A-4T132G/160P	132/160	175/210	256/307	253/304
ES500A-4T160G/185P	160/185	210/250	307/350	304/340
ES500A-4T185G/200P	185/200	250/260	350/385	340/377
ES500A-4T200G/220P	200/220	260/300	385/430	377/426
ES500A-4T220G/250P	220/250	300/330	430/468	426/465
ES500A-4T250G/280P	250/280	330/370	468/525	465/520
ES500A-4T280G/315P	280/315	370/420	525/590	520/585
ES500A-4T315G/350P	315/350	420/470	590/665	585/650
ES500A-4T350G/400P	350/400	470/530	665/785	650/725
ES500A-4T400G	400	530	785	725
ES500A-4T450G	450	600	840	820
ES500A-4T500G	500	660	880	860
ES500A-4T560G	560	750	980	950
ES500A-4T630G	630	840	1130	1100
ES500A-4T710G	710	950	1290	1250

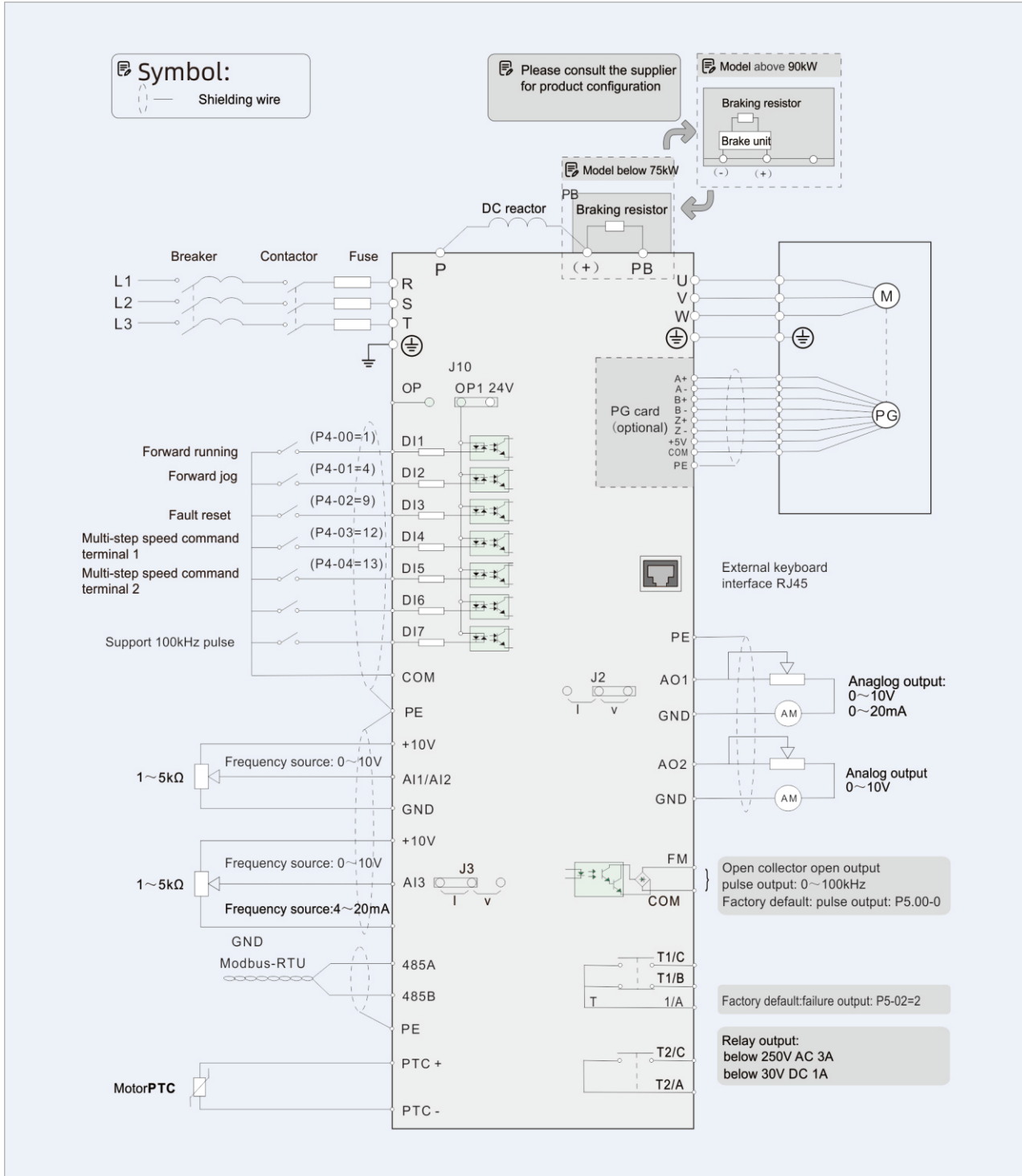
## Technical Specifications

	Technical Item	Specification
Basic function	Output frequency	Vector control: 0~500Hz V/f control: 0~3200Hz
	Control mode	V/f control Sensorless vector control (SVC) Close-loop vector control (FVC)
	Carrier frequency	0.8kHz~12kHz, automatically adjusted based on the load characteristics
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: maximum frequency * 0.025%
	Starting torque	G type: 0.5Hz/150%      P type: 0.5Hz/100%
	Speed adjustment range	1:100 (SVC), 1:1000 (FVC)
	Speed stability accuracy	±0.5% (SVC), ±0.02% (FVC)
	Torque control response & precision	Response time: 5ms, precision: ±5% (FVC)
	Overload capacity	G type: 150% 60s; 180% 3s      P type: 120% 60s; 150% 3s
	Torque boost	Automatic torque boost; manual torque boost 0.1%~30.0%
	V/f curve	Three types: linear, multiple point and square type (1.2 power, 1.4 power, 1.6 power, 1.8 power, square)
	V/f separation	2 modes: complete separation, half separation
	Acceleration/deceleration mode	Straight line/S curve; four kinds of acceleration/deceleration time, range: 0.1s~6500.0s
	DC braking	DC braking frequency: 0.00Hz~maximum frequency Braking time: 0.0s~36.0s Braking action current value: 0.0%~100.0%
	Jog control	Jog frequency range: 0.00Hz~50.00Hz Jog acceleration/deceleration time: 0.0s~6500.0s
	Simple PLC & multi-step speed operation	It can realize up to 16 steps speed via the built-in PLC function or control terminal
	Built-in PID	Built-in PID control to easily realize the close loop control of the process parameters (such as pressure, temperature, flow, etc.)
	Automatic voltage Regulation (AVR)	Automatically maintain a constant output voltage when grid voltage changes
Common DC bus	Common DC bus for several inverters, energy balanced automatically	
