SANTERNO
CARRARO GROUP

TG3000 4000 5000 VVVF Constant Pressure

Water Supply Controller

User Manual

Contents

1. System overview

TG3000/4000/5000 series VVVF Constant pressure water supply controller is designed for constant water supply system, It can used with various brand inverters to make water supply system. It has high control precision, stable water pressure, second fire pressure (dynamic pressure) setting, auto discharge control function in over pressure situation, parameter password lock functions.

2. Main function specification

1. Programmable 15 kind pump working modes. The controller can drive five pumps at most. (TG3000 select 1 vvvf pump and 4 commercial frequency pump)

   Note: TG4000 add 4 pumps circling mode function, TG5000 add 5 pumps circling mode function.

2. The controller has pressure measurement filter function.
3. Parameters can be protected by password.
4. The controller has intelligent control algorithm, has few parameter to set. The control precision is high. The controller has internal watchdog circuit and has digital filter and multi anti-noise method.
5. The controller can adopt passive remote pressure gauge, active voltage and current pressure sensor.
6. “0～10V” output control frequency voltage is DC 0-10V. It can

also setting to DC 0-5V.

7. The controller has pressure sensor zero and full scale compension

8. The controller has timed switching function.

9. The controller has second pressure (fire pressure) setting and controlled function.

10. The controller has auto lack water protection function and input stop protection function.

11. While the controller works in system water supplement mode, it has auto discharge control function in over pressure situation.

12 The controller has water supply affiliated small pump function. The small pump can work in vvvf mode or commercial frequency mode.

13. The controller has optional timed ON-OFF control function.

14. The controller has small pump sleeping control function.

15. The controller has handle function. It can adjust output voltage to control inverter frequency handely.

16. The controller can do high/low limit pressure control instead of Electric node pressure gauge

17. The controller has timed pressure control function. It has six time range at most.

3. Product outline, mounting dimension and wiring terminal

1. Product outline: 160mm×80mm×90mm, Panel clip mounting

2. The controller size 151mm×75mm,

3. Usage Environment: free from dust, corrosive gas and direct sunlight

4. Usage Environment temperature :-20℃～50℃

5. Relative Humidity:<95%;

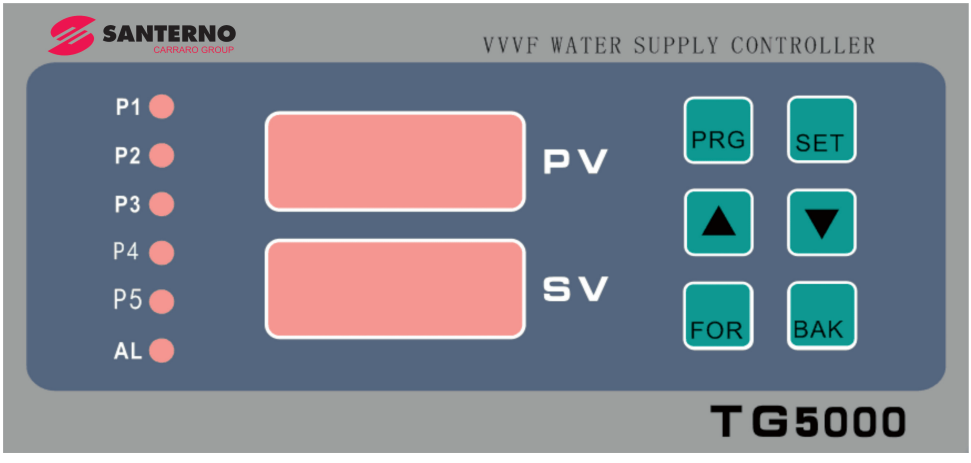
6. Rating working voltage: AC220V±10%;

