



# AR 200 Intelligent Pump Controller

# Pump Controller

## SAFETY AND CAUTIONS

Make sure the wiring and the pump's rotation direction is correct before using. This manual will be helpful in the installation, parameter setting, trouble shooting, and daily maintenance. To guarantee safe operation of the equipment, read the following safety guidelines before connecting power to it. Keep this operating manual handy and distribute to all users for reference.

### Safety Definition

There are three kinds of safety cautions in the manual:

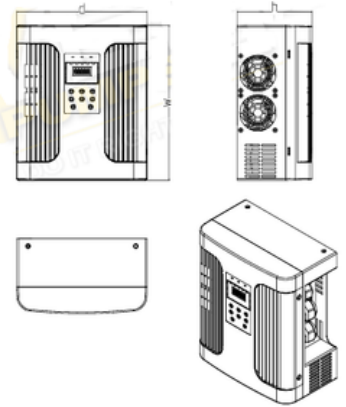
**Danger:** Operations which are not performed according to the requirements will cause severe hurt or even death.

**Warning:** Operations which are not performed according to the requirements may cause severe hurt or even death.

**Note:** Operations which are not performed according to requirements may cause light hurt or equipment damage.

### Main Parameters

- ✔ Simple adjustment
- ✔ Convenient assembly
- ✔ Quick cascade



## Naming Way.

**AR200 - F 0015 L 2 3**



## Selection Table

Voltage	Model	Output Power kW	Applicable Motor kW	Rated Current (A)	AR200
(1PH-1PH) 220V	F0022L21	2.2	0.37-2.2	13	✔
(1PH-3PH) 220V	F0022L23	2.2	0.37-2.2	10.0	✔

\*Model F0022L21 is only for Single cap motors without a centrifugal switch.

Enclosure	Dimension		
	W	D	H
R202	210	170	111

Voltage	Item	Specification	
Basic functions	Control system	Current Vector VFD—Performance and functions are specially for water pump	
	Drive performance	High efficiency drive induction motor and synchronous motor	
	Max. frequency	Vector control: 0~300Hz V/F control: 0~3200Hz	
	Carrier frequency	0.5kHz~15kHz	
		Auto regulate the carrier frequency for different load	
	Input frequency	Digital setting: 0.01Hz	
		Analog setting: Max. Frequency x0.025%	
	Control mode	SVC FVC V/F	
	Start torque	0.5Hz/110%	
	Speed control range	1:100(SVC)	1:1000(FVC)
	Speed accuracy	±0.5%(SVC)	±0.02%(FVC)
	Pressure accuracy	0.01Mpa	
	Torque control accuracy	±5%(FVC)	
	Accel/decel curve	Lines or S curve accel/decel way	
		4 independent setting 0.0~6500.0s	
	Jog control	Jog frequency range: 0.00Hz~50.00Hz	
		Jog accel/decel time: 0.0s~6500.0s	
	Auto voltage regulate	Output voltage stays constant	
Over voltage/current control	Voltage & current auto limit to avoid over current/voltage trip		
Quick current limit	Limit the over current trip to protect VFD		
Running	Order given	Keypad setting, control terminal setting, communication setting (4G/WIFI setting is optional)	
	Frequency given	keypad setting, analog voltage setting, analog current setting,communication setting (4G/WIFI setting is optional)	
	Pressure given	Keypad setting, control terminal setting, communication setting (4G/WIFI setting is optional)	
	Input/output terminal	4 digital input terminals; 2 relays output terminals	
2 analog 4-20mA input terminals			
Display and keypad operation	LED display	Parameter display	
	Button lock& function choose	Parameters lock. To define parameter ranges to avoid wrong operation	
	Protect functions	Input/output phase failure protection, Over current protection,Over voltage protection,Under voltage protection; Overheat protection; overload protection,etc	
Environment	Installation location	Indoor in which there is no direct sunlight, dust, erosive gas,combustible gas, oil smoke, water vapor, dripping, salt, etc.	
	Altitude	1000m or lower	
	Ambient temperature	-10 ~+40 °C (If it is 40°C 50°C please derating using)	
	Ambient humidity	Below 90% RH(non-condensing)	
	Storage temperature	-20 ~+60 °C	

Note: Avoid Signal Line Short Circuits: Ensure no entanglement with power or pump lines, and steer clear of areas with strong interference from electrical appliances like transformers or signal towers.

