



Automation for a Changing World

Delta IP55 Fan and Pump Drive CFP2000 Series



www.deltaww.com

 **DELTA**
Smarter. Greener. Together.

CFP2000

Delta's CFP2000 series is an AC motor drive specially designed for HVAC, fans & pumps, and water treatment applications. It is designed with an IP55 enclosure to provide effective protection against water, dust, and other particles, and features outstanding functions to help users reduce setup / tuning time and enhance operation efficiency in applications. In addition, it includes many outstanding features and built-in functions that reduce setup and tuning time in operation and provide higher efficiency.

The CFP2000 is equipped with a built-in EMC filter and a DC choke. This design replaces the need for an electrical distribution cabinet and saves space for other devices, while providing the benefits of harmonic suppression and better power quality to the system. Various parameter groups are also included, which allow you to simply select the needed application in the parameter group setting and the system setup is ready. If a higher safety standard is required, an optional main switch function is also available upon selection. Other outstanding features include support for both IM/PM motors, real-time clock, built-in 10k steps PLC capacity and various optional extension cards.

The CFP2000 Series integrates all of your needs in one drive, and is your friendliest and smartest choice available in the industry!

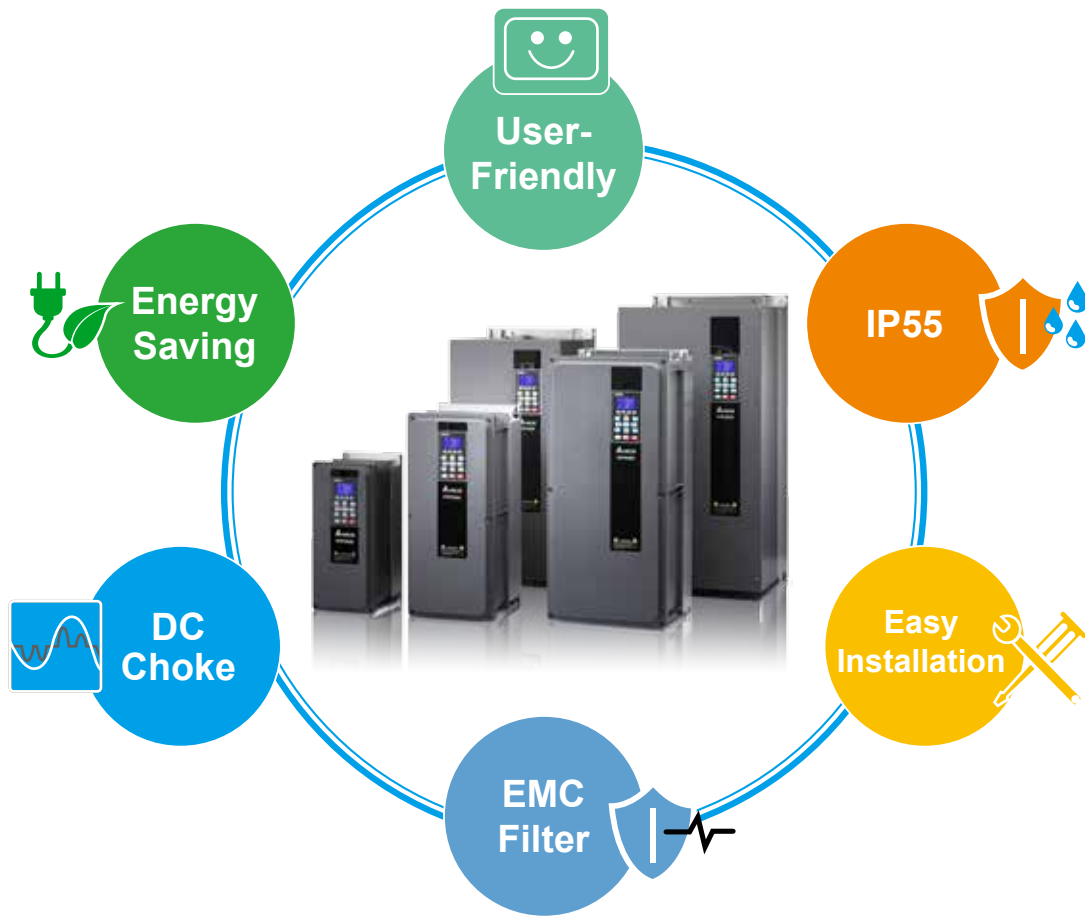


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Highlights



Standard Models

Power range: AC 380 to 480V/3 phase

| | | | | | | | | | | | | | | | | | |
|------------|------|-----|-----|-----|---|-----|-----|----|----|------|----|----|----|----|----|-----|-----|
| kW | 0.75 | 1.5 | 2.2 | 3.7 | 4 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 55 | 75 | 90 |
| HP | 1 | 2 | 3 | 5 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 100 | 125 |
| Frame Size | A | | | | | | | B | | | | C | D0 | D | | | |

Application



HVAC



Fans



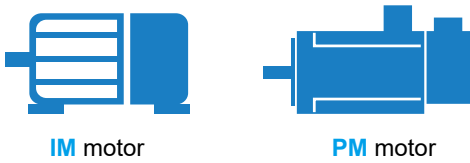
Chiller



Water treatment

Features

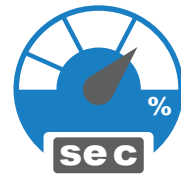
▶ Motor Controls



▶ Overload Ability

Light duty:
120% for 60sec

Normal duty:
120% for 60sec
160% for 3sec



▶ I/O Terminals

- 10 MI
- 3 AI
- Optional I/O extension cards
- 2 AO
- 3 relay



▶ Built-in STO SIL2



▶ Mains Switch (Optional)

- Available for all IP55 models 0.75kW to 90kW
- Allows users to turn off the power easily during daily maintenance and does not require an additional breaker box



▶ LCD Keypad

- Quick setting for frequent use modes and facilitates the installation process
- Multi-row display, Intuitive operation, user friendly operation interface
- Parameter management and copy
- Real time clock
- Multi-language: English, Spanish, Portuguese, French, Russian, Turkish, Polish
- TP Editor for users to define the display on the screen of the keypad



Create homepage logo

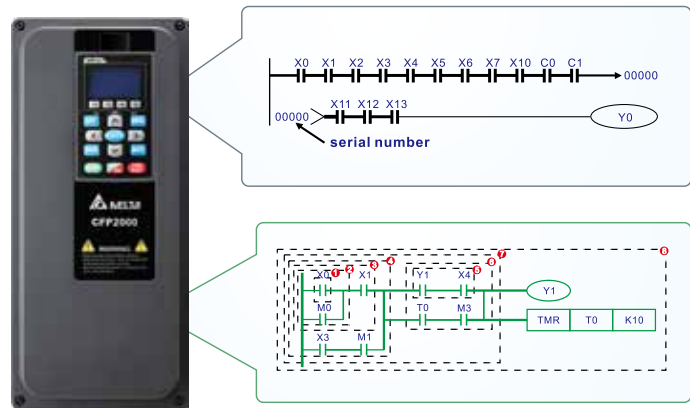


Editable message display



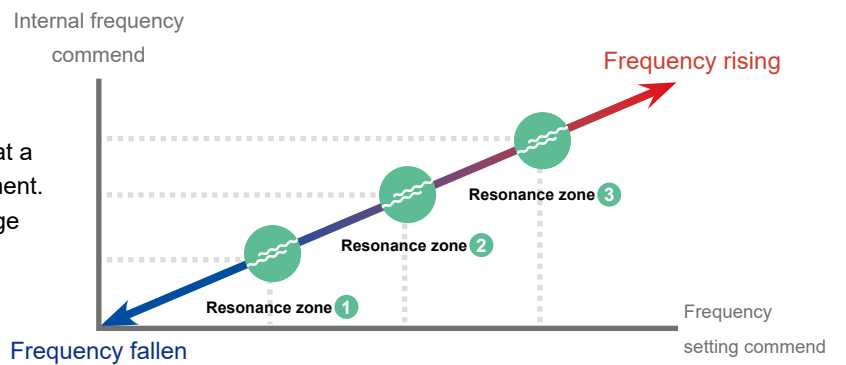
► Built-in PLC Function

- 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 savings operation and many other settings.



► Skip Frequency

- Skip Frequency function avoids motor vibration at a specific frequency band and protects the equipment. User can restrict up to 3 zones of frequency range



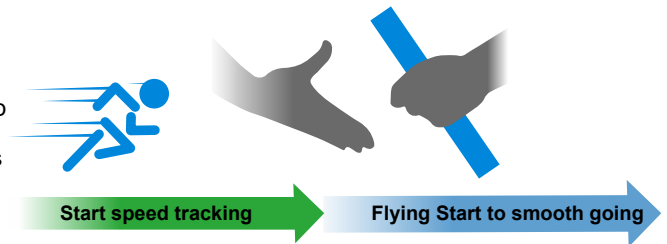
► Fire Mode

- Application: ventilation of buildings, tunnels, subways and more
- The drive will bypass the alarm warning in fire mode. When a fire occurs, it forces the drive to continue to operate to extract smoke or supplies water until the drive fails or runs out of emergency power
 - » Preset speed mode: set the drive to continue to operate under a preset speed
 - » BYPASS mode: the AC Mains Bypass breaker will bypass the drive and connect to the emergency power
 - » Fire mode with PID control: it balances the pressure between the stairwell and fire location to ensure the fire door can be easily opened



► Flying Start

- Ensures the drive runs smoothly under high inertial load without triggering the alarm, does not require the motor to stop
- When the drive restarts after momentary power loss (within 5s on LV), the speed searching allows the drive to activate flying start immediately and ensure a stable operation of the system without requiring the motor to fully stop in order to save time

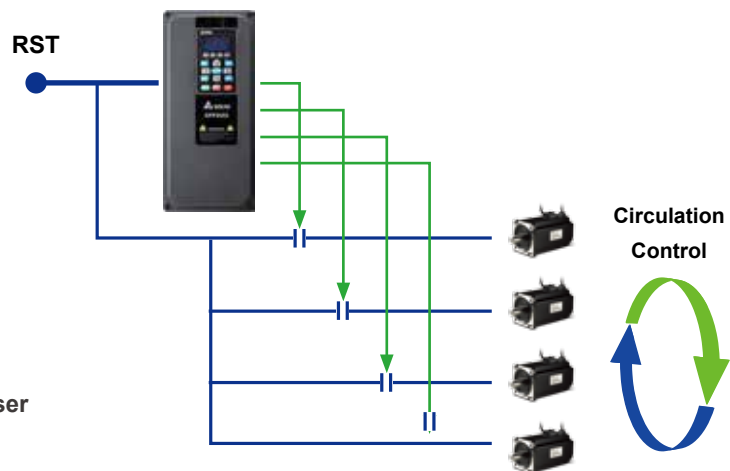


► Multi-pump Control

Built-in various modes for multi-pump control

- Fixed time circulation (by time)
- Fixed amount circulation (by PID)
- Fixed amount control (by PID)
- Fixed time circulation + fixed amount circulation
- Fixed time circulation + fixed amount control

Built-in 10k steps PLC function and RTC for user to program a time sequence control



► Parameter Groups

Without parameter group.....




CFP2000 parameter group function simplifies the drive setting procedures. Various applications are provided:

- 01: User Defined
- 02: AHU
- 03: Fan
- 04: Pump
- 05: Compressor



► Advanced Networking

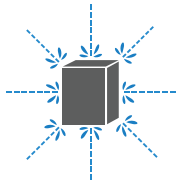
- Built-in RS-485 (Modbus)
- Built-in BACnet MS/TP 
- Various communication card options

PROFINET, , EtherNet/IP, DeviceNet, Modbus TCP, CANopen (DS402)

Operating Environment

► Protection Class

IP55 NEMA12, IP41 NEMA1



Water Resistant



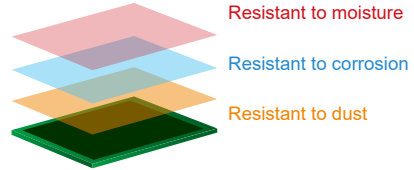
Dust Resistant

► Enhanced PCB Coating

Standard:

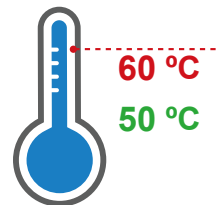
IEC 60721-3-3 class 3C3

Protects PCB from gases such as salt, SO₂, O₃, H₂S, and others to extend the product life when used in a water treatment application



► Operation Temperature

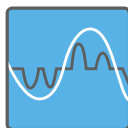
Up to **50 °C** without derating
Up to **60 °C** with derating



