Introduction

independent R& D technologies, featuring high quality, multifunction, low frequency, high torque and flux vector control, quick torque response, good load adaptability, reliable operation, high accuracy and reliability, provided with functions as as automatic parameter tuning, zero-servo null-speed sensor, vector control and V/F control switch, perfect user password protection, quick menu design, rotation speed tracking, built-in PID controller, signal setting / feedback disconnection monitoring & switching, underload protection, fault signal tracking, automatic restart upon fault, built-in braking unit, 25 fault protection modes, fault monitoring, different I/O terminals, different speed setting modes, automatic voltage adjustment, wobble frequency control and multi-speed control, can help to increase the power factor and efficiency as much as possible and meet requirement of different load to motion control. The keyboard is provided with a LED for display of running data and fault codes. The LCD can show state information and operation description in Chinese and help to copy and download parameters; The powerful background commissioning and monitoring software can be used through the built-in standard RS485 interface network; The MODBUS bus protocol and expansion card are compatible with on-site bus control such as PROFIBUS, DEVICENET and CANOPEN etc.

Application:

OEM machinery: Machinery used for textile industry, plastics industry, food industry, printing industry, package industry, carpentry, winding, mining and hoisting etc.

Heavy industry: Industries such as metallurgy, chemical industry, cement, electric power, coal, petroleum, paper making, water supply, heating & ventilation and sewage treatment etc.

Feature

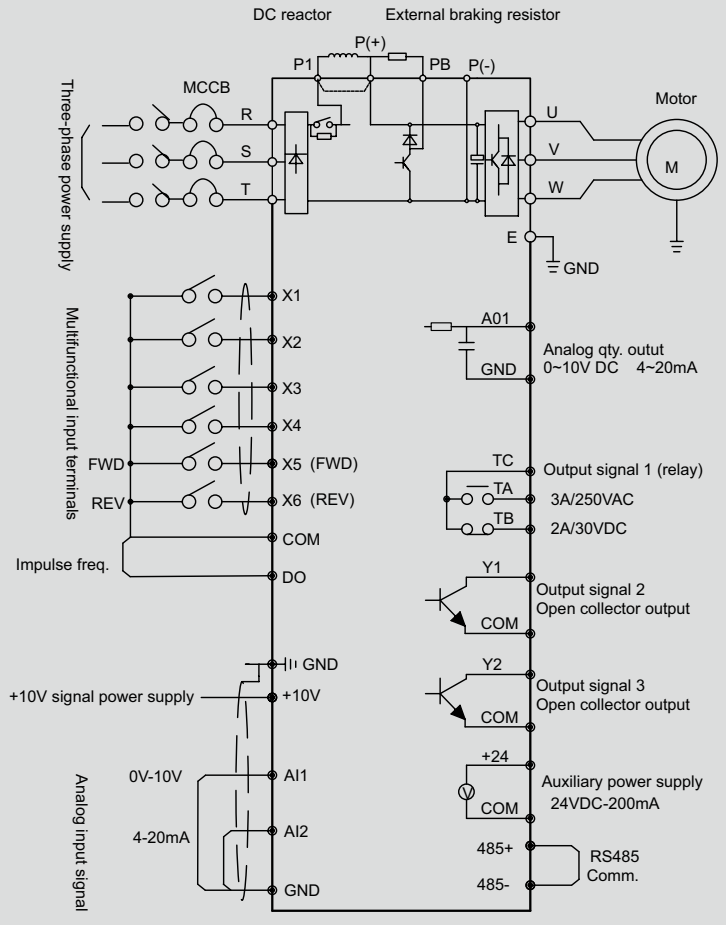
2.1. Multiple control modes, good versatility.
2.2. Automatic identification of motor parameter.
2.3. 150% torque output under 0.5Hz.
2.4. Powerful low speed / reliable high speed running.
2.5. Null-speed torque output.
2.6. Silent running.
2.7. Trip control, realizing powerful and stable running.
2.8. Quick menu design.
2.9. Easy PLC, PID adjustment.
2.10. Built-in flexible PWM power consumption brake for quick shutdown.
2.11. Compact and handy structure.
2.12. Customized design with good stability and high anti-interference ability
2.13. Built-in RS-485 communication interface, standard MODBUS protocol.
2.14. 25 protection modes.