7. Controller rating power waste:<=AC 5W;

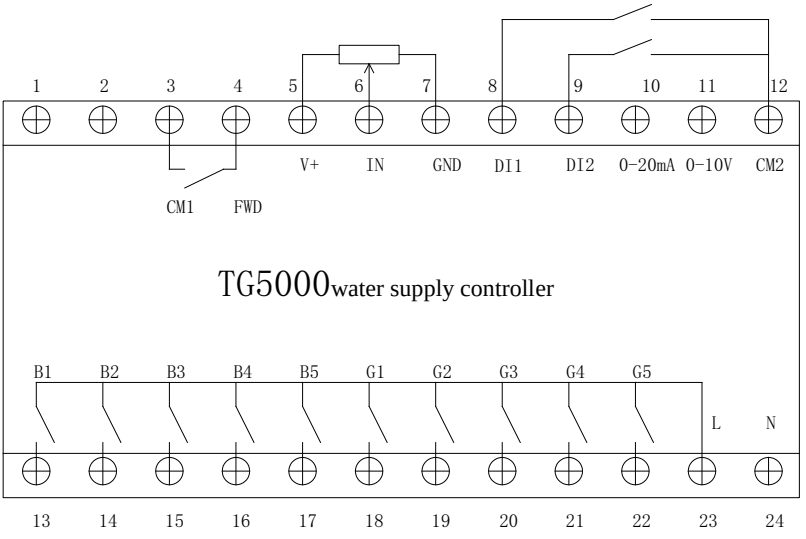
8. Controller wiring terminal capacity : 3A/ AC220V

9. Keypad and wiring terminal description

TG3000/4000/5000 Series controller keypad figure



TG5000 Series controller wiring terminal figure



TG5000 series controller wiring terminal description:

N---AC 220V zero line

L --- AC 220V fire line

B1---1# pump vvvf contact

B2---2# pump vvvf contact

B3---3# pump vvvf contact

B4---4# pump vvvf contact

B5--5# pump vvvf contact

G1---1# pump commercial frequency contact

G2---2# pump commercial frequency contact

G3---3# pump commercial frequency contact

G4---4# pump commercial frequency contact

G5---5# pump commercial frequency contact

GND—signal ground

CM1---signal common point 1

FWD---forward run

V+ ----Pressure gauge + terminal

IN--- Pressure signal input

GND--- Pressure signal common point

DI2---stop signal input

DI1---second pressure setting terminal

0~10V ---DC 0-10V output

0-20mA ---0（4）-20mA input

CM2---signal common point 2

4. Parameter list and default value

1. Display pad and key

PV window displays the measured pressure. SV window display the setting pressure. "Program" key is the parameter setting key. "▲" and "▼" is "+" and "-" key. In parameter setting status, "Forward" and "Back" keys are the page roll keys. In working status "Back" key is the switch key and can switch the pressure and output frequency display.

2. Working status indicator

There are five pump working status indicators: P1, P2, P3, P4, P5. When the indicator led is green, it indicate that the pump is working in vvvf mode. When the indicator led is green, it indicate that the pump is working in commercial frequency mode. If the controller is working in second pressure mode (fire pressure), **AL** indicator led is green. When system in lack water situation or stop terminal is on, **AL** indicator led is red. In this situation, all control output is off till the lack water condition is dispeared.

3. Parameter setting

In normal condition, Press the "Program" key for 3 seconds. When the display window display "-.-.- -.-.-", then release the "Program" key, enter parameter programming status. In this time, PV window display parameter item P00, SV window display current parameter value.

"Forward" key and "Back" key are the parameter rolling page key. User can use "Forward" key and "Back" key to display different parameter item. Press "▲" and "▼" key to modify current setting value, the changed parameter value is stored in controller automatically. After setting the parameter, press the "Program" key, the controller returns to normal work status. In this time, when **P00=18,**

press "▲" and "▼" key, the setting pressure(P01) is changed. When second pressure terminal （DI1and CM2）is closed, SV window display the second pressure setting value. Press "▲" and "▼" key, the second pressure setting value is changed. User can also setting the second pressure setting value by change parameter **P02.**

4. Setting the default value

First press the "Program" key while power the controller. When the display window display "-.-.- -.-.-" press the "Program" key for 1s, then release the "Program" key, the controller restore the default factory parameters .

