Sitronic

Italiano
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Sitronic General Inverters VFC3 Series Simple instruction

V1.07

High price–performance ratio

VFC3-021-0.2K～2.2K
VFC3-023-0.2K～3.7K
VFC3-043-0.4K～5.5K

Thank you for choosing Sitronic inverters VFC3 series.
This instruction will explain the use and precautions of the product. Please read this instruction carefully before installation and use the inverter correctly and safely.

1) Safety Instructions

Safety Instructions

✓☐ **The qualified specialized person should be invited to install, operate, maintain and inspect the product.**
✓☐ **In the instruction, the levels of the safety caution include "Warning" and "Caution".**
⚠ **Warning: the incorrect operation may cause hazardous situation, and accordingly lead to death or serious injury.**
⚠ **Caution: the incorrect operation may cause hazardous situation, and accordingly lead to general or minor injury or damage of the object.**

⚠ Warning

- ✓ The front cover plate and the wiring board should not be opened when the inverter is powered on. In addition, the inverter should not be operated when the front cover plate and the wiring board are demounted. Otherwise, the electric shock may be caused due to contacting with the high-voltage terminal and the charging part.
- ✓ If the wiring needs to be changed or inspection is required, the power supply of the inverter should be turned off first. There is still high voltage inside the inverter before the LED display of the inverter is turned off. Therefore, please don't touch the internal circuit and parts.
- ✓ The inverter must be earthed correctly.
- ✓ Please don't operate with wet hands, don't touch the heat sink, and don't plug and unplug the cable; or electric shock may be caused.
- ✓ Do not replace the cooling fan when the inverter is powered on, otherwise the risk may occur. It is dangerous to replace the cooling fan when the inverter is powered on.

⚠ Caution

- ✓ Voltage applied to each terminal must be the one specified in the user manual; otherwise, failure or damage may be caused.
- ✓ Do not operate a voltage-resistant test for the parts inside the inverter because semiconductors in inverter may be easily damaged due to high-voltage breakdown.
- ✓ Do not touch the inverter because the temperature of the inverter is very high when it is powered on or right after disconnecting the power supply, only built-in keypad is touchable, otherwise, burn may occur.
- ✓ Failure or damage may be caused due to wrong wiring.
- ✓ Do not reverse the polarities (+, -) by mistake, failure or damage may be caused.
- ✓ Please install the inverter on nonflammable walls without holes (to avoid contacts with the cooling fin of the inverter from the back). If the inverter is installed on or close to flammable objects it may cause a fire.
- ✓ Please disconnect the inverter from power supply in case of failure. Overload current passes through the inverter continuously may cause a fire.

2) Product Model

VFC3- 043- 0.75K - xy

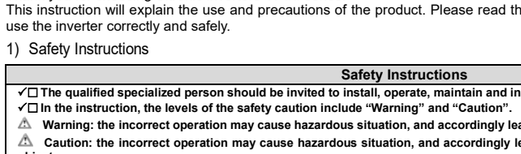
Series category	Voltage level	Capacity	Others
VFC3 series	-043：three phase 440V -023：three phase 220V -021：single phase 220V	0.75kW	None：General model -xy：Customize or specialize or region difference

3) Installation Environment

Ambient temperature	-10 ~ +50℃ (non-freezing), parallel install -10~ +40℃ (non-freezing).
Ambient humidity	Under 90%Rh (non-condensing).
Storage temperature	-20 ~ +65℃。
Surrounding environment	Indoor, no corrosive gas, no flammable gas, no flammable powder.
Altitude	Altitude below 2000 meters, when altitude is above 1,000 m, derate the rated current 2% per 100 m
Vibration	Below 5.9m/ s^2 (0.6G)
Grade of protection	IP20
The degree of pollution	2

4) Installation and Wiring

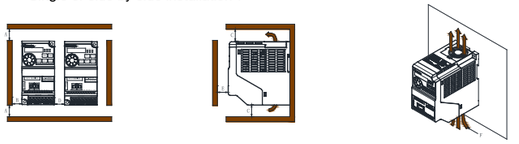
➤ Please install the inverter vertically in order not to reduce the heat dissipation effect:



(a) Vertical arrangement (b) Horizontal arrangement (c) Level arrangement

➤ Please follow the installation restrictions shown below to ensure enough ventilation space for inverter cooling and wiring space:

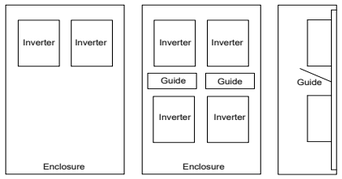
• Single or side by side installation：



unit：mm

size	Frame A	Frame B
A	50	50
B	50	50
C	100	100
D	50	50
E	50	50
F	ventilation direction	

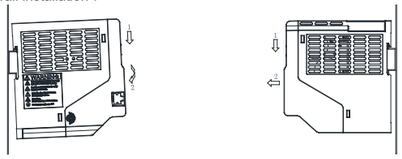
• Arrangement of multiple inverters：



(a) Horizontal arrangement (b) Vertical arrangement

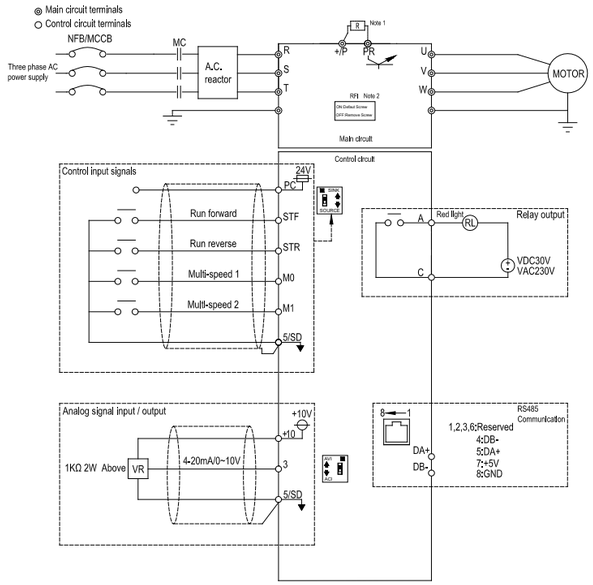
Note 1: When installing different sizes inverters in parallel, please align the upper positions of the inverters before installing, for easier replacement of the cooling fan.
Note2: When it is inevitable to arrange inverters vertically to minimize space, install guides since heat from the bottom inverters can increase the temperature on the top inverters, causing inverter failures
Note 3: Side-by-side installation, that is, when the D dimension is 0, ensure that the ambient temperature in the cabinet is not higher than 40°C. It is not possible to use keypad or communicate through the RS485 interface.

