



Digitized Automation for a Changing World

Delta Fan/Pump Vector Control Drive CP2000 Series



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 **DELTA**
Smarter. Greener. Together.

WHY CP2000?

Delta Industrial Automation Green Technology

Delta Industrial Automation introduces the CP2000 Series AC motor drive for energy-saving HVAC systems and for pump and fan applications. The CP2000 Series is equipped with special HVAC parameters and PID control functions for efficient operation, as well as multi-segment V/F control curve and soft start functions to assist frequent torque change and constant output applications with energy-saving performance.





Water Circulation Pump Control

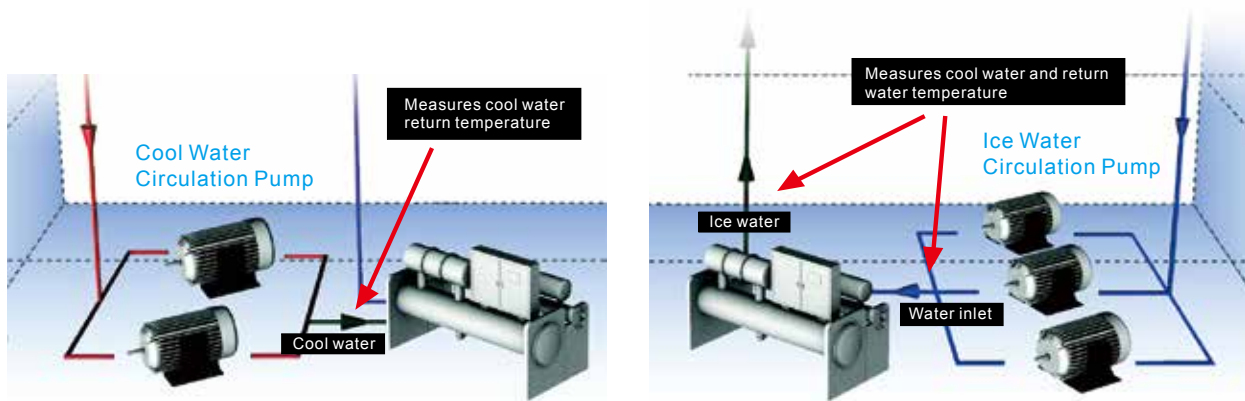


Figure1: Multi-Pump Control

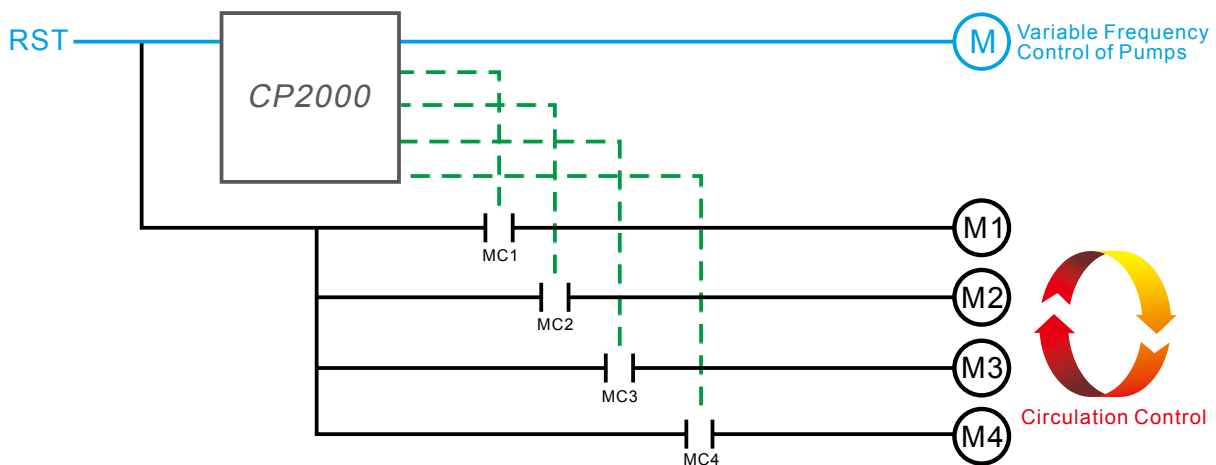


Figure 2: Fixed Amount and Circulation Control

Features

- ▶ LCD keypad - An easy-to-use text panel with TP Editor software allows users to customize the main page screen
- ▶ Quick setting functions to support self-defined parameter groups and parameter duplication for fast and easy installation
- ▶ Modular design for flexible extension and easy maintenance
- ▶ High-speed communications include BACnet and Modbus. Optional communication cards are available upon purchase: PROFIBUS DP, PROFINET, DeviceNet, Modbus TCP, EtherNet/IP, CANopen and BACnet IP
- ▶ Extended life cycle
- ▶ Enhanced conformal coating on PCBs for superior durability in critical environments
- ▶ Fire mode and bypass functions: continuous pressure to extract smoke when emergencies occur
- ▶ Various modes for fans/pump applications including PID control, sleep/wake up functions, flying start and skip frequency
- ▶ Multi-pumps synchronous control of up to 8 motors at one time and provides fixed amount and fixed time circulation control
- ▶ Built-in 10K steps PLC programming capacity and Real Time Clock (RTC)

Advanced Drive Technology

High Performance Variable Frequency Drive Technology

1. Sensorless Vector Control (SVC)
2. Dual rating design (Light duty & Normal duty)
3. Excellent variable torque control of asynchronous motors

Versatile Drive Control

1. Built-in PLC function
2. Built-in brake unit*
3. Networking drive system
4. Auto energy saving



Modular Design

1. Hot pluggable LCD keypad
2. I/O extension card
3. Various communication cards
4. Removable fans

Environmental Adaptability

1. 50°C operation temperature
2. Built-in DC choke*
3. Coated circuit boards
4. Built-in EMC filter*
5. International safety standard CE/UL/cUL

*Note: Please refer to the Product Specifications for more details.

Standard Models

Power range: 230 V 0.75~90 kW, 460 V 0.75~630 kW

230 V (kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
230 V (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		

460 V (kW)	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30	37
460 V (HP)	1	2	3	5	5	7.5	10	15	20	25	30	40	50
Frame Size	A							B			C		

460 V (kW)	45	55	75	90	110	132	160	185	200	220	250	280	315	355	400	500	560	630
460 V (HP)	60	75	100	125	150	175	215	250	270	300	340	375	425	475	530	675	750	850
Frame Size	D0		D		E		F		G				H					

Power range: 575 V 1.5~15 kW, 690 V 18.5~630 kW

575 V (kW)	1.5	2.2	3.7	5.5	7.5	11	15
575 V (HP)	2	3	5	7.5	10	15	20
Frame Size	A			B			

690 V (kW)	18.5	22	30	37	45	55	75	90	110	132	160	200	250	315
690 V (HP)	25	30	40	50	60	75	100	125	150	175	215	270	335	425
Frame Size	C				D		E				F		G	

690 V (kW)	400	450	560	630
690 V (HP)	530	600	750	850
Frame Size	H			

High-Speed Network

- ▶ Advanced network functions

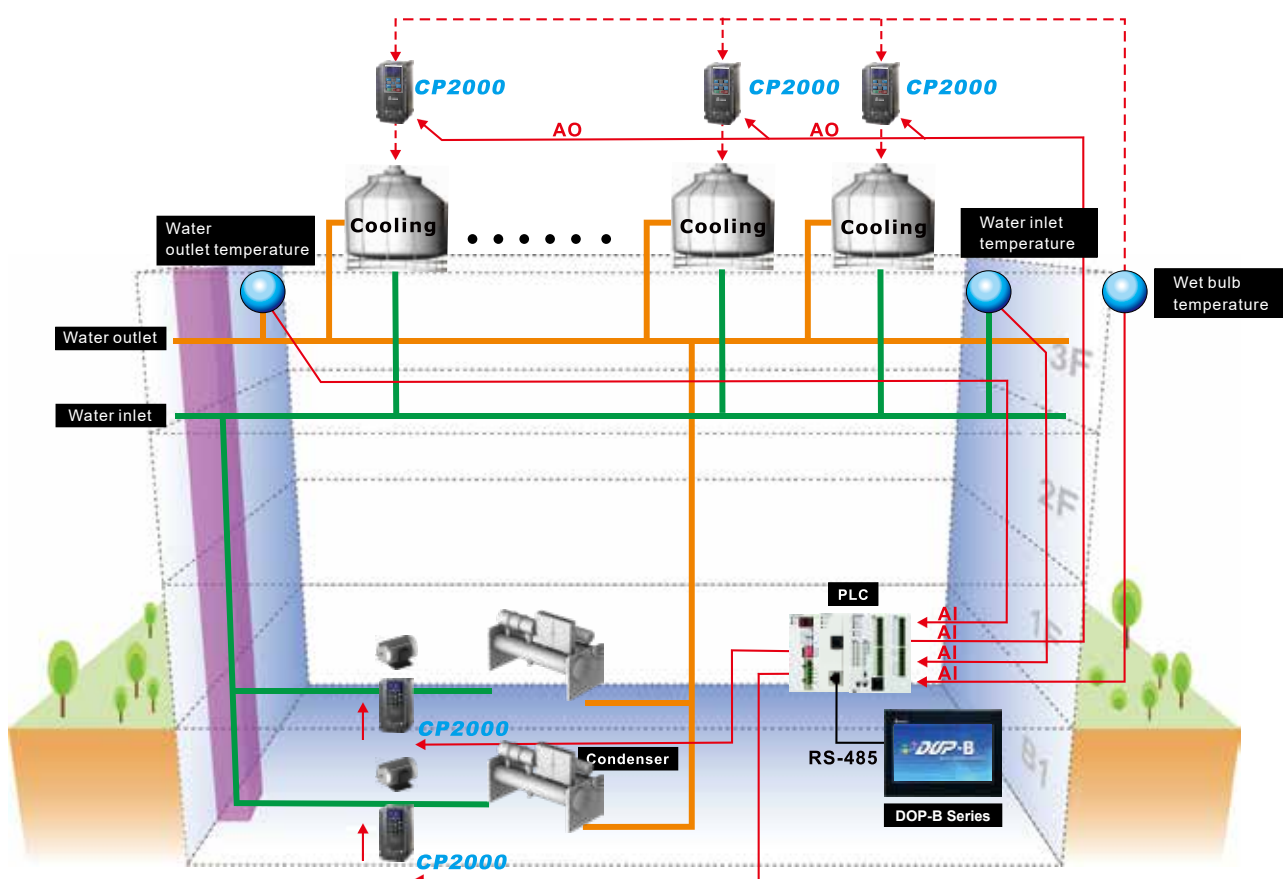
- Built-in RS-485 (Modbus)
- Built-in BACnet MS/TP 

- ▶ Various communication card options

PROFINET, PROFIBUS DP, **EtherNet/IP**, BACnet IP, DeviceNet, Modbus TCP, CANopen (DS402)

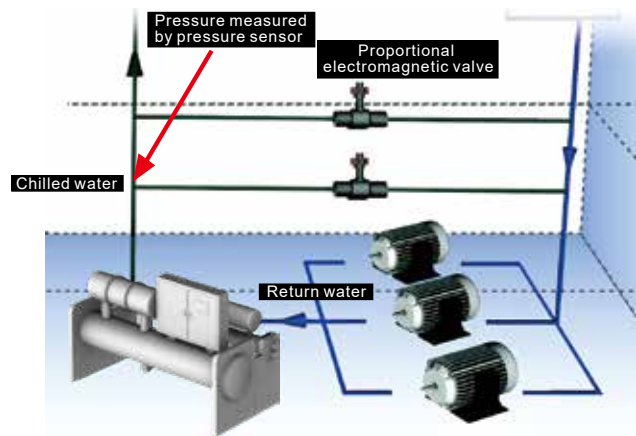
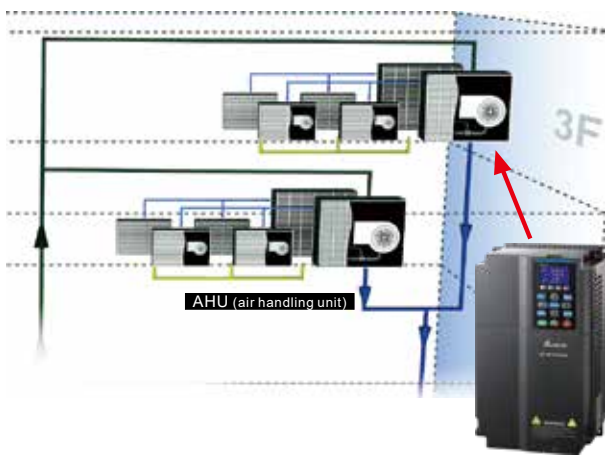
Building Automation Applications

- ▶ 4-point adjustable V/F control - Real-time adjustment of output voltage under variable torque load environments, especially for pump and fan applications.
- ▶ Flying start and auto restart after momentary power loss functions, suitable for fan application.
- ▶ Skip frequency function avoids mechanical resonance and protects the equipment.
- ▶ Low-current protection function prevents free load operation.
- ▶ Built-in BACnet communication protocol saves wiring for building automation applications.



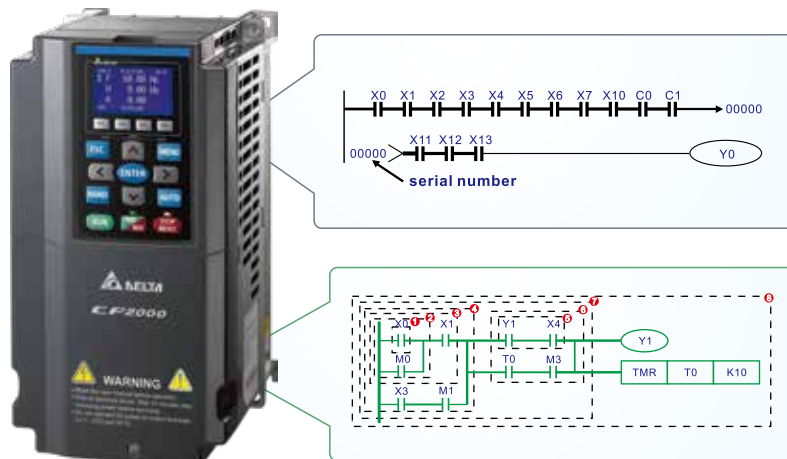
Improves Motor Performance

- ▶ Sensorless Vector Control (SVC) and auto-tuning functions improve motor performance for variable torque load applications.
- ▶ Deceleration Energy Backup (DEB) function decelerates motor to a stop when sudden power failure occurs to protect the equipment from damage.
- ▶ Auto adjusting acceleration/deceleration speed, reduces mechanical vibration when activating and stopping the equipment and provides smooth operation.
- ▶ Energy saving control functions include PID control, sleep/wakeup mode and auto-energy saving mode.



