

## ALPHA6000S Series Open Loop Vector Control AC Drive



## Feature

ALPHA6000S series AC drive is a high-performance product under open loop vector control mode. Adoption of the international leading technology of current vector control and torque control allows this product to really achieve the decoupling of AC motor and control manner of DC motor. The superior control attributes of our product can fully satisfy the motion drive requirements of our customers.

## Technical Characteristics

- Input voltage fluctuation range is  $\pm 20\%$ .
- Built-in RS485 communication supports MODBUS-RTU protocol.
- Flexible frequency mix-given function
- Multiple programmable I/O terminals
- Abundant fault-protection and running-monitor functions
- Support a range of extension cards including I/O, communication card, and more.
- Three control modes including V/F control, Non-PG vector control, and V/F separation control.

### V/F Control

It features superior control performance of vector control. Also, it is insensitive to motor parameters.

Start Torque	0.5Hz/ 150% rated torque
Speed Range	1:100
Steady-State Precision	$\pm 0.5\%$

It can control the motor to run stably with 150% rated torque at 0.5Hz.

### Non-PG Vector Control (Open Loop Vector Control)

Independent current loop control guarantees the real torque control. It supports the immediate switching between torque control mode and speed control mode.

Start Torque	0.5Hz/ 180% rated torque
Speed Range	1:200
Steady-State Precision	$\pm 0.5\%$
Torque Precision	$\pm 5\%$
Torque Response	< 20ms

It can control the motor to run smoothly with 150% rated torque at 0.5Hz.

- Superior Control Properties
  - 1) 0.1s acceleration-deceleration under rated torque is attainable.
  - 2) No sudden change or oscillation occurs in current phase when motor rotation reverses at zero speed.
  - 3) Mains voltage is under stable control. Quick and reliable brake is available at deceleration even without dynamic brake.
- Trip-Free Running
  - 1) Advanced current and voltage control technology allows the AC drive to run stably without trip when alternatively accelerated and decelerated in 0.1s command.
  - 2) Due to strong load capacity, the AC drive can work continuously for 20s with 180% rated load, and 1min with 150% rated load.
  - 3) The AC drive offers smooth operation with large torque at low frequency under vector control mode.
- Unique treatment to instantaneous power-failure
- Extraordinary torque tracking function
  - 1) Without special hardware detection circuit or function code setup, the AC drive can recognize motor speed, rotation, and phase angle in 0~60Hz within 0.2s. It also provides smooth tracking start of freely rotating motor.

## Industry Applications

The open loop vector control AC drive can be used in various industries including the wire drawing machine, film winding machine, coating machine, CNC machinery, knitting machine, jacquard machine, fan, water pump, chemical fiber, textile, synchronous linkage, injection molding machine, rolling mill, paper making line, etc.