• Din rail installation：



(a) DIN rail mounting (b) DIN rail remove

5) Terminal Connection Diagrams



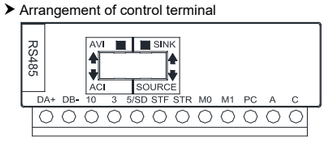
Note 1: VFC3-043-0.4K~1.5K, VFC3-023-0.2~1.5K, VFC3-021-0.2~0.75K without +/P and PR terminals.
Note 2: All VFC3 have built-in RFI filters to suppress electromagnetic interference, but to comply with CE regulations, please refer to the relevant instructions in the instruction manual for installation.

6) Main Circuit Wiring and Terminal Specification

Inverter model	Terminal screw specifications	Tightening torque(Kgf.cm)	Recommended wiring specification(mm2) R、S、T	U、V、W	+/P、PR	Grounding Cable	Recommended wiring specification (AWG) R、S、T	U、V、W	+/P、PR	Grounding Cable
VFC3-021-0.2K	M3	4~6	2.5	1.5	---	1.5	14	16	---	16
VFC3-023-0.2K			1.5	1.5	---	1.5	16	16	---	16
VFC3-043-0.4K			1.5	1.5	---	1.5	16	16	---	16
VFC3-021-0.4K			2.5	2.5	---	2.5	14	14	---	14
VFC3-023-0.4K			2.5	2.5	---	2.5	14	14	---	14
VFC3-043-0.75K			2.5	2.5	---	2.5	14	14	---	14
VFC3-021-0.75K			2.5	2.5	---	2.5	14	14	---	14
VFC3-023-0.75K			2.5	2.5	---	2.5	14	14	---	14
VFC3-043-1.5K			2.5	2.5	---	2.5	14	14	---	14
VFC3-023-1.5K			2.5	2.5	---	2.5	14	14	---	14
VFC3-021-1.5K			2.5	2.5	2.5	2.5	14	14	14	14
VFC3-043-2.2K			2.5	2.5	2.5	2.5	14	14	14	14
VFC3-021-2.2K			4	4	4	4	12	12	12	12
VFC3-023-2.2K			4	4	4	4	12	12	12	12
VFC3-043-3.7K			2.5	2.5	2.5	2.5	10	14	14	14
VFC3-043-5.5K			2.5	2.5	2.5	2.5	14	14	14	14
VFC3-023-3.7K			4	4	4	4	12	12	12	12

7) Control Terminal

➤ Arrangement of control terminal



➤ Control terminal description

Terminal type	Terminal name	Function instructions	Terminal specifications
Switch signal input	STF	These four terminals are multifunction digital input, can switch between SINK/SOURCE.	Input impedance:4.7 kΩ Action current:5mA(when 24VDC) Voltage range:10~28VDC Maximum frequency:1kHz
	STR		
	M0		
	M1		
Analog signal input	10	+10.5±0.5V	Maximum current:10mA
	3	0~10V/4~20mA	Input impedance:10kΩ

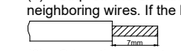
Relay output	A	Multi-function relay output terminals. A-C is normally open contact, C is common terminal.	Maximum voltage:30VDC or 250VAC Maximum current: Resistor load 5A NO/3A NC Inductance load 2A NO/1.2A（cosΦ=0.4）
	C		
Communication terminal	RJ45	RS485, optical coupling isolation RJ45 and "DA+/DB-" can't work at the same time	Distance: up to 500m Bit rate: up to 115200bps
	DA+		
	DB-		
Common terminal	5/SD	Common terminal for terminal STF,STR,M0, M1,3（SINK）	---
	PC	Common terminal for terminal STF,STR,M0, M1（SOURCE）	---

Note1：When connecting control terminal to external devices, please pay attention to the voltage and current specifications of terminals to avoid damaging the inverter.
Note2：The function of the control terminal is decided by inverter parameters, please refer to Instruction Manual for setting.
Note3：Please pay attention to polarity when connect to external power and devices.

➤ Wiring method

· Wire connection

For the control circuit wiring, strip off the sheath of a cable, and use it with a blade terminal. For a single wire, strip off the sheath of the wire and apply directly.
Insert the blade terminal or the single wire into a socket of the terminal.
(1) Strip off the sheath for the below length. If the length of the sheath peeled is too long, a short circuit may occur with neighboring wires. If the length is too short, wires might come off.

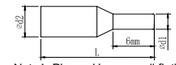


(2) Crimp the blade terminal

Insert wires to a blade terminal, and check that the wires come out for about 0 to 0.5 mm from a sleeve.
Check the condition of the blade terminal after crimping. Do not use a blade terminal of which the crimping is inappropriate, or the face is damaged.

· Please do use blade terminals with insulation sleeve. Blade terminals commercially available:

Cable gauge (mm²)	Blade terminals model	L (mm)	d1 (mm)	d2 (mm)	Manufacturer	Tool type
0.3	AI 0,25-6 WH	10.5	0.8	2	Phoenix Contact Co., Ltd.	CRIMPFOX 6
0.5	AI 0,5-6 WH	12	1.1	2.5		
0.75	AI 0,75-6 GY	12	1.3	2.8		
0.75 (for two wires)	AI-TWIN 2×0,75-6 GY	12	1.3	2.8		



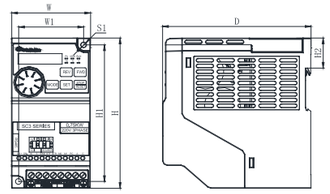
Note1: Please Use a small flathead screw driver (tip thickness: 0.6mm, width:3.0mm). If a flathead screwdriver with a narrow tip is used, terminal block maybe damaged.
Note2: Tightening torque is 3.2~4.8kgf.cm, too large tightening torque can cause crew slippage, too little tightening torque can cause a short circuit or malfunction.

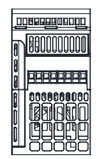
➤ Wiring Precautions

- After wiring, wire offcuts must not be left in the inverter.
  Wire offcuts can cause an alarm, failure or malfunction. Always keep the inverter clean. When drilling mounting holes in an enclosure etc., please make sure no medal scraps enter the inverter.
- To prevent a malfunction due to noise, keep the signal cables 10 cm (3.94 inches) or more away from the power cables, and keep it away from the input/output side.
- Set the voltage/current input switch correctly. Incorrect setting may cause a fault, failure or malfunction.

