Value	Function	Description
0	setting frequency	0 to maximum output frequency
1	running frequency	0 to maximum output frequency
2	output current	0 to 2 times of rated motor current
3	output voltage	0 to 1.2 times of rated AC drive voltage
4	output speed	0 to rotational speed corresponding to maximum output frequency
5	output torque	0 to 2 times of rated motor torque
6	output power	0 to 2 times of rated power
7	pulse input	0.01kHz～100.00kHz
8	AI1	0V～10V
9	AI2	0V～10V（or 0～20mA）
10	AI3	0V～10V
11	lenth	0 to maximum set length
12	count value	0 to maximum count value
13	Rs485 communication	0.0%～100.0%
14	output current 100% corresponding to 1000.0A	0.0A～1000.0A
15	output voltage 100% corresponding to 1000.0V	0.0V～1000.0V

Function Code	Parameter Name	Setting Range	Default
F06.15	AO1 offset coefficient	-100.0%～100.0%	0.0%
F06.16	AO1 gain	-10.00～+10.00	1.00
F06.17	AO1 offset coefficient	-100.0%～100.0%	0.0%
F06.18	AO1 gain	-10.00～+10.00	1.00

These parameters are used to correct the zero drift of analog output and the output amplitude deviation. They can also be used to define the desired AO curve.

If "b" represents zero offset, "k" represents gain, "Y" represents actual output, and "X" represents standard output, the actual output is: Y = kX + b.

The zero offset coefficient 100% of AO1 and AO2 corresponds to 10 V (or 20 mA). The standard output refers to the value corresponding to the analog output of 0 to 10 V (or 0 to 20 mA) with no zero offset or gain adjustment.

For example, if the analog output is used as the running frequency, and it is expected that the output is 8 V when the frequency is 0 and 3 V at the maximum frequency, the gain shall be set to -0.50, and the zero offset shall be set to 80%.

Function Code	Parameter Name	Setting Range	Default
F06.19	AO1 output filter time	0～10.00	0
F06.20	AO2 output filter time	0～10.00	0
F06.21	HDO output filter time	0～10.00	0

Function Code	Parameter Name	Setting Range	Default
F06.22	HDO output max.frequency	0.01kHz～100.00kHz	50.00kHz

This function code is used to select max.frequency of output pulse when HDO ternimal as pulse output.

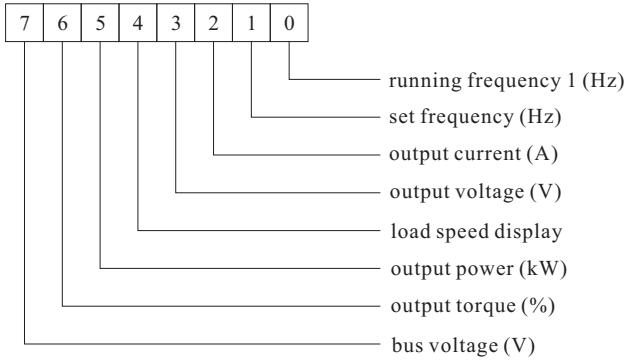
Group F07: Keypad And Display

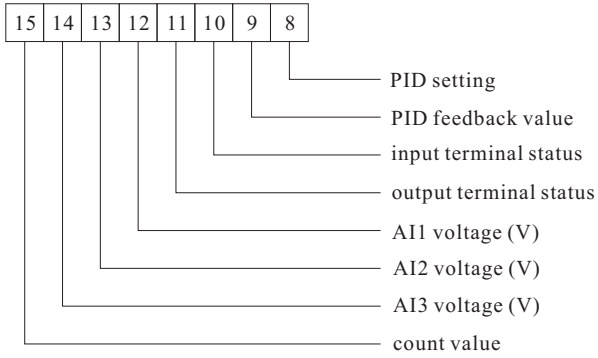
Function Code	Parameter Name	Setting Range	Default
F07.00	User password	0～65535	0

Press FUNC/DATA key to confirm password.
Don't press again within 1 minute, password will saved.

If no need password,setting to 00000.

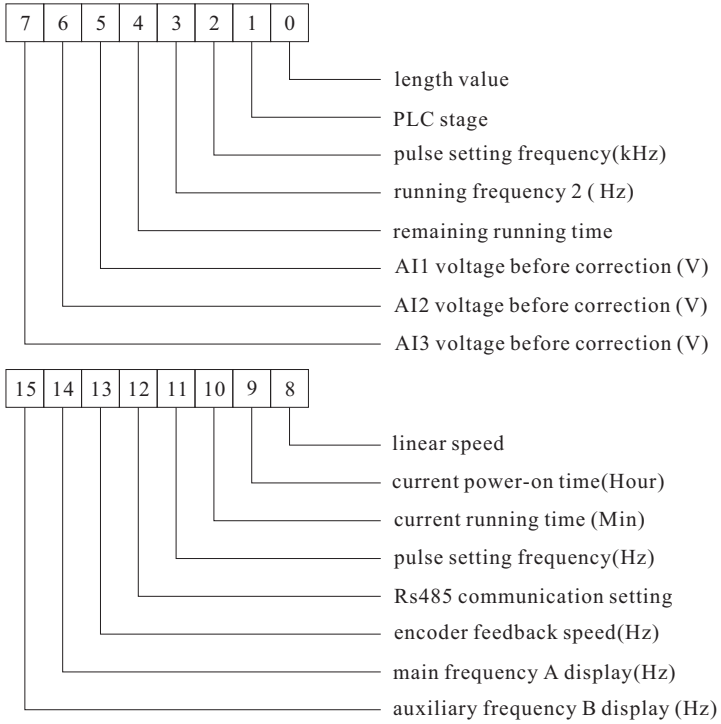
Function Code	Parameter Name	Setting Range	Default
F07.02	STOP key function selection	0: STOP/RST key enabled only in keypad control 1: STOP/RST key enabled in any operation mode	1
F07.03	LED display running parameters 1	0000～FFFF	H.008F





If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set F07.03 to the hexadecimal equivalent of this binary number.

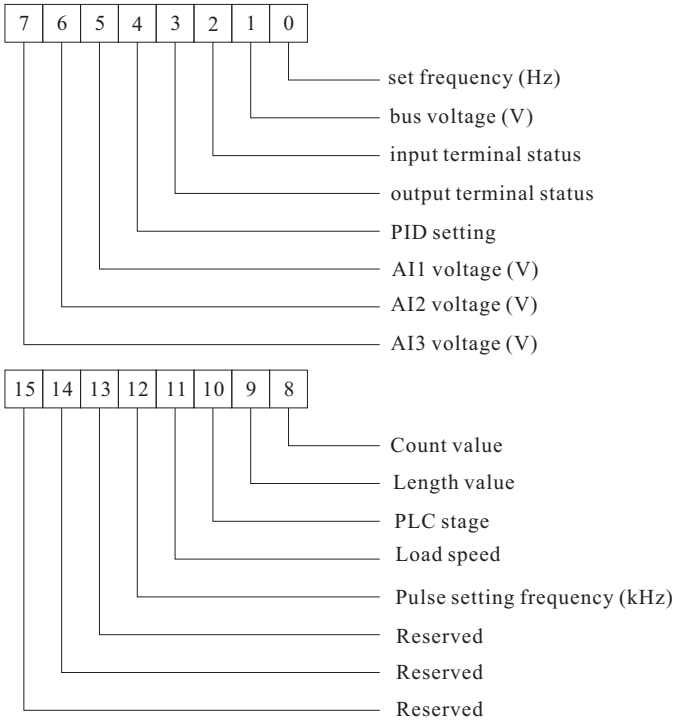
Function Code	Parameter Name	Setting Range	Default
F07.04	LED display running parameters 2	0000～FFFF	H.0000



If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set F07.04 to the hexadecimal equivalent of this binary number.

These two parameters are used to set the parameters that can be viewed when the AC drive is in the running state. You can view a maximum of 32 running state parameters that are displayed from the lowest bit of F07.03.

Function Code	Parameter Name	Setting Range	Default
F07.05	LED display stop parameters	0000～FFFF	H.0063



If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set F07.05 to the hexadecimal equivalent of this binary number.

Function Code	Parameter Name	Setting Range	Default
F07.06	Load speed display coefficient	0.0001～6.5000	1.0000

This parameter is used to adjust the relationship between the output frequency of the AC drive and the load speed. For details, see the description of F07.12.

Function Code	Parameter Name	Setting Range	Default
F07.07	Heatsink temperature of rectifier bridge	0.0℃～100.0℃	-

Function Code	Parameter Name	Setting Range	Default
F07.08	Heatsink temperature of inverter module	0.0℃～100.0℃	-
F07.09	Software version	–	-
F07.10	Accumulative running time	0h～65535h	-
F07.11	Product number	–	-

These function code can not be modify.
Heatsink temperature of inverter module is used to display the insulated gate bipolar transistor (IGBT) temperature of the inverter module, and the IGBT overheat protection value of the inverter module depends on the model.

Function Code	Parameter Name	Setting Range	Default
F07.12	Number of decimal places for load speed display	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1

F07.12 is used to set the number of decimal places for load speed display. The following gives an example to explain how to calculate the load speed:

Assume that F07.06 (Load speed display coefficient) is 2.000 and F07.12 is 2 (2 decimal places). When the running frequency of the AC drive is 40.00 Hz, the load speed is 40.00 x2.000 = 80.00 (display of 2 decimal places).

If the AC drive is in the stop state, the load speed is the speed corresponding to the set frequency, namely, "set load speed". If the set frequency is 50.00 Hz, the load speed in the stop state is 50.00 x 2.000 = 100.00 (display of 2 decimal places).

Function Code	Parameter Name	Setting Range	Default
F07.13	Accumulative power-on time	0h～65535h	-

It is used to display the accumulative power-on time of the AC drive since the delivery. If the time reaches the set power-on time (F08.16), the terminal with the digital output function 24 becomes ON.

Function Code	Parameter Name	Setting Range	Default
F07.14	Accumulative power consumption	0–65535 kWh	-

It is used to display the accumulative power consumption of the AC drive until now.

Group F08: Auxiliary Functions

Function Code	Parameter Name	Setting Range	Default
F08.00	Acceleration time 2	0.0s～6500.0s	Model dependent
F08.01	Deceleration time 2	0.0s～6500.0s	Model dependent
F08.02	Acceleration time 3	0.0s～6500.0s	Model dependent
F08.03	Deceleration time 2	0.0s～6500.0s	Model dependent
F08.04	Acceleration time 4	0.0s～6500.0s	Model dependent
F08.05	Deceleration time 2	0.0s～6500.0s	Model dependent

The drive provides a total of four groups of acceleration/deceleration time, that is, the preceding three groups and the group defined by F00.12 and F00.13. Definitions of four groups are completely the same. You can switch over between the four groups of acceleration/deceleration time through different state combinations of digital input(S) terminals. For more details, see the descriptions of F05.01 to F05.05.

Function Code	Parameter Name	Setting Range	Default
F08.06	JOG running frequency	0.00Hz～F00.03(max.frequency)	2.00Hz
F08.07	JOG acceleration time	0.0s～6500.0s	20.0s
F08.08	JOG deceleration time	0.0s～6500.0s	20.0s

These parameters are used to define the set frequency and acceleration/deceleration time of the AC drive when jogging. The startup mode is "Direct start" (F01.00 = 0) and the stop mode is "Decelerate to stop" (F01.08 = 0) during jogging.

Function Code	Parameter Name	Setting Range	Default
F08.09	Jump frequency 1	0.00Hz～F00.03(max.frequency)	0.00Hz
F08.10	Jump frequency 2	0.00Hz～F00.03(max.frequency)	0.00Hz
F08.11	Frequency jump amplitude	0.00Hz～F00.03(max.frequency)	0.00Hz

If the set frequency is within the frequency jump range, the actual running frequency is the jump frequency close to the set frequency. Setting the jump frequency helps to avoid the mechanical resonance point of the load.
The drive supports two jump frequencies. If both are set to 0, the frequency jump function is disabled. The principle of the jump frequencies and jump amplitude is shown in the following figure 6-15.

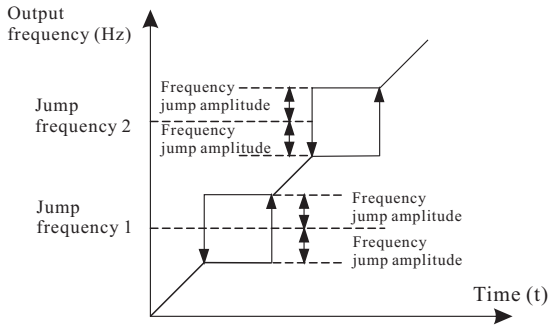


Figure 6-15 Principle of the jump frequencies and jump amplitude

Function Code	Parameter Name	Setting Range	Default
F08.12	Forward/Reverse rotation dead-zone time	0.0s～3000.0s	0.0s

It is used to set the time when the output is 0 Hz at transition of the AC drive forward rotation and reverse rotation, as shown in the following figure.

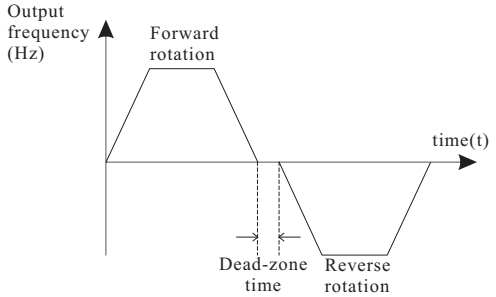


Figure 6-16 Forward/Reverse rotation dead-zone time

Function Code	Parameter Name	Setting Range	Default
F08.13	Reverse control	0: enabled 1: disabled	0

It is used to set whether the AC drive allows reverse rotation. In the applications where reverse rotation is prohibited, set this parameter to 1.

Function Code	Parameter Name	Setting Range	Default
F08.14	Running mode when set frequency lower than frequency lower limit	0:run at frequency lower limit 1: stop 2: run at zero speed	0

It is used to set the AC drive running mode when the set frequency is lower than the frequency lower limit. The AC provides three running modes to satisfy requirements of various applications.

