

Sensorless Vector Control Drives

CP2000
For HVAC Drive Applications

Delta Electronics, Inc.

Taoyuan 1
31-1, Xingbang Road, Guishan Industrial Zone,
Taoyuan County 33370, Taiwan, R.O.C.
TEL: 886-3-362-6301 / FAX: 886-3-362-7267

Delta Electronics (Jiang Su) Ltd.

Wujiang Plant3
1688 Jiangxing East Road,
Wujiang Economic Development Zone,
Wujiang City, Jiang Su Province,
People's Republic of China (Post code: 215200)
TEL: 86-512-6340-3008 / FAX: 86-512-6340-7290

Delta Greentech (China) Co., Ltd.

238 Min-Xia Road, Cao-Lu Industry Zone, Pudong, Shanghai,
People's Republic of China
Post code: 201209
TEL 021-58635678 FAX: 021-58630003

Delta Electronics (Japan), Inc.

Tokyo Office
Delta Shibadaimon Building, 2-1-14
Shibadaimon, Minato-Ku, Tokyo, 105-0012,
Japan
TEL: 81-3-5733-1111 / FAX: 81-3-5733-1211

Delta Electronics (Korea), Inc.

234-9, Duck Soo Building 7F, Nonhyun-Dong,
Kangnam-Gu, Seoul, Korea 135-010
TEL: 82-2-515-5305 / FAX: 82-2-515-5302

Delta Electronics Int'l (Singapore) Pte Ltd

4 Kaki Bukit Ave 1, # 05 - 05, Singapore 417939
TEL: 65-6747-5155 / FAX: 65-6744-9228

Delta Electronics (India) Pvt. Ltd.

Plot No. 43, Sector - 35, HSIIDC,
Gurgaon 122001, Haryana, India
TEL: 91-124-416-9040 / FAX: 91-124-403-6045

Americas

Delta Products Corporation (USA)

Raleigh Office
P.O. Box 12173, 5101 Davis Drive,
Research Triangle Park, NC 27709, U.S.A.
TEL: 1-919-767-3813 / FAX: 1-919-767-3969

Delta Greentech (Brasil) S/A

Sao Paulo Office
Rua Itapeva, Nº 26, 3º andar, Bela vista
ZIP: 01332-000 - São Paulo - SP - Brasil
TEL: 55-11-3568-3875 / FAX: 55-11-3568-3865

Europe

Deltronics (The Netherlands) B.V.

Eindhoven Office
De Witbogt 15, 5652 AG Eindhoven, The Netherlands
TEL: 31-40-2592850 / FAX: 31-40-2592851





WHY CP2000?

Green Technology and Design

To fulfill Delta's mission to achieve greater energy-savings, we are proud to introduce a sensorless vector control VFD which is made for pump and fan applications and HVAC systems.

With the best performance in the industry, this VFD is specially designed for related applications with an intelligent PID controller.

Functions such as sensorless vector control, multi-segment V/F control curve and soft start greatly improve the efficiency of the variable torque loads and constant horsepower loads.

Variable Frequency Power Saving with HVAC Motors

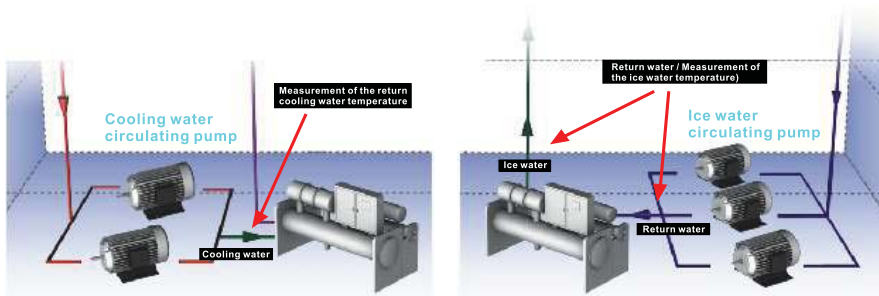


Figure 1: Multi-Pump Control

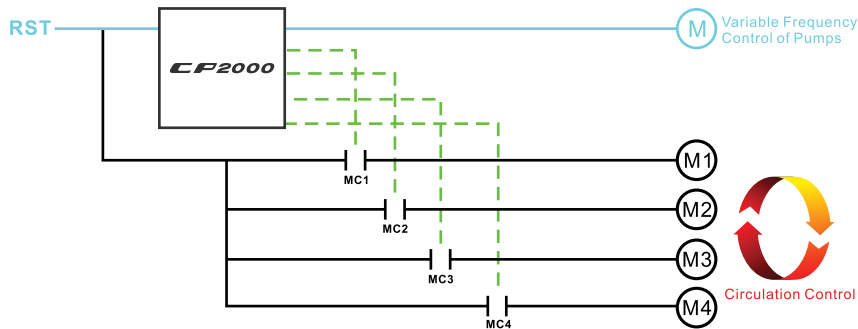


Figure 2: Fixed Quantity and Circulation Control of Pumps

Features

- 01 LCD keypad offers a user-friendly operation interface. The display screen can be defined by the user with TP-Editor soft.
- 02 Quick setting, user defined parameter management, and parameter copy functions make the installation fast and easy.
- 03 Modular design for flexible extension and ease maintenance.
- 04 Built-in BACnet and MODBUS. Various optional communication cards such as ProfiBUS-DP, DeviceNet, MODBUS TCP, EtherNet-IP, and CANopen.
- 05 Long-life design.
- 06 The PCB (Printed Circuit Board) coating enhances the reliability and durability.
- 07 Fire mode and Bypass functions provide safe operation in an emergency.
- 08 Useful functions for pump and fan applications, such as: PID control, sleep/wake up functions, flying start, and skip frequency.
- 09 Multi-pumps control functions, such as: fixed time, fixed quantity, circulating controls. The driver can control a maximum of eight pumps at the same time. An optional relay extension card is available depending on the pump quantity.
- 10 Built-in PLC 10K step and Real time Clock.



Standard Models

Power range: 230V 0.75~90kW, 460V: 0.75~400kW

230V (kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	
230V (HP)	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	
Frame Size	A			B			C			D			E				
460V (kW)	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
460V (HP)	1	2	3	5	5	7.5	10	15	20	25	30	40	50	60	75	100	125
Frame Size	A				B				C				D				
460V (kW)	110	132	160	185	220	280	315	355	400								
460V (HP)	150	175	215	250	300	375	425	475	536								
Frame Size	E		F		G		H										

Advanced Drive Technology

High performance Variable Frequency Drive Technology

1. SVC Sensorless vector control
2. Dual Rating Design (Light Duty & Normal Duty)
3. Excellent variable torque control

Modular Design

1. Hot Plug LCD keypad
2. I/O extension Card
3. Various communication card
4. Removable Fans

Versatile Drive Control

1. Built-in Programmable Logic Controller
2. Built-in Brake Unit*
3. Networking Drive System
4. Auto energy saving design

Environmental Adaptability

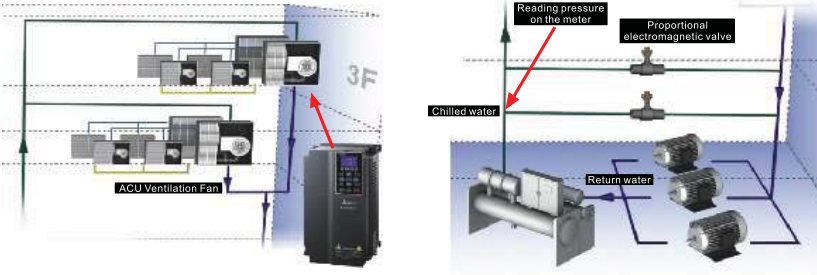
1. 50°C operation temperature
2. Built-in DC choke*
3. Coated circuit boards
4. Built-in RFI Filter
5. Global safety standards (CE/UL/cUL)



* Note: Please refer to the Product Specification

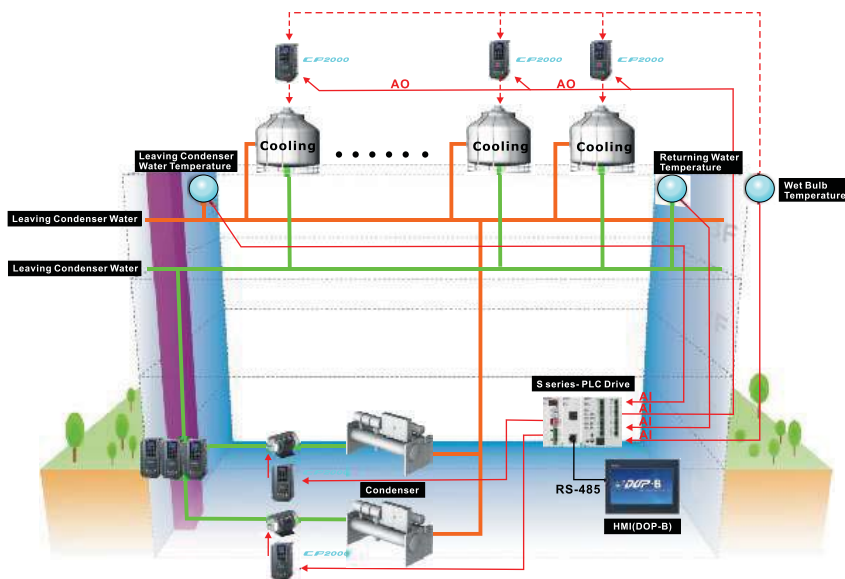
Increases Motor Performance

- The sensorless vector control(SVC) and AUTO-TUNING functions increase motor performance for variable torque loads applications.
- Deceleration Energy Backup (DEB): when a power loss occurs the drive decelerates and stops the motor to protect the equipment.
- Optimal Acceleration/Deceleration function makes the motor run smoothly and reduces vibration during start and stop.
- Various control functions for saving energy, such as: PID control, sleep/wake up function, and auto energy saving mode.



