HYPER INVERTER

Quick setup

SSInverter
SSI80E

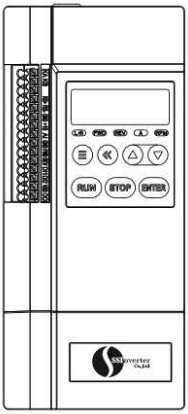
English-26June2024

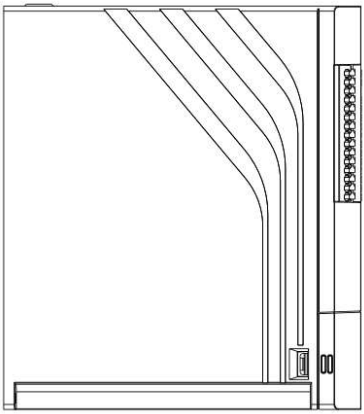
Contents

1. Summary

SSI80E Smart Vector Frequency inverter

The products are strictly tested and packaged before leaving the factory, if any abnormalities such as damage, wrong type and lack of accessories, please contact with our sales.



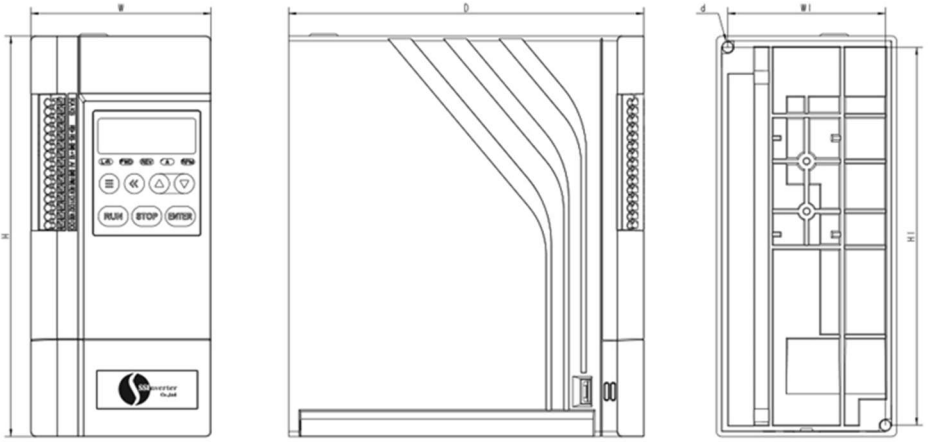


2. Safety Information

- Before operating this product, please read and pay attention to the relevant safety information, and install, debug, repair and maintain by professionals.
- When operating the wiring, please make sure that the power is off.
- After turning off the power, there may still be high voltage inside the power unit. Do not touch the internal circuit and the main circuit terminals. Otherwise, there may be a risk of electric shock. Wait at least 4 minutes before operating.
- Never plug or remove any connector of the product when the product is powered, doing so may lead to product damage or humane injury or death.
- The grounding terminal of product must be properly grounded.

- The main circuit terminals must be correctly wired. R/L、S、T/N are power input terminals. Never mix them with U, V, and W. Otherwise, the product will be damaged when power on.
- Products and accessories should be installed away from fire source and flammable materials.
- the motor power is only allowed to be one level higher or two levels lower than the rated power of the inverter. Otherwise it may result in reduced control performance or motor burn out.
- Please set the motor parameters correctly according to the motor nameplate， then set P1-13 = 1 or 2 to start self-learning. Otherwise may cause the motor to burn out.

3. SSI80E Dimentions



Dimensions(mm)						Rated Power		Frame
d	H1	W1	D	H	W	3×380-480V	1×200-240V	
4.5	151	63	142	160	72	0.75~2.2kW	0.37-1.5kW	E1

4. SSI80E Model and Specificationons

220V					
Model Type	Power (KW)	Voltage (V)	Current		Air(m^3/h)
			Input(A)	Output(A)	
SSI80E-2S0R3	0.37	1×200-240	6.2	2.5	17.2
SSI80E-2S0R7	0.75	1×200-240	9	4.5	17.2
SSI80E-2S1R5	1.5	1×200-240	15	6.8	17.2

380V					
Model Type	Power (KW)	Voltage (V)	Current		Air(m^3/h)
			Input(A)	Output(A)	
SSI80E-4T0R7	0.75	3×380-480	3.6	2.3	17.2
SSI80E-4T1R5	1.5	3×380-480	5.9	3.8	17.2
SSI80E-4T2R2	2.2	3×380-480	8.3	5.3	17.2

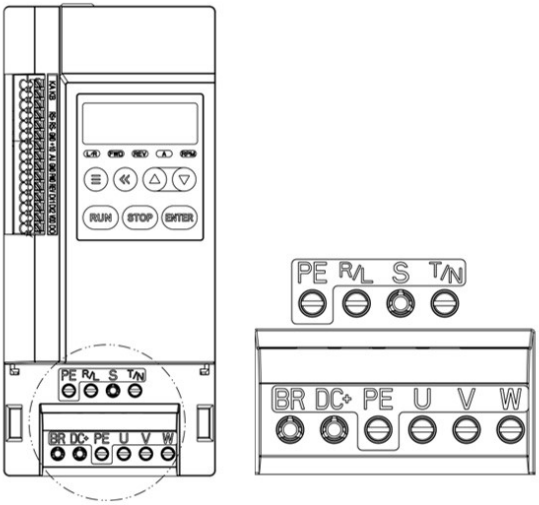
Description	
4T	3phase380V
2S	Single phase 220V
1R5	Power size, 1R5 means 1.5kw

5. SSI80E Terminals and Diagram

5.1. SSI80E Main circuit terminals

Main circuit terminals wiring steps:

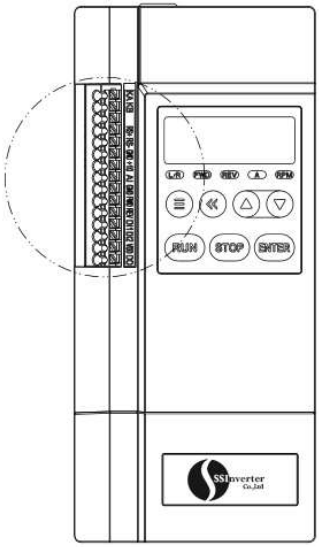
1) Connect the motor ground wire and power ground wire to the ground terminal
2) Connect the three-phase of motor to the U, V, W terminals
3) If you need to connect the braking resistor, please connect the braking resistor to the DC+ and BR terminals.
4) Connect the main power cable to the input terminals R/L, S, T/N terminals (for single phase connect to R/L, T/N)

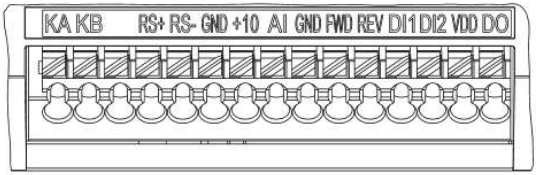


0.37-1.5kW 220V/0.75-2.2kW 380V

Terminals		Functions
0.37-1.5kW 220V	0.75-2.2kW 380V	
R/L、S、T/N	R/L、T/N	Terminals for power inputs from grid
U、V、W	U、V、W	Terminals for Power output to motor
DC+、BR	DC+、BR	Terminals for Brake resistor
PE	PE	For ground connection