► Built-in DC Choke

Suppress harmonics

THDi < 48%



EN61000-3-12

► Built EMC Filter


EN61800-3 C2 & C1*



*A zero phase reactor is required to fulfill EMC category C1

Environment for Operation, Storage and Transportation

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

| | | | |
|--------------------------------|---|--|----------------------|
| Ambient Conditions | Installation Location | IEC60364-1/IEC60664-1 Pollution degree 2, indoor use only | |
| | Surrounding Temperature (°C) | Storage/Transportation | -25 ~ 70 |
| | | 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 (kPa) | Operation/Storage | 86 ~ 106 |
| | | Transportation | 70 ~ 106 |
| | Environment | IEC60721-3-3 | |
| | | Operation | Class 3C3; Class 3S2 |
| Storage | | Class 1C2; Class 1S2 | |
| Transportation | | Class 2C2; Class 2S2 | |
| Altitude | Operation | <p>If the AC motor drive is installed at an altitude 0~1,000m, follow normal operation restrictions. For every 100m increase in altitude, the AC motor drive needs to either lower rated current by 1% or by 0.5°C of temperature for operation. If the drive is installed at an altitude above 2,000m, please refer to the voltage derating graph in the user manual for more instructions</p> <p>Note: Voltage derating is not needed for a Center Ground System, and maximum installation altitude is 4,000m.</p> | |
| Vibration Operating | IEC 60068-2-6 | | |
| | Frame A: 2Hz ≤ f ≤ 13.2Hz/Amplitude 1mm; 13.2Hz < f ≤ 55Hz/Gravity 0.7G to 2.0G; 55Hz < f ≤ 512Hz/Gravity 2.0G | | |
| | Frame B: 2Hz ≤ f ≤ 13.2Hz/Amplitude 1mm; 13.2Hz < f ≤ 55Hz/Gravity 0.7G to 1.5G; 55Hz < f ≤ 512Hz/Gravity 1.5G | | |
| | Frame C/ D0/ D: 2Hz ≤ f ≤ 13.2Hz/Amplitude 1mm; 3.2Hz < f ≤ 55Hz/Gravity 0.7G to 1.0G; 155Hz < f ≤ 512Hz/Gravity 1.0G | | |
| Shock Operating | IEC 60068-2-27 | | |
| | Frame A; B; C; D0: Max. 30G; 11ms; Frame D: Max. 15G; 11ms | | |
| In protective shipping package | Vibration | IEC 60068-2-64 | |
| | 10 Hz ≤ f ≤ 100 Hz/ASD: 1.0m2/s3; 100 Hz ≤ f ≤ 200 Hz/Slope: -3dB/octave | | |
| Shock | Cardboard box type: Free fall drop in accordance with ISTA 1A | | |
| | Wooden box type: In accordance with ISTA 1E (4 side incline) and ISTA 2B (Bottom side drop) | | |
| Operation Position | Max. allowed offset angle ±10° (under normal installation position) |  | |

Specifications for Operation Temperature and Protection Level

| Model | Frame | Protection Level | Operation Temperature |
|----------------|------------------------|------------------|-----------------------|
| VFDxxxFPxxx-52 | Frame A ~ D: 0.75~90kW | IP55/NEMA12 | -10 °C~50 °C* |
| VFDxxxFPxxx-41 | Frame A ~ D: 0.75~90kW | IP41/NEMA1 | -10 °C~50 °C* |

*Note: 15°C~50°C, without derating; 51°C~60°C, with derating

Specifications

| Frame Size | | A | | | | | | | B | | | | C | | D0 | | D | | |
|------------------------|---|---|--|------|-----|------|------|------|------|-----|------|------|--------------------------------|-----|------|-----|-----|-----------------|-----|
| Models VFD-____FP4E-__ | | 007 | 015 | 022 | 037 | 040 | 055 | 075 | 110 | 150 | 185 | 220 | 300 | 370 | 450 | 550 | 750 | 900 | |
| 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 | 120 | 143 |
| | | Rated Output Current (A) | 3 | 4.2 | 5.5 | 8.5 | 10.5 | 13 | 18 | 24 | 32 | 38 | 45 | 60 | 73 | 91 | 110 | 150 | 180 |
| | | 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 | 75 | 90 |
| | | Applicable Motor Output (HP) | 1 | 2 | 3 | 5 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 100 | 125 |
| | | Overload Tolerance | 120% for 60 seconds in every 5 minutes | | | | | | | | | | | | | | | | |
| | | Max. Output Frequency (Hz) | 599 | | | | | | | | | | | | | | | | |
| | | Carrier Frequency (kHz) | 2~15 (default 6) | | | | | | | | | | 2~10 (default 6) | | | | | 2~9 (default 6) | |
| | NORMAL DUTY | Rated Output Capacity (kVA) | 1.4 | 2.4 | 3.2 | 4.8 | 7.2 | 8.4 | 10 | 14 | 19 | 25 | 30 | 36 | 48 | 58 | 73 | 88 | 120 |
| | | 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 | 110 | 150 |
| | | 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 | 55 | 75 |
| | | Applicable Motor Output (HP) | 0.5 | 1 | 2 | 3 | 5 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 53 | 60 | 75 | 100 |
| | | Overload Tolerance | 120% for 60 seconds in every 5 minutes 160% for 3 seconds in every 25 seconds | | | | | | | | | | | | | | | | |
| | | Max. Output Frequency (Hz) | 599 | | | | | | | | | | | | | | | | |
| | | Carrier Frequency (kHz) | 2~15 (default 6) | | | | | | | | | | 2~10 (default 6) ^{*1} | | | | | 2~9 (default 6) | |
| INPUT RATING | Input Current (A) Light Duty | 3.0 | 4.2 | 5.5 | 8.5 | 10.5 | 13 | 18 | 24 | 32 | 38 | 45 | 60 | 73 | 91 | 110 | 150 | 180 | |
| | Input Current (A) Normal Duty | 1.7 | 3.0 | 4.0 | 6.0 | 9.0 | 10.5 | 12 | 18 | 24 | 32 | 38 | 45 | 60 | 73 | 91 | 110 | 150 | |
| | Rated Voltage/Frequency | 3-phase AC 380V~480V (-15%~+10%), 50/60Hz | | | | | | | | | | | | | | | | | |
| | Operating Voltage Range | 323~528V _{AC} | | | | | | | | | | | | | | | | | |
| | Frequency Tolerance | 47~63Hz | | | | | | | | | | | | | | | | | |
| Efficiency (%) | 97 | | | | | | | | | | | | | | | | | | |
| Power factor | > 0.98 | | | | | | | | | | | | | | | | | | |
| Drive Weight (Kg) | 6.8 | | | | | 14.5 | | | | | 26.5 | | 42 | | 59.5 | | | | |
| Cooling Method | Natural cooling | Fan cooling | | | | | | | | | | | | | | | | | |
| Braking Chopper | Frame A, B, C, Built-in | | | | | | | | | | | | | | | | | | |
| DC Choke | Built-in DC choke meets EN6100-3-12 | | | | | | | | | | | | | | | | | | |
| EMC Filter | Built-in EMC filter meets EN61800-3 C2 & C1 ^{*2} | | | | | | | | | | | | | | | | | | |

*1 The carrier frequency range of VFD900FP4EA-xx is 2~9kHz, default setting 6kHz

*2 A zero phase reactor is required to fulfill EMC category C1

NOTE

- The value of the carrier frequency is a factory setting. To increase the carrier frequency, the current needs to be decreased. Please see derating curve diagram of Pr. 06-55 for more information.
- When a load is a surge load, use a higher level model.

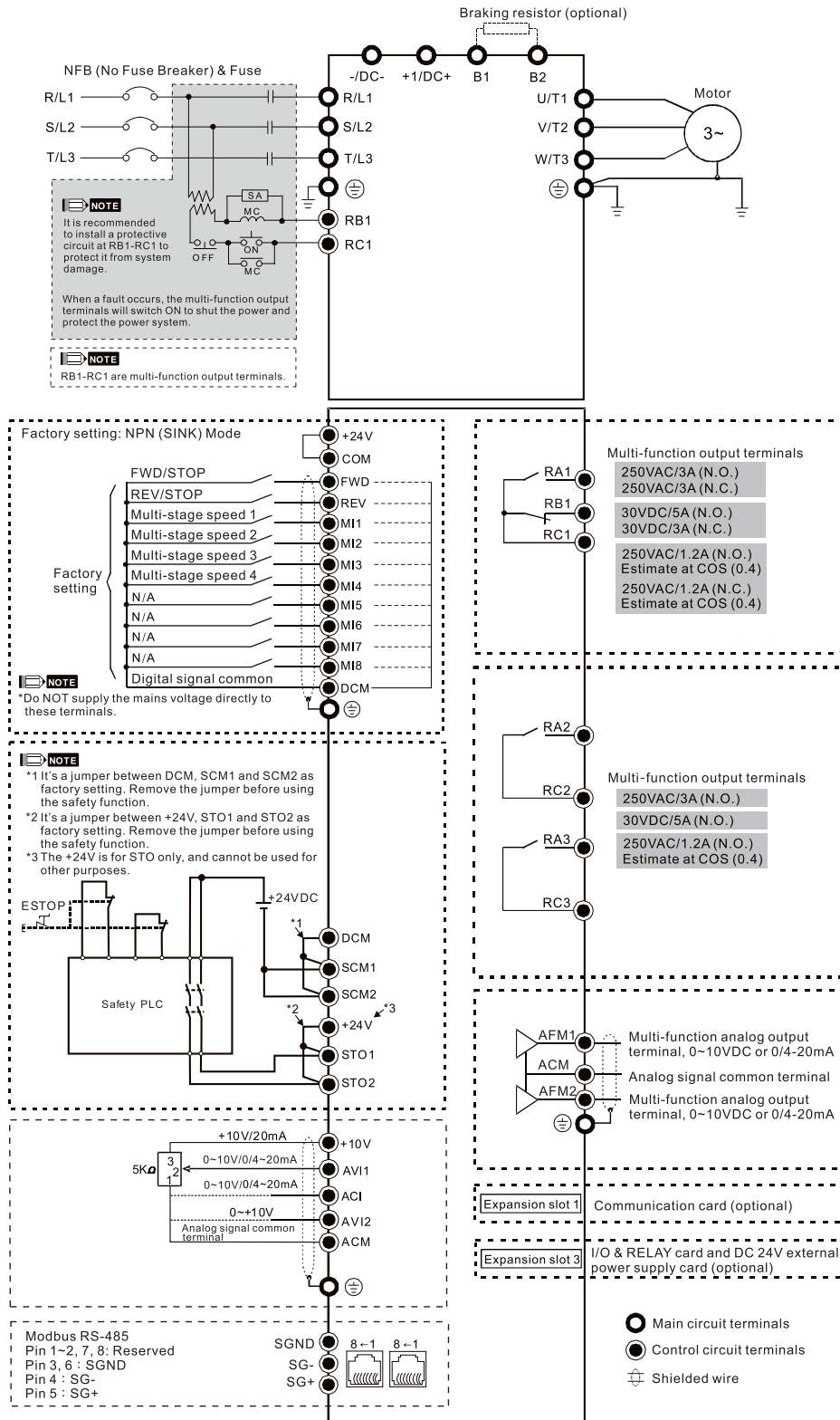
General Specifications

| | | |
|-------------------------------------|---|--|
| CONTROL CHARACTERISTICS | Control Method | Pulse Width Modulated (PWM) |
| | Control Mode | 1: V/F (V/F control), 2: SVC (Sensorless Vector Control), 3: PMSVC |
| | 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 | 599.00 Hz |
| | Frequency Output Accuracy | Digital command: ±0.01%, -10°C~+40°C; Analog command: ±0.1%, 25°C±10°C |
| | Output Frequency Resolution | Digital command: 0.01 Hz; Analog command: Max. output frequency×0.03/60 Hz (± 11-bit) |
| | Overload Tolerance | 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 Light duty: 120% of rated current can endure for 1 minute |
| | Frequency Setting Signal | 0~+10V, 4~20 mA, 0~20 mA, pulse input |
| | Accel./decel. Time | 0.00~600.00/0.0~6000.0 seconds |
| Main Control Function | 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, Frequency upper/lower limit settings, DC injection braking at start/stop, High slip braking, PID control (with sleep function), Energy saving control, MODBUS communication (RS-485 RJ45, max. 5.2 Kbps) | |
| Fan Control | VFD300FP4E and above are PWM control VFD220FP4E and below are on/off switch control | |
| PROTECTION CHARACTERISTICS | Motor Protection | Electronic thermal relay protection |
| | Over-Current Protection | Light duty: Over-current protection for 200% rated current, Normal duty: Over-current protection for 240% rated current, Current clamp (Light duty: 130~135%) (Normal duty: 170~175%) |
| | Over-Voltage Protection | Drive will stop when DC-BUS voltage exceeds 820V |
| | Over-Temperature Protection | Built-in temperature sensor |
| | Stall Prevention | Stall prevention during acceleration, deceleration and running independently |
| | Restart After Instantaneous Power Failure | Parameter setting up to 20 seconds |
| | Grounding Leakage Current Protection | Leakage current is higher than 50% of rated current of the AC motor drive |
| | 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, GB/T12668-2 | |

