Technology Interaction Vitality
SANCH

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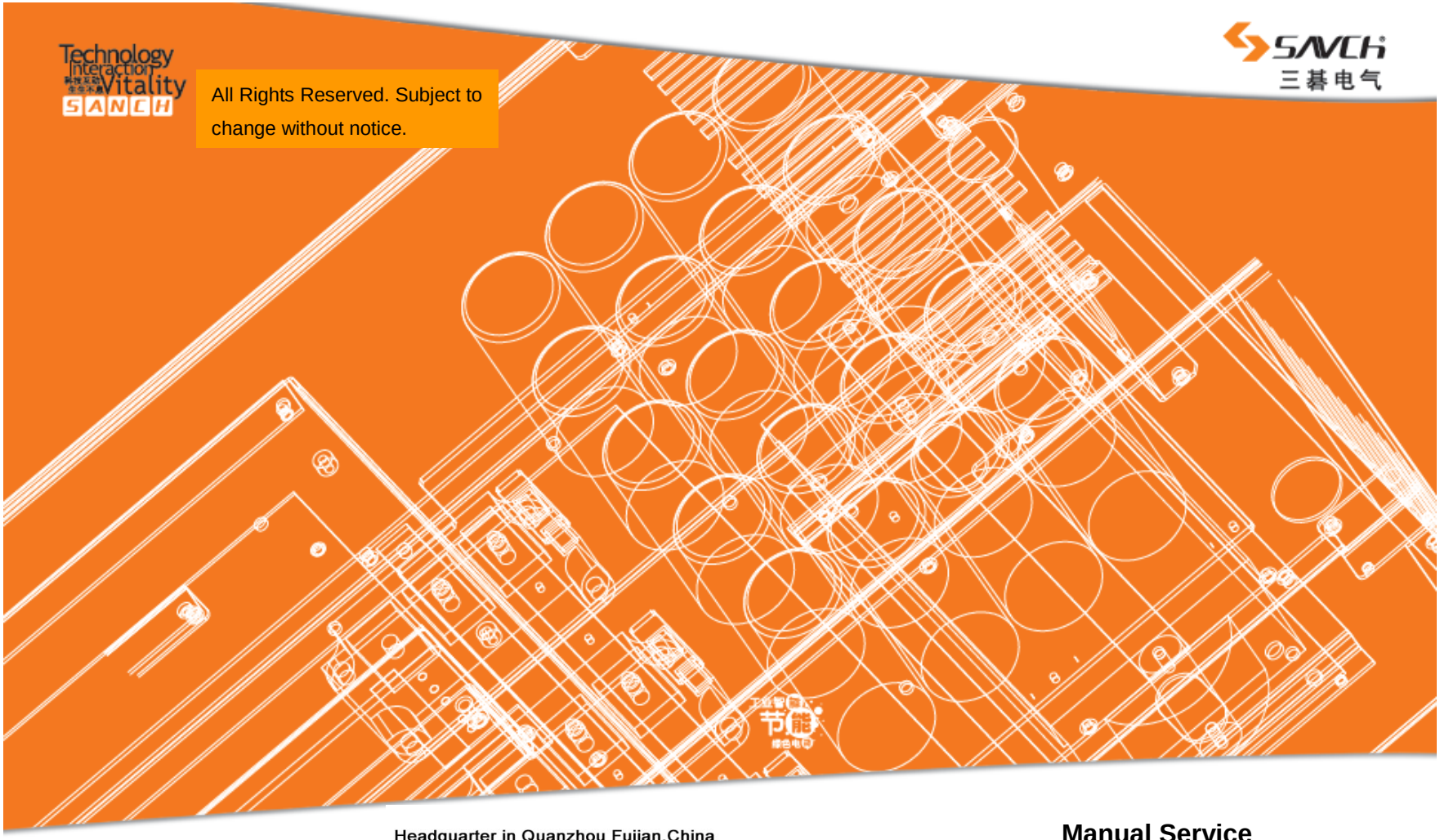
三碁电气



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Manual Service
For S900 Series Inverters

Contents

Preface

This instruction manual, which includes operation descriptions and notes for maintenance, shall be delivered to the end-user.

For safety running and effective operation, this instruction manual shall be read thoroughly prior to use, which shall also be preserved for later use.

Provided problems occur and solution is not provided in this instruction manual, contact your SANCH ELECTRIC representative or contact with our company directly. Our professional technicians will serve for you actively. And please continue to adopt products of SANCH, give valuable opinion and advice.

1. Reading Instructions

symbols of" DANGER" and" ATTENTION" in the manual indicates that, for safety running or maintenance of inverters or other electrical products, attention shall be attached during delivering, installation, operation and checks for the inverter. And these notes shall be applied for a better and safer operation.

DANGER	indicates a potentially hazardous situation visiting. If not used correctly, personnel damage even death may be caused.
CAUTION	indicates a potentially hazardous situation visiting. If not used correctly, serious damage to inverter or machine may be resulted.

DANGER
● Do not touch circuit board and other components after power supply off and CHARGE indicators are still ON. ● Never connect wires while power on. Do not check components or signal for circuit board during operation. ● Do not dismantle or change inner wire, circuit or components unnecessarily. Make sure grounding terminals are correctly grounded. 220V level: Grounding Ⅲ;440V level:SpecialGrounding

ATTENTION
● Do not perform a withstand voltage test for components of inverter, it can cause semi-conductor components to be damaged by high voltage. ● Never connect the output terminals U/T1, V/T2, W/T3 to AC power supply. ● IC of CMOS on control circuit of the inverter shall be damaged by electrostatic influence. Do not touch main circuit board.

2. Products receiving

All products have been performed with strict test and inspection. After receiving the inverters, the following checks shall be performed.

- To check that SANCH inverter, an instruction manual.
- To check whether model number correspond with model and capacity your purchase order.
- To check whether there are damaged parts during transportation and delievering. If there are, do not connect with power supply.

If any of the above checkpoints are not satisfactory, contact your SANCH ELECTRIC representative for a quick resolution.

1 SAFETY INSTRUCTIONS

1.1 NOTES FOR OPERATION

Before wiring

⚠ CAUTION
● Specification of applying power supply shall correspond to input voltage of the inverter.

⚠ DANGER
● Main circuit terminals must be correct, L1/R, L2/ S and L3/ T is input terminals and it's forbidden to use mixing with U/T1, V/T2 and W/T3. Failure to observe this may cause the inverter damaged.

⚠ CAUTION
● When delivering the inverter, do not take the cover directly. Take the air fan seat to prevent the cover got off. Inverters getting off which may cause damage to personal or machine shall be avoided. ● Install the inverter on metal or other non-inflammable materials. Do not fix it on inflammable materials which may cause a fire hazard. ● In case of several inverters are installed together in one control panel, a fan shall be prepared to make sure temperature lower than 50℃, thus over-heating or a fire hazard shall be avoided. ● Make sure applied power supply comply with label showed on the right of the machine. Failure to observe this may cause action failure.

During operation

⚠ DANGER
● Never put in or take off the motor during operation, otherwise over-current even over burning the main circuit of the inverter may happen. ● When auto-restart function is set, do not approach the machine since motor can be reset suddenly after being stopped. ● The function set can make the stop key invalid, which is different from the emergency stop key. Please pay attention to it.

⚠ CAUTION
● Never touch heatsink or discharging resistor since temperature may be very high. ● Since it is easy to change running speed from low to a high speed, verify safe working range of motor and machine before running. ● Use brake according to the method described in wiring diagram. ● Do not check signals during running. ● All parameters of the inverter have been preset at the factory according to line frequency. Do not change the setting value at will.

During check and maintenance

⚠ CAUTION
● Ambient temperature for operating the inverter shall be -10℃ to + 50℃ (+40℃ parallel installation) and 90%RH no condensation. However under this condition, the ambient environment must be without drips of water or metal dust.

During rejection

⚠ CAUTION
● Explosion may occur when burning the electrolytic capacitor of the main circuit and printing plate. Toxic gas may be generated when burning control panel and other plastic fittings. It shall be treated as Industrial waste.

1.2 NOTES FOR OPERATION ENVIRONMENT

Make sure the inverter is protected from the following during operation:

Direct Sunlight.

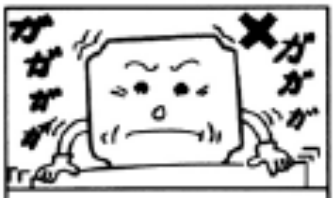
Corrosive gas or fluids

Oil l

Salt or saline

Rain, moisture

Iron chips and dust



Large impelling

Extreme low temperatures

Extreme high ambient temperatures (Above 40℃)

Electromagnetic waves and ultra high-angle rays (For example: locations of welding machines and etc.)

Radioactive materials

Locations of inflammable materials

2 DESCRIPTIONS FOR SANCH AND INSTALLATION

2.1 OPERATION ENVIRONMENT

Since operation environment can directly influence functions and operation life, to ensure proper performance and long operation, follow the recommendations below when choosing allocation for installing the inverter. Make sure it is protected from the following:

Extreme cold and heat.

Use only with the ambient temperature range: -10℃ to +50℃ (+40℃ parallel installation)

Rain, moisture

Direct sunlight.(Avoid using outdoors)

Corrosion of oil sprays or salt

Corrosive fluid and methane

Dust or metallic particles in the air.

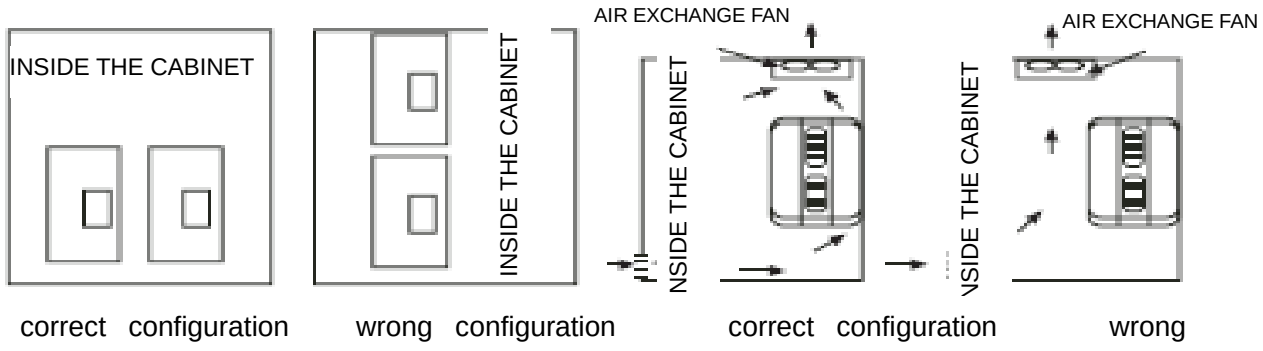
Radioactive materials and inflammable materials

Electromagnetic interference (Avoid using together with welding machine or dynamic machines.)

Vibration.

(If inverter must be used in this environment, an anti vibration pad is necessary).

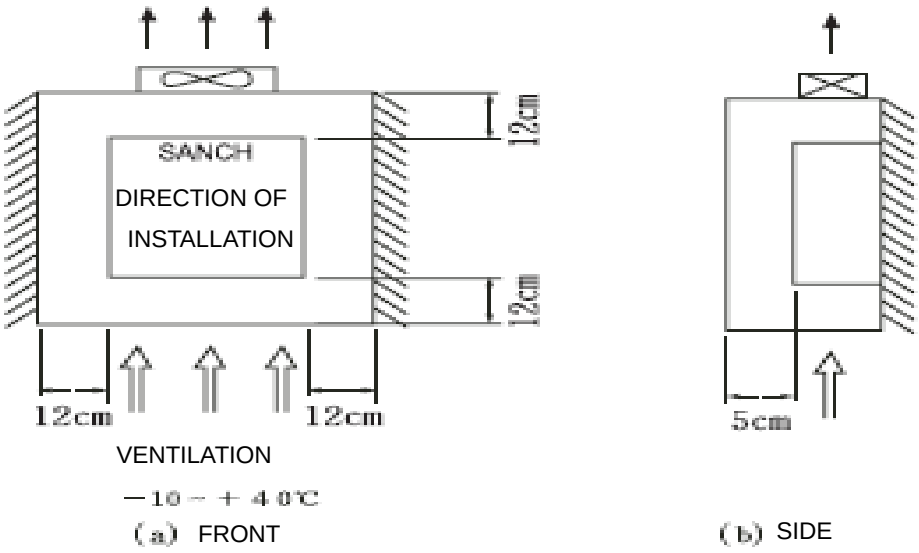
Attention shall be attached to clearance of inverters allocated closely. A fan shall be installed to make sure temperature is lower than 50℃



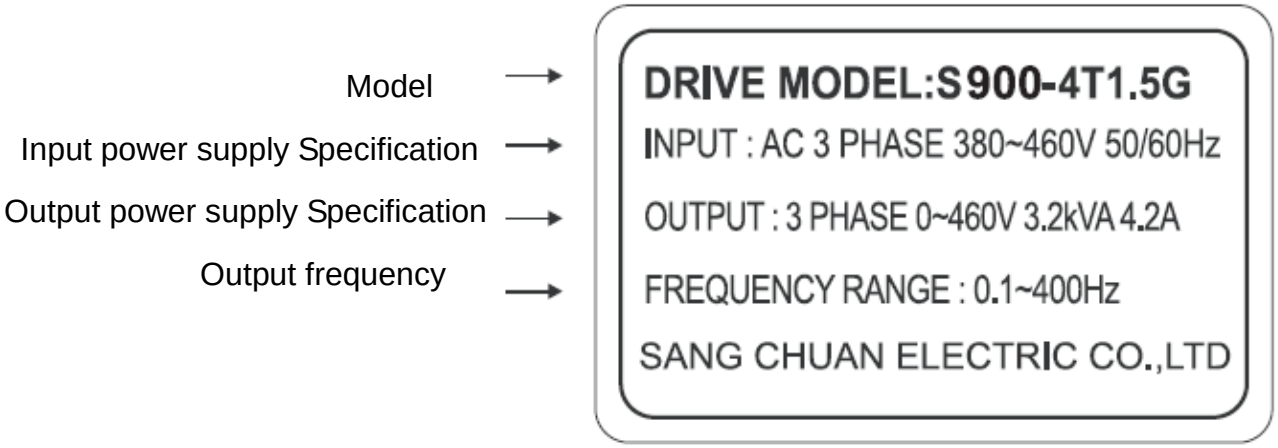
correct configuration wrong configuration correct configuration wrong

For cooling off, face shall be toward front and upper parts shall be upwards.

Clearance shall meet the following specifications:



2.2 MODEL DESCRIPTION



S 900 - 4T 1.5 G

SANCH

PRODUCT SERIES

2T:220V SINGLE PHASE

4T:440V THREE PHSES

0.2:0.2KW
0.4:0.4KW
0.75:0.75KW
1.5:1.5KW
2.2:2.2KW
3.7:3.7KW

G: CONSTANT TORQUE LOAD (FOR GENERAL USE)

P: Variable torque load

2.3 PRODUCT SPECIFICATION

Individual Specification

■220V Signal phase Series

Model number S900-2s□□□G		0.2	0.4	0.75	1.5	2.2
Output	Max applicable motor output power(kW)	0.2	0.4	0.75	1.5	2.2
	Max applicable motor output power(HP)	0.25	0.5	1	2	3
	Output rated capacity(kVA)	0.6	1.0	1.9	2.5	4.2
	Output rated current (A)	1.6	2.5	4.2	7.5	11
	Output frequency range	0.1~400Hz				
	Over load capacity	150% of rated output current and run for 60sec.				
	Max output voltage	Correspond to input power supply				
Input	Phase number. Voltage. Frequency	Single phase. 200 to 240V. 50/60Hz				
	Allowable variation range for Voltage. Frequency	Voltage: ±10%, Frequency: ±5%				
	Input current (A)	4.9	6.5	10	17.5	27
Cooling System		Natural air cooling		Forced air cooling		

■440V Three phase Series

Model number S900-4T□□□G		0.4	0.75	1.5	2.5	3.7
Output	Max applicable motor output power(kW)	0.4	0.75	1.5	2.5	3.7
	Max applicable motor output power(HP)	0.5	1	2	3	5
	Output rated capacity(kVA)	1.2	2.3	3.2	4.2	6.3
	Output rated current (A)	1.5	2.5	4.2	5.5	8.2
	Output frequency range	0.1~400Hz				
	Over load capacity	150% of rated output current and run for 60sec.				
	Max output voltage	Correspond to input power supply				
Input	Phase number. Voltage. Frequency	Three phase. 380 to 460V. 50/60Hz				
	Allowable variation range for Voltage. Frequency	Voltage: ±10%, Frequency: ±5%				
	Input current (A)	1.9	3.5	6.0	7.2	9.0
Cooling System		Natural air cooling		Forced air cooling		

Individual Specification

■Standard Specification

Controlling Characteristics	Control mode		Adopting SVPWM or SPWM modulating techniques
	Output frequency range		0.01~400.0Hz
	Frequency setting analyzing degree		0.1Hz
	Output frequency analyzing degree		0.1Hz
	PWM load wave frequency		Available to modulate from 2 to 12kHz.
	Torque increase		Auto torque-increase and auto slip compensation, at 5Hz the starting torque can reach 150% of rated torque.
	Jog frequency		3 points can be set from 0.1 to 400.0Hz
	Acceleration/deceleration time		0.1 to 600.0seconds. (2 steps of accel/decel time can be set separately.)
	Stall Prevention Level		According to the load characteristics of motor, it's available to be set as 50 to 200% of rated current of the drive
	DC braking		Available to be operated from 0.1 to 60.0Hz from STOP, braking current 0 to 100% of the rated current. Starting time 0 to 60.0 sec. Stopping time 0 to 60.0 sec.
	V/F curve		V/F curve available to be set
Operation Characteristics	Frequency setting signal	Digital Operator	Set by UP and DOWN
		External information	Potentiometer 5KΩ, 0-10VDC, multi-function input choosing3-5 (7 velocities: jog-on, up/down command), serial communication (RS-485)
	Running operating signal	Digital Operator	Available to be operated by RUN, STOP and JOG keys.
		External terminals	2 wire style (Fwd/Stop, Rev/Stop, Run/Stop and Fwd/Rev)/ 3 wire operation, JOG running, Serial Communication Board(RS-485)
	Intelligent Input Terminal		Switching of 7 step pre-set available speed; Switching of First/Second acceleration/deceleration time; prohibiting acceleration/deceleration and external interrupt input; Jog running UP/DOWN frequency terminal setting; Count terminals
	Intelligent Output Terminal		During running, frequency agreement output, non-zero count agreement output, over torque output, external interrupt reference, low voltage detection, operation mode reference, fault output and external fault interruption.
	Analog signal output		Corresponding to output current, output frequency 1(before slip ratio compensation), output frequency 2(after slip ratio compensation), output voltage, consumed power, DC bus voltage
Built-in Function			Setting max/min output frequency; momentary power off restarting; fault restarting; setting of S curve acceleration/deceleration time; auto-voltage stabilizing output modulation; digital frequency output signal; fault records; parameters locking; reset to factory setting; inhibiting reverse run; over current stalling prevention, over voltage stalling prevention, electrical thermal relay.
Protection Function			Over current; over voltage, low voltage;' external fault interruption input; motor over load; over load of the drive and drive overheating
Digital operator			Consisting of 6 functional keys, 7 step LED in 4 digits; 4 status LED indicators. Available to set frequency, display actual output frequency, output current, self-determined unit parameter overview of users, modify settings and for parameter locking, fault displaying. Available to perform running, stop, reset, fwd/rev run and jog run.
environment	Operational Environment temperature		-10℃ to +50℃ (+40℃ parallel installation, no condensation, no freezing)
	Storing temperature		-20℃ to +60℃
	Operational Environment dampness		Below 90%RH without moister
	Installation height		Lower than 1000m, without corrosive gas, fluid and dust.

SANCH ELECTRIC shall not be responsible for faults due to the following:

(1) Absence or inapplicable or over large non fuse breakers was put between the power supply and the inverter, which results in the inverter fault.

(2) Magnetic contactors or advance capacitor or Surge Absorber were connected in series between the inverter and motor.

- A three phase Squirrel-cage induction motor which corresponds with the capacity of the inverter shall be adopted.
- If more than one motors were driven simultaneously by one inverter, the current of these motors when running shall below capacity of the inverter. And each motor shall be prepared with a thermal relay in appropriate capacity.
- Phase advance capacitors and other capacity elements such as LC or RC shall not be fixed between the inverter and motor.

2.4 List of applicable no-fuse breaker

Type S900-2S single-phase series	Suitable power of motor (kW)	Rated current of breaker (A)	Main return circuit				Control circuit (mm^2)
			Input wire	Positive and negative bus	Output wire	Grounding wire	Control terminal wire
S900-2S0.2G	0.2	10	1	1	1	2	1
S900-2S0.4G	0.4	15	1.5	1	1	2	1
S900-2S0.75G	0.75	20	2.5	1	1	2	1
S900-2S1.5G	1.5	40	4	1.5	2.5	2	1
S900-2S2.2G	2.2	50	5.5	1.5	2.5	2	1

Type S900-4T three-phase series	Suitable power of motor (kW)	Rated current of breaker (A)	Main return circuit				Control circuit (mm^2)
			Input wire	Positive and negative bus	Output wire	Grounding wire	Control terminal wire
S900-4T0.4G	0.4	5	1	1	1	2	1
S900-4T0.75G	0.75	10	1	1	1	2	1
S900-4T1.5G	1.5	15	1.5	1	1.5	2	1
S900-4T2.2G	2.2	15	1.5	1.5	1.5	2	1
S900-4T3.7G	3.7	20	2.5	1.5	2.5	2	1

2.5 Application and description for ambient equipments

Power supply:

Power supply:

- Make sure voltage class is correct, otherwise inverter may be damaged.
- A no fuse breaker (air circuit breaker) shall be provided between AC supply and inverter.

No fuse Breaker

No fuse Breaker:

- Circuit breaker which complies with rated voltage and current of inverter shall be applied as ON/OFF control for inverter. And it shall also be protective to the inverter.
- Never use circuit breaker as ON/OFF switch for inverter.

Magnetic Contactor

Leakage Breaker

- A leakage breaker shall be installed to prevent mal-functioning and to ensure the safety of operators; To prevent the mal functions, those of which the sensitivity current above 200mA and action time above 0.1 sec shall be applied.

Power Improving AC Electric Reactor

Magnetic Contactor

- Inverters can be used without a magnetic contactor (MC) installed at the power supply side. However, when used for external control or automatically restart after power off, or when braking control is used, a magnetic contactor shall be applied.
- Do not use the magnetic contactor as RUN/STOP switch for inverter.

Input side Noise Filter

Power Improving AC Electric Reactor

- When the output capacity is greater than 500KVA or enter-wire electricity capacity acts, the instant jump of voltage or current will be produced, resulting to damage the internal circuit. So it is recommended that an AC electric reactor is installed additionally to improve function factors and decrease the power harmonic. The wiring distance is within 10m.