8) Appearance and Dimensions

➤ Frame A

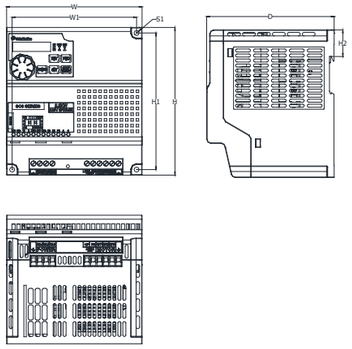




unit：mm

Model	W	W1	H	H1	H2	D	S1
VFC3-021-0.2K	68	56	132	120	26.5	128	5 (tighten torque 20~25kgf.cm)
VFC3-021-0.4K							
VFC3-021-0.75K							
VFC3-023-0.2K							
VFC3-023-0.4K							
VFC3-023-0.75K							
VFC3-023-1.5K							
VFC3-043-0.4K							
VFC3-043-0.75K							
VFC3-043-1.5K							

➢ Frame B



unit：mm

Model	W	W1	H	H1	H2	D	S1
VFC3-021-1.5K	136	125	147	136	26.5	128	5 (tighten torque 20~25kgf.cm)
VFC3-021-2.2K							
VFC3-023-2.2K							
VFC3-023-3.7K							
VFC3-043-2.2K							
VFC3-043-3.7K							
VFC3-043-5.5K							

9) Optional Equipment

Category	Name	Description	Order code
Keypad	PU301	LED display	SNKPU301
	DU06	LED display	SNKDU06
	DU08	LED display	SNKDU08
	PU302	LED display	SNKPU302
	DU10	LED display	SNKDU10

10) Parameter group

➢ System Parameter Group 00

Group	No.	Name	Setting Range	Default	User Setting
00-00	P.90	Inverter model	Read only	---	
00-01	P.188	Firmware version	Read only	---	
00-02	P.996 ~ P.999	Parameter restoration	0: Off 1: Clear alarm history (P.996=1) 2: Reset inverter (P.997=1) 3: Restore all parameters to default (P.998=1) 4: Restore some parameters to default 1 (P.999=1) 5: Restore some parameters to default 2 (P.999=2) 6: Restore some parameters to default 3 (P.999=3)	0	
00-03	P.77	Selection of parameters write protection	0: Parameters can be written only when the motor stops. 1: Parameters cannot be written. 2: Parameters can also be written when the motor is running. 3: Parameters cannot be read when in password protection.	0	
00-04	P.294	Password parameter	0~65535	0	
00-05	P.295	Password setup	2~65535	0	
00-06	P.110	Built-in keypad monitor selection	X0：When inverter starts, built-in keypad enters monitor mode automatically, screen displays output frequency (with slip compensation). X1：When inverter starts, built-in keypad displays target frequency. X2：When inverter starts，built-in keypad enters monitor mode automatically, screen displays steady state output frequency X3：When inverter starts, built-in keypad enters monitor mode automatically, screen displays current pressure and feedback pressure of the constant pressure system in percentage X4：When inverter starts, built-in keypad doesn't enter monitor mode but enter the previous mode before power off X5：When inverter starts，built-in keypad enters monitor mode automatically, screen displays current pressure and feedback pressure of the constant pressure system 4X: When the inverter is on standby, the operation panel automatically enters the target frequency range and the value flashes	2	
00-07	P.161	Multi-function display	0: Output AC voltage (V) 1: DC bus voltage. (V) 2: Inverter temperature rising accumulation rate (%) 3: Target pressure of the constant pressure system (%) 4: Feedback pressure of the constant pressure system (%) 5: Running frequency (Hz) 6: Electronic thermal accumulation rate (%) 7：Reserved 8: Signal value (mA) of 3-5 input terminals (mA/V). 9: Output power (kW). 10：Reserved	0	
00-07	P.161	Multi-function display	11: Forward reverse rotation signal. Built-in keypad: Frd is forward，rEv is reverse，STOP is not operating status. External keypad:1 is forward , 2 is reverse, 0 is not operating status.. 12: NTC temperature (℃) 13：Motor electronic thermal accumulation rate (%) 14~18：Reserved 19: Digital terminal input state 20: Digital terminal output state 21: Actual working carrier frequency	0	
00-08	P.37	Speed display	0：Display output frequency(not mechanical speed) 0.1~5000.0 1~50000	0.0	
00-09	P.259	Speed display unit selection	X0: Speed display unit is 1 X1: Speed display unit is 0.1	1	
00-10	P.59	Built-in keypad set target frequency selection	XXX0: Use wheel on built-in keypad or external keypad to set frequency XXX1: Use keypad knob on external keypad to set frequency X0XX: After changing the frequency, it will be automatically stored within 30s X1XX: After changing the frequency, it will be automatically saved within 10s X2XX: Every frequency change will not save 0XXX: Set frequency will work immediately when use wheel on built-in keypad 1XXX: Set frequency will work after pressing SET when use up down button on built-in keypad	---	
00-11	P.72	Carrier frequency	1~15kHz	5 kHz	
00-12	P.31	Soft-PWM carrier function selection	0: Off 1: When 00-11(P.72)<5,Soft-PWM is on(only apply to V/F control) 2 : When 00-11(P.72)＞9, if the IGBT temperature is higher than 60°c, carrier frequency will decrease automatically, when temperature go back to under 40°c, carrier frequency go back to 00-11(P.72) value	0	
00-13	P.71	Idling brake / DC brake	0: Idling brake 1: DC brake	1	
00-14	P.75	Stop function selection	0: Press STOP button and inverter stop running in PU and H2 mode 1: Press STOP button and inverter stop running in all mode.	1	
00-15	P.78	Prevent forward/reverse rotation selection	0: Forward/reverse rotation are both permitted. 1: Prevent reverse rotation (Giving reverse signal decelerates and stops the motor). 2: Prevent forward rotation (Giving forward signal decelerates and stops the motor).	0	
00-16	P.79	Operation mode selection	0: "PU mode", "external mode" and "Jog mode" are interchangeable. 1: "PU mode" and "JOG mode" are interchangeable. 2: "External mode" only 3: "Communication mode" only 4: "Combined mode 1" 5: "Combined mode 2" 6: "Combined mode 3" 7: "Combined mode 4" 8: "Combined mode 5"	0	
00-17	P.97	Second target frequency selection	0: Frequency set by built-in keypad 1: Frequency set by RS485 communication 2: Frequency set by analog input	0	
00-19	P.35	Communication mode selection	0: In communication mode, run signal and frequency is given by communication. 1: In communication mode, run signal and frequency is given by external signal.	0	
00-21	P.300	Motor control mode selection	0: Induction motor V/F control 1. Reserved 2 : Induction motor simple vector control	0	
00-24	P.189	50Hz/60Hz switch selection	0: Frequency related parameter default value is 60Hz. 1: Frequency related parameter default value is 50Hz.	0 1	
00-25	P.990	Parameter display mode setting	0: Parameter is displayed in "group mode" 1: Parameter is displayed in "sequence P mode"	0	

