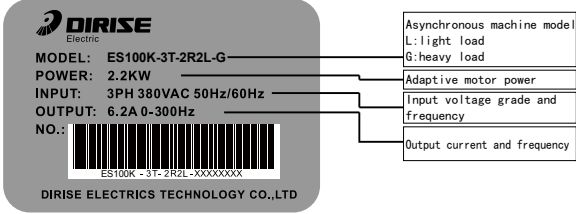




ES100K Special Asynchronous Inverter For Air Compressor User Manual

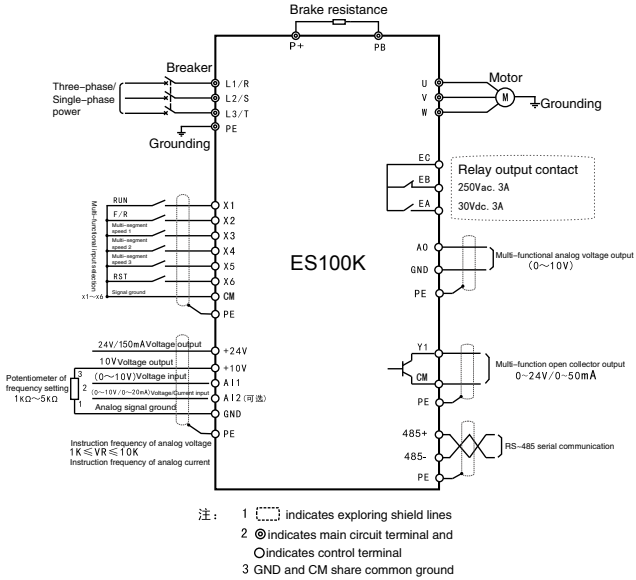
1 ES100K nameplate description

Below the right side plate of housing , Nameplate marked with ES100K inverter model and rated value is pasted up on it. The contents of nameplate is shown as follow:



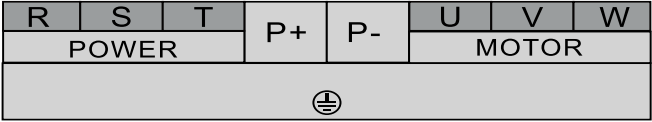
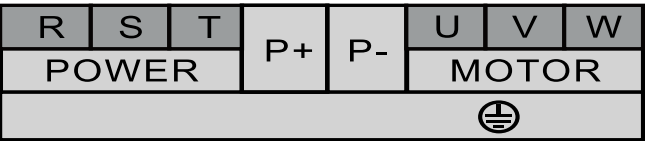
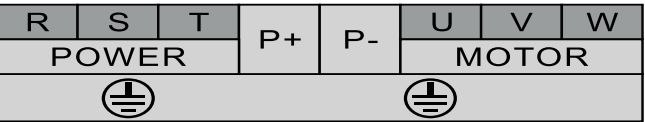
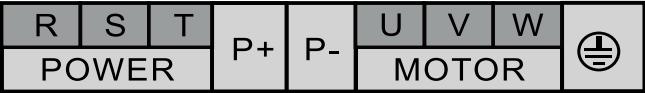
2 Wiring diagram of main circuit terminal and control circuit terminal

Standard wiring diagram of ES100K inverter main circuit and control circuit is shown as follow:

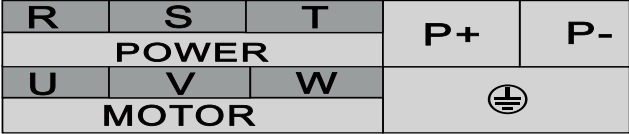


3 Main circuit terminal’ s functions

ES100K main circuit terminals are shown as follow:



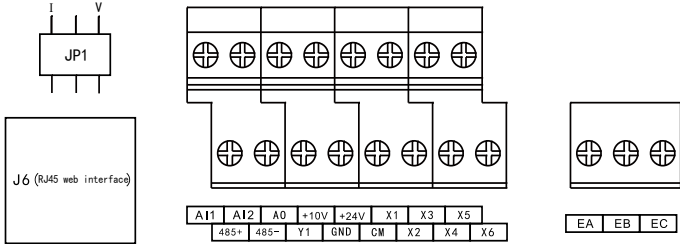
ES100k 110KW major loop terminals diagram



ES100k 132KW-160KW major loop terminals diagram

4 Control circuit terminal’ s functions

ES100K control circuit terminals are shown as follow:



Lifting dial switching means current I ;pulling down dial switching means voltage V.