S900 Inverter

Input side Noise Filter

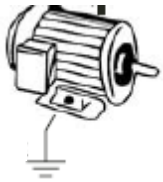
- The Input side Noise Filter must be applied if inverter has electronic induction load around.

Zero Phase Noise Filter

Inverter

- Input Power supply terminals R/L1, S/L2 and T/L3 can be connected without phase sequence.
- Connect output terminals U/T1, V/T2 and W/T3 to U/T1, V/T2 and W/T3.of motors, if the inverter is in forward run reference, while motor reverse runs, change any two of U/T1, V/T2 or W/T3
- Never connect U, V, W to AC Power supply otherwise inverter may be damaged.
- Grounding terminals shall be grounded correctly. Category Ⅲ Grounding: below 100Ω
  Special grounding: below 10Ω.

Three Phase Squirrel Cage Motor



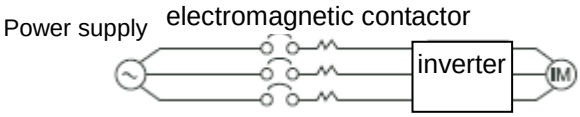
Zero Phase Noise Filter

- If specialized noise filters are fit at inverter output side, radiation interference and induction noise shall be decreased.

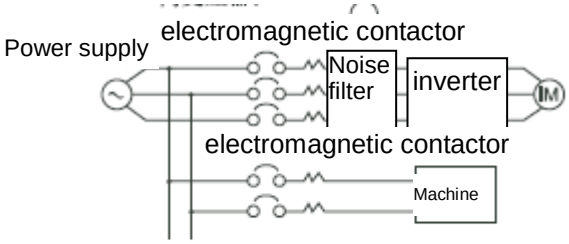
Wiring shall be checked whether correct or not. Peripheral wiring shall fulfill the following requirements. (Do not use a buzzer of control circuit to check wiring)

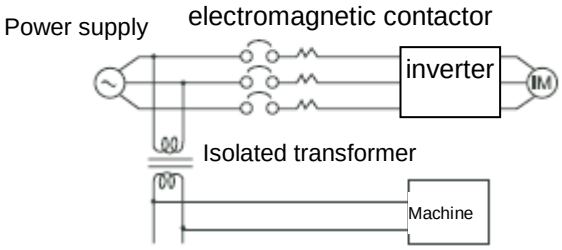
(A) Wiring for control circuit Power supply must be isolated or far from other high voltage wirings or high current power lines, thus electromagnetic interference can be avoided. See diagrams below:

- Individual power supply bridge for inverter

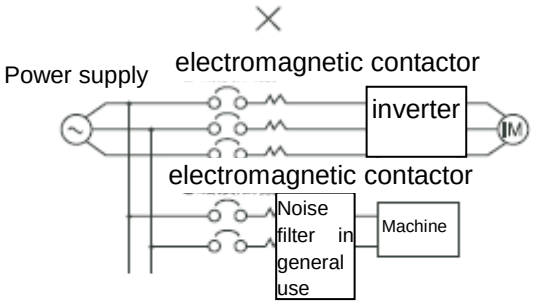


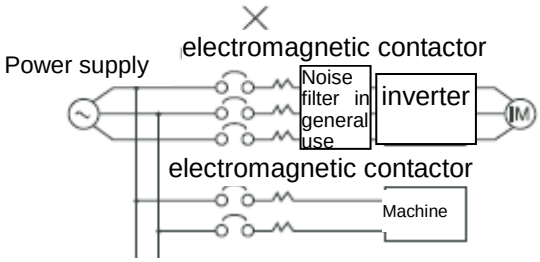
- If inverter power supply circuit is used commonly with other machines, inverter-specialized noise filter or isolating transformer shall be added.



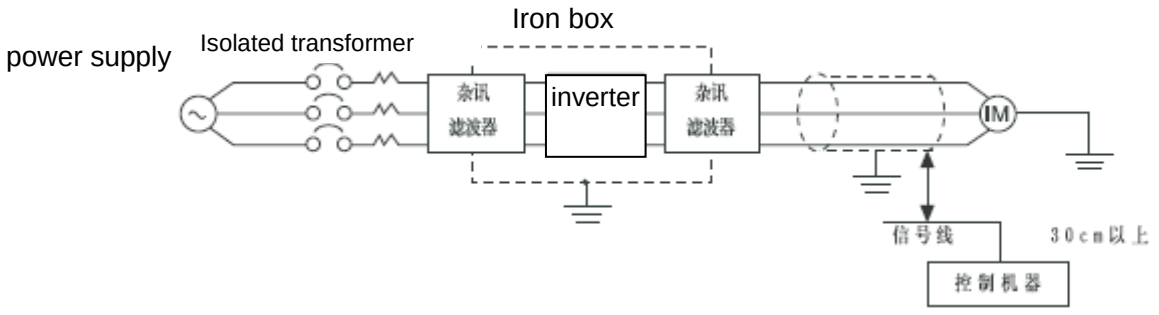


- Good effect may not be received if general use noise filters are applied





- Interference during transmission can be prohibited by adding an inverter-specialized noise filter at main circuit output side. For preventing electromagnetic radiation, a metal tube shall be installed, and distance from signal wiring of other control machines shall be 30cm at least.



杂讯滤波器 Noise filter　信号线 Signal wire　控制机器 Control device
30cm 以上 30cm above

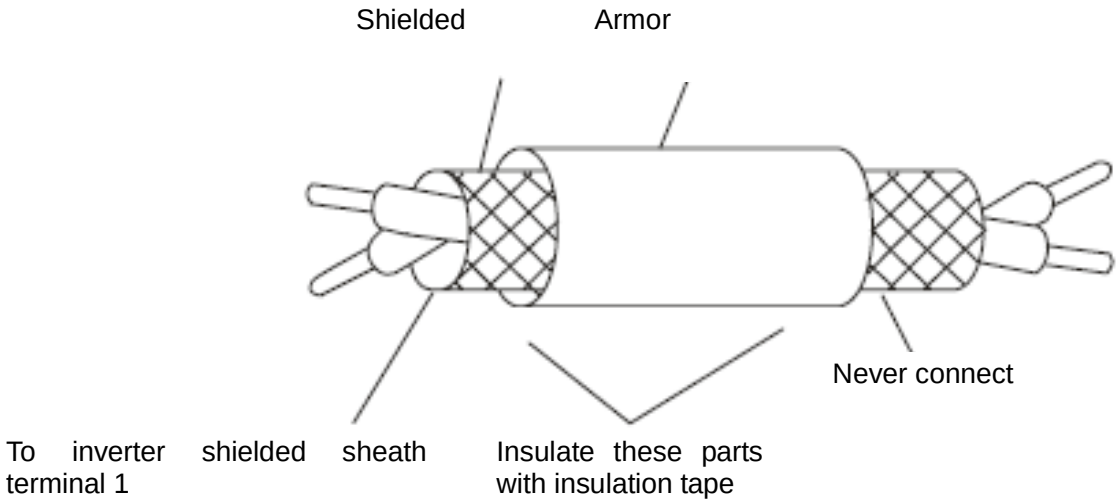
- Voltage drop of wiring shall be considered providing that inverter and motor are with an excessive distance. Voltage drop (V) =$3^{1/2}$× wiring resistance (Ω/km) × wire length (m) × current(A) × 10^{-3}, load wave frequency shall be modified according to wiring prepared.

Distance between inverter and motor wiring	Below 50M	Below 100M	Above 100M
Allowable load wave no.	Below 12kHz	Below 9kHz	Below 6kHz
Set value for parameter 2-09	12	9	6

(B) Wiring for control circuit shall be isolated or far from main circuit wiring or other high voltage/current power lines, thus electromagnetic interference shall be avoided.

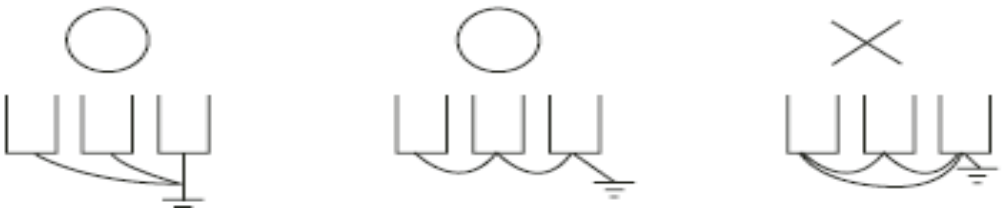
- For preventing electromagnetic interference and false sequence, shielding wiring shall be used for control circuit. Shielding wiring shall connect grounding terminals.

Distance for wiring shall be 50m or less.



(C) Grounding terminal for inverters shall be grounded properly. Below 100Ω: Category III; Below 10Ω: Special

- AWG shall be taken as standard for ground wire. Ground wire shall be as short as possible.
- Never ground simultaneously for Inverter ground wire with other large current load (such as welding machine or large Power motors). They shall be grounded separately.
- Ground circuit shall be avoided when several inverters are grounded simultaneously.



(a) CORRECT (b) CORRECT (c) FAULSE

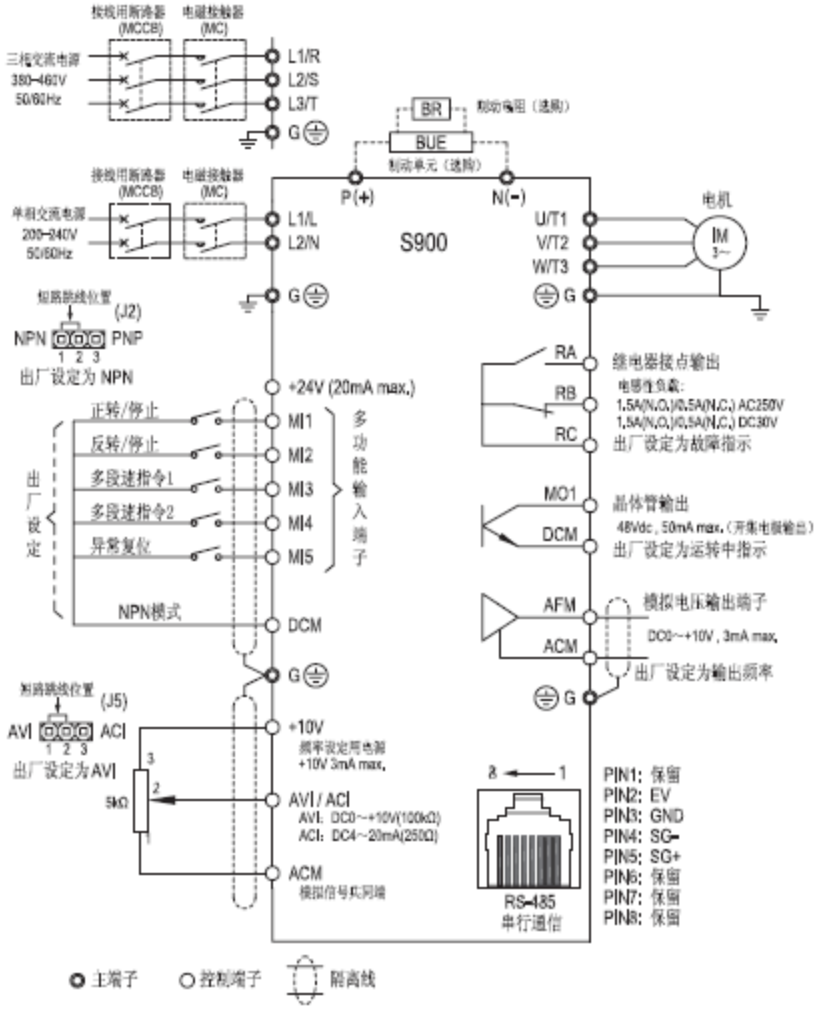
(D) Cable line width for main circuit and control circuit shall be selected according to power line standard.

(E) After completing of grounding and wiring, check for the following items: wiring is proper; wire is not broken and screws are securely tightened.

2.6 Basic Wiring Diagram

Wiring of AC motor drive can be divided into two parts, the main circuit and control circuit. Users must connect terminals as diagram shows.

The following diagram is the standard wiring diagram of S900 series AC motor driver.



以上图片翻译为,中英文对照：

三相交流电源：three-phase AC power supply
接线用断路器：wiring with breaker
电磁接触器：electromagnetic connector
制动电阻（选购）： braking resistance （optional）
制动单元（选购）：braking Unit （optional）
单相交流电源：single-phase AC power supply
电机：motor
短路跳线位置：short circuit jumper position
出厂设定为 NPN： factory setting NPN
出厂设定： factory setting
正转/停止：Fwd run/Stop
反转/停止：Rev run / Stop
多段速指令 1：multi-velocity command 1
多段速指令 2：multi-velocity command 1
异常复位：abnormal reset
NPN 模式：NPN mode
多功能输入端子：multi-function input terminal
继电器接点输出：relay joint output
电感性负载：inductive load
出厂设定为故障指示：factory setting is fault indication
晶体管输出：transistor output
出厂设定为运转中指示; factory setting is indication in operation.
模拟电压输出端子：analog voltage output terminal
出厂设定为输出频率：factory setting is output frequency
出厂设定为 AVI： factory setting AVI
频率设定用电源：set frequency by power supply
模拟信号共同端：analog signal joint terminal
串行通信; serial communication
保留：reserved
主端子：main terminal
控制端子： control terminal
隔离线：shielding wire

Note: RS-485 may damage the terminal of connector side. So the terminal configuration has to be confirmed before connection. The used signal wire can be cut if necessarily.

Description for S900 Series inverter terminals

Main circuit terminal descriptions

Terminal symbols	Function
L1/R,L2/S,L3/T	Main circuit AC power supply input(For single phase input, connect to L1/L and L2/N)
U/T,V/T2,W/T3	Connect to motor
P/(+),N(-)	Connecting to braking module
G ⏚	For grounding(High voltage wave impact and noise interference shall be avoided.)

Terminal Symbol Description

Terminal symbols	Function of Terminal	Specification
RA-RC	Multifunctional reference signal output contactor	See Description 3-05 for RELAY CONTACTOR OUTPUT
RB-RC	Multifunctional reference signal output contactor	
MI1-DCM	Rev run/ Stop	See Description 4-05-4-08
MI2-DCM	Fwd run/ Stop	
MI3-DCM	Multifunctional input option 1	
MI4-DCM	Multifunctional input option 2	
MI5-DCM	Abnormal reset	
MO1-MCM	Multifunctional output terminal	See description of 3-09 and 3-10 (Open collector output)
+10V-ACM	Power supply for speed setting	Speed reference power supply (+10V)
AVI/ ACI -ACM	Analog voltage frequency reference	0 to +10V/4~20ma Max output frequency
AFM-ACM	Analog frequency/ current meter	0 to +10V/Max output frequency
RS-485 serial communication	Serial connected communication board	RS-485 Serial connected communication connector
+24V-DCM	Assisted control power supply	DC 20V-26V (20Ma Max)

Pay attention to insulate the control signal wire with insulation tape.

Note: RS-485 may damage the terminal of connector side. So the terminal configuration has to be confirmed before connection. The used signal wire can be cut if necessarily.

2.7 DIAGRAM FOR PRODUCT OUTLINE

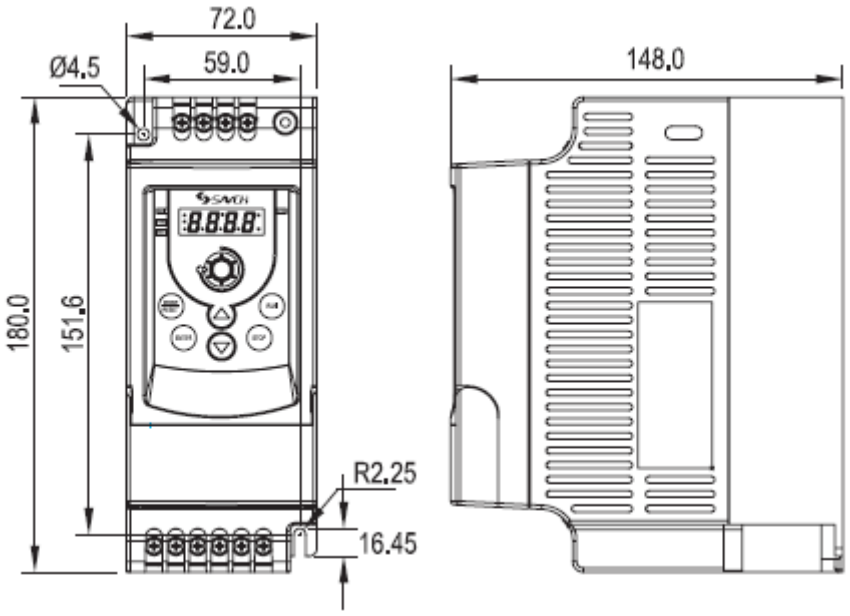


Figure 7-1 Dimension and installation size of
S900-2S0.2G~0.75G/S900-4T0.4G -1.5G (unit: mm)

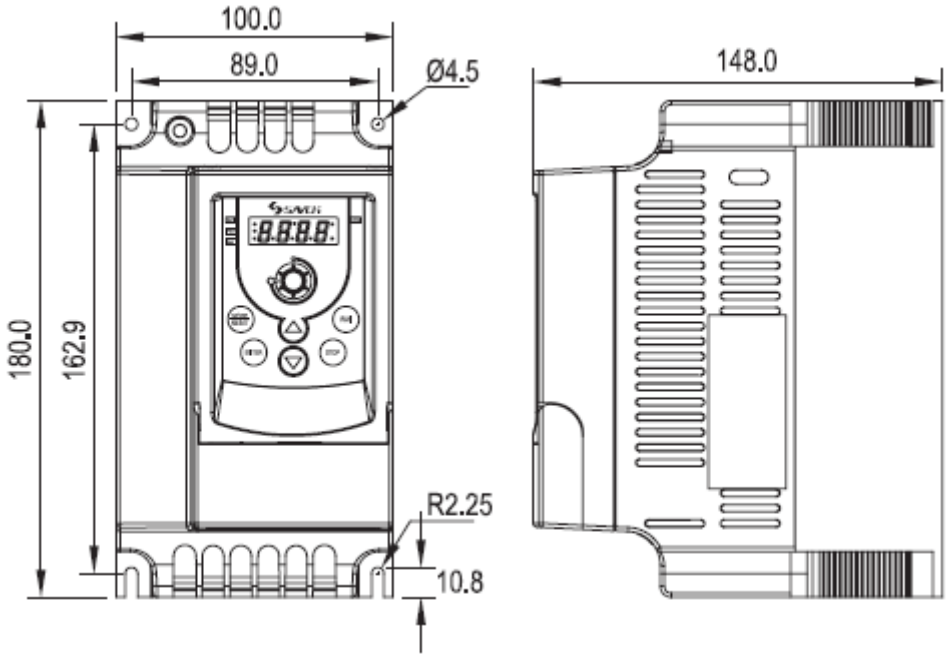
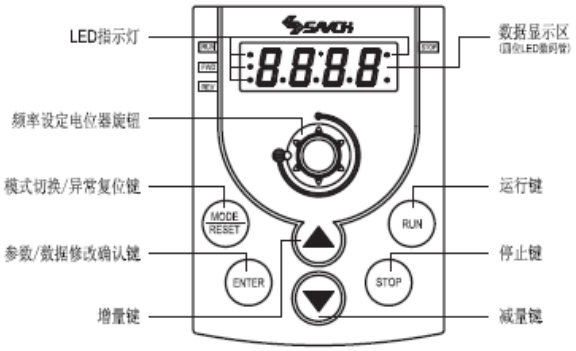


Figure 7-2 Dimension and installation size of
S900-2S1.5G~2.2G/S900-4T2.2G -3.7G (unit: mm)

3 DESCRIPTION OF OPERATORS

3.1 DESCRIPTION FOR DIGITAL OPERATOR

The digital operator has two spaces: display space and operating space. Parameters setting and different operation states shall be displayed on the display space, while for the operating space, it is an interface for communication of the operators and AC motor drive.



左侧依次为：
LED 指示灯 LED indicator light
频率设定电位器旋钮 potentiometer knob for frequency setting
模式切换/异常复位键 mode switch / fault reset key
参数/数据修改确认键 confirm key for parameter/data modify
增量键 increment key

右侧依次为：
数据显示区 data display space
(四位 LED 数码管)(LED four-digital tube)
运行键 Operation key
停止键 STOP key
减量键 decrease key

MODE/RESET

In normal operation mode, various states information of the AC motor drive, such as frequency reference and input current, shall be displayed by depressing this key; in various operative modes of the parameter setting, the machine shall reset by depressing this key; Press this key to reset the error when error occurs

ENTER

After selecting appropriate operation or program mode, i.e. parameters must be replaced (This key shall be available regardless the AC motor drive is in operation or stop), program mode shall be realized by depressing this key; as an ENTER key for parameter setting, if this key is depressed in program mode, modified parameters shall be taken into memory by the system.

RUN

To start operation (Pressing this key is invalid when set as external terminal control)

STOP

To stop operation

UP/DOWN

For modifying data or parameter programs

If depressing this key for long time, for a short time then released, all modified parameters shall be alternated step by step;

If depressed it for a long time and not released, all modified parameters shall alternate quickly.

Description of indicator light

RUN operation indicator light: it will light on when the inverter is in operation state.

STOP stop indicator light:: it will light on when the inverter is in stop state.

FWD forward indicator light: it will light on when the rotating direction of inverter is forward.

REV reverse indicator light: it will light on when the rotating direction of inverter is reversal.

Note: In the following several states, indicator lights are combined to indicate the inverter state.

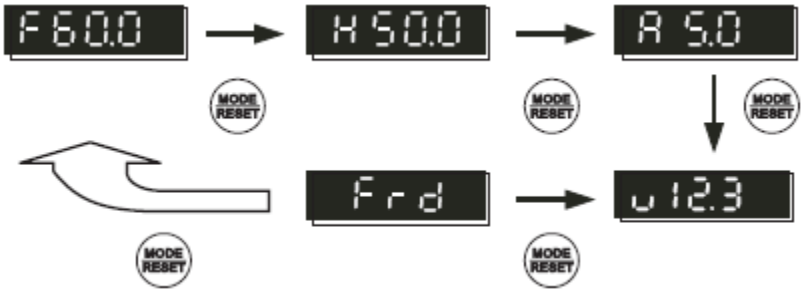
- set the inverter to operate, RUN indicator light is on and STOP flickers when the output frequency is 0.
- set the inverter to stop, RUN indicator light flickers and STOP is on when the output frequency hasn't decreased to 0.
- If it is necessary to set the inverter to do the reverse operation when it is in forward operation state, stop the forward operation first, then start the reverse operation. The FWD indicator light flickers and REV is on before the forward rotating stops.
- If it is necessary to set the inverter to do the forward operation when it is in reverse operation state, stop the reverse operation first, then start the forward operation. The FWD indicator light is on and REV flickers before the reverse rotating stops.

