PETER electronic

VersiDrive i
C2 Series

POWERFUL FEATURES. HIGH EFFICIENCY.

The VersiDrive i ... C2 Series AC motor drive provides the most efficient solution for all types of drive applications. It features precise speed, torque and position control functions that are suitable for both sensor and sensorless types of synchronous and asynchronous motors. The VersiDrive i ... C2 Series is also equipped with built-in PLC functions and supports the CANopen Master/Slave extension for the ultimate in system flexibility and fast data exchange.

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Future-oriented features

High Performance

1. High bandwidth control
2. Speed / torque / position control mode
3. Dual rating design (normal duty / heavy duty)
4. 4-quadrant torque control and limit
5. For both synchronous and asynchronous motors

Environmental Adaptability

1. 50°C operating temperature
2. Built-in DC reactor
3. Coated circuit boards
4. Built-in EMC filter
5. International safety standard (CE/UL/cUL)

*Note: Please refer to the Product Specification

Versatile Drive Controls

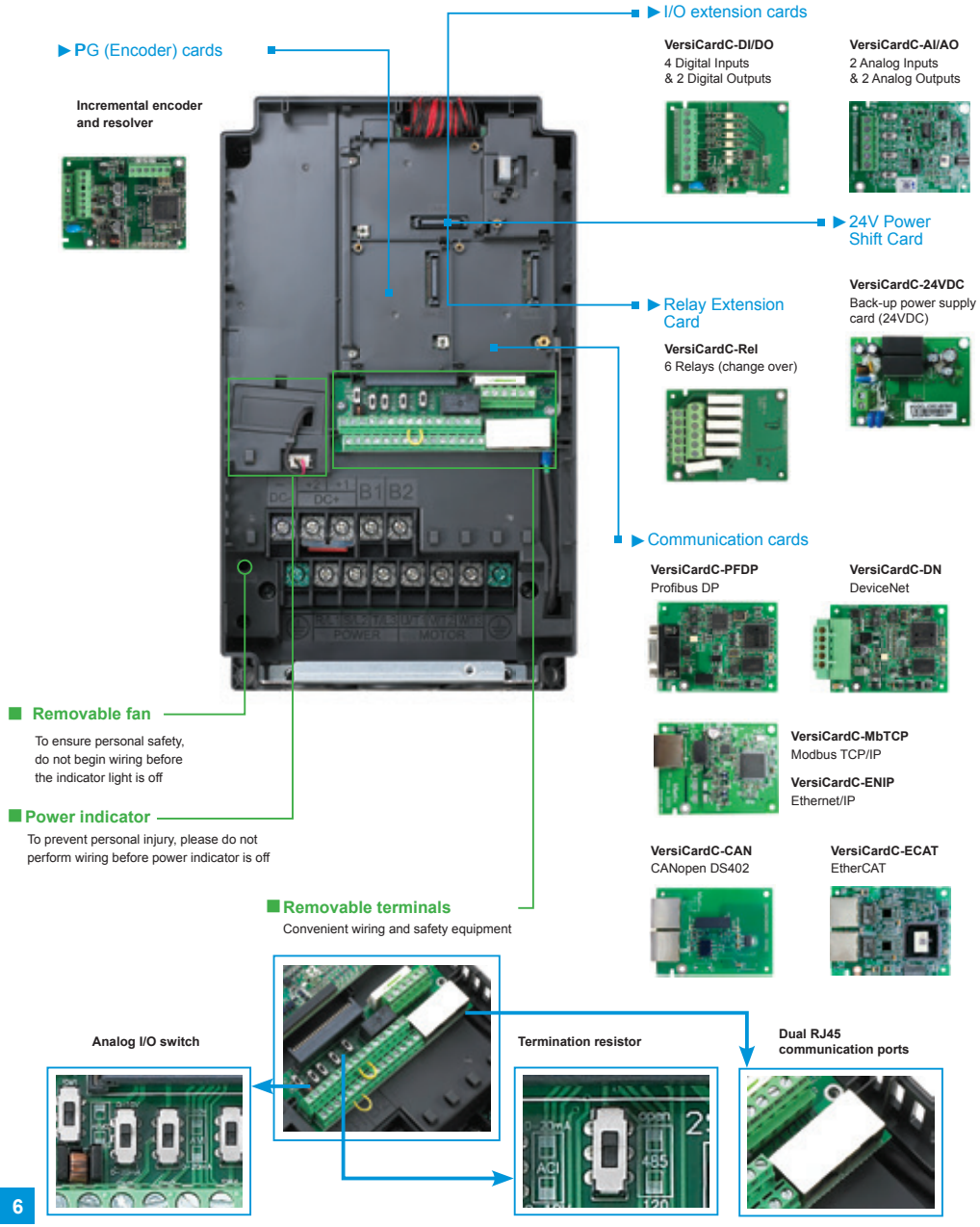
1. Built-in safe stop function
2. Built-in PLC function
3. Built-in brake unit
4. Supports various network protocols
5. Position control

Modular Design

1. Hot pluggable LCD keypad
2. I/O extension cards
3. Various PG (encoder) feedback cards
4. Network cards for fieldbus modules
5. Removable fan

Modular design & certificates

Various accessories options, such as I/O extension cards, encoder feedback cards, communication cards, hot pluggable LCD keypad, removable terminals and removable fans.