Built-in PLC Function

- ▶ Built-in 10K steps PLC function supports independent and distributed control when connecting to a network system for high operation flexibility.
- ▶ Real Time Clock (RTC) function facilitates the PLC program writing process for ON/OFF chronology, daylight saving operation and many other settings.



Standards

■ CE Low Voltage: EN61800-5-1	EMC: EN61000-3-12, EN61800-3, IEC61000-6-2, IEC61000-6-4, IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8
■ UL, cUL	
■ RCM	
■ ROHS	

Modular Design

Powerful motor drive control functions. The modular design satisfies various system applications with higher flexibility and is easy to maintain. Accessories include input/output extension cards, communication cards, hot pluggable LCD keypad, removable terminal blocks and removable fans.

- KPC-CC01 keypad
- Standard RJ45 cable for remote operation.
- Easy to install and remove with one press.



- RFI Jumper



- Remove the safety screws and press on both side tabs to remove the cover.



- The product nameplate shows the input/output voltage, input /output current, frequency range, and more.



- Modular fan design, easy to replace and clean, extending product life.



High Adaptability to Environment

- ▶ Built-in DC choke to suppress harmonics*
- ▶ Built-in EMC and RFI filter for noise suppression*
- ▶ Enhanced conformal coating on PCBs for superior durability in critical environments.
- ▶ The electronic components of the drive are isolated from the cooling system to reduce heat interference. Dissipated heat can be discharged by flange-mounting installation, and forced fan cooling can import cold air into the heat sink. The heat dissipation performance is optimized by these two cooling methods.

Note: Please refer to the Product Specifications for more detail



Environment for Operation, Storage and Transportation

DO NOT expose the AC motor drive to harsh environments, such as dust, direct sunlight, corrosive/flammable gasses, humidity, liquid or vibrations. The salts 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 (°C)	-25 ~ 70
		Non-condensation, non-frozen	
	Rated Humidity	Operation	Max. 95%
		Storage/Transportation	Max. 95%
		No condense water	
	Air Pressure	Operation/Storage (kPa)	86 ~ 106
		Transportation (kPa)	70 ~ 106
	Pollution Level	IEC60721-3-3	
		Operation	Class 3C3; Class 3S2
		Storage	Class 1C2; Class 1S2
		Transportation	Class 2C2; Class 2S2
Altitude	If the AC motor drive is to be used under harsh conditions with high level of contamination (e.g. dew, water, dust), make sure it is installed in an environment qualified for IP54 such as in a cabinet.		
	Operation	If the AC motor drive is installed at an altitude of 0~1,000m, follow normal operation restrictions. If it is installed at altitude 1,000~2,000m, decrease 1% of rated current or lower 0.5°C of temperature for every 100m increase in altitude. Maximum altitude for Corner Grounded TN system is 2,000m. For application over 2,000m, please contact Delta for more details.	
Package Drop	Storage/Transportation	ISTA procedure 1A (according to weight) IEC60068-2-31	
Vibration	1.0 mm, peak to peak value range from 2 Hz to 13.2Hz; 0.7 G ~ 1.0 G range from 13.2 Hz to 55Hz; 1.0 G range from 55 Hz to 512Hz. Comply with IEC 60068-2-6.		
Impact	IEC/EN 60068-2-27		
Operation Position	Max. allowed offset angle ±10° (under normal installation position)		

Specifications for Operation Temperature and Protection Level

Model	Frame	Top Cover	Conduit Box	Protection Level	Operation Temperature
VFDxxxCP23x-21 VFDxxxCP43x-21 VFDxxxCP4Ex-21 VFDxxxCP53x-21 VFDxxxCP63x-xx	Frame A~C 230V: 0.75~30kW 460V: 0.75~37kW 575V: 1.5~15kW 690V: 18.5~37kW	Remove top cover	Standard conduit plate	IP20/UL Open Type	30V & 460V: -10°C~50°C*
		Standard with top cover		IP20/UL Type1/NEMA1	575V & 690V: -10°C~50°C
	Frame D~H 230V: ≥ 37kW 460V: ≥ 45kW 690V: ≥ 45kW	N/A	Conduit box	IP20/UL Type1/NEMA1	-10°C~40°C
		N/A		IP00 IP20/UL Open Type	-10°C~40°C
VFDxxxCP23x-00 VFDxxxCP43x-00 VFDxxxCP63x-00	Frame D~H 230V: ≥ 37kW 460V: ≥ 45kW 690V: ≥ 45kW	N/A	No conduit box	 Protection degree for the circled area is IP00; other areas are IP20	230V & 460V: -10°C~50°C* 690V: -10°C~50°C

*1 When the carrier wave for light duty is 2kHz, the maximum operation temperature can reach up to 50°C

Specifications

230 V																			
Frame Size			A					B			C			D		E			
Model VFD-□□□□CP23□-□□			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 during every 5 minutes																
		Max. Output Frequency (Hz)	599.00														400.00		
	NORMAL DUTY	Carrier Frequency (kHz)	2~15(default setting 8)									2~10(default setting 6)					2~9(default setting 4)		
		Rated Output Capacity (kVA)	1.2	2.0	3.2	4.4	6.8	10	13	20	26	30	36	48	58	72	86	102	
		Rated Output Current (A)	3	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	19	22	30	37	45	55	75	
		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 during every 5 minutes; 160% of rated current for 3 seconds during every 25 seconds																
Input Rating	Max. Output Frequency (Hz)	599.00														400.00			
	Carrier Frequency (kHz)	2~15(default setting 8)									2~10(default setting 6)					2~9(default setting 4)			
	Input Current (A) Light Duty	6.4	9.6	15	22	25	35	50	65	83	100	116	146	180	215	276	322		
Input Current (A) Normal Duty	3.9	6.4	12	16	20	28	36	52	72	83	99	124	143	171	206	245			
Rated Voltage/Frequency	3-phase, 200~240V _{AC} (-15%~+10%), 50/60 Hz																		
Operating Voltage Range	170~264V _{AC}																		
Frequency Tolerance	47~63Hz																		
Efficiency (%)	97.8														98.2				
Power Factor	>0.98																		
Weight (Kg)	2.6 ± 0.3					5.4 ± 1				9.8 ± 1.5				38.5 ± 1.5		64.8 ± 1.5			
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: Built-in 3%					
EMC Filter	Optional																		
460 V																			
Frame Size			A						B			C			D0				
Models VFD-□□□□CP43□-□□ VFD-□□□□CP4E□-□□			007	015	022	037	040	055	075	110	150	185	220	300	370	450	550		
Output Rating	LIGHT DUTY	Rated Output Capacity (kVA)	2.4	3.3	4.4	6.8	8.4	10.4	14.3	19	25	30	36	48	58	73	88		
		Rated Output Current (A)	3	4.2*	5.5*	8.5*	10.5	13*	18*	24*	32*	38*	45	60*	73*	91	110		
		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	45	55		
		Applicable Motor Output (HP)	1	2	3	5	5	7.5	10	15	20	25	30	40	50	60	75		
		Overload Tolerance	120% of rated current for 1 minute during every 5 minutes																
		Max. Output Frequency (Hz)	599.00																
	NORMAL DUTY	Carrier Frequency (kHz)	2~15(default setting 8)											2~10(default setting 6)					
		Rated Output Capacity (kVA)	2.2	2.4	3.2	4.8	7.2	8.4	10.4	14.3	19	25	30	36	48	58	73		
		Rated Output Current (A)	1.7	3.0	4.0	6.0	9.0	10.5	12	18	24	32	38	45	60	73	91		
		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	37	45		
		Applicable Motor Output (HP)	0.5	1	2	3	5	5	7.5	10	15	20	25	30	40	53	60		
		Overload Tolerance	120% of rated current for 1 minute during every 5 minutes; 160% of rated current for 3 seconds during every 25 seconds																
Input Rating	Max. Output Frequency (Hz)	599.00																	
	Carrier Frequency (kHz)	2~15(default setting 8)											2~10(default setting 6)						
	Input Current (A) Light Duty	4.3	6.0	8.1	12.4	16	20	22	26	35	42	50	66	80	91	110			
Input Current (A) Normal Duty	3.5	4.3	5.9	8.7	14	15.5	17	20	26	35	40	47	63	74	101				
Rated Voltage/Frequency	3-phase, 380~480V _{AC} (-15%~+10%), 50/60 Hz																		
Operating Voltage Range	323~528V _{AC}																		
Frequency Tolerance	47~63Hz																		
Efficiency (%)	97.8																		
Power Factor	>0.98																		
Weight (Kg)	2.6 ± 0.3					5.4 ± 1				9.8 ± 1.5				27 ± 1					
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, Built-in 3%																		
EMC Filter	Frame A, B, C of VFD____CP4EA_-_; Built-in																		
	Frame A, B, C of VFD____CP43A_-_; no built-in Frame D above, Optional																		

* It means the rated output current is for the models of version B. (e.g. VFD015CP43B-21)

460 V																		
Frame Size			D		E		F		G			H						
Model VFD-□□□□CP43□-□□			750	900	1100	1320	1600	1850	2000	2200	2500	2800	3150	3550	4000	5000	5600 6300	
Output Rating	LIGHT DUTY	Rated Output Capacity (kVA)	120	143	175	207	247	295	315	367	383	422	491	544	613	773	872 966	
		Rated Output Current (A)	150*	180	220	260*	310	370*	395	460	481	530	616	683	770	930	1094 1212	
		Applicable Motor Output (kW)	75	90	110	132	160	185	200	220	250	280	315	355	400	500	560 630	
		Applicable Motor Output (HP)	100	125	150	175	215	250	270	300	340	375	425	475	530	675	750 850	
		Overload Tolerance	120% of rated current for 1 minute during every 5 minutes															
		Max. Output Frequency (Hz)	599.00	400.00														
	NORMAL DUTY	Carrier Frequency (kHz)	2 ~ 10 (default setting 6)	2~9 (default setting 4)														
		Rated Output Capacity (kVA)	88	120	143	175	207	247	247	295	315	367	438	491	544	720	741	872
		Rated Output Current (A)	110	150	180	220	260	310	310	370	395	460	550	616	683	866	930	1094
		Applicable Motor Output (kW)	55	75	90	110	132	160	160	185	200	220	280	315	355	450	500	560
		Applicable Motor Output (HP)	75	100	125	150	175	215	215	250	270	300	375	425	475	600	675	750
		Overload Tolerance	120% of rated current for 1 minute during every 5 minutes; 160% of rated current for 3 seconds during every 25 seconds															
		Max. Output Frequency (Hz)	599.00	400.00														
		Carrier Frequency (kHz)	2 ~ 10 (default setting 6)	2~9 (default setting 4)														
Input Rating	Input Current (A) Light Duty		150	180	220	260	310	370	395	460	481	530	616	683	770	930	1094 1212	
	Input Current (A) Normal Duty		114	157	167	207	240	300	300	380	390	400	494	555	625	866	930 1094	
	Rated Voltage/Frequency		3-phase, 380~480 V _{AC} (-15%~+10%), 50/60 Hz															
	Operating Voltage Range		323~528 V _{AC}															
	Frequency Tolerance		47~63 Hz															
Efficiency (%)			97.8	98.2														
Power Factor			>0.98															
Weight (Kg)			38.5 ± 1.5		64.8 ± 1.5		86.5 ± 1.5		134 ± 4			228						
Cooling Method			Fan cooling															
Braking Chopper			Frame D above, Optional															
DC Choke			Frame D above, Built-in, 3%															
EMC Filter			Frame D above, Optional															

* It means the rated output current is for the models of Version B. (e.g. VFD015CP43B-21)

575V									
Frame Size			A			B			
Model VFD-□□□CP53A-21			015	022	037	055	075	110	150
Output *	LIGHT DUTY	Rated Output Capacity (kVA)	3	4.3	6.7	9.9	12.1	18.6	24.1
		Rated Output Current (A)	3	4.3	6.7	9.9	12.1	18.7	24.2
		Applicable Motor Output (kW)	1.5	2.2	3.7	5.5	7.5	11	15
		Applicable Motor Output (HP)	2	3	5	7.5	10	15	20
	NORMAL DUTY	Rated Output Capacity (kVA)	2.5	3.6	5.5	8.2	10	15.4	19.9
		Rated Output Current (A)	2.5	3.6	5.5	8.2	10	15.4	20
		Applicable Motor Output (kW)	0.75	1.5	2.2	3.7	5.5	7.5	11
		Applicable Motor Output (HP)	1	2	3	5	7.5	10	15
	Carrier Frequency (kHz)		2~9 (default setting 4)						
Input	Input Current (A) Light Duty		3.8	5.4	10.4	14.9	16.9	21.3	26.3
	Input Current (A) Normal Duty		3.1	4.5	7.2	12.3	15	18	22.8
	Rated Voltage/Frequency		3-Phase, 525~600 V _{AC} (-15% ~+10%), 50/60 Hz						
	Operating Voltage Range		446~660 V _{AC}						
	Frequency Tolerance		47~63Hz						
Efficiency (%)			97			98			
Power Factor			> 0.98						
AC Drive Weight (Kg)			3±0.3			4.8±1			
Cooling Method			Natural cooling			Fan cooling			
Braking Chopper			Built-in						
DC Choke			Optional						