5 Functional parameter table

“ ○ ” : Indicate code parameter can be modified when driver is on ;
“ ” : Indicate code parameter can not be modified when driver is on ;
“ ” : Indicate code parameter can be read only and can not be modified.

P00 group: Basic parameter

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P00.00	Control methods	0: V/F control 1: Vector control		1	○
P00.01	Command source choosing	0: Native keyboard 1: External terminals 2: Computer communication		0	○
P00.02	Main frequency source choosing	0: Main digital frequency 1: Keyboard potentiometer 2: AI1 3: AI2		1	○
P00.03	Auxiliary main frequency source choosing	0: Auxiliary digital frequency 1: Keyboard potentiometer 2: AI1 3: AI2 4: PLC 5: PLD 6: Pendulum frequency running		0	○
P00.04	output frequency source choosing	0: Main frequency source 1: Auxiliary frequency source 2: Main frequency source choosing and auxiliary frequency source 3: Main frequency source choosing minus auxiliary frequency source 4: MAX (Main frequency source,, auxiliary frequency source) 5: MIN (Main frequency source,, auxiliary frequency source)		0	○
P00.05	1: Auxiliary frequency source range during the superposition	0: Compared to maximum frequency 1: Compared to main frequency		0	○
P00.06	Auxiliary frequency source proportion during the superposition	0.00 ~ 200.00	%	100.00	○

P00.07	output frequency source control	0: Input frequency source 1: AI1*Output frequency source 2: AI2*Output frequency source		0	○
P00.08	Main digital frequency	0.00 ~ max frequency	Hz	0.00	○
P00.09	Auxiliary digital frequency	0.00 ~ max frequency	Hz	0.00	○
P00.10	Setting rotation direction	0: Forward rotation 1: Reverse rotation		0	○
P00.11	Acceleration time1	0.00 ~ 600.00	S	10.00	○
P00.12	Deceleration time1	0.00 ~ 600.00	S	10.00	○
P00.13	Carrier frequency	2.000 ~ 15.000	KHz	4.000	○
P00.14	Max frequency	20.00 ~ 300.00	Hz	50.00	○
P00.15	Upper frequency	Lower frequency ~ Max frequency	Hz	50.00	○
P00.16	Lower frequency	0.00 ~ upper frequency	Hz	0.00	○
P00.17	Lower frequency control	0: Operate at the lower frequency 1: When lower frequency's running time is over, the frequency inverter operates at zero speed.		0	○
P00.18	Lower frequency's operation time	0.00 ~ 600.00	S	60.00	○
P00.19	Reverse rotation's control	0: Forward/reverse rotation is allowed. 1: Reverse rotation is forbidden.		0	○
P00.20	Forward/reverse rotation's dead zone time	0.00 ~ 600.00	S	0.00	○
P00.21	Load speed factor	0.00 ~ 300.00		30.00	○
P00.22	Factory defaults' resetting	0: Invalid 1: Factory reset		0	○
P00.23	load type	0: G type constant rotation load Universal Type 1: P type fan/pump etc Stable Type		0	○

P01Group. Start–stop Control

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P01.00	Acceleration/deceleration mode	0: Linear mode 1: S curve mode		0	○
P01.01	S Curve time	0.00 ~ 600.00	S	0.00	○
P01.02	Start DC injection braking current	0.00 ~ 150.00	%	0.00	○
P01.03	Time of starting DC injection braking	0.00 ~ 30.00	S	0.00	○
P01.04	Stopping method	0: Stopping via deceleration 1: Stopping without control		0	○
P01.05	DC injection braking frequency when stopping	0.10 ~ 60.00	Hz	2.00	○
P01.06	DC injection braking current when stopping	0.00 ~ 150.00	%	0.00	○
P01.07	DC injection braking waiting time	0.00 ~ 30.00	S	0.00	○
P01.08	DC injection braking time when stopping	0.00 ~ 30.00	S	0.00	○

