Automation for a Changing World

Delta Economy Vector Control Drive C200 Series

www.deltaww.com

Smarter. Greener. Together.

Features

- Flexible and user-friendly interface supporting multi-point inputs, analog inputs, CANopen and RS-485 with MODBUS communication application flexibility
- Simple and fast installation, parameter setting and tuning
- Built-in 5 K steps PLC programming capability
- Supports wall mount installation (Frame A)
- Enhanced conformal coating on PCB and thermal design suitable for harsh environment applications
- Fan-cooling with air passage targeting the heatsink, prevents dust and dirt from entering the drive
- Instant response to sudden load impact and prevents inrush current from interrupting system operation
- Built-in encoder feedback terminals (MI7&MI8, maximum speed 33 kHz)
- Built-in 2 terminals for multi-function frequency output (DFM1&DFM2, maximum speed 33 kHz)

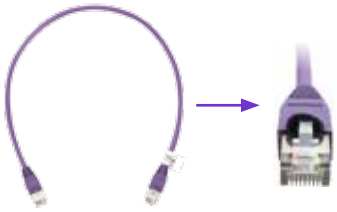
Built-in High-speed Fieldbus

- Built-in RS-485 with MODBUS communication
- CANopen (DS402)
  - − Delta provides CANopen Builder software to facilitate the planning process
  - − I/O data configuration for all products that support CANopen communication protocol

Optional Accessories for CANopen

MKCB-HUB01

TAP-CB10



Large Fan Model

- Effectively blows fiber and dust out of the drive, suitable for textile applications

*Suitable for model name 43B type.

Built-in PLC Functions

- Supports distributed control and independent operation via network.

Input Device:

Device	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	X14	X15	X16	X17
1	FWD	REV	M11	M12	M13	M14	M15	M16	M17	M18						

1: Control board I/O

Output Device:

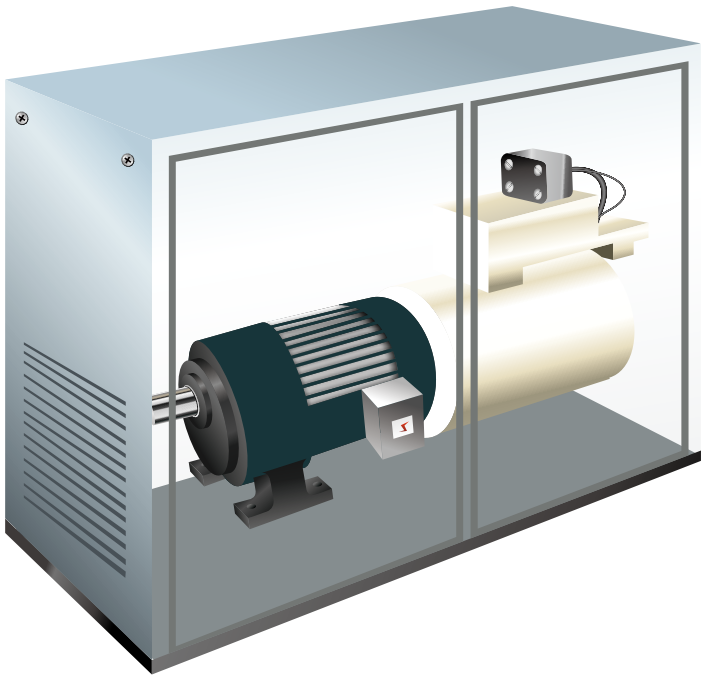
Device	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
1	RY1	RY2		DFM1	DFM2											

1: Control board I/O

Permanent Magnet Synchronous Motor

- PM Sensorless* control function for open-loop speed control, suitable for compressors and vacuum pumps.

  * PM Sensorless control function is available for the C200 series with firmware ver. 1.03 or above.



Field Applications

Easy to use with high safety standard and versatile control functions for applications that require speed.

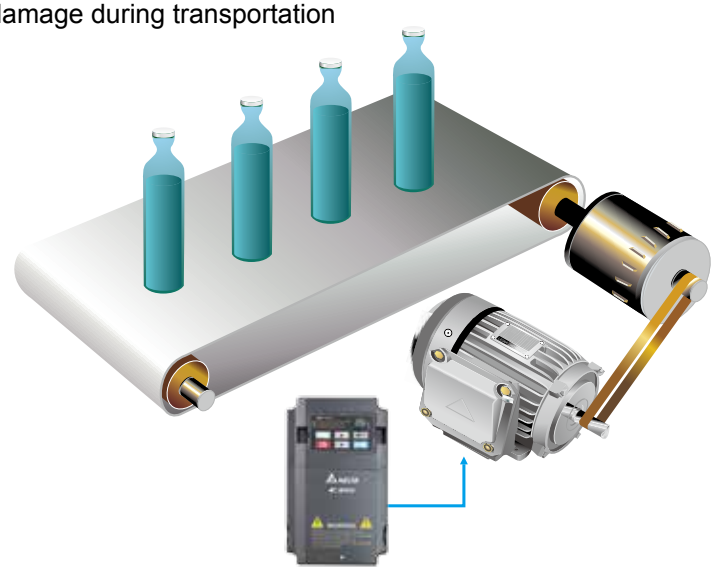
- Processing machines
- Packaging machines
- Textile machines
- Printing machines
- Material handling machines
- Treadmills
- Solar equipment
- Fans, pumps

Conveyors

Conveyors are common in industrial automation for transporting products from one location to another. Delta's C200 Series provides:

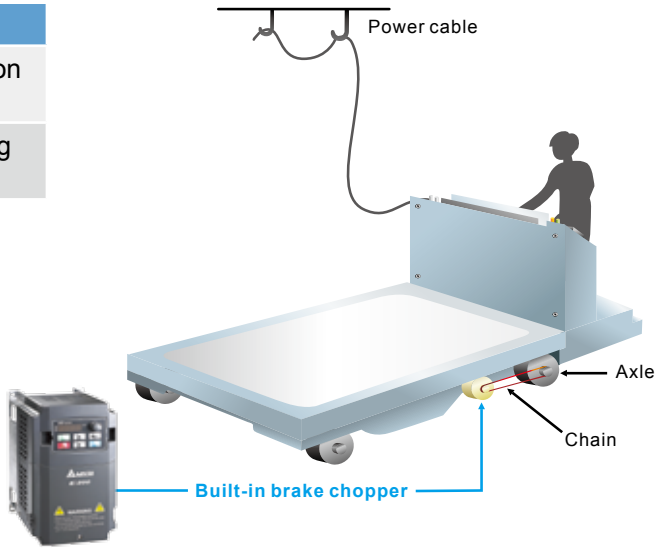
- Compact design saves installation space
- Flexible speed setting for all types of mechanical structures
- Soft start and soft stop functions to prevent product damage during transportation

