

**FC360 series HMI+PLC
Booster pump controller
User manual**

V2.0

2022.6

Conventions used in this manual

Read this manual carefully before any operation.

Please keep this manual for future use.



Generic danger Failure to comply with the safety regulations that follow can irreparably damage the controller or equipment.



Electric shock risk Failure to comply with the safety regulations that follow can cause death or serious personal injury.

Part 1 FC360 series controller introduction

IPK0724 HMI+PLC intelligent pump controller used for booster water supply support VFD .

Product introduction

1.1 Features

1. 7 inch colorful TFT-LCD ,Parameter setting ,displaying working status ,system faults record checking ,3D dynamic effect.
2. 4 water pumps control ,each pump can be set separately as fixed-speed pump and variable speed pump easily (if required more ,the controlller can support it by extention .
3. Supports all pumps with a frequency inverter and each water pump with a frequency inverter ; supports water supply of non-negtive pressure and constant pressure water supply from water tank..
4. Timer period setting ,setting different target pressure value at differnt timer period .
5. Faults alarm record review at real -time and history .
6. Launage in optional .
5. Maintance is easy way ,faults displaying .
6. Dynamic real-time working curve diagram displaying .
7. With RS 485 ,Cloudy monitor control is optional by Cellllphone APP and Camera both .
8. System lock function

1.2 FC360 series name

FC360- 0724-224XP -C

1 2 3 4 5

- 1) Serial name : FC360 series:
- 2) HMI : 0724: 07 is 7" Touch LCD 24: DC 24V
- 3) Inupt/output ports quantity :24,14 for input , 10 for output
- 4) Type: CPU224XP 2 Analog signal input , 1 analog signal output
- 5) Mobile phone remote monitor

1.3 Technical Specification

Model no	FC360-0724-224XP-C
Characteris	
LCD Characteristic	
Size (inch)	7 or 10
LCD Displaying	TFT , LED backlight
Color displaying	True color, 65535
Resoltuion	800*400 250cd/m ²
HMI	Resistive
RAM	256M 256M NADA FLASH
CPU	AM335X
Main frequency	800M
Configuration software	HMI configuration
PLCharacteristic	
Qty of on/off signal	14ports input 10 ports output
Qty of analog signal	2ports 0-10v input 2ports voltage/currentoutput (optional)
RAM (Forever saved)	19000K
Digital input filtering time	20ms
Speed	0,08us
communication	1
software	Compatible with STEP 7 MicroWIN SP9
Isolation	Light-coupled isolation
Rated input	4MA
Output (Relay)	
Welding capcity	Max 5A
Response time	10mS
Resistance wihout load	10,000,000times
Resistance with load	100,000 times -- 300,000 times
Output (Analog)	
Output signal range	0-10V/0-20mA
Number of analog output	1
Accuracy	16
Working Enviroment	
Working temp	0℃~45℃
Working humidity	5%~90%
Storage temp	-10℃~60℃
Main data of installation	
Construction	Plastic
Color	Gray
Product Size	210×150×45
Installation size	192*138
Power supply	DC24V, 30W
External interface	
Ethernet	Common port

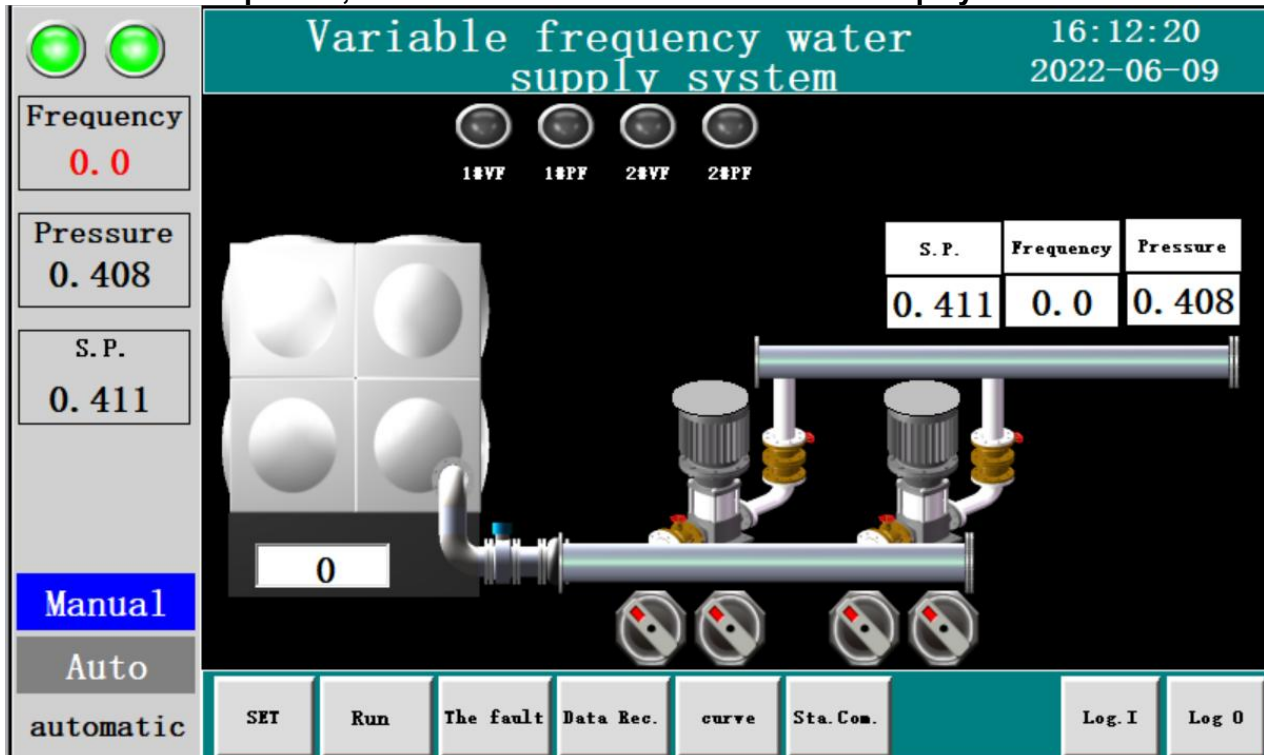
1.4 Port Definiton:

Port name		definition
1	L+	Working power: DC24V+
2	M	Working power: DC24V-
3	1M	Com
4	I0.0	Manual
5	I0.1	Auto
6	I0.2	VFD fault (single inverter mode)
7	I0.3	1#fault (all inverter mode)
8	I0.4	2#fault (all inverter mode)
9	I0.5	3#fault (all inverter mode)
10	I0.6	4#fault (all inverter mode)
11	I0.7	
12	I1.0	
13	I1.1	
14	I1.2	
15	2M	Com
16	I1.3	Dry running protection(Float switch at water tank)
17	I1.4	Dry running protection(float swtich at pressure tank)
18	I1.5	Remote control
19	null	
20	null	

Port name		definition
21	1L	Output com
22	Q0.0	Output alarm
23	Q0.1	VFD Start
24	Q0.2	1#variable speed running
25	Q0.3	1#fixed speed running
26	Q0.4	2#variable speed running
27	2L	Output com
28	Q0.5	2#fixed speed running
29	Q0.6	3#variable speed running
30	Q0.7	3#variable speed running
31	Q1.0	4#variable speed running
32	Q1.1	4#variable speed running
33	null	
34	null	
35	AQ-M	Analog singal output(GND=0)
36	AQ-I	Current 0-20mA
37	AQ-V	Voltage 0-10v
38	AI-M	com
39	AQ-A+	Outlet signal input 4-20MA
40	AQ-B+	Inlet signal input 4-20MA

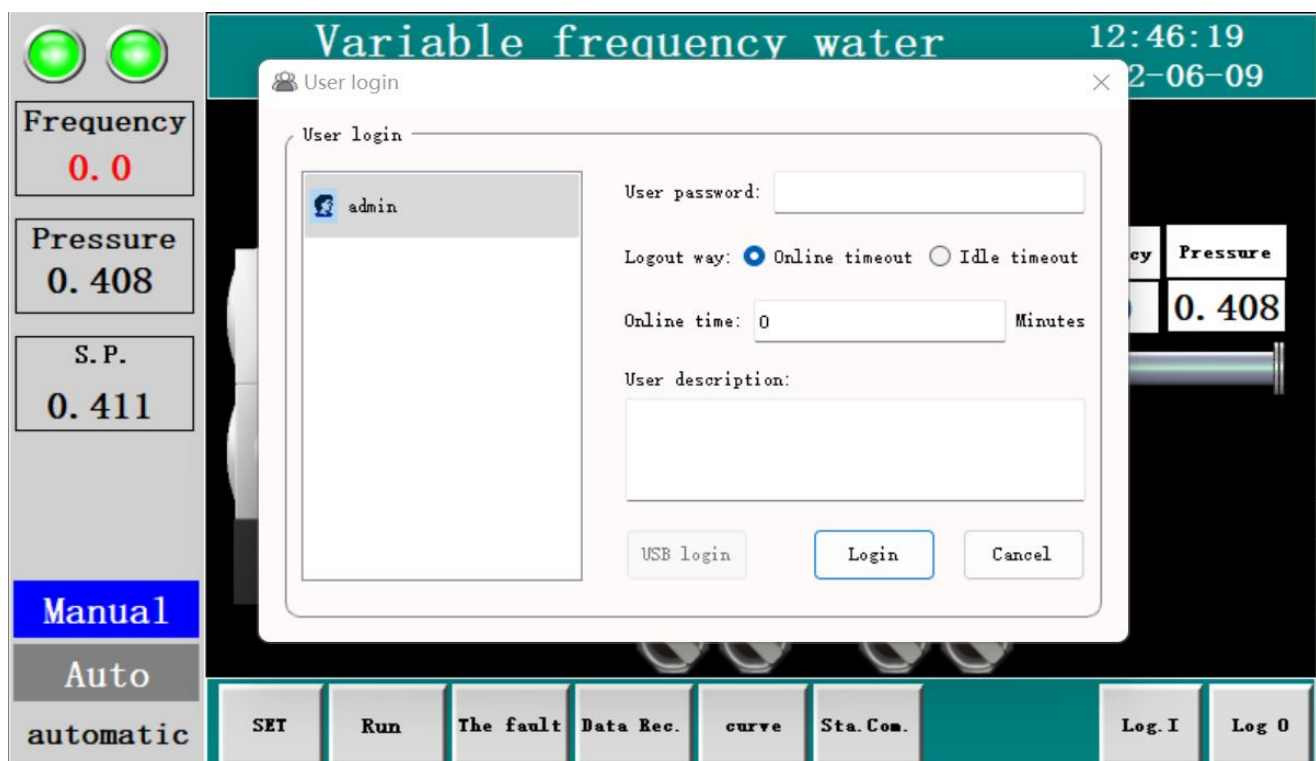
Part 2. LCD displaying

2.1 HMI Run the picture, Power on the controller 5 seconds to display the boot screen.



2.2 Parameter setting

1. Click the menu to enter the parameter setting, login user name and password: admin



2: water outlet

Variable frequency water supply system		16:13:44 2022-06-09	
Frequency 0.0	A00:Low range of water outlet (Bar)	0.00	A:water outlet
Pressure 0.408	A01:Upper range of water outlet (Bar)	1.00	B:water inlet
	A02:Fine adjustment	1.00	D:Pump group
S.P. 0.411	A03:correction (bar)	0.00	E:VFD
	A04:Decimal digits	3	F:algorithm
Manual	A05:Response on Inlet transmitt fault	1	G:Add/Reduce
	A10:Pressure setting of over pressue (bar)	0	H:sleep
Auto	A11:Response of over pressure	0	I:Period
	A12:Pressure out of control setting (bar)	0	J:Default
automatic	A13:Response of out of control	0	K:Date&Time
SET		Run	The fault
Data Rec.		curve	Sta.Com.
Log. I		Log 0	