Technical specification

	Item	Spec.
Input	Rated voltage / freq.	380V or 220V 50Hz/60Hz
	Variable volt range	Variation range: ≤ % 20% voltage unbalance rate: < 3% freq. range: < ± 5%
Output	Voltage	0~380V or 0~220V
	Freq.	0~600Hz
	Overload capacity	G type: 150% rated current-1min, 180% -1s, 200%-instantaneous protection P type: 120% rated current -1min, 150% -1s, 180% - instantaneous protection
Main control	Control mode	Standard V/F control, flux vector control
	Modulation mode	Space voltage vector PWM modulation
	Speed control range	1:50
	Start torque	≥ 150% rated torque under 2.0Hz
	Freq. accuracy	Digital setting: max. freq. x ± 0.01% Analog setting: max. freq. X ± 0.2%
	Freq. resolution	Digital setting: 0.01Hz analog setting: max. freq. x 0.05%
	Torque increase	Automatic torque increase, manual torque increase 0.1%~30.0%
	V/F curve	Three modes: One customized V/F curve, quadratic V/F curve and linear V/F curve
	Acc. / dec. curve	Three modes: Linear acc. / dec. S-shaped acc./dec.; four acc./dec. durations, optional time unit (min/s), the longest duration: 60h
	DC braking	Initial freq. for shutdown DC braking: 0.00Hz~max. output freq. Braking duration: 0.0~30.0s Braking current: 0.0%~100.0% rated current
	Automatic voltage regulation (AVR)	When the grid voltage changes, the constant output voltage can be kept
	Slip comp.	Available slip setting can help to compensate speed change caused by load, realizing higher speed control accuracy
	Automatic current limiting	Automatic current limiting during operation, preventing fault trip caused by frequent overcurrent
	Overvoltage stall	Automatic voltage limiting during operation, preventing fault trip caused by deceleration overvoltage
Customized function	Textile wobble freq.	Textile wobble freq. control, realizing fixed wobble freq. and variable wobble freq.
	Freq. combination	The running command channels and freq. setting channels can combine at random
	Length setting	Length reaching shutdown, max. length: 65.535KM
	Inching	Inching freq. range: 0.00 Hz~max. output freq.; Inching acc./dec. duration: 0.1~3600.0s, settable; inching interval: 0.1~3600.0s, settable
	Multi-speed running	Multi-speed running through PLC or control terminals

	Item	Spec.
	Built-in closed- loop process control	A closed-loop control system can be formed easily
Running function	Running command channel	Operation panel, control terminal and serial port setting switchable through different ways
	Freq. setting channel	Digital setting, analog voltage setting, analog current setting, impulse setting, serial port setting, terminal setting and multi-speed setting switchable through different ways.
	Auxiliary freq. setting	Free auxiliary freq. trimming and synthesis
	Impulse output terminal	0 ~ 50kHz rectangular impulse signal output, realizing output of set freq. and output freq. etc.
	Analog output terminal	One line analog signal output, 0/4 ~ 20mA or 0/2 ~ 10V optional, realizing output of set freq. and output freq. etc.
Operating panel	LED display	61 types of parameters such as set freq., output freq., output voltage and output current etc. can be displayed
	LCD display	Optional, Chinese / English guidance
	Parameter copy	Quick upload and download of parameters through the operation panel are allowed
	Key function selection	Part of the keys can be customized for fear of misoperation
Environment	Protection	Open-phase protection (optional), overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection and underload protection etc.
	Place	Indoor, free from direct light, dust, corrosive gas, inflammable gas, oil mist, steam, water drop or salt etc.
	Altitude	The rated value shall be lowered for places with the altitude being over 1000m. 10% of the rated value shall be lowered per 1000m
	Ambient temp.	-10℃ ~ + 40℃ (the rated value shall be lowered when the ambient temp. is within 40℃ ~ 50℃)
	Humidity	5% ~ 95% RH, without condensate
	Vibration	Below 5.9m / (0.6g)
	Storage temp.	-40℃ ~ + 70℃
Struc-ture	Protection class	IP 20
	Cooling mode	Air cooling, with fan control
	Efficiency	45kW or lower ≥ 93%; 55kW or higher ≥ 95%

Wiring diagram for basic running



Basic wiring schematic of FC

11. Function parameter list

11.1 Description of symbols in the code list

"○" : Parameter modifiable during running;

"×" : Parameter unmodifiable during running;

"◆" : Read-only parameter, unmodifiable.

11.2 Function code list

F0 System Management Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F0.00	User PW	0~65535	1	0	○
F0.01	Agent PW (kept)	0~65535	1	0	○
F0.02	Selection of menu modes (only available for LCD keyboard)	0: Full menu mode (all parameters will be shown) 1: Calibration of menu mode(only set parameters which are different from factory settings will be shown)	1	0	○
F0.03	Parameter initialization	0: no operation 1: Factory setting reset 1 (except for those of the control mode and motor) 2: Factory setting reset 2 (reset of all parameters) 3: Fault record clearance	1	0	×
F0.04	Parameter write protection	0: All parameters modifiable (some parameters unmodifiable during running) 1: Only set freq. parameter modifiable 2: All parameters unmodifiable Note: Unavailable for this parameter and F0.00 parameter.	1	0	○
F0.05	Parameter copy (only available for LCD keyboard)	0: No operation 1: The function parameters of this machine can be uploaded to the keyboard 2: All function parameters can be downloaded to this machine 3: All function parameters except for those of the motor can be downloaded to this machine	1	0	×
F0.06	Key setting	LED ones place: M-FUNC key function 0: JOG 1: FWD/ REV rotation switching 2: Clear ▲ / ▼ freq. setting LED tens place: STOP key function selection 0: All modes available 1: Only available for keyboard control 2: Only unavailable for keyboard control 3: Only unavailable for comm. control LED hundreds place: STOP+RUN shortcut function 0: No function 1: Free shutdown LED thousands place: Keyboard locking 0: not allowed 1: All locked 2: All locked except STOP/RESET	1	0100	×
F0.07	Accumulated running time (min)	0~59	1	-	◆
F0.08	Accumulated running time (h)	0~65535	1	-	◆
F0.09	Accumulated power-on time (h)	0~65535	1	-	◆
F0.10	FC power	0.10~655.35KW	0.01KW	Model setting	◆
F0.11	Software used for main controller	1.00~99.99	0.01	1.02	◆
F0.12	Software used for keyboard	1.00~99.99	0.01	1.01	◆