## Specification

### Technical Specification of ALPHA6000S

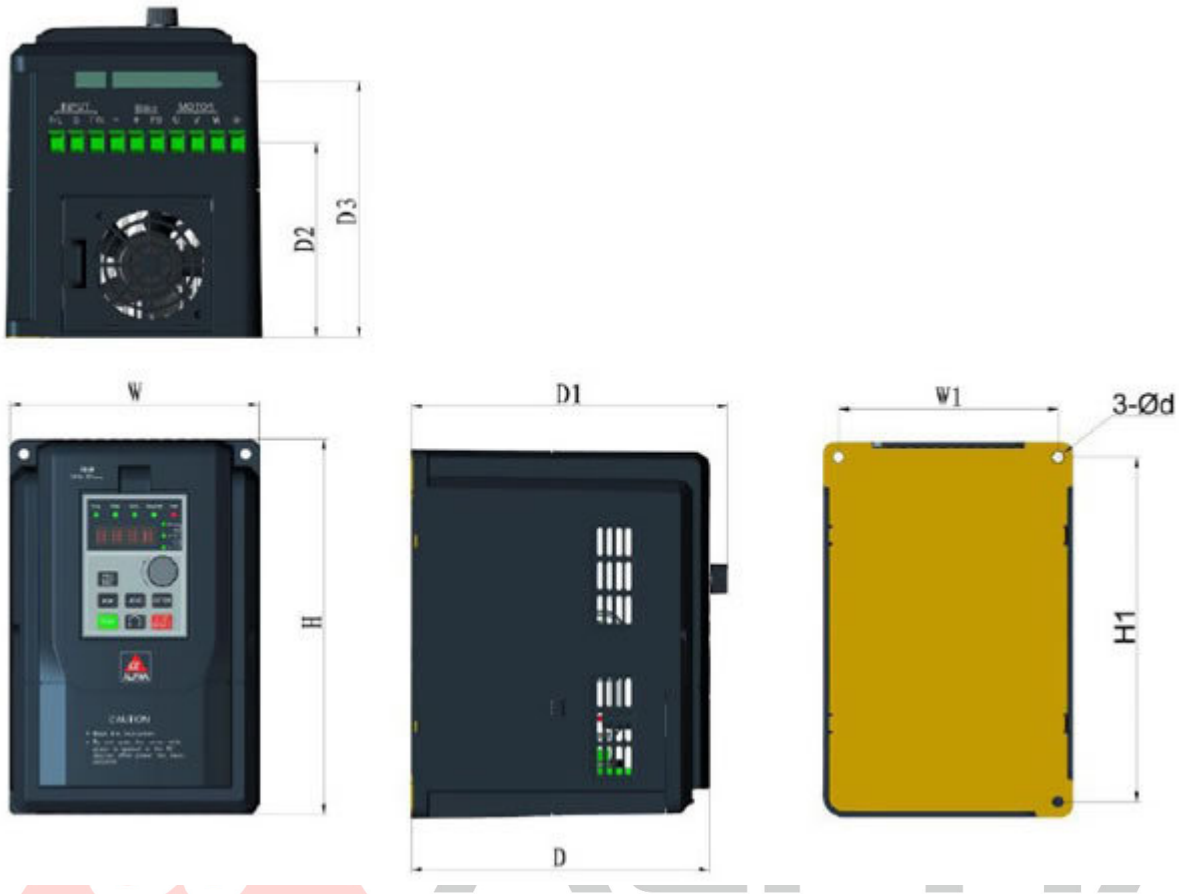
Item	Specification
Power Range	380V $\pm$ 20% three phases: From 0.75 to 500kW
Rated Input Voltage and Frequency	380V three phases: 50/60Hz

Allowable Input Voltage Range	380V three phases: From 304 to 456V, Voltage unbalance rate of less than 3%, Frequency fluctuation of below $\pm 5\%$
Rated Output Voltage	From 0 to rated input voltage
Max. Overload Current	G model: 150% for one minute, 180% for 20 seconds
Control Method	V/F control, Non-PG vector control, and V/F separation control
Frequency Range	From 0.00 to 650.00Hz (from S21R5GB to 3004GB) From 0.00 to 400.00Hz (from 35R5GB/37R5PB to 3500G)
Frequency Accuracy	Digital command $\pm 0.01\%$ (from $-10^{\circ}\text{C}$ to $+40^{\circ}\text{C}$ ) Simulation command $\pm 0.01\%$ ( $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ )
Preset Frequency Resolution	Digital command 0.01Hz Simulation command 1/1000 of the maximum frequency
Output Frequency Resolution	0.01Hz
Preset Frequency Signal	From 0 to 10V, From 0 to 20mA
Acceleration-Deceleration Time	From 0.1 to 3600 seconds (The acceleration and deceleration time can be preset separately.)
Braking Torque	The additional braking resistance reaches up to 125%.
Voltage-Frequency Characteristics	Four kinds of fixed V /F characteristics are selectable. Any V/F characteristic can be preset.
Protective Functions	Over-voltage, under-voltage, current limit, over-current, overload, electronic thermal relay, overheating, over-voltage stall, load short circuit, grounding, under-voltage protection, input phase loss, output phase loss, short circuit to ground, interphase short circuit, motor overload protection, etc
Ambient Temperature	From $-10^{\circ}\text{C}$ to $+40^{\circ}\text{C}$
Humidity	From 5 to 95% RH (No condensation)
Storage Temperature	From $-40^{\circ}\text{C}$ to $+70^{\circ}\text{C}$
Service Place	Indoor (without any corrosive gas)
Installation Site	The altitude is at most 1,000m. There is not any dust, corrosive gas, or direct solar radiation.
Vibration	Less than $5.9\text{m/s}^2$ (0.6g)
Protection Rating	IP20
Cooling Method	Natural cooling or forced air cooling

