VM600 AC Drive
User Manual

Verion Code 6.0004.0538-00-VM600-E-V03-202107

Preface

Thank you for choosing VM600 Series AC Drive.

This user manual introduces the technical specifications, installation instructions, functions and performance of VM600 Series AC Drive properly. Please read this user manual carefully before carrying out works such as installation, commissioning, maintenance, etc.

You are specially warned to read and understand safety precaution items of this manual before using this product, and to ensure that relevant electrical installation testers' professional qualification shall be in line with the provisions of the labor supervision department, and the electrical and environmental conditions for product use shall be in conformity with relevant national standards.

Be sure to verify that the wiring is correct before powering on the product. Before starting the product, it is necessary to debug to ensure correct motor rotating direction.

During the installation, use and maintenance of the product, if you need to consult the product's function, performance, other technical problems and safety precautions, please contact the company's customer service center according to the service hotline in this manual (please See the cover page of the manual).

Due to the continuous upgrade of the company's products, the content changes without notice.

Guangzhou Sanjing Electric Co., Ltd.

CONTENTS

Safety precautions

■ Warning sign

⚠ DANGER: Indicates that failure to comply with the notice will result in severe personal injure or even death.

⚠ WARNING: Indicates that failure to comply with the notice will result in moderate personal injury, property damage or equipment damage.

WARNING
◎Do not install or operate any AC Drive that is damaged or with missing parts. Failing to follow this rule can result in facility damage or severe injury.
◎When installing or handling the AC Drive, please hold the bottom of the product rather than the case only, to prevent its falling and being damaged.
◎Install the AC Drive on nonflammable material like metal, and keep away from flammable or explosive object, heat source, and similar environment. Otherwise, fire may be caused.
◎When AC Drive is installed inside an electrical cabinet or other kind of enclosure, please install fans or other cooling devices, and keep ventilation well enough to ensure the enclosure temperature below 40℃, or the AC Drive may be damaged due to extreme high temperature.
◎ Before wiring, ensure the AC Drive rated input voltage and phases are compatible with the input power source, or fire or personal injury may be caused.
◎ Never connect the AC power supply to output terminals U, V and W. Otherwise, the AC Drive will be damaged and the warranty is invalid.
◎Never carry out withstand voltage test to the AC Drive, for example by a megohmmeter. Otherwise, it may cause damage to the AC Drive.
◎The connecting cable of the main circuit terminal should use an insulating sleeve.
◎When the cable length between the AC Drive and the motor exceeds 50 meters, an output reactor is recommended to be used.

◎Do not use a circuit breaker to control the start and stop of the AC Drive. Otherwise, the AC Drive may be damaged.

◎Since the AC Drive makes the motor running speed from low to high in a short time, please confirm that the motor and equipment are in the allowed running range before running.

◎Do not touch due to high temperature of the heat sink and braking resistor.

◎The factory parameters of the AC Drive can meet the requirments of most equipment operation. Under normal circumstances, please do not modify the AC Drive parameters at will. Even if there is some special applications need to change the AC Drive parameters, only necessary parameters could be changed. Otherwise, AC Drive damage may be caused.

◎The PCB board has a CMOS integrated circuit. Do not touch it with your hands, otherwise, static electricity will damage the PCB board.

DANGER

◎Wiring must be completed by qualified professional electricians, otherwise, there may be electric shock or damage to the AC Drive.
◎The power must be disconnected during wiring; otherwise, it may cause electric shock or fire.
◎The grounding terminal should be effectively grounded; otherwise, the outer casing of the AC Drive may be energized.

◎Do not touch the main circuit terminals, otherwise, it may cause electric shock.

◎Terminals for brake resistor are (+) and PB. Do not wire to other terminals, otherwise, fire may be caused.

◎It is only allowed to power on the AC Drive after the wiring is finished and its cover is reinstalled. It is strictly prohibited to remove the cover of AC Drive while power is on. Otherwise, it may cause electric shock.

◎Before programming the AC Drive with fault auto reset or restart option after power off, the mechanical device need to be implemented with safety protection measures first. Otherwise, personal injury will be caused.

◎“ STOP/RESET” key may become invalid as a result of some function setting. It is recommended to install an independent emergency circuit breaker for the AC Drive control system, otherwise, or personal injury may be caused.

◎When the power is on, there may be electricity in the AC Drive’s terminals even if it is in stop mode. Do not touch U, V, W terminals and motor connection terminals, or electrical shock may be caused.

◎Never touch the AC Drive connection terminals when power is on. Otherwise, it may cause an electrical shock.

◎Only qualified electricians can be authorized to do the jobs of maintenance, checking, or parts replacement.

◎After the power supply is OFF, make sure the charge LED is OFF and the residual voltage does not exist, or wait for at least 10 minutes before carrying out maintenance or inspection. Otherwise, damage or injury may be caused.