Wiring

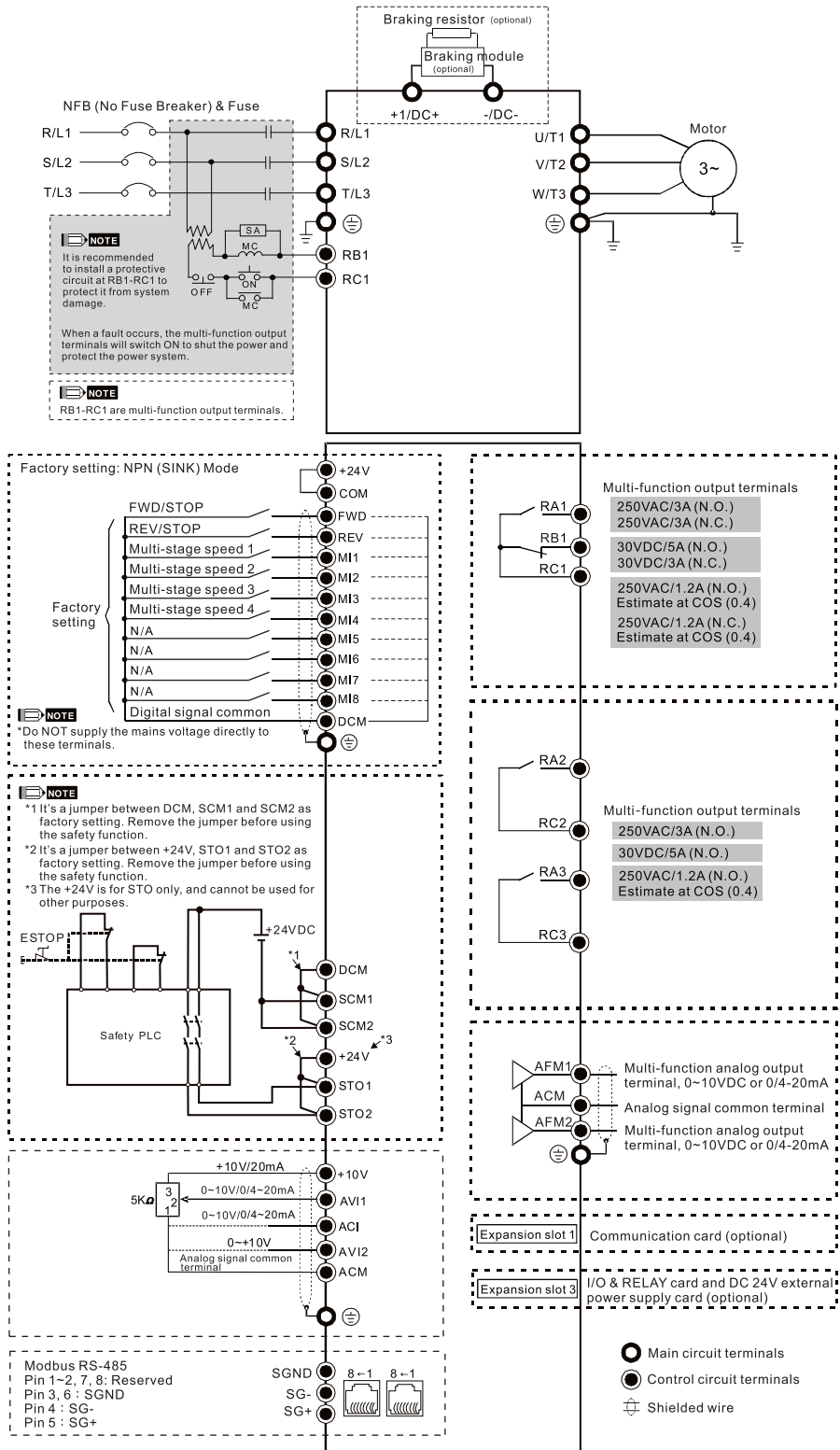
Wiring Diagram for Frame A~C

*Input: 3-phase power



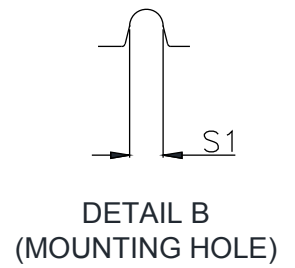
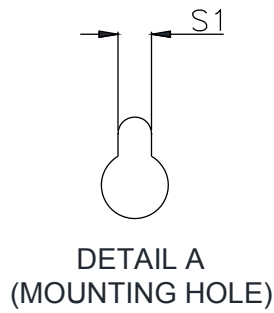
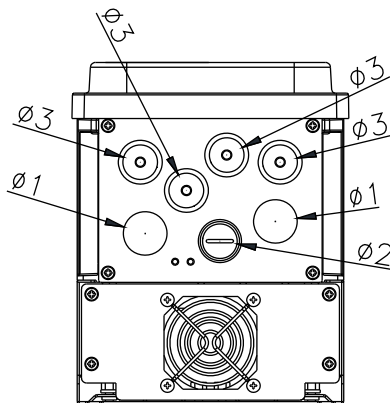
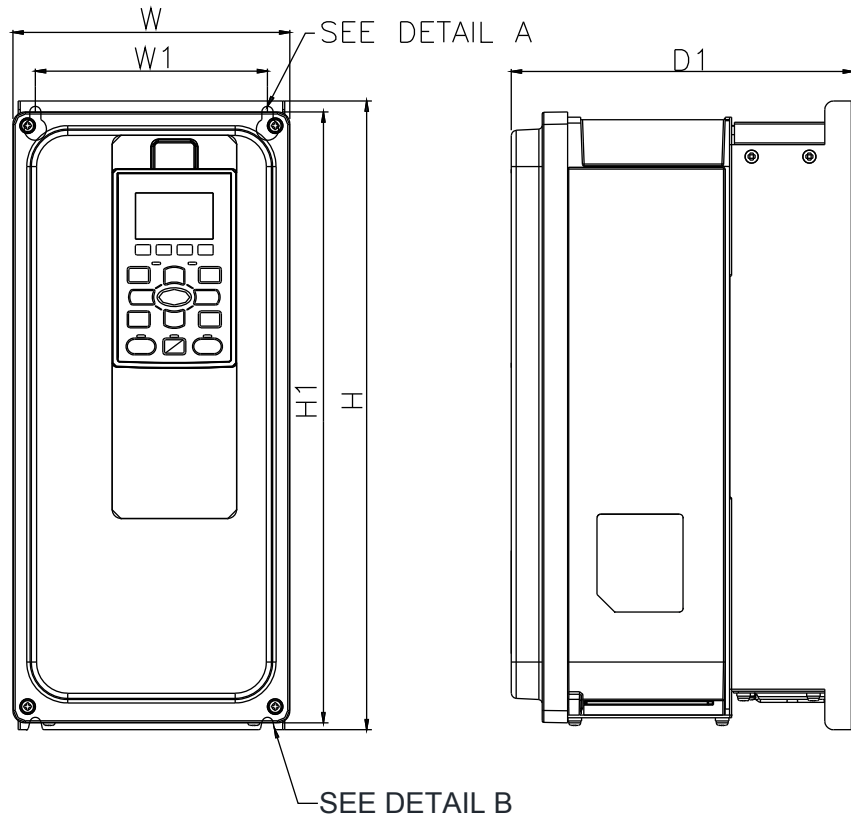
Wiring Diagram for Frame D0~D

*Input: 3-phase power



Dimensions

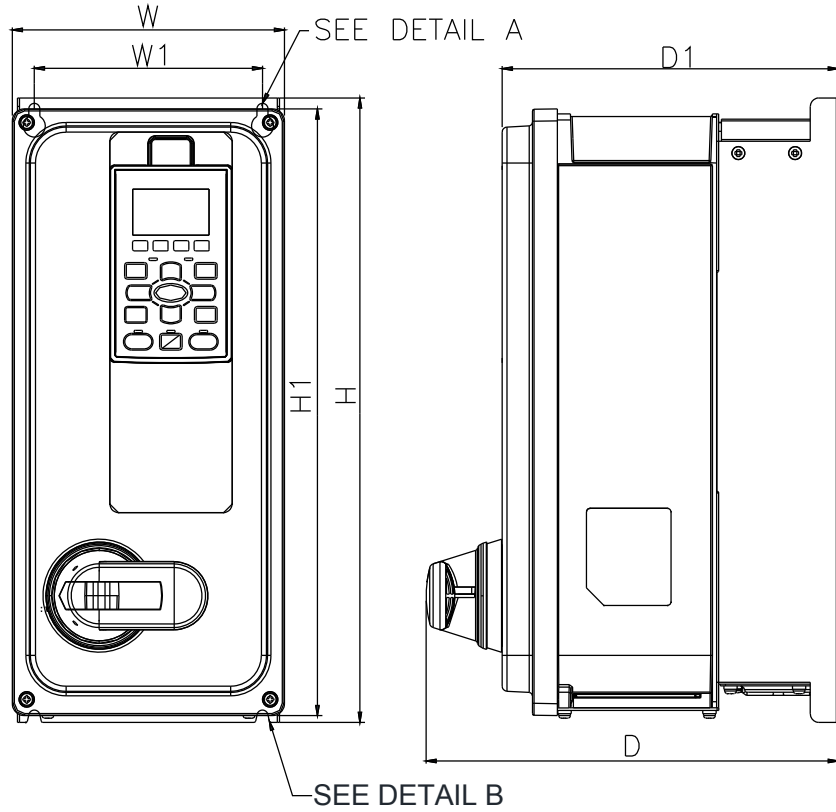
FRAME A (IP55)



| MODEL | |
|------------------|--|
| FRAME A-1 | |
| VFD007FP4EA-52 | |
| VFD015FP4EA-52 | |
| VFD022FP4EA-52 | |
| VFD037FP4EA-52 | |
| VFD040FP4EA-52 | |
| VFD055FP4EA-52 | |
| VFD075FP4EA-52 | |

| FRAME | | W | H | D | W1 | H1 | D1 | S1 | Ø1 | Ø2 | Ø3 |
|-------|------|-------|-------|---|-------|-------|-------|------|------|------|------|
| A-1 | mm | 161.0 | 366.4 | - | 135.0 | 356.0 | 199.0 | 6.5 | 25.4 | 20.3 | 20.3 |
| | inch | 6.34 | 14.43 | - | 5.31 | 14.02 | 7.83 | 0.26 | 1.00 | 0.80 | 0.80 |

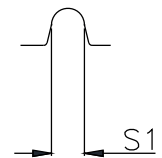
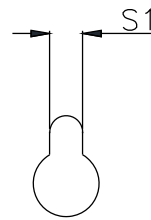
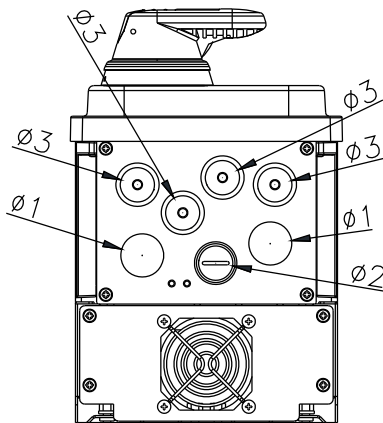
FRAME A (IP55)



MODEL

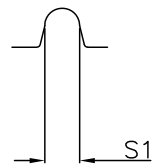
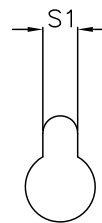
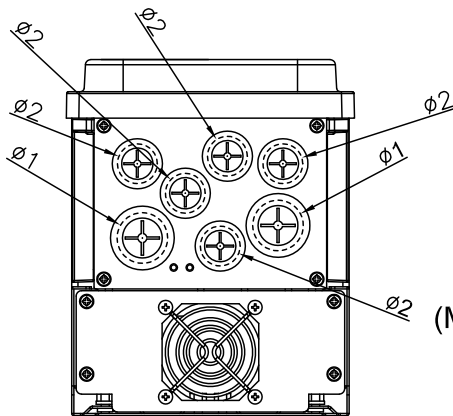
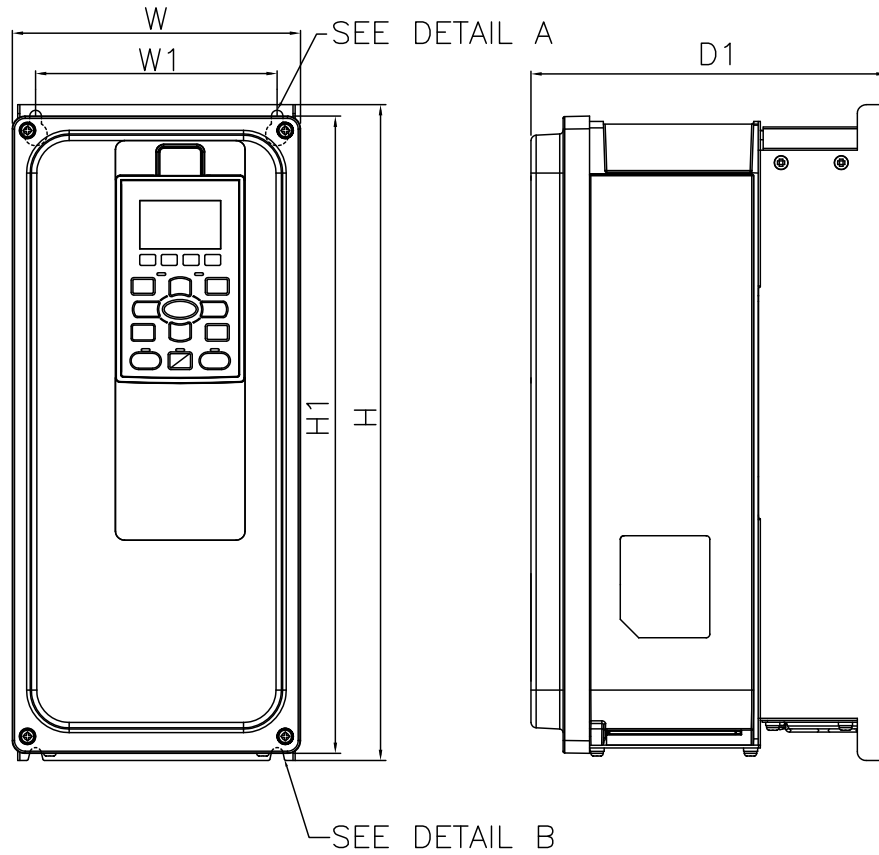
FRAME A-2