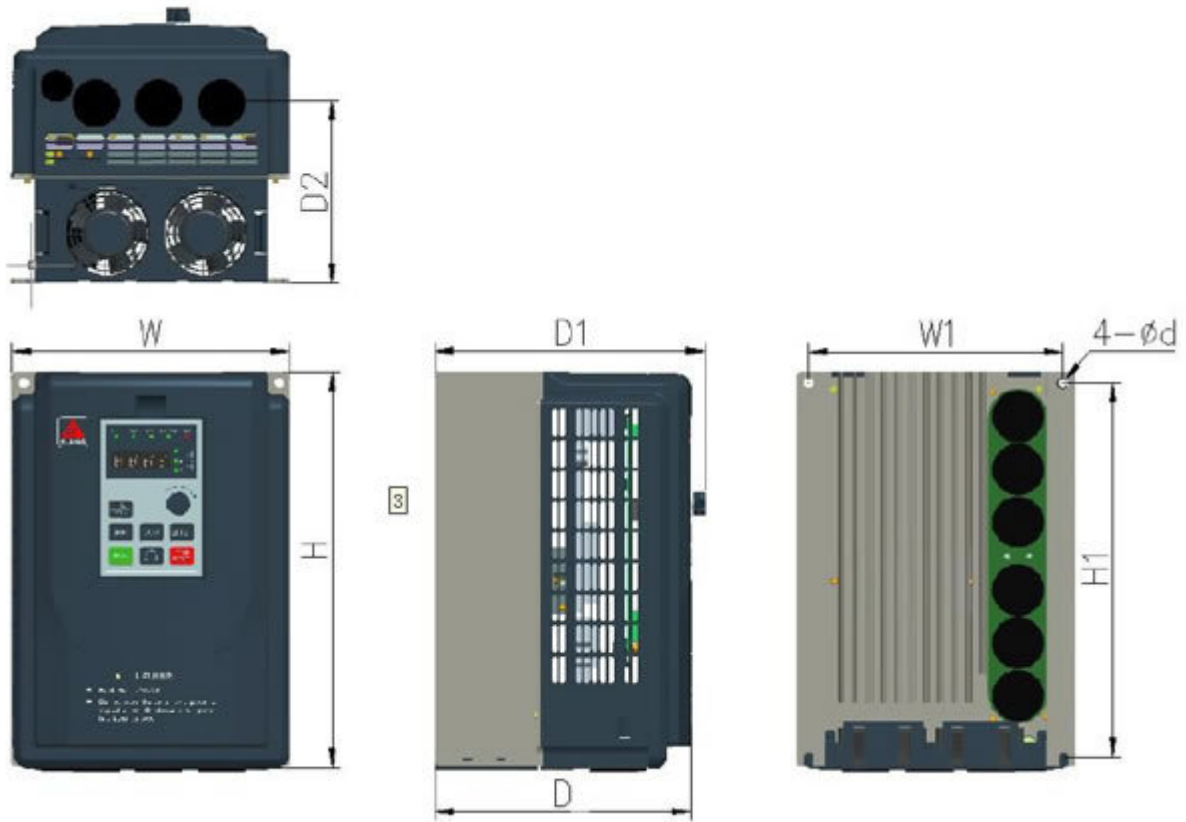
## Selection Guide

### ALPHA6000S Model Selection

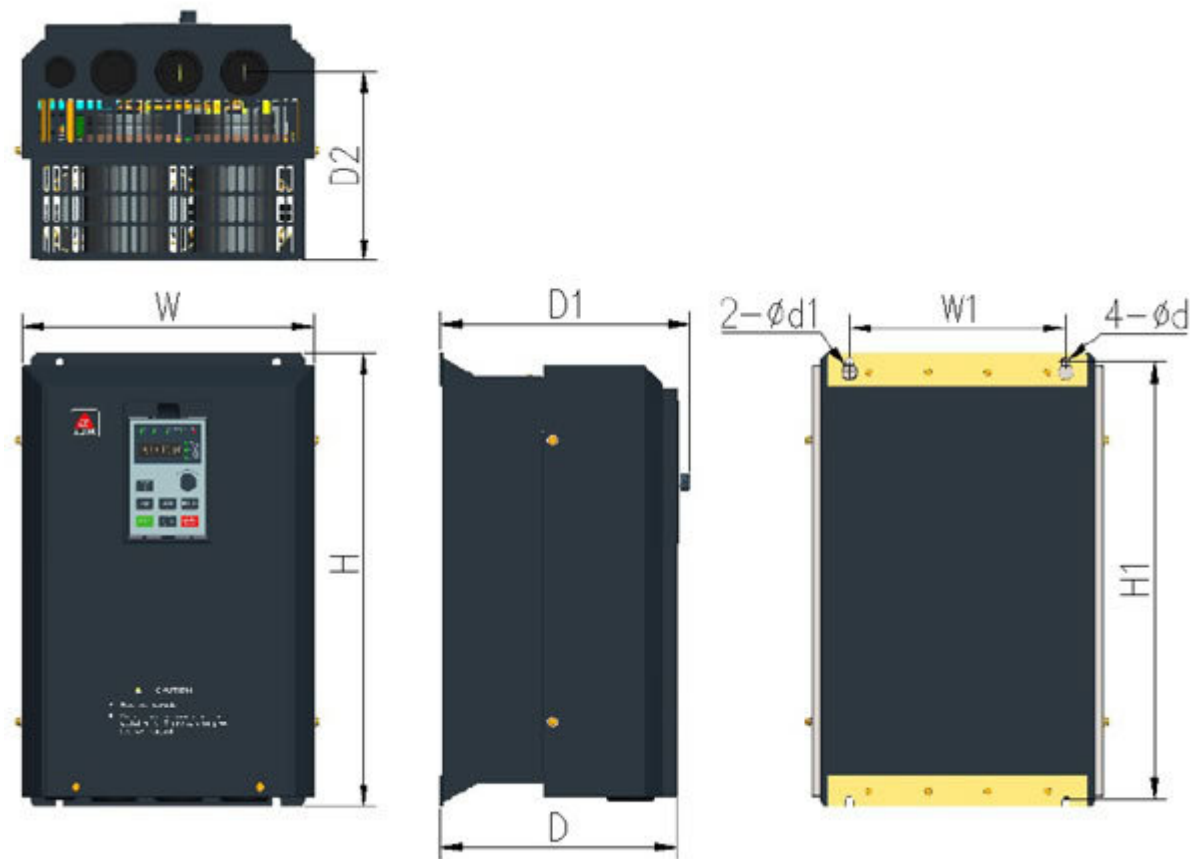
Voltage Classes	Model	Motor Power (kW)	Rated Output Current (A)
380V Three Phases	6000S-3R75GB	0.75	2.5
	6000S-31R5GB	1.5	4
	6000S-32R2GB	2.2	6
	6000S-3004GB	4	9
	6000S-35R5GB	5.5	13
	6000S-37R5GB	7.5	17
	6000S-3011GB	11	25
	6000S-3015GB	15	32
	6000S-3018G	18.5	37
	6000S-3022G	22	45
	6000S-3030G	30	60
	6000S-3037G	37	75
	6000S-3045G	45	90
	6000S-3055G	55	110
	6000S-3075G	75	152
	6000S-3093G	93	176
	6000S-3110G	110	210
	6000S-3132G	132	253
	6000S-3160G	160	304
	6000S-3185G	185	342
	6000S-3200G	200	380
	6000S-3220G	220	426
	6000S-3250G	250	480
	6000S-3280G	280	520
6000S-3315G	315	600	
6000S-3355G	355	680	
6000S-3400G	400	750	
6000S-3500G	500	900	

