科润技术
K&R TECHNOLOGY

ACD200 ~299 Series
ECONOMIC INVERTER

User Manual

K&R™

ACD200~299 Series
User Manual

Ver 1.0

Preface

This manual is helpful for type selecting, installation, parameter setting, site commissioning, rubleshooting, and daily maintenance of the inverter. To guarantee safe operation of the inverter, please read this manual thoroughly, and keep it handy for referance in the future..

First use this product:

For those users who use this product for the first time, should read this manual thoroughly. If you have any question in the Function and Functional performance, please feel free to contact our technical support personnel for assist.

Notice:

- ◆ Before wiring, please make sure to cut off the power.
- ◆ The electronic components in the inverter are sensitive to static, so please do not put anything in the inverter, and do not touch the main circuit board.
- ◆ After cutting off the AC power supply, if the indicator light still on, please do not touch the circuit and any part in the inverter, beacause there still be high voltage in the inverter which is very dangerous.
- ◆ The terminals of inverter must be connected to the ground correctly.
- ◆ The Input power line absolutely can not be connected to the Output terminal U/T1、V/T2 and W/T3.

Application range of this manual:

This manual is applied to ACD2（ACD2** means ACD200~ACD299） Series Inverters of our company.**

Chapter 1 Safety information and use notice points

In order to ensure the safety of your personal and equipment, please read this chapter of content conscientiously before using the inverter .

1.1 Safety precautions

There are three kinds of safety relevant warnings in this service manual.They are as follows:


This symbol briefs on: if do not operate as request, may make the body injured or equipment damaged.

This symbol is briefed on useful information.


This symbol briefs on: if do not operate as request, may cause death, severely injured or serious property loss.

(1) Forbid to connect U/T1、V/T2、W/T3 output end to AC power supply, otherwise cause the totally damage of the inverter.
(2) Don't make DC- and P2 or DC+ short-circuited, otherwise cause the inverter to be damaged.
(3) The inverter is forbidden to install on flammables, otherwise have the danger of fire.
(4) Don't install it in the environment with explosive gas,otherwise have the risk of explosion.
(5) After connecting main loop, should carry on insulating treatment to bare wiring end , otherwise have danger of getting an electric shock.
(6) If being connected to the power supply, don't operate the inverter with moist hands, otherwise have danger of getting an electric shock.
(7) The ground terminal of the inverter must be grounded well.
(8) Inverter being connected to power supply, please don't open cover and carry on wiring, Can connect the wire or the check only after closing power for 10 minutes.
(9) Only qualified personnel may carry on wiring and forbid leaving over any conductive thing in machine, otherwise have danger of gentting an electric shock or causing damage of the inverter.
(10) inverter stored for 2 years, should be stepped up gradually with voltage regulator first while having the electricity ,otherwise have danger of getting an electric shock an explosion.

(1) It is prohibited that conncet AC 220V signal to control ends except RA, RB, RC, TA, TB, TC, otherwise have danger of damaging property.
(2) If the inverter is damaged or without all parts, please don't install and operate it, otherwise have danger of fire or cause personnel injury.
(3) In the process of installation, should choose a place where can lay up the inverter, otherwise have danger of personnel injury or property damage while falling down.

1.2 Use range

(1) This inverter is only suitable for three phases AC asynchronous motor in general industrial field.

(2) When apply inverter to such equipments that arerelated much to the life, great property, safety devices etc., please must handle cautiously and consult producer.

(3) This inverter belongs to the control device of general industrial motor, if used in dangerous equipments, must consider the security safeguard procedures when the inverter breaks down.

1.3 Use notice points

(1) ACD280 series inverter is voltage-type inverter, so temperature, noise and vibration slightly increasing compared to power source running when using, belongs to normal phenomenon.

(2) If need to run for a long time with constant torque of low-speed, must select motor of frequency conversion. To use general asynchronous AC motor when running at a low speed should control temperature of the motor or carry on heat dissipation measure forcedly, so as not to burn the generator.

(3) Such mechanical devices such as gearbox and gear wheel need lubrication. After running at a low speed for a long time, may be damaged because the lubrication result become poor, so please take necessary measures in advance.

(4) When the motor running with frequency above specified, besides considering the vibration, noise increase of the motor, must also conform speed range of the motor bearing and the mechanical device.

(5) For hoist and great inertia load, the inverter would shut off frequently due to over-current or over-voltage failure in order to guarantee normal work. At this time, should consider to choose the proper brake package.

(6) Should switch on/off the inverter through terminal or other normal order channels. It is prohibited that switch on/off the inverter frequently by using strong electric switch such as magnetic control conductor, otherwise will cause the equipment damage.

(7) If need to install such switch as the magnetic control conductor, etc. between inverter output and the motor, please guarantee the inverter is switched on/off without output, otherwise may damage the inverter.

(8) The inverter may meet with mechanical resonance of the load within certain range of frequency output, can set up jumping frequency to evade.

(9) Before using, should conform the voltage of the power is within the working voltage range allowed, otherwise should vary voltage or order special inverter.

(10) In the condition of altitude above 1000 meters, should use the inverter in lower volume, reduce output current by 10% of specified current after each 1500 meters height increasing.

(11) Should make insulation check to the motor before using it for the first time or after a long time placement. Please inspect with 500V voltage-type megohm meter according to method shown as graph 1-1 and insulation resistance should not be smaller than 5MΩ, otherwise inverter may be damaged.

(12) To forbid assembling capacitor for improving power factor or lightning proof voltage-sensible resistance etc., otherwise will cause malfunction trip of the inverter or damage of the parts, show as graph 1-2

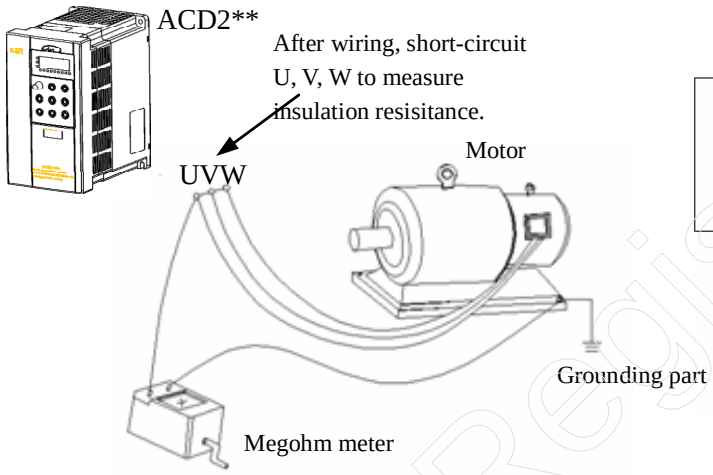


Fig.1-1 motor insulation measure

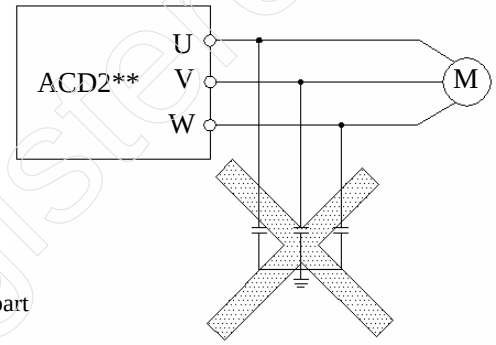


Fig.1-2 capacitor at output forbidden

1.4 Scrap notice points

When disposing scrap inverter and its parts, please note:

(1) The unit: please discard as industrial useless.

(2) Electrolytic capacitor: when burning the inverter electrolytic capacitor in it may explode.

(3) Plastic: when plastic, rubber parts etc. in the inverter are burning, they may bring bad, poisonous gas, so please be ready to safeguards.

Chapter 2 Type and specification of the inverter

2.1 Incoming inverter inspect

(1) Check if there is a damage during transportation and inverter itself has damage or fall-off parts

(2) Check if parts presented in packing list are all ready.

(3) Please confirm rated data of the inverter is in line with your order requirement.

Our product is guaranteed by strict quality system during manufacturing, packing, transportation etc,. please contact our company or local agent rapidly if some careless omission or mistake arise, we'll deal with it as soon as possible.

2.2 Type explanation

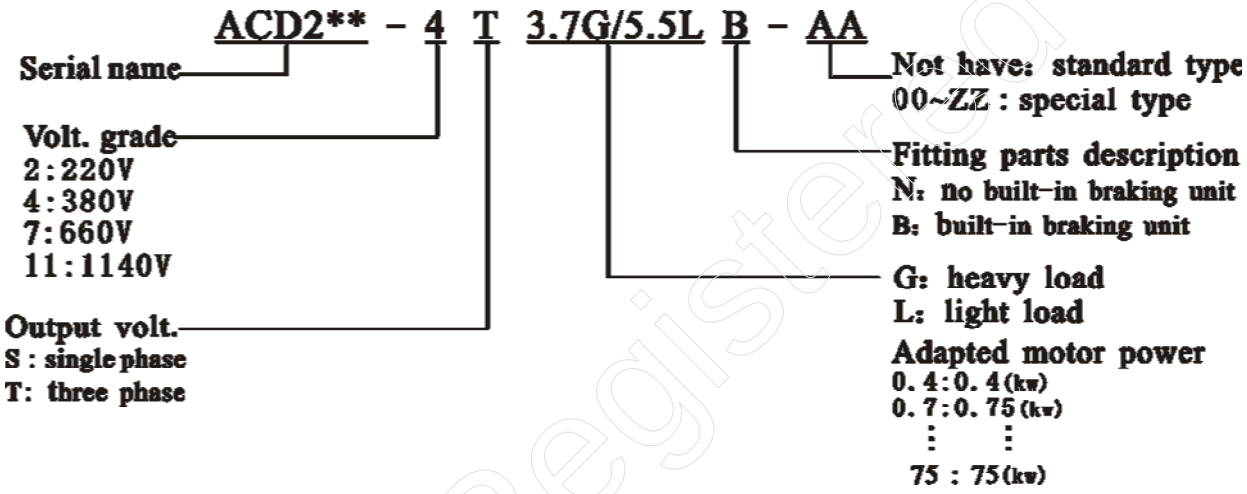


Fig.2-1 type explanation

2.3 Nameplate explanation

Nameplate presented as figure 2-2 with type and rating data at the bottom of inverter right side