Function Code	Parameter Name	Setting Range	Default
F08.15	Accumulative power-on time threshold	0h～65000h	0h

If the accumulative power-on time (F07.13) reaches the value set in this parameter, the corresponding DO terminal becomes ON.

Function Code	Parameter Name	Setting Range	Default
F08.16	Accumulative running time threshold	0h～65000h	0h

It is used to set the accumulative running time threshold of the AC drive. If the accumulative running time (F07.10) reaches the value set in this parameter, the corresponding DO terminal becomes ON.

Function Code	Parameter Name	Setting Range	Default
F08.17	Startup protection	0: No 1: Yes	0

This parameter is used to set whether to enable the safety protection. If it is set to 1, the AC drive does not respond to the run command valid upon AC drive power-on (for example, an input terminal is ON before power-on). The AC drive responds only after the run command is cancelled and becomes valid again.

In addition, the AC drive does not respond to the run command valid upon fault reset of the AC drive. The run protection can be disabled only after the run command is cancelled. In this way, the motor can be protected from responding to run commands upon power-on or fault reset in unexpected conditions.

Function Code	Parameter Name	Setting Range	Default
F08.18	Droop control	0.00Hz～10.00Hz	0.00Hz

This function is used for balancing the workload allocation when multiple motors are used to drive the same load. The output frequency of the AC drives decreases as the load increases. You can reduce the workload of the motor under load by decreasing the output frequency for this motor, implementing workload balancing between multiple motors.

Function Code	Parameter Name	Setting Range	Default
F08.19	Motor switch over	0:Motor 1　1:Motor 2	0

Function Code	Parameter Name	Setting Range	Default
F08.20	Frequency detection value (FDT1)	0.00Hz～F00.03(max.frequency)	50.00Hz
F08.21	Frequency detection hysteresis (FDT hysteresis 1)	0.0%～100.0%（FDT1 level）	5.0%
F08.22	Frequency detection value (FDT2)	0.00Hz～F00.03(max.frequency)	50.00Hz
F08.23	Frequency detection hysteresis (FDT hysteresis 2)	0.0%～100.0%（FDT2 level）	5.0%

If the running frequency is higher than the value of F08.20, the corresponding multi-function output terminal becomes ON. If the running frequency is lower than value of F08.20, multi-function output terminal goes OFF.

These two parameters are respectively used to set the detection value of output frequency and hysteresis value upon cancellation of the output. The value of F08.21 is a percentage of the hysteresis frequency to the frequency detection value (F08.20).

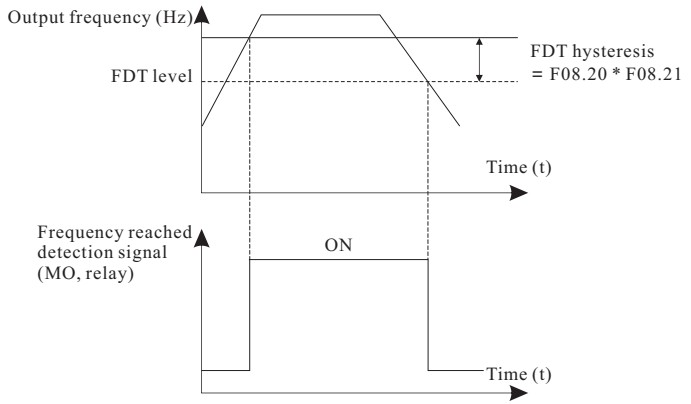


Figure 6-17　The FDT function

Function Code	Parameter Name	Setting Range	Default
F08.24	Detection range of frequency reached	0.0%～100.0%（max.frequency）	0.0%

If the AC drive running frequency is within the certain range of the set frequency, the corresponding multi-function output terminal becomes ON.

This parameter is used to set the range within which the output frequency is detected to reach the set frequency. The value of this parameter is a percentage relative to the maximum frequency. The detection range of frequency reached is shown in the following figure.

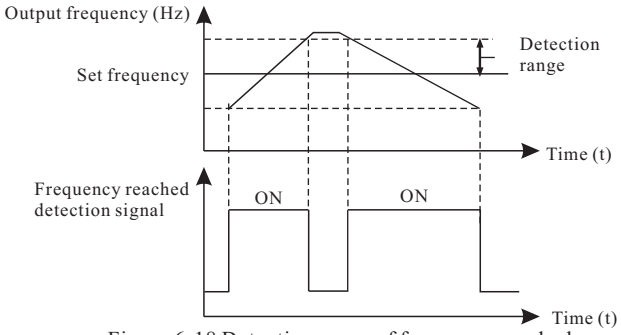


Figure 6-18 Detection range of frequency reached

Function Code	Parameter Name	Setting Range	Default
F08.25	Jump frequency during acceleration/deceleration	0: disabled 1: enabled	0

It is used to set whether the jump frequencies are valid during acceleration/deceleration.

When the jump frequencies are valid during acceleration/deceleration, and the running frequency is within the frequency jump range, the actual running frequency will jump over the set frequency jump amplitude (rise directly from the lowest jump frequency to the highest jump frequency). The following figure shows the diagram when the jump frequencies are valid during acceleration/deceleration.

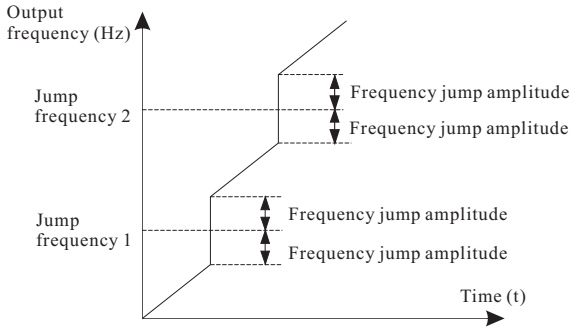


Figure 6-19 Diagram when the jump frequencies are valid during acceleration/deceleration

Function Code	Parameter Name	Setting Range	Default
F08.28	Frequency switch over point between acceleration time 1 and acceleration time 2	0.00Hz ~ F00.03(max.frequency)	0.00Hz
F08.29	Frequency switch over point between deceleration time 1 and deceleration time 2	0.00Hz ~ F00.03(max.frequency)	0.00Hz

This function is valid when motor 1 is selected and acceleration/deceleration time switch over is not performed by means of S terminal. It is used to select different groups of acceleration/deceleration time based on the running frequency range rather than S terminal during the running process of the AC drive.

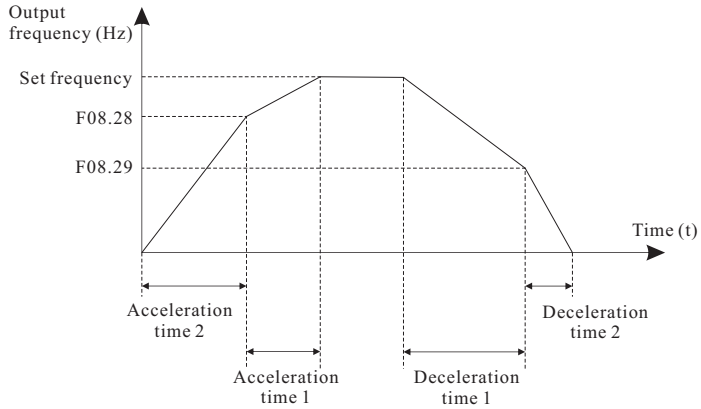


Figure 6-20 Acceleration/deceleration time switch over

During acceleration, if the running frequency is smaller than the value of F08.28, acceleration time 2 is selected. If the running frequency is larger than the value of F08.28, acceleration time 1 is selected.

During deceleration, if the running frequency is larger than the value of F08.29, deceleration time 1 is selected. If the running frequency is smaller than the value of F08.29, deceleration time 2 is selected.

Function Code	Parameter Name	Setting Range	Default
F08.30	Terminal JOG preferred	0: Disabled 1: Enabled	1

It is used to set whether terminal JOG is preferred.
If terminal JOG is preferred, the AC drive switches to terminal JOG running state when there is a terminal JOG command during the running process of the AC drive.

Function Code	Parameter Name	Setting Range	Default
F08.31	Any frequency reaching detection value 1	0.00 Hz to F00.03 (maximum frequency)	50.00Hz
F08.32	Any frequency reaching detection amplitude 1	0.0%–100.0% (maximum frequency)	0.0%
F08.33	Any frequency reaching detection value 2	0.00 Hz to F00.03 (maximum frequency)	50.00Hz
F08.34	Any frequency reaching detection amplitude 2	0.00 Hz to F00.03 (maximum frequency)	0.0%

If the output frequency of the AC drive is within the positive and negative amplitudes of the any frequency reaching detection value, the corresponding multi-function output becomes ON.The AC provides two groups of any frequency reaching detection parameters, including frequency detection value and detection amplitude, as shown in the following figure.

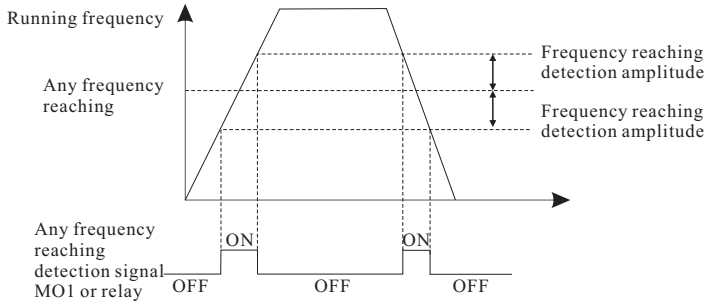


Figure 6-21 Any frequency reaching detection

Function Code	Parameter Name	Setting Range	Default
F08.35	Zero current detection level	0.0%～300.0% (rated motor current)	5.0%
F08.36	Zero current detection delay time	0.01s～600.00s	0.10s

If the output current of the AC drive is equal to or less than the zero current detection level and the duration exceeds the zero current detection delay time, the corresponding multi-function output terminal becomes ON.
The zero current detection is shown in the following figure:

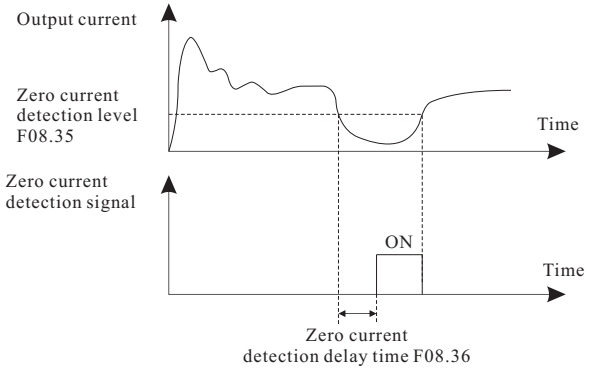


Figure 6-22 Zero current detection

Function Code	Parameter Name	Setting Range	Default
F08.37	Output overcurrent threshold	0.0% (no detection) 0.1%–300.0% (rated motor current)	200.0%
F08.38	Output overcurrent detection delay time	0.00s～600.00s	0.00s

If the output current of the AC drive is equal to or higher than the overcurrent threshold and the duration exceeds the detection delay time, the corresponding multi-function output terminal becomes ON. The output overcurrent detection function is shown in the following figure.

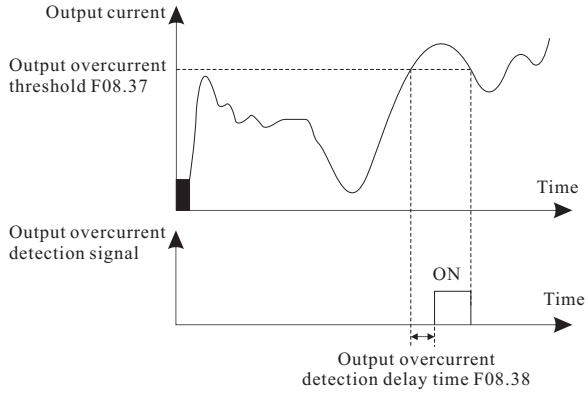


Figure 6-23 Output overcurrent detection

Function Code	Parameter Name	Setting Range	Default
F08.39	Any current reaching 1	0.0%～300.0% (rated motor current)	100.0%
F08.40	Any current reaching 1 amplitude	0.0%～300.0% (rated motor current)	0.0%
F08.41	Any current reaching 2	0.0%～300.0% (rated motor current)	100.0%
F08.42	Any current reaching 2 amplitude	0.0%～300.0% (rated motor current)	0.0%

If the output current of the AC drive is within the positive and negative amplitudes of any current reaching detection value, the corresponding multi-function output terminal becomes ON.

The drive provides two groups of any current reaching detection parameters, including current detection value and detection amplitudes, as shown in the following figure.

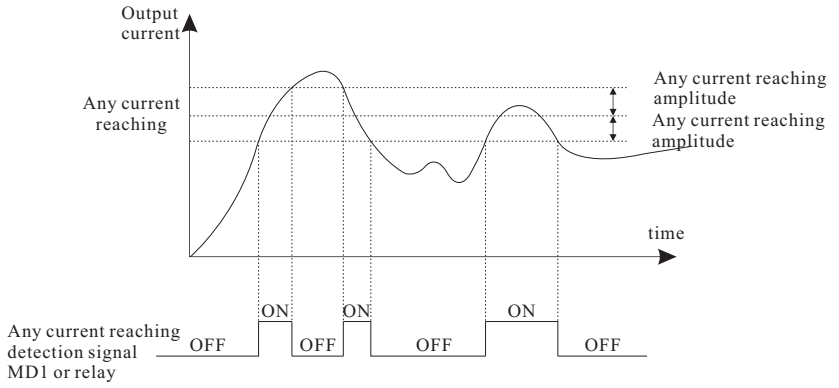


Figure 6-24 Any current reaching detection

Function Code	Parameter Name	Setting Range	Default
F08.43	Timing function	0: Disabled 1: Enabled	0
F08.44	Timing duration source	0: F08.45 1: analog AI1 2: analog AI2 3: analog AI3 (100% of analog input corresponds to the value of F8.45)	0
F08.45	Timing duration	0.0Min～6500.0Min	0.0Min

These parameters are used to implement the AC drive timing function.
If F08.43 is set to 1, the AC drive starts to time at startup. When the set timing duration is reached, the AC drive stops automatically and meanwhile the corresponding multi-function terminal output becomes ON.

