



## Features :

- ▶ V/f Control
- ▶ Automatic voltage regulation
- ▶ 150% overload capacity for 1 min
- ▶ Expandable keypad
- ▶ PI feedback control
- ▶ Protection against Over voltage, Under voltage, Over temperature, Over load, Under current, Over current, Short circuit and Output phase loss
- ▶ MODBUS RTU protocol over RS485 communication

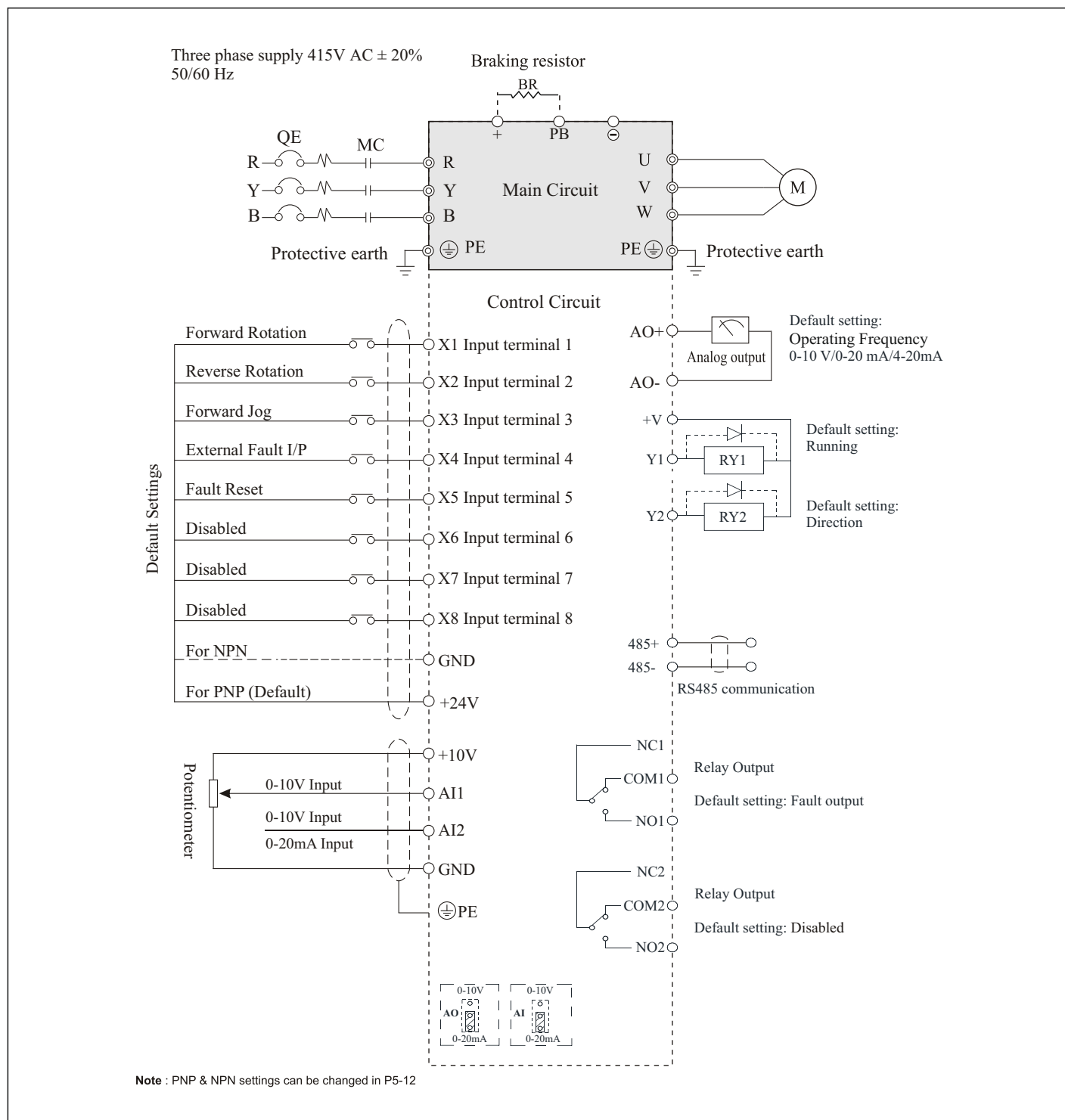
## Technical specifications

|                                   | Single phase                                                                       |      |      |     |     |     | Three phase                                  |      |      |      |     |                            |     |     |     |      |     |  |
|-----------------------------------|------------------------------------------------------------------------------------|------|------|-----|-----|-----|----------------------------------------------|------|------|------|-----|----------------------------|-----|-----|-----|------|-----|--|
| Model                             | 002                                                                                | 005  | 010  | 020 | 030 | 050 | 005                                          | 010  | 020  | 030  | 050 | 075                        | 100 | 150 | 200 | 250  | 300 |  |
| Applicable motor output (kW)      | 0.18                                                                               | 0.4  | 0.75 | 1.5 | 2.2 | 4.0 | 0.4                                          | 0.75 | 1.5  | 2.2  | 3.7 | 5.5                        | 7.5 | 11  | 15  | 18.5 | 22  |  |
| Applicable motor output (HP)      | 0.2                                                                                | 0.5  | 1    | 2   | 3   | 5   | 0.5                                          | 1    | 2    | 3    | 5   | 7.5                        | 10  | 15  | 20  | 25   | 30  |  |
| Input rating                      |                                                                                    |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Rated voltage / Frequency         | 230V AC, 50/60 Hz                                                                  |      |      |     |     |     | 415V AC, 50/60 Hz                            |      |      |      |     |                            |     |     |     |      |     |  |
| Maximum input current             | 1.5A                                                                               | 5A   | 10A  | 16A | 20A | 32A | 1.5A                                         | 3.5A | 7A   | 10A  | 16A | 24A                        | 31A | 47A | 63A | 80A  | 96A |  |
| Voltage tolerance                 | ±20% (332 ~ 498V)                                                                  |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Frequency tolerance               | ±5% (47 ~ 63 Hz)                                                                   |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Output rating                     |                                                                                    |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Rated output current              | 1A                                                                                 | 2.5A | 5A   | 7A  | 11A | 18A | 1.2A                                         | 2.5A | 3.7A | 5.1A | 9A  | 13A                        | 17A | 25A | 32A | 37A  | 45A |  |
