F069	Setting range	Unit	Ex-factory value	Alteration
Pulse output maximum frequency	1.0～10.0kHz	0.1	10.0	□

6.4 Functional parameter of analog quantity

F070	Setting range	Unit	Ex-factory value	Alteration
Input channel selection for analog quantity	0～11	1	0	□

There are two channels AI1 and AI2 and three modes to be selected for analog quantity input:

The unit ： 0： 0～10V 1： 0～5V

decade ： 0： 0～20mA / 0～10V 1： 4～20mA/2～10V

[Note] Current or voltage input can be selected by channel 2 through jumper J3

This parameter can be set to satisfy different analog input signals.

F071	Setting range	Unit	Ex-factory value	Alteration
Filtering time of analog quantity	0～1000ms	1	20	□

Setting of this parameter is related to reaction speed of analog quantity; the larger the F071 is set, the slower the analog quantity makes response.

F072	Setting range	Unit	Ex-factory value	Alteration
High-end frequency of analog quantity	0.0～1000.0 Hz	0.1 Hz	50.0	□
F073	0.0～1000.0 Hz	0.1 Hz	0.0	□
Low-end frequency of analog quantity				
F074	0～1	1	0	□
Bias direction of high-end frequency				
F075	0～1	1	0	□
Bias direction of low-end frequency				

0: Positive direction 1: Negative direction

Bias direction refers to forward/reverse command instruction; positive bias represents forward and negative bias symbolizes reverse. Refer to diagram description of F076 for details.

F076	Setting range	Unit	Ex-factory value	Alteration
Reverse selection for negative bias of analog quantity	0～1	1	0	▯

0: Reverse unavailable for negative bias 1: Reverse available for negative bias

This parameter can be used to set range and zero point of external analog terminal, thus composing any form of curve to control the motor, as shown in Figure 6-11.

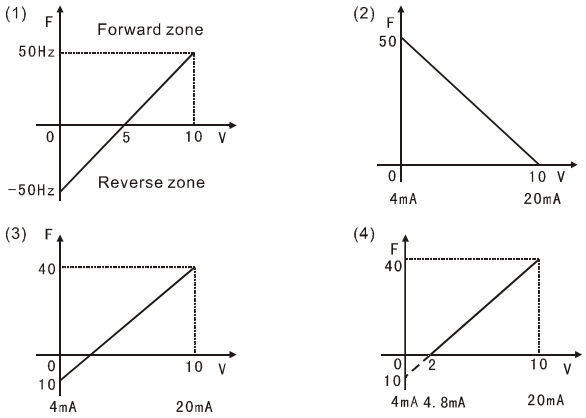


Figure 6-11 Setting Curve for Analog Quantity

(1) Parameters: F073=50 F075=1 F072=50 F074=0 F076=1
[Description] The curve can be used to make easy combination with other systems for various complex applications. When the curve is applied, forward/reverse instruction of external terminals is still effective, meaning the curve will be reversed upon forward/reverse switching.

(2) Parameters: F073=50 F075=0 F072=0 F074=0 F076=0
[Description] The curve is specially applied to negative slope setting, where pressure and temperature are controlled by transducer, with a large quantity of pressure and output signals. Therefore, the curve exactly meets requirements when stop or deceleration is required of corresponding inverter.

(3) Parameters: F073=10 F075=1 F072=40 F074=0 F076=1
[Description] It can be widely and flexibly used by users.

(4) Parameters: F073=10 F075=1 F072=40 F074=0 F076=0

[Description] This curve is an extended one of the above curve. 2V-10V (4.8mA-20mA) is corresponding to 0Hz-40Hz and signals of 0V-2V (4-4.8mA) are invalid. The curve can be used to avoid noise disturbance. Under severe environment, signals under 1V shall not be used as far as possible to set operating frequency of the inverter.

F077	Setting range	Unit	Ex-factory value	Alteration
Memory function selection for UP & DOWN	0～1	1	0	□

0: Not memorized 1: Memorized

This parameter can be used to select whether the value modified through UP and DOWN is memorized or not after stop. When F077 is set as 1, the value upon stop will be memorized after re-start up; if need power off protection, then set F117 to 1 with the value of UP and DOWN at the same time.

Refer to F044-F049 description for details about related parameters.

F078	Setting range	Unit	Ex-factory value	Alteration
Increment selection For UP & DOWN	0～1	1	0	□

0: For 0.01HZ, minimum up/down speed is 0.01HZ

1: For 0.1HZ, minimum up/down speed is 0.1HZ

This parameter can be used to adjust up/down speed unit for UP and DOWN to meet users' need.

F079	Setting range	Unit	Ex-factory value	Alteration
Increment multiple for UP & DOWN	1～250	1	0	□

The actual increment of UP and DOWN refers to the result after values of F078 and F079 are multiplied.

6.5 Functional parameters of multi-segment speed

F080	Setting range	Unit	Ex-factory value	Alteration
Multi-segment speed mode selection	0～5	1	2	▯

0: Normal operation

1: Internally controlled 16-segment speed

2: Externally controlled 4 segment speed

3: Externally controlled 16-segment speed

4: Externally controlled 4 segment speed(running command valid automatically)

5: Externally controlled 16-segment speed(running command valid automatically)

1: Internally controlled multi-segment(16-segment speed)

[Description]
1) 16-segment speed is composed by main speed and 15-segment speed;
2) Acceleration/deceleration time of each segment speed is set through F084 and F085;
3) Operating time is set by timers F101-F116 and timers for unused control segments are set as 0;
4) Operating direction of each segment speed is set through F082 and F083;
5) Under operation of internally controlled multi-segment speed, operating time and direction is dependent on the setting of internal parameters, with invalid external time and forward/reverse switching.

2: Externally controlled 4-segment speed (refer to function description for high-speed, medium-speed and low-speed terminals F044-F049)

3: Externally controlled 16-segment speed

Multi-function digital input terminal				Result
Multi-segment speed I	Multi-segment speed II	Multi-segment speed III	Multi-segment speed IV	
OFF	OFF	OFF	OFF	Main frequency
ON	OFF	OFF	OFF	For multi-segment speed II, the frequency is determined by F086

OFF	ON	OFF	OFF	For multi-segment speed III, the frequency is determined by F087
ON	ON	OFF	OFF	For multi-segment speed IV, the frequency is determined by F088
OFF	OFF	ON	OFF	For multi-segment speed V, the frequency is determined by F089
ON	OFF	ON	OFF	For multi-segment speed VI, the frequency is determined by F090
OFF	ON	ON	OFF	For multi-segment speed VII, the frequency is determined by F091
ON	ON	ON	OFF	For multi-segment speed VIII, the frequency is determined by F092
OFF	OFF	OFF	ON	For multi-segment speed IX, the frequency is determined by F093
ON	OFF	OFF	ON	For multi-segment speed X, the frequency is determined by F094
OFF	ON	OFF	ON	For multi-segment speed XI, the frequency is determined by F095
ON	ON	OFF	ON	For multi-segment speed XII, the frequency is determined by F096
OFF	OFF	ON	ON	For multi-segment speed XIII, the frequency is determined by F097
ON	OFF	ON	ON	For multi-segment speed XIV, the frequency is determined by F098
OFF	ON	ON	ON	For multi-segment speed XV, the frequency is determined by F099
ON	ON	ON	ON	For multi-segment speed XVI, the frequency is determined by F100

[Description]

1) When F080 is set as 3, externally controlled multi-segment speed mode is effective;

2) Any four digital input terminals are selected, with their functions set as 19 multi-segment speed I, 20 multi-segment speed II, 21 multi-segment speed III and 26 multi-segment speed IV respectively;

3) Multi-segment speed I, II, III and IV can be used to form 15-segment speed; 16-segment speed will be available when main frequency is involved;

4) Each acceleration/deceleration time and programming operation direction is determined by external terminals

5) Main frequency is set by F002; when F002=0, i.e. main frequency is set by keyboard, main frequency is value of F003.

4: Draft is a special parameter used to realize a constant speed for taking up and paying off of curl cord, i.e. constant linear speed can be realized within certain accuracy, as shown in Figure 6-12.

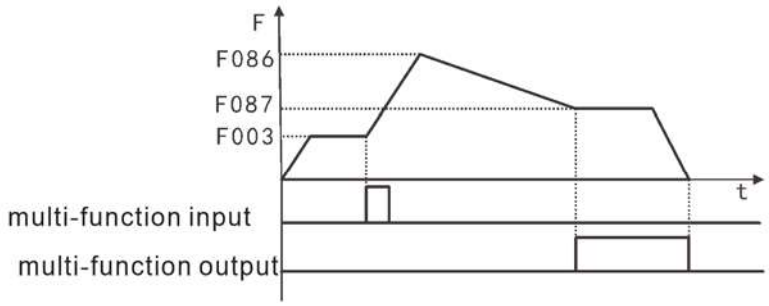


Figure 6-12 Daft Actuation Curve

[Description]
1) Draft will be actuated upon triggering of the external multi-function terminal.
2) During draft actuation, running time T is F101×10.
3) After the completion of draft actuation, the inverter outputs at a constant speed (F087), and corresponding multi-function output contacts are actuated until the stop command is issued, and then, the inverter stops running, and multi-function output contact resets.