The AC drive starts timing from 0 each time it starts up and the remaining timing duration. The timing duration is set in F08.44 and F08.45, in unit of minute.

Function Code	Parameter Name	Setting Range	Default
F08.46	AI1 input voltage lower limit	0.00V～F08.47	3.10V
F08.47	AI1 input voltage upper limit	F08.46～10.00V	6.80V

These two parameters are used to set the limits of the input voltage to provide protection on the AC drive. When the AI1 input is larger than the value of F08.47 or smaller than the value of F08.46, the corresponding multi-function output terminal becomes ON, indicating that AI1 input exceeds the limit.

Function Code	Parameter Name	Setting Range	Default
F08.48	Module temperature threshold	0℃～100℃	75℃

When the heatsink temperature of the AC drive reaches the value of this parameter, the corresponding multi-function output terminal becomes ON, indicating that the module temperature reaches the threshold.

Function Code	Parameter Name	Setting Range	Default
F08.49	Cooling fan control	0: Fan working during running 1: Fan working continuously	0

It is used to set the working mode of the cooling fan. If this parameter is set to 0, the fan works when the AC drive is in running state. When the AC drive stops, the cooling fan works if the heatsink temperature is higher than 40°C, and stops working if the heatsink temperature is lower than 40°C.

If this parameter is set to 1, the cooling fan keeps working after power-on.

Function Code	Parameter Name	Setting Range	Default
F08.50	Wakeup frequency	Dormant frequency (F8.52) to maximum frequency (F00.03)	0
F08.51	Wakeup delay time	0.0s～6500.0s	0.0s
F08.52	Dormant frequency	0.00 Hz to wakeup frequency (F08.50)	0.00Hz
F08.53	Dormant delay time	0.0s～6500.0s	0.0s

These parameters are used to implement the dormant and wakeup functions in the water supply application.

When the AC drive is in running state, the AC drive enters the dormant state and stops automatically after the dormant delay time (F08.53) if the set frequency is lower than or equal to the dormant frequency (F08.52).

When the AC drive is in dormant state and the current running command is effective, the AC drives starts up after the wakeup delay time (F08.51) if the set frequency is higher than or equal to the wakeup frequency (F08.50).

Generally, set the wakeup frequency equal to or higher than the dormant frequency. If the wakeup frequency and dormant frequency are set to 0, the dormant and wakeup functions are disabled.

When the dormant function is enabled, if the frequency source is PID, whether PID operation is performed in the dormant state is determined by F10-28. In this case, select PID operation enabled in the stop state (F10.28 = 1).

Function Code	Parameter Name	Setting Range	Default
F08.54	Current running time reached	0.0Min～6500.0Min	0.0Min

If the current running time reaches the value set in this parameter, the corresponding multi-function output terminal becomes ON, indicating that the current running time is reached.

Function Code	Parameter Name	Setting Range	Default
F08.55	DPWM switch over running frequency upper limit	0.00Hz～Max.frequency(F03.00)	8.00Hz

Only valid on V/F control.

Function Code	Parameter Name	Setting Range	Default
F08.56	PWM modulation system	0: asynchronous modulation 1: synchronous modulation	0

Only valid on V/F control.

Function Code	Parameter Name	Setting Range	Default
F08.57	Dead zone compensation mode selection	0: no compensation mode 1: compensation mode 1 2: compensation mode 2	1

This parameter is no need to modify normally, only if special request of output voltage wave, or motor oscillation.

High power suggest compensation modes 2.

Function Code	Parameter Name	Setting Range	Default
F08.58	Depth of PWM random	0:PWM random disabled 1～10: PWM carrier frequency random depth	0

This parameter can be used in soft motor voice and reduce electromagnetic interference.

Function Code	Parameter Name	Setting Range	Default
F08.59	Rapid current limit	0: Disabled 1: Enabled	1

This parameter can be used in overcurrent protection.
If rapid current limit long time, AC drive will overheat and cause drive damaged.

Function Code	Parameter Name	Setting Range	Default
F08.60	Current detection compensation	100～110	105

This parameter is no need to modify normally.

Function Code	Parameter Name	Setting Range	Default
F08.61	Under-voltage point	200V-1000V	Model dependent

Voltage class	Under-voltage point base value
Single phase 220V	200V
Three phase 220V	200V
Three phase 380V	350V
Three phase 480V	350V
Three phase 690V	650V
Three phase 1140V	1350V

Function Code	Parameter Name	Setting Range	Default
F08.62	SVC optimize mode selection	0 no optimize 1: optimize mode 1 2: optimize mode 2	1

Optimize mode 1: can be used in application need high torque control.
Optimize mode 2: can be used in application need high speed control.

Function Code	Parameter Name	Setting Range	Default
F08.63	Dead-zone time adjustment	100%～200%	150%

This parameter is only valid on 1140V and no need to modify normally.

Function Code	Parameter Name	Setting Range	Default
F08.64	Over-voltage point	200. 0V～2500. 0V	Model dependent

Voltage class	Under-voltage point base value
Single phase 220V	400.0V
Three phase 220V	400.0V
Three phase 380V	810.0V
Three phase 480V	890.0V
Three phase 690V	1300.0V
Three phase 1140V	2000.0V

Group F09: Fault and Protection

Function Code	Parameter Name	Setting Range	Default
F09.00	Input phase loss protection	0: disabled 1: enabled	1

It is used to determine whether to perform input phase loss or contactor energizing protection.

Drive ≥18.5kW G type drive provide the function of input phase loss protection.
Drive < 18.5kW P type drive do not provide the function of input phase loss protection no matter whether F09.00 is set to 0 or 1.

Function Code	Parameter Name	Setting Range	Default
F09.01	Output phase loss protection	0: Disabled 1: Enabled	1

It is used to determine whether to perform output phase loss protection.

Function Code	Parameter Name	Setting Range	Default
F09.02	Action selection at instantaneous power failure	0: Invalid 1: Decelerate 2: Decelerate to stop	0
F09.03	Voltage rally judging time at instantaneous power failure	0.00s～100.00s	0.50s
F09.04	Action judging voltage at instantaneous power failure	60.0%～100.0%(standard bus voltage)	80.0%

Upon instantaneous power failure or sudden voltage dip, the DC bus voltage of the AC drive reduces. This function enables the AC drive to compensate the DC bus voltage reduction with the load feedback energy by reducing the output frequency so as to keep the AC drive running continuously.

• If F09.02 = 1, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates. Once the bus voltage resumes to normal, the AC drive accelerates to the set frequency. If the bus voltage remains normal for the time exceeding the value set in F09.03, it is considered that the bus voltage resumes to normal.

• If F09.02 = 2, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates to stop.

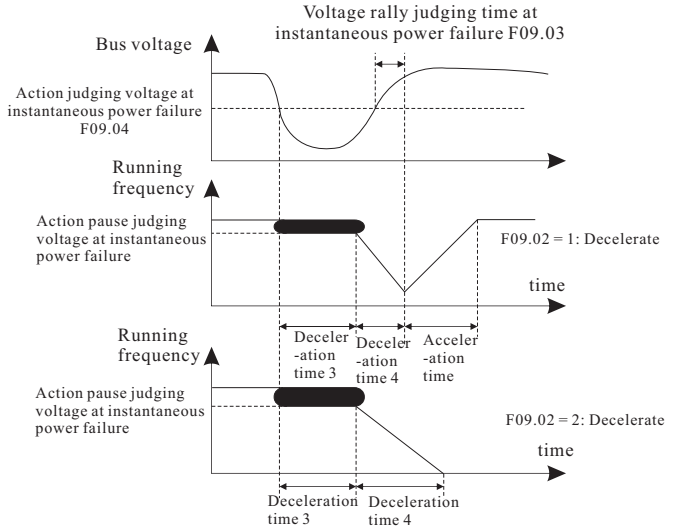


Figure 6-25 AC drive action diagram upon instantaneous power failure

Function Code	Parameter Name	Setting Range	Default
F09.05	Overvoltage stall gain	0～100	30
F09.06	Overvoltage stall protective voltage	200.0V-2000.0V	Model dependent

When the DC bus voltage exceeds the value of F09.06 (Overvoltage stall protective voltage) during deceleration of the AC drive, the AC drive stops deceleration and keeps the present running frequency. After the bus voltage declines, the AC drive continues to decelerate. F09.05 (Overvoltage stall gain) is used to adjust the overvoltage suppression capacity of the AC drive. The larger the value is, the greater the overvoltage suppression capacity will be.

In the prerequisite of no overvoltage occurrence, set F09.05 to a small value.
For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and an overvoltage fault may occur.
If the overvoltage stall gain is set to 0, the overvoltage stall function is disabled.

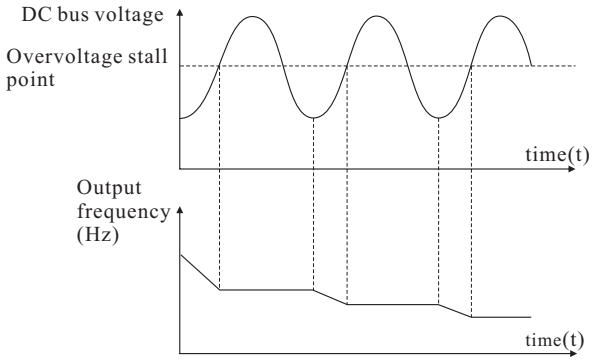


Figure 6-26 Diagram of the overvoltage stall protection function

Function Code	Parameter Name	Setting Range	Default
F09.07	Overcurrent stall gain	0～100	20
F09.08	Overcurrent stall protective current	100%～200%	150%

When the output current exceeds the overcurrent stall protective current during acceleration/deceleration of the AC drive, the AC drive stops acceleration/deceleration and keeps the present running frequency. After the output current declines, the AC drive continues toaccelerate/decelerate.

F09.07(Overcurrent stall gain) is used to adjust the overcurrent suppression capacity of the AC drive. The larger the value is, the greater the overcurrent suppression capacity will be. In the prerequisite of no overcurrent occurrence, set F09.08 to a small value.

For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and overcurrent fault may occur.

If the overcurrent stall gain is set to 0, the overcurrent stall function is disabled.

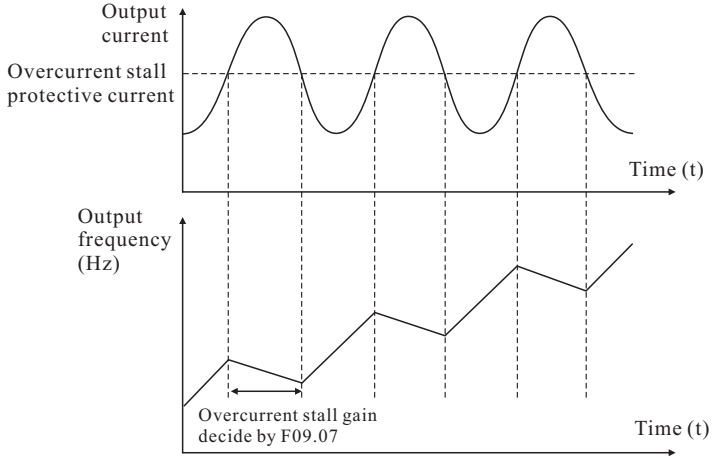


Figure 6-27 Diagram of the overcurrent stall protection function

Function Code	Parameter Name	Setting Range	Default
F09.09	Motor overload warning selection	0: disabled 1: enabled	1

F09.09=0: no motor overload protection, it will cause motor overheat and damaged, we suggest to use thermal relay.

F09.09=1: motor overload protection according to inverse time limit curve.

Function Code	Parameter Name	Setting Range	Default
F09.10	Motor overload pre-alarm warning detection levels	0.20～10.00	1.00
F09.11	Motor overload pre-alarm warning detection time	50%～100%	80%

Function Code	Parameter Name	Setting Range	Default
F09.12	Protection upon load becoming 0	0: disabled 1: enabled	0
F09.13	Detection level of load becoming 0	0.0～100.0% (rated motor current)	10.0%
F09.14	Detection time of load becoming 0	0.0～60.0s	1.0s

If protection upon load becoming 0 is enabled, when the output current of the AC drive is lower than the detection level (F09.13) and the lasting time exceeds the detection time (F09.14), the output frequency of the AC drive automatically declines to 7% of the rated frequency. During the protection, the AC drive automatically accelerates to the set frequency if the load resumes to normal.

Function Code	Parameter Name	Setting Range	Default
F09.15	Over-speed detection value	0.0%～50.0%(F00.03(max.frequency))	20.0%
F09.16	Over-speed detection time	0.0～60.0s	1.0s

This function is valid only when the AC drive runs in the sensor vector control mode. If the actual motor rotational speed detected by the AC drive exceeds the maximum frequency and the excessive value is greater than the value of F09.15 and the lasting time exceeds the value of F09.16, the AC drive reports E035 and acts according to the selected fault protection action.

Function Code	Parameter Name	Setting Range	Default
F09.17	Detection value of too large speed deviation	0.0%～50.0%(F00.03(max.frequency))	20.0%
F09.18	Detection time of too large speed deviation	0.0s～60.0s	5.0s

This function is valid only when the AC drive runs in the sensor vector control mode.

If the AC drive detects the deviation between the actual motor rotational speed detected by the AC drive and the set frequency is greater than the value of F09.17 and the lasting time exceeds the value of F09.18, the AC drive reports E034 and according to the selected fault protection action.

If F09.18 (Detection time of too large speed deviation) is 0.0s, this function is disabled.

Function Code	Parameter Name	Setting Range	Default
F09.19	Fault auto reset times	0～20	0

It is used to set the times of fault auto resets if this function is used. After the value is exceeded, the AC drive will remain in the fault state.