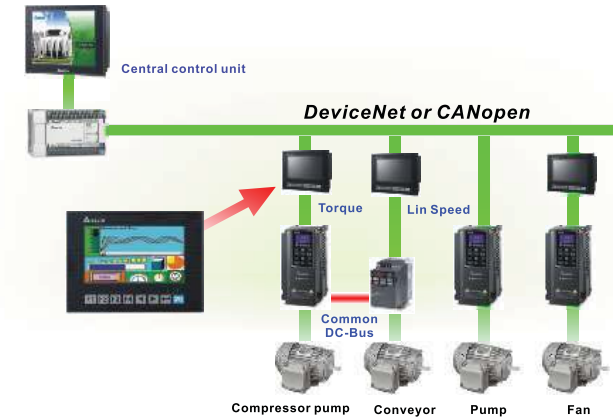
Features for Building Automation Applications

- Features for Building Automation Applications
- The four-segment exponential response curve can adjust the input voltage to increase performance for variable torque loads applications, especially for pump and fan applications
- Flying start and restart functions after a momentary power down provide the best operation for fan applications.
- Skip frequency function avoid motor vibration at a specific frequency band and protects the equipment.
- Low current protection protects the motor from load loss.
- Built-in BACnet lowers the cost of wiring for building automation.



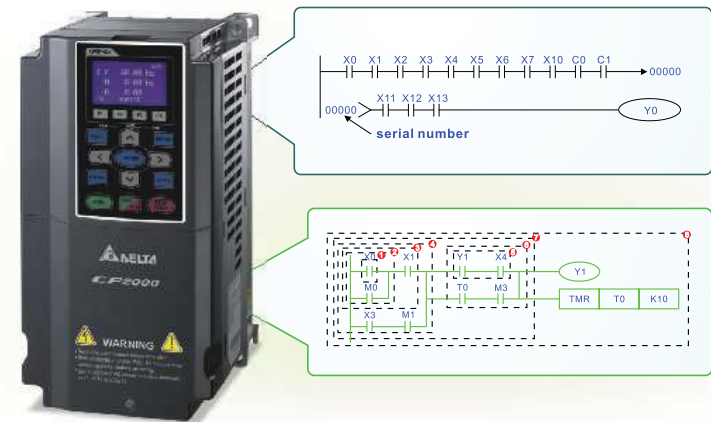
AC Motors Drives Network

- Advanced Network Functions.
 - RS-485 built in: International Standard Communication Interface.
 - Built-in BACnet , MODBUS
- Various communication network card and field bus cards are available.
- CANopen (DS402) , MODBUSTCP ,



Intelligent Programmable Logic Controller

- By connecting the built-in Delta PLC (programmable logic controller) to a network, you can easily use distributed control mode and independent operation to create an intelligent control space.
- The real time clock & calendar function allows you to program the PLC procedure, ON/OFF in chronological order, daylight saving time and more.



Modular Design

Modular design enhances drive and control. Depending on the requirements of system applications maintenance you can install input/output expansion cards, communication cards, hot plug LCD keypads, assembly terminal blocks and removable fans.



Designed for Environmental Adaptability

- Built-in DC choke* and RFI filter to effectively restrain harmonic waves and prevent noise.
- Enhanced coating on the control board's PCB to ensure reliability of VFD in an adverse environment.
- Flange mounting: designed to completely separate the heat dissipating system and other electronic components. Its installation can disperse heat out of the VFD. Cooling fan method can blow cold air into aluminum heat sink. Both heat dissipating methods are efficient, choose the one that fits the working environment for the best heat dissipation results.



*Note: Please refer to the Product Specification

Operating Environment

DO NOT expose the AC motor drive to harsh environments, such as dust, direct sunlight, corrosive/ inflammable gasses humidity, liquid or vibrations. The salt in the air must be less than 0.01 mg/cm² per year.

Environment	Installation location	IEC60364-1/IEC60664-1 Pollution degree 2, Indoor use only	
	Surrounding Temperature	Storage/ Transportation	-25°C ~ +70°C
No condensation, non-frozen			
Rated Humidity	Operation	Max. 90%	
	Storage/ Transportation	Max. 95%	
No condensed water			
Air Pressure	Operation/ Storage	86 to 106 kPa	
	Transportation	70 to 106 kPa	
Pollution Level	IEC721-3-3		
	Operation	Class 3C2 : Class 3S2	
	Storage	Class 2C2 : Class 2S2	
	Transportation	Class 1C2 : Class 1S2	
No concentrate			
Altitude	Operation		
	If AC motor drive is installed at altitude 0~1000m, follow normal operation restriction. If it is installed at altitude 1000~3000m, decrease 2% of rated current or lower 0.5 of temperature for every 100m increase in altitude. Maximum altitude for Corner Grounded is 2000m.		
Package Drop	Storage/ Transportation	ISTA procedure 1A(according to weight) IEC60068-2-31	
Vibration	1.0mm, peak to peak value range from 2Hz to 13.2 Hz; 0.7G~1.0G range from 13.2Hz to 55Hz; 1.0G range from 55Hz to 512 Hz. Complies with IEC 60068-2-6		
Impact	IEC/EN 60068-2-27		
Operation Position	Max. allowed offset angle±10° (under normal installation position)		±10°

Specification for Operation Temperature and Protection Level

Model	Frame	Top cover	Conduit Box	Protection Level	Operation Temperature
VFDxxxxCP23A-21 VFDxxxxCP43A-21 VFDxxxxCP4EA-21 VFDxxxxCP43C-21	Frame A~C 230V: 0.75~30kW 460V: 0.75~37kW	Remove top cover	Standard conduit plate	IP20/UL Open Type	ND: -10°C ~50°C LD: -10°C ~40°C
		Standard with top cover		IP20/UL Type1/NEMA1	ND: -10°C ~40°C LD: -10°C ~40°C
	Frame D~H 230V: above 37kW 460V: above 45kW	N/A	With conduit box	IP20/UL Type1/NEMA1	ND: -10°C ~40°C LD: -10°C ~40°C
VFDxxxxCP23A-00 VFDxxxxCP43A-00 VFDxxxxCP43C-00	Frame D~H 230V: above 37kW 460V: above 45kW	N/A	With conduit box	IP00 IP20/UL Open Type	ND: -10°C ~50°C LD: -10°C ~40°C (ND=Normal Duty LD=Light Duty)

Product Specifications

230V		A					B					C					D					E											
Frame Size																																	
Model : VFD-____CP23A-____		007	015	022	037	055	075	110	150	185	220	300	370	450	550	750	900																
Output Rating	Light Duty	Rated Output Capacity (kVA)	2.0	3.0	4.0	6.0	8.4	12	18	24	30	36	42	58	72	86	110	128															
		Rated Output Current (A)	5	7.5	10	15	21	31	46	61	75	90	105	146	180	215	276	322															
		Applicable Motor Output(kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90															
		Applicable Motor Output(HP)	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125															
		Overload tolerance	120% of rated current for 1 minute																														
	Normal Duty	Max. output frequency (Hz)	600.00Hz(55kW~ : 400.00Hz)																														
		Carrier Frequency (kHz)	2~15kHz(8KHz)					2~10kHz(6KHz)					2~9kHz(4KHz)																				
		Rated Output Capacity (kVA)	1.8	2.0	3.2	4.4	6.8	10	13	20	26	30	36	48	58	72	86	102															
		Rated Output Capacity (A)	4.6	5	8	11	17	25	33	49	65	75	90	120	146	180	215	255															
		Applicable Motor Output(kW)	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75															
Input Rating	Light Duty	Applicable Motor Output(HP)	0.5	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100															
		Overload tolerance	120% of rated current for 1 minute;160% of rated current for 3 seconds																														
		Max. output frequency (Hz)	600.00Hz(55 kW~ : 400.00Hz)																														
		Carrier Frequency (kHz)	2~15kHz(8KHz)					2~10kHz(6KHz)					2~9kHz(4KHz)																				
		Input Current (A) Normal Duty	6.4	9.6	15	22	25	35	50	65	83	100	116	146	180	215	276	322															
	Normal Duty	Input Current (A) Light Duty	3.9	6.4	12	16	20	28	36	52	72	83	99	124	143	171	206	245															
		Rated Voltage/Frequency	3-Phase AC 200V~240V(-15%~+10%), 50/60Hz																														
		Operating Voltage Range	170~265Vac																														
		Frequency Tolerance	47~63Hz																														
		Cooling method	Natural Cooling	Fan Cooling																													
Braking Chopper	Frame A,B,C Built-in					Frame D and above: Optional																											
DC choke	Frame A,B,C Optional					Frame D and above: 3% built-in																											
EMI Filter	Optional																																

