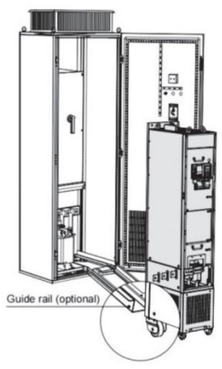
FD300 series

High performance vector inverter

Product advantage

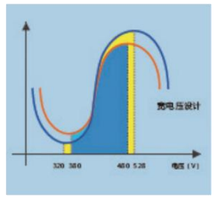
■ Compact structure, easy to install and save space



■ Environmental adaptability

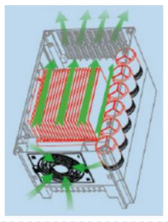
Wide voltage range design

Rated voltage: 380 - 480 V
Rated frequency: 50 / 60Hz
Allowable voltage fluctuation range:320 - 485 Vac
Unbalance: ＜ 3%
Frequency range: 47-63Hz



Independent air duct

Completely independent air duct, truly realizing "driver and control" isolation.



■ Function Introduction

. Improving performance

High-efficiency operation of synchronous asynchronous motor can be realized by advanced motor driving technology.

Rich motor identification methods

Efficient and fast motor parameter identification algorithm, supporting multiple self-learning modes, accurate and consistent dynamic and static learning, no manual adjust ment required, and giving full play to driving performance

Reliable braking performance

Integrated with DC, magnetic flux, short circuit and other braking modes, which can realize safe and fast shutdown of large inertia load

No impact speed tracking

The software can automatically search the motor speed and direction, and realize the smooth and impact-free start of the motor at any speed

Stable low frequency heavy duty performance

Under the closed-loop vector mode, the low frequency torque is large and the torque pulsation is small, so the extremely low speed 0.01HZ stable on-load operation can be realized, and the to rque and speed modes can be switched smoothly online

Excellent motor control algorithm

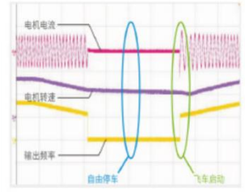
- New magnetic field directional control algorithm, excellent low frequency and heavy load performance, improving torque control accuracy;
- New speed observer reduces motor parameter dependency and improves speed control stability

Reliable torque limits

"Digger "feature: limit the torque output through high-precisiont orque limiting function, so as to safely and effectively protect the mechanical equipment in case of sudden load change

. Full-band rotation speed tracking

Full-band rotation speed tracking technology ensures a smooth operation without any impact, effectively reduces motor and mechanical impact, and facilitates the implementation of the process.



Integrated speed, torque and position control

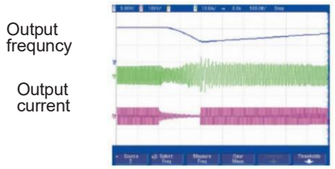
More accurate and powerful motor torque, mechanical positioning applications

(1) Position control performance - suitable for ensure that the machinery operates stably,

(2) Torque and speed control performance - responds quickly and has small torque fluctuation

No stop upon instantaneous power of

When the power grid drops instantaneously, the frequency converter can operate without shutdown by using the feedback energy within an effective time. It is especially suitable for occasions requiring high equipment operation continuity, such as chemical fiber and textile production lines



Multiple braking modes and instant stopping

Dynamic braking

- Available on the situation of big inertiaload and frequent braking
- Big braking torque and quick braking
- Configure with braking units and resistors

Flux braking

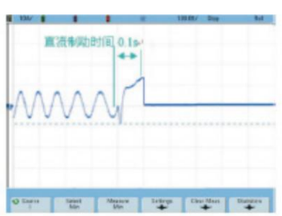
- No need to configurebraking units and resistors.
- Available on the instant stopping situation with big inertia load and no frequent braking.
- Not available on the situation of big inertia load and frequent and braking (the energy consumed on the stator and its cooling is better than DC braking).