5: Disturbance (traverse function) This parameter is specific for the chemical fiber, printing and dyeing; any command input, except stop, external fault, and emergency stop in the running, is not accepted.

[Description] 1) Each frequency of the turning point is determined by F003 and F086;
2) The hopping frequency is determined by F092;
3) The running time is determined by F101 and F102;
4）Related parameters：F003 and F086-F116.

F081	Setting Range	Unit	Ex-factory value	Alteration
Running mode selection of internally controlled multi-segment speed	0～3	1	0	□

0: Program running stops after one cycle
1: Circular running
2: Automatic running (stop interval) stops after one cycle
3: Automatic running (stop interval) in circular running.

This parameter setting is only effective when F080 is set as 1. Refer to F003, F080, and F082-F116 for related parameters.

[Description]
1) Program running stops after one cycle: the inverter runs at the set value of internal parameters after the command of automatic program running is given, and stops automatically after running for one cycle. The inverter can restart after the second running command is given.
2) Circular running: the inverter runs in sequence and circularly at the set value of internal parameters for segment speed frequency and running time; any command input, except stop, external fault, and emergency stop in the circular running, is not accepted.
3) Automatic running (stop interval) stops after one cycle.

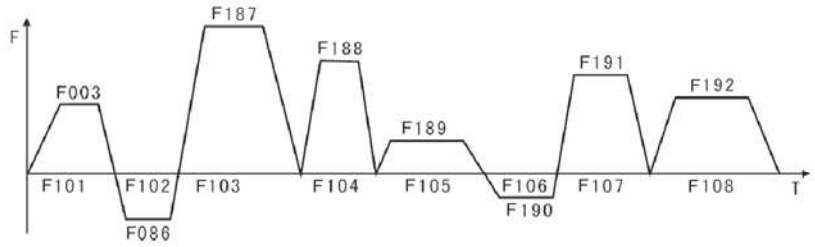


Figure 6-13 Running Curve and Control Parameters for Internally Controlled Multi-segment Speed

[Description] 1) The inverter runs according to parameters after the command of automatic programming running is given, but stop first and then restart in the transformation of each stage; stop automatically after running for one cycle, and the inverter restarts after the second running command is given;

2) The frequency for each segment speed is set by F003, F086~F100;

3) The running time for each segment speed is set by F101~F116;

4) The running direction is set by F082, F083.

F082	Setting Range	Unit	Ex-factory value	Alteration
Speed running direction of first 8 segments	0～255	1	0	□
F083			0	□
Speed running direction of last 8 segments				

F082 parameter set is only effective when F080 is set as 1， The setting mode of running direction for frequency band of F086-F092 and F003 in the programming running is as follows:

The running direction is set by binary 8bit which can be changed into decimal value for the parameter setting. For example, parameter value 01001010 can be changed into decimal

value, i.e., $1\times2^6+1\times2^3+1\times2^1=64+8+2=74$，P082=74. F082=74. F083 is set for the speed running direction of last 8 segments (calculation method is as the same as that for F082)。

F084	Setting Range	Unit	Ex-factory value	Alteration
Acceleration/deceleration time selection for first 8 segments	0～65535	1s	0	▯
F085				▯
Acceleration/deceleration time selection for last 8 segments				

This parameter set is only effective when F080 is set as 1. The setting methods of acceleration/deceleration time for internally controlled multi-stage speed and segment speed are as follows:：

Acceleration/deceleration time is determined by binary 2bit

Bit1	Bit0	加减速时间
0	0	First acceleration/deceleration time F014, F015
0	1	Second acceleration/deceleration time F016, F017
1	0	Third acceleration/deceleration time F018, F019
1	1	Fourth acceleration/deceleration time F020, F021

Acceleration/deceleration time for each segment is determined by binary 16bit

Eighth segment speed		Seventh segment speed		Sixth segment speed		Fifth segment speed		Fourth segment speed		Third segment speed		Second segment speed		First segment speed	
t8		t7		t6		t5		t4		t3		t2		t1	
0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1

t1 acceleration/deceleration time IV
t2 acceleration/deceleration time I
t3 acceleration/deceleration time III
t4 acceleration/deceleration time II
t5 acceleration/deceleration time I
t6 acceleration/deceleration time I

set value
$1\times2^0+1\times2^1+1\times2^5+1\times2^6=99$

F084 is set as 99
Attached: $2^0=1$ $2^1=2$ $2^2=4$ $2^3=8$

t7 acceleration/deceleration time I 2^4=16 2^5=32 2^6=64 2^7=128
t8 acceleration/deceleration time I

F085 is a selection for the acceleration/deceleration time of last 8 segments (calculation method is the same as that for F084)

F086	Setting Range	Unit	Ex-factory Value	Alteration
Frequency II setting	0.0～1000.0 Hz	0.01 Hz	15	
F087			20	
Frequency III setting				
F088			25	
Frequency IV setting				
F089			30	
Frequency V setting				
F090			35	
Frequency VI setting				
F091			40	
Frequency VII setting				
F092			0.5	
Frequency VIII setting				
F093			10	
Frequency IX setting				
F094			15	
Frequency X setting				
F095			20	
Frequency XI setting				
F096			25	
Frequency XII setting				
F097			30	
Frequency XIII setting				
F098			35	
Frequency XIV setting				

F099			40	
Frequency XV setting				
F100			45	
Frequency XVI setting				

The parameter can be set, combining multi-function input terminals, with externally controlled 4-segment speed, externally controlled multi-segment speed and internally controlled multi- segment speed selectable. Refer to F080 and F086-F100 description for details about related parameters.

F101	Setting Range	Unit	Ex-factory Value	Alteration
Timer I	0.0～6500.0s	0.1s	10.0	▯
F102			10.0	
Timer II				
F103			0.0	
Timer III				
F104			0.0	
Timer IV				
F105			0.0	
Timer V				
F106			0.0	
Timer VI				
F107			0.0	
Timer VII				
F108			0.0	
Timer VIII				
F109			0.0	
Timer IX				
F110			0.0	
Timer X				
F111			0.0	
Timer XI				
F112			0.0	
Timer XII				
F113			0.0	
Timer XIII				

F114			0.0	
Timer XIV				
F115			0.0	
Timer XV				
F116			0.0	
Timer XVI				

The parameter setting is applicable to the running time setting for internally controlled multi-segment speed and draft actuation. Refer to F080 and F101-F116 description for details about related parameters.

F117	Setting Range	Unit	Ex-factory Value	Alteration
Memory function for internally controlled multi-segment speed （UP.DOWN power down reserve）	0～1	1	0	▯

0: Not memorized 1: Memorized

This parameter determines the pause function during inverter control at internally controlled multi-segment speed; when F117=1, it can memorize the inverter operating state, and can even memorize during stop or failure, then continue to run after back to normal; when F117=0, memorizing is unavailable.

When use UP and Down function, the parameter and F077 can realize UP and DOWN Timer power down reverse function. When F077=1, UP and DOWN timer memorize during stop. Meanwhile if F177=1, UP and DOWN timer power down reserve.

6.6 Protection function parameters

F118	Setting range	Unit	Ex-factory value	Alteration
Selection of overvoltage stall prevention	0-1	1	1	□

0: Overvoltage stall prevention function is invalid
1: Overvoltage stall prevention function is valid

During inverter deceleration, the motor shall produce rebound energy into inverter under the influence of load inertia to make the voltage on inverter DC side rise; while overvoltage stall function is started and inverter DC voltage is overhigh, the inverter shall stop decelerating till DC side voltage is lower than set value, and for the inverter is decelerating, deceleration time shall automatically prolong.

F119	Setting range	Unit	Ex-factory value	Alteration
Stall level during acceleration	0-200%	1%	150	□

During inverter acceleration, output current of the inverter shall rise rapidly due to overload or excessively short acceleration time, and the inverter shall stop accelerating while exceeding rated set level; when the current is lower than set value, the inverter shall continue accelerating.
[Note] 100% current refers to rated current of the motor, and when the parameter is set to 0, stall prevention function is invalid during acceleration.

F120	Setting range	Unit	Ex-factory value	Alteration
Stall level during constant speed	0-200%	1%	0	□

During constant running of variable frequency accelerator, the current increases due to fluctuation of load or other reason; when the current exceeds rated set value, the inverter shall decrease output frequency, and if output current returns to normal, the inverter shall reaccelerate up to set frequency.

F121	Setting range	Unit	Ex-factory value	Alteration
Deceleration time for stall prevention during constant speed	0.1-25.5s	0.1s	5.0	□

When the inverter is applied to the load of fans and pumps, P120 can be set as 120%; when the current of inverter is greater than 120%, output frequency shall decrease, consequently the current shall decrease; however, after the current returns to normal, the frequency also shall become normal gradually, thus achieving stall prevention function; decrease rate of the frequency depends on F121.