5. Parameter list and default value

Item para	parameter name	value range	Default value	Parameter description
P00	password	0-100	18	If this parameter is 18, all the parameters of the controller can be modified. If this parameter is not 18, all other parameters are locked.
P01	Current setting pressure	0-2.5Mpa	0.20	First setting pressure or the low limit pressure setting value
P02	Second setting pressure	0-2.5Mpa	0.30	Second setting pressure, fire pressure or dynamic pressure setting value
P03	Pump control mode	1-13	1	1-1# pump vvvf , 2-2# pump vvvf, 3-one vvvf pump and one commercial frequency pump 4- water supplement pressure discharge 5- ON/OFF control 6-1# and 2# circulating 7-1#,2#,3# circulating 8- 1 vvvf pump and 2 commercial frequency pumps 9-1 vvvf pump and 3 commercial frequency pumps 10-fire 2 commercial frequency pumps 11-1 vvvf pump and 4 commercial frequency pumps 12-1#,2#,3#,4# circulating 13-1#,2#,3#,4#，5# circulating

P04	VVVF→ commercial frequency Time setting	0.1-5 second	0.2	Multi pumps circulating mode, the switch time of vvvf to commercial frequency
P05	Low pressure add pump time	0-250 second	20	Multi pumps working condition, the time of start up next pump when lack pressure
P06	High pressure delete pump time	0-250 second	15	Multi pumps working condition, the time of delete next pump when overpressure
P07	Output voltage mode	1-2	1	1---0-10V 2---0-5V
P08	Pressure sensor mode	1-3	1	1---0-5V 2--- 1-5V(4-20mA) 3---0-20mA
P09	Pressure sensor range	0.6, 1.0, 1.6, 2.5 MPa	1.0	0.6Mpa,1.0MPa,1.6MPa,2.5Mpa
P10	Sensor zero point adjust	0-0.1MPa	0.00	Fill the value that the PV window display when the pressure is zero.
P11	Sensor full scale adjust	0-50%	12%	Full scale compensation ratio（0-50%）
P12	Timed switch pump setting	0-1	0	0---no switching pump 1—timed switching pump(P03=1,2,6,7,12,13timed switching pump function is avalable)
P13	Timed switch pump time	1-100 hour	12	Time of timed switching pump
P14	Pump switching residue time	1-100 hour	12	Display the time before pump switching. It can not be modified
P15	Manual output frequency control	0-50Hz	0	P18=1，control the ”0～10V”output frequency manualy
P16	Gain coefficient	0-100	18	Adjust the pressure tracking speed
P17	Suppression coefficient	0-100	18	Adjust the pressure tracking stability
P18	0～10V output select	0--1	0	0---output frequency automatically 1--- output frequency automatically
P19	Pressure sensor filter value	0-20	0	Pressure sensor filter coefficient, the value big, the measured pressure stable
P20	Discharge pressure limit	0-0.5MPa	0.02	When P03=4, if measure pressure is bigger than or equal to (P01+P20) for 3 seconds, controller contact B2(P2) is closed. if measure pressure is less than (P01+P20) for 2 seconds, controller contact B2(P2) is opened.

P21	Up pressure limit setting	0-2.5Mpa	0.3	When P03=5, if measure pressure is less than P01 for 3 seconds, controller contact B1(P1) is closed. if measure pressure is bigger than P21 for 2 seconds, controller contact B1(P1) is opened. If measure pressure is bigger than or equal to (P21+P20) for 2 seconds, controller contact B2(P2) is closed. If measure pressure is less than or equal to P21, controller contact B2(P2) is opened.
P22	Small supplement pump sleeping frequency	0-50Hz	0	P22=0 no sleeping function P22>0, if the output frequency less than or equal to P22 for the time defined by P28, the ”0～10V” is setting to 0, the RUN signal is off. When the (P01-measure) >=0.05, the RUN signal is ON and the ”0～10V” is on.
P23	Auxiliary small pump control	0-2	0	**P23=0** ,no auxiliary small pump control **P23=1 and P03=1,2,3,6,7,8,9,12**; the auxiliary small pump control works in vvvf mode. If the water system has one only main pump, the running frequency of main pump is less than P24 for the time that defined by P29, the controller close the main pump and open the auxiliary small pump(B5 relay). When the small pump is running, if the frequency of the small pump is 50Hz for the time defined by P05, if the measure pressure is less than the setting value, then the controller close the small pump. **P23=2 and P03=1,2,3,6,7,8,9,12,** he auxiliary small pump control works in commercial mode. If the water system has one only main pump, the running frequency of main pump is less than P24 for the time that defined by P29, the controller close the main pump and open the auxiliary small pump(G5 relay). When the small pump is running, if the frequency of the small pump is 50Hz for the time defined by P05, if the measure pressure is less than the setting value, then the controller