DC braking

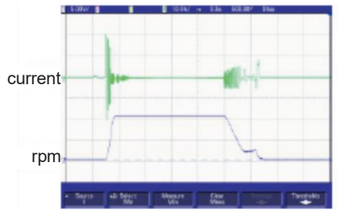
- No need to configure braking units and resistors.
- Available on the situation when start the running motor after braking and the situation when keep the moment output after braking to zero speed.
- Not available on the situation of big inertia load or instant stopping braking in high speed running.

Short circuit braking

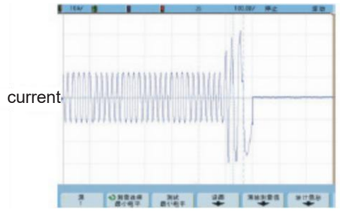
- No need to configure braking units and resistors, capable of braking quickly.
- Applicable to the motors at quick start and stop or restart after braking.
- Not applicable to big inertia load and frequent braking.



Current waveform of asynchronous motor under space voltage vector control mode, brakin g current 100%, DC braking starting frequency 10Hz and braking time 0.1s



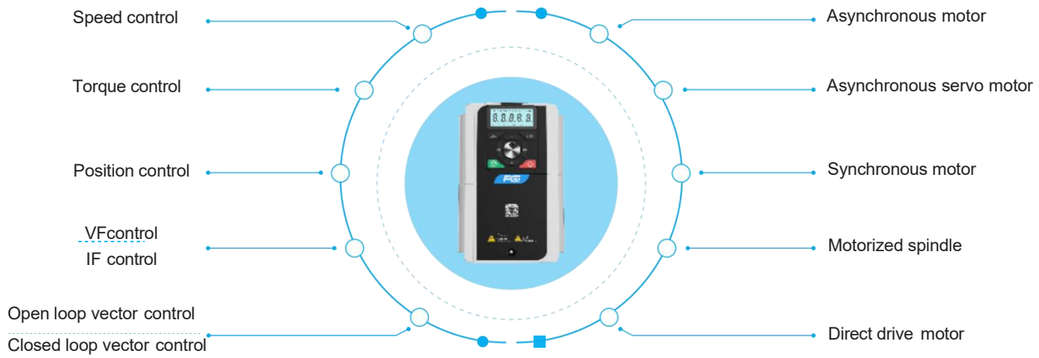
Permanentmagnet synchronous motor short-circuit braking waveform, acceleration time 0 1s, deceleration time 0 4s motor rated frequency 100Hz, short circuit braking frequency 20Hz, braking time 0 5s)



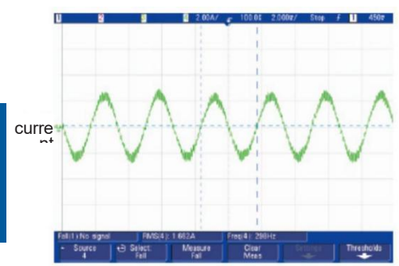
When the space voltage vector control mode of asynchronous motor operates at 50Hz with 100% rated load and deceleration time of 0.1s, the magnetic flux braking current waveform

Integrated synchronous and asynchronous motor control

It can drive all kinds of motors: direct drive motor, permanent magnet synchronous motor, motorized spindle, asynchronous servo motor, ordinary asynchronous motor, variable frequency motor, servo motor, etc



Synchronous and asynchronous drive integration, open loop and closed loop comprehensiveness, excellent motor driving performance



Current waveform of synchronous motor under open-loop vector control mode 300Hz with 100% rated load