11.3 Function code list

F1 Basic Running Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F1.00	Selection of control mode	0: Standard V/F control 1: Flux vector control	1	0	×
F1.01	Selection of running com. channel	0: Keyboard running com. channel 1: Terminal running com. channel 2: Communication running com. channel	1	0	○
F1.02	Selection of fixed main freq. channel A	0: Digital setting 1, adjustment through " ▲ / ▼ " of operation panel or digital encoder 1: Digital setting 2, adjustment through Terminal UP / DOWN 2: Digital setting 3, comm. setting 3: AI1 analog setting (0 ~ 10V) 4: AI2 analog setting (0~20mA) 5: Terminal impulse setting (0 ~ 50KHz) 6: Easy PLC setting 7: Multi-speed setting 8: PID setting 9: Selection of external terminal	1	0	○
F1.03	Selection of auxiliary freq. setting channel B	00: No auxiliary setting 1: Digital setting 1, adjustment through " ▲ / ▼ " of operation panel or digital encoder 2: Digital setting 2, adjustment through Terminal UP / DOWN 3: Digital setting 3, comm. setting 4: AI1 analog setting (0 ~ 10V) 5: AI2 analog setting (0~20mA) 6: Terminal impulse setting (0 ~ 50KHz)	1	0	○
F1.04	Operation rule selection of main / auxiliary freq. setting channel	0: K1* A + K2* B 1: K1* A - K2* B 2: K1* A - K2* B for absolute value 3: Higher value from the two channels as the set freq. 4: Lower value from the two channels as the set freq. 5: Non-zero value from the two channels available, value from Channel A preferred	1	0	○
F1.05	Digital freq. control	LED ones place: Storage after power-off 0: Storage required 1: Storage not required LED tens place: Freq. keeping after shutdown 0: Storage required 1: Storage not required LED hundreds place: Blank LED thousands place: Blank Note: Only available when F1.02=0, 1, F1.03=1, 2	1	00	○
F1.06	Setting of running freq. 1	0.00~Upper freq. limit	0.01Hz	50.00	○
F1.07	Setting of running freq. 2	0.00~Upper freq. limit	0.01Hz	50.00	○
F1.08	Max. output freq.	MAX (50.00, upper freq. limit) ~ 600.00 Hz	0.01Hz	50.00	×
F1.09	Upper freq. limit	【F1.10】~【F1.08】	0.01Hz	50.00	×
F1.10	Lower freq. limit	0.00~【F1.09】	0.01Hz	0.00	×
F1.11	Weight coefficient K1 of Channel A	0.01~99.99	0.01	1.00	○
F1.12	Weight coefficient K2 of Channel B	0.01~99.99	0.01	1.00	○
F1.13	Running direction setting	0: FWD rotation 1: REV rotation 2: REV rotation prevention	1	0	○
F1.14	Acc. duration 1	0.1~3600.0s Note: The default unit is second; see F2.23 for selection of acc. / dec. duration unit	0.1s	Model setting	○
F1.15	Dec. duration 1		0.1s	Model setting	○
F1.16	Setting of carrier wave freq.	0.4~7.5KW 7.5K 1.0~10.0KHz 11~30KW 6.0K 1.0~10.0KHz 37~75KW 4.0K 1.0~8.0KHz 90~315KW 2.0K 1.0~8.0KHz	0.1KHz	Model setting	○

11.4 Function code list

F2 Auxiliary Running Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F2.00	Starting mode	0: By starting freq. 1: By speed tracking	1	0	×
F2.01	Starting freq.	Starting freq. duration	0.01Hz	1.00	○
F2.02	Starting freq. duration	0.0~10.0s	0.1s	0.0	×
F2.03	Starting DC braking current	0.0~100.0%	0.1%	0.0%	○
F2.04	Starting DC braking duration	0.0: No DC braking happens within 0.1~30.0s	0.1s	0.0	×
F2.05	Acc. / dec. mode	0: Linear acc. / dec. 1: S-shaped curve acc. / dec.	1	0	○
F2.06	Prop. regarding S-shaped curve staring time	10.0~50.0%	0.1%	20.0%	×
F2.07	Prop. regarding S-shaped curve ending time	10.0~50.0%	0.1%	20.0%	×
F2.08	Shutdown mode	0: Shutdown by dec. 1: Free shutdown	1	0	×
F2.09	Initial freq. for shutdown DC braking	0.00~【F1.08】	0.01Hz	0.00	○
F2.10	Shutdown DC braking current	0.0~100.0%	0.1%	0.0%	○
F2.11	Shutdown DC braking duration	0.0: No DC braking happens within 0.1~30.0s	0.1s	0.0	×
F2.12	Blank	—	—	0	◆
F2.13	Setting of FWD rotation inching freq.	0.00~50.00Hz	0.01Hz	10.00	○
F2.14	Setting of REV rotation inching freq.	0.00~50.00Hz	0.01Hz	10.00	○
F2.15	Inching acc. duration	0.1~3600.0 Note: The default unit is second; see F2.23 for selection of acc. / dec. duration unit	0.1s	10.0	○
F2.16	Inching dec. duration		0.1s	10.0	○
F2.17	Acc. duration 2	0.1~3600.0 Note: The default unit is second; see F2.23 for selection of acc. / dec. duration unit	0.1s	10.0	○
F2.18	Dec. duration 2		0.1s	10.0	○
F2.19	Acc. duration 3		0.1s	10.0	○
F2.20	Dec. duration 3		0.1s	10.0	○
F2.21	Acc. duration 4		0.1s	10.0	○
F2.22	Dec. duration 4		0.1s	10.0	○
F2.23	Unit used for acc./ dec. duration	0: Second 1: Minute	1	0	○
F2.24	Blank	—	—	0	◆
F2.25	Hopping freq. 1	0.00~upper freq. limit	0.01Hz	0.00	○
F2.26	Hopping freq. 2	0.00~upper freq. limit	0.01Hz	0.00	○
F2.27	Hopping freq. 3	0.00~upper freq. limit	0.01Hz	0.00	○
F2.28	Hopping range	0.00~10.00Hz	0.01Hz	0.00	○
F2.29	Treatment under lower freq. limit	0: Running under lower freq. limit 1: Null-speed running	1	0	×
F2.30	Dead zone duration for FWD/ REV rotation	0.0~10.0s	0.1s	0.0	×
F2.31	FWD/ REV rotation switching mode	0: Switching after zero-freq. 1: Switching after starting freq.	1	0	×
F2.32	Selection of freq. display resolution	0: Two digits after decimal point 1: One digit after decimal point 2: Ones place	1	0	○