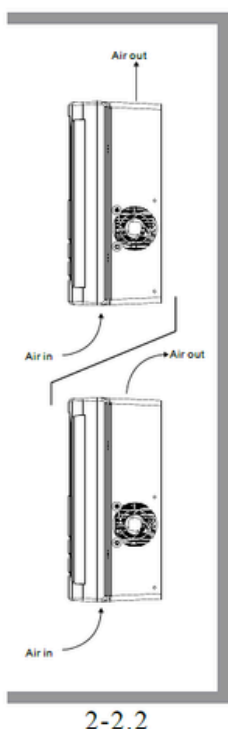
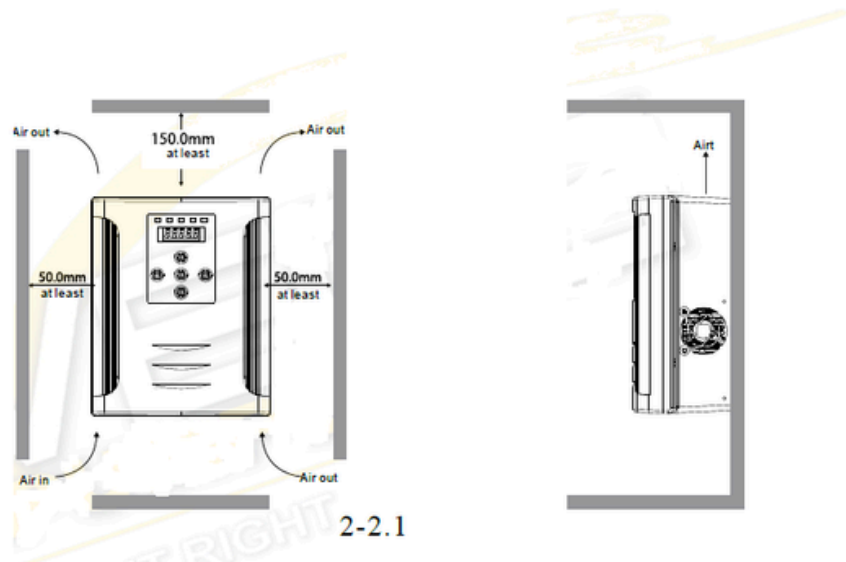


# Mechanical & Electrical Installation

## Installation environment:

1. Ambient temperature: Ambient temperature influences the inverter life greatly, so it should be within the range of -10 ~50 .
2. Mount the inverter in a flame retardant surface and the clearance around the inverter shall be enough because the inverter will generate lots of heat during running, besides mount the inverter on the base vertically with screws.
3. Mount the inverter in the location free of water drop, steam, dirt, dust and metal powder.
4. Mount in the location free of oil, salt and corrosive gas.
5. Mount in the location where vibration is less than 0.6G; the inverter shall be far away from impacting lathe.
6. Please don't install the inverter in the place with direct sunlight, high humidity (<95%) and water.
7. Mount the inverter in the location free of flammability, explosive gas, liquid.

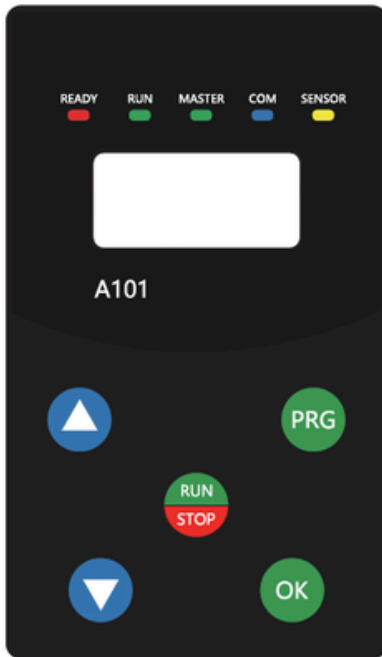
## INSTALLATION



The user shall focus on the heat dissipation issues when installing the inverter, and pay attention to the following points:

1. Installation space is shown in Fig.2-2.1 so as to ensure the heat dissipation space, but consider the heat dissipation of other components when placing the inverter.
2. Install the inverter vertically so that the heat may be expelled from the top, but do not install the inverter upside down. When two Variable Speed Drives are mounted up and down, an air flow diverting plate should be fixed in between as shown in Fig.2-2.2.
3. The installation bracket must be flame retardant.
4. Install the heat sink outside of the cabinet if the inverter is installed in the area with metal powder. And in this case, the space inside the sealing cabinet shall be big enough.