Benefits
Avoids spillage and slip-back
Facilitates product switching/replacing process and improves operation efficiency with the adjustable speed function



Trolley

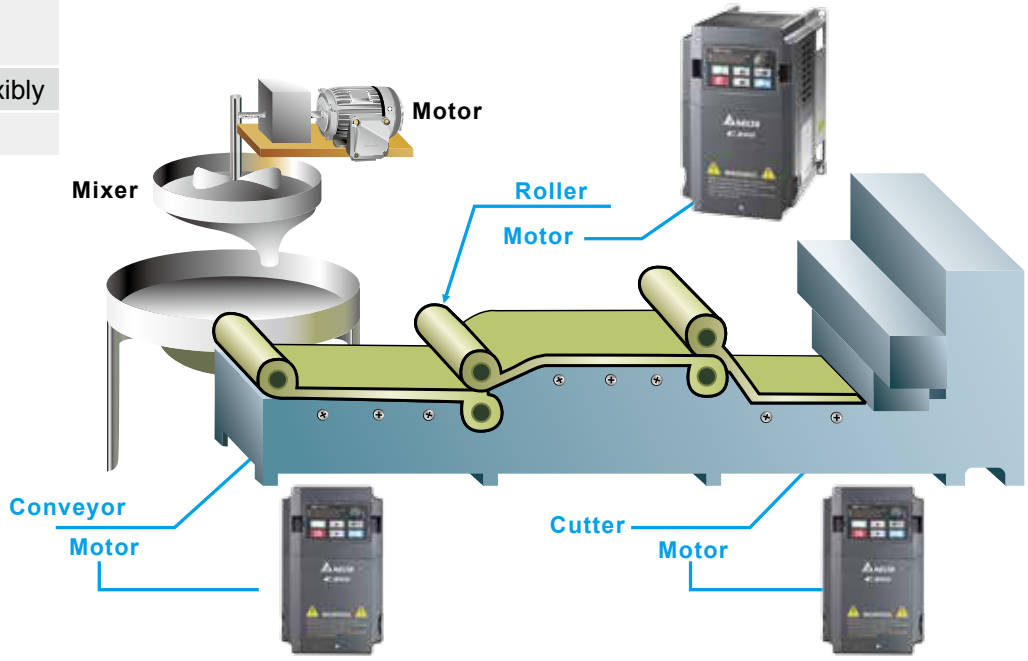
Benefits
Adjusts speed flexibly to meet different operation requirements
Reduces the speed impact on machinery during acceleration and deceleration



Food Processing Machinery

The food processing industry has a high demand for product safety and quality. Delta's C200 Series provides high stability to the production line.

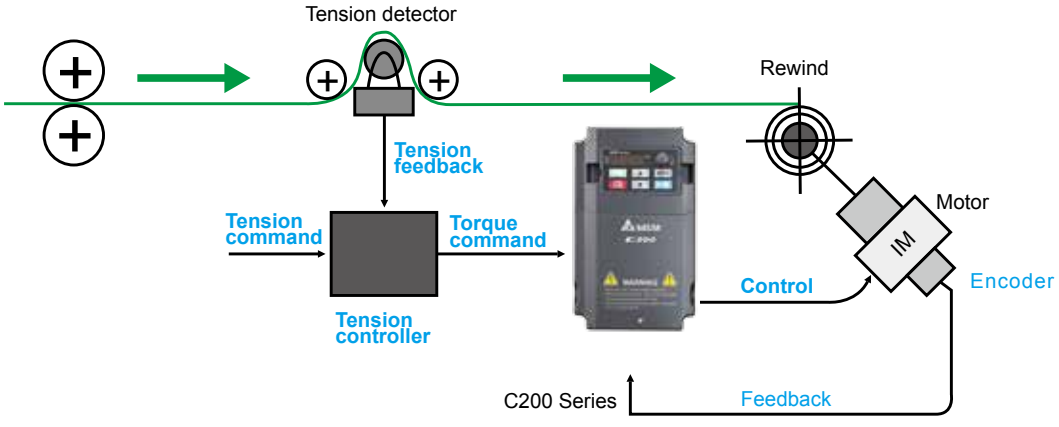
Benefits
Adjusts roller speed precisely
Adjusts noodle width flexibly
Simple and easy to use



Winding Machinery

A winding machine requires winding and rewinding flexibility at a precise speed to prevent material breakage such as for paper, film, fabric, cable and others. Delta's C200 Series accepts external torque commands to perform open loop/ closed loop torque control.

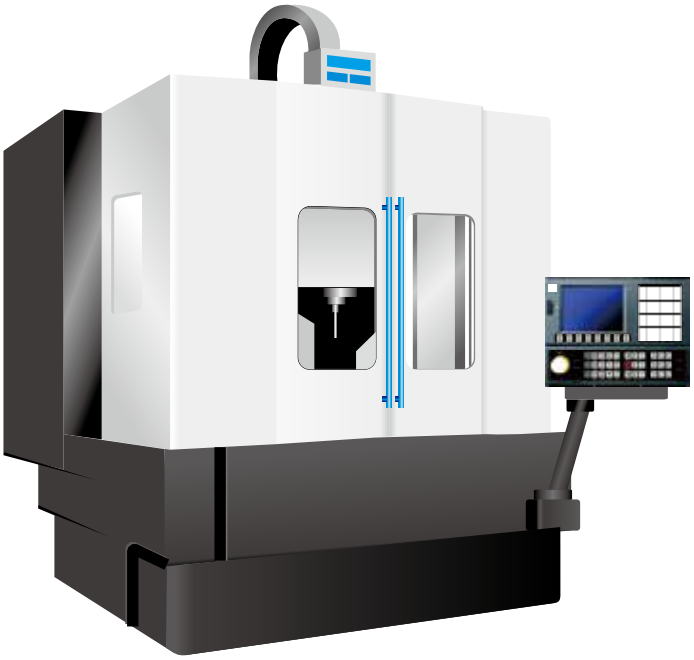
Features
Supports open loop torque control without the need of an encoder
Supports close loop torque control via the C200 Series' built-in encoder feedback terminal (MI7 & MI8)
Supports various torque commands (from keypad or via analog command, RS-485 and CANopen)