3:water inlet

Variable frequency water supply system		16:14:53 2022-06-09	
Frequency 0.0	B00:Inlet float switch availabe	0	A:water outlet
Pressure 0.408	B01:Sensor or not	0	B:water inlet
	B02:Low range of water inlet transmitter (Bar)	0.00	D:Pump group
S.P. 0.411	B03:Upper range of water inlet transmitter (Ba	1.00	E:VFD
	B04:Fine adjustment	1.00	F:algorithm
Manual	B05:Correction (Bar)	0.00	G:Add/Reduce
	B06:Decimal digits	2	H:sleep
Auto	B07:Inlet first level low pressure (Bar)	0.15	I:Period
	B08:Inlet second level low pressure (Bar)	0.1	J:Default
automatic	B09:Pressure for recovery (Bar)	0.2	K:Date&Time
B10:Response on Inlet transmitt fault		1	
SET		Run	The fault
Data Rec.		curve	Sta.Com.
Log. I		Log 0	

4. Pump group

Variable frequency water supply system		16:15:33 2022-06-09	
Frequency 0.0	D00:Pump qty&supply mode	201	A:water outlet
Pressure 0.408	D01:Qty of main pump	2	B:water inlet
S. P. 0.411	D04:Pump alternation time	12	D:Pump group
Manual	D05:1# pump able/disable	1	E:VFD
	D06:2# pump able/disable	1	F:algorithm
	D07:3# pump able/disable	0	G:Add/Reduce
	D08:4# pump able/disable	0	H:sleep
Auto			I:Period
automatic			J:Default
			K:Date&Time
	SET	Run	The fault
	Data Rec.	curve	Sta. Com.
			Log. I
			Log 0

5. VFD

Variable frequency water supply system		16:16:06 2022-06-09	
Frequency 0.0	E00:Single or All variable speed	0	A:water outlet
Pressure 0.408			B:water inlet
S. P. 0.411			D:Pump group
Manual			E:VFD
			F:algorithm
			G:Add/Reduce
			H:sleep
Auto			I:Period
automatic			J:Default
			K:Date&Time
	SET	Run	The fault
	Data Rec.	curve	Sta. Com.
			Log. I
			Log 0

6.Algorithm

Variable frequency water supply system				16:16:34 2022-06-09	
Frequency 0.0	F00:S.P.	0.411	Control mode selection	1	A:water outlet
Pressure 0.408	F05:Low frequency(HZ)	50	Primary control algorithm		B:water inlet
S.P. 0.411	F06:Low frequency(HZ)	25	F01:Control algorithm	1	D:Pump group
Manual Auto automatic			F02:Control algorithm	0.05	E:VFD
			F03Control algorithm	0	F:algorithm
			Quadratic control algorithm		G:Add/Reduce
			F01:Control algorithm	1	H:sleep
			F02:Control algorithm	0.08	I:Period
		F03Control algorithm	0	J:Default	K:Date&Time
SET Run The fault Data Rec. curve Sta.Com. Log.I Log 0					

7.Add/Reduce

Variable frequency water supply system				16:17:01 2022-06-09	
Frequency 0.0	G00:way of pump cut in	0			A:water outlet
Pressure 0.408	G01:Delay time for pump cut in(s)	20			B:water inlet
S.P. 0.411	G02:pressure difference of pump cut in	0	0.411		D:Pump group
Manual Auto automatic	G03:Increase the pump frequency	50.0			E:VFD
	G06:delay time of pump cut down (S)	5			F:algorithm
	G07:pressure difference of pump cut d	0	0.411		G:Add/Reduce
	G08:Pump frequency reduction	46.0			H:sleep
					I:Period
				J:Default	K:Date&Time
SET Run The fault Data Rec. curve Sta.Com. Log.I Log 0					

8.Sleep

Variable frequency water supply system		16:17:37 2022-06-09	
Frequency 0.0			A:water outlet
Pressure 0.408			B:water inlet
S.P. 0.411			D:Pump group
			E:VFD
			F:algorithm
			G:Add/Reduce
			H:sleep
			I:Period
			J:Default
			K:Date&Time
Manual			
Auto			
automatic	SET	Run	The fault
	Data Rec.	curve	Sta.Com.
			Log.I
			Log 0

9.Default setting

Variable frequency water supply system		16:18:36 2022-06-09	
Frequency 0.0			A:water outlet
Pressure 0.408			B:water inlet
S.P. 0.411			D:Pump group
			E:VFD
			F:algorithm
			G:Add/Reduce
			H:sleep
			I:Period
			J:Default
			K:Date&Time
Manual			
Auto			
automatic	SET	Run	The fault
	Data Rec.	curve	Sta.Com.
			Log.I
			Log 0

Note:
Restoring the factory settings will clear all
These data may not be normal data for the ci
So be cautious!

Reset factory value

10 Date&Time

Frequency

0.0

Pressure

0.408

S.P.

