

AT20

**Series Advanced
Vector Control Inverter**

User's Manual

- Thank you very much for your buying AT20 series High-performance Vector Control Inverter.
- Before use, please read this manual thoroughly to ensure proper usage. Keep this manual at an easily accessible place so that can refer anytime as necessary.

Safety Precautions

Please read this operation manual carefully before installation, operation, maintenance or inspection. In this manual, the safety precautions were sorted to "WARNING" or "CAUTION".



WARNING

Indicates a potentially dangerous situation which, if can not avoid will result in death or serious injury.



CAUTION

Indicates a potentially dangerous situation which, if can not avoid will cause minor or moderate injury and damage the device. This Symbol is also used for warning any un-safety operation.

In some cases, even the contents of "CAUTION" still can cause serious accident. Please follow these important precautions in any situation.

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★ **NOTE** indicate the necessary operation to ensure the device run properly.

Warning Marks are placed on the front cover of the inverter.

Please follow these indications when using the inverter.

WARNING
• May cause injury or electric shock. • Please follow the instructions in the manual before installation or operation. • Disconnect all power line before opening front cover of unit. Wait at least 10 minutes until DC Bus capacitors discharge. • Use proper grounding techniques. • Never connect AC power to output UVW terminals.

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Chapter 1 Introduction

1-1 Technology Features

MODEL: AT20-03R7G4

INPUT: 3PH 380V 50Hz/60Hz

OUTPUT: 3PH 380V 9.0

FREQ RANGE: 0.1-600Hz 3.7kW



14011311111

MODE: AT20 - 03R7 G4

G2: 1PH AC220V

G4: 3PH AC380V

03R7:3.7kW

011:11kW

Trade Mark

1-2 Technology Features

Item		AT20
Basic function	Control Mode	V/F control Sensorless flux vector control (SVC)(Above 3.7K) Close-loop vector control (FVC)(Above 3.7KW)
	Maximum frequency	0~600Hz
	Carrier frequency	0.5kHz~8kHz The carrier frequency is automatically adjusted based on the load features.
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: Maximum frequency x 0.025%
	Start torque	G Type: 0.5Hz/150%(SVC)□ P Type: 0.5Hz/100%
	Speed range	1: 100 (SVC)

Item		AT20
Basic function	Speed stability accuracy	±0.5%(SVC)
	Overload capacity	G Type: 60s for 150% of the rated current, 3s for 180% of the rated current. P Type: 60s for 120% of the rated current, 3s for 150% of the rated current.
	Torque boost	Auto-boost; Customized boost: 0.1%~30.0%
	V/F Curve	Straight-line V/F curve Multi-point V/F curve N-power V/F curve (1.2-power, 1.4-power, 1.6-power, 1.8-power, square)
	V/F separation	2 types: complete separation; half separation
	Ramp Mode	Straight-line ramp. Four groups of acceleration/deceleration time with the range of 0.00~6500.0s
	DC braking	DC braking frequency: 0.00Hz~Maximum frequency Braking time: 0.0s~36.0s Braking action current value: 0.0%~100.0%
	JOG control	JOG frequency range: 0.00Hz~50.00Hz. JOG acceleration/deceleration time: 0.0s~6500.0s.
	Simple PLC, Multiple preset speeds	It implements up to 16 speeds via the simple PLC function or combination of terminal states
	Onboard PID	It realizes process-controlled closed loop control system easily
	Auto voltage regulation(AVR)	It can keep constant output voltage automatically when the mains voltage changes
	Overvoltage/ overcurrent stall control	The current and voltage are limited automatically during the running process so as to avoid frequent tripping due to over voltage/over current
	Rapid current limit	It helps to avoid frequent over current faults of the AC drive.
Individualized functions	Torque limit and control	It can limit the torque automatically and prevent frequent over current tripping during the running process. Torque control can be implemented in the FVC mode.
	High performance	Control of asynchronous motor are implemented through the high-performance current vector control technology
	Rapid dip ride through	The load feedback energy compensates the voltage reduction so that the AC drive can continue to run for a short time

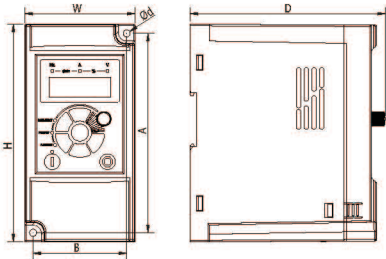
Item		AT20
Individualized functions	Rapid current limit	It helps to avoid frequent over current faults of the AC drive.
	Timing control	Timing range: 0.0Min~6500.0Min
	Communication methods	RS - 485
Running	Command source	Operation panel/Control terminals/Serial communication port You can perform switchover between these sources in various ways.
	Frequency source	There are ten frequency sources. Digital setting, analog voltage setting, analog current setting, pulse setting, serial port setting. You can perform switchover in various ways.
	Auxiliary frequency source	There are ten auxiliary frequency sources. It can implement fine tuning of auxiliary frequency and frequency synthesis.
	Input terminal	Standard: 4 digital input terminals(Below 5.5KW) /6 digital input terminals(Above 7.5KW); 1 analog input terminal(Below 5.5KW)/2 analog input terminals(Above 7.5KW); 1 voltage input (only support for 0~10V, above 7.5KW), 1 voltage input(0~10V) or current input (4~20mA)
	Output terminal	1 High-speed pulse output terminal (Open-collector) (Above 3.7KW) 1 replay output terminal (Below 5.5KW)/2 replay output terminals(Above 7.5KW) 1 analog output terminal(3.7KW~5.5KW)/2 analog output terminal(Above 7.5KW), Support for 4~20mA current output or 0~10V voltage output
Display and operation panel	LED display	It displays the parameters
	Key locking and function selection	It can lock the keys partially or completely and define the function range of some keys so as to prevent mal-function.
	Protection mode	Motor short-circuit detection at power-on, input/output phase loss protection, over current protection, over voltage protection, under voltage protection, overheat protection and overload protection

Operation Instruction of AT20 Series Inverter

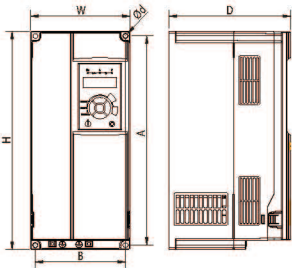
Item		AT20
Environment	Installation location	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapor, drip or salt.
	Altitude	Lower than 1000m
	Ambient temperature	-10°C ~+ 40°C (de-rated if the ambient temperature is between 40°C ~50°C)
	Humidity	Less than 95%RH, without condensing
	Vibration	Less than 5.9m/s ² (0.6g)
	Storage temperature	-20°C ~+ 60°C

1-3 Installation

SIZE A

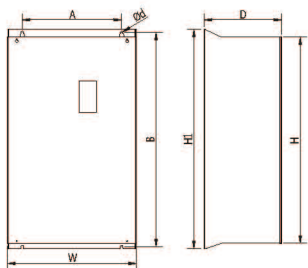


SIZE B



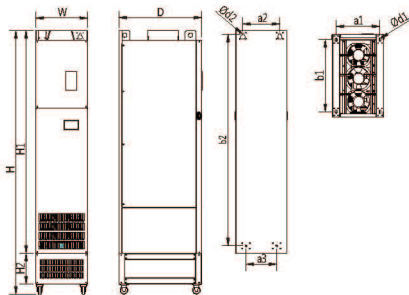
SIZE	Model	W	H	D	A	B	Φd
A	AT20-00R4G2	72	142	127	130	61	4.5
	AT20-00R7G2						
	AT20-01R5G2						
	AT20-02R2G2						
	AT20-00R4G4						
	AT20-00R7G4						
	AT20-01R5G4						
A	AT20-02R2G4	85	180	131	167	72	5.5
	AT20-03R7G2						
	AT20-03R7G4						
B	AT20-05R5G4	106	240	168	230	96	4.5
	AT20-07R5G4						
B	AT20-011G4	151	332	183	318	137	7
	AT20-015G4						
	AT20-018.5G4						
B	AT20-022G4	217	400	216	385	202	7
	AT20-030G4						
	AT20-037G4						

SIZE C



SIZE	Model	W	H	H1	D	A	B	Φd
C	AT20-045G4	300	440	470	240	200	455	9
	AT20-055G4							
C	AT20-075G4	275	590	630	310	200	612	9
	AT20-090G4							
	AT20-110G4							
C	AT20-132G4	400	675	715	310	320	695	11
	AT20-160G4							

SIZE D



SIZE	Model	Outline dimention (mm)					Installation Size (mm)			Wall-mounted Size (mm)			
		W	H	H1	H2	D	a1	b1	d1	a2	a3	b2	d2
D	AT20-185G4	300	1445	1180	200	500	250	430	14	220	150	1135	13
	AT20-200G4												
	AT20-220G4												
D	AT20-250G4	330	1595	1330	200	545	280	475	14	220	185	1275	13
D	AT20-280G4	325	1495	1230	200	545	275	470	14	225	185	1175	14
	AT20-315G4												
D	AT20-350G4	335	1720	1455	200	545	285	470	14	240	200	1380	14
	AT20-400G4												
	AT20-450G4												