**Overall Dimension of ALPHA6000S Series Open Loop Vector Control AC Drive**


Model	H	H1	W	W1	D	D1	D2	D3	d
6000S-3R75GB	180	169	115	105	150	158	85	120	4.5
6000S-31R5GB									
6000S-32R2GB									
6000S-3004GB	195	173	130	108	157	167	100	130	5.5



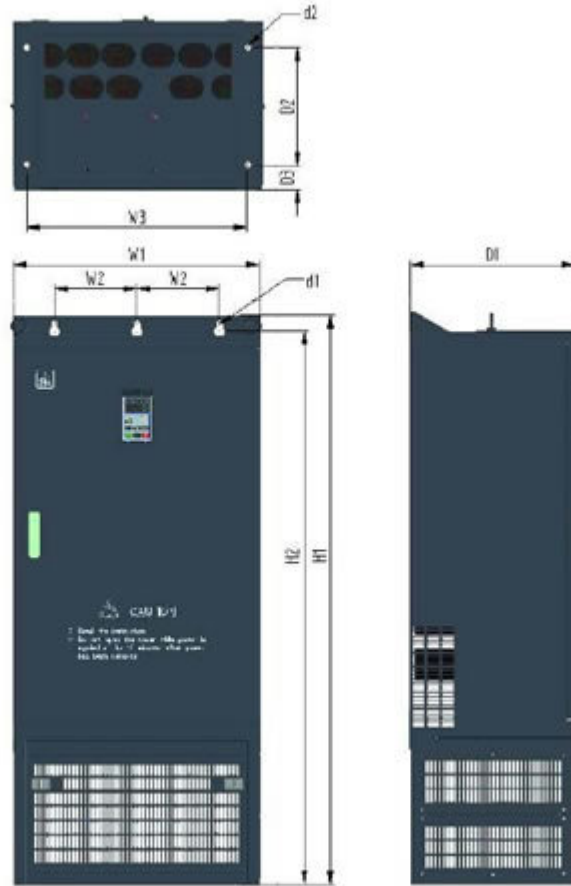
Model	H	H1	W	W1	D	D1	D2	d
6000S-35R5GB	270	255	190	175	176	186	122	7
6000S-37R5GB								



Model	H	H1	W	W1	D	D1	D2	d	d 1
6000S-3011GB	373	360	235	200	176	188	125	7	12
6000S-3015GB									
6000S-3018G	420	405	270	200	218	230	175	7	14
6000S-3022G									
6000S-3030G	503	488	311	200	230	242	180	7	14
6000S-3037G									
6000S-3045G	590	570	351	200	254	266	192	10	20
6000S-3055G									
6000S-3075G	698	672	400	280	260	272	186	12	22
6000S-3093G									
6000S-3110G	850	823	505	420	280	292	212	12	22
6000S-3132G									