Machine Tools

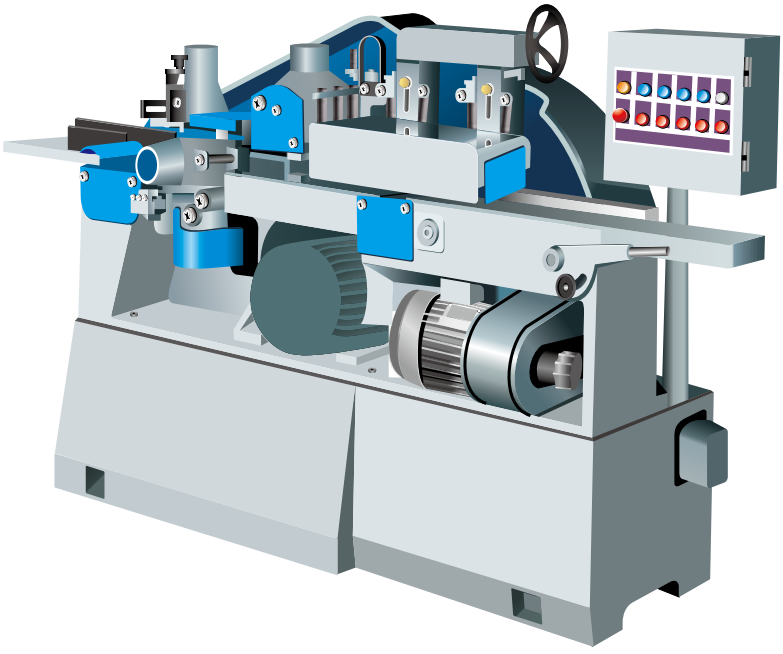
Delta's C200 Series provides precise speed control, excellent low speed torque output and high durability to meet machine tool requirements.

Comparison
Before: Traditional machine tool uses hand wheel to control the spindle speed to process the workpiece
Now: Delta's C200 Series controls spindle speed via simple parameter setting to provide advanced processing quality



Woodworking Machinery

Benefits
Improves wood cutting efficiency
Adjusts cutting speed for different types of woods
Prevents gear damage via the soft-start function



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	-25 °C ~ +70 °C
		Only allowed at non-condensation, non-frost, non-conductive environment.	
	Rated Humidity	Operation	Max. 95%
		Storage / Transportation	Max. 95%
		Only allowed at non-condensation, non-frost, non-conductive environment.	
	Air Pressure	Operation / Storage	86 to 106 kPa
		Transportation	70 to 106 kPa
	Pollution Level	IEC60721-3-3	
		Operation	Class 3C2; Class 3S2
		Storage	Class 1C2; Class 1S2
		Transportation	Class 2C2; Class 2S2
		No-Dewfall, non-conductive	
	Altitude	Operation	If the AC motor drive is installed at an altitude 0 ~ 1000 m, follow normal operation restriction. If it is install at altitude 1000 ~ 3000 m, decrease 1% of rated current or lower 0.5 °C of temperature for every 100 m increase in altitude. Maximum altitude for Corner Grounded TN system is 2000m; for application over 2000m, 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 13.2 Hz; 0.7 G ~ 1.0 G range from 13.2 Hz to 55 Hz; 1.0 G range from 55 Hz to 512 Hz. Comply with IEC 60068-2-6.	
Impact		IEC / EN 60068-2-27	
Operation Position		Max. allowed offset angle ±10 ° (in vertical installation position)	

Operation Temperature and Protection Level

Model	Frame		Protection Level	Operation Temperature
VFDxxxCBxxA-20	Frame A0 ~ A	230 V: 0.4 ~ 3.7 kW 460 V: 0.75 ~ 7.5 kW	IP20/UL Open Type	-10 ~ 50 °C
VFDxxxCBxxA-21	Frame A0 ~ A	230 V: 0.4 ~ 3.7 kW 460 V: 0.75 ~ 7.5 kW	IP20/NEMA1	-10 ~ 40 °C
VFDxxxCBxxA-21M*2	Frame A0 ~ A	230 V: 0.4 ~ 3.7 kW 460 V: 0.75 ~ 7.5 kW	IP20/NEMA1	-10 ~ 40 °C
VFDxxxCBxxB-20	Frame A0 ~ A	460 V: 2.2 ~ 7.5 kW	IP20/UL Open Type	-10 ~ 50 °C

*2 The C200 Series with model names ending with "-21 M" is designed with higher rigidity of case cover. When ambient temperature is -10 ~ 35 °C, the rated current is 100%. When ambient temperature goes beyond 36 °C, the rated current decreases by 2% with every 1 °C increase in temperature.

Specifications

230 V										
Frame Size			A0 (1-Phase)				A0 (3-phase)				
Model VFD-□□□CB2□A-□□□*1			004	007	015	022	004	007	015	022	037
Applicable Motor Output (kW)			0.4	0.75	1.5	2.2	0.4	0.75	1.5	2.2	3.7
Applicable Motor Output (HP)			0.5	1	2	3	0.5	1	2	3	5
Output Rating	NORMAL DUTY	Rated Output Capacity (kVA)	1.2	2.0	3.2	4.4	1.2	2.0	3.2	4.4	6.8
		Rated Output Current (A)	3	5	8	11	3	5	8	11	17
		Overload Capacity	120% of rated current: 1 minute for every 5 minutes; 160% of rated current: 3 seconds for every 30 seconds								
		Max. Output Frequency (Hz)	599.00 Hz								
		Carrier Frequency (kHz)	2 ~ 15 kHz (default setting 8 kHz)								
	HEAVY DUTY	Rated Output Capacity (kVA)	1.1	1.9	2.8	4.0	1.1	1.9	2.8	4.0	6.4
		Rated Output Current (A)	2.8	4.8	7.1	10	2.8	4.8	7.1	10	16
		Overload Capacity	150% of rated current: 1 minute for every 5 minutes; 180% of rated current: 3 seconds for every 30 seconds								
		Max. Output Frequency (Hz)	599.00 Hz								
		Carrier Frequency (kHz)	2 ~ 15 kHz (default setting 2 kHz)								
Input Rating	Input Current (A) of Normal Duty		7.2	12	15.7	22	3.9	6.4	12	16	20
	Input Current (A) of Heavy Duty		6.7	11.5	14	20	3.6	6.1	11	15	18.5
	Rated Voltage/Frequency		1-phase/3-phase AC 200 V ~ 240 V (-15% ~ +10%), 50/60 Hz								
	Range of Operating Voltage		170 ~ 265 V_{AC}								
	Frequency Tolerance		47 ~ 63 Hz								
Cooling Method			Natural cooling		Fan cooling		Natural cooling		Fan cooling		
Braking Chopper			Built-in								