## OPERATION PANEL DESCRIPTION



Operation panel SP102

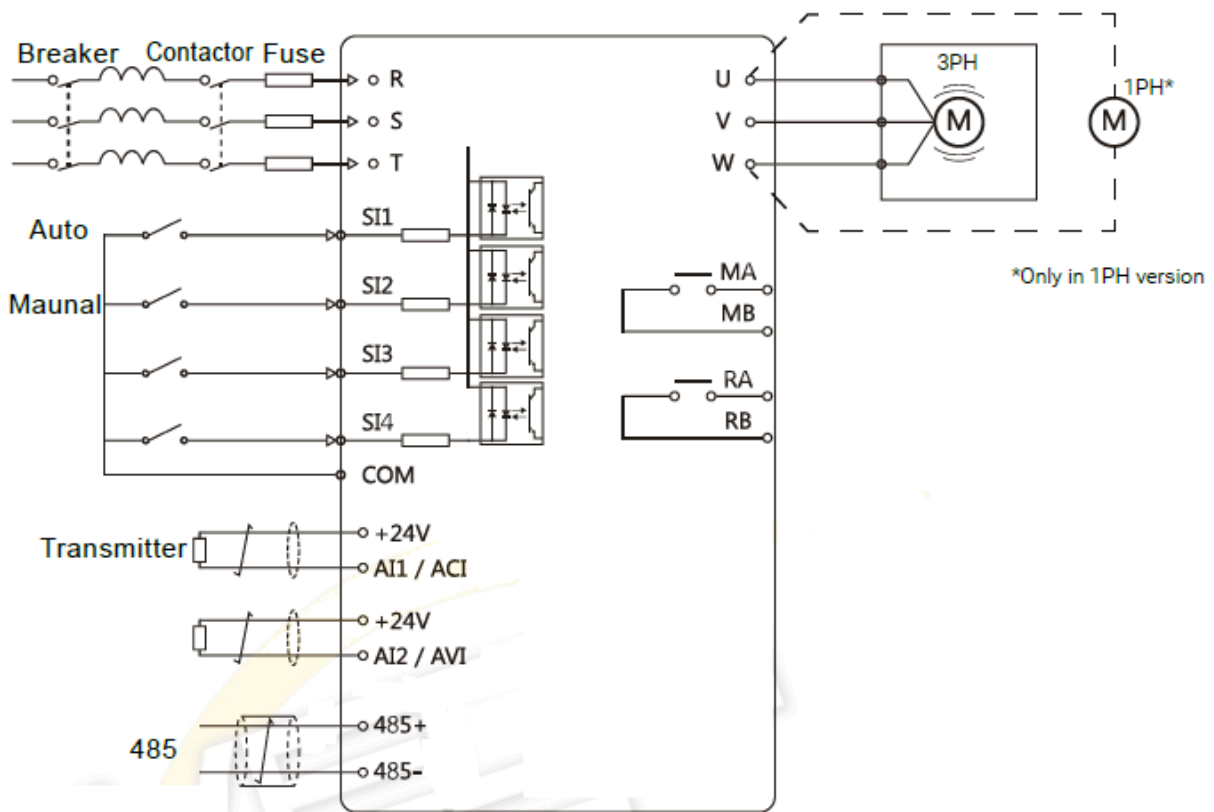
	Light On	Light Off	Light Twinkle
Power/Alarm	Be ready for run	Not ready, check again	Controller failure
Run/Stop	Run state	Stop state	Sleep state
Master/Auxiliary	Master unit	Man or failure state	Auxiliary state
Power/Alarm		Non or failure communication	Communication state
Communication	Sensor normal state	No transmitter detected	No sensor or sensor abnormal
A	Master unit		Auxiliary unit
M	Man mode		
C	Speed mode		

## DISPLAY

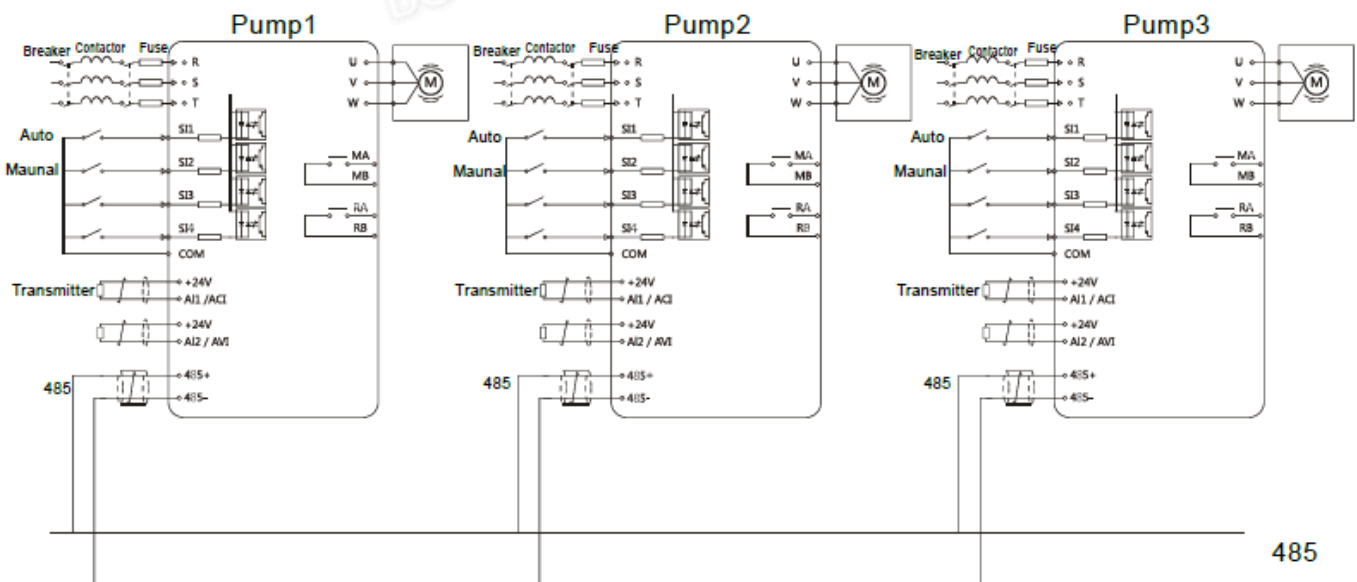
Button	Display	Code	Description
OK	P 1358	P	Motor speed
OK	H 50.00	H	Given frequency
OK	C 5.8	C	
OK	d 380.0	d	Output voltage
OK	U 623.7	U	Bus voltage
OK	5.0 - 4.9	-	Setting pressure-Actual pressure
OK	T 35.6	T	Temperature
OK	A 2.00	A	Setting pressure
OK	b 2.35	b	Actual pressure