| Maximum output voltage (V)        | Proportional to input voltage                                                      |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Output frequency                  | 0.1 ~ 400 Hz                                                                       |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Carrier frequency                 | 2 ~ 10 kHz                                                                         |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Control characteristics           |                                                                                    |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Control system                    | Space vector PWM (SVPWM) based scalar control                                      |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Frequency setting resolution (Hz) | 0.1 Hz                                                                             |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Overload endurance                | 150% up to 60 Sec, 180% up to 10s, 200% up to 1 Sec (every 10 mins)                |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Skip frequency                    | Two zones, Setting range 0.1 to 400 Hz                                             |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| DC injection braking              | Up to 150% of rated current for 0 to 50.0 Sec during starting and stopping cycles. |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Accel. / Decel. time              | 0.1 ~ 3600.0 Sec. Four acceleration / deceleration time settings available         |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| V/f mode                          | 4 Pre-set V/f mode & 1 user defined V/f program                                    |      |      |     |     |     |                                              |      |      |      |     |                            |     |     |     |      |     |  |
| Control Input / Output            |                                                                                    |      |      |     |     |     | 0.5 to 3 HP (H1 frame)                       |      |      |      |     | 5 to 30 HP (H2 & H3 frame) |     |     |     |      |     |  |
| Digital input                     | Programmable digital inputs                                                        |      |      |     |     |     | 5                                            |      |      |      |     | 8                          |     |     |     |      |     |  |
|                                   | Logic                                                                              |      |      |     |     |     | PNP or NPN                                   |      |      |      |     |                            |     |     |     |      |     |  |
|                                   | Voltage level                                                                      |      |      |     |     |     | 0 - 24V DC                                   |      |      |      |     |                            |     |     |     |      |     |  |
|                                   | Input resistance                                                                   |      |      |     |     |     | ~6kΩ                                         |      |      |      |     |                            |     |     |     |      |     |  |