The modular design fulfills the needs of system applications and equipment maintenance.

Excellent Environment Adaptability

- ▶ Built-in DC choke to surpress harmonics*
- ▶ Built-in EMC filter to filter noise*
- ▶ Conformal coating (Class 3C3 of IEC60721-3-3 standard) ensures drive operation stability and safety 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 Specification

Certifications

UL, cUL	**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
C-Tick	
ROHS	

LCD operation panel

Quick and Easy Parameters Setting via the LCD Keypad

- Multi-column display for the drive status
- Simple and intuitive operation
- User-defined parameter groups
- Real Time Clock and calendar function
- Language selection for display
- Copy function saves parameters and PLC programs to the keypad memory for later transfer to another drive
- IP66 protection level

F1 to F4: User-defined function keys

Selection keys

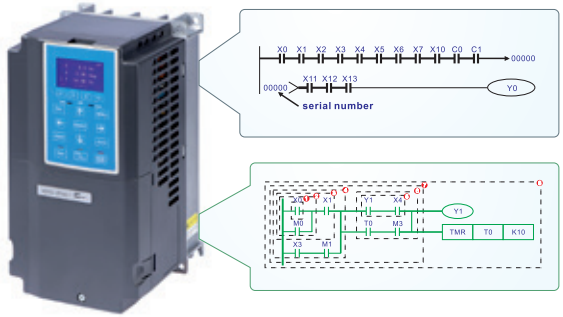
LED displays the current drive status

Editable message display

Editable chart display

Intelligent PLC Functions

- Built-in 10 K steps capacity of PLC functions. Distributed control and independent operation are easily achieved via network connection
- CANopen Master protocol and PLC functions provide synchronous control and fast data exchange



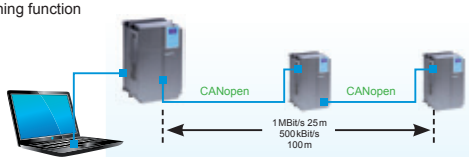
High-Speed Network

- Provides optional MODBUS RTU and various fieldbus cards for flexible applications
- Advanced network functions
- Built-in MODBUS communication

CANopen (DS402)

Ability to control up to 8 Slave drives via the CANopen Master function

- Supports all PETER electronic industrial automation products (Built-in EDS files for all PETER electronic industrial automation products)
- I/O data configurations for each device on the CANopen network
- Motion control planning function
- WPL Soft



- RJ45 cable

DeviceNet

Through the PETER electronic specially designed DeviceNet Builder software, users can easily establish a standard DeviceNet control network by the parameter pre-assignment function for each equipment and remote I/O.

- Supports all PETER electronic industrial automation products (Built-in EDS files for all PETER electronic industrial automation products)
- I/O data configurations for each device on the DeviceNet network
- DeviceNet layout software

EtherNet/IP

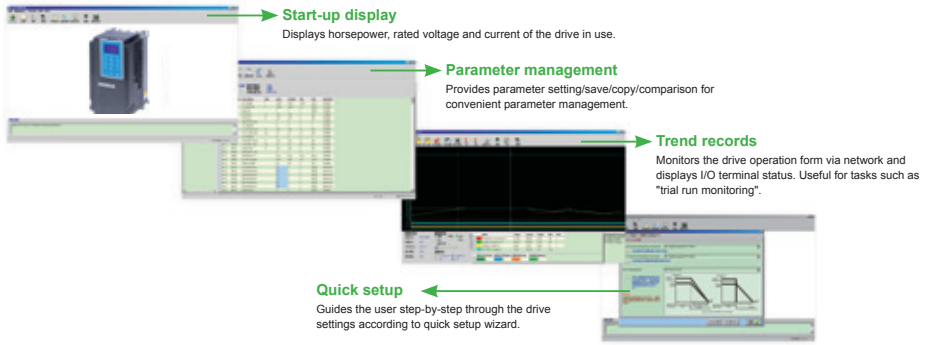
MODBUS TCP

PETER electronic provides communication integrator software that offers graphic module settings and a user friendly interface to support all Ethernet products settings and online monitoring.

- PETER electronic software for Ethernet/MODBUS TCP products
- Graphic module settings and an user friendly interface
- Auto search function
- Supports Virtual COM settings

Convenient Drive System Management Platform

- Provides a complete operation platform for users' easy control and monitoring via PC, including parameters save/setting, real-time wave monitor, quick setup, for multiple languages and with multi-language operation systems.



Start-up display
Displays horsepower, rated voltage and current of the drive in use.

Parameter management
Provides parameter setting/save/copy/comparison for convenient parameter management.

Trend records
Monitors the drive operation form via network and displays I/O terminal status. Useful for tasks such as "trial run monitoring".

Quick setup
Guides the user step-by-step through the drive settings according to quick setup wizard.