0.411

Manual

Auto

automatic

Variable frequency water supply system

16:28:45
2022-06-09

Note:
CPU Time setting
Correctly setup system time
Enter two digits

22

—

6

—

9

week

28

28

44

5

Week Description

1. Sunday.

2. Monday.

3. Tuesday.

4. Wednesday.

5. Thursday.

6. Friday.

7. Saturday.

A:water outlet

B:water inlet

D:Pump group

E:VFD

F:algorithm

G:Add/Reduce

H:sleep

I:Period

J:Default

K:Date&Time

SET

Run

The fault

Data Rec.

curve

Sta.Com.

Log. I

Log 0

REMARK:

These parameters are important please set at installation .

A: Water outlet (Page 1/2 in total)				D: Pump set properties				
Code		Set	Reference	Code		Set	Reference	
A00	Low range of water outlet (Bar)	0.000		D00	Pump qty&supply mode	301	water tank	
A01	Upper range of water outlet (Bar)	1.000		D01	Qty of main pump	3		
A05	Faults of transmitter	1	alarm&stop	D05	1# pump able/disable	1	Fixed speed	
				D06	2# pump able/disable	1	Variable speed	
				D07	3# pump able/disable	1	Fixed speed	
				D08	4# pump able/disable	0	Disable	
B: Water outlet (Pressure tank)				F: Control algorithm				
Code		Set	Reference	Code		Set	Reference	
B00	Inlet float switch available		NO	F00	Target pressure (Bar)	0.550		
B01	Inlet transmitter available	0	NO	F01	Control algorithm _A	1.000	An algorithm	
B02	Low range of water inlet---	0.000		F02	Control algorithm _B	1.000		
B03	Upper range of water inlet---	1.000		F03	Control algorithm _C	0.050		
B07	Inlet first level low pressure---	0.150		F04	Control algorithm _D	0.000		
B08	Inlet second level low pressure---	0.100		F05	Upper frequency(HZ)	50.00		
B09	Pressure for recovery (Bar)	0.200		F06	Low frequency(HZ)	25.00		
B10	Response on Inlet transmitt fault	1	alarm&stop					
Menu	Return	SET	Alarm	Data Rec	Curve Di	Sta. Com.	Service	Debug---

Part 3. Parameter code setting

Code	A:Outlet water	Set	Ref
A00	Low range of water outlet (Bar)	0.0	Default setting: 0.0
A01	Upper range of water outlet (Bar)	1.0	Default setting : 1.0
A02	Fine adjustment	1.0	Default setting: 1.0
A03	Correction (Bar)	0.0	Default setting: 1.0
A04	Decimal digits	3	Default setting: 3
A05	Faults of transmitter	1	Default setting: 1 0=alarm 1=alarm&stop
A06	Harmonics sample quantity (2-168)	2	Setting: 2, 4, 8, 16, 32, 64, 128,
A07	harmonics deadzone (16-4080=forbidden)	0	Setting range :16—4080
A08	over pressure switch available or not	0	Default setting: 0 0=NO 1=YES
A09	Response of over pressure when switch available	0	Default : 0 0=alarm 1=alarm&stop
A10	Pressure setting of over pressure	0	0=NO
A11	Response of over pressure	0	Default : 0 0=alarm 1=alarm&stop
A12	Pressure out of control setting	0	0=NO
A13	Response of out of control	0	Default : 0 0=alarm 1=alarm&stop
Code	B:Inlet water (pressure tank)	Set	Ref
B00	Inlet float switch available	0	Default: 0 0=NO 1=YES
B01	Inlet transmitter available	0	Default: 0 0=NO 1=YES
B02	Low range of water inlet transmitter (Bar)	0	Default: 0.0
B03	Upper range of water inlet transmitter (Bar)	1	Default: 1.0
B04	Fine adjustment	1	Default: 1.0
B05	Correction (Bar)	0	Default: 0.0
B06	Decimal digits	3	Default: 3
B07	Inlet first level low pressure (Bar)	15	
B08	Inlet second level low pressure (Bar)	10	
B09	Pressure for recovery (Bar)	20	
B10	Response on Inlet transmitt fault	0	Default : 0 0=alarm 1=alarm&stop
B11	Measure Harmonics sample quantity (2-168)	2	Setting: 2, 4, 8, 16, 32, 64, 128,
Code	D: Pump Group	Set	Ref
D00	Pump qty&supply mode	301	Tank type
D01	Qty of main pump	3	1,2,3,4
D02	Fixed VFD water pump YES OR NO	1	0=YES ,1=NO
D03	VFD water pump number #	1	1,2,3,4
D04	Pump alternation time	12.00	Count Down: 00:00:00
D05	1# pump able/disable	1	0=disable,1=Ready for working
D06	2# pump able/disable	1	0=disable,1=Ready for working
D07	3# pump able/disable	1	0=disable,1=Ready for working
D08	4# pump able/disable	0	0=disable,1=Ready for working
D11	able after recovery	1	0=in manula 1=auto
Code	E:VFD characteristic	Set	Ref
E00	Single or All variable speed	0	
E01	Temporary solution after VFD fault	0	Alarm & Stop
E02	Pump cut in pressure (Bar) after VFD unavailable	0.00	0.550
E03	Pump cut off pressure (Bar) after VFD	0.05	0.600