11.5 Function code list

F3 VF Control Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F3.00	V/F curve setting	0: Linear curve 1: Quadratic curve 2: User-defined V/F curve (determined by F3.01 ~ F3.08)	1	0	×
F3.01	V/F freq. F1	0.0 ~ freq. value F2	0.01Hz	10.00	×
F3.02	V/F volt value V1	0.0 ~ volt value V2	0.1%	20.0%	×
F3.03	V/F freq. F2	Freq. value F1 ~ freq. value F3	0.01Hz	20.00	×
F3.04	V/F volt value V2	Voltage value V1 ~ voltage value V3	0.1%	40.0%	×
F3.05	V/F freq. F3	Freq. value F2 ~ freq. value F4	0.01Hz	30.00	×
F3.06	V/F volt value V3	Voltage value V2 ~ voltage value V4	0.1%	60.0%	×
F3.07	V/F freq. F4	Freq. value F3 ~ max. output freq.	0.01Hz	40.00	×
F3.08	V/F volt value V4	Voltage value V3~voltage value V3 100%*Route(rated voltage of motor)	0.1%	80.0%	×
F3.09	Torque increase selection	0: Manual 1: Automatic (not available under standard V/F mode)	1	0	×
F3.10	Manual torque increase amount	0.0 ~ 30.0% Note: Only available under F3.09=0	0.1%	Model setting	○
F3.11	Freq. for stopping manual torque increase	0.00~50.00Hz	0.01Hz	10.00	×
F3.12	Blank	—	—	0	◆

11.6 Function code list

F4 Motor Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F4.00	Selection of FC model(load type)	0: G type(constant torque load) 1: P type(quadratic torque load)	1	0	×
F4.01	Rated volt of motor	380V：200~500V 220V：100~250V	1V	380 220	×
F4.02	Rated cur. of motor	0.1~999.9A	0.1A	Model setting	×
F4.03	Rated speed of motor	0~36000RPM	1RPM	Model setting	×
F4.04	Rated freq. of motor	1.00~600.00Hz	0.01Hz	Model setting	×
F4.05	No-load cur. of motor	0.1~999.9A	0.1A	Model setting	×
F4.06	Stator resistance of motor	0.001~10.000Ω	0.001Ω	Model setting	×
F4.07	Blank	—	—	0	◆
F4.08	Blank	—	—	0	◆
F4.09	Blank	—	—	0	◆
F4.10	Parameter-tuning of motor	0: No operation 1: Static tuning (stator resistance measuring) 2: Full tuning(stator resistance and no-load current measuring)2	1	0	×

11.7 Function code list

F5 Performance Optimization Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F5.00	Selection of AVR function	0: Not allowed 1: Always available 2: Only available for dec.	1	2	×
F5.01	Selection of overmoduation	0: Not allowed 1: Available	1	0	×
F5.02	Oscillation suppression coef.	0~255	1	Model setting	○
F5.03	Selection of carrier wave mode	LED ones place: PWM mode 0: PWM mode 1 1: PWM mode 2 2: PWM mode 3 LED tens place: Blank LED hundreds place: Blank LED thousands place: Blank	1	0	×
F5.04	Blank	—	—	0	◆
F5.05	Selection of null-speed control function	0: Without output duration 1: DC voltage control	1	0	×
F5.06	Null-speed control voltage setting	0.0~30.0%	0.1%	5.0%	×
F5.07	Slip freq. comp. under VF control	0.0~150.0%	0.1%	0.0%	○
F5.08	Energy-saving running	0: Not allowed 1: Smart mode running (blank) 2: Running based on set energy-saving control coef.	1	0	×

F5 Performance Optimization Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F5.09	Energy-saving control system	0~10	1	0	×
F5.10	Blank	—	—	0	◆
F5.11	Flux comp. coef. 1	0.5~2.0	0.1	1.0	×
F5.12	Flux comp. coef. 2	0.5~2.0	0.1	1.0	×
F5.13	Cutoff point of flux comp. coef.	1.00~6.00Hz	0.01Hz	3.00	×
F5.14	Scale factor of closed-loop flux	0.01~5.00	0.01	1.00	○
F5.15	Integration time constant of closed-loop flux	0.01~10.00s	0.01s	1.00	○
F5.16	Blank	0.00~50.00Hz	0.01Hz	0	×
F5.17	Blank	—	—	0	◆