690V												
Frame Size			C				D		E			
Model VFD-□□□CP63A-□□			185	220	300	370	450	550	750	900	1100	1320
Output *	LIGHT DUTY	Rated Output Capacity (kVA)	29	36	43	54	65	80	103	124	149	179
		Applicable Motor Output (690V, kW)	18.5	22	30	37	45	55	75	90	110	132
		Applicable Motor Output (690V, HP)	25	30	40	50	60	75	100	125	150	175
		Applicable Motor Output (575V, HP)	20	25	30	40	50	60	75	100	125	150
		Rated Output Current (A)	24	30	36	45	54	67	86	104	125	150
		Overload Tolerance	120% of rated current for 1 minute during every 5 minutes									
		Max. Output Frequency (Hz)	599.00									
	NORMAL DUTY	Rated Output Capacity (kVA)	24	29	36	43	54	65	80	103	124	149
		Applicable Motor Output (690V, kW)	15	18.5	22	30	37	45	55	75	90	110
		Applicable Motor Output (690V, HP)	20	25	30	40	50	60	75	100	125	150
		Applicable Motor Output (575V, HP)	15	20	25	30	40	50	60	75	100	125
		Rated Output Current (A)	20	24	30	36	45	54	67	86	104	125
		Overload Tolerance	120% of rated current for 1 minute during every 5 minutes; 160% of rated current for 3 seconds during every 25 seconds									
		Max. Output Frequency (Hz)	599.00									
	Input	Carrier Frequency (kHz)	2~9 (default setting 4)									
Input Current (A) Light Duty		29	36	43	54	65	81	84	102	122	147	
Input Current (A) Normal Duty		24	29	36	43	54	65	66	84	102	122	
Rated Voltage/Frequency		3-Phase, 525~690 V _{AC} (-15% ~ +10%), 50/60 Hz										
Operating Voltage Range		446~759 V _{AC}										
Frequency Tolerance		47~63 Hz										
Efficiency (%)		97										
Power Factor		>0.98										
AC Drive Weight (Kg)		10±1.5				39±1.5				61±1.5		
Cooling Method		Fan cooling										
Braking Chopper	Frame C (built-in)					Frame D and above (optional)						
DC Choke	Frame C (optional)					Frame D and above (built-in)						

690V												
Frame Size			F		G		H					
Model VFD-□□□CP63A-□□			1600	2000	2500	3150	4000	4500	5600	6300		
Output *	LIGHT DUTY	Rated Output Capacity (kVA)	215	263	347	418	494.5	534.7	678.5	776		
		Applicable Motor Output (690V, kW)	160	200	250	315	400	450	560	630		
		Applicable Motor Output (690V, HP)	215	270	335	425	530	600	750	850		
		Applicable Motor Output (575V, HP)	150	200	250	350	400	450	500	750		
		Rated Output Current (A)	180	220	290	350	430	465	590	675		
		Overload Tolerance	120% of rated current for 1 minute during every 5 minutes									
		Max. Output Frequency (Hz)	599.00									
	NORMAL DUTY	Rated Output Capacity (kVA)	179	215	239	347	402.5	442.7	534.7	776		
		Applicable Motor Output (690V, kW)	132	160	200	250	315	355	450	630		
		Applicable Motor Output (690V, HP)	175	215	270	335	425	475	600	850		
		Applicable Motor Output (575V, HP)	150	150	200	250	350	400	450	750		
		Rated Output Current (A)	150	180	220	290	350	385	465	675		
		Overload Tolerance	120% of rated current for 1 minute during every 5 minutes; 160% of rated current for 3 seconds during every 25 seconds									
		Max. Output Frequency (Hz)	599.00									
	Input	Carrier Frequency (kHz)	2~9 (default setting 4)									2~9 (default setting 3)
Input Current (A) Light Duty		178	217	292	353	454	469	595	681			
Input Current (A) Normal Duty		148	178	222	292	353	388	504	681			
Rated Voltage/Frequency		3-Phase, 525~690 V _{AC} (-15% ~ +10%), 50/60 Hz										
Operating Voltage Range		446~759 V _{AC}										
Frequency Tolerance		47~63 Hz										
Efficiency (%)		97		98								
Power Factor		>0.98										
AC Drive Weight (Kg)	88±1.5		135±4		243±5							
Cooling Method	Fan cooling											
Braking Chopper	Frame D and above (optional)											
DC Choke	Frame D and above (built-in)											

Note : 1. When a load is a surge load, use a higher level model.
2. For Frame A, B and C, Model VFDXXXCPXXX-21, the enclosure type is IP20/ UL OPEN TYPE.
3. For Frame D and above, if the last two characters of the model are 00, then the enclosure type is IP00/ IP20/ UL OPEN TYPE; if the last two characters of the model are 21, the enclosure type is IP20/NEMA1/ UL TYPE1.

General Specifications

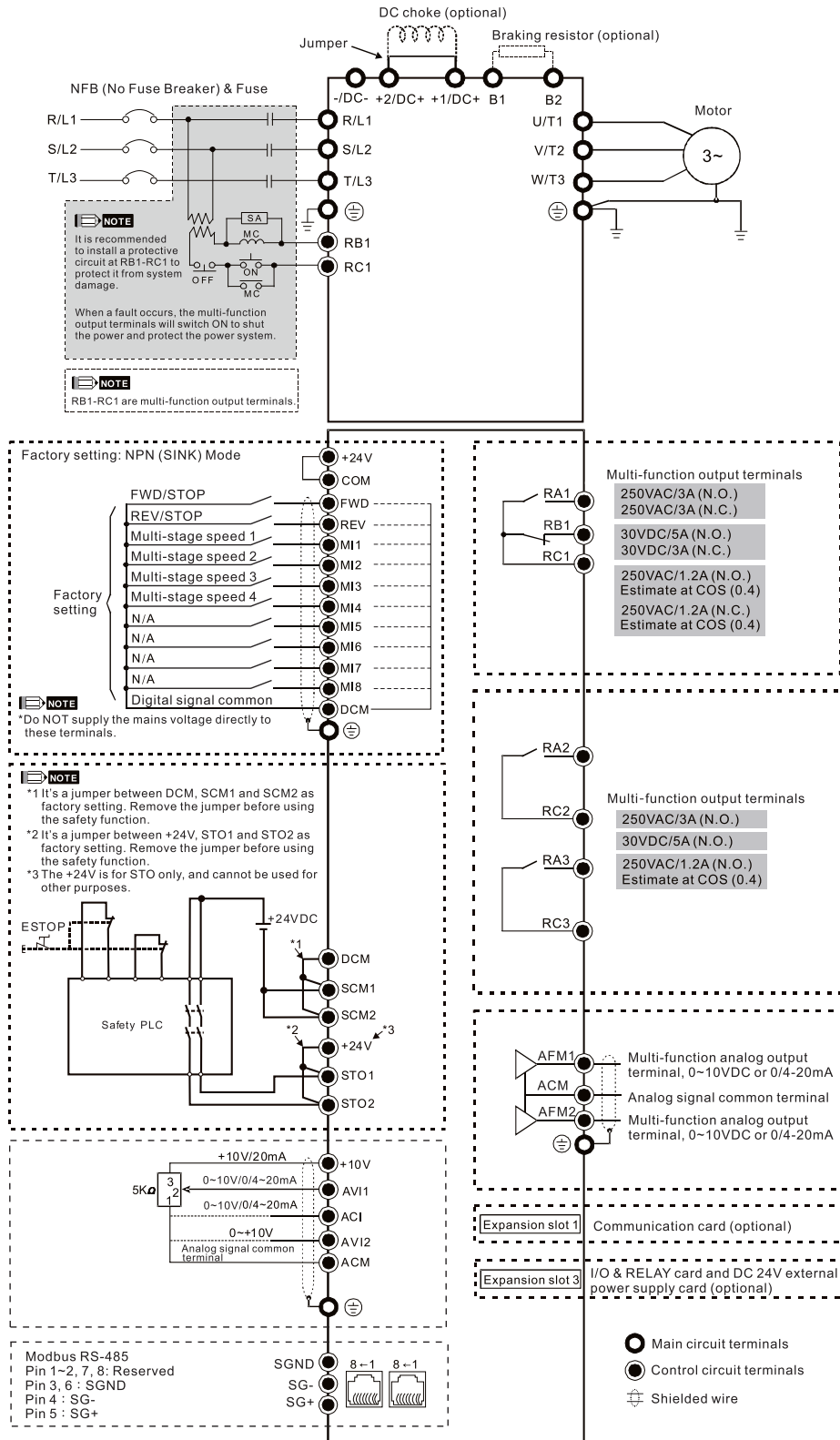
Control Characteristics	Control Method	Pulse Width Modulated (PWM)				
	Control Mode	1: V/F (V/F control), 2: SVC (Sensorless Vector Control), 3: PM (Permanent Magnet Motor)				
	Starting Torque	Reach up to 150% or above at 0.5Hz				
	V/F Curve	4 point adjustable V/F curve and square curve				
	Speed Response Ability	5 Hz				
	Torque Limit	Light Duty: Max. 130% torque current; Normal Duty: Max. 160% torque current				
	Torque Accuracy	±5%				
	Max. Output Frequency (Hz)	230 V model: 599.00 (55 kW and above: 400.00) 460 V model: 599.00 (90 kW and above: 400.00) 575 V/690 V model: 599.00				
	Frequency Output Accuracy	Digital command: ±0.01%, -10 °C ~+40 °C, Analog command: ±0.1%, 25 ±10 °C				
	Output Frequency Resolution	Digital command: 0.01 Hz; Analog command: Max. output frequency x0.03/60Hz (±11 bit)				
	Overload Tolerance	Light duty: 120% of rated current for 1 minute during every 5 minutes Normal duty: 120% of rated current for 1 minute during every 5 minutes; 160% of rated current for 3 seconds during every 25 seconds				
	Frequency Setting Signal	0 ~+10 V, 4 ~20 mA, 0 ~20 mA				
	Accel./decel. Time	0.00 ~ 600.00/0.0 ~ 6000.0 seconds				
Main Control Function	Fault restart	Torque limit	High-Slip braking	Dwell	3-wire sequence	
	Speed search	Parameter copy	JOG frequency	Slip compensation	Torque compensation	
	S-curve accel/decel	Energy saving control	Accel/Decel. Time switch	Frequency upper/lower limit settings	Momentary power loss ride thru	
	PID control (with sleep function)	Auto-Tuning (rotational, stationary)	DC injection braking at start/stop	BACnet Communication	17-step speed (max.)	
	Over-torque detection	Modbus communication (RS-485 RJ45, Max. 5.2 Kbps)				
	Fan Control	230 V model: Model with spec higher than VFD185CP23 (included) are PWM control; Model with spec lower than VFD150CP23 (not included) are on/off switch control. 460 V model: Model with spec higher than VFD220CP43/4E (included) are PWM control; Model with spec lower than VFD185CP43/4E (not included) are on/off switch control. 575 V/690 V model: PWM control				
Protection Characteristics	Motor Protection	Electronic thermal relay protection				
	Over-Current Protection	230 V/460 V model: Light duty: Over-current protection for 185% rated current, Normal duty: Over-current protection for 240% rated current, Current clamp (Light duty: 130 ~ 135%) ; (Normal duty: 170 ~ 175%) 575 V/690 V model: Over-current protection for 225% rated current Current clamp (Light duty: around 128 ~ 141%) ; (Normal duty: around 170 ~ 175%)				
	Over-Voltage Protection	230 V model: drive will stop when DC bus voltage exceeds 410 V 460 V model: drive will stop when DC bus voltage exceeds 820 V 575 V model: drive will stop when DC bus voltage exceeds 1016 V 690 V model: drive will stop when DC bus voltage exceeds 1189 V				
	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				
	Short-circuit Current Rating (SCCR)	Per UL508C, the drive is suitable for use on a circuit capable of delivering not more than 100kA symmetrical amperes (rms) when protected by fuses given in the fuse table				
	International Certifications*	      SEMI F47, GB/T12668.3				

Note : 1. EAC Certification is for 230 V and 460 V models only
2. No UL certification for models above 500 kW