Descriptions of Functional Displaying Project

Display Project	Description
	Showing the current set frequency of AC motor drive.
	Displaying actual frequency output from AC motor drive to motor
	Displaying physical quantity(U) defined by users (U=H×0.05)
	Displaying count value(C) of internal counter
	Displaying output current of U/T1, V/T2 and W/T3 at output side of the AC motor drive
	Displaying parameter project. Content of this parameter shall be displayed by depressing ENTER .
	Displaying parameter content value. Modified materials shall be stored by depressing. ENTER
	If END information (as diagram left shows) lasts for about 1 sec, it means that data has been received and memorized automatically. If data needs modifying, it shall be completed by acting directly with UP / DOWN and depress ENTER key again.
	This interface will be displayed when setting parameters are not received.

3.2 DESCRIPTION OF KEYBOARD OPERATION

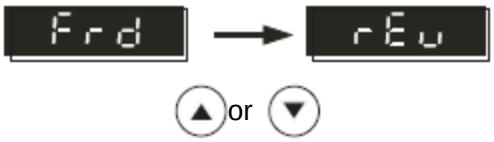
Scenes Selection



Configuration Setup

Data Modification

Steering Setup

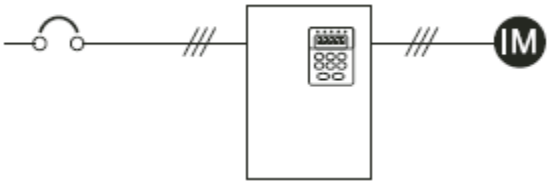


3.3 PRELIMINARY OPERATION-NOT CONNECTING WITH MOTOR

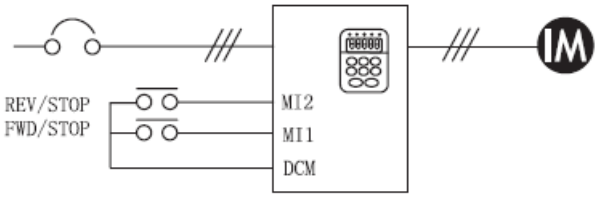
- Prior to connecting power supply with AC motor drive, check and make sure that AC power supply voltage is within input voltage range of the drive.
- Connect power supply to L1/R,L2/S and L3/T input terminals of the AC motor drive.
- Operation mode control selection

The operation mode can be divided into the following categories:

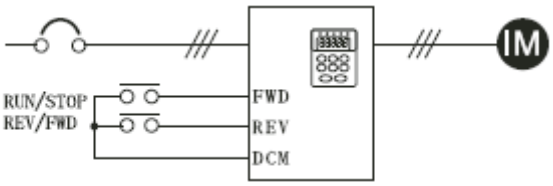
☐ operation command is controlled by keyboard.
(2-03=d0) (Factory setting)



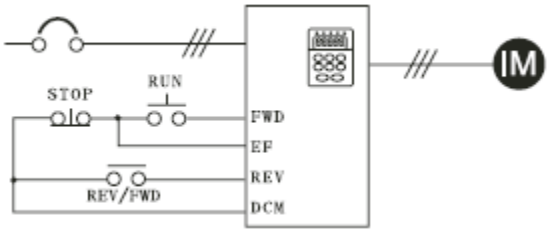
☐ Operation command is controlled by external terminals, STOP key on keyboard is valid.
Two line operation control, “FWD/STOP” and “REV/STOP”
(2-03=d1, 4-04=d1)



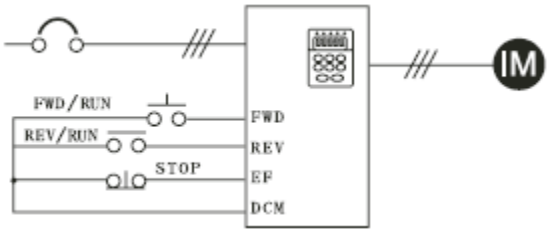
☐ Operation command is controlled by external terminals, STOP key on keyboard is valid.
Two line operation control, “FWD / REV” and “OPERATION/STOP” control configuration.
(2-03=d1, 4-04=d2)



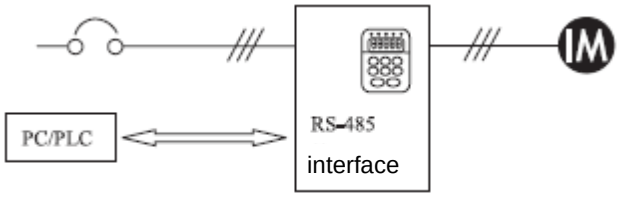
☐ Three line operation control mode Configuration 1
(2-03=d1, 4-04=d3)



☐ Three line operation control mode Configuration 2
(2-03=d1, 4-04=d3)



☐ operation command is controlled communication
(2-03=d3/d4 [STOP key valid/invalid])



4 LIST OF DESCRIPTIONS FOR FUNCTIONAL PARAMETERS

0	User's parameter		↗ set during running available	
	Parameter	Parameter functions	Setting range	Factory setting
	0-00	Machine Model Recognition (Only for Reading)	1:220V/0.2KW	Factory setting
			2:220V/0.4KW	
			3:220V/0.75KW	
			4: 220V/1.5KW	
			5: 220V/2.2KW	
			6~9: Reserved	
			10:440V/0.4KW	
			11:440V/0.75KW	
			12:440V /1.5KW	
			13:440V/2.2KW	
			14:440V/3.7KW	
	0-01	Rated Current Display for AC Motor Drive (Only for Reading)	220V/0.2KW:1.6A	Factory setting
			220V/0.4KW:2.5A	
			220V/0.75KW:4.2A	
			220V/1.5KW:7.5A	
			220V/2.2KW:11.0A	
			440V/0.4KW:1.5KW	
			440V/0.75KW:2.5KW	
			440V/1.5KW:4.2KW	
			440V/2.2KW:5.5A	
			440V/3.7KW:8.2A	
	0-02	Parameter Reset	**0~20：no function**	**0**
			10: Parameter reset to factory setting	
↗	0-03	Machine ON Display Selection	0: F(Display set frequency reference)	0
			1: H(Display actual running frequency)	
			2: U (Display multi-function determination)	
			3: A(Display motor running current)	
↗	0-04	Determining multifunctional display	0: Displaying output physical quantity(u) defined by operators	0
			1: Displaying count value (c)	
			2: Displaying program operation content (X=tt)	
			3: Displaying DC-BUS voltage(U)	
			4: Displaying output voltage (E)	
			5: Displaying rotating speed(r)	
			6: output frequency 2 (after slip compensation) (h)	
			7: consumed power (p)	
↗	0-05	Proportional constant setting	0.1~160	1.0
	0-06	Software Version	Only for reading	#.#
	0-07	Input parameter locking code	0~999	0
↗	0-08	Setting parameter locking code	0~999	0
↗	0-09	Reserved		

1 Basic Parameters			Set during running available	
	Parameter	Parameter functions	Setting range	Factory setting
	1-00	Max operation frequency setting	5.0~400Hz	50.0
	1-01	Max voltage frequency setting	10.0~400.0Hz	50.0
	1-02	Max output voltage setting	220V:2.0~255.0V	220
			440V:2.0~510V	440
	1-03	Intermediate frequency setting	0.1~400Hz	1.0
	1-04	Intermediate voltage setting*	220V:2.0~255V	12.0
			440V:2.0~510V	24.0
	1-05	Min output frequency setting	0.1~60.0Hz	1.0
	1-06	Min output voltage settubg*	220V:2.0~255V	12.0
			440V:2.0~510V	24.0
	1-07	Max frequency of output frequency	1~110%	100
	1-08	Min frequency of output frequency	0~100%	0
✓	1-09	1st Acceleration time	0.01~600s	10.00
✓	1-10	1st Deceleration time	0.01~600s	10.00
✓	1-11	2nd acceleration time	0.01~600s	10.00
✓	1-12	2nd deceleration time	0.01~600s	10.00
✓	1-13	JOG acceleration time setting	0.01~600s	10.00
✓	1-14	JOG deceleration time setting	0.01~600s	10.00
✓	1-15	JOG frequency setting	1.0~400Hz	6.0
	1-16	Reserved		
	1-17	Reserved		
	1-18	Reserved		
	1-19	V/f curve setting	0~6	0

2 Operation mode parameters			Set during running available	
	Parameter	Parameter functions	Setting range	Factory setting
	2-00	Master frequency input source	0: Keyboard(OP) input	3
			1: Input DC 0 to 10V by external terminals AVI	
			2: Input 4 to 20Ma by external terminals ACI	
			3: controlled by VR on digital controller	
			4:Operated by RS-485 communication interface	
			5:Operated by RS-485 communication interface(Frequency memory)	
			6:Controlled by UP/DOWN	
			7:Controlled by UP/DOWN (Frequency memory)	
			8: Reserved	

2 Operation mode parameters				Set during running available
	Parameter	Parameter functions	Setting range	Factory setting
	2-01	Auxiliary frequency input source	0: Keyboard(OP) input	0
			1: Input DC 0 to 10V by external terminals AVI	
			2: Input 4 to 20Ma by external terminals ACI	
			3: controlled by VR on digital controller	
			4: reserved	
			5: reserved	
			6: Controlled by UP/DOWN	
			7:Controlled by UP/DOWN (Frequency memory)	
			8:reserved	
	2-02	Combination way of frequency sources	0: Master frequency	0
			1: Master frequency + Auxiliary frequency	
			2: Master frequency - Auxiliary frequency	
	2-03	Operation Reference Source	0: Operated by keyboard	0
			1: Operated by external terminals. STOP on keyboard available	
			2: Operated by external terminals. STOP on keyboard unavailable	
			3: Operated by Communication Interface RS-485. STOP on keyboard available	
			4: Operated by Communication Interface RS-485. STOP on keyboard unavailable	
	2-04	STOP mode *	0: Deceleration and stop	0
			1: Coast to a stop	
	2-05	Reserved		
	2-06	External fault EF stop mode	0: Reserved	1
			1: EF free running to stop	
	2-07	AVI Zeroing stop mode	0: AVI Zeroing braking to stop	2
			1: AVI Zeroing free running to stop	
			2: AVI Zeroing braking to stop and running signals are reserved.	
	2-08	Reserved		
	2-09	PWM load wave frequency setting	2.0~12.0khz	6.0
	2-10	Operation direction inhibition setting	0: Fwd/rev run available	0
			1: Reverse run inhibited	
			2: Fwd run inhibited	
	2-11	ACI(4 to 20mA) broken line treatment	0: Non-treatment to ACI broken line	0
			1: Free operation stops when ACI line broken	
			2: Braking to stop displaying EF when ACI line broken	
			3: Run in final set frequency when ACI line broken	
	2-12	Power supply starting operation locking	0: Operation available	0
			1: Operation unavailable	
	2-13~2-14	reserved		

Notes:

1) In 2-00 and 2-01, when 2-00 has been set as 1(AVI) or 2(ACI), 2-01 can't be set as 1 or 2 again.

2) In 2-00 and 2-01, when 2-00 has been set as 6 or 7 (controlled by UP/DOWN), 2-01 can't be set as 6 or 7 again.

3) The parameter of 2-07 is valid only when the frequency is given by analog input AVI and input set 0. If the frequency is given by AVI, but press the STOP key, the inverter will stop still according to the mode of 2-04.

3 Output Function Parameters			Set during running available	
	Parameter	Parameter functions	Setting range	Factory setting
	3-00	Random frequency agreement setting	1.0~400Hz	1.0
	3-01	Count value agreement setting	0~999	0
	3-02	Appointed count agreement setting	0~999	0
	3-03	Fwd run reference delay setting	0.0~60.0s	0.0
	3-04	Rev run reference delay setting	0.0~60.0s	0.0
	3-05	Multifunctional output contactor indication Normally Open Contactor(RA-RC) Normally Closed Contactor(RB-RC)	0: No function	8
			1: Reference during running	
			2: Set frequency agreement reference	
			3: Reference during zero speed	
			4: Over-torque detection reference	
			5: Reference during BB	
			6. Low voltage detection reference	
			7:Motor drive operation mode reference	
			8: Fault reference	
			9:Random frequency agreement reference	
			10:Reference during program auto-running	
			11.Reference of step running completion.	
			12.Reference of program running completion.	
			13: Program running pause	
			14: Set count agreement	
			15: Appointed count agreement	
			16: Driver preparation completion	
			17: Fwd run direction reference	
			18: Rev run direction reference	
			19: Fwd/ Rev run direction reference	
	3-06	Analog output setting	0:output frequency 1 (before slip compensation)	0
			1:output frequency 2 (after slip compensation)	
			2:Analog current meter(0 to 250% of rated current)	
			3: output voltage	
			4: DC bus voltage	
			5: consumed power	
	3-07	Reserved		
	3-08	Analog output gain selection	1-200%	100

3 Output Function Parameters				Set during running available
	Parameter	Parameter functions	Setting range	Factory setting
	3-09	Multifunctional Output Terminal 1(MO1)	0: no function	1
			1: Reference during operation	
			2:Reference for set frequency agreement	
			3: Zero-speed reference	
			4: Over torque detection reference	
			5: Reference during BB	
			6: Reference for low voltage detection	
			7: AC Motor driver operation mode	
			8: Fault reference	
			9: Any frequency reaching indication	
			10: automatic operation indication	
			11: stage one operation finished	
			12: automatic operation finished	
			13: automatic operation pause	
			14: reach setting counting	
			15: reach specified counting	
			16: driver preparation finished	
			17: forward direction indication	
			18: reverse direction indication	
			19: forward/reverse direction indication	
	3-10	Reserved		
	3-11	Dead time setting of forward and reverse	0.0-600 s	0.0
	3-12	Cooling fan control	0: fan continuous running	0
			1: run for 1 minute after pressing stop key	
			2: operate/stop along with diver	
✓	3-13	Min. AVI input voltage	0.0~10.0V	0.00
✓	3-14	Min. AVI input voltage corresponding frequency	0.0~100%Fmax	0.0
✓	3-15	Max. AVI input voltage	0.0~10.0V	10.0
✓	3-16	Max. AVI input voltage corresponding frequency	0.0~100%Fmax	100
✓	3-17	Min. ACI input current	0.0~20.0mA	4.0
✓	3-18	Min. ACI input current corresponding frequency	0.0~100%Fmax	0.0
✓	3-19	Max. ACI input current	0.0~20.0mA	20.0
✓	3-20	Max. ACI input current corresponding frequency	0.0~100%Fmax	100
	3-21	reserved		
	3-22	reserved		

4 Input Function Parameters				Set during running available
	Parameter	Parameter functions	Setting range	Factory setting
↗	4-00	VR Analogue input frequency deviation	0.0-350Hz	0.0
↗	4-01	VR Deviation adjustment direction	0: positive direction 1: negative direction	0
↗	4-02	VR Input frequency increase	1-200%	100
	4-03	VR Negative pressure operation setting	0: no negative bias	0
			1: reversible negative bias	
			2: not reversible negative bias	
	4-04	Multifunctional input Option 1(MI1) (Setting range from d0 to d31)*	0: No function	1
			1: MI1: forward run/stop, MI2: reverse run/stop	
			2: MI1: run/stop, MI2: fwd/rev run	
			3: Three line operation control(1): MI1 run, MI2 fwd/rev run, MI3 STOP(Normally closed)	
			4:Three line operation control(2): MI1 run (Triggering), MI2 run(Triggering), MI3 STOP(Normally closed)	
	4-05	Multifunctional input Option 2(MI2) (Setting range d0, d5 to d31)	5: EF, normally open interface input (N.O)	0
			6: EF, normally closed interface input (N.C)	
			7: RESET reference	
			8: Multi-step speed Reference 1	
	4-06	Multifunctional input Option 3(MI3)(Setting range d0, d5 to d31)	9: Multi-step speed Reference 2	8
			10: Multi-step speed Reference 3	
			11: Reserved	
			12: frequency switch function	
	4-07	Multifunctional input Option 4(MI4)(Setting range d0, d5 to d31)	13: Accel/decel inhibition reference	9
			14: Switching of 1^{ST} and 2^{nd} Accel/Decel time	
			15: bb, normally open (NO) input	
			16: bb, normally closed(NC) input	
	4-08	Multifunctional input Option 5(MI5) (Setting range d0, d5 to d31)	17: UP COMMAND	7
			18: DOWN COMMAND	
			19: Auto-program operation performance	
			20: Auto-program operation pause	
			21: JOG frequency reference	
			22: Count reset	
			23: Reserved	
			24: JOG-FWD	
			25: JOG-REV	
			26: Reserved	
			27: Wobble frequency function input	
			28: Wobble frequency state reset	
			29: Inhibiting output (N.C)	
			30 :Inhibiting output (N.C)	
			31: counter trigger signal input	

4 Input Function Parameters			Set during running available	
	Parameter	Parameter functions	Setting range	Factory setting
	4-09	Speed tracking after b.b reset	0:Tracking downwards from speed before b.b	0
			1:Tracking upwards from min speed	
	4-10~4.22	Reserved		

Notes:

When 4-04 is set as 1~2, function set by MI2 is invalid. When 4-04 is set as 3～4, function set by MI2 and MI3 is invalid.

5 Multi-step Speed and Auto-Program Operation Parameters			Set during running available	
	Parameter	Parameter functions	Setting range	Factory setting
	5-00	1st Step Speed	0.0~400Hz	0.0
	5-01	2nd Step Speed	0.0~400Hz	0.0
	5-02	3rd Step Speed	0.0~400Hz	0.0
	5-03	4th Step Speed	0.0~400Hz	0.0
	5-04	5th Step Speed	0.0~400Hz	0.0
	5-05	6th Step Speed	0.0~400Hz	0.0
	5-06	7th Step Speed	0.0~400Hz	0.0
	5-07	Reserved		
	5-08	Reserved		
	5-09	Reserved		
	5-10	Reserved		
	5-11	Reserved		
	5-12	Reserved		
	5-13	Reserved		
	5-14	Reserved		
	5-15	Auto program Operation Mode	0. Auto operation mode cancelled	0
			1. Stop after auto operating for 1 cycle.	
			2. Auto operation perform in cycles	
			3. Stop after auto operating for 1 cycle (STOP intervals).	
			4. Stop after auto operating for 1 cycle (STOP intervals).	
	5~16	PLC Rotating Direction 1 (0 to 7th step speed)	0-255(0: Forward Run 1: Reverse Run)	0
	5-17	Reserved		
	5-18	PLC Step 0 Time	0~65500S	0
	5-19	PLC 1st Step Time	0~65500S	0
	5-20	PLC 2nd Step Time	0~65500S	0
	5-21	PLC 3rd Step Time	0~65500S	0
	5-22	PLC 4th Step Time	0~65500S	0
	5-23	PLC 5th Step Time	0~65500S	0
	5-24	PLC 6th Step Time	0~65500S	0
	5-25	Reserved		
	5-26	Reserved		

Remarks: From 5-18 to 5-33, the time premium is set more than 9999, and the "." under the unit nixietube means multiplying current value by 10. For example, d1000. means the setting value is 10000.

5 Multi-step Speed and Auto-Program Operation Parameters			Set during running available	
	Parameter	Parameter functions	Setting range	Factory setting
	5-28	Reserved		
	5-29	Reserved		
	5-30	Reserved		
	5-31	Reserved		
	5-32	Reserved		
	5-33	Reserved		

6 Protection Parameters			Set during running available	
	Parameter	Parameter functions	Setting range	Factory setting
	6-00	Over voltage stall prevention function	0: Unavailable	370 740
			220V series: 340V-400V 440 V series: 680V-800V	
	6-01	Over current stall prevention level setting	0: Unavailable	170
			20-200%	
	6-02	Over-torque detection function option	0: No detection	0
			1: Over torque detection (oL2) during constant speed running, continue to run after detection.	
			2: Over torque detection (oL2) during constant speed running, stop running after detection.	
			3: Over torque detection (oL2) during acceleration, continue to run after detection.	
			4: Over torque detection (oL2) during acceleration, stop running after detection.	
	6-03	Over torque detection level	30~200%	150
	6-04	Over torque detection time	0.1~10.0S	0.1
	6-05	Electrical thermal relay selection	0:No action	0
			1:Act in standard motor	
			2:Act in special motor	
	6-06	Thermal relay action time	30~600S	60
	6-07	Recent 1st fault record	0: No fault records	0
	6-08	Recent 2nd fault record	1: oc (over current)	0
	6-09	Recent 3rd fault record	2: ov (over voltage)	0
	6-10	Recent 4th fault record	3: oh (over heating)	0
	6-11	Recent 5th fault record	4: oL (drive over load)	0
	6-12	Recent 6th fault record	5 :oL1(Electrical thermal relay)	0
			6: EF(external fault)	
			7: Reserved	
			8: Reserved	
			9: Reserved	
			10: Reserved	
			11: Reserved	

7 Special Parameters				Set during running available
	Parameter	Parameter functions	Setting range	Factory setting
	7-00	Motor full load current setting	30~120%	85
	7-01	Motor no load current setting	0~90%	30
	7-02	Auto-torque compensation setting	0.0~1.0	0.0
	7-03	Auto slip compensation setting	0.0~10.0	0.0
	7-04~7-10	(Reserved)		
	7-11	Motor rated power	500~3000	1450
	7-12	Motor pole number	0~30	4
	7-13	Motor rated revolution	5.0~400	50.0
	7-14~7-33	Reserved		

8 High Function Parameters				Set during running available
	Parameter	Parameter functions	Setting range	Factory setting
	8-00	DC braking level setting	0~100%	0
	8-01	DC braking time setting at starting	0.0~60.0S	0.0
	8-02	DC braking time setting at stopping	0.0~60.0S	0.0
	8-03	Starting frequency of DC braking at stopping	0.1~60.0Hz	1.0
	8-04	Restarting after momentary power loss	0:Stop running after momentary power loss	0
			1:Run continuously after momentary power loss, track upwards from frequency after power loss	
			2:Run continuously after momentary power loss, track downwards from frequency after power loss	
	8-05	Max allowable time for power loss	0.3~5.0S	2.0
	8-06	Speed tracking time for B.B	0.3~5.0S	0.5
	8-07	Max current setting for speed tracking	30~200%	150
	8-08	Max of inhibited frequency setting1	0.0~400Hz	0.0
	8-09	Min of inhibited frequency setting1	0.0~400Hz	0.0
	8-10	Max of inhibited frequency setting2	0.0~400Hz	0.0
	8-11	Min of inhibited frequency setting2	0.0~400Hz	0.0
	8-12	Max of inhibited frequency setting3	0.0~400Hz	0.0
	8-13	Min of inhibited frequency setting3	0.0~400Hz	0.0
	8-14	Fault restarting times	0~10	0
	8-15	AVR function options	0:AVR function available	1
			1:AVR function unavailable	
			2:AVR function cancelled during deceleration	
	8-16~8-18	Reserved		
	8-19	Automatic energy saving	1: no processing	0
			2: energy saving	
	8-20	Error restart times automation reset time	1~100 mins.	10
	8-21	Reserved		
	8-22	Error restart delay time	0.1~20.0s	2.0

9 Communication Parameters			Set during running available	
	Parameter	Parameter functions	Setting range	Factory setting
	9-00	Communication address	1~247	1
	9-01	Communication transmitting speed	0:Baud rate 4800	1
			1: Baud rate 9600	
			2:Baud rate 14400	
			3: Baud rate 19200	
			4: Baud rate 38400	
	9-02	Transmitting fault treatment	0:Warning and running continuously	0
			1:warning and deceleration to stop	
			2:warning and coasting to a stop	
			3:no warning and running continuously	
	9-03	Communication watchdog Time setting	0: Not detected	0
			1~20s	
	9-04	Communication Material Format 1 ASCII mode	0:8, N,1	0
			1:8, N,2	
			2:8, E,1	
			3:8, E,2	
			4:8, O,1	
			5:8, O,2	
		Communication Material Format 1 RTU mode	6:8, N,2	
			7:8, E,1	
			8:8, O,1	
			9~11 Reserved	
	9-05	Reserved		
	9-06	Reserved		
	9-07	Communication response delay time	0~200 (one unit=2ms)	1

A: Wobble Frequency Function Parameters				Set during running available
	Parameter	Parameter functions	Setting range	Factory setting
	A-00	Wobble Frequency selection	0:Not applying 1:Applying	0
	A-01	Wobble Frequency input mode	0:Input automatically 1:Manually controlled by externa l terminals.	0
	A-02	Pre-set frequency of Wobble Frequency	0.0~400Hz	0.0
	A-03	Action delay setting of preset Wobble Frequency	0.0~600(s)	0.0
	A-04	Central frequency option of Wobble Frequency	0:According to operation frequency source 1:According to fixed frequency setting	0
	A-05	Fixed central frequency setting(Max frequency) of Wobble Frequency	0.01~100% Fmax	20.0
	A-06	Reference source setting for wobble aptitude	0:Relative centering frequency 1:Relative Max frequency	0
	A-07	wobble aptitude size setting	0.0~50.0%	0.00
	A-08	wobble frequency hopping (Relative aptitude)	0.0~50.0%	0.00
	A-09	wobble frequency circle	0.1~655(s)	10.0
	A-10	Triangle wave rising time(Relative cycle)	0.1~99.9%	50.0
	A-11	wobble frequency machine stop starting mode	0:Starting in memorizing state before machine stop 1:Restarting	0
	A-12	wobble state power loss memory	0:Memorizing 1:Non-memorizing	0

5 DESCRIPTION OF FUNCTIONAL PARAMETERS

All the functional parameters are described in detail in this chapter. According to attributes, the parameters can be divided into 11 groups; in most of the applications, presetting for operation shall be completed by performing with these parameters of groups.