Serial No.	Button	Display	Description
Parameters setting	[Green]	P	Enter parameter group
	[Blue Up/Down]	Pr PE	(See parameter list)
	[Green]		Enter parameter group
	[Blue Up/Down]		Exit
	[Green]		Exit parameter group
Pressure setting	[Blue Up/Down]	1.0 - 1.0	Control pressure mode: The first 2 bits are setting pressure The next 2 bits are actual pressure
Speed setting	[Blue Up/Down]	H 33.12	Speed mode: Adjust the output frequency directly
Master selection	[Blue Up/Down]	F1	
	[Green]		Select master mode
	[Green]		Exit
Auxiliary selection	[Blue Up/Down]	F2	
	[Green]		Select as auxiliary mode
	[Green]		Exit
Choose man mode	[Blue Up/Down]	F3	
	[Green]		Select as man mode
	[Green]		Exit
Running data query	[Blue Up/Down]	F0	See running data 2
	[Green]		Query running data
	[Green]		Exit
State query	[Green]		
	[Green]	Pr call	See running data 1

## Single pump wiring diagram



## Multi-pumps wiring diagram



Notes: Wireless functions is optional.

# FO Parameters Group

Code	Name	Precision	Unit	Description
F0-00	Motor speed	1233		
F0-01	Setting frequency	0.01	Hz	
F0-02	DC bus voltage	0.1	V	
F0-03	Output voltage	1	V	
F0-04	Output current	0.01	A	
F0-05	Output power	0.1	kw	
F0-06	Output torque	0.1	%	
F0-07	Input terminal state	1		0 ~ 14 bit: Input terminal state: 0: Invalid 1: Valid
F0-08	Output terminal state	1		0 ~ 9 bit: Input terminal state: 0: Invalid 1: Valid
F0-09	AI1 analog	0.01	V	
F0-10	AI2 analog	0.01	V	
F0-11	Stop time	0.1	Min	
F0-12	Operate time	0.1	Min	
F0-13	Power on timing	1	Min	
F0-14	Operate timing	0.1	Min	
F0-15	PID pressure set point	1	Bar	
F0-16	PID feedback pressure	1	Bar	
F0-17	Setting-Actual pressure			
F0-18	Radiator temperature	0.1	C	
F0-19	Countdown to exchange	0	Min	
F0-20	Pump change over			
F0-21	+ pump			
F0-22	- pump			
F0-23	Countdown to pressure holding	0.1	s	
F0-24	Pump numbers			
F0-25	Auxiliary pump number set			
F0-26	Auxiliary pump numbers			
F0-27	Sensor range			
F0-28	Version type	0.1		
F0-29	Delay of reducing pumps	0.1		
F0-30	Reserve			
F0-31	Reserve			
F0-32	Reserve			
F0-34	Reserve			
F0-35	Reserve			
F0-36	Reserve			
F0-37	Reserve			
F0-38	Reserve			

# PA Parameters Group

Code	Name	Range	Factory Setting	Description
PA00	Sensor range	0-90.00	10.00	
PA01	Pressure given source	0-6	0	0:PA02 set 1:AI1 2:AI2 3:Reserved 4:Reserved 5:Communication 6:Mult-command
PA02	Pressure set value	0.0-100.0%	30.00%	
PA03	Pressure feedback source	0-3	0	0:AI1 1:AI2
PA04	PID initial speed	0.0-100.0%	40.00%	
PA05	Initial speed hold time	0.00-650.00s	0.1s	
PA06	Feedback filtering time	0.00-60.00s	0.00s	
PA07	Output filtering time	0.00-60.00s	0.00s	
PA08	Max.forward deviation	0.0-100.0%	1.00%	
PA09	Max. Reverse deviation	0.0-100.0%	1.00%	
PA10	Proportional gain:Kp1	0.0-100.0	50	
PA11	Integral time:Ti1	0.01-10.00s	0.8s	
PA12	Differential time:Td1	0.00-10.000	0.000s	
PA13	Proportional gain:Kp2	0.0-100.0	100	
PA14	Integral time:Ti2	0.01-10.00s	0.2	
PA15	Differential time:Td2	0.00-10.000	0.000s	
PA16	PID exchange condition	0-2	0	0:Non-exchange 1:Exchange by terminal DI 2:Auto exchange by deviation 3:Auto exchange by run frequenc
PA17	Exchange deviation 1	0.0-PA20	0.5%	
PA18	Exchange deviation 2	PA19-100.0%	0.1%	
PA19	Feedback missing value	0-50s	0.1%	0.0%:No judgment feedback loss 0.1%: 0.1%~100.0%
PA20	Feedback missing time	0.0-20.00s	0s	
PA21	PID stop operation	0-1	0	0:No operation at stop state 1: Operation at stop state
				Units: Integral separation 0: Invalid
PA22	PID Integral property	0-1	0	1: valid Tens:Whether to stop integration after the output reaches the limit 0:Continue integration 1:Stop integration
PA23	PID cut-off frequency			
PA24	PID deviation limit			
PA25	PID differential amplitude			
PA26	Setting change time			
PA27	PID direction			0: Positive 1:Reverse