1-4 Selection Guide

Model	Input voltage	Rated output power(kW)	Rated input current(A)	Rated output current(A)	Motor Power (KW)
AT20-00R4G2	AC220V±15% 1PH	0.4	5.4	2.5	0.4
AT20-00R7G2		0.75	7.2	5	0.75
AT20-01R5G2		1.5	10	7	1.5
AT20-02R2G2		2.2	16	11	2.2
AT20-03R7G2		3.7	17	16.5	3.7
AT20-05R5G2		5.5	21	25	5.5
AT20-07R5G2		7.5	31	32	7.5

Model	Input voltage	Rated output power(kW)	Rated input current(A)	Rated output current(A)	Motor Power (KW)
AT20-00R4G4	3PH AC380V±15%	0.4	3.4	1.2	0.4
AT20-00R7G4		0.75	3.8	2.5	0.75
AT20-01R5G4		1.5	5	3.7	1.5
AT20-02R2G4		2.2	5.8	5	2.2
AT20-03R7G4		3.7/5.5	10/15	9/13	3.7/5.5
AT20-05R5G4		5.5	15/20	13/17	5.5/7.5
AT20-07R5G4		7.5/11	20/26	17/25	7.5/11
AT20-011G4		11/15	26/35	25/32	11/15
AT20-015G4		15/18.5	35/38	32/37	15/18.5
AT20-018.5G4		18.5/22	38/46	37/45	18.5/22
AT20-022G4		22/30	46/62	45/60	22/30
AT20-030G4		30/37	62/76	60/75	30/37
AT20-037G4		37/45	76/90	75/90	37/45
AT20-045G4		45/55	90/105	90/110	45/55
AT20-055G4		55	105/140	110/150	55/75
AT20-075G4		75/90	140/160	150/176	75/90
AT20-090G4		90/110	160/210	176/210	90/110
AT20-110G4		110/132	210/240	210/253	110/132
AT20-132G4		132/160	240/290	253/300	132/160
AT20-160G4		160/185	290/330	300/340	160/185
AT20-185G4		185/200	330/370	340/380	185/200
AT20-200G4		200/220	370/410	380/420	200/220
AT20-220G4		220/250	410/460	420/470	220/250
AT20-250G4		250/280	460/500	470/520	250/280
AT20-280G4		280/315	500/580	520/600	280/315
AT20-315G4		315/350	580/620	600/640	315/350
AT20-400G4		350/400	620/670	640/690	350/400
AT20-450G4		400/450	670/790	690/790	400/450
AT20-450G4		450/500	790/835	790/860	450/500

Chapter 2 wiring

2-1 Terminal Configuration

1) 0.4KW-2.2KW



RB RC S2 S1 REV FWD RS- RS+ FIC +10V GND

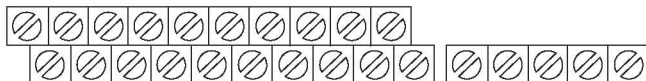
2) 3.7KW-5.5KW



RB RC FWD REV S1 S2 S3 24V MO1 FOV FIC 10V GND RS+ RS-GND

3) Above 7.5KW

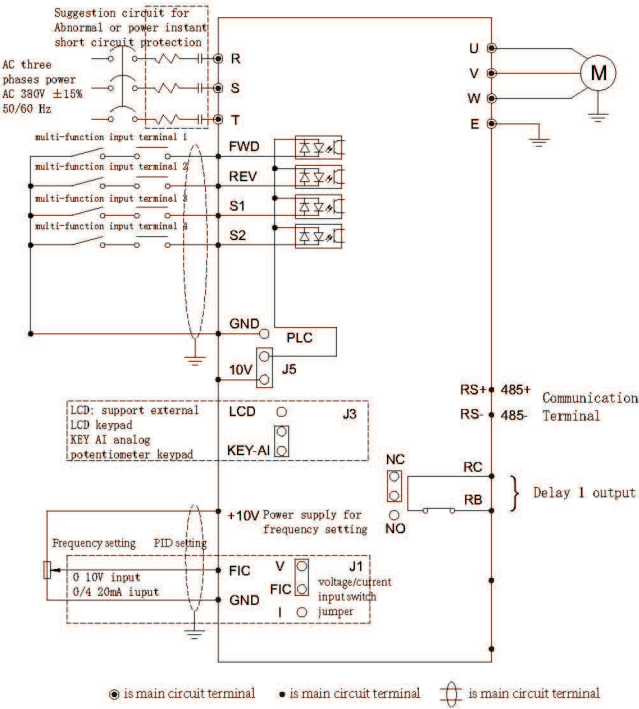
24V COM FWDREV S1 S2 S3 S4 COM MO1



10V GND FIC FIV GND FOC FOV GND RS+ RS- TA TC RA RB RC

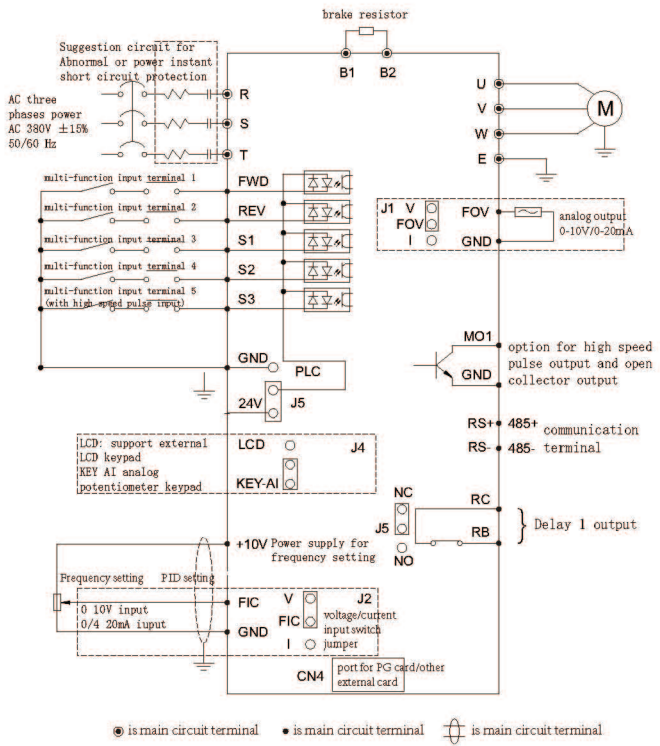
2-2 Wiring Diagram

1) 0.4KW-2.2KW

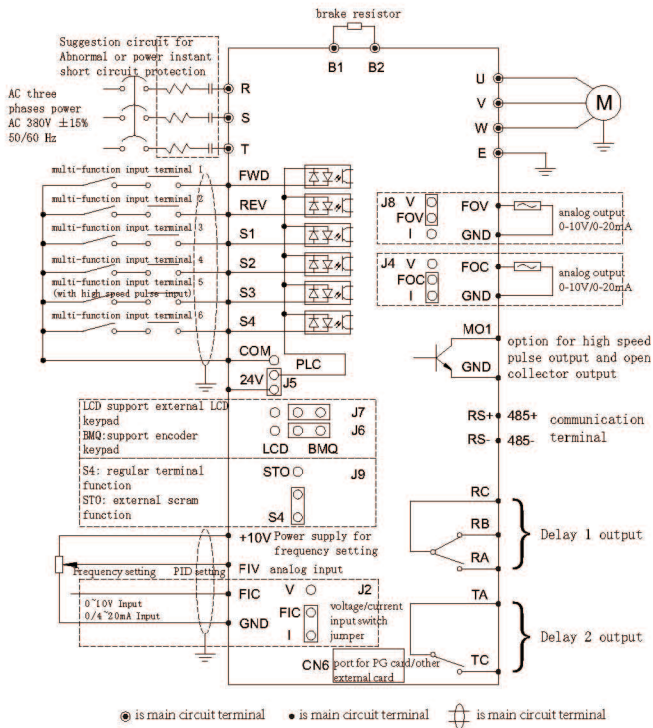


Note: It is only for V/F control

2) 3.7KW-5.5KW

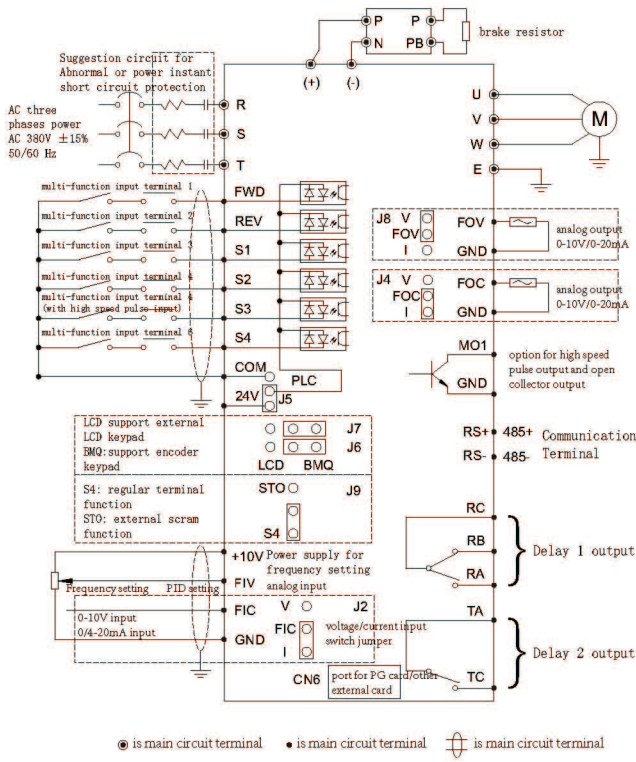


3) 7.5KW-160KW



Note: It is built-in braking unit for below 37kW, the braking unit is optional for 45-160kW