	unavailable		
Code	F:Control algorithm	Set	Ref
F00	Target pressure (Bar)	0.55	
F01	Control algorithm A	1.00	Primary algorithm
pF02	Control algorithm B	1.00	
F03	Control algorithm C	0.05	
F04	Control algorithm D	1.00	
F05	Upper frequency(HZ)	50	
F06	Low frequency(HZ)	25	
F07	Frequency at manual mode (HZ)	30	
F08	Find adjustment of analog output voltage	0.00	Default :1.0
F09	Control algorithm A	1.00	Second algorithm
F10	Control algorithm B	1.00	
F11	Control algorithm C	0.08	
F12	Control algorithm D	0.00	
F13	Difference	-0.05	0.500
Code	C:Pump Cut in , Pump Cut down	Set	Ref
G00	way of pump cut in	0	Default :0,adding fixed speed pump
G01	Delay time for pump cut in(s)	20	Default :15s
G02	pressure difference of pump cut in (Bar)	0.001	0.549
G03	frequency difference of pump cut in (HZ)	0.00	50.00
G04	After fixed speed pump adding ,Variable speed pump stop Yes or no	2	0=not stop ,1= stop
G05	Delay time for variable pump changed to be fixed speed pump (s)	5	
G06	delay time of pump cut down		
G07	pressure difference of pump cut down	0.00	
G08	frequency difference of pump cut down (HZ)	15.00	40.00
G09	The frequent extra difference of pump cut down (HZ)	5.0	
Code	H:sleeping	Set	Ref
H00	delay time of sleeping (s)	0	0=Without Sleeping
H01	Pressure difference of sleep (Bar)	- 0.001	0.549
H02	Frequency difference of sleep (HZ)	5.00	45.00
H03	Pressure difference of awaken. (Bar)	0.002	0.548
Code	I:Working period control	Set	Ref
I00	Period one,Variable speed start or end		Without Reference data ,depend on user requirement .
	Adding pump or not		
	Target pressure		
	Max frequency		
	Start time		
	Stop time		
Code	J: Factory default setting	Set	Ref
	Confirmation of factory default setting		Confirmation
Code	K: Date and time	Set	Ref
	CPU Time setting:		21:03:19:16:36:54

A :Outlet water

A00	Low range of water outlet	Default: 0.0	Max: —	Min: 0.0
	Means:	Unit:Bar	Reference: —	

★Remark: Transmitter measurement (DC4—20mA) ,the min (4mA) setting: 0.0

A01	Upper range of water outlet	Default : 1.0	Max: —	Min: —
	Means:	Unit: Bar	Reference: —	

★Remark: Transmitter measurement (DC4—20mA) ,the max (20mA) , setting:1.0

A02	Fine adjustment	Default: 1.0	Max: —	Min: —
	Means:	Unit: —	Reference: —	

★Remark:Fine adjustment of water outlet , setting: 1.0

A03	Correction	Default: 0.0	Max: ±—	Min: ±—
	Means:	Unit: Bar	Reference: —	

★Remark: Correctioin of water outlet, setting: 0.0

A04	Decimal digits	Default: 3	Max: 4	Min: 0
	Means:	Unit: —	Reference: —	

- 0 Integer only
- 1 One decimal point
- 2 Two decimal point
- 3 Three decimal point
- 4 Four decimal point

★Remark: Precision of water outlet of transmitter

A05	Faults of transmitter	Default: 1	Max: 1	Min: 0
	Means:	Unit: —	Ref: “Alarm only”、 “Alarm & Stop”	

- 0 Alarm only
- 1 Alarm &System Stop

★Remark:

1. Keeping the transmitter signal is DC4—20mA;

A06 **Measure Harmonics sample quantity** Default : 16 Max: 256 Min: 2

Means: Unit: — Reference: —

Setting: 2, 4, 8, 16, 32, 64, 128, 256

It is average number after sampling

★ Remark : The smaller the value is, the faster the reaction is, but the stability is not good .

The higher the value is, the more stable it is, but the reaction is slower.

A07 **Measure harmonics deadzone** Default: 200 Max: 4080 Min: 16

Means: Unit: — Reference: —

0 Forbidden

Range 16—4080,

★ Remark: Choose the appropriate measurement filter value according to the need.

A08 **Over pressure switch available YES or NOT** Default: 0 Max: 1 Min: 0

Means: Unit: — Reference: “Yes”、 “No”

0 NO

1 YES

★ Remark: When setting it is 1, over pressure protection activated by pressure switch

Response of over pressure

A09 when switch available Default: 0 Max: 1 Min: 0

Means: Unit: — Ref: “Alarm only”、 “Alarm & Stop”

0 Alarm only

1 Alarm and stop

★ Remark: When setting at 1 , Making alarm and pump stop .

A10 Pressure setting of over pressue Default: 0.0 Max: — Min: 0.0

Means: Unit: Bar Ref:

0.0 Without over pressure protection

★ Remark : Setting>0,Over pressure protection activated once pressure reach to this

setting

A11	Response of over pressure	Default: 0	Max: 1	Min: 0
	Means:	Unit: —	Ref: “Alarm only”、 “Alarm & Stop”	
	0 Alarm only			
	1 Alarm and stop			
	★Remark: Setting at 1, Refer to A10			

A12	Pressure out of control setting	Default: 0.0	Max: —	Min: 0.0
	Means:	Unit: Bar	Ref: —	
	0.0 This function disable			

★Remark: When the setting is bigger than 0.0, the protection activated

When the main pump is in full operation and the outlet pressure is lower than this set, and the state is still the same after a delay of 5 seconds, the pressure is considered to be out of control:

Possible reasons: the water pump is working without water, the water pump is not flowing due to mechanical failure, the motor is not rotating normally or not rotating, etc

A13	Response of out of control	Default: 0	Max: 1	Min: 0
	Means:	Unit: —	Ref: “Alarm only”、 “Alarm & Stop”	
	0 Alarm only			
	1 Alarm and stop			
	★Remark: Setting at 1, Refer to A12			

B:Inlet water

B00	Inlet float switch available	Default: 0	Max: 1	Min: 0
	Means:	Unit: —	Ref: “Yes”、 “No”	
	0 No			
	1 Yes			

★Remark: Setting at 1,dry running protection activated by this float switch

B01	Inlet transmitter available	Default: 0	Max: 1	Min: 0
	Means:	Unit: —	Ref: “Yes”、 “No”	
	0 No			
	1 Yes			

★Remark: Setting at 0,below items all are unavailable .