Overvoltage stall

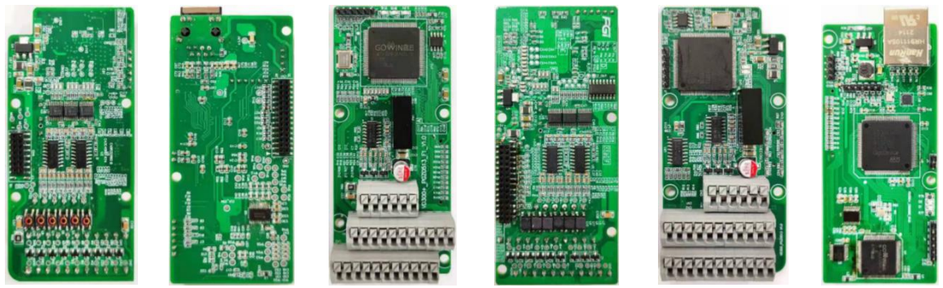
In the process of deceleration, the output frequency is adjusted to avoid excessive power generation of the motor caused by too fast deceleration, resulting in overvoltage of the DC bus of the frequency converter.

Overcurrent stall

In the process of acceleration, the output frequency is adjusted to avoid excessive load caused by too fast acceleration, resulting in overcurrent of the frequency converter.

■ Abundant extended functions

Strengthen the expansion capability and meet the needs of a variety of applications at the same time



(1) Optional I / Ocard, CANopen communication card, PROFIBUS DP communication card, isolated 485 communication card and various types of PG cards can meet the needs of various expansion cards at the same time and quickly meet the personalized needs of customers.

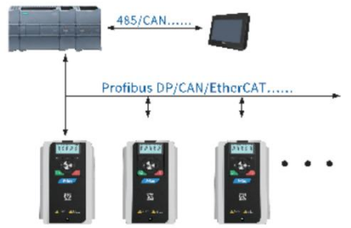
(2) It supports various encoder interfaces such as differential, rotary transformer and collector signal, and can realize highprecision closed-loop vector control.

(3) Simple and fashionable segment code screen keyboard design makes debugging more smooth and convenient.

■ Multi-functions

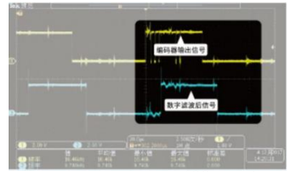
▪Support various industrial communication protocols and be compatible with various industrial control systems

RS485 communication is configured as standard and supported by expansion card:Ethernet,CANopen,CAN,Profibus DP,Profinet,Modbus-TCP,EtherCAT



▪PG card adopts digital filtering technology to improve electromagnetic compatibility and realize long-distance stable reception of encoder signals. Compared with traditional schemes, the anti-interference performance is doubled

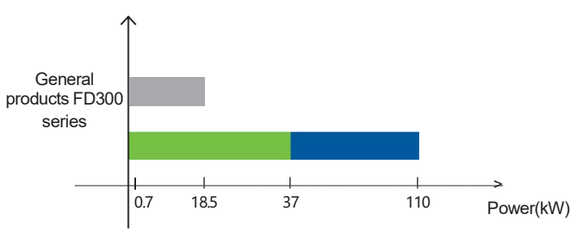
Support pulse setting and frequency division output; It has the function of quick detection of encoder disconnection to avoid the expansion of the influence of system failure



Encoder signal when 100m motor line is coupled in near field

▪Two channels of HDI are equipped as standard, which can be used as speed source and support high-speed AB pulse input signal to form a simple closed-loop application and provide customers with a cost-effective closed-loop application scheme

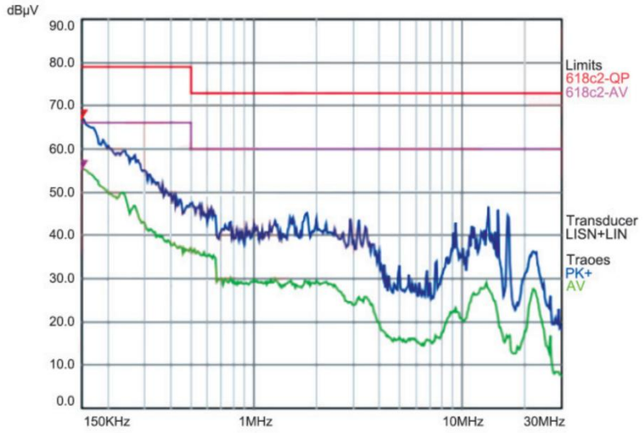
▪Maximum support for 110KW built-in braking unit, saving cost and installation space for customers