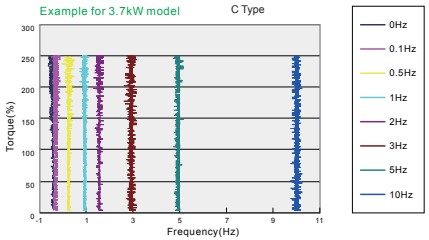
*NOTE: These software programs are available for download on PETER electronic´s website.

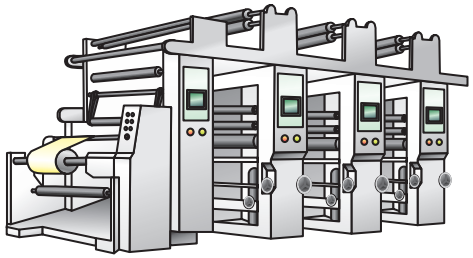
Functions & applications

High-Performance Field Oriented Control

The FOC+PG mode of C2 Series can output 150% of starting torque at extremely low speeds for precise and stable speed control.

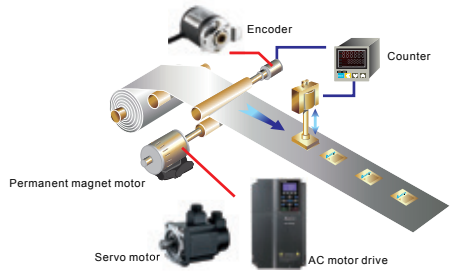
Precise position and speed control ideal for printing machine applications.





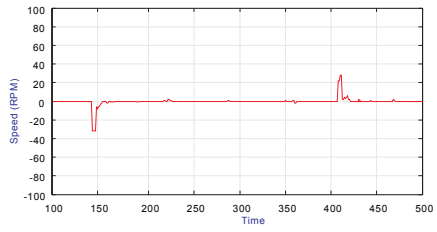
A Drive for Permanent Magnet (PM) Motors

VersiDrive i... C2 is a dual mode drive to control both an induction motor and permanent magnet motor. The dynamic response of a PM motor provides precise control of position, speed and torque.



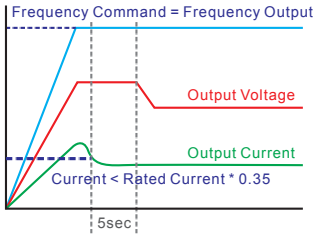
Fast Response to Impact Load

During load changes, the C2 Series calculates the required torque response and minimizes the vibration caused by load impact using FOC.



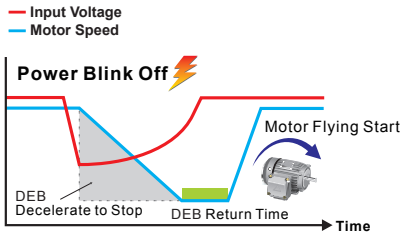
Auto Energy-Saving Operation

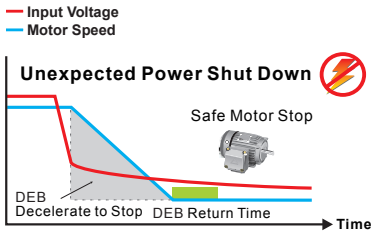
Auto-calculates the optimal voltage for the load output using load power when under constant speed operation.



Deceleration Energy Backup (DEB)

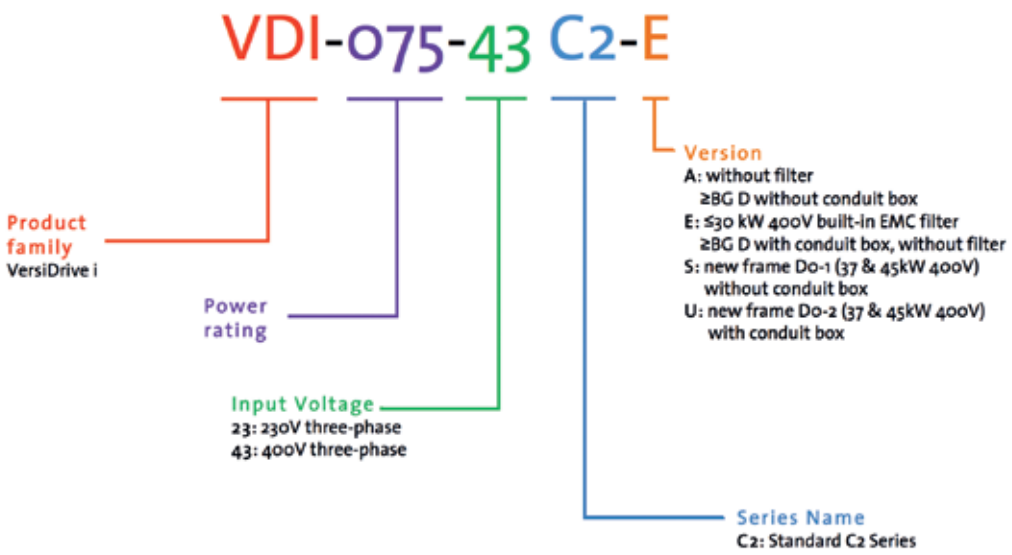
This function controls the motor deceleration to stop when power blinks off to prevent mechanical damage and then accelerates to its original operation speed when power resumes.