- VFD007FP4EA-52S
- VFD015FP4EA-52S
- VFD022FP4EA-52S
- VFD037FP4EA-52S
- VFD040FP4EA-52S
- VFD055FP4EA-52S
- VFD075FP4EA-52S



| FRAME | W | H | D | W1 | H1 | D1 | S1 | Ø1 | Ø2 | Ø3 | |
|-------|------|-------|-------|-------|-------|-------|-------|------|------|------|------|
| A-2 | mm | 161.0 | 366.4 | 244.0 | 135.0 | 356.0 | 199.0 | 6.5 | 25.4 | 20.3 | 20.3 |
| | inch | 6.34 | 14.43 | 9.61 | 5.31 | 14.02 | 7.83 | 0.26 | 1.00 | 0.80 | 0.80 |

FRAME A (IP41)



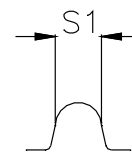
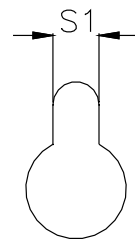
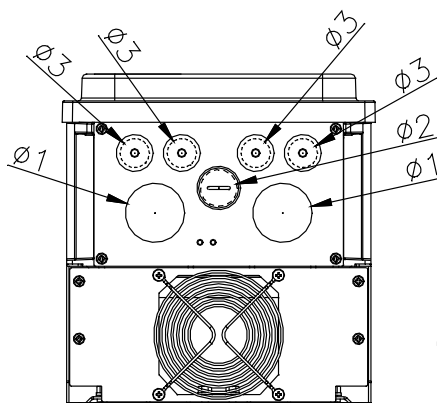
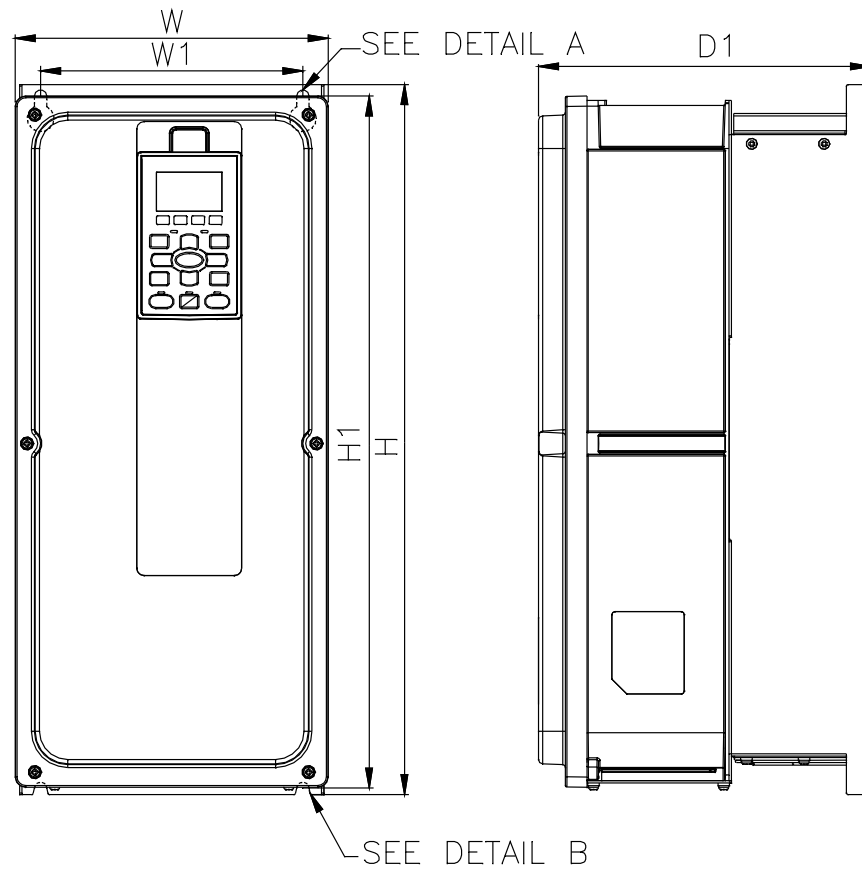
MODEL

FRAME A-3

- VFD007FP4EA-41
- VFD015FP4EA-41
- VFD022FP4EA-41
- VFD037FP4EA-41
- VFD040FP4EA-41
- VFD055FP4EA-41
- VFD075FP4EA-41

| FRAME | | W | H | D | W1 | H1 | D1 | S1 | Ø1 | Ø2 |
|-------|------|-------|-------|---|-------|-------|-------|------|------|------|
| A-3 | mm | 161.0 | 366.4 | - | 135.0 | 356.0 | 199.0 | 6.5 | 28.0 | 22.0 |
| | inch | 6.34 | 14.43 | - | 5.31 | 14.02 | 7.83 | 0.26 | 1.10 | 0.87 |

FRAME B (IP55)

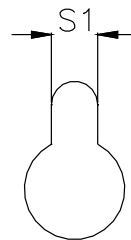
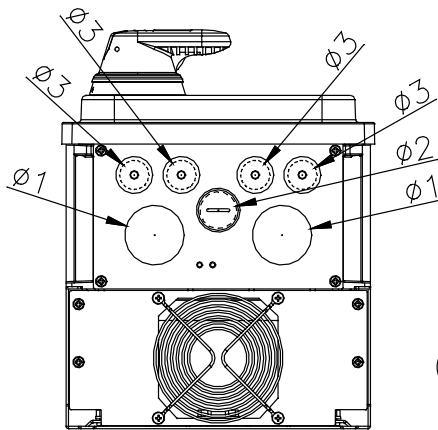
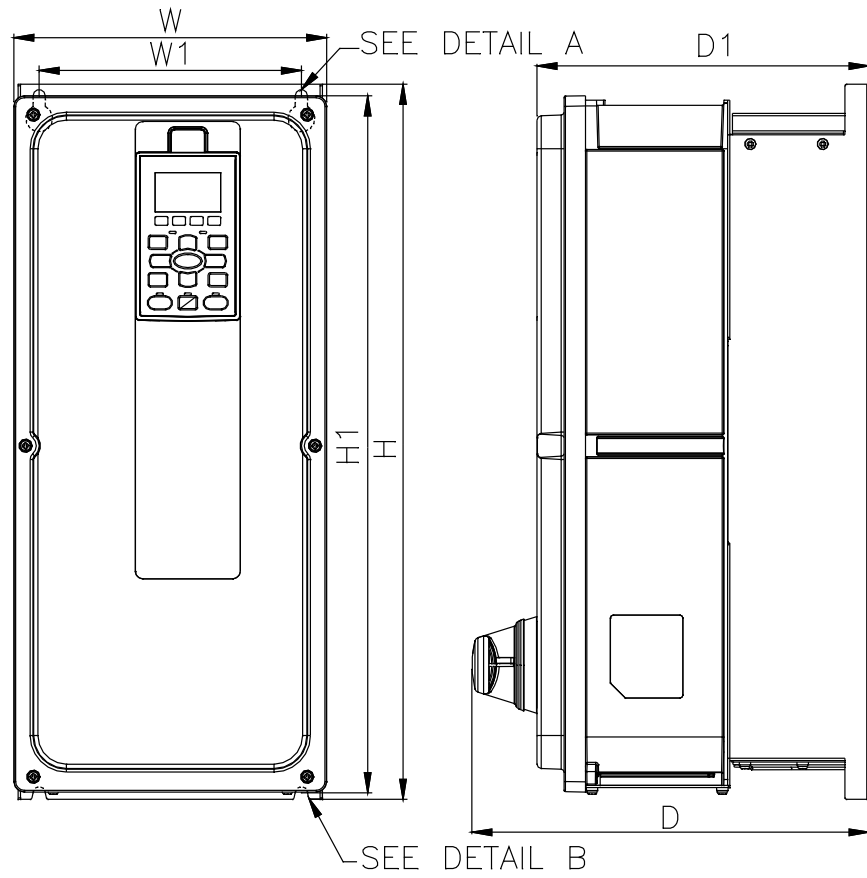


DETAIL A (MOUNTING HOLE) DETAIL B (MOUNTING HOLE)

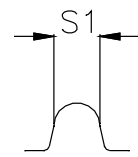
| MODEL | |
|------------------|--|
| FRAME B-1 | |
| VFD110FP4EA-52 | |
| VFD150FP4EA-52 | |
| VFD185FP4EA-52 | |
| VFD220FP4EA-52 | |

| FRAME | W | H | D | W1 | H1 | D1 | S1 | $\varnothing 1$ | $\varnothing 2$ | $\varnothing 3$ | |
|-------|------|-------|-------|----|-------|-------|-------|-----------------|-----------------|-----------------|------|
| B-1 | mm | 216.0 | 491.4 | - | 181.0 | 479.0 | 229.0 | 8.5 | 41.0 | 25.4 | 20.3 |
| | inch | 8.50 | 19.35 | - | 7.13 | 18.86 | 9.02 | 0.33 | 1.61 | 1.00 | 0.80 |

FRAME B (IP55)



DETAIL A
(MOUNTING HOLE)

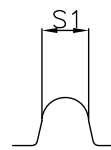
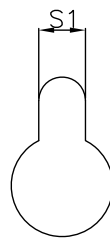
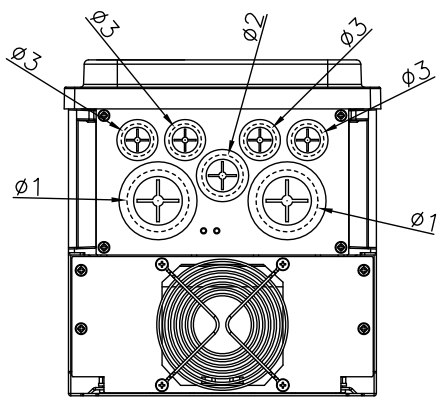
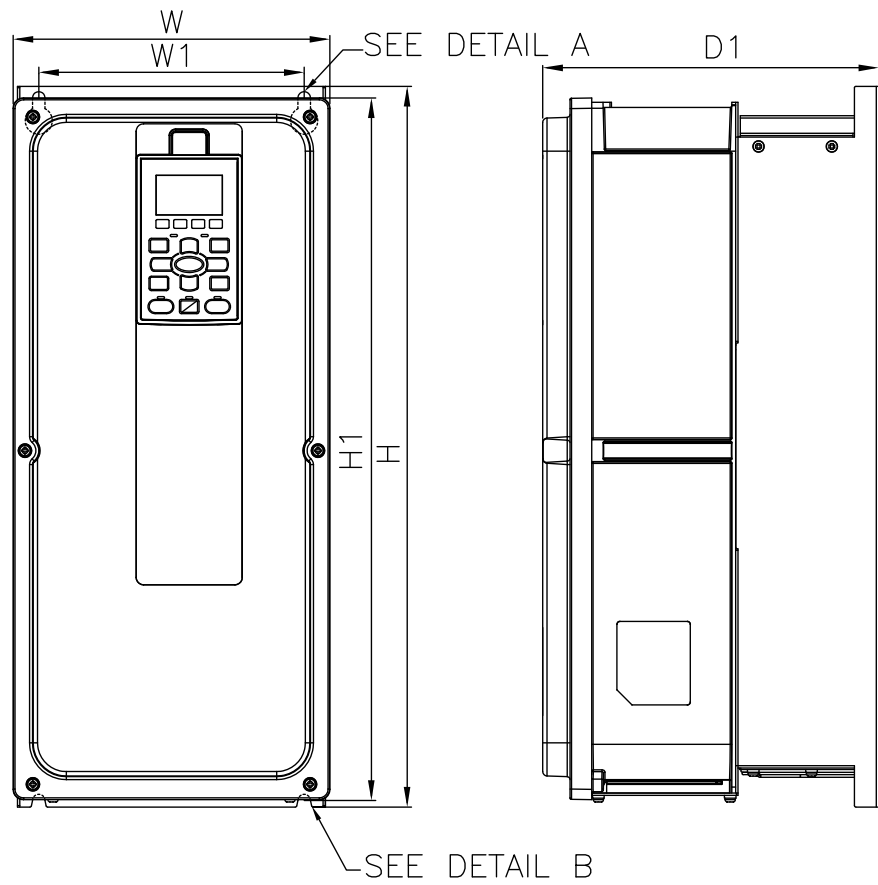