				close the small pump. If the measure pressure bigger than P21, the G5 is off, if the measure pressure less than P01, the G5 is on. If the measure pressure can not reach the setting pressure for the time defined by P05, the controller switch on the main pump and switch off the small pump.
P24	Small pump on min frequency	0-50Hz	10	If the frequency of the main pump is less than or equal to the frequency defined by P24 for the time defined by P29, the controller switch to small pump.
P25	Lack water minimum pressure	0-0.2MPa	0.05	When the water supply system is running, if the measure pressure is less than or equal to P25 for the time defined by P26, the system may be lack water or pump fault. The controller display alternately Er1 and measured pressure every 1 seconds.
P26	Lack water protection time	0-250 (X5 seconds)	0	P26=0, no lack water protection function P26>0, lack water protection function enable The 1 of parameter is five seconds.
P27	High limit protection pressure	0-2.5Mpa	1.0	When the measured pressure is over the high limit protection pressure, all the controller output s are off till the pressure is normal.
P28	Sleeping wait time	0-250 （X5 seconds）	12	When P22>0,and the output frequency is less than or equal to P22 for the time defined by P28, the pump sleeping function is activated.
P29	Small pump waiting time	0-250 （X5 seconds）	12	When P23>0, if there is only one main pump, if output frequency <=P24 for the time defined by P29, the small pump is on.
P30	Min output frequency	0-50Hz	0	Control the min frequency of the inverter
P31	“ 0 ～ 10V ” output mode	0-1	0	0—positive control 1—negtive control
P32	The pressure difference of restore sleeping	0-0.2MPa	0.02	After the sleeping, if the current pressure <(P01-P31), the main pump restarted.
P33	Timed ON/OFF Function	0-2	0	P33=1 time，timed constant pressure water supply P33=2 time，timed various pressure water

				supply
P34	First on time			Hour:minute（06 ： 00 ）
P35	Fist off time			Hour:minute（07 ： 30 ）
P36	Second on time			Hour:minute（08 ： 00 ）
P37	Second off time			Hour:minute（09 ： 00 ）
P38	Third on time			Hour:minute（10 ： 00 ）
P39	Third off time			Hour:minute（11 ： 30 ）
P40	Current clock		08：30：00	Hour：minute：second (when rolling to this page, “P40 “ do not display, it displays the current time and updates every second. Press "▲" key the hour is changed, Press "▼" key the minute is changed, the second is not changed. The changed value is stored in controller. The initial time is08：30：00
P41	Forth on time			Hour:minute（12 ： 00 ）
P42	Forth off time			Hour:minute（13 ： 30 ）
P43	Fifth on time			Hour:minute（14 ： 00 ）
P44	Fifth off time			Hour:minute（15 ： 00 ）
P45	Sixth on time			Hour:minute（16 ： 30 ）
P46	Sixth off time			Hour:minute（17 ： 30 ）
P47	First pressure	0-2.5MPa	0.2 MPa	Setting pressure value at first ON time
P48	Second pressure	0-2.5MPa	0.2 MPa	Setting pressure value at Second ON time
P49	Third pressure	0-2.5MPa	0.2 MPa	Setting pressure value at third ON time
P50	Forth pressure	0-2.5MPa	0.2 MPa	Setting pressure value at forth ON time
P51	Fifth pressure	0-2.5MPa	0.2 MPa	Setting pressure value at fifth ON time
P52	Sixth pressure	0-2.5MPa	0.2 MPa	Setting pressure value at sixth ON time

6. Detail function parameter description

P00----Password for parameter

If this parameter is 18, all the parameters of the controller can be modified. If this

parameter is not 18, all other parameters are locked and can not be modified..

P01---- First setting pressure or the low limit pressure setting value

when P03<>5, P01 is the current setting pressure, user can setting pressure by the P01 or using "▲" key and "▼" key in running status. If P03=5, the P01 is low limit pressure setting value.

P02---- Second setting pressure, fire pressure or dynamic pressure setting value

If the terminal DI1and CM2 is closed for 2 seconds, the current pressure changed to value of P02. In this time, the value can be changed by "▲" key and "▼" key, the modified value is stored into P02. When the terminal DI1and CM2 is opened, the the current pressure changed to value of P01

P03----pump control mode. For TG5000 series controller, P03 can select from 01 to 13. Wrong setting this parameter can lead to wrong relay action.