➢ Basic Parameter Group 01

Group	No.	Name	Setting Range	Default	User Setting
01-00	P.1	Maximum frequency	0.00～01-02（P.18）Hz	120.00Hz	
01-01	P.2	Minimum frequency	0～120.00Hz	0.00Hz	
01-02	P.18	High-speed maximum frequency	01-00（P.1）～650.00Hz	120.00Hz	
01-03	P.3	Base frequency	50Hz system setting: 0～650.00Hz	50.00Hz	
			60Hz system setting: 0～650.00Hz	60.00Hz	
01-04	P.19	Base voltage	0～1000.0V	99999	
			99999: Change according to the input voltage		
01-05	P.29	Acceleration/deceleration curve selection	0: Linear acceleration /deceleration curve 1: S shape acceleration /deceleration curve 1 2: S shape acceleration /deceleration curve 2 3: S shape acceleration /deceleration curve 3	0	
01-06	P.7	Acceleration time	0～360.00s/0～3600.0s：3.7Kw and below	5.00s	
			0～360.00s/0～3600.0s：5.5Kw model	10.00s	
01-07	P.8	Deceleration time	0～360.00s/0～3600.0s：3.7Kw and below	5.00s	
			0～360.00s/0～3600.0s：5.5Kw model	10.00s	
01-08	P.21	Acceleration/deceleration time increments	0: Time increment is 0.01s 1: Time increment is 0.1s	0	
01-09	P.20	Acceleration/deceleration reference frequency	50Hz system setting: 1.00～599.00Hz	50.00Hz	
			60Hz system setting: 1.00～599.00Hz	60.00Hz	
01-10	P.0	Torque boost	0～30.0%：0.75K and under	6.0%	
			0～30.0%：1.5K～3.7K	4.0%	
			0～30.0%：5.5Kw model	3.0%	
01-11	P.13	Starting frequency	0～60.00Hz	0.50Hz	
01-12	P.14	Load pattern selection	0: For constant torque loads (conveyor belt, etc.) 1: For variable torque loads (fans and pumps, etc.) 2、3: For Lifting loads 4: Multipoint V/F curve 5~13: Special two-point V/F curve	0	
01-13	P.15	JOG frequency	0～650.00Hz	5.00Hz	
01-14	P.16	JOG Acc/ Dec time	0～360.00s/0～3600.0s	0.50s	
01-15	P.28	Output frequency filter time	0～31	0	
01-16	P.91	Frequency jump 1A	0～650.00Hz	99999	
			99999: Off		
01-17	P.92	Frequency jump 1B	0～650.00Hz	99999	
			99999: Off		
01-18	P.93	Frequency jump 2A	0～650.00Hz	99999	
			99999: Off		
01-19	P.94	Frequency jump 2B	0～650.00Hz	99999	
			99999: Off		
01-20	P.95	Frequency jump 3A	0～650.00Hz	99999	
			99999: Off		
01-21	P.96	Frequency jump 3B	0～650.00Hz	99999	
			99999: Off		
01-22	P.44	Second acceleration time	0～360.00s/0～3600.0s	99999	
			99999: Off		
01-23	P.45	Second deceleration time	0～360.00s/0～3600.0s	99999	
			99999: Off		
01-24	P.46	Second torque boost	0～30.0%	99999	
			99999: Off		
01-25	P.47	Second base frequency	0～650.00Hz	99999	
			99999: Off		
01-26	P.98	Middle frequency 1	0～650.00Hz	3.00Hz	
01-27	P.99	Output voltage 1 of middle frequency	0～100.0%	10.0%	
01-28	P.162	Middle frequency 2	0～650.00Hz	99999	
			99999: Off		
01-29	P.163	Output voltage 2 of middle frequency	0～100.0%	0.0%	
01-30	P.164	Middle frequency 3	0～650.00Hz	99999	
			99999: Off		
01-31	P.165	Output voltage 3 of middle frequency	0～100.0%	0.0%	
01-32	P.166	Middle frequency 4	0～650.00Hz	99999	
			99999: Off		
01-33	P.167	Output voltage 4 of middle frequency	0～100.0%	0.0%	
01-34	P.168	Middle frequency 5	0～650.00Hz	99999	
			99999: Off		
01-35	P.169	Output voltage 5 of middle frequency	0～100.0%	0.0%	
01-36	P.255	S curve time at the beginning of acceleration	0～25.00s/0～250.0s	0.20s	
01-37	P.256	S curve time at the end of acceleration	0～25.00s/0～250.0s	99999	
			99999: Off		
01-38	P.257	S curve time at the beginning of deceleration	0～25.00s/0～250.0s	99999	
			99999: Off		
01-39	P.258	S curve time at the end of deceleration	0～25.00s/0～250.0s	99999	
			99999: Off		
01-40	P.219	Remote function acc/dec time selection	0 : Use default acc/dec time（same as regular mode）	0	
			1 : Use second acc/dec time		

➢ Analog Input and Output Parameter Group 02

Group	No.	Name	Setting Range	Default	User Setting
02-06	P.185	Proportional linkage gain	0～100%	0%	
02-07	P.240	Auxiliary frequency	0: Off 2: Output frequency = basic frequency + auxiliary frequency (given by terminal 3-5) 4: Output frequency = basic frequency - auxiliary frequency (given by terminal 3-5) 6: Output frequency = proportional linkage signal (given by terminal 3-5)	0	
02-10	P.60	Terminal 3-5 filter time	0～2000ms	31ms	
02-20	P.17	Terminal 3-5 signal range selection	0: Signal sampling range from 4~20mA. 1: Signal sampling range from 0～10V. 2: Signal sampling range from 0～5V.	1	
02-21	P.39	Terminal 3-5 maximum operation frequency	50 Hz system:1.00～599.00Hz	50.00Hz	
			60 Hz system:1.00～599.00Hz	60.00Hz	
02-24	P.184	Terminal 3-5 disconnect selection	0: Off 1: Inverter decelerates to 0Hz, multi-function digital output terminal set off alarm 2: Inverter stops immediately, and keypad displays "AErr" alarm 3: Inverter runs continuously according to the frequency command before disconnection. Digital output terminal will set off alarm.	0	
02-25	P.198	Terminal 3-5 minimum input current/ voltage	0～20.00 mA /V	0.00V	
02-26	P.199	Terminal 3-5 maximum input current/ voltage	0～20.00 mA/ V	10.00V	
02-27	P.196	Percentage corresponds to terminal 3-5 minimum input current/ voltage	0～100.0%	0.0%	
02-28	P.197	Percentage corresponds to terminal 3-5 maximum input current/ voltage	0～100.0%	100.0%	
02-52	P.56	Inverter rated current display level	0~500.00A	According to kw	
02-61	P.141	Polarity of percentage corresponds to terminal 3-5 current/ voltage signal	0~11	0	