460 V									
Frame Size			A0				A		
Model VFD-□□□CB43A-□□□*1			007	015	022	037	040	055	075
Applicable Motor Output (kW)			0.75	1.5	2.2	3.7	4.0	5.5	7.5
Applicable Motor Output (HP)			1	2	3	5	5.5	7.5	10
Output Rating	NORMAL DUTY	Rated Output Capacity (kVA)	2.4	3.2	4.8	7.2	8.4	10	14
		Rated Output Current (A)	3.0	4.0	6.0	9.0	10.5	12	18
		Overload Capacity	120% of rated current: 1 minute for every 5 minutes; 160% of rated current: 3 seconds for every 30 seconds						
		Max. Output Frequency (Hz)	599.00 Hz						
		Carrier Frequency (kHz)	2 ~ 15 kHz (default setting 8 kHz)						
	HEAVY DUTY	Rated Output Capacity (kVA)	2.3	3.0	4.5	6.5	7.6	9.6	14
		Rated Output Current (A)	2.9	3.8	5.7	8.1	9.5	11	17
		Overload Capacity	150% of rated current: 1 minute for every 5 minutes; 180% of rated current: 3 seconds for every 30 seconds						
		Max. Output Frequency (Hz)	599.00 Hz						
		Carrier Frequency (kHz)	2 ~ 15 kHz (default setting 2 kHz)						
Input Rating	Input Current (A) of Normal Duty		4.3	5.9	8.7	14	15.5	17	20
	Input Current (A) of Heavy Duty		4.1	5.6	8.3	13	14.5	16	19
	Rated Voltage/Frequency		3-phase AC 380 V ~ 480 V (-15% ~ +10%), 50/60 Hz						
	Range of Operating Voltage		323 ~ 528 V_{AC}						
	Frequency Tolerance		47 ~ 63 Hz						
Cooling Method			Natural cooling		Fan cooling				
Braking Chopper			Built-in						

*1: _ _ _ refers to models -10/-21/-21M

460V（Large fan model）						
Frame Size			A0		A	
Model VFD-□□□CB43B-□□			022	037	040	055	075
Applicable Motor Output (kW)			2.2	3.7	4.0	5.5	7.5
Applicable Motor Output (HP)			3	5	5.5	7.5	10
Output Rating	NORMAL DUTY	Rated Output Capacity (kVA)	4.8	7.2	8.4	10	14
		Rated Output Current (A)	6.0	9.0	10.5	12	18
		Overload Capacity	120% of rated current: 1 minute for every 5 minutes; 160% of rated current: 3 seconds for every 30 seconds				
		Max. Output Frequency (Hz)	599.00 Hz				
		Carrier Frequency (kHz)	2~15 kHz (default setting 8 kHz)				
	HEAVY DUTY	Rated Output Capacity (kVA)	4.5	6.5	7.6	9.6	14
		Rated Output Current (A)	5.7	8.1	9.5	11	17
		Overload Capacity	150% of rated current: 1 minute for every 5 minutes; 180% of rated current: 3 seconds for every 30 seconds				
		Max. Output Frequency (Hz)	599.00 Hz				
		Carrier Frequency (kHz)	2~15 kHz (default setting 2 kHz)				
Input Rating	Input Current (A) of Normal Duty		8.7	14	15.5	17	20
	Input Current (A) of Heavy Duty		8.3	13	14.5	16	19
	Rated Voltage/Frequency		3-Phase AC 380 V ~ 480 V (-15% ~ +10%), 50/60 Hz				
	Range of Operating Voltage		323~528 Vac				
	Frequency Tolerance		47~63 Hz				
Cooling Method			Fan cooling				
Braking Chopper			Built-in				