The controller can control the various pump working mode by changing the P03 parameter.

P03=1,2，one using pump, one spare pump. B1 and B2 are spared each other. When P12=1, B1and B2 alternately working according to the time defined by P13.

P03=3，one vvvf pump and one commercial frequency pump mode. B1 is vvvf pump and G2 is commercial frequency pump. When B1 pump running frequency reached 50Hz for the time defined by P05. If the measured pressure is not reach the system setting value, the G2 commercial frequency pump started. When G2 is running, the controlled stable the system pressure by controlling the frequency of B1 pump. If the system pressure is over pressure, the G2 is stopped and the controller table the system pressure by controlling the frequency of B1 pump.

P03=4，Water supplement mode for boil and heat exchanger

In this mode, B1 is the vvvf water supplement pump, B2 is the discharge solenoid valve control relay. If the measured pressure >=P01(or P02)+P20, B2 is on and control the water discharge. If the measured pressure<P01(or P02), B2 is off and the water discharge is stopped.

P03=5, ON/OFF control mode

In this working mode, B1 is the commercial frequency water supplement pump and B2 is the discharge solenoid valve control relay. In this time, SV display the high limit pressure setting value of P21. In this working mode, P01 is the low limit pressure setting value and P21 is the high limit pressure setting value of P21. When the measured pressure <=P01, delay 2 seconds, B1 is on, when the measured pressure >=P21, B1 is off. If the measured pressure >=P21+P20, B2 is on and control the water discharge. If the measured pressure<=P21, and the water discharge is stopped.

P03=6, Two pump alternately working mode.

In this mode, B1,B2 is two vvvf pump working terminal and G1、G2 is two commercial frequency working terminal. In this mode, when system is powered on, B1 is start first, then 1# vvvf pump worked. When 1# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B1 is off, G1 is On. The 1# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B2 is on, 2# pump work in vvvf mode. If the measured pressure is higher than setting pressure, if 2# vvvf pump output frequency is 0Hz, delay the time defined by P06. In this situation if the measured pressure is higher than setting pressure, G1 is off, the 1# commercial frequency pump is stopped. The controller control 2# vvvf pump to stabilize the pressure of

system.

P03=7, Three pump alternately working mode.

In this mode, B1,B2,B3 are three vvvf pump working terminals and G1,G2 ,G3 are three commercial frequency working terminals.

In this mode, when system is powered on, B1 is start first, then 1# vvvf pump worked. When 1# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B1 is off, G1 is On. The 1# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B2 is on, 2# pump work in vvvf mode.

When 2# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B2 is off, G2 is On. The 2# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B3 is on, 3# pump work in vvvf mode.

If the measured pressure is higher than setting pressure, according to the rule**" first start, first stop",** stop the commercial frequency one by one and the controller control the last vvvf pump to stabilize the pressure of system. If the measured pressure is less than setting pressure, the controller start the pump that not in work station one by one.

P03=8, one vvvf pump and two commercial frequency pumps mode

In this mode, B1 is the vvvf pump working terminals and G2 ,G3 are two commercial frequency working terminals.

If 1# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, G2 is on and the 2# commercial frequency pump started.

If 1# vvvf pump running frequency is 50Hz again, delay time

defined by P05, if the measured pressure is not reached the setting value, G3 is on and the 3# commercial frequency pump started.

The controller control the vvvf pump to stabilize the pressure of system. If the measured pressure is bigger than the setting value, first turn off 2# commercial frequency pump, then turn off 3# commercial frequency pump.

P03=9, one vvvf pump and three commercial frequency pumps mode

In this mode, B1 is the vvvf pump working terminals and G2 ,G3,G4 are three commercial frequency working terminals.

If 1# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, G2 is on and the 2# commercial frequency pump started.

If 1# vvvf pump running frequency is 50Hz again, delay time defined by P05, if the measured pressure is not reached the setting value, G3 is on and the 3# commercial frequency pump started.

If the three pumps work in full load situation and the measured pressure is not reached the setting value, G4 is on and the 4# commercial frequency pump started.

The controller control the vvvf pump to stabilize the pressure of system. If the measured pressure is bigger than the setting value, first turn off 2# commercial frequency pump, then turn off 3# commercial frequency pump, then turn off 4# commercial frequency pump.