F122	Setting range	Unit	Ex-factory value	Alteration
Stall level during deceleration	200～800V	1V	Model dependent	□

F123	Setting range	Unit	Ex-factory value	Alteration
Selection of over torque detection method	0-3	1	0	▯

0: While achieving the frequency, start to detect over torque; after the detection of over torque, continue operating.
1: While achieving the frequency, start to detect over torque; after the detection of over torque, stop operating.
2: Detect the over torque during running; after the detection of over torque, continue operating.
3: Detect the over torque during operating; after the detection of over torque, stop operating.

F124	Setting range	Unit	Ex-factory value	Alteration
Over torque detection level	0-200%	1%	0	▯

When output current goes beyond torque detection level and exceeds half of set time value (ex-factory value 1.0s), over torque detection shall be indicated and corresponding multi-function alarm contact shall be actuated; when it exceeds set time value, the inverter shall provide protection, and when this parameter is set to 0, over torque shall not be detected.

F125	Setting range	Unit	Ex-factory value	Alteration
Over torque detection time	0.1-20.0s	0.1s	1.0	▯

When the inverter detects that output current exceeds set motor current, it shall start to calculate over torque time; when over torque time goes beyond half of set detection time value, corresponding multi-function output terminal shall be actuated with over torque alarm, and the inverter continue operating. In case that over torque time exceeds set detection time value (F125 setting), the inverter shall provide protection, failure information be displayed and the inverter stop outputting.

Refer to F123 and F124 for relevant parameters.

F126	Setting range	Unit	Ex-factory value	Alteration
Counter memory	0-1	0	0	▯

0: Not memorized 1: Memorized

Determine whether to memorize counter values after power failure of the inverter via memory function of pulse counter.

F127 - F129	Reserve

6.7 Function parameters of constant-pressure water supply

F130	Setting range	Unit	Ex-factory value	Alteration
Number of auxiliary pumps	0-2	1	0	□

The quantity of auxiliary pumps shall be set via this parameter; start or stop of auxiliary pumps are realized by using multi-function output contact, and auxiliary pump 1 or 2 shall be controlled through peripheral control circuit.

F131	Setting range	Unit	Ex-factory value	Alteration
Continuous operating time of auxiliary pump	1-9000 (min)	1	60	□

When only one of two pumps is in service, for the purpose of making each pump operating in an average manner, when operating time of one pump reaches P131, the other pump shall be switched for operating.

F132	Setting range	Unit	Ex-factory value	Alteration
Interlocking time of auxiliary pump	1-250s	1s	5	□

Setting of this parameter shall determine interlocking time of two auxiliary pumps during mutual switching as shown in Figure 6-14.

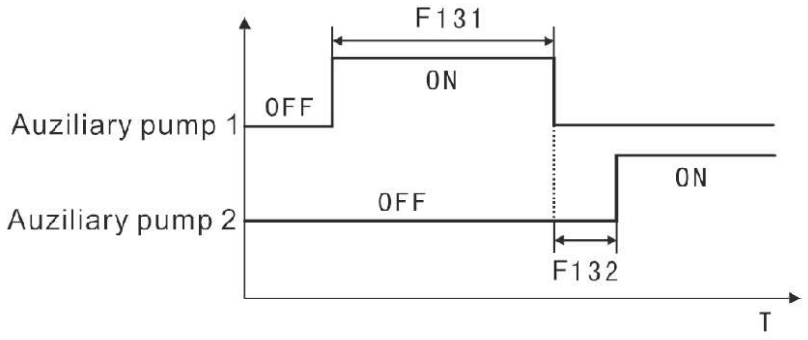


Figure 6-14 Interlocking Time Switching of Auxiliary Pump

F133	Setting range	Unit	Ex-factory value	Alteration
High-speed operating time	1-250s	1s	60	□

In the process of applying constant pressure water supply, main pump operates at fast frequency (as set in F060) due to larger water consumption; when high-speed operating time is achieved, corresponding multi-function contact shall be actuated and auxiliary pumps start to operate. Refer to Figure 6-15 for details.

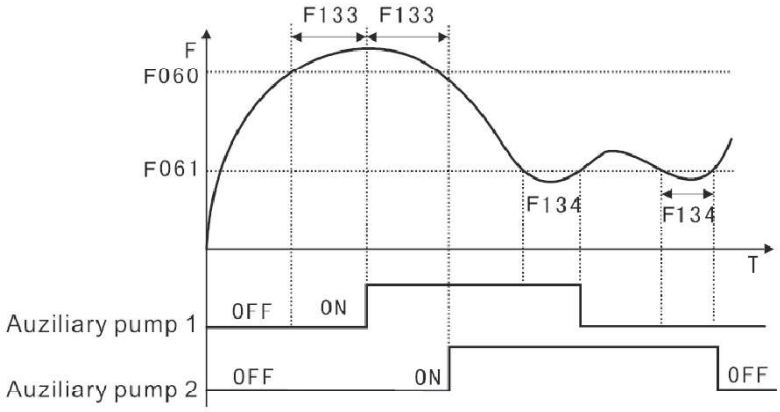


Figure 6-15 High/Low-speed Operating Time Curve of Pump

F134	Setting range	Unit	Ex-factory value	Alteration
Low-speed operating time	1-250s	1s	60	□

During the application of constant pressure water supply, when main pump frequency operates at low speed (set via F061) due to reduction of water consumption and low-speed operating time (F134) is achieved, corresponding multi-function contact shall be actuated and auxiliary pumps stop.

F133 and F134 must be used in coordination with F060, F061 and multi-function output terminal and mainly used for addition and reduction of auxiliary pumps. Refer to Figure 6-15 for details.

F135	Setting range	Unit	Ex-factory value	Alteration
Shutdown pressure level	0-150%	1%	95	□
F136 Shutdown level continuous time	1-250s	1s	30	□
F137 Wake-up level	1-150%	1%	80	□
F138 Sleep frequency	0.00-400.0	0.01Hz	20.00	□
F139 Sleep frequency continuous time	1-250s	1s	20	□

Shutdown pressure level mainly refers to pressure level occurring when main pump enters the dormancy state; refer to Figure 6-16 for details.

Shutdown level continuous time refers to the duration time on the condition of shutdown

pressure level before going sleep; refer to Figure 6-16 for details.

Wake-up level refers to wake-up pressure level from dormancy state to recovery; refer to Figure 6-16 for details.

Sleep frequency refers to the minimum operating frequency while going sleep; refer to Figure 6-16 for details.

Sleep frequency continuous time refers to continuous time of operating under sleep frequency; refer to Figure 6-16 for details.

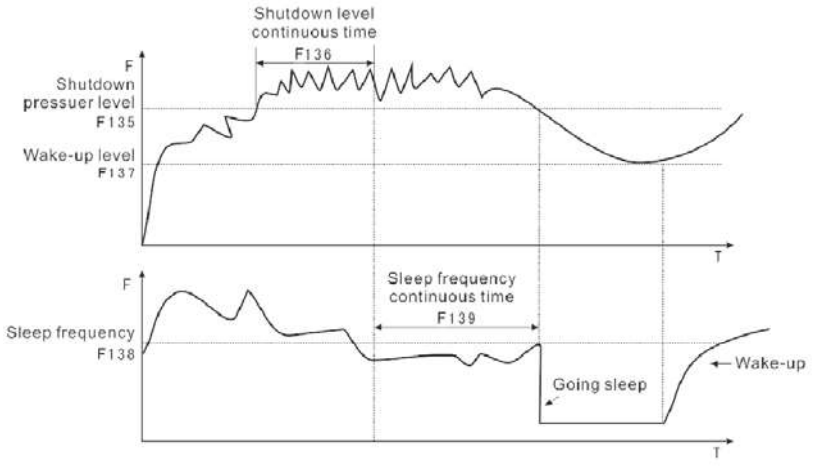


Figure 6-16 Main Pump State Setting and Time Curve

6.8 Motor function parameters

F141	Setting range	Unit	Ex-factory value	Alteration
Rated power of motor		0.01KW	*	□

F141	Setting range	Unit	Ex-factory value	Alteration
Rated voltage of motor		0.1V	*	□

It shall be set as per rated voltage value on motor nameplate; ex-factory value of 230V grade inverter and that of 440V grade inverter are respectively 220 and 380.

F142	Setting range	Unit	Ex-factory value	Alteration
Rated current of motor		0.1A	*	□

This parameter shall be set according to rated value on motor nameplate and can be used for limiting output current of the inverter so as to prevent over current and protect the motor; in case that motor current exceeds this value, AC motor inverter shall provide the protection.

F143	Setting range	Unit	Ex-factory value	Alteration
Number of motor poles	02-22	1	04	□

Number of motor poles shall be determined via this parameter which is set according to motor nameplate.