Note:37KW and below products support standard built-in braking unit, and 45 ~ 110KW products support optional builtin braking unit

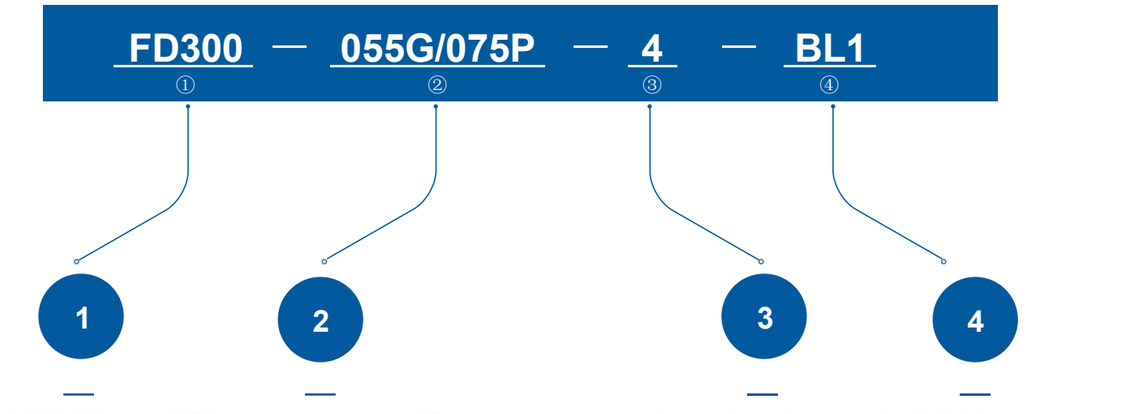
.380 volt level products standard equipped with C3 filter, and optional C2 filter

In order to meet different application requirements in various places, 380 volt class product is equipped with builtin C3 input filter as standard and assembled before leaving the factory, so as to save external installation space and avoid electromagnetic interference caused by improper selection and on-site installation caused by the use of external filter



Remarks:
C2 filter: EMC performance of the VFD achieves the limited usage requirement in civil environment.C3 filter: EMC performance of the VFD achieves the limited usage requirement in industrial environment.

Product model and Parameters



Model No. description

Product Model and Rated Current Parameters(380V)

Model No.	Output power (kW)		Input current(A)		Output current(A)		Standard	Apolegamic
	G Type	P Type	G Type	P Type	G Type	P Type		
FD300-1R5G/2R2P-4-B	1.5	2.2	5.0	5.8	3.7	5	Standard brake unit	
FD300-2R2G/004P-4-B	2.2	4	5.8	13.5	5	9.5		
FD300-004G/5R5P-4-B	4	5.5	13.5	19.5	9.5	14		
FD300-5R5G/7R5P-4-B	5.5	7.5	19.5	25	14	18.5		
FD300-7R5G/011P-4-B	7.5	11	25	32	18.5	25		
FD300-011G/015P-4-B	11	15	32	40	25	32		
FD300-015G/018P-4-B	15	18.5	40	47	32	38		
FD300-018G/022P-4-BL1	18.5	22	47	51	38	45	Standard brake unit,DC reactor	
FD300-022G/030P-4-BL1	22	30	51	70	45	60		
FD300-030G/037P-4-BL1	30	37	70	80	60	75		
FD300-037G/045P-4-BL1	37	45	80	98	75	92		
FD300-045G/055P-4-L1	45	55	98	128	92	115	Standard DC reactor	Optional brake unit
FD300-055G/075P-4-L1	55	75	128	139	115	150		
FD300-075G/090P-4-L1	75	90	139	168	150	180		
FD300-090G/110P-4-L1	90	110	168	201	180	215		
FD300-110G/132P-4-L1	110	132	201	265	215	260		
FD300-132G/160P-4-L1	132	160	265	310	260	305	Standard DC reactor	
FD300-160G/185P-4-L1	160	185	310	345	305	340		
FD300-185G/200P-4-L1	185	200	345	385	340	380		
FD300-200G/220P-4-L1	200	220	385	430	380	425	Standard DC reactor	Optional output reactor
FD300-220G/250P-4-L1	220	250	430	460	425	480		
FD300-250G/280P-4-L1	250	280	460	500	480	530		
FD300-280G/315P-4-L1	280	315	500	580	530	600		
FD300-315G/355P-4-L1	315	355	580	625	600	650		
FD300-355G/400P-4-L1	355	400	625	715	650	720	Standard DC reactor	Optional output reactor
FD300-400G/450P-4-L1	400	450	715	840	720	820		
FD300-450G/500P-4-L1	450	500	840	890	820	860		
FD300-500G/560P-4-L02	500	560	890	997	860	1020	Standard input+output DC reactor	
FD300-560G/630P-4-L02	560	630	997	1121	1020	1100		
FD300-630G-4-L02	630	710	1121	/	1100	/		