| Analog input                      | Analog input                                                                       |      |      |     |     |     | 2                                            |      |      |      |     | 2                          |     |     |     |      |     |  |
|                                   | Modes                                                                              |      |      |     |     |     | AI1 - Voltage / POT; AI2 - Voltage / Current |      |      |      |     |                            |     |     |     |      |     |  |
|                                   | Voltage level                                                                      |      |      |     |     |     | 0 to +10V                                    |      |      |      |     |                            |     |     |     |      |     |  |
|                                   | Current level                                                                      |      |      |     |     |     | 0/4 to 20mA                                  |      |      |      |     |                            |     |     |     |      |     |  |
| Analog output                     | Analog output                                                                      |      |      |     |     |     | 1                                            |      |      |      |     | 1                          |     |     |     |      |     |  |
|                                   | Voltage level                                                                      |      |      |     |     |     | 0 to +10V                                    |      |      |      |     |                            |     |     |     |      |     |  |
|                                   | Current level                                                                      |      |      |     |     |     | 0/4 to 20mA                                  |      |      |      |     |                            |     |     |     |      |     |  |
| Multifunction output              | Open collector O/P                                                                 |      |      |     |     |     | 1                                            |      |      |      |     | 2                          |     |     |     |      |     |  |
|                                   | Voltage level at digital output                                                    |      |      |     |     |     | 24V                                          |      |      |      |     |                            |     |     |     |      |     |  |
|                                   | Output current (sink)                                                              |      |      |     |     |     | 50mA                                         |      |      |      |     |                            |     |     |     |      |     |  |
|                                   | Relay output                                                                       |      |      |     |     |     | 1                                            |      |      |      |     | 2                          |     |     |     |      |     |  |
|                                   | Max. terminal load (AC)                                                            |      |      |     |     |     | 250V, 5A                                     |      |      |      |     |                            |     |     |     |      |     |  |