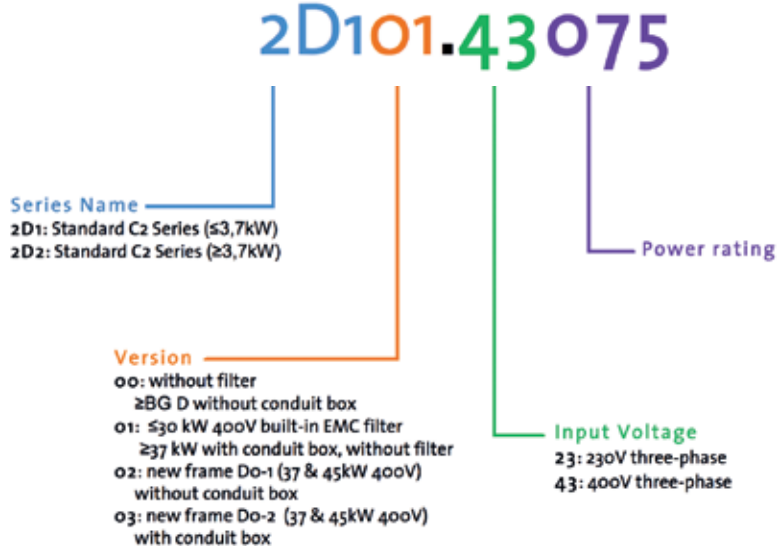




Specifications

Model Name Explanation





230 V series

Device data of the 230 V series (size A – E)

Frame Size			A1				B1			C1			D1		E1		
Model VD i □23C2-_			075	150	220	370	550	750	1100	1500	1850	2200	3000	3700	4500	5500	7500
Order no.: 2D100.23...			075	150	220	370	–	–	–	–	–	–	–	–	–	–	–
Order no.: 2D200.23...			–	–	–	–	005	007	011	015	018	022	030	037	045	055	075
Output Rating ①	Normal Duty	Rated Output Capacity [kVA]	2.0	3.2	4.4	6.8	10	13	20	26	30	36	48	58	72	86	102
		Rated Output Current [A]	5	8	11	17	25	33	49	65	75	90	120	146	180	215	255
		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
		Applicable Motor Output [HP]	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100
		Overload Capacity	120% of rated output current: 1 minute for every 5 minutes; 160% of rated output current: 3 seconds for every 30 seconds														
		Max. Output Frequency [Hz]	0.00–599.00														
		Carrier Frequency [kHz]	2–15 (Default: 8)							2–10 (Default: 6)					2–9 (Default: 4)		
	Heavy Duty	Rated Output Capacity [kVA]	1.9	2.8	4.0	6.4	9.6	12	19	25	28	34	45	55	68	81	96
		Rated Output Current [A]	4.8	7.1	10	16	24	31	47	62	71	86	114	139	171	204	242
		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
		Applicable Motor Output [HP]	0.5	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75
		Overload Capacity	150% of rated output current: 1 minute for every 5 minutes; 180% of rated output current: 3 seconds for every 30 seconds														
		Max. Output Frequency [Hz]	0.00–300.00														
		Carrier Frequency [kHz]	2–15 (Default: 2)							2–10 (Default: 2)					2–9 (Default: 2)		
Rating Input	Input Current [A]	Normal Duty	6.4	12	16	20	28	36	52	72	83	99	124	143	171	206	245
		Heavy Duty	6.1	11	15	18.5	26	34	50	68	78	95	118	136	162	196	233
	Rated Voltage/ Frequency		3-phase AC 200 V–240 V (-15%–+10%), 50/60 Hz														
	Operating Voltage Range		170–264 V AC														
	Frequency Tolerance		47–63 Hz														
Efficiency [%]			97.8												98.2		
Power Factor			>0.98														
Drive Weight [Kg]			2.6 ± 0.3				5.4 ± 1			9.378 ± 1.5			38.5 ± 1.5		64.8 ± 1.5		
Cooling Method			Natural cooling	Fan cooling													
Braking Chopper			Frame A–C: Built-in										Frame D–F: Optional				
DC choke			Frame A–C: Optional										Frame D–F: Built-in				
EMC Filter			Frame A–F: Optional														
VersiCard C-CAN ©			Frame A–F: Optional														

460 V series

Device data of the 460 V series (size A – C)