The 11 groups of parameters are listed as below:

0: User's Parameters
1: Basic Parameters
2: Operation Mode Parameters
3: Output Function Parameters
4: Input Function Parameters
5: Multi-step and Auto-program Operation Parameters
6: Protection Parameters
7: Motor Parameters
8: High Function Parameters
9: Communication Parameters
A : Wobble Frequency Function Parameters

＊: indicates that for 440V class, value shall be 2 times of setting.

: indicates that it's available to be set during running.

0 User's Parameters

0-00	Machine type code recognition of AC motor drive (Only for reading)	Factory setting	d#
	Setting range	Non	

AC motor drive machine type code shall be read through this parameter, and for capacity of the drive, which has been set at factory, please see diagram below. Also, it shall be applied to judge whether current in parameter (0-01) corresponds with rated current of the specific machine. Parameter 0-00 corresponds with 0-01 as the diagram below indicates.

220V(type code)	d1	d2	d3	d4	d5
Power KW	0.2	0.4	0.75	1.5	2.2
Horsepower HP	0.25	0.5	1	2	3
rated current 0-01(A)	1.6	2.5	4.2	7.5	11.0

440V(type code)	d10	d11	d12	d13	d14
Power KW	0.4	0.75	1.5	2.2	3.7
Horsepower HP	0.5	1	2	3	5
rated current 0-01(A)	1.5	2.5	4.2	5.5	8.2

0-01	Rated current of AC motor drive (Only for reading)		Factory setting	**d#.#**
	Setting range	Non		

This parameter displays the rated current of AC motor drive, corresponding to machine types displayed at Parameter 0-00.

0-02	Parameter resetting			Factory setting	**d 0**
	Setting range	d 0~20	No action		
		d 10	All parameters reset to factory setting		

Resetting all parameters to factory setting shall be available by this parameter.

0-03	Machine On display Selection			Factory setting	**d 0**
	Setting range	d 0	F (Displaying set frequency reference)		
		d 1	H(Displaying actual running frequency)		
		d 2	U(Displaying multifunctional definitions)		
		d 3	A(displaying motor running current)		

This parameter enables users to determine the machine ON display by themselves.

0-04	Determining multifunctional display			Factory setting	**d 0**
	Setting range	d 0	Displaying output physical quantity(u) defined by operators		
		d 1	Displaying count value (c)		
		d 2	Displaying program operation content (X=tt)		
		d 3	Displaying DC-BUS voltage(U)		
		d 4	Displaying output voltage (E)		
		d 5	Displaying rotating speed(R)		
		d 6	Output frequency 2 (after slip compensation) (h)		
		d 7	Consumed power (p)		

Output physical quantity defined by users shall be displayed when it is set to 0 (Physical quantity =H×0-05)

0-05	Proportional constant setting		Factory setting	**d 1.0**
	Setting range	d 0.1<->d 160	Unit	0.1

Proportional constant, the constant used in output physical quantity defined by users. This parameter should be used in conjunction with d0, d5 and d6 of 0-04.

The display value shall be counted as this formula shows:

When set 0-04 as 0, display value= Output frequency (before slip compensation) x K (0-05)

When set 0-04 as 5, display value= rotating speed x K (0-05)

When set 0-04 as 6, display value= Output frequency 2 (after slip compensation) x K (0-05)

0-06	Software Version		Factory setting	**d #.##**
	Setting range	Non		

Software version is only for reading.

0-07	Input parameter locking code		Factory setting	**d 0**
	Setting range	**d 0<->d 999**		
	Description of Display	**d0**	No code locking or correct code has been input	
		d1	Parameters have been locked	

When this parameter indicates as d1, all parameters have been locked. Correct password must be entered to make this parameter able to write. This parameter will display d0 after entering the correct password. It will be locked again if incorrect password is entered.

After having entered the correct password, all parameters can be set before this interruption of power supply. However, if the value of 0-08 isn't cleared, which means the password protection function hasn't been cancelled, the correct password must be entered again to modify parameters when power on next time. "End" will be displayed whether the parameter password is entered correctly or not, otherwise "Err" will be displayed.

This password has three times of entering limit to prevent from entering password arbitrarily. If enter wrong password three times continuously, "Err" will be displayed. It is necessary to reboot the power supply to enter password again.

0-08	Input parameter locking code		Factory setting	**d 0**
	Setting range	**d 0<->d 999**		
	Description of Display	**d0**	Code not set	
		d1	Code set	

This parameter is set to 0 when no code locking was set. All parameters shall be locked if it is set to numbers other than 0. When this parameter is d1, modification of parameter will be displayed "Err". Decode the parameter through 0-07 to reset the new password.

0-09	Reserved

1. Basic Parameters

1-00	Max operation frequency setting		Factory setting	**d 50.0**
	Setting range	**d 5.0<->d 400Hz**	Unit	0.1Hz

To set max operation frequency of the AC motor drive. Range of this frequency is corresponded to digital operator frequency and all the other analog input frequency setting signals (0 to +10V, 4 to 20mA)

1-01	Max voltage frequency setting		Factory setting	**d 50.0**
	Setting range	**d 10.0<->d 400Hz**	Unit	0.1Hz

This setting shall be in accordance with rated operation voltage frequency of the motor explained on the nameplate.

1-02	Max output voltage setting		Factory setting	**d 220***
	Setting range	**d 2.0<->d 255V***	Unit	0.1V

It is used to set Max output voltage of AC motor drive. This setting shall be in accordance with rated voltage motor explained on the nameplate.

1-03	Intermediate frequency setting		Factory setting	**d 1.0**
	Setting range	**d 0.1<->d 400Hz**	Unit	0.1Hz

This parameter shall be used to set intermediate frequency for a random V/f curve. V/f ratio of Min frequency to Intermediate frequency shall be determined by this setting.

1-04	Intermediate voltage setting		Factory setting	**d 12.0**
	Setting range	**d 2.0<->d 255V***	Unit	0.1V

This parameter shall be used to set intermediate voltage for a random V/f curve. V/f ratio of Min output voltage to Intermediate voltage shall be determined by this setting.

1-05	Min output frequency setting		Factory setting	**d 1.00**
	Setting range	**d 0.1<->d 60.0Hz**	Unit	0.0Hz

For setting Min output frequency of AC motor drive

1-06	Min output voltage setting		Factory setting	**d 12.0***
	Setting range	**d 2.0<->d 255V***	Unit	0.1V

For setting Min output voltage of AC motor drive

Setting of 1-01 to 1-06 shall be input only if the following requirements be met: 1-02≥1-04≥1-06; 1-01≥1-03≥1-05, and according to different voltage classes, voltage of 1-02, 1-04 and 1-06 shall display corresponding voltage values.

1-07	Setting of Max output frequency		Factory setting	**d 100**
	Setting range	**d 1<->d 110%**	Unit	1%

1-08	Setting of Min frequency		Factory setting	**d 0**
	Setting range	**d 0<->d 100%**	Unit	1%

`The % value of the above two parameters shall take Parameter 1-00 for reference.

The min as well as max values are mainly set to prevent mishandling of operators, thus protect motor from overheating caused by over-low running frequency, or mechanical wearing by an over-high speed.

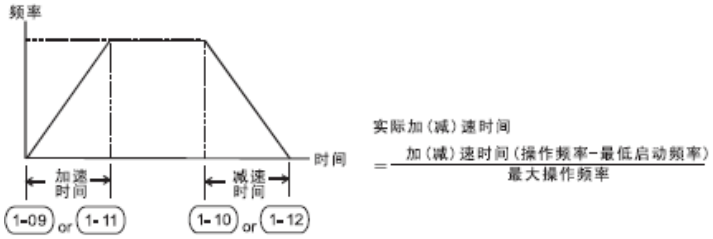
If max output frequency is set to 80%, and frequency set to (1-00) 60Hz, then max output frequency shall be 48Hz. If min output frequency is set to 10%, while Min operation frequency (1-05) set to 1.5Hz, it shall run in 6Hz in case of set frequency is below 6Hz

1-09	1st Acceleration time selection		Factory setting	**d 10.0**
1-10	1st Deceleration time selection		Factory setting	**d 10.0**
1-11	2nd Acceleration time selection		Factory setting	**d 10.0**
1-12	2nd Deceleration time selection		Factory setting	**d 10.0**
	Setting range	**d 0.01<->d 600S**	Unit	0.01S

The acceleration time during motor acceleration and deceleration shall be the time used for accelerating from 0Hz to Max operation frequency(1-00); while deceleration time refers to the time for deceleration from Max operation frequency to 0Hz.

Applying the 2nd accel/decel time shall be available after the multi-functional terminals are set to switching of 1st and 2nd accel/decel. 2nd accel/decel shall be performed when terminals for this function are closed.

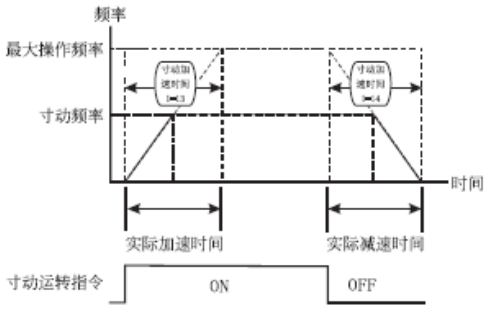
As diagram shows below, the motor adopts area of max operation frequency (1-00) from 0Hz for acceleration and deceleration calculation, If 1-00 is 60.0Hz. Provided that min frequency is 1.0Hz, time for accelerating to 60Hz shall be 9.83sec, and deceleration to stop shall also be 9.83sec.



中英文对照：
频率 FREQUENCY　　加速时间 ACCELERATION TIME
减速时间 DECELERAION TIME　　时间 TIME
实际加（减）速时间 Actual acceleration/deceleration time
加（减）速时间（操作频率-最低启动频率） Acceleration/deceleration time (operation frequency –minimum starting frequency)
最大操作频率 Max operation frequency

1-13	JOG acceleration time setting		Factory setting	**d 10.0**
	Setting Range	**d 0.01<->d 600s**	Unit	0.01S
1-14	JOG deceleration time setting		Factory setting	**d 10.0**
	Setting Range	**d 0.01<->d 600s**	Unit	0.01S
1-15	JOG frequency setting		Factory setting	**d 6.0**
	Setting Range	**d 1.0<->d 400Hz**	Unit	0.01Hz

If switches connected with JOG function are CLOSED, AC motor drive shall accelerate from MIN operation frequency (1-05) to jog operation frequency (1-15). Accel/decel time of jog run is determined with reference time set by parameter (1-13/1-14). Jog run reference also can be performed while AC motor driver is in operation. The AC motor driver will return to the original operation frequency after canceling the jog-on command. But other operation commands can't be performed in jog operation.

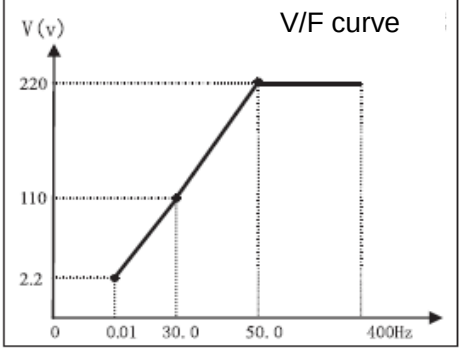


频率：Frequency　　最大操作频率：Max operation frequency　　寸动频率：Jog reference
时间：Time　　实际加速时间：Actual acceleration time　　寸动加速时间：Jog acceleration time
寸动运转指令：Jog run reference

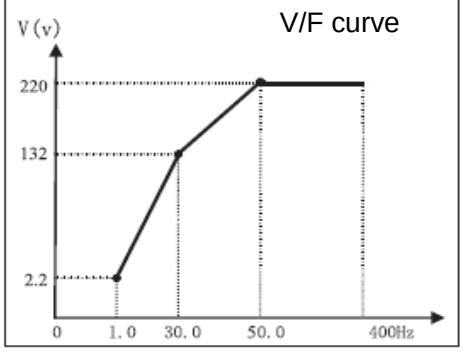
1-16	**Reserved**
1-17	**Reserved**
1-18	**Reserved**

1-19	Special V/f curve setting			Factory setting	**d 0**
	Setting Range	**d 0<->d 6**		Unit	1

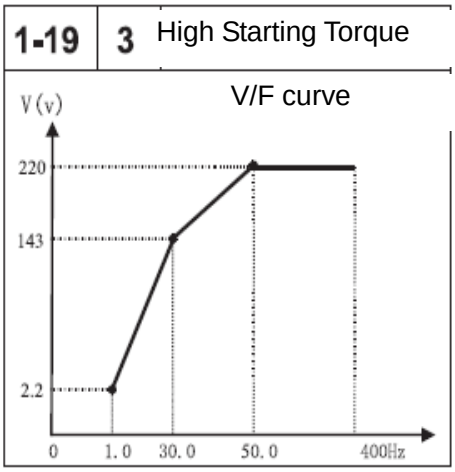
1-19 1 GENERAL USE



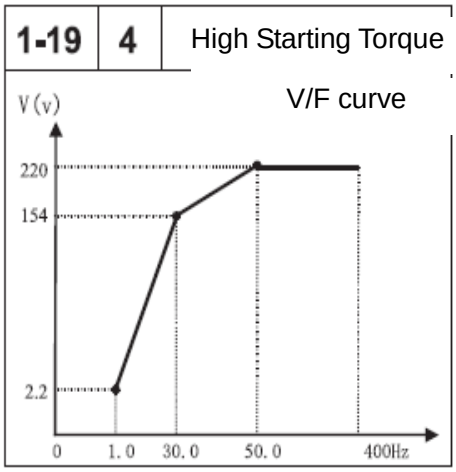
1-19 2 High Starting Torque



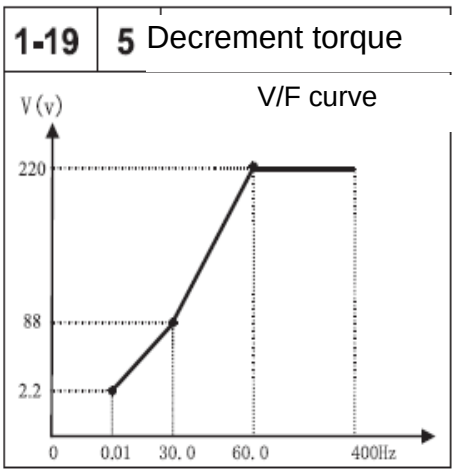
1-19 3 High Starting Torque



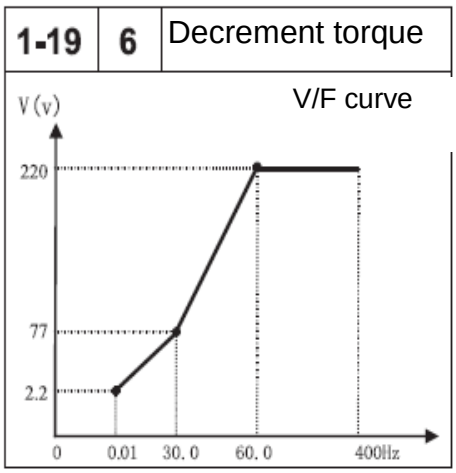
1-19 4 High Starting Torque



1-19 5 Decrement torque



1-19 6 Decrement torque

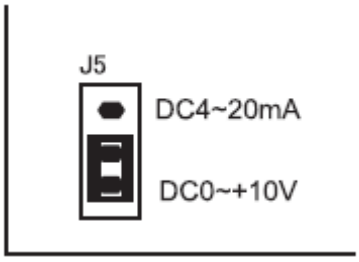


Notes: For 440V Class inverters, the voltage corresponding to frequency indicating on the V/F curve shall be 2 times of this voltage.

2. Operation mode parameters

2-00	Frequency Setting Mode Option 1		Factory setting	**d 3**
	Setting range	0: Keyboard(OP) input		
		1: Input DC 0 to 10V by external terminals AVI		
		2: Input 4 to 20Ma by external terminals ACI		
		3: controlled by VR on digital controller		
		4: Operated by RS-485 communication interface		
		5: Operated by RS-485 communication interface(Frequency memory)		
		6: Controlled by UP/DOWN		
		7: Controlled by UP/DOWN (Frequency memory)		
		8: reserved		

This parameter can set the frequency source of the alternating current motor drive;
When the setting of frequency source uses outside analog quantity input, it may switch the voltage AVI input (DC 0-+10V) or current ACI input (4-20mA) according to the jumper cap J5, whose diagram is as follows:



2-01	Frequency Setting Mode		Factory setting	**d 0**
	Setting range	0: Keyboard input		
		1: Outside terminal ACI input analogue signals (DC: 0-+10v)		
		2: Outside terminal ACI input analogue signals (DC 4-+20mA)		
		3: controlled by VR on digital controller		
		4: Reserved		
		5: Reserved		
		6: Controlled by UP/DOWN		
		7: Controlled by UP/DOWN (Frequency memory)		
		8: reserved		

This parameter set the source of the auxiliary frequency. Refer to the master frequency source setting of 2-00;
When 2-00 has been set as 1 (AVI) or 2 (AVI), 2-01 can't be set like that again.
When 2-00 has been set as 6 or 7, 2-01 can't be set as 6 again.

2-02	Combination way of frequency sources		Factory setting	**d 0**
	Setting range	0: Master frequency		
		1: Master frequency + auxiliary frequency		
		2: Master frequency - auxiliary frequency		

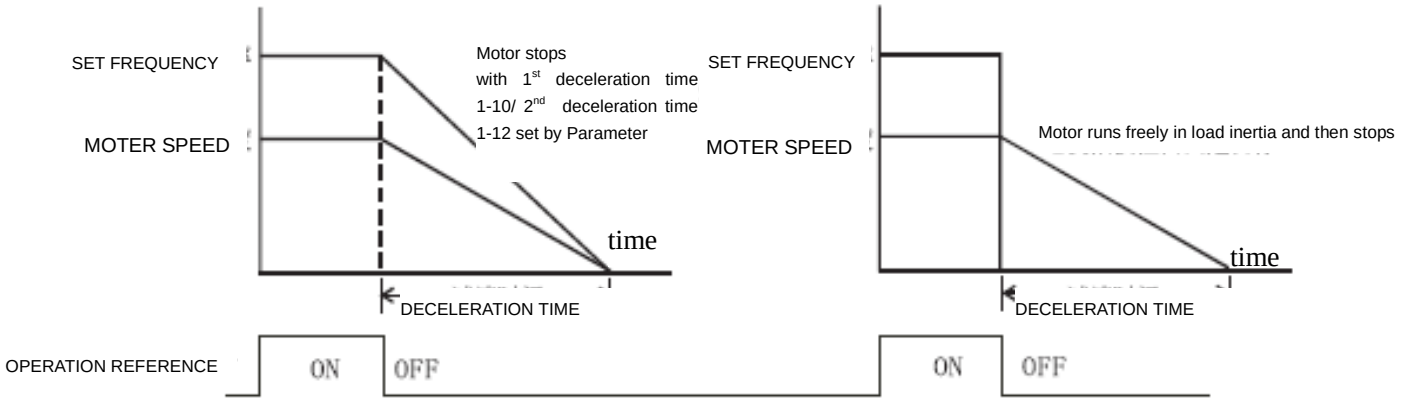
This parameter is used for the compound mode of master/auxiliary frequency. When it is set to d1, the additive frequency is set no more than the max operation frequency(1-00); when it is set to d2, it is set to the absolute value that the master frequency minus the auxiliary frequency.

2-03	Operation Reference Source		Factory setting	**d 0**
	Setting range	**d 0**	0: Operated by keyboard	
		d 1	1: Operated by external terminals. STOP on keyboard available	
		d 2	2: Operated by external terminals. STOP on keyboard unavailable	
		d 3	3: Operated by Communication Interface RS-485. STOP on keyboard available	
		d 4	4: Operated by Communication Interface RS-485. STOP on keyboard unavailable	

For external operation source reference, apart from parameter 2-03 shall be set, others see detailed descriptions in Parameter Group 4.