◎Modification to the AC Drive without permission is strictly prohibited, otherwise, severe injury may be caused. Arbitrarily modification of AC Drive will result in service warranty invalid.

Chapter 1 Product information

1. 1 Technical specifications

Item		Specifications
Control features	Control mode	V/F control
	Startup torque	0.5Hz/100%
	Speed range	1：50
	Speed stability accuracy	±1%
	Carrier frequency	1kHz ～ 6kHz；
	Overload capacity	60s for 150% of the rated current, 1s for 180% of the rated current.
	Torque boost	0.0% ～ 30.0%
Input and Output	Input voltage range	220V/380V; fluctuation range : ±15%
	Input frequency range	50/60Hz； fluctuation range : ±5%
	Output voltage range	0-input voltage; the error is less than 5%
	Output frequency range	0-400Hz
Basic function	Running command source	Three command source： keypad; control terminals; serial communication port.
	Frequency source	such as digital setting, analog voltage setting, analog current setting, serial communication port setting.
	DC braking	Braking time: 0.0s ～ 50.0s; Braking action current value: 0.0% ～ 100.0%
	Simple PLC/Multiple speeds	It implements up to 8 speeds via the simple PLC function or combination of DI terminal states.
	Protection mode	Motor short-circuit detection at power-on, input/output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection and so on.
Display and Key operation	LED display	It displays the parameters.
	Parameters locking function	It can lock the parameters to prevent malfunction.
Environment	Installation location	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapour, drip or salt.
	Altitude	Lower than 1000m. When it is higher than 1000m, for every

Item		Specifications
		100m, it needs to reduce power by 1%, and the maximum altitude is 3000m.
	Ambient temperature	-10℃～ 50℃. When it is higher than 40℃, for every 1℃, it needs to reduce power by 1%, and the maximum ambient temperature is 50℃
	Humidity	≤95%RH, without condensing
	Vibration	Less than 5.9m/s2 (0.6g)
	Storage temperature	-25℃～+60℃

Table 1-1-1 Technical specification shee

1. 2 Product nameplate

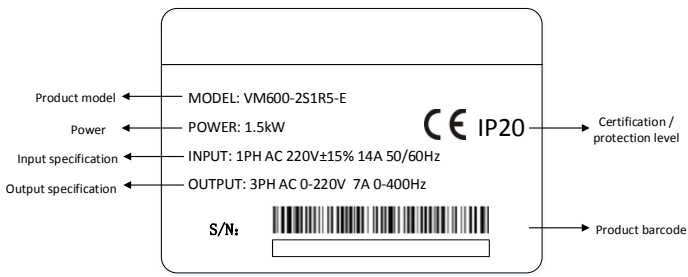

Figure 1-2-1 Product nameplate

1. 3 Model description

VM600 - 2 S 1R5GB
① ② ③ ④

Field	No.	Identification	Description
Product series	①	Product series	VM600 series
Voltage grade	②	Voltage grade	2：220VAC； 4：380VAC
The input power	③	Power phase identification	S: single ； T: three-phase
Rated power	④	Power range	1R5-1. 5kW，R is the decimal point

Table 1-3-1 VM600 series model field comment

1.4 Product model

AC Drive Model	Rated power	Power capacity	Input current	Output current	Motor G/P	
	kW	kVA	A	A	kW	HP
VM600-2SR75	0.75	1.5	8.2	4	0.75	1
VM600-2S1R5	1.5	3	14.2	7	1.5	2
VM600-2S2R2	2.2	4	23	9.6	2.2	3
VM600-4TR75	0.75	1.5	3.4	2.5	0.75	1
VM600-4T1R5	1.5	3	5	3.8	1.5	2
VM600-4T2R2	2.2	4	5.8	5.1	2.2	3
VM600-4T004	4	5.9	10.5	9	4/	5.5
VM600-4T5R5	5.5	8.9	14.6	13	5.5	7.5
VM600-4T7R5	7.5	11	20.5	17	7.5	10
VM600-4T011	11	17	26	25	11	15
VM600-4T015	15	21	35	32	15	20

Table 1-4-1 Product model table

Chapter 2 Installation

2. 1 Overall structural drawing（unit：mm）

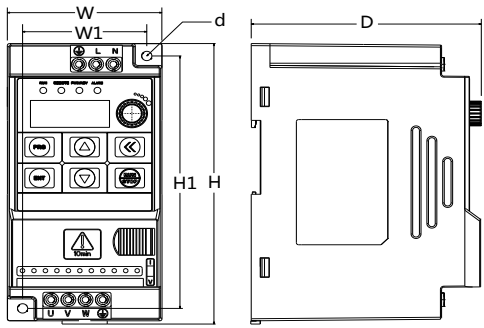

Figure 2-1-1 Outline dimension diagram

AC Drive Model	Overall Dimensions			Mounting Hole		Mounting Hole Diameter
	H	W	D	H1	W1	d
VM600-2SR75	134	69	104	123	55	5
VM600-2S1R5						
VM600-2S2R2	142	72	116	130	59	5
VM600-4TR75						
VM600-4T1R5						
VM600-4T2R2						
VM600-4T004	196	95	132	179	79	5.5
VM600-4T5R5	225	115	154	208	99	5.5
VM600-4T7R5						
VM600-4T011	–	–	–	–	–	–
VM600-4T015	–	–	–	–	–	–