11.8 Function code list

F6 Switching Value Input / Output					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F6.00	Function of input terminal X1	0: Control port idle 1: Multi-speed selection SS1 2: Multi-speed selection SS2 3: Multi-speed selection SS3 4: Multi-speed selection SS4 5: Acc. / dec. duration TT1 6: Acc. / dec. duration TT2 7: Main freq. channel selection 1 8: Main freq. channel selection 2 9: Main freq. channel selection 3 10: Main freq. channel selection 4 11: Running com. channel selection 1 12: Running com. channel selection 2 13: Blank 14: FWD rotation inching control 15: REV rotation inching control 16: Forward rotation control (FWD) 17: Reversal rotation control (REV) 18: Free shutdown control 19: Freq. scaleup com. (UP) 20: Freq. scaledown com. (DOWN) 21: Fault input of external equipment 22: Blank 23: Three-wire running control 24: Shutdown DC braking com. 25: Counter triggering signal 26: Counter reset signal 27: Timer triggering signal 28: Timer reset signal 29: External reset signal input (RST) 30: Terminal UP / DOWN freq. reset 31: Freq. source switching to A 32: Freq. source switching to K1 * A 33: Freq. source switching to K1 * A + K2 * B 34: Keyboard-oriented running com. 35: Terminal-oriented running com. 36: Communication-oriented running com. 37: Blank 38: Bland 39: PID pause 40: Blank 41: PLC pause 42: Wobble freq. Running 43: Wobble freq. cancellation 44: Wobble freq. Reset 45: External shutdown com. 46: Acc. / dec. cancellation com. 47: Impulse freq. input (only available for X7) 48: Blank 49: Length counting input (only available for X7) 50: Length reset input 51: Blank	1	0	×
F6.01	Function of input terminal X2		1	0	×
F6.02	Function of input terminal X3		1	0	×
F6.03	Function of input terminal X4		1	29	×
F6.04	Function of input terminal X5/ function of FWD		1	16	×
F6.05	Function of input terminal X6/ function of REV		1	17	×
F6.06	Function of input terminal X7		1	47	×
F6.07	FWD / REV terminal control mode	0: Double-wire type control mode 1 1: Double-wire type control mode 2 2: Three-wire type control mode 1 3: Three-wire type control mode 2	1	0	×
F6.08	Terminal function testing under electrification	0: Terminal running com. unavailable under electrification 1: Terminal running com. available under electrification	1	0	×
F6.09	Switching value filtering times	1~10	1	5	○
F6.10	Terminal UP/DOWN mod. rate	0.01Hz~99.99Hz/s	0.01Hz/s	1.00	○

F6 Switching Value Input / Output					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F6.11	Setting of output terminal Y1 of open collector	0: Indication during running of FC 1: Indication during null-speed of FC 2: FC ready for running 3: Signal of freq./speed ready(FAR) 4: Freq./speed degree testing signal 1(FDT1) 5: Freq. / speed degree testing signal 2 (FDT2) 6: Shutdown due to fault of external equipment 7: Upper output freq. Limit 8: Lower output freq. Limit 9: Pre-alarm signal for motor overload 10: Pre-alarm signal for FC overload 11: Counter testing output 12: Counter reset output 13: FC fault 14: Shutdown due to undervoltage 15: Upper / lower wobble freq. Limit 16: Prog. multi-speed stage running completed 17: Single prog. multi-speed period running completed 18: Preset time expires 19: Upper length limit reaches 20: Overvoltage preventing 21: Blank 22: Blank	1	0	○
F6.12	Setting of output terminal Y2 of open collector		1	1	○
F6.13	Programmable relay output		1	13	○
F6.14	Freq. meeting the FAR testing amplitude	0.00Hz~15.0Hz	0.01Hz	5.00	○
F6.15	FDT1 level setting	0.00Hz~upper freq. limit	0.01Hz	10.00	○
F6.16	FDT1 lagged value	0.00~30.00Hz	0.01Hz	1.00	○
F6.17	FDT2 level setting	0.00Hz~upper freq. limit	0.01Hz	20.00	○
F6.18	FDT2 lagged value	0.00~30.00Hz	0.01Hz	1.00	○
F6.19	Overload pre-alarm level	20~120%	1%	100%	○
F6.20	Overload pre-alarm delay	0.0~15.0s	0.1s	1.0	○
F6.21	Selection of counting mode	0: Upward counting 1: Downward counting	1	0	○
F6.22	Setting for reset value of counter	【F6.23】~65535	1	1	○
F6.23	Setting for testing value of counter	0~【F6.22】	1	1	○
F6.24	Timer setting	0~65535s	1s	0	○
F6.25	Blank	—	—	0	◆

11.9 Function code list

F7 Analog and Impulse Input / Output Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F7.00	Blank	—	—	0	◆
F7.01	AI1 lower input voltage limit	0.00~【F7.02】	0.01V	0.00	○
F7.02	AI1 upper input voltage limit	【F7.01】~10.00V	0.01V	10.00	○
F7.03	Corresponding lower limit setting of AI1	-100.0%~100.0%	0.1%	0.0%	○
F7.04	Corresponding upper limit setting of AI1	-100.0%~100.0%	0.1%	100.0%	○
F7.05	AI2 lower input voltage limit	0.00~【F7.06】	0.01V	0.00	○
F7.06	AI2 upper input voltage limit	【F7.05】~10.00V	0.01V	10.00	○
F7.07	Corresponding lower limit setting of AI2	-100.0%~100.0%	0.1%	0.0%	○
F7.08	Corresponding upper limit setting of AI2	-100.0%~100.0%	0.1%	100.0%	○
F7.09	Lower input freq. limit of external impulse	0.00~【F7.10】	0.01KHz	0.00	○
F7.10	Upper input freq. limit of external impulse	【F7.09】~50.00kHz	0.01KHz	20.00	○
F7.11	Corresponding lower limit setting of external impulse	-100.0%~100.0%	0.1%	0.0%	○
F7.12	Corresponding upper limit setting of external impulse	-100.0%~100.0%	0.1%	100.0%	○
F7.13	Filtering duration constant for analog input signals	0.1~5.0s	0.1s	0.5	○