5.2. SSI80E Control terminals

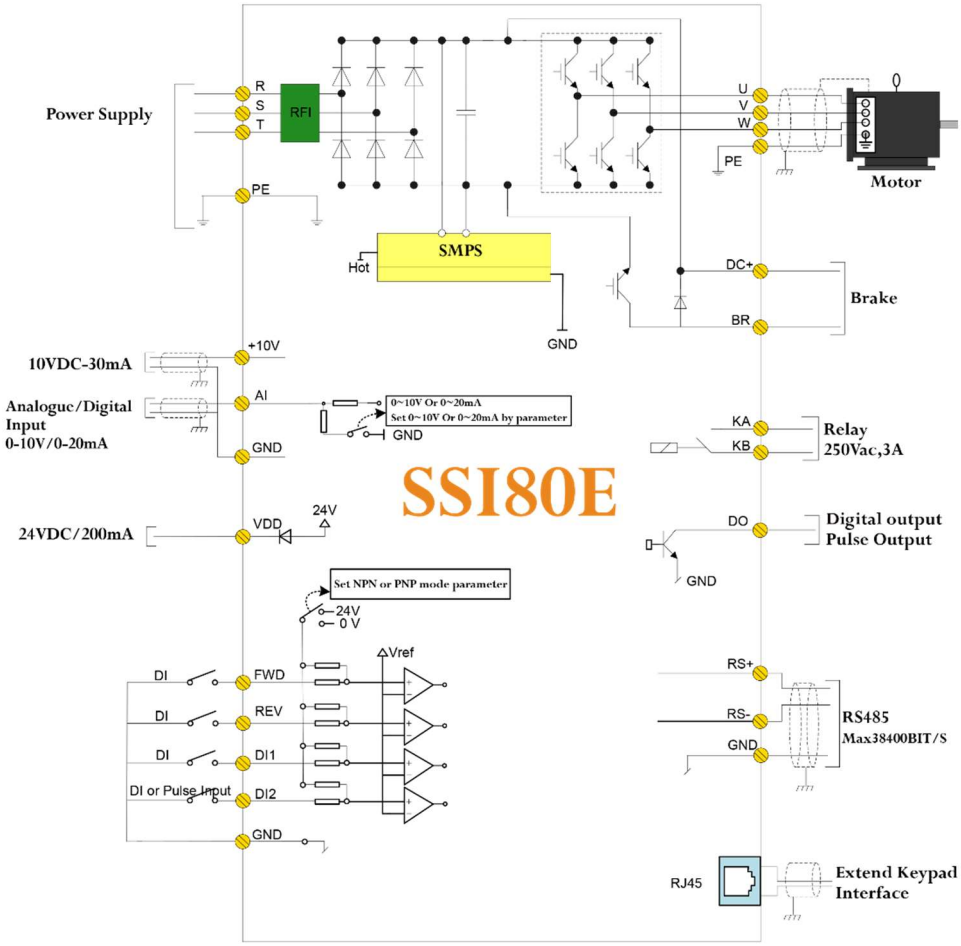




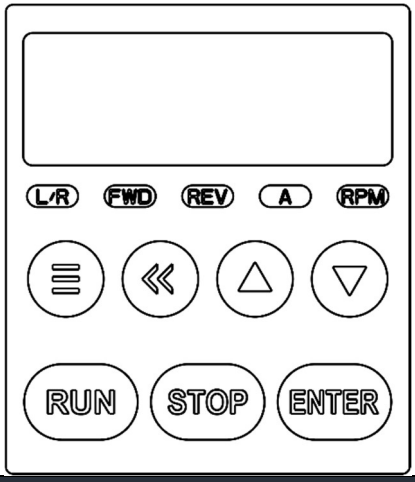
Specification	Function	Name
FWD,REV, DI1,DI2	Digital Input	Input type：NPN and PNP; Input Voltage：0~30V； Input Impedance：3.6kΩ； DI2 can be configured as pulse input
DI2	Pulse Input	Frequency Range: 0.00~100.00kHz; Power Supply Range: 24V ± 20%; Duty Cycle Range: 40%~60%;
DO	Digital Output	Output type: Open Collector; Output Current: 0~40mA; Output Voltage: 0~30V; Can be configured as pulse output: Load Capacity: Resistive>1kΩ, capacitive <10nf; Frequency Range: 0.00~100.00kHz; Duty Cycle Range: 40%~60%;

RS+, RS-	RS485 Communication	Max Bit Rate: 38400bit/s ;
KA-KB	Relay output	Resistive Load：250VAC 3A/30VDC 3A ; Inductive Load：250VAC 0.2A/24VDC 0.1A (cosφ=0.4) ;
AI	Analogue and Digital input	Configurable as analogue voltage inputs, analogue current inputs. 1. As Analogue Voltage Inputs: Input Impedance: 10kΩ; Input Voltage Range: 0~10V; 2. As Analogue Current Inputs: Input Impedance: ≤500Ω; Input Current Range: 0~20mA;
VDD	24V signal power supply	Max 200mA
+10	10V signal power supply	Max 30mA
GND	Signal Ground	

5.3. SSI80E Diagramls



6. SSI80E Keypad and display



Function	Key Name	The Key
	Menu key	Press to enter the menu for parameter setup or exit the menu
	Numberical shift key	In home display, press to switch the physical variables shown for monitoring; In parameter number selection, press to switch the digit place of the parameter number to be modified; In parameter value modification, press to switch the digit place of parameter value to be modified
	Up key	Press to increase the numerical value of parameter or parameter number
	Down key	Press to decrease the numerical value of parameter or parameter number
ENTER	Enter key	Press to confirm the parameter number selection and enter the parameter value displaying/modification, or Press to confirm the parameter value and back to the Parameter number selection menu.
RUN	Run key	Press to run the motor when product is in Local Mode.

STOP	Stop - reset key	Press to control the product stop when product is in Local Mode or reset the fault (if there is alarm)

The product can be set by P6-31 to two different running modes: Local Mode and Remote Mode.

Local Mode: The product is controlled by keypad, including start/stop and target frequency set etc.

Remote Mode: The product is controlled by I/O terminals or communication Bus, keypad is only for monitoring and parameter setup.

* If you need to switch the remote/local mode, press and hold the number shift key and the menu key at the same time for more than 3 seconds; Or set P6.31=0 to enter remote mode and P6.31=1 to enter local mode.

Description of the lights on keypad

- L/R Light: To indicate the mode of the product, Always On --- Remote Mode, Flashing --- Local Mode.
- FWD、REV Lights:

Status	REV	FWD
Running in Forward Direction	Off	On
Running in Reverse Direction	On	Off
Stopped	Off	Off

NOTE：LED lights of "RPM", "A": Used to indicate the physical meaning of the values shown on the key pad, please refer to the UM.The five digits LED display can show the reference frequency, parameter number or value, alarm/warning code etc.

7.SSI80E Basic Application Guide

7.1. Control with Keypad

1- Ensure the product is working in Local Mode (L/R light flashing), or set P6-31=1 to switch to Local Mode

2-Adjust the set frequency by pressing the up or down keys

3-Press the "RUN" key to start the motor, and adjust the motor speed by pressing the up or down keys

4-Press the "STOP" key to stop the motor

Note: In Local Mode, the product only receives commands from the keypad. Normally Local Mode is for system debugging

7.2. Control with Terminals

1-Ensure the product is working in Remote Mode (L/R light always ON). If not, switch the product to the Remote Mode by set P6-31=0. The product is default in Remote Mode.