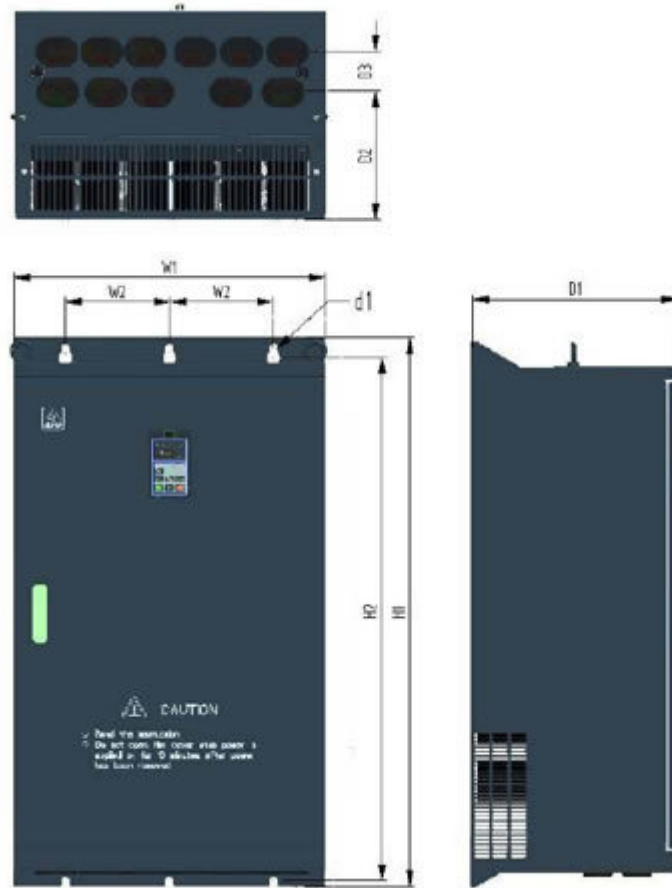


## Installation Size of 380V 160-355kW Three-Phase Standard Model with Base



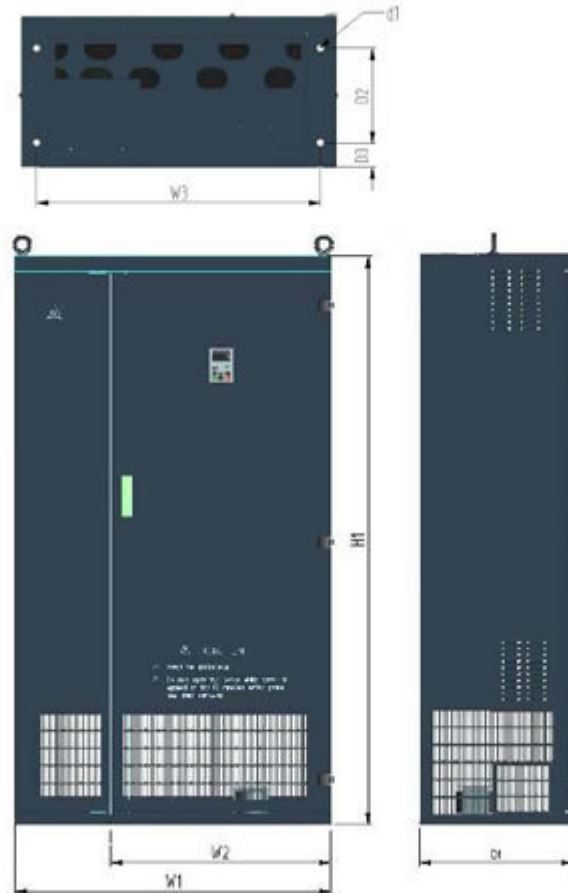
Model	W1	W2	W3	H1	H2	D1	D2	D3	d 1	d 2
6000S-3160G	600	200	530	1380	1360	400	280	60	3-φ 14	4-φ 14
6000S-3185G										
6000S-3200G										
6000S-3220G										
6000S-3250G	800	300	730	1535	1515	410	288	60	3-φ 14	4-φ 14
6000S-3280G										
6000S-3315G										
6000S-3355G										