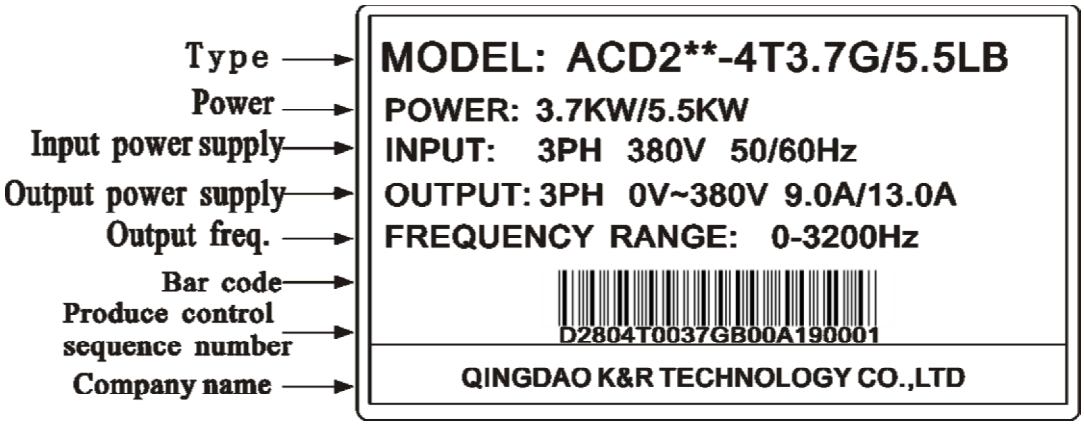


Fig. 2-2 Nameplate

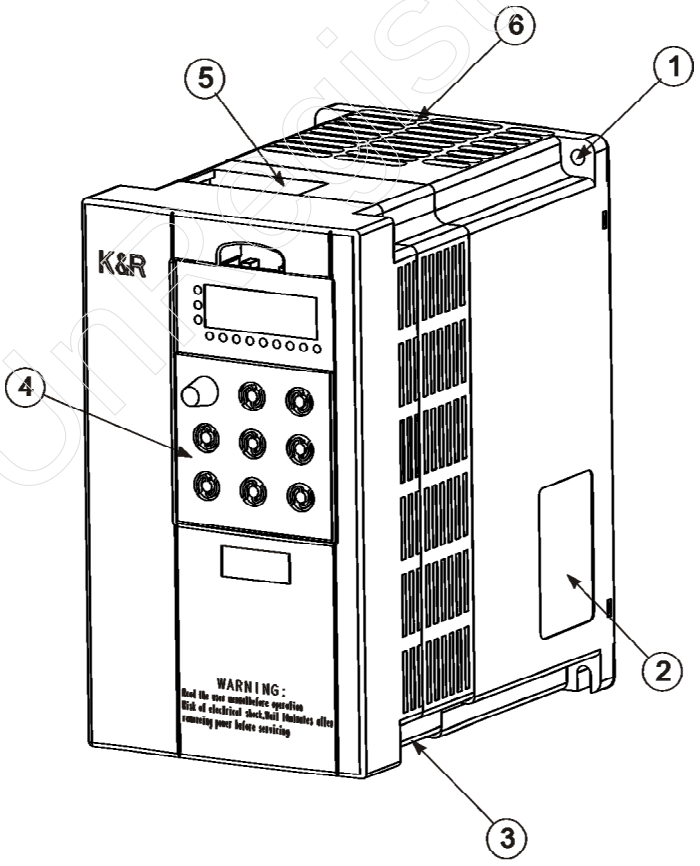
2.4 Series type explanation

Table 2-1 series type explanation

Inverter type	Input voltage(V)	Rated power (KVA)	Rated input current(A)	Rated output current(A)	Adapted motor(KW)
ACD2**-2S0.4	Single phase 220V range: -15%~20%	1.0	5.4	2.3	0.4
ACD2**-2S0.7		1.5	8.2	4.0	0.75
ACD2**-2S1.5		3.0	14.0	7.0	1.5
ACD2**-2S2.2		4.0	23.0	9.6	2.2
ACD2**-2S3.7		5.7	31.5	15.0	3.7
ACD2**-4T0.7	Three phase 380V range: -15%~20%	1.5	3.4	2.1	0.75
ACD2**-4T1.5		3.0	5.0	3.8	1.5
ACD2**-4T2.2		4.0	5.8	5.1	2.2
ACD2**-4T3.7		5.9	10.5	9.0	3.7
ACD2**-4T5.5		8.9	14.6	13.0	5.5
ACD2**-4T7.5		11.0	20.5	17.0	7.5
ACD2**-4T11		17.0	26.0	25.0	11
ACD2**-4T15		21.0	35.0	32.0	15
ACD2**-4T18.5		24.0	38.5	37.0	18.5
ACD2**-4T22		30.0	46.5	45.0	22
ACD2**-4T30		40.0	62.0	60.0	30
ACD2**-4T37		57.0	76.0	75.0	37
ACD2**-4T45		69.0	92.0	91.0	45
ACD2**-4T55		85.0	113.0	112.0	55
ACD2**-4T75		114.0	157.0	150.0	75
ACD2**-4T90		134.0	180.0	176.0	90
ACD2**-4T110		160.0	214.0	210.0	110
ACD2**-4T132		192.0	256.0	253.0	132
ACD2**-4T160		231.0	307.0	304.0	160
ACD2**-4T185		237.0	340.0	330.0	185
ACD2**-4T200		250.0	385.0	377.0	200
ACD2**-4T220		280.0	430.0	426.0	220
ACD2**-4T250		355.0	468.0	465.0	250
ACD2**-4T280		396.0	525.0	520.0	280
ACD2**-4T315		445.0	590.0	585.0	315
ACD2**-4T355		500.0	665.0	650.0	355

ACD2**-4T400		565.0	785.0	725.0	400
ACD2**-4T450		630.0	883.0	820.0	450
ACD2**-7T132	Three phase 660V: -15%~20%	192.0	170.0	150.0	132
ACD2**-7T160		231.0	200.0	175.0	160
ACD2**-7T200		250.0	235.0	215.0	200
ACD2**-7T250		355.0	265.0	260.0	250
ACD2**-7T280		396.0	305.0	299.0	280
ACD2**-7T315		445.0	350.0	330.0	315
ACD2**-7T355		500.0	382.0	374.0	355
ACD2**-7T400		565.0	435.0	410.0	400
ACD2**-7T450		630.0	490.0	465.0	450
ACD2**-7T500		700.0	595.0	550.0	500
ACD2**-7T560		730.0	605.0	575.0	560

2.5 Appearance and parts name explanation



①:Screw hole

②:Nameplate

③:Motor output terminal lower-cover

④:Operation surface

⑤:Power input terminal upper-cover

⑥:Heat radiation vent

⑦:Power input terminal

⑧:External input/output terminal

⑨:Energy consumption braking resistance terminal

⑩:Motor output end

⑪:Grounding end

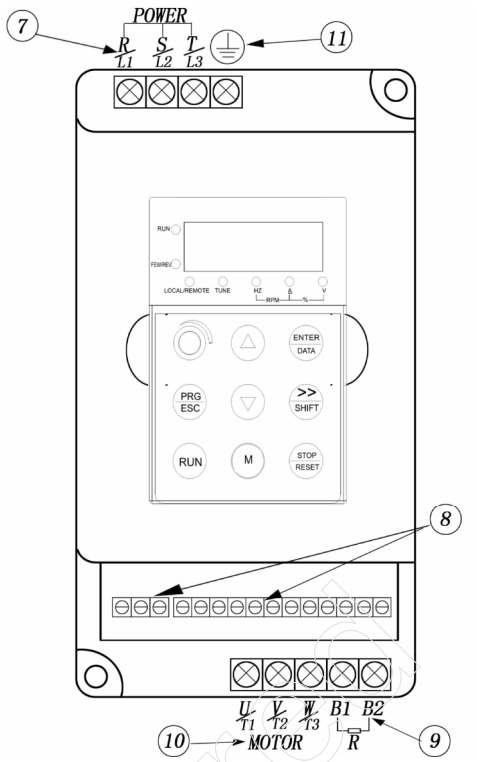


Fig.2-3 parts name sketch

2.6 Out size

2.6.1 Keypad out size

For example：71[2.80] and 36.5[1.44] Unit：millimeter [inch]

