



# Manual

## FS50L Series

High performance permanent magnet  
synchronous inverter

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### Function & Parameter Table

The functional parameters of FS50L series inverters are grouping by function, total 15 groups from P0~PP. Each functional group includes several function codes. Function codes adopt three-level menu, for example, “P5-03” means 3rd function code of the functions in group P5.

For convenience of setting function codes, while operating with operation panel, function group number corresponding first-level menu, function code number corresponding second-level menu, and function code parameters corresponding third-level menu.

1. Contents note of function table is described as below:

First column “function code”: Functional parameter set and parametric number;

Second column “name”: Full name of functional parameters;

Third column “setting range”: Valid set value range of functional parameters;

Fourth column “factory default”: Original factory default of functional parameters;

Fifth column “modify”: Alteration property of functional parameters (whether or not it is permitted to modify and modification conditions) and the explanations are described as below:

“※”: it means the setting value of this parameter can be modified when inverter is in stop or running state;

“●”: it means the setting value of this parameter cannot be modified when inverter is in running state;

“\*\*”: it means the numerical value of this parameter is practical detection record value, and cannot be modified;

“##”: it means the numerical value of this parameter is “factory parameter”, and is limited to be set by manufacturers. Users are prohibited about such operation.

Sixth column “No. ”: Serial number of this function code in the whole function codes, as well as the store address in communication.

(Inverters have already made automatic inspection constraint about the modification property of all parameters, which can help users to avoid faults in modification.)

2. “Factory default” refers to the numerical value after function code parameters are renovated when you take factory reset operation; but the actually detective parameter values or recorded values won’t be renovated.

3. To make more effective parameter protection, inverters provide password protection for function codes. After users set password (the parameter of user password, F07.00 set to non-0), and press PRGM/ESC to enter into user parameter editing state, the system will enter into user password authorization state, and display “0.0.0.0.”. The manipulator must input user password correctly, or he cannot get access to it. In the unlocked state of password protection, user password can be altered at any time, and user password will be confirmed as the last input numerical value. When F07.00 is set to 0, user password can be canceled; while power on, PP-00 set to non-0, then parameters are protected by password.

4. While function code parameters are altered with serial communications, any functions of user password still keep to above regulations.

**Function & Parameter Table**

Function code	Name	Description(setting range)	Factory Default	Change
Group P0 : Standard Function Parameters				
P0-01	Speed control mode	0: non-PG vector control (SVC) 1: PG vector control (FVC) 2: V/F control	0	●
P0-02	Command source selection	0:keypad control 1:terminal control 2:RS 485 communication control	0	※
P0-10	Max.output frequency	50.00Hz~600.00Hz	50.00Hz	●
P0-12	Run frequency upper limit	F00.05~F00.03 (max.frequency)	50.00Hz	※
P0-14	Run frequency lower limit	0.00Hz~F00.04(run frequency upper limit)	00.00Hz	※
P0-03	Frequency A command selection	0:keypad, no retentive upon power failure 1:keypad, retentive upon power failure 2:analog AI1 3:analog AI2 4:analog AI3 5:pulse (HDI) 6:multi-speed running 7:simple PLC 8:PID control 9:RS485 Communication 10:potentiometer	0	●
P0-04	Frequency B command selection	same as F00.06	0	●
P0-05	Range of frequency B command selection	0: relative to maximum frequency 1: relative to frequency A command	0	※

Function code	Name	Description(setting range)	Factory Default	Change
P0-07	Frequency source combination mode	0: frequency A command 1: frequency B command 2: switch over between frequency A command and frequency B command 3: A+B 4: A-B 5: MAX (A and B) 6: MIN (A and B)	0	※
P0-08	Keypad setting frequency	0.00Hz~F00.03 (max. frequency)	50.00Hz	※
P0-17	Acceleration time 1	0.00s~6500.0s	Model dependent	※
P0-18	Deceleration time 1	0.00s~6500.0s	Model dependent	※
P0-19	Acceleration/Deceleration time unit	0:1s 1: 0.1s 2: 0.01s	1	●
P0-25	Acceleration/Deceleration time base frequency	0:max.frequency ( F00.03 ) 1:setting frequency 2:100Hz	0	●
P0-09	Rotation direction	0: same direction 1: reverse direction	0	※
P0-15	Carrier frequency	0.5kHz~16.0kHz	Model dependent	※
P0-16	Carrier frequency adjustment with temperature	0: No 1: Yes	1	※
P0-11	Source of frequency upper limit	0: set by F00.04 1: analog AI1 2:analog AI2 3:analog AI3 4:pulse(HDI) 5:RS485 communication	0	●
P0-13	Frequency upper limit offset	0.00Hz~max.frequency (F00.03)	00.00Hz	※
P0-26	Base frequency for UP/DOWN modification during running	0: running frequency 1: set frequency	0	●

Function code	Name	Description(setting range)	Factory Default	Change
P0-27	Binding command source to frequency source	Unit digit: (Binding keypad command to frequency source) 0: no binding 1: keypad setting 2: analog AI1 3: analog AI2 4: analog AI3 5: pulse setting (HDI) 6: multi-speed run setting 7: Simple PLC 8: PID control 9: RS485 communication Ten's digit (Binding terminal command to frequency source) Hundred's digit (Binding communication command to frequency source) Thousands digit: (Binding auto-operation command to frequency source)	0000	※
P0-21	Frequency offset of frequency B source during superposition	0.00Hz~max.frequency P0-10	00.00Hz	※
P0-23	Retentive of keypad setting frequency upon power failure	0: no retentive 1: retentive	0	※
PP-01	Function parameter restore	0: no operation 1: restore factory defaults, not include motor parameter 2: clear fault file	0	●