Function Code	Parameter Name	Setting Range	Default
F09.20	Time interval of fault auto reset	0.1s～100.0s	1.0s

It is used to set the waiting time from the alarm of the AC drive to fault auto reset.

Function Code	Parameter Name	Setting Range	Default
F09.21	Fault protection action selection 1	Unit's digit:motor overload（E007） 0:coast to stop 1:stop according to the stop mode 2:continue to run Ten's digit :power input phase loss (E012) Hundred's digit:power output phase loss (E013) Thousand's digit:external equipment fault(E00d) Ten thousand's digit:communication fault(E018)	0000
F09.22	Fault protection action selection 2	Unit's digit:encoder/PG card fault(E026) 0:coast to stop Ten's digit:EEPROM read-write fault(E021) 0:coast to stop 1:stop according to the stop mode Hundred's digit: reserved Thousand's digit: motor overheat(E036) Ten thousand's digit (Accumulative running time reached)(E020)	0000

Function Code	Parameter Name	Setting Range	Default
F09.23	Fault protection action selection 3	Unit's digit reserved Ten's digit: reserved Hundred's digit (Accumulative power-on time reached(E029) 0: coast to stop 1: stop according to the stop mode 2: continue to run Thousand's digit: off load(E030) 0: coast to stop 1: decelerate to stop 2: continue to run at 7% of rated motor frequency and resume to the set frequency if the load recovers	0000
F09.24	Fault protection action selection 4	Unit's digit :too large speed deviation（E034） 0:coast to stop 1:stop according to the stop mode 2:continue to run Ten's digit :motor over-speed（E035） Hundred's digit :initial position fault（E037）	0000

If "Coast to stop" is selected, the AC drive displays E0** and directly stops.

• If "Stop according to the stop mode" is selected, the AC drive displays A** and stops according to the stop mode. After stop, the AC drive displays E0**.

• If "Continue to run" is selected, the AC drive continues to run and displays A**. The running frequency is set in F09.26.

Function Code	Parameter Name	Setting Range	Default
F09.26	Frequency selection for continuing to run upon fault	0: Current running frequency 1: Set frequency 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency upon abnormality	0

If a fault occurs during the running of the AC drive and the handling of fault is set to "Continue to run", the AC drive displays A** and continues to run at the frequency set in F09.26.

Function Code	Parameter Name	Setting Range	Default
F09.27	Current fault type	0～32	–
F09.28	2nd fault type		–
F09.29	1st fault type		–

It is used to record the types of the most recent three faults of the AC drive. 0 indicates no fault. For possible causes and solution of each fault, refer to Chapter 8.

Function Code	Parameter Name	Setting Range	Default
F09.30	Frequency upon current fault	It displays the frequency when the latest fault occurs	–
F09.31	Output current upon current fault	It displays the current when the latest fault occurs.	–
F09.32	Bus voltage upon current fault	It displays the bus voltage when the latest fault occurs.	–
F09.33	Input terminal status upon current fault	It displays the status of all digital input terminals when the latest fault occurs. The sequence is as follows: BIT9 BIT8 BIT7 BIT6 BIT5 BIT4 BIT3 BIT2 BIT1 BIT0 HDI S9 S8 S7 S6 S5 S4 S3 S2 S1 If a input terminal is ON, the setting is 1. If the DI is OFF, the setting is 0. The value is the equivalent decimal number converted from the S status..	–
F09.34	Output terminal status upon current fault	It displays the status of all output terminals when the latest fault occurs. The sequence is as follows: BIT4 BIT3 BIT2 BIT1 BIT0 DO2 MO1 RA TA FMP If an output terminal is ON, the setting is 1. If the output terminal is OFF, the setting is 0. The value is the equivalent decimal number converted from the S statuses.	–
F09.35	AC drive status upon current fault	Reserved	–
F09.36	Power-on time status upon current fault	It displays the present power-on time when the latest fault occurs	–
F09.37	Running time status upon current fault	It displays the present running time when the latest fault occurs.	–

Function Code	Parameter Name	Setting Range	Default
F09.38	Frequency upon 2nd fault	Same as F09.30～F09.37	–
F09.39	Output current upon 2nd fault		–
F09.40	Bus voltage upon 2nd fault		–
F09.41	Input terminal status upon 2nd fault		–
F09.42	Output terminal status upon 2nd fault		–
F09.43	AC drive status upon 2nd fault		–
F09.44	Power-on time upon 2nd fault		–
F09.45	Running time upon 2nd fault		–
F09.46	Frequency upon 1st fault		–
F09.47	Output current upon 1st fault		–
F09.48	Bus voltage upon 1st fault		–
F09.49	Input terminal status upon 1st fault		–
F09.50	Output terminal status upon 1st fault		–
F09.51	AC drive status upon 1st fault		–
F09.52	Power-on time upon 1st fault		–
F09.53	Running time upon 1st fault		–

Function Code	Parameter Name	Setting Range	Default
F09.54	Short-circuit to ground upon power-on	0: Disabled 1: Enabled	1

It is used to determine whether to check the motor is short-circuited to ground at power-on of the AC drive. If this function is enabled, the AC drive's UVW will have voltage output a while after power-on.

Function Code	Parameter Name	Setting Range	Default
F09.55	Output terminal action during fault auto reset	0: Not act 1: Act	0

Set by F09.55.

Function Code	Parameter Name	Setting Range	Default
F09.56	Backup frequency upon abnormality	0.0%～ 100.0% (100.0% corresponding to maximum frequency)F00.03	100.0%

Function Code	Parameter Name	Setting Range	Default
F09.57	Type of motor temperature sensor	0: No temperature sensor 1: PT100 2: PT1000	0
F09.58	Motor overheat protection threshold	0℃～200℃	110℃
F09.59	Motor overheat warning threshold	0℃～200℃	90℃

The signal of the motor temperature sensor needs to be connected to the multi-function analog input terminal. Analog input AI3 can be used for the temperature signal input. The motor temperature sensor is connected to AI3 and ACM terminal. The AI3 terminal of the drive supports both PT100 and PT1000. Set the sensor type correctly during the use.

If the motor temperature exceeds the value set in F09.58, the AC drive reports an alarm and acts according to the selected fault protection action.

If the motor temperature exceeds the value set in F09.59, motor overheat warning becomes ON.

Function Code	Parameter Name	Setting Range	Default
F09.60	Action pause judging voltage at instantaneous power failure	F09.04～100.0%	90.0%
F09.61	Brake unit work starting voltage	650V-800V	760V

Group F10: Process Control PID Function

PID control is a general process control method. By performing proportional, integral and differential operations on the difference between the feedback signal and the target signal, it adjusts the output frequency and constitutes a feedback system to stabilize the controlled counter around the target value.

It is applied to process control such as flow control, pressure control and temperature control. The following figure shows the principle block diagram of PID control.

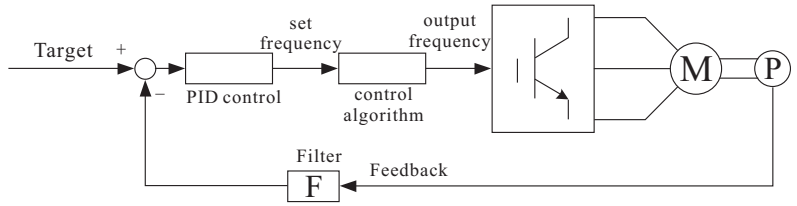


Figure 6-28 Principle block diagram of PID control

Function Code	Parameter Name	Setting Range	Default
F10.00	PID setting source	0: Keypad (F10.01) 1: Analog AI1 2: Analog AI2 3: Analog AI3 4: Pulse setting (HDI) 5: Rs485 communication setting 6: Multi-speed command	0
F10.01	PID digital setting	0.0～100.0%	50.0%

F00.06 is used to select the channel of target process PID setting. The PID setting is a relative value and ranges from 0.0% to 100.0%. The PID feedback is also a relative value. The purpose of PID control is to make the PID setting and PID feedback equal.

Function Code	Parameter Name	Setting Range	Default
F10.02	PID feedback source	0: AI1 1: AI2 2: AI3 3: AI1 – AI2 4: Pulse setting (HDI) 5: Rs485 communication setting 6: AI1 + AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0

This parameter is used to select the feedback signal channel of process PID.
The PID feedback is a relative value and ranges from 0.0% to 100.0%.

Function Code	Parameter Name	Setting Range	Default
F10.03	PID output characteristic	0：positive 1：negative	0

•0：positive
When the feedback value is smaller than the PID setting, the AC drive's output frequency rises. For example, the winding tension control requires forward PID action.
• 1：negative
When the feedback value is smaller than the PID setting, the AC drive's output frequency reduces. For example, the unwinding tension control requires reverse PID action.

Function Code	Parameter Name	Setting Range	Default
F10.04	PID setting feedback range	0～65535	1000

This parameter is a non-dimensional unit. It is used for PID setting display and PID feedback display.
Relative value 100% of PID setting feedback corresponds to the value of F10.04.

Function Code	Parameter Name	Setting Range	Default
F10.05	Proportional gain Kp1	0.0～100.0	20.0
F10.06	Integral time Ti1	0.01s～10.00s	2.00s
F10.07	Differential time Td1	0.000s～10.000s	0.000s

• F10.05 (Proportional gain Kp1)
It decides the regulating intensity of the PID regulator. The higher the Kp1 is, the larger the regulating intensity is. The value 100.0 indicates when the deviation between PID feedback and PID setting is 100.0%, the adjustment amplitude of the PID regulator on the output frequency reference is the maximum frequency.

• F10.06 (Integral time Ti1)
It decides the integral regulating intensity. The shorter the integral time is, the larger the regulating intensity is. When the deviation between PID feedback and PID setting is 100.0%, the integral regulator performs continuous adjustment for the time set in F10.06. Then the adjustment amplitude reaches the maximum frequency.

• F10.07 (Differential time Td1)
It decides the regulating intensity of the PID regulator on the deviation change. The longer the differential time is, the larger the regulating intensity is. Differential time is the time within which the feedback value change reaches 100.0%, and then the adjustment amplitude reaches the maximum frequency.

Function Code	Parameter Name	Setting Range	Default
F10.08	Cut-off frequency of PID reverse rotation	0.00～F00.03(maximum frequency)	0.00Hz

In some situations, only when the PID output frequency is a negative value (AC drive reverse rotation), PID setting and PID feedback can be equal. However, too high reverse rotation frequency is prohibited in some applications, and F10.08 is used to determine the reverse rotation frequency upper limit.

Function Code	Parameter Name	Setting Range	Default
F10.09	PID deviation limit	0.0%～100.0%	0.0%

If the deviation between PID feedback and PID setting is smaller than the value of F10.09, PID control stops. The small deviation between PID feedback and PID setting will make the output frequency stabilize, effective for some closed-loop control applications.

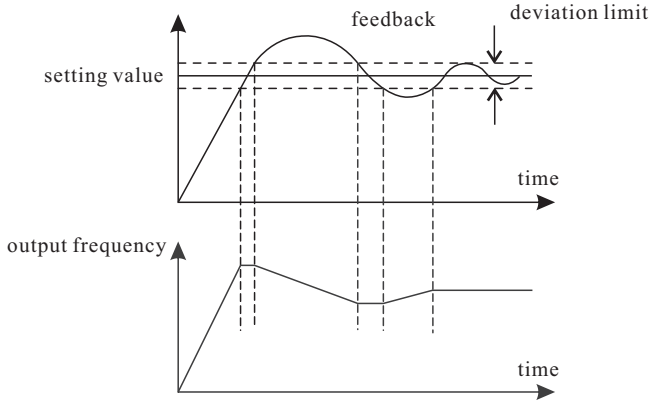


Figure 6-29 relation between deviation limit and output frequency

Function Code	Parameter Name	Setting Range	Default
F10.10	PID differential limit	0.00%～100.00%	0.10%

It is used to set the PID differential output range. In PID control, the differential operation may easily cause system oscillation. Thus, the PID differential regulation is restricted to a small range.

Function Code	Parameter Name	Setting Range	Default
F10.11	PID setting change time	0.00～650.00s	0.00s

The PID setting change time indicates the time required for PID setting changing from 0.0% to 100.0%. The PID setting changes linearly according to the change time, reducing the impact caused by sudden setting change on the system.

Function Code	Parameter Name	Setting Range	Default
F10.12	PID feedback filter time	0.00～60.00s	0.00s
F10.13	PID output filter time	0.00～60.00s	0.00s

F10.12 is used to filter the PID feedback, helping to reduce interference on the feedback but slowing the response of the process closed-loop system.
F10.13 is used to filter the PID output frequency, helping to weaken sudden change of the AC drive output frequency but slowing the response of the process closed-loop system.

Function Code	Parameter Name	Setting Range	Default
F10.15	Proportional gain Kp2	0.0～100.0	20.0
F10.16	Integral time Ti2	0.01s～10.00s	2.00s
F10.17	Differential time Td2	0.000s～10.000s	0.000s
F10.18	PID parameter switch over condition	0: No switch over 1: Switch over via input terminal 2: Automatic switch over based on deviation	0
F10.19	PID parameter switch over deviation 1	0.0%～F10.20	20.0%
F10.20	PID parameter switch over deviation 2	F10.19～100.0%	80.0%

In some applications, PID parameters switch over is required when one group of PID parameters cannot satisfy the requirement of the whole running process.

These parameters are used for switch over between two groups of PID parameters. Regulator parameters F10.15 to F10.17 are set in the same way as F10.05 to F10.07.

The switch over can be implemented either via a S terminal or automatically implemented based on the deviation.

If you select switch over via a S terminal, the multi-function terminal must be allocated with function 43 "PID parameter switch over". If the multi-function terminal is OFF, group 1 (F10.05 to F10.07) is selected. If the multi-function terminal is ON, group 2 (F10.15 to F10.17) is selected.