2-04	STOP mode		Factory setting	**d 0**
	Setting range	**d 0**	0: Deceleration and stop	
		d 1	1: Coast to a stop	

After STOP reference received, the AC motor drive shall control the motor to stop as parameter set.
Deceleration and stop: according to deceleration time set by 1-10 or 1-12, AC motor drive decelerate in tape speed way to min output frequency(1-05) and then machine stops.
Coast to a stop: AC motor drive stops output immediately and motor runs freely in load inertia and then stops.



1 Deceleration and stops 2. Free running

The motor stopping mode depends on the characteristics of load or machinery stopping

- It's recommended to choose the mode of deceleration and stop in circumstance that, when machines stops, motor shall stop immediately to avoid individual injury or waste of materials. However, deceleration time shall be determined according to specific characteristics of machine.
- While it shall be set to free running and stops, provided motor idling allowable or machine with large load flexibility, for example, air fan, pump and stirring machines.

2-05	Reserved

2-06	External fault (EF) stop mode setting		Factory setting	**d 1**
	Setting range	**d 0**	Reserved	
		d 1	EF free running to stop	

Description of action: When EF is detected by the system, a stop signal shall be sent and AC motor shall stop in the mode of this parameter.

2-07	External fault (EF) stop mode setting		Factory setting	**d 2**
	Setting range	**d 0**	AVI Zeroing braking to stop	
		d 1	AVI Zeroing free running to stop	
		d 2	AVI Zeroing braking to stop and running signals are reserved.	

Description of action: A stop signal shall be sent when frequency is set to AVI, parameter is set to 0 or 1 and system has detected that AVI set frequency is 0, AC motor drive shall coast to a stop in accordance with this setting at the same time; if this parameter is set to 2 and AVI set frequency is 0, motor stops by braking, but running signals are reserved. Motor shall run continuously when AVI set frequency rise up again.

Notes: Operation key shall be unavailable when parameter is set to 0 or 1 and AVI input is 0.

2-08	Reserved	Factory setting	**d 0**

2-09	PWM load wave frequency option		Factory setting	**d 6.0**
	Setting range	**d 2.0<->d 12.0kHz**	Unit	0.1kHz

Load frequency of PMW output shall be set by this parameter.

Load frequency	Electromagnetic noise	Noise, spill current	Radiation
2kHz	Big	Small	Small
6kHz	|	|	|
12kHz	Small	Big	Big

The above form suggests that load wave frequency shall influence electromagnetic noise, radiation as well as interference to the environment of motor; thus, decreasing the load wave frequency shall help the motor drive to decrease temperature rise if ambient noise exceeds noise of the motor; in case of high load wave frequency, although operation noise shall be eliminated to a large degree, attention shall be paid to the interference and protection of the machine.

2-10	Operation direction inhibition setting		Factory setting	**d 0**
	Setting range	**d 0**	0: Fwd/rev run available	
		d 1	1: Reverse run inhibited	
		d 2	2: Fwd run inhibited	

If parameter is set to 1" Reverse run inhibited", REV reference of both the operator and external terminals shall be unavailable. Even if Rev Run is performed currently, it shall be switched to fwd run directly. Also, provided that fwd run is inhibited, only Rev run reference shall be performed.

2-11	ACI(4 to 20mA) broken line treatment		Factory setting	**d 0**
	Setting range	0: Non-treatment to ACI broken line		
		1: Free operation stops when ACI line broken		
		2: Braking to stop displaying EF when ACI line broken		
		3: Run in final set frequency when ACI line broken		

Treatment to reference of ACI(4 to 20mA) broken line is determined by this parameter. If it was set to 2 and fault occurs, depress ENTER to reset after fault is eliminated.

2-12	Power supply starting operation locking			Factory setting	**d 0**
	Setting range	**d 0**	Operation available		
		d 1	Operation unavailable		

When operation reference is from external terminal and operation reference is always in kept station, and when power supply of AC motor drive is starting, this parameter is to determine operation status of motor. If it is set to 0, operation reference shall be accepted and motor begin to run; if it is set to 1, the operation reference shall be rejected and motor coast to a stop. To start the motor running, operation reference shall be firstly cancelled and then input again.

Due to mechanical vibration or switch bouncing which may be caused by switch parts fault, operation may be not inhibited although this parameter is set to 1. Thus great care shall be attached when using this function.

2-13~2-14	Reserved	Factory setting	**d 0**

3. Output function parameters

3-00	Random frequency agreement setting		Factory setting	**d 1.0**
	Setting range	**d 1.0<->d 400Hz**	Unit	0.1Hz

When output frequency of AC motor drive meets a random appointed frequency value, multifunction external terminal contactor shall be “Closed” if this terminal is set to d9(3-05).

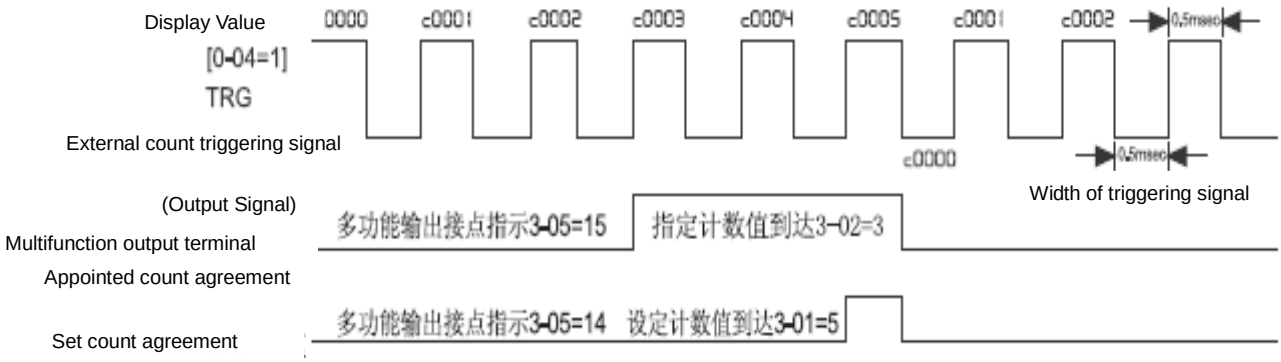
3-01	Count value agreement setting		Factory setting	**d 0**
	Setting range	**d 0<->d 999**	Unit	1

This parameter set the count value of the internal counter S1100, with outside terminal as the trigger terminal. When the counting ends (arrives), its appointed signal output the terminal action.

3-02	Appointed count agreement setting		Factory setting	**d 0**
	Setting range	**d 0<->d 999**	Unit	1

Beginning from C1, when count value reaches this parameter setting value, the multi-functional corresponding shall act. This parameter shall be applicable when count is to end. This output signal shall be used prior to machine stop, to make AC motor drive run in low speed till motor stop.

When the counting value reaches the setting value of 3-01 from C1, give it one counting pulse again to make it return to C1 to restart counting. So the setting value of 3-02 must be less than 3-01.



多功能输出接点指示：multi-function output junction indication
指定计数值到达 specified counting value reach
设定计数值到达 set counting value reach

3-03	Fwd run reference delay setting		Factory setting	**d 0.0**
	Setting range	**d 0.0<->d 60.0S**	Unit	0.1S

3-04	Rev run reference delay setting		Factory setting	**d 0.0**
	Setting range	**d 0.0<-> d 60.0S**	Unit	0.0S

When 3-05 is set as 17,18 and 19, above two parameters match with it to use.

3-05	Multifunctional output contactor reference Normally Open Contactor(RA-RC) Normally Closed Contactor(RB-RC)		Factory setting	**d 8**
	Setting range	**d 0<->d 19**	Unit	1

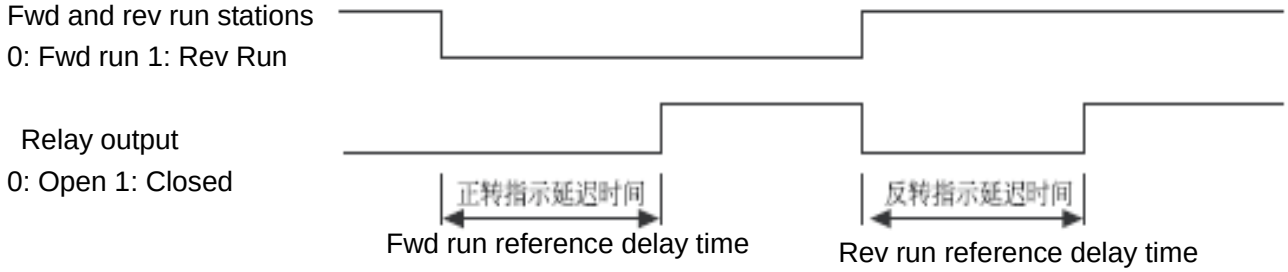
Function List

Set value	Description of function
d 0	No function
d 1	Reference during running. If output occurs to motor drive, output terminal contactor which sets this parameter shall be CLOSED.
d 2	Set frequency agreement reference. When output frequency of motor drive agrees with set frequency, this contactor shall be CLOSED.
d 3	Reference during zero speed. When motor drive set frequency is less than Min starting frequency setting, this contactor shall be CLOSED.
d 4	Over-torque detection reference. This contactor shall be CLOSED when over-torque is detected by motor drive.
d 5	Reference during BB. This contactor shall be CLOSED when b.b happens to motor drive.
d 6	Low voltage detection reference. This contactor shall be CLOSED when input voltage over-low is detected by motor drive.
d 7	Motor drive operation mode reference. This contactor shall be CLOSED when AC motor drive reference is controlled by external terminals.
d 8	Fault reference. This contactor shall be CLOSED when fault is detected by AC motor drive
d 9	Random frequency agreement reference. This contactor shall be CLOSED when output frequency agrees with appointed reference (3-00).
d 10	Reference during program auto-running. This contactor shall be CLOSED when program auto-running performed.
d 11	Reference of step running completion. During program auto-running, this contactor shall be CLOSED after each running step, but it shall maintain only for 0.5sec.
d 12	Reference of program running completion. This contactor shall be CLOSED after completion of program running, but it shall maintain only for 0.5sec.
d 13	Program running pause. This contactor shall be CLOSED when external pause auto-running is in action during program auto running.
d 14	Set count agreement. This contactor shall be CLOSED when count value is equivalent with set value of Parameter 3-01.
d 15	Appointed count agreement. This contactor shall be CLOSED when count value is equivalent with set value of Parameter 3-02.

d 16	Driver preparation completion. This contactor shall be CLOSED if no fault was detected after motor drive power is supplied.
d 17	Fwd run direction reference. When inverter is in fwd run, delay reference time shall be in accordance with setting in Parameter3-03, and contactor shall be CLOSED when time met. Relay shall be interrupted when inverter stops or is switched to Rev run stations. Attention shall be paid that counting here shall begin from Fwd run.
d 18	Rev run direction reference. When inverter is in Rev run, delay reference time shall be in accordance with setting in Parameter3-03, and contactor shall be CLOSED when time met. Relay shall be interrupted when inverter stops or is switched to Fwd run stations. Attention shall be paid that counting here shall begin from Rev run.
d 19	Fwd/ Rev run direction reference. This reference shall be available at switching of Fwd/Rev run. Description of action: During direction switching of motor drive, the relay shall be Opened and then delayed in a time complied with setting in 3-03 and 3-04. After delay, the relay shall be closed. Provided that delay setting in 3-03 and 3-04 is 0, relay shall be kept in closed condition and not open until machine stop signal appears.

Notes: 1."CLOSED" mentioned above refers to closing of normally open contactor(RA-RC), and normally closed contactor(RB-RC) shall open simultaneously; while "open" shall refer to opening of normally open contactor(RA-RC), and normally closed contactor(RB-RC) shall be closed simultaneously.

2.When it is set to d17, d18 and d19, once stop signal appears, relay shall be interrupted immediately. See sequence diagram below:



3-06	Analog output frequency/current signal setting		Factory setting	0
	Setting range	0: output frequency 1 (before slip compensation)		
		1: output frequency 2 (after slip compensation)		
		2: Analog current meter(0 to 250% of rated current)		
		3: output voltage		
		4: DC bus voltage		
		5: consumed power		

This parameter select AC motor driver signal voltage (0 to +10V) to output the corresponding content, which is as shown in table below:

Setting value	Analog content	Max. value of output voltage corresponds to :
0	Output frequency 1 (before slip compensation)	Highest operation frequency （1-00）
1	Output frequency 2 (after slip compensation)	Highest operation frequency （1-00）
2	Output current	250% rated current
3	Output voltage	220V series:250V
		440V series: 500V
4	Bus voltage	220V series:500V
		440V series: 1000V
5	Consumed power	200% inverter rated output

3-07	Reserved

3-08	Analog output gain selection		Factory setting	100
	Setting range	1~200%		

This parameter adjusts voltage level of AC motor drive analog signal output terminal AFM output to analog meter head.

3-09	Multifunctional Output Terminal 1(MO1)		Factory setting	1
	Setting range	0: no function		
		1: Reference during operation		
		2: Reference for set frequency agreement		
		3: Zero-speed reference		
		4: Over torque detection reference		
		5: Reference during BB		
		6: Reference for low voltage detection		
		7: AC Motor driver operation mode		
		8: Fault reference		
		9: Any frequency reaching indication		
		10: automatic operation indication		
		11: stage one operation finished		
		12: automatic operation finished		
		13: automatic operation pause		
		14: reach setting counting		
		15: reach specified counting		
		16: driver preparation finished		
		17: forward direction indication		
		18: reverse direction indication		
		19: forward/reverse direction indication		

This function corresponds to external terminal MO1-DCM (open-collector output). Different system signals output can be obtained if set value of 3-09 as per above table. The function description is same to that in 3-05.

3-10	Reserved

3-11	CW/CCW rotation dead zone time setting		Factory setting	**d 0.0**
	Setting range	**d 0.0 <-> d 600**	Unit	0.1

3-12	Cooling fan control			Factory setting	**d 0**
	Setting range	**d 0**	0: fan continuous running		
		d 1	1: run for 1 minute after pressing stop key		
		d 2	2: operate/stop along with diver		

This parameter determines the action mode of cooling fan.

3-13	Min. AVI input voltage		Factory setting	**d 0.0**
	Setting range	**d 0.0<-> d 10.0V**	Unit	0.1V
3-14	Min. AVI input voltage corresponding frequency		Factory setting	**d 0.0%**
	Setting range	**d 0.0%<-> d 100% Fmax**	Unit	0.1%
3-15	Max. AVI input voltage		Factory setting	**d 10.0**
	Setting range	**d 0.0<-> d 10.0V**	Unit	0.1V
3-16	Max. AVI input voltage corresponding frequency		Factory setting	**d 100%**
	Setting range	**d 0.0%<-> d 100% Fmax**	Unit	0.1%

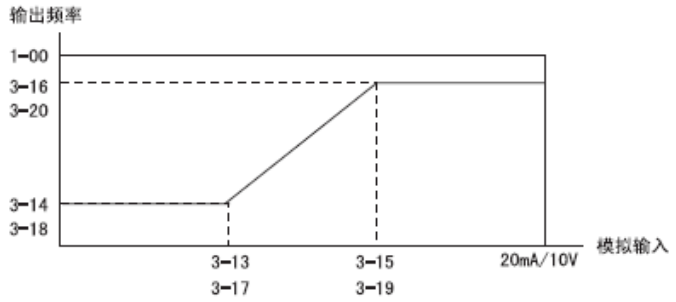
These four parameters correspond to the condition when 2-00 or 2-01 is set as 1 (external terminal AVI input DC 0～+10V).

3-17	Min. ACI input current		Factory setting	**d 4.0**
	Setting range	**d 0.0<-> d 20.0mA**	Unit	**0.1Ma**
3-18	Min. ACI input current corresponding frequency		Factory setting	**d 0.0%**
	Setting range	**d 0.0%<-> d 100% Fmax**	Unit	0.1%
3-19	Max. ACI input current		Factory setting	**d 20.0**
	Setting range	**d 0.0<-> d 20.0mA**	Unit	**0.1Ma**
3-20	Max. ACI input current corresponding frequency		Factory setting	**d 100%**
	Setting range	**d 0.0%<-> d 100% Fmax**	Unit	0.1%

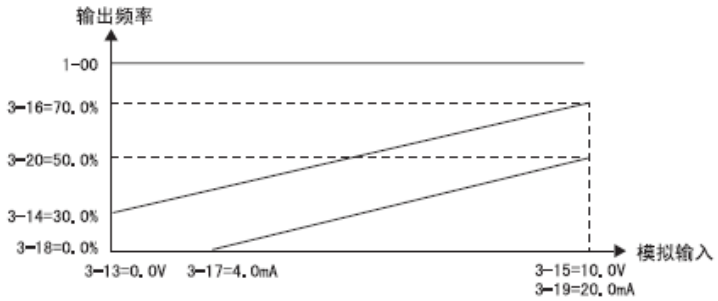
These four parameters correspond to the condition when 2-00 or 2-01 is set as 2 (external terminal AVI input DC 4～20mA).

The jumper cap has to switch to current ACI input (4～20mA).

Above eight parameters define the corresponding relationship between analog input voltage and voltage/current.



Example:



输出频率 output frequency　模拟输入 analog input

3-21	Reserved
3-22	Reserved

4 Input Function Parameters

4-00	VR Analogue input frequency bias		Factory setting	**d 0.0**
	Setting range	**d 0.00<->d350.0Hz**	unit	0.1Hz

4-01	VR Bias adjustment direction		Factory setting	**d 0**
	Setting range	**d 0**	positive direction	
		d 1	negative direction	

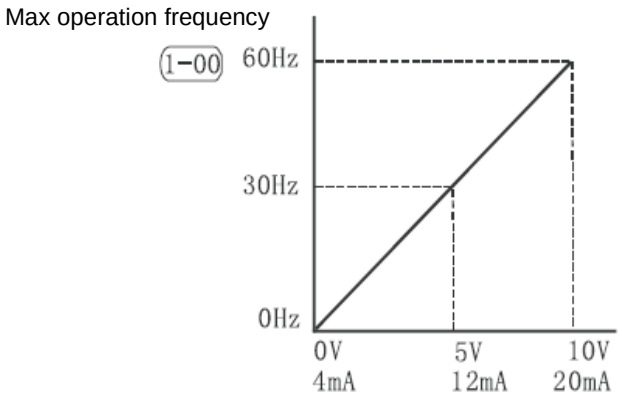
4-02	VR Input frequency increase setting		Factory setting	**d 100**
	Setting range	**d 1<->d200%**	unit	1%

4-03	VR Negative pressure operation setting		Factory setting	**d 0**
	Setting range	**d 0**	no negative bias	
		d 1	reversible negative bias	
		d 2	not reversible negative bias	

The parameters above is used for functions from 4-00 to 4-03, all of which set applied parameter by setting and adjusting outside voltage/current signals, please refer to the following examples. In addition, the negative bias d2 in parameter 4-03 is not reversible refers to that the drive remains operating in current direction instead of reversing direction when frequency reaches the reverse frequency by adjusting the potentiometer on digital manipulator. But the rotating direction can be switched over by button or outside terminal, in order to adjust the motor rotating direction.

Example 1:

This is the most frequently used adjustment method in the industry. The user only need to set the parameter 2-00 or 2-01 to 3(controlled by VR on digital manipulator), then the frequency can be set by using the potentiometer on digital manipulator.



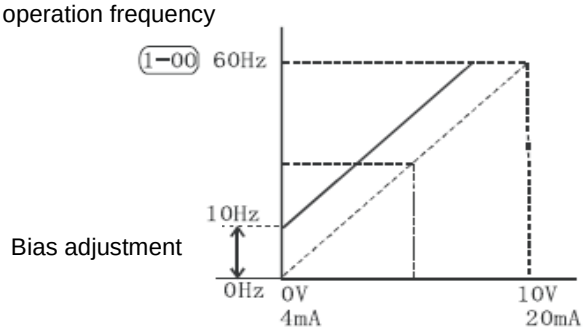
Set value

1－00＝60Hz	Max operation frequency
4－00＝0Hz	Bias adjustment
4－01＝0	Bias direction adjustment
4－02＝100%	Gain adjustment
4－03＝0	Negative bias operation setting

Example 2:

This example is used in the industry when operating AC motor drive. They hope the regulation resistance to be set is 10Hz when it rotates to the leftmost point, that is, the min input of AC motor drive must be 10Hz when starting, and the other frequency then be adjusted by the industry itself. The diagram shows that at this time the relationship between VR and the set frequency has changed from 0～10V corresponding to 0～60Hz into 0～8.33V. Therefore, the central point of the regulation resistance becomes 40Hz and becomes 60Hz in the posterior segment of the regulation resistance. In order to make the posterior segment of the regulation resistance can be operated, please refer to example 3:

Max operation frequency



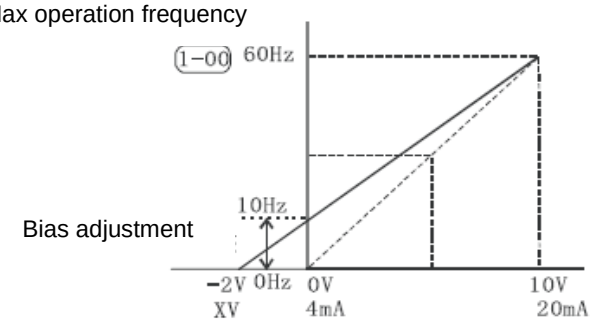
Set value

1－00＝60Hz	Max operation frequency
4－00＝10Hz	Bias adjustment
4－01＝0	Bias direction adjustment
4－02＝100%	Gain adjustment
4－03＝0	Negative bias operation setting

Example 3:

This example is also a frequently used example in the industry. The setting of regulation resistance can make the best use of all range, which can increase its flexibility.

