Configuration number：KC100-W1

Revision Record:

Version No	Change and Reason	Date
1.0	New fiction	2023-11-27

1 Overview

Kinco Electric (shenzhen) Ltd,which according to the special application needs of HVAC water supply industry, specially developed the "KC100-W1 HVAC water supply special inverter", this document lists in detail the newly added water supply related functional parameters, other parameters please refer to *the KC100 series high-performance precision vector inverter user manual*

2 Set function parameters

2.1 Change the function parameters in detail

Added water supply application function (F00.01=2) and special parameter group for water supply.

2.1.1 D04 group water supply status parameters

Parameter	Parameter Name	Set range [factory value]
D04.00	Set water supply pressure	Actual value
	Displays the set water pressure.	
D04.01	Feedback water supply pressure	Actual value
	Displays feedback water supply pressure.	
D04.02	Main pump condition	Actual value
	0：stopped state 1：running state 2：dormant state 3：Anti-freezing operation state 4：Water Shortage Shutdown state	
D04.03	Slave pump condition	Actual value
	Units: state from pump 1 Tens: State from pump 2 Hundreds: State from pump 3 Thousands：State from pump 4 ten thousands：State from pump 5 0：stopped state 1：running state 2：failure state	

2.1.2 F group

Parameter	Parameter Name	Set range [factory value]
F00.01	Application macro	0,2【0】
	0：Standard features 2：Water supply application macro	
F14.10	Communication master-slave control	0—1【0】
	0：Slave 1：Master	
F14.11	Master-slave running commands linkage	0—1【0】
	0：Master-slave running commands linkage 1：Master-slave running commands are not linked If the command linkage function is selected, the slave command channel F01.03 must be set to the communication setting.	
F14.12	Host send frequency instruction selection	0—2【0】
	0：Given frequency 1：Target frequency 2：Maximum frequency	

2.1.3 P00 group water supply basic parameters

Parameter	Parameter Name	Set range [factory value]
P00.00	Water supply mode selection	0—14【0】
	0：Single pump mode 10：One master and one slave 11：One master and two slaves 12：One master and three slaves 13：One master and for slaves 14：One master and five slaves In one master and multiple slaves mode, host F14.10 must be set to 1, and F14.11 and F14.12 must be set according to the linkage between commands and frequencies.10 to 14 pairs of slave machines 1 to 5, and slave addresses (F14.03) of the four slave machines (F14.10=0) must be set to 1 to 5. The baud rate and data format of the host and slave machines must be consistent.	
P00.01	Pump Cascade Mode	0—2【0】
	0：Automatic rotation control from the pump Main pump built-in automatic add and subtract pump switching logic, automatic rotation of the slave pump.In order to ensure that each pump can be rotated to avoid the long-term unavailability of the slave pump, the pump number will be automatically recorded, and the automatic rotation logic of the pump will be reduced when the pump is added first, and the pump will be reduced when the pump is added first, and the pump will be reduced later, and the slave pump will be equivalent to the power frequency pump, and the running time of each slave pump will be equally allocated. The main setting parameters: the main pump F14.10=1, F14.11=0, F14.12=2, the command channel of the slave pump is given by communication (F01.03=2), and the frequency channel is given by communication (F01.04=5). 1：Multi-pump master-slave control The pressure is insufficient, so that the slave pump is put into operation at one time. The slave running command can be set by itself or controlled by the host. The slave frequency is determined by F01.03 set by the slave and F14.12 set by the host. 2:One ready and one use When there is only one master and one slave (P00.00=10), you can select the standby mode.	

Parameter	Parameter Name	Set range [factory value]
P00.02	Standby main pump mode	0—2【0】
	0：Stop 1：Constant speed control 2：Constant voltage control When the one ready and one use mode is defined, the operating state of the main pump when the slave pump is rotated.	
P00.03	Standby master mode operating frequency	0.00—F01.11【50.00Hz】
	The operating frequency of the main pump is defined when the main pump is in the rotation process and the standby main pump mode selects constant speed control.	
P00.04	Pump switching cycle	0.00—6000.0【0.0min】
	The rotation cycle of the main pump and slave pump is defined in the one ready and one use mode.	
P00.10	Add pump pressure tolerance	0.0—50.0【10.0%】
P00.11	Add Pump detection frequency	0.00—F01.11【50.00Hz】
P00.12	Add pump detection time	0.0—6000.0【10.0s】
P00.15	Reduce pump pressure tolerance	0.0—50.0【10.0%】
P00.16	Reduce pump detection frequency	0.00—F01.11【20.00Hz】
P00.17	Reduce pump detection time	0.0—6000.0【10.0s】
P00.20	Sleep selection	0—2【2】
	0：Sleep is prohibited. 1：Constant pressure sleep. Under constant pressure control, no pump can be reduced and automatically enters sleep state 2：Designated pressure sleep When the frequency is less than the sleep frequency (P00.21), the feedback pressure is greater than the set pressure * (1+P00.22), and the continuous sleep delay time (P00.23), it enters the sleep state. When the feedback pressure is less than the set pressure * (1-p00.24), and the continuous sleep wake detection time (P00.25), it exit the sleep state.	
P00.21	Sleep frequency	0.00—F01.11【20.00Hz】
P00.22	Sleep pressure tolerance	0.0—100.0【10.0%】
P00.23	Sleep delay time	0.0—6000.0【5.0s】
P00.24	Sleep wake pressure tolerance	0.0—100.0【10.0%】
P00.25	Sleep wake detection time	0.0—6000.0【5.0s】