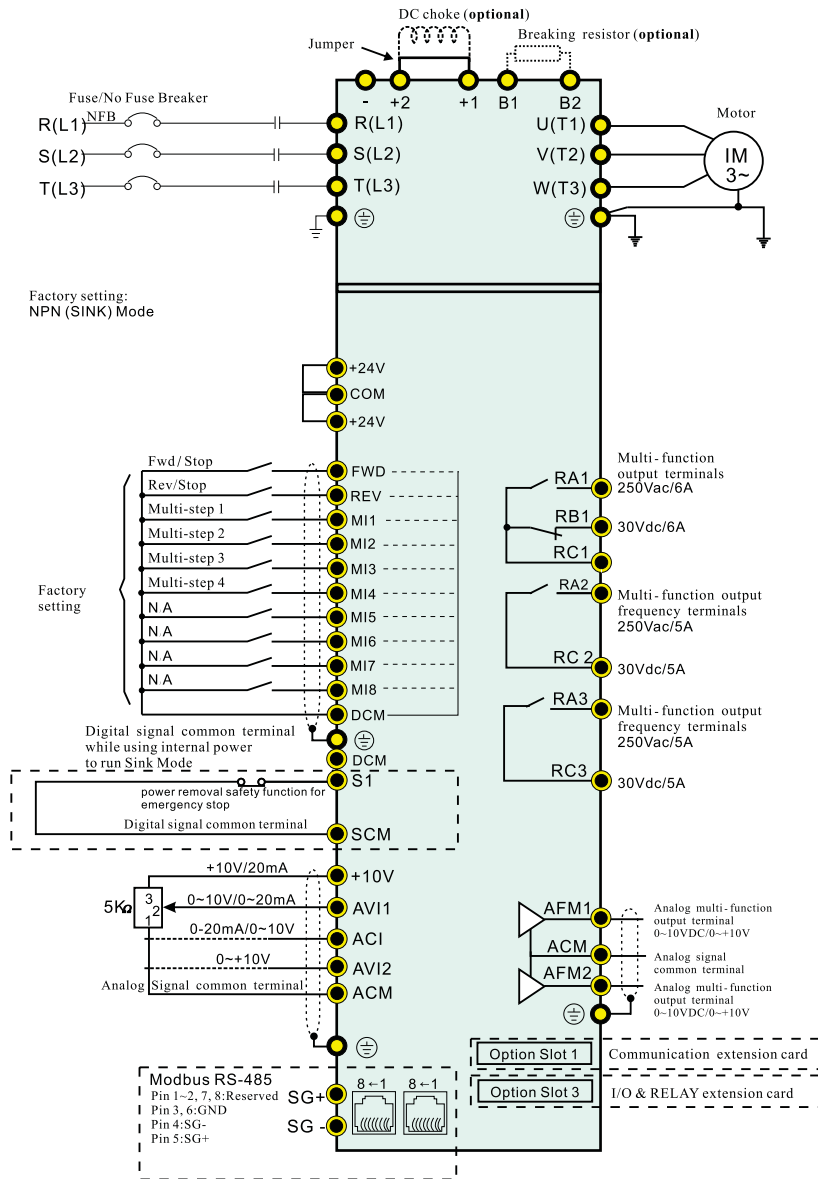
460V		A					B					C								
Frame																				
Models VFD-____CP43A-____; VFD-____CP4EA-____;		007	015	022	037	040	055	075	110	150	185	220	300	370						
Output Rating	Light Duty	Rated Output Capacity (kVA)	2.4	2.9	4.0	6.0	8.4	9.6	11.2	18	24	29	36	45	57					
		Rated Output Current (A)	3	3.7	5	7.5	10.5	12	14	22.5	30	36	45	56	72					
		Applicable Motor Output(kW)	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30	37					
		Applicable Motor Output(HP)	1	2	3	5	5	7.5	10	15	20	25	30	40	50					
		Overload tolerance	120% of rated current for 1 minute																	
	Normal Duty	Max. output frequency (Hz)	600.00Hz(90 kW~:400.00Hz)																	
		Carrier Frequency (kHz)	2~15kHz(8KHz)					2~10kHz(6KHz)												
		Rated Output Capacity (kVA)	2.2	2.4	3.2	4.8	7.2	8.4	10	14	19	25	30	36	48					
		Rated Output Current (A)	2.8	3.0	4.0	6.0	9.0	10.5	12	18	24	32	38	45	60					
		Applicable Motor Output(kW)	0.4	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30					
Input Rating	Light Duty	Applicable Motor Output(HP)	0.5	1	2	3	5	5	7.5	10	15	20	25	30	40					
		Overload tolerance	120% of rated current for 1 minute;160% of rated current for 3 seconds																	
		Max. output frequency (Hz)	600.00Hz(90kW~:400.00Hz)																	
		Carrier Frequency (kHz)	2~15kHz(8KHz)					2~10kHz(6KHz)												
		Input Current (A) Normal Duty	4.3	5.4	7.4	11	16	18	20	25	33	39	47	58	76					
	Normal Duty	Input Current (A) Light Duty	3.5	4.3	5.9	8.7	14	15.5	17	20	26	35	40	47	63					
		Rated Voltage/Frequency	3-Phase AC 380V~480V(-15%~+10%), 50/60Hz																	
		Operating Voltage Range	323~528Vac																	
		Frequency Tolerance	47~63Hz																	
		Cooling method	Natural Cooling	Fan Cooling																
Braking Chopper	Frame A,B,C Built-in																			
DC choke	Frame A,B,C Optional																			
EMI Filter	Frame A,B,C of VFD____CP4EA-____, Eml filter Built-in Frame A,B,C of VFD____CP43A-____, Eml filter NOT Built-in																			

460V		D				E				F				G				H									
Frame																											
Models VFD-____CP43A-____; VFD-____CP43C-____;		450	550	750	900	1100	1320	1600	1850	2200	2800	3150	3550	4000													
Output Rating	Light Duty	Rated Output Capacity (kVA)	73	88	115	143	175	196	247	273	367	422	491	544	613												
		Rated Output Current (A)	91	110	144	180	220	246	310	343	460	530	616	683	770												
		Applicable Motor Output(kW)	45	55	75	90	110	132	160	185	220	280	315	355	400												
		Applicable Motor Output(HP)	60	75	100	125	150	175	215	250	300	375	425	475	536												
		Overload tolerance	120% of rated current for 1 minute																								
	Normal Duty	Max. output frequency (Hz)	600.00Hz(90 kW~ : 400.00Hz)																								
		Carrier Frequency (kHz)	2~10kHz(6KHz)								2~9kHz(4KHz)																
		Rated Output Capacity (kVA)	58	73	88	120	143	175	207	247	295	367	438	491	544												
		Rated Output Current (A)	73	91	110	150	180	220	260	310	370	460	550	616	683												
		Applicable Motor Output(kW)	37	45	55	75	90	110	132	160	185	220	280	315	355												
Input Rating	Light Duty	Applicable Motor Output(HP)	50	60	75	100	125	150	175	215	250	300	375	425	475												
		Overload tolerance	120% of rated current for 1 minute;160% of rated current for 3 seconds																								
		Max. output frequency (Hz)	600.00Hz(90 kW~ : 400.00Hz)																								
		Carrier Frequency (kHz)	2~10kHz(6KHz)								2~9kHz(4KHz)																
		Input Current (A) Light Duty	91	110	144	180	220	246	310	343	460	530	616	683	770												
	Normal Duty	Input Current (A) Normal Duty	74	101	114	157	167	207	240	300	380	400	494	555	625												
		Rated Voltage/Frequency	3-Phase AC 380V~480V(-15%~+10%), 50/60Hz																								
		Operating Voltage Range	323~528Vac																								
		Frequency Tolerance	47~63Hz																								
		Cooling method	Fan Cooling																								
Braking Chopper	Frame D and above: Optional																										
DC choke	Frame D and above: 3% built-in																										
EMI Filter	Frame D and above: Optional																										

Control Method	1: V/F(V/F control), 2: SVC(Sensorless Vector Control),				
Starting Torque	Reach up to 150% or above at 0.5Hz.				
V/F Curve	4 point adjustable V/F curve and square curve				
Speed Response Ability	5Hz				
Torque Limit	Normal Duty: Max. 170% torque current				
Torque Accuracy	±5%				
Max. Output Frequency (Hz)	230V series: 600.00Hz (55kW and above: 400.00Hz); 460V series: 600.00Hz (90kW and above: 400.00Hz)				
Frequency Output Accuracy	Digital command:±0.01%, -10°C~+40°C, Analog command: ±0.1%, 25±10°C				
Output Frequency Resolution	Digital command: 0.01Hz, Analog command: max. output frequency x 0.03/60Hz (±11 bit)				
Overload Tolerance	Light duty: 120% of rated current for 1 minute; Normal duty: 120% of rated current for 1 minute;160% of rated current for 3 seconds				
Frequency Setting Signal	0~+10V, 4~20mA, 0~20mA, pulse input				
Accel./Decel. Time	0.00~600.00/0.0~6000.0 seconds				
Main control function	Fault restart	Parameter copy	Smart stall	BACnet Communication	Momentary power loss ride thru
	Speed search	Over-torque detection	Torque limit	16-step speed (max)	Accel/Decel. Time switch
	S-curve accel/decel	3-wire sequence	Auto-Tuning (rotational, stationary)	Dwell	Cooling fan on/off switch
	Slip compensation	Torque compensation	JOG frequency	Frequency upper/lower limit settings	DC injection braking at start/stop
	PID control (with sleep function)	Energy saving control	MODBUS communication (RS-485 RJ45, max. 115.2 kbps)		
Fan Control	230V series Models higher than VFD150CP23A-21 (included) are PWM control ; Models lower than VFD150CP23A-21 (not included) are on/off switch control. 460V series Models higher than VFD150CP43A-21/4EA-21 (included) are PWM control ; Models lower than VFD150CP43A-21/4EA-21(not included) are on/off switch control.				
Motor Protection	Electronic thermal relay protection				
Over-current Protection	Normal Duty: Over-current protection for 240% rated current Current clamp *Normal duty: 170~175% _a				
Over-voltage Protection	230: drive will stop when DC-BUS voltage exceeds 410V 460: drive will stop when DC-BUS voltage exceeds 820V				
Over-temperature Protection	Built-in temperature sensor				
Stall Prevention	Stall prevention during acceleration, deceleration and running independently				
Restart After Instantaneous Power Failure	Parameter setting up to 20 seconds				
Grounding Leakage Current Protection	Leakage current is higher than 50% of rated current of the AC motor drive				
International Certifications	CE ULS GB/T12668-2				