➢ Digital Input/ Output Parameter Group 03

Group	No.	Name	Setting Range	Default	User Setting
03-00	P.83	Terminal STF input function	0: STF(Inverter runs forward) 1: STR(Inverter runs reverse) 2: RL(Multi-speed low speed) 3: RM(Multi-speed medium speed) 4: RH(Multi-speed high speed) 5: Reserved	0	
03-00	P.83	Terminal STF input function	6: External thermal relay actuate 7: MRS(Stops inverter output immediately) 8: RT(Inverter second function) 9: EXJ(External JOG) 10：STF+EXJ 11：STR+EXJ 12：STF+RT 13：STR+RT 14：STF+RL 15：STR+RL 16：STF+RM 17：STR+RM 18：STF+RH 19：STR+RH 20：STF+RL+RM 21：STR+RL+RM 22：STF+RT+RL 23：STR+RT+RL 24：STF+RT+RM 25：STR+RT+RM 26：STF+RT+RL+RM 27：STR+RT+RL+RM 28: RUN(Inverter runs forward) 29: STF/STR(use with RUN signal, when ON, motor runs reverse ; when OFF, motor runs forward) 30: RES(External reset function) 31: STOP(Use as three line control with RUN signal and STF-STR signal) 32: REX(Extend multi-speed to 16 levels) 33: PO(In "external mode", run programmed operation) 34: RES_E (External reset, valid only when alarm.) 35: MPO (In "external mode" run manual cycle operation.) 36: TRI(Triangle wave function) 37：Reserved 38：Reserved 39: STF/STR +STOP (Use with RUN signal, when ON, motor runs	0	

			reverse, when OFF, motor stops then runs forward.)		
			40: P_MRS (Stops inverter output immediately by pulse signal input)		
			41~42：Reserved		
			43: RUN_EN (Enable digital input terminal operation)		
			44: PID_OFF (Enable digital input terminal turning off PID)		
			45: Second frequency command source mode		
			46~91:Reserved		
			92: Fire mode command 1 (with run command)		
			93: Fire mode command 2 (without run command)		
03-01	P.84	Terminal STR input function	Same as 03-00	1	
03-03	P.80	Terminal M0 input function	Same as 03-00	2	
03-04	P.81	Terminal M1 input function	Same as 03-00	3	
03-11	P.85	Terminal A-C output function	0: RUN(Output when inverter running)	5	
			1: SU(Output when reach target frequency)		
			2: FU(Output when reach 03-21 03-22 value)		
			3: OL(Output when overload)		
			4: OMD(Output when output current is zero)		
			5: ALARM(Output when alarm)		
			6: PO1(Output when in program operation step)		
			7: PO2(Output when in program operation cycle)		
			8: PO3(Output when in program operation pause)		
			9：Reserved		
			10：Reserved		
			11：OMD1(Output when output current is zero 1)		
			12 ：OL2(Output when over torque)		
			13～16：Reserved		
			17: RY(Output when inverter is powered on and no alarm)		
			18: Output when it's time for maintenance		
			41: PID feedback line break (AErr) alarm		
			42: Fire mode indication		
03-14	P.87	Digital input logic	0～15	0	
03-15	P.88	Digital output logic	0：Terminal A-C output positive logic	0	
			2：Terminal A-C output negative logic		
03-16	P.120	Output signal delay time	0～3600.0s	0.0s	
03-17	P.157	Digital input terminal filter time	0～2000	4	
03-18	P.158	Digital input terminal enable when power on	0: When power on digital terminals work directly	0	
			1: When power on digital terminals work after switch off then on		
03-20	P.41	Output frequency detection sensitivity	0～100.0%	10.0%	
03-21	P.42	Output frequency detection for forward rotation	0～650.00Hz	6.00Hz	
03-22	P.43	Output frequency detection for reverse rotation	0～650.00Hz	99999	
			99999: Same as the setting of 03-21(P.42)		
03-23	P.62	Zero current detection level	0～200.0%	5.0%	
			99999: Off		
03-24	P.63	Zero current detection time	0.05～100.00s	0.50s	
			99999: Off		

➢ Multi-speed Parameter Group 04

Group	No.	Name	Setting Range	Default	User Setting
04-00	P.4	Speed 1 (high speed)	0～650.00Hz	60.00Hz	
04-01	P.5	Speed 2 (medium speed)	0～650.00Hz	30.00Hz	
04-02	P.6	Speed 3 (low speed)	0～650.00Hz	10.00Hz	
04-03	P.24	Speed 4	0～650.00Hz	99999	
			99999: Off		
04-04	P.25	Speed 5	Same as 04-03(P.24)	99999	
04-05	P.26	Speed 6	Same as 04-03(P.24)	99999	
04-06	P.27	Speed 7	Same as 04-03(P.24)	99999	
04-07	P.142	Speed 8	Same as 04-03(P.24)	0.00Hz	
04-08	P.143	Speed 9	Same as 04-03(P.24)	99999	
04-09	P.144	Speed 10	Same as 04-03(P.24)	99999	
04-10	P.145	Speed 11	Same as 04-03(P.24)	99999	
04-11	P.146	Speed 12	Same as 04-03(P.24)	99999	
04-12	P.147	Speed 13	Same as 04-03(P.24)	99999	
04-13	P.148	Speed 14	Same as 04-03(P.24)	99999	
04-14	P.149	Speed 15	Same as 04-03(P.24)	99999	
04-15	P.100	Programmed operation minute / second selection	0: Select minute as the time increment.	1	
			1: Select second as the time increment.		
04-16	P.121	Run direction in each section	0～255	0	
04-17	P.122	Programmed operation cycle selection	0:Off	0	
			1～8: Start cycle from the set section.		
04-18	P.123	Programmed operation acceleration / deceleration time setting selection	0:Acceleration time is 01-06(P.7), deceleration time is 01-07(P.8).	0	
			1:Acceleration and deceleration time is set by 04-35(P.111)～04-42(P.118).		
04-19	P.131	Programmed operation mode speed 1	0～650.00Hz	0.00Hz	
04-20	P.132	Programmed operation mode speed 2	0～650.00Hz	0.00Hz	
04-21	P.133	Programmed operation mode speed 3	0～650.00Hz	0.00Hz	
04-22	P.134	Programmed operation mode speed 4	0～650.00Hz	0.00Hz	
04-23	P.135	Programmed operation mode speed 5	0～650.00Hz	0.00Hz	
04-24	P.136	Programmed operation mode speed 6	0～650.00Hz	0.00Hz	
04-25	P.137	Programmed operation mode speed 7	0～650.00Hz	0.00Hz	
04-26	P.138	Programmed operation mode speed 8	0～650.00Hz	0.00Hz	
04-27	P.101	Programmed operation mode speed 1 operating time	0～6000.0s	0.0s	
04-28	P.102	Programmed operation mode speed 2 operating time	0～6000.0s	0.0s	
04-29	P.103	Programmed operation mode speed 3 operating time	0～6000.0s	0.0s	
04-30	P.104	Programmed operation mode speed 4 operating time	0～6000.0s	0.0s	
04-31	P.105	Programmed operation mode speed 5 operating time	0～6000.0s	0.0s	
04-32	P.106	Programmed operation mode speed 6 operating time	0～6000.0s	0.0s	
04-33	P.107	Programmed operation mode speed 7 operating time	0～6000.0s	0.0s	
04-34	P.108	Programmed operation mode speed 8 operating time	0～6000.0s	0.0s	
04-35	P.111	Programmed operation mode speed 1 Acc/Dec time	0～600.00s/0～6000.0s	0.00s	
04-36	P.112	Programmed operation mode speed 2 Acc/Dec time	0～600.00s/0～6000.0s	0.00s	
04-37	P.113	Programmed operation mode speed 3 Acc/Dec time	0～600.00s/0～6000.0s	0.00s	
04-38	P.114	Programmed operation mode speed 4 Acc/Dec time	0～600.00s/0～6000.0s	0.00s	
04-39	P.115	Programmed operation mode speed 5 Acc/Dec time	0～600.00s/0～6000.0s	0.00s	
04-40	P.116	Programmed operation mode speed 6 Acc/Dec time	0～600.00s/0～6000.0s	0.00s	
04-41	P.117	Programmed operation mode speed 7 Acc/Dec time	0～600.00s/0～6000.0s	0.00s	
04-42	P.118	Programmed operation mode speed 8 Acc/Dec time	0～600.00s/0～6000.0s	0.00s	