2-Control in default parameter setup: In default, the DI terminal named as "FWD" is set to function of start/stop (P2-05=10), the DI terminal named as "REV" is set to function of reverse run (P2-06=12), and the main set value source is set to AI terminal (P0-11 = 1), and the AI terminal is set as analogue voltage input (P3-00=0). In the default parameter setup, you can start the motor forward direction by enabling the signal to terminal "FWD" (short circuit the "FWD" terminal to "GND") and stop the motor by disconnecting the terminal "FWD" from terminal "GND". You can start the motor reverse direction by connecting the terminal "REV" to "GND" and stop the motor by disconnecting the terminal "REV" from terminal "GND". You can change the motor speed by adjusting the voltage on terminal AI.

3-Control with Preset multi-stage value: Based on the default parameter setup, you need to change the main set value source to preset multi-stage value (P0-11=11) and keep the function of terminals "DI1"~"DI2" as default (P2-07 = 22, P2-08 = 23), and set the preset

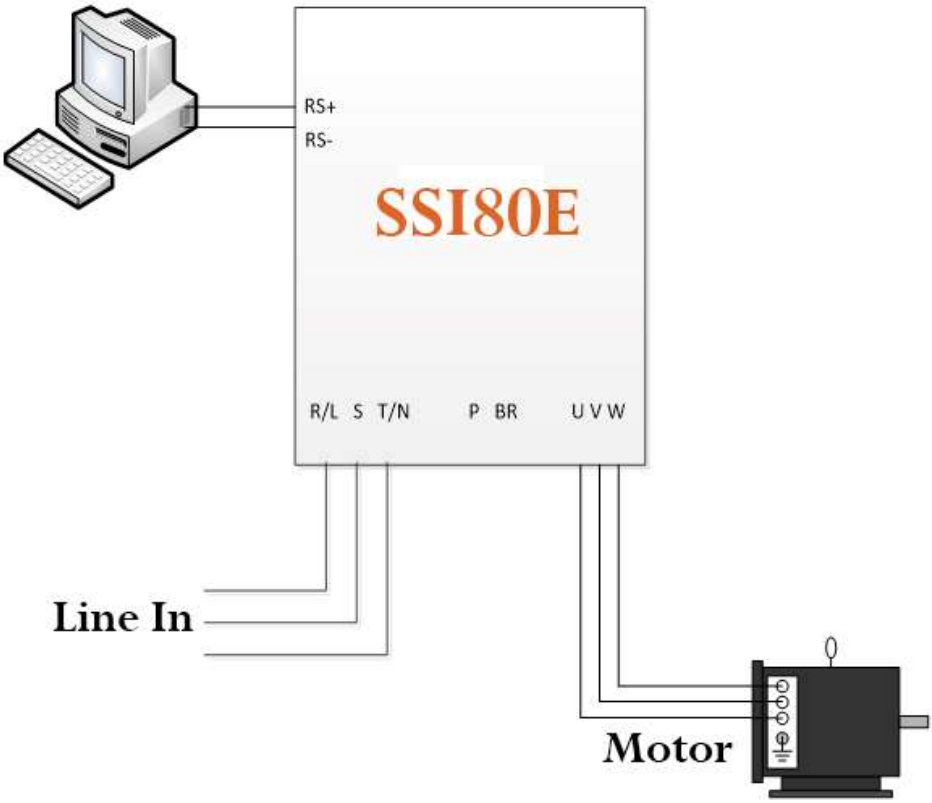
values in parameters P0-30~P0-37 to the speeds you expect. Then you can change the "motor speed to preset value by changing the logic status of terminals "DI1" ~ "DI2.

7.3. Using of Modbus communication

※Reg. 9999 specification

Bit 7~0(run/stop control etc.)	0x00: No function 0x01: Run forward 0x02: Reverse 0x03: Jog 0x04: Jog reverse 0x05: Stop 0x06: Coast 0x07: Reset
Bit 11~8(Preset value select)	0000B:P0-30(Preset Value 0) 0001B: P0-31(Preset Value1) … 0111B: P0-37(Preset Value 7)
Bit 13~12(Ramp time select)	00B: Ramp 1 01B: Ramp 2 10B: Ramp 3 11B: Ramp 4
Bit 14	Reserved
Bit 15	1B: Enable Bit8~13 function 0B: Disable Bit8~13 function

*Reg. 10000 specification



When using communication to control the drive, you can set the frequency directly by writing register 10000 . The register value is in the range of 0.00 ~ P5-08, unit 0.01Hz.

7.4 Reset the parameters to Factory Defaults

1-Set parameter P7-00 = 9

2-Power down the product fully and power on again, the keypad shows A.01

3-Press the "STOP" key to clear the A.01, then the parameters are reset to factory defaults except for the parameter group 8 and group 9

7.5 Reset the Faults (Alarms)

For non-locked faults, press "STOP" key to reset the fault

For locked faults:

If parameter P5-30 = 0, press "STOP" to reset the fault

If parameter P5-30 =1, you need to power down and power on first, then press "STOP" key to reset the fault

You can also set a DI terminal function to reset fault (set one of the parameters from P2-05 to P2-08 equals 1), and use DI signal to reset the fault

7.6 Motor Parameters Auto Tuning

1-Correct motor parameters help to ensure the control performance. Motor parameter auto tuning function can identify the motor parameters (parameters from P1-14 to P1-27) automatically. If you did not run the motor parameter auto tuning operation, the control will use default motor parameters or use the parameters you set manually

2-Ensure the motor is standstill

3-Set Parameters from P1-02 to P1-07 as the nameplate of the motor

4-Set parameter P1-13 to value 1 or 2 or 3 or 4 or 5 depending on your demands (Refer to description of parameter P1-13 in 3.3.2). After you confirm the parameter P1-13 value, the keypad will show "PUSH" "RUN". Then press the "RUN" key, the product starts the motor parameter auto tuning function

Wait the until the keypad shows "PUSH" "Ent", then press the "ENTER" key. The motor parameter auto tuning function finished and the motor parameters are updated

8. SSI80E Fault Handling

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
	A.01		Factory Reset	Parameters reset to factory defaults without confirmation	Press "STOP "key to Confirm
	A.02*		Internal Fault		Contact our local support
u.03	A.03*		Motor control / IO communication time out	Motor control board Failed to communicate with IO board	1. Power off, then confirm the installation of IO board 2. Contact our local support
	A.04*		Power Board 24V Error	Internal Hardware fault	1. Confirm no problem in external load to 24v 2. Contact our local support
	A05*		Gate drive voltage fault	Internal Hardware fault	
u.07	A.07*		Fan Fault	Too much dust on the fan or the fan is aged	Clean or replace the fan
	A.16*		Short Circuit	Short circuit between phases of motor	Check the motor cable and motor insulation status

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
u.17	A.17*		Earth fault	Flashover or short circuit between output phases and ground	1. Check cable or motor phase to ground insulation status 2.Replace cable or motor
u.19	A.19*		Brake resistor short circuit	Brake resistor is short circuit (22kW and below)	Check the wire of brake resistor or Replace Brake resistor
u.20	A.20*		Brake transistor short circuit	Brake transistor is damaged (22kW and below)	Contact our local support to repair
u.21	A.21*		Brake Detect	Brake resistor is not connected or working.	Check the Brake resistor or replace suitable Brake resistor
u.23	A.23		Over Current at low voltage	Over current due to that power supply voltage dips too much	Check the Power supply
u.24	A.24		Under Voltage	Power supply voltage dips too much or high load to too low power supply voltage	Check the Power supply