2.1.4 P01 group system configuration parameter

Parameter	Parameter Name	Set range [factory value]
P01.00	Pressure sensor range	0.0—50.0Bar【16.0Bar】
	The range of the pressure sensor is defined. The current set pressure and actual feedback pressure values can be viewed by D04.00 and D04.01.	

2.1.5 P02 group water supply protection parameters

Parameter	Parameter Name	Set range [factory value]
P02.00	Overpressure protection setting	0.0—100.0【90.0%】
P02.01	Overpressure protection detection time	0.0—6000.0【600.0s】
	When the feedback pressure is greater than the overpressure protection setting value of the total range (P02.00), and the continuous overpressure protection detection time (P02.01), DO terminal output 113 function: overpressure signal output.	
P02.02	Undervoltage protection setting	0.0—100.0【10.0%】

Parameter	Parameter Name	Set range [factory value]
P02.03	Undervoltage protection detection time	0.0－6000.0【600.0s】
	When the feedback pressure is less than the undervoltage protection set value of the total range (P02.02), and the continuous undervoltage protection detection time (P02.03), DO terminal output 114 function: undervoltage signal output.	
P02.05	Slave pump troubleshooting	0－2【0】
	0：Do not inquire about slave pump failures. 1：Regularly query the slave pump fault, detect the fault and delete the slave pump, and automatically add the rotating pump when the fault is recovered. 2：Regularly query the slave pump fault, detect the fault and delete the slave pump, and then add the rotating pump in the next operation.	
P02.06	Antifreeze function	0－2【0】
	0：Prohibition 1：Enable, antifreeze conditions are met, and only the main pump runs 2：Enabled, the antifreezing conditions are met, and the main pump and slave pump are linked If the equipment is not operated for a long time in cold weather and some components are damaged, the antifreeze function can be enabled. When the operation command is not given outside the main pump and the antifreeze detection period is continued (P02.09), the main pump will automatically start the inverter operation at the antifreeze operating frequency (P02.07), and the running time is the antifreeze operating time (P02.08).	
P02.07	Antifreeze operating frequency	0.00－F01.11【10.00Hz】
P02.08	Antifreeze operation time	0.0－6000.0【120.0s】
P02.09	Antifreeze detection cycle	0.0－6000.0【30.0min】
P02.10	Water shortage detection enabled	0－2【0】
	0：Prohibition 1：Enable Enable water shortage detection function,When the running frequency exceeds the water shortage detection frequency (P02.12), the output current is less than the water shortage detection current (F02.13), the pipe network pressure is less than the water shortage detection pressure (P02.14), and the continuous water shortage detection time (P02.11), it is considered that the current pool is in a state of water shortage, and the main pump and slave pump will automatically stop. In this process, the operation command of the main pump is not revoked. When the feedback pressure exceeds the automatic restart pressure of water shortage (P02.16) and the automatic restart time of continuous water shortage (P02.15), it is considered that the current pool is not short of water, the main pump and slave pump will be automatically started.	
P02.11	Water shortage detection time	0.0－6000.0【120.0s】
P02.12	Water shortage detection frequency	0.00－F01.11【45.00Hz】
P02.13	Water shortage detection current	0.0－100.0【40.0%】
P02.14	Water shortage detection pressure	0.0－100.0【20.0%】
P02.15	Water shortage automatic restart time	0.0－6000.0【30.0min】
P02.16	Water shortage automatically restart pressure	0.0－100.0【50.0%】

Communication protocol

The added function parameter group number is mapped to the height byte of the MODBUS read/write register address, and the corresponding relationship is shown in the following table. For other details, see "MODBUS Communication Protocol" in Appendix I of *the KC100 series high-performance precision vector inverter user manual*

Register address high byte	Group number	Register address high byte	Group number
0x38	P00	0x39	P01
0x3a	P02		