Wiring

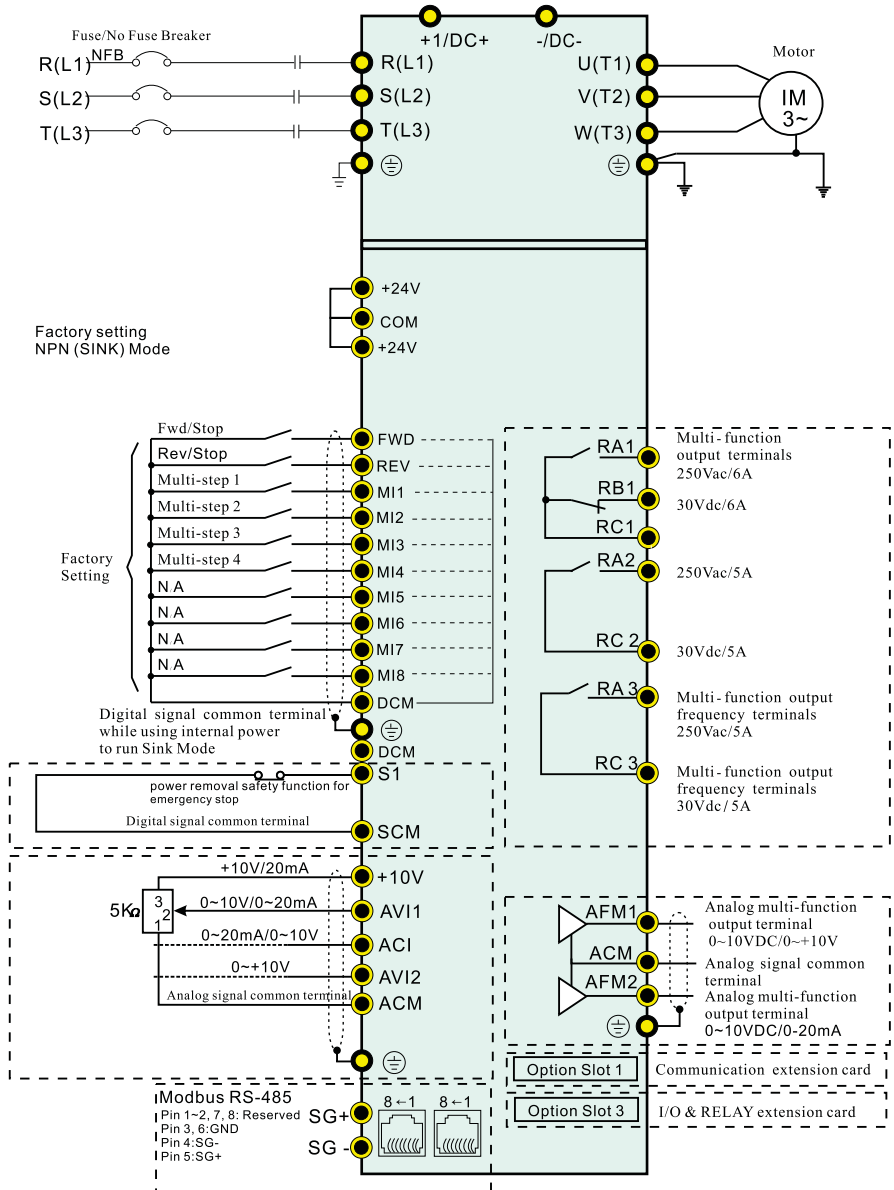
Wiring Diagram for Frame A~C, 3-phase power is provided



● Main circuit(power) terminals ● Control terminals ⊕ Shielded leads & cables

Wiring

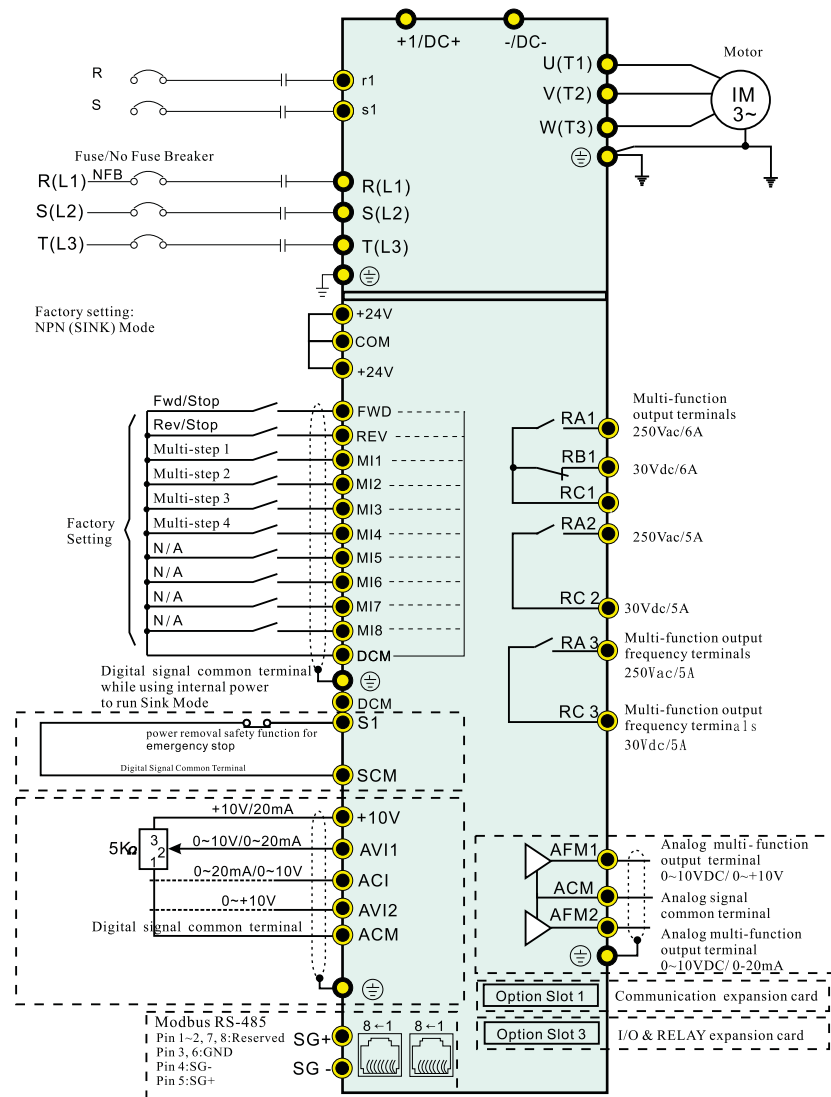
Wiring Diagram for Frame D, 3-phase power is provided



● Main circuit(power) terminals ● Control terminals ⊕ Shielded leads & cables

Wiring

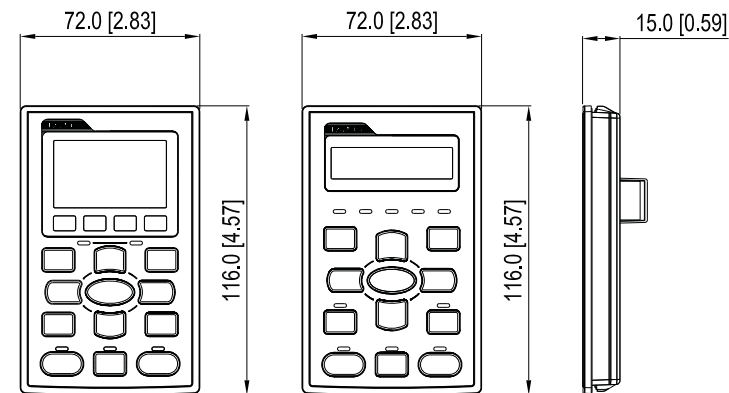
Wiring Diagram for Frame E and above, 3-phase power is provided



● Main circuit(power) terminals ● Control terminals ⊕ Shielded leads & cables

Dimensions

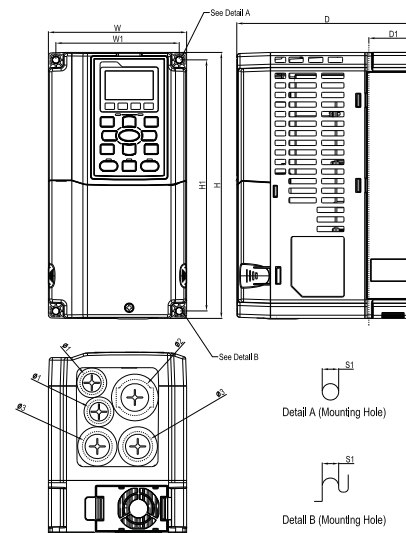
Digital Keypad



KPC-CC01
Standard LCD Keypad

KPC-CE01
Optional LED Keypad

Frame A



MODEL

VFD007CP23A-21	VFD055CP43A-21
VFD015CP23A-21	VFD075CP43A-21
VFD022CP23A-21	VFD007CP4EA-21
VFD037CP23A-21	VFD015CP4EA-21
VFD055CP23A-21	VFD022CP4EA-21
VFD007CP43A-21	VFD037CP4EA-21
VFD015CP43A-21	VFD040CP4EA-21
VFD022CP43A-21	VFD055CP4EA-21
VFD037CP43A-21	VFD075CP4EA-21
VFD040CP43A-21	