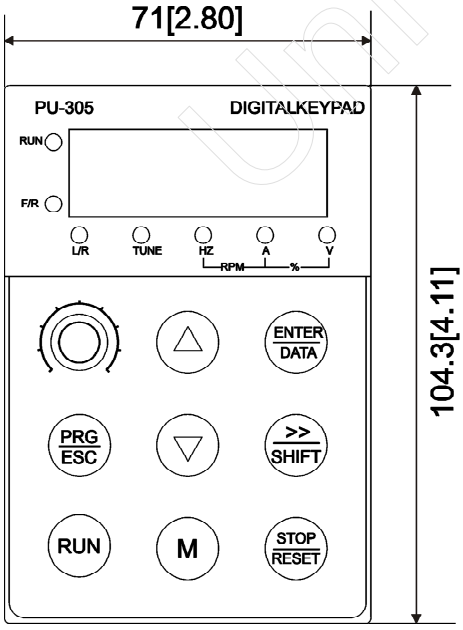


Fig.2-4 Fig.a1 Outer dimension

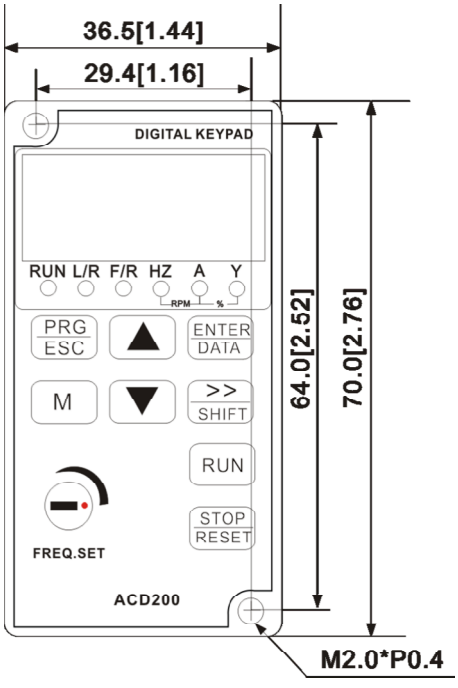


Fig.2-4 Fig.b1 Outer dimension

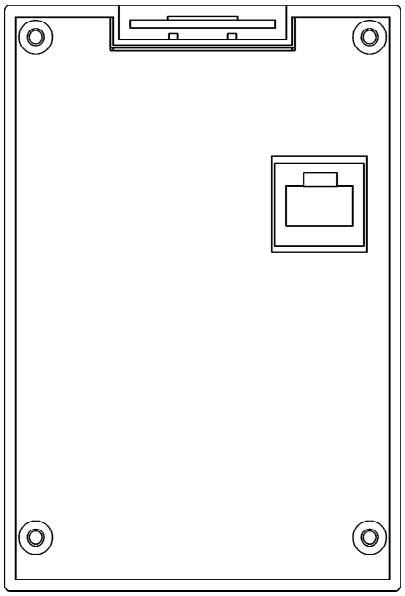


Fig.2-4 Fig.a2 Outer dimension

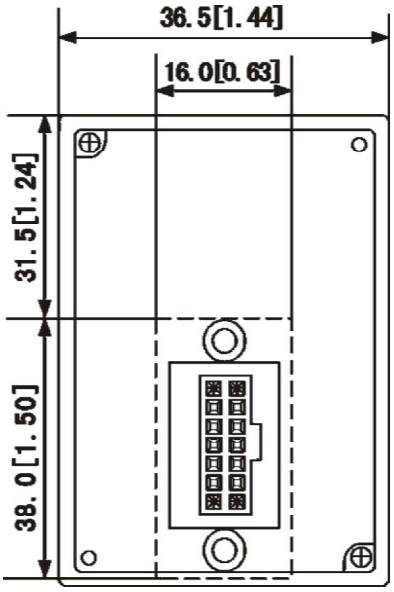


Fig.2-4 Fig.b2 Outer dimension

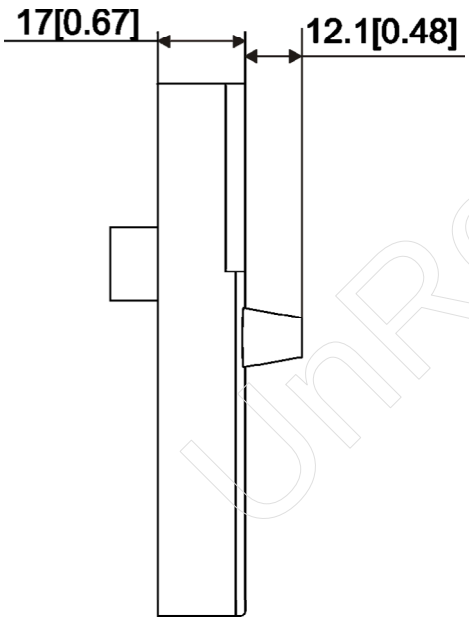


Fig.2-4 Fig.a3 Outer dimension

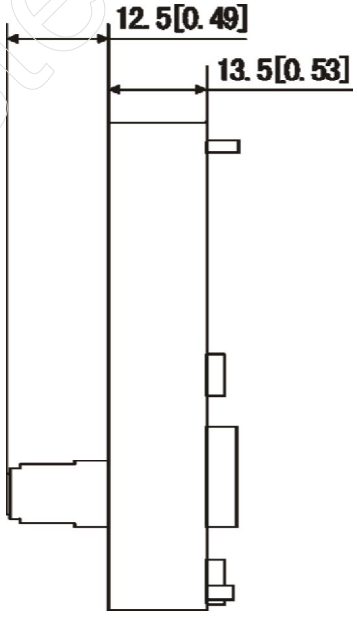
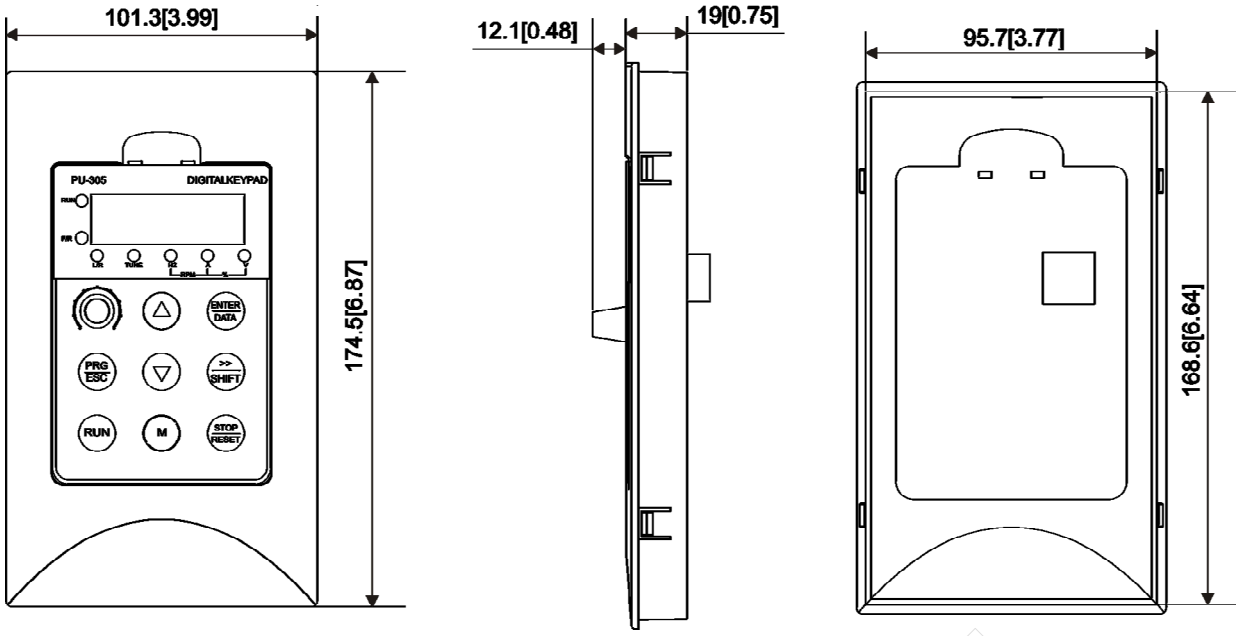
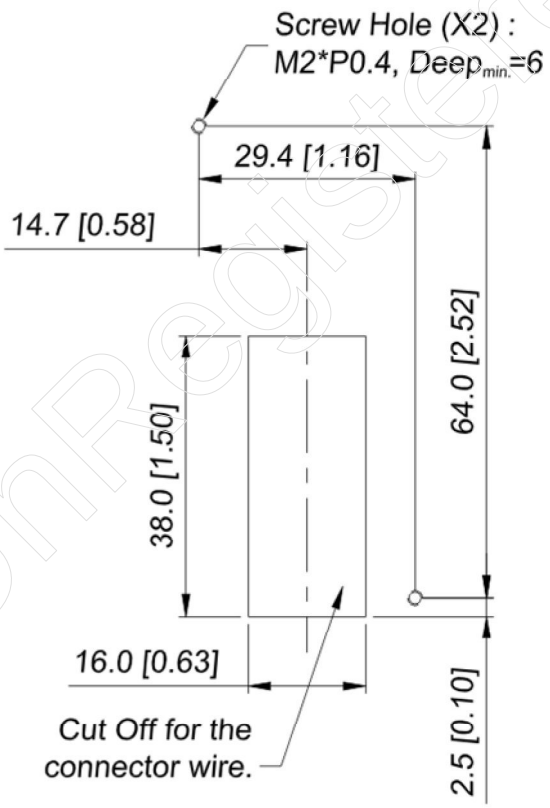