Overvoltage & overcurrent stall control	Automatically limit the current and voltage during the operation, prevent frequent overcurrent and overvoltage trip	

## Technical Specifications

	Technical Item	Specification
Basic function	Rapid current limit	Minimizing overcurrent fault, protect the normal operation of inverter
	Torque limit & control	"Excavator" characteristics, automatically limit the torque during the operation, prevent frequent overcurrent trip; torque control can be achieved on close-loop vector control mode.
	Fault protection function	Overcurrent, overvoltage, under-voltage, overheating, default phase, overload, short-circuit, etc., can record the detailed running status during failure & has fault automatic reset function
Individualized function	High performance	Can control the asynchronous motor and synchronous motor based on the high-performance current vector control technology
	Non-stop when instantaneous power off	The load feedback energy compensates the voltage reduction when instantaneous power off, so that the AC drive can continue to run for a short time
	Virtual IO	Five groups of virtual DI/DO can realize simple logic control
	Timing control	Time range: 0.0min~6500.0min
	Multi-motor switching	2 groups of motor parameters, arbitrary switching between 2 motors
	Communication protocol	Standard MODBUS (RS-485) and optional CANopen communication
	Multiple encoder support	It supports various encoders such as differential encoder, open-collector encoder and also support rotary transformer
Operation	Running command source	Keypad control Terminal control Serial communication control
	Frequency source	Digital setting, analog setting, pulse frequency setting, serial communication setting, multi-step speed setting & simple PLC, PID setting, etc. These frequency settings can be combined & switched in various modes
	Auxiliary frequency source	There are ten auxiliary frequency sources It can implement fine tuning and frequency synthesis
	Input terminal	7 digital input (DI1~DI7), DI7 supports max. 100 kHz high-speed pulse input 3 analog input: AI1 & AI2: 0~10V AI3: 0~10V or 4~20mA
	Output terminal	1 output (FM), optional for open collector output or high-speed pulse output (0~100kHz) 2 relay output 2 analog output: AO1: 0~10V or 0/4~20mA Ao2: 0~10V
Environment	Altitude	Less than 1000m; rises each 1000m, derates 10% to use
	Ambient temperature	-10 ~+40 (if 40 ~50 , please derate to use)
	Humidity	Less than 95%RH, no water condenses
	Storage temperature	-20 ~+60