# PC Parameters Group

Code	Name	Range	Factory Setting	Description
PC-00	Function parameters			Pump station set Eg.: 05.01 Pump quantity:5pcs. Currnt pump number: 1ST
PC-08	Pump quantity	2-16	1	Pump quantity (Decide by PC-00 value)
PC-09	Current pump number	1-16	1	Current pump number (Decide by PC-00 value)
PC-10	Serial number	0-9999	0	Reserve
PC-11	Operation mode	1-5	1	1:Master 2:Auxiliary: 3:Manual 4:Disable 5:Failure:
PC-12	WiFi serial setting	0-9999	0	Reserve
PC-13	Division code	0-9999	0	Reserve
PC-14	Quantity of main pumps	1-16	1	The quantity of pumps will run in the system
PC-15	Quantity of small pumps	1-5	0	The quantity of small flow pumps will run in the system
PC-16	Pump's exchange time	0-6500s	10800s	Exchange time of master pump
PC-17	Small pump's exchange time11	0-6000s	0	Exchange time of small pump
PC-18	Small pump's exchange speed	0-9999	0	Small pump exchange speed point
PC-19	Exchange temperature point	0-100.0	70	Auto exchanged when master controller's temperature more than this value
PC-20	Adding. pump speed	0-100	95	Auxiliary pump speed value
PC-21	Reducing. pump speed	100%	75	Auxiliary pump speed value
PC-22	Delay of adding&reducing pump	0-6500	10	Delay of adding & reducing pump
PC-23	Reserve			
PC-24	Water source sensor range	0-100.00	0	Sensor range
PC-25	Water source detect deviation	0-10.00	0	Water detect deviation
PC-26	Water source alarm1	0-100	0	PC26>PC27, high level alarm; PC26<PC27, recovered
PC-27	Water source alarm 2	0-100	0	Water alarm deviation
PC-28	Level outlet1(for double sensors function)	0-50	0	PC28>PC29: as high level alarm( code 26)
PC-29	Level outlet2 (for double sensors function)	0-50	0	PC28<PC29, as low level alarm (code:26)
PC-30	Delay of high/low pressure alarm	0-6500	0	
PC-31	Delay of high water level alarm	0-600.0	0	0: AlarmEr:31—reset by manual >0, alarm delay, reset delay (Terminal function:9)
PC-32	Delay of low water level alarm	0-600.0	0	0:Alarm Er:27,reset by manual >0, alarm delay, reset delay (Terminal function:10)
PC-33	PID start buffering	0-600.0	5	Change this value if use bigger pressure vessel(longer time to avoid pressure lash)
PC-34	Inspect interval	0-6500	4320.0	Pumps auto start after long time no use to avoid freezing or rusting
PC-35	Inspect frequency	0-1000	700	
PC-36	Inspect working time	0-6500.0	20	

Code	Name	Range	Factory Setting	Description
PC-37	Input terminal function: S1	0-18	1	
PC-38	Input terminal function: S2	0-18	4	
PC-39	Reserve	0-18	9	
PC-40	Reserve	0-18	0	
PC-41	Output terminal 1(MA/MB)	0-18	0	
PC-42	Output terminal 2(RA/RB)	0-18	2	
PC-43	Output terminal function 3	0-18	0	
PC-44	The last failure record			
PC-45	The last two failure			
PC-46	The latest failure			
PC-47	Recent failure frequency	3times failure frequency		The latest failure frequency
PC-48	Recent failure current	3times failure current		The latest failure current
PC-49	Recent failure DC voltage	3 times bus voltage		The latest failure bus voltage
PC-50	Recent failure running	3 power on time		The latest power on time
PC-51	Failure's feedback pressure			

## Input Terminal Functions PC37---PC40 Description

Code	Display	Setting Range	Factory Setting	Change Limit
PC-37	Input terminal function: S1	0~18	1	*
PC-38	Input terminal function: S2	0~18	4	*
PC-39	Reserve	0~18	9	*
PC-40	Reserve	0~18	0	*