P03=10 two commercial frequency pump, one used and one spared mode

In this mode, G1、G2 is two commercial frequency pumps. G1 is the main pump, G2 is the spared pump, B3 is the discharge solenoid valve control relay, B3 is the alarm control relay.

In normal work status, DI1 terminal is not closed, PV window

displays the P02 fire pressure. The controller control the system pressure using main pump . The P01 is the low pressure limit and the P02 is the high pressure limit. If measured pressure <=P01, G1 is on and the main pump starts. If measured pressure >=P02, G1 is off and the main pump stops. If measured pressure >=P02, B3 is on and the discharge starts. If measured pressure <=P01, B3 is off and the discharge stops.

If DI1 and CM2 are closed for 2 seconds, The fire signal is input in controller. G1 is on and discharge is disable. G3 alarm terminal is on. In this situation, the pump is not stopped even if DI1signal is not closed. In this time if measured pressure is less than or equal to P01, G2 is on, the spared pump is start. In fire working status, DI2 is not valid. If user want to stop pumps, he must shut off the power of the system.

P03=11, one vvvf pump and four commercial frequency pumps mode

In this mode, B1 is the vvvf pump working terminals and G2 ,G3,G4, G5 are four commercial frequency working terminals.

If 1# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, G2 is on and the 2# commercial frequency pump started.

If 1# vvvf pump running frequency is 50Hz again, delay time defined by P05, if the measured pressure is not reached the setting value, G3 is on and the 3# commercial frequency pump started.

If the three pumps work in full load situation and the measured pressure is not reached the setting value, G4 is on and the 4# commercial frequency pump started.

According to the rules above, all commercial frequency pump started.

The controller control the vvvf pump to stabilize the pressure of system. If the measured pressure is bigger than the setting value, first turn off 2# commercial frequency pump, then turn off 3# commercial frequency pump, then turn off 4# commercial frequency pump, then turn off 5# commercial frequency pump.

P03=12, **four pumps alternately working mode.** (**TG3000 not avaible**)

In this mode, B1,B2,B3,B4 are four vvvf pumps working terminals and G1,G2 ,G3,G4 are four commercial frequency working terminals.

In this mode, when system is powered on, B1 is start first, then 1# vvvf pump worked. When 1# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B1 is off, G1 is On. The 1# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B2 is on, 2# pump work in vvvf mode.

When 2# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B2 is off, G2 is On. The 2# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B3 is on, 3# pump work in vvvf mode.

When 3# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B3 is off, G3 is On. The 3# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B4 is on, 4# pump work in vvvf mode.

If the measured pressure is higher than setting pressure, according to the rule**" first start, first stop",** stop the commercial frequency one by one and the controller control the last vvvf pump to stabilize the pressure of system. If the measured pressure is less than setting pressure, the controller

start the pump that not in work station one by one.

P03=13，**five pumps alternately working mode.** (**TG3000 TG4000not avaible**)

In this mode, B1,B2,B3,B4,B5 are five vvvf pumps working terminals and G1,G2 ,G3,G4,G5 are five commercial frequency working terminals.

In this mode, when system is powered on, B1 is start first, then 1# vvvf pump worked. When 1# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B1 is off, G1 is On. The 1# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B2 is on, 2# pump work in vvvf mode.

When 2# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B2 is off, G2 is On. The 2# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B3 is on, 3# pump work in vvvf mode.

When 3# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B3 is off, G3 is On. The 3# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B4 is on, 4# pump work in vvvf mode.

When 4# vvvf pump running frequency is 50Hz, delay time defined by P05, if the measured pressure is not reached the setting value, B4 is off, G4 is On. The 4# pump change from vvvf mode to commercial frequency mode. Delay 3 seconds, B5 is on, 5# pump work in vvvf mode.

If the measured pressure is higher than setting pressure, according to the rule**" first start, first stop",** stop the commercial frequency one by one and the controller control the last vvvf pump to stabilize the pressure of

system. If the measured pressure is less than setting pressure, the controller start the pump that not in work station one by one.

P04---- VVVF→commercial frequencyTime setting

If the P03=6,7,12,13, the controller works in multi pump alternately working mode. In this work status, if the output frequency of vvvf pump is 50Hz and the measured pressure is less than the setting value, the vvvf pump must changed to commercial frequency pump. The switch time is defined by parameter P04. According to the power of the pump, the value is from 0.2 to 1 second.