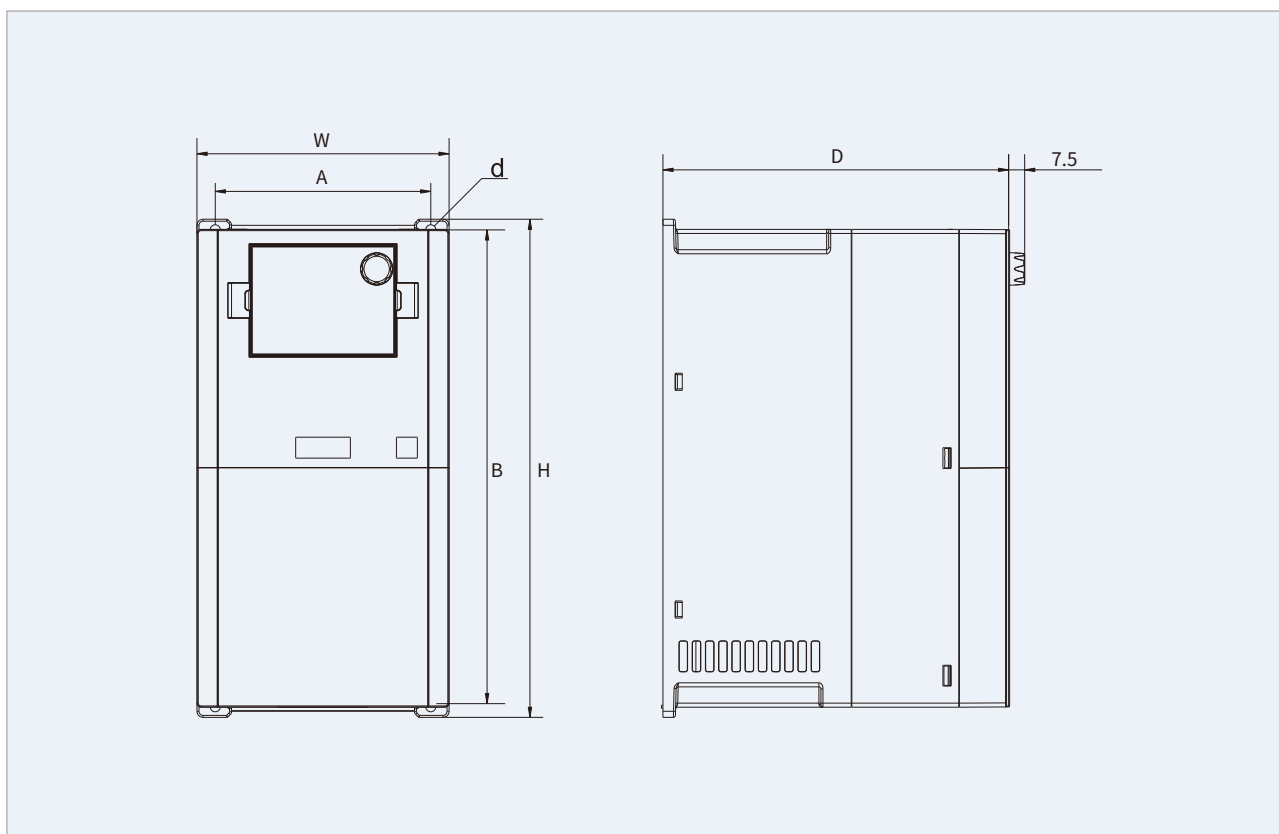
# Typical application wiring diagram



## Installation Dimensions

### ES230 (Plastic Case)

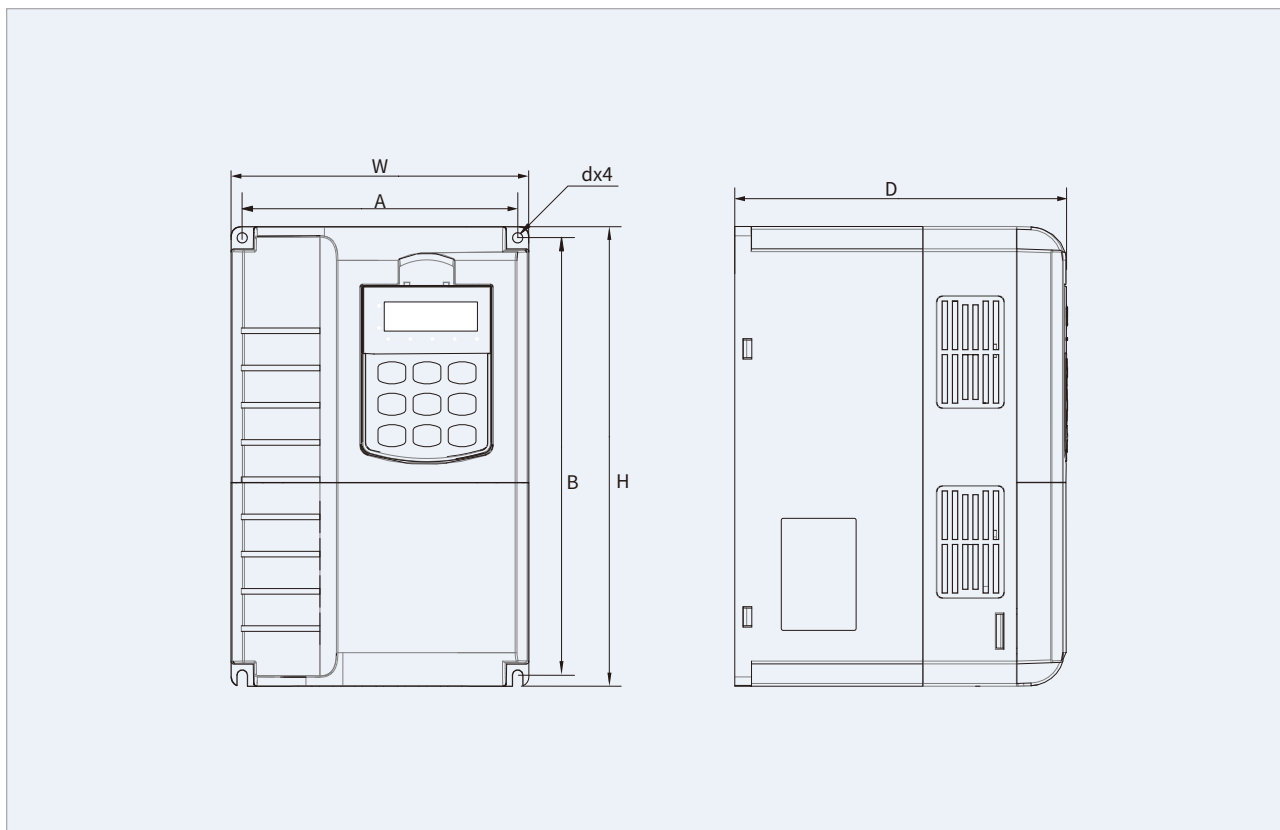
Structure code (Power range)	External Dimension (mm)			Installation Dimension (mm)		Installation aperture (mm)
	W	H	D	A	B	
E02(0.75-2.2kW)	85	170	128	157.5	67.5	Φ5.5
E03(3.7-5.5kW)	97	194	142.5	85	184	Φ4.7
E04(7.5-11kW)	124	245	170	106	233	Φ5