4) 185KW-450KW



Chapter 3 Operation

3-1 Keypad Description

1) 0.4KW-5.5KW



2) 7.5KW-450KW



3) Function key description

Key	Name	Description
PRG	Programming key	Entry or escape of first-level menu
ENTER	Data enter key	Progressively enter menu and confirm parameters
▲	UP Increment Key	Progressively increase data or function codes
▼	DOWN Decrement Key	Progressively decrease data or function codes
▶	Shift Key	In parameter setting mode, press this button to select the bit to be modified. In stop and running display modes, cyclically displays parameters by shift key.
	Run key	Start to run the inverter in keypad control mode
	Stop/Fault reset key	In running status, restricted by P7.02, can be used to stop the inverter. When fault alarm, can be used to reset the inverter without any restriction.
JOG	Shortcut Key	Determined by function code P7.01 0: No function 1: Switchover between operation panel command and remote operation command. It indicates the switchover between the current command source and operation panel control (local operation). If the current command source is operation panel control, the key is invalid. 2: Switch between forward and reverse, it only valid when command source is operation panel channel. 3: Forward JOG 4: Reverse JOG
M	No function	

4) Indicator light description

Indicator Light Name	Indicator light description
Hz	Frequency unit
A	Current unit
V	Voltage unit
FWD/REV	Extinguished: Forward operation Light on: Reverse operation

Indicator Light Name	Indicator light description
LOCAL/REMOT	Extinguished: Local operation Flickering: Terminal operation Light on: Communication control
FUNC/ERR	Extinguished: Running state Flickering: Pre-alarm of overload Light on: Fault
	Extinguished: Stop mode Flickering: In the process of auto-tuning Light on: Running mode

Chapter 4

List of Function Parameters

If PP-00 is set to a non-zero number, parameter protection is enabled. You must enter the correct user password to enter the menu. To cancel the password protection function, enter with password and set PP-00 to 0.

Parameters menu the user customizes are not protected by password.Group P is the basic function parameters , Group D is to monitor the function parameters.The symbols in the function code table are described as follows:

"☆": The parameter can be modified when the AC drive is in either stop or running state.

"★": The parameter cannot be modified when the AC drive is in the running state.

"●": The parameter is the actually measured value and cannot be modified.

"*": The parameter is factory parameter and can be set only by the manufacturer.

Standard Function Parameters:

Function code	Parameter Name	Setting range	Default	Property
Group P0 Standard Function Parameters				
P0.00	G/P type display	1: G type (Constant torque load) 2: P type (variable torque load e.g. fan and pump)	Model dependent	●
P0.01	Control mode selection	0: No PG (speed sensor) vector control 1: With PG (speed sensor) vector control 2: V/F control	2	★

Chapter 4 List of Function Parameters

Function code	Parameter Name	Setting range	Default	Property
P0.02	Command source selection	0: Operation panel control (LED off) 1: Terminal control (LED on) 2: Communication control (LED linking)	0	☆
P0.03	Main frequency source X selection	0: Digital setting (P0.08 preset frequency, can modify the UP/DOWN, power lost don't memory) 1: Digital setting (P0.08, preset frequency, can modify the UP/DOWN, power lost memory) 2: FIV (above 7.5KW) 3: FIC 4: Potentiometer on operation panel (below 5.5KW) 5: PULSE (S3, Above 3.7KW) 6: Multistage instruction 7: Simple PLC 8: PID 9: Communication setting	0	★
P0.04	Auxiliary frequency source Y selection	The same as P0.03 (frequency source X selection)	0	★
P0.05	Auxiliary frequency source superposition Y range selection	0: Relative to the maximum frequency 1: Relative to the main frequency source X	0	☆
P0.06	Auxiliary frequency source superposition Y range	0%~150%	100%	☆

Operation Instruction of AT20 Series Inverter

Function code	Parameter Name	Setting range	Default	Property
P0.07	Frequency source superposition selection	Unit's digit (Frequency source) 0: Main frequency source X 1: X and Y operation (operation relationship determined by ten's digit) 2: Switchover between X and Y 3: Switchover between X and "X and Y operation" 4: Switchover between Y and "X and Y operation" Ten's digit (X and Y operation) 0: X+Y 1: X-Y 2: Both the maximum 3: Both the minimum	00	☆
P0.08	Frequency preset	0.00Hz~maximum frequency (P0.10)	50.00Hz	☆
P0.09	Rotation direction	0: Same direction 1: Reverse direction	0	☆
P0.10	Maximum frequency	50.00Hz~600.00Hz	50.00Hz	★
P0.11	Upper limit frequency source	0: P0.12 setting 1: Potentiometer on operate panel (below 5.5KW) FIV (above 7.5KW) 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Communication setting	0	★
P0.12	Upper limit frequency	Frequency lower limit P0.14~Maximum frequency P0.10	50.00Hz	☆
P0.13	Upper limit frequency offset	0.00Hz~Maximum frequency P0.10	0.00Hz	☆
P0.14	Frequency lower limit	0.00Hz~Upper limit frequency P0.12	0.00Hz	☆
P0.15	Carrier frequency	0.5kHz~16.0kHz	Model dependent	☆

Function code	Parameter Name	Setting range	Default	Property
P0.16	Carrier frequency adjustment with temperature	0: No 1: Yes	1	☆
P0.17	Acceleration time 1	0.00s~65000s	Model dependent	☆
P0.18	Deceleration time 1	0.00s~65000s	Model dependent	☆
P0.19	Acceleration/Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	★
P0.21	Frequency offset of auxiliary frequency source for X and Y operation	0.00Hz~Maximum frequency P0.10	0.00Hz	☆
P0.22	Frequency instruction resolution	2: 0.01Hz	2	★
P0.23	Retentive of digital setting frequency upon power	0: Not retentive 1: Retentive	0	☆
P0.25	Acceleration/Deceleration time base frequency	0: Maximum frequency (P0.10) 1: Set frequency 2: 100Hz	0	★
P0.26	Base frequency for UP/DOWN modification during running	0: Running frequency 1: Set frequency	0	★

Operation Instruction of AT20 Series Inverter

Function code	Parameter Name	Setting range	Default	Property
P0.27	Binding command source to frequency source	Unit's digit: Binding operation panel command to frequency source 0: No binding 1: Frequency source by digital setting 2: Potentiometer on operation panel (below 5.5KW) FIV (above 7.5KW) 3: FIC 4: Reserved 5: PULSE (S3, above 3.7KW) 6: Multi-Reference 7: Simple PLC 8: PID 9: Communication setting Ten's digit: Binding terminal command to frequency source Hundred's digit: Binding communication command to frequency source	0000	☆
Group P1 Motor parameter				
P1.00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	★
P1.01	Rated motor power	0.1kW~1000.0kW	Model dependent	★
P1.02	Rated motor voltage	1V~2000V	Model dependent	★
P1.03	Rated motor current	0.01A~655.35A (AC drive power <=55kW) 0.1A~6553.5A (AC drive power >55kW)	Model dependent	★
P1.04	Rated motor frequency	0.01Hz~maximum frequency	Model dependent	★
P1.05	Rated motor rotational speed	1rpm~65535rpm	Model dependent	★

Function code	Parameter Name	Setting range	Default	Property
P1.06	Stator resistance (asynchronous motor)	0.001Ω~65.535Ω (AC drive power ≤55kW) 0.0001Ω~6.5535Ω (AC drive power >55kW)	Tuned parameter	★
P1.07	Rotor resistance (asynchronous motor)	0.001Ω~65.535Ω (AC drive power ≤55kW) 0.0001Ω~6.5535Ω (AC drive power >55kW)	Tuned parameter	★
P1.08	Leakage inductive reactance (asynchronous motor)	0.01mH~655.35mH (AC drive power ≤55kW) 0.001mH~65.535mH (AC drive power >55kW)	Tuned parameter	★
P1.09	Mutual inductive reactance (asynchronous motor)	0.1mH~6553.5mH (AC drive power ≤55kW) 0.01mH~655.35mH (AC drive power >55kW)	Tuned parameter	★
P1.10	No-load current (synchronous motor)	0.01A~P1.03 (AC drive power ≤55kW) 0.1A~P1.03 (AC drive power >55kW)	Tuned parameter	★
P1.27	Encoder pulses per revolution	1~65535	1024	★
P1.28	Encoder type	0: ABZ incremental encoder 2: Resolver	0	★
P1.30	AB phase sequence of ABZ incremental encoder AB phase sequence	0: Forward 1: Reverse	0	★
P1.31	Encoder install angle	0.0~359.9°	0.0°	★
P1.34	Rotation pole logarithm	1~65535	1	★
P1.36	Speed feedback PG card break line detection time	0.0: No action 0.1s~10.0s	0.0	★
P1.37	Auto tuning selection	0: No operation 1: static auto-tuning 2: dynamic auto-tuning 3: complete static auto-tuning	0	★