P02Group. Motor Parameters

Function codes	Function codes' name	Range set	Unit	Factory defaults	Property
P02.00	Motor's rated power	0.10 ~ 600.00	KW	XX.XX	○
P02.01	Motor's rated voltage	0 ~ 660	V	XX.X	○
P02.02	Motor's rated current	0.1 ~ 1500.0	A	XX.X	○
P02.03	Motor's rated frequency	20.00 ~ 300.00	Hz	XX.XX	○
P02.04	Motor's rated rotation speed	1 ~ 30000	rpm	XXXX	
P02.05	Motor's connection method	0: Y 1: Δ		X	x
P02.06	Power factor	0.70 ~ 0.95		X.XX	○
P02.07	Motor's efficiency	70.00 ~ 97.00	%	XX.XX	○
P02.08	No-load current	0.1 ~ 1000.0	A	XX.X	○
P02.09	Stator resistive (R1)	0.01 ~ 300.0	Ω	XX.X	○
P02.10	Stator resistive (R2)	0.01 ~ 300.0	Ω	XX.X	○
P02.11	Interaction inductive reactance	0.1 ~ 3000.0	mH	XXX.X	○
P02.12	Leakage inductance factor	0.1 ~ 3000.0		X.XXX	○

P02.13	Parameter's self-identification	0: None identification 1: Motor's stationary state's auto-identification 2: Motor's rotational state's auto-identification		0	○
--------	---------------------------------	--	--	---	---

P03Group. V/F Control Parameters

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P03.00	V/F curve setting	0: V/F straight line 1: Multi-point V/F curve 2: Fan curve 1 3: Fan curve 2 4: Fan curve 3 5: Fan curve 4		1	○
P03.01	Reference frequency	20.00 ~ 300.00	Hz	50.00	○
P03.02	V/F voltage value V0	0.00 ~ 100.00	%	1.00	○
P03.03	V/F voltage value V1	0.00 ~ 100.00	%	4.00	○
P03.04	V/F voltage value V2	0.00 ~ 100.00	%	10.00	○
P03.05	V/F voltage value V3	0.00 ~ 100.00	%	16.00	○
P03.06	V/F frequency value F0	V/FF1	%	1.00	○
P03.07	V/F frequency value F1	Frequency value F0 ~ frequency value F2	%	4.00	○
P03.08	V/F frequency value F2	Frequency value F1 ~ frequency value F3	%	10.00	○
P03.09	V/F frequency value F3	Frequency value F2 ~ 100.00	%	16.00	○

P04Group. Input Terminal Control

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P04.00	DI terminal filter	0 ~ 100		10	
P04.01	DI Input logic	Bit5, Bit4, Bit3, Bit2, Bit1, Bit0 X6, X5, X4, X3, X2, X1 0: Effective when connected 1: Ineffective when disconnected		0000000	○
P04.02	X1 Delay Time	0.00 ~ 300.00	S	0.00	○
P04.03	X2 Delay Time	0.00 ~ 300.00	S	0.00	○
P04.04	Multi-functional input X1	0: No functions 1: Operate RUN 2: Forward rotation and reverse rotation/R 3: Three-wire operation's stopping control 4: Normal inching turning FJOG 5: Reverse inching turning RJOG 6: Terminal TP 7: Terminal DOWN 8: UP/DOWN zero clearing 9: Stopping without control (FRS) 10 Failure Reset 11: External fault (EXT) 12: No acceleration and deceleration 13: Terminal 1 with multiple sections of frequency 14: Terminal 2 with multiple sections of frequency 15: Terminal 3 with multiple sections of frequency 16: Switch between acceleration time and deceleration time 17: Run command to switch to the terminal 18: Switch to auxiliary speed 19: DC injection braking time when stopping 20: Program operation reset 21: Pendulum frequency running		1	○
P04.05	Multi-functional input X2			2	○
P04.06	Multi-functional input X3			13	○
P04.07	Multi-functional input X4			14	○
P04.08	Multi-functional input X5			15	○
P04.09	Multi-functional input X6			10	○
P04.10	Terminals command mode	0: Two-wire control1 1: Two-wire control2 2: Three-wire control1 3: Three-wire control2		1	○
P04.11	Keyboard potentiometer filtering Time	0.00 ~ 10.00	S	0.10	○
P04.12	AI1 filtering time	0.00 ~ 10.00	S	0.10	○