➢ Motor Parameter Group 05

Group	No.	Name	Setting Range	Default	User Setting
05-00	P.301	Motor specifications automatic measurement	0: Off	0	
			1: Induction motor specifications automatic measurement (Run motor to measure)		
			2: Induction motor specifications automatic measurement (Don't run motor to measure)		
			3: Induction motor specifications automatic measurement (Measure when operating)		
05-01	P.302	Motor rated power	0～160.00kW	0.00kW	
05-02	P.303	Motor poles	0～48	4	
05-03	P.304	Motor rated voltage	0～510V	380V/440V	
				220V	
05-04	P.305	Motor rated frequency	50Hz system：0～650.00Hz	50.00Hz	
			60Hz system：0～650.00Hz	60.00Hz	
05-05	P.306	Motor rated current	0~500.0A	According to kw	
05-06	P.307	Motor rated rotation speed	50Hz system：0～9998r/min	1410r/min	
			60Hz system：0～9998r/min	1710r/min	
05-07	P.308	Motor excitation current	0~500.0A	According to kw	
05-08	P.309	IM motor stator resistance	0～99.98Ω	According to kw	

➢ Protection Parameter Group 06

Group	No.	Name	Setting Range	Default	User Setting
06-00	P.9	Electronic thermal relay capacity	0~500.00A	0.00A	
06-01	P.22	Stall prevention operation level	0～250.0%	150.0%	
06-02	P.23	Stall prevention operation level correction factor	0～200.0%	99999	
			99999: Stall prevention operation level is the setting value of 06-01(P.22).		
06-03	P.66	Stall prevention operation reduction starting frequency	50Hz system: 0～650.00Hz	50.00Hz	
			60Hz system: ：0～650.00Hz	60.00Hz	
06-05	P.30	Regenerative brake selection	0: Brake duty is fixed at 3%, parameter 06-06(P.70) will be off.	0	
			1: Brake duty is 06-06(P.70) value.		
06-06	P.70	Special regenerative brake duty	0～100.0%	0.0%	
06-08	P.155	Over torque detection level	0～200.0%	0.0%	
06-09	P.156	Over torque detection time	0～60.0s	1.0s	
06-10	P.260	Action when detect over torque	0: OL2 alarm will not be reported after over torque detection, and inverter keeps running.	1	
			1: OL2 alarm will be reported after over torque detection, and inverter stops.		
06-12	P.245	Cooling fan working mode	0 :When running turn on the fan, after stop for 30 seconds turn off the fan.	1	
			1：When power on turn on the fan, after power off turn off the fan.		
			2：When running and the heat sink temperature exceeds 60℃ turn on the fan, under 40℃ turn off the fan.		
			3：When the heat sink temperature exceeds 60℃ turn on the fan, under 40℃ turn off the fan.		
06-13	P.281	Input phase loss protection	0: Off	0	
			1: When input phase loss, built-in keypad shows IPF alarm and inverter stops		
06-17	P.261	Maintenance alarm function	0: Off	0	
			1～9998day: Used to set the time for maintenance alarm output signal		
06-18	P.280	Short circuit to ground protection function when start	0：Off	0	
			1：Detect short circuit to ground when inverter start		
06-19	P.282	GF detection level when operating	0～100%	50%	
06-27	P.292	Total inverter operation time (minutes)	0～1439 min	0 min	
06-28	P.293	Total inverter operation time (days)	0～9999 day	0 day	
06-29	P.296	Total inverter power on time (minutes)	0～1439 min	0 min	
06-30	P.297	Total inverter power on time (days)	0～9999 day	0 day	
06-40	P.288	Alarm record code query	Choose 0～12 recorded alarm	0	
06-41	P.289	Alarm record code display	Read only	Read only	
06-42	P.290	Alarm record message query	Choose 0～10 recorded alarm	0	
06-43	P.291	Alarm record message display	Read only	Read only	
06-84	P.207	Fire mode	XXX0:Off (fire mode off (normal mode)	0	
			XXX1:Forward operation (inverter runs forward in fire mode)		
			XXX2:Reverse operation (inverter runs reverse in fire mode)		
			0XXX:Manual exit fire mode 1 (after the fire mode terminal function is off, manually reset inverter to go to normall mode)		
			1XXX:Auto exit fire mode (after the fire mode terminal function is off, inverter automatically return to normal mode)		
			2XXX: Manual exit fire mode 2 (after the fire mode terminal function is off, The inverter continues to keep running, manually reset inverter to go to normall mode)		
06-85	P.208	Fire mode frequency	0~650.00Hz	60.00Hz	
06-88	P.209	Fire mode cumulate times	Read only	Read only	