Wiring

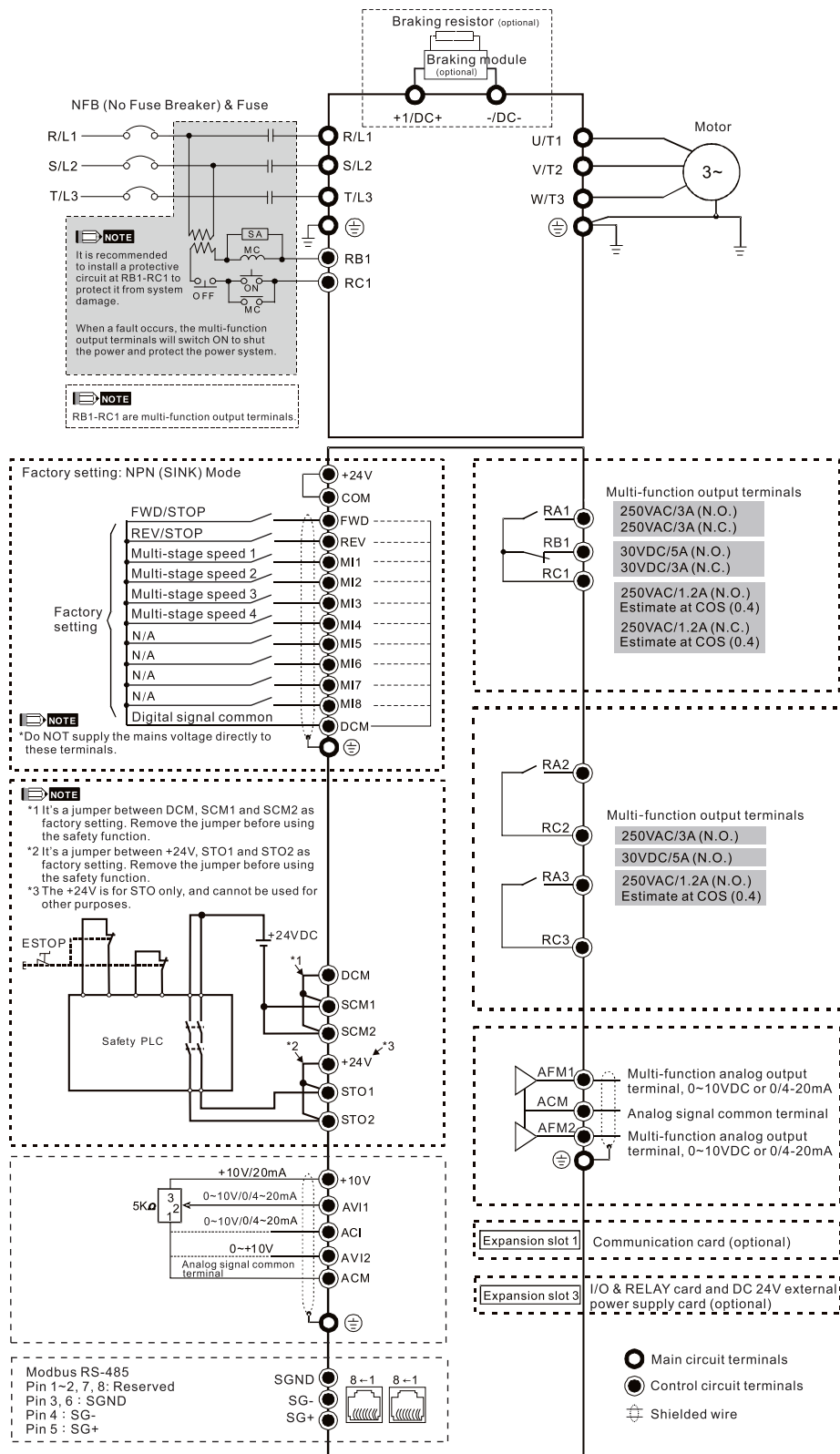
Wiring Diagram for Frame A ~ C

*Input: 3-phase power



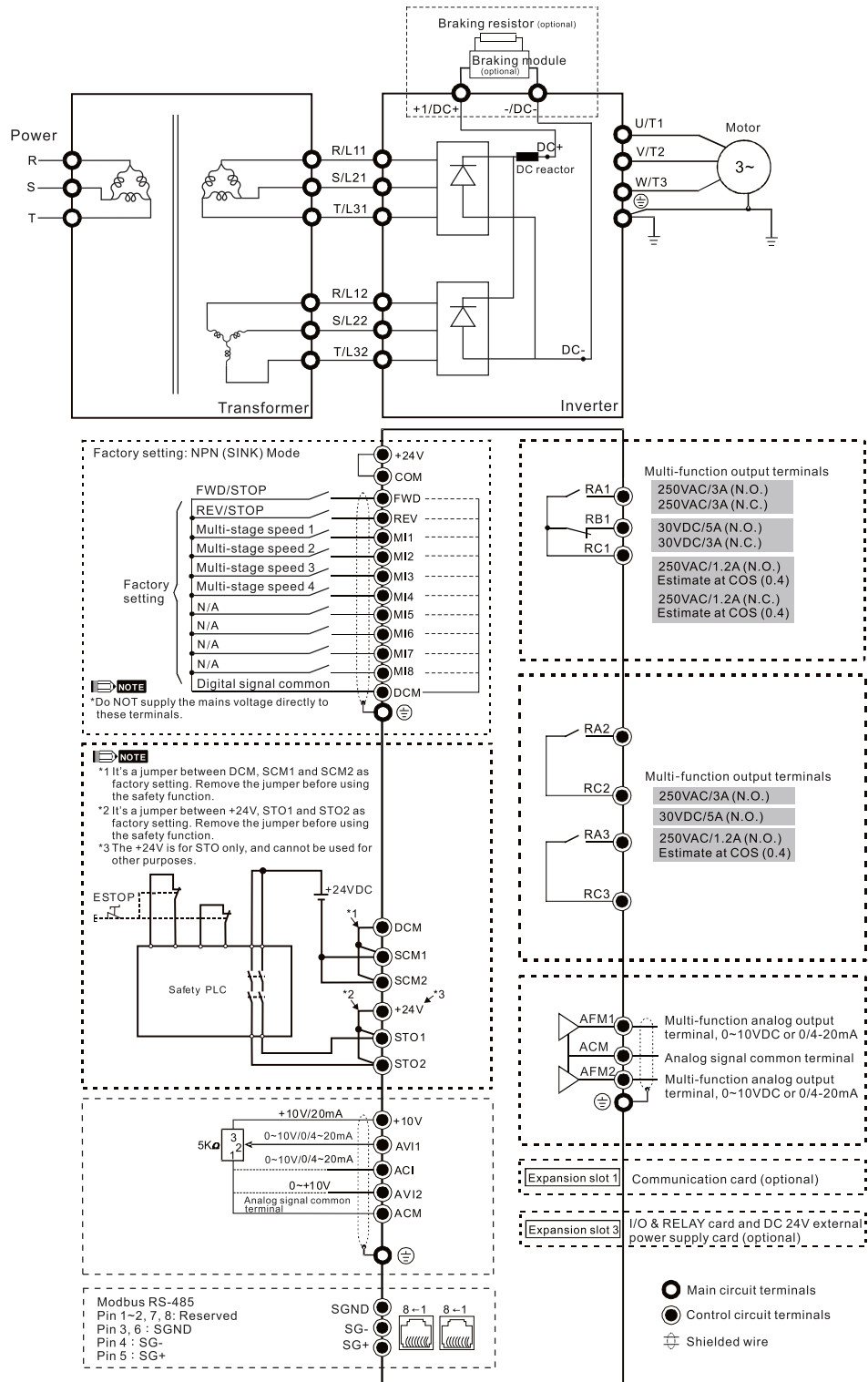
Wiring Diagram for Frame D ~ F

*Input: 3-phase power



Wiring Diagram for Frame G ~ H

*Input: 3-phase power

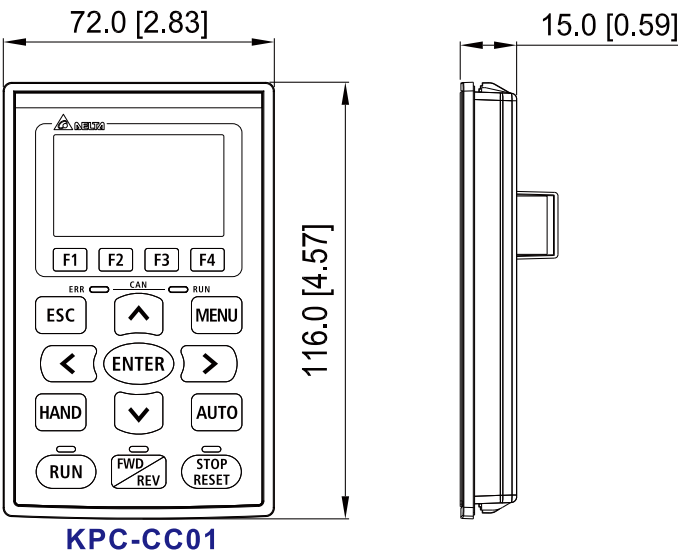


NOTE

• When wiring for 12 Pulse Input, please strictly follow above wiring diagram.

Dimensions

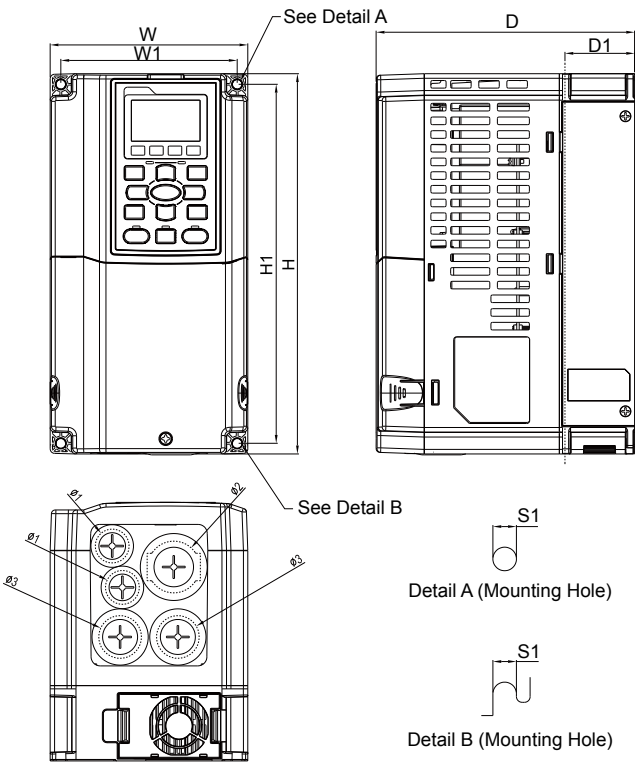
Digital Keypad Unit: mm [inch]



Standard LCD keypad

Frame A

MODEL	
VFD007CP23A-21	VFD007CP4EA-21
VFD015CP23A-21	VFD015CP4EB-21
VFD022CP23A-21	VFD022CP4EB-21
VFD037CP23A-21	VFD037CP4EB-21
VFD055CP23A-21	VFD040CP4EA-21
VFD007CP43A-21	VFD055CP4EB-21
VFD015CP43B-21	VFD075CP4EB-21
VFD022CP43B-21	VFD015CP53A-21
VFD037CP43B-21	VFD022CP53A-21
VFD040CP43A-21	VFD037CP53A-21
VFD055CP43B-21	
VFD075CP43B-21	



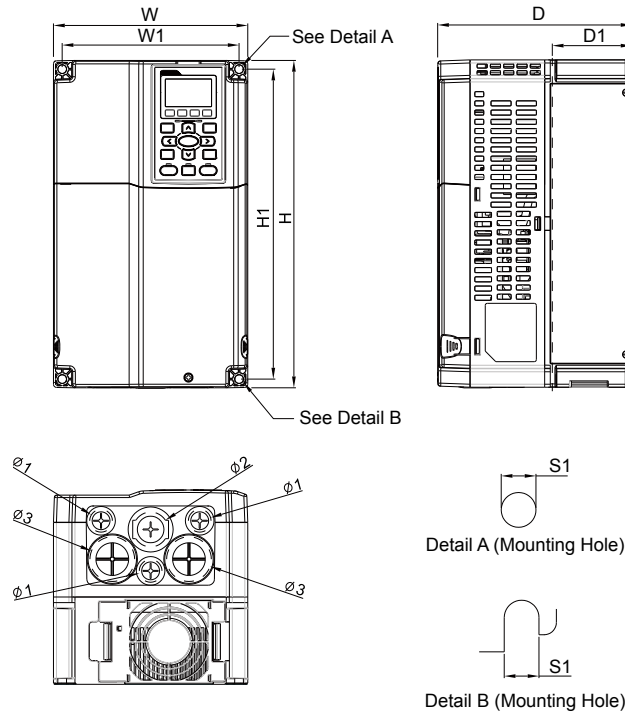
Frame		W	H	D	W1	H1	D1*	Ø	Ø1	Ø2	Ø3
A	mm	130.0	250.0	170.0	116.0	236.0	45.8	6.2	22.2	34.0	28.0
	inch	5.12	9.84	6.69	4.57	9.29	1.80	0.24	0.87	1.34	1.10

*D1: Flange mount.

Frame B

MODEL

VFD075CP23A-21
VFD110CP23A-21
VFD150CP23A-21
VFD110CP43B-21
VFD150CP43B-21
VFD185CP43B-21
VFD110CP4EB-21
VFD150CP4EB-21
VFD185CP4EB-21
VFD055CP53A-21
VFD075CP53A-21
VFD110CP53A-21
VFD150CP53A-21



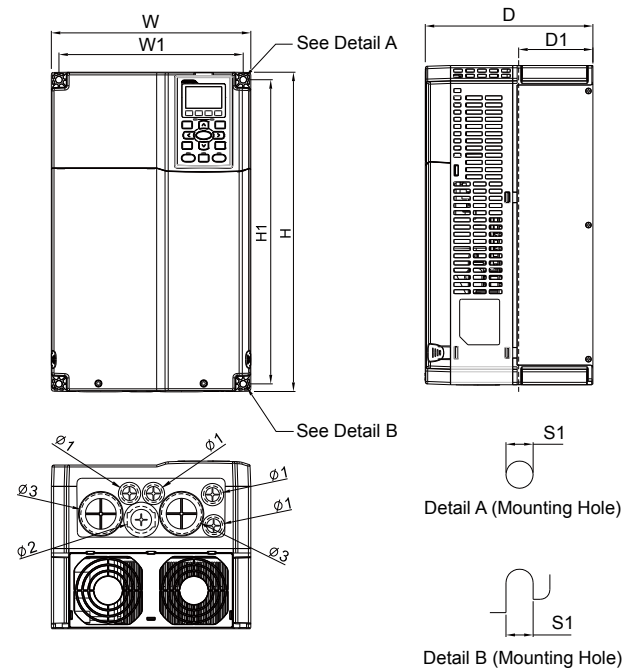
Frame		W	H	D	W1	H1	D1*	S1	Ø1	Ø2	Ø3
B1	mm	190.0	320.0	190.0	173.0	303.0	77.9	8.5	22.2	34.0	43.8
	inch	7.48	12.60	7.48	6.81	11.93	3.07	0.33	0.87	1.34	1.72

*D1: Flange mount.

Frame C

MODEL

VFD185CP23A-21
VFD220CP23A-21
VFD300CP23A-21
VFD220CP43A-21
VFD300CP43B-21
VFD370CP43B-21
VFD220CP4EA-21
VFD300CP4EB-21
VFD370CP4EB-21
VFD185CP63A-21
VFD220CP63A-21
VFD300CP63A-21
VFD370CP63A-21



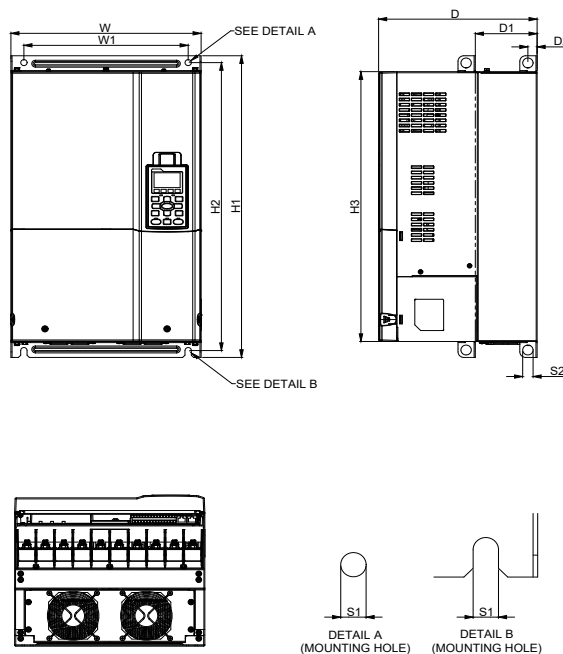
Frame		W	H	D	W1	H1	D1*	S1	Ø1	Ø2	Ø3
C1	mm	250.0	400.0	210.0	231.0	381.0	92.9	8.5	22.2	34.0	50.0
	inch	9.84	15.75	8.27	9.09	15.00	3.66	0.33	0.87	1.34	1.97

*D1: Flange mount.