P04.13	AI2 filtering time	0.00 ~ 10.00	S	0.10	○
P04.14	Keyboard potentiometer's minimum input	0.0 ~ 100.0	%	1.0	○
P04.15	Keyboard potentiometer's maximum input	0.0 ~ 100.0	%	98.0	○
P04.16	AI1 output bias 0	−100.0 ~ 100.0	%	0.0	○
P04.17	AI1 output bias 1	−100.0 ~ 100.0	%	25.0	○
P04.18	AI1 output bias 2	−100.0 ~ 100.0	%	75.0	○
P04.19	AI1 output bias 3	−100.0 ~ 100.0	%	100.0	○
P04.20	AI1 input bias 0	0.0 ~ AI1 Input bias1	%	0.0	○
P04.21	AI1input bias1	AI1 input bias0 ~ AI1input bias2	%	25.0	○
P04.22	AI1Input bias2	AI1 input bias1 ~ AI1input bias3	%	75.0	○
P04.23	AI1 Input bias3	AI1input bias2 ~ 100.0	%	100.0	○
P04.24	AI2output bias0	−100.0 ~ 100.0	%	0.0	○
P04.25	AI2output bias1	−100.0 ~ 100.0	%	25.0	○
P04.26	AI2 output bias2	−100.0 ~ 100.0	%	75.0	○
P04.27	AI2output bias3	−100.0 ~ 100.0	%	100.0	○
P04.28	AI2input bias0	0.0 ~ AI2 Input bias1	%	0.0	○
P04.29	AI2input bias1	AI2 input bias0 ~ AI2 Input bias2	%	25.0	○
P04.30	AI2 input bias2	AI2 input bias1 ~ AI1 input bias3	%	75.0	○
P04.31	AI2 Input bias3	AI2Input bias2 ~ 100.0	%	100.0	○
P04.32	AI1 proportional gain	0.00 ~ 300.00	%	100.00	○
P04.33	AI2 proportional gain	0.00 ~ 300.00	%	100.00	○
P04.34	AD Hysteries	0 ~ 200		10	○

P05Group. Output Terminal Control

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P05.00	Multi–functional input	0┆: frequency inverter's operation		0	⊙
P05.01	Relay output R1	1┆: Operate in reverse rotation 2┆: Frequency arrival (FAR) 3┆: Frequency degree inspection (FDI) 4┆: Frequency inverter's fault 5┆: Upper frequency's arrival 6┆: Lower frequency's arrival 7┆: Operation readiness 8┆: FDT inching invalid 9┆: overload pre–alarm		4	⊙
P05.02	Analog output AO	0┆: Operation frequency 1┆: Setting frequency 2┆: Output current 3┆: Output voltage 4┆: Busbar voltage 5┆: AI1 6┆: AI2 7┆: +10V 8┆: Reservation		0	⊙
P05.03	AO output lower limit	0.00 ~ 100.00	%	0.00	○
P05.04	AO output upper limit	0.00 ~ 100.00	%	100.00	○
P05.05	AO output gain	0.00 ~ 300.00	%	100.00	○
P05.06	FDT upper limit	0.00 ~ max frequency	Hz	30.00	⊙
P05.07	FDT lower limit	0.00 ~ max frequency	Hz	30.00	⊙
P05.08	FAR frequency arrival	0.00 ~ 20.00	Hz	5.00	○

P06Group. Auxiliary Parameters

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P06.00	Inching digital frequency	0.00 ~ max frequency	Hz	5.00	○
P06.01	Inching acceleration time	0.00 ~ 600.00	S	10.00	○
P06.02	Inching deceleration time	0.00 ~ 600.00	S	10.00	○
P06.03	Acceleration time2	0.00 ~ 600.00	S	10.00	○
P06.04	Deceleration time2	0.00 ~ 600.00	S	10.00	○
P06.05	Multiple sections of speed1	0.00 ~ max frequency	Hz	0.00	○
P06.06	Multiple sections of speed2	0.00 ~ max frequency	Hz	5.00	○
P06.07	Multiple sections of speed3	0.00 ~ max frequency	Hz	10.00	○

P06.08	Multiple sections of speed4	0.00 ~ max frequency	Hz	15.00	○
P06.09	Multiple sections of speed5	0.00 ~ max frequency	Hz	20.00	○
P06.10	Multiple sections of speed6	0.00 ~ max frequency	Hz	25.00	○
P06.11	Multiple sections of speed7	0.00 ~ max frequency	Hz	30.00	○
P06.12	UP/DOWN velocity	0.00 ~ 100.00 0.00 (automatic velocity)		1.00	○
P06.13	UP/DOWN power down data storage	0┆: frequency before no power down storage 1┆: frequency before power down storage 2┆: UP/DOWN auto returning to zero when power–off		0	⊙