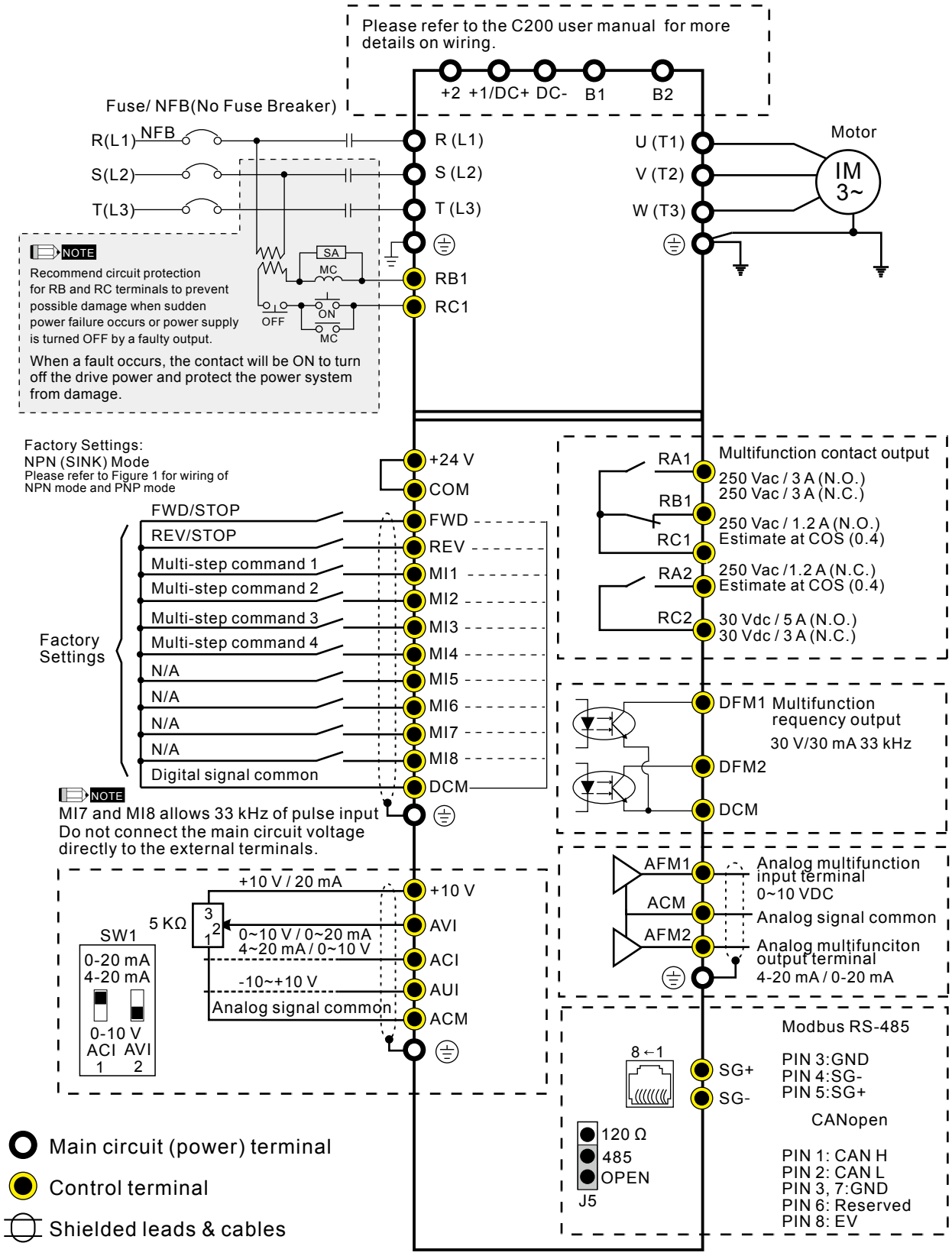
General Specifications

Control Characteristics	Control Method	V/F, V/F+PG, SVC, FOC Sensorless, FOC+PG, PM Sensorless*, TQC+PG, TQC Sensorless
	Starting Torque	Reach up to 150% or above at 0.5 Hz. In FOC+PG mode, starting torque reaches above 150% at 0.5 Hz and reaches 150% at 0 Hz for 1 minute.
	Speed Response Ability	5 Hz (vector control can reach up to 40 Hz)
	Torque Limit	Normal Duty: 175% of the torque current under Normal Duty; Heavy Duty: 180% of the torque current
	TQC Mode (Torque Accuracy)	TQC + PG：±5% TQC Sensorless：±15%
	Max. Output Frequency (Hz)	0.00 ~ 599 Hz
	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: 0.03 x Max. output frequency/60 Hz (±11 bit)
	Frequency Setting Signal	+10 V ~ -10, 0 ~ +10 V, 4 ~ 20 mA
	Acc/Dec Time	0.0 ~ 6000.0 seconds or 0.0 ~ 600.0 seconds
	Main Control Functiona	Torque control, Droop control, Speed/torque control switching, Feed forward control, Momentary power loss ride thru, Speed search, Over-torque detection, Torque Limit, 17-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, High slip braking, PID control (with sleep function), Energy saving control, MODOBUS communication (RS-485 RJ45, Max. 115.2 kbps), Fault restart, Parameter copy
	Fan Control	Fan operation can be set by Pr.07-19
Protection Characteristics	Motor Protection	Electronic thermal relay protection
	Over-Current Protection	Over-current protection for 240% rated current Current clamp (Normal duty: 170 ~ 175%); (Heavy duty: 180 ~ 185%)
	Over-Voltage Protection	230: drive will stop when DC bus voltage exceeds 410 V 460: drive will stop when DC bus voltage exceeds 820 V
	Over-Temperature Protection	Built-in temperature sensor
	Stall Prevention	Stall prevention during acceleration, deceleration and in operation
	Grounding Leakage Current Protection	Leakage current is higher than 50% of rated current of the AC motor drive
International Certifications		CE UL EAC

*PM Sensorless ready in Ver. 1.03
*2 Large fan model: certification in progress

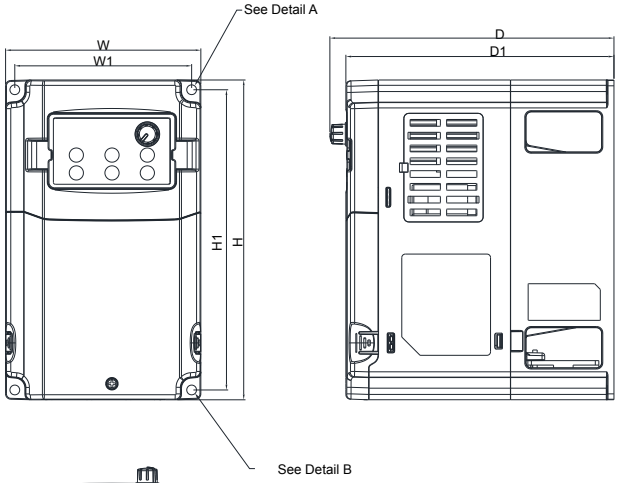
Wiring

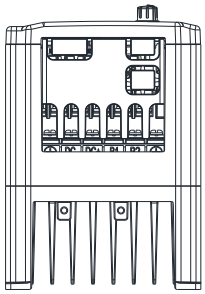
Input: Single-phase/ 3-phase power



Dimensions

Frame A0





Detail A (Mounting Hole)

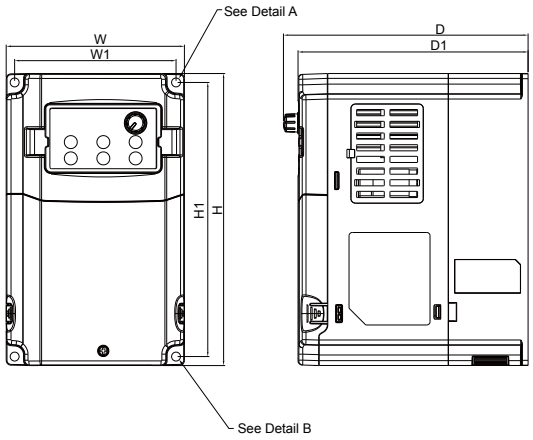
Detail B (Mounting Hole)

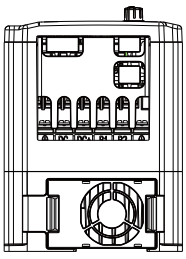
MODEL

VFD004CB21A-20
VFD007CB21A-20
VFD004CB23A-20
VFD007CB23A-20
VFD007CB43A-20
VFD015CB43A-20
VFD015CB23A-20 (Built-in fan module)

Frame		W	H	D	W1	H1	D1	S1	Ø1	Ø2	Ø3
A0	mm	110.0	180.0	160.0	99.6	169.0	151.0	5.5	-	-	-
	inch	4.33	7.09	6.30	3.92	6.65	5.94	0.22	-	-	-

Frame A0





Detail A (Mounting Hole)

Detail B (Mounting Hole)

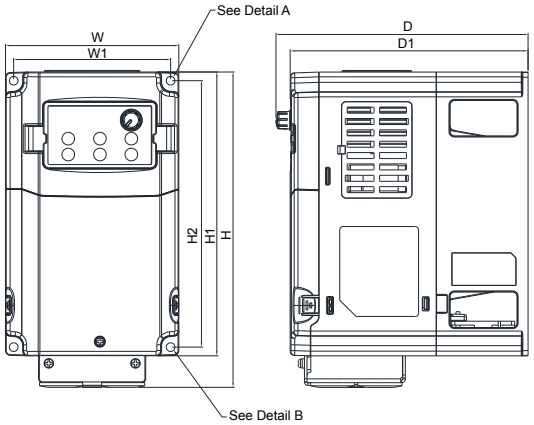
MODEL

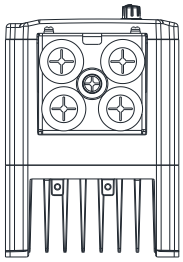
VFD015CB21A-20
VFD022CB21A-20
VFD022CB23A-20
VFD037CB23A-20
VFD022CB43A-20
VFD037CB43A-20

Frame		W	H	D	W1	H1	D1	S1	Ø1	Ø2	Ø3
A0	mm	110.0	180.0	151.0	99.6	169.0	142.0	5.5	-	-	-
	inch	4.33	7.09	5.94	3.92	6.65	5.59	0.22	-	-	-

Dimensions

Frame A0





Detail A (Mounting Hole)