Remark

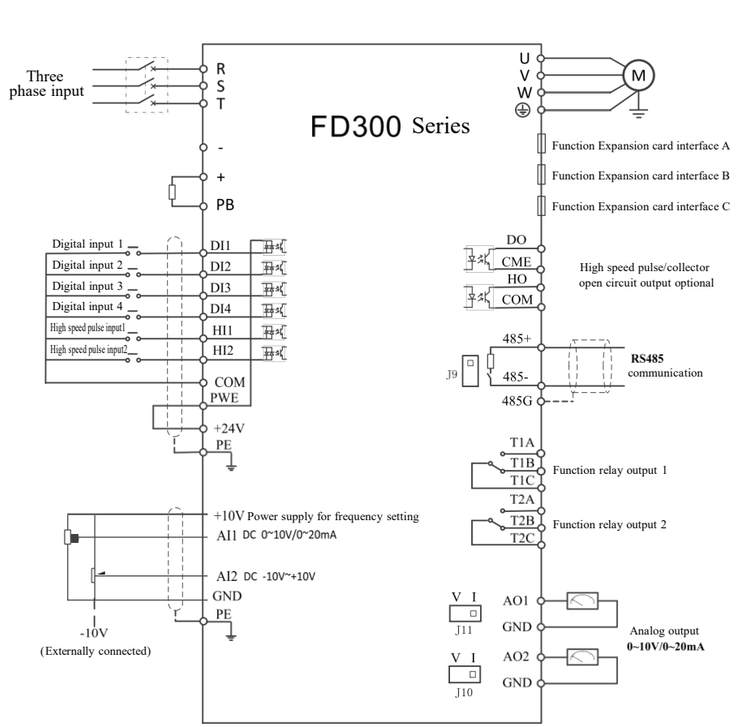
1.FD300 380V Single Unit maximum is 630KW.
2.The input current is the actual test result when the input voltage is 380V, and the input current above 30kW (included) is the measured current value after the DC reactor is configured.
3.Under the allowable input voltage range, the output current shall not exceed the rated output current; The output power shall not exceed the rated output power.
4.Built-in brake unit shall be configured below 37kW (included); 45-110KW optional built-in brake unit.
5. 18.5-315KW standard DC reactor.6. 132-450KW optional output reactor.