Operation Instruction of AT20 Series Inverter

Function code	Parameter Name	Setting range	Default	Property
P2 Motor vector control parameter				
P2.00	Speed loop proportional gain 1	1~100	30	☆
P2.01	Speed loop integral time 1	0.01s~10.00s	0.50s	☆
P2.02	Switchover frequency 1	0.00~P2.05	5.00Hz	☆
P2.03	Speed loop proportional gain 2	1~100	20	☆
P2.04	Speed loop integral time 2	0.01s~10.00s	1.00s	☆
P2.05	Switchover frequency 2	P2.02~Maximum frequency	10.00Hz	☆
P2.06	Vector control slip gain	50%~200%	100%	☆
P2.07	Time constant of speed loop filter	0.000s~0.100s	0.015s	☆
P2.08	Vector control over-excitation gain	0~200	64	☆
P2.09	Torque upper limit source in speed control mode	0: P2.10 1: Potentiometer on operation panel (below 5.5KW) FIV (above 7.5KW) 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Communication setting 6: MIN (Potentiometer on operation panel, FIC) (below 5.5KW) MIN (FIV,FIC) (above 7.5KW) 7: MAX (Potentiometer on operation panel, FIC) (below 5.5KW) MAX (FIV,FIC) (above 7.5KW) The full range of 1-7 is correspond to P2.10	0	☆

Function code	Parameter Name	Setting range	Default	Property
P2.10	Torque upper limit setting in speed control mode (electrical)	0.0%~200.0%	150.0%	☆
P2.11	Torque upper limit instruction selection in speed control mode (generation)	0: P2.10 1: Potentiometer on operation panel (below 5.5KW) FIV (above 7.5KW) 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Communication setting 6: MIN (Potentiometer on operation panel, FIC) (below 5.5KW) MIN (FIV,FIC) (above 7.5KW) 7: MAX (Potentiometer on operation panel, FIC) (below 5.5KW) MAX (FIV,FIC) (above 7.5KW) 8: P2.12 setting Full range of 1-7 corresponding to P2.12	0	☆
P2.12	Torque upper limit digital setting in speed control mode (generation)	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 proportional gain	0~60000	2000	☆
P2.16	Torque adjustment integral gain	0~60000	1300	☆

Operation Instruction of AT20 Series Inverter

Function code	Parameter Name	Setting range	Default	Property
P2.17	Speed loop integral property	Unit's digit: integral separation 0: Disabled 1: Enabled	0	☆
P2.21	Maximum torque coefficient of field weakening	50%~200%	100%	☆
P2.22	Generation power limit enabled	0: Disabled 1: Enabled always 2: Enabled when constant speed 3: Enabled when deceleration	0	☆
P2.23	Generation power upper limit	0.0%~200.0%	Model dependent	☆
Group P3 V/F control parameters				
P3.00	VF curve setting	0: Linear V/F 1: Multi-point V/F 2: Square V/F 3: 1.2-power V/F 4: 1.4-power V/F 6: 1.6-power V/F 8: 1.8-power V/F 9: Reserved 10: VF complete separation 11: VF half separation	0	★
P3.01	Torque boost	0.0%: (fixed torque boost) 0.1%~30.0%	Model dependent	☆
P3.02	Cut-off frequency of torque boost	0.00Hz~Maximum frequency	50.00Hz	★
P3.03	Multi-point VF frequency 1	0.00Hz~P3.05	0.00Hz	★
P3.04	Multi-point voltage 1	0.0%~100.0%	0.0%	★
P3.05	Multi-point VF frequency 2	P3.03~P3.07	0.00Hz	★
P3.06	Multi-point voltage 2	0.0%~100.0%	0.0%	★
P3.07	Multi-point VF frequency 3	P3.05~rated motor frequency (P1.04)	0.00Hz	★
P3.08	Multi-point voltage 3	0.0%~100.0%	0.0%	★

Chapter 4 List of Function Parameters

Function code	Parameter Name	Setting range	Default	Property
P3.09	V/F slip compensation gain	0.0%~200.0%	0.0%	☆
P3.10	V/F over-excitation gain	0~200	64	☆
P3.11	V/F oscillation suppression gain	0~100	Model dependent	☆
P3.13	Voltage source for V/F separation	0: Digital setting (P3.14) 1: Potentiometer on operation panel (below 5.5KW) FIV (above 7.5KW) 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Multi-reference 6: Simple PLC 7: PID 8: Communication setting Note: 100.0% corresponding to the rated motor voltage	0	☆
P3.14	Voltage digital setting for V/F separation	0V~rated motor voltage	0V	☆
P3.15	Voltage acceleration time for V/F separation	0.0s~1000.0s Note: it indicated the time for the voltage change from 0V to rated motor voltage	0.0s	☆
P3.16	Voltage deceleration time for V/F separation	0.0s~1000.0s Note: it indicated the time for the voltage change from the rated motor voltage to 0V	0.0s	☆
P3.17	Stop mode selection for V/F separation	0: Frequency/voltage independent decline to 0 1: After voltage decline to 0 then decline the frequency	0	☆
P3.18	Action current of the over current lost speed	50%~200%	150%	★

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Function code	Parameter Name	Setting range	Default	Property
P3.19	Over current lost speed enabled	0: Disabled 1: Enabled	1	★
P3.20	Over current lost speed suppression gain	0~100	20	☆
P3.21	Triple-speed suppression of action current compensation coefficient	50%~200%	50%	★
P3.22	Action voltage of the over voltage lost speed	650.0V~800.0V	770.0V	★
P3.23	Over voltage lost speed enabled	0: Disabled 1: Enabled	1	★
P3.24	Suppression frequency gain of over voltage lost speed	0~100	30	☆
P3.25	Suppression voltage gain of over voltage lost speed	0~100	30	☆
P3.26	Maximum rising frequency limit of over voltage lost speed	0~50Hz	5Hz	★
Group P4 Input terminal				
P4.00	FWD terminal function selection	0: No function 1: Forward RUN (FWD) 2: Reverse RUN (REV) 3: Three-line control 4: Forward JOG (JOGF) 5: Reverse JOG (JOGR) 6: Terminal UP 7: Terminal DOWN	1	★
P4.01	REV terminal function selection	8: Coast to stop 9: Fault reset (RESET) 10: Run pause 11: Normally open(NO) input of external fault 12: Multi-reference terminal 1 13: Multi-reference terminal 2	4	★

Chapter 4 List of Function Parameters

Function code	Parameter Name	Setting range	Default	Property
P4.02	S1 terminal function selection	14: Multi-reference terminal 3 15: Multi-reference terminal 4 16: Terminal 1 for acceleration/ deceleration time selection 17: Terminal 2 for acceleration/ deceleration time selection 18: Frequency source switchover 19: UP/DOWN setting clear (terminal, operation panel)	9	★
P4.03	S2 terminal function selection	20: Command source switchover terminal 21: Acceleration/ Deceleration prohibited 22: PID pause 23: PLC status reset 24: Swing pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset	12	★
P4.04	S3 terminal function selection	29: Torque control prohibited 30: PULSE frequency input (Enabled only for S3, above 3.7KW) 31: Reserved 32: Immediate DC braking 33: Normally closed (NC) input of external fault 34: Frequency modification enabled 35: Reverse PID action direction 36: External stop terminal 1	13	★

Function code	Parameter Name	Setting range	Default	Property
P4.05	S4 terminal function selection	37: Command source switchover terminal 2 38: PID integral pause 39: Switchover between main frequency source X and preset frequency 40: Switchover between auxiliary frequency source Y and preset frequency	0	★
P4.06	Reserved	41~42: Reserved 43: PID parameter switchover 44~45: Reserved	0	★
P4.07	Reserved	46: Speed control /Torque control switchover 47: Emergency stop 48: External stop terminal 2 49: Deceleration DC braking 50: Clear the current running time 51~59:Reserved	0	★
P4.10	X filter time	0.000s~1.000s	0.010s	☆
P4.11	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0	★
P4.12	Terminal UP/DOWN rate	0.001Hz/s~65.535Hz/s	1.00Hz/s	☆
P4.13	FI curve 1 minimum input	0.00V~P4.15	0.00V	☆
P4.14	Corresponding setting of FI curve 1 minimum input	-100.0%~+100.0%	0.0%	☆
P4.15	FI curve 1 maximum input	P4.13~+10.00V	10.00V	☆
P4.16	Corresponding setting of FI curve 1 maximum input	-100.0%~+100.0%	100.0%	☆
P4.17	FI curve 1 filter time	0.00s~10.00s	0.10s	☆