Function code	Name	Description(setting range)	Factory Default	Change
<b>Group P6: Start-stop Control Parameters</b>				
P6-00	Start mode	0: direct start 1: rotational speed tracking restart (valid on V/F control) 2: pre-excited start	0	※
P6-03	Startup frequency	0.00Hz~10.00Hz	0.00Hz	※
P6-04	Startup frequency holding time	0.0s~100.0s	0.0s	●
P6-05	Startup DC braking current/ Pre-excited current	0%~100%	0%	●
P6-06	Startup DC braking time/ Pre-excited time	0.0s~100.0s	0.0s	●
P6-07	Acceleration/ deceleration mode	0: line Acc/Dec time 1: S curve Acc/Dec A 2: S curve Acc/Dec B	0	●
P6-08	Time proportion of S-curve start segment	0.0%~ (100.0%-F01.07)	30.0%	●
P6-09	Time proportion of S-curve end segment	0.0%~ (100.0%-F01.06)	30.0%	●
P6-10	Stop mode	0: deceleration to stop 1: stop freely	0	※
P6-15	Brake usage rate	0%~100%	100%	※

Function code	Name	Description(setting range)	Factory Default	Change
Group P1: Motor Parameters				
P1-01	Rated power of synchronous motor 1	0.1kW~1000.0kW	Model dependent	●
P1-04	Rated frequency of synchronous motor 1	0.01Hz~F00.03 (max. frequency)	Model dependent	●
P1-05	Rated speed of synchronous motor 1	1rpm~65535rpm	Model dependent	●
P1-02	Rated voltage of synchronous motor 1	1V~2000V	Model dependent	●
P1-03	Rated current of synchronous motor 1	0.01A~655.35A (inverter power≤55kW) 0.1A~6553.5A (inverter power>55kW)	Model dependent	●
P1-16	Stator resistance of synchronous motor 1	0.001Ω~65.535Ω (inverter power≤55kW) 0.0001Ω~6.5535Ω (inverter power>55kW)	Model dependent	●
F02.07	Rotor resistance of synchronous motor 1	0.001Ω~65.535Ω (inverter power≤55kW) 0.0001Ω~6.5535Ω (inverter power>55kW)	Model dependent	●
P1-17	Inductance of D shaft	0.01mH~655.35mH (inverter power≤55kW) 0.001mH~65.535mH (inverter power>55kW)	Model dependent	●
P1-18	Inductance of Q shaft	0.1mH~6553.5mH (inverter power≤55kW) 0.01mH~655.35mH (inverter power>55kW)	Model dependent	●
P1-20	Back electromotive force of synchronous motor	0.1V~6553.5V	Model dependent	●

Function code	Name	Description(setting range)	Factory Default	Change
P1-28	Encoder type	0:ABZ incremental encoder 1:UVW incremental encoder	0	●
P1-27	Encoder pulses per revolution	1~65535	2500	●
P1-32	AB phase sequence of ABZ incremental encoder	0: forward 1: reverse	0	●
P1-31	Encoder installation angle	0.0~359.9°	0.0°	●
P1-30	UVW phase sequence of UVW encoder	0: forward 1: reverse	0	●
P1-33	UVW encoder angle offset	0.0~359.9°	0.0°	●
P1-36	Encoder wire-break fault detection time	0.0s: No action 0.1~10.0s	0.0	●
P1-37	Self-learning of motor parameter	<b>00</b> no self-learning <b>11</b> dynamic self-learning of synchronous motor <b>12</b> static self-learning of synchronous motor	0	●

Function code	Name	Description(setting range)	Factory Default	Change
Group P2: Vector Control Parameters				
P2-00	Proportional gain 1 of speed loop	1~100	30	※
P2-01	Integral time 1 of speed loop	0.01s~10.00s	0.50s	※
P2-02	Switch over low point frequency	0.00Hz~F03.05	5.00Hz	※
P2-03	Proportional gain 2 of speed loop	1~100	20	※
P2-04	Integral time 2 of speed loop	0.01s~10.00s	1.00s	※
P2-05	Switch over high point frequency	F03.02~F00.03 (max. frequency)	10.00Hz	※
P2-06	Vector control slip gain	50%~200%	100%	※
P2-07	Speed loop output filter	0.000s~0.100s	0.000s	※
P2-08	Vector control over excitation gain	0~200	64	※

P2-09	Torque upper limit source in speed control mode	0:F03.10 1:analog AI1 2:analog AI2 3:analog AI3 4:Pulse (HDI) 5:RS485 Communication 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) (corresponding to F03.10 digital setting)	0	※
P2-10	Digital setting of torque upper limit in speed control mode	0.0%~200.0%	150.0%	※
P2-13	Excitation adjustment proportional gain	0~60000	2000	※
P2-14	Excitation adjustment integral gain	0~60000	1300	※
P2-15	Torque adjustment proportion gain	0~60000	2000	※
P2-16	Torque adjustment integral gain	0~60000	1300	※
P2-18	Weak magnetic mode	0: weak magnetic invalid 1:direct calculation mode 2: automatically adjust	1	※
P2-19	Depth of weak magnetic	0~50	5	※
P2-22	Torque upper limit effect enable	0: invalid 1: valid	0	※
P2-23	Output voltage upper limit margin	0%~50%	5%	※
P2-24	The initial position angle detection current	50%~180%	80%	※
P2-25	The initial position angle detection current	0: detection every time operation 1: no detection 2: detection when first time power on	0	※