Product Model and Rated Current Parameters(690V)

Model No	Output power(kW)	Input current(A)	Output current(A)	Carrier frequency(kHz)
FD300-022G-6	22	35	27	1~15
FD300-030G-6	30	40	35	1~15
FD300-037G-6	37	47	45	1~15
FD300-045G-6	45	52	52	1~15
FD300-055G-6	55	65	62	1~15
FD300-075G-6	75	85	86	1~15
FD300-090G-6	90	95	98	1~15
FD300-110G-6	110	118	120	1~15
FD300-132G-6	132	145	150	1~15
FD300-160G-6	160	165	175	1~15
FD300-185G-6	185	190	200	1~15
FD300-200G-6	200	210	220	1~15
FD300-220G-6	220	230	240	1~15
FD300-250G-6	250	255	270	1~15
FD300-280G-6	280	286	300	1~15
FD300-315G-6	315	334	350	1~15
FD300-355G-6	355	360	380	1~15
FD300-400G-6	400	411	430	1~15
FD300-450G-6	450	461	480	1~15
FD300-500G-6	500	518	540	1~15
FD300-560G-6	560	578	600	1~15
FD300-630G-6	630	655	680	1~15
FD300-710G-6	710	750	750	1~15
FD300-800G-6	800	860	860	1~15
FD300-1000G-6	1000	1036	1080	1~15
FD300-1250G-6	1250	1310	1360	1~15

Rich external interfaces, meeting most application sites

Function		Specification
Peripheral interface	Analog input	1(AI1)0~10V/0~20mA,1(AI2)-10~10V
	Analog output	2way(AO1 AO2)0~10V /0~20mA
	Terminal analog input resolution	≤ 20mV
	Terminal switch input resolution	≤ 2ms
	Digital input	4 common input, maximum frequency 1kHz, internal impedance: 3.3kΩ; 2 high-speed input, maximum frequency 100kHz
	Digital output	1 high-speed pulse output, maximum frequency 100kHz; 1 DO terminal output collector open-circuit output
	Relay Output	2 programmable relay outputsT1A normally open, T1B normally closed, T1C common terminalT2A normally open, T2B normally closed, T2C common terminalContact capacity: 3A/AC250V, 1A/DC30V
	communication interface	1 RS485 (non-isolated)
	Expansion interface	2 expansion interfaces are supported below 5.5kW: Slot1 and Slot2;Three expansion interfaces are supported for devices above 7.5kW: Slot1, Slot2, and Slot3;Scalable PG card, communication card, programmable card, IoT card, I/O card, etc