DETAIL B
(MOUNTING HOLE)

| | |
|------------------|--|
| MODEL | |
| FRAME B-2 | |
| VFD110FP4EA-52S | |
| VFD150FP4EA-52S | |
| VFD185FP4EA-52S | |
| VFD220FP4EA-52S | |

| FRAME | W | H | D | W1 | H1 | D1 | S1 | $\phi 1$ | $\phi 2$ | $\phi 3$ | |
|-------|------|-------|-------|-------|-------|-------|-------|----------|----------|----------|------|
| B-2 | mm | 216.0 | 491.4 | 274.0 | 181.0 | 479.0 | 229.0 | 8.5 | 41.0 | 25.4 | 20.3 |
| | inch | 8.50 | 19.35 | 10.79 | 7.13 | 18.86 | 9.02 | 0.33 | 1.61 | 1.00 | 0.80 |

FRAME B (IP41)



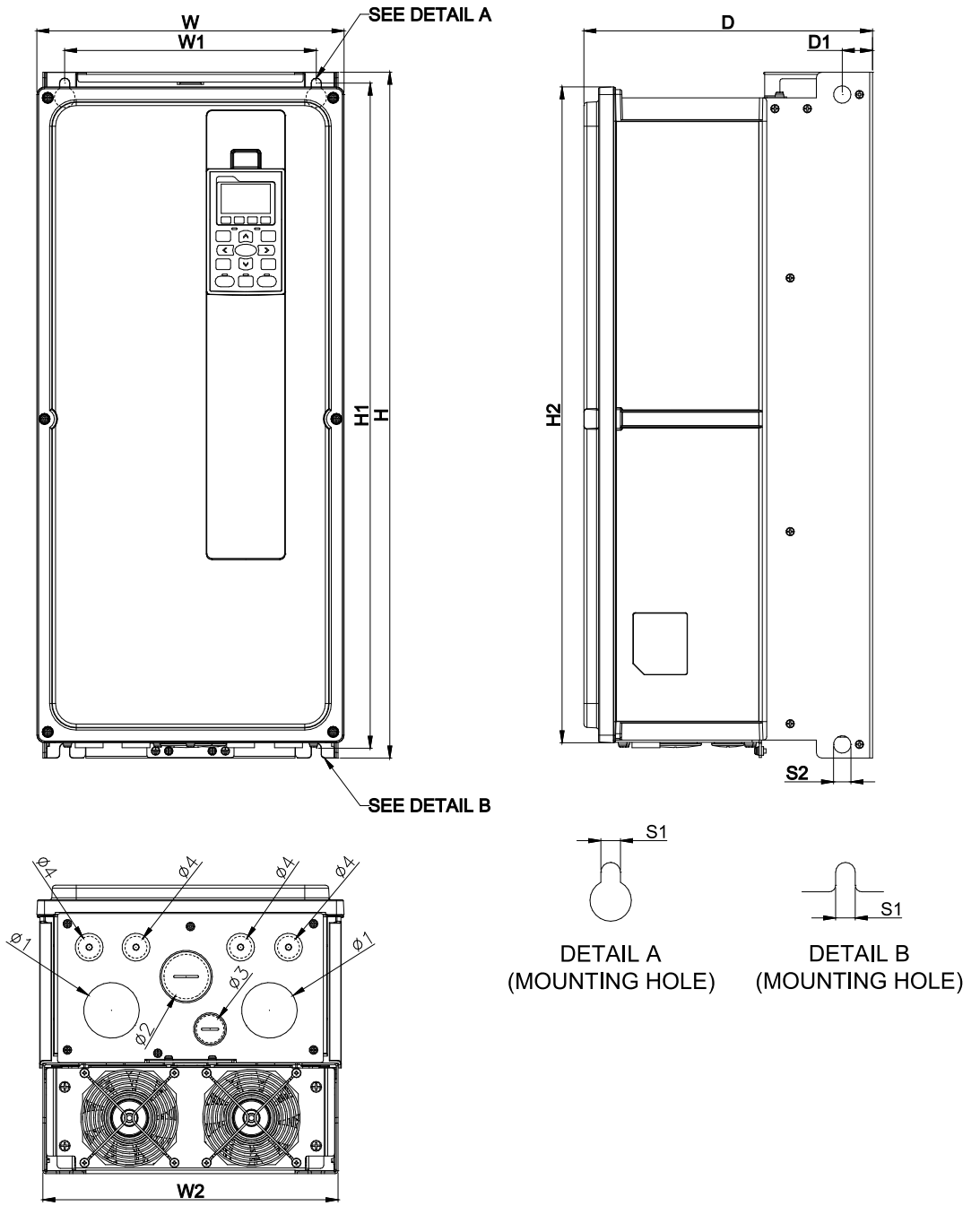
MODEL

FRAME B-3

- VFD110FP4EA-41
- VFD150FP4EA-41
- VFD185FP4EA-41
- VFD220FP4EA-41

| FRAME | W | H | D | W1 | H1 | D1 | S1 | Ø1 | Ø2 | Ø3 |
|-------|------|-------|-------|----|-------|-------|------|------|------|------|
| B-3 | mm | 216.0 | 491.4 | - | 181.0 | 479.0 | 8.5 | 41.8 | 28.0 | 22.0 |
| | inch | 8.50 | 19.35 | - | 7.13 | 18.86 | 0.33 | 1.65 | 1.10 | 0.87 |

FRAME C (IP55)

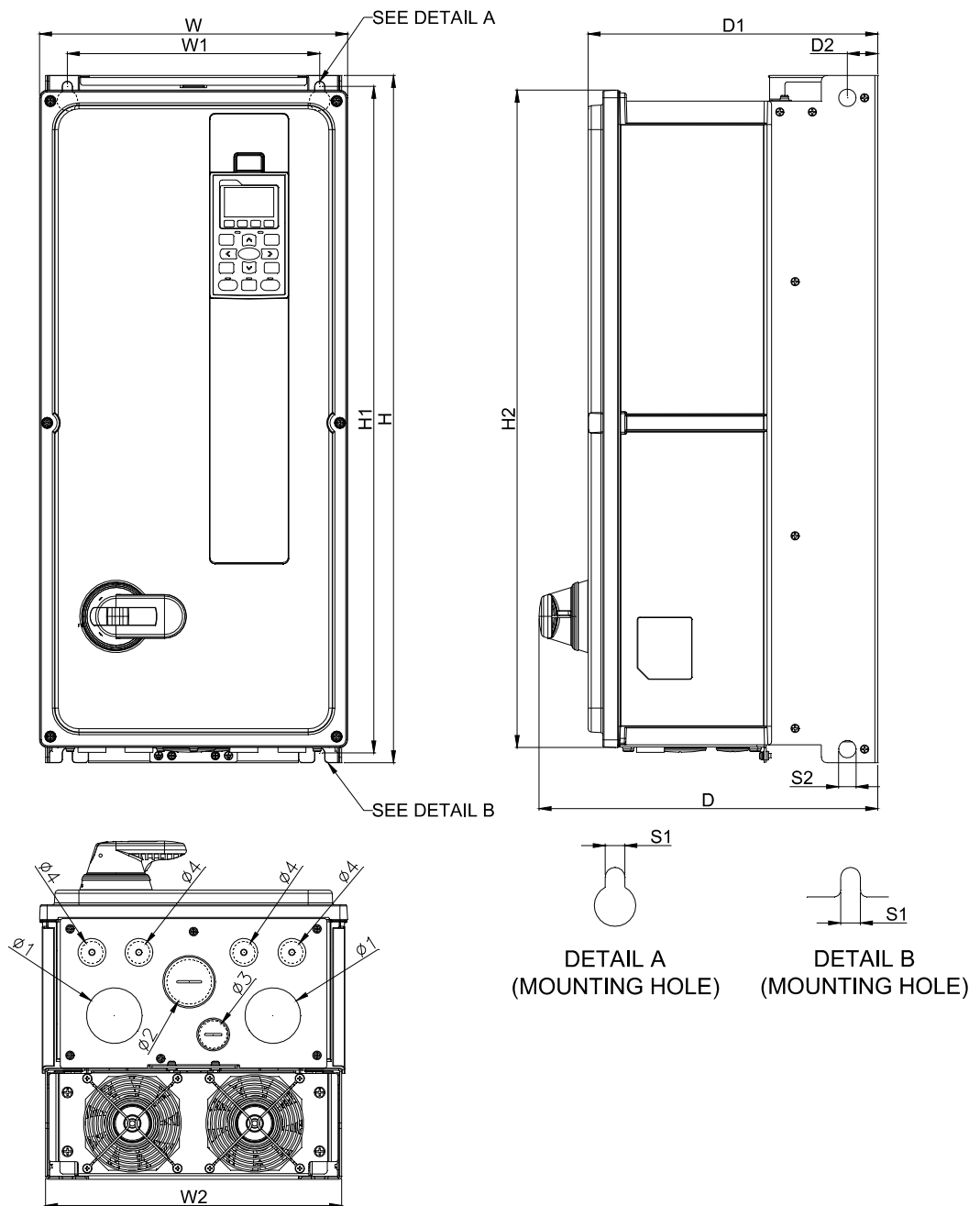


MODEL

FRAME C-1
VFD300FP4EA-52
VFD370FP4EA-52

| FRAME | W | H | D | W1 | H1 | D1 | S1 | W2 | H2 | D2 | S2 | $\phi 1$ | $\phi 2$ | $\phi 3$ | $\phi 4$ | |
|-------|------|-------|-------|----|-------|-------|-------|------|-------|-------|------|----------|----------|----------|----------|------|
| C-1 | mm | 282.0 | 630.0 | - | 231.0 | 611.0 | 265.0 | 9.0 | 271.0 | 602.5 | 27.8 | 16.0 | 51.0 | 41.0 | 25.4 | 20.3 |
| | inch | 11.10 | 24.80 | - | 9.09 | 24.06 | 10.43 | 0.35 | 10.67 | 23.72 | 1.09 | 0.63 | 2.01 | 1.61 | 1.00 | 0.80 |

FRAME C (IP55)



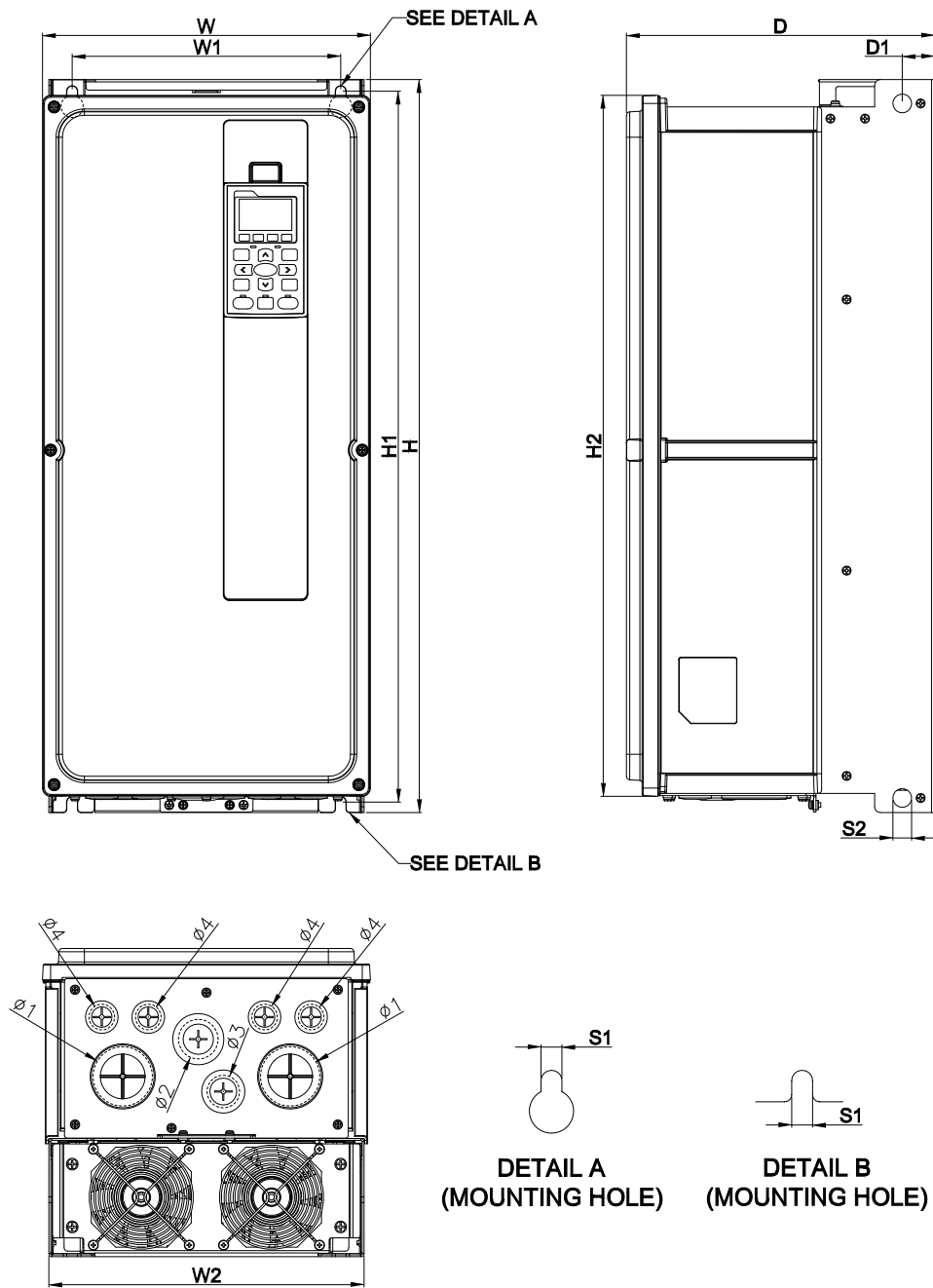
MODEL

FRAME C-2

VFD300FP4EA-52S
VFD370FP4EA-52S

| FRAME | W | H | D | W1 | H1 | D1 | S1 | W2 | H2 | D2 | S2 | Ø1 | Ø2 | Ø3 | Ø4 |
|-------|------|-------|-------|-------|-------|-------|------|-------|-------|------|------|------|------|------|------|
| C-2 | mm | 282.0 | 630.0 | 310.0 | 231.0 | 611.0 | 9.0 | 271.0 | 602.5 | 27.8 | 16.0 | 51.0 | 41.0 | 25.4 | 20.3 |
| | inch | 11.10 | 24.80 | 12.20 | 9.09 | 24.06 | 0.35 | 10.67 | 23.72 | 1.09 | 0.63 | 2.01 | 1.61 | 1.00 | 0.80 |