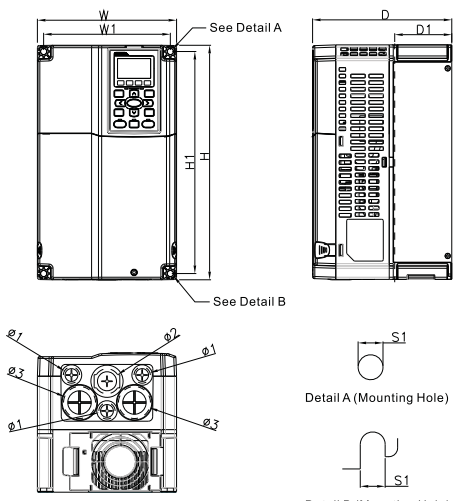
Unit: mm[inch]

Frame	W	H	D	W1	H1	D1*	S1	O1	O2	O3
A1	130.0 [5.12]	250.0 [9.84]	170.0 [6.69]	116.0 [4.57]	236.0 [9.29]	45.8 [1.80]	6.2 [0.24]	22.2 [0.87]	34.0 [1.34]	28.0 [1.10]

D1*: Flange mounting

■ Dimensions

■ Frame B



MODEL

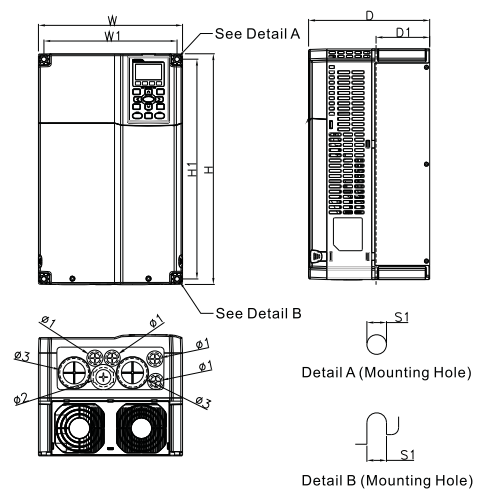
- VFD075CP23A-21
- VFD110CP23A-21
- VFD150CP23A-21
- VFD110CP43A-21
- VFD150CP43A-21
- VFD185CP43A-21
- VFD110CP4EA-21
- VFD150CP4EA-21
- VFD185CP4EA-21

Unit : mm [inch]

Frame	W	H	D	W1	H1	D1*	S1	Ø1	Ø2	Ø3
B1	190.0 [7.48]	320.0 [12.60]	190.0 [7.48]	173.0 [6.81]	303.0 [11.93]	77.9 [3.07]	8.5 [0.33]	22.2 [0.87]	34.0 [1.34]	43.8 [1.72]

D1* : Flange mounting

■ Frame C



MODEL

- VFD185CP23A-21
- VFD220CP23A-21
- VFD300CP23A-21
- VFD220CP43A-21
- VFD300CP43A-21
- VFD370CP43A-21
- VFD220CP4EA-21
- VFD300CP4EA-21
- VFD370CP4EA-21

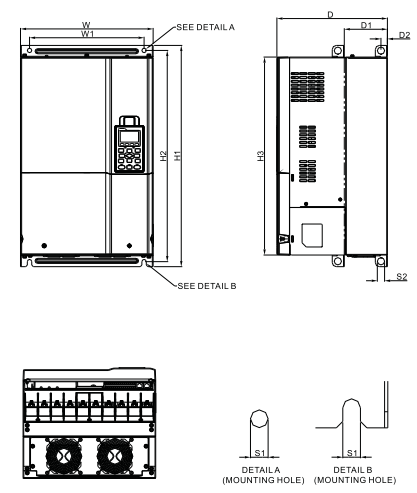
Unit : mm [inch]

Frame	W	H	D	W1	H1	D1*	S1	Ø1	Ø2	Ø3
C1	250.0 [9.84]	400.0 [15.75]	210.0 [8.27]	231.0 [9.09]	381.0 [15.00]	92.9 [3.66]	8.5 [0.33]	22.2 [0.87]	34.0 [1.34]	50.0 [1.97]

D1* : Flange mounting

■ Dimensions

■ Frame D1



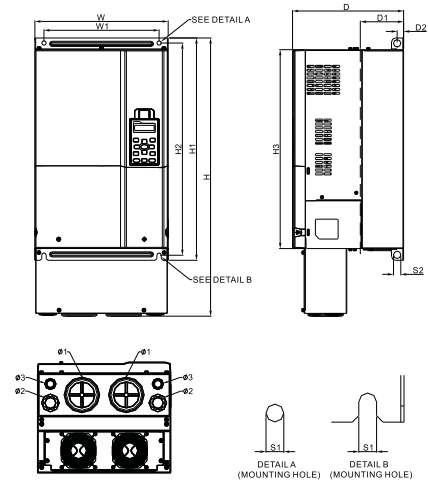
MODEL

- VFD370CP23A-00
- VFD450CP23A-00
- VFD450CP43A-00
- VFD550CP43A-00
- VFD750CP43A-00
- VFD900CP43A-00

Unit : mm [inch]

Frame	W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2	Ø1	Ø2	Ø3
D1	330.0 [12.99]	-	275.0 [10.83]	285.0 [11.22]	550.0 [21.65]	525.0 [20.67]	492.0 [19.37]	107.2 [4.22]	16.0 [0.63]	11.0 [0.43]	18.0 [0.71]	-	-	-

■ Frame D2



MODEL

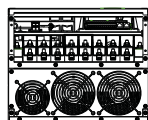
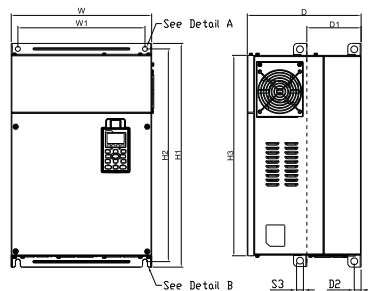
- VFD370CP23A-21
- VFD450CP23A-21
- VFD450CP43A-21
- VFD550CP43A-21
- VFD750CP43A-21
- VFD900CP43A-21

Unit : mm [inch]

Frame	W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2	Ø1	Ø2	Ø3
D2	330.0 [12.99]	688.3 [27.10]	275.0 [10.83]	285.0 [11.22]	550.0 [21.65]	525.0 [20.67]	492.0 [19.37]	107.2 [4.22]	16.0 [0.63]	11.0 [0.43]	18.0 [0.71]	76.2 [3.00]	34.0 [1.34]	22.0 [0.87]

Dimensions

Frame E1



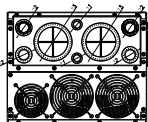
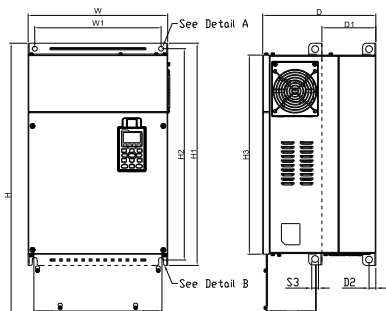
MODEL

VFD550CP23A-00
 VFD750CP23A-00
 VFD900CP23A-00
 VFD1100CP43A-00
 VFD1320CP43A-00

Unit : mm [inch]

Frame	W	H	D	W1	H1	H2	H3	D1*	D2	S1,S2	S3	Ø1	Ø2	Ø3
E1	370.0 [14.57]	-	300.0 [11.81]	335.0 [13.19]	589 [23.19]	560.0 [22.05]	528.0 [20.80]	143.0 [5.63]	18.0 [0.71]	13.0 [0.51]	18.0 [0.71]	-	-	-

Frame E2



MODEL

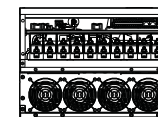
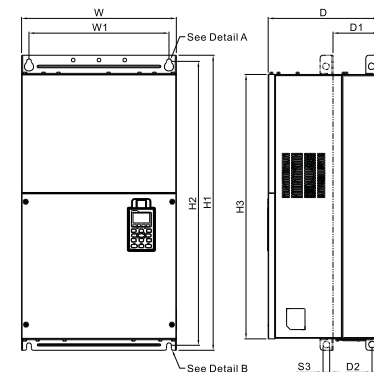
VFD550CP23A-21
 VFD750CP23A-21
 VFD900CP23A-21
 VFD1100CP43A-21
 VFD1320CP43A-21

Unit : mm [inch]

Frame	W	H	D	W1	H1	H2	H3	D1*	D2	S1,S2	S3	Ø1	Ø2	Ø3
E2	370.0 [14.57]	715.8 [28.18]	300.0 [11.81]	335.0 [13.19]	589 [23.19]	560.0 [22.05]	528.0 [20.80]	143.0 [5.63]	18.0 [0.71]	13.0 [0.51]	18.0 [0.71]	22.0 [0.87]	34.0 [1.34]	92.0 [3.62]