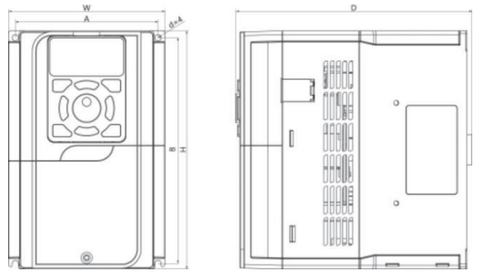


Control loop wiring diagram

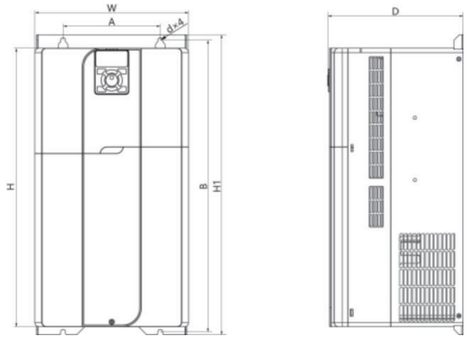
Technical Specifications

Function		Specification
Input Power	Input Voltage(V)	AC 3PH 380V(-15%)~440V(+10%)Rated Voltage:380V AC 3PH 520V(-15%)~690V(+10%)Rated Voltage:690V
	Input current(A)	Please refer to "Product rated current parameters"
	Input frequency(Hz)	50Hz or 60Hz, allowable range:47~63Hz
Output Power	Output voltage(V)	0~ Input voltage
	Output current (A)	Please refer to "Product rated current parameters"
	Output Power(kW)	Please refer to "Product rated current parameters"
	Output frequency(Hz)	0~600H(zexport product 0~400Hz)
Technical control performance	Control Mode	Space voltage vector control mode, no PG vector control mode, PG vector control mode asynchronous motor, synchronous motor.
	Motor type	Asynchronous motor, synchronous motor.
	Speed regulation ratio	Asynchronous motor 1:200 (SVC), synchronous motor 1:50 (SVC), 1:1000 (VC)
	Speed control accuracy	±0.2% (without PG vector control), ±0.02% (with PG vector control)
	Speed fluctuation	± 0.3% (without PG vector control)
	Torque response	<20ms (without PG vector control), <10ms (with PG vector control)
	Torque control accuracy	10% (without PG vector control), 5% (with PG vector control)
	Starting Torque	Asynchronous motor: 0.25Hz/150% (without PG vector control) Synchronous motor: 1Hz/150% (without PG vector control)Hz/ 200% (with PG vector control)
	Overload Capacity	(G type machine): 150% rated current 1min, 180% rated current 10S, 200% rated current 1s (P type machine): 120% rated current 1min, 150% rated current 3S, 160% rated current 1s
Operational control performance	Frequency setting mode	Digital setting, analog setting, pulse frequency setting, multi-stage speed operation setting, simple PLC setting, PID setting, Modbus communication setting, Profibus communication setting, etc; Realize setting combination and setting channel switching
	Automatic voltage adjustment function	When the grid voltage changes, it can automatically keep the output voltage constant
	Failsafe function	Provide more than thirty fault protection functions: overcurrent, overvoltage, undervoltage, overtemperature, phase loss, overload and other protection functions
	Speed tracking restart function	The inverter(VFD) can track the rotating speed of the rotating motor i n full frequency band and Smooth starting of the rotating motor

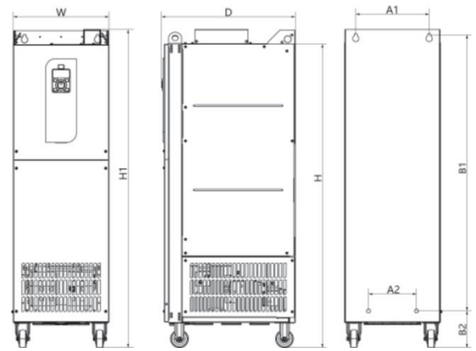
C Type(C1-C4)



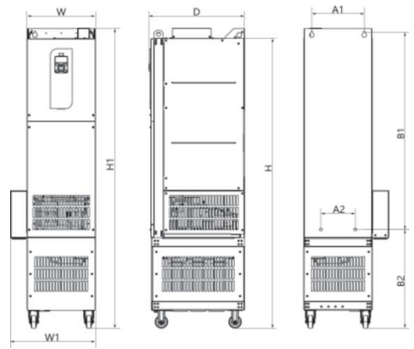
C Type(C5-C7)



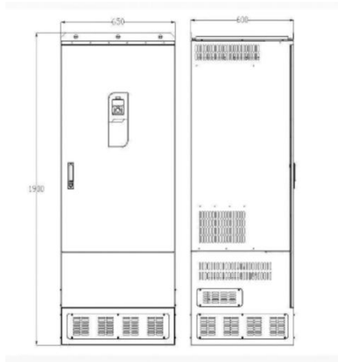
C Type(C8-C10)



C Type(C8-C10 Optional)



C Type(C11)



Note: Customized development is supported. If you need the size of the inverter cabinet, please contact the manufacturer