F144	Setting range	Unit	Ex-factory value	Alteration
Motor rotating speed	0-60000	1r/min	1440	□

It shall be set according to actual speed of the motor; displayed value is identical to this parameter and can be used as the parameter used for monitoring to facilitate the user; this set value is corresponding to the rotating speed at 50Hz.

F145	Setting range	Unit	Ex-factory value	Alteration
Automatic torque compensation	0.0-10.0%	1%	2.0	□

This parameter can be used to make the inverter automatically output extra voltage during running and to compensate the insufficient torque of motor during low frequency. Excessive torque compensation is inadvisable and the setting shall be performed upward gradually based on actual situation. Insufficient compensation shall cause insufficient torque of the motor under low frequency while excessive compensation shall induce excessive torque, thus producing certain impact on machinery and even causing inverter tripping. As shown in the Figure 6-17 on the right.

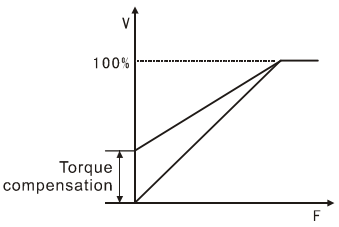


Figure 6-17 Automatic Torque Compensation

F146	Setting range	Unit	Ex-factory value	Alteration
No-load current of motor	0-100%	1%	40	□

The setting of motor no-load current shall affect the quantity of slip compensation and rated current of the motor is 100%.

F147	Setting range	Unit	Ex-factory value	Alteration
Motor slip compensation	0.0～2.0	0.1	1.0	□

When the inverter drives the motor, both the load and the slippage shall increase, and motor running speed shall be closer to synchronous speed via slip compensation and slippage reduction.

F148	Setting range	Unit	Ex-factory value	Alteration
Max.frequency of motor slip compensation	0.0～20.0	0.1Hz	2.0	□

F149	Setting range	Unit	Ex-factory value	Alteration
Slip compensation filtering time	0～2000ms	1ms	20	□

F192	Setting range	Unit	Ex-factory value	Alteration
Motor stator resistance	0.0～99.99	0.01	*	□

F193	Setting range	Unit	Ex-factory value	Alteration
Motor rotor resistance	0.0～99.99	0.01	*	□

F194	Setting range	Unit	Ex-factory value	Alteration
Mutual inductance of motor	0.0～99.99	0.01	*	□

F195	Setting range	Unit	Ex-factory value	Alteration
Leakage of motor	0.0～99.99	0.01	*	□

F150	Setting range	Unit	Ex-factory value	Alteration
AVR function	0-1	1	1	□

0: Invalid 1: Valid

AVR function refers to automatic voltage regulation. On the condition of unstable input power, in case of overhigh voltage, the running of motor under the power supply exceeding rated voltage shall cause temperature rise of the motor, damage the insulation and make output torque unstable; however, automatic voltage regulation can be used to automatically regulate output voltage at rated voltage of the motor.

When this function set is invalid, output voltage shall fluctuate.

F151	Setting range	Unit	Ex-factory value	Alteration
Automatic energy-saving function	0.0-20.0%	0.1%	0.0	□

Automatic energy saving function is invalid while at 0; during acceleration and deceleration, it shall run with full voltage; during constant speed running, the optimum voltage value shall be calculated via load power and supplied to the load to achieving the purpose of energy saving.

F152	Setting range	Unit	Ex-factory value	Alteration
Fault restart time	0.2-25s	0.1s	1.0	□

When the inverter is set in the mode of fault restart, after the duration of inverter fault tripping exceeds the time as set in F152, the inverter shall be restarted. Attention must be paid to the safety during the application of this function.

F153	Setting range	Unit	Ex-factory value	Alteration
Power failure restart selection	0-1	1	0	□

0: Power failure restart is invalid No longer restart after momentary outage

1: Frequency tracking startup Please refer to F025 description

F154	Setting range	Unit	Ex-factory value	Alteration
Allowable outage duration	0.1-5.0s	0.1s	0.5	□

The maximum duration of outage can be determined via this parameter; in case of going beyond set time, the inverter shall still stop outputting after power recovery; restart shall proceed as per general startup sequence.

F155	Setting range	Unit	Ex-factory value	Alteration
Times of fault restart	00-10	1	00	□

The inverter shall be automatically reset and restarted in case of abnormal situation (such as overcurrent and overvoltage); in case of common starting mode, this mode shall be followed; in case of frequency tracking start, the start shall be conducted in the manner of tracking start. After starting, if no anomaly occurs within 60s, set times shall be recovered; if any anomaly occurs and set number is achieved, the converter shall no longer output, and restart shall be conducted after resetting. If F155 is at 0, no automatic reset or restart function shall be performed in case of anomaly.

6.9 PID function parameters

F156	Setting range	Unit	Ex-factory value	Alteration
Proportional constant (P)	0.0-1000.0%	0.1%	100.0	○

Error value gain is set for proportional constant; in case of I=0 and D=0, only proportional control shall be actuated.

F157	Setting range	Unit	Ex-factory value	Alteration
Integration time (I)	0.1-3600.0s	0.1s	5.0	○

Response speed of PID actuation is set via integration time (I); the larger I value is, the slower the response speed is; contrarily, faster response speed and small integration time shall cause the oscillation.

F158	Setting range	Unit	Ex-factory value	Alteration
Derivation time (D)	0.01-10.00s	0.01s	0	○

The attenuation of PID actuation is set via derivation time (D); the larger D value is, the more obvious the attenuation is; D=0 indicate that no effect is produced, that is, invalid.

F159	Setting range	Unit	Ex-factory value	Alteration
Target value	0-100.0%	1%	*	○

Control target value can be set via external voltage signal or panel, and 100% target value is corresponding to the frequency at +10V analog.

PID closed-loop control is generally used for controlling the process with slow change in physical quantity, such as controlling pressure and temperature; generally feedback signal is acquired from temperature transmitter and pressure transmitter; during PID control, feedback signal input channel is analog current signal of 4-20mA.

PID closed-loop control is valid during starting of multi-function input PID. Generally adjustment method of PID control is as follows:
1) Correctly select the inverter, and use the inverter with the input specification in accordance with standard signal of 4-20mA;
2) Correctly set target value;
3) In case of nonoscillatory input, increase proportionality constant P;
4) In case of nonoscillatory input, decrease integration time I;
5) In case of nonoscillatory input, increase the derivation D;
6) Refer to the descriptions in Figure 6-19/6-20 for specific application.
PID control block is shown in Figure 6-18:

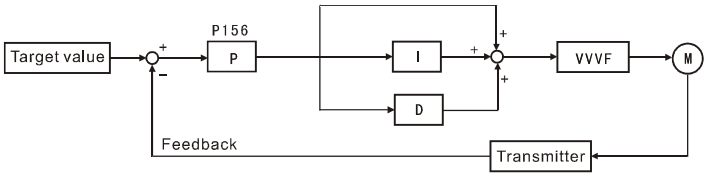


Figure 6-18 PID Control Block Diagram

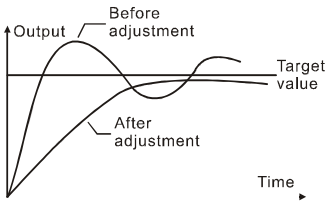


Figure 6-19 Suppress Output Exceeding of PID Control

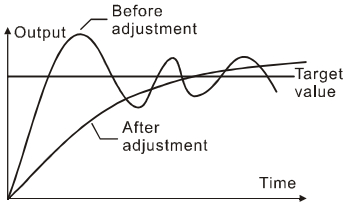


Figure 6-20 Suppress Output Oscillation of PID Control

(1) Suppress output exceeding
a: Decrease derivation time (D value)
b: Extend integration time (I value)

(2) Suppress output oscillation
a: Decrease derivation time (D value) or set it as 0
b: Decrease proportionality constant (P value)

F160	Setting range	Unit	Ex-factory value	Alteration
PID channel setting	0-1	1	10	□

0: PID target value refers to the value set as in F159.
1: PID target value refers to the value of external analog 0-10V (corresponding to 0-100%) and the value set as in F159 is invalid. Target value selection can be set via selection panel and external analog which is 0-10V signal or set through potentiometer.

Unit's digit set PID given channel:

0:F159 given　　1: AI1　　2: AI2

Ten's digit PID feedback channel

0:AI1　　1: AI2

F161	Setting range	Unit	Ex-factory value	Alteration
PID upper limit	0~100%	1%	100	□

When PID feedback value is greater than set value in P161, corresponding multi-function output terminal shall be actuated and the machine shall not shut down.

F162	Setting range	Unit	Ex-factory value	Alteration
PID lower limit	0~100%	1%	0	□

When PID feedback value is less than set value in F162, corresponding multi-function output terminal shall be actuated and the machine shall not shut down.

6.10 Communication function parameters

F163	Setting range	Unit	Ex-factory value	Alteration
Communication address	0-250	1	1	▯

When RS-485 communication port control is set for the inverter, the position of each inverter shall be set via a parameter.