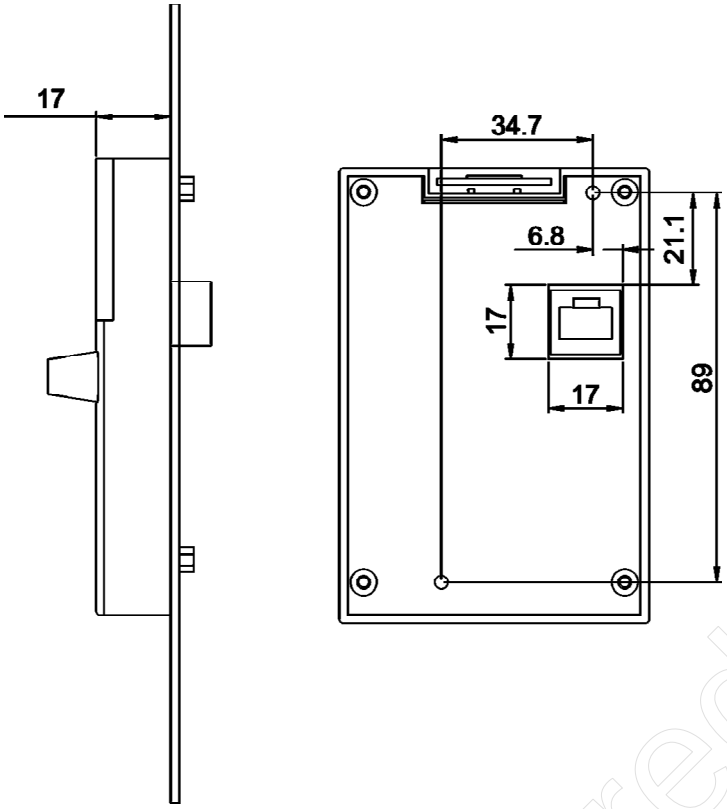
Fig.2-4 Fig.b3 Outer dimension

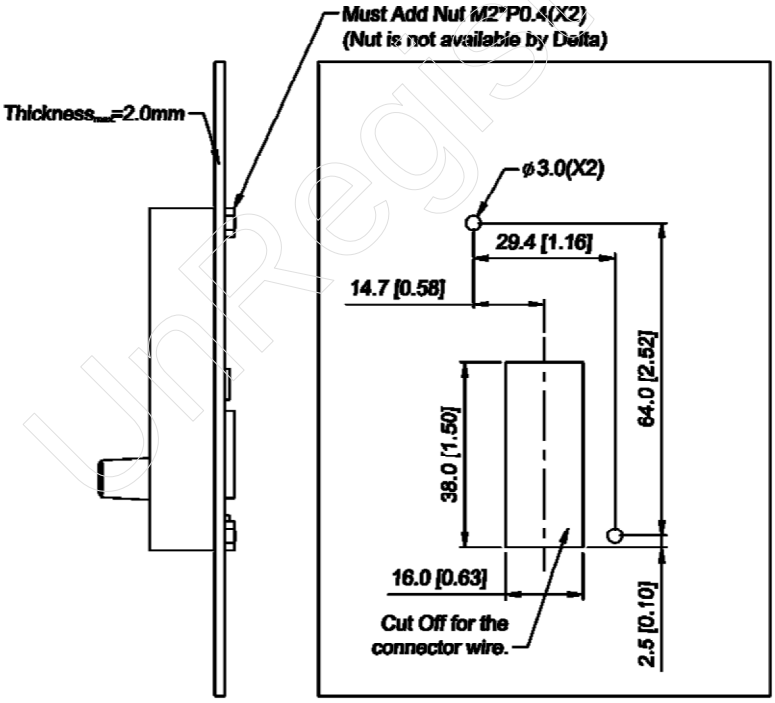
Out-pull panel indicator A- using keypad sheath





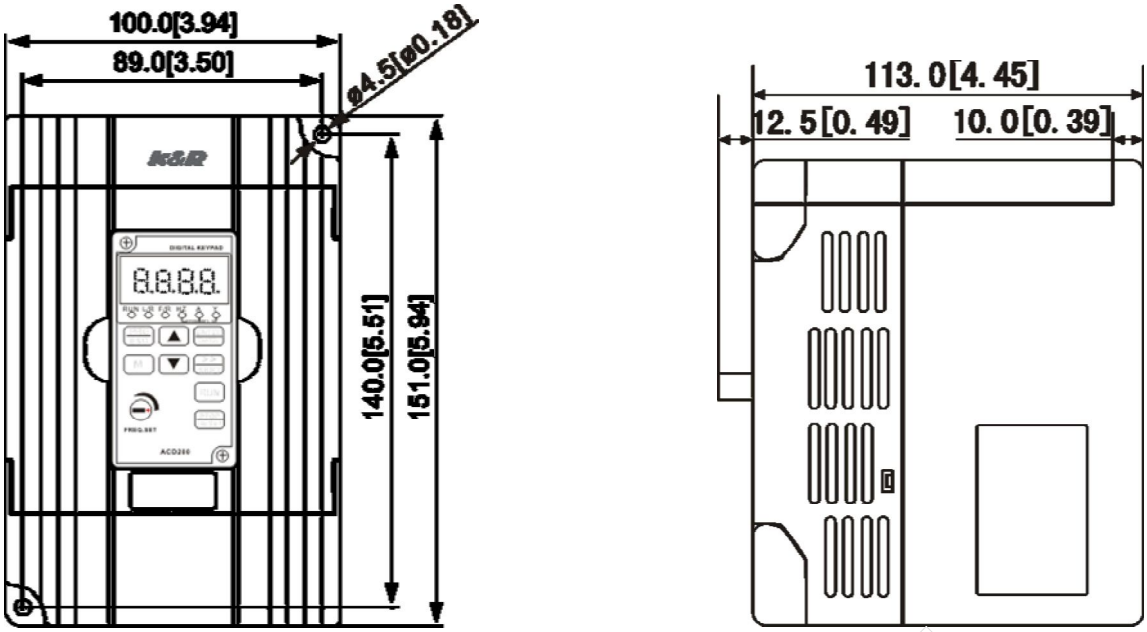
Out-pull panel indicator B- not using keypad sheath



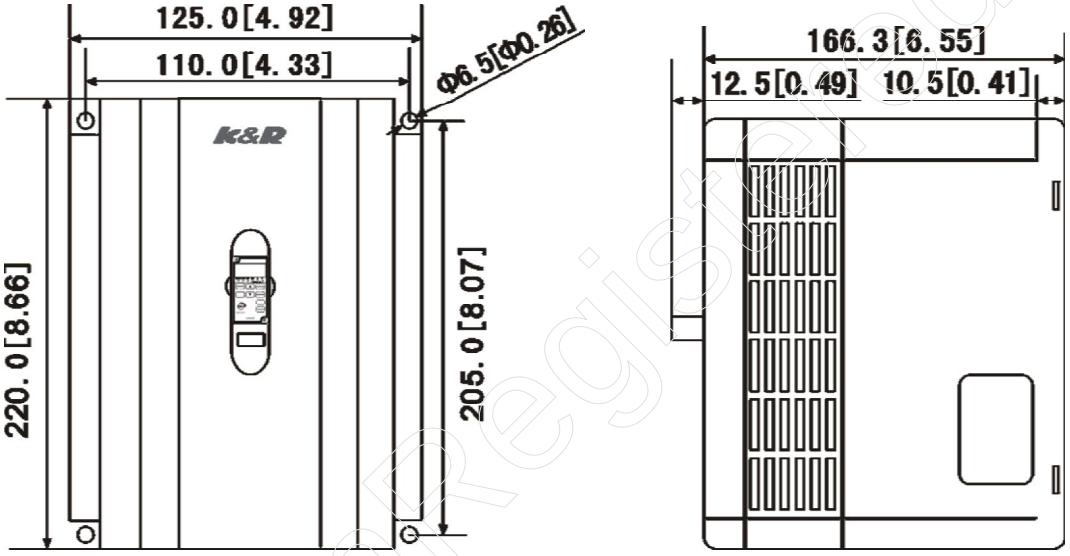


2.6.2 Chassis out size

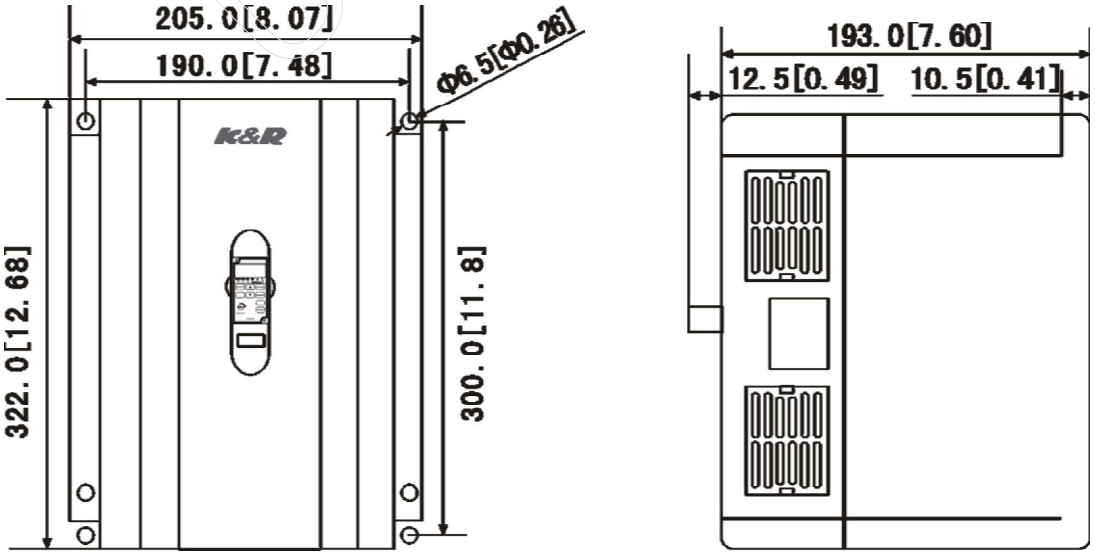
2.6.2.1 Plastic **chassis out size(wall mounted)**