➢ Communication Parameter Group 07

Group	No.	Name	Setting Range	Default	User Setting
07-00	P.33	Communication protocol selection	0: Modbus protocol	1	
			1: Proprietary protocol		
07-01	P.36	Inverter communication station number	0～254	0	
07-02	P.32	Serial communication baud rate	0：Baud rate:4800bps	1	
			1：Baud rate:9600bps		
			2：Baud rate:19200bps		
			3：Baud rate:38400bps		
			4：Baud rate:57600bps		
			5：Baud rate:115200bps		
07-03	P.48	Data length	0：8bit	0	
			1：7bit		
07-04	P.49	Stop bit length	0：1bit	0	
			1：2bit		
07-05	P.50	Parity check selection	0: No parity check	0	
			1: Odd		
			2: Even		
07-06	P.51	CR/LF selection	1: CR only	1	
			2: Both CR and LF		
07-07	P.154	Modbus communication format	0：1、7、N、2 (Modbus, ASCII)	4	
			1：1、7、E、1 (Modbus, ASCII)		
			2：1、7、O、1 (Modbus, ASCII)		
			3：1、8、N、2 (Modbus, RTU)		
			4：1、8、E、1 (Modbus, RTU)		
			5：1、8、O、1 (Modbus, RTU)		
			6：1、8、N、1 (Modbus, RTU)		
07-08	P.52	Number of communication retries	0～10	1	
07-09	P.53	Communication interval allowed time	0~999.8s: Checking communication timeout with the set value	99999	
			99999: No timeout check		
07-10	P.153	Communication alarm action	0: Alarm and stop freely	0	
			1: No alarm and continuing to operation		
07-11	P.34	EEPROM write-in selection	0: When writing parameters in communication mode, write in RAM and EEPROM	0	
			1: When writing parameters through communication, only write into RAM		

➢ PID Parameter Group 08

Group	No.	Name	Setting Range	Default	User Setting
08-00	P.170	PID function selection	0: Off	0	
			2:Parameter 08-03(P.225) as target value, terminal 3-5 current/voltage input as feedback source		
			3: The target value is given by the multi-speed, terminal 3-5 current/voltage input as feedback source		
08-01	P.171	PID feedback control method	0: Negative feedback control.	0	
			1: Positive feedback control.		
08-03	P.225	PID target value from keypad	0～08-43（P.251）	20.0%	
08-04	P.172	Proportional gain	1~100	20	
08-05	P.173	Integral time	0～100.0s	1.0s	
08-06	P.174	Differential time	0～1000ms	0ms	
08-07	P.175	Abnormal deviation	0～100.0%	0.0%	
08-08	P.176	Abnormal duration time	0～600.0s	30.0s	
08-09	P.177	Abnormal processing mode	0: Stop freely	0	
			1: Slow down to stop		
			2: Alarm and continue operation		
08-10	P.178	Sleep detection deviation	0～100.0%	0.0%	
08-11	P.179	Sleep detection duration time	0～255.0s	1.0s	
08-12	P.180	Wake-up level	0～100.0%	90.0%	
08-13	P.181	Stop level	0～120.00Hz	40.00Hz	
08-14	P.182	Upper integral limit	50Hz system:0～120.00Hz	50.00Hz	
			60Hz system:0～120.00Hz	60.00Hz	
08-15	P.183	Deceleration step length when stable	0～10.00Hz	0.50Hz	
08-18	P.223	Analog feedback signal bias	0～100.0%	0.0%	
08-19	P.224	Analog feedback signal gain	0～100.0%	100.0%	
08-43	P.251	PID pressure unit (Bar) setting	1.0~100.0	100.0	
08-45	P.253	Analog signal feedback loss detection time	0.0~600.0s	0.0s	
08-46	P.254	Analog signal feedback loss action selection	0：Alarm AErr and inverter stop freely	0	
			1：Slow down to stop then alarm AErr		
			2：Alarm AErr and continue operation		

➢ Application Parameter Group 10

Group	No.	Name	Setting Range	Default	User Setting
10-00	P.10	DC brake operating frequency	0～120.00Hz	3.00Hz	
10-01	P.11	DC brake operating time	0～60.0s	0.5s	
10-02	P.12	DC brake operating voltage	0～30.0%	4.0%	
10-03	P.151	Zero-speed control function selection	0: Off.	0	
			1: DC voltage braking		
10-04	P.152	Voltage at zero-speed control	0～30.0%	5.0%	
10-05	P.242	DC brake before inverter start	0: Off	0	
			1: Before starting operate DC brake first.		
10-06	P.243	DC brake time before inverter start	0～60.0s	0.5s	
10-07	P.244	DC brake voltage before inverter start	0～30.0%	4.0%	
10-08	P.150	Restart mode selection	X0：No frequency search.	0	
			X1：Reserved		
			X2：Decrease voltage mode		
			0X：Power on once.		
			1X：Start each time.		
			2X：Only instantaneous stop and restart		
			3X：Only valid when the fire mode is reset		
10-09	P.57	Restart idling time	0～30.0s	99999	
			99999: Off.		
10-10	P.58	Restart rising time	0～60.0s：	10.0s	
10-11	P.61	Remote control function	0: Off	0	
			X1：Remote control function, frequency save in memory		
			X2：Remote control function, frequency won't save		
			X3：Remote control function, frequency won't save, clear frequency setting every time STF/STR "turn off".		
			X4: Remote control function, frequency save in memory every 5s		
			1X:Frequency command range 01-01(P.2)~01-00(P.1), frequency command value from RH,RM setting		
10-12	P.65	Auto reset function	0: Off.	0	
			1: When over-voltage, inverter will reset.		
			2: When over-current, inverter will reset.		
			3: When either over-voltage or over-current, inverter will reset.		
			4: When any alarm occurs, inverter will reset.		
10-13	P.67	Auto reset times	0: Off.	0	
			1～10: If the alarm exceeds 10-13(P.67) times, inverter will not reset.		
10-14	P.68	Auto reset waiting time	0～360.0s	6.0s	
10-15	P.69	Auto reset times count	Read only	0	
10-16	P.119	Forward and reverse rotation dead time	0～3000.0s	0.0s	
10-17	P.159	Energy-saving control function	0: Off.	0	
			1: Energy-saving mode.		
10-18	P.229	Dwell function selection	0: Off.	0	
			1: Backlash compensation function.		
			2: Acceleration and deceleration interrupt waiting function.		
10-19	P.230	Dwell frequency at acceleration	0～650.00Hz	1.00Hz	
10-20	P.231	Dwell time at acceleration	0～360.0s	0.5s	
10-21	P.232	Dwell frequency at deceleration	0～650.00Hz	1.00Hz	
10-22	P.233	Dwell time at deceleration	0～360.0s	0.5s	