If you select automatic switch over, when the absolute value of the deviation between PID feedback and PID setting is smaller than the value of F10.19, group 1 is selected. When the absolute value of the deviation between PID feedback and PID setting is higher than the value of F10.20, group 2 is selected. When the deviation is between F10.19 and F10.20, the PID parameters are the linear interpolated value of the two groups of parameter values.

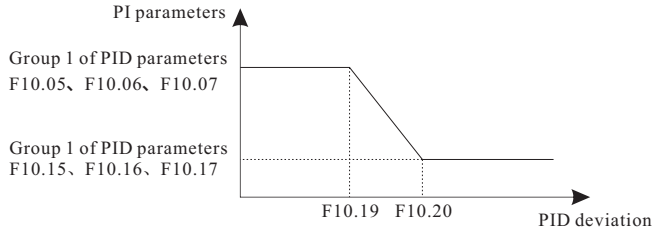


Figure 6-30 PID parameters switch over

Function Code	Parameter Name	Setting Range	Default
F10.21	PID initial value	0.0%～100.0%	0.0%
F10.22	PID initial value holding time	0.00～650.00s	0.00s

When the AC drive starts up, the PID starts closed-loop algorithm only after the PID output is fixed to the PID initial value (F10.21) and lasts the time set in F10.22.

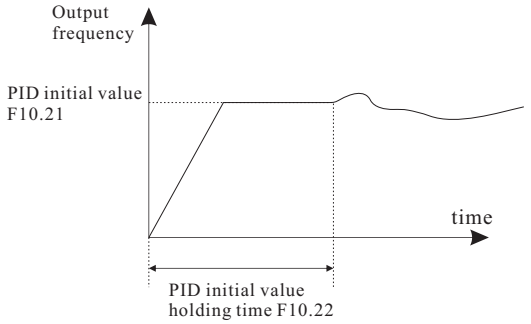


Figure 6-31 PID initial value function

Function Code	Parameter Name	Setting Range	Default
F10.23	Maximum deviation between two PID outputs in forward direction	0.00%～100.00%	1.00%
F10.24	Maximum deviation between two PID outputs in reverse direction	0.00%～100.00%	1.00%

F10.23 and F10.24 respectively correspond to the maximum absolute value of the output deviation in forward direction and in reverse direction.

Function Code	Parameter Name	Setting Range	Default
F10.25	PID integral property	Unit's digit :Integral separated 0: Invalid 1: Valid Ten's digit :Whether to stop integral operation when the output reaches the limit 0: Continue integral operation 1: Stop integral operation	00

• Integral separated
If it is set to valid, the PID integral operation stops when the multi-function digital S allocated with function 22 "PID integral pause" is ON In this case, only proportional and differential operations take effect.

If it is set to invalid, integral separated remains invalid no matter whether the S allocated with function 22 "PID integral pause" is ON or not.

• Whether to stop integral operation when the output reaches the limit.
If "Stop integral operation" is selected, the PID integral operation stops, which may help to reduce the PID overshoot.

Function Code	Parameter Name	Setting Range	Default
F10.26	Detection value of PID feedback loss	0.0%: Not judging feedback loss 0.1%–100.0%	0.0%
F10.27	Detection time of PID feedback loss	0.0s～20.0s	0.0s

These parameters are used to judge whether PID feedback is lost.

If the PID feedback is smaller than the value of F10.26 and the lasting time exceeds the value of F10.27, the AC drive reports E02E and acts according to the selected fault protection action.

Function Code	Parameter Name	Setting Range	Default
F10.28	PID operation at stop	0: No PID operation at stop 1: PID operation at stop	1

It is used to select whether to continue PID operation in the state of stop. Generally, the PID operation stops when the AC drive stops.

Group F11: Swing Frequency, Fixed Length and Count

The swing frequency function is applied to the textile and chemical fiber fields and the applications where traversing and winding functions are required.
The swing frequency function indicates that the output frequency of the AC drive swings up and down with the set frequency as the center. The trace of running frequency at the time axis is shown in the following figure.
The swing amplitude is set in F11.00 and F11.01. When F11.01 is set to 0, the swing amplitude is 0 and the swing frequency does not take effect.

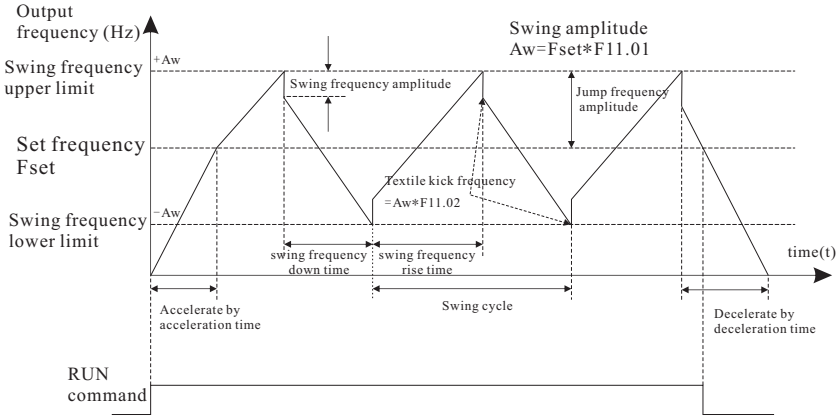


Figure 6-32 Swing frequency control

Function Code	Parameter Name	Setting Range	Default
F11.00	Swing frequency setting mode	0: Relative to the central frequency 1: Relative to the maximum frequency	0

This parameter is used to select the base value of the swing amplitude.
• 0: Relative to the central frequency (F00.09 frequency source selection)
It is variable swing amplitude system. The swing amplitude varies with the central frequency (set frequency).
• 1: Relative to the maximum frequency (F00.03 maximum output frequency)
It is fixed swing amplitude system. The swing amplitude is fixed.

Function Code	Parameter Name	Setting Range	Default
F11.01	Swing frequency amplitude	0.0%～100.0%	0.0%
F11.02	Jump frequency amplitude	0.0%～50.0%	0.0%

This parameter is used to determine the swing amplitude and jump frequency amplitude.
The swing frequency is limited by the frequency upper limit and frequency lower limit.
• If relative to the central frequency (F11.00 = 0), the actual swing amplitude AW is the calculation result of frequency source selection multiplied by F11.00.
• If relative to the maximum frequency (F11.00 = 1), the actual swing amplitude AW is the calculation result of maximum frequency multiplied by F11.00.
Jump frequency = Swing amplitude AW x FB-02 (Jump frequency amplitude).
• If relative to the central frequency (F11.00 = 0), the jump frequency is a variable value.
• If relative to the maximum frequency (F11.00 = 1), the jump frequency is a fixed value.
The swing frequency is limited by the frequency upper limit and frequency lower limit.

Function Code	Parameter Name	Setting Range	Default
F11.03	Swing frequency cycle	0.1s～3000.0s	10.0s
F11.04	Triangular wave rising time coefficient	0.1%～100.0%	50.0%

F11.03 specifies the time of a complete swing frequency cycle.
F11.04 specifies the time percentage of triangular wave rising time to F11.03 (Swing frequency cycle).
• Triangular wave rising time = F11.03 (Swing frequency cycle) x F11.04 (Triangular wave rising time coefficient, unit: s)
• Triangular wave falling time = F11.03 (Swing frequency cycle) x (1 – F11.04 Triangular wave rising time coefficient ,unit: s)

Function Code	Parameter Name	Setting Range	Default
F11.05	Set length	0m～65535m	1000m
F11.06	Actual length	0m～65535m	0m
F11.07	Number of pulses per meter	0.1～6553.5	100.0

The preceding parameters are used for fixed length control.

The length information is collected by multi-function digital input(DI) terminals. F11.06 (Actual length) is calculated by dividing the number of pulses collected by the DI terminal by F11.07 (Number of pulses each meter).

When the actual length F11.06 exceeds the set length in F11.05, the multi-function digital output terminal allocated becomes ON.

During the fixed length control, the length reset operation can be performed via the multi-function S terminal allocated with function 28. For details, see the descriptions of F05.00 to F05.09.

Allocate corresponding input terminal with function 27 (Length count input) in applications. If the pulse frequency is high, HDI must be used.

Function Code	Parameter Name	Setting Range	Default
F11.08	Set count value	1～65535	1000
F11.09	Designated count value	1～65535	1000

The count value needs to be collected by input terminal. Allocate the corresponding input terminal with function 25 (Counter input) in applications. If the pulse frequency is high, HDI must be used.

When the count value reaches the set count value (F11.08), multi-function digital output terminal allocated with function 8 (Set count value reached) becomes ON. Then the counter stops counting.

When the counting value reaches the designated counting value (F11.09), multi-function digital output terminal allocated with function 9 (Designated count value reached) becomes ON. Then the counter continues to count until the set count value is reached.

F11.09 should be equal to or smaller than F11.08.

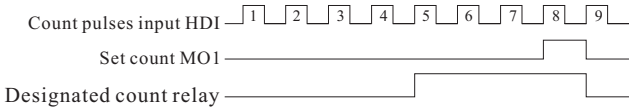


Figure 6-33 Reaching the set count value and designated count value

Group F12: Simple PLC Function And Multi-speed control

The drive multi-command has many functions. Besides multi-speed, it can be used as the setting source of the V/F separated voltage source and setting source of process PID. In addition, the multi-command is relative value.

The simple PLC function is different from the drive user programmable function. Simple PLC can only complete simple combination of multi-command, while the user programmable function is more practical.

Function Code	Parameter Name	Setting Range	Default
F12.00	Simple PLC running mode	0: Stop after the AC drive runs one cycle 1: Keep final values after the AC drive runs one cycle 2: Repeat after the AC drive runs one cycle	0

Simple PLC can be either the frequency source or V/F separated voltage source.

When simple PLC is used as the frequency source, whether parameter values of F12.02 to F12.17 are positive or negative determines the running direction. If the parameter values are negative, it indicates that the AC drive runs in reverse direction.

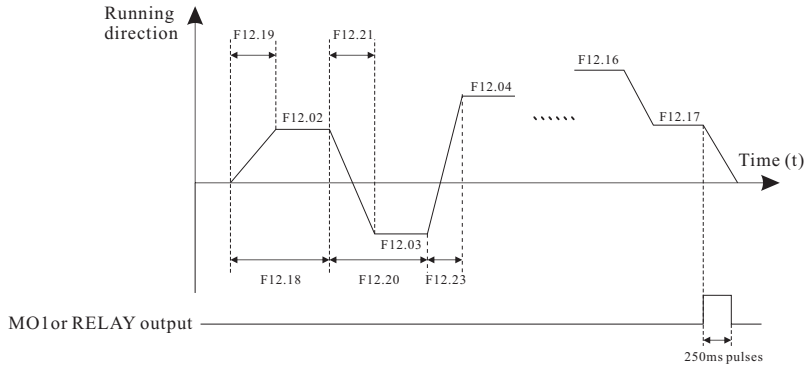


Figure 6-34 Simple PLC when used as frequency source

• 0: Stop after the AC drive runs one cycle
The AC drive stops after running one cycle, and will not start up until receiving another command.

• 1: Keep final values after the AC drive runs one cycle
The AC drive keeps the final running frequency and direction after running one cycle.

• 2: Repeat after the AC drive runs one cycle
The AC drive automatically starts another cycle after running one cycle, and will not stop until receiving the stop command.

Function Code	Parameter Name	Setting Range	Default
F12.01	Simple PLC retentive selection	Unit's digit :Retentive upon power failure 0: No 1: Yes Ten's digit :Retentive upon stop 0: No 1: Yes	00

PLC retentive upon power failure indicates that the AC drive memorizes the PLC running moment and running frequency before power failure and will continue to run from the memorized moment after it is powered on again. If the unit's digit is set to 0, the AC drive restarts the PLC process after it is powered on again.
PLC retentive upon stop indicates that the AC drive records the PLC running moment and running frequency upon stop and will continue to run from the recorded moment after it starts up again. If the ten's digit is set to 0, the AC drive restarts the PLC process after it starts up again.

Function Code	Parameter Name	Setting Range	Default
F12.02	Multi-speed 0	−100.0%～100.0%	0.0%
F12.03	Multi-speed 1	−100.0%～100.0%	0.0%
F12.04	Multi-speed 2	−100.0%～100.0%	0.0%
F12.05	Multi-speed 3	−100.0%～100.0%	0.0%
F12.06	Multi-speed 4	−100.0%～100.0%	0.0%
F12.07	Multi-speed 5	−100.0%～100.0%	0.0%
F12.08	Multi-speed 6	−100.0%～100.0%	0.0%
F12.09	Multi-speed 7	−100.0%～100.0%	0.0%
F12.10	Multi-speed 8	−100.0%～100.0%	0.0%
F12.11	Multi-speed 9	−100.0%～100.0%	0.0%
F12.12	Multi-speed 10	−100.0%～100.0%	0.0%
F12.13	Multi-speed 11	−100.0%～100.0%	0.0%
F12.14	Multi-speed 12	−100.0%～100.0%	0.0%
F12.15	Multi-speed 13	−100.0%～100.0%	0.0%
F12.16	Multi-speed 14	−100.0%～100.0%	0.0%
F12.17	Multi-speed 15	−100.0%～100.0%	0.0%

Multi-command can be the setting source of frequency, V/F separated voltage and process PID. The multi-command is relative value and ranges from -100.0% to 100.0%.

As frequency source, it is a percentage relative to the maximum frequency. As V/F separated voltage source, it is a percentage relative to the rated motor voltage. As process PID setting source, it does not require conversion.

Multi-command can be switched over based on different states of multi-function digital S terminals. For details, see the descriptions of group F05.