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
u.25	A.25		Overload at low voltage	High load at continuous low power supply voltage	Check the Power supply
u.26	A.26*		Mains Phase Loss	Missing phase on supply side	Check the Power supply
u.27	A.27		KEB fault	KEB function triggered but failed to hold the DC voltage at power supply voltage drop, due to too less inertia or two long time for power supply voltage drop.	1.Check the Power supply 2.Set suitable KEB Threshold voltage
	A.28*		Motor phase U missing	1.motor phase imbalance 2.motor cable loose	Check the motor phase cable and motor.
	A.29*		Motor phase V missing		
	A.30*		Motor phase W missing		
u.36	A.36		Over Voltage	1. The input voltage is too high; 2. The motor works in generator mode; 3. The deceleration time is too short; 4. The braking unit and braking resistor are not installed.	1. Check the power supply 2. Use brake resistor or energy feedback unit to consume or use up the generate energy 3. Adjust relative parameters to avoid the motor working in generator mode

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
u.37	A.37		IGBT Over Temperature	Too high load or the cooling condition beyond the specification	1. Check the load 2. Check the cooling condition, include to clean the airduct or replace the fan
u.38	A.38		IGBT Temperature Sensor Error	1. Too much dust on the fan or the fan is aged; 2. Temperature Sensor Error;	1. Clean or replace the fan; 2. Contact our local support
u.45	A.45		Over Current	1. Motor parameters and/or motor control parameters are not set appropriately; 2. The power size of inverter is too small comparing to the motor or the load ; 3. The power supply voltage is too low; The inverter failed to catch a spinning motor at fly	1.Adjust relevant parameters 2.Select inverter with higher power rating 3.Check the power supply voltage 4.Contact our local support
u.46	A.46		Drive Overload	1. Too heavy load or too low power supply voltage 2. The power size of inverter is too small comparing to the motor or the load 3. Motor parameters and/or motor control parameters are not set appropriately;	1.Correctly set relevant parameters especially the motor parameters 2.Select inverter with high power rating. 3. Contact the local distributor

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
u.48	A.48		Motor Over Temperature	1. Too heavy load on the motor 2. Cooling condition for the motor is not good enough 3. Thermistor for motor temperature sensing is not used correctly	1.Check selection /installation of the thermistor for motor temperature sensing 2.Check the cooling conditions for motor 3. Check the load versus rated power of the motor
u.49	A.49		Motor Overload	1. Motor parameters and/or motor control parameters are not set appropriately; 2. Too heavy load on the motor	1. Correctly set relevant parameters especially the motor parameters 2. Check the load versus rated power of the motor
u.50	A.50		Current Limit	Current exceeds the parameter set max. current (P5-07) due to: 1. Too heavy load comparing to the power size of the inverter 2. Too fast ramp with inertia 3. Too low power supply voltage 4. Motor parameters and/or motor control parameters are not set appropriately;	Adjust P5-07 or try A.45 solution
u.51	A.51		Torque Limit	Torque exceeds the parameter set max. torque (P5-04/P5-05).	Adjust P5-04/P5-05 or try A.45 solution

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
u.57	A.57		Analogue input terminals Error	1. Wire connection problem 2. The parameters for AI live zero are not correctly set	1. Check the wire connection 2. Adjust the relevant parameter setup
u.62	A.62		Modbus Communication Timeout	Drive communication timeout (with external controller PC/PLC/HMI etc.) 1. External controller abnormal 2. communication line connection problem 3. communication Parameters(P0-8X) incorrect. 4.EMC problem.	1.Check external controller PC, PLC, HMI etc. 2.Check communication line connection 3.Correctly set communication parameters(P0-8X) 4. Wiring the communication cables correctly, including shielding and grounding 5.Contact our local support or Company
u.66			Motor Loss	Motor cable connection or motor problems;	Check motor cable or motor phase
	A.69		Mechanic Brake Current Low	Actual motor current cannot exceed release brake current (P1-97~P1-98) within start delay time.	Correctly set mechanical brake parameters(P1-97~P1-98)

Warning	Alarm	Error	Fault Name	Reason Description	Suggested Handling
u.75			Drive License Timeout	Drive License Timeout function activated	Contact our local support
u.76	A.76		External alarm	DI terminals select external alarm function	Check external alarm source
		Er.90	Communication failure between I0 and Power	Hardware failure	Contact our local support or Company
		Er.93	Parameter change disabled	1. They keypad was locked when changing the parameters 2. parameters over the range	1. deblock the keypad 2. set the parameters correctly
		Err	Parameter change disabled	The parameter cannot be changed when Drive running	The parameter cannot be changed when Drive running
	A.99		AMA Error	Failed to finish the motor parameter auto tuning	Correctly set motor parameters according to motor nameplate

9.Parameters list

Parameter Number	Parameter Name	Value Range	Factory Default
Parameter Group 0 : General Control Mode and Commands			
P0-01	Control Mode	0: Speed Mode Speed Sensor less	0
*P0-02	Motor Control Principle	0: V/F ; 1: Vector Control 1	1
P0-03	Macro-program	0 : Invalid ; 1 : Pump Control ; 2: Simple PLC	0
*P0-04	Torque Characteristics	0 : CT ; 1 : VT	0
*P0-05	Motor Speed Direction	0 : Clockwise 1 : Anticlockwise 2 : Bidirectional	2
*P0-09	Selection of reverse direction of motor	0: invalid; 1: reverse selection is valid	0
P0-10	Speed Set Source Selection	0: main set source 1: Multi preset value with priority 2: Calculation of main set source and additional set source. 3: Switchover between main set source and additional set source. 4: Switchover between main set source and the calculation of main set source and additional set source 5: Switchover between additional set source and the calculation of main set source and additional set source Selecting 4 or 5 works similar as selecting 3.	2