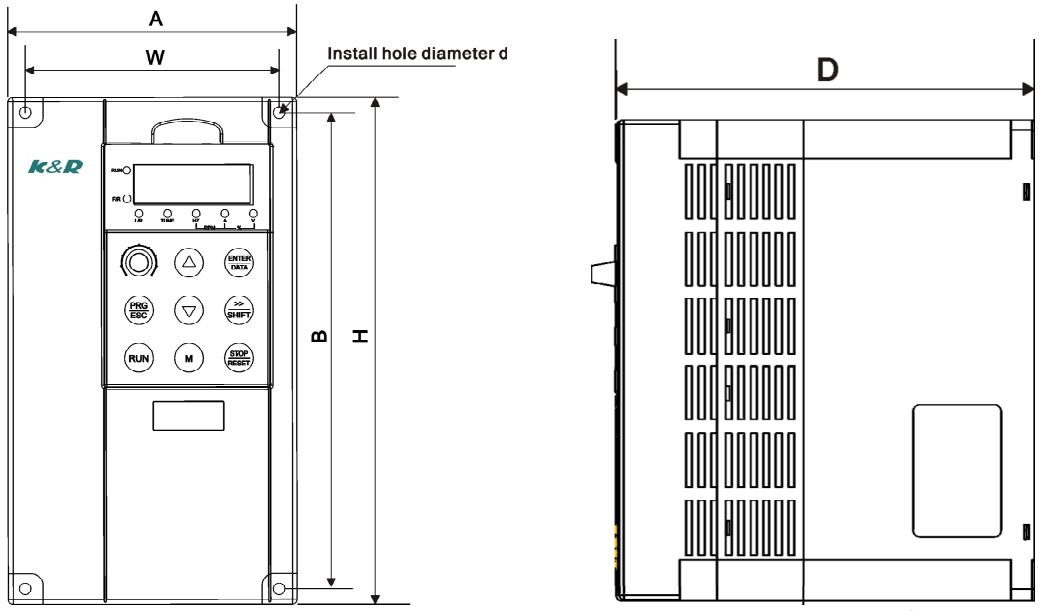
T22



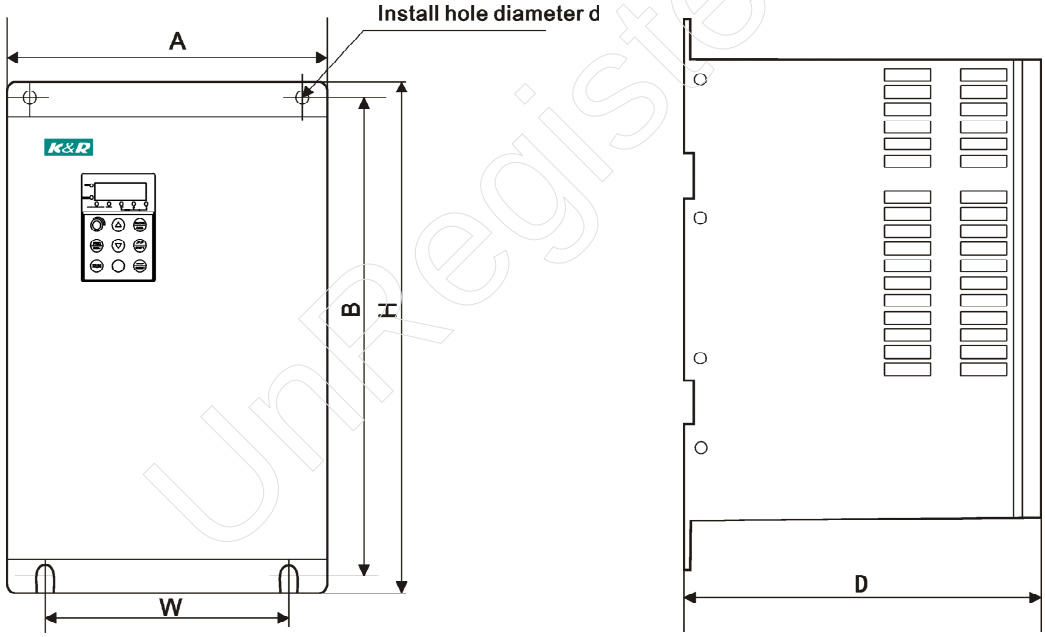
T75



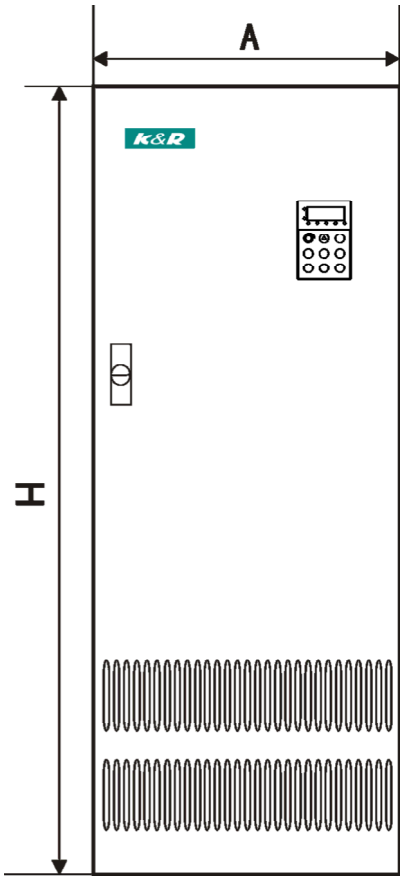
T015

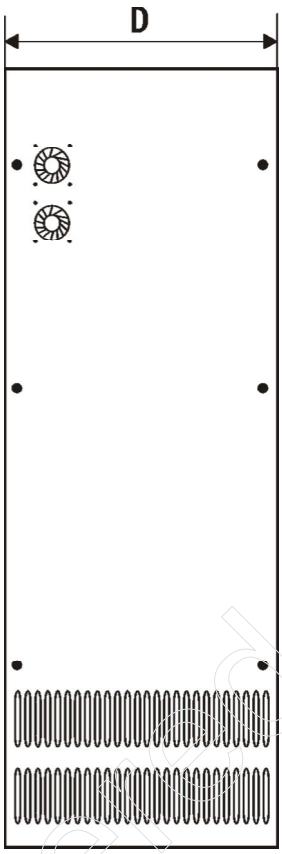


2.6.2.2 Metals **chassis out size(wall mounted)**



2.6.2.3 Metals **chassis outline dimention drawing (clothes closet)**





Size table

Chassis	Specification and type	Size (mm)						Shell
		A	B	H	W	D	d	
T22	ACD200-2S0.4GB	100.0	140.0	151.0	89.0	113.0	4.5	Plastic chassis
	ACD200-2S0.7LB							
	ACD200-2S0.7GB							
	ACD200-2S1.5LB							
	ACD200-2S1.5GB							
	ACD200-2S2.2LB							
	ACD200-4T0.7GB							
	ACD200-4T1.5LB							
	ACD200-4T1.5GB							
	ACD200-4T2.2LB							
	ACD200-4T2.2GB							
	ACD200-4T3.7LB							
	ACD210-2S0.75L							
	ACD210-2S1.5L							
	ACD210-2S2.2L							
	ACD220-2S0.75L							
	ACD220-2S1.5L							

Chassis	Specification and type	Size (mm)						Shell
		A	B	H	W	D	d	
T75	ACD200-2S2.2GB ACD200-2S3.7LB ACD200-2S3.7GB ACD200-2S4.5LB ACD200-2S5.5LB ACD200-4T2.2GBA ACD200-4T3.7GB ACD200-4T5.5LB ACD200-4T5.5GB ACD200-4T7.5LB ACD200-4T7.5GBA ACD210-2S3.7L ACD210-2S5.5L ACD210-2S7.5L ACD210-4T 3.0L ACD210-4T3.7L ACD 210-4T5.5L	125.0	205.0	220.0	110.0	166.3	6.5	Plastic chassis
T015	ACD200-4T7.5GB ACD200-4T11LB ACD200-4T11GB ACD200-4T15LB ACD200-4T15GB ACD200-4T18.5LB	205.0	300.0	322.0	190.0	193.0	6.5	Plastic chassis
E55	ACD280-2S2.2G ACD280-2S3.7G ACD280-4T3.7GB ACD280-4T5.5LB ACD280-4T5.5G ACD280-4T7.5LB	125.0	205.0	220.0	110.0	188.0	6.5	Plastic chassis
E015	ACD280-4T7.5GB ACD280-4T11LB ACD280-4T11GB ACD280-4T15LB ACD280-4T15GB ACD280-4T18.5LB	205.0	300.0	322.0	190.0	209.0	6.5	
T030	ACD280-4T18.5G ACD280-4T22L ACD280-4T22G ACD280-4T30L ACD280-4T30G ACD280-4T37L	285.0	457.0	475.0	195.0	240.0	9.0	Wall mounting Metals chassis
T045	ACD280-4T37G ACD280-4T45L ACD280-4T45G ACD280-4T55L	315.0	620.0	645.0	230.0	310.0	11.0	
T090	ACD280-4T55G ACD280-4T75L ACD280-4T75G	375.0	725.0	750.0	290.0	335.0	13.0	

	ACD280-4T90L							
	ACD280-4T90G							
	ACD280-4T110L							
T132	ACD280-4T110G	**480.0**	**860.0**	**880.0**	**370.0**	**335.0**	**13.0**	
	ACD280-4T132L							
	ACD280-4T132G							
	ACD280-4T160L							
T200	ACD280-4T160G	**610.0**	**850.0**	**880.0**	**250.0**	**345.0**	**13.0**	
	ACD280-4T185L							
	ACD280-4T185G							
	ACD280-4T200L							
	ACD280-4T200G							
	ACD280-4T220L							
K132	ACD280-4T110G	**500.0**	**-**	**1080.0**	**-**	**380.0**	**-**	**Clothes closet** Metals **chassis**
	ACD280-4T132L							
	ACD280-4T132G							
	ACD280-4T160L							
K200	ACD280-4T160G	**680.0**	**-**	**1280.0**	**-**	**440.0**	**-**	
	ACD280-4T200L							
	ACD280-4T200G							
	ACD280-4T220L							
K400	ACD280-4T220G	**800.0**	**-**	**1600.0**	**-**	**550.0**	**-**	
	ACD280-4T250L							
	ACD280-4T250G							
	ACD280-4T280L							
	ACD280-4T280G							
	ACD280-4T315L							
	ACD280-4T315G							
	ACD280-4T355L							
	ACD280-4T355G							
	ACD280-4T400L							
	ACD280-4T400G							

2.7 Product technic index and spec

Item		Item description
Input	Rating voltage, frequency	Three phase 380V，50Hz/60Hz; Single phase 220V，50Hz/60Hz
	Allowed work voltage range	Three phase voltage：320V~460V; Single phase voltage：200V~260V
output	Voltage	220V grade：0~220V；380V grade：0-380V; 660V grade：0-660V; 1140V grade：0-1140V;
	Frequency	0Hz-3200Hz
	Over load capacity	G type: 150% of rating current for 1 minute, 200% of rating current for 0.5 second; L type: 120% of rating current for 1 minute.