F7 Analog and Impulse Input / Output Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F7.14	Zero-freq. threshold	0.00~10.00V	0.01V	0.00	×
F7.15	Zero-freq. return diff.	0.00~10.00V	0.01V	0.00	×
F7.16	Selection of AO1 analog qty. output terminal function	0: Output freq. (before slip comp.) 1: Output freq. (after slip comp.) 2: Set freq.	1	0	○
F7.17	Blank	3: Output current 4: Synchronous speed of motor 5: Actual speed of motor (estimated) 6: Output voltage	—	0	◆
F7.18	Selection of DO impulse output terminal function	7: Bus voltage 8: AI1 9: AI2 10: External input impulse freq. 11: Output torque	1	10	○
F7.19	Selection of analog output range	LED ones place: Selection of AO1 output 0: 0 ~ 10V or 0 ~ 20mA 1: 2 ~ 10V or 4 ~ 20mA LED tens place: Selection of AO1 / DO output 0: DO available 1: AO1 available LED hundreds place: Blank LED thousands place: Blank	1	10	○
F7.20	Setting of AO1 gain	0.0%~100.0%	0.1%	100%	○
F7.21	Blank	—	—	0	◆
F7.22	Lower freq. limit of DO output	0.00~50.00KHz	0.01KHz	0.00	○
F7.23	Upper freq. limit of DO output	0.00~50.00KHz	0.01KHz	20.00	○

11.10 Function code list

F8 Process PID Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F8.00	PID function setting	LED ones place: Selection of PID setting channel 0: Digital setting 1: AI1 2: AI2 LED tens place: Selection of PID feedback channel 0: AI1 1: AI2 2: Terminal impulse 3: AI1 + AI2 4: AI1 - AI2 5: MIN (AI1, AI2) 6: MAX (AI1, AI2) LED hundreds place: PID regulation characteristics 0: Positive 1: Negative LED thousands place: Integral control selection 0: When the freq. reaches the upper / lower limit, the integral control will stop 1: When the freq.reaches the upper / lower limit, the integral will go on	1	0000	×
F8.01	Setting of given digital qty.	0.00~10.00V	0.01V	0.00	○
F8.02	Feedback channel gain	0.01~10.00	0.01	1.00	○
F8.03	Proportional gain	0.01~10.00	0.01	1.00	○
F8.04	Integration time Ti	0.1~200.0s	0.1s	1.0	○
F8.05	Differential time Td	0.0: Without differential, 0.1~10.0s	0.1s	0.0	○
F8.06	Sampling period T	0.00: Automatic, 0.01~10.00s	0.01s	0.00	○
F8.07	Deviation limit	0.0~20.0%	0.1%	0.0%	○
F8.08	Closed loop preset freq.	0.0~max. output freq.	0.01Hz	0.00	○
F8.09	Duration of preset freq.	0.0~6000.0s	0.1s	0.0	×
F8.10	Sleep threshold	0.00~10.00V	0.01	10.00	○
F8.11	Wake threshold	0.00~10.00V	0.01	0.00	○
F8.12	Sleep duration	1.0~6000.0s	0.1s	100.0	○
F8.13	Wake duration	1.0~6000.0s	0.1s	100.0	○
F8.14	Blank	—	—	0	◆