Dimensions

Frame F1



MODEL

VFD1600CP43A-00
 VFD1850CP43A-00

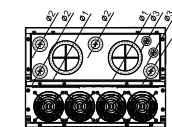
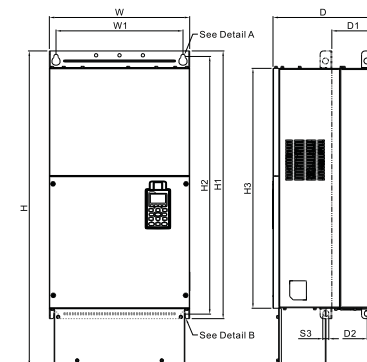
Frame	W	H	D	W1
F1	420.0 [16.54]	-	300.0 [11.81]	380.0 [14.96]

Unit : mm [inch]

Frame	H1	H2	H3	D1*	D2	S1	S2	S3	Ø1	Ø2	Ø3
F1	800.0 [31.50]	770.0 [30.32]	717.0 [28.23]	124.0 [4.88]	18.0 [0.71]	13.0 [0.51]	25.0 [0.98]	18.0 [0.71]	-	-	-

D1* : Flange mounting

Frame F2



MODEL

VFD1600CP43A-21
 VFD1850CP43A-21

Frame	W	H	D	W1
F2	420.0 [16.54]	940.0 [37.00]	300.0 [11.81]	380.0 [14.96]

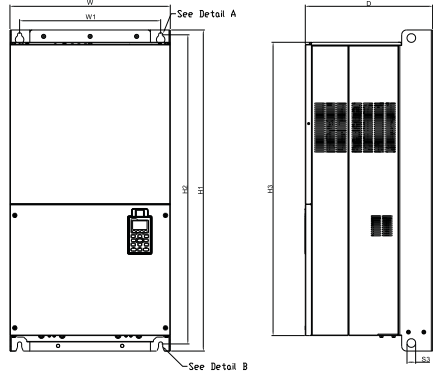
Unit : mm [inch]

Frame	H1	H2	H3	D1*	D2	S1	S2	S3	Ø1	Ø2	Ø3
F2	800.0 [31.50]	770.0 [30.32]	717.0 [28.23]	124.0 [4.88]	18.0 [0.71]	13.0 [0.51]	25.0 [0.98]	18.0 [0.71]	92.0 [3.62]	35.0 [1.38]	22.0 [0.87]

D1* : Flange mounting

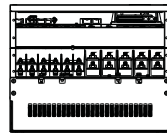
■ Dimensions

■ Frame G1



MODEL
VFD2200CP43A-00
VFD2800CP43A-00

Frame	W	H	D
G1	500.0 [19.69]	-	397.0 [15.63]



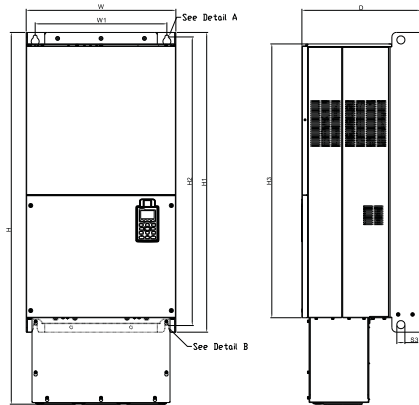
Detail A (Mounting Hole)

Detail B (Mounting Hole)

Unit : mm [inch]

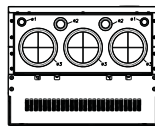
Frame	W1	H1	H2	H3	S1	S2	S3	Ø1	Ø2	Ø3
G1	440.0 [217.32]	1000.0 [39.37]	963.0 [37.91]	913.6 [35.97]	13.0 [0.51]	26.5 [1.04]	27.0 [1.06]	-	-	-

■ Frame G2



MODEL
VFD2200CP43A-21
VFD2800CP43A-21

Frame	W	H	D
G2	500.0 [19.69]	1240.2 [48.83]	397.0 [15.63]



Detail A (Mounting Hole)

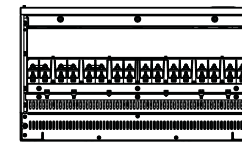
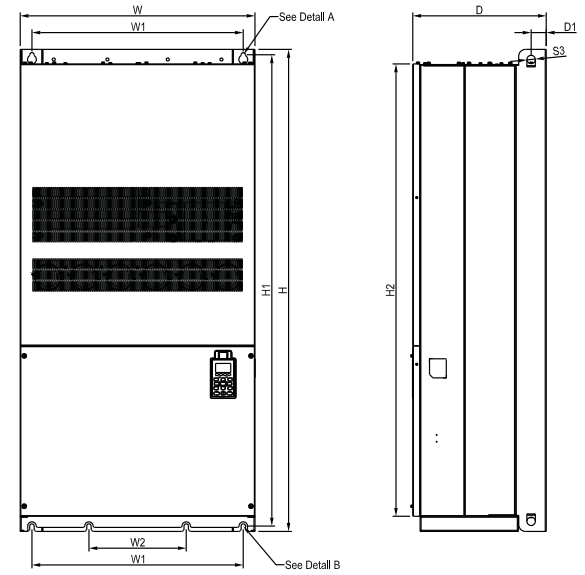
Detail B (Mounting Hole)

Unit : mm [inch]

Frame	W1	H1	H2	H3	S1	S2	S3	Ø1	Ø2	Ø3
G2	440.0 [217.32]	1000.0 [39.37]	963.0 [37.91]	913.6 [35.97]	13.0 [0.51]	26.5 [1.04]	27.0 [1.06]	22.0 [0.87]	34.0 [1.34]	117.5 [4.63]

■ Dimensions

■ Frame H1



See Detail A (Mounting Hole)

See Detail B (Mounting Hole)

MODEL
VFD3150CP43A-00
VFD3550CP43A-00
VFD4000CP43A-00

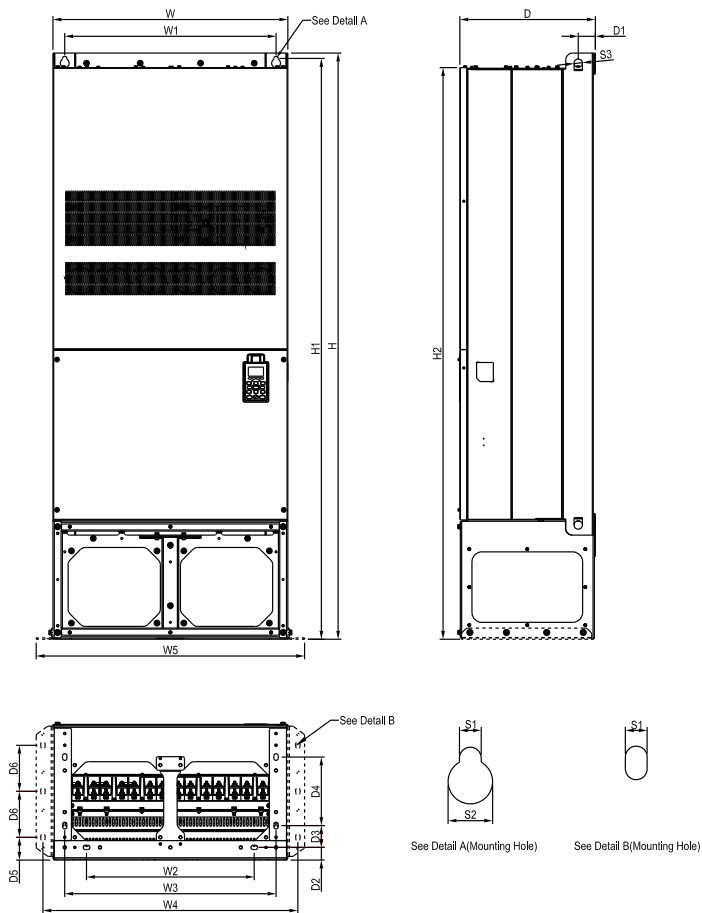
Unit : mm [inch]

Frame	W	H	D	W1	W2	W3	W4	W5	W6	H1	H2	H3	H4
H1	700.0 [27.56]	1435.0 [56.5]	398.0 [15.67]	630.0 [24.8]	290.0 [11.42]	-	-	-	-	1403.0 [55.24]	1346.6 [53.02]	-	-

Frame	H5	D1	D2	D3	D4	D5	D6	S1	S2	S3	Ø1	Ø2	Ø3
H1	-	45.0 [1.77]	-	-	-	-	-	13.0 [0.51]	26.5 [1.04]	25.0 [0.98]	-	-	-