Function code	Name	Description(setting range)	Factory Default	Change
Group P4: Input Terminals				
P4-00	S1 terminal function selection		1	●
P4-01	S2 terminal function selection	0: no function	4	●
P4-02	S3 terminal function selection	1: forward run	9	●
P4-03	S4 terminal function selection	2: reverse run	12	●
P4-04	HDI terminal function selection	3: 3-wire operation control	13	●
P4-05	S5 terminal function selection	4: forward jog	0	●
P4-06	S6 terminal function selection	5: reverse jog	0	●
		6: coast to stop		
		7: fault reset		
		8: external fault normal open input		
		9: UP command		
		10: DOWN command		
		11: clear UP/DOWN (terminal, keypad)		
		12: multi-speed terminal 1		
		13: multi-speed terminal 2		
		14: multi-speed terminal 3		
		15: multi-speed terminal 4		
		16: Pause operation		
		17: Acc/Dec time selection 1		
		18: Acc/Dec time selection 2		
		19: frequency source switch over		
		20: run command switch over terminal		
		21: Acceleration/Deceleration prohibited		
		22: PID pause		
		23: PLC status reset		
		24: swing pause		

Function code	Name	Description(setting range)	Factory Default	Change
		25: terminal count 26: counter reset 27: length count input 28: length reset 29: torque control prohibited 30: pulse input (enabled only for HDI) 31: reserved 32: immediate DC braking 33: Normally closed (NC) input of external fault 34: frequency modification forbidden 35: reverse PID action direction 36: external STOP terminal 1 37: command source switch over terminal 2 38: PID integral pause 39: reserved 40: reserved 41: motor selection terminal 1 42: reserved 43: PID parameter switch over 44: reserved 45: reserved 46: speed / torque control switch over 47: emergency stop 48: external stop terminal 2 49: deceleration DC braking 50: clear the current running time 51: two-wire/ three wire switch		

Function code	Name	Description(setting range)	Factory Default	Change
P4-38	Input terminal valid mode selection 1	0: valid on high level 1: valid on low level units' digit: S1 tens' digit: S2 hundreds' digit: S3 thousands' digit: S4 ten thousands' digit: S5	00000	●
P4-39	Input terminal polarity selection 2	0: valid on high level 1: valid on low level units' digit: S6 tens' digit: S7 hundreds' digit: S8 thousands' digit: S9 ten thousands' digit: HDI	00000	●
P4-10	Filtering time of switch	0.000s~1.000s	0.010s	※
P4-11	Terminal control operation mode	0: 2-wire control 1 1: 2-wire control 2 2: 3-wire control1 3: 3-wire control 2	0	●
P4-12	Terminal UP/DOWN rate	0.001Hz/s~65.535Hz/s	1.00Hz/s	※
P4-35	S1 delay time	0.0s~3600.0s	0.0s	●
P4-36	S2 delay time	0.0s~3600.0s	0.0s	●
P4-37	S3 delay time	0.0s~3600.0s	0.0s	●
P4-13	AI1 lower limit	0.00V~F05.20	0.00V	※
P4-14	Corresponding setting of AI1 lower limit	-100.0%~+100.0%	0.0%	※
P4-15	AI1 upper limit	F05.18~+10.00V	10.00V	※
P4-16	Corresponding setting of AI1 upper limit	-100.0%~+100.0%	100.0%	※
P4-17	AI1 input filter time	0.00s~10.00s	0.10s	※
P4-18	AI2 low limit	0.00V~F05.25	0.00V	※

Function code	Name	Description(setting range)	Factory Default	Change
P4-19	Corresponding setting of AI2 lower limit	-100.0%~+100.0%	0.0%	※
P4-20	AI2 upper limit	F05.23~+10.00V	10.00V	※
P4-21	Corresponding setting of AI2 upper limit	-100.0%~+100.0%	100.0%	※
P4-22	AI2 input filter time	0.00s~10.00s	0.10s	※
P4-23	AI3 lower limit	-10.00V~F05.30	0.00V	※
P4-24	Corresponding setting of AI3 lower limit	-100.0%~+100.0%	0	※
P4-25	AI3 upper limit	F05.28~+10.00V	4.00V	※
P4-26	Corresponding setting of AI3 upper limit	-100.0%~+100.0%	100.0%	※
P4-27	AI3 input filter time	0.00s~10.00s	0.10s	※
P4-28	HDI lower limit	0.00kHz~F05.35	0.00kHz	※
P4-29	Corresponding setting of HDI lower limit	-100.0%~+100.0%	0.0%	※
P4-30	HDI upper limit	F05.33~+100.00kHz	50.00kHz	※
P4-31	Corresponding setting of HDI upper limit	-100.0%~+100.0%	100.0%	※
P4-32	HDI frequency input filter time	0.00s~10.00s	0.10s	※
P4-33	AI curve selection	units' digit: AI curve selection 1: curve 1 (2 point, see F05.18~F05.21) 2: curve 2 (2 point, see F05.23~F05.26) 3: curve 3 (2 point, see F05.28~F05.31) 4: curve 4 (4 point, see F05.40~F05.47) 5: curve 5 (4 point, see F05.48~F05.55) tens' digit: AI2 curve selection hundreds' digit: AI3 curve selection	H.321	※
P4-34	Setting for AI less than minimum input	units' digit: (setting for AI1 less than minimum input) 0: corresponding to the minimum input set 1: 0.0% tens' digit: (setting for AI2 less than minimum input) setting selection hundreds' digit: (setting for AI3 less than minimum input)	H.000	※