The indexes in the status parameter group of the frequency converter are shown in the following table. For others, see "MODBUS Communication Protocol" in Appendix I of *the KC100 series high-performance precision vector inverter user manual*

Register address	Parameter name	Register address	Parameter name
0x6400	Setting pressure	0x6401	Feedback pressure
0x6402	Main pump condition	0x6403	Slave pump status

2.2 Debugging description

2.2.1 Single pump mode

Single pump mode, no need to control the slave pump, the main pump adopts constant pressure control, can choose hibernation, overpressure, underpressure, antifreeze, water shortage detection and other functions, the main parameters are as follows:

Parameter	Parameter name	Set value (meaning)
F00.01	Application macro	2（Special function for water supply）
F01.03	Command channel selection	1（Terminal command channel）
F01.04	Frequency channel selection	7（PID given）
F01.23	Acceleration time 1	According to actual settings (it is recommended to set it slightly smaller, such as 2.0s)
F01.24	Deceleration time 1	
F08.00	DI1 terminal function Select	1（Forward command）
F16.01	Keyboard number PID given	50.0%
F16.09	Proportional gain Kp1	20.0
F16.10	Integration time Ti1	2.00s

2.2.2 One master multi-slave Mode

(Taking one master and five slaves and slave pump automatic rotation control as an example)

One master multi-slave mode, master and slave through 485 communication link, the master pump and all the 485 signals of the slave pump and connect. The address of the pump must be set from 1 in order, such as a master and a slave, then the address of the pump is set to 1, a master and two slaves, the address of the pump 1 is set to 1, the address of the pump 2 is set to 2, and so on, the default is multi-pump automatic rotation control, up to 5 slave pumps can be used in a main pump, and the baud rate and data format in the communication parameters of the main pump must be consistent. The start-stop command and running frequency of the pump are controlled by the main engine. The main parameters are set as follows:

Host setting parameters:

Parameter	Parameter name	Set value (meaning)
F00.01	Application macro	2（Special function for water supply）
F01.03	Command channel selection	1（Terminal command channel）
F01.04	Frequency channel selection	7（PID given）
F01.23	Acceleration time 1	According to actual settings (it is recommended to set it slightly smaller, such as 2.0s)
F01.24	Deceleration time 1	
F08.00	DI1 terminal function Select	1（Forward command）
F14.10	Communication master-slave control	1（Host）
F14.11	Master-slave command linkage	0（Master-slave command linkage）
F14.12	Host send frequency instruction selection	2（ Maximum frequency）
F16.01	Keyboard number PID given	50.0%
F16.09	Proportional gain Kp1	20.0
F16.10	Integration time Ti1	2.00s

Slave 1 Set parameters:

Parameter	Parameter name	Set value (meaning)
F01.03	Command channel selection	2（Communication command channel）
F01.04	Frequency channel selection	5（Communication setting）
F01.23	Acceleration time 1	According to actual settings (it is recommended to set it slightly smaller, such as 2.0s)
F01.24	Deceleration time 1	
F14.03	Local address	1
F14.10	Master-slave control	Slave

Slave 2 Set parameters:

Parameter	Parameter name	Set value (meaning)
F01.03	Command channel selection	2（Communication command channel）
F01.04	Frequency channel selection	5（Communication setting）
F01.23	Acceleration time 1	According to actual settings (it is recommended to set it slightly smaller, such as 2.0s)
F01.24	Deceleration time 1	
F14.03	Local address	2
F14.10	Master-slave control	Slave

Slave 3 Set parameters:

Parameter	Parameter name	Set value (meaning)
F01.03	Command channel selection	2（Communication command channel）
F01.04	Frequency channel selection	5（Communication setting）
F01.23	Acceleration time 1	According to actual settings (it is recommended to set it slightly smaller, such as 2.0s)
F01.24	Deceleration time 1	
F14.03	Local address	3
F14.10	Master-slave control	Slave

Slave 4 Set parameters:

Parameter	Parameter name	Set value (meaning)
F01.03	Command channel selection	2（Communication command channel）
F01.04	Frequency channel selection	5（Communication setting）
F01.23	Acceleration time 1	According to actual settings (it is recommended to set it slightly smaller, such as 2.0s)
F01.24	Deceleration time 1	
F14.03	Local address	4
F14.10	Master-slave control	Slave

Slave 5 Set parameters:

Parameter	Parameter name	Set value (meaning)
F01.03	Command channel selection	2（Communication command channel）
F01.04	Frequency channel selection	5（Communication setting）
F01.23	Acceleration time 1	According to actual settings (it is recommended to set it slightly smaller, such as 2.0s)
F01.24	Deceleration time 1	
F14.03	Local address	5
F14.10	Master-slave control	Slave