10-23	P.234	Triangular wave function selection	0: Off. 1: If terminal function TRI is triggered, triangular wave function will on. 2: Triangular wave function is on at all time.	0	
10-24	P.235	Maximum amplitude	0～25.0%	10.0%	
10-25	P.236	Amplitude compensation at deceleration	0～50.0%	10.0%	
10-26	P.237	Amplitude compensation at acceleration	0～50.0%	10.0%	
10-27	P.238	Amplitude acceleration time	0～360.00s/0～3600.0s	10.00s	
10-28	P.239	Amplitude deceleration time	0～360.00s/0～3600.0s	10.00s	
10-46	P.268	Voltage stall level	220V：155～400V	380V	
			440V：310～800V	760V	
10-55	P.226	Reciprocating machine function selection	0：Off 1：Turn on reciprocating machine function	0	
10-56	P.227	Reciprocating forward limit time	0~3600.0s	0.0s	
10-57	P.228	Reciprocating reverse limit time	0~3600.0s	0.0s	

➢ Speed control parameter group 11

Group	No.	Name	Setting Range	Default	User Setting
11-00	P.320	Slip compensation gain	0~200%	85%	
11-01	P.321	Torque boost filter coefficient	0~2000	20	
11-02	P.322	Cutoff frequency point of current filter time 1	0~30.00Hz	4.00Hz	
11-03	P.323	Current filter time 1	0~400.00ms	20.00ms	
11-04	P.324	Low frequency current filter time 2	0~400.00ms	1.00ms	
11-05	P.325	High frequency current filter time 2	0~400.00ms	36.00ms	

➢ Special Adjustment Parameter Group 13

Group	No.	Name	Setting Range	Default	User Setting
13-00	P.89	Slip compensation coefficient	0～10	0	
13-03	P.286	High frequency vibration suppression factor	0～15	0	

➢ User Parameter Group 15

Group	No.	Name	Setting Range	Default	User Setting
15-00	P.900	User registered parameter 1	P parameter mode:0～399 Parameter group mode：00-00~13-99	99999	
15-01	P.901	User registered parameter 2		99999	
15-02	P.902	User registered parameter 3		99999	
15-03	P.903	User registered parameter 4		99999	
15-04	P.904	User registered parameter 5		99999	
15-05	P.905	User registered parameter 6		99999	
15-06	P.906	User registered parameter 7	P parameter mode:0～399 Parameter group mode：00-00~13-99	99999	
15-07	P.907	User registered parameter 8		99999	
15-08	P.908	User registered parameter 9		99999	
15-09	P.909	User registered parameter 10		99999	
15-10	P.910	User registered parameter 11		99999	
15-11	P.911	User registered parameter 12		99999	
15-12	P.912	User registered parameter 13		99999	
15-13	P.913	User registered parameter 14		99999	
15-14	P.914	User registered parameter 15		99999	
15-15	P.915	User registered parameter 16		99999	
15-16	P.916	User registered parameter 17		99999	
15-17	P.917	User registered parameter 18		99999	
15-18	P.918	User registered parameter 19		99999	
15-19	P.919	User registered parameter 20		99999	

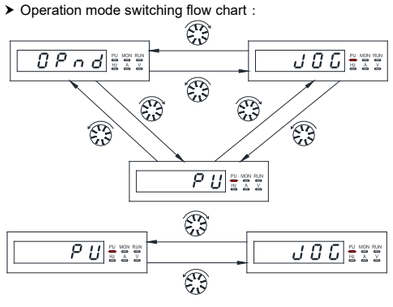
11) Switching Parameter Mode

➢VFC3 series classify parameters according to functions, and default displayed as “Group Mode”

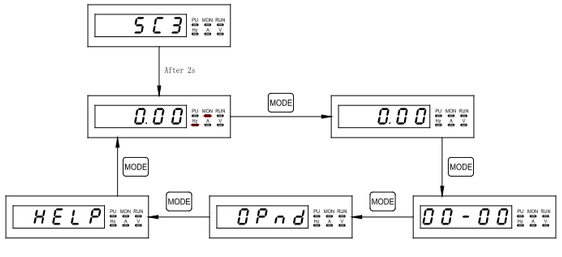
➢ If users prefer to display as “P.xxx” mode, please set parameter 00-25 as “1”, and parameters will be displayed as “Traditional P Mode”.

12) Parameter Setting Flow chart

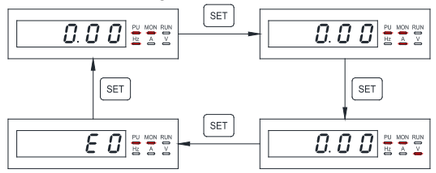
➢ Operation mode switching flow chart：



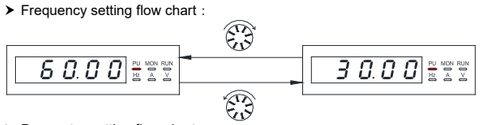
➢ Work mode switching flow chart：



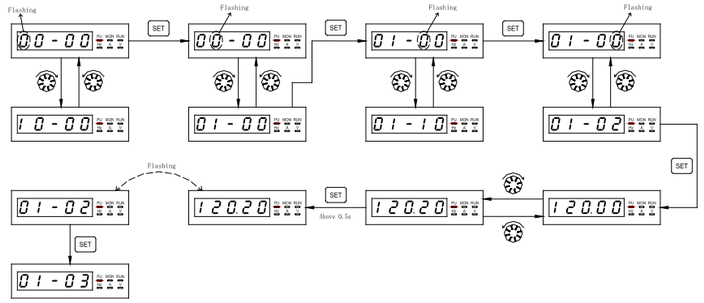
➢ Monitor mode switching flow chart：



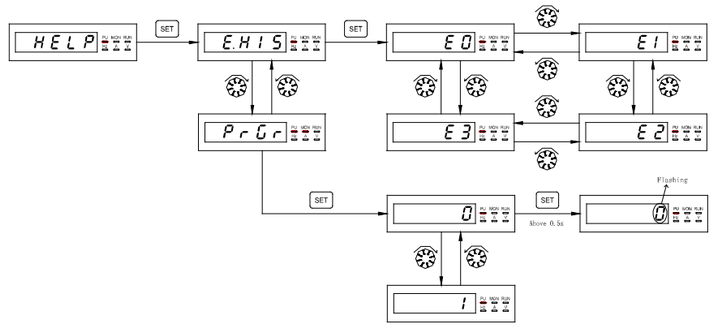
➢ Frequency setting flow chart：



➢ Parameter setting flow chart：



➢ HELP mode flow chart：



13) Others

➢ To improve our products, the parameters and contents may be modified, please contact the agent or refer to Sit Automation websites (http://www.sitautomation.it) to download the latest version.

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