Control performance	Control mode		V/F control, slip vector control.
	Speed regulation range		1:100
	Start-up torque		150% of rating torque at low frequency
	Running speed stable state precision		≤±0.5% of rating synchronous speed.
	Frequency precision		Digital setting: max.frequency ×±0.01%；Analog setting：max.frequency×±0.2%
	Frequency resolution	Analog setting	0.1% of max.frequency
		Digital setting	0.1Hz
		Exterior impulse	0.5% of max.frequency
	Torque boost		Automatic torque boost, manual torque boost 0.1%~20.0%
	V/F curve (voltage frequency characteristic		Set rating frequency randomly at range of 5~3200Hz,can choose constant torque, degressive torque 1, degressive torque 2, degressive torque 3, user-defined V/F and enhancement mode V/F in total 33 kinds of curve.
	Accelerating decelerating curve		2 modes: straight line accelerating decelerating and S curve accelerating decelerating; 4 kinds of accelerating decelerating time, unit (minute/second) can be optioned, max.time 6000 minutes.
	Brake	Power consumption brake	Interior exterior brake resistance
		DC brake	Optional start-up and stop, action frequency 0~15Hz，action voltage 0~15%, action time 0~20.0s.
	Jog		Jog frequency range: 0.5Hz~50.0Hz；Jog accelerating decelerating time 0.1~60.0s can be set.
	Multisection speed running		Realized by interior PLC or control terminal.
	Interior PID controller		Be convenient to make closed-loop system.
	Automatic energy save running		Optimize V/F curve automatically based on the load to realize power save running.
	Automatic voltage regulation(AVR)		Can keep constant output voltage when power source voltage varies.
	Automatic current limiting		Limit running current automatically to avoid frequent over-current which will cause trip.
Run function	Running order specified channel		Keypad specified, control terminal specified, serial port specified.
	Running frequency specified channel		Digital provision, analog provision, impulse provision, serial port provision, combined provision, can be switched at anytime by kinds of method.
	Analog output channel		2 channel of analog signal output, thereinto AO1 channel can be 0~20mA or 0~10V.Though them the inverter can realize output of physical parameter such as setting frequency, output frequency etc..
Keypad	LED display		Can display setting frequency, output frequency, output voltage, output current etc. in total 9 kinds of parameter.
	Lock the button		Lock all or part of the buttons (analog potentiometer can't be locked.
Protection function			Over-current protection, over-voltage protection, lack-voltage protection, over-heat protection, over-load protection, lack-phase protection（selectable） etc..
Fitting parts			Brake subassembly, remote-control keypad, connecting cable for remote-control keypad etc.

Ambient	Use ambient	Indoor, not bare to sunlight, not dust, no corrosive gas, no flammable gas, no oil fog, no water drop or salt etc.
	Altitude	Lower than 1000m
	Ambient temperature	-10ºC~+40ºC(under ambient temperature 40ºC ~50ºC, please reduce the volume or strengthen heat sink)
	Ambient humidity	Smaller than 95%RH, no condensation water
	vibration	Smaller than 5.9m/s²(0.6g)
	Storage temperature	-40ºC~+70ºC
configuration	Defending grade	IP20
	Cooling mode	By fan with automatic temperature control.


Note

To exert excellent performance of this inverter, please choose correct type and check relevant content according to this chapter before wiring for use.

Must choose correct type, otherwise may cause abnormal running of the motor or damage of the inverter.

Chapter 3 Installation and wiring

3.1 Installation ambient

3.1.1 Demand for installation ambient

(1) Installed in drafty indoor place, ambient temperature within -10ºC~40ºC, need external compulsory heat sink or reduce the volume if temperature exceeds 40ºC.

(2) Avoid installing in place with direct sunlight, much dust, floating fibre and metal power.

(3) Forbid to install in place with corrosive, explosible gas.

(4) Humidity should be smaller than 95%RH, without condensation water.

(5) Installed in place of plane fixing vibration smaller than 5.9 m/s²(0.6G)

(6) Keep away from electromagnetic disturbance source and other electronic apparatus sensible to electromagnetic disturbance.

3.1.2 Installation direction and place

(1) Normally the inverter should be mounted vertically, horizontal mounting will seriously affect heat dissipation and the inverter must be used in lower volume.

(2) Demand for minimum mounting space and distance, please see Fig.3-1

(3) When install multiple inverters up and down, must apply leading divider between them, see Fig.3-2

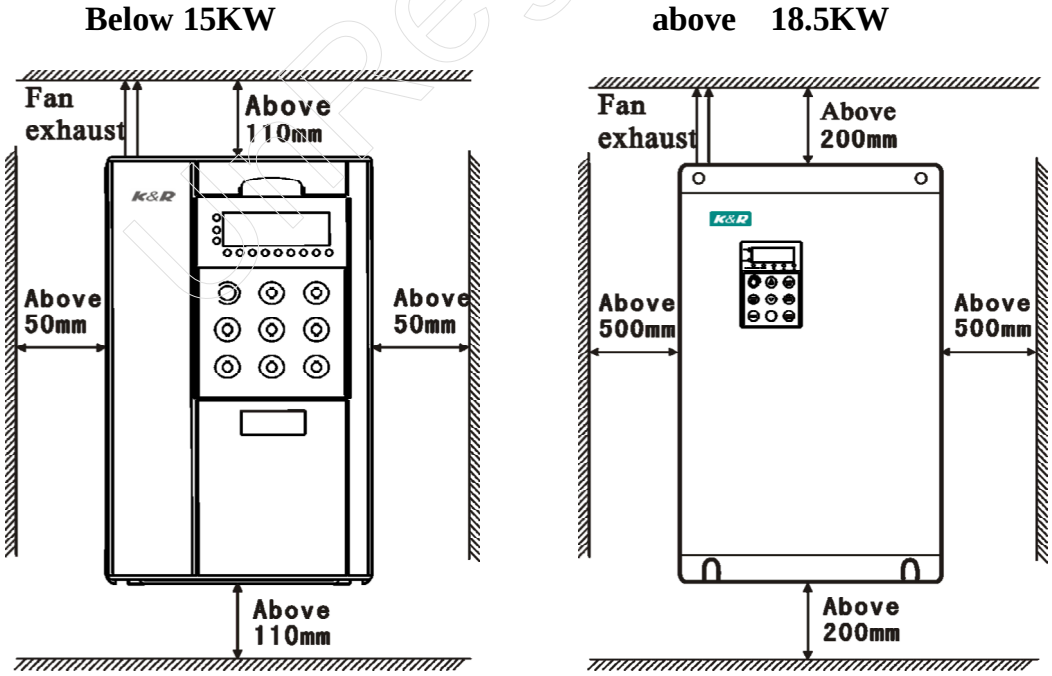


Fig.3-1 mounting space

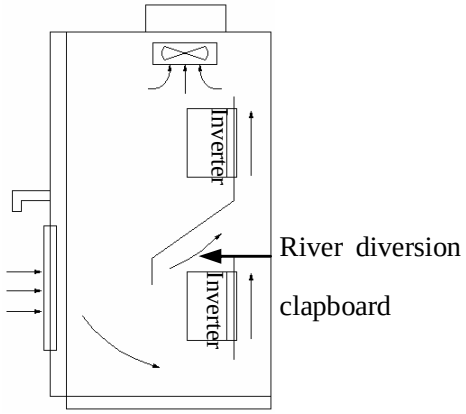


Fig.3-2 mounting multiple inverters

3.2 Wiring notice points

(1) Assure power cut off completely for above 10 minutes before wiring, otherwise have danger of getting electric shock.

(2) Forbid connecting power wire to output U/T1、V/T2、W/T3 of the inverter.

(3) There is current leakage in the inverter and leak current of middle/high power inverter is bigger than 5mA, for safety reason, inverter and motor must be earthed safely, commonly use 14~12AWG copper wire .as ground wire and ground resistance smaller than 10Ω

(4) Before shipment compression resistance test of the inverter is passed, so user should not conduct compression resistance test again.

(5) Should not assemble electromagnetic contactor and absorbing capacitance or other absorbing device, see Fig.3-6

(6) To be convenient to over current protect of input side and power off maintenance, inverter should be connected to power supply through relay.

(7) Connecting wire for relay input and output loop(MI1、MI2、MI3、MI4、MI5、MI6、AO1、AO2、DO、MO1、FWD、REV), should use above 22~16AWG glued wire or shielding wire, one shielding layer end hung in the air, the other connected to grounding end ⏚ , connecting wire shorter than 20m.

(1) Before wiring, assure power supply is cut off completely for 10 minutes and all LED indicator light extinguished.

(2) Wiring can only be done by professional person trained and qualified.

(3) Before electrification, check if voltage grade of the inverter is in line with that of power supply voltage, otherwise will cause personnel injured and device damaged.

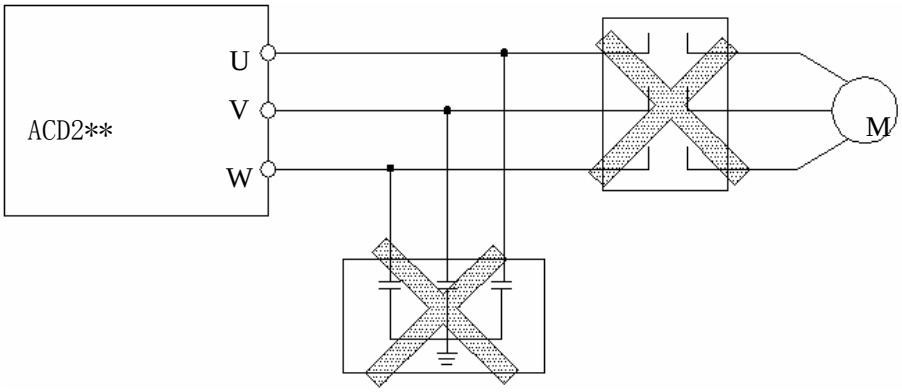
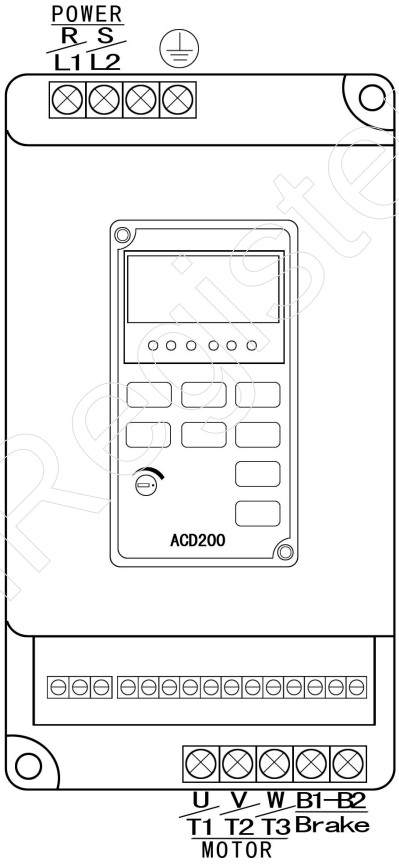