Frame D1

MODEL FRAME_D1

VFD370CP23A-00
VFD450CP23A-00
VFD750CP43B-00
VFD900CP43A-00
VFD450CP63A-00
VFD550CP63A-00



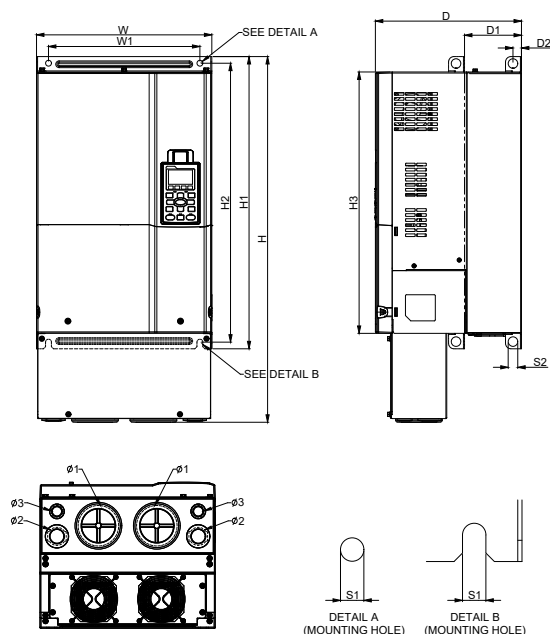
Frame		W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2	Ø1	Ø2	Ø3
D1	mm	330.0	-	275.0	285.0	550.0	525.0	492.0	107.2	16.0	11.0	18.0	-	-	-
	inch	12.99	-	10.83	11.22	21.65	20.67	19.37	4.22	0.63	0.43	0.71	-	-	-

*D1: Flange mount.

Frame D2

MODEL FRAME_D2

VFD370CP23A-21
VFD450CP23A-21
VFD750CP43B-21
VFD900CP43A-21
VFD450CP63A-21
VFD550CP63A-21



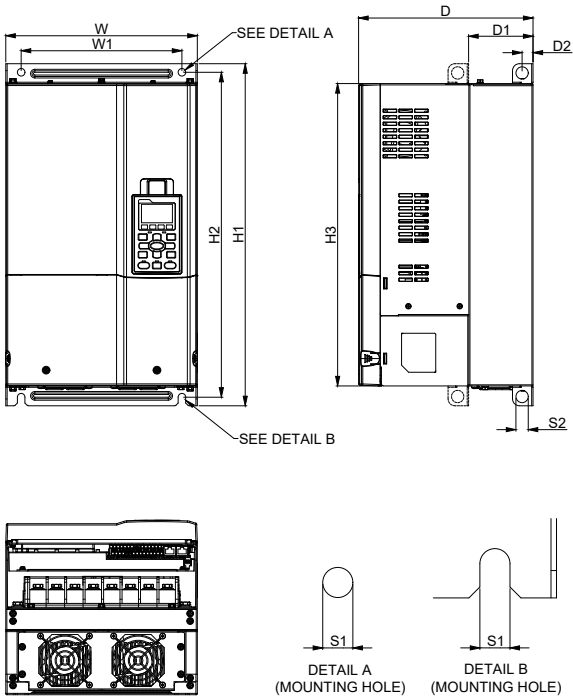
Frame		W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2	Ø1	Ø2	Ø3
D2	mm	330.0	688.3	275.0	285.0	550.0	525.0	492.0	107.2	16.0	11.0	18.0	76.2	34.0	22.0
	inch	12.99	27.10	10.83	11.22	21.65	20.67	19.37	4.22	0.63	0.43	0.71	3.00	1.34	0.87

*D1: Flange mount.

Frame D0-1

MODEL
FRAME_D0-1

VFD450CP43S-00
VFD550CP43S-00



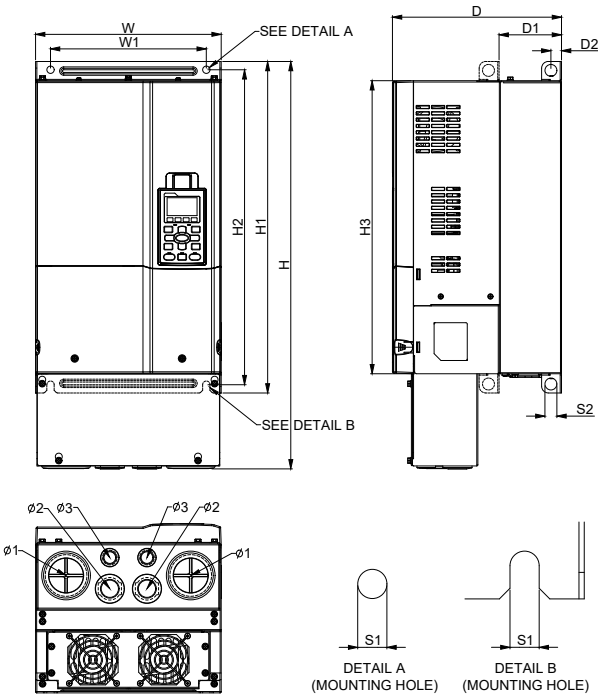
Frame		W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2
D0-1	mm	280.0	-	255.0	235.0	500.0	475.0	442.0	94.2	16.0	11.0	18.0
	inch	11.02	-	10.04	9.25	19.69	18.70	17.40	3.71	0.63	0.43	0.71

*D1: Flange mount.

Frame D0-2

MODEL
FRAME_D0-2

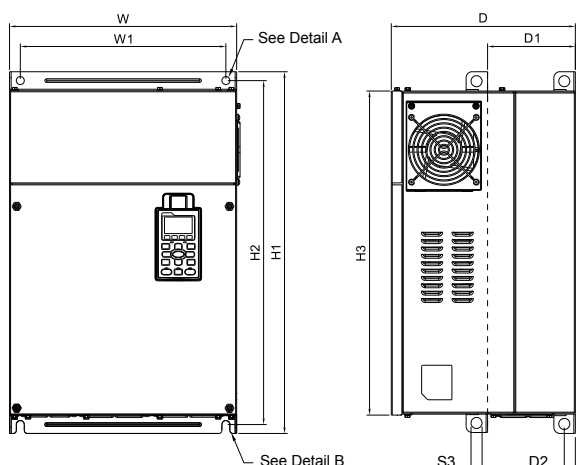
VFD450CP43S-21
VFD550CP43S-21



Frame		W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2	Ø1	Ø2	Ø3
D0-2	mm	280.0	614.4	255.0	235.0	500.0	475.0	442.0	94.2	16.0	11.0	18.0	62.7	34.0	22.0
	inch	11.02	24.19	10.04	9.25	19.69	18.70	17.40	3.71	0.63	0.43	0.71	2.47	1.34	0.87

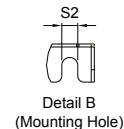
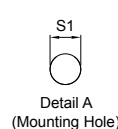
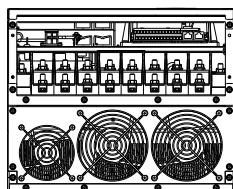
*D1: Flange mount.

Frame E1



MODEL

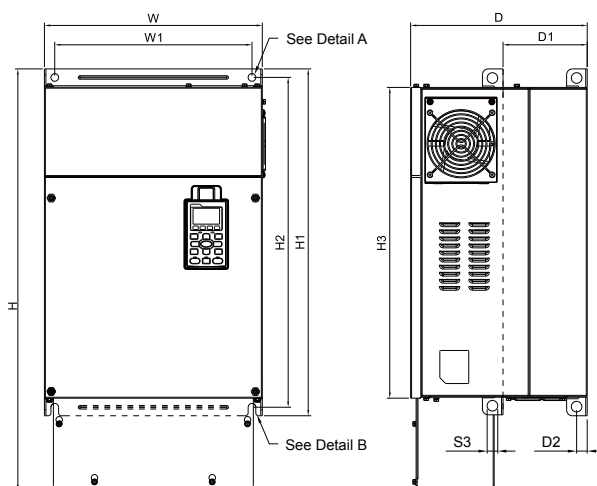
VFD550CP23A-00	VFD750CP63A-00
VFD750CP23A-00	VFD900CP63A-00
VFD900CP23A-00	VFD1100CP63A-00
VFD1100CP43A-00	VFD1320CP63A-00
VFD1320CP43B-00	



Frame		W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2	S3	Ø1	Ø2	Ø3
E1	mm	370.0	-	300.0	335.0	589.0	560.0	528.0	143.0	18.0	13.0	13.0	18.0	-	-	-
	inch	14.57	-	11.81	13.19	23.19	22.05	20.80	5.63	0.71	0.51	0.51	0.71	-	-	-

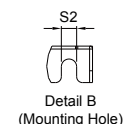
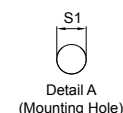
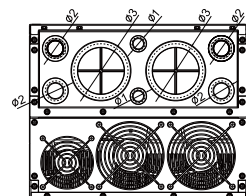
*D1: Flange mount.

Frame E2



MODEL

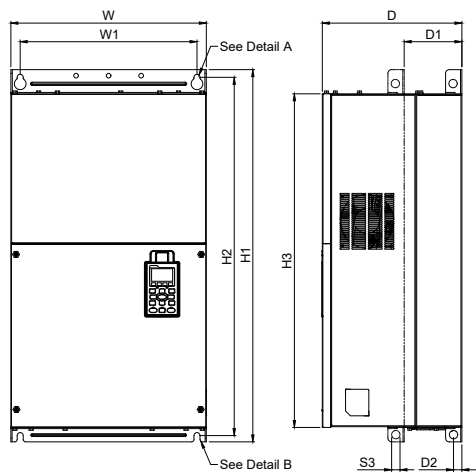
VFD550CP23A-21	VFD750CP63A-21
VFD750CP23A-21	VFD900CP63A-21
VFD900CP23A-21	VFD1100CP63A-21
VFD1100CP43A-21	VFD1320CP63A-21
VFD1320CP43B-21	



Frame		W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2	S3	Ø1	Ø2	Ø3
E2	mm	370.0	715.8	300.0	335.0	589.0	560.0	528.0	143.0	18.0	13.0	13.0	18.0	22.0	34.0	92.0
	inch	14.57	28.18	11.81	13.19	23.19	22.05	20.80	5.63	0.71	0.51	0.51	0.71	0.87	1.34	3.62

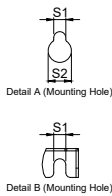
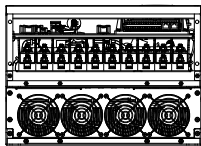
*D1: Flange mount.

Frame F1



MODEL

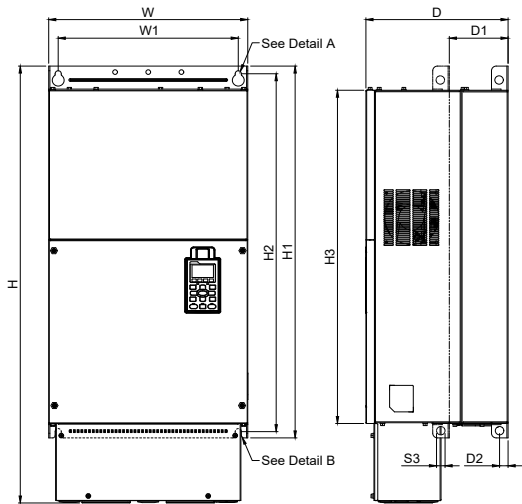
VFD1600CP43A-00
VFD1850CP43B-00
VFD1600CP63A-00
VFD2000CP63A-00



Frame		W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2	S3	Ø1	Ø2	Ø3
F1	mm	420.0	-	300.0	380.0	800.0	770.0	717.0	124.0	18.0	13.0	25.0	18.0	-	-	-
	inch	16.54	-	11.81	14.96	31.50	30.32	28.23	4.88	0.71	0.51	0.98	0.71	-	-	-

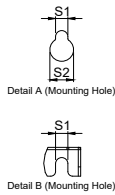
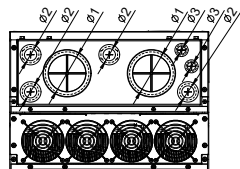
*D1: Flange mount.

Frame F2



MODEL

VFD1600CP43A-21
VFD1850CP43B-21
VFD1600CP63A-21
VFD2000CP63A-21



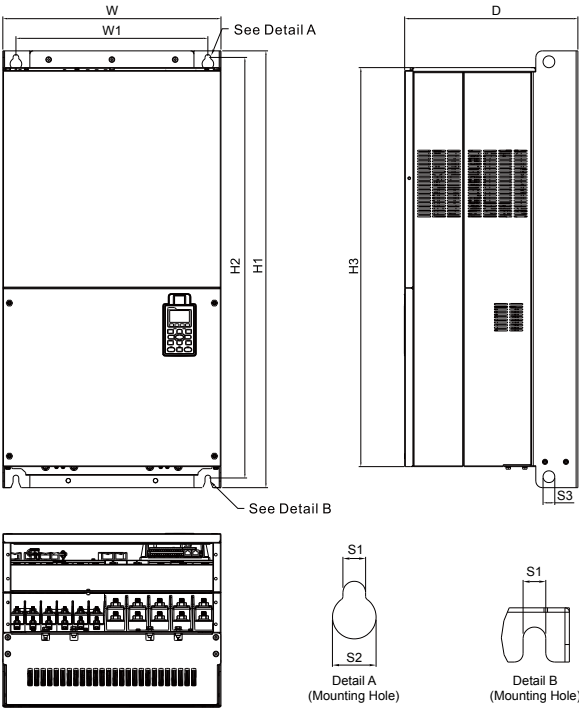
Frame		W	H	D	W1	H1	H2	H3	D1*	D2	S1	S2	S3	Ø1	Ø2	Ø3
F2	mm	420.0	940.0	300.0	380.0	800.0	770.0	717.0	124.0	18.0	13.0	25.0	18.0	92.0	35.0	22.0
	inch	16.54	37.00	11.81	14.96	31.50	30.32	28.23	4.88	0.71	0.51	0.98	0.71	3.62	1.38	0.87

*D1: Flange mount.