Frame Size			A 1						B 1			C 1		
Model VD i □43C2-_			075	150	220	370	400	550	750	1100	1500	1850	2200	3000
Order no.: 2D101.43...			075	150	220	370	–	–	–	–	–	–	–	–
Order no.: 2D201.43...			–	–	–	–	004	005	007	011	015	018	022	030
Output Rating ①	Normal Duty	Rated Output Capacity [kVA]	2.4	3.2	4.8	7.2	8.4	10	14	19	25	30	36	48
		Rated Output Current [A]	3.0	4.0	6.0	9.0	10.5	12	18	24	32	38	45	60
		Applicable Motor Output [kW]	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30
		Applicable Motor Output [HP]	1	2	3	5	5	7.5	10	15	20	25	30	40
		Overload Capacity	120% of rated output current: 1 minute for every 5 minutes; 160% of rated output current: 3 seconds for every 30 seconds											
		Max. Output Frequency [Hz]	0.00–599.00											
		Carrier Frequency [kHz]	2–15 (Default: 8)								2–10 (Default: 6)			
	Heavy Duty	Rated Output Capacity [kVA]	2.3	3.0	4.5	6.5	7.6	9.6	14	18	24	29	34	45
		Rated Output Current [A]	2.9	3.8	5.7	8.1	9.5	11	17	23	30	36	43	57
		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
		Applicable Motor Output [HP]	0.5	1	2	3	5	5	7.5	10	15	20	25	30
		Overload Capacity	150% of rated output current: 1 minute for every 5 minutes; 180% of rated output current: 3 seconds for every 30 seconds											
		Max. Output Frequency [Hz]	0.00–300.00											
		Carrier Frequency [kHz]	2–15 (Default: 2)								2–10 (Default: 2)			
Rating Input	Input Current [A]	Normal Duty	4.3	5.9	8.7	14	15.5	17	20	26	35	40	47	63
		Heavy Duty	4.1	5.6	8.3	13	14.5	16	19	25	33	38	45	60
	Rated Voltage/Frequency		3-phase AC 380 V–480 V (-15%–+10%), 50/60 Hz											
	Operating Voltage Range		323–528 V AC											
	Frequency Tolerance		47–63 Hz											
Efficiency [%]			97.8											
Power Factor			>0.98											
Drive Weight [Kg]			2.6 ± 0.3						5.4 ± 1			9.8 ± 1.5		
Cooling Method			Natural cooling						Fan cooling					
Braking Chopper			Frame A–C: Built-in											
DC choke			Frame A–C: Optional											
EMC Filter			VD i (X)XXX-43C2-A: Optional; Frame A–C VD i (X)XXX-43C2-E: Built-in											
VersiCard C-CAN ②			VD i (X)XXX-43C2-A: Optional; VD i (X)XXX-43C2-E: Built-in											

460 V series

Device data of the 460 V series (size D0 – E), without conduit box

Frame Size			D0 1		D 1		E 1	
Model VD i □43C2-_			3700	4500	5500	7500	9000	11000
Order no.: 2D202.43...			037	045	–	–	–	–
Order no.: 2D200.43...			–	–	055	075	090	110
Output Rating ①	Normal Duty	Rated Output Capacity [kVA]	58	73	88	120	143	175
		Rated Output Current [A]	73	91	110	150	180	220
		Applicable Motor Output [kW]	37	45	55	75	90	110
		Applicable Motor Output [HP]	50	60	75	100	125	150
		Overload Capacity	120% of rated output current: 1 minute for every 5 minutes; 160% of rated output current: 3 seconds for every 30 seconds					
		Max. Output Frequency [Hz]	0.00–599.00					
		Carrier Frequency [kHz]	2–10 (Default: 6)			2–9 (Default: 4)		
	Heavy Duty	Rated Output Capacity [kVA]	55	69	84	114	136	167
		Rated Output Current [A]	69	86	105	143	171	209
		Applicable Motor Output [kW]	30	37	45	55	75	90
		Applicable Motor Output [HP]	40	53	60	75	100	125
		Overload Capacity	150% of rated output current: 1 minute for every 5 minutes; 180% of rated output current: 3 seconds for every 30 seconds					
		Max. Output Frequency [Hz]	0.00–300.00					
		Carrier Frequency [kHz]	2–10 (Default: 2)			2–9 (Default: 2)		
Rating Input	Input Current [A]	Normal Duty	74	101	114	157	167	207
		Heavy Duty	70	96	108	149	159	197
	Rated Voltage / Frequency		3-phase AC 380 V–480 V (-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					
Drive Weight [Kg]			27 ± 1.5		38.5 ± 1.5		64.8 ± 1.5	
Cooling Method			Fan cooling					
Braking Chopper			Frame D0–E: Optional					
DC choke			Frame D0–E: Built-in					
EMC Filter			Frame D0–E: Optional					
VersiCard C-CAN ②			VD i (X)XXX-43C2-A: Optional; VD i (X)XXX-43C2-E: Built-in					

NOTES

- a: The factory setting is Normal Duty mode.
- b: CANopen® communication card
- The carrier frequency is default. Increasing the carrier frequency requires a reduction in current. Please refer to section 8.5.1 Derating Curve of Ambient Temperature.
- The AC motor drive should operate in derating current when its control method is set to FOC Sensorless, TQC+PG, TQC sensorless. PM+PG, PM sensorless Please refer to Pr. 06-55 for more information.
- Select the AC motor drive with capacity one grade larger for the impact load application.
- The rated input current will be affected by not only Power Transformer and the connection of the reactors on input side, but also fluctuates with the impedance of power side.
- For Frame A, B and C, VD i (X)XXX-43C2-A is under IP20/NEMA1/UL TYPE1 protection level.
- For Frame D and above, if the last character of the model is A then it is under IP20 protection level but the wiring terminal is under IP00 protection level; if the last character of the model is E, it is under IP20/NEMA1/UL TYPE1 protection level.
- Model VD i 4500-43C2-x does not have UL certification.