Max operation frequency



Set valuea

1－00＝60Hz	Max operation frequency
4－00＝10Hz	Bias adjustment
4－01＝0	Bias direction adjustment
4－02＝83%	Gain adjustment
4－03＝0	Negative bias operation setting

The calculation of gain and bias value

$$4\text{-}02=\frac{10V}{12V}\times 100\%=83\%$$

The calculation of bias value

$$\frac{60-10Hz}{10V}=\frac{10-0Hz}{XV}$$

$$XV=\frac{100}{50}=2V$$

$$\therefore 4\text{-}00=\frac{2}{10}\times 100\%$$

4-04	Multifunctional input Option 1(MI1)		Factory setting	**d 1**
	Setting range	**d 0<->d 31**		

4-05	Multifunctional input Option 2(MI2)		Factory setting	**d 0**
	Setting range	**d 0,d 5<->d 31**		

4-06	Multifunctional input Option 3(MI3)		Factory setting	**d 8**
	Setting range	**d 0,d 5<->d 31**		

4-07	Multifunctional input Option 4(MI4)		Factory setting	**d 9**
	Setting range	**d 0,d 5~d 31**		

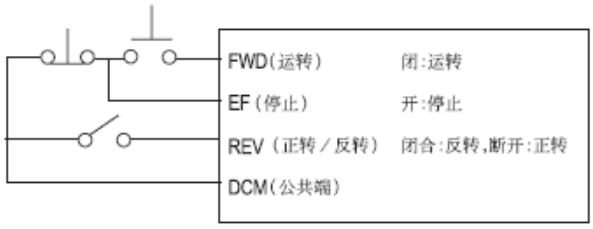
4-08	Multifunctional input Option 5(MI5)		Factory setting	**d 7**
	Setting range	**d d 0,d 5~d 31**		

Function List

Set value	Function	Set value	Function
d 0	No function	d 16	bb, normally closed(NC) input
d 1	MI1: forward run/stop, MI2: reverse run/stop	d 17	UP COMMAND
d 2	MI1: run/stop, MI2: fwd/rev	d 18	DOWN COMMAND
d 3	Three line operation control(1): MI1 run, MI2 fwd/rev run, MI3 STOP(Normally closed)	d 19	Program auto- operation reference
d 4	Three line operation control(1): MI1 run (Triggering), MI2 run(Triggering), MI3 STOP(Normally closed)	d 20	Auto-program operation pause
d 5	EF, normally open interface input (N.O)	d 21	JOG frequency reference
d 6	EF, normally closed interface input (N.C)	d 22	Count reset
d 7	RESET reference	d 23	Reserved
d 8	Multi-step speed Reference 1	d 24	JOG-FWD
d 9	Multi-step speed Reference 2	d 25	JOG-REV
d 10	Multi-step speed Reference 3	d 26	Reserved
d 11	Reserved	d 27	Wobble frequency function input
d 12	frequency switch function	d 28	Wobble frequency state reset
d 13	Accel/decel inhibition reference	d 29	Inhibiting output (N.C)
d 14	Switching of 1^{ST} and 2^{nd} Accel/Decel time	d 30	Inhibiting output (N.C)
d 15	bb, normally open (NO) input	d 31	counter trigger signal input

Explanation of functions:

- No function (d0):
  Description of action: No function terminal is set to isolate the external terminals, which shall be free from fault action in unclear cause.
- Operational terminals setting for external terminals (d1, d2, d3 and d4)
  Two line operation control 1 (d1): Controlling parameter 4-04, terminal MI1 and MI2, in which MI1: forward run/stop, MI2: reverse run/stop. When 4-04 is set as 1, function set by MI2 is invalid.
  Two line operation control 2 (d2): Controlling parameter 4-04, terminal MI1 and MI2, in which MI1: forward run/stop, MI2: reverse run/stop. When 4-04 is set as 2, function set by MI2 is invalid.
  Three line operation control 1 (d 3): Controlling parameter 4-04, terminal MI1, MI2 and MI3, in which MI1 run, MI2 fwd/rev run, MI3 STOP(Normally closed). When 4-04 is set as 3, function set by MI2 and MI3 is invalid. The wiring diagram is as follows.



Three Line Control (1)

上图中英对照：
运转：FWD(running)
停止：EF(stops)
（正转/反转）：REV (fwd/rev run)
公共端：DCM (terminal common)
闭：运转，CLOSED: run
开：停止，OPEN: stops
闭合：反转，断开：正转：CLOSED: reverse run, OPEN: forward run

Three line operation control 2 (d 4): Controlling parameter 4-04, terminal MI1, MI2 and MI3, in which MI1 run (Triggering), MI2 run(Triggering), MI3 STOP(Normally closed). When 4-04 is set as 4, function set by MI2 and MI3 is invalid. The wiring diagram is as follows.

Three Line Control (2)

中英文对照：	停止（常闭）：EF(stops)(normally	闭：正转运行 CLOSED: Forward run
左侧：	closed)	闭：反转运行 CLOSED: reverse run
正转运行：FWD(Forward run)	公共端：DCM (terminal common)	开：停止 OPEN: stops
反转运行：REV (reverse run)	右侧：	

Note: The corresponding function of MI2 and MI3 will be restored when 4-04 is not set as from 1 to 4.

- External fault input (d5, d6)
  Description of action: once the AC motor driver receives EF signal, the output will be stopped immediately and EF will be displayed on digital manipulator. At this moment, the motor rotates normally. The operation can be continued through pressing RESET after disappearing of external fault.

- External RESET input (d7):
  Description of action: Provided that faults such as EF, OH, OC or OV occur to the AC motor drive, Terminal RST shall be applied after cause eliminated to reset the AC motor drive. The terminal is in a same function with RESET key on the digital operator.

- Multi-step speed reference input (d8, d9, d10): Available to set terminals MI1 (4-05), MI 2(4-06), MI3 (4-07) and RST (4-08)
  Description of action: 8 step speeds in total shall be commanded by this 3 terminal switches. Relative parameters are (5-00 to 5-06) and main speed setting. Apart from relative parameters, multi-step operation shall also be supported by operation reference. Auto-operation shall also be available by this function cooperating with program running. For setting of this function, see 5-18 to 5-25 for detailed descriptions.

- Function d11 is reserved.

- Function sources switch (d12)
  Description of action: when it is used to set the switching action of terminals. the frequency source of inverter will be switched to 2-01 given (auxiliary frequency input source) from 2-02 given (combination way of frequency sources) and return to 2-02 given when the switch is turned off.

- Accel/decel inhibition reference input (d13)
  Description of action: In performing Accel/decel inhibition function, Accel/decel of AC motor drive shall be stopped immediately. When this function is cancelled, Accel/decel of AC motor drive shall be continued from inhibition place. This reference shall only be available during acceleration or deceleration of the AC motor drive.

- Reference input of 1st and 2nd accel/decel switching (d14):
  Description of action: Prior to closing of terminals switch, the accel/decel time of AC motor drive shall be in accordance with setting of Parameter 1-09 and 1-10. During switch closing, accel/decel time shall be in accordance with setting of Parameter 1-11and 1-12. If AC motor drive is in constant speed, changing of switches shall not influence output frequency, which shall be effective when acceleration or deceleration of motor drive is performing.

- Reference input during b.b (d15, d16):
  Description of action: When switch of this terminal acts, output of AC motor drive shall stop immediately and motor run freely. After switch reset, AC motor drive shall firstly track upwards from frequency before interruption to holding rotating speed, and then accelerate to set frequency. Even if motor has stopped completely after b.b, speed tracking shall be performed once switch reset.7
- Up/down reference input (d17, d18):
  Description of action: this parameter has to match with 2-00 or 2-02 (when set as 6 or 7) to modify the given frequency. When switch of this terminal in action, frequency of AC motor drive shall happen the corresponding modification. The increase and decrease rate of frequency is determined by acceleration and deceleration time. It is valid only in operation state. The given frequency is cleared to 0 when stop.
- Input of Program auto- operation reference starting (d19): cooperate with parameters of 5^{th} group.
  Input of Auto-program operation pause reference (d20): cooperate with parameters of 5^{th} group.
  Description of action: When switch for program auto operation is in operation, output frequency of AC motor drive shall run in accordance with setting of Parameter group 5-00 to 5-06. Pause terminal can interrupt running program during running, and after reset, operation program shall be performed continuously. For detailed description for action, see Parameter 5-15.
- JOG frequency reference (d21):
  Description of action: When external terminal is set with this function, JOG set frequency (1-15) shall be available by short circuiting of this terminal; original frequency reference shall be reset after circuiting opened.
- Counting reset (d22):
  Description of action: Current counting display shall be reset by action of this terminal, and “C0” shall be restored. Counting upwards of the AC motor drive from triggering signal shall not be available until this signal disappears.
- Function d23 is reserved.
- JOG FWD (d24): Jog forward run. For relative application, see description of Parameter (1-13, 1-14 and1-15)
  JOG REV (d25): Jog reverse run. For relative application, see description of Parameter (1-13, 1-14 and1-15)
  Description of action: When external terminal contactor is OFF, motor shall coast to a stop in accordance with Jog run deceleration time. For relative application, see description of Parameter (1-13, 1-14). Jog run reference shall only be used when the AC motor drive in stop and [STOP] key from the digital operator shall be available
- d26 is reserved.
- Wobble frequency function input (d27):
  Description of action: If wobble frequency starting is manual, wobble frequency status shall be available when terminals are closed; when terminals open, wobble frequency function shall be cancelled and the operation frequency keeps at wobble frequency preset frequency A-02.

- Wobble frequency function reset (d28):
  Description of action: For both auto and manual selection of wobble frequency function, when this terminal is closed, wobble frequency state information in memory shall be cancelled, and operation frequency shall be preset; after opening the terminal, wobble frequency shall restart, and if it was auto input mode, wobble frequency state shall only be available after wobble frequency delay time.
- Inhibiting output (d29. d30):
  This function provides the motor drive to receive emergency stop contactor from electrical system or other fault signals without any fault output or RESET. After stop, operation shall only be available after operation signal re-input, and driver shall restart from 0Hz.
- Counter trigger signal input (d31): It shall not be used together with Parameter 0-04, 3-01 and 3-02 and if all set to 0, counting shall not vary.
  Description of action: This function terminal TRG can use external triggering signals (e.g. signals near switch, photoelectric inductors) to make inverter count. And control application based on counting shall be completed by reference signal of multifunctional output terminals (counting agreement, random counting agreement). Examples are coiling machine and packing machine.

4-09	Speed tracking after b.b. reset		Factory setting	**d 0**
	Setting range	**d 0**	Tracking downwards from speed before b.b	
		d 1	Tracking upwards from min speed	

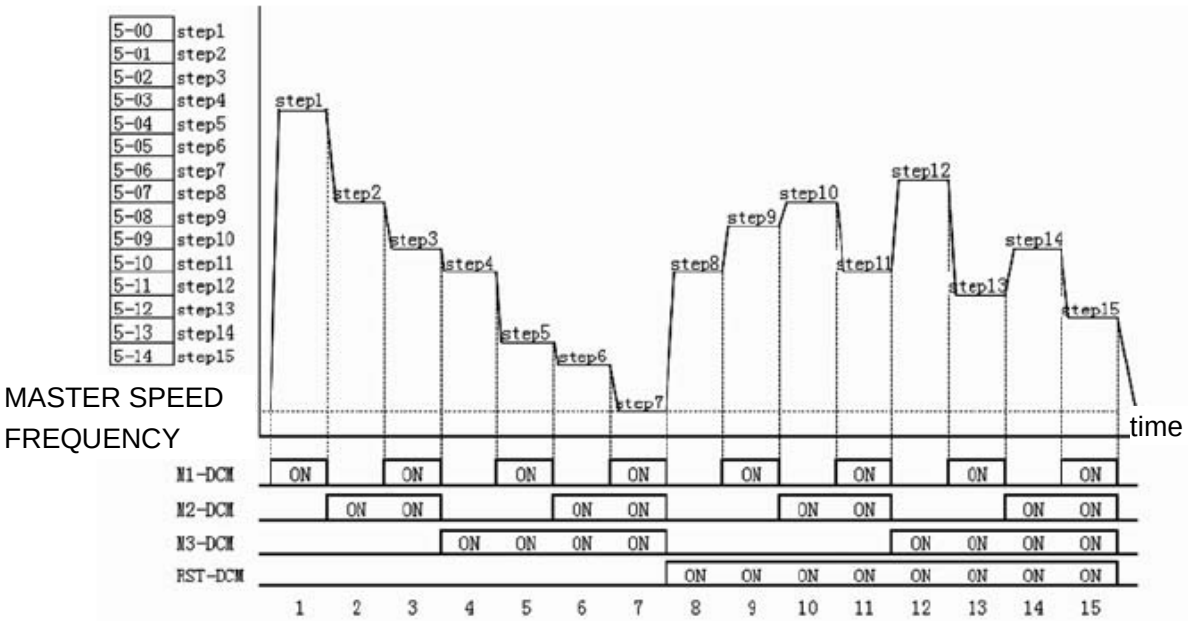
For detailed action description, see Parameter8-04.

4-10~4-22	Reserved

5. Multi-step and auto-program operation parameter

5-00	1st Step Speed		Factory setting	**d 0.0**
5-01	2nd Step Speed		Factory setting	**d 0.0**
5-02	3rd Step Speed		Factory setting	**d 0.0**
5-03	4th Step Speed		Factory setting	**d 0.0**
5-04	5th Step Speed		Factory setting	**d 0.0**
5-05	6th Step Speed		Factory setting	**d 0.0**
5-06	7th Step Speed		Factory setting	**d 0.0**
	Setting range	**d0.0<->d 400Hz**	Unit	0.1Hz

Multi-step operation (8-step as maximum value) shall be available by means of multi-function input terminals (see 4-04 to 4-08 for reference), the step speed frequency shall be set respectively within a range of 5-00 to 5-06. Programming automatic operation shall be available in coroperation to parameters (5-18 to 5-25).



5-07~5-14	Reserved

5-15	Auto programming operation mode		Factory setting	**d 0**
	Setting range	**d 0**	Auto operation mode cancelled	
		d 1	Stop after auto operating for 1 cycle.	
		d 2	Auto operation perform in cycles	
		d 3	Stop after auto operating for 1 cycle (STOP intervals).	
		d 4	Stop after auto operating for 1 cycle (STOP intervals).	

This parameter shall be applicable for operation process control of general micro machine, food treatment machine and washing machine, and some control wiring such as traditional relay, switch and timing machine shall be replaced; when this function is used, many parameters shall be set, and attention shall be paid to each detail. Read descriptions below carefully.

5-16	PLC Rotating Direction 1 (0 to 7th step speed)		Factory setting	**d 0**
	Setting range	**d 0<-> d 255** (0: forward run; 1: reverse run)	Unit	**1**

This parameter determines rotating direction of programming operation 5-00 to 5-06 as well as all step running of the master speed.

Setting method: Operation direction setting is in binary 8 bit, and only input this parameter after it is transferred into decimal value.

5-17	Reserved

5-18	PLC Step 0 Time		Factory setting	**d 0**
5-19	PLC 1st Step Time		Factory setting	**d 0**
5-20	PLC 2nd Step Time		Factory setting	**d 0**
5-21	PLC 3rd Step Time		Factory setting	**d 0**
5-22	PLC 4th Step Time		Factory setting	**d 0**
5-23	PLC 5th Step Time		Factory setting	**d 0**
5-24	PLC 6th Step Time		Factory setting	**d 0**
5-25	PLC 7th Step Time		Factory setting	**d 0**
	Setting range	**d 0<->d 65500S**	Unit	**1S**

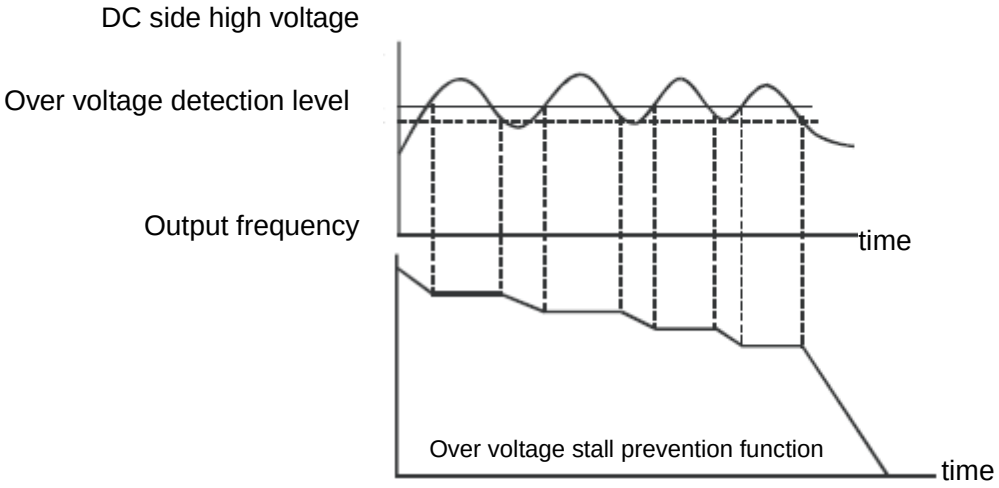
Time setting for 8 parameters above refers to time which fits each step of auto-programming operation. Max of the parameter shall be 65530 sec, and display shall be d 65.5.

Special description: When this parameter is set to d0 (0 sec), it means that operation for this step is omitted and operation of next step shall be performed automatically. This means that although 8 steps are provided by the inverter, users can minify it into 2 steps according to specific requirements, this function can be realized by set time of the step which shall be omitted to d0 (0 sec).

5-26~5-33	Reserved

6 Protection parameters

6-00	Over voltage stall prevention function	Factory setting	**d 370,d 740**
	Setting range **d 0**	Disabled	
	Setting range **d 1**	220V series: 340V-400V 440 V series: 680V-800V	



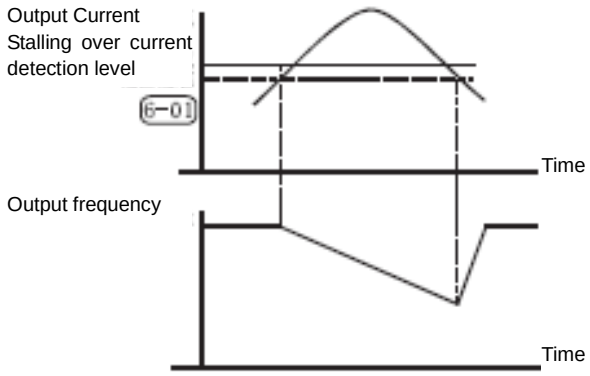
When deceleration is performed, back-up energy may be generated in AC motor drive due to inertia of motor load, and DC side voltage may rise to max value. Thus, when over voltage stall prevention is started, over voltage at DC side shall be detected, and deceleration shall be interrupted (output frequency shall be kept), which will not be performed again by AC motor drive until voltage is below setting value.

Techniques Forum

This function is set for uncertain load inertia circumstances. Deceleration over voltage shall not occur in normal load stop, and deceleration time shall also be applicable. However, tripping shall not occur due to over voltage in occasional load back up inertia increase stop; in these occasions, deceleration time shall be increased automatically by the inverter to stop. This function is inapplicable provided that deceleration time disturbs application. This problem shall be solved by increasing deceleration time or install braking resistor to absorb excessive back up voltage.

6-01	Over current stall prevention level setting			Factory setting	**d 170**
	Setting range	**d 0**	Unavailable		
		d 1	**d 20<->d 200%**	UNIT	1%

During operation of AC motor drive, provided that output current exceeds set value of 6-01 (Over current stall prevention current level during running), output frequency shall be decreased by AC motor drive to prevent motor stalling. AC motor drive shall perform acceleration again to set frequency when output current is below setting of 6-01. Set unit shall be percentage of rated output current (100%) of the AC motor drive.



Over current stall prevention function during running

6-02	Over-torque detection function option			Factory setting	**d 0**
	Setting range	**d 0**	No detection		
		d 1	Over torque detection (oL2) during constant speed running, continue to run after detection.		
		d 2	Over torque detection (oL2) during constant speed running, stop running after detection.		
		d 3	Over torque detection (oL2) during acceleration, continue to run after detection.		
		d 4	Over torque detection (oL2) during acceleration, stop running after detection.		

when this parameter sets the action of driver when OL2 actuates, no action when set as 0. When set as other values, the manipulator will display OL2 error when OL2 actuates. 1 or 3 setting shows that the inverter continues to operate after error occurs. The rest of OL2 error needs to its automatic reset after the error disappears or stop the inverter and reset error simultaneously. 2 or 4 setting indicates that the inverter stops operating after error happens. Press RESET key to reset OL2 error after 5 seconds. Determine whether setting this function at constant speed or accelerated speed is more effective according to the actual usage.

6-03	Over-torque detection function option		Factory setting	**d 150**
	Setting range	**d 20<->d 200%**	Unit	1%

Set Over torque detection level, unit shall be percentage of rated current (100%) of AC motor drive.

6-04	Over-torque detection function option		Factory setting	**d 0.1**
	Setting range	**d 0.1<->d 10.0S**	Unit	0.1S

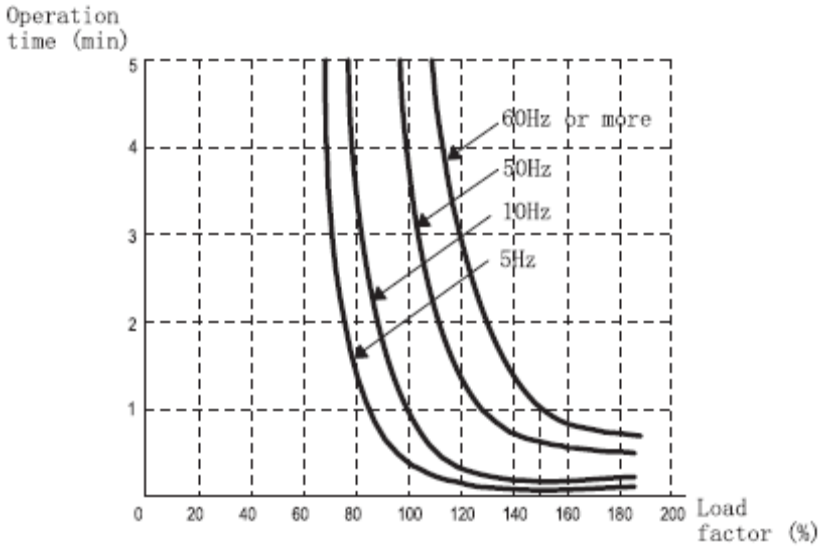
Over-torque detection method: This contactor shall be closed, if output current exceeds over torque detection level (6-04 set value; factory setting: 150%) and 6-04 setting for over torque detection time (Factory setting: 0.1 sec) and if multifunctional output terminal is set to over torque detection reference. See descriptions in 3-03.

6-05	Electrical thermal relay selection			Factory setting	**d 0**
	Setting range	d 0	No action		
		d 1	Act in standard motor		
		d 2	Act in special motor		

To prevent over-heating in low speed running of self-cold motor, users shall set electric relay to control the output frequency of AC motor drive within allowable range.

6-06	Thermal relay action time		Factory setting	**d 60**
	Setting range	**d 30<->d 600S**	Unit	1S

This parameter sets time of I^2t protection relay characteristics of electric relay, with three categories available: Short-time rated, standard rated and long-time rated.