P07Group. Communication Functions

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P07.00	Local address	0┆: Broadcast address. 1 ~ 247		1	⊙
P07.01	Communication baud rate	0┆: 4800 1┆: 9600 2┆: 19200 3┆: 38400	bps	1	⊙
P07.02	Communication format	0┆: No check 1+8+1 1┆: Occasional check 1+8+1+1 2┆: Odd parity check 1+8+1+1		0	⊙
P07.03	Communication timeout time	0.0 ~ 60.0 0.0 Ineffective functions for communication timeout	S	0.0	⊙
P07.04	Communication method of master machine and slave machine	0┆: The local machine is the master machine. 1┆: The local machine is the slave machine.		0	⊙
P07.05	Address for master machine to write slave machine	0┆: main digital frequency 1┆: auxiliary digital frequency		0	⊙
P07.06	Proportion factor of the local machine's reception	0.00 ~ 300.00	%	100.00	○
P07.07	The local machine's data sent for communications	0┆: Output frequency 1┆: Input frequency 2┆: Main digital frequency 3┆: Keyboard potentiometer 4┆: AI1 5┆: AI2		0	⊙

P08Group. PID control functions

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P08.00	PID source given	0┆: given number 1┆: AI1 2┆: AI2		0	⊙
P08.01	PID given number	0.0 ~ 100.0	%	50.0	○
P08.02	PID feedback source	0┆: AI1 1┆: AI2		0	⊙
P08.03	PID max capacity	0 ~ 60000		1000	○
P08.04	PID action direction	0┆: Direct action 1┆: Reaction		0	⊙
P08.05	PID output gain	0.00 ~ 100.00	%	100.00	○
P08.06	Proportion gain Kp	0.00 ~ 100.00		0.40	○
P08.07	Integration time Ti	0.00 ~ 30.00┆, 0.00┆: No integration	S	2.00	○
P08.08	Derivative time Td	0.00 ~ 300.00┆, 0.00┆: No derivative	mS	0.00	○
P08.09	Integration action range	0.00 ~ 100.00	%	100.00	○
P08.10	PID deviation limit	0.0 ~ 100.0	%	0.0	○
P08.11	PID output's upper limit	−100.0 ~ 100.0	%	100.0	○
P08.12	PID output's lower limit	−100.0 ~ 100.0	%	0.0	○
P08.13	PID inspection value of feedback breakage	0.0 ~ 100.0	%	0.0	○
P08.14	PID inspection time of feedback breakage	0.0 ~ 30.0	S	1.0	○
P08.15	Start Threshold	0.0 ~ Sleep threshold	%	0.0	×

P08.16	Start delay time	0.0~30.0	S	0.0	×
P08.17	Sleep Threshold	Start threshold to 100.0	%	100.0	×
P08.18	Sleep dalay time	0.0~30.0	S	0.0	×

P09Group. Simple PLC functions

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P09.00	PLC operation method	0┆: shut down after first operation 1┆: shut down after the limited–time cycle 2┆: Operate for the seventh period after finishing one single operation 3┆: Operate in a cycle		0	⊙
P09.01	PLC operation control	0┆: Operate at the interrupted period 1┆: Operate from the first period		0	⊙
P09.02	PLC running direction	Bit6 Bit5 Bit4 Bit3 Bit2 Bit1 Bit0 T7 T6 T5 T4 T3 T2 T1 0┆: Forward rotation 1┆: Reverse rotation		000000	⊙
P09.03	The first period of operation T1	0 ~ 60000	S	30	○
P09.04	The second period of operation T2	0 ~ 60000	S	30	○
P09.05	The third period of operation T3	0 ~ 60000	S	30	○
P09.06	The fourth period of operation T4	0 ~ 60000	S	30	○
P09.07	The fifth period of operation T5	0 ~ 60000	S	30	○
P09.08	The sixth period of operation T6	0 ~ 60000	S	30	○
P09.09	The seventh period of operation T7	0 ~ 60000	S	30	○
P09.10	Limited periodical times	1 ~ 30000		1	○
P09.11	Pendulum frequency running mode	Units┆: Pendulum running control 1┆: terminal control Tens┆: Pendulum frequency input style 0┆: Pendulum frequency running when reaching midpoint 1┆: Pendulum frequency preset time to starting pendulum frequency running		00	⊙
P09.12	Pendulum frequency preset frequency	0.00 ~ Fmax	Hz	0.00	○
P09.13	Pendulum frequency preset time	0.00 ~ 600.00	S	15.00	○
P09.14	Upper limit of pendulum frequency	0.00 ~ Fmax	Hz	40.00	○
P09.15	Lower limit of pendulum frequency	0.00 ~ Fmax	Hz	20.00	○
P09.16	Startup frequency of pendulum frequency	0.00 ~ Fmax	Hz	5.00	○
P09.17	Rise time of pendulum frequency	0.00 ~ 600.00	S	15.00	○
P09.18	Fall time of pendulum frequency	0.00 ~ 600.00	S	5.00	○