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 0：General Control Mode and Commands				
P0-11	Main Set Source	0: No function; 1: Terminal AI 5: Pulse input, use pulse input as set source 10: Multi preset value 0 + Up/Down 11: Multi preset values 20: Communication 21: Process PID 30: Keypad		1
P0-12	Additional Set Source	Same as P0-11		20
P0-14	Set Value Calculation from Main and Additional Source	0：Main Set Source + Additional Set Source 1：Main Set Source - Additional Set Source 2：Maximal Value of Main and Additional Set Source 3：Minimal Value of Main and Additional Set Source		0
P0-15	Speed Set Range	0：0~P0-16; 1：-P0-16~P0-16		0
P0-16	Base Value for Speed Set	0.0~400.0		50.0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 0 : General Control Mode and Commands				
P0-17	Control Site	0 : Terminal or Bus Communication 1 : Terminal 2 : Bus Communication		0
P0-18	Selection of Communication Control Source	0 : Null 1 : Local RS485		1
P0-30	Multi Preset Value0	-100.00~100.00	%	0.00
P0-31	Multi Preset Value1	-100.00~100.00	%	0.00
P0-32	Multi Preset Value2	-100.00~100.00	%	0.00
P0-33	Multi Preset Value3	-100.00~100.00	%	0.00
P0-34	Multi Preset Value4	-100.00~100.00	%	0.00
P0-35	Multi Preset Value5	-100.00~100.00	%	0.00
P0-36	Multi Preset Value6	-100.00~100.00	%	0.00
P0-37	Multi Preset Value7	-100.00~100.00	%	0.00
P0-46	UP/DOWN Step Value	0.01~50.00		0.10
P0-47	Save Up/Down Set Value	0 : Not Save 1 : Save when Stop 2 : Save when Power Down		0
P0-48	Jog Speed	0.0~400.0Hz	Hz	5.0
P0-49	Ramp Time Resolution	0 : 0.1s ; 1 : 0.01s		1
P0-50	Ramp 1 Type	0 : Linear ; 1 : S ramp		0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 0 : General Control Mode and Commands				
P0-51	Ramp 1 Ramp Up Time	0.05~655.35	s	*
P0-52	Ramp 1 Ramp Down Time	0.05~655.35	s	*
P0-53	Ramp 2 Type	0 : Linear ; 1 : S ramp		0
P0-54	Ramp 2 Ramp Up Time	0.05~655.35	s	*
P0-55	Ramp 2 Ramp Down Time	0.05~655.35	s	*
P0-56	Ramp 3 Type	0 : Linear ; 1 : S ramp		0
P0-57	Ramp 3 Ramp Up Time	0.05~655.35	s	*
P0-58	Ramp 3 Ramp Down Time	0.05~655.35	s	*
P0-59	Ramp 4 Type	0 : Linear ; 1 : S ramp		0
P0-60	Ramp 4 Ramp Up Time	0.05~655.35	s	*
P0-61	Ramp 4 Ramp Down Time	0.05~655.35	s	*
P0-62	Jog Ramp Time	0.05~655.35	s	*
P0-63	S Ramp Up Initiate Period	0.05~655.35	s	*
P0-64	S Ramp Up Termination Period	0.05~655.35	s	*
P0-65	S Ramp Down Initiate Period	0.05~655.35	s	*
P0-66	S Ramp Down Termination Period	0.05~655.35	s	*
P0-80	Local Address	1~127		1
P0-81	Baud Rate	0 : 2400 1 : 4800 2 : 9600 3 : 19200 4 : 38400 5~9 : Reserved		2

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 0 : General Control Mode and Commands				
P0-82	Communication Data Format (Parity/Stop Bits)	0 : Even parity (1 stop bit) 1 : Odd parity (1 stop bit) 2 : No parity (1 stop bit) 3 : No parity (2 stop bit)		0
P0-83	Min. Communication Response Delay	0.000~0.500	s	0.002
P0-84	Max. Communication Response Delay	0.010~10.000	s	5.000
P0-85	Message Response	0 : Normal Reponses 1 : Only Response Exceptional Message 2 : Not Response		0
P0-86	Parameter (Set by Communication) Saving at Power Down	0 : Not Save Parameter at Power Down 1 : Save Parameter at Power Down		0
P0-88	Communication Timeout Time	0.01~650.00	s	1.00
P0-89	Communication Timeout Response Function	0 : No Function 2 : Stop Motor 3 : Jogging 4 : Run with Max Frequency P5-03 5 : Alarm Fault and Trip to stop 6 : Warning		0
P0-90	Reset Communication Timeout	0 : No Action ; 1 : Reset the Timeout		0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 1 : Basics for Inverter and Motor Control				
P1-00	Switching Frequency	2~10 : 2~10 kHz		*
*P1-01	Grid Type	2~122		*
*P1-02	Motor Type	0 : Induction Motor 1 : SPM 2 : IPM without Saturation 3 : IPM with Saturation		0
*P1-03	Rated Motor Power	0.12~450	kW	*
*P1-04	Rated Motor Voltage	50~1000	V	*
*P1-05	Rated Motor Frequency	20~400	Hz	*
*P1-06	Rated Motor Current	0.1~1200	A	*
*P1-07	Rated Motor Speed	100~24000	rpm	*
*P1-08	Rated Motor Torque	0.1~6553.5	N·m	*
*P1-13	Autotuning for Motor Parameters	0 : No Function ; 1 : Simple Static Motor Auto Tuning 2 : Complete Static Motor Auto Tuning		0
*P1-14	Stator Resistance (Rs)	Depends on motor model	Ω	*
*P1-15	Rotor Resistance (Rr)	Depends on motor model	Ω	*
*P1-16	Stator Leakage Reactance (X1)	Depends on motor model	Ω	*
*P1-17	Main Reactance (Xh)	Depends on motor model	Ω	*
*P1-18	Ld, PM D-axis Inductance	0.01~655.35	mH	*
*P1-19	Lq, PM Q-axis Inductance	0.01~655.35	mH	*
*P1-20	Ld-s, PM D-axis Inductance Saturated	0.01~655.35	mH	*

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 1 : Basics for Inverter and Motor Control				
*P1-22	Saturation Current at D-axis for Ld-s	20~200	%	100
*P1-23	Saturation Current at Q-axis for Lq-s	20~200	%	100
*P1-24	Number of Motor Poles	2~100	P	4
*P1-25	BEMF at Rated Speed for PM	0~9000	V	*
*P1-26	Motor Cable Length	0~150	m	10
*P1-27	System Inertia	0.000~65.535	kg· m2	*
P1-32	Load Compensation Gain for Low Speed	0~199	%	100
P1-33	Load Compensation Gain for High Speed	0~199	%	100
P1-34	Motor Magnet Current at 0 Speed	0~300	%	100
P1-35	Cut in Speed for Normal Magnet Current	0.0~10.0	Hz	0.0
P1-36	Min Motor Current at Low Speed	0~120	%	80
P1-37	Slip Compensation Gain	-400~399	%	*
P1-38	Slip Compensation Time Constant	0.05~5.00	s	*
P1-39	Resonance Damping Gain	0~3000	%	*
P1-40	Time Constant for Resonance Damping Filter	0.005~0.050	s	0.005
P1-41	Damping Coefficient for PM	0~250	%	120
P1-42	Damping Time Constant for Low Speed range (PM)	0.01~20.00	s	0.80
P1-43	Damping Time Constant for High Speed range (PM)	0.01~20.00	s	0.80
P1-44	Time Constant for Current Filter (PM)	0.001~1.000	s	0.500
P1-53/55 /57/59/61	Voltage for V/F curve points	0.0~999.9	V	*
P1-54/56 /58/60/62	Frequency for V/F curve Points	0.0~400.0	Hz	*