Frame G1

MODEL

VFD2000CP43A-00
VFD2200CP43A-00
VFD2500CP43A-00
VFD2800CP43A-00
VFD2500CP63A-00
VFD3150CP63A-00

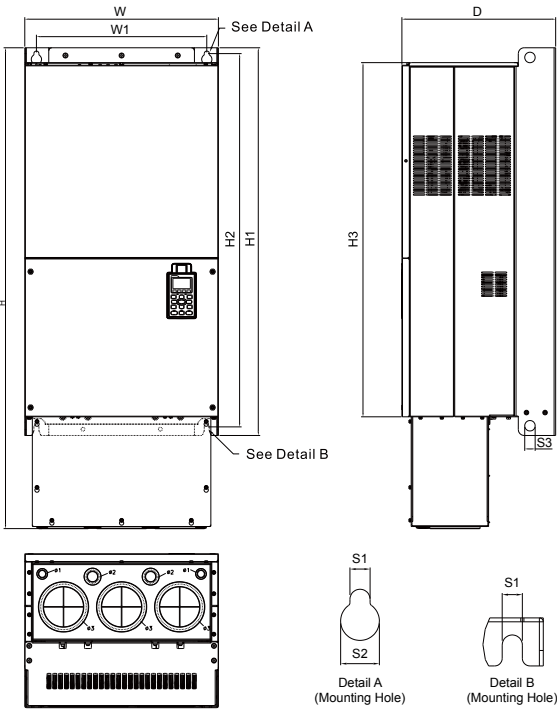


Frame		W	H	D	W1	H1	H2	H3	S1	S2	S3	Ø1	Ø2	Ø3
G1	mm	500.0	-	397.0	440.0	1000.0	963.0	913.6	13.0	26.5	27.0	-	-	-
	inch	19.69	-	15.63	217.32	39.37	37.91	35.97	0.51	1.04	1.06	-	-	-

Frame G2

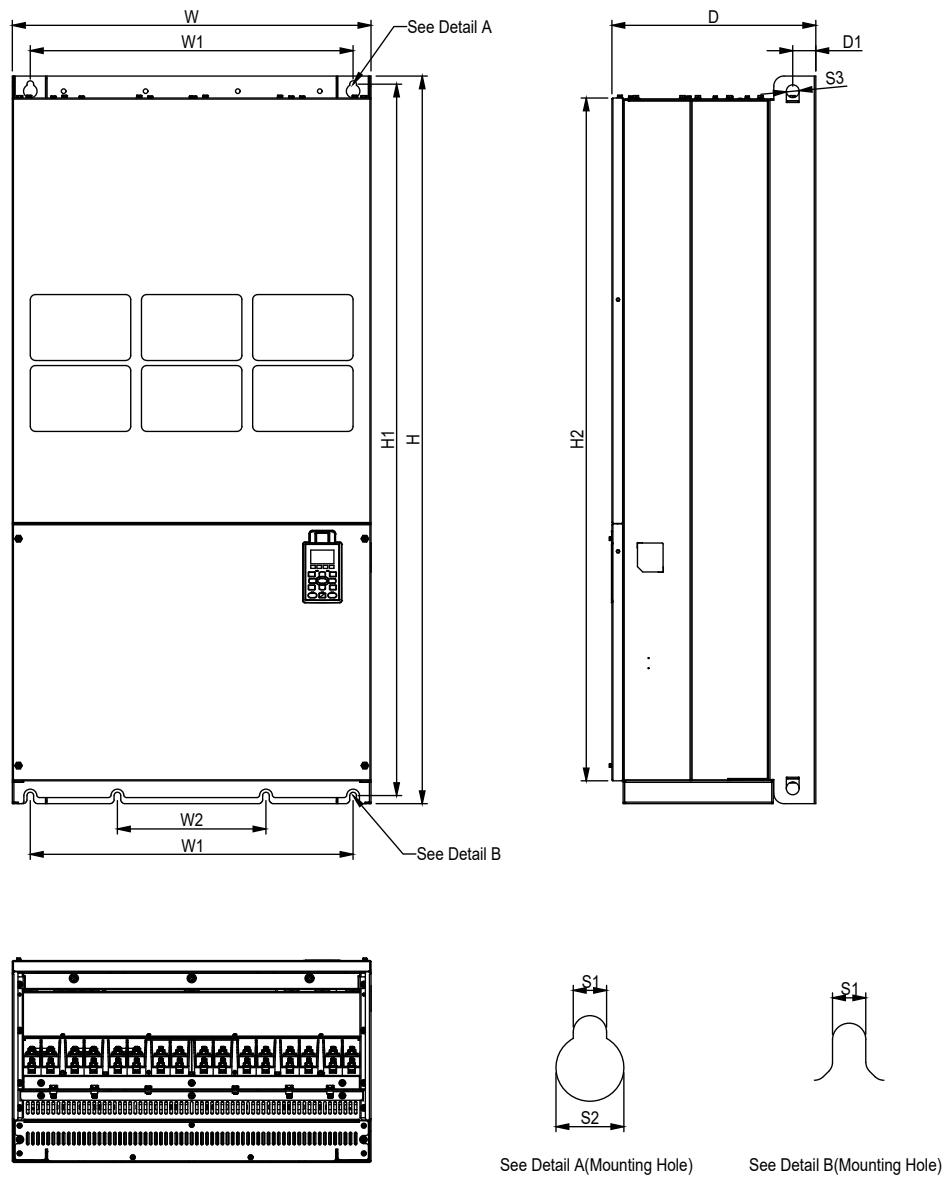
MODEL

VFD2000CP43A-21
VFD2200CP43A-21
VFD2500CP43A-21
VFD2800CP43A-21
VFD2500CP63A-21
VFD3150CP63A-21



Frame		W	H	D	W1	H1	H2	H3	S1	S2	S3	Ø1	Ø2	Ø3
G2	mm	500.0	1240.2	397.0	440.0	1000.0	963.0	913.6	13.0	26.5	27.0	22.0	34.0	117.5
	inch	19.69	48.83	15.63	217.32	39.37	37.91	35.97	0.51	1.04	1.06	0.87	1.34	4.63

Frame H1

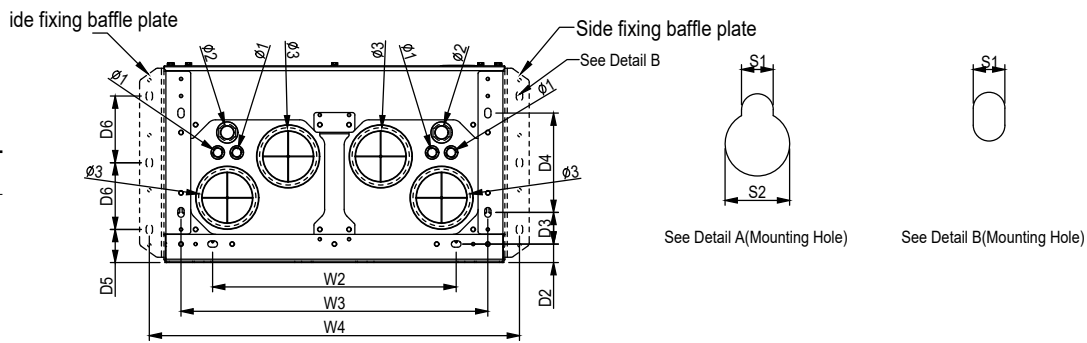
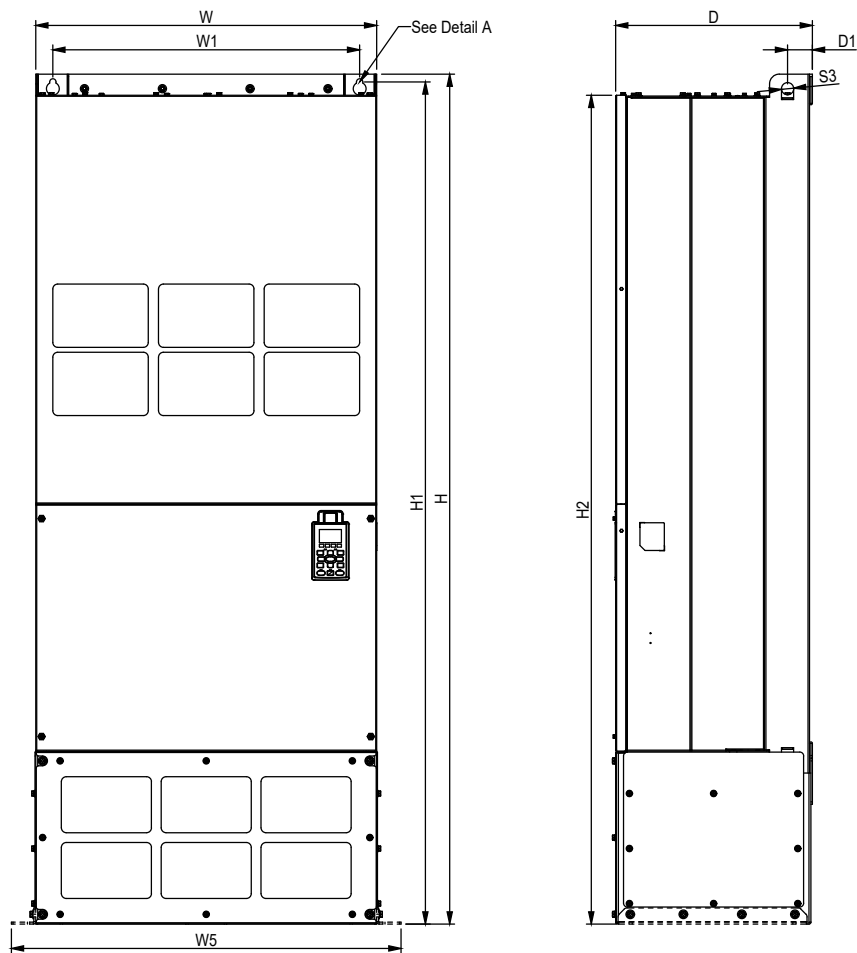


MODEL

VFD3150CP43A-00
 VFD3550CP43A-00
 VFD4000CP43A-00
 VFD5000CP43A-00
 VFD5600CP43A-00
 VFD6300CP43A-00

Frame		W	H	D	W1	W2	W3	W4	W5	W6	H1	H2	H3	H4
H1	mm	700.0	1435.0	398.0	630.0	290.0	-	-	-	-	1403.0	1346.6	-	-
	inch	27.56	56.5	15.67	24.80	11.42	-	-	-	-	55.24	53.02	-	-
Frame		H5	D1	D2	D3	D4	D5	D6	S1	S2	S3	Ø1	Ø2	Ø3
H1	mm	-	45.0	-	-	-	-	-	13.0	26.5	25.0	-	-	-
	inch	-	1.77	-	-	-	-	-	0.51	1.04	0.98	-	-	-

Frame H3

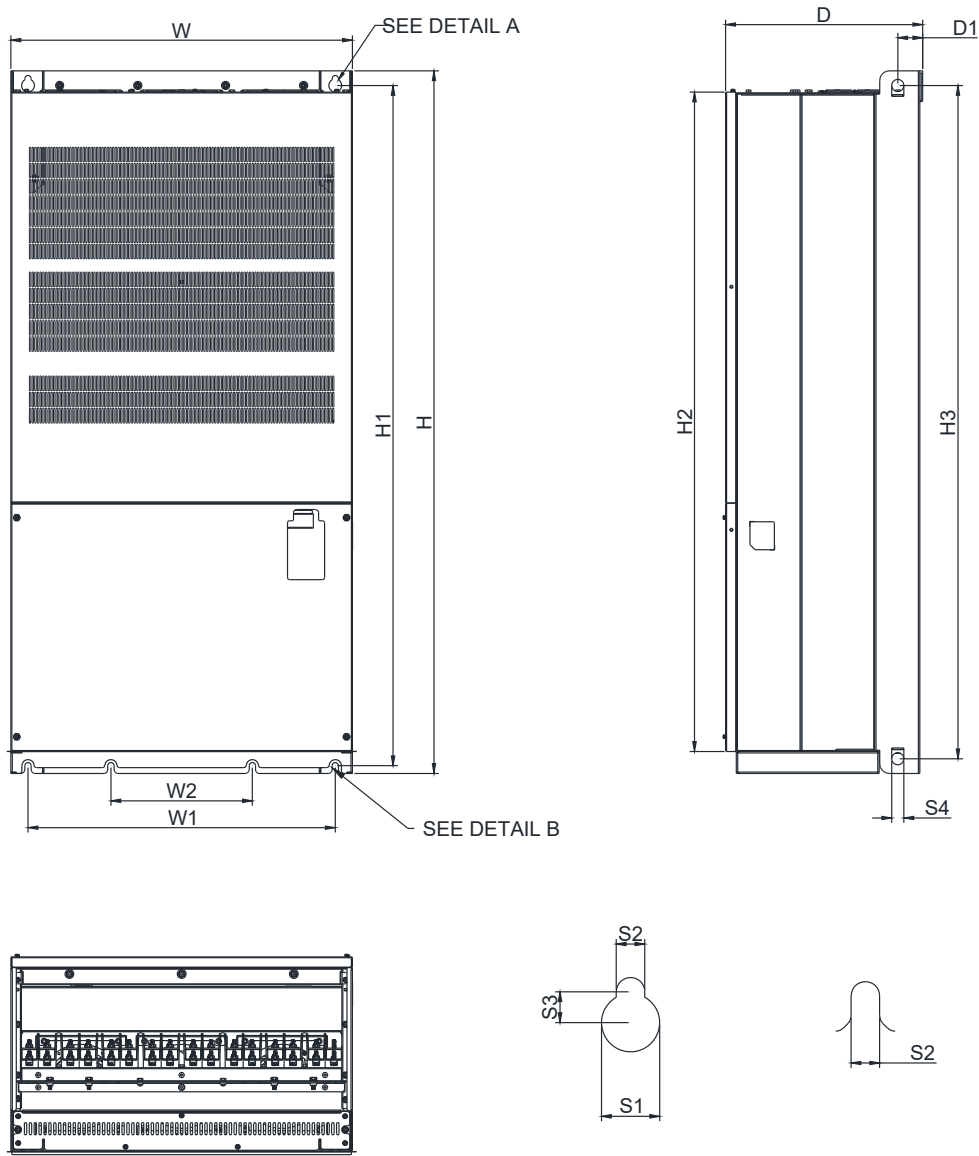


MODEL

VFD3150CP43C-21
 VFD3550CP43C-21
 VFD4000CP43C-21
 VFD5000CP43C-21
 VFD5600CP43C-21
 VFD6300CP43C-21

Frame		W	H	D	W1	W2	W3	W4	W5	W6	H1	H2	H3	H4
H3	mm	700.0	1745.0	404.0	630.0	500.0	630.0	760.0	800.0	-	1729.0	1701.6	-	-
	inch	27.56	68.70	15.91	24.80	19.69	24.80	29.92	31.50	-	68.07	66.99	-	-
Frame		H5	D1	D2	D3	D4	D5	D6	S1	S2	S3	Ø1	Ø2	Ø3
H3	mm	-	51.0	38.0	65.0	204.0	68.0	137.0	13.0	26.5	25.0	22.0	34.0	117.5
	inch	-	2.0	1.50	2.56	8.03	2.68	5.4	0.51	1.04	0.98	0.87	1.34	4.63