P10Group. Fault and Protection

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P10.00	Motor overload protection	0┆: Invalid 1┆: Valid		0	⊙
P10.01	Protection for the motor's overload Time	30 ~ 300	S	60	⊙
P10.02	Protection for over–current and stall	0┆: Invalid 1┆: Mode1 2┆: Mode2		2	⊙
P10.03	Current limit level	50.00 ~ 180.00	%	150.00	⊙

P10.04	Protection for over–voltage and stall	0┆: Invalid 1┆: Mode1 2┆: Mode2		2	⊙
P10.05	Point of stall and over–voltage	380V┆: 640 ~ 800 220V┆: 370 ~ 400	V	750 390	⊙
P10.06	Fault retrial control	0┆: Fault retrial invalid 1 ~ 3┆: Retry for once, twice, and three times 4┆: Retry for endless times		0	⊙
P10.07	Fault retrial period	0┆: Inaction 1┆: Action		0	⊙
P10.08	Fault retrial interval	0.01 ~ 30.00	S	0.50	⊙
P10.09	No fault interval	0.01 ~ 30.00	S	10.00	⊙
P10.10	Fault retrial choosing	Bit4 Bit3 Bit2 Bit1 Bit0 ERR07 ERR05 ERR04 ERR03 ERR02 0┆: Fault retrial valid 1┆: Fault retrial invalid		11111	⊙
P10.11	Fault shielding	Bit7 Bit6 Bit5 Bit4 * ERR15 ERR12 ERR07 Bit3 Bit2 Bit1 Bit0 ERR10 ERR06 ERR05 ERR04 0┆: Protection valid 1┆: Protection invalid		00000010	⊙
P10.12	overload pre–alarm selection	0:terminal Y outputs and keeps running 1:fault warned and stop		0	⊙
P10.13	overload pre–alarm detection level	20.00 ~ 200.00	%	130.00	⊙
P10.14	overload pre–alarm detection time	0.0 ~ 60.0	S	5.0	⊙

P11Group. Control parameters

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P11.00	Fan motor control	0┆: Operate once power is on. 1┆: Operate once started.		1	⊙
P11.01	Carrier method	0┆: Fixed carrier 1┆: Random carrier		0	○
P11.02	Carrier's upper limit	2.000 ~ 15.000	KHz	6.000	○
P11.03	Carrier's lower limit	2.000 ~ 15.000	KHz	2.000	○
P11.04	Automatic voltage stabilization	0┆: Invalid 1┆: Valid 2┆: Invalid when it is over rated voltage		0	⊙
P11.05	Energy consumption braking control	0┆: Valid once power is on. 1┆: Valid during operation 2┆: Valid during deceleration		0	⊙
P11.06	Braking using rate	5.00 ~ 100.00	%	100.00	⊙
P11.07	Energy consumption braking voltage	380V: 640 ~ 800 220V: 350 ~ 400	V	700 380	⊙
P11.08	Output voltage	5.00 ~ 100.00	%	100.00	○
P11.09	Over–modulation function	0┆: Invalid 1┆: Valid		0	○
P11.10	Vibration restrain	0 ~ 100		0	○
P11.11	Slip compensation factor	0.00 ~ 200.00	%	0.00	○
P11.12	Voltage compensation factor	0.00 ~ 200.00	%	80.00	○
P11.13	Excitation control	0 ~ 2		1	⊙
P11.14	Lowering time for limiting current when the speed is constant.	0.01 ~ 100.00	S	0.20	○
P11.15	Over–current stall proportional gain	0.01 ~ 100.00		0.10	○
P11.16	Over–current stall integration time	0.00 ~ 30.00	S	10.00	○
P11.17	Over–voltage stall proportional gain	0.01 ~ 100.00		3.00	○
P11.18	Over–voltage stall integration time	0.00 ~ 30.00	S	10.00	×

P12Group. Keyboard and Its Display

Function codes	Function codes' names	Range set	Unit	Factory defaults	Property
P12.00	User's password	0 ~ 65535		XXXXX	⊙
P12.01	Parameter control's setting	0:Parameter setting allowed 1: Parameter locking0 2: Parameter locking1		0	⊙