## Enviromental conditions

|                                      |                                          |
|--------------------------------------|------------------------------------------|
| Protection level                     | IP20                                     |
| Pollution degree                     | 2                                        |
| Installation location                | Indoor, <1000 m altitude above sea level |
| Ambient working temperature          | -10 °C ~ +60 °C                          |
| Storage / Transportation temperature | -20 °C ~ +65 °C                          |
| Ambient humidity                     | <90 %, No condensation                   |
| Vibration                            | <5.9 m/s <sup>2</sup> (0.6 g)            |

## Connection diagram



## Model description

**MODEL: VFD - SH - 3 - 050 - B - 415V**

Supply voltage: 230V / 415V

A-No breaking unit

B-In-built breaking unit

Motor configuration: 002-0.25HP 005-0.5HP  
010-1HP 020-2HP  
030-3HP 050-5 HP  
075-7.5 HP 100-10 HP  
150-15 HP 200-20 HP  
250-25 HP 300-30 HP

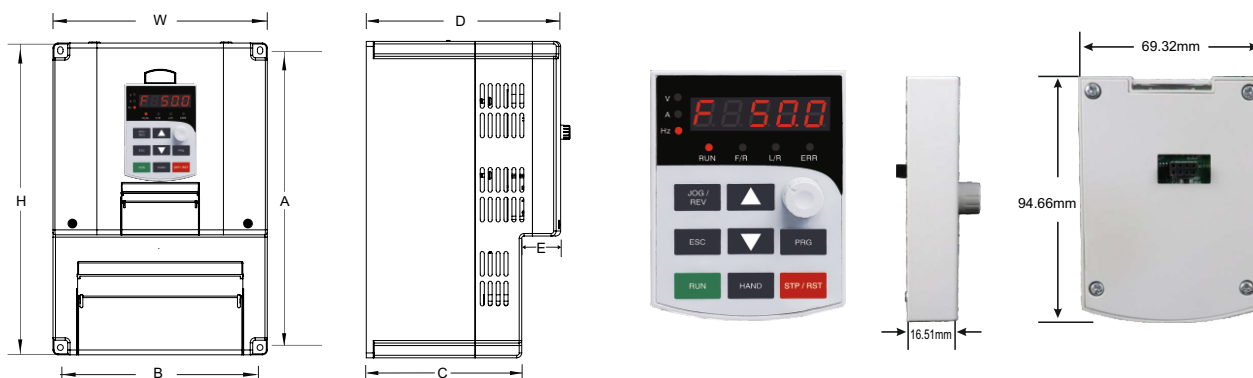
Input voltage phase: 1 - Single phase  
3 - Three phase

Product series: S - Standard series

H - Heavy duty

Model VFD

## Dimensions



| Product code        | Mounting dimension |      | Dimension |     |       | Pore diameter<br>(mm) | Weight<br>(kg) |
|---------------------|--------------------|------|-----------|-----|-------|-----------------------|----------------|
|                     | A                  | B    | H         | W   | D     |                       |                |
| VFD-S-1-002-230V    | 141                | 80.5 | 150       | 89  | 123   | 5.2                   | 0.96           |
| VFD-S-1-005-230V    |                    |      |           |     |       |                       | 0.96           |
| VFD-S-1-010-230V    |                    |      |           |     |       |                       | 0.98           |
| VFD-S-1-020-230V    |                    |      |           |     |       |                       | 1              |
| VFD-S-1-030-230V    |                    |      |           |     |       |                       | 1.03           |
| VFD-S-3-005-415V    |                    |      |           |     |       |                       | 0.96           |
| VFD-S-3-010-415V    |                    |      |           |     |       |                       | 0.98           |
| VFD-S-3-020-415V    |                    |      |           |     |       |                       | 1.03           |
| VFD-S-3-030-415V    |                    |      |           |     |       |                       | 1.03           |
| VFD-S-3-050-415V    |                    |      |           |     |       |                       | 1.03           |
| VFD-S-1-050-230V    | 240                | 148  | 247       | 160 | 173   | 10                    | 3.58           |
| VFD-SH-3-050-B-415V |                    |      |           |     |       |                       | 3.58           |
| VFD-SH-3-075-B-415V |                    |      |           |     |       |                       | 3.66           |
| VFD-SH-3-100-B-415V |                    |      |           |     |       |                       | 3.78           |
| VFD-SH-3-150-B-415V | 305                | 205  | 320       | 220 | 196.5 | 10                    | 7.07           |
| VFD-SH-3-200-B-415V |                    |      |           |     |       |                       | 7.28           |
| VFD-SH-3-250-B-415V |                    |      |           |     |       |                       | 7.50           |
| VFD-SH-3-300-B-415V |                    |      |           |     |       |                       | 7.75           |