11.11 Function code list

F9 Programmable Running Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F9.00	Programmable running control (easy PLC running)	LED ones place: Selection of running mode 0: Single cycle 1: Continuous cycle 2: Keeping final value after single cycle LED tens place: Starting mode 0: Restart from the first stage 1: Start from stage since shutdown (fault) 2: Start from stage and freq. since shutdown (fault) LED hundreds place: Storage selection after power-off 0: Storage not required 1: Store LED thousands place: Blank	1	000	○
F9.01	Multi-speed freq. 0	-100%~100%	0.1%	0.0%	○
F9.02	Multi-speed freq. 1	-100%~100%	0.1%	0.0%	○
F9.03	Multi-speed freq. 2	-100%~100%	0.1%	0.0%	○
F9.04	Multi-speed freq. 3	-100%~100%	0.1%	0.0%	○
F9.05	Multi-speed freq. 4	-100%~100%	0.1%	0.0%	○
F9.06	Multi-speed freq. 5	-100%~100%	0.1%	0.0%	○
F9.07	Multi-speed freq. 6	-100%~100%	0.1%	0.0%	○
F9.08	Multi-speed freq. 7	-100%~100%	0.1%	0.0%	○
F9.09	Multi-speed freq. 8	-100%~100%	0.1%	0.0%	○
F9.10	Multi-speed freq. 9	-100%~100%	0.1%	0.0%	○
F9.11	Multi-speed freq. 10	-100%~100%	0.1%	0.0%	○
F9.12	Multi-speed freq. 11	-100%~100%	0.1%	0.0%	○
F9.13	Multi-speed freq. 12	-100%~100%	0.1%	0.0%	○
F9.14	Multi-speed freq. 13	-100%~100%	0.1%	0.0%	○
F9.15	Multi-speed freq. 14	-100%~100%	0.1%	0.0%	○
F9.16	Multi-speed freq. 15	-100%~100%	0.1%	0.0%	○
F9.17	Running duration of Stage 0	0.0~6000s	0.1s	10.0	○
F9.18	Running duration of Stage 1	0.0~6000s	0.1s	10.0	○
F9.19	Running duration of Stage 2	0.0~6000s	0.1s	10.0	○
F9.20	Running duration of Stage 3	0.0~6000s	0.1s	10.0	○
F9.21	Running duration of Stage 4	0.0~6000s	0.1s	10.0	○
F9.22	Running duration of Stage 5	0.0~6000s	0.1s	10.0	○
F9.23	Running duration of Stage 6	0.0~6000s	0.1s	10.0	○
F9.24	Running duration of Stage 7	0.0~6000s	0.1s	10.0	○
F9.25	Running duration of Stage 8	0.0~6000s	0.1s	10.0	○
F9.26	Running duration of Stage 9	0.0~6000s	0.1s	10.0	○
F9.27	Running duration of Stage 10	0.0~6000s	0.1s	10.0	○
F9.28	Running duration of Stage 11	0.0~6000s	0.1s	10.0	○
F9.29	Running duration of Stage 12	0.0~6000s	0.1s	10.0	○
F9.30	Running duration of Stage 13	0.0~6000s	0.1s	10.0	○
F9.31	Running duration of Stage 14	0.0~6000s	0.1s	10.0	○
F9.32	Running duration of Stage 15	0.0~6000s	0.1s	10.0	○

F9 Programmable Running Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
F9.33	Stage acc. / dec. selection 1	LED ones place: Acc. / dec. duration of stage 0, 0~3 LED tens place: Acc. / dec. duration of stage 1, 0~3 LED hundreds place: Acc. / dec. duration of stage 2, 0~3 LED thousands place: Acc. / dec. duration of stage 3, 0~3	0	0000	○
F9.34	Stage acc. / dec. selection 2	LED ones place: Acc. / dec. duration of stage 4, 0~3 LED tens place: Acc. / dec. duration of stage 5, 0~3 LED hundreds place: Acc. / dec. duration of stage 6, 0~3 LED thousands place: Acc. / dec. duration of stage 7, 0~3	0	0000	○
F9.35	Stage acc. / dec. selection 3	LED ones place: Acc. / dec. duration of stage 8, 0~3 LED tens place: Acc. / dec. duration of stage 9, 0~3 LED hundreds place: Acc. / dec. duration of stage 10, 0~3 LED thousands place: Acc. / dec. duration of stage 11, 0~3	0	0000	○
F9.36	Stage acc. / dec. selection 4	LED ones place: Acc. / dec. duration of stage 12, 0~3 LED tens place: Acc. / dec. duration of stage 13, 0~3 LED hundreds place: Acc. / dec. duration of stage 14, 0~3 LED thousands place: Acc. / dec. duration of stage 15, 0~3	0	0000	○
F9.37	Blank	Blank	—	—	◆
F9.38	Wobble freq. running parameter	LED ones place: Function selection 0: Not allowed 1: Available; LED tens place: Wobble freq. running mode 0: Automatic 1: Manual operation based on defined multifunctional terminal; LED hundreds place: Wobble freq. shutdown / start selection 0: Start based on state saved before shutdown 1: Restart; LED thousands place: Wobble freq. storage after power-off 0: Store 1: Storage not required	1	0000	×
F9.39	Center wobble freq.	0.00 ~ max. output freq.	0.01Hz	10.00	○
F9.40	Preset wobble freq.	0.00 ~ max. output freq.	0.01Hz	10.00	○
F9.41	Preset wobble freq. duration	0.0~3600.0s	0.1s	0.0	×
F9.42	Wobble freq. amplitude	0.0~50.0%	0.1%	10.0%	○
F9.43	Jump freq.	0.0 ~ 50.0% (in relation to the wobble freq.)	0.1%	10.0%	○
F9.44	Wobble freq. period	0.1~3600.0s	0.1s	10.0s	○
F9.45	Triangular wave increase duration	0.0 ~ 100.0% (in relation to the wobble freq.)	0.1%	50.0%	○

11.12 Function code list

FA Protection Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
FA.00	Protection setting 1	LED ones place: Selection of motor overload protection 0: Without protection 1: Common motor(with low speed comp.) 2: Variable-freq. Motor; LED tens place: Selection of overvoltage stall prot. 0: Not allowed (with braking resistor) 1: Available LED hundreds place: Selection of current control action 0: Only unavailable for constant speed 1: Available for full process LED thousands place: Selection of input / output open 0: Always unavailable 1: Input available, output unavailable 2: Input unavailable, output available 3: Always available	1	0111	×