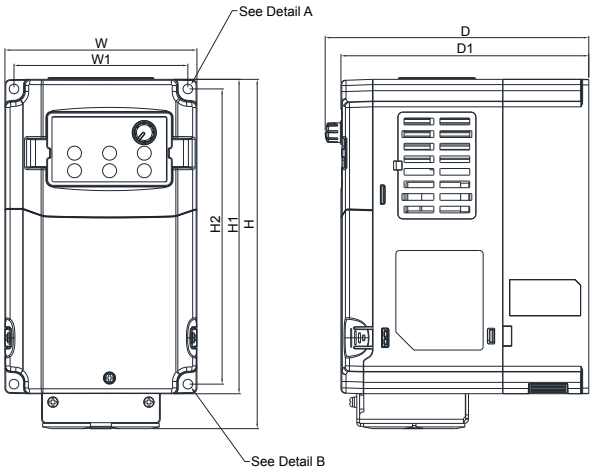
Detail B (Mounting Hole)

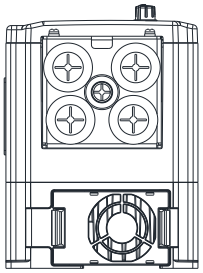
MODEL

VFD004CB21A-21
VFD007CB21A-21
VFD004CB23A-21
VFD007CB23A-21
VFD007CB43A-21
VFD015CB43A-21
VFD015CB23A-21 (Built-in fan module)

Frame		W	H	D	W1	H1	H2	D1	S1	Ø1	Ø2	Ø3
A0	mm	110.0	200.0	160.0	99.6	180.0	169.0	151.0	5.5	-	-	-
	inch	4.33	7.87	6.30	3.92	7.09	6.65	5.94	0.22	-	-	-

Frame A0





Detail A (Mounting Hole)

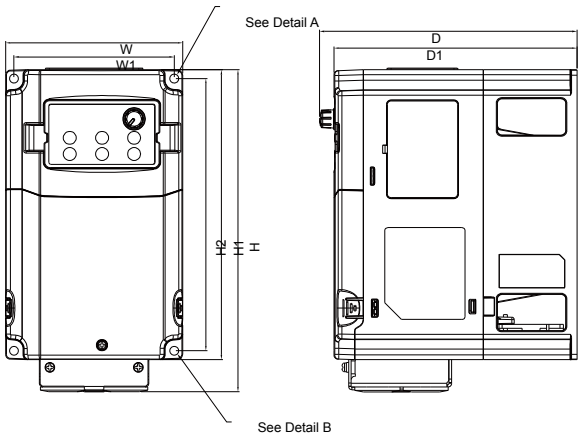
Detail B (Mounting Hole)

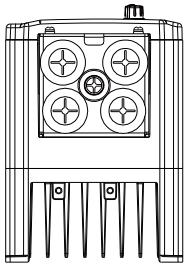
MODEL

VFD015CB21A-21
VFD022CB21A-21
VFD022CB23A-21
VFD037CB23A-21
VFD022CB43A-21
VFD037CB43A-21

Frame		W	H	D	W1	H1	H2	D1	S1	Ø1	Ø2	Ø3
A0	mm	110.0	200.0	151.0	99.6	180.0	169.0	142.0	5.5	-	-	-
	inch	4.33	7.87	5.94	3.92	7.09	6.65	5.59	0.22	-	-	-

Frame A0





Detail A (Mounting Hole)

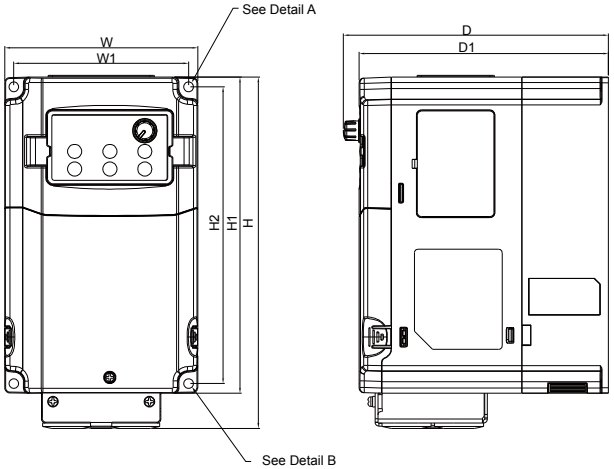
Detail B (Mounting Hole)

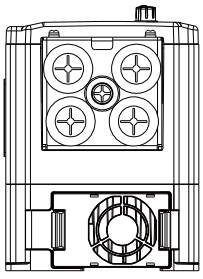
MODEL

VFD004CB21A-21M
VFD007CB21A-21M
VFD004CB23A-21M
VFD007CB23A-21M
VFD007CB43A-21M
VFD015CB43A-21M
VFD015CB23A-21M (Built-in fan module)

Frame		W	H	D	W1	H1	H2	D1	S1	Ø1	Ø2
A0	mm	110.0	200.0	160.0	99.6	180.0	169.0	151.0	5.5	-	-
	inch	4.33	7.87	6.30	3.92	7.09	6.65	5.94	0.22	-	-

Frame A0





Detail A (Mounting Hole)

Detail B (Mounting Hole)

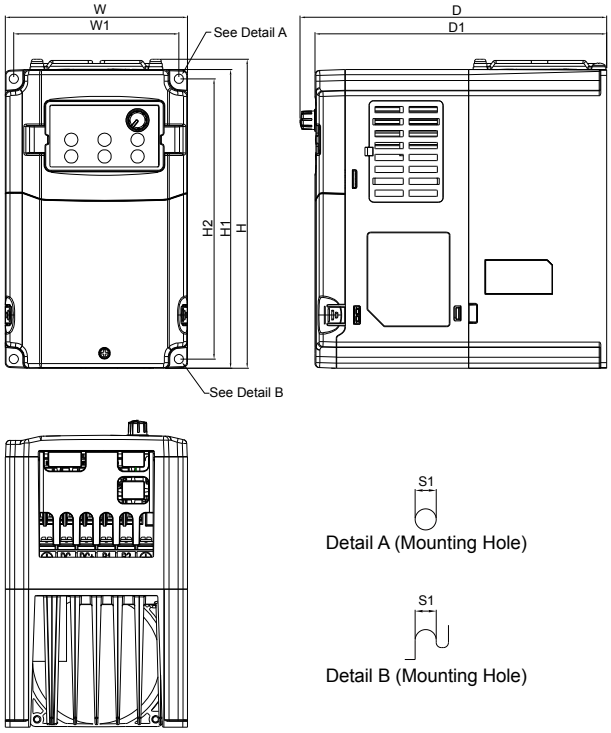
MODEL

VFD015CB21A-21M
VFD022CB21A-21M
VFD022CB23A-21M
VFD037CB23A-21M
VFD022CB43A-21M
VFD037CB43A-21M

Frame		W	W1	H	H1	H2	D	D1	S1	Ø1	Ø2
A0	mm	110.0	200.0	151.0	99.6	180.0	169.0	142.0	5.5	-	-
	inch	4.33	7.87	5.94	3.92	7.09	6.65	5.59	0.22	-	-