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 1 : Basics for Inverter and Motor Control				
P1-63	PM Start Method	0 : Initial Position Detection (IPD); 1 : Parking		1
*P1-64	IM Start Method	0 : Direct Start; 1 : Fly start		0
P1-67	Min Valid Speed Set	0.0~50.0	Hz	0.0
P1-68	Bypass Range for IM Low Speed	0.0~20.0	Hz	0.0
P1-70	Delay Time at Start	0.0~10.0	s	0.0
P1-71	Delay Function at Start	0 : Free Coast; 1 : DC Hold		0
P1-72	DC Hold Current	0~150	%	50
P1-80	Function at Stop	0 : Free Coast; 1 : DC hold		0
P1-81	Cut in Speed for Function at Stop	0.0~400.0	Hz	0.0
P1-82	DC Brake Current (IM)	0~150	%	50
P1-83	DC Brake Time (IM)	0.0~60.0	s	2.0
P1-84	DC Brake Cut in Speed (IM)	0.0~400.0	Hz	0.0
P1-85	Demagnetizing Rate at DC Cut in	0~100	%	100
P1-86	Parking Current (PM Start)	0~150	%	80
P1-87	Parking Time (PM Start)	0.1~60.0	s	3.0
P1-91	Brake Function	0 : No Function; 1 : Resistor Brake; 2 : AC Brake		0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 2: Digital Terminal Functions				
P2-00	DI Positive-Negative Logic Selection	0~65535		0
P2-01	DO/Relay Positive-Negative Logic Selection	0~65535		0
P2-04	DI Filter time	2~16	ms	4
P2-05	FWD Input Function Selection	0 : No Function; 1 : Reset 2 : Coast to Stop (Negative Logic) 3 : Coast to Stop and Reset (Negative Logic) 4 : Stop (Negative Logic) 10 : Run 11 : Forward/Reverse Selection 12 : Run in Reverse Direction 13 : Latched run forward 14 : Latched run reverse 15 : Forward Jog 16 : Reverse Jog 20 : Forbid Forward 21 : Forbid Reverse 22 : Preset Value Command Bit 1 23 : Preset Value Command Bit 2 24 : Preset Value Command Bit 3 25 : Preset Value Command Bit 4		10

		26：Ramp Time Selection Bit 1 27：Ramp Time Selection Bit 2 30：Speed UP 31：Speed DOWN 32：Counter A 34：Reset Counter A 35：Counter B 37：Rest Counter B 40：Pulse Input 41：Switch Set Source 42：Switch Speed Mode/Torque Mode 50：External Fault Input 51：Freeze PID output		

Parameter Number	Parameter Name	Value Range	Factory Default
Parameter Group 2: Digital Terminal Functions			
P2-06	REV Input Function Selection		12
P2-07	DI Function Selection - Terminal D1		22
P2-08	DI Function Selection - Terminal D2		23
P2-21	Action for DI as External Fault Input	0：No Action； 2：Stop and Warning 3：Jog and Warning 4：un to Max Speed P5-03 and Warning 5：Alarm Fault and Trip to stop 6：Warning	0
P2-22	DO Function Selection - Terminal DO	0：No operation; 1：Drive ready, 2：Remote control ready 3：Drive ready/stop 4：Drive running, the drive is running; 5：Drive running/No warning, the drive is running and no warning is present; 6：Run in current range 7：Run on reference 8：Reverse	0
P2-28	Relay Output Function Selection - RL		10

		10：Alarm 11：Alarm or warning 12：Thermal warning 13：Ready 14：Remote ready 15：Bus OK 20：Out of current range 21：Below current low 22：Above current high 23：Out of frequency range 24：Below frequency low, 25：Above frequency high 26：Out of feedback range 27：Below feedback low 28：Above feedback high 29：Out of reference range 30：Below reference low 31：Above reference high 40：Drive in Local mode; 41：Drive in Remote mode; 42：Mech. brake control, 43：External alarm 44：Unbalance warning 47: Counter A 48: Counter B	

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 2: Digital Terminal Functions				
P2-29	Relay on Delay Time - RL	0.00~600.00	s	0.00
P2-30	Relay off Delay Time - RL	0.00~600.00	s	0.00
P2-46	Save DI Counter Value at Power down	0：Save None; 1：Save Counter A 2：Save Counter B; 3：Save Both Counter A and B		0
P2-47	Counter A Preset threshold	0~65535		65535
P2-48	Counter B Preset threshold	0~65535		65535
P2-50	Min Frequency for Pulse Input	0.00~P2-51	kHz	0.00
P2-51	Max Frequency for Pulse Input	P2-50~100.00	kHz	50.00
P2-53	Set Value/Feedback Value Versus Max Frequency for Pulse Input	-200.00~200.00	%	100.00
P2-54	Pulse input Filter Time	1~1000	ms	100
P2-60	Pulse output function selection	0：Digital output 1：Output frequency 2：Output current 3：Output Power 4：Motor Speed 5：Output voltage 10：Set Value 11：Feedback 13：Set Value from Bus 14：Input frequency of the pulse input 15：Terminal AI input value 20：DC link voltage 30：Output Torque		0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 2: Digital Terminal Functions				
P2-61	Min Frequency for Pulse Output	0.00~P2-62	kHz	0.00
P2-62	Max Frequency for Pulse Output	P2-61~100.00	kHz	0.00
P2-63	Function Value Versus Min Frequency for Pulse Output	0.00~200.00	%	0.00
P2-64	Function Value Versus Max Frequency for Pulse Output	0.00~200.00	%	100.00

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 3 : Analogue Terminal Functions				
P3-00	Signal Type - Terminal AI	0.Analogue Voltage 1.Analogue Current		0
P3-01	Terminal AI Filter Time	0.00~10.00	s	0.01
P3-02	Zero Voltage Dead Band - Terminal AI	0.00~20.00	V/mA	0.00
P3-03	Min Input Voltage-Terminal AI	0.00~P3-04	V	0.00
P3-04	Max Input Voltage-Terminal AI	P3-03~10.00	V	10.00
P3-05	Min Input Current - Terminal AI	0.00~ P3-06	mA	0.00
P3-06	Max Input Current -Terminal AI	P3-05~20.00	mA	20.00
P3-07	Set Value/Feedback Value Versus Min Input -Terminal AI	-200.00~200.00	%	0.00
P3-08	Set Value/Feedback Value Versus Max Input -Terminal AI	-200.00~200.00	%	100.00
P3-68	Min Set Value from Keypad	-200.00~200.00	%	0.00
P3-69	Max Set Value from Keypad	-200.00~200.00	%	100.00

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 4：Process PID and Other Controllers				
P4-00	Process PID Feedback Source	0：No Function 1：Terminal AI 5：Pulse Input 20：Bus Communication		0
P4-01	Process PID Set Source	0：No Function 1：Terminal AI 5：Pulse Input 10：Preset Value 0 + UP/DOWN 11：Multi Preset Value 20：Bus Communication 30：Keypad		0
P4-02	Fiducial Value for Process PID Set/Feedback	0.0~3000.0		50.0
P4-04	Process PID Control Logic: Positive/Negative	0：Positive 1：Negative		0
P4-05	Process PID Anti Windup	0：Disable 1：Enable		1
P4-06	Cut-in Frequency for Process PID Speed Mode	0.0~200.0	Hz	0.0
P4-07	Proportional Gain - Process PID 1	0.0~10.00		0.01

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 4 : Process PID and Other Controllers				
P4-08	Integral Time - Process PID 1	0.01~655.35	s	655.35
P4-09	Differentiating Time - Process PID 1	0.00~10.00	s	0.00
P4-13	Process PID Differential Limit	1.0~50.0		5.0
P4-14	Error Tolerance Limit to Enable Process PID	0.0~200.0	%	0.1
P4-15	Process PID Out/In Mode to Error Tolerance	0~2		0
P4-18	Process PID Output Low Limit	-100.00~100.00	%	0.00
P4-19	Process PID Output High Limit	-100.00~100.00	%	100.00
P4-22	Process PID Integral Output Low Limit	-100.00~100.00	%	0.00
P4-23	Process PID Integral Output High Limit	-100.00~100.00	%	100.00
P4-51	PM Current Limit Controller Feedforward Gain	0~400	%	100
P4-52	Proportional Gain - Current Limit Controller	0~500	%	100
P4-53	Integration Time - Current Limit Controller	0.000~2.000	s	0.020
P4-54	Filter Time - Current Limit Control	2.0~100.0	ms	*
P4-61	Isd PI Control Bandwidth	10~200	Hz	30
P4-62	Isd PI Control Damping Coefficient	1~200		100
P4-63	Isd Load Compensation Coefficient	0.1~1.0		0.5
P4-64	Isq PI Control Bandwidth	0.010~1.000	Hz	0.030
P4-65	Isq PI Control Damping Coefficient	1~200		1