Function Code	Parameter Name	Setting Range	Default
F12.18	Running time of simple PLC multi-speed 0	0.0s(h)～6500.0s(h)	0.0s(h)
F12.19	Acceleration/deceleration time of simple PLC multi-speed 0	0～3	0
F12.20	Running time of simple PLC multi-speed 1	0.0s(h)～6500.0s(h)	0.0s(h)
F12.21	Acceleration/deceleration time of simple PLC multi-speed 1	0～3	0
F12.22	Running time of simple PLC multi-speed 2	0.0s(h)～6500.0s(h)	0.0s(h)
F12.23	Acceleration/deceleration time of simple PLC multi-speed 2	0～3	0
F12.24	Running time of simple PLC multi-speed 3	0.0s(h)～6500.0s(h)	0.0s(h)
F12.25	Acceleration/deceleration time of simple PLC multi-speed 3	0～3	0
F12.26	Running time of simple PLC multi-speed 4	0.0s(h)～6500.0s(h)	0.0s(h)
F12.27	Acceleration/deceleration time of simple PLC multi-speed 4	0～3	0
F12.28	Running time of simple PLC multi-speed 5	0.0s(h)～6500.0s(h)	0.0s(h)
F12.29	Acceleration/deceleration time of simple PLC multi-speed 5	0～3	0
F12.30	Running time of simple PLC multi-speed 6	0.0s(h)～6500.0s(h)	0.0s(h)
F12.31	Acceleration/deceleration time of simple PLC multi-speed 6	0～3	0
F12.32	Running time of simple PLC multi-speed 7	0.0s(h)～6500.0s(h)	0.0s(h)
F12.33	Acceleration/deceleration time of simple PLC multi-speed 7	0～3	0
F12.34	Running time of simple PLC multi-speed 8	0.0s(h)～6500.0s(h)	0.0s(h)
F12.35	Acceleration/deceleration time of simple PLC multi-speed 8	0～3	0
F12.36	Running time of simple PLC multi-speed 9	0.0s(h)～6500.0s(h)	0.0s(h)

Function Code	Parameter Name	Setting Range	Default
F12.37	Acceleration/deceleration time of simple PLC multi-speed 9	0～3	0
F12.38	Running time of simple PLC multi-speed 10	0.0s(h)～6500.0s(h)	0.0s(h)
F12.39	Acceleration/deceleration time of simple PLC multi-speed 10	0～3	0
F12.40	Running time of simple PLC multi-speed 11	0.0s(h)～6500.0s(h)	0.0s(h)
F12.41	Acceleration/deceleration time of simple PLC multi-speed 11	0～3	0
F12.42	Running time of simple PLC multi-speed 12	0.0s(h)～6500.0s(h)	0.0s(h)
F12.43	Acceleration/deceleration time of simple PLC multi-speed 12	0～3	0
F12.44	Running time of simple PLC multi-speed 13	0.0s(h)～6500.0s(h)	0.0s(h)
F12.45	Acceleration/deceleration time of simple PLC multi-speed 13	0～3	0
F12.46	Running time of simple PLC multi-speed 14	0.0s(h)～6500.0s(h)	0.0s(h)
F12.47	Acceleration/deceleration time of simple PLC multi-speed 14	0～3	0
F12.48	Running time of simple PLC multi-speed 15	0.0s(h)～6500.0s(h)	0.0s(h)
F12.49	Acceleration/deceleration time of simple PLC multi-speed 15	0～3	0
F12.50	Time unit of multi-speed	0: s (second) 1:h (hour)	0
F12.51	Multi-speed 0 source	0: Set by F12.02 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: PID 6: Set frequency via keypad (F00.10), modified UP/DOWN	0

It determines the setting channel of reference 0. You can perform convenient switch over between the setting channels. When multi-command or simple PLC is used as frequency source, the switch over between two frequency sources can be realized easily.

Group F13: Communication Parameters

Function Code	Parameter Name	Setting Range	Default
F13.00	Local address	1～247，0 is broadcast address	1

Function Code	Parameter Name	Setting Range	Default
F13.01	Baud rate	0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS	5

This parameter is used on set data transfer rate between host computer and AC drive.

Note: Baud rate of host computer and AC drive must be same, or communication is failed. The higher baud rate, the faster communication speed.

Function Code	Parameter Name	Setting Range	Default
F13.02	Data format	0: No check, data format (8,N,2) 1: Even parity check, data format (8,E,1) 2: Odd Parity check, data format (8,O,1) 3: Data format (8,N,1)	3

Note: Data format of host computer and AC drive must be same, or communication is failed.

Function Code	Parameter Name	Setting Range	Default
F13.03	Response delay	0～20ms	20ms

Function Code	Parameter Name	Setting Range	Default
F13.04	Communication timeout	0.0 (invalid), 0.1s~60.0s	0.0s

This parameter is invalid when set to 0.0s.

Function Code	Parameter Name	Setting Range	Default
F13.05	Modbus protocol selection	0: Non-standard Modbus protocol 1: Standard Modbus protocol	1

Function Code	Parameter Name	Setting Range	Default
F13.06	Communication reading current resolution	0: 0.01A 1: 0.1A	0

Group F15: Motor 2 Parameters

Drive can switch over two motor. This two motor can set independent nameplate parameters and self-learning.

Refer to description of motor 1 parameter

Chapter 7 Fault Diagnosis and Trouble Shooting

7.1 Faults and Solutions

The drive provides a total of 34 pieces of fault information and protective functions. After a fault occurs, the AC drive implements the protection function, and displays the fault code on the operation panel (if the operation panel is available).

Before contacting for technical support, you can first determine the fault type, analyze the causes, and perform troubleshooting according to the following tables. If the fault cannot be rectified, contact the agent or Folinn.
E033 is the AC drive hardware overcurrent or overvoltage signal. In most situations, hardware overvoltage fault causes E033.

Display	Fault Name	Possible Causes	Solutions
E001	Bus under-voltage	1. instantaneous power failure 2. input voltage of the inverter is not within the specified requirements 3. bus voltage is abnormal 4. rectifier bridge and buffer resistance is abnormal 5. drive board is abnormal 6. main control board is abnormal	1.fault reset 2.adjust to normal voltage 3.seek technical support 4.seek technical support 5.seek technical support 6.seek technical support
E002	Over-voltage during acceleration	1.input voltage is too high 2.external force dragging motor running in the process of acceleration 3.acceleration time is too short 4.have no install brake unit or brake resistance	1.adjust to normal voltage 2.cancel external force or add a brake resistance 3.increase acceleration time 4.install brake unit or brake resistance
E003	Over-voltage at constant speed running	1.input voltage is too high 2.external force dragging motor running in the process of running	1.adjust to normal voltage 2.cancel external force or add a brake resistance

Display	Fault Name	Possible Causes	Solutions
E004	Over-current during acceleration	1.AC drive output circuit is ground or short circuit 2.no self-learning of motor parameter 3.acceleration time is too short 4.manual torque boost or V/F curve is not suitable 5.voltage is too low 6.start rotating motor 7.additional load when acceleration 8.AC drive type is too small	1.eliminate external faults 2.self-learning of motor parameter 3.increase acceleration time 4.adjust manual torque boost or V/F curve 5.adjust to normal voltage 6.speed tracking restart or start after motor stop 7.cancel additional load 8.select an AC drive of higher power class
E005	Over-current during deceleration	1.AC drive output circuit is ground or short circuit 2.no self-learning of motor parameter 3.deceleration time is too short 4.voltage is too low 5.additional load when deceleration 6.have no install brake unit or brake resistance	1.eliminate external faults 2.self-learning of motor parameter 3.increase deceleration time 4.adjust to normal voltage 5.cancel additional load 6.install brake unit or brake resistance
E006	Over-current at constant speed running	1.AC drive output circuit is ground or short circuit 2.no self-learning of motor parameter 3.voltage is too low 4.additional load when running 5.AC drive type is too small	1.eliminate external faults 2.self-learning of motor parameter 3.adjust to normal voltage 4.cancel additional load 5.select an AC drive of higher power class.
E007	Motor overload	1.Whether protection parameter F09.10 is suitable 2.Whether load is too heavy or motor lock-rotor 3. AC drive type is too small	1.setting parameter correctly 2.reduce the load and check the motor and mechanical condition. 3.select an AC drive of higher power class.

Display	Fault Name	Possible Causes	Solutions
E008	AC drive overload	1.The load is too heavy or locked motor occurs on the motor. 2.The AC drive model is of too small power class.	1. reduce the load and check the motor and mechanical condition. 2. select an AC drive of higher power class.
E00A	Overvoltage during deceleration	1: The input voltage is too high. 2: An external force drives the motor during acceleration. 3: The acceleration time is too short. 4: The braking unit and braking resistor are not installed.	1.adjust the voltage to normal range. 2.cancel the external force or install a braking resistor. 3.increase the acceleration time. 4.install the braking unit and braking resistor.
E00d	External equipment fault	1.external fault signal is input via S. 2.external fault signal is input via virtual I/O.	1.reset the operation 2.reset the operation
E00E	Module overheat	1.the ambient temperature is too high. 2. the air filter is blocked. 3.the fan is damaged. 4. the thermally sensitive resistor of the module is damaged. 5.the inverter module is damaged.	1.lower the ambient temperature. 2.clean the air filter. 3.replace the damaged fan. 4.replace the damaged thermally sensitive resistor. 5.replace the inverter module.
E00F	EEPROM readwrite fault	The EEPROM chip is damaged.	Replace the main control board.
E012	Power input phase loss	1.the three-phase power input is abnormal. 2.the drive board is faulty. 3.the lightening board is faulty. 4.the main control board is faulty.	1.eliminate external faults. 2.seek technical support 3.seek technical support 4.seek technical support
E013	Power output phase loss	1.the cable connecting the AC drive and the motor is faulty. 2.the AC drive's three-phase outputs are unbalanced when the motor is running. 3.the drive board is faulty. 4.the module is faulty.	1.eliminate external faults. 2.check whether the motor three-phase winding is normal. 3.seek technical support 4.seek technical support

Display	Fault Name	Possible Causes	Solutions
E015	Current detection fault	1.the HALL device is faulty. 2.the drive board is faulty.	1.replace the faulty HALL device. 2.replace the faulty drive board.
E016	Motor self-learning fault	1.the motor parameters are not set according to the nameplate. 2.the motor self-learning times out.	1.set the motor parameters according to the nameplate properly. 2.check the cable connecting the AC drive and the motor.
E017	Contactor fault	1.the drive board and power supply are faulty. 2.the contactor is faulty.	1.replace the faulty drive board or power supply board. 2.replace the faulty contactor.
E018	Communication fault	1.the host computer is in abnormal state. 2.the communication cable is faulty. 3: F00.02 is set improperly. 4.the communication parameters in group F13 are set improperly.	1.check the cabling of host computer. 2.check the communication cabling. 3.set F00.02 correctly. 4.set the communication parameters properly.
E020	Accumulative running time reached	The accumulative running time reaches the setting value.	Clear the record through the parameter initialization function.
E023	Short circuit to ground	The motor is short circuited to the ground.	Replace the cable or motor
E026	Encoder fault	1.the encoder type is incorrect. 2.the cable connection of the encoder is incorrect. 3.the encoder is damaged. 4.the PG card is faulty.	1.set the encoder type correctly based on the actual situation. 2.eliminate external faults. 3.replace the damaged encoder. 4.replace the faulty PG card.
E029	Accumulative power-on time reached	The accumulative power-on time reaches the setting value.	Clear the record through the parameter initialization function.
E02E	PID feedback lost during running	The PID feedback is lower than the setting of F10.26.	Check the PID feedback signal or set F10.26 to a proper value.
E030	Load becoming 0	The AC drive running current is lower than F09.13.	Check that the load is disconnected or the setting of F09.13 and F09.14 is correct.

Display	Fault Name	Possible Causes	Solutions
E032	Pulse-by-pulse current limit fault	1.the load is too heavy or locked motor occurs on the motor. 2.the AC drive model is too small power class.	1.reduce the load and check the motor and mechanical condition. 2.select an AC drive of higher power class.
E033	AC drive hardware fault	1.overvoltage exists. 2.overcurrent exists.	1.handle based on overvoltage. 2.handle based on overcurrent.
E034	Too large speed deviation	1.the encoder parameters are set incorrectly. 2.the motor self-learning is not performed. 3.F09.17 and F09.60 are set incorrectly.	1.set the encoder parameters properly. 2.perform the motor self-learning. 3.set F09.17 and F09.60 correctly based on the actual situation.
E035	Motor over-speed	1.the encoder parameters are set incorrectly. 2.the motor self-learning is not performed. 3.F09.17 and F09.60 are set incorrectly.	1.set the encoder parameters properly. 2.perform the motor self-learning. 3.set F09.17 and F09.60 correctly based on the actual situation.
E036	Motor overheat	1.the cabling of the temperature sensor becomes loose. 2.the motor temperature is too high.	1.check the temperature sensor cabling and eliminate the cabling fault. 2.lower the carrier frequency or adopt other heat radiation measures.
E037	Initial position fault	The motor parameters are not set based on the actual situation.	Check that the motor parameters are set correctly and whether the setting of rated current is too small.
E038	Motor switch over fault during running	Change the selection of the motor via terminal during running of the AC drive.	Perform motor switch over after the AC drive stops.

7.2 Common Faults and Solutions

You may come across the following faults during the use of the AC drive. Refer to the following table for simple fault analysis.

Table 7-1 Troubleshooting to common faults of the AC drive

SN	Fault	Possible Causes	Solutions
1	There is no display at power-on.	1.there is no power supply to the AC drive or the power input to the AC drive is too low. 2.the power supply of the switch on the drive board of the AC drive is faulty. 3.the rectifier bridge is damaged. 4.the control board or the operation panel is faulty. 5.the cable connecting the control board and the drive board and the operation panel breaks.	1. check the power supply. 2. check the bus voltage. 3. re-connect the 34-core cables. 4. seek technical support
2	"bd600" is displayed at power-on.	1.the cable between the drive board and the control board is in poor contact. 2.related components on the control board are damaged. 3.the motor or the motor cable is short circuited to the ground. 4.the HALL device is faulty. 5.the power input to the AC drive is too low.	1. re-connect the 34-core cables. 2. seek technical support
3	"E023" is displayed at power-on.	1.the motor or the motor output cable is short-circuited to the ground. 2.the AC drive is damaged.	1.measure the insulation of the motor and the output cable with a megger. 2.seek technical support
4	The AC drive display is normal upon poweron. But "bd600" is displayed after running and stops immediately.	1.the cooling fan is damaged or locked-rotor occurs. 2.the external control terminal cable is short circuited.	1.replace the damaged fan. 2.eliminate external fault.
5	E00E (module overheat) fault is reported frequently.	1.the setting of carrier frequency is too high. 2.the cooling fan is damaged, or the air filter is blocked. 3.components inside the AC drive are damaged (thermal coupler or others).	1.reduce the carrier frequency (F00.17). 2.seplace the fan and clean the air filter. 3.seek technical support
6	The motor does not rotate after the AC drive runs.	1.check the motor and the motor cables. 2.the AC drive parameters are set improperly (motor parameters). 3.the cable between the drive board and the control board is in poor contact. 4.the drive board is faulty.	1.ensure the cable between the AC drive and the motor is normal. 2.replace the motor or clear mechanical faults. 3.check and re-set motor parameters.