B02	Low range of water inlet transmitter (Mpa)				
	Default: 0.0	Max: —	Min: 0.0		
	Means:	Unit: Bar	Ref: —		
★ Remark: Transmitter measure range (DC4—20mA) (low range is 4mA), default setting is 0.0					
B03	Upper range of water inlet transmitter				
	Default:1.0	Max: —	Min: —		
	Means:	Unit: Bar	Ref: —		
★ Remark: Measure range is DC4—20mA),the upper range is 20mA					
B04	Fine adjustment		Default: 1.0	Max: —	Min: —
	Means:		Unit: —	Ref: —	
	★ Remark: The setting is : 1.0				
B05	Correction		Default: 0.0	Max: ±—	Min: ±—
	Means:		Unit: Bar	Ref: —	
	★ Remark: Setting : 0.0				
B06	Decimal digits		Default: 3	Max: 4	Min: 0
	Means:		Unit: —	Ref: —	
	0	Integer only			
	1	One decimal point			
	2	Two decimal point			
	3	Three decimal point			
	4	Four decimal point			
★ Remark: Precision of water outlet of transmitter					
B07	Inlet first level low pressure		Default: 15.0	Max: —	Min: —
	Means:		Unit: Bar	Ref: —	

★ Remark : When the inlet pressure is lower than this value, only one pump is allowed to operate with vfd without adding pump, and fixed speed pump stops running.。

B08 **Inlet second level low pressure** Default : 10.0 Max: — Min: —
Means: Unit: Bar Ref: —

★ Remark:

1. Pressure value of inlet water ,if measured pressure value <this setting ,pump stop.
2. When pressure up to B09, Pump starts again .

B09 **Pressure for recovery** Default: 20.0 Max: — Min: —
Means: Unit: Bar Ref: —

★ Remark : When inlet water pressure reach to this value ,the system starts running again

B10 **Response on transmitter fault** Default: 0 Max: 1 Min: 0
Means: Unit: — Ref: “Alarm only”、 “Alarm and Stop”
0 Alarm only
1 Alarm and Stop

★ Remark: This is available when transmitter signal DC4—20mA

B11 **Measure Harmonics sample quantity** Default: 16 Max: 256 Min: 2
Means: Unit: — Ref: —
Setting: 2, 4, 8, 16, 32, 64, 128, 256

★ Remark : The smaller the value is, the faster the reaction is, but the stability is not good .

The higher the value is, the more stable it is, but the reaction is slower.

B12 **Measure Harmonics deadzone** Default: 200 Max: 4080 Min: 16

Means: Unit: — Ref: —

0 Forbidden

Range 16—4080

★ Remark: Choose the appropriate measurement filter value according to the need.。

D Setting

D00 Pump Qty &Supply mode Default: 301 Max: 412 Min: —

Means: Unit: — Ref: —

★ Remark : When setting at 0 , it is not working ; this parameter setting after PLC disconnction; After PLC starts ,Setting is forbidden .

Team : XYZ 100/101/102/200/201/202/300/301/302/400/401/402

X: Main pump quantity

Option:1: One; 2: Two; 3: Three; 4: Four;

Y: if have auxiliary pump

Option:0: No; 1: yes;

Z: Supply Mode

0=without water tank; 1=with water tank; 2 presure tank+water tank

D01 Qty of main pump Default: 4 Max: 4 Min: —

Means: Unit: pcs Ref: —

1 One main pump ,others are backup .

2 Two main pump ,others are backup

3 Three main pump ,others are backup

4 Four main pump ,no backup

D02 Fixed VFD water pump Default: 1 Max: 1 Min: 0
YES OR NO

Means: Unit: — Ref: “Fixed pump ”、 “Pump cycle”

0 Fixed; Once starting VFD, always D03 setting pump with VFD

1 Pump cycle ; Once starting VFD ,Pump cycle .

★ Remark: setting at 0 , only works for single -variable mode 、 only fixed speed pump cut in when required ; there is no alternation function;

D03 VFD pump Nubmer Default: 0 Max: 4 Min: 1

Means: Unit: — Ref: —

—

★ Remark:

D02=0 ,setting is 1,2,3,4

D02=1,setting not required .

D04	Pump alternation time	Default: 8.0	Max: 360.0	Min: 0.0
	Means:	Unit: Hour	Ref: Runing countdown (h)	
	0.0	Closed this function		
	★ Extra funtion: Anti-rust			
	★ Remark: Only one variable speed pump running ,this function is availabe .			
D05	1# Pump able/disable	Default: 1	Max: 1	Min: 0
	Means:	Unit: —	Ref : “Standby” 、 “variable speed” 、 “fixed speed” “disable”	
	0	Disable		
	1	Able		
	★ Remark : When the pump overload or all variable speed mode when VFD failure, the system will automatically disable the pump,after maintance ,System come back working by auto or manual			
D06	2# Pump able/disable	Default: 1	Max: 1	Min: 0
	Means:	Unit: —	Ref:“Standby” 、 “variable speed” 、 “fixed speed”“disable”	
	0	Diable		
	1	Able		
	★ Remark : When the pump overload or all variable speed mode when VFD failure, the system will automatically disable the pump,after maintance ,System come back working by auto or manual			
D07	3# Pump able/disable	Default: 1	Max: 1	Min: 0
	Means:	Unit: —	Ref : “Standby” 、 “variable speed” 、 “fixed speed”“disable”	
	0	Disable		
	1	Able		
	★ Remark : When the pump overload or all variable speed mode when VFD failure, the system will automatically disable the pump,after maintance ,System come back working by auto or manual 。			
D08	4# Pump able/disable	Default: 1	Max: 1	Min: 0
	Means:	Unit: —	Ref : “Standby” 、 “variable speed” 、 “fixed speed”“disable”	
	0	Disable		