Volume (case code)	Inverter Model	Mounting hole location(mm)			Dimension(mm)					Mounting Hole Dia(mm)
		A1	A2	B	H	H1	W	W1	D	
C1	FD300-1R5G/2R2P-4-B	114		180	190	/	125	/	185	φ5
	FD300-2R2G/003P-4-B									
	FD300-004G/5R5P-4-B									
	FD300-5R5G/7R5P-4-B									
C2	FD300-7R5G/011P-4-B	147		298	310	/	160	/	208	φ6
	FD300-011G/015P-4-B									
	FD300-015G/018P-4-B									
C3	FD300-018G/022P-4-BL1	187		333	345	/	200	/	208	φ6
	FD300-022G/030P-4-BL1									
C4	FD300-030G/037P-4-BL1	227		378	390	/	240	/	222	φ6
	FD300-037G/045P-4-BL1									
C5	FD300-045G/055P-4-L1	180		540	515	555	285	/	252	φ9
	FD300-055G/075P-4-L1									
	FD300-075G/090P-4-L1									
C6	FD300-090G/110P-4-L1	260		535	511	555	340	/	336	φ11
	FD300-110G/132P-4-L1									
C7	FD300-132G/160P-4-L1	260		800	775	825	340	/	400	φ11
	FD300-160G/185P-4-L1									
	FD300-185G/200P-4-L1									
No built-in output reactor										
C8	FD300-200G/220P-4-L1	260	170	980	1080	1133	340	/	475	φ11
	FD300-220G/250P-4-L1									
C9	FD300-250G/280P-4-L1	260	170	1149	1260	1313	340	/	550	φ11
	FD300-280G/315P-4-L1									
	FD300-315G/355P-4-L1									
C10	FD300-355G/400P-4-L1	260	170	1259	1370	1423	340	/	550	φ11
	FD300-400G/450P-4-L1									
	FD300-450G/500P-4-L1									
Optional built-in output reactor										
C8	FD300-200G/220P-4-L12	260	170	980	1440	1493	340	422	475	φ11
	FD300-220G/250P-4-L12									
C9	FD300-250G/280P-4-L12	260	170	1149	1591	1644	340	478	550	φ11
	FD300-280G/315P-4-L12									
	FD300-315G/355P-4-L12									
C10	FD300-355G/400P-4-L12	260	170	1259	1701	1754	340	478	550	φ11
	FD300-400G/450P-4-L12									
	FD300-450G/500P-4-L12									
C11	FD300-500G/560P-4-L02	/	/	/	1900	/	650	/	600	/
	FD300-560G/630P-4-L02									
	FD300-630G-4-L02									

Volume (case code)	Inverter Model	Mounting hole location(mm)			Dimension(mm)					Mounting Hole Dia(mm)
		A1	A2	B	H	H1	W	W1	D	
C3	FD300-022G-6	187		333	345	/	200	/	208	φ6
	FD300-030G-6									
C4	FD300-037G-6	227		378	390	/	240	/	222	φ6
	FD300-045G-6									
C5	FD300-055G-6	180		540	515	555	285	/	252	φ9
	FD300-075G-6									
	FD300-090G-6									
C6	FD300-110G-6	260		535	511	555	340	/	336	φ11
	FD300-132G-6									
C7	FD300-160G-6	260		800	775	825	340	/	400	φ11
	FD300-185G-6									
	FD300-200G-6									
No built-in output reactor										
C8	FD300-220G-6	260	170	980	1080	1133	340	/	475	φ11
	FD300-250G-6									
C9	FD300-280G-6	260	170	1149	1260	1313	340	/	550	φ11
	FD300-315G-6									
	FD300-355G-6									
C10	FD300-400G-6	260	170	1259	1370	1423	340	/	550	φ11
	FD300-450G-6									
	FD300-500G-6									
Optional built-in output reactor										
C8	FD300-220G-6-L2	260	170	980	1440	1493	340	422	475	φ11
	FD300-250G-6-L2									
C9	FD300-280G-6-L2	260	170	1149	1591	1644	340	478	550	φ11
	FD300-315G-6-L2									
	FD300-355G-6-L2									
C10	FD300-400G-6-L2	260	170	1259	1701	1754	340	478	550	φ11
	FD300-450G-6-L2									
	FD300-500G-6-L2									
C11	FD300-560G-6-L02	/	/	/	1900	/	650	/	600	
	FD300-630G-6-L02									
	FD300-710G-6-L02									