Table 2-1-1 outline dimension

2. 2 Terminal connection

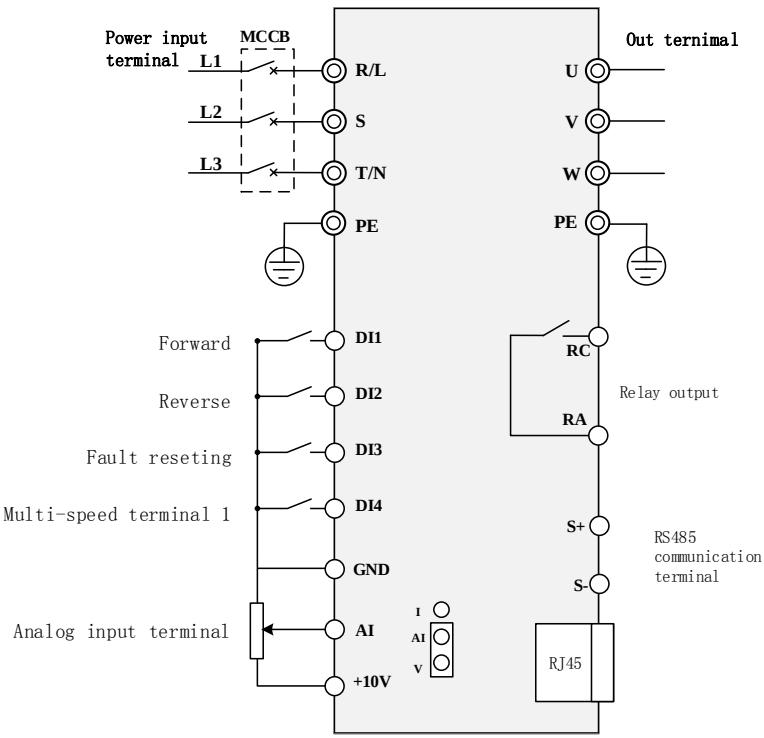

Figure 2-2-1 Terminal connection

■ Main circuit connection

Terminal mark	Name	Description
R、S、T	Power supply input terminals	Connect to the AC power supply
U、V、W	AC drive output terminals	Connect the three-phase motor.
⏚	Grounding terminal	Must be grounded.

Table 2-2-1 Main circuit terminals and function

■ Control circuit connection

Category	Terminal symbol	Terminal name	Function description
Power supply	+10V-GND	+10V power supply	Provide +10V power supply to external unit. Maximum output current: 20 mA.
	+24V-COM	+24V power supply	Provide +24V power supply to external unit.
Analog input	AI-GND	Analog input terminal 1	Input voltage range: 0-10V
Digital input	DI1	Digital input 1	
	DI2	Digital input 2	
	DI3	Digital input 3	
	DI4	Digital input 4	
Relay output	RA-RC	NO terminal	NO terminal
Communication port and socket		S+	RS485 signal positive terminal
		S-	RS485 signal negative terminal

Table 2-2-2 Control terminal instruction

Chapter 3 Display and operation

3. 1 Keypad

You can modify the parameters, monitor the working status and start or stop the AC Drive by operating the keypad, as shown in the following figure.

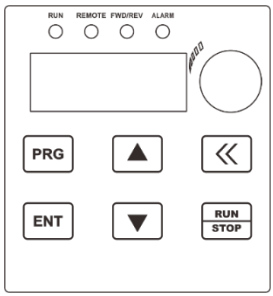

Figure 3-1-1 Keypad diagram

3. 2 Description of indicators and keys

Item	Name	Function
Indicator	Status	■ RUN： ON/Running；OFF/Stop. ■ REMOTE： ON/Terminal control； Blinking/Communication； OFF/keypad control. ■ FWD/REV： ON/Forward rotation； OFF/Reverse rotation； Blinking/Forward and reverse switching. ■ ALARM：Blinking /Fault state.
按键	PRG (Programming)	Enter or exit the first menu.
	ENT (Confirm)	Enter the menu interfaces and confirm the parameter setting.
	△（Increment）	Increase date or function code.
	▽（Decrement）	Decrease data or function code.
	<<（Shift）	Select the displayed parameters in the stop or running state and select the digit to be modified when modifying parameters.
	RUN/STOP	Control drive start and stop in keypad control mode. Perform the reset operation when it is in the fault state.
potentiometer	Resistance potentiometer	Frequency adjustment in keyboard operation mode

Table 3-2-1 Description of Indicators and key

Chapter 4 Parameter function

"○": the parameter can be modified in both standby and operating state;

"●": the parameter can't be modified in operating state;

"◎":the parameter is the actual detected and recorded value which can't be modified;

Note: the communication address is hexadecimal.