0: No communication function　　01-250: Position of inverter

F164	Setting range	Unit	Ex-factory value	Alteration
Communication transmission speed	0-3	1	2	▯

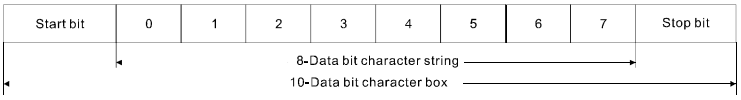
0:4800 bit/s　　1:9600 bit/s　　2:19200 bit/s　　3:38400 bit/s

F165	Setting range	Unit	Ex-factory value	Alteration
Communication data mode	0-5	1	3	▯

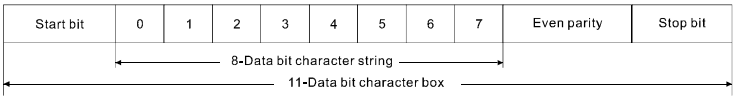
0: 8N1 For ASCII　　1: 8E1 For ASCII　　2: 8O1 For ASCII

3: 8N1 For RTU　　4: 8E1 For RTU　　5: 8O1 For RTU

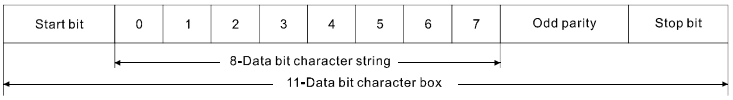
[Note] 8N1 For ASCII F165=0 or 8N1 For RTU F165=3



8E1 For ASCII F165=1 or 8E1 For RTU F165=4



8O1 For ASCII F165=2 or 8O1 For RTU F165=5



F166-F168	Reserve

F169	Setting range	Unit	Ex-factory value	Alteration
Communication protocol selection	0-1	1	1	□

0: Standard Modbus protocol 1: H100 communication protocol

Standard Modbus Communication Protocol

(1) H100 series converters support RTU mode in standard Modbus protocol.
RTU mode: Each 8bit data is composed of two hexadecimal characters of 4bit, for example: 64H (hex).

	RTU Mode
Start bit	3.5 bits
Slave address	1 bit
Modbus function NO.	1 bit
Data	n bit
CHECK	CRC16（2 bit）
End bit	3.5 bits

Inverter parameters communication address indicate hexadecimal system, for example communication address of F100 is 0064H.

Communication specific variables: including communication specific instruction variables and communication specific state variables, address starting from 0200H.

Save of communication variables: rewrite inverter parameters (for example F100) to be stored in EEPROM.Still save after power failure. But parameters cannot be rewritten frequently, otherwise EEPROM memory may be damaged. Rewriting communication-specific variables (variables after 0200H) only modifies values in RAM. Do not save after power failure, it allow rewriting frequently.

Data Types in Communication: because of data is hexadecimal integer, the smallest unit can be seen from the decimal point position of the parameters in the function table. For example, the minimum unit of F003 is 0.1Hz. Therefore, according to Modbus protocol, communication transmission 300 represents 30.0Hz.

Rewritten, of F013 and F172 parameters can only by 06H function, not support by 10H function, and there is no response frame.

Supported Modbus Function

Parameter	Function	Specification
01H	Read parameter address status	Read from 1 to 32
03H	Read holding register	Read from 1~20. Read all parameters, communication-specific variables
04H	Read input register	Read from 1~20.
05H	Write single parameter address	Write data FF00H，parameter address ON；write 0000H，parameter address OFF
06H	Write single holding register	All parameters and communication-specific variables can be rewritten
0FH	Write multiple parameter address	Write from 1~32. parameter address start from 0048H
10H	Write multiple holding registers	Rewritten from 1~20.All parameters and communication-specific variables can be rewritten

(1) Communication Address table

1) parameter address address table

Modbus mode include：01H（read parameter address status），05H（write single parameter address），0FH (write multiple parameter address）

parameter address address	Name	R/W	Specification
0000	Operation	R	0-Stop 1-Operating
0001	JOG	R	0-Invalid 1-JOG
0002	Forward/reverse	R	0-Forward 1-Reverse
0003	In operation	R	0-Stop 1-In operation
0004	In jogging	R	0-Invalid 1-In jogging
0005	In	R	0-In forward rotation

	forward/reverse rotation		1-In reverse rotation
0006	In braking	R	0-Invalid 1-In braking
0007	Frequency tracking	R	0-Invalid 1-Frequency tracking
0008-0047	reserve		
0048	Operation	W	0000—Invalid FF00（or 100，bit8 set 1）—Valid
0049	Forward	W	0000—Invalid FF00—Valid
004A	Reverse	W	0000—Invalid FF00—Valid
004B	Stop	W	0000—Invalid FF00—Valid
004C	Forward/reverse switch	W	0000—Invalid FF00—Valid
004D	JOG	W	0000—Invalid FF00—Valid
004E	JOG Forward	W	0000—Invalid FF00—Valid
004F	JOG Reverse	W	0000—Invalid FF00—Valid

2) Input register address table

All address only read. Modbus function include 04H（read input register）.

Fault Code table:

Address	Name
0000	Output frequency
0001	Set frequency
0002	Output current
0003	Output speed
0004	DC voltage
0005	AC voltage
0006	temperature
0007	Counter
0008	PID target value
0009	PID feedback value
000A	Current fault
000B	Total operating hours
000C	Output power
000D	X terminal state

Decimal	Fault code
64	E.OCS
80	E.oUS
88	E.LuS
92	E.oHS
96	E.oLS
100	E.oAS
104	E.oTS

Note 1: The BIT0-BIT5 in X terminal state corresponds to the X1-X6 terminal , and 1 means terminal is closed.

Note 2: The fault code suffixes S, A, d and n are four consecutive numbers, such as 65 for E.OC.A.

3) Holding register address table

Modbus functions include: 03H (read and hold register), 06H (write a single hold register), 10H (write multiple hold registers)

Definition	Address	Specification

Internal parameters	0000H～00FFH	Inverter parameter address，F000～F255
Communication Specific Instruction Variable	0200H	Main control bit，BIT0-BIT7 mapping parameter address 0048H～004FH ，BIT8 virtual input terminal enable
	0201H	Given frequency，given frequency address when F002=2
	0202H	Virtual input terminal1，BIT0-BIT15 corresponding digital input terminal function 01-16. Digital input terminal function 1-8 already exists in the main control bit, the modification here is invalid.
	0203H	Virtual input terminal 2, BIT0-BIT15 corresponding digital input terminal function 17-32
	0204H	EDO，Communication control digital output terminal, BIT3 corresponding (FA, FB, FC) relay terminal
	0205H	EAO，Communication control analog output terminal AO
	0206H～020FH	Reverse
Communication-specific state variables, read-only	0210H	Main control bit，BIT0～BIT15 mapping parameter address 0000H～000FH
	0211H	Digital terminal status，BIT0-BIT5 corresponding X1-X6，BIT11 corresponding (FA, FB, FC) relay
	0212H	Virtual Output State 1, BIT0-BIT15 corresponding to Digital Output Terminal Function 01～16.
	0213H	Virtual output state 2, BIT0-BIT15 corresponds to digital output terminal function 17-32.
	0214H-021FH	Reverse
	0220H～022DH	Mapping input registers (addresses 0000H-000DH)
	022EH	AI1. Analog input value 1（0～100.00%）
	022FH	AI2. Analog input value 2（0～100.00%）
	0230H	PFI. Pulse input value
	0231H～023FH	Reverse

(1) For example

1. Setting No.01 inverter given frequency is 300.0Hz, Application Function Code 06H. Given frequency is communication port（F002=2）.

Master command message：

	RTU Mode
START	
Slave address	01H
Modbus function NO.	06H
High bit of register address	02H
Low bit of register address	01H
High bit of written data	0BH
Low bit of written data	B8H
Check	DEH（CRC low bit）
	F0H（CRC high bit）
END	3.5 bit

Slave response：frequency is set to 300.0Hz, returns the same data as the master requests.

Note 1: When F002 = 2, use 06H or 10H function to rewrite frequency, address is 0201H, EEPROM is not operated at this time.

If the rewriting frequency is to be written to EEPROM, the F003 value needs to be rewritten.

Note 2: Calculations of check bits

RTU mode adopts CRC method. The C language code of CRC16 is as follows：

```
unsigned char data              // Indicators of information buffer
unsigned char length      //Number of bytes in the information buffer
   unsigned int crc_chk(unsigned char data,unsigned char length)
   {
        int j;
        unsigned int reg_crc=0xffff;
        while(length--){
             reg_crc^=*data++;
```

```
            for(j=0;j<8;j++){
                if(reg_crc&0x01)
                reg_crc=(reg_crc>>1)^0xa001;
                else
                reg_crc=reg_crc>>1;
            }
        }
        return reg_crc;
    }
```

2. Make No. 01 inverter run, function code 05H or 06H. Requirement control mode is communication port（F001=2）.

   0FH and 10H can also achieve this function as multi-write modes. See the following examples for their formats.