## Installation Dimensions

### ES500 (Plastic Case)

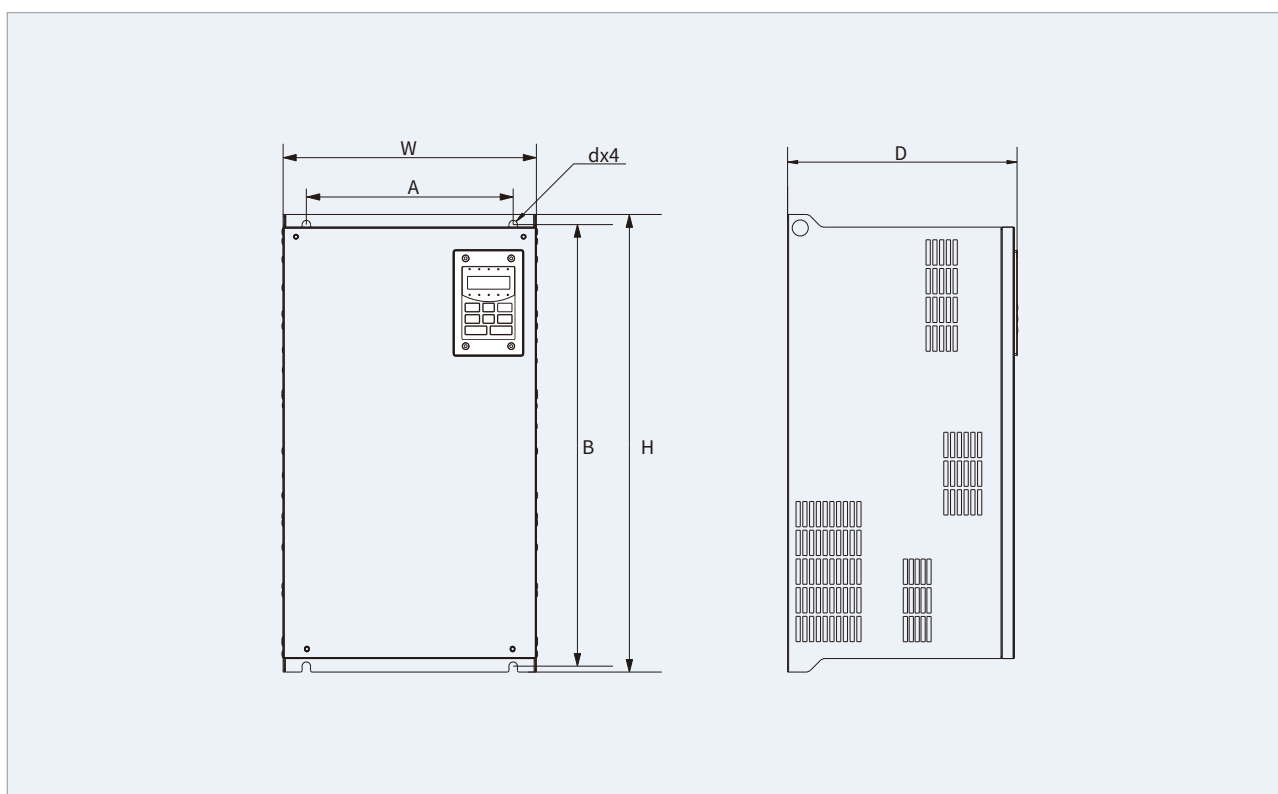
Structure code (Power range)	External Dimension (mm)			Installation Dimension (mm)		Installation aperture (mm)
	W	H	D	A	B	
D01(0.75-3.7kW)	118	185	156.7	106.6	175.3	Φ4.5
D02(5.5-11kW)	160	247	178	148	235	Φ5.5