4.1 Functional parameter

Parameter	Name	Setting Range	Default	Property	Address
F0.00	Reserved	Reserved	0	●	0000
F0.01	Command source selection	0：Operation panel control（LED off） 1：Terminal control（LED on） 2：Communication LED (LED blinking）	0	●	0001
F0.02	Setting main frequency source X	0：Digital setting (non-retentive at power failure) 1：Digital setting (retentive at power failure) 2：Keypad Knob 3：AI 4：Multi-stage speed 5：Simple PLC 6：Communication	2	●	0002
F0.03	Keypad setting frequency	0.00Hz～F0.05	50.0Hz	○	0003
F0.04	Running direction selection	0：Forward 1：Reverse	0	○	0004
F0.05	Maximum Output Frequency	50.00Hz～400.00Hz	50.0Hz	●	0005
F0.06	Upper Limit of Frequency	F0.07～F0.05	50.0Hz	○	0006
F0.07	Lower Limit of Frequency	0.00Hz～F0.06	0.0Hz	○	0007
F0.08	The option of frequency lower limit	0：Running at frequency lower limit 1：Stop 2：Standby	0	○	0008
F0.09	Carrier Frequency	1kHz～6.0kHz	6.0kHz	●	0009
F0.10	Acceleration Time 1	0.0s～100.0s	10.0s	○	000A
F0.11	Deceleration Time 1	0.0s～100.0s	10.0s	○	000B
F0.12	Stop Mode	0：Decelerate to stop 1：Free stop	0	○	000C

Parameter	Name	Setting Range	Default	Property	Address
F0.13	Retentive of digital setting frequency	0：No retentive 1：retentive	1	●	000D
F0.14	Fan operating mode	0：Run when motor is running 1：Keep run when power on	0	○	000E
F0.15	AI1 Input Option	0：0-10V 1：4-20mA 2: 0-20mA 3：0-5V 4：0.5-4.5V	0	○	000F
F1.00	Default Setting Restoring	0：No Operation 1：Restore to factory default setting (not including F2 parameters) 2：Clear error records	0	●	0100
F1.01	Parameters Lockup	0：Invalid 1：Valid	0	○	0101
F1.02	User Password	0～65000	0	○	0102
F2.00	Motor Rated Power	0.1kW～2.2kW	Determined by Drive Model	●	0200
F2.01	Motor Rated Voltage	0-380V	Determined by Drive Model	●	0201
F2.02	Motor Rated Frequency	0- F0.05	Determined by Drive Model 定	●	0202
F2.03	Motor Rated Current	1.00-10.00	Determined by Drive Model	●	0203
F2.05	Type of Motor	0：Single Phase 1：Three Phase	0	●	0205
F2.06	Single-phase motor main and auxiliary winding turns ratio	10 ～ 200	80	○	0206
F2.07	Single-phase motor current correction factor	50 ～ 200	130	○	0207
F3.00	V/F Curve Setting	0：Linear 1：Multi-Point	0	●	0300
F3.01	Multi-Point Frequency 1	0.00Hz~F3.03	3	●	0301
F3.02	Multi-Point Voltage 1	0.0%~100.0%	8	●	0302
F3.03	Multi-Point Frequency 2	F3.03~F3.05	5	●	0303
F3.04	Multi-Point Voltage 2	0.0%~100.0%	15	●	0304

Parameter	Name	Setting Range	Default	Property	Address
F3.05	Multi-Point Frequency 3	F3.05~F2.02（Motor Rated Frequency）	8	●	0305
F3.06	Multi-Point Voltage 3	0.0%~100.0%	22	●	0306
F4.00	Torque Boost	0.0%～30.0%	4.0%	○	0400
F4.01	Cut-off frequency of torque boost	0.00Hz～F0.05	50.00Hz	●	0401
F4.02	Trigging frequency of DC braking at stop	0.00Hz～F0.05	0.00Hz	○	0402
F4.03	Delay time of DC braking at stop	0.0s～50.0s	0.0s	○	0403
F4.04	The current of DC braking at stop	0～100%	0	○	0404
F4.05	The time of DC braking at stop	0.0s～50.0s	0.0s	○	0405
F4.06	Automatic adjustment of carrier Frequency	0:Invalid; 1:Valid	0	●	0406
F4.07	0 frequency output option	0:Valid; 1:Invalid	1	●	0407
F5.00	DI1 terminal function selection	0: No function 1: Forward running (FWD) 2: Reverse running (REV) 3: Three-wire operationcontrol 4: Forward point movement (FJOG) 5: Reverse point movement (RJOG) 6:Error Reset 7:Terminal UP 8:Terminal Down 9:UP/DOWN Setting Clear 10:External error input(Normally Open) 11：PLC Status reset 12:Multi stage speed terminal 1 13: Multi stage speed terminal 2 14:Reserved	1	●	0500
F5.01	DI2 terminal function selection		2	●	0501
F5.02	DI3 terminal function selection		6	●	0502
F5.03	DI4 terminal function selection		0	●	0503
F5.04	DI filter time	0.000s～1.000s	0.010s	○	0504
F5.05	Terminal Command Option	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0	●	0505
F5.06	UP/DOWN change rate range	0.01Hz～50.00Hz	0.50Hz	○	0506
F5.07	AI minimum input	0.00V～F5.09	0.00V	○	0507
F5.08	Percentage rate of AI minimum input	-100.0%～+100.0%	0.0%	○	0508
F5.09	AI maximum input	F5.07～+10.00V	10.00V	○	0509
F5.10	Percentage rate of AI maximum input	-100.0%～+100.0%	100.0%	○	050A
F5.11	AI filter time	0.00s～10.00s	0.10s	○	050B
F5.12	DI1 Enable Delay Time	0.0s～100.0s	0.0s	○	050C
F5.13	DI2 Enable Delay Time	0.0s～100.0s	0.0s	○	050D