   Master command message：

	Write parameter address	Write hold register
Slave address	01H	01H
Modbus function number	05H	06H
High bit of parameter address/register address	00H	02H
Low bit of parameter address/register address	48H	00H
High bit of write data	FFH	00H
Low bit of write data	00H	01H
CRC	——	——

Slave response： inverter is forward operation and returns the same data as the master requests.

3. Read 01 slave running status, function code 01H or 03H.

Master command message：

	Read parameter address	Read hold register
Slave address	01H	01H
Modbus function number	01H	03H
High bit of parameter address/register start address	00H	02H
Low bit of parameter address/register start address	00H	10H
Read parameter address/register quantity(high bit)	00H	00H
Read parameter address/register quantity(low bit)	08H	01H
CRC	—	—

Slave response：09H to 00001001B，comparing with the parameter address table, it indicates that inverter on command and operating.

	Read parameter address	Read hold register
Slave address	01H	01H
Modbus function number	01H	03H
Byte number	01H	02H
Read data	09H	00H
		09H
CRC	—	—

4. Read the operating frequency and setting frequency of No. 01 inverter, function code 04H or 03H.

Master command message：

	Read input register	Read hold register
Slave address	01H	01H
Modbus function number	04H	03H
High bit of input/hold register start address	00H	02H
Low bit of input/hold register start address	00H	20H
Read byte number(high bit)	00H	00H
Read byte number(low bit)	02H	02H
CRC	—	—

Slave response: The return content indicates that the current frequency of inverter is 0.0Hz and the set frequency is 50.0Hz.

	Read input register	Read hold register
Slave address	01H	01H
Modbus function number	04H	03H
Return byte number	04H	04H
High bit of first register content	00H	00H
Low bit of first register content	00H	00H
High bit of second register content	01H	01H
Low bit of second register content	F4H	F4H
CRC	—	—

5. Write 20.0s for F014, 15.0s for F015 and 10H for function code.

Master command message:

Slave address	01H
Modbus function number	10H
Start address (high bit)	00H
Start address (low bit)	0EH
Register number(high bit)	00H
Register number(low bit)	02H

Byte number	04H
High bit of first number	00H
Low bit of first register content	C8H
High bit of second register content	00H
High bit of second register content	96H
CRC	—

Slave response：

Slave address	01H
Modbus function number	10H
Start address (high bit)	00H
Start address (low bit)	0EH
Register number(high bit)	00H
Register number(low bit)	02H
CRC	—

Abnormal response frame: When the slave station cannot complete the request sent by the master station, the abnormal response frame is returned. The frame format is as follows:

1 bit
1 bit（Modbus function number+80H）
1bit: 01：Modbus function number that cannot be processed 02：Unreasonable data address 03：Out-of-range data values 04：Operation failure (write read-only parameters, change parameters that cannot be changed during operation, etc.)
—

6.11 Monitoring function parameters

F170	Setting range	Unit	Ex-factory value	Alteration
Selection of displayed content 1	0-11	1	4	□

F171	Setting range	Unit	Ex-factory value	Alteration
Selection of displayed content 2	0-11	1	5	□

This parameter is set to select PID feedback value and other contents to display, thus in favor of monitoring by the user, and the contents is displayed one by one through switching key; in respect of displayed contents, upon shipping out of factory, operating frequency, set frequency, current and AC voltage are defaulted to be displayed, and if other contents are required be monitored; P170 and P171 can be set for the purpose as below:

0：no display　1：PID feedback value　2：running speed　3：PID target value

4：DC voltage　5：heat sink temperature　6：Counter value　7：output torque

8：Input terminal status　9：AI1　10：AI2　11：PFI

F172	Setting range	Unit	Ex-factory value	Alteration
Fault clearing	00-10	1	0	△

01 refers to fault clearing function and the others are reserved items in factory.

F173	Setting range	Unit	Ex-factory value	Alteration
Rated voltage of inverter	*	1	*	△

It is the value set in factory according to the model and read-only parameter; alteration is inapplicable.

F174	Setting range	Unit	Ex-factory value	Alteration
Rated current of inverter	*	1	*	△

It is the value set in factory according to the model and read-only parameter; alteration is inapplicable.

F175	Setting range	Unit	Ex-factory value	Alteration
Inverter type	0-1	1		△

0: Constant torque　1: Fans

Read-only parameter, alteration inapplicable.

F176	Setting range	Unit	Ex-factory value	Alteration
Standard for inverter frequency	0-1	1	0	△

0:50Hz　1:60Hz

The value set in factory, read-only parameter, monitoring applicable and alteration inapplicable.

F177	Setting range	Unit	Ex-factory value	Alteration
Unexpected error 1				
F178				
Unexpected error 2				
F179			*	△
Unexpected error 3				
F180				
Unexpected error 4				

Check fault display via access to this parameter; no fault record, display —.

F181	Setting range	Unit	Ex-factory value	Alteration
Software version No.	0～10.00	0.01	-	△

Check software version No. via 01 setting.

F182	Setting range	Unit	Ex-factory value	Alteration
Running time	0～3600	1s	-	▯
F183	Setting range	Unit	Ex-factory value	Alteration
Cumulative running time	0～65535	1h	-	▯

Cumulative running time of inverter

F184	Setting range	Unit	Ex-factory value	Alteration
Speed display coefficient	0.000～9.999	0.001	1.000	▯

When F170 or F171 select 2 (running speed), the value displayed on the keyboard = actual running speed × F184.

F185	Setting range	Unit	Ex-factory value	Alteration
Start up preset display selection	00～10	1	0	▯

F185 means start display volume of inverter after power-on.

F184～F250	Reserve

NO.7 Maintenance and Fault Information

Regular maintenance and inspection during the application shall make your inverter in normal condition for long period.

7.1 Maintenance and inspection cautions

1 Be sure to first cut off power supply of inverter (L1. L2. L3.L.N) during maintenance and inspection.
2 Be sure cut off power supply of the inverter and make the display disappear; conduct maintenance and inspection till high-voltage indicator is off.
3 Never pull up or mismatch internal power supply, wires and cables during the inspection; otherwise the inverter shall not operate or be damaged.
4 During installation, do not leave the screws and other fittings inside the inverter so as to avoiding short circuit of circuit board.
5 After the installation, keep the inverter clean and prevent the dust, oil mist or moisture invading.

7.2 Regular inspection items

1 Confirm the voltage meets the demand of inverter;
(In particular, pay special attention to the damage of power line and motor)
2 Whether the terminal and connector are loose;
(Whether power line and terminal connecting line suffer from strand breakage)
3 Whether there is dust, scrap iron and corrosive liquids inside the inverter;
4 Prohibit measuring insulation impedance of the inverter;
5 Measure output voltage, output current and output frequency of the inverter;
(avoid big difference in measurement results)
6 Inspect whether the ambient temperature is around -5℃ -40℃ and installation environment has good ventilation;
7 Keep the humidity below 90% (without condensing into water droplet);
8 Whether there is abnormal sound or abnormal vibration during the running (avoid placing the inverter in the place with severe vibration);
9 Please regularly clean venthole.

7.3 Fault information and fault clearing

Inverters of H100 feature more perfect protection function in terms of overload, interphase short circuit, earthing short circuit, undervoltage, overheating and overcurrent, etc. In case of occurrence of inverter protection, ascertain the cause as per the information shown below. After handling, perform the running operation newly; if incapable of handling, please contact local dealer.

Fault display	Fault content and description	Handling method
E.oc (E.oc)	Overcurrent during running	1：Inspect whether the motor is in short circuit/ partial short circuit and the insulation of output line is in good condition 2：Inspect whether the motor is locked and mechanical load changes abruptly 3：Extend acceleration time or deceleration time 4：Reducing torque boost value 5：Whether network voltage changes abruptly 6：DC braking amount is too large, so reduce it 7：Unreasonable inverter configuration, increase the capacity of inverter
E.ou (E.ou)	Overvoltage during running	1：Extend deceleration time or install brake resistor 2：Whether network voltage changes abruptly
E.Lu (E.Lu)	Variable frequency low voltage	1: Inspect network voltage 2: Send for repair
E.oH (E.oH)	Inverter overheating	1: Inspect whether the fan is locked and radiating fin is free of foreign matter 2: Whether ambient temperature is normal 3: Whether there is air space enough for air convection 4: Inspect whether the thermistor and connecting line are in open circuit
E.FoP (E.FoP)	Inverter power tube protection	1：Inspect whether the motor is in short circuit/ partial short circuit 2：Inspect whether insulation of output line is in good condition 3：Send for repair
E.GFF （E.GFF）	Short circuit to ground	1：Inspect whether the motor is in short circuit 2：Inspect whether insulation of output line is in good condition 3：Send for repair
E.oLd (E.oLd)	Inverter overloading 150% For 1min	1: Inspect whether the capacity of inverter is too small; if yes, increase the capacity 2: Inspect whether mechanical load is locked 3: Poor V/F curve setting, so reset
E.oLL (E.oLL)	Motor overloading 150% For 1min	1: Whether mechanical load changes abruptly 2: Too small motor adapted 3: Heating insulation of the motor becomes poor 4: Whether the voltage fluctuates greatly

		5: Whether open-phase exists 6: Mechanical load increases
E.PLo (E.PLo)	Output phase lost	1：whether the three-phase stator windings of the motor phase lost 2：Inspect output cable
E.PL 1 (E.PL1)	Input phase lost	1：whether power supply input phase lost
E.HHC (E.HHC)	Abnormal internal communication of inverter	Send for repair
Er	Wrong parameter setting	Correct parameter setting

Code table:

A	b	C,c	d	E	F	G	H	O,o	S	n	L	T	P	r	u	2
A	b	C	d	E	F	G	H	O	5	n	L	T	P	r	u	2

7.4 Fault and analysis

1. Motor fails to run after operating key is pressed

(1) Operating mode is set in error, that is, the operating mode is enabled together with external control terminal on the condition of external control terminal.
(2) Frequency instruction is low level or not given.
(3) Peripheral wiring is in error, such as wrong two-wire system and three-wire system wiring and relevant parameters setting.
(4) Setting of multi-function input terminal is in error (on the condition of external control).
(5) The inverter is in fault protection condition.
(6) Fault of motor or inverter.