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 5 : Limitation, Protection and Failure Detection				
*P5-02	Motor Low Speed Limit	0.0~400.0	Hz	0.0
*P5-03	Motor High Speed Limit	0.0~400.0	Hz	65.0
P5-04	Torque Limit at Motor Mode	0~1000	%	160
P5-05	Torque Limit at Generator Mode	0~1000	%	160
P5-07	Max Current Limit	0~300	%	*
*P5-08	Max Output Frequency Limit	0.0~400.0	Hz	65.0
P5-09	Threshold for Low Current Warning	0.00~P9-16	A	0.0
P5-10	Threshold for High Current Warning	0.00~P9-16	A	*
P5-11	Threshold for Low Speed Warning	0.0~400.0	Hz	0.0
P5-12	Threshold for High Speed Warning	0.1~400.0	Hz	65.0
P5-13	Threshold for Low Set Value Warning	-200.00~200.00	%	0.00
P5-14	Threshold for High Set Value Warning	-200.00~200.00	%	100.00
P5-15	Threshold for Low Feedback Warning	-200.00~200.00	%	0.00
P5-16	Threshold for High Feedback Warning	-200.00~200.00	%	100.00
*P5-17	Enable Motor Phase Loss Protection	0 : Disable 1 : Enable		1
P5-18	Enable Current Limit/Torque Limit Warning	0 : Disable 1 : Enable		1
P5-22	Threshold for Communication with IO Board Timeout	0.10~60.00	s	1.00

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 5：Limitation, Protection and Failure Detection				
P5-26	Motor Thermal Protection Function	0：No Function 1：ETR Warning 2：ETR Alarm Fault 3：ETR Warning for Self-cooled Motor 4：ETR Alarm Fault for Self-cooled Motor		0
P5-27	Motor Overload Protection Time	0.1~60.0	min	2.0
P5-28	Threshold for Motor Overload Protection	100~160	%	150
P5-29	Function at Mains Phase Loss	0：No Action 1：Only Waring 2：Trip to stop and Alarm Fault (Heavy Load) 3：Trip to stop and Alarm Fault (Mid Load) 4：Trip to stop and Alarm Fault (Light Load)		3
P5-30	Alarm/Fault Lock Handling	0：Not Lock, Alarm/Fault Resettable without Re-Power On 1：Lock, Alarm/Fault Lock Resettable only after Re-Power On		1

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 5：Limitation, Protection and Failure Detection				
P5-31	Delay Time to Alarm Current Limit Fault	0~60	s	60
P5-32	Delay Time to Alarm Torque Limit Fault	0~60	s	60
P5-33	Action at Warning	0：Trip to stop and Alarm Fault directly 1：Warning and Re-catch Motor after Failure Disappear		1
P5-34	Method to Re-catch Motor at Warning	0：Speed Track（IM/PM）and Angle Track (Fly start) 1：Direct Re-catch		0
P5-60	Selection of unloading detection function	0: invalid 1; valid		0
P5-61	Unloading detection threshold	0.1~200.0	%	5
P5-62	Off-load detection filtering time	0.1~600.0	s	1

Parameter Number	Parameter Name	Value Range	Factory Default
Parameter Group 6 : Keypad Operation and Display			
P6-03	Customer Defined Value for 0 Speed	0.0~6553.5	0.0
P6-04	Customer Defined Value for Max Speed	0.0~6553.5	100.0
P6-05	Keypad Display Option	0~8191	0
P6-31	Local/Remote Mode Selection	0 : Remote Mode 1 : Local Mode	0
P6-32	Free key function Selection	0 : Disabled 1 : Reverse RUN	0
P6-34	Lock Keypad for Parameter Edit	0 : Disabled 1 : Enabled and Lock	0
P6-35	Panel adjustment frequency step setting	0 : 0.1 Hz 1 : 1.0 Hz 2 : 10 Hz	1
P6-50	Motor speed ratio	0.01~655.35	1.00
*P6-51	Current display compensation	0.01~655.35	1.00
*P6-52	Power display compensation	0.01~655.35	1.00

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 7：Auxiliary and Special Functions				
P7-00	Special Operation Function	0：No Function 9：Reset Parameters to Factory Defaults		0
P7-01	Function at Re-Power (for Local Mode Only)	0：Resume with Set Value as Set before Re-power 1：Not Run, but Keep Set Value as Set before Re-power 2：Not Run and Clear Set Value		1
*P7-10	Min Switch Frequency	2~16：2~16 kHz	kHz	2
*P7-11	Over Modulation Coefficient	90.0~105.5	%	100.0
*P7-12	DC-Link Voltage PWM Compensation Function	0：Compensate Average DC voltage 2：Compensate DC Ripple Voltage		0
P7-13	DC-link Voltage PWM Compensation Disable at VF control	0：Disable 1：Enable		1
P7-14	Dead Time Compensation Adjustment Coefficient	0~200	%	100
P7-17	Max Speed for Dead Time Compensation	20~400	Hz	*

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 7：Auxiliary and Special Functions				
P7-26	Function at Mains Voltage Sag	0：No Function 1：Passive Ramp Down 2：Passive Ramp Down, Trip 3：Coast and Fly start 4：KEB Control 5：KEB Control, Trip 6：Trip to stop and Alarm		0
P7-27	Threshold Triggering Mains Voltage Sag Function	100~220/380	V	*
P7-28	KEB Control Gain	0 ~ 500	%	100
P7-35	Interval time between automatic zero clearance of reset times	0~6000	min	0
P7-36	Method to Reset Alarm Fault	0：Reset by Command 1~10：Auto Reset for 1~10 Times 11：Auto Reset for Unlimited Times		0
P7-37	Alarm Auto Reset Waiting Time	0~600	s	10
*P7-38	VT Function Level	40~90	%	90
*P7-39	Min Magneton at AEO	40~75	%	66

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 7：Auxiliary and Special Functions				
P7-40	Magneton Optimization Factor (PM)	-400~400	%	10
P7-46	Threshold Voltage for OVC Function	Grid Voltage Dependent	V	*
P7-47	OVC Function	0：Disable 1：Enable with Mode 1 2：Enable with Mode 2		*
P7-48	OVC Integral Time	0.01~0.10	s	*
P7-49	OVC Proportional Gain	0~200	%	*
P7-50	Bypass Speed Start 1	0.0~400.0	Hz	0.0
P7-51	Bypass Speed End 1	0.0~400.0	Hz	0.0
P7-52	Bypass Speed Start 2	0.0~400.0	Hz	0.0
P7-53	Bypass Speed End 2	0.0~400.0	Hz	0.0
P7-54	Bypass Speed Start 3	0.0~400.0	Hz	0.0
P7-55	Bypass Speed End 3	0.0~400.0	Hz	0.0
P7-60	Power outage restart delay time	0~3600	s	0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 8：Basic and Running Information				
P8-00	Power Board Software Version			
P8-01	IO Board Software Version			
P8-30	Total Days with Power On	0~9999	d	
P8-31	Total Running Hours	0~60000	h	
P8-32	Total Energy Consumed (kWh)	0~65535	kWh	
P8-33	Number of Power Ups	0~65535		
P8-34	Number of Over-Temperatures	0~65535		
P8-35	Number of Over-Voltages	0~65535		
P8-36	Reset Consumed Energy Counter	0：Not Reset 1：Reset		0
P8-37	Reset Running Hours Counter	0：Not Reset 1：Reset		0
P8-40~P8-49	Alarm Log			
P8-50~P8-59	Warnings Log			