General specifications

Control Characteristics	**Control Method**	Pulse Width Modulated (PWM)
	Control Mode	230 V / 460 V model: 1: V / F · 2: SVC · 3: VF+PG · 4: FOC+PG · 5: TQC+PG · 6: PM+PG · 7: FOC sensorless · 8: TQC sensorless · 9: PM sensorless
		575 V / 690 V model: 1: V / F · 2: V / F+PG · 3: SVC
	Starting Torque	Reach up to 150% or above at 0.5 Hz. Under FOC+PG mode, starting torque can reach 150% at 0 Hz
	V / F Curve	4-point adjustable V / F curve and square curve
	Speed Response Ability	5 Hz (vector control can reach up to 40 Hz)
	Torque Limit	230 V / 460 V model: Normal duty 160%, heavy duty 180% of torque current ; 575 V / 690 V model: Maximum 200% of torque current
	Torque Accuracy at TQC Mode	TQC + PG : ±5% TQC Sensorless : ±15%
	Max. Output Frequency (Hz)	Light Duty / Normal duty: 0.01 ~ 599.00 Hz; Heavy duty: 0.00 ~ 300.00 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 * max. output frequency / 60 Hz (±11 bit)
	Overload Capacity	230 V / 460 V model: Normal duty: 120% of rated current can endure for 1 minute during every 5 minutes ; 160% of rated current can endure for 3 seconds during every 30 seconds Heavy duty: 150% of rated current can endure for 1 minute during every 5 minutes ; 180% of rated current can endure for 3 seconds during every 30 seconds
		575 V / 690 V model: Light duty: 120% of rated current can endure for 1 minute Normal duty: 120% of rated current can endure for 1 minute, 150% can endure for 3 seconds Heavy duty: 150% of rated current can endure for 1 minute, 180% can endure for 3 seconds
	Frequency Setting Signal	+10 V ~ -10V, 0 ~ +10 V, 4 ~ 20 mA, 0 ~ 20 mA, pulse input
	Accel. / decel. Time	0.00 ~ 600.00 / 0.0 ~ 6000.0 Seconds
	Main Control Function	Torque control, Speed / torque control switching, Feed forward control, Zero-servo control, 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, Slip compensation, Torque compensation, JOG frequency, Fault restart, Frequency upper / lower limit settings, DC injection braking at start / stop, High slip braking, Parameter copy PID control (with sleep function), Energy saving control, MODOBUS communication (RS-485 RJ45, Max. 115.2 kbps)
	Fan Control	230 V model: VD i 1500-23C2-A (include) and series above: PWM control; VD i 1100-23C2-A and below: on/off switch control
		460 V model: VD i 1850-43C2-A (include) and series above: PWM control; VD i 1500-43C2-A and below: 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: Over-current protection for 240% of rated current (Normal duty) Current clamp (Normal duty: around 170 ~ 175%); (Heavy duty: around 180 ~ 185%)
		575 V / 690 V model: Over-current protection for 225% rated current (Normal duty) Current clamp (Light duty: around 128 ~ 141%); (Normal duty: around 170 ~ 175%); (Heavy duty: around 202% ~ 210%)
	Over-Voltage Protection	The C2 Series will shut down under below conditions: 230 V: DC bus over 410 V; 460 V: DC bus over 820 V; 575 V / 690 V: DC bus over 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		CE UL

Operation temperature and protective structure

Model	Frame	Top Cover	Conduit Box	Protection Level	OperationTemperature
VD i xxx-xxC2A	Frame A ~ C 230 V: 0.75 ~ 22 kW 460 V: 0.75 ~ 30 kW	Remove top cover	Standard conduit plate	IP20 / UL Open Type	-10 °C ~ 50 °C
		Standard with top cover		IP20 / UL Type1 / NEMA1	-10 °C ~ 40 °C
	Frame D ~ H 230 V: > 22 kW 460 V: > 30 kW	N / A	No conduit box	 Protection degree for the circled area is IP00, other areas are IP20	-10 °C ~ 50 °C
VD i xxx-xxC2E VD i xxx-xxC2U	Frame A ~ C 460 V: 0.75 ~ 30 kW	Remove top cover	Standard conduit plate	IP20 / UL Open Type	-10 °C ~ 50 °C
		Standard with top cover		IP20 / UL Type1 / NEMA1	-10 °C ~ 40 °C
	Frame D ~ H 230 V: > 22 kW 460 V: > 30 kW	N / A	Standard conduit box	IP20 / UL Type1 / NEMA1	-10 °C ~ 40 °C