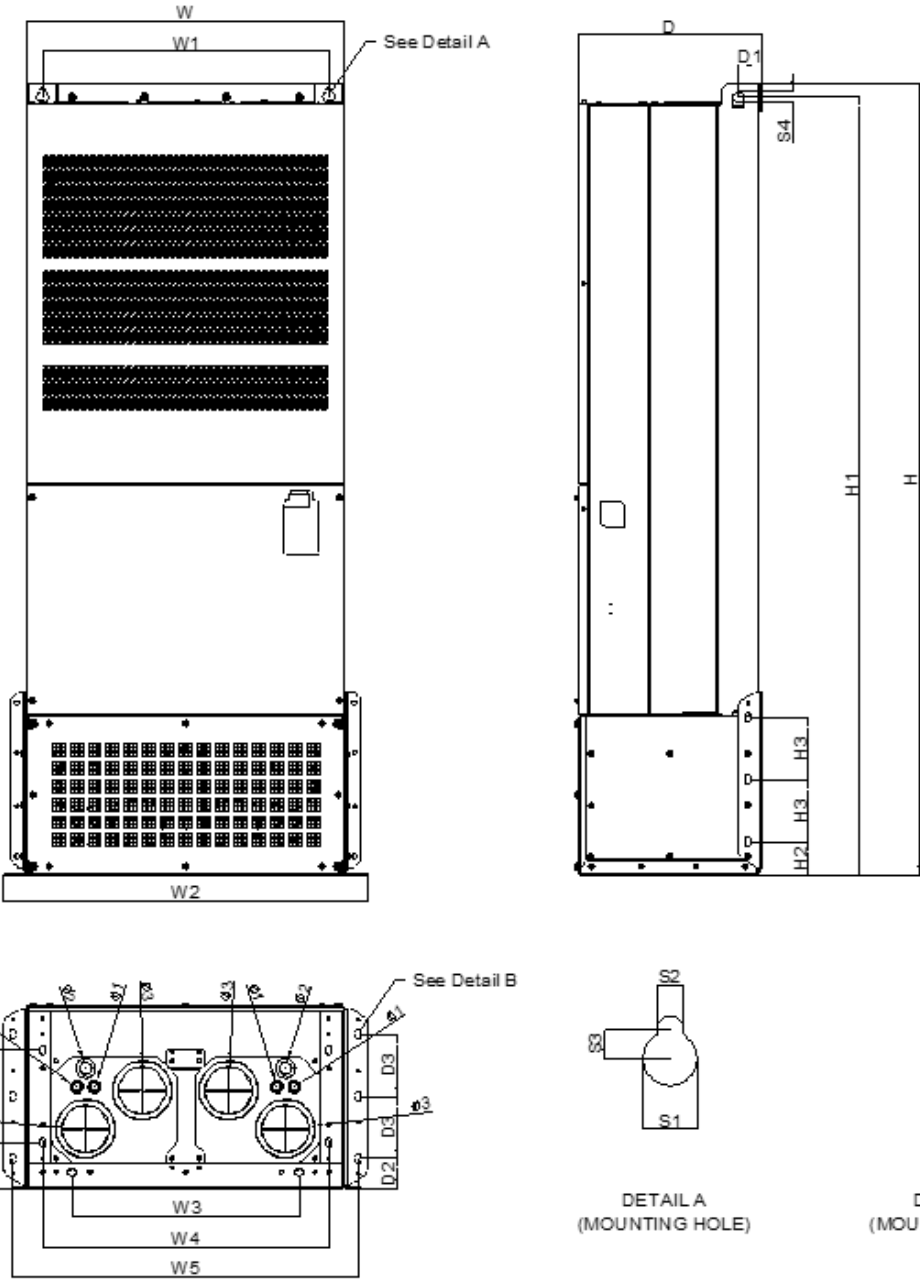
690 V Frame H1



MODEL
690V FRAME_H1
VFD4000CP63A-00
VFD4500CP63A-00
VFD5600CP63A-00
VFD6300CP63A-00

Frame		W	H	D	W1	W2	W3	W4	W5	W6	H1	H2	H3	H4
H1	mm	700.0	1435.0	398.0	630.0	290.0	-	-	-	-	1389.0	1346.6	1375.0	-
	inch	27.56	56.5	15.67	24.8	11.42	-	-	-	-	54.68	53.02	54.13	-
Frame		H5	D1	D2	D3	D4	D5	D6	S1	S2	S3	S4		
H1	mm	-	45.0	-	-	-	-	-	26.5	13.0	14.0	25.0		
	inch	-	1.77	-	-	-	-	-	1.04	0.51	0.55	0.98		

690 V Frame H2



MODEL
690V FRAME_H2
VFD4000CP63A-21
VFD4500CP63A-21
VFD5600CP63A-21
VFD6300CP63A-21

Frame		W	H	D	W1	W2	W3	W4	W5	W6	H1	H2	H3	H4	H5
H2	mm	700.0	1745.0	404.0	630.0	800.0	500.0	630.0	760.0	-	1715.0	74.5	137.0	-	-
	inch	27.56	68.70	15.91	24.8	31.5	19.69	24.8	29.92	-	67.52	2.93	5.39	-	-
Frame		D1	D2	D3	D4	D5	D6	S1	S2	S3	S4	S5	Ø1	Ø2	Ø3
H2	mm	51.0	68.0	137.0	103.0	204.0	-	26.5	13.0	14.0	25.0	13.0	22.0	34.0	117.5
	inch	2.01	2.68	5.39	4.06	8.03	-	1.04	0.51	0.55	0.98	0.51	0.87	1.34	4.63

Accessories

Relay Extension Card

▪ EMC-R6AA

	Terminals	Descriptions
	RA10~RA15 RC10~RC15	Refer to Pr. 02-36~Pr. 02-41 for multi-function output selection Resistive load: 3A (N.O.)/250 V _{AC} 5A (N.O.)/30 V _{DC} Inductive load (COS 0.4) 1.2A (N.O.)/250 V _{AC} 2.0A (N.O.)/30 V _{DC} It is used to output each monitor signal, such as for drive in operation, frequency attained or overload indication.

Analog I/O Extension Card

▪ EMC-A22A

	Terminals	Description
	AVI10 AVI11	Refer to Pr. 14-00~Pr. 14-01 for function selection (input), and Pr. 14-18~Pr. 14-19 for mode selection Two sets of AVI port for AVI or ACI switch: SSW3 (AVI10) and SSW4 (AVI11) AVI: Input 0~10V ACI: Input 0~20 mA/4~20 mA
	AFM10 AFM11	Refer to Pr. 14-12~Pr. 14-13 for function selection (output), and Pr. 14-36~Pr. 14-37 for mode selection Two sets of AFM port for AVO or ACO switch: SSW1 (AFM10) and SSW2 (AFM11) AVO: Output 0~10V ACO: Output 0~20.0 mA/4.0~20.0 mA
	ACM	Analog signal common terminal

I/O Extension Card

▪ EMC-D611A

	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: 100~130 V _{AC} ; Input frequency: 57~63 Hz Input impedance: 27 K Ω Terminal response time: ON: 10 ms; OFF: 20 ms

I/O Extension Card

▪ EMC-D42A

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

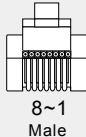
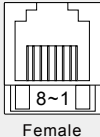
24V Power Shift Card

■ EMC-BPS01

	Terminals	Descriptions
	24V GND	Allows operation of network system, PLC function and partial functions when the AC motor drive is power off Input power: 24 V_{DC} ± 5% Maximum input current: 0.5A Note: Do not connect the control terminal +24V (Digital control signal common: SOURCE) directly to the EMC-BPS01 input terminal 24V. Do not connect control terminal GND directly to the EMC-BPS01 input terminal GND.

CANopen Card

■ EMC-COP01

	 8~1 Male	 8~1 Female	RJ-45 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 / 0 V / V-
			6	CAN_GND	Ground / 0 V / V-

EtherNet/IP, Modbus TCP Card

■ CMC-EIP01 / CMC-EIP02 NEW



Features

- ▶ Supports max. 32 words input and 32 words output of I/O connection
- ▶ User-defined parameter mapping
- ▶ IP Filter, basic firewall function
- ▶ Supports DLR ring nodes
*Applicable to CMC-EIP02

Network Interface

Network Protocol	DHCP, BOOTP, EtherNet/IP, Modbus TCP	Interface	RJ-45
Transmission Speed	10/100 Mbps	Number of Ports	1(CMC-EIP01) / 2(CMC-EIP02)
Transmission Method	I/O connection / Explicit message	Transmission Cable	Category 5e shielding
Transmission Distance	100m, extension is allowed via switch		

BACnet Card

■ eZVFD-CC NEW



Features

- ▶ Supports native BACnet protocol Rev 12
- ▶ Supports BACnet/IP, BACnet over Ethernet communication protocols
- ▶ Dual port Ethernet supports daisy-chaining multiple VFD devices
- ▶ Maps VFD I/O terminals as BACnet I/O
- ▶ Fully programmable in GCL+
- ▶ Setup and configure using Delta Controls facility management software enteliWEB
- ▶ Real-time clock with supercap power backup

eZVFD Connector

Interface	Dual Port RJ45
Transmission Method	Ethernet
Transmission Cable	Shielded CAT 5e/6

eZVFD Communication

Transmission Speed	10/100 Base-T
Network Protocol	BACnet/IP, BACnet Ethernet
BACnet Protocol	Rev 12
Device Addressing	Software Addressed

Accessories

PROFINET Card

CMC-PN01 NEW



Features

- ▶ Supports PROFINET IO device
- ▶ Supports synchronous data transmission and synchronous parameter access
- ▶ Provides GSDML file for PROFINET communication

Network Interface

Interface	RJ-45	Transmission Cable	Category 5e shielding 100M
Number of Ports	2 Ports	Transmission Speed	10/100 Mbps auto-negotiate
Transmission Method	IEEE 802.3	Network Protocol	PROFINET

PROFIBUS DP Card

CMC-PD01



Features

- ▶ Supports PZD control data exchange
- ▶ Supports PKW polling AC motor drive parameters
- ▶ Supports user diagnosis function
- ▶ Supports remote I/O function
- ▶ Baud (auto-detection): max. 12 Mbps

PROFIBUS DP Connector

Interface	DB9 connector
Transmission Method	High-speed RS-485
Transmission Cable	Shielded twisted pair cable
Electrical Isolation	500 V _{DC}

Communication

Message Type	Cyclic data exchange
Module Name	CMC-PD01
GSD Document	DELA08DB.GSD
Company ID	08DB (HEX)
Serial Transmission Speed Supported (auto-detection)	9.6 Kbps; 19.2 Kbps; 93.75 Kbps; 187.5 Kbps; 125 Kbps; 250 Kbps; 500 Kbps; 1.5 Mbps; 3 Mbps; 6 Mbps; 12 Mbps (bits per second)

DeviceNet Card

CMC-DN01



Features

- ▶ Based on the high-speed communication interface of Delta HSSP protocol, able to conduct immediate control of an AC motor drive
- ▶ Supports Group 2 only connection and polling I/O data exchange
- ▶ Supports max. 32 words input / 32 words output and remote I/O function for I/O mapping
- ▶ Node address and serial transmission speed can be set up on AC motor drive
- ▶ Power supplied from AC motor drive

DeviceNet Connector

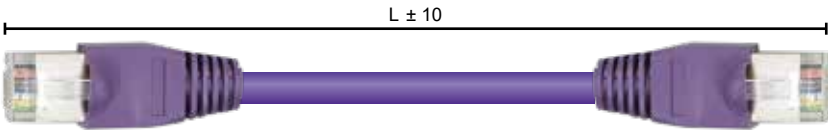
Interface	5-Pin 5.08mm Pluggable Connector
Transmission Method	CAN
Transmission Cable	Shielded twisted pair cable (with 2 power cables)
Transmission Speed	125 Kbps, 250 Kbps, 500 Kbps and extendable serial transmission speed mode
Network Protocol	DeviceNet protocol

DeviceNet Connector

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

Delta Standard Fieldbus Cables

Delta Cables	Part Number	Description	Length
CANopen Cable	UC-CMC003-01A	CANopen cable, RJ45 connector	0.3m
	UC-CMC005-01A	CANopen cable, RJ45 connector	0.5m
	UC-CMC010-01A	CANopen cable, RJ45 connector	1m
	UC-CMC015-01A	CANopen cable, RJ45 connector	1.5m
	UC-CMC020-01A	CANopen cable, RJ45 connector	2m
	UC-CMC030-01A	CANopen cable, RJ45 connector	3m
	UC-CMC050-01A	CANopen cable, RJ45 connector	5m
	UC-CMC100-01A	CANopen cable, RJ45 connector	10m
	UC-CMC200-01A	CANopen cable, RJ45 connector	20m
DeviceNet Cable	UC-DN01Z-01A	DeviceNet cable	305m
	UC-DN01Z-02A	DeviceNet cable	305m
EtherNetCable	UC-EMC003-02A	EtherNet cable, Shielding	0.3m
	UC-EMC005-02A	EtherNet cable, Shielding	0.5m
	UC-EMC010-02A	EtherNet cable, Shielding	1m
	UC-EMC020-02A	EtherNet cable, Shielding	2m
	UC-EMC050-02A	EtherNet cable, Shielding	5m
	UC-EMC100-02A	EtherNet cable, Shielding	10m
	UC-EMC200-02A	EtherNet cable, Shielding	20m
PROFIBUS Cable	UC-PF01Z-01A	PROFIBUS DP cable	305m



CANopen / DeviceNet TAP Breakout Boxes

Part Number	Description
TAP-CN01	1 in 2 out, built-in 121Ω terminal resistor
TAP-CN02	1 in 4 out, built-in 121Ω terminal resistor
TAP-CN03	1 in 4 out, RJ45 connector, built-in 121Ω terminal resistor

Unit: mm [inch]