Parameter	Name	Setting Range	Default	Property	Address
F5.14	DI1 Disable Delay Time	0.0s～100.0s	0.0s	○	050E
F5.15	DI2 Disable Delay Time	0.0s～100.0s	0.0s	○	050F
F5.16	AI Input Digital Functional Option	0: No function 1: Forward running (FWD) 2: Reverse running (REV) 3: Three-wire operationcontrol 4: Forward point movement (FJOG) 5: Reverse point movement (RJOG) 6:Error Reset 7:Terminal UP 8:Terminal Down 9:UP/DOWN Setting Clear 10:External error input(Normally Open) 11：PLC Status reset 12:Multi stage speed terminal 1 13: Multi stage speed terminal 2 14:Reserved	0	●	0510
F5.17	AI Input Valid Level Option	0：Low Level Valid 1：High Level Valid	1	○	0511
F6.00	Relay Output Option	0：No Output 1：VFD Running 2：Error Output(Output is valid only after VFD stops) 3：Ready for Running 4：Communication Setting 5: User Defined Output	0	○	0600
F6.01	Relay1 Closed Delay Time	0.0s～100.0s	0.0s	○	0601
F6.02	Relay1 Open Delay Time	0.0s～100.0s	0.0s	○	0602
F6.03	User defined output Variability option（EX）	0：Running Frequency 1：Set Frequency 2：Bus Voltage 3：Output Voltage 4：Output Current	0	○	0603
F6.04	User defined comparison method	Units digit：comparison test method 0: Equal (EX==X1) 1: Equal or greater than 2: Equal or less than 3 Interval comparison (X1≤EX≤X2) 4:Units digit test (EX&X1=X2) Tens digit: output method 0: False value output 1: Real value output	0	○	0604
F6.05	User defined output dead	0～65535	0	○	0605

Parameter	Name	Setting Range	Default	Property	Address
	zone				
F6.06	User-defined output comparison value 1	0～65535	0	○	0606
F6.07	User-defined output comparison value 2	0～65535	0	○	0607
F6.08	AO1 Output Option	0：Running Frequency（0～F0.05） 1：Set Frequency（0～F0.05） 2：Output Current（0～Double Rated Current of VFD） 3：Output Voltage（0～1.2times of VFD Rated Output Voltage） 4：AI（0～10V） 5：Bus Voltage（0～500.0/1000.0V）	0	○	0608
F6.09	AO2 Output Option		0	○	0609
F6.10	AO1 offset coefficient	-100.0%～+100.0%	0.0%	○	060A
F6.11	AO1 gain	-10.00～+10.00	1.00	○	060B
F6.12	AO2 offset coefficient	-100.0%～+100.0%	0.0%	○	060C
F6.13	AO2 offset coefficient	-10.00～+10.00	1.00	○	060D
F7.00	Reserved	Reserved	0	○	0700
F7.01	STOP Button Function	0：Valid only at keypad control mode 1：Valid at all control modes	1	○	0701
F7.02	LED display parameters at running status	Bit0：Running Frequency(Hz) Bit1：Set Frequency(Hz)	0x1F	○	0702
F7.03	LED display parameters at stop status	Bit2：Bus Voltage(V) Bit3：Output Voltage(V) Bit4：Output Current(A) Bit5：DI Input Status Bit6：DO Output Status Bit7：Keypad Knob Voltage(V) Bit8：AIVoltage(V) Bit9：Load Speed Bit10：PID Set Value Bit11：PID Feedback Value Bit12：PLC Stage Bit13：Feedback Frequency（Unit：0.1Hz) Bit14：Communication Set Value Bit15：Main Frequency Source X	0x06	○	0703
F7.04	Load speed display coefficient	0.0001～6.5000	3.000	○	0704
F7.05	Software Version	-	-	◎	0705
F8.00	Jog Running Frequency	0.00Hz～F0.05	2.00Hz	○	0800
F8.01	Jog Acceleration Time	0.0s～100.0s	10.0s	○	0801