Setting	Function	Description
0	No function	The terminals can set as no functions you don't use them
1	(FWD)	User the external terminals to control inverter's FWD & REV.
2	(REV)	
3	Three-wire operation instruction	
4	(FJOG)	FJOG: FWD inching turning, RJOG: REV reverse inching turning. Jog running frequency, JOG-acc./dec. Time, Parameter PE08, PE09
5	(RJOG)	
6	UP	Modify the frequency by external terminal setting frequency. When the frequency set as Numbers, press UP/DOWN to change the frequency.
7	DOWN	
8	(RESET)	To reset by the terminal control. It is with same function as panel's RESET.
9	External fault input1	PC31=0; Alarm immediately Er.31, Reset by manual. PC31>0; Alarm delay Er.31, Reset delay
10	External fault input2	PC32=0; Alarm immediately Er.27, Reset by manual. PC32>0; Alarm delay Er.27, Reset delay
11	External fault normal open input	When the signal deliver to inverter, it display Er.014

Setting	Function	Description
12	Multi-speed terminal1	With 8 multi-speed setting by these three terminals.
13	Multi-speed terminal2	
14	Multi-speed terminal3	
16	Forward host enable	Multi-pump system, when standby, enable as master, and motor direction forward
17	Reverse host enable	Multi-pump system, when standby, enable as master, and motor direction reverse
25	PE01=3	Valid
26	PE01=3	Valid
27	PC32>0	
28	PC31<0	

## Output Terminal Functions PC41---PC43 Description

Code	Display	Setting Range	Factory Setting	Change Limit
PC-41	Relay output function choose	MA/MB 0~18	1	*
PC-42	Relay output function choose	RA/RB 0~18	2	*
PC-43	Relay output function choose	0~18	0	*

Setting	Function	Description
0	No output	The output terminal has no function
1	Inverter running	This indicates the inverter is running state. With output frequency (frequency can be 0), output as ON Signal.
2	Fault output (Fault shutdown)	When the inverter fails and stops, output as ON Signal.
5	Run at zero speed (stop but no output)	When inverter is running and output frequency is 0, output as ON Signal. When the inverter is at stop state, output as OFF Signal.
6	Motor overload pre-alarm	Before the motor overload protection acts, it judges according to the overload pre-alarm threshold, and outputs ON Signal after exceeding the pre-alarm.
7	Inverter overload pre-alarm	10s before overload protection of inverter, output as ON Signal.
12	Cumulative running time reached	The accumulative running time of the inverter has reached.
13	Frequency limit	When the setting frequency exceed the upper limit frequency or lower frequency, and it's output frequency also reaches the upper limit frequency or lower limit frequency, output as ON Signal.
15	Ready to run	When the inverter's main circuit and control circuit of power supply are state, also no failure information detected, inverter is enable to run, output as ON Signal.
17	Upper limit frequency reached	When the running frequency is up to upper limit frequency, output as ON Signal.
18	Lower limit frequency reached (Stop state but no output)	When the running frequency is up to lower limit frequency, output as ON Signal. If stop state, output as OFF Signal.

# PE Parameters Group

Code	Name	Precision	Unit	Description
PE-00	Pump motor working mode	0-2	0	0: Vector 2: VF
PE-01	Control order choose	0-2	0	0:Keypad control 1:External terminal control
PE-02	Frequency source choose	0-8	8	0: Frequency set by keypad 8: Constant pressure control mode
PE-03	Motor rotation	0-1	0	0: Run as choose 1:Run the opposite direction
PE-04	Carrier frequency	0.5-16.0KHz	8	According to the inverter power
PE-05	Preset frequency	0.001-Max. frequency	30.0	
PE-06	Acc. time	0.0-6500.0s	5	
PE-07	Dec. time	0.0-6500.0s	5	
PE-08	Jog frequency	0-Max. frequency	2	
PE-09	Jog acc./dec. time	0-6500.0s	20	
PE-10	Sleep frequency	0-Max.speed	1500	
PE-11	Sleep delay	0-6500.0s	60.0	
PE-12	Wake up differential pressure	0-6553.5	0.30	
PE-13	Wake up delay	0-500	0.1	
PE-14	Barometric coefficients	0-120	20	
PE-15	Delay of built-in lack of water	0-6553.5 30	30	0: Closed
PE-16	Speed limit lack of water	0-Max.speed	2800	
PE-17	Delay of transmitter breakage	0-6553.5	30.0	0: Closed
PE-18	Speed limit as transmitter breakage	0-Max.speed	2100	
PE-19	Delay of non-motor	0-6553.5	10	0: Closed
PE-20	Motor type	0: Normal asynchronous motor 1: Variable frequency asynchronous motor 2:Permanent magnet synchronous motor	0	
PE-21	Rated voltage	1-200v		
PE-22	Rated power	0.1-1000.0kw		
PE-23	Rated current	0.01A-655.35A		
PE-24	Rated rpm	1-65535rpm		
PE-25	Rated frequency	0.01-Max. frequency		