FRAME C (IP41)

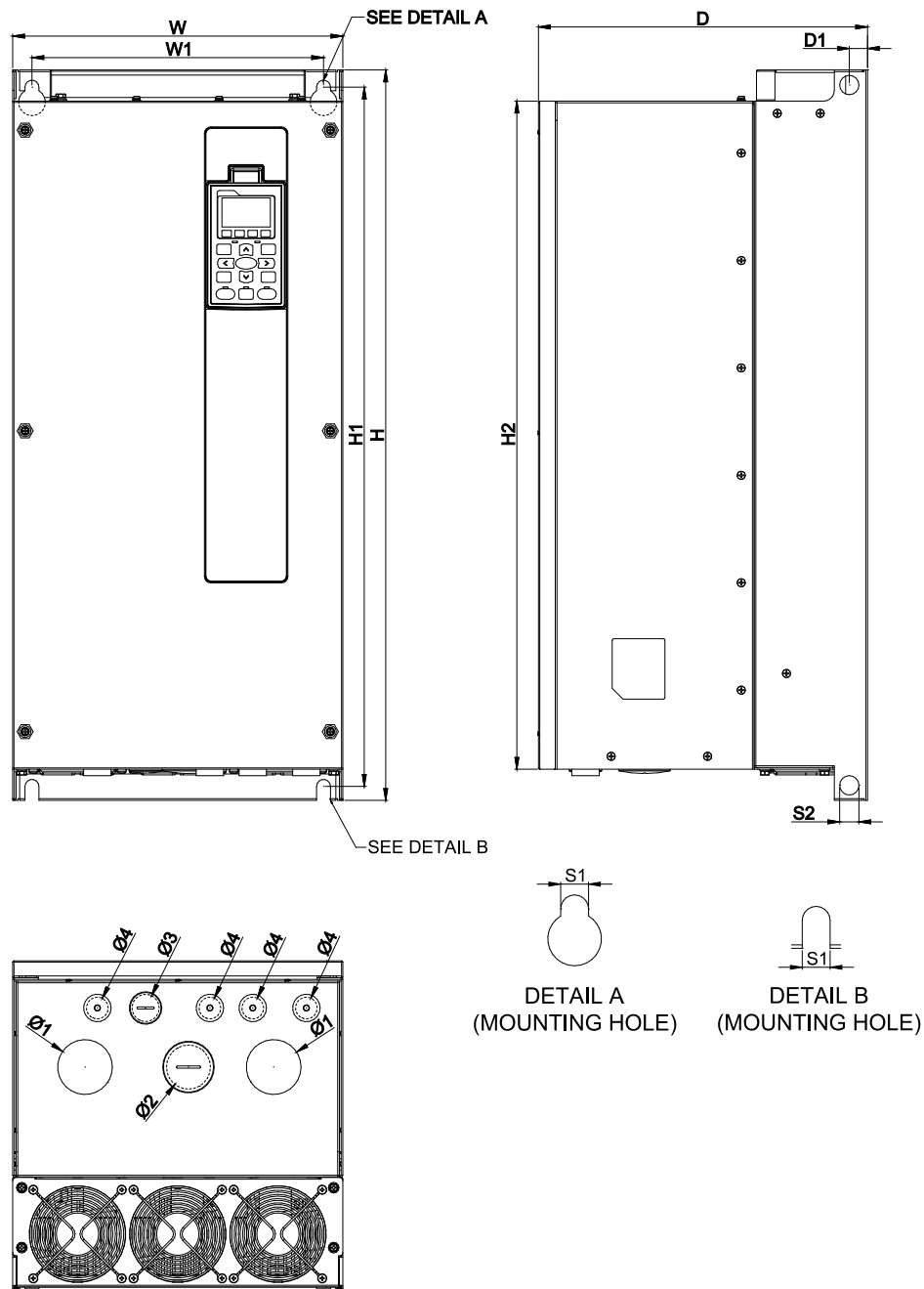


MODEL

FRAME C-3
VFD300FP4EA-41
VFD370FP4EA-41

| FRAME | W | H | D | W1 | H1 | D1 | S1 | W2 | H2 | S2 | Ø1 | Ø2 | Ø3 | Ø4 | |
|-------|------|-------|-------|-------|-------|-------|------|------|-------|-------|------|------|------|------|------|
| C-3 | mm | 282.0 | 630.0 | 265.0 | 231.0 | 611.0 | 27.8 | 9.0 | 271.0 | 602.5 | 16.0 | 51.0 | 34.0 | 28.0 | 22.0 |
| | inch | 11.10 | 24.80 | 10.43 | 9.09 | 24.06 | 1.09 | 0.35 | 10.67 | 23.72 | 0.63 | 2.01 | 1.34 | 1.10 | 0.87 |

FRAME D0 (IP55)

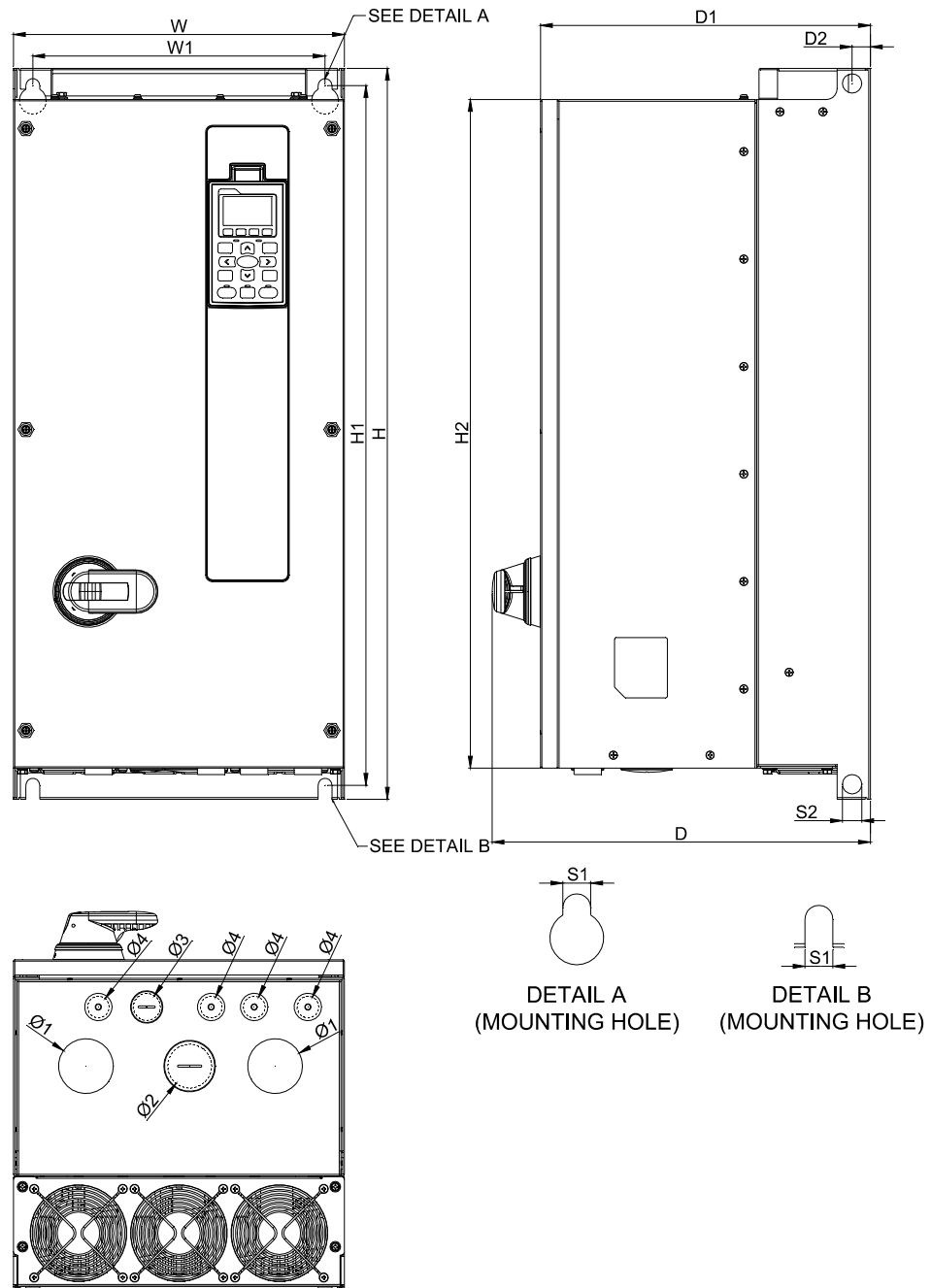


MODEL

FRAME D0-1
VFD450FP4EA-52
VFD550FP4EA-52

| FRAME | W | H | D | W1 | H1 | D1 | S1 | H2 | D2 | S2 | Ø1 | Ø2 | Ø3 | Ø4 | |
|-------|------|-------|-------|----|-------|-------|-------|------|-------|------|------|------|------|------|------|
| D0-1 | mm | 308.0 | 680.0 | - | 272.0 | 651.0 | 307.0 | 13.0 | 622.0 | 17.0 | 18.0 | 51.0 | 41.0 | 25.4 | 20.3 |
| | inch | 12.13 | 26.77 | - | 10.71 | 25.63 | 12.09 | 0.51 | 24.49 | 0.67 | 0.71 | 2.01 | 1.61 | 1.00 | 0.80 |

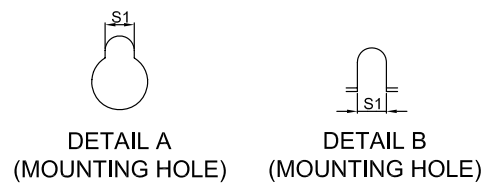
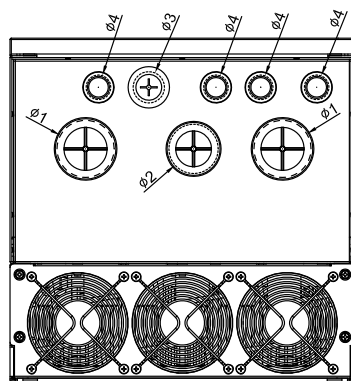
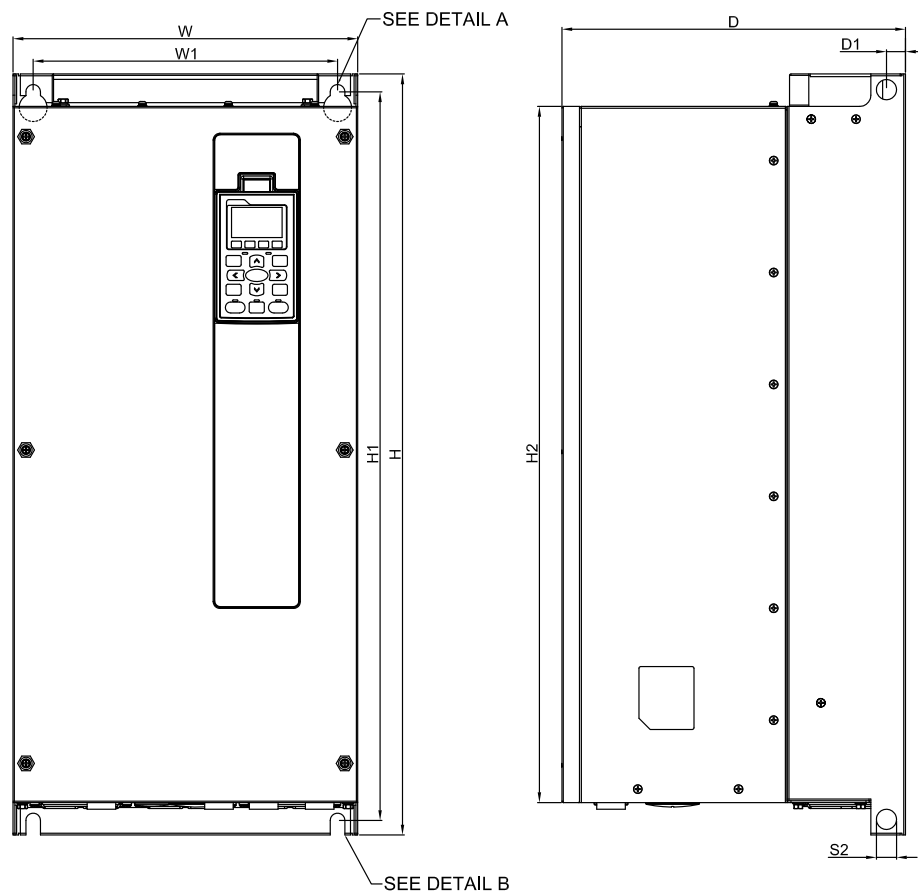
FRAME D0 (IP55)