Fig.3-3 banned magnetic control conductor and absorbing capacitance between inverter and motor

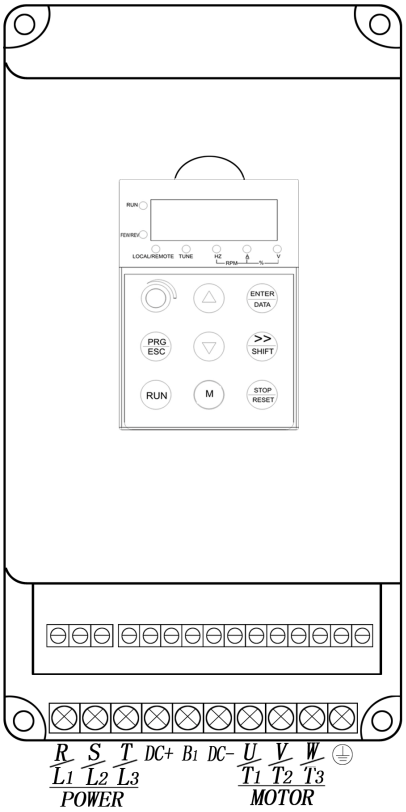
3.3 Main loop terminal wiring

3.3.1 ACD200/210/220 main loop simple wiring

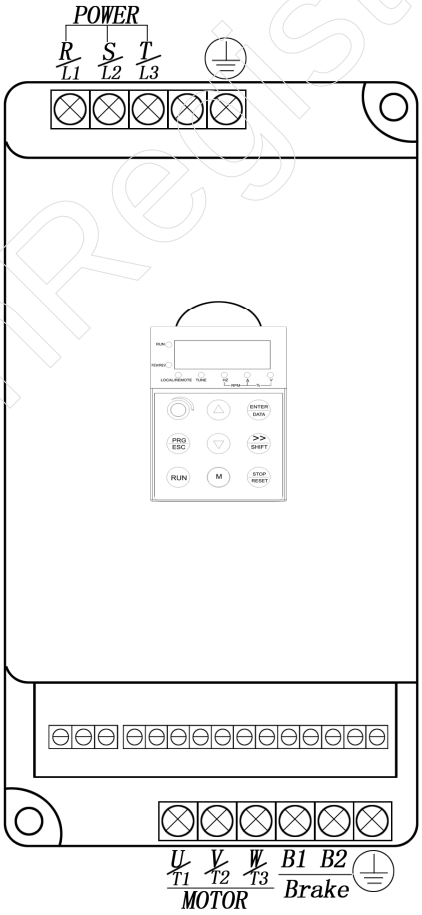


3.3.2 ACD280 main loop simple wiring

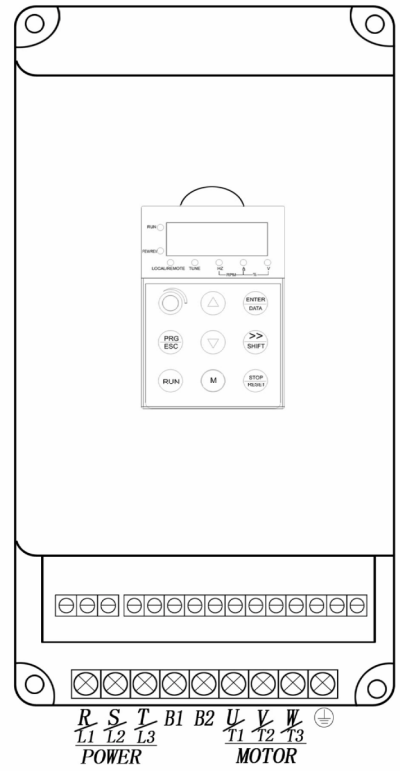
1. 0.4～2.2KW



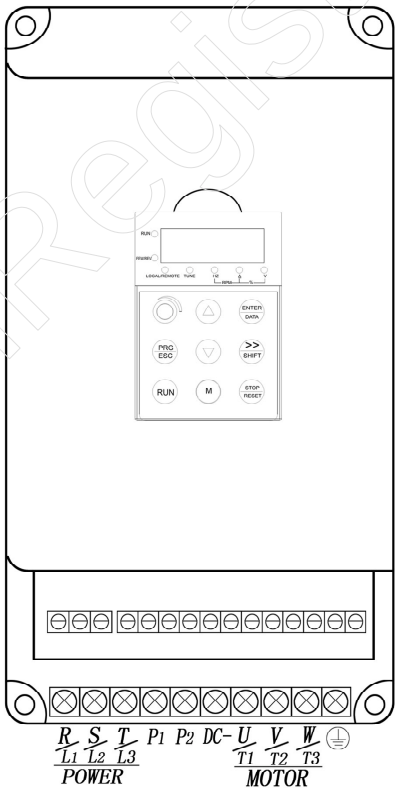
2. 3.7～5.5KW



3. 7.5～15KW



4. 18.5KW～30KW



5．37KW～400KW

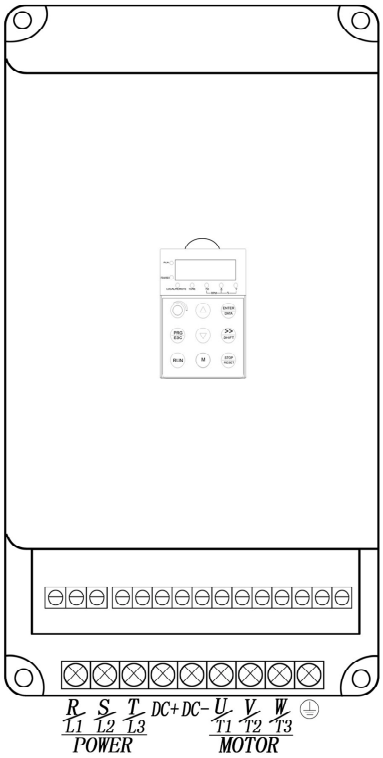


Fig.3-4 main loop simple wiring

Main loop terminal description

End sign	Name	Function description
R/L1、S/L2、T/L3	Main loop power input end	Single phase power end: R/L1、S/L2 3 phase power end: R/L1、S/L2、T/L3
U/T1、V/T2、W/T3	Inverter output end	Connecting to 3 phase motor
B1、B2	Energy consumption braking terminal	Connecting external braking resistance
P1 (DC+)、DC-	DC bus end	Common DC bus input end Connecting external braking unit
P1、P2	External reactor end	Connecting external DC reactor
⏚ E	Grounding end	Inverter must be grounded safely

Wiring Layout of Control Terminals(factory setting)

Diameter of wire: 24 ～12AWG

Wire Type: 75 ℃， Copper Only

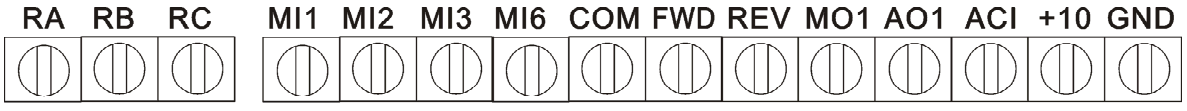
Torsion: 4kgf-cm (3.5in-lbf)

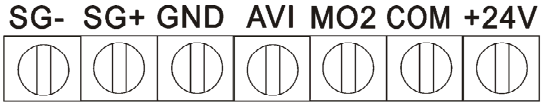
Diameter of wire: 22 ～16AWG

Wire Type: Copper Only

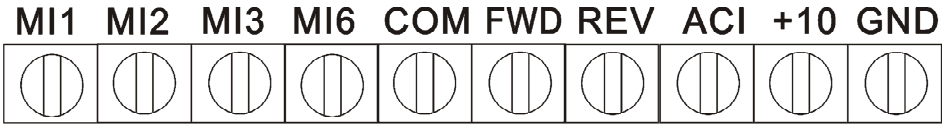
Torsion: 2.5kgf-cm (2.2in-lbf)