Function code	Name	Description(setting range)	Factory Default	Change
Group P5: Output Terminals				
P5-00	HDO terminal output mode	0: Pulse output (HDOP) 1: Switch signal output (HDOR)	0	※
P5-01	HDOR output selection	0: no output	0	※
P5-05	Relay TA output selection (TA*TB*TC)	1: frequency reached 2: frequency-level detection	2	※
P5-04	Relay RA output selection (RA*RB*RC)	FDT1 output 3: fault output (stop)	0	※
P5-02	MO1 output selection	4: motor overload pre-warning 5: inverter overload pre-warning 6: zero-speed running (no output at stop) 7: zero-speed running 2 (no output at stop) 8: frequency upper limit reached 9: frequency lower limit reached (no output at stop) 10: set count value reached 11: designated count value reached 12: length reached 13: PLC cycle complete 14: accumulative running time reached 15: frequency limited 16: torque limited 17: ready for RUN 18: inverter running 19: AI1>AI2 20: undervoltage state output 22: reserved 23: reserved 24: accumulative power-on time reached 25: Frequency level detection FDT2 output	1	※

Function code	Name	Description(setting range)	Factory Default	Change
		26: frequency 1 reached 27: frequency 2 reached 28: current 1 reached 29: current 2 reached 30: timing reached 31: AI1 input limit exceeded 32: load becoming 0 33: reverse running 34: zero current state 35: module temperature reached 36: output current limit exceeded 37: Frequency lower limit reached (having output at stop) 38: Alarm output (keep running) 39: motor overheat warning 40: current running time reached		
P5-22	Output terminal valid mode selection	0: Positive logic 1: Negative logic Unit's digit: HDO Ten's digit: TA Hundred's digit: RA Thousand's digit: MO1	0000	※
P5-17	HDO delay time	0.0s~3600.0s	0.0s	※
P5-21	TA delay time	0.0s~3600.0s	0.0s	※
P5-20	RA delay time	0.0s~3600.0s	0.0s	※
P5-18	MO1 output delay time	0.0s~3600.0s	0.0s	※

Function code	Name	Description(setting range)	Factory Default	Change
P5-06	HDOP output selection	0: setting frequency 1: running frequency 2: output current 3: output voltage 4: output speed 5: output torque 6: output power 7: Pulse input (100% corresponding to 100.0kHz) 8: AI1 9: AI2 10: AI3 11: lenth 12: count value 13: RS485 communication 14: output current (100.0% corresponding to 1000.0A) 15: output voltage (100.0% corresponding to 1000.0V) 16: reserved	0	※
P5-07	AO1 output selection		0	※
P5-08	AO2 output selection		1	※
P5-18	AO1 offset coefficient	-100.0%~100.0%	0.0%	※
P5-11	AO1 gain	-10.00~+10.00	1.00	※
P5-12	AO2 offset coefficient	-100.0%~100.0%	0.0%	※
P5-13	AO2 gain	-10.00~+10.00	1.00	※

Function code	Name	Description(setting range)	Factory Default	Change
Group P7: Keypad And Display				
PP-00	User password	0~65535	0	※
P7.02	STOP key function selection	0: STOP/RST key enabled only in keypad control 1: STOP/RST key enabled in any operation mode	1	※
P7-03	LED display running parameters 1	0000~FFFF Bit00: running frequency 1 (Hz) Bit01: set frequency (Hz) Bit02: output current (A) Bit03: output voltage (V) Bit04: load speed display Bit05: output power (kW) Bit06: output torque (%) Bit07: bus voltage (V) Bit08: PID setting Bit09: PID feedback value Bit10: input terminal status Bit11: output terminal status Bit12: AI1 voltage (V) Bit13: AI2 voltage (V) Bit14: AI3 voltage (V) Bit15: count value	H.008F	※

Function code	Name	Description(setting range)	Factory Default	Change
P7-04	LED display running parameters 2	0000 - FFFF Bit00: length value Bit01: PLC stage Bit02: pulse setting frequency(kHz) Bit03: running frequency 2 (Hz) Bit04: remaining running time Bit05: AI1 voltage before correction (V) Bit06: AI2 voltage before correction (V) Bit07: AI3 voltage before correction (V) Bit08: linear speed Bit09: current power-on time(Hour) Bit10: current running time (Min) Bit11: pulse setting frequency(Hz) Bit12: Rs485 communication setting value Bit13: encoder feedback speed(Hz) Bit14: main frequency A display(Hz) Bit15: auxiliary frequency B display (Hz)	H.0000	※
P7-05	LED display stop parameters	0000~FFFF Bit00: set frequency (Hz) Bit01: bus voltage (V) Bit02: input terminal status Bit03: output terminal status Bit04: PID setting Bit05: AI1 voltage (V) Bit06: AI2 voltage (V) Bit07: AI3 voltage (V) Bit08: Count value Bit09: Length value Bit10: PLC stage Bit11: Load speed Bit12: Pulse setting frequency (kHz)	H.0063	※

Function code	Name	Description(setting range)	Factory Default	Change
P7-06	Load speed display coefficient	0.0001~6.5000	1.0000	※
P7-07	Heatsink temperature of inverter module	0.0℃~100.0℃	-	**
P7-08	Software version	-	-	**
P7-09	Accumulative running time	0h~65535h	-	**