MODEL
FRAME D0-2
 VFD450FP4EA-52S
 VFD550FP4EA-52S

| FRAME | | W | H | D | W1 | H1 | D1 | S1 | H2 | D2 | S2 | Ø1 | Ø2 | Ø3 | Ø4 |
|-------|------|-------|-------|-------|-------|-------|-------|------|-------|------|------|------|------|------|------|
| D0-2 | mm | 308.0 | 680.0 | 352.0 | 272.0 | 651.0 | 307.0 | 13.0 | 622.0 | 17.0 | 18.0 | 51.0 | 41.0 | 25.4 | 20.3 |
| | inch | 12.13 | 26.77 | 13.86 | 10.71 | 25.63 | 12.09 | 0.51 | 24.49 | 0.67 | 0.71 | 2.01 | 1.61 | 1.00 | 0.80 |

FRAME D0 (IP41)

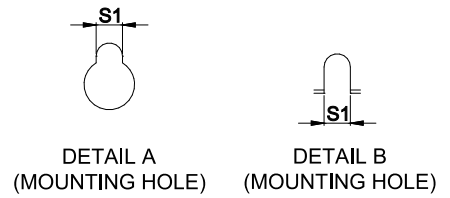
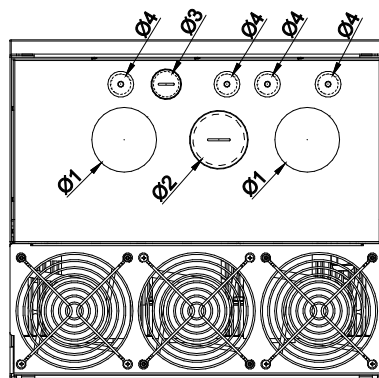
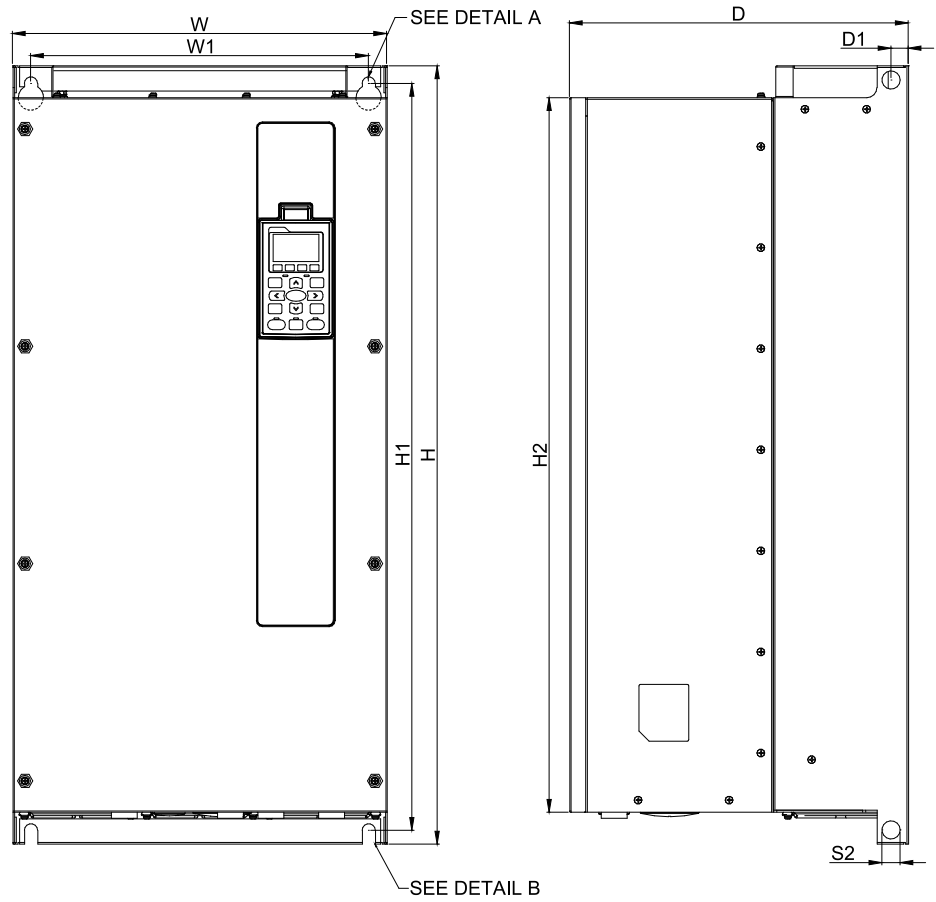


MODEL

FRAME D0-3
VFD750FP4EA-41
VFD900FP4EA-41

| FRAME | W | H | D | W1 | H1 | D1 | S1 | H2 | D2 | S2 | $\phi 1$ | $\phi 2$ | $\phi 3$ | $\phi 4$ | |
|-------|------|-------|-------|-------|-------|-------|------|------|-------|------|----------|----------|----------|----------|------|
| D0-3 | mm | 308.0 | 680.0 | 307.0 | 272.0 | 651.0 | 17.0 | 13.0 | 622.0 | 17.0 | 18.0 | 51.0 | 44.0 | 28.0 | 22.0 |
| | inch | 12.13 | 26.77 | 12.09 | 10.71 | 25.63 | 0.67 | 0.51 | 24.49 | 0.67 | 0.71 | 2.01 | 1.73 | 1.10 | 0.87 |

FRAME D (IP55)



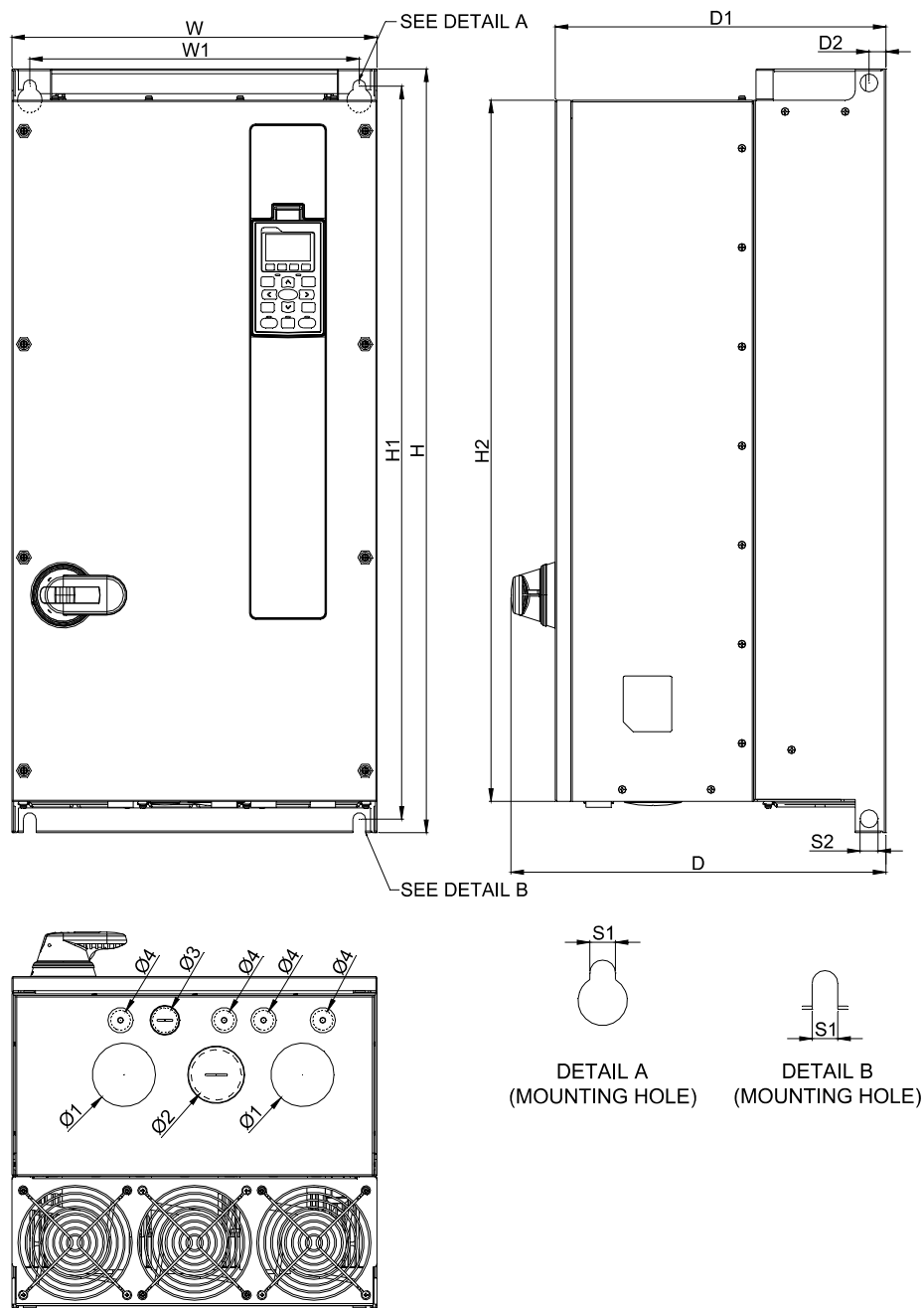
MODEL

FRAME D-1

VFD750FP4EA-52
VFD900FP4EA-52

| FRAME | W | H | D | W1 | H1 | D1 | S1 | H2 | D2 | S2 | Ø1 | Ø2 | Ø3 | Ø4 | |
|-------|------|-------|-------|----|-------|-------|-------|------|-------|------|------|------|------|------|------|
| D-1 | mm | 370.0 | 770.0 | - | 334.0 | 739.0 | 335.0 | 13.0 | 707.0 | 17.0 | 18.0 | 64.0 | 51.0 | 25.4 | 20.3 |
| | inch | 14.57 | 30.31 | - | 13.15 | 29.09 | 13.19 | 0.51 | 27.83 | 0.67 | 0.71 | 2.52 | 2.01 | 1.00 | 0.80 |

FRAME D (IP55)

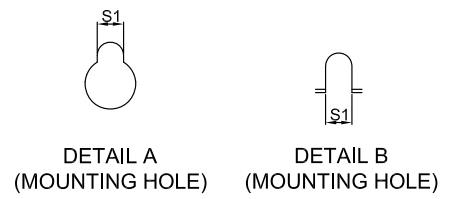
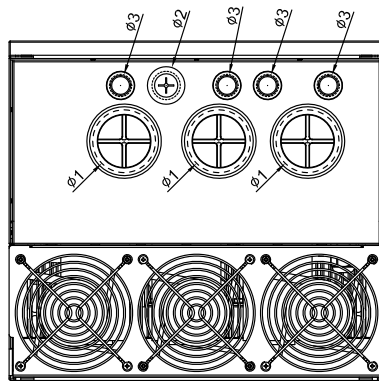
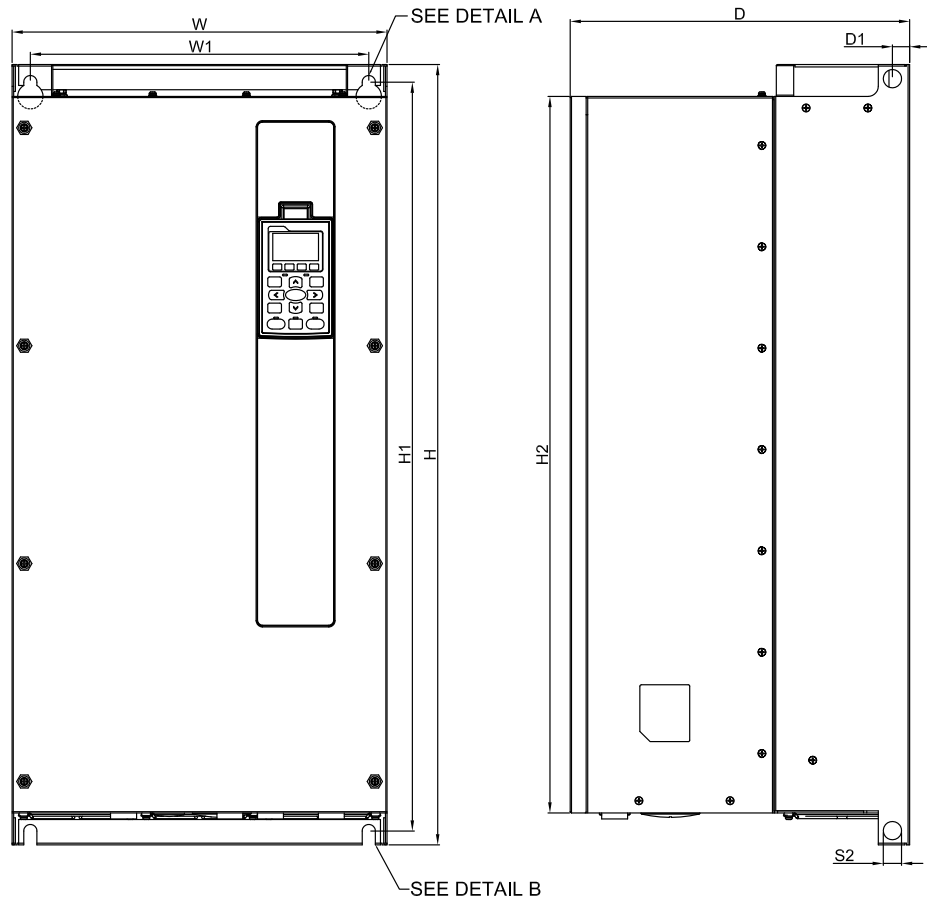