1 Able

★ Remark : When the pump overload or all variable speed mode when VFD failure, the system will automatically disable the pump,after maintance ,System come back working by auto or manual

D11 able after recovery Default: 1 Max: 1 Min: 0
Means: Unit: — Ref: “able in manual”、 “able in auto”
0 Manual
1 Auto
★Remark: For **D05—D09**

E:VFD

E00 Single or all variable speed Default: 0 Max: 1 Min: 0
Means: Unit: — Ref: “Single -frequency control ”、 “All-variable frequecny control ”
0 Single -frequency control
1 All-variable frequecny control
★Remark: setting at 1, **E01—E03 non available**

E01 Temporary soltuion afer VFD fault Default: 0 Max: 5 Min: 0
Means: Unit: — Ref: —
0 No setting ,System STOP.
1 Set 1 Pump as working pump as per setting in E02-E03
2 Set 2 Pump as working pump as per setting in E02-E03
3 Set 3 Pump as working pump as per setting in E02-E03
4 Set 4 Pump as working pump as per setting in E02-E03
5 Set Auxiliary pump as working pump as per setting in E02-E03
★Remark: Only for single -frequecny control

E02 Pump cut in pressure after VFD unavailable Default: 0.0 Max: — Min: 0.0
Means: Unit: Bar Ref: Pressue value for pump cut in

★Target pressue + this value= Pressue value of pump cut in

★Remark: this is apply for single variable speed control when VFD get fault .

E03	Pump cut off pressure after VFD unavailable	Default: 0.0	Max: —	Min: 0.0
	Means:	Unit: MPa	Ref:Pressure value for pump cut off	

★Pressue value of pump cut in + this value=Pressue value for pump cut off

★Remark: this is apply for single variable speed control when VFD get fault .

F:Control algorithm

F00	Main Target pressure	Default: 0.550	Max: —	Min: —
	Means:	Unit: Bar	Ref: —	

★Remark: The pressure of main pump working ,when working in period control ,please come to I code .

F01	Control algorithm_A	Default: 1.0	Max: —	Min: —
	Means:	Unit: —	Ref: —	

★Remark: our default setting is 1.0

F02	Control algorithm_B	Default: 1.0	Max: —	Min: 0.0
	Means:	Unit: —	Ref: —	

★Remark: our default setting is 1.0

F03	Control algorithm_C	Default: 0.05	Max: —	Min: 0.0
	Means:	Unit: —	Ref: —	

★Remark: Default setting is 0.05

F04	Control algorithm_D	Default: 0.0	Max: —	Min: 0.0
	Means:	Unit: —	Ref: —	

★Remark:

F05	Upper frequency(HZ)	Default: 50.0	Max: 50.0	Min: —
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	Means:	Unit: Hz	Ref: —	
	★Remark: Output max frequency			
F06	Low freqecny(HZ)	Default: 25.0	Max: —	Min: —
	Means:	Unit: Hz	Ref: —	
	★Remark: The low frequency			
F07	Frequency at manual	Default: —	Max: —	Min: —
	Means:	Unit: Hz	Ref: —	
	★Remark,it is Output frequency when HMI at Manual mode			
F08	Fine adjustment of analog output voltage	Default: 1.0	Max: —	Min: —
	Means:	Unit: —	Ref: —	
	★Remark:			
	1.Default setting : 1.0			
	2.Controller output voltage is DC0—10V , when output is less than 10V , this setting value can be setted bigger .			
F09	Control algorithm_A	Default : 1.0	Max: —	Min: —
	Means:	Unit: —	Ref: —	
	★Remark: Default setting 1.0			
F10	Control algorithm_B	Default: 1.0	Max: —	Min: 0.0
	Means:	Unit: —	Ref: —	
	★Remark: Default setting is 1.0			
F11	Control algorithm_C	Default: 0.08	Max: —	Min: 0.0
	Means:	Unit: —	Ref: —	
	★Remark: Default setting is 0.08 ,this value bigger a little bit , constant pressure more stable .			

F12	Control algorithm_D	Default : 0.0	Max: —	Min: 0.0
	Means:	Unit: —	Ref: —	

★Remark:

F13	Difference	Default: -0.05	Max: —	Min: 0.0
	Means:	Unit: Bar	Ref: —	

★Remark: Default setting is -0.05

G:Pump cut in ,Pump cut off

G00	Way of pump cut in	Default: 0	Max: 1	Min: 0
	Means:	Unit: —	Ref: —	
	0	Variable speed pump keep ,Fixed speed pump added ,		
	1	Variable speed pump switch to fixed speed ,next pump running come to variable speed ,		

★Remark:Default: 0

G01	Delay time for pump cut in	Default: 15	Max: —	Min: —
	Means:	Unit: s	Ref: —	

0 No pump cut in

★Remark: one conditon for adding pump

G02	Pressure difference of a pump cut in	Default: 0.0	Max: —	Min: —
	Means:	Unit: Bar	Ref: Pressure value of Pump cut in .	

★Target pressue value—this difference =Pump value of pump cut in

★Remark: One conditon of pump cut in

G03	Frequecnny difference of pump cut in	Default: 0.0	Max: —	Min: —
	Means:	Unit: Hz	Ref: Frequency of Pump cut in	

★Upper frequency -this difference =Frequency of pump cut in

★Remark: Remark: One conditon of pump cut in

After fixed speed pump

G04 adding ,Variable speed pump stop Yes or no Default: 0 Max: 1 Min: 0

Means: Unit: — Ref: “NOT Stop”、 “Stop”

0 Not Stop

1 Stop

★Remark: After fixed speed pump adding ,Variable speed stop or not ,as if not stop ,it is possible that Pipe pressure is over .