Parameter	Name	Setting Range	Default	Property	Address
F8.02	Jog Deceleration Time	0.0s～100.0s	10.0s	○	0802
F8.03	FWD/REV dead zone time	0.0s～100.0s	0.0s	○	0803
F8.04	Reverse control	0：valid 1：invalid	0	○	0804
F8.05	Reserved	0	0	●	0805
F8.06	Startup Protection Option	0：Invalid 1：Valid	0	○	0806
F8.07	Terminal jogging priority	0：Invalid 1：Valid	1	○	0807
FC.00	Local Addresse	1～30，0 for broadcast addresse	1	○	0C00
FC.01	Baud Rate	0：4800bPS 1：9600bPS 2：19200bPS	1	○	0C01
FC.02	Data format	0：No check, data format (8.N.1) 1：Odd Parity check, data format (8.O.1) 2：Even parity check, data format (8.E.1)	0	○	0C02
FC.03	Respond Delay	0ms～20ms	2	○	0C03
FC.04	Reserved	0	0	●	0C04
FD.00	Multistage speed 0	-100.0%～100.0%(100.0% as F0.05)	0.00%	○	0D00
FD.01	Multistage speed 1	-100.0%～100.0%	0.00%	○	0D01
FD.02	Multistage speed 2	-100.0%～100.0%	0.00%	○	0D02
FD.03	Multistage speed 3	-100.0%～100.0%	0.00%	○	0D03
FD.04	Simple PLC running mode	0:Stop after the AC Drive runs one cycle 1:Keep final values after the AC Drive runs one cycle 2:Repeat after the AC Drive runs one cycle	0	○	0D04
FD.05	Simple PLC retentive option	Units Digit：Reserved Tens Digit： 0：Invalid 1：Valid	0	○	0D05
FD.06	Running time of simple PLC reference 0	0.0s(h)～100.0s(h)	0.0s(h)	○	0D06
FD.07	Acceleration/deceleration time of simple PLC reference 0	0～3	0	○	0D07
FD.08	Running time of simple PLC reference 1	0.0 ～ 100.0	0.0s(h)	○	0D08
FD.09	Acceleration/deceleration time of simple PLC reference 1	0 ～ 3	0	○	0D09
FD.10	Running time of simple PLC reference 2	0.0 ～ 100.0	0.0s(h)	○	0D0A
FD.11	Acceleration/deceleration time of simple PLC reference 2	0 ～ 3	0	○	0D0B
FD.12	Running time of simple PLC reference 3	0.0 ～ 100.0	0.0s(h)	○	0D0C

Parameter	Name	Setting Range	Default	Property	Address
FD.13	Acceleration/deceleration time of simple PLC reference 3	0 ～ 3	0	○	0D0D
FD.14	Time unit of simple PLC running	0：s（second） 1：h（hour） 2：min（minute）	0	○	0D0E
FD.15	The source of multistage speed 0	0：Set by FD.00 1：AI	0	○	0D0F

4. 2 Monitoring Parameters

Parameter	Name	Minimum Unit	Priority	Address
D0.00	Running Frequency(Hz)	0.01Hz	◎	D000
D0.01	Set Frequency(Hz)	0.01Hz	◎	D001
D0.02	Bus Voltage(V)	0.1V	◎	D002
D0.03	Output Voltage(V)	1V	◎	D003
D0.04	Output Current(A)	0.01A	◎	D004
D0.05	IGBT Module Temperature（℃）	0.1℃	◎	D005
D0.06	DI Input Status	1	◎	D006
D0.07	DO Output Status	1	◎	D007
D0.08	Keypad Knob Voltage	0.01V	◎	D008
D0.09	AI Voltage(V)	0.01V	◎	D009
D0.10	Reserved	1	◎	D010
D0.13	PLC Stage	1	◎	D013
D0.14	Feedback Speed(Unit0.1Hz)	0.1Hz	◎	D014

4.3 Error Records

Parameter	Name	Range and Description	Priority	Address
E0.00	Latest error type	No Error:0 Acceleration Over Current：Err02 Deceleration Over Current：Err03 Over Current at constant speed：Err04 Acceleration Over Voltage：Err05 Deceleration Over Voltage：Err06 Over Voltage at constant speed：Err07 Low Voltage error：Err09 VFD overload：Err10 Motor overload：Err11 IGBT overheat：Err14 External Error：Err15 Current Detection Error：Err18 Parameter writing/reading error：Err21 EEPROM writing/reading error:Err22	●	E000
E0.01	Running Frequency at latest error	0.0Hz-F0.05	●	E001
E0.02	Output Current at latest error	0.00-655.35	●	E002
E0.03	Bus Voltage at latest error	0.0-810	●	E003
E0.04	Input terminals status at latest error	0-63	●	E004
E0.05	IGBT temperature at latest error	0-65535	●	E005
E1.00	Former error type	As E0.00	●	E100
E1.01	Running Frequency at former error	0.0Hz-F0.05	●	E101
E1.02	Output Current at former error	0.00-655.35	●	E102
E1.03	Bus Voltage at former error	0.0-810	●	E103
E1.04	Input terminals status at former error	0-63	●	E104
E1.05	IGBT temperature at former error	0-65535	●	E105