P05---- Low pressure add pump time

If P03=3,6,7,8,9,11,12,13, this parameter is enable. This parameter defines the time interval between the add pump process.

P06---- Low pressure add pump time

If P03=3,6,7,8,9,11,12,13, this parameter is enable. This parameter defines the time interval between the delete pump process.

P07----Output voltage select

The controller output voltage select. It has 0--5V and 0--10V selection to accommodate for various inverter.

P08----Input sensor selection

The controller has three pressure sensor types.

P08=1: passive remote pressure gauge or active 0-5V output voltage pressure sensor. If user want to 0-5V output voltage pressure sensor, please informed before ordering products.

P08=2: **4-20mA current** pressure sensor. The signal is connected to the (0-20ma) terminal of controller.

P08=3: **0-20mA current** pressure sensor. The signal is connected to the (0-20ma) terminal of controller.

P09----Pressure range selection

The controller can use various range pressure sensor. This Value must be same as the connected pressure sensor. If not correct setting this parameter, the measured pressure is not same as actual pressure.

P10----sensor zero adjust

Commonly, this value is not need to adjust when the controller connects the pressure transmitter. But it maybe has some error when using remote pressure gauge. User can adjust the value to compensate the zero error.

P11----sensor full scale adjust

When the actual pressure is not same as the measured pressure, user can adjust this value to compensate the error. This parameter is the percentage of the full scale.

P12---- Timed switch pump setting.

P03=1,2,6,7,12,13timed switching pump function is avalable

P13---- Time of timed switching pump

P14---- Pump switching residue time

Display the time before pump switching. It can not be modified.

P15---- Manual output frequency control

P18=1，control the ”0～10V”output frequency manualy

P16---- Gain coefficient

The tracking speed of the controller. The value is bigger, the "0-10V" output is more quickly, but it may cause some overshoot.

P17---- Suppression coefficient

The stability adjust of the controller. The value is big, the system is more stable. If P17=0, the pressure is fluctuating.

P18----”0～10V”output controlselect

P18=0,”0～10V”is controlled automatically by controller. P18=1,”0～

10V” is controlled by parameter by P18=1,” 0～10V”

P19----Pressure sensor filter value

Pressure sensor filter coefficient, the value big, the measured pressure stable

P20---- Discharge pressure limit

When P03=4,5, if measure pressure is bigger than or equal to (P01+P20) for 3 seconds, controller contact B2(P2) is closed. if measure pressure is less than (P01+P20) for 2 seconds, controller contact B2(P2) is opened.

P21---- Up pressure limit setting

When P03=5, if measure pressure is less than P01 for 3 seconds, controller contact B1(P1) is closed. if measure pressure is bigger than P21 for 2 seconds, controller contact B1(P1) is opened. If measure pressure is bigger than or equal to (P21+P20) for 2 seconds, controller contact B2(P2) is closed. If measure pressure is less than or equal to P21, controller contact B2(P2) is opened.

P22---- Small supplement pump sleeping frequency

P22=0 no sleeping function

P22>0, if the output frequency less than or equal to P22 for the time defined by P28, the ”0～10V”is setting to 0, the RUN signal is off. When the (P01-measure) >=0.05, the RUN signal is ON and the ” 0～10V” is on.

P23---- Auxiliary small pump control

P23=0 ,no auxiliary small pump control

P23=1 and P03=1,2,3,6,7,8,9,12; the auxiliary small pump control works in vvvf mode. If the water system has one only main pump, the running frequency of main pump is less than P24 for the time that defined by P29, the controller close the main pump and open the auxiliary small pump(B5 relay). When the small pump is running, if the frequency of the small pump is 50Hz for the time defined by P05, if the measure pressure is less than the setting value, then the controller close the small pump.

P23=2 and P03=1,2,3,6,7,8,9,12, he auxiliary small pump control works in commercial mode. If the water system has one only main pump, the running frequency of main pump is less than P24 for the time that defined by P29, the controller close the main pump and open the auxiliary small

pump(G5 relay). When the small pump is running, if the frequency of the small pump is 50Hz for the time defined by P05, if the measure pressure is less than the setting value, then the controller close the small pump. If the measure pressure bigger than P21, the G5 is off.