6-07	Recent 1st fault record		Factory setting	**d 0**
6-08	Recent 2nd fault record		Factory setting	**d 0**
6-09	Recent 3rd fault record		Factory setting	**d 0**
6-10	Recent 4th fault record		Factory setting	**d 0**
6-11	Recent 5th fault record		Factory setting	**d 0**
6-12	Recent 6th fault record		Factory setting	**d 0**
	Setting range	Non		

Parameter 6-07 to 6-12 is available to record fault signals of recent six times. AC motor drive shall be reset to prepared station provided that fault has been eliminated. Records of 6 times shall not be reset to factory setting due to parameter reset.

d 0 No fault records	d16: read error of internal storage IC data (CF2)
d 1 oc (over current)	d 17 external BB signal input (bb)
d 2 ov (over voltage)	d 18 motor overload (oL2)
d 3 oh (over heating)	d 19~d21 Reserved
d 4 ol (drive over load)	d 22 internal temperature is over high or circuit fault at power-on test (CF3.1)
d 5 ol1(Electrical thermal relay)	d 23 over voltage of internal DC voltage side at power-on test (CF3.2)
d 6 EF(external fault)	d 24 under voltage of internal DC voltage side at power-on test (CF3.3)
d 7~d15 Reserved	d29: over voltage protection circuit fault (HPF.1)
	d31: over current protection circuit fault (HPF.3)
	D37: wobble frequency setting error (Errb)

7 Special Parameters

7-00	Motor no load current setting		↗	Factory setting	**d 85**
	Setting range	**d 30<->d 120%**		Unit	1%

This parameter must be set according to specifications on nameplate of the motor. Factory setting shall be set according to rated current of AC motor drive. By this parameter, output current of AC motor drive shall be controlled to prevent motor overheat. Provided that current of motor exceeds this setting, output frequency shall decrease until current draws below setting value.

7-01	Motor no load current setting		↗	Factory setting	**d 30**
	Setting range	**d 0<->d 90%**		Unit	1%

This parameter is to set no load current of motor; it shall influence torque compensation, and rated current of the AC motor shall be 100%; this parameter setting must be lower than setting of Parameter 7-00.

7-02	Auto slip compensation setting		Factory setting	**d 1**
	Setting range	**d 0.0~d 1.0**	Unit	0.1

This parameter can set AC motor drive to automatically output additional voltage when rotating in order to get a higher torque. I .

7-03	Auto slip compensation setting		Factory setting	**d 0.1**
	Setting range	**d 0.0~d 10.0**	Unit	0.1

Since load and slip shall increase when AC motor drives induction motor, this parameter(set value: 0.0-10.0) can set compensation frequency to decrease slip and provide the motor running speed under rated current approach synchronous rotating speed. When output current of AC motor drive exceeds motor no load current (7-01 set value), the motor drive shall compensate frequency in accordance with this parameter.

7-04 ~7-10	Reserved

7-11	Motor rated revolution		Factory setting	**d 1450**
	Setting range	**d500<->d 3000**	Unit	1

This parameter must be set up in accordance with the specifications in the nameplate of the motor.

7-12	Motor pole number		Factory setting	**d 4**
	Setting range	**D0<->d30**	Unit	2

This parameter can set number of pole.(can't be odd)

7-13	Motor rated power		Factory setting	**d 50.0**
	Setting range	**D 5.0<->d 400**	Unit	0.1

This parameter must be set according to the nameplate specification of motor.

7-14~7-33	Reserved	Factory setting	

8. High Function Parameters

8-00	DC braking level setting		Factory setting	**d 0**
	Setting range	**d 0<->d 100%**	Unit	1%

Description of parameter: This parameter sets DC braking level of motor at starting or stopping; braking capability shall increase as DC braking percentage increases. However, pay attention that setting shall be increased gradually enough torque appear. And great care shall be given that this braking percentage must be free from overlarge.

8-01	DC braking level setting		Factory setting	**d 0.0**
	Setting range	**d0.0<->d 60.0S**	Unit	0.1S

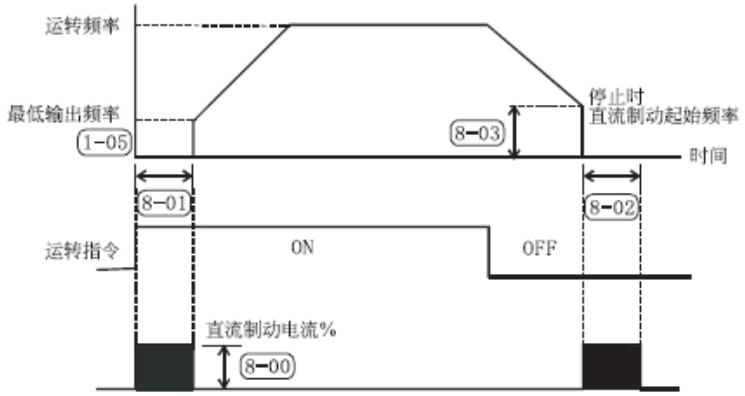
This parameter is to set time lasting of DC braking voltage input to motor during start of AC motor drive.

8-02	DC braking time setting at stopping		Factory setting	**d 0.0**
	Setting range	**d0.0<->d 60.0S**	Unit	0.1S

This parameter is to set time lasting of DC braking voltage input to motor during braking. If DC braking is necessary at stop, this function shall be available if Parameter 2-04 is set to deceleration and stop (d0).

8-03	Starting frequency of DC braking at stopping		Factory setting	**d 1.0**
	Setting range	**d 0.1<->d 60.0Hz**	Unit	0.1Hz

This parameter is to set DC braking starting frequency from deceleration to stop of AC motor drive. When set value is below min frequency (1-05), starting frequency of DC braking shall begin from min frequency.



运转频率 Running frequency　最低输出频率 Min output frequency 运转指令 Running reference
直流制动电流%DC braking current % 停止时直流制动时间 DC braking time at stopping
时间 time

Techniques Forum: DC braking before running is generally applied in circumstances which load can move when machine such as fan or pumps stop. For these loads, prior to AC motor drive start, motor is generally in free rotating, while direction is uncertain. Prior to start, it is advisable to perform DC braking before starting motor. DC braking at stopping is generally used in circumstances when motor is suggested to be braked quickly, or for control of location, such as traveling crane and cutting machine.

8-04	Restarting after momentary power loss			Factory setting	**d 0**
	Setting range	**d 0**	Stop running after momentary power loss		
		d 1	Run continuously after momentary power loss, track upwards from frequency after power loss		
		d 2	Run continuously after momentary power loss, track downwards from frequency after power loss		
8-05	Restarting after momentary power loss			Factory setting	**d 2.0**
	Setting range	**d 0.3<->d 5.0S**		Unit	0.1S

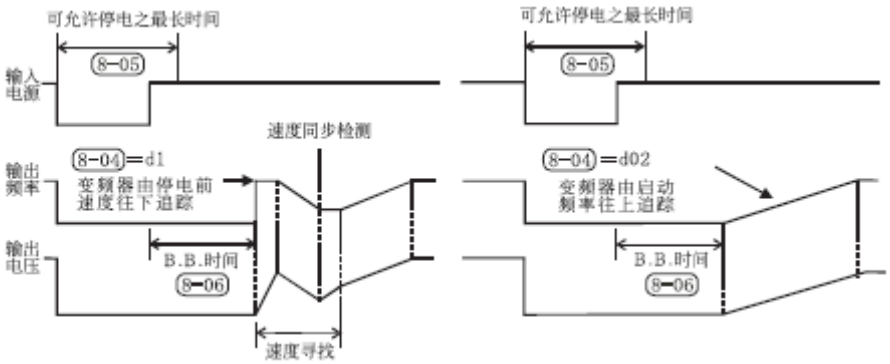
This parameter shall set Max allowable time for power loss in case of momentary power loss and if function of Restarting after momentary power loss is started. If power supply breaking time exceeds Max allowable time, output of AC motor drive shall stop after power resupplied.

8-06	Speed tracking time for B.B		Factory setting	**d 0.5**
	Setting range	**d 0.3<->d 5.0S**	Unit	0.1S

If power supply interruption is detected, AC motor drive shall stop output and shall not be re-started until after set time by this parameter. It's preferred to provide output side residual voltage to be approximately 0V prior to AC motor drive starting.

When setting external B.B and restart after fault, this parameter shall be time for speed tracking.

8-07	Max current setting for speed tracking		Factory setting	**d 150**
	Setting range	**d 30<->d 200%**	Unit	1%



可允许停电之最长时间 Max allowable time for power loss
输入电源 Input power supply 输出频率 Output frequency 速度寻找 speed search
输出电压 Output voltage
变频器由停电前速度往下追踪 Track downwards from speed before power loss of inverter
B.B 时间 B.B time
速度同步检测 speed synchronous detection
变频器由停电前速度往上追踪 Track upwards from speed before power loss of inverter

8-08	Max of inhibited frequency setting 1		Factory setting	**d 0.0**
8-09	Min of inhibited frequency setting 1		Factory setting	**d 0.0**
8-10	Max of inhibited frequency setting 2		Factory setting	**d 0.0**
8-11	Min of inhibited frequency setting 2		Factory setting	**d 0.0**
8-12	Max of inhibited frequency setting 3		Factory setting	**d 0.0**
8-13	Min of inhibited frequency setting 3		Factory setting	**d 0.0**
	Setting range	**d 0.0<->d 400Hz**	Unit	0.1Hz

Parameters above define inhibited frequency setting, and this range shall be avoided from frequency setting for AC motor drive, reason is that frequency output shall not be stable at these ranges but shall stay beyond these ranges of frequency. However, since frequency output shall be continuous, when frequency is not set within these ranges, frequency output shall be continuous and jumping shall not occur at locations of inhibition frequency.

8-14	Fault restarting times		Factory setting	**d 0**
	Setting range	**d 0<->d 10**		

Times of auto restarting of AC motor drive shall be set to 10 times after fault (for fault allowable situations: OC (over current) and OV (over voltage)). If it is set to 0, auto-reset/restarting function shall not be performed. In restarting after fault, AC motor drive shall be started in speed tracking mode up to down.

8-15	AVR function options		Factory setting	**d 1**
	Setting range	**d 0**	AVR function available	
		d 1	AVR function unavailable	
		d 2	AVR function cancelled during deceleration	

Motor rating generally consists of AC 220V/220V and 60Hz/50Hz; input voltage of AC motor ranges from AC 180V to 264V, 50Hz/60Hz; Thus, for AC motor drive without function of auto-voltage stabilizing, if input power supply of AC motor drive is AC 250V, a same voltage shall be output to motor, and motor shall then run in over voltage power supply, which will cause an increased temperature rise to motor. This shall also be unfavorable to insulation and torque output, thus, duration of motor shall be decreased sharply as a result.

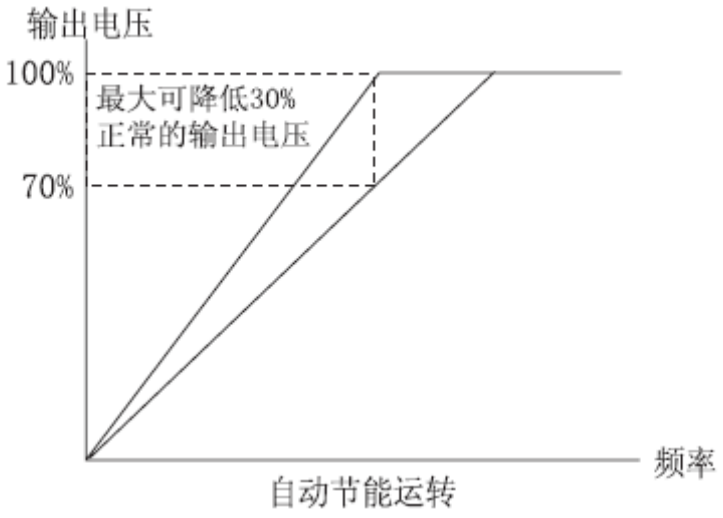
Auto-voltage stabilizing function of AC motor drive shall stabilize automatically output power supply to rated voltage of motor when input power supply exceeds rated voltage of the motor. For example, if V/F curve is set to AC 220V/50Hz and input power supply is in a range of AC200 to 264V, voltage output to motor shall be stabilizing automatically to AC 220V/50Hz, not exceeding the set voltage. If input power supply varies from AC 180 to 200V, voltage output to motor shall be proportional to input power supply.

It has been discovered that in deceleration to stop, time of deceleration shall be decreased when AVR function is closed. In addition with fine function of auto acceleration and deceleration, the accel/decel of motor shall be much more speeded.

8-16~8-18	Reserved

8-19	Automatic energy saving		Factory setting	**d 0**
	Setting range	**d 0**	1: no processing	
		d 1	2: energy saving	

when the inverter operates in energy saving mode, full voltage operate it in acceleration and deceleration time. In the constant speed rotating mode, the load power will calculated automatically to supply the load with best voltage value. This function is not suitable for load variation frequency or the load which has approached to the full load rated load in operation.



输出电压 output voltage 最大可降低 30% can decrease by 30% at most
正常的输出电源 normal output power supply 频率 frequency
自动节能运转 automatic energy-saving operation

8-20	Error restart times automation reset time		Factory setting	**d 10**
	Setting range	**d 1<->d100 minutes**		

Error restart times automation reset time: every retry (including the waiting period before retry) will make the time of fault restart minus 1. The inverter will not restart automatically when the fault restart time has been decreased to 0. If OU and OC fault don't happen in the time set by 8-20, the time of fault restart will set to the time set by 8-14 automatically.

8- 21	Reserved

8-22	Error restart delay time		Factory setting	**d 2.0**
	Setting range	**d 1<->d 20.0S**		

It is the waiting time for fault restart, which means the restart command will be performed after the time set by this parameter when fault happens.

9 Communication Parameters

9-00	Communication address			Factory setting	**d 1**
	Setting range	**d 1<->d 247**			

If AC motor drive is set to RS-485 series communication interface control, each AC motor drive shall set its individual address in this parameter. And each address in a same connection net shall be ONLY, shall not be repeated.

9-01	Communication transmitting speed			Factory setting	**d 1**
	Setting range	d 0	Baud rate 4800 (data transmitting speed, bit/sec)		
		d 1	Baud rate 9600 (data transmitting speed, bit/sec)		
		d 2	Baud rate 14400 (data transmitting speed, bit/sec)		
		d 3	Baud rate 19200 (data transmitting speed, bit/sec)		
		d 4	Baud rate 38400 (data transmitting speed, bit/sec)		

Parameter in AC motor drive shall be set and modified by inner communication interface (RS-485 series communication interface) for S1100, and operation status of the motor drive shall also be monitored by this parameter. This parameter is to set communication transmission speed.

9-02	Transmitting fault treatment			Factory setting	**d 0**
	Setting range	d 0	Warning and running continuously		
		d 1	warning and deceleration to stop		
		d 2	warning and coasting to a stop		
		d 3	no warning and running continuously		

This parameter is used to set the driver state when communication fault occurs.

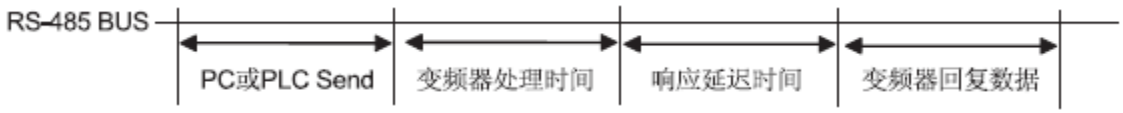
9- 03	Reserved

9-04	Communication transmission format			Factory setting	**d 0**
	Setting range	d 0	Modbus ASCⅡMode,Data format<8,N,1>		
		d 1	Modbus ASCⅡMode,Data format<8,N,2>		
		d 2	Modbus ASCⅡMode,Data format<8,E,1>		
		d 3	Modbus ASCⅡMode,Data format<8,E,2>		
		d 4	Modbus ASCⅡMode,Data format<8,O,1>		
		d 5	Modbus ASCⅡMode,Data format<8,O,2>		
		d 6	Modbus RTU Mode, Data format <8,N,2>		
		d 7	Modbus RTU Mode, Data format <8,E,1>		
		d 8	Modbus RTU Mode, Data format <8,O,1>		
		9～11	Reserved		

9- 05	Reserved
9- 06	Reserved

9-07	Communication response delay time		Factory setting	**d 1**
	Setting range	0～200 (one unit=2ms)		

A period of time is needed to switch the host computer from sending state to receiving state. This parameter can set the delay time to ensure the normal receiving of host computer.



变频器处理时间 inverter process time 响应延迟时间 response delay time
变频器回复数据 inverter recovery data

Computer control

For RS-485 series communication interface, each S1100 shall be prepared with individual communication address in Parameter 9-00, thus inverter shall control it based on the individual communication addresses.

S1100 AC motor drive is set to Modbus networks communication, and the following two modes are available: ASCⅡMode(American Standard Code for Information Interchange) or RTU Mode (Remote terminal Unit). Users can set specific mode and communication agreements in Parameter 9-04.

Code Meaning of Modes:

ASCⅡMode:

Each 8-bit data shall be consisted of two ASCII characters. For example: a 1-byte data 64H (hexadecimal) shall be indicated as “64” by ASCⅡcode, consisting of “6” (36H) and “4” (34H)

Character symbol	‘0’	‘1’	‘2’	‘3’	‘4’	‘5’	‘6’	‘7’
ASCⅡcode	30H	31H	32H	33H	34H	35H	36H	37H

Character symbol	‘8’	‘9’	‘A’	‘B’	‘C’	‘D’	‘E’	‘F’
ASCⅡcode	38H	39H	41H	42H	43H	44H	45H	46H

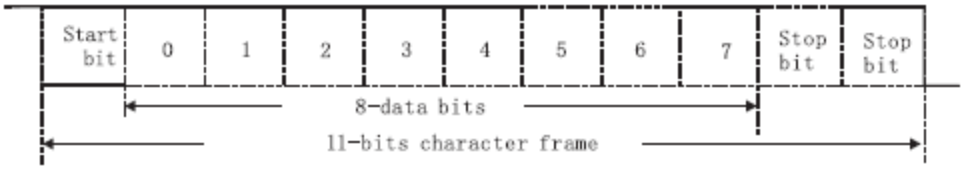
RTU Mode:

Each 8-bit data consists of two 4-bit hexadecimal characters. For example: 64H.

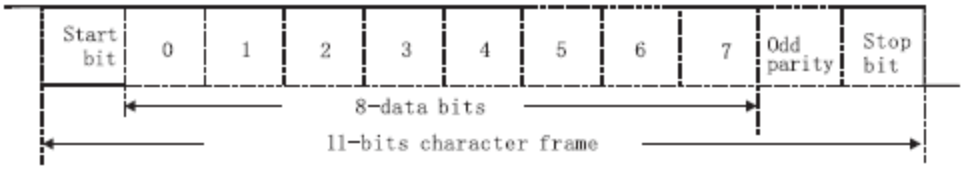
Structure of characters:

11-bit character frame (used for 8-bit character) (explained in following examples)

❖（8，N, 2:parameter9-04=1 or 6）



❖（8，O, 1:parameter9-04=4 or 8）



Communication data structure

Communication data form frame:

ASCⅡMode:

STX	Starting characters(3AH)
ADR1	Communication address:
ADR0	8-bit address consists of 2 ASCⅡcodes.
CMD1	Command code
CMD2	8-bit address consists of 2 ASCⅡcodes.
DATA(n-1)	Data:
……	N ×8-bit data consists of 2n ASCⅡcodes.
DATA 0	N≤25,50ASCⅡcodesatmost.
LRC CHK 1	Longitudinal Redundancy Check
LRC CHK 0	8-bit LRC consists of 2 ASCⅡcodes.
END 1	END character:
END 0	END1=CR(0DH); END2=LF(0AH)

RTU Mode

START	Inaction period of exceeding 10ms.
ADR	Communication address: 8-bit address
CMD	Command code: 8-bit command
DATA(n-1)	Data: N ×8-bit data, N≤25
……	
DATA 0	
CRC CHK Low	Cyclical Redundancy Check 16-bit CRC consists of two 8-bit characters
CRC CHK High	
END	Inaction period of exceeding 10ms.

ADR (Communication address)

Allowable communication address shall range from 0 to 247. Communication address 0 indicates that communication shall be sent to all AC motor drives. And in this case, AC motor shall not response any signal to master device.

For example: Communication to AC motor drive of which the communication address is 16 (decimal)

ASCⅡMode:(ADR 1,ADR 0)='1','0'=>'1'=31H,'0'=30H

RTU Mode:(ADR)=10H

CMD (Command reference) and DATA

Format of data characters depends on command code. Available command code is explained below:

- Command code: 03H, available to read N characters, Max (N) =12. for example: From address 01H to starting address 2102H of AC motor drive to read 2 characters continuously.

ASCⅡMode:

Command

STX	':'
ADR1	'0'
ADR0	'1'
CMD 1	'0'
CMD0	'3'
Starting data address	'2'
	'1'
	'0'
	'2'
Number of data (Counting in "word")	'0'
	'0'
	'0'
	'2'
LRC CHK 1	'D'
LRC CHK 0	'7'
END 1	CR
END 0	LF

Response

STX	':'
ADR1	'0'
ADR0	'1'
CMD 1	'0'
CMD0	'3'
Number of data (Counting in "byte")	'0'
Starting data address 2102H	'4'
	'1'
	'7'
	'7'
	'0'
Data address 2103H	'0'
	'0'
	'0'
	'0'
LRC CHK 1	'7'
LRC CHK 0	'1'
END 1	CR
END 0	LF

RTU Mode

Command

ADR	01H
CMD	03H
Starting data address	21H
	02H
Number of data (Counting in “word”)	00H
	02H
CRC CHK Low	6FH
CRC CHK High	F7H

Response

ADR	01H
CMD	03H
Number of data (Counting in “byte”)	04H
Starting data address 2102H	17H
	70H
Data address 2103H	00H
	00H
CRC CHK Low	FEH
CRC CHK High	5CH

- Command code: 06H, write for one character (word), for example: write 6000(1770H) to Address 0100H of AC motor drive in 0.1 H for address.

ASCⅡMode:

Command

STX	‘:’
ADR1	‘0’
ADR0	‘1’
CMD 1	‘0’
CMD0	‘6’
Data address	‘0’
	‘1’
	‘0’
	‘0’
Data	‘1’
	‘7’
	‘7’
	‘0’
LRC CHK 1	‘7’
LRC CHK 0	‘1’
END 1	CR
END 0	LG

Response

STX	‘:’
ADR1	‘0’
ADR0	‘1’
CMD 1	‘0’
CMD0	‘6’
Data address	‘0’
	‘1’
	‘0’
	‘0’
Data	‘1’
	‘7’
	‘7’
	‘0’
LRC CHK 1	‘7’
LRC CHK 0	‘1’
END 1	CR
END 0	LF

RTU Mode

Command

ADR	01H
CMD	06H
Data address	01H
	00H
Data	17H
	70H
CRC CHK Low	86H
CRC CHK High	22H

Response

ADR	01H
CMD	06H
Data address	01H
	00H
Data	17H
	70H
CRC CHK Low	86H
CRC CHK High	22H

CHK (check sum)

ASCⅡMode:

LRC(Longitudinal Redundancy check) is adopted by ASCⅡMode.

It is calculated as follows: get sum of data from ADR1 to the last one, unit of SUM shall be 256 in unit, and remove the extra bite(For example, for 128H of hexadecimal results, only 28H shall be accepted.), then perform quadratic counter bonification.

For example, obtain one character from 0401H address of AC motor drive to 01H address.