Dimensions

Frame A0
(Large fan model)

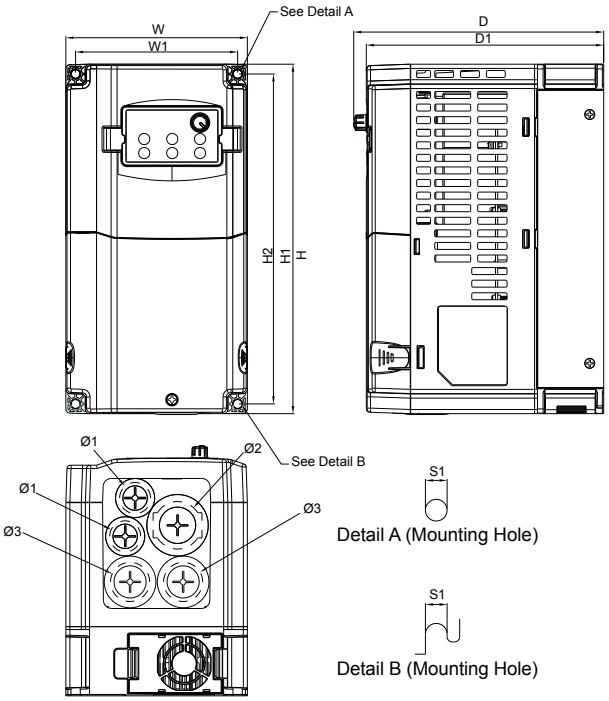


MODEL

VFD022CB43B-20
VFD037CB43B-20

Frame		W	W1	H	H1	H2	D	D1	S1	Ø1	Ø2
A0	mm	110.0	99.6	186.3	169.0	180.0	185.0	176.0	5.5	-	-
	inch	4.33	3.92	7.34	6.65	7.09	7.28	6.93	0.22	-	-

Frame A

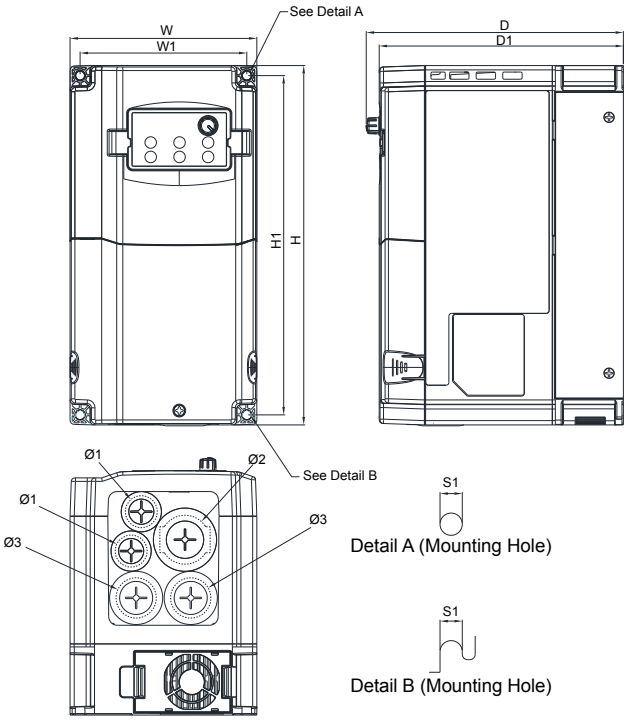


MODEL

VFD040CB43A-20
VFD055CB43A-20
VFD075CB43A-20
VFD040CB43A-21
VFD055CB43A-21
VFD075CB43A-21

Frame		W	H	D	W1	H1	D1	S1	Ø1	Ø2	Ø3
A	mm	130.0	250.0	179.0	116.0	236.0	170.0	6.2	22.2	34.0	28.0
	inch	5.12	9.84	7.05	4.57	9.29	6.69	0.24	0.87	1.34	1.10

Frame A

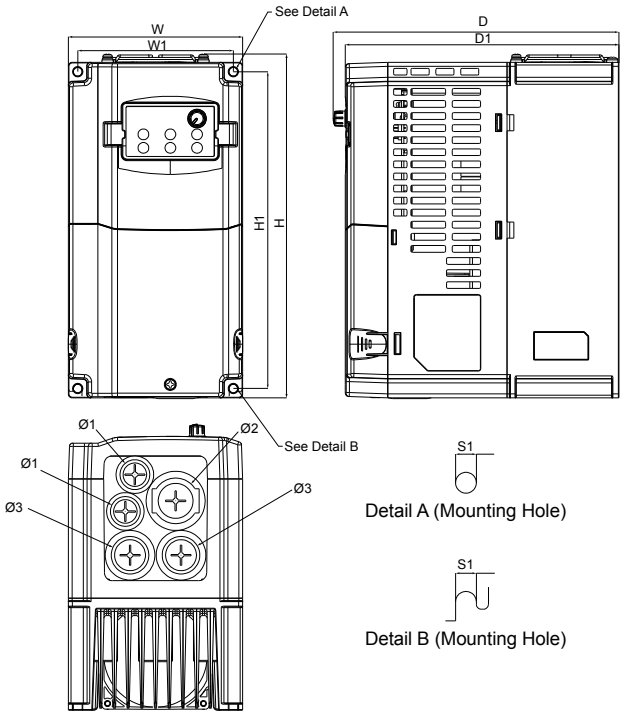


MODEL

VFD040CB43A-21M
VFD055CB43A-21M
VFD075CB43A-21M

Frame		W	H	D	W1	H1	D1	S1	Ø1	Ø2	Ø3
A	mm	130.0	250.0	179.0	116.0	236.0	170.0	6.2	22.2	34.0	28.0
	inch	5.12	9.84	7.05	4.57	9.29	6.69	0.24	0.87	1.34	1.10

Frame A (Large fan model)



MODEL

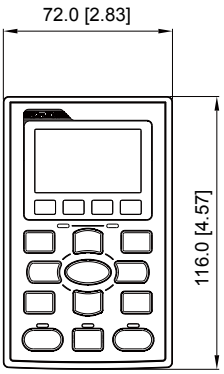
VFD040CB43B-20
VFD055CB43B-20
VFD075CB43B-20

Frame		W	W1	H	H1	D	D1	S1	Ø1	Ø2	Ø3
A	mm	130.0	116.0	250.0	236.0	213.0	204.0	6.2	22.2	34.0	28.0
	inch	5.12	4.57	9.84	9.29	8.38	8.03	0.24	0.87	1.34	1.10