Dimensions

Frame H2



MODEL
 VFD3150CP43C-00
 VFD3550CP43C-00
 VFD4000CP43C-00

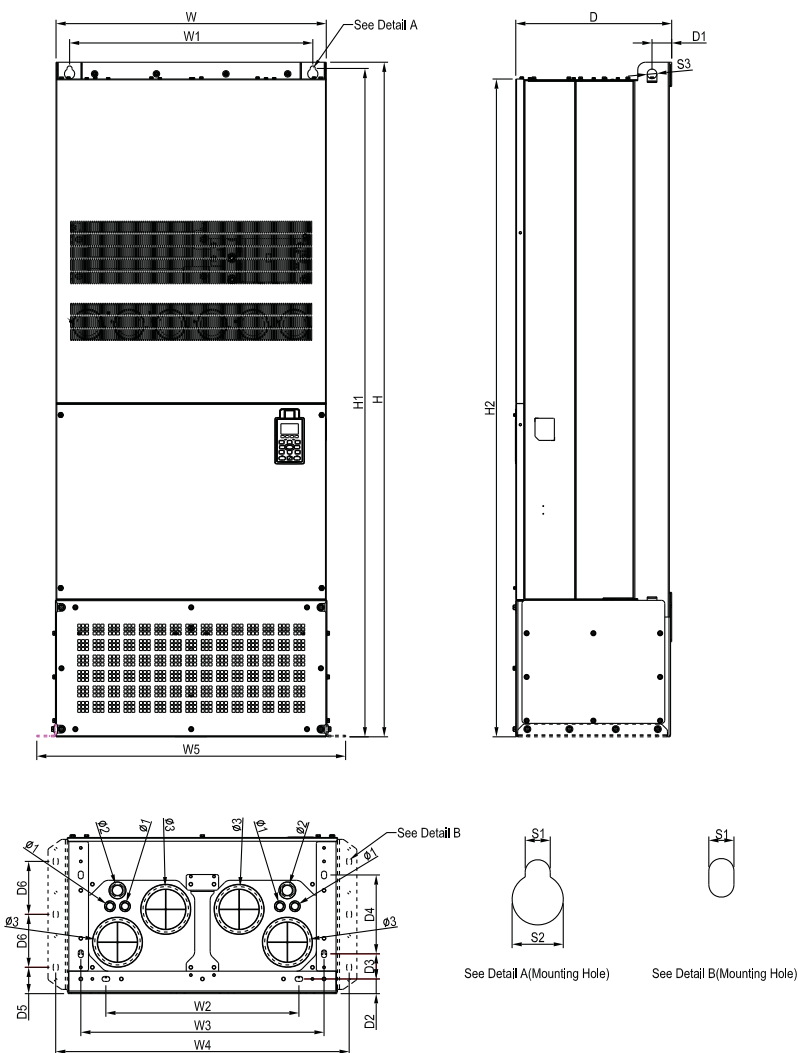
Unit : mm [inch]

Frame	W	H	D	W1	W2	W3	W4	W5	W6	H1	H2	H3	H4
H2	700.0 [27.56]	1745.0 [68.70]	404.0 [15.91]	630.0 [24.8]	500.0 [19.69]	630.0 [24.8]	760.0 [29.92]	800.0 [31.5]	-	1729.0 [68.07]	1701.0 [66.99]	-	-

Frame	H5	D1	D2	D3	D4	D5	D6	S1	S2	S3	Ø1	Ø2	Ø3
H2	-	51.0 [2.00]	38.0 [1.50]	65.0 [2.56]	204.0 [8.03]	69.0 [2.68]	137.0 [5.40]	13.0 [0.51]	26.5 [1.04]	25.0 [0.98]	-	-	-

Dimensions

Frame H3



MODEL
 VFD3150CP43C-21
 VFD3550CP43C-21
 VFD4000CP43C-21

Unit : mm [inch]

Frame	W	H	D	W1	W2	W3	W4	W5	W6	H1	H2	H3	H4
H3	700.0 [27.56]	1745.0 [68.70]	404.0 [15.91]	630.0 [24.80]	500.0 [19.69]	630.0 [24.80]	760.0 [29.92]	800.0 [31.5]	-	1729.0 [68.07]	1701.6 [66.99]	-	-

Frame	H5	D1	D2	D3	D4	D5	D6	S1	S2	S3	Ø1	Ø2	Ø3
H3	-	51.0 [2.01]	38.0 [1.50]	65.0 [2.56]	204.0 [8.03]	68.0 [2.68]	137.0 [5.40]	13.0 [0.51]	26.5 [1.04]	25.0 [0.98]	22.0 [0.87]	34.0 [1.34]	117.5 [4.63]

Option Cards

EMC-D42A



I/O Extension Card

Terminals	Descriptions
COM	Common for multi-function input terminals Select SINK (NPN) /SOURCE (PNP) in J1 jumper / external power supply
MI10~ MI13	Refer to parameters 02-26~02-29 to program the multi-function inputs MI10~MI13. Internal power is applied from terminal E24: +24Vdc±5% 200mA, 5W External power +24Vdc: max. voltage 30Vdc, min. voltage 19Vdc, 30W ON: the activation current is 6.5mA OFF: leakage current tolerance is 10µA
MO10~MO11	Multi-function output terminals (photocoupler) Duty-cycle: 50% Max. output frequency: 100Hz Max. current: 50mA Max. voltage: 48Vdc
MXM	Common for multi-function output terminals MO10, MO11(photocoupler) Max 48Vdc 50mA

EMC-D611A



I/O Extension Card

Terminals	Descriptions
AC	AC power common for multi-function input terminal (Neutral)
MI10~ MI15	Refer to Pr. 02.26~ Pr. 02.31 for multi-function input selection Input voltage: 100~130VAC Input frequency: 57~63Hz Input impedance: 27Kohm Terminal response time: ON: 10ms OFF: 20ms

EMC-R6AA



Relay Extension Card

Terminals	Descriptions
R10A~R15A R10C~R15C	Refer to Pr. 02.36~ Pr. 02.41 for multi-function input selection Resistive load: 5A(N.O.)/3A(N.C.) 250VAC 5A(N.O.)/3A(N.C.) 30Vdc Inductive load (COS 0.4) 2.0A(N.O.)/1.2A(N.C.) 250VAC 2.0A(N.O.)/1.2A(N.C.) 30Vdc It is used to output each monitor signal, such as for drive in operation, frequency attained or overload indication.

Screw Specifications for Option Card Terminals:

EMC-D42A	Wire gauge	24~12AWG (0.205~3.31mm ²)
	Torque	4Kg-cm [3.47lb-in]
EMC-R6AA	Wire gauge	24~16AWG (0.205~1.31mm ²)
	Torque	6Kg-cm [5.21lb-in]

CMC-MOD01



Features

- MDI/MDI-X auto-detect
- Virtual serial port.
- Supports Modbus TCP protocol
- AC motor drive keypad/Ethernet configuration
- E-mail alarm
- Baud rate: 10/100Mbps auto-detect

Network Interface

Interface	RJ-45 with Auto MDI/MDIX
Number of ports	1 Port
Transmission method	IEEE 802.3, IEEE 802.3u
Transmission cable	Category 5e shielding 100M
Transmission speed	10/100 Mbps Auto-Detect
Network protocol	ICMP, IP, TCP, UDP, DHCP, SMTP, MODBUS OVER TCP/IP, Delta Configuration

CMC-EIP01



Features

- MDI/MDI-X auto-detect
- Supports Modbus TCP and Ethernet/IP protocol
- Baud rate: 10/100Mbps auto-detect
- AC motor drive keypad/Ethernet configuration
- Virtual serial port

Network Interface

Interface	RJ-45 with Auto MDI/MDIX
Number of ports	1 Port
Transmission method	IEEE 802.3, IEEE 802.3u
Transmission cable	Category 5e shielding 100M
Transmission speed	10/100 Mbps Auto-Detect
Network protocol	ICMP, IP, TCP, UDP, DHCP, HTTP, SMTP, MODBUS OVER TCP/IP, EtherNet/IP, Delta Configuration

CMC-PD01



Features

- Supports PZD control data exchange.
- Supports PKW polling AC motor drive parameters.
- Supports user diagnosis function.
- Auto-detects baud rates; supports Max. 12Mbps.

PROFIBUS DP Connector

Interface	DB9 connector
Transmission method	High-speed RS-485
Transmission cable	Shielded twisted pair cable
Electrical isolation	500VDC

Communication

Message type	Cyclic data exchange
Module name	CMC-PD01
GSD document	DELA08DB.GSD
Company ID	08DB (HEX)
Serial transmission speed supported (auto-detection)	9.6kbps; 19.2kbps; 93.75kbps; 187.5kbps; 125kbps; 250kbps; 500kbps; 1.5Mbps; 3Mbps; 6Mbps; 12Mbps (bits per second)

■ Option Cards

CMC-DN01



Features

- Based on the high-speed communication interface of Delta HSSP protocol, able to conduct immediate control of AC motor drive.
- Supports Group 2 only connection and polling I/O data exchange.
- For I/O mapping, supports Max. 32 words of input and 32 words of output.
- Supports EDS file configuration in DeviceNet configuration software.
- Supports all baud rates on DeviceNet bus: 125kbps, 250kbps, 500kbps and extendable serial transmission speed mode.
- Node address and serial transmission speed can be set up on AC motor drive.
- Power supplied from AC motor drive.