P7-12	Number of decimal places for load speed display	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1	※
P7-13	Accumulative power-on time	0h~65535h	-	**
P7-14	Accumulative power consumption	0~65535 kWh	-	**
Group P8: Auxiliary Functions				
P8-03	Acceleration time 2	0.0s~6500.0s	Model dependent	※
P8-04	Deceleration time 2	0.0s~6500.0s	Model dependent	※
P8-05	Acceleration time 3	0.0s~6500.0s	Model dependent	※
P8-06	Deceleration time 3	0.0s~6500.0s	Model dependent	※
P8-07	Acceleration time 4	0.0s~6500.0s	Model dependent	※
P8-08	Deceleration time 4	0.0s~6500.0s	Model dependent	※
P8-00	JOG running frequency	0.00Hz~F00.03 (max. frequency)	2.00Hz	※
P8-01	JOG acceleration time	0.0s~6500.0s	20.0s	※
P8-02	JOG deceleration time	0.0s~6500.0s	20.0s	※
P8-09	Jump frequency 1	0.00Hz~F00.03 (max. frequency)	0.00Hz	※
P8-10	Jump frequency 2	0.00Hz~F00.03 (max. frequency)	0.00Hz	※
P8-11	Frequency jump amplitude	0.00Hz~F00.03 (max. frequency)	0.00Hz	※
P8-12	Forward/Reverse rotation dead-zone time	0.0s~3000.0s	0.0s	※
P8-13	Reverse control	0: enabled 1: disabled	0	※
P8-14	Running mode when set frequency lower than frequency lower limit	0: run at frequency lower limit 1: stop 2: run at zero speed	0	※

Function code	Name	Description(setting range)	Factory Default	Change
P8-16	Accumulative power-on-time threshold	0h~65000h	0h	※
P8-17	Accumulative running time threshold	0h~65000h	0h	※
P8-18	Startup protection	0: No 1: Yes	0	※
P8-15	Droop control	0.00Hz~10.00Hz	0.00Hz	※
			0	●
P8-19	Frequency detection value (FDT1)	0.00Hz~F00.03 (max. frequency)	50.00Hz	※
P8-20	Frequency detection hysteresis (FDT hysteresis 1)	0.0%~100.0% (FDT1 level)	5.0%	※
P8-28	Frequency detection value (FDT2)	0.00Hz~F00.03 (max. frequency)	50.00Hz	※
P8-29	Frequency detection hysteresis (FDT hysteresis 2)	0.0%~100.0% (FDT2 level)	5.0%	※
P8-21	Detection range of frequency reached	0.0%~100.0% (F00.03 (max. frequency))	0.0%	※
P8-22	Jump frequency during acceleration/deceleration	0: disabled 1: enabled	0	※
P8-25	Frequency switch over point between acceleration time 1 and acceleration time 2	0.00Hz~F00.03 (max. frequency)	0.00Hz	※
P8-26	Frequency switch over point between deceleration time 1 and deceleration time 2	0.00Hz~F00.03 (max. frequency)	0.00Hz	※
P8-27	Terminal JOG preferred	0: disabled 1: enabled	0	※
P8-30	Any frequency reaching detection value 1	0.00Hz~F00.03 (max. frequency)	50.00Hz	※
P8-31	Any frequency reaching detection amplitude 1	0.0%~100.0% (F00.03 (max. frequency))	0.0%	※
P8-32	Any frequency reaching detection value 2	0.00Hz~F00.03 (max. frequency)	50.00Hz	※
P8-33	Any frequency reaching detection amplitude 2	0.0%~100.0% (F00.03 (max. frequency))	0.0%	※
P8-34	Zero current detection level	0.0%~300.0% (rated motor current)	5.0%	※
P8-35	Zero current detection delay time	0.01s~600.00s	0.10s	※
P8-36	Output overcurrent threshold	0.0% (no detection) 0.1%~300.0% (rated motor current)	200.0%	※
P8-37	Output overcurrent detection delay time	0.00s~600.00s	0.00s	※
P8-38	Any current reaching 1	0.0%~300.0% ((rated motor current)	100.0%	※

Function code	Name	Description(setting range)	Factory Default	Change
P8-39	Any current reaching 1 amplitude	0.0%~300.0% (rated motor current)	0.0%	※
P8-40	Any current reaching 2	0.0%~300.0% (rated motor current)	100.0%	※
P8-41	Any current reaching 2 amplitude	0.0%~300.0% (rated motor current)	0.0%	※
P8-42	Timing function	0: Disabled 1: Enabled	0	※
P8-43	Timing duration source	0: F08.45 1: analog AI1 2: analog AI2 3: analog AI3 (100% of analog input corresponds to the value of F8.45)	0	※
P8-44	Timing duration	0.0Min~6500.0Min	0.0Min	※
P8-45	AI1 input voltage lower limit	0.00V~F08.47	3.10V	※
P8-46	AI1 input voltage upper limit	F08.46~10.00V	6.80V	※
P8-47	Module temperature threshold	0℃~100℃	75℃	※
P8-48	Cooling fan control	0: Fan working during running 1: Fan working continuously	0	※
P8-49	Wakeup frequency	Dormant frequency (F8.52) to maximum frequency (F00.03)	0.00Hz	※
P8-50	Wakeup delay time	0.0s~6500.0s	0.0s	※
P8-51	Dormant frequency	0.00 Hz to wakeup frequency (F08.50)	0.00Hz	※
P8-52	Dormant delay time	0.0s~6500.0s	0.0s	※
P8-53	Current running time reached	0.0Min~6500.0Min	0.0Min	※

Function code	Name	Description(setting range)	Factory Default	Change
Group P9: Fault and Protection				
P9-12	Input phase loss protection	0: disabled 1: enabled	1	※
P9-13	Output phase loss protection	0: disabled 1: enabled	1	※
P9-00	Motor overload warning selection	0: disabled 1: enabled	1	※
P9-01	Motor overload pre-alarm warning detection levels	0.20~10.00	1.00	※
P9-02	Motor overload pre-alarm warning detection time	50%~100%	80%	※
P9-09	Fault auto reset times	0~20	0	※
P9-11	Time interval of fault auto reset	0.1s~100.0s	1.0s	※
P9-16	Current fault type	0: No fault 1: Overcurrent during acceleration (E004) 2: Overcurrent during deceleration (E005) 3: Overcurrent at constant speed 4: Overvoltage during acceleration (E002) 5: Overvoltage during deceleration (E00A) 6: Overvoltage at constant speed (E003) 7: Undervoltage (E001) 8: Motor overload (E007) 9: inverter overload (E008) 10: Power input phase loss (E012) 11: Power output phase loss (E013) 12: Module overheat (E00E) 13: Buffer resistance overload (E014)	-	●
P9-15	2nd fault type		-	●
P9-14	1st fault type		-	●