STX	':'
ADR 1	'0'
ADR 0	'1'
CMD 1	'0'
CMD 0	'3'
Data address	'0'
	'4'
	'0'
	'1'
Data	'0'
	'0'
	'0'
	'1'
LRC CHK 1	'F'
LRC CHK 0	'6'
END 1	CR
END 0	LF

01H+03H+04H+01H+00H+01H=0AH, Quadratic counter bonification of 0AH shall be F6H)

RTU Mode:

CRC (Cyclical Redundancy Check) is adopted by RTU Mode, and CRC shall be calculated in following procedures:

Procedure 1: Fit an FFFFH 16-bit Cache memory (Named as CRC Cache memory)

Procedure 2: Perform "Exclusive OR" calculation on the first byte of Command and sequential byte of 16-bit Cache memory. And results shall be memorized in CRC Cache memory.

Procedure 3: Move 1 bit rightwards for content of CRC cache memory, and the first left bit shall be completed with 0. Check for value of the lowest bit of CRC cache memory.

Procedure 4: Repeat Procedure 3 if the lowest bit is 0; otherwise, perform "Exclusive OR" calculation on CRC cache memory and A001H.

Procedure 5: Procedure 3 and Procedure 4 shall be repeated until content of CRC cache memory has been moved rightwards for 8 bits. At this time, this byte has completed treatment.

Procedure 6: Procedure 2 to 5 shall be repeated to next byte of the command, until treatment to all bytes have been completed, and final data of CRC shall be value of CRC. Sequence of low byte and high byte shall be switched, which means that low byte shall be sent in priority.

For example, read 2 characters from the address which is at 2102H address of O1H AC motor drive, the last content calculation of CRC Cache memory from ADR to the last character of number of data calculate is F76FH, then command signal is shown as follows, among which 6FH is sending before F7H:

Commands

ADR	01H
CMD	03H
Initializing Data Add	21H
	02H
Data number (Counting in WORD)	00H
	02H
CRC CHK Low	6FH
CRC CHK High	F7H

Example:

CRC value below is generated from C++. And this function shall be assisted with two parameters:

```
Unsigned char* data ← ／／讯息指令指针
Unsigned char length ← ／／讯息指令的长度
此函数将转回 unsigned integer 型态之 CRC 值。
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){/* LSB(b0)=1 */
           reg_crc=(reg_crc>>1) ^ 0xA001;
         }else{
            reg_crc=reg_crc>>1;
          }
       }
  }
  return reg_crc                    //最后加传CRC缓存器的值
  }
```

(讯息指令指针) Signal reference index

(讯息指令长度) Length of reference index

此函数将转回 unsigned integer 型态之 CRC 值

CRC for unsigned integer of this function

(最后加传 CRC 缓存器的值)Final value fit with CRC Cache memory

Definition of address in communication agreement:

Available addresses are listed below:

Function	Address	Content	
AC motor drive parameters	ggnnH	Gg: indicates parameter group; nn: indicates parameter. For example: 0401H indicates parameter (4-01). Functions of parameters shall see descriptions before for reference, when catching parameter by from command code 03H, only one parameter shall be got for each time.	
Command(written only)	2000H	bit 0-1	00: Blank 01: Stop reference 10: Run reference 11: JOG+RUN reference
		bit 4-5	00: Blank 01: Fwd reference 10: REV reference 11: Changing direction
		bit 2-3 bit 6-15	Not used
	2001H	Frequency reference	
	2002H	bit0	1. E.F. ON (External fault)
		bit1	1 reset reference
		bit2	Reserved
	2003H	Reserved	
Monitor status (Reference read)	2100H	Error code	
		00: No fault records	
		01: oc (over current)	
		02: ov (over voltage)	
		03: oh (over heating)	
		04: oL (drive over load)	
		05: oL1(Motor over load)	
		06: EF(external fault)	
		07: CPU writing fault (cf1)	
		08: Cf3 (CPU or analog circuit fault)	
		09: HPF (Hardware circuit fault)	
		10: ocA(over current in acceleration)	
		11: ocd(over current in deceleration)	
		12: ocn(over current in constant speed)	
		13: GFF (Grounding short circuit)	
		14: LV (low voltage)	
		15: Reserved	
		16: cf2(CPU read fault)	
		17: b.b	
		18: ol2 (over torque)	
		19: cfa (auto accel/decel unavailable)	
		20: codE (software code protection)	

Monitor status (Reference read)	2101H	bit0-1	00: Stop LED off, Run LED on. 01: Stop LED blinks, Run LED ON. 10: Stop LED on, Run LED blinks. 11: Stop LED on, Run LED off.
		bit 2	1:JOG acts
		bit3,bit4	00: REV LED off, FWD LED on. 01: REV LED blinks, FWD LED on. 10: REV LED off, FWD LED blinks. 11::REV LED on, FWD LED off.
		bit 5-7	Reserved
		bit 8	1: Master frequency input from communication interface
		bit 9	1 Master frequency input from analog signal
		bit 10	1: Running reference input from communication interface
		bit 11	1 Parameter locking
		bit 12	0: machine stop 1: during running
		bit 13	1 JOG reference appears
		bit14,15	Reserved
	2102H	Frequency set (two decimals)	
	2103H	Output frequency (H)(two decimals)	
	2104H	Output current (A)(two decimals)	
	2105H	DC-Bus voltage(U) (one decimal)	
	2106H	Output voltage(E) (one decimal)	
	2107H	Current Step speed for multi-step speed reference (step)	
	2108H	PLC rotating speed (step)	
	2109H	PLC rotating time(sec)	
	210AH	External TRIGGER count(count)	
	2113H	Main frequency command (o)	
	2114H	Auxiliary frequency command (b)	

Abnormal response:

Except for communication signals, the AC motor drive shall feedback a normal signal after receiving command from master device. Circumstances of abnormal feedback to master device are described below:

- AC motor receives no signal due to communication fault. Thus AC motor has no response. This shall be treated as timeout status finally by master device.

- In case of AC motor receives signals correctly, but treating this signal is unavailable, an abnormal signal shall be sent back to master device, and digital operator shall display fault signal “CE xx”. “Xx” is an abnormal signal in decimal. In abnormal response, highest byte of original command code shall be set to 1, and abnormal code which explains the abnormal information shall be feedback.

Example below shows abnormal response for communication command 06H and abnormal code 02H, in which the highest byte of 06H is set to 1 thus, it becomes into 86H:

ASCII Mode:

STX	':'
ADR1	'0'
ADR0	'1'
CMD 1	'8'
CMD0	'6'
Abnormal code	'0'
	'2'
LRC CHK 1	'7'
LRC CHK 0	'7'
END 1	CR
END 0	LF

RTU Mode

ADR	01H
CMD	86H
Abnormal code	02H
CRC CHK Low	C3H
CRC CHK High	A1H

Meaning of abnormal code is shown below:

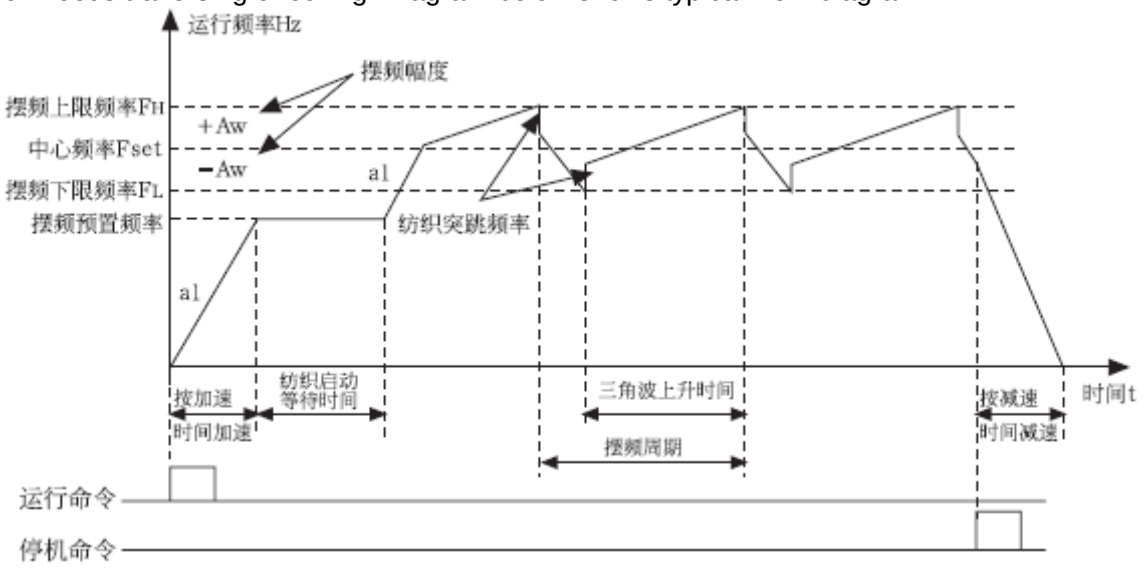
Abnormal code	Meaning	
1	Unavailable command code	In command signals, command code received is unavailable to drive the Ac motor drive.
2	Unavailable data address	In command signals, data address received is unavailable to drive the Ac motor drive.
3	Unavailable data value	In command signals, data value is not within allowable range.
4	Command unavailable	Required action can not be performed by AC motor drive.

- No signals are received by AC motor drive, but a communication fault was detected, thus no signals feedback, but a fault signal "CE xx" shall be displayed on control panel. It shall be finally treated with timeout status by the master device. 'xx" is a decimal fault code, which is explained in detail below:

Fault code	Meaning
5	Reserved
6	Intervals between commands too short. At least 10ms interval must be provided between two available commands. If no command feedback, this interval shall also be kept.
7	Reserved
8	Reserved
9	Check sum fault: to check that check sum is correct.
10	Time-out(Only for ASCII Mode) Apart from no check on time out limit, time intervals between characters shall not exceed 500ms.
11	Format fault Check that communication Baud rate complies with data format.
12	Command information too short
13	Command information length is not within specified range.
14	Apart from characters of START and END, command information also includes ASCII data which is non "0" to "9" or "A" to "F".(Only for Modbus ASCII mode)

A Wobble Frequency Function Parameters

Wobble function shall be applicable to industries such as textile and chemical fiber, and circumstances which needs traversing or coiling. Diagram below shows typical work diagram:



运行频率 Running frequency
摆频上限频率 Max wobble frequency
中心频率 Centering frequency
摆频下限频率 Min wobble frequency
摆频预置频率 Wobble preset frequency
摆频幅度 wobble amplitude
纺织突跳频率 Textile hopping frequency
按加速时间加速 Accelerate in accordance with acceleration time
纺织起动等待时间 waiting time for textile starting
三角波上升时间 triangle wave rising time
摆频周期 wobble frequency cycle
按减速时间减速 Decelerate in accordance with deceleration time
时间 time
运行命令 Running command
停机命令 machine stop command

Wobble process shall be following for general: Firstly accelerate in accordance with acceleration time to preset frequency A-02, and wait for a time of A3, then wobble centering frequency (A-04, A-05) according to accel/decel time shall be realized. After that, it shall run in cycle in set wobble amplitude (A-06, A-07), wobble frequency hopping A-08, wobble cycle A-09 and triangle wave rising frequency A-10. It shall stop in accordance with deceleration time when a STOP command is received.

Also attention shall be paid that, wobble frequency shall be cancelled automatically in jog running or closed loop running.

PLC shall run simultaneously with wobble frequency, and wobble frequency shall be unavailable in switching of Plc period. Wobble frequency shall start after PLC setting is reached in accordance with accel/decel setting in Plc period; and decelerating to machine stop shall be according to deceleration time in PLC step.

A-00	Wobble Frequency Function selection			Factory setting	**d 0**
	Setting range	**d 0**	Not using wobble function		
		d 1	Using wobble function		

This parameter is to determine using wobble frequency function or not.

A-01	Wobble Frequency input mode			Factory setting	**d 0**
	Setting range	**d 0**	Input automatically (A-03)		
		d 1	Manually controlled by external terminals.		

This parameter is to set input mode of wobble frequency:

- When it is set to 0, it shall be input automatically. In this case, it shall firstly run for a period (A-03) in wobble frequency preset frequency (A-02) after starting, and then wobble frequency shall be realized automatically.
- When it is set to 1, it shall be controlled manually by external terminals. Which means that wobble frequency shall be realized when multifunction terminal (Function 27 is for wobble frequency input) available; while wobble frequency shall not exist when terminal unavailable, with running frequency kept at wobble frequency preset frequency A-02.

A-02	Wobble Frequency Function selection		Factory setting	**d 0.0**
	Setting range	**d 0.0<->d 400Hz**	Unit	0.1Hz

Operation frequency of the inverter prior to wobble frequency running status shall be determined by this parameter.

A-03	Action delay setting of preset Wobble Frequency		Factory setting	**d 0.00**
	Setting range	**d 0.0<->d 600S**	Unit	0.1Sec

When auto-restarting is in option, A-30 is to set the delay time running in preset frequency of wobble frequency; and it shall be unavailable when inverter is set to manually control mode.

A-04	Central frequency option of Wobble Frequency			Factory setting	**d 0**
	Setting range	**d 0**	According to operation frequency source		
		d 1	According to fixed frequency setting(A-05)		
A-05	Fixed central frequency setting of Wobble Frequency			Factory setting	**d 20.0**
	Setting range	**d 0.01<->d 100%** (Corresponding Maximum Frequency Operation)		Unit	0.1%
A-06	Reference source setting for wobble aptitude			Factory setting	**d 0**
	Setting range	**d 0**	Relative central frequency		
		d 1	Relative Max operation frequency(1-00)		

Wobble frequency running is limited by min and max setting. Fault shall occur if it is not set properly.

A-07	wobble aptitude size setting		Factory setting	**d 0.0**
	Setting range	**d 0.0<->d 50.0%**	Unit	0.1%

Wobble amplitude shall be calculated according to Parameter A-06.

A-08	wobble frequency hopping		Factory setting	**d 0.0**
	Setting range	**d 0.0<->d 50.0%**	Unit	0.1%

When it is set to 0, it refers that no frequency hopping occurs.

A-09	Wobble frequency cycle		Factory setting	**d 10.0**
	Setting range	**d 0.1<->d 655S**	Unit	0.1Sec

This parameter sets time for a complete work cycle including wobble rising and descending. Never select auto acceleration/deceleration running cycle in wobble frequency running mode, otherwise fault to wobble frequency cycle may occur.

A-10	Triangle wave rising time		Factory setting	**d 50.0**
	Setting range	**d 0.1<->d 99.9%**	Unit	0.1%

This parameter sets operation time of wobble frequency rising, which is equivalent to (A-09)×(A-10)(sec), and operation time of wobble frequency rising shall be (A-09)×(A-10)(sec).

A-11	wobble frequency machine stop starting mode			Factory setting	**d 0**
	Setting range	**d 0**	Starting in memorizing state before machine stop		
		d 1	Restarting		
A-12	wobble state power loss memory			Factory setting	**d 0**
	Setting range	**d 0**	Memorizing		
		d 1	Non-memorizing		

This parameter shall only be available when A-11 is set to 0(Starting in memorizing state before machine stop)

6 TROUBLE SHOOTING

AC motor drive is provided with functions of warning and protection such as over voltage, low voltage and over current. Once fault occurs, protection function shall act, AC motor drive output stop, fault contactor act and also free running of motor shall stop. For causes and corrective measures of fault, display of fault shall be taken for reference. Fault records shall be stored into computer memory inside AC motor drive (fault records for recent six times shall be available), and records shall be read at digital control panel.

Attention shall be paid that, depressing RESET after fault shall only be available after fault has been eliminated.

6.1 Fault and corrective measures

Display	Descriptions of fault	Corrective measures
oc	AC motor drive detects Over current at output side.	1. Check rated current of motor complies with that of AC motor drive. 2. Check that there is no short circuit in U/t1-V/t2-W/T3. 3. Check that no short circuit or grounding occur to connection of motor. 4. Check that screws are securely tightened to AC motor drive. 5. Increase acceleration time (1-09, 1-10). 6. Check there is no over load to motor.
ou	AC motor drive detects Over voltage at DC high voltage side.	1. Check input voltage is within rated voltage range of AC motor drive, and see that no voltage surge occurs. 2. If over voltage occurs at DC high voltage side of AC motor drive caused by inertia back up voltage, deceleration time shall be increased.
oH	AC motor drive detects over heat, exceeding protection level.	1. Check that ambient environment is not over heat. 2. Check radiator and air fan is running. 3. Check enough clearance for air flowing is provided to AC motor drive is with.
Lu	DC high voltage side over low inside AC motor drive.	1. Check power supply voltage is correct. 2. Check no sudden heavy load.
oL	Output current exceeds allowable current of AC motor drive. 65 sec shall be in station if 150% of rated current of AC motor drive is output.	1. Check motor over load. 2. Decrease torque (7-02) to improve set value. 3. Increase output capacity of AC motor drive.
oL 1	Inner electric relay protection acts	1. Check motor over load. 2. Check rated current (07-00) of motor is proper. 3. Check electric relay function setting 4. Increase motor capacity.
oL2	Motor load overlarge	1. Check motor load is not overlarge. 2. Check over-torque detection level setting (06-03).

Display	Descriptions of fault	Corrective measures
EF	AC motor drive stops output when external multifunction terminals EF and DCM (Sink mode) closed.	Depress RESET key after fault eliminated.
cF1	Inner memory IC data writing fault	1. Supply power again after power off. 2. Factory maintenance and overhaul
cF2	Inner memory IC data reading fault	1. Depress RESET key and reset parameter to factory setting. 2. If unavailable, search for factory maintenance and overhaul.
cF3.1	Internal temperature is over high at power-on test	1. check the environment temperature, whether it is too high 2. If the environment temperature is normal, send to factory for service
cF3.2	Over voltage of AC motor driver internal DC voltage side at power-on test	1. check the input voltage, whether it is within the rated input voltage of AC motor driver 2. if the input voltage is normal, send to factory for service
cF3.3	Under voltage of AC motor driver internal DC voltage side at power-on test	1 check whether the input power supply voltage is normal 2. if the input voltage is normal, send to factory for service
HPF.1	Circuit fault of over voltage protection	Factory service
HPF.3	Circuit fault of over current protection	Factory service
bb	AC motor drive stops output when external multifunction terminals (MI1, MI2, and MI3) and DCM (Sink mode) closed.	B.b shall disappear immediately after signal source eliminated.
CE--	Communication fault	1. Check the connection condition of communication circuit 2. Check the communication format
Sc	Signal fault of module upper and lower bridge control	1. whether there is serious interference sources around 2. Factory service
Errb	Wobble frequency setting fault, the central frequency of wobble frequency is lower than width, or the max. value of wobble frequency exceeds the upper and lower limit of frequency.	1. reset the correct wobble frequency parameter

6.2 Troubleshooting for faults in general

Fault	Check points	Treatment
Motor doesn't run	Check connection of power supply to terminals L1/R, L2/S, L3/T?	Input power supply Supply power again after power firstly interrupted. Verify voltage class of power supply Tighten screws for terminals
	Check voltage output from output terminals U/T1, V/T2, W/T3.	Supply power again after power firstly interrupted.
	Check motor is not blocked due to load over-large	Decrease load to make motor running available
	Check fault of inverters	Check wiring and correct it if necessary in accordance with reference for fault.
	Check fwd/rev run reference achieved	
	Check input of Analog frequency setting	Verify wiring for analog frequency input signal Verify frequency input set voltage
	Verify operation mode setting	Controlled by digital operator.
Contrary rotation direction of motor	Check wiring for output terminals U/T1, V/T2, W/T3	Match correctly with terminals U/T1, V/T2, W/T3 of motor
	Check wiring for FWD/REV run	Verify wiring and correct if necessary
Velocity variation unavailable for motor running	Check wiring for analog frequency input	Verify wiring and correct if necessary
	Check operation mode setting	Check and verify operation mode setting
	Check motor is free from overload.	Decrease load
Motor running speed over high or over low	Check specification(number of poles and voltage)of motor	Confirm specification of motor
	Check gear proportion	Confirm gear proportion
	Check Max output frequency setting	Confirm Max output frequency setting
	Check voltage is not dropping at motor side	Verify V/F curve setting
Speed variation fault during motor running	Check motor overload	Decrease load
	Check load is not in sharp variation	Decrease load variation Increase capacity of inverter and motor.
	Check no phase failure occur to power supply	For single phase mode, fix AC reactor to power supply side Verify wiring for Three phase mode.

7 MAINTENANCE AND AMBIENT ELEMENTS

For safety and normal operation, the inverter shall be provided with daily as well as periodical maintenance.
Diagram below shows items that must be checked.
Check shall again performed after the inverter is powered off for several minutes, to prevent injury to operators caused by residual power of inverter condenser.

Inspection item	Inspection content	Inspection period		Inspection method	Assessment base	Corrective measures to fault
		Daily	Annual			
Machine ambient environment	Verify ambient temperature and humidity	○		Measure with temperature or humidity meter in accordance with notes for installation	Temperature: -10 to 10℃; humidity: below 95%RH	Improve environments
	Check stacking with inflammable materials	○		View inspection	No foreign materials	
Inverter installing and grounding	Check abnormal vibration to machine	○		View and auditory inspection	No foreign materials	Tighten securing screws
	Check grounding resistance complies with specification		○	Measure resistance with three-functional meter	220V Class: below 100Ω ; 440V Class: below 100Ω	Modify grounding
Input power supply voltage	Check main circuit voltage	○		Measure resistance with three-functional meter	Voltage value complies with specifications	Modify input power supply
External terminal securing screws of the inverter	Check security of screwed parts		○	View inspection and check screws are secured tightly with screwdriver	All OK	Tighten or sent for factory maintenance and overhaul
	Check terminal board is not damaged		○			
	Check no clear rust exists		○			
Inverter inner wiring	Check no distortion appears		○		All OK	
	Check outer shielding is not broken		○	View inspection	All OK	Replace or sent for factory maintenance and overhaul
Radiator	Check no dust or chipping stacked	○		View inspection	All OK	Remove stacking such as dust
Printing circuit board	Check no inductive metal or oil stacked		○	View inspection	All OK	Remove or replace electric board
	Check elements are exclusive of color changing or burning due to overheat		○			
Cooling fan	Check abnormal vibration or noise		○	View inspection and auditory inspection	All OK	Replace cooling fan
	Check no dust or chipping stacked	○		View inspection		Remove
Power elements	Check no dust or chipping stacked		○	View inspection	All OK	Remove
	Check resistance between terminals		○	Check using three-functional meter	No short circuit or circuit break for three phase output	Replace power elements or inverter
Condenser	Check for odor or leakage	○		View inspection	All OK	Replace elec condenser or inverter
	Check for expansion or distortion	○				

Always inspection and maintenance is not necessary for the inverter.

For long time safety operation, periodical inspection shall be prepared to the inverter in accordance with descriptions below. Inspection shall only performed after power supply is off for several minutes. (since residual voltage may exist in the large capacity condensers.)

（1） Remove dirty stacking inside the machine

（2） Check screws securing terminals or elements are securely tightened; if not, tighten the screws