Dimensions of Accessories

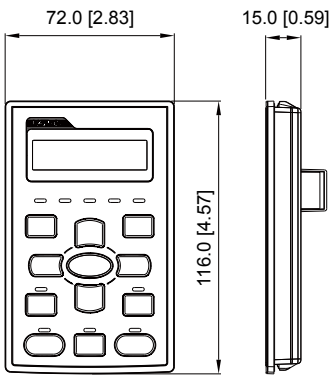
Optional:

KPC-CC01



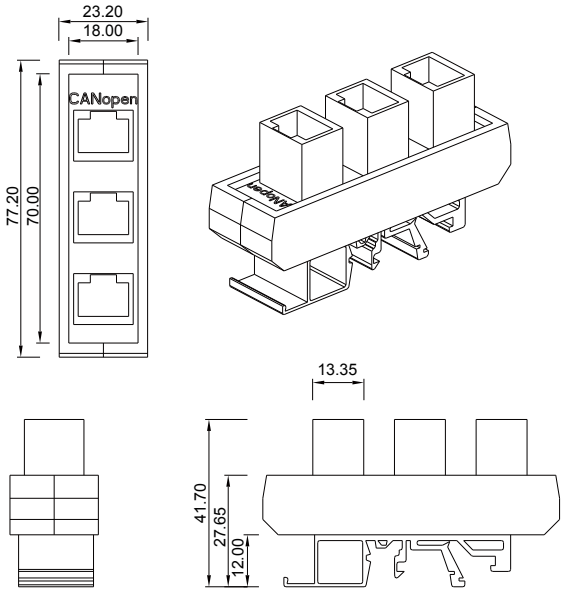
LCD Keypad

KPC-CE01



LED Keypad

MKCB-HUB01



Digital Keypad

- Built-in high resolution LED panel with turning knob facilitates the frequency tuning process
- Easy to install and wire

1 Status Display
Indicates the drive's operation status
(during operations, STOP, FWD, REV and more)

2 LED Display
Displays the frequency, voltage, current, operation direction, user-defined unit, fault and more

3 Frequency Knob
Master frequency can be set by turning the knob

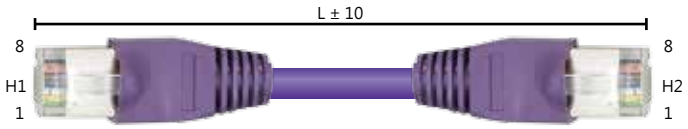
4 Up/Down Keys
Changes the value or parameter settings

- Function Key Description

Key	Description	Key	Description
RUN	Operation begins	MODE	Select display mode
STOP / RESET	Stop the operation or reset the drive when an error occurs	ENTER	Read or change parameter settings

▪ CANopen Communication Cable

Model: TAP-CB05, TAP-CB10



Title	Part No.	L	
		mm	inch
1	UC-CMC003-01A	300	11.8
2	UC-CMC005-01A	500	19.6
3	UC-CMC010-01A	1000	39
4	UC-CMC015-01A	1500	59
5	UC-CMC020-01A	2000	78.7
6	UC-CMC030-01A	3000	118.1
7	UC-CMC050-01A	5000	196.8
8	UC-CMC100-01A	10000	393.7
9	UC-CMC200-01A	20000	787.4

▪ Digital Accessories: RJ45 Extension Leads and CMC-EIP01 Cables

Applicable Models: CBC-K3FT, CBC-K5FT, CBC-K7FT, CBC-K10F, CBC-K16FT

Title	Part No.	Explanation
1	CBC-K3FT	RJ45 extension lead, 3 feet (approximately 0.9 m)
2	CBC-K5FT	RJ45 extension lead, 5 feet (approximately 1.5 m)
3	CBC-K7FT	RJ45 extension lead, 7 feet (approximately 2.1 m)
4	CBC-K10FT	RJ45 extension lead, 10 feet (approximately 3 m)
5	CBC-K16FT	RJ45 extension lead, 16 feet (approximately 4.9 m)

Model Name

VFD | 007 | CB | 43 | A | - | 20 | _ / M

Case Type
- _ Standard model
- M Harsh environment application model

IP Protection
- 20 IP20 / UL Open Type
- 21 IP20 / NEMA1

Installation Type
- A Wall mount
- B Wall mount, Large fan

Input voltage
- 21 230 V 1-Phase
- 23 230 V 3-Phase
- 43 460 V 3-Phase

Product Series
- C C200

Applicable Motor Capacity
004: 0.5 HP (0.375 kW) ~ 075: 10 HP (7.5 kW)
Refer to the Specifications in user manual for more details

Product
Variable Frequency Drive

Ordering Information

Frame Size		Power Range	Models		
			230V Single phase	230V 3 phase	460V 3 phase
Frame A0		230V: 0.4kW ~ 3.7kW 460V: 0.75kW ~ 3.7kW	VFD004CB 21A-20 VFD007CB 21A-20 VFD015CB 21A-20 VFD022CB 21A-20	VFD004CB 23A-20 VFD007CB 23A-20 VFD015CB 23A-20 VFD022CB 23A-20 VFD037CB 23A-20	VFD007CB 43A-20 VFD015CB 43A-20 VFD022CB 43A-20 VFD037CB 43A-20
Frame A0		230V: 0.4kW ~ 3.7kW 460V: 0.75kW ~ 3.7kW	VFD004CB 21A-21 VFD007CB 21A-21 VFD015CB 21A-21 VFD022CB 21A-21 VFD004CB 21A-21M VFD007CB 21A-21M VFD015CB 21A-21M VFD022CB 21A-21M	VFD004CB 23A-21 VFD007CB 23A-21 VFD015CB 23A-21 VFD022CB 23A-21 VFD037CB 23A-21 VFD004CB 23A-21M VFD007CB 23A-21M VFD015CB 23A-21M VFD022CB 23A-21M VFD037CB 23A-21M	VFD007CB 43A-21 VFD015CB 43A-21 VFD022CB 43A-21 VFD037CB 43A-21 VFD007CB 43A-21M VFD015CB 43A-21M VFD022CB 43A-21M VFD037CB 43A-21M
Frame A		460V: 4kW ~ 7.5kW			VFD040CB 43A-20 VFD055CB 43A-20 VFD075CB 43A-20 VFD040CB 43A-21 VFD055CB 43A-21 VFD075CB 43A-21 VFD040CB 43A-21M VFD055CB 43A-21M VFD075CB 43A-21M
Frame A0 (Large fan size model)		460V: 2.2kW ~ 3.7kW			VFD022CB 43B-20 VFD037CB 43B-20
Frame A (Large fan size model)		460V: 4kW ~ 7.5kW			VFD040CB 43B-20 VFD055CB 43B-20 VFD075CB 43B-20

Attention

Standard Motors

Output reactor
Please refer to manual to use the output AC reactor when the output cable is long.

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°C 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 the 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 Absorber
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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