MODEL

FRAME D-2
VFD750FP4EA-52S
VFD900FP4EA-52S

| FRAME | W | H | D | W1 | H1 | D1 | S1 | H2 | D2 | S2 | Ø1 | Ø2 | Ø3 | Ø4 | |
|-------|------|-------|-------|-------|-------|-------|-------|------|-------|------|------|------|------|------|------|
| D-2 | mm | 370.0 | 770.0 | 380.0 | 334.0 | 739.0 | 335.0 | 13.0 | 707.0 | 17.0 | 18.0 | 64.0 | 51.0 | 25.4 | 20.3 |
| | inch | 14.57 | 30.31 | 14.96 | 13.15 | 29.09 | 13.19 | 0.51 | 27.83 | 0.67 | 0.71 | 2.52 | 2.01 | 1.00 | 0.80 |

FRAME D (IP41)




MODEL
FRAME D-3
 VFD750FP4EA-41
 VFD900FP4EA-41

| FRAME | W | H | D | W1 | H1 | D1 | S1 | H2 | S2 | Ø1 | Ø2 | Ø3 | |
|-------|------|-------|-------|-------|-------|-------|------|------|-------|------|------|------|------|
| D-3 | mm | 370.0 | 770.0 | 335.0 | 334.0 | 739.0 | 17.0 | 13.0 | 707.0 | 18.0 | 62.0 | 28.0 | 22.0 |
| | inch | 14.57 | 30.31 | 13.19 | 13.15 | 29.09 | 0.67 | 0.51 | 27.83 | 0.71 | 2.44 | 1.10 | 0.87 |

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) 2.0A (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 0~20mA/4~20mA |
| | 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 0~10.00V ACO: Output 0~20.0mA/4.0~20.0mA |
| | 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% 200mA, 5W External power +24 V _{DC} : max. voltage 30 V _{DC} , min. voltage 19 V _{DC} , 30W ON: the activation current is 6.5mA; 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: 50mA; Max. voltage: 48 V _{DC} |
| | MXM | Common for multi-function output terminals MO10, MO11 (photocoupler) Max. 48 V _{DC} 50mA |

Accessories


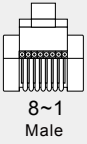
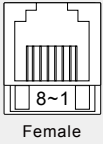
24 V Power Shift Card

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: 24VDC ± 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/0V/V- |
| | | | 6 | CAN_GND | Ground/0V/V- |

EtherNet/IP, Modbus TCP Card

CMC-EIP01



Features

- ▶ Support EtherNet/IP and Modbus TCP protocol
- ▶ User-defined parameter mapping
- ▶ IP Filter, basic firewall function

Network Interface

| | | | |
|----------------------------|--------------------------|---------------------------|--|
| Interface | RJ-45 with Auto MDI/MDIX | Transmission Cable | Category 5e shielding 100M |
| Number of Ports | 1 Port | Transmission Speed | 10/100 Mbps Auto-Detect |
| Transmission Method | IEEE 802.3, IEEE 802.3u | Network Protocol | ICMP, IP, TCP, UDP, DHCP, BOOTP, SMTP, EtherNet/IP, Modbus TCP |

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 _{oc} |

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

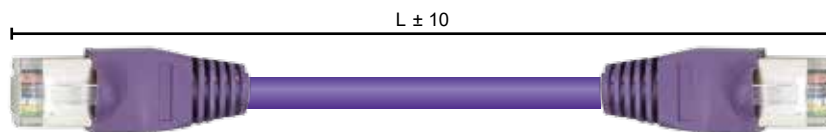
| | |
|----------------------------|--|
| Interface | 5-Pin 5.08mm Pluggable Connector |
| Transmission Method | CAN |
| Transmission Cable | Shielded twisted pair cable (with 2 power cables) |
| Transmission Speed | 125 Kbps, 250 Kbps, 500 Kbps and extendable serial transmission speed mode |
| Network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



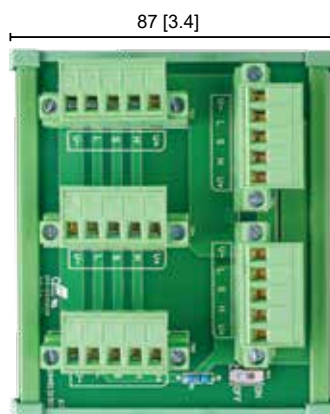
CANopen / DeviceNet TAP Breakout Boxes

| 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

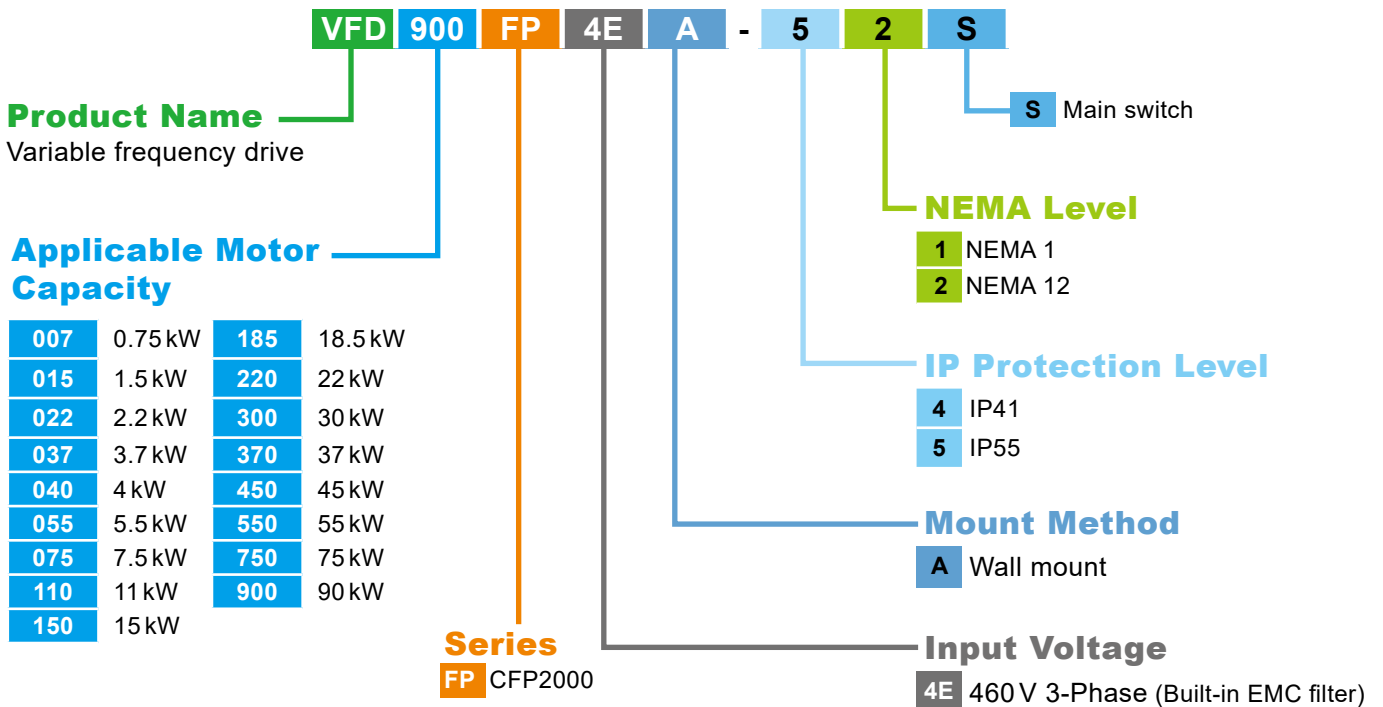


TAP-CN03

Ordering Information

| FRAME | Power Range | IP55 NEMA12 w/o Mains Switch | IP55 NEMA12 with Mains Switch | IP41 NEMA1 |
|-------|-------------|------------------------------|-------------------------------|----------------|
| A | 0.75 | VFD007FP4EA-52 | VFD007FP4EA-52S | VFD007FP4EA-41 |
| | 1.5 | VFD015FP4EA-52 | VFD015FP4EA-52S | VFD015FP4EA-41 |
| | 2.2 | VFD022FP4EA-52 | VFD022FP4EA-52S | VFD022FP4EA-41 |
| | 3.7 | VFD037FP4EA-52 | VFD037FP4EA-52S | VFD037FP4EA-41 |
| | 4 | VFD040FP4EA-52 | VFD040FP4EA-52S | VFD040FP4EA-41 |
| | 5.5 | VFD055FP4EA-52 | VFD055FP4EA-52S | VFD055FP4EA-41 |
| | 7.5 | VFD075FP4EA-52 | VFD075FP4EA-52S | VFD075FP4EA-41 |
| B | 11 | VFD110FP4EA-52 | VFD110FP4EA-52S | VFD110FP4EA-41 |
| | 15 | VFD150FP4EA-52 | VFD150FP4EA-52S | VFD150FP4EA-41 |
| | 18.5 | VFD185FP4EA-52 | VFD185FP4EA-52S | VFD185FP4EA-41 |
| | 22 | VFD220FP4EA-52 | VFD220FP4EA-52S | VFD220FP4EA-41 |
| C | 30 | VFD300FP4EA-52 | VFD300FP4EA-52S | VFD300FP4EA-41 |
| | 37 | VFD370FP4EA-52 | VFD370FP4EA-52S | VFD370FP4EA-41 |
| D0 | 45 | VFD450FP4EA-52 | VFD450FP4EA-52S | VFD450FP4EA-41 |
| | 55 | VFD550FP4EA-52 | VFD550FP4EA-52S | VFD550FP4EA-41 |
| D | 75 | VFD750FP4EA-52 | VFD750FP4EA-52S | VFD750FP4EA-41 |
| | 90 | VFD900FP4EA-52 | VFD900FP4EA-52S | VFD900FP4EA-41 |

Model Name



Global Operations

ASIA (Taiwan)



Taoyuan Technology Center (Green Building)



Taoyuan Plant 1



Tainan Plant (Diamond-rated Green Building)

ASIA (China)



Wujiang Plant 3



Delta Electronics



ASIA (Japan)



Tokyo Office

ASIA (India)



Rudrapur Plant
(Green Building)

EUROPE



Amsterdam, Netherlands

AMERICA



Research Triangle Park

▲ Factories 5 ■ Branch Offices 102 ● R&D Centers 6 ■ Distributors 824

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Uzbekistan
Azerbaijan
Armenia

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Kolkata
Ahmedabad
Mumbai
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Chennai
Coimbatore
Visakhapatnam
Jamshedpur

Bangladesh
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Malaysia
Singapore
Indonesia

Australia
Melbourne

Korea

Seoul
Daegu

Japan

Tokyo
Osaka

Japan

Shanghai

Wujiang

Taoyuan

(Technology Center & Plant 1)

Zhong Li

Taichung

Tainan

Philippines

China

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Shenyang

Dalian

4 Shanxi

Taiyuan

5 Beijing

Tianjin

6 Hebei

Shijiazhuang

8 Shandong

Weifang

Qingdao

Jinan

Linyi

9 Jiangsu

Yangzhou

Nanjing

Nantong

Changzhou

Wuxi

Suzhou

Zhangjiagang

10 Shanghai

11 Anhui

Hefei

12 Zhejiang

Hangzhou

Ningbo

Taizhou

Wenzhou

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13 Fujian

Xiamen

14 Jiangxi

Nanchang

15 Guangdong

Shantou

Dongguan

Shenzhen

Guangzhou

Foshan

16 Guangxi

Nanning

17 Yunnan

Kunming

18 Sichuan

Chengdu

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Xian

20 Henan

Zhengzhou

21 Hubei

Wuhan

22 Hunan

Changsha

23 Chongqing

■ New Zealand



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