2. Parameter setting failure

(1) Password is locked; conduct setting after decoding.
(2) The inverter is operating.
(3) Abnormal connection of connector assemblies and abnormal communication of digital actuator; remove the actuator and reinstall after cutting off power supply.

3. Motor fails to reversely rotate

Reverse is prohibited.

4. Motor rotates in opposite direction

Motor output connecting line is wrong, it is only necessary to exchange any two connecting lines among U, V and W.

5. Motor decelerates too slowly

(1) Too long deceleration time set, reduce deceleration time.
(2) Install brake resistor.
(3) Install DC brake.

6. Motor overheating

(1) The load is too large and actual torque has exceeds rated torque of the motor, so it is proposed to increase the capacity of motor.
(2) Ambient temperature is overhigh; the motor may be burn out in the environment with high temperature, so it is necessary to reduce ambient temperature of the motor.
(3) Interphase withstand voltage of the motor is insufficient, on/off action of the inverter shall produce impulse wave among winding coils of the motor; generally the maximum impulse voltage shall be 3 times input power of the inverter, and the motor with interphase impulse withstand voltage higher than the maximum impulse voltage shall be used.

7. Starting of inverter interferes in other control devices

(1) Reduce carrier frequency and the times of internal on/off action.
(2) Set up noise filter respectively on power input side and output side of the inverter.
(3) Please properly earth the inverter and motor.
(4) Encase the cable with metal tube for shielding.
(5) Separately route main circuit wiring and control line.

8. Overcurrent stall of inverter is detected during starting of fan

(1) When the start is performed, the fan is in idling condition, so DC braking during starting is required to be set.
(2) DC braking during starting has been set, and it is required to increase DC braking value.

9. Vibration or roaring of the machine

(1) For resonance of vibration frequency of mechanical system and carrier wave, adjust carrier wave to avoid resonance point.
(2) Resonance of vibration frequency of mechanical system and inverter output frequency.
a. Set skipping function to avoid the resonance point;
b. Set rubber vibration insulator on bottom board of the motor.

7.5 Common anomalies and countermeasures

Analysis, judgment and countermeasures of common anomalies are shown in the table below:

Anomaly		Possible causes and countermeasures
Motor fails to run	No keyboard display	Inspect whether power failure occurs, input power is in open-phase and input power is connected in error.
	No keyboard display while charging indicator inside is on	Test the connecting wire and socket relating to keyboard are in good condition. Measure the voltage of each control power supply inside to confirm whether switching power supply is in normal operation. In case of abnormal operation of switching power supply, inspect the socket of switching power incoming line (DC+, DC-) is well connected, start-oscillation resistor is damaged or voltage regulator tube is normal.
	No voltage or low voltage of DC+ and DC- terminals	Inspect charging circuit.
	Buzzing of motor	Too big load of motor, try to reduce it.
	Anomaly not found	Confirm whether it is in tripping state or reset is not performed after tripping, whether it is in restarting state after power failure, whether the keyboard is reset, whether program operating state, operating state of multi-segment speed, set operating state or non-operating state is accessed; try restoring ex-factory value to confirm whether operating instruction is provided and inspect whether running frequency is set to 0.
Unfavorable acceleration/deceleration of motor		Improper setting of acceleration/deceleration time. Too low current limit is set. Overvoltage protection during deceleration. Improper setting of carrier frequency, overloading or oscillation.
Overhigh or overlow motor speed		Improper selection of V/F characteristic. Improper selection of reference for V/F characteristic and resetting shall be performed. Substandard or non-standard rated voltage of the motor. Low voltage of power supply. Wrong setting of frequency signal gain. Wrong setting of output frequency.

No.8 Selection and Configuration of Peripheral Facilities

8.1 Options

Name	Function
Breaker and leakage switch for connection	Protect the connection of inverter, be sure to set breaker on power side, and please use the leakage switch with higher harmonic prevention
Electromagnetic contactor	Set electromagnetic contactor to prevent burning out brake resistor and connect surge absorber while applying.
Surge absorber	Absorb switching surge current of electromagnetic contactor and relay for controlling
Isolation transformer	Isolate input and output effects of the inverter and produce effect on reducing the interference
DC reactor	Improve input power factor of the inverter
AC reactor	Improve input power factor of the inverter and prevent surge voltage impact
Brake resistor and brake unit	Consume recovered energy of the motor and shorten deceleration time

1. Leakage switch

The inside of inverter, inside of motor and input and output leads have earth electrostatic capacitance and the inverter has relatively high carrier frequency, so large earth leakage current is induced to the inverter, which is more obvious for high-capacity machines; the application of leakage switch may cause misoperation of protection circuit, so the attention should be paid to the selection of leakage switch during the application, simultaneously carrier frequency shall be reduced and the lead shortened appropriately.

2. AC reactor

AC reactor can be used for suppressing higher harmonic of inverter input current, improving input power factor of the inverter and preventing leakage-induced impact. It is suggested to use input AC reactor under following circumstances:
1) Unbalanced three-phase power;
2) The same power supply is connected with thyristor or switch-controlled power factor compensating device;

8.2 Configuration

1. AC reactor configuration

Model	Matched power (W)	Rated current (A)	Inductance (mH)
220V	0.4	2.5	4.2
	0.75	5	2.1
	1.5	10	1.1
	2.2	15	0.71
380V	0.4	1.3	18
	0.75	2.5	8.4
	1.5	5	4.2
	2.2	7.5	3.6
	3.0	10	2.8
	4.0	12	2.2
	5.5	15	1.4
	7.5	20	1.0
	11	24	0.52
	15	34	0.397
	18.5	38	0.352

Line reactor, through which alternating current flows, is also called commutation reactor and applied to network incoming line and it is used for suppressing inverter harmonic and feedbacking to the network.

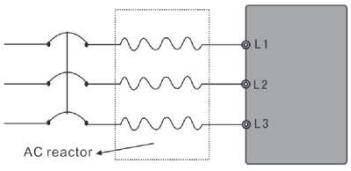


Figure 8-1 AC Reactor

2. Brake resistor configuration

Model of inverter	Specification of brake resistor		Brake torque 10%ED	Dedicated motor KW
	W	Ω		
100-0.4S2-1A	80	200	125	0.4
100-0.75S2-1A	100	200	125	0.75
100-1.5S2-1A	300	100	125	1.5
100-2.2S2-1A	300	70	125	2.2
100-3.7S2-1A	390	40	125	3.7
100-5.5S2-1A	520	33	125	5.5
100-0.4T4-1A	80	750	125	0.4
100-0.75T4-1A	80	750	125	0.75
100-1.5T4-1A	300	400	125	1.5
100-2.2T4-1A	300	250	125	2.2
100-3.7T4-1A	400	150	125	3.7
100-5.5T4-1A	500	100	125	5.5
100-7.5T4-1A	1000	75	125	7.5
100-11T4-1A	1000	50	125	11
100-15T4-1A	1500	40	125	15
100-18.5T4-1A	4800	32	125	18.5

[Note] 1) Please select resistance value and service power set by our company;

2) Our company shall assume no responsibility for the damage of inverter or other devices induced by the application of brake resistor and brake unit which are not provided by our company;

3) Be sure to take the safety and inflammability of the environment for installation of brake resistor and make the distance between it and inverter up to 100mm at least;

4) For changing resistance and power number, please contact local dealer;

5) In need of brake resistor, separately order brake resistor, and contact local dealer for details;

6) It is necessary to install brake unit if quick braking is required of the inverter over 11KW.

Annex

Annex I Examples of Simple Application

1. Forward/reverse rotation of motor in the control of potentiometer

As shown in the curve of Figure F-3.

