# Product Information

## 1 Designation Rules



Diagram 1-1 Designation rules

## 2 Technical Specifications

Table 2-2 Technical specifications of EM12

| **Item** | | **Specifications** | |
| --- | --- | --- | --- |
| **Standard functions** | Voltage | 1 phase 220V input to 3 phase 380V output | |
| Maximum frequency | Vector control: 0~320 Hz  V/F control: 0~3200 Hz | |
| Carrier frequency | 0.5–16 kHz (The carrier frequency is automatically adjusted based on the load features.) | |
| Input frequency resolution | Digital setting: 0.01 Hz  Analog setting: maximum frequency x 0.025% | |
| Control mode | Sensor-less vector control (SVC)  Closed-loop vector control (FVC)+ PG card  Voltage/Frequency (V/F) control | |
| Startup torque | G type: 0.5 Hz/150% (SVC); 0 Hz/180% (FVC)  P type: 0.5 Hz/100% | |
| Speed range | 1:100 (SVC) | 1:1000(FVC) |
| Speed stability accuracy | ± 0.5% (SVC) | ± 0.02% (FVC) |
| Torque control accuracy | ± 10% (SVC) | ± 5% (FVC) |
| Overload capacity | G type: 60s for 150% of the rated current, 3s for 180% of the rated current  P type: 60s for 120% of the rated current, 3s for 150% of the rated current | |
| Torque boost | Auto boost  Manual boost 0.1%~30.0% | |
| V/F curve | Straight-line V/F curve  Multi-point V/F curve  N-power V/F curve (1.2-power, 1.4-power, 1.6-power, 1.8-power, square) | |
| V/F separation | Two types: complete separation; half separation | |
| Acceleration/deceleration curve | Straight-line ramp  S-curve ramp  Four groups of acceleration/deceleration time with the range of 0.0s~65000s | |
| DC braking | DC braking frequency: 0.00 Hz ~ maximum frequency  Braking time: 0.0s~36.0s  Braking trigger current value: 0.0%~100.0% | |
| JOG control | JOG frequency range: 0.00Hz~50.00 Hz  JOG acceleration/deceleration time: 0.00s~6500.0s | |
| Built-in simple PLC, multiple speeds | It realizes up to 16 speeds via the simple PLC function or combination of DI terminal states. | |
| Built-in PID | It realizes closed loop control system easily. | |
| Auto voltage regulation (AVR) | It can keep constant output voltage automatically when the mains voltage fluctuation. | |
| Overvoltage/ Over current stall control | The current and voltage are limited automatically during the running process so as to avoid frequently tripping due to overvoltage / over current. | |
| Rapid current limit function | It can auto limit running current of frequency inverter to avoid frequently tripping. | |
| Torque limit and control | (Excavator characteristics) It can limit the torque automatically and prevent frequently over current tripping during the running process.  Torque control can be implemented in the VC mode. | |
| **Individualized functions** | High performance | Control of asynchronous motor and synchronous motor are implemented through the high-performance current vector control technology. | |
| Instant power off not stop | The load feedback energy compensates the voltage reduction so that the frequency inverter can continue to run for a short time. | |
| Rapid current limit | To avoid frequently over current faults of the frequency inverter. | |
| Virtual I/O | Five groups of virtual DI/DO can realize simple logic control. | |
| Timing control | Time range: 0.0~6500.0 minutes | |
| Multi-motor switchover | Two motors can be switched by two groups of motor parameters. | |
| Multiple communication protocols | It supports communication bus via Modbus-RTU, PROFIBUS-DP, CANlink and CANopen. | |
| Motor overheat protection | The optional I/O extension card enables AI3 to receive the motor temperature sensor input (PT100, PT1000) so as to realize motor overheat protection. | |
| Multiple encoder types | It supports various encoders such as differential encoder, open-collector encoder, resolver, UVW encoder, and SIN/ COS encoder. | |
| Advanced background software | It supports the operation of frequency inverter parameters and virtual oscillograph function, by which the state of frequency inverter can be monitored. | |
| **RUN** | Running command giving | key panel; Control terminals; Serial communication port; You can switch between these giving in various ways. | |
| Frequency giving | There are 10 kinds frequency giving: digital setting, analog voltage setting, analog current setting, pulse setting and serial communication port setting.  You can switch between these giving in various ways. | |
| Auxiliary frequency giving | There are 10 kinds auxiliary frequency giving. It can implement tiny tuning of auxiliary frequency and frequency synthesis. | |
| Input terminal | Standard:  6 digital input (DI) terminals, one of which supports up to 100 kHz high-speed pulse input  3 analog input (AI) terminals, AI1,AI2 support 0V~10 V or 0mA~20mA input, AI3 support -10V~+10V  Expanding capacity:  many DI terminals | |
| Output terminal | Standard:  1 high-speed pulse output terminal (open-collector) that supports 0–100 kHz square wave signal output (Can be used as DO output)  2 relay output terminal  2 analog output (AO) terminals, both of them supports 0mA~20mA current output and 0V~10V voltage output.  Expanding capacity:  many DO terminals  many relay output terminals | |
| **Display and keypad operation** | LED display | It displays the parameters. | |
| Parameters copy | Optional LCD keypad can copy parameters. (Option) | |
| Key locking and function selection | It can lock the keys partially or completely and define the function range of some keys so as to prevent misoperation. | |
| Protection mode | Motor short-circuit detection at power-on, input/output phase loss protection, over current protection, overvoltage protection, less voltage protection, overheat protection and overload protection,etc. | |
| **Environment** | Installation location | Indoor, no direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapour, drip or salt. | |
| Altitude | Lower than 1000 m | |
| Ambient temperature | -10°C~ +40°C (de-rated if the ambient temperature is between 40°C and 50°C) | |
| Humidity | Less than 95%RH, without condensing | |
| Vibration | Less than 5.9 m/s2 (0.6 g) | |
| Storage temperature | -20°C ~ +60°C | |

## 3 Product appearance and installation dimension

| **Model** | **Output Current**  **(A)** | **Adaptable Motor** | | **Appearance and installing dimension（mm）** | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **KW** | **HP** | **W** | **W1** | **H** | **H1** | **D** | **Φd** |
| **1 phase 220V input & 3 phase 380V output** | | | | | | | | | |
| EM12-G13-d75 | 2.1 | 0.75 | 1 | 100 | 89 | 151 | 140 | 116.5 | Φ4 |
| EM12-G13-1d5 | 3.8 | 1.5 | 2 |
| EM12-G13-2d2 | 5.1 | 2.2 | 3 | 118 | 106.5 | 185 | 175.5 | 157 | Φ4.5 |
| EM12-G13-004 | 9 | 3.7 | 5 |
| EM12-G13-5d5 | 13 | 5.5 | 7.5 | 160 | 148 | 247 | 235 | 177 | Φ5.5 |
| EM12-G13-7d5 | 17 | 7.5 | 10 |
| EM12-G13-011 | 25 | 11 | 15 | 220 | 205 | 320 | 305 | 198 | Φ5.5 |
| EM12-G13-015 | 32 | 15 | 20 |
| EM12-G13-018 | 37 | 18.5 | 25 |



Diagram 3-1 Appearance and installation dimension of EM12 series (Plastic housing structure)