Environment conditions for operation, storage and transportation

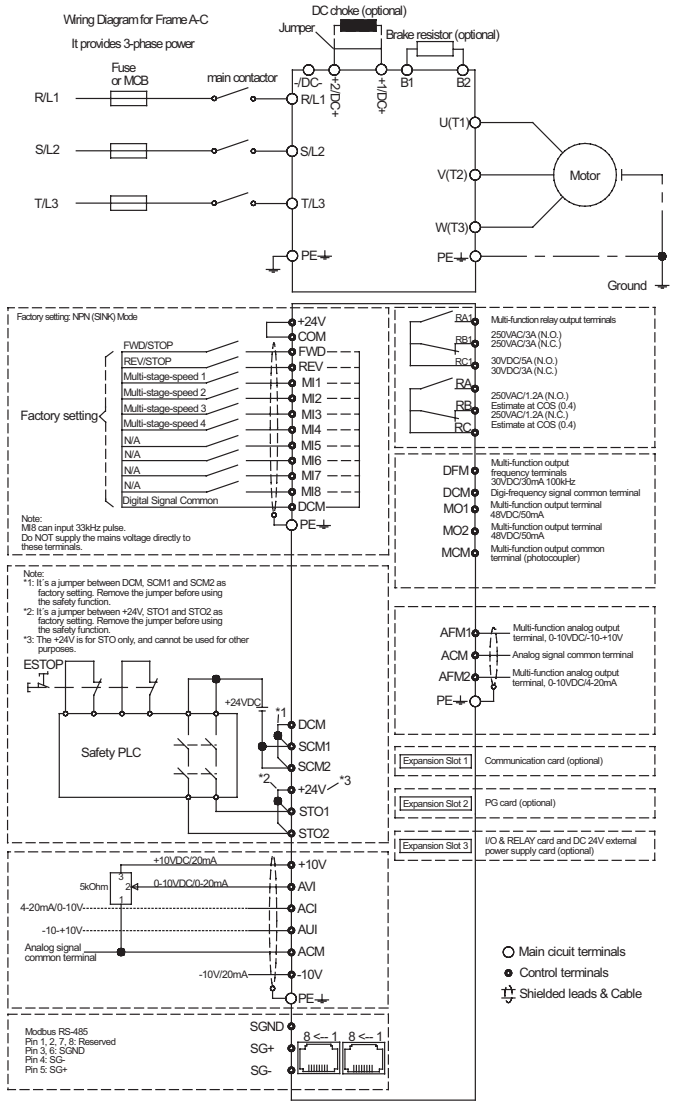
DO NOT expose the AC motor drive to harsh environments, such as dust, direct sunlight, corrosive / flammable gasses, humidity, liquid or vibrations. The salts in the air must be less than 0.01 mg / cm² per year.

Environment	**Installation Location**	IEC60364-1 / IEC60664-1 Pollution degree 2, indoor use only	
	Surrounding Temperature (°C)	Storage / Transportation	-25 ~ 70
		Only allowed in non-condensation, non-frost, non-conductive environment	
	Rated Humidity	Operation/Storage / Transportation	Max. 95%
		Only allowed in non-condensation, non-frost, non-conductive environment	
	Air Pressure (kPa)	Operation / Storage	86 ~ 106
		Transportation	70 ~ 106
	Pollution Level	IEC60721-3-3	
		Operation	Class 3C3; Class 3S2
		Storage	Class 1C2; Class 1S2
		Transportation	Class 2C2; Class 2S2
		If the AC motor drive is to be used under harsh environment 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.	
	Altitude	Operation	If the AC motor drive is installed at an altitude 0 ~ 1000 m, follow normal operation restriction. If it is installed at altitude 1000 ~ 2000 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 PETER electronic 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 ° (under normal installation position)	

Wiring

Wiring of frame A-C

*Input: 3-phase power

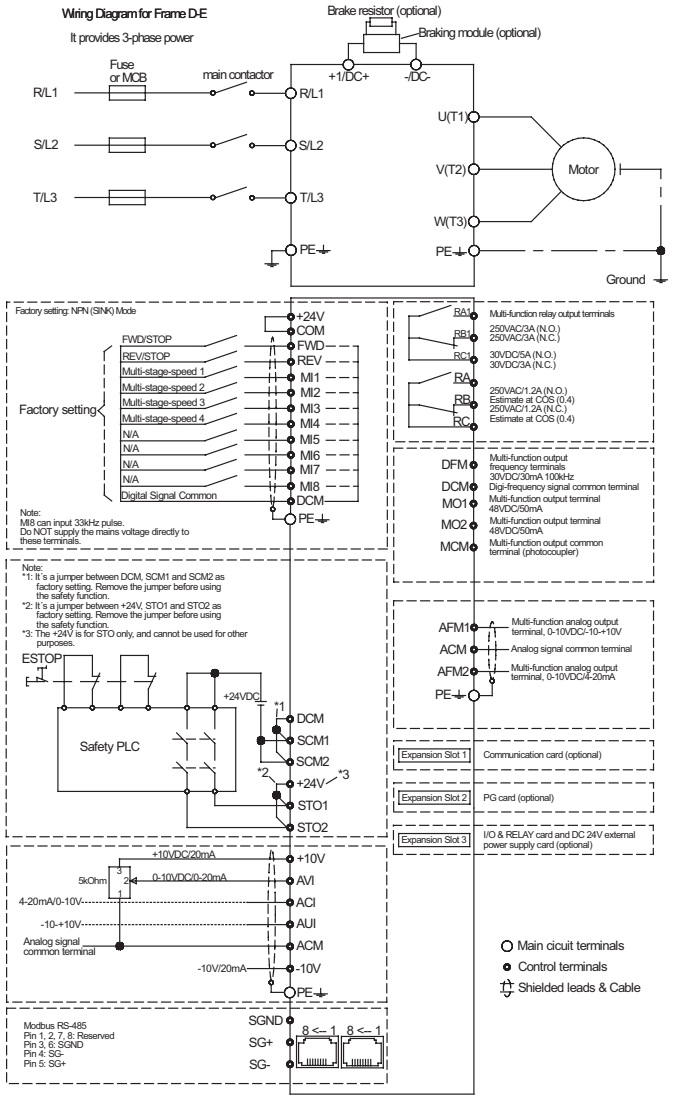


NOTE

It is not recommended to use a power capacitor or automatic power factor regulator (APFR) at the power input side. If the system requires such a device, please make sure a reactor is installed between the drive and the power capacitor or APFR.