Chapter5 Communication Protocol

VM600 Series AC Drive provides RS485 communication interface and supports Modbus communication protocol. Users can achieve centralized control by computer or PLC, set AC Drive operation commands, modify or read function code parameters, read the working state and fault info of the AC Drive.

5.1 Communication Control Address

Function	Address	Description	Remarks	Characteristic
Communication Set Value	1000H	-10000～10000（with ±sign）	F0.05*（±100.00%）	R/W
Control Command	2000H	0001: Forward running	-	W
		0002: Reverse running	-	W
		0003: JOG forward	-	W
		0004: JOG reverse	-	W
		0005: Free stop	-	W
		0006: Deceleration stop	-	W
		0007: Fault reset	-	W
Running Status	3000H	0001：FWD running	-	R
		0002：REV running	-	R
		0003：Stopped	-	R
Monitoring Data	1001H	Running Frequency（Hz）	2 decimal places	R
	1002H	Set Frequency（Hz）	2 decimal places	R
	1003H	Bus Voltage（V）	1 decimal place	R
	1004H	Output Voltage（V）	1 decimal place	R
	1005H	Output Current（A）	2 decimal places	R
	1006H	IGBT Temperature	1 decimal place	R
	1007H	Digital input status	DI1-DI4 Added by binary bit weight	R
	1009H	Keypad Knob Voltage（V）	1 decimal place	R
	101AH	AI Volatage （V）	1 decimal place	R
	100BH	Load Speed Display	1 decimal place	R
	100EH	PLC Stage	Simple PLC running stage	R
Failure status	8000H	0000：No error	-	R
		0002：Acceleration Over Current	-	R
		0003：Acceleration Over Current	-	R
		0004：Over Current at Constant Speed	-	R
		0005：Acceleration Over Voltage	-	R
		0006：Deceleration Over Voltage	-	R
		0007：Over Voltage at Constant	-	R

Function	Address	Description	Remarks	Characteristic
		Speed		
		0009：Low Voltage Error	-	R
		000A：VFD Overload	-	R
		000B：Motor Overload	-	R
		000E：IGBT Overheat	-	R
		000F：External Error	-	R
		0012：Current Detection Error	-	R
		0015：Parameters Writing/Reading Error	-	R
Communication Error Feedback	8001H	0000：No Error	-	R
		0001：Password Error	-	R
		0002：Command Code Error	-	R
		0003：CRCError	-	R
		0004：Invalid Address	-	R
		0005：Invalid Parameter	-	R
		0006：Parameters Adjustment Failed	-	R
		0007：System Locked	-	R
		0008：Parameters Being Saved	-	R

Sheet 5-1-1 Control Command Addresses

5.2 EEPROM Addresses Introduction

The addresses listed in the sheet above is the way of writing RAM. The RAM stores the data after power-off and does not save it. In the communication mode, for the write command "06H", if the parameter needs to be stored after power-off, the method of writing EEPROM should be used. The original "0" of the most significant bit of the RAM address is changed to "F", which is converted into the corresponding EEPROM address, for example: "0XXX" is changed to "FXXX"

Example of address conversion: Upper limit frequency F006, write RAM communication address: 0006, corresponding EEPROM address: F006.

Acceleration time F010, the communication address for writing RAM is: 000A, and the corresponding address for EEPROM is: F00A.

Other parameters, are like that...

It should be noted that the erasing life of EEPROM is about 1 million times. After exceeding the erasing times, it will affect the reliability of data storage. If it is not necessary, it is recommended to control the communication by writing to RAM.