TAP-CN01



TAP-CN02



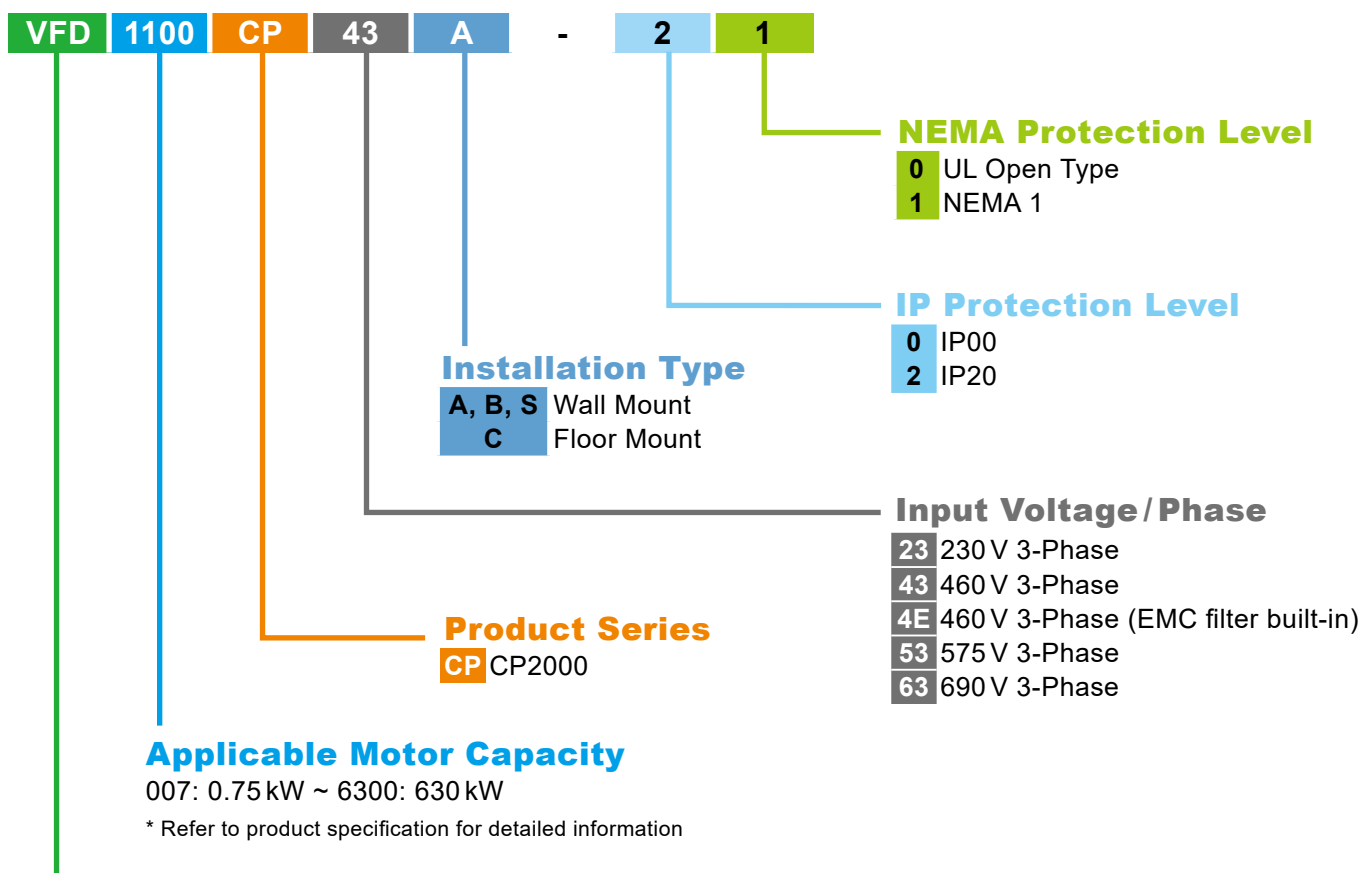
TAP-CN03

Ordering Information

Frame Size		Power Range	Models			
Frame A		230 V: 0.75 ~ 5.5 kW	VFD007CP23A-21 VFD015CP23A-21 VFD022CP23A-21 VFD037CP23A-21 VFD055CP23A-21	VFD007CP43A-21 VFD015CP43B-21 VFD022CP43B-21 VFD037CP43B-21 VFD040CP43A-21 VFD055CP43B-21 VFD075CP43B-21	VFD007CP4EA-21 VFD015CP4EB-21 VFD022CP4EB-21 VFD037CP4EB-21 VFD040CP4EA-21 VFD055CP4EB-21 VFD075CP4EB-21	VFD015CP53A-21 VFD022CP53A-21 VFD037CP53A-21
		460 V: 0.75 ~ 7.5 kW				
Frame B		230 V: 7.5 ~ 15 kW	VFD075CP23A-21 VFD110CP23A-21 VFD150CP23A-21	VFD110CP43B-21 VFD150CP43B-21 VFD185CP43B-21	VFD110CP4EB-21 VFD150CP4EB-21 VFD185CP4EB-21	VFD055CP53A-21 VFD075CP53A-21 VFD110CP53A-21 VFD150CP53A-21
		460 V: 11 ~ 18.5 kW				
Frame C		230 V: 18.5 ~ 30 kW	VFD185CP23A-21 VFD220CP23A-21 VFD300CP23A-21	VFD220CP43A-21 VFD300CP43B-21 VFD370CP43B-21	VFD220CP4EA-21 VFD300CP4EB-21 VFD370CP4EB-21	VFD185CP63A-21 VFD220CP63A-21 VFD300CP63A-21 VFD370CP63A-21
		460 V: 22 ~ 37 kW				
Frame D		230 V: 37 ~ 45 kW	Frame D1: VFD370CP23A-00 VFD450CP23A-00 VFD750CP43B-00 VFD900CP43A-00	Frame D2: VFD370CP23A-21 VFD450CP23A-21 VFD750CP43B-21 VFD900CP43A-21		Frame D1: VFD450CP63A-00 VFD550CP63A-00
		460 V: 45 ~ 90 kW	Frame D0-1: VFD450CP43S-00 VFD550CP43S-00	Frame D0-2: VFD450CP43S-21 VFD550CP43S-21		Frame D2: VFD450CP63A-21 VFD550CP63A-21
Frame E		230 V: 55 ~ 90 kW	Frame E1: VFD550CP23A-00 VFD750CP23A-00 VFD900CP23A-00 VFD1100CP43A-00 VFD1320CP43B-00	Frame E2: VFD550CP23A-21 VFD750CP23A-21 VFD900CP23A-21 VFD1100CP43A-21 VFD1320CP43B-21		Frame E1: VFD750CP63A-00 VFD900CP63A-00 VFD1100CP63A-00 VFD1320CP63A-00
		460 V: 110 ~ 132 kW				Frame E2: VFD750CP63A-21 VFD900CP63A-21 VFD1100CP63A-21 VFD1320CP63A-21
Frame F		230 V: 185 ~ 220 kW				
		460 V: 160 ~ 185 kW	Frame F1: VFD1600CP43A-00 VFD1850CP43B-00	Frame F2: VFD1600CP43A-21 VFD1850CP43B-21		Frame F1: VFD1600CP63A-00 VFD2000CP63A-00
Frame G		230 V: 220 ~ 280 kW	Frame G1: VFD2000CP43A-00 VFD2200CP43A-00 VFD2500CP43A-00 VFD2800CP43A-00	Frame G2: VFD2000CP43A-21 VFD2200CP43A-21 VFD2500CP43A-21 VFD2800CP43A-21		Frame G1: VFD2500CP63A-00 VFD3150CP63A-00
		460 V: 220 ~ 280 kW				Frame G2: VFD2500CP63A-21 VFD3150CP63A-21

Frame Size		Power Range	Models		
Frame H		460V: 315 ~ 630 kW	Frame H1: VFD3150CP43A-00 VFD3550CP43A-00 VFD4000CP43A-00 VFD5000CP43A-00 VFD5600CP43A-00 VFD6300CP43A-00	Frame H3: VFD3150CP43C-21 VFD3550CP43C-21 VFD4000CP43C-21 VFD5000CP43C-21 VFD5600CP43C-21 VFD6300CP43C-21	
Frame H (690 V Model)		690V: 400 ~ 630 kW			Frame H1: VFD4000CP63A-00 VFD4500CP63A-00 VFD5600CP63A-00 VFD6300CP63A-00 Frame H2: VFD4000CP63A-21 VFD4500CP63A-21 VFD5600CP63A-21 VFD6300CP63A-21

Model Name



Product

Variable Frequency Drive



Attention

Standard Motors

Used with 400V Standard Motors

It is recommended to add an AC output reactor when using with a 400V standard motor to prevent damage to motor insulation.

Torque Characteristics and Temperature Rise

When a standard motor is drive controlled, the motor temperature will be higher than with DOL operation.

Please reduce the motor output torque when operating at low speeds to compensate for less cooling efficiency.

For continuous constant torque at low speeds, external forced motor cooling is recommended.

Vibration

When the motor drives the machine, resonances may occur, including machine resonances.

Abnormal vibration may occur when operating a 2-pole motor at 60Hz or higher.

Noise

When a standard motor is drive controlled, the motor noise will be higher than with DOL operation.

To lower the noise, please increase the carrier frequency of the drive. The motor fan can be very noisy when the motor speed exceeds 60Hz.

Special Motors

High-speed Motor

To ensure safety, please try the frequency setting with another motor before operating the high-speed motor at 120Hz or higher.

Explosion-proof Motor

Please use a motor and drive that comply with explosion-proof requirements.

Submersible Motor & Pump

The rated current is higher than that of a standard motor.

Please check before operation and select the capacity of the AC motor drive carefully.

The motor temperature characteristics differ from a standard motor, please set the motor thermal time constant to a lower value.

Brake Motor

When the motor is equipped with a mechanical brake, the brake should be powered by the mains supply.

Damage may occur when the brake is powered by the drive output. Please DO NOT drive the motor with the brake engaged.

Gear Motor

In gearboxes or reduction gears, lubrication may be reduced if the motor is continuously operated at low speeds.

Please DO NOT operate in this way.

Synchronous Motor

These motors need suitable software for control. Please contact Delta for more information.

Single-phase Motor

Single-phase motors are not suitable for being operated by an AC Motor Drive. Please use a 3-phase motor instead when necessary.

Environmental Conditions

Installation Position

1. The drive is suitable for installation in a place with ambient temperature from -10 to 50[°]C.
2. The surface temperature of the drive and brake resistor will rise under specific operation conditions. Therefore, please install the drive on materials that are noncombustible.
3. Ensure that the installation site complies with the ambient conditions as stated in the manual.

Wiring

Limit of Wiring Distance

For remote operation, please use twist-shielding cable and the distance between the drive and control box should be less than 20m.

Maximum Motor Cable Length

Motor cables that are too long may cause overheating of the drive or current peaks due to stray capacitance.

Please ensure that the motor cable is less than 30m.

If the cable length can't be reduced, please lower the carrier frequency or use an AC reactor.

Choose the Right Cable

Please refer to current value to choose the right cable section with enough capacity or use recommended cables.

Grounding

Please ground the drive completely by using the grounding terminal.

How to Choose the Drive Capacity

Standard Motor

Please select the drive according to applicable motor rated current listed in the drive specification.

Please select the next higher power AC drive in case higher starting torque or quick acceleration/deceleration is needed.

Special Motor

Please select the drive according to: Rated current of the drive > rated current of the motor

Transportation and Storage

Please transport and store the drive in a place that meets environment specifications.

Peripheral Equipment

Molded-Case Circuit Breakers (MCCB)

Please install the recommended MCCB or ELCB in the main circuit of the drive and make sure that the capacity of the breaker is equal to or lower than the recommended one.

Add a Magnetic Contactor(MC) in the Output Circuit

When a MC is installed in the output circuit of the drive to switch the motor to commercial power or other purposes, please make sure that the drive and motor are completely stopped and remove the surge absorbers from the MC before switching it.

Add a Magnetic Contactor (MC) in the Input Circuit

Please only switch the MC ONCE per hour or it may damage the drive. Please use RUN/STOP signal to switch many times during motor operation.

Motor Protection

The thermal protection function of the drive can be used to protect the motor by setting the operation level and motor type (standard motor or variable motor). When using a high-speed motor or a water-cooled motor the thermal time constant should be set to a lower value.

When using a longer cable to connect the motor thermal relay to a motor, high-frequency currents may enter via the stray capacitance. It may result in malfunctioning of the relay as the real current is lower than the setting of thermal relay. Under this condition, please lower the carrier frequency or add an AC reactor to solve this.

DO NOT Use Capacitors to Improve the Power Factor

Use a DC reactor to improve the power factor of the drive. Please DO NOT install power factor correction capacitors on the main circuit of the drive to prevent motor faults due to over current.

Do NOT Use Surge Absorbers

Please DO NOT install surge absorbers on the output circuit of the drive.

Lower the Noise

To ensure compliance with EMC regulations, usually a filter and shielded wiring is used to lower the noise.

Method Used to Reduce the Surge Current

Surge currents may occur in the phase-lead capacitor of the power system, causing an overvoltage when the drive is stopped or at low loads.

It is recommended to add a DC reactor to the drive.



Smarter. Greener. Together.

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[VFD2200CP43A-00](#) [VFD007CP23A-21](#) [VFD007CP4EA-21](#) [VFD015CP23A-21](#) [VFD015CP4EB-21](#) [VFD015CP53A-21](#) [VFD022CP23A-21](#) [VFD022CP4EB-21](#) [VFD022CP53A-21](#) [VFD037CP23A-21](#) [VFD037CP4EB-21](#) [VFD037CP53A-21](#) [VFD055CP23A-21](#) [VFD055CP4EB-21](#) [VFD055CP53A-21](#) [VFD075CP23A-21](#) [VFD075CP4EB-21](#) [VFD075CP53A-21](#) [VFD1100CP43A-00](#) [VFD1100CP63A-21](#) [VFD110CP23A-21](#) [VFD110CP4EB-21](#) [VFD110CP53A-21](#) [VFD1320CP43B-00](#) [VFD150CP23A-21](#) [VFD150CP4EB-21](#) [VFD150CP53A-21](#) [VFD1600CP43A-00](#) [VFD1850CP43B-00](#) [VFD185CP23A-21](#) [VFD185CP4EB-21](#) [VFD185CP63A-21](#) [VFD220CP23A-21](#) [VFD220CP4EA-21](#) [VFD220CP63A-21](#) [VFD300CP23A-21](#) [VFD300CP4EB-21](#) [VFD300CP63A-21](#) [VFD3550CP43A-00](#) [VFD370CP4EB-21](#) [VFD370CP63A-21](#) [VFD4000CP43A-00](#) [VFD450CP43S-21](#) [VFD450CP63A-21](#) [VFD550CP43S-21](#) [VFD550CP63A-21](#) [VFD750CP43B-00](#) [VFD750CP63A-21](#) [VFD900CP43A-00](#) [VFD900CP63A-21](#) [VFD3150CP43C-00](#) [VFD3550CP43C-00](#) [VFD4000CP43C-00](#)