# Fault Code

Fault Code	Fault Name	Fault Reason	Disposal Methods
Err.01P	Under voltage	<ol style="list-style-type: none"> <li>1. Transient power cut exists or not</li> <li>2. Check if the input voltage of the motor driver inverter is within the value required by the regulation</li> <li>3. Measure if the DC bus voltage is normal</li> <li>4. Check if the rectifying bridge or the buffering resistor is normal</li> <li>5. Check if the drive board is normal</li> <li>6. Check if the main control board is normal</li> </ol>	<ol style="list-style-type: none"> <li>1. Motor driver inverter reset</li> <li>2. Adjust the power supply or remove the peripheral power-supply loop fault</li> <li>3. Seek technical support</li> </ol>
Err.02P	Over voltage during accel.	<ol style="list-style-type: none"> <li>1. Is there any brake unit or brake resistor installed</li> <li>2. The input voltage is too high or not</li> <li>3. If there exists the external force driving the motor operation during the acceleration process</li> <li>4. The acceleration time is too short or not</li> </ol>	<ol style="list-style-type: none"> <li>1. Install the brake unit and resistor</li> <li>2. Adjust the voltage within the normal range</li> <li>3. Cancel the external force or install the brake resistor</li> <li>4. Increase the acceleration time</li> </ol>
Err.03P	Over-current during decel.	<ol style="list-style-type: none"> <li>1. Check if the output loop of the inverter has the earthing or short circuit</li> <li>2. Whether the motor parameter identification has been performed or not</li> <li>3. Is the deceleration time too short</li> <li>4. Is the voltage too low</li> <li>5. Whether there exists a shock load during the deceleration process</li> <li>6. Is there the brake unit or brake resistor installed</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove the peripheral fault</li> <li>2. Perform the motor parameter identification</li> <li>3. Increase the deceleration time</li> <li>4. Adjust the voltage within the normal range</li> <li>5. Cancel the shock load</li> <li>6. Install the brake unit and brake resistor</li> </ol>
Err.04P	Over-current at constant speed	<ol style="list-style-type: none"> <li>1. Check if the output loop of the motor driver inverter has the short circuit or leakage circuit</li> <li>2. Whether it is V/F mode, the motor parameter identification has been performed or not</li> <li>3. The voltage is too low</li> <li>4. Is there the shock load during the running</li> <li>5. The type of inverter is too small</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove the peripheral fault</li> <li>2. Perform the motor parameter identification</li> <li>3. Adjust the voltage within the normal range</li> <li>4. Cancel the shock load</li> <li>5. Choose the bigger power inverter</li> </ol>
Err.05P	Over-current during accel.	<ol style="list-style-type: none"> <li>1. Is the acceleration time too short.</li> <li>2. Whether it is proper to manually raise torque or V/F curve</li> <li>3. The voltage is too low or not</li> <li>4. If the output loop of the inverter has the earthing or short circuit</li> <li>5. Control mode is V/F, but the motor parameter identification is not performed.</li> <li>6. Try to drive the rotating motor.</li> <li>7. Is there the shock load during the acceleration process</li> <li>8. The type of inverter is small</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase the acceleration time</li> <li>2. Adjust the manual raising of torque or V/F curve</li> <li>3. Adjust the voltage to the normal range</li> <li>4. Remove the peripheral fault</li> <li>5. Perform the motor parameter identification. Select the rotation speed tracing before restarting or restart after the motor stops</li> <li>7. Cancel shock load</li> <li>8. Choose the bigger power inverter</li> </ol>
Err.06P	Over voltage during decel	<ol style="list-style-type: none"> <li>1. The input voltage is too high. If there exists external forces driving the</li> <li>2. motor operation during the deceleration process</li> <li>3. The deceleration time is too short or no</li> <li>4. Is there any brake resistor installed</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust the voltage within normal range</li> <li>2. Cancel the external force or install the brake resistor</li> <li>3. Increase the deceleration time or install the brake resistor</li> <li>4. Install the brake resistor</li> </ol>
Err.07P	Motor Over Load	<ol style="list-style-type: none"> <li>1. The type of inverter is small</li> <li>2. The motor protection parameter P9.01 setting is suitable or not</li> <li>3. The load is too big or the motor is blocked</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase the inverter capacity</li> <li>2. Correctly set up the parameter</li> <li>3. Reduce the load</li> </ol>
Err.08P	Inverter Over Load	<ol style="list-style-type: none"> <li>1. The type of inverter is small</li> <li>2. The load is too big or the motor is blocked</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase the inverter capacity</li> <li>2. Reduce the load</li> </ol>