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 9 : Real Time Running Status Monitoring				
P9-00	Control Word	0~65535		
P9-01	Status Word	0~65535		
P9-02	Set Value	-4999.0~4999.0		
P9-04	Motor Speed	0~9999	rpm	
P9-05	Output Power	0.000~655.35	kW	
P9-06	Output Voltage	0~65535	V	
P9-07	Output Frequency	0.0~400.0	Hz	
P9-08	Output Current	0.00~655.35	A	
P9-09	Output Torque	-200.0~200.0	%	
P9-10	Motor Thermal Load Status	0~100	%	
P9-11	DC Link Voltage	0~65535	V	
P9-13	Heatsink or IGBT Temperature	-128~127	℃	
P9-14	Inverter Thermal Load Status	0~255	%	
P9-15	Nominal Inverter Current	0.0~6553.5	A	
P9-16	Max Inverter Current	0.0~6553.5	A	
P9-19	PID Set Value	-200.0~200.0	%	
P9-20	PID Feedback Value	-200.0~200.0		
P9-21	PID Output	-200.0~200.0	%	
P9-22	Digital Input	0~65535		
P9-23	AI Analogue Input Type	0 : 0~10V 1 : 0~20mA		
P9-24	AI Input Value	0.00-20.00	V/m A	
P9-34	Set Value by Pulse Input	-200.0~200.0	%	

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 9： Real Time Running Status Monitoring				
P9-35	Frequency of Pulse Input	0.00~100.00	kHz	
P9-38	DO Output Status	0~255		
P9-39	Relay Output Status	0~65535		
P9-43	Pulse Output Frequency	0.00~100.00	kHz	
P9-45	Counter A Value	0~65535		
P9-46	Counter B Value	0~65535		
P9-47	Set Value from Bus Communication	-32768~32767		
P9-48	Variable Defined by Customer	0~6553.5		

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 19：Simple PLC function				
P19-00	SPLC control mode	0：once running then keep running 1：once running then stop 2：cycle running		0
P19-01	SPLC store selection	0：No function 1：save at Stop 2：save at Power down		0
P19-02	SPLC reset times reset	0: invalid 1: Reset times are reset		0
P19-10	SPLC multi-speed0	-100.00%~100.00%	%	0
P19-11	SPLC multi-speed1	-100.00%~100.00%	%	0
P19-12	SPLC multi-speed2	-100.00%~100.00%	%	0
P19-13	SPLC multi-speed3	-100.00%~100.00%	%	0
P19-14	SPLC multi-speed4	-100.00%~100.00%	%	0
P19-15	SPLC multi-speed5	-100.00%~100.00%	%	0
P19-16	SPLC multi-speed6	-100.00%~100.00%	%	0
P19-17	SPLC multi-speed7	-100.00%~100.00%	%	0
P19-18	SPLC multi-speed8	-100.00%~100.00%	%	0
P19-19	SPLC multi-speed9	-100.00%~100.00%	%	0
P19-20	SPLC multi-speed10	-100.00%~100.00%	%	0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 19 : Simple PLC function				
P19-21	SPLC multi-speed11	-100.00%~100.00%	%	0
P19-22	SPLC multi-speed12	-100.00%~100.00%	%	0
P19-23	SPLC multi-speed13	-100.00%~100.00%	%	0
P19-24	SPLC multi-speed14	-100.00%~100.00%	%	0
P19-25	SPLC multi-speed15	-100.00%~100.00%	%	0
P19-26	SPLC step0 ramp time	0.0~6000.0	S	0
P19-27	SPLC step1 ramp time	0.0~6000.0	S	0
P19-28	SPLC step2 ramp time	0.0~6000.0	S	0
P19-29	SPLC step3 ramp time	0.0~6000.0	S	0
P19-30	SPLC step4 ramp time	0.0~6000.0	S	0
P19-31	SPLC step5 ramp time	0.0~6000.0	S	0
P19-32	SPLC step6 ramp time	0.0~6000.0	S	0
P19-33	SPLC step7 ramp time	0.0~6000.0	S	0
P19-34	SPLC step8 ramp time	0.0~6000.0	S	0
P19-35	SPLC step9 ramp time	0.0~6000.0	S	0
P19-36	SPLC step10 ramp time	0.0~6000.0	S	0
P19-37	SPLC step11 ramp time	0.0~6000.0	S	0
P19-38	SPLC step12 ramp time	0.0~6000.0	S	0
P19-39	SPLC step13 ramp time	0.0~6000.0	S	0
P19-40	SPLC step14 ramp time	0.0~6000.0	S	0
P19-41	SPLC step15 ramp time	0.0~6000.0	S	0
P19-42	SPLC step0 running time	0.0~6000.0	S	0
P19-43	SPLC step1 running time	0.0~6000.0	S	0
P19-44	SPLC step2 running time	0.0~6000.0	S	0

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 19 : Simple PLC function				
P19-45	SPLC step3 running time	0.0~6000.0	S	0
P19-46	SPLC step4 running time	0.0~6000.0	S	0
P19-47	SPLC step5 running time	0.0~6000.0	S	0
P19-48	SPLC step6 running time	0.0~6000.0	S	0
P19-49	SPLC step7 running time	0.0~6000.0	S	0
P19-50	SPLC step8 running time	0.0~6000.0	S	0
P19-51	SPLC step9 running time	0.0~6000.0	S	0
P19-52	SPLC step10 running time	0.0~6000.0	S	0
P19-53	SPLC step11 running time	0.0~6000.0	S	0
P19-54	SPLC step12 running time	0.0~6000.0	S	0
P19-55	SPLC step13 running time	0.0~6000.0	S	0
P19-56	SPLC step14 running time	0.0~6000.0	S	0
P19-57	SPLC step15 running time	0.0~6000.0	S	0
P19-80	Average Speed	0~65535	RPM	
P19-81	Current Running step	0~15		
P19-82	Current Running step time	0.0~6553.5	S	
P19-83	SPLC reset times	0~65535		

Parameter Number	Parameter Name	Value Range	Unit	Factory Default
Parameter Group 20 : Pump control function				
P20-00	pump control mode	0 : pressure mode		0
P20-01	minimum output frequency	0.00~P20-02	%	40
P20-02	maximum output frequency	P20-01~100.00	%	100
P20-60	Sleep enable selection	0 : disable 1 : enable		0
P20-61	Sleep frequency threshold	0.00~100.00	%	2
P20-62	Sleep pressure threshold	0.00~100.00	%	2
P20-63	Sleep detection time	0.0~300.0	S	10
P20-64	minimum sleep time	0.0~1800.0	S	300
P20-65	wake up pressure threshold	0.00~100.00	%	10
P20-66	wake up detection time	0.0~60.0	S	1