Chapter 4 List of Function Parameters

Function code	Parameter Name	Setting range	Default	Property
P4.18	FI curve 2 minimum input	0.00V~P4.20	0.00V	☆
P4.19	Corresponding setting of FI curve 2 minimum input	-100.0%~+100.0%	0.0%	☆
P4.20	FI curve 2 maximum input	P4.18~+10.00V	10.00V	☆
P4.21	Corresponding setting of FI curve 2 maximum input	-100.0%~+100.0%	100.0%	☆
P4.22	FI curve 2 filter time	0.00s~10.00s	0.10s	☆
P4.23	FI curve 3 minimum input	-10.00V~P4.25	-10.00V	☆
P4.24	Corresponding setting of FI curve 3 minimum input	-100.0%~+100.0%	-100.0%	☆
P4.25	FI curve 3 maximum input	P4.23~+10.00V	10.00V	☆
P4.26	Corresponding setting of FI curve 3 maximum input	-100.0%~+100.0%	100.0%	☆
P4.27	FI curve 3 filter time	0.00s~10.00s	0.10s	☆
P4.28	PULSE minimum input	0.00kHz~P4.30	0.00kHz	☆
P4.29	Corresponding setting of PULSE minimum input	-100.0%~100.0%	0.0%	☆
P4.30	PULSE maximum input	P4.28~100.00kHz	50.00kHz	☆
P4.31	Corresponding setting of PULSE maximum input	-100.0%~100.0%	100.0%	☆
P4.32	PULSE filter time	0.00s~10.00s	0.10s	☆

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Function code	Parameter Name	Setting range	Default	Property
P4.33	FI curve selection	Unit's digit: Potentiometer on operation panel /FIV curve selection 1: Curve 1 (2 points, See P4.13~P4.16) 2: Curve 2 (2 points, See P4.18~P4.21) 3: Curve 3 (2 points, See P4.23~P4.26) 4: Curve 4 (4 points, See C6.00~C6.07) 5: Curve 5 (4 points, See C6.08~C6.15) Ten's digit: FIC curve selection, Sam as FIV Hundred's digit: Reserved	321	☆
P4.34	Setting selection for FI less than minimum input	Unit's digit: Potentiometer on operation panel/Setting for FIV less than minimum input 0: Corresponds to the minimum input settings 1:0.0% Ten's digit: Setting selection for FIC less than minimum input (same as FIV)	000	☆
P4.35	FWD delay time	0.0s~3600.0s	0.0s	★
P4.36	REV delay time	0.0s~3600.0s	0.0s	★
P4.37	S1 delay time	0.0s~3600.0s	0.0s	★
P4.38	S terminal valid mode selection 1	0: High level valid 1: Low level valid Unit's digit: FWD Ten's digit: REV Hundred's digit: S1 Thousand's digit: S2 Ten thousand's digit: S3	00000	★
P4.39	S terminal valid mode selection 2	0: High level valid 1: Low level valid Unit's digit: S4 Ten's digit: Reserved Hundred's digit: Reserved Thousand's digit: Reserved Ten thousand's digit: Reserved	00000	★

Chapter 4 List of Function Parameters

Function code	Parameter Name	Setting range	Default	Property
Group P5 Output terminals				
P5.00	MO1 terminal output mode selection	0: Pulse output (YOP) 1: Switch signal output (YOR)	0	☆
P5.01	YOR output function selection	0: No output 1: AC drive running 2: Fault output (fault stop) 3: Frequency-level detection FDT1 output 4: Frequency reached 5: Zero-speed running(no output at stop) 6: Motor overload pre-warning 7: AC drive overload pre-warning 8: Setting count value Reached 9: Designated count value reached	0	☆
P5.02	Relay function selection on control board (RA-RB-RC/RB-RC)	10: Length reached 11: PLC cycle complete 12: Accumulative running time reached 13: Frequency limited 14: Torque limited 15: Ready for RUN 16: FIV>FIC 17: Frequency upper limit reached 18: Frequency lower limit reached (Relate to running) 19: Under voltage state output	2	☆
P5.03	Relay function selection (TA-TC)	20: Communication setting 21: (Reserved) 22: (Reserved) 23: Zero-speed running 2 (having output at stop) 24: Accumulative power-on time reached 25: Frequency level detection FDT2 output 26: Frequency 1 reached output	0	☆

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Function code	Parameter Name	Setting range	Default	Property
P5.04	Reserved	27: Frequency 2 reached output 28: Current 1 reached output	1	☆
P5.05	Reserved	29: Current 2 reached output 30: Timing reached output 31: FIV 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) 40: Current running time reached 41: Fault	4	☆
P5.06	YOP output function selection	0: Running frequency 1: Setting frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage	0	☆
P5.07	FOV output function selection (above 3.7KW)	6: PULSE input (100.% corresponding to 100.0kHz) 7: FIV 8: FIC 9: Reserved 10: Length 11: Count value 12: Communication setting 13: Motor rotational speed 14: Output current (100.0% corresponding to 1000.0A) 15: Output voltage (100.0% corresponding to 1000.0V)	0	☆

Chapter 4 List of Function Parameters

Function code	Parameter Name	Setting range	Default	Property
P5.08	FOC output function selection (above 7.5KW)	16: Motor output torque (Actual value, corresponding to the motor percentage)	1	☆
P5.09	YOP output maximum frequency	0.01kHz~100.00kHz	50.00kHz	☆
P5.10	FOV bias coefficient	-100.0%~+100.0%	0.0%	☆
P5.11	FOV gain	-10.00~+10.00	1.00	☆
P5.12	FOC bias coefficient	-100.0%~+100.0%	0.0%	☆
P5.13	FOC gain	-10.00~+10.00	1.00	☆
P5.17	YOR output delay time	0.0s~3600.0s	0.0s	☆
P5.18	RA-RB-RC/RB-RC output delay time	0.0s~3600.0s	0.0s	☆
P5.19	TA-TC output delay time	0.0s~3600.0s	0.0s	☆
P5.20	Reserved	0.0s~3600.0s	0.0s	☆
P5.21	Reserved	0.0s~3600.0s	0.0s	☆
P5.22	Output terminal valid mode selection	0: Positive logic 1: Negative logic Unit's digit: YOR Ten's digit: RA-RB-RC/RB-RC Hundred's digit: TA-TC Thousand's digit: FOV (Above 3.7KW) Ten thousand's digit: FOC (above 7.5KW)	00000	☆
Group P6 Start/Stop parameter				
P6.00	Start mode	0: Direct start 1: Rotational speed tracking restart速度跟踪再启动 2: Pre-excited start (AC asynchronous motor) 3: SVC quick start	0	☆

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Function code	Parameter Name	Setting range	Default	Property
P6.01	Rotational speed tracking mode	0: Start from the stop frequency 1: Start from 0 2: Start from maximum frequency	0	★
P6.02	Rotational speed tracking	1~100	20	☆
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: Straight-line acceleration/deceleration 1: S curve acceleration/deceleration A 2: Dynamic S curve acceleration/deceleration	0	★
P6.08	S curve of beginning segment time proportional	0.0%~(100.0%-P6.09)	30.0%	★
P6.09	S curve of end segment time proportional	0.0%~(100.0%-P6.08)	30.0%	★
P6.10	Stop mode	0: Deceleration to stop 1: Coast to stop	0	☆
P6.11	Initial frequency of stop DC braking	0.00Hz~maximum frequency	0.00Hz	☆
P6.12	Waiting time of stop DC braking	0.0s~100.0s	0.0s	☆
P6.13	Stop DC braking current	0%~100%	0%	☆

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Function code	Parameter Name	Setting range	Default	Property
P6.14	Stop DC braking time	0.0s~100.0s	0.0s	☆
P6.15	Brake use rate	0%~100%	100%	☆
P6.18	Rotational speed tracking current	30%~200%	Model dependent	★
P6.21	Demagnetization time (Valid for SVC)	0.00~5.00s	Model dependent	☆
P6.23	Over-excitation selection	0: Not effective 1: Effective only when deceleration 2: Effective always	0	☆
P6.24	Over-excitation suppression current value	0~150%	100%	☆
P6.25	Over-excitation gain	1.00~2.50	1.25	☆
Group P7 Operation display and Display				
P7.01	JOG function parameter	0: No function 1: Switchover between operation panel command and remote operation command. It indicates the switchover between the current command source and operation panel control (local operation). If the current command source is operation panel control, the key is invalid. 2: Switchover between forward and reverse through JOG, it only valid when command source is operation panel channel. 3: Forward Jog (JOG-FWD) 4: Reverse Jog (JOG-REV)	0	★

Function code	Parameter Name	Setting range	Default	Property
P7.02	STOP/RESET key function	0: STOP/RESET key enabled only in operation panel control 1: STOP/RESET key enabled in any operation mode	1	☆
P7.03	LED display running parameter 1	0000~FFFF Bit00: Running frequency 1 (Hz) Bit01: Setting frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: S input status Bit08: MO1 output status Bit09: FIV/Voltage of potentiometer on operation panel (V) Bit10: FIC Voltage (V) Bit11: Reserved Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	1F	☆

Chapter 4 List of Function Parameters

Function code	Parameter Name	Setting range	Default	Property
P7.04	LED display running parameter 2	0000~FFFF Bit00: PID feedback Bit01: PLC stage Bit02: Pulse input frequency(kHz) Bit03: Running frequency 2 (Hz) Bit04: Remaining running time Bit05: FIV/Voltage of potentiometer on operation panel before correction (V) Bit06: FIC voltage before correction (V) Bit07: Reserved Bit08: Motor rotational speed Bit09: Current power-on time(Hour) Bit10: Current running time (Min) Bit11: Pulse input frequency(Hz) Bit12: Communication setting value Bit13: Speed feedback of Encoder(Hz) Bit14: Main frequency X display(Hz) Bit15:Auxiliary frequency Y display (Hz)	0	☆