SN	Fault	Possible Causes	Solutions
7	The S terminals are disabled.	1.the parameters are set incorrectly. 2.the external signal is incorrect. 3.the jumper bar across DCM and +24 V becomes loose. 4.the control board is faulty.	1.check and reset the parameters in group F05. 2.re-connect the external signal cables. 3.re-confirm the jumper bar across DCM and +24 V. 4.seek technical support
8	The motor speed is always low in close loop vector control mode.	1.the encoder is faulty. 2.the encoder cable is connected incorrectly or in poor contact. 3.the PG card is faulty. 4.the drive board is faulty.	1.replace the encoder and ensure the cabling is proper. 2.replace the PG card. 3.seek technical support
9	The AC drive reports overcurrent and overvoltage frequently.	1.the motor parameters are set improperly. 2.the acceleration/deceleration time is improper. 3.the load fluctuates.	1.re-set motor parameters or re-perform the motor self-learning. 2.set proper acceleration/deceleration time. 3.seek technical support
10	E017 is reported upon power-on or running.	The soft startup contactor is not picked up.	1.check whether the contactor cable is loose. 2.check whether the contactor is faulty. 3.heck whether 24 V power supply of the contactor is faulty. 4.seek technical support
11	88888 is displayed upon power-on.	Related component on the control board is damaged.	Replace the control board.

Appendix A Serial Communications

The AC drive provide the RS485 communication interface, and adopt the ModBus communication protocol of international standard to make master- slave communication. Users can realize centralized control by PC/ PLC, upper computer controlling and so on(set the controlling command, operation frequency, correlation function code parameters change, inverter working state and fault information monitoring, etc.) , so as to adapt to specific application requirements.

1. Protocol content

The Modbus serial communication protocol defines the frame content and using form of asynchronous transmission in serial communication, including: host polling and broadcast frame, slave response frame format; frame content of host organization includes: slave address (or the broadcast address) , performing commands, data and error checking, etc. ; slave response is also using the same structure , content including: action confirmation, data returning and error checking, etc. if error happens when slave is receiving frame, or cannot achieve the requirements of the host, it will organize a fault frame as a response feedback to the host.

2. Application way

The AC drive access the controlling network of "single master multiple slave" with RS232/ RS485 bus.

3. Bus structure

(1) The interface way

RS485 hardware interface

(2) Transmission mode

Asynchronous serial and half- duplex transmission mode. At the same time only one between the host and the slave can send data and the other receives data. In the process of serial asynchronous communication, data is sending in the form of message, and frame by frame.

(3) Topological structure

Single master multiple slave system. Slave address set range from 1～247, 0 as the broadcast address, and each slave address in the network has uniqueness. This is the foundation of guaranteeing Modbus serial communication.

4. Protocol specification

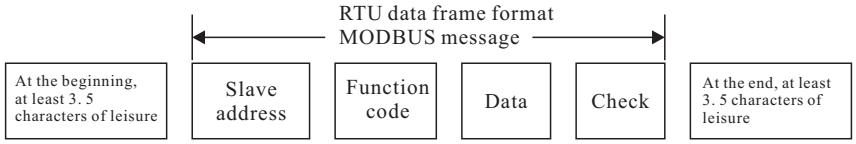
The communication protocol of AC drive is a kind of master-slave Modbus communication protocol with asynchronous serial, and in the network only one device (host) can establish protocol (called "query/ command") . Other device (slave) can only respond to "query/ command" of the host with the provided data, or make corresponding action according to the "query/ command" of the host. Host here refers to the personal computer (PC) , industrial control equipment or programmable logic controller (PLC) , etc. , and slave refers to drive or other controlling equipment of the same communication protocol. Host can not only separately communicate with a certain slave, but also can release broadcast information to all slaves. For the separately "query/ command" of the host, slave should return a information (called response) , and for broadcast information of the host, the slave does not have to feedback information to the host.

5. Communication frame structure

The Modbus protocol communication data format of drives as following :

In RTU mode, new information always becomes silent for at least 3. 5 bytes of transmission time as a start. In the network that calculates transmission rate by baud rate, transmission time of 3. 5 bytes can be easily grasped. And then the transmitted data fields are, in order: slave address, operation command code, data and CRC check words,transmitted bytes of each domain are hexadecimal 0. . . 9，A. . . F. network device always monitors the activities of the communication bus, even in the silent intervals.When receiving the first field (address information) , each network device will conform the byte.With the last byte transmission completion, a similar 3. 5 bytes of transmission time interval is used to show the end of the frame. After this, the transmission of a new frame will start.

Information of a frame must be transmitted in a continuous flow of data. If the interval is more than 1. 5 bytes before the end of the whole frame transmission, the receiving device will remove the incomplete information, and mistakenly consider the following byte to be part of a new frame address. In the same way, if the interval between the start of a new frame and previous frame is less than 3. 5 bytes, receiving device will consider it to be a continuation of the previous frame. Because of the frame disorder, the final CRC check value is not correct, which will lead to communication fault.



The standard structure of RTU frame:

START	T1-T2-T3-T4 (3. 5 bytes of transmission time)
SLAVE ADDR	Communication address：1～247
CMD	03H：read slave parameters：06H：write slave parameters
DATA (N-1)	Data: function code parameter address, number of function code parameter ,value of function code parameter
DATA (N-2)	
……	
DATA0	
CRC CHK high- order	Check value: CRC
CRC CHK low- order	
END	T1-T2-T3-T4 (3. 5 bytes of transmission time)

Command code (CMD): 03H , read N words (at most continuously read 12 words) . For example, the inverter of which slave address is 01, memory starting address is F02, when continuously reading two words, and then the host command information as below:

ADR	01H
CMD	03H
Starting address high- order	F0H
Starting address low- order	02H
Number of data high- order	00H
Number of data low- order	02H
CRC CHK low- order	need to calculate CRC,CHK
CRC CHK high- order	

Slave response information
When F13.05 set to 0:

ADR	01H
CMD	03H
Number of bytes high-order	00H
Number of bytes low-order	04H
Data address F002H high- order	00H
Data address F002H low- order	00H
Data address F003H high- order	00H
Data address F003H low- order	01H
CRC CHK low- order	need to calculate CRC,CHK
CRC CHK high- order	

When F13.05 set to 1:

ADR	01H
CMD	03H
Number of bytes	04H
Data address F002H high- order	00H
Data address F002H low- order	00H
Data address F003H high- order	00H
Data address F003H low- order	01H
CRC CHK low-order	need to calculate CRC,CHK
CRC CHK high-order	

Command code: 06H, write a word
For example, write 5000(1388H) in F00AH address of inverter that the slave address is 02H.

Host command information

ADR	02H
CMD	06H
Data address high-order	F0H
Data address low-order	0AH
Data content high- order	13H
Data content low- order	88H
CRC CHK low- order	need to calculate CRC,CHK
CRC CHK high- order	

Slave response information

ADR	02H
CMD	06H
Data address high-order	F0H
Data address low-order	0AH
Data content high- order	13H
Data content low- order	88H
CRC CHK low- order	need to calculate CRC,CHK
CRC CHK high- order	

CRC checking methods- - - CRC(Cyclical Redundancy Check) :
Use the RTU frame format, and frame contains frame error detection domain based on CRC calculation. CRC domain detects the content of the entire frame. CRC domain is two bytes, containing 16 bit binary value. It joins the frame after calculated by the transmission equipment, and the receiving device recalculates CRC of the received frame, and compared with the received value of CRC domain, if the two CRC value is not equal, then there is an error in transmission.

CRC is deposited in the OxFFFF first, and then process more than six consecutive bytes of the frame with the value of current register. Only 8 bit data of each character is valid for CRC, and the start bit and stop bit and parity bit are all invalid.

In the process of CRC, each 8- bit character is separately XOR with register content,and as a result, moves to the lowest effective direction, and the highest effective bit fills with 0. LSB is extracted to detect, if the LSB is 1, register is separately XOR with preset value, if the LSB is 0, then give up. The whole process will repeat 8 times. After the completion of the final bit (eighth bit) , next 8- bit bytes will separately XOR with the current value of register. The value in the register finally is the CRC value after all bytes in the frame perform.

This calculation method of CRC adopts the CRC check rule of international standards. When users edit CRC algorithm, they can refer to relevant standard of the CRC algorithm, and write CRC calculation program that really meets the requirements.

Now offer a simple function of CRC calculation for user reference (programming with C language) :

```
unsigned int crc_chk_value (unsigned char *data_value, unsigned char length)
{
  unsigned int crc_value=0xFFFF;
  int i;
  while (length--)
    {
      crc_value^=*data_value++;
      for (i=0; i<8; i++)
        {
          if(crc_value&0x0001)
           {
             crc_value= (crc_value>>1) ^0xa001;
           }
          else
             {
             crc_value=crc_value>>1;
              }
        }
    }
  return (crc_value) ;
}
```

The definition of communication data address:
This part is the address definition of communication data, and used to control the operation of the inverter, obtain inverter state information and related function parameters settings, etc.

6. Function code parameter address rules
High and low byte range respectively: high byte F0～FE(F group),A0~A2(F15~F17 group) ; low byte 00~FF. For example, if visit F04.02, so the function code address is 0xF40C.

Note: F14 group: manufactures setting parameters, neither can read this group of parameter, nor change this group of parameters; F17 group: can read this group of parameter,but can not change parameter.When inverter is in operation, some parameters cannot be changed; some parameters cannot be changed no matter what state the inverter is; when changing the function code parameters, you also should note the parameter setting range, units, and related instructions.

Function code group	Communication visit address	Function code address of communication change RAM
F00～F14	0xF000～0xFEFF	0x0000～0x0EFF
F15～F17	0xA000～0xA2FF	0x4000～0x42FF

Because the EEPROM is frequently stored, it will reduce the service life of EEPROM. As for users, some function code does not need to be stored under the mode of communication, and only need to change the value of RAM to satisfy the usage requirements. This function can be achieved only by changing the high-order of the corresponding code address from F to 0.

High and low byte range respectively: high byte 00～0F(F group); low byte 00～FF.

For example:
Function code F04.12 is not stored in the EEPROM, and set the address to 040C.
Function code F15.51 is not stored in the EEPROM, and set the address to 4033.
This address can only be used for chip RAM, and cannot used as a function of reading, if doing so, then invalid address. For all parameter, it can realize this function by command code 07H.

Control command input to AC drive: (only write)

Command address	Command function
1000H	0001H：forward running
	0002H：reverse running
	0003H：forward jog
	0004H：reverse jog
	0005H：free stop
	0006H：decelerate to stop
	0007H：fault resetting

Digital output to terminal control: (only write)

Command address	Command function
1001H	BIT0 : MO1 output control BIT1 : retain BIT2 : RA output control BIT3 : TA output control BIT4 : HDO output control BIT5 : retain BIT6 : retain BIT7 : retain BIT8 : retain BIT9 : retain

Analog output AO1 control: (only write)

Command address	Command function
1002H	0～7FFF means 0%～100%

Analog outputAO2 control: (only write)

Command address	Command function
1003H	0～7FFF means 0%～100%

Pulse output control: (only write)

Command address	Command function
1004H	0～7FFF means 0%～100%

Read AC drive status: (only write)

Status address	Status function
2000H	0001 : forward running
	0002 : reverse running
	0003 : stop

Stop/run parameter address:

Address	Data meaning
3000H	*communication setting range（-10000～10000）(decimalism）
3001H	frequency running
3002H	bus voltage
3003H	output voltage
3004H	output current
3005H	output power
3006H	output torque
3007H	run speed
3008H	terminal input symbol
3009H	terminal output symbol
300AH	AI1 voltage
300BH	AI2 voltage
300CH	AI3 voltage
300DH	count value input
300EH	length valuse input
300FH	load speed
3010H	PID setting

Address	Data meaning
3011H	PID feedback value
3012H	PLC steps
3013H	input pulse frequency，unit is 0.01kHz
3014H	feedback speed，unit is 0.1Hz
3015H	residue running time
3016H	AI1 voltage before correcting
3017H	AI2 voltage before correcting
3018H	AI3 voltage before correcting
3019H	line speed
301AH	current power on time
301BH	current run time
301CH	input pulse frequency，unit is 1Hz
301DH	communication setting time
301EH	actual feedback speed
301FH	A frequency display
3020H	B frequency display

Note: communication setting value is relative percentage (-100.00%～100.00%), and can make communication write operations.When setting as frequency source, relative is the largest frequency(F00.03);When setting as torque source, relative is F03.10,F15.48 (motor1,motor2.)