Fault Code	Fault Name	Fault Reason	Disposal Methods
Err.09P	Inverter unit protection	1.Inverter's output to motor possible short circuits. 2.The wiring between motor and inverter is too long 3.Module is overheat 4.Inverter inner wiring loose 5.Motherboard unnormal 6.Power board unnormal 7.Inverter module unnormal	1.Check and rule out external faulty 2.Add electric reactor and output filter 3.Check air duct if is blocking;fan if could normal work 4.Plug all connection cables 5.Please seek technical service
Err.10P	Power supply fault	1.Check if the input voltage of the motor driver inverter is within the value required by the normal range	1.Adjust the power supply
Err.11P	Over voltage during constant running.	1.Is there any the external force driving the motor during the operation 2.The input voltage is too high or not	1.Cancel the external force or install the brake resistor 2.Adjust the voltage within the normal range
Err.12P	Output phase failure	1.Check if the lead wire from frequency inverter to the motor is normal 2.Check if the three-phase output of frequency inverter is balanced when running without motor 3.Check if drive board is normal 4.Check if the module is normal	1.Remove peripheral fault 2. Check if the motor three-phase winding is normal, If no, remove the fault 3.Seek technical support
Err.13P	Module overheat	1.If the wind channel is blocked 2.If the fan is damaged 3.If the environmental temperature is too high 4.If the module heat-variable resistor is damaged 5.If the inverse module is damaged	1.Clear the wind channel 2.Change the fan 3.Reduce the environmental temperature 4.Change the heatvariable resistor 5.Change the inverse module
Err.14P	External device fault	1.Input peripheral fault signal via multifunctional terminal DI or not 2.Input external fault signal via analog IO function	1.Reset running
Err.15P	Communication fault	1.Communication connection is normal or not 2.Communication parameters P0.28 are correctly set up or not 3.Communication parameters PD are correctly set up or not 4.Master station works or not	1.Check communication connection 2.Change communication parameters
Err.16P	Contact fault	1.Input phase fault 2.Drive board, contactor is normal or not	1.Check and remove the problems in the peripheral lines 2.Change the drive board, power board, contactor
Err.17P	Current Inspection Circuit Failure	1.Check if Hall device is normal 2.Check if the drive board is normal	1.Change Hall device 2.Change drive board
Err.18P	Motor self-learning failure	1.The parameters identification process is overtime or not 2.The motor parameters are configured as per the data on the nameplate or not	1.Check the lead wire from frequency inverter to motor 2.Correctly configure the motor parameters
Err.19P	Encoder disk fault	1.Encoder damaged 2.PG card problem 3.Encoder model not correct 4.Encoder connection wrong	1.Change the encoder 2.Change the PG card 3.Set the correct encoder type 4.Check the connection
Err.20P	Input phase failure	1.Check if the drive board is normal 2.Check if the lightning protection board is normal 3.Check if The main control board is normal 4.Check if the three-phase input power is normal	1.Change drive board, main control board 2.Seek technical support 3.Check and remove the problems in the peripheral lines,To make the three-phase power entering the frequency inverter normal

Fault Code	Fault Name	Fault Reason	Disposal Methods
Err.21P	Hardware fault	1.Over voltage 2.Over current	1.Over voltage solve way 2.Over current solve way
Err.22P	Ground fault	1.Motor to Ground short circuit	1. Change cable or motor
Err.25P	Total running time failure	1.Total running time achieve the setting value	1. To use the reset function to clear the record
Err.26P	EEPROM read-write failure	1.Whether it is normal after the renewal of the main control board	1.main control board fault
Err.27P	User fault 2	1.Input user fault1 signal via multifunctional terminal DI or not 2.Input user fault1 signal via analog IO function	1.Reset running
Err.31P	User fault 1	1. Input user fault1 signal via multifunctional terminal DI or not 2. Input user fault1 signal via analog IO function	1. Reset running
Err.32P	Transmitter breakdown or broken	1. No transmitter 2. Transmitter problem	PE.17 Protection time 0: Close protection
Err.33P	Lack of water	1. Water coming not enough 2. Air in the pipeline	PE.15 Protection time 0: Close protection
Err.35P	Water pump run without any load	1. If air in the pump body 2. If suction side block	PE.19 Protection time 0: Close protection
Err.36P	Low level alarm	Digital signal terminal, set function code 27 : connect, alarm Err.36 Disconnect, recovered ,(usually for float switch)	Check the function code and signal if is normal
Err.37P	High level alarm	Digital signal terminal, set function code 28 : connect, alarm Err.38 Disconnect, recovered ,(usually for float switch)	Check the function code and signal if is normal
Err.38P	Low level alarm2	1.The command from up machine	The communication and signal from up machine if is normal
Err.39P	High level alarm2	1.The command from up machine	The communication and signal from up machine if is normal
Err.040	Change over fault	1.Change the motorby terminal when inverter is running	1.Operate after inverter stop
Err.41P	Speed deviation fault	1.Speed deviation is too big, and P9.69&P9.60 setting is not correct. 2.Encoder parameter setting is not correct. 3. Does not with parameter identification	1. Setting the value suitable 2. Set the correct encoder 3. Motor parameter identification
Err.42P	Motor over speed fault	1.Speed deviation is too big, and P9.69&P9.60 setting is not correct. 2.Encoder parameter setting is not correct. 3. Does not with parameter identification	1.Setting the value suitable 2.Set the correct encoder 3.Motor parameter identification



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