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Function code	Parameter Name	Setting range	Default	Property
P7.05	LED display stop parameter	0000~FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: S input status Bit03: MO1 output status Bit04: FIV/Voltage of potentiometer on operation panel(V) Bit05: FIC voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting Bit12: Pulse input frequency(kHz)	33	☆
P7.06	Load speed display coefficient	0.0001~6.5000	1.0000	☆
P7.07	Heatsink temperature of inverter IGBT	0.0°C ~120.0°C	-	●
Group P8 Auxiliary Functions				
P8.00	JOG running frequency	0.00Hz~maximum frequency	2.00Hz	☆
P8.01	JOG running frequency	0.0s~6500.0s	20.0s	☆
P8.02	JOG running frequency	0.0s~6500.0s	20.0s	☆
P8.03	JOG running frequency	0.00s~65000s	Model dependent	☆
P8.04	JOG running frequency	0.0s~65000s	Model dependent	☆
P8.05	JOG running frequency	0.0s~65000s	Model dependent	☆
P8.06	JOG running frequency	0.0s~65000s	Model dependent	☆
P8.07	JOG running frequency	0.0s~65000s	Model dependent	☆
P8.08	deceleration time 4	0.0s~65000s	Model dependent	☆
P8.09	Jump frequency 1	0.00Hz~maximum frequency	0.00Hz	☆
P8.10	Jump frequency 2	0.00Hz~maximum frequency	0.00Hz	☆

Function code	Parameter Name	Setting range	Default	Property
P8.11	Frequency jump amplitude	0.00Hz~maximum 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	☆
P8.15	Droop control	0.00Hz~10.00Hz	0.00Hz	☆
P8.16	Accumulative power-on time threshold setting	0h~65000h	0h	☆
P8.17	Accumulative running time threshold setting	0h~65000h	0h	☆
P8.18	Startup protection	0: No protect 1: Protect	0	☆
P8.19	Frequency detection value (FDT1)	0.00Hz~maximum frequency	50.00Hz	☆
P8.20	Frequency detection hysteresis (FDT1)	0.0%~100.0% (FDT1 level)	5.0%	☆
P8.21	Detection range of frequency reached	0.0%~100.0% (maximum frequency)	0.0%	☆
P8.22	Jump frequency during the process of acceleration/ deceleration	0: Disabled 1: Enabled	0	☆
P8.25	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00Hz~maximum frequency	0.00Hz	☆

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Function code	Parameter Name	Setting range	Default	Property
P8.26	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00Hz~maximum frequency	0.00Hz	☆
P8.27	Terminal JOG preferred	0: Disabled	1: Enabled	☆
P8.28	Frequency detection value (FDT2)	0.00Hz~maximum frequency	50.00Hz	☆
P8.29	Frequency detection hysteresis (FDT2)	0.0%~100.0% (FDT2 level)	5.0%	☆
P8.30	Any frequency reaching detection value 1	0.00Hz~maximum frequency	50.00Hz	☆
P8.31	Any frequency reaching detection amplitude 1	0.0%~100.0% (maximum frequency)	0.0%	☆
P8.32	Any frequency reaching detection value 2	0.00Hz~maximum frequency	50.00Hz	☆
P8.33	Any frequency reaching detection amplitude 2	0.0%~100.0% (maximum frequency)	0.0%	☆
P8.34	Zero current detection level	0.0%~300.0% 100.0% corresponding to rated motor current	5.0%	☆
P8.35	Zero current detection delay time	0.01s~600.00s	0.10s	☆
P8.36	Output over-current threshold	0.0% (no detection) 0.1%~300.0% (rated motor current)	200.0%	☆
P8.37	Output over-current detection delay time	0.00s~600.00s	0.00s	☆
P8.38	Any current reaching 1	0.0%~300.0% (rated motor current)	100.0%	☆

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Function code	Parameter Name	Setting range	Default	Property
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 selection	0:Disabled 1:Enabled	0	☆
P8.43	Timing duration source	0: P8.44 1: FIV/potentiometer on operation panel 2: FIC 3: Reserved 100% of analog input corresponds to the value of P8.44	0	☆
P8.44	Timing duration	0.0Min~6500.0Min	0.0Min	☆
P8.45	FIV input voltage lower limit protection value	0.00V~P8.46	3.10V	☆
P8.46	FIV input voltage upper limit protection value	P8.45~10.00V	6.80V	☆
P8.47	Module temperature threshold	0°C ~100°C	75°C	☆
P8.48	Cooling fan control	0: Fan working during running 1: Fan working continuously	0	☆
P8.49	Wakeup frequency	Dormant frequency (P8.51)~maximum frequency (P0.10)	0.00Hz	☆
P8.50	Wakeup delay time	0.0s~6500.0s	0.0s	☆
P8.51	Dormant frequency	0.00Hz~wakeup frequency (P8.49)	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	☆

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Function code	Parameter Name	Setting range	Default	Property
P8.54	Output power correction coefficient	0~200%	100%	☆
P8.55	Emergency deceleration time	0~6553.5s	Model dependent	☆
Group P9: Fault and Protection				
P9.00	Motor overload protection selection	0: Disabled 1: Enabled	1	☆
P9.01	Motor overload protection gain	0.20~10.00	1.00	☆
P9.02	Motor overload warning coefficient	50%~100%	80%	☆
P9.03	Over voltage stall gain	0~100	30	☆
P9.04	Protection voltage of over voltage stall	120%~150%	130%	☆
P9.07	Short-circuit to ground upon power on	0: Disabled 1: Enabled	1	☆
P9.09	Fault auto reset times	0~20	0	☆
P9.10	YO action selection during fault auto reset	0: No act 1: Act	0	☆
P9.11	Time interval of fault auto reset	0.1s~100.0s	1.0s	☆
P9.12	Input phase lost/contactor suction protection selection	Unit's digit: Input phase lost protection Ten's digit: contactor suction protection 0: disabled 1: enabled	00	☆
P9.13	Output phase loss protection selection	0: Disabled 1: Enabled Unit's digit: output phase loss protection Ten's digit: output phase loss protection before running	1	☆

Function code	Parameter Name	Setting range	Default	Property
P9.14	1st fault type	0: No fault 1: Reserved 2: Over-current during acceleration 3: Over-current during deceleration 4: Over-current at constant speed 5: Over-voltage during acceleration 6: Over-voltage during deceleration 7: Over-voltage at constant speed 8: Over-load of butter resistance 9: Under voltage 10: AC drive overload 11: Motor overload 12: Input Phase lost		●
P9.15	2nd fault type	13: Power output phase loss 14: Module overheat 15: External equipment fault 16: Communication fault 17: Contactor fault 18: Current detection fault 19: Motor auto-tuning fault 20: Encoder/PG card fault 21: Parameters read-write fault 22: AC drive hardware fault 23: Short circuit to ground 24: Reserved 25: Reserved 26: Running time reached 27: User-defined fault 1 28: User-defined fault 2 29: Power-on time reached 30: Load becoming 0 31: PID feedback lost during running 40: Fast limit overtime	-	●

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Function code	Parameter Name	Setting range	Default	Property
P9.16	3rd (latest) fault type	41: Switchover motor when running 42: Speed deviation too large 43: Motor over speed 45: Motor over temperature 51: Initial position fault	-	●
Group PA PID function				
PA.00	PID setting source	0: PA.01 1: FIV/potentiometer on operation panel 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Communication setting 6: Multi-reference	0	☆
PA.01	PID digit setting	0.0%~100.0%	50.0%	☆
PA.02	PID feedback source	0: FIV/potentiometer on operation panel 1: FIC 2: Reserved 3: FIV-FIC/ potentiometer on operation panel-FIC 4: PULSE (S3, above 3.7KW) 5: Communication setting 6: FIV+FIC/ potentiometer on operation panel +FIC 7: MAX (FIV , FIC)/ MAX (potentiometer on operation panel , FIC) 8: MIN (FIV , FIC)/ MIN (potentiometer on operation panel , FIC)	0	☆
PA.03	PID action direction	0: Forward action 1: Reverse action	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	☆

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Function code	Parameter Name	Setting range	Default	Property
PA.07	Differential time Td1	0.000s~10.000s	0.000s	☆
PA.08	Cut-off frequency of PID reverse rotation	0.00~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.14	Reserved	-	-	☆
PA.15	Proportional gain KP1	0.0~100.0	20.0	☆
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 switchover condition	0: No switchover 1: Switchover via S terminal 2: Automatic switchover based on deviation 3: Automatic switchover based on running frequency	0	☆
PA.19	PID parameter switchover deviation 1	0.0%~PA.20	20.0%	☆
PA.20	PID parameter switchover deviation 2	PA.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	☆