Wiring of Frame D-F

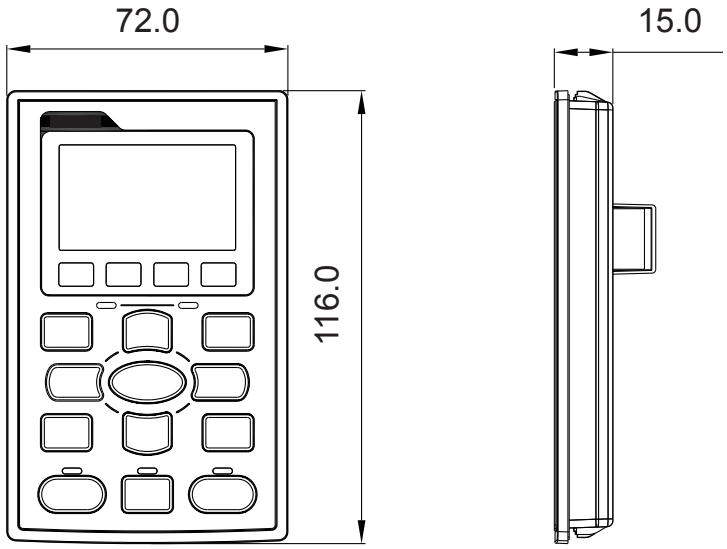
*Input: 3-phase power



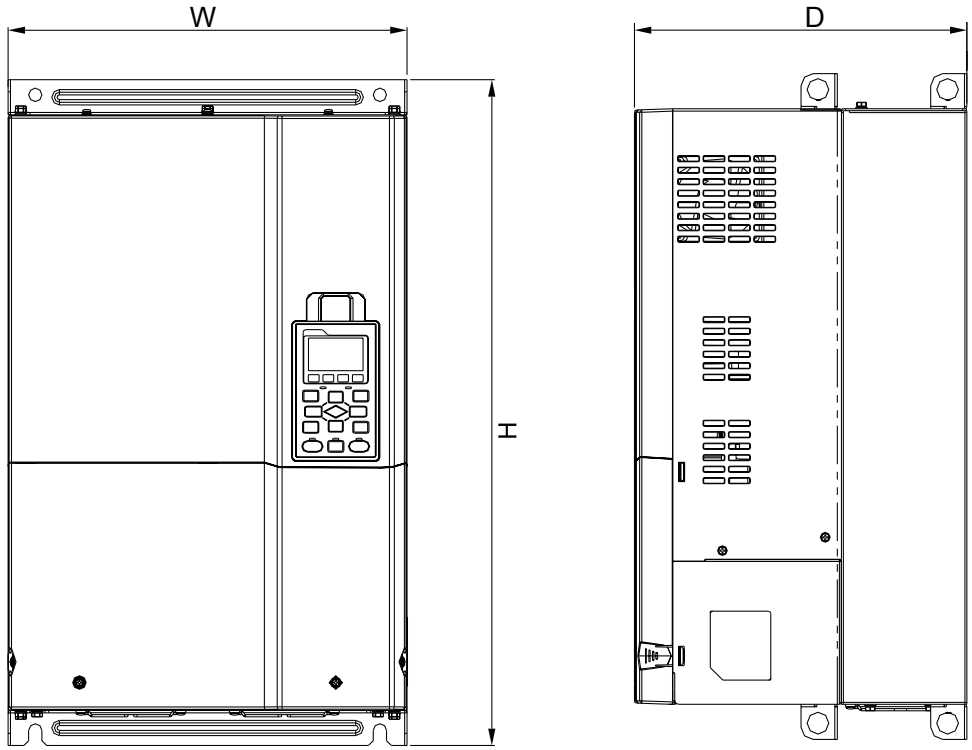
Dimensions

Operation panel

Unit: mm



Frame dimensions



Dimensions	W (mm)	H (mm)	D (mm)
A1	130	250	170
B1	190	320	190
C1	250	400	210
D0-1	280	500	255
D1	330	550	275
D0-2	280	614,4	255
D2	330	688,3	275
E1	370	589	300
E2	370	715,8	300

PETER electronic

Notes:

PETER electronic

VersiDrive i
C2 Series

PETER electronic GmbH & Co. KG

Bruckäcker 9
92348 Berg

www.peter-electronic.com

Contact:

Fon +49 (0) 91 89 / 41 47 0
Fax +49 (0) 91 89 / 41 47 47

mail@peter-electronic.com