## Ordering information

| Product code        | Description                                                                                                                                                         | Braking unit | Recommended resistance value | Output current |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------|----------------|
| VFD-S-1-002-230V    | 1 phase input 230V AC, 3 phase output 0 to rated Input voltage 0.25HP/0.18kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display)      | Built In     | 100W 700Ω                    | 1A             |
| VFD-S-1-005-230V    | 1 phase input 230V AC, 3 phase output 0 to rated Input voltage 0.5HP/0.4kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display)        | Built In     | 100W 700Ω                    | 2.5A           |
| VFD-S-1-010-230V    | 1 phase input 230V AC, 3 phase output 0 to rated input voltage 1HP/0.75kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display)         | Built In     | 150W 360Ω                    | 5A             |
| VFD-S-1-020-230V    | 1 phase input 230V AC, 3 phase output 0 to rated input voltage 2HP/1.5kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display)          | Built In     | 200W 200Ω                    | 7A             |
| VFD-S-1-030-230V    | 1 phase input 230V AC, 3 phase output 0 to rated input voltage 3HP/2.2kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display)          | Built In     | 300W 120Ω                    | 11A            |
| VFD-S-1-050-230V    | 1 phase input 230V AC, 3 phase output 0 to rated Input voltage 5HP/3.7kW, General purpose series (8 DI, 2 AI, RS485, 2 RO, 2 TO, 1AO, Detachable display)           | Built In     | 600W 70Ω                     | 18A            |
| VFD-S-3-005-415V    | 3 phase input 415V AC, 3 phase output 0 to rated Input voltage 0.5HP/0.4kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display)        | Built In     | 200W 850Ω                    | 1.2A           |
| VFD-S-3-010-415V    | 3 phase input 415V AC, 3 phase output 0 to rated Input voltage 1HP/0.75kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display)         | Built In     | 200W 850Ω                    | 2.5A           |
| VFD-S-3-020-415V    | 3 phase input 415V AC, 3 phase output 0 to rated input voltage 2HP/1.5kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display)          | Built In     | 350W 500Ω                    | 3.7A           |
| VFD-S-3-030-415V    | 3 phase input 415V AC, 3 phase output 0 to rated input voltage 3HP/2.2kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display)          | Built In     | 550W 450Ω                    | 5.1A           |
| VFD-S-3-050-415V    | 3 phase input 415V AC, 3 phase output 0 to rated input voltage 3HP/2.2kW, General purpose series (5DI, 2AI, 1AO, RS485, 1RO SPDT, 1TO, Detachable display, Compact) | Built In     | 500W 300Ω                    | 9A             |
| VFD-SH-3-050-B-415V | 3 phase input 230V AC, 3 phase output 0 to rated Input voltage 5HP/3.7kW, General purpose series (8 DI, 2 AI, RS485, 2 RO, 2 TO, 1AO, Detachable display)           | Built In     | 350W 150Ω                    | 9A             |
| VFD-SH-3-075-B-415V | 3 phase input 230V AC, 3 phase output 0 to rated Input voltage 7.5HP/5.5kW, General purpose series (8 DI, 2 AI, RS485, 2 RO, 2 TO, 1AO, Detachable display)         | Built In     | 500W 90Ω                     | 13A            |
| VFD-SH-3-100-B-415V | 3 phase input 230V AC, 3 phase output 0 to rated Input voltage 10HP/7.5kW, General purpose series (8 DI, 2 AI, RS485, 2 RO, 2 TO, 1AO, Detachable display)          | Built In     | 800W 60Ω                     | 17A            |
| VFD-SH-3-150-B-415V | 3 phase input 230V AC, 3 phase output 0 to rated Input voltage 15HP/11kW, General purpose series (8 DI, 2 AI, RS485, 2 RO, 2 TO, 1AO, Detachable display)           | Built In     | 1000W 47Ω                    | 25A            |
| VFD-SH-3-200-B-415V | 3 phase input 230V AC, 3 phase output 0 to rated Input voltage 20HP/15kW, General purpose series (8 DI, 2 AI, RS485, 2 RO, 2 TO, 1AO, Detachable display)           | Built In     | 1500W 36Ω                    | 32A            |
| VFD-SH-3-250-B-415V | 3 phase input 230V AC, 3 phase output 0 to rated Input voltage 25HP/18.5kW, General purpose series (8 DI, 2 AI, RS485, 2 RO, 2 TO, 1AO, Detachable display)         | Built In     | 3000W 32Ω                    | 37A            |
| VFD-SH-3-300-B-415V | 3 phase input 230V AC, 3 phase output 0 to rated Input voltage 30HP/22kW, General purpose series (8 DI, 2 AI, RS485, 2 RO, 2 TO, 1AO, Detachable display)           | Built In     | 4000W 26Ω                    | 45A            |

## Applications :

Suitable for Fans, Pumps, Conveyor, Compressors, Food & Drink packaging machinery and Most general purpose industries.