Parameter setting F001=1 F002=1 F072=50 F073=50
F074=0 F075=1 F076=1

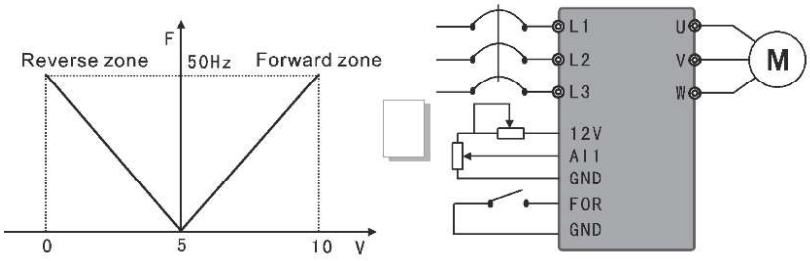


Figure F-3 Motor Forward/Reverse Curve and Wiring Diagram

2. Internally controlled 8-segment speed operation

Realize those shown in the curve of Figure F-4 and stop internally controlled 8-segment speed after operating by one cycle.

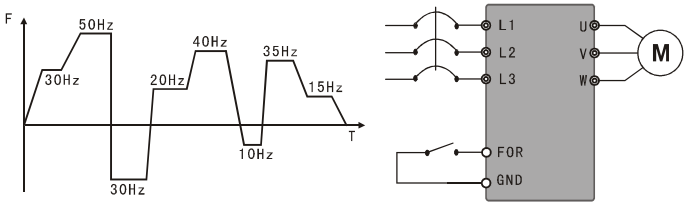


Figure F-4 Operation Curve and Wiring Diagram of Internally Controlled 8-segment Speed

Parameter setting	F080=1	F003=30	F086=50	F087=30	F088=20
	F089=40	F090=10	F091=35	F092=15	F082=36
	F081=0	F014=5	F015=5	F001=1	F083=0
	F044=1	F101-F108=15			

[Description] 1) Operating time of each segment speed is set via F101-F108=15;

2) Automatic cycle F081=1;

3) After giving operating instruction, stop after operating by one cycle as per set curve.

3. Simple constant-pressure water supply

(1) Use pressure transmitter with the range of 0-10kg and feedback of 4-20mA; pressure water supply of 5kg as required, alarm while above upper limit of 6kg and below lower limit of 4kg, and stop starting external terminal. As shown in Figure F-5.

Parameter setting	F001=1	F002=0	F046（X3 terminal function）=25		F052=28
	F053=29	F070=10	F156=*	F157=*	F158=*
	F159=50	F160=0	F161=60	F162=40	

[Note] F156, F157 and F158 shall be set based on actual situations, and in general, constant-pressure water supply F156=80-100, F157=2.5-~3 and F158=0.

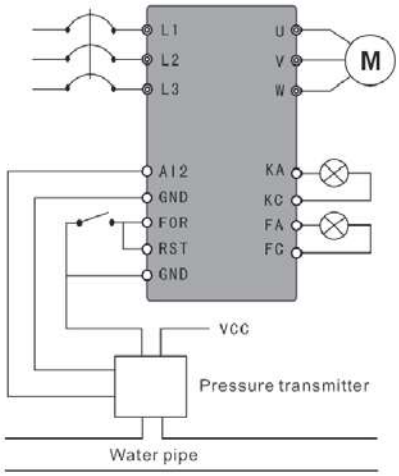


Figure F-5 Constant-Pressure Water Supply – Pressure Transmitter

(2) Use remote pressure gauge of 0-10kg; as required, use external terminal to control the operation and stop and set target value via potentiometer. As shown in Figure F-6.

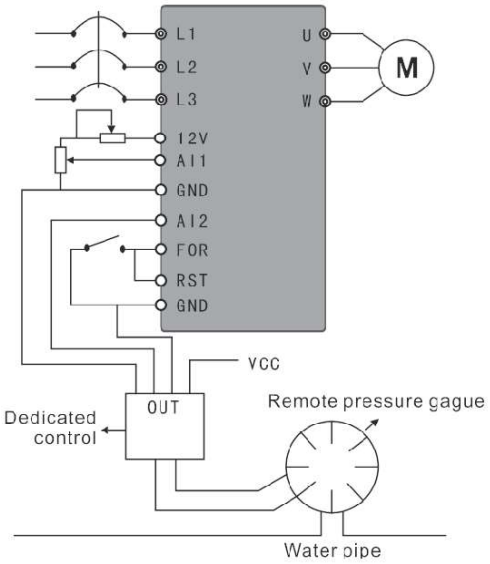


Figure F-6 Constant-pressure Water Supply – Remote Pressure Gauge

Parameter setting	F001=1	F002=0	F046=25	F070=3
	F156=*	F157=*	F158=*	F160=1

[Note]

1) Target value of H100 series inverter can be selected through two methods, one referring setting via panel and the other one referring to 0-10V analog ;

2) Feedback signal is 4-20mA and the others are invalid;

3) Target value in the case is set via potentiometer (0-10V);

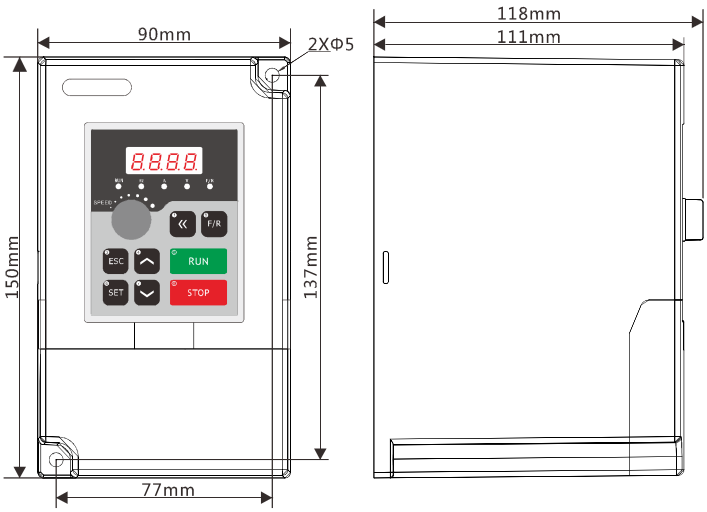
4) F156, F157 and F158 shall be set based on concrete conditions (refer to parameter description for details);

5) PID special control board is designed as common remote pressure gauge and input internal resistance is converted into standard signal as per 0-400Ω; in case that the resistance of remote pressure gauge used by the user exceeds prescribed limit, remote pressure gauge shall be replaced or the previous resistor shall be connected in parallel for calibration;

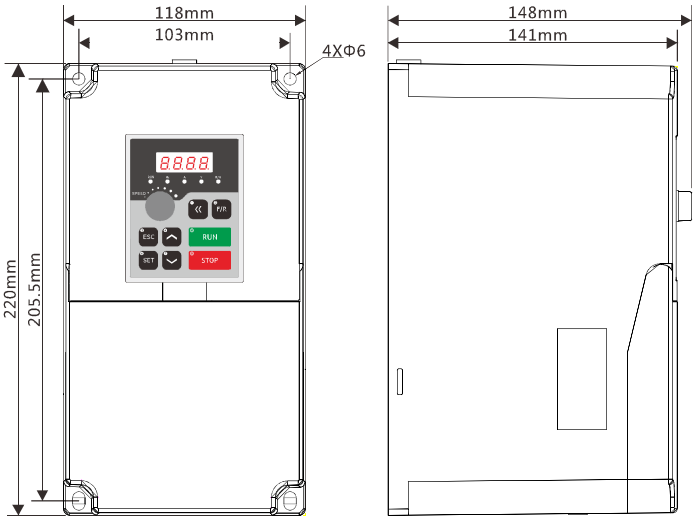
6) When target value is set via potentiometer, F002 still must be set to 0; otherwise, PID shall be ineffective.

Annex II External and Installation Dimensions

1. External dimension of F0 shell

Name	100-0.4S2-1A 100-0.75S2-1A 100-1.5S2-1A 100-0.75T4-1A 100-1.5T4-1A 100-2.2T4-1A
External & installation dimensions	

2. External dimension of F1 shell

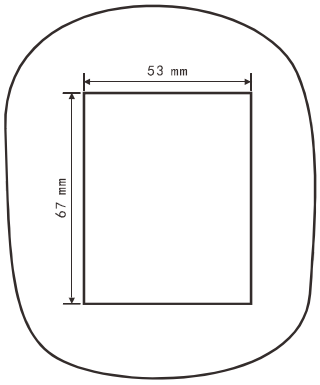
Name	100-2.2S2-1A 100-3.7S2-1A 100-3.7T4-1A 100-5.5T4-1A 100-7.5T4-1A
External & installation dimensions	

3. Installation dimension of keyboard

The keyboard can be removed from the inverter and installed on the cabinet connect by extension cable.

◆ Direct Installation Method

- Open holes on the cabinet as shown below;
- Remove the keyboard from the inverter to cabinet
- one end of the extension cable into the keyboard , and the other end into the socket of the inverter keyboard.



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:	