Chapter 6 Troubleshooting & countermeasures

6.1 Faults and solutions

Fault code	Fault type	Reason	Solution
Err02	Overcurrent during acceleration	1. The output circuit of AC Drive is grounded or short circuited. 2. The acceleration time is too short. 3. The startup operation is performed on the rotating motor. 4. The AC Drive model is of too small power.	1. Eliminate external faults. 2. Increase the acceleration time. 3. Select rotational speed tracking restart or start the motor after it stops. 4. Select the AC Drive of higher power.
Err03	Overcurrent during deceleration	1. The output circuit of AC Drive is grounded or short circuited. 2. The deceleration time is too short.	1. Eliminate external faults. 2. Increase the deceleration time.
Err04	Overcurrent at constant speed	1. The output circuit of AC Drive is grounded or short circuited. 2. The AC Drive model is of too small power.	1. Eliminate external faults. 2. Select the AC Drive of higher power.
Err05	Overvoltage during acceleration	1. Input voltage abnormal. 2. An external force drives the motor during acceleration. 3. The acceleration time is too short. 4. The braking unit and braking resistor are not installed.	1. Turn the input power to the normal range. 2. Cancel the external force. 3. Increase the acceleration time. 4. Installed the braking unit and braking resistor.
Err06	Overvoltage during deceleration	1. Input voltage abnormal. 2. An external force drives the motor during deceleration. 3. The deceleration time is too short. 4. The braking unit and braking resistor are not installed.	1. Turn the input power to the normal range. 2. Cancel the external force. 3. Increase the deceleration time. 4. Installed the braking unit and braking resistor.
Err07	Overvoltage at constant speed	1. Input voltage abnormal. 2. An external force drives the motor during deceleration.	1. Turn the input power to the normal range. 2. Cancel the external force.
Err09	Undervoltage	1. Instantaneous power failure occurs on the input supply. 2. The input voltage is not within the normal range. 3. The AC Drive has an abnormality.	1. Reset the fault. 2. Adjust the input voltage to normal range. 3. Looking for technical service.
Err10	AC Drive overload	1. The load is too heavy or lockedrotor occurs on motor. 2. The AC Drive model is of too small power.	1. Reduce the load and check the motor. 2. Select the AC Drive of higher power.
Err11	Motor overload	The parameter setting of F2.03 does not match the motor 2. The AC Drive model is of too small power.	1. Set this parameter correctly. 2. Reduce the load and check the motor.
Err14	Module overheating	1. The ambient temperature is too high.	1. Lower the ambient temperature. 2. Clean the air filter.

Fault code	Fault type	Reason	Solution
		2. The air filter is blocked. 3. The fan is damaged. 4. The IGBT is damaged.	3. Replace the fan. 4. Ask for technical service.
Err15	External equipment fault	External fault signal (DI) triggers	1. Check the input DI terminal
Err16	Communication fault	1. The PC is in abnormal state. 2. The communication cable is faulty. 3. The communication parameters of FC group are set improperly.	1. Check the cabling of the PC. 2. Check the communication cabling. 3. Set the communication parameters properly.
Err18	Current detection fault	1. Current detection circuit is abnormal. 2. Control circuit is abnormal.	1. Ask for technical service.
Err21	Data overflow	1. The control board is abnormal.	1. Ask for technical service.
Err22	On-power EEPROM check fault	1. The EEPROM chip is damaged.	1. Ask for technical service.

Table 6-1-1 Faults and solutions

6. 2 Common faults and solutions

SN	Fault	Possible causes	Solutions
1	No display at power-on state	1. The input power of AC Drive is abnormal. 2. The control board has a bad contact with cable that is connected to the keypad. 3. The AC Drive is abnormal.	1. Check the input power. 2. Re-connect the cable. 3. Ask for technical service.
2	The motor does not rotate after the AC Drive runs.	1. The motor is damaged. 2. The motor cables is abnormal. 3. The cable between the drive board and control board is in poor contact. 4. The AC Drive is abnormal.	1. Replay the motor. 2. Ensure the cable between the AC Drive and the motor is normal. 3. Check the cable between the drive board and control board. 4. Ask for technical service.
3	DI termianls are disabled.	1. The parameters are set incorrectly. 2. The external signal is incorrect. 3. The control board is abnormal.	1. Check and reset the parameters in group F5. 2. Re-connect the external signal cables. 3. Ask for technical service.
4	AC Drive interference	1. Carrier frequency setting is not suitable. 2. The grounding method of the AC Drive and the motor is incorrect. 3. The wire between the AC Drive and the motor is too long.	1. Reduce the carrier frequency 2. The AC Drive and the motor are effectively grounded and separated from the ground of the peripheral device. 3. Install out reactor or reduce wire distance.
5	Motor noise is too loud.	1. Motor damage or mechanical failure. 2. Carrier frequency setting is too small.	1. Replace the motor or clear the mechanical fault. 2. Increase the carrier frequency appropriately.
6	Switch trip	1. Installed a leakage switch or an air switch overload. 2. The input power of AC Drive is abnormal. 3. The AC Drive is damaged.	1. Replay the leakage switch or replay the larfer capacity air switch. 2. Eliminate whether the input power is shorted. 3. Ask for technical service.

Table 6-2-1 Common faults and solutions

Chapter 7 Contect SAJ

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Warranty Card

Customer info.	Company name:	
	Company address:	
	Contact:	Tel.:
	Fax:	Zip code:
Product info.	Product model:	SN code:
	Buying date:	Fault date:
	Motor power:	Application situation:
Fault info.	Fault description: Signature: Date:	

Due to continuous improvement of products，technical parameters in this manual are modified without prior notice.