In this mode, **B5 is the vvvf small pump control terminal and G5 is the commercial frequency terminal.**

P24---- Small pump on min frequency

If the frequency of the main pump is less than or equal to the frequency defined by P24 for the time defined by P29, the controller switch to small pump.

P25---- Lack water minimum pressure

When the water supply system is running, if the measure pressure is less than or equal to P25 for the time defined by P26, the system may be lack water or pump fault. The controller display alternately Er1 and measured pressure every 1 seconds.

P26---- Lack water protection time

P26=0, no lack water protection function
P26>0, lack water protection function enable
The 1 unit of parameter is five seconds.

P27---- High limit protection pressure

When the measured pressure is over the high limit protection pressure, all the controller output s are off till the pressure is normal.

P28---- Sleeping wait time

When P22>0,and the output frequency is less than or equal to P22 for the time defined by P28, the pump sleeping function is activated. The 1 unit of parameter is five seconds.

P29---- Small pump waiting time

When P23>0, if there is only one main pump, if output frequency <=P24 for the time defined by P29, the small pump is on. The 1 unit of parameter is five seconds.

P30---- Control the min frequency of the inverter.

P31----”0～10V”output mode selection

0—positive control 1—negtive control

P32---- The pressure difference of restore sleeping

After the sleeping, if the current pressure <(P01-P31), the main pump restarted.

P33---- Timed ON/OFF Function

P33=1 时，timed constant pressure water supply

P33=2 时，timed various pressure water supply

P34----- First on time **P35-----** First off time

P36-----second on time **P37-----**second off time

P38-----third on time **P39-----** third off time

P40---- Current clock

7. Routing inspection function (This function is optional)

This function is optional and normal controller has not this function. If user want to use this function, please contact the factory.

8. Fault code description of the controller

Er0---When the controller is running, if the measure pressure is great or equal to the value of the parameter P09, the PV window displays the measure pressure and Er0 alternately is 1 second interval. It indicate that the

measure value is not correct or the sensor is broken line.

Er1--- When the controller is running, if P26>0, when the measure pressure <=P25 and the running bigger than or equal to P26, it may be lack of water or pump fault. The controller turn off all the output, the PV window display Er1 and the measured pressure alternately every 1 second. The status only canceled by power off the controller.

9. Input signal terminal of the controller

DI1 second pressure/fire signal terminal. When DI1 terminal and CM2 terminal closed for 2 s, the setting pressure changes to the second pressure setting value P02. At this time, the pressure setting value can be changed by keypad. When DI1 terminal and CM2 terminal is opened, the current pressure changed to first setting pressure value and can be changed by keypad.

DI2 stop signal(or lack water detection)

If DI2 and CM2 terminals closed for 2 seconds, all the output of the controller is shutting off including ”0～10V” output. The setting and measurement function of the controller is normal. The shutting off sequence is as following. First shut off ”0～10V” for 3 seconds, then shut off RUN (CM1, FWD) for 2 seconds, then shut off the vvvf relay,. At last shut off commercial realys(first start, first off), interval is 2 seconds.

if (P02-P01)>=0.2MPa, the controller do not stop whether the status of DI2. This function is to ensure the controller is not stopped when the fire condition.

When power up, if the DI2 is shorted, the controller shut off the all the output. If the DI2 is opened for 2 seconds, the controller works.

10. Adjust of the real time clock

Press "Program" key, when the display window displays "-.-.--.-.-", release the "Program" key, enter into parameter setting mode. Then press "Back" key, the value displayed in the window is the current time. Press "▲" key the hour is changed, Press "▼" key the minute is changed, the second is not changed. The changed value is stored in controller. Press "Program" key, exit the time setting status

Timed ON/OFF function is optional function. General products has not this function. If user want to use this function,

11. The list of controller connection with some inverters

Please setting the analog input function of inverter to :0-10V; on/off command to: terminal control ; the stop mode of inverter to :free stop.

Note:

1. The control relay of Multi pumps circling mode must be interlocked.
2. If the contact current that the controller drived

is above 60A, the controller and the contacts must have intermediate relay to avoid electromagnetic interference

3. Timed on-off function, timed pressure function and routing inspection function are optional functions of the controller. General controller don't include these functions. If custom want to use these function, must specified when ordering products.

4. Because of the upgrade and promotion of the controller, if some parameters or description differ from the manual, it is not informed. If custom has some problems, please contact the factory.