Function code	Name	Description(setting range)	Factory Default	Change
		14: Contactor fault (E017) 15: External equipment fault (E00d) 16: Communication fault(E018) 17: Current detection fault (E015) 18: Motor auto-tuning fault (E016) 19: Running time reached (E020) 20: EEPROM read-write fault (E00F) 21: Short circuit to ground (E023) 22: PID feedback lost during running (E02E) 23: Encoder/PG card fault(E026) 24: inverter hardware fault (E033) 25: Power-on time reached (E029) 26: Load becoming 0 (E030) 27: With-wave current limit fault (E032) 28: Too large speed deviation (E034) 29: Motor switch over fault during running (E038) 30: Motor over-speed (E035) 31: Motor overheat (E036) 32: Initial position fault (E037)		
P9-17	Frequency upon current fault	-	-	●
P9-18	Output current upon current fault	-	-	●
P9-19	Bus voltage upon current fault	-	-	●
P9-20	Input terminal status upon current fault	-	-	●
P9-21	Output terminal status upon current fault	-	-	●
P9-22	inverter status upon current fault	-	-	●
P9-23	Power-on time status upon current fault	-	-	●
P9-24	Running time status upon current fault	-	-	●
P9-27	Frequency upon 2nd fault	-	-	●
P9-28	Output current upon 2nd fault	-	-	●

Function code	Name	Description(setting range)	Factory Default	Change
P9-29	Bus voltage upon 2nd fault	-	-	●
P9-30	Input terminal status upon 2nd fault	-	-	●
P9-31	Output terminal status upon 2nd fault	-	-	●
P9-32	inverter status upon 2nd fault	-	-	●
P9-33	Power-on time upon 2nd fault	-	-	●
P9-34	Running time upon 2nd fault	-	-	●
P9-37	Frequency upon 1st fault	-	-	●
P9-38	Output current upon 1st fault	-	-	●
P9-39	Bus voltage upon 1st fault	-	-	●
P9-40	Input terminal status upon 1st fault	-	-	●
P9-41	Output terminal status upon 1st fault	-	-	●
P9-42	inverter status upon 1st fault	-	-	●
P9-43	Power-on time upon 1st fault	-	-	●
P9-44	Running time upon 1st fault	-	-	●
P9-07	Short-circuit to ground upon power-on	0: Disabled 1: Enabled	1	※
P9-10	Output terminal action during fault auto reset	0: Not act 1: Act	0	※
P9-55	Backup frequency upon abnormality	0.0%~100.0% (100.0% corresponding to maximum frequency)F00.03)	100.0%	※
P9-56	Type of motor temperature sensor	0: No temperature sensor 1: PT100 2: PT1000	0	※
P9-57	Motor overheat protection threshold	0℃~200℃	110℃	※
P9-58	Motor overheat warning threshold	0℃~200℃	90℃	※
P9-62	Action pause judging voltage at instantaneous power failure	F09.04~100.0%	90.0%	※

Function code	Name	Description(setting range)	Factory Default	Change
Group PA: Process Control PID Function				
PA-00	PID setting source	0: Keypad (F10.01) 1: Analog AI1 2: Analog AI2 3: Analog AI3 4: Pulse setting (HDI) 5: Rs485 communication setting 6: Multi-speed command	0	※
PA-01	PID digital setting	0.0~100.0%	50.0%	※
PA-02	PID feedback source	0: AI1 1: AI2 2: AI3 3: AI1 - AI2 4: Pulse setting (HDI) 5: Rs485 communication setting 6: AI1 + AI2 7: MAX ( AI1 ,  AI2 ) 8: MIN ( AI1 ,  AI2 )	0	※
PA-03	PID output characteristic	0 : positive 1 : negative	0	※
PA-04	PID setting feedback range	0~65535	1000	※
PA-05	Proportional gain Kp1	0.0~100.0	20.0	※
PA-06	Integral time Ti1	0.01s~10.00s	2.00s	※
PA-07	Differential time Td1	0.000s~10.000s	0.000s	※
PA-08	Cut-off frequency of PID reverse rotation	0.00~F00.03 (maximum frequency)	2.00Hz	※
PA-09	PID deviation limit	0.0%~100.0%	0.0%	※
PA-10	PID differential limit	0.00%~100.00%	0.10%	※
PA-11	PID setting change time	0.00~650.00s	0.00s	※
PA-12	PID feedback filter time	0.00~60.00s	0.00s	※
PA-13	PID output filter time	0.00~60.00s	0.00s	※
PA-15	Proportional gain Kp2	0.0~100.0	20.0	※