Delay time for variable pump changed to be fixed pump

G05 Default: 2.0 Max: — Min: —

Means: Unit: s Ref: —

★ Remark:one condition of pump added ,if pump group is big output power ,suggestion 2s .

It is availabel when G00=1

Delay time for pump cut down

G06 Default: 5 Max: — Min: —

Means: Unit: s Ref: —

0 Pump cut off (NO)

★Remark: One conditon of pump cut down

Pressure difference of pump cut down .

G07 Default: 0.0 Max: — Min: 0.0

Means: Unit: Bar Ref: Pressure value of pump cut down .

★Target pressure + this difference

★ Remark : One condition of pump cut down , when the measured pressure >Target pressure + this difference,pump cut down .

,

Frequecy difference of pump cut down

G08 Default: 5.0 Max: — Min: 0.0

Means: Unit: Hz Ref: Frequency of pump cut down

★Low frequency + this difference=Frequency of pump cut down

★Remark: One condition of pump cut down, applied for single variable speed control

G09 **extra frequency difference of pump cut down** Default: 3.0 Max: — Min: 0.0

Means: Unit: Hz Ref: Frequency value of pump cut down

★G08 + this difference=frequency value of pump cut down

★Remark:

- 1.Only applied for all variable speed control .
- 2.One of condition of pump cut down

H:Sleep

H00 **Delay time of sleep** Default: 5 Max: — Min: —

Means: Unit: s Ref: —

0 No sleep

★Remark: One condition of main pump sleep .

H01 **Pressure difference of sleep** Default: 0.0 Max: — Min: 0.0

Means: Unit: Bar Ref: Pressure value of sleep .

★Target pressure + this difference

★ Remark : one condition of main pump sleep , when measured pressure value >Pressure for sleep ,then pump come into sleep

H02 **Frequency difference of sleep** Default: 5.0 Max: — Min: 0.0

Means: Unit: Hz Ref: Frequency of pump sleep

★Frequency of pump cut down +this difference =Frequency of pump sleep

★Remark: One condition of pump sleep, When output frequency <Frequency of pump sleep ,pump come into sleep .

H03 **Pressure difference of pump awoken** Default : 0.0 Max: — Min: 0.0

Means: Unit: Bar Ref: Pressure value of pump awoken .

★Target pressure -this difference =Pressue of pump awaken

★Remark: After main pump come into sleep , When outlet pressure decreased to setting of pump awaken ,then pump come into awaken .

I:Period Control

Period1 -Start/End Default: 0 Max: — Min: —

Means: Unit: — Ref: “Start”、 “End”

Close Period control is closed .

Open Period control is open

★Remark: Start time and stop time must be setted in advance .

— **Period1—Pump cut in** Default: Yes Max: — Min: —

Means: Unit: — Ref:

No In this period , extra pump cannot cut in .

Yes In this period ,extra pump can cut in .

★Remark:

— **Period1 —Target pressue** Default: 0.0 Max: — Min: —

Means: Unit: Bar Ref:

★Remark:

— **Period1 — Upper frequency** Default: 50.0 Max: 50.0 Min: —

Means: Unit: Hz Ref:

★Remark: in this period—the biggest frequency

— **Period1—Start time** Default: — Max: — Min: —

Means: Unit: h: m Ref:

24 Hours

★Remark:

— **Period1—End time** Default: — Max: — Min: —

Means: Unit: h: m Ref:

24 =Hours

★Remark:

Period 2 :All of parameter please refer to Period 1

Period 3:All of parameter please refer to Period 1

Period 4:All of parameter please refer to Period 1

Remark:

1. The start and end times of the four periods do not result in repeated use,
2. Time format is 24hours;
3. When the running time is not within four periods, Pump runing as per parameter F00;
4. firstly set "L item : date time" to ensure that it is consistent with the current time

K Item:Factory restored setting

★	Restored factory setting	Default: —	Max: —	Min: —
	Means:	Unit: —	Ref: —	

1. Factory default setting are called only when the system is first used.
2. When the device is abnormal and cannot be used normally, it can be restored to the factory data.
3. After the operation of the device, the parameters can be re-set reasonably as per site request.
4. Restore factory Settings will clear all parameters of the current device operation, and restore to the factory data, these data may be abnormal data for the current device, so it needs to be operated with caution.。
5. Water supply mode: 302

L itemDate and Time

Setting Date and Time	Default: —	Max: —	Min: —
Means:	Unit: —	Ref: —	

1. This function is used to display and modify controller's built-in date and time
2. Example:21-03-18-14:45:23

Admin mangement :

User login:	Default: —	Max: —	Min: —
Means:	Unit: —	Ref: —	

-
1. User name : admin
 2. Password: admin
 3. It is modified by coming to Menu"Admin"

4, TROUBLE SHOOTING GUIDE

The system has alarm functions such as overpressure, low liquid level, frequency conversion fault, sensor disconnection fault, etc. Once a fault occurs, the system will enable the protection function, the controller stops running, Please solve the problem quickly according to the fault displayed on the controller, the fault table is as follows:

Fault Message	solution
VFD Fault	Checking VFD Manual and find solution .
Outlet transmitter fault	Input signal 4-20mA check sensor power supply and output signal match
Over pressure	Checking A10 parameter.
Inlet transmitter fault	Input signal 4-20mA check sensor power supply and output signal match
Interfere of outlet transmitter	Checking A06 parameter ,setting >32
Pressure out of control	Checking A12 parameter
Low level	Please check water source place and transmitter connection
1 pump overload 2 pump overload 3 pump overload 4 pump overload	Checking input power for each pump
CPUsystem fault	Please contact with supplier