



Product Solutions Announcement

Delta Industrial Automation Global Solution Center



Product	AMD	Type	VFD-CP2000	Security Level	☒ General ☐ High ☐ Top
				No.	N/A
Issued by	GSC	Author	John Zuo	Release Date	20 th September 2012

Fixed Quantity Circulation Function in CP2000

Devices and tools:

The Circulation Testing DEMO

- VFD007CP23A. Testing firmware is V9.020 D12381.
- EMC-R6AA.



Operation Steps:

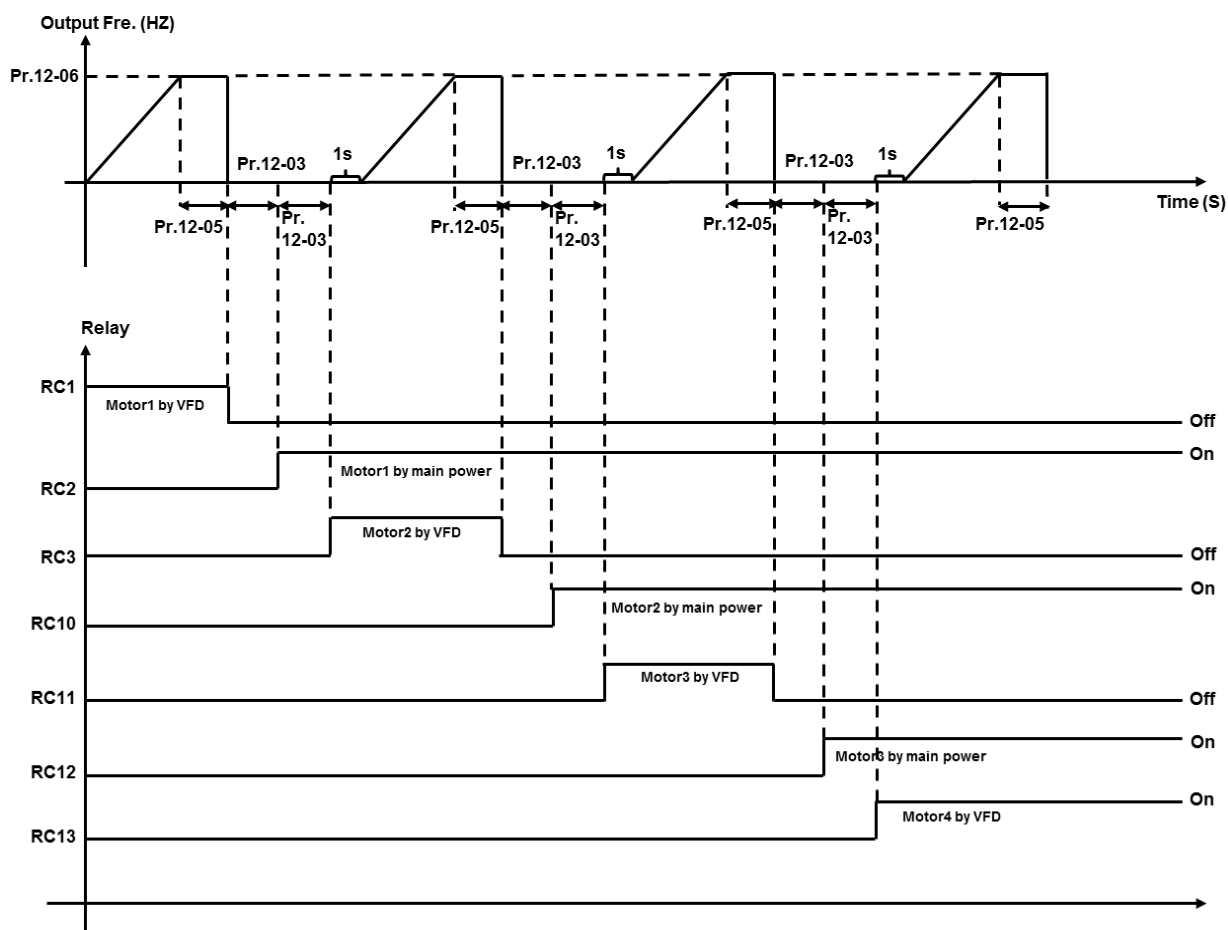
1. Setting necessary Parameters for CP2000 Fixed Quantity Circulation Control.

Pr. no	Definition	Setting value
12-00	Circulation Control Mode	2
12-01	Number of Motors to be connected	4
12-03	Delay Time due to the Acceleration at Motor Switching	6.0 s
12-04	Delay Time due to the Deceleration at Motor Switching	6.0 s

12-05	Delay Time while fixed quantity circulation at Motor Switching	1.0 s
12-06	Frequency when switching motors at fixed quantity circulation	40.00HZ
12-08	Frequency when stopping auxiliary motor	10.00HZ
08-00	Input Terminal for PID feedback	1 (for negative PID feedback)
03-00	Analogue Input 1 (AVI1)	5 (PID feedback signal)
01-12	Acceleration Time	1.00 s
01-13	Deceleration Time	1.00 s

2. Understanding the Fixed Quantity Circulation Control Process.

- When the pressure or flow is not enough, the output frequency of inverter will go up, and auxiliary motor should be added into. The process is:

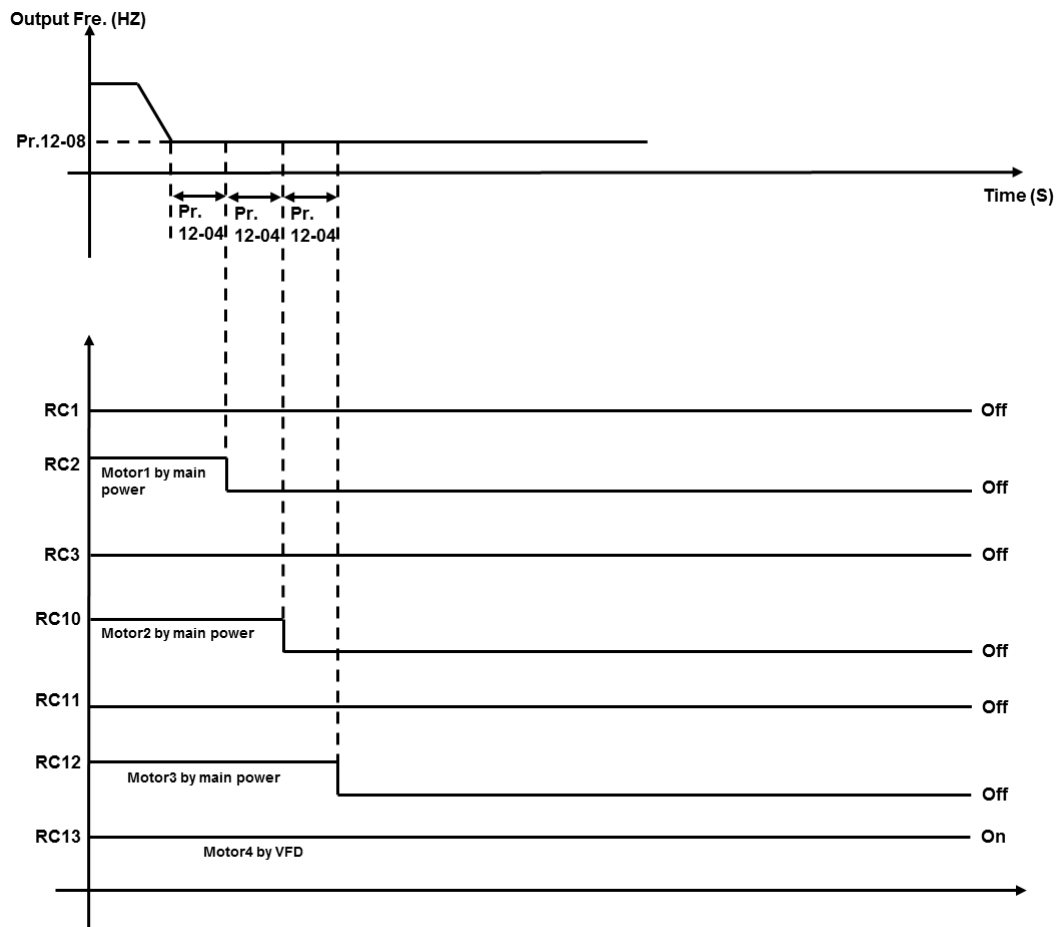


A. Only 4 motors we can control in fixed quantity circulation mode. The maximum relays CP000 can control are 8. However, in fixed quantity circulation mode, 2 relays have to match with one motor

since one relay is to connect motor with VFD, the other is to connect motor with Main Power. So only 4 motors we can control as the maximum.

B. There is at least one motor and only one is controlled by VFD any time. The other motors are controlled by main power.

- When the pressure or flow is too big, the output frequency of inverter will go down, and auxiliary motor should be removed automatically. The process is:



A. The relay which VFD is connecting to motor will be always on during this process.

3. Running CP2000 and test the fixed quantity circulation control.

Attentions:

1. Do we have to operate fixed quantity circulation control in PID mode?

No, we don't have to. If you never use PID but the normal mode, it is also OK. However, sometimes PID application should be the main for fixed quantity circulation control.

2. Can we prohibit some motors run in fixed quantity circulation control?

Yes, there are 4 motors which fixed quantity circulation mode can control as the maximum. If we want to prohibit one of them, that is available. We can set 02-01~02-04 as follows:

Pr02-01~02-04	60	61	62	63	64
Motors prohibited	All	Motor 1	Motor 2	Motor 3	Motor 4

3. How can we choose the Relays relationship match with auxiliary motors?

If we set Pr12-00 to no zero, the circulation function is enabled and the relay mode parameters have been set automatically for circulation function. **For Fixed Quantity Circulation, the relay parameters can be set automatically as follows:**

P12-01	01	01	02	02	03	03	04	04	
P02-13 RC1	55	55	55	55	55	55	55	55	Motor #1 by drive
P02-14 RC2		56	56	56	56	56	56	56	Motor #1 by mains
P02-15 RC3			57	57	57	57	57	57	Motor #2 by drive
P02-36 RC10				58	58	58	58	58	Motor #2 by mains
P02-37 RC11					59	59	59	59	Motor #3 by drive
P02-38 RC12						60	60	60	Motor #3 by mains
P02-39 RC13							61	61	Motor #4 by drive
P02-40 RC14								62	Motor #4 by mains

P02-13 ~ P02-15 and P02-36 ~ P02-40 are not able to be changed if Pr12-00 is no zero namely in circulation control mode. The setting values above in the table will be stable and fixed into these parameters unless you set Pr12-00=0 for disabling circulation pump.

4. What is the default relay for connecting CP2000 to motor when we power on?

RC1 will be the default relay and it will be on when we power on the CP2000. So Motor 1 is available every power on time since RC1 is on.

5. Is there no any requirement for Pr12-06 & Pr12-08?

The Pr12-06 should be higher than Pr12-08. If we can't ensure this, the firmware will go to disorder. From the logical idea, Pr12-06 also should be higher than Pr12-08, so this is one reasonable precondition.