## Installation Size of 380V 160-355kW Three-Phase Standard Model with Wall Mount



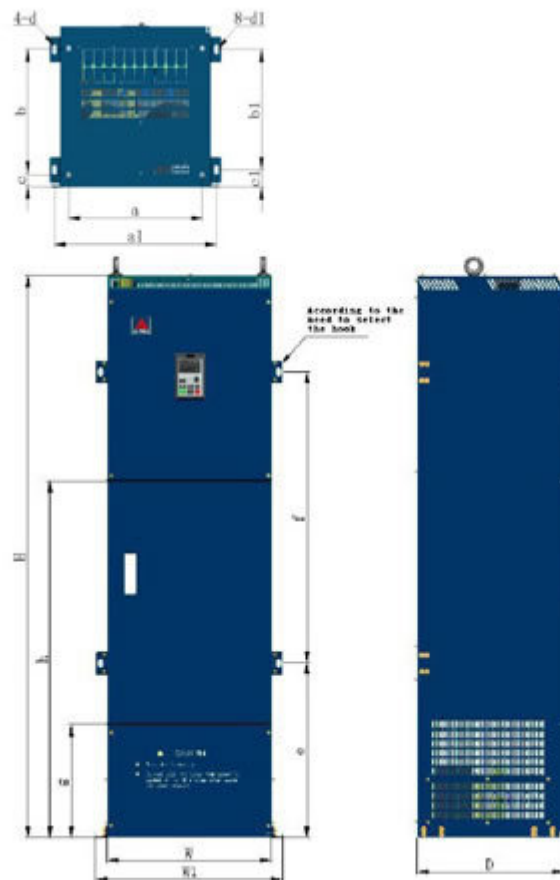
Model	W1	W2	H1	H2	D1	D2	D3	d 1
6000S-3160G	600	200	1026	1360	400	245	77	6-φ 14
6000S-3185G								
6000S-3200G								
6000S-3220G								
6000S-3250G	800	300	1180	1515	410	250	88	6-φ 14
6000S-3280G								
6000S-3315G								
6000S-3355G								

## Installation Size of 380V 400-500kW Three-Phase Standard Model

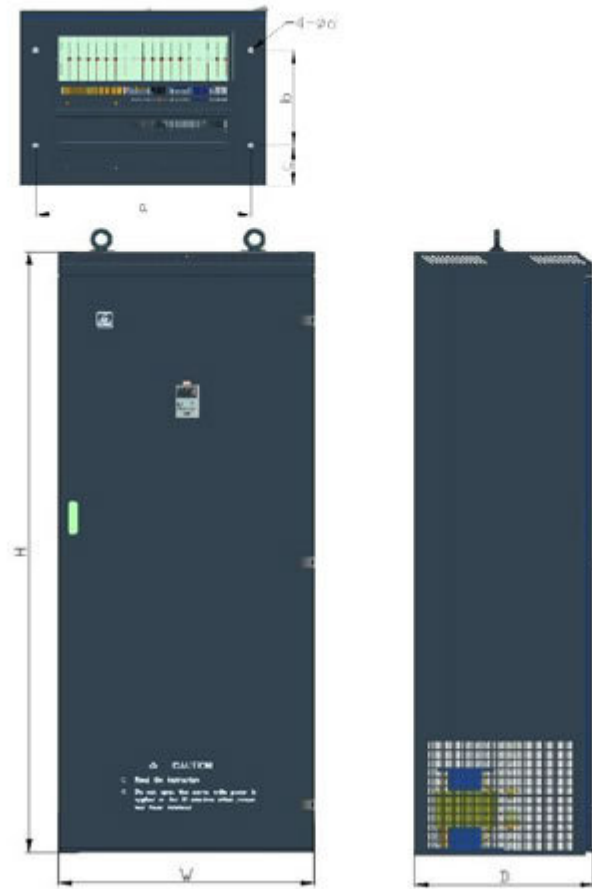


Model	W1	W2	W3	H1	D1	D2	D3	d 1
6000S-3400G	1000	700	900	1800	480	300	80	4-φ 22
6000S-3500G								

## Installation Size of 380V 160-500kW Three-Phase Narrow-Body Model



Model	W	W1	D	H	a	b	c	d
6000S-3160G	450	514	400	1600	400	315	30	15
6000S-3185G								
6000S-3200G								
6000S-3220G								
6000S-3250G	450	514	400	1800	400	315	30	15
6000S-3280G								
6000S-3315G								
6000S-3355G								



Model	W	D	H	a	b	c	d
6000S-3400G	800	550	2000	700	300	125	18
6000S-3500G							