Function code	Name	Description(setting range)	Factory Default	Change
PA-16	Integral time Ti2	0.01s~10.00s	2.00s	※
PA-17	Differential time Td2	0.000s~10.000s	0.000s	※
PA-18	PID parameter switch over condition	0: No switch over 1: Switch over via input terminal 2: Automatic switch over based on deviation	0	※
PA-19	PID parameter switch over deviation 1	0.0%~F10.20	20.0%	※
PA-20	PID parameter switch over deviation 2	F10.19~100.0%	80.0%	※
PA-21	PID initial value	0.0%~100.0%	0.0%	※
PA-22	PID initial value holding time	0.00~650.00s	0.00s	※
PA-23	Maximum deviation between two PID outputs in forward direction	0.00%~100.00%	1.00%	※
PA-24	Maximum deviation between two PID outputs in reverse direction	0.00%~100.00%	1.00%	※
PA-25	PID integral property	Unit's digit : Integral separated 0: Invalid 1: Valid Ten's digit : Whether to stop integral operation when the output reaches the limit 0: Continue integral operation 1: Stop integral operation	00	※
PA-26	Detection value of PID feedback loss	0.0%: Not judging feedback loss 0.1%~100.0%	0.0%	※
PA-27	Detection time of PID feedback loss	0.0s~20.0s	0.0s	※
PA-28	PID operation at stop	0: No PID operation at stop 1: PID operation at stop	0	※

Function code	Name	Description(setting range)	Factory Default	Change
Group Pb: Swing Frequency, Fixed Length and Count				
Pb-00	Swing frequency setting mode	0: Relative to the central frequency 1: Relative to the maximum frequency	0	※
Pb-01	Swing frequency amplitude	0.0%~100.0%	0.0%	※
Pb-02	Jump frequency amplitude	0.0%~50.0%	0.0%	※
Pb-03	Swing frequency cycle	0.1s~3000.0s	10.0s	※
Pb-04	Triangular wave rising time coefficient	0.1%~100.0%	50.0%	※
Pb-05	Set length	0m~65535m	1000m	※
Pb-06	Actual length	0m~65535m	0m	※
Pb-07	Number of pulses per meter	0.1~6553.5	100.0	※
Pb-08	Set count value	1~65535	1000	※
Pb-09	Designated count value	1~65535	1000	※
Group PC: Simple PLC Function And Multi-speed control				
PC-16	Simple PLC running mode	0: Stop after the inverter runs one cycle 1: Keep final values after the inverter runs one cycle 2: Repeat after the inverter runs one cycle	0	※
PC-17	Simple PLC retentive selection	Unit's digit :Retentive upon power failure 0: No 1: Yes Ten's digit :Retentive upon stop 0: No 1: Yes	00	※
PC-00	Multi-speed 0	-100.0%~100.0%	0.0%	※
PC-01	Multi-speed 1	-100.0%~100.0%	0.0%	※
PC-02	Multi-speed 2	-100.0%~100.0%	0.0%	※
PC-03	Multi-speed 3	-100.0%~100.0%	0.0%	※
PC-04	Multi-speed 4	-100.0%~100.0%	0.0%	※
PC-05	Multi-speed 5	-100.0%~100.0%	0.0%	※
PC-06	Multi-speed 6	-100.0%~100.0%	0.0%	※
PC-07	Multi-speed 7	-100.0%~100.0%	0.0%	※

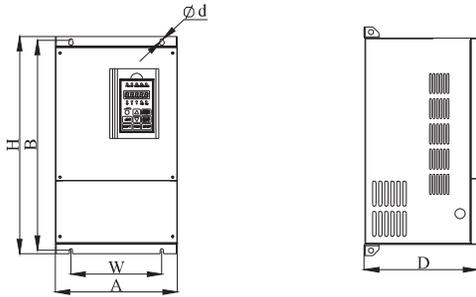
Function code	Name	Description(setting range)	Factory Default	Change
PC-08	Multi-speed 8	-100.0%~100.0%	0.0%	※
PC-09	Multi-speed 9	-100.0%~100.0%	0.0%	※
PC-10	Multi-speed 10	-100.0%~100.0%	0.0%	※
PC-11	Multi-speed 11	-100.0%~100.0%	0.0%	※
PC-12	Multi-speed 12	-100.0%~100.0%	0.0%	※
PC-13	Multi-speed 13	-100.0%~100.0%	0.0%	※
PC-14	Multi-speed 14	-100.0%~100.0%	0.0%	※
PC-15	Multi-speed 15	-100.0%~100.0%	0.0%	※
PC-18	Running time of simple PLC multi-speed 0	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-19	Acceleration/deceleration time of simple PLC multi-speed 0	0~3	0	※
PC-20	Running time of simple PLC multi-speed 1	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-21	Acceleration/deceleration time of simple PLC multi-speed 1	0~3	0	※
PC-22	Running time of simple PLC multi-speed 2	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-23	Acceleration/deceleration time of simple PLC multi-speed 2	0~3	0	※
PC-24	Running time of simple PLC multi-speed 3	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-25	Acceleration/deceleration time of simple PLC multi-speed 3	0~3	0	※
PC-26	Running time of simple PLC multi-speed 4	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-27	Acceleration/deceleration time of simple PLC multi-speed 4	0~3	0	※
PC-28	Running time of simple PLC multi-speed 5	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-29	Acceleration/deceleration time of simple PLC multi-speed 5	0~3	0	※
PC-30	Running time of simple PLC multi-speed 6	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-31	Acceleration/deceleration time of simple PLC multi-speed 6	0~3	0	※
PC-32	Running time of simple PLC multi-speed 7	0.0s(h)~6500.0s(h)	0.0s(h)	※