# Installation Dimensions

## ES500 (Steel Case)

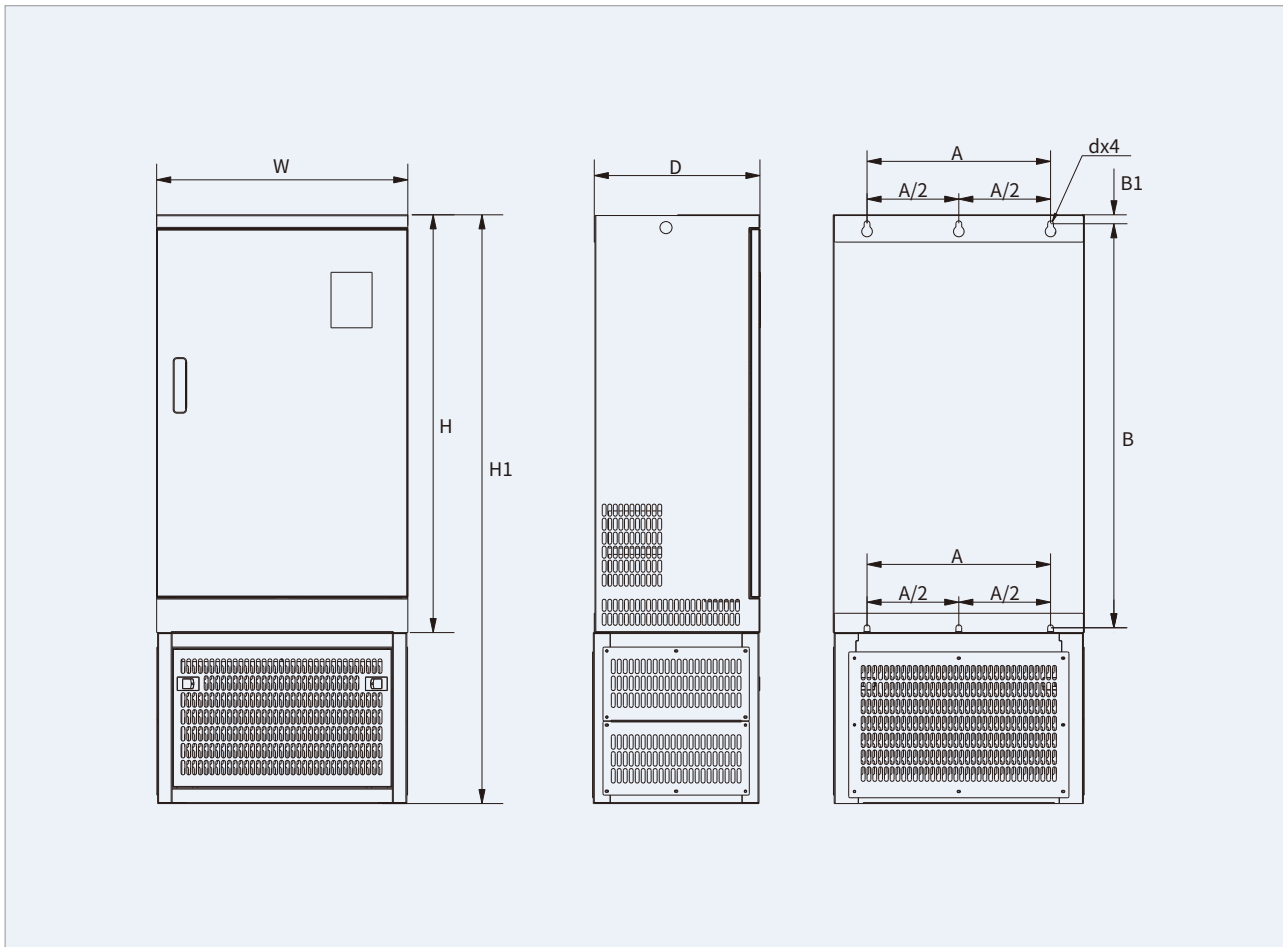
Structure code (Power range)	External Dimension (mm)			Installation Dimension (mm)		Installation aperture (mm)
	W	H	D	A	B	
D03(15-18.5kW)	217	335	194	140	324	Φ6
D04(22kW)	228	361	203.5	139	349	Φ6
D06(30-37kW)	285	463	224	235	447	Φ6
C07(45-55kw)	300	542	272	245	523	Φ10
D07(45-75kW)	305	613	294	200	592	Φ10
C08(75-110kW)	338	580	315	270	560	Φ10
D08(90-132kW)	400	753	293	280	731.5	Φ10
C09(132-160kW)	400	815	315	320	790	Φ11



# Installation Dimensions

## ES500 (Steel Case)

Structure code (Power range)	External Dimension (mm)				Installation Dimension (mm)			Installation aperture (mm)
	W	H	H1*	D	A	B	B1	
D09(160-220kW)	520	865	1219	343	380	836.5	18.5	Φ12
D10(250-400kW)	800	1172	1495	412	600	1143	19	Φ14
D11(450-710kW)	1080	N/A	1800	500	620	N/A	20	Φ12



# Our market



COMMITTED TO MACHINE INTELLIGENCE, FOCUS MOTOR CONTROL



Address: 4F, Building 8, No. 493, Linping Avenue, Economic and Technological Development Zone, Linping District, Hangzhou, Zhejiang, China

Sale : 0086-571-88326782      Technical : 0086-571-88645851      Fax : 0086-571-89719501

Mail : [market@bergerda.com](mailto:market@bergerda.com)      web : [www.bergerda.com](http://www.bergerda.com)      Post Code : 310030

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