FA Protection Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
FA.01	Protection setting 2	LED ones place: Selection of PID feedback disconnection action 0: Prot. action and free shutdown 1: Alarm and keep running under disconnection freq. 2: Alarm and run under dec. -null-speed acc. to set mode; LED tens place: Selection of 485-comm. failure action 0: Prot. action and free shutdown 1: Alarming but running under current state 2: Alarm and stop acc. to set mode; LED hundreds place: Blank; LED thousands place: Blank	1	11	×
FA.02	Overload prot. coef. of motor	30%~110%	1%	100%	×
FA.03	Undervoltage protection level	200~280/360~480V	1V	220/380	×
FA.04	Overvoltage control level	350~380/660~760V	1V	370/720	×
FA.05	Current amplitude control level	120%~220%	1%	160%	×
FA.06	Freq. drop rate during cur. control	0.00~100.00Hz/s	0.01Hz/s	10.00	×
FA.07	Input open phase prot. duration	0.1s~20.0s	0.1s	1.0	×
FA.08	Testing standard for output open phase protection	0%~100%	1%	0%	×
FA.09	Feedback disconnection testing value	0.0~100.0%	0.1%	0.0%	×
FA.10	Feedback disconnection testing duration	0.1~6000.0s	0.1s	10.0	×
FA.11	Blank	—	—	0	◆

11.13 Function code list

FB Supplementary Function Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
FB.00	Selection of energy consumption braking function	0: Unavailable 1: Always available for full process 2: Only available for deceleration	1	2	○
FB.01	Initial volt for energy consumption braking	340~380/660~760V	—	360/700	◆
FB.02	Return diff. volt for energy consumption braking	10~100V	1V	20/40	○
FB.03	Action prop. for energy consumption braking	10~100%	1%	50%	○
FB.04	Cooling fan control	0: Automatic control mode 1: Operation kept under power-on	1	0	○
FB.05	Blank	—	—	0	◆
FB.06	Blank	—	—	0	◆
FB.07	Rotation speed tracking duration	0.1~5.0s	0.1s	1.0	×
FB.08	Selection of speed searching mode	0: Search downward from running speed before tracking 1: Search upward from min. speed	1	0	×
FB.09	Rotation speed tracking state	1~100	1	50	×
FB.10	Rotation speed tracking volt curve	0~4	1	2	×
FB.11	Selection of instantaneous stop / non-stop	0: Not allowed 1: Available	1	0	×
FB.12	Freq. drop rate setting under volt compensation	0.00~100.00Hz/s	0.01Hz/s	10.00	×
FB.13	Blank	—	—	0	◆
FB.14	Automatic fault reset times	0 ~ 10, where 10 indicates times not limited	1	0	×
FB.15	Interval for automatic fault reset	0.5~25.0s	0.1	3.0	×
FB.16	Restart setting after power-off	0: Not allowed 1: Regular start 2: Start with rotation speed tracking	1	0	×
FB.17	Duration for restart after power-off	0.0~20.0s	0.1s	0.5	×
FB.18	Blank	—	—	0	◆

FB Supplementary Function Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
FB.19	Running limitation password	0~65535	1	0	×
FB.20	Selection of running limitation function	0: Unavailable 1: Available	1	0	×
FB.21	Setting of running limitation time	0~65535H	1H	0	×
FB.22	Blank	—	—	0	◆
FB.23	Blank	—	—	0	◆
FB.24	Blank	—	—	0	◆
FB.25	Blank	—	—	0	◆
FB.26	Blank	—	—	0	◆
FB.27	Blank	—	—	0	◆
FB.28	Blank	—	—	0	◆

11.14 Function code list

FC Communication Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
FC.00	Add. of this machine	0 ~ 247, where 0 means broadcast add.s	1	1	×
FC.01	MODBUS comm. configuration	LED ones place: Protocol selection 0: RTU 1: Blank LED tens place: Selection of baud rate; 0: 4800BPS; 1: 9600BPS; 2: 19200BPS; 3: 38400BPS; LED hundreds place: Data format; 0: No parity check; 1: Even parity check; 2: Odd parity check LED thousands place: Comm. response mode; 0: Normal response; 1: Only response to slave machine address; 2: No response	1	0120	×
FC.02	Comm. timeout check duration	0.0~100.0s	0.1s	10.0	×
FC.03	Response delay time of this machine	0~1000ms	1ms	5	×
FC.04	Linkage proportion	0.01~10.00	0.01	1.00	○

11.15 Function code list

FD Monitoring and Display Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
FD.00	Selection of monitoring parameter item under running	0~FFFFH	1	0	○
FD.01	Selection of monitoring parameter item under shutdown	0~FFFFH	1	0	○
FD.02	Cycle display of monitoring parameter	0: Automatic cycle display not allowed 1: Automatic cycle display of all selected item through "▶▶"	1	0	○
FD.03	Linear speed coef.	0.01~100.0	0.01	1.00	○
FD.04	Motor speed display coef.	0.01~100.0	0.01	1.00	○
FD.05	Closed loop display coef	0.01~100.0	0.01	1.00	○

11.16 Function code list

FE Industrial Expansion Parameter					
Function code	Name	Setting range	Min. unit	Default setting	Mod.
FE.00	Length control	0: Not allowed 1: Available	1	0	×
FE.01	Set length	0.000~65.535(KM)	0.001KM	0.000	○
FE.02	Actual length	0.000~65.535(KM)	0.001KM	0.000	○
FE.03	Length scale factor	0.100~30.000	0.001	1.000	○
FE.04	Length calibration coef.	0.001~1.000	0.001	1.000	○
FE.05	Perimeter of gauging spindle	0.10~100.00CM	0.01CM	10.00	○
FE.06	Number of impulses per spindle turn (X7)	1~65535	1	1	○
FE.07	Blank	—	—	0	◆