Function code	Name	Description(setting range)	Factory Default	Change
PC-33	Acceleration/deceleration time of simple PLC multi-speed 7	0~3	0	※
PC-34	Running time of simple PLC multi-speed 8	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-35	Acceleration/deceleration time of simple PLC multi-speed 8	0~3	0	※
PC-36	Running time of simple PLC multi-speed 9	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-37	Acceleration/deceleration time of simple PLC multi-speed 9	0~3	0	※
PC-38	Running time of simple PLC multi-speed 10	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-39	Acceleration/deceleration time of simple PLC multi-speed 10	0~3	0	※
PC-40	Running time of simple PLC multi-speed 11	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-41	Acceleration/deceleration time of simple PLC multi-speed 11	0~3	0	※
PC-42	Running time of simple PLC multi-speed 12	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-43	Acceleration/deceleration time of simple PLC multi-speed 12	0~3	0	※
PC-44	Running time of simple PLC multi-speed 13	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-45	Acceleration/deceleration time of simple PLC multi-speed 13	0~3	0	※
PC-46	Running time of simple PLC multi-speed 14	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-47	Acceleration/deceleration time of simple PLC multi-speed 14	0~3	0	※
PC-48	Running time of simple PLC multi-speed 15	0.0s(h)~6500.0s(h)	0.0s(h)	※
PC-49	Acceleration/deceleration time of simple PLC multi-speed 15	0~3	0	※
PC-50	Time unit of multi-speed	0: s (second) 1: h (hour)	0	※

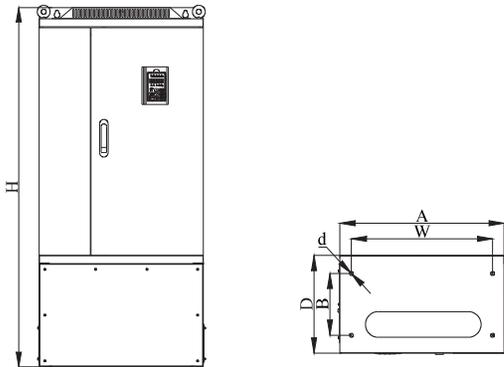
Function code	Name	Description(setting range)	Factory Default	Change
PC-51	Multi-speed 0 source	0: Set by F12.02 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: PID 6: Set frequency via keypad (F00.10), modified UP/DOWN	0	※
Group Pd: Communication Parameters				
Pd-02	Local address	1~247, 0 is broadcast address	1	※
Pd-00	Baud rate	0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS	5	※
Pd-01	Data format	0: No check, data format (8,N,2) 1: Even parity check, data format (8,E,1) 2: Odd Parity check, data format (8,O,1) 3: Data format (8,N,1)	3	※
Pd-03	Response delay	0ms~20ms	20	※
Pd-04	Communication timeout	0.0 (invalid) , 0.1s~60.0s	0.0	※
Pd-05	Modbus protocol selection	0: Non-standard Modbus protocol 1: Standard Modbus protocol	1	※
Pd-06	Communication reading current resolution	0: 0.01A 1: 0.1A	0	※

## Appendix B External Dimension

### 1.External dimension 1: wall-mounted housing



### 2.External dimension 2: wall-mounted/ floor combination housing



Base No.	Model	Power (kw)	Dimensions (mm)						Housing
			A-width	H-height	D-depth	W	B	d	
B10	FS50L-0R5G-2	0.55kW	116	175	153	103	165	5	Wall-mounted plastic housing
	FS50L-0R7G-2	0.75kW							
	FS50L-1R5G-2	1.5kW							
B01	FS50L-2R2G-2	2.2kW	134	251	173	121	238	5	
	FS50L-3R7G-2	3.7kW							
B02	FS50L-5R5G-2	5.5kW	161	274	198	148	261	6	
	FS50L-7R5G-2	7.5kW							

Base No.	Model	Power (kw)	Dimensions (mm)						Housing
			A-width	H-height	D-depth	W	B	d	
B10	FS50L-0R7G/1R5P-4	0.75kW	116	175	153	103	165	5	Wall-mounted plastic housing
	FS50L-1R5G/2R2P-4	1.5kW							
	FS50L-2R2G/3R7P-4	2.2kW							
B01	FS50L-3R7G/5R5P-4	3.7kW	134	251	173	121	238	5	
B02	FS50L-5R5G/7R5P-4	5.5kW	161	274	198	148	261	6	
	FS50L-7R5G/011P-4	7.5kW							
B03	FS50L-011G/015P-4	11kW	210	343	215	195	327	6	
	FS50L-015G/018P-4	15kW							
B11	FS50L-018G/022P-4	18.5kW	220	393	222	160	377	6	
	FS50L-022G/030P-4	22kW							
B04	FS50L-030G/037P-4	30kW	255	453	237	190	440	7	
	FS50L-037G/045P-4	37kW							
B05	FS50L-045G/055P-4	45kW	280	582	295	200	563	9	
	FS50L-055G/075P-4	55kW							
B06	FS50L-075G/093P-4	75kW	300	685	323	200	667	11	
	FS50L-093G/110P-4	93kW							
B07	FS50L-110G/132P-4	110kW	420	840	334	150*150	815	11	Wall-mounted steel casing housing
	FS50L-132G/160P-4	132kW							
	FS50L-160G/200P-4	160kW							
B09	FS50L-200G/220P-4	200kW	640	1035	390	250*250	1003	11	
	FS50L-220G/250P-4	220kW							
	FS50L-250G/280P-4	250kW							
	FS50L-280G/315P-4	280kW							
	FS50L-315G/350P-4	315kW							
B07-G	FS50L-110G/132P-4-01	110kW	420	1108	334	320	230	12	
	FS50L-132G/160P-4-01	132kW							
	FS50L-160G/200P-4-01	160kW							
B09-G	FS50L-200G/220P-4-01	200kW	640	1400	390	5500	240	15	
	FS50L-220G/250P-4-01	220kW							
	FS50L-250G/280P-4-01	250kW							
	FS50L-280G/315P-4-01	280kW							
	FS50L-315G/350P-4-01	315kW							