DeviceNet Connector

Interface	5-PIN open removable connector. Of 5.08mm PIN interval
Transmission method	CAN
Transmission cable	Shielded twisted pair cable (with 2 power cables)
Transmission speed	125kbps, 250kbps, 500kbps and extendable serial transmission speed mode
Network protocol	DeviceNet protocol

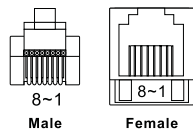
AC Motor Drive Connection Port

Interface	50 PIN communication terminal
Transmission method	SPI communication
Terminal function	1. Communicating with AC motor drive 2. Transmitting power supply from AC motor drive
Communication protocol	Delta HSSP protocol

EMC-COP01



RJ-45 Pin Definition



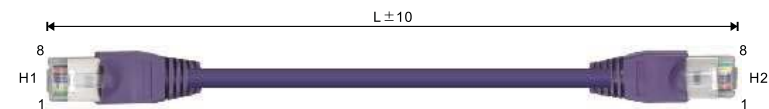
Pin	Pin name	Definition
1	CAN_H	CAN_H bus line (dominant high)
2	CAN_L	CAN_L bus line (dominant low)
3	CAN_GND	Ground/0V/V-
7	CAN_GND	Ground/0V/V-

Specification

Interface	RJ-45
Number of ports	1 Port
Transmission method	CAN
Transmission cable	CAN standard cable
Transmission speed	1M 500k 250k 125k 100k 50k
Communication protocol	CANopen

■ CANopen Communication Cable

Model: TAP-CB03, TAP-CB04



Title	Part No.	L	
		mm	inch
1	TAP-CB03	500±10	19±0.4
2	TAP-CB04	1000±10	39±0.4

■ CANopen Breakout Box

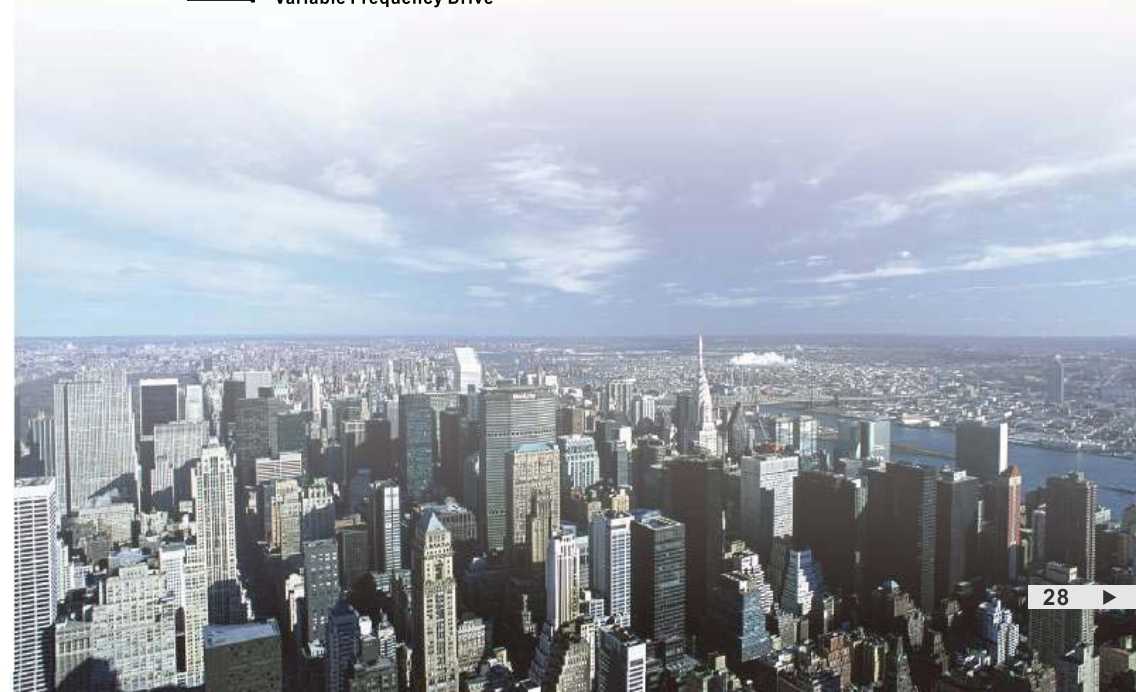
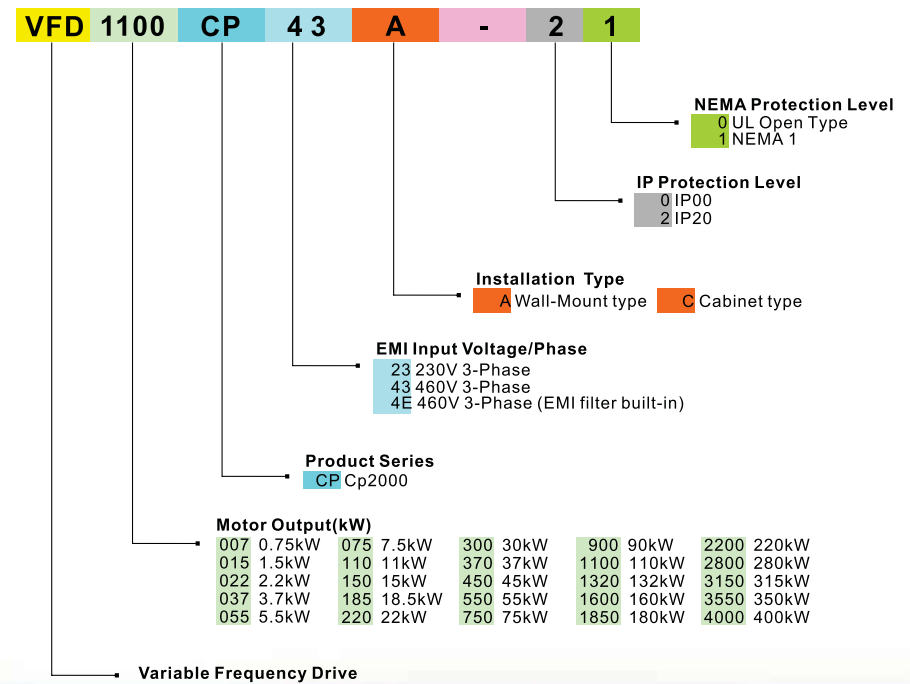
Model: TAP-CN03



Ordering information

<p>Frame A</p> 	<p>230V: 0.75kw~5.5kw</p> <p>460V: 0.75kw~7.5kw</p>	<p>Corresponding models:</p> <p>VFD007CP23A-21 VFD007CP43A-21 VFD007CP4EA-21 VFD015CP23A-21 VFD015CP43A-21 VFD015CP4EA-21 VFD022CP23A-21 VFD022CP43A-21 VFD022CP4EA-21 VFD037CP23A-21 VFD037CP43A-21 VFD037CP4EA-21 VFD055CP23A-21 VFD055CP43A-21 VFD055CP4EA-21 VFD075CP43A-21 VFD075CP4EA-21</p>
<p>Frame B</p> 	<p>230V: 7.5kw~15kw</p> <p>460V: 11kw~18.5kw</p>	<p>Corresponding models:</p> <p>VFD075CP23A-21 VFD110CP43A-21 VFD110CP4EA-21 VFD110CP23A-21 VFD150CP43A-21 VFD150CP4EA-21 VFD150CP23A-21 VFD185CP43A-21 VFD185CP4EA-21</p>
<p>Frame C</p> 	<p>230V: 18.5kw~30kw</p> <p>460V: 22kw~37kw</p>	<p>Corresponding models:</p> <p>VFD185CP23A-21 VFD220CP43A-21 VFD220CP4EA-21 VFD220CP23A-21 VFD300CP43A-21 VFD300CP4EA-21 VFD300CP23A-21 VFD370CP43A-21 VFD370CP4EA-21</p>
<p>Frame D</p> 	<p>230V: 37kw~45kw</p> <p>460V: 45kw~90kw</p>	<p>Corresponding models:</p> <p>Frame D1: VFD370CP23A-00 VFD370CP23A-21 VFD450CP23A-00 VFD450CP23A-21 VFD450CP43A-00 VFD450CP43A-21 VFD550CP43A-00 VFD550CP43A-21 VFD750CP43A-00 VFD750CP43A-21 VFD900CP43A-00 VFD900CP43A-21</p> <p>Frame D2: VFD370CP23A-21 VFD450CP23A-21 VFD450CP43A-21 VFD550CP43A-21 VFD750CP43A-21 VFD900CP43A-21</p>
<p>Frame E</p> 	<p>230V: 55kw~90kw</p> <p>460V: 110kw~132kw</p>	<p>Corresponding models:</p> <p>Frame E1: VFD550CP23A-00 VFD550CP23A-21 VFD750CP23A-00 VFD750CP23A-21 VFD900CP23A-00 VFD900CP23A-21 VFD1100CP43A-00 VFD1100CP43A-21 VFD1320CP43A-00 VFD1320CP43A-21</p> <p>Frame E2: VFD550CP23A-21 VFD750CP23A-21 VFD900CP23A-21 VFD1100CP43A-21 VFD1320CP43A-21</p>
<p>Frame F</p> 	<p>460V: 160kw~185kw</p>	<p>Corresponding models:</p> <p>Frame F1: VFD1600CP43A-00 VFD1600CP43A-21 VFD1850CP43A-00 VFD1850CP43A-21</p> <p>Frame F2: VFD1600CP43A-21 VFD1850CP43A-21</p>
<p>Frame G</p> 	<p>460V: 220kw~280kw</p>	<p>Corresponding models:</p> <p>Frame G1: VFD2200CP43A-00 VFD2200CP43A-21 VFD2800CP43A-00 VFD2800CP43A-21</p> <p>Frame G2: VFD2200CP43A-21 VFD2800CP43A-21</p>
<p>Frame H</p> 	<p>460V: 315kw~400kw</p>	<p>Corresponding models:</p> <p>Frame H1: VFD3150CP43A-00 VFD3150CP43C-00 VFD3150CP43C-21 VFD3550CP43A-00 VFD3550CP43C-00 VFD3550CP43C-21 VFD4000CP43A-00 VFD4000CP43C-00 VFD4000CP43C-21</p> <p>Frame H2: VFD3150CP43C-00 VFD3550CP43C-00 VFD4000CP43C-00</p> <p>Frame H3: VFD3150CP43C-21 VFD3550CP43C-21 VFD4000CP43C-21</p>

Model name



Sales Channels of Delta Industrial Automation are Located Worldwide in 74 Countries