Parameter lock password calibration: (if back to 8888H, is means password calibration passed)

Address	Data meaning
1F00H	******

Parameter initializing address is 1F01H:

Parameter initializing address	Command function
1F01H	0001H : factory reset, not include motor parameter
	0002H : clear fault file

AC Drive fault description:

AC Drive fault address	AC Drive fault information
8000H	0000H: no fault 0001H: acceleration overcurrent (E004) 0002H: deceleration overcurrent (E005) 0003H: constant speed overcurrent (E006) 0004H: acceleration overvoltage (E002) 0005H: deceleration overvoltage (E00A) 0006H: constant speed overvoltage (E003) 0007H: undervoltage falut (E001) 0008H: motor overload (E007) 0009H: AC drive overload (E008) 000AH: input phase loss (E012) 000BH: output phase loss (E013) 000CH: module overheat (E00E) 000DH: buffer resistance overload (E014) 000EH: contactor fault (E017) 000FH: external fault (E00d) 0010H: communication fault (E018) 0011H: current detection fault (E015) 0012H: motor self-learning fault (E016) 0013H: accumulative running time reached (E020) 0014H: EEPROM readwrite fault (E00F) 0015H: Short circuit to ground (E023) 0016H: PID feedback lost during running (E02E) 0017H: encoder fault (E026) 0018H: AC drive hardware fault (E033) 0019H: accumulative power-on time reached (E029) 001AH: load becoming 0 (E030) 001BH: rapid current limit timeout (E032) 001CH: too large speed deviation (E034) 001DH: motor switch over fault during running (E038) 001EH: motor over-speed (E035)

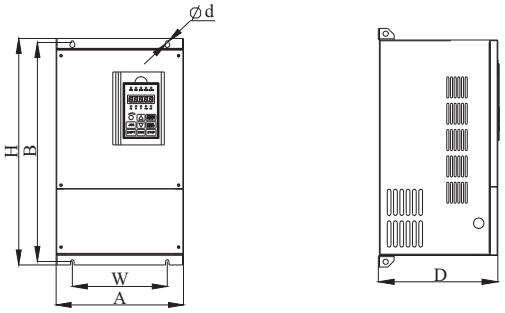
AC Drive fault address	AC Drive fault information
8000H	001FH: motor overheat (E036) 0020H: initial position fault (E037)

Communication fault description: (fault code)

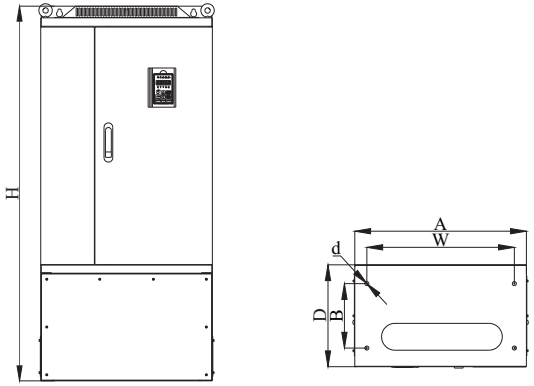
Communication fault address	Communication fault information
8001H	0000H: no fault 0001H: wrong password 0002H: wrong command code 0003H: wrong CRC check 0004H: invalid address 0005H: invalid parameter 0006H: invalid parameter change 0007H: system is locked 0008H: inverter busy (EEPR0M in storage)

Appendix B External Dimension

1.External dimension 1:wall-mounted housing



2.External dimension 2:wall-mounted/ floor combination housing



Base No.	Power (kW)	Dimensions (mm)						Housing
		A-width	H-height	D-depth	W	B	d	
B10	0.55kW	116	175	153	103	165	5	Wall -mounted plastic housing
	0.75kW							
	1.5kW							
B01	2.2kW	134	251	173	121	238	5	
	3.7kW							
B02	5.5kW	161	274	198	148	261	6	
	7.5kW							

Base No.	Power (kW)	Dimensions (mm)						Housing
		A-width	H-height	D-depth	W	B	d	
B10	0.75kW	116	175	153	103	165	5	Wall -mounted plastic housing
	1.5kW							
	2.2kW							
B01	3.7kW	134	251	173	121	238	5	
B02	5.5kW	161	274	198	148	261	6	
	7.5kW							
B03	11kW	210	343	215	195	327	6	
	15kW							
B11	18.5kW	220	395	222	160	378	7	Wall -mounted steel casing housing
	22kW							
B04	30kW	255	453	237	190	440	8	
	37kW							
B05	45kW	280	582	295	200	563	9	
	55kW							
B06	75kW	300	685	327	200	667	11	
	93kW							
B07	110kW	420	840	334	150*150	815	11	
	132kW							
	160kW							
	187kW							
B09	200kW	640	1035	390	250*250	1003	11	
	220kW							
	250kW							
	280kW							
	315kW							
B12	350kW	950	1300	415	350*350	1262	15	
	400kW							
	450kW							
B07-G	110kW	420	1108	334	320	230	12	Floor type steel casing housing
	132kW							
	160kW							
B09-G	200kW	640	1400	390	550	240	15	
	220kW							
	250kW							
	280kW							
	315kW							
B12-G	350kW	950	1652	415	825	245	15	
	400kW							
	450kW							

Appendix C Accessories Selection

1:Brake unit and brake resistance

Voltage	AC drive Power	brake unit		brake resistance			brake torque (10%UD)
		model	quantity (piece)	power(W) /resistance value(Ω)		quantity (piece)	
220V	0.55kW	Built-in		80	120	1	100%
	0.75kW			80	120	1	
	1.5kW			150	100	1	
	2.2kW			300	68	1	
	3.7kW			300	68	1	
	5.5kW			400	30	1	
	7.5kW			400	30	1	
380V	0.75kW			150	300	1	
	1.5kW			200	300	1	
	2.2kW			200	200	1	
	3.7kW			400	150	1	
	5.5kW			400	100	1	
	7.5kW			750	75	1	
	11kW			1000	60	1	
	15kW			1500	40	1	
	18.5kW			2500	30	1	
	22kW			3000	30	1	
	30kW	DBU-4030	1	5000	25	1	
	37kW	DBU-4045	1	7500	20	1	
	45kW		1	10000	13.6	1	
	55kW	DBU-4030	2	5000*2	25	1	
	75kW	DBU-4045	2	7500*2	15	1	
	93kW		2	10000*2	13.6	1	
	110kW	DBU-4160	1	20000	8	1	
	132kW		1	25000	6	1	
	160kW		1	30000	6	1	
	200kW		1	35000	4.5	1	
	220kW	DBU-4280	1	40000	4.5	1	
	250kW		1	45000	4	1	
	280kW		1	50000	3.5	1	
	315kW		1	55000	3	1	
	350kW		1	60000	2.5	1	
	400kW		1	60000	2.5	1	
	500kW		1	80000	2	1	

Notes：

1:Please select the power and the resistance value recommended by our company.

2: The power and the resistance value that recommended above can be calculated by 100% braking torque and 10% frequency of utilization. The power and the resistance value can be appropriately reduced as long as it meets the load demand and the system is reliable: The power and the resistance value of the braking resistor should be appropriately changed if the braking torque and frequency of utilization need to be increased, or users can contact the company.

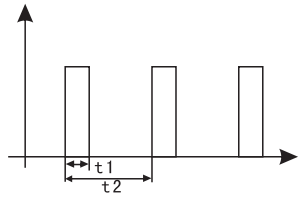
3: When installing a braking resistor, please consider the safety and the inflammability of the surrounding environment.

4: The frequency of use of Braking UD=t1/t2*100%

tl：the braking time in a working period

t2：a working period

If the braking efficiency is double, the power of the corresponding braking unit and braking resistor also need to be double.



5. The resistance of the resistor that over 2500W and the power are the total amount of resistance and power. The power of the resistor is get from parallel connection based on 2500W. For example, to get a 25000W 6Ω IS, ten 2500W 60Ω resistors are needed to be connected in parallel.

The calculation of braking resistor: Statistics show that

IB=IMN/2 → TB≈TMN or IB=2UB/IMN

Notes：IB—braking current , A；IMN—the motor rated current , A；

TB—braking torque, N·m；TMN—rated load torque of motor, N·m。

As a general rule, the range of choice of braking torque is：

TMN＜TB＜2TMN IMN＜IB＜21MN

According to specific situation, users can decide the braking current according to the formula(3-12) and (3-13).

After that, it is easy to calculate the braking resistance：

RB=UB/IB RBmin=UB/IMN

Notes：UB is the braking threshold voltage；RB is braking resistor value . UB is 1. 1 times as that of the rated voltage of bus. RBmin is the minimum braking resistance the common braking threshold voltage：

AC220V：DC380V AC380V：DC680V AC660V：DC1140V

When get IB and RB, the power of resistance will be known.

λ: Actual resistance value/calculated value ED%: Braking efficiency e. g:

Suppose that there is a 7. 5kW motor, rated current is 18A and rated input voltage is 380V

and：RB=680V/9A=75Ω

RBmin=680/18=38Ω

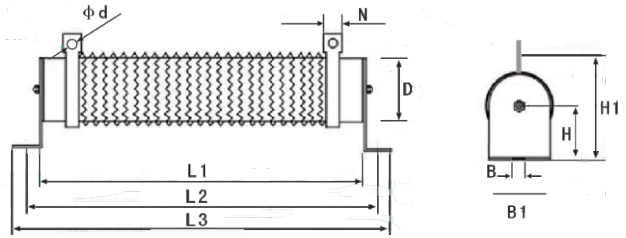
Empirically, the value is 75Ω

The power of braking resistor=1*680^2/75*0. 1=616W

The power can be appropriately enlarged in actual use.

2.Mounting dimension of brake resistance

rated power	dimension (mm)									
(w)	L1 (±2)	L2 (±5)	L3 (±3)	D (±2)	B	B1	H	H1 (±3)	N	Φd
80	152	174	196	28	6.5	28	28	61	10	4.5
150	195	217	239	40	8	40	41	81	12	5.5
200	195	217	239	40	8	40	41	81	12	5.5
300	282	304	326	40	8	40	41	81	12	5.5
400	282	304	326	40	8	40	41	81	12	5.5
750	316	338	360	50	8	50	45	101	16	6
1000	300	325	350	60	8.5	60	60	119	16	6
1500	415	440	465	60	8.5	60	60	119	16	6
2000	510	535	560	60	8.5	60	60	119	16	6
2500	600	625	650	60	8.5	60	60	119	16	6



3. Display panel

Hole diameter of the panel installation box (height*width) ：142*98mm
size of outline box：147*103

Appendix D Using Introduction of I/O extension card

1. Introduction

BD-IO02 is I/O extension card of AC (applied to all models).BD-IO03 extends 4 multi -function digital input (it can be extends HDI high speed pulse input), 1 HDO output terminal (it can be extends HDI high speed pulse output or open collector output)

2.Installation and description

1) Installation:

①: make sure the AC drive is power off completely.
②: aim I/O extension card to interface and install.
③: fix by screw

2)Description:

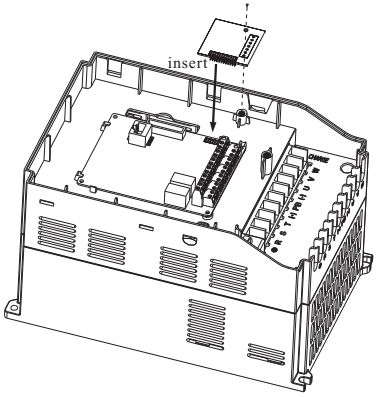


Figure 1 Install of I/O extension card

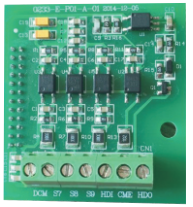


Figure 2 Extension card

DCM	S7	S8	S9	HDI	CME	HDO

Figure 3 Wiring terminal of extension card

② Description of I/O extension card control circuit terminal :

Terminal identification	Terminal function description	
S7-DCM	Multifunctional input terminal 7	Function setting: F05.06～F05.09
S8-DCM	Multifunctional input terminal 8	
S9-DCM	Multifunctional input terminal 9	
HDI-DCM	High speed pulse input terminal Max.input frequency 100kHz	
HDO-CME	Multifunctional output terminal (it can be high-speed pulse output terminal or open collector output)	Function setting: F06.00 Function setting: F06.01/F06.12、F06.07/F06.21、F06.22

Appendix E Using Introduction of PG card

1. Introduction

BD-PG03 is PG card of AC (applied to all models) as optional accessories when close-loop vector control.

2.Installation and description

1) Installation:

①: make sure the AC drive is power off completely.
②: insert PG card and extension card of inverter.
③: fix by screw as Figure 1

2) The appearance, terminal block and function description are shown in figure 1, figure 2 and table 1.

① diagram of PG card

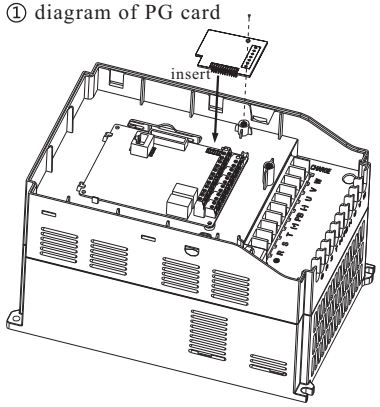


Figure 1 Install of PG extension card

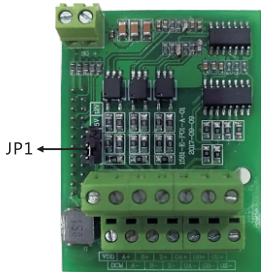


Figure 2 PG card

VDD	A+	B+	Z+	OA+	OB+	OZ+
DCM	A-	B-	Z-	OA-	OB-	OZ-

Figure 3 Wiring terminal of PG card

② Description of PG card terminal :

Terminal identification	Terminal function description
A+	encoder output A signal positive
A−	encoder output A signal negative
B+	encoder output B signal positive
B−	encoder output B signal negative
Z+	encoder output Z signal positive
Z−	encoder output Z signal negative
VDD	encoder input power supply
DCM	power supply pool

OA+	frequency dividing output A signal positive
OA-	frequency dividing output A signal negative
OB+	frequency dividing output B signal positive
OB-	frequency dividing output B signal negative
OZ+	frequency dividing output Z signal positive
OZ-	frequency dividing output Z signal negative

3、PG card jumper function:

JP1：encoder input power supply+5V/12V switch over

Warranty Card

Name of unit:	
Add. of unit:	
P.C.:	Contact person:
Tel.:	Fax.:
Product model:	
Power:	
Contract No.	Purchased Date
Name of agent:	
Maintenance time and content Maintenance personnel:	