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Function code	Parameter Name	Setting range	Default	Property
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 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	☆
Group PC Multi-Reference and Simple PLC Function				
PC.00	Multi-Reference 0	-100.0%~100.0%	0.0%	☆
PC.01	Multi-Reference 1	-100.0%~100.0%	0.0%	☆
PC.02	Multi-Reference 2	-100.0%~100.0%	0.0%	☆
PC.03	Multi-Reference 3	-100.0%~100.0%	0.0%	☆
PC.04	Multi-Reference 4	-100.0%~100.0%	0.0%	☆
PC.05	Multi-Reference 5	-100.0%~100.0%	0.0%	☆
PC.06	Multi-Reference 6	-100.0%~100.0%	0.0%	☆
PC.07	Multi-Reference 7	-100.0%~100.0%	0.0%	☆
PC.08	Multi-Reference 8	-100.0%~100.0%	0.0%	☆
PC.09	Multi-Reference 9	-100.0%~100.0%	0.0%	☆
PC.10	Multi-Reference 10	-100.0%~100.0%	0.0%	☆
PC.11	Multi-Reference 11	-100.0%~100.0%	0.0%	☆
PC.12	Multi-Reference 12	-100.0%~100.0%	0.0%	☆
PC.13	Multi-Reference 13	-100.0%~100.0%	0.0%	☆
PC.14	Multi-Reference 14	-100.0%~100.0%	0.0%	☆

Function code	Parameter Name	Setting range	Default	Property
PC.15	Multi-Reference 15	-100.0%~100.0%	0.0%	☆
PC.16	Simple PLC running mode	0: Stop after the AC drive runs one cycle 1: Keep final values after the AC drive runs one cycle 2: Repeat after the AC drive 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.18	Running time of simple PLC reference 0	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.19	Acceleration/ deceleration time of simple PLC reference 0	0~3	0	☆
PC.20	Running time of simple PLC reference 1	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.21	Acceleration/ deceleration time of simple PLC reference 1	0~3	0	☆
PC.22	Running time of simple PLC reference 2	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.23	Acceleration/ deceleration time of simple PLC reference 2	0~3	0	☆
PC.24	Running time of simple PLC reference 3	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.25	Acceleration/ deceleration time of simple PLC reference 3	0~3	0	☆

Function code	Parameter Name	Setting range	Default	Property
PC.26	Running time of simple PLC reference 4	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.27	Acceleration/ deceleration time of simple PLC reference 4	0~3	0	☆
PC.28	Running time of simple PLC reference 5	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.29	Acceleration/ deceleration time of simple PLC reference 5	0~3	0	☆
PC.30	Running time of simple PLC reference 6	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.31	Acceleration/ deceleration time of simple PLC reference 6	0~3	0	☆
PC.32	Running time of simple PLC reference 7	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.33	Acceleration/ deceleration time of simple PLC reference 7	0~3	0	☆
PC.34	Running time of simple PLC reference 8	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.35	Acceleration/ deceleration time of simple PLC reference 8	0~3	0	☆
PC.36	Running time of simple PLC reference 9	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.37	Acceleration/ deceleration time of simple PLC reference 9	0~3	0	☆

Function code	Parameter Name	Setting range	Default	Property
PC.38	Running time of simple PLC reference 10	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.39	Acceleration/ deceleration time of simple PLC reference 10	0~3	0	☆
PC.40	Running time of simple PLC reference 11	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.41	Acceleration/ deceleration time of simple PLC reference 11	0~3	0	☆
PC.42	Running time of simple PLC reference 12	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.43	Acceleration/ deceleration time of simple PLC reference 12	0~3	0	☆
PC.44	Running time of simple PLC reference 13	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.45	Acceleration/ deceleration time of simple PLC reference 13	0~3	0	☆
PC.46	Running time of simple PLC reference 14	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.47	Acceleration/ deceleration time of simple PLC reference 14	0~3	0	☆
PC.48	Running time of simple PLC reference 15	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.49	Acceleration/ deceleration time of simple PLC reference 15	0~3	0	☆

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Function code	Parameter Name	Setting range	Default	Property
PC.50	Time unit of simple PLC running	0: s (second) 1: h (hour)	0	☆
PC.51	Reference 0 source	0: Set by PC.00 1: FIV/Potentiometer on operation panel 2: FIC 3: Reserved 4: PULSE 5: PID 6: Set by preset frequency (P0.08), UP/DOWN can be modified	0	☆
Group PD: Communication Parameters				
PD.00	Baud rate	Unit's digit: MODBUS 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Ten's digit: Reserved Hundred's digit: Reserved Thousand's digit: Reserved	0005	☆
PD.01	Data format	0: No check, <8-N-2> 1: Even parity check, <8-E-1> 2: Odd Parity check, <8-O-1> 3: 8-N-1	3	☆
PD.02	Local address	1~247	1	☆
PD.03	Response delay	0ms~20ms	2	☆
PD.04	Communication timeout	0.0 (Invalid), 0.1s~60.0s	0.0	☆
PD.05	Data transfer format selection	Unit's digit: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol Ten's digit: Reserved	1	☆

Function code	Parameter Name	Setting range	Default	Property
PD.06	Communication reading current resolution	0: 0.01A 1: 0.1A	0	☆
Group PP: User-Defined Function Codes				
PP.00	User password	0~65535	0	☆
PP.01	Parameter Initialization	0: No operation 01: Restore factory settings except motor parameters	0	★
Group C0 Torque control parameter				
C0.00	Speed/Torque control mode selection	0: Speed control 1: Torque control	0	★
C0.01	Torque setting source selection in torque control mode	0: Digital setting 1 (C0.03) 1: FIV/ Potentiometer on operation panel 2: FIC 3: Reserved 4: PULSE 5: Communication setting 6: MIN (FIV,FIC)/ MIN (Potentiometer on operation panel,FIC) 7: MAX (FIV,FIC)/ MAX (Potentiometer on operation panel,FIC) (The full range of 1-7 corresponding to the digit setting of C0.03)	0	★
C0.03	Torque digit setting in torque control	-200.0%~200.0%	150.0%	☆
C0.05	Forward maximum frequency in torque control	0.00Hz~maximum frequency	50.00Hz	☆
C0.06	Reverse maximum frequency in torque control	0.00Hz~maximum frequency	50.00Hz	☆
C0.07	Acceleration time in torque control	0.00s~65000s	0.00s	☆
C0.08	Deceleration time in torque control	0.00s~65000s	0.00s	☆

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Function code	Parameter Name	Setting range	Default	Property
Group C5 Control optimization parameters				
C5.00	DPWM switchover frequency upper limit	0.00Hz~maximum frequency	8.00Hz	☆
C5.01	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	0	☆
C5.02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode 1	1	☆
C5.03	Random PWM depth	0: Random PWM invalid 1~10: PWM carrier frequency random depth	0	☆
C5.04	Rapid current limit	0: Disabled 1: Enabled	1	☆
C5.05	Voltage over modulation coefficient	100~110	105	☆
C5.06	Under voltage threshold setting	210~420	350	☆
C5.08	Dead zone time adjustment	100%~200%	150%	☆
C5.09	Over voltage threshold setting	200.0V~2500.0V	Model dependent	

Monitoring parameters:

Function Code	Parameter Name	Unit
Group D0 Basic monitoring parameters		
D0.00	Running frequency (Hz)	0.01Hz
D0.01	Set frequency (Hz)	0.01Hz
D0.02	Bus voltage (V)	0.1V
D0.03	Output voltage (V)	1V
D0.04	Output current (A)	0.01A
D0.05	Output power (kW)	0.1kW
D0.06	Output torque (%)	0.1%
D0.07	S input status	1
D0.08	MO1 output status	1
D0.09	Potentiometer on operation panel/FIV Voltage (V)	0.01V
D0.10	FIC Voltage (V)	0.01V

Function Code	Parameter Name	Unit
D0.11	Reserved	
D0.12	Count value	1
D0.13	Length value	1
D0.14	Load speed display	1
D0.15	PID setting	1
D0.16	PID feedback	1
D0.17	PLC stage	1
D0.18	PULSE input pulse frequency (kHz)	0.01kHz
D0.19	Reserved	
D0.20	Remaining running time	0.1Min
D0.21	Potentiometer on operation panel /FIV voltage before correction	0.001V
D0.22	FIC voltage before correction	0.001V
D0.23	Reserved	
D0.24	Linear speed	1m/Min
D0.25	On the current power-on time	1Min
D0.26	The current running time	0.1Min
D0.27	Input pulse frequency	1Hz
D0.28	Communication setting value	0.01%
D0.29	Reserved	
D0.30	Reserved	
D0.31	Auxiliary frequency Y display	0.01Hz
D0.32	View any memory address values	1
D0.33	Reserved	
D0.34	Motor temperature value	1°C
D0.35	Target torque (%)	0.1%
D0.36	Reserved	1
D0.37	Power factor angle	0.1°
D0.38	Reserved	1
D0.39	Target voltage upon V/F separation	1V
D0.40	Output voltage upon V/F separation	1V
D0.41	Reserved	
D0.42	Reserved	
D0.43	Reserved	
D0.44	Reserved	
D0.45	Fault info	0
D0.58	Z signal counter	1
D0.59	Set frequency (%)	0.01%
D0.60	Running frequency (%)	0.01%
D0.61	AC drive status	1

Function Code	Parameter Name	Unit
D0.74	AC drive output torque	0.1
D0.76	Accumulative power consumption low level	0.1°C
D0.77	Accumulative power consumption high level	1°C
D0.78	Linear speed	1m/min

Fault code list:

Fault code	Name	Fault code	Name
AL.02/OC1	Over current during acceleration		
AL.03/OC2	Over current during deceleration	AL.18/IE	Current detection fault
AL.04/OC3	Over current during constant speed	AL.19/TE	Motor auto-tuning fault
AL.05/OU1	Over voltage during acceleration		
AL.06/OU2	Over voltage during deceleration	AL.21/EEP	EEPROM read-write fault
AL.07/OU3	Over voltage during constant speed	AL.23/GND	Short circuit to ground fault
AL.08/POFF	Control power fault	AL.26/END1	Accumulative running time reached fault
AL.09/LU	Under voltage fault	AL.29/END2	Accumulative power on time reached fault
AL.10/OL2	AC drive over load	AL.30/LOAD	Load becoming 0 fault
AL.11/OL1	Motor over load	AL.31/PIOE	PID feedback lost during running fault
AL.12/LI	Input phase loss	AL.40/CBC	Rapid current limit fault
AL.13/LO	Output phase loss	AL.42/ESP	Speed deviation too large fault
AL.14/OH	Module over heat	AL.43/OSP	Motor over speed fault

Fault code	Name	Fault code	Name
AL.15/EF	External equipment fault		
AL.16/CE	Communication fault		

Appdenix

ParameterDescription of PID Control(0.4~2.2kW)

1. Main Functions of PID Control

Special function	Function description	Showing Code
Pressure setting and displaying	1) "Setting Pressure, Feedback Pressure" is displayed on the digital tube at the same time, unit is bar, and other contents can be switched to display. 2) Pressure mode can be adjusted by up and down keys. Refer to PA.00 parameter. PA.00 = 0: number target value PA.01	
PID Sleep Function	1) When the pressure arrives, the running frequency is less than the sleep frequency PA.29, and the duration is longer than the sleep time PA.30, the frequency drops to 0, and it enters the sleep mode, displaying "SLP". 2) The running frequency is higher than the sleep frequency PA.29, and when the frequency is under stable operation, the frequency inverter can recognize intelligently and enter the sleep mode. The related parameters PA.45~PA.48 3) Frequency bigger than PA.49, no judgment of sleep.	SLP
Wake-up function or leakage detection function of PID	In sleep, when the pressure drops to the set pressure of PA31, the frequency inverter wakes up and the PID starts to work.	
Anti freezing function	When sleep and anti-freezing function is effective, the duration is longer than PA.42, running PA.43 time at the frequency of PA.44.	
Detection of Pressure Sensor Wire Break	When the pressure sensor wire break, the frequency inverter will report the fault and display "PidE", refer to parameters PA26, PA27	PidE
High water pressure alarm	If the pressure is higher than PA.32, the high pressure fault will be reported and shutdown. The fault code (delayed time PA.35 then automatic reset failure after pressure returns to normal)	HP

Special function	Function description	Showing Code
Low water pressure alarm	If the pressure is lower than PA.33 and the duration is longer than PA.36, the low pressure fault will be reported and the shutdown. The fault code "LP" (Delay time PA.35 automatic reset fault)	LP
Water shortage alarm	"Detection frequency A"= 2 Hz below maximum frequency = P.10-2 Hz If the running frequency of frequency inverter is bigger than "detection frequency A", the duration is longer than PA. 37, and the pressure is less than PA. 34, the water shortage fault will be reported and shutdown.The fault code "LL"	LL
Automatic Reset Function for Water Shortage Fault	When water shortage fault occurs, the frequency inverter will automatically reset the fault and run. The automatic reset interval time refers to PA.39.PA.40. Realize the shutdown after cut off the water supply, and automatically restore the normal water supply after the tap water is normal.	

2. Controlled parameters of PID

Function Code	Parameter Name	Setting Range	Default	Property
PA Group PID Function				
PA.00	PID given source	0: PA.01 Setting 2: FIC 5: Communication giving 6: Multi-segment instruction giving	0	☆
PA.01	Setting pressure 0.00-50.00bar	0.00bar~PA.04 bar	2.50 bar	☆
PA.02	PID feedback source	1: FIC 5: Communication giving	1	☆
PA.03	PID action direction	0: forward action 1: reverse action	0	☆
PA.04	Pressure range 0.00-50.00bar	0~650.00 bar	10.00 bar	☆ 0.00-50.00bar
PA.05	Proportional gain Kpl	0.0~100.0	80.0	☆
PA.06	Integral time Ti1	0.01s~10.00s	2.00s	☆
PA.07	Derivative Time Td1	0.000s~10.000s	0.000s	☆

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Function Code	Parameter Name	Setting Range	Default	Property
PA.08	reverse rotation cut-off frequency of PID	0.00~maximum frequency	0.00Hz	☆
PA.09	PID deviation limit	0.0%~100.0%	0.1%	☆
PA.10	PID Differential limiting	0.00%~100.00%	0.10%	☆
PA.11	PID giving 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.14	Reserved	-	-	☆
PA.15	Proportional gain Kp2	0.0~100.0	100.0	☆
PA.16	Integral time TI2	0.01s~10.00s	0.50s	☆
PA.17	Differential time Td2	0.000s~10.000s	0.000s	☆
PA.18	PID Parameter switchover condition	0: No switch over 1: Switch over via X terminal 2: Automatic switch over based on deviation	2	☆
PA.19	PID parameter switchover deviation 1	0.0%~PA.20	5.0%	☆
PA.20	PID parameter switchover deviation 2	PA.19~100.0%	10.0%	☆
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	Forward direction maximum value of two output deviations	0.00%~100.00%	2.00%	☆
PA.24	Reverse direction maximum value of two output deviations	0.00%~100.00%	2.00%	☆

Appdenix ParameterDescription of PID Control

Function Code	Parameter Name	Setting Range	Default	Property
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 0: Continue integral operation 1: Stop integral operation	00	☆
PA.26	Detection value of PID feedback loss	0.00V: Not judging feedback loss Set 1.00V to be valid (2mA*500 ohms = 1.00V)	0.00V	☆
PA.27	Detection time of PID feedback loss	0.0s~20.0s	1.0s	☆
PA.28	PID operation at stop	0: No PID operation at stop 1: PID operation at stop	0	☆
PA.29	Sleep frequency	0.00~maximum frequency	25.00HZ	☆
PA.30	Sleep time	0.00~6000S	10S	☆
PA.31	Sleep wake-up percentage	0.0~ 100.0%	90.0%	☆
PA.32	Upper limit alarm value of feedback signal (e.g. high pressure)	PA.33~PA.04	5.00	☆
PA.33	Lower limit alarm value of feedback signal: set to 0, no alarm	0.00~PA.32	0	☆
PA.34	Detection value of water shortage pressure	0.00 ~ PA.01	0.25	☆
PA.35	When the pressure returns to normal and delays, PA.35 automatically relieves the high-voltage or low-voltage faults.	0~9999S	10S	☆

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Function Code	Parameter Name	Setting Range	Default	Property
PA.36	Low voltage alarm detection time	0~9999S	10S	☆
PA.37	Water shortage alarm detection time	0~9999S	100S	☆
PA.38	Power-on automatic operation delay settings	0~65000S (0:0~65000S (0:Do not run automatically when power-on)	0	☆
PA.39	Interval time of 10 times ahead of automatic reset of water shortage	0~65000S	600S	☆
PA.40	Interval time of 10 times after reset of water-shortage pressure	0~1000 minutes	60 minutes	☆
PA.40	Interval time of 10 times after reset of water-shortage pressure	0~1000 minutes	60 minutes	☆
PA.41	Anti freezing valid: 1-Valid 0-Invalid	0~1	0	☆
PA.42	Anti freezing waiting time when sleep	0~65000s	900s	☆
PA.43	Anti freezing running time when sleep	0~65000s	30s	☆
PA.44	Anti freezing running frequency when sleep	0~50.00Hz	15.00 HZ	☆
PA.45	sleep judgment: only when Frequency change < P635/ S, start to judging sleep	0~10.00Hz	0.50HZ	☆

Function Code	Parameter Name	Setting Range	Default	Property
PA.46	sleep judgment: Allowed declining pressure when frequency lower	0.0~10.0%	0.60%	☆
PA.47	sleep judgment: Declined frequency per second	0~10.00Hz	0.30HZ	☆
PA.48	Sleep judgment: times of frequency decline	0~1000	10□	☆
PA.49	Sleep judgment: frequency is higher than PA.49, no judgment of sleep	0~Maximum frequencyP0.10	42.00HZ	☆
PA.50	PID sample time	0~1000 ms	4ms	☆

3.Fault alarm

Fault name	Panel display	Fault code
Acceleration overcurrent	oC1	2
Deceleration overcurrent	oC2	3
Constant Speed overcurrent	oC3	4
Acceleration overvoltage	oU1	5
Deceleration overvoltage	oU2	6
Constant speed overcurrent	oU3	7
Buffer resistance overload (Continuous enter undervoltage)	POF	8
Undervoltage	LU	9
Frequency inverter overload	OL2	10
Motor overload	OL1	11
Module overheating	OH	14
External fault	EF	15
Communication overtime	CE	16

Fault name	Panel display	Fault code
Low water pressure alarm	LP	24
High water pressure alarm	hP	27
Water shortage alarm	LL	28
Run time arrival	End1	26
Power-on time arrival	End2	29
feedback loss at running time (Pressure sensor wire breaking detection)	PidE	31
Noted information	Operation panel display	
Frequency inverter under sleep	SLP	