ACD200 control terminal identification show as follows：

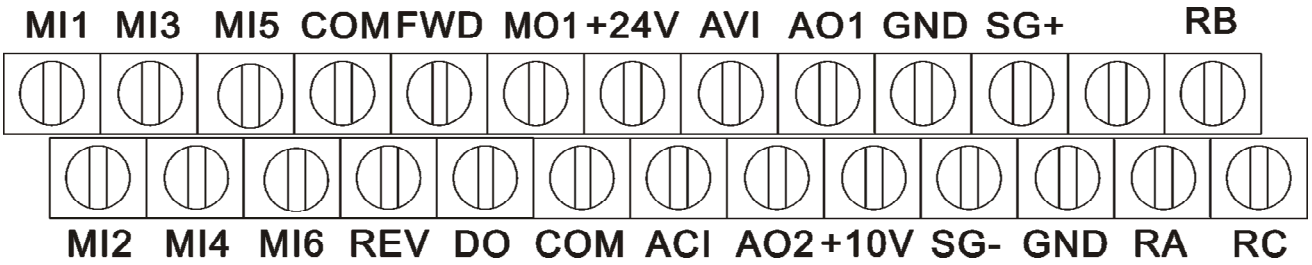




ACD210 control terminal identification show as follows：

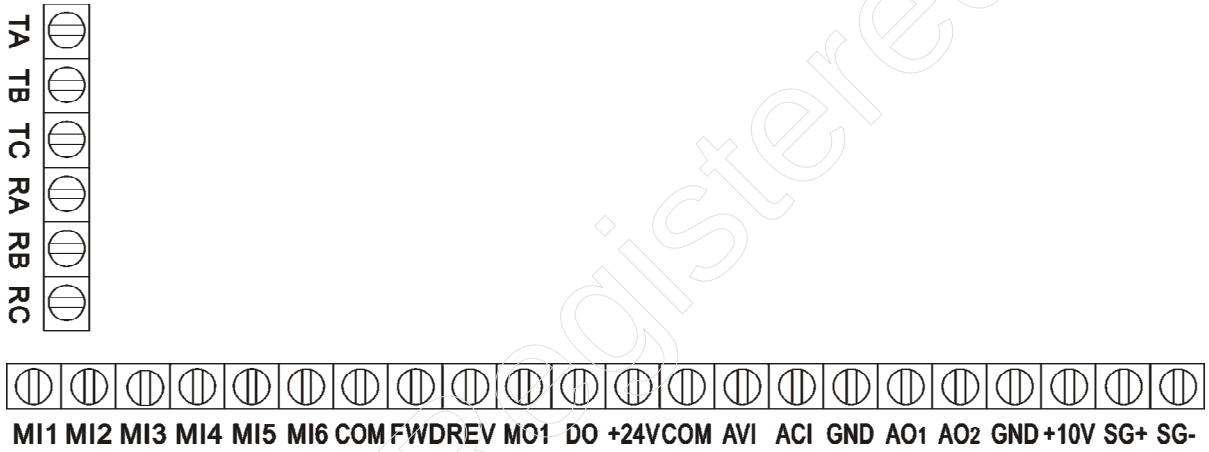


ACD280 control terminal identification shown as follows ：
below 15KW:



ACD280 control terminal identification shown as follows：

inverter above 18.5KW:



Explanation for control terminal

Item	Symbol	Name	Function description	spec
Run command	FWD-COM	Forward run command	Forward reverse run command, see H6.08 group double-wire and three-wire control function description.	Optocoupler isolation input Input impedance: R=2KΩ
	REV-COM	Reverse run command		
Muiti-function input terminal	MI1-COM	Multi-function input terminal 1	Used for multi-function input terminal, for detailed see Chapter 6 Section 6.5 terminal function parameter(H6 group) input end function description. MI6 can be set as H-speed impulse input port, for detailed see Chapter 6 Section 6.5 terminal function parameter (H6	Optocoupler isolation input Input impedance: R=2KΩ Max.input frequency:200Hz
	MI2-COM	Multi-function input terminal 2		
	MI3-COM	Multi-function input terminal 3		
	MI4-COM	Multi-function input terminal 4		
	MI5-COM	Multi-function		

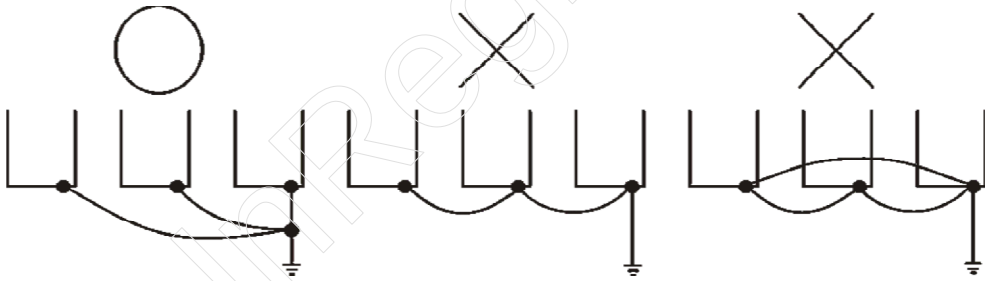
		input terminal 5	group) input end function description.(common end: COM)	
	MI6-COM	Multi-function input terminal 6		Input freq range: 0.1kHz~50.0kHz
Power supply	+10V-GND	+10V power supply	Provide +10V power supply.(negative pole： GND)	Max. output current：10mA
	+24V-COM	+24V power supply	Provide +24V power supply.(negative pole： GND)	Max. output current：200mA
	COM	+24V power supply negative pole	Common end of FWD, REV, MI1, MI2, MI3, MI6 and reference ground of +24V power supply.	Internal isolating between COM and GND
	GND	+10V power supply negative pole	Reference ground of analog signal and +10V power supply.	
Analog value input	AVI-GND	Analog value input 1	Accept analog voltage input （reference ground：GND）	Input voltage range：DC 0～10V；input impedance：100KΩ
	ACI-GND	Analog value input 2	Accept analog voltage/current input，voltage， current optioned by jumping-wire J1, factory default is current. （reference ground：GND）	Input voltage range：DC 0～10V（input impedance：100KΩ） Input current range：4~20mA(input impedance：500Ω); Resolution：1/1000
Analog value output	AO1-GND	Analog value output 1	Provide analog voltage/current output, for detailed see H6.17 parameter description, output voltage/current optioned by J2, factory default output voltage. (reference ground: GND)	Voltage output range: 0~10V Current output range: 0~20mA
	AO2-GND	Analog value output 2	Provide analog voltage output, for detailed see H6.19 parameter description	Output voltage range: 0～10V

Multi-function output terminal	MO1-COM	Open circuit collector output terminal 1	Used for multi-function switch output terminal, for detailed see Chapter 6 Section 6.5 terminal function parameter(H6 group) output end function description.(common end: COM)	Optocoupler isolation output Work voltage range: 15~30V Max. output current: 50mA Use method see description of parameter H6.10
	DO-COM	H-speed impulse output or open circuit collector output terminal	Restricted by function code H6.06, can be outputted as H-speed impulse or open collector.	As the H-speed impulse output: 0～50KHz; as the open collector output: the same specifications as MO1
Serial port communication	SG+	RS485 serial port communication	485 difference signal positive end	For standard interface RS-485， please use twisted-pair or shielded wire
	SG-		485 difference signal negative end	
Relay output terminal	RA-RB	Relay output 1	Always-closed terminal	Contact capacity：AC250V，3A，COSΦ=0.4。DC 30V，1A
	RA-RC		Always-open terminal	
	TA-TB	Relay output 2	Always-closed terminal	Contact capacity：AC250V，3A，COSΦ=0.4。DC 30V，1A
	TA-TC		Always-open terminal	
Assistant interface	CN7	Expansion card interface	28PIN interface，connected to selectable card（multi-function IO expansion card，PG card etc.）	-
	CN3	Native keypad interface	Connecting to native keypad or wire of pull-out keypad	-

Wiring notice points

- The wiring of main circuit and control circuit should be separated to prevent erroneous actions.
- Please use shield wire for the control wiring and not to expose the peeled-off net in front of the terminal.
- Please use the shield wire or tube for the power wiring and ground the two ends of the shield wire or tube.
- Damaged insulation of wiring may cause personal injury or damage to circuits/equipment if it comes in contact with high voltage.

- The AC motor drive, motor and wiring may cause interference. To prevent the equipment damage, please take care of the erroneous actions of the surrounding sensors and the equipment.
- When the AC drive output terminals U/T1, V/T2, and W/T3 are connected to the motor terminals U/T1, V/T2, and W/T3, respectively. To permanently reverse the direction of motor rotation, switch over any of the two motor leads.
- With long motor cables, high capacitive switching current peaks can cause over-current, high leakage current or lower current readout accuracy. To prevent this, the motor cable should be less than 20m for 3.7kW models and below. And the cable should be less than 50m for 5.5kW models and above. For longer motor cables use an AC output reactor.
- The AC motor drive, electric welding machine and the greater horsepower motor should be grounded separately.
- Use ground leads that comply with local regulations and keep them as short as possible.
- No brake resistor is built in the VFD-M series, it can install brake resistor for those occasions that use higher load inertia or frequent start/stop. Refer to Appendix B for details.
- Multiple VFD-M units can be installed in one location. All the units should be grounded directly to a common ground terminal, as shown in the figure below. Ensure there are no ground loops.



- Connect these terminals (R/L1, S/L2, T/L3) via a non-fuse breaker or earth leakage breaker to 3-phase AC power (some models to 1-phase AC power) for circuit protection. It is unnecessary to consider phase-sequence.
- It is recommended to add a magnetic contactor (MC) in the power input wiring to cut off power quickly and reduce malfunction when activating the protection function of AC motor drives. Both ends of the MC should have an R-C surge absorber.
- Please make sure to fasten the screw of the main circuit terminals to prevent sparks which is made by the loose screws due to vibration
- Please use voltage and current within the regulation shown in Appendix A.
- When using a GFCI (Ground Fault Circuit Interrupter), select a current sensor with sensitivity of 200mA, and not less than 0.1-second detection time to avoid nuisance tripping.

- Do NOT run/stop AC motor drives by turning the power ON/OFF. Run/stop AC motor drives by RUN/STOP command via control terminals or keypad. If you still need to run/stop AC drives by turning power ON/OFF, it is recommended to do so only ONCE per hour.
- Do NOT connect 3-phase models to a 1-phase power source.
- When it needs to install the filter at the output side of terminals U/T1, V/T2, W/T3 on the AC motor drive. Please use inductance filter. Do not use phase-compensation capacitors or L-C (Inductance-Capacitance) or R-C (Resistance-Capacitance), unless approved by Delta.
- DO NOT connect phase-compensation capacitors or surge absorbers at the output terminals of AC motor drives.
- Use well-insulated motor, suitable for inverter operation.
- Connect a brake resistor or brake unit in applications with frequent deceleration ramps, short deceleration time, too low braking torque or requiring increased braking torque.
- The AC motor drive has a built-in brake chopper, you can connect the external brake resistor to the terminals [B1, B2] when needed.
- When not used, please leave the terminals [B1, B2] open.

3.4 Connection between inverter and fitting parts

(1) Must assembly disjunction device such as isolation switch etc. between power source and the inverter to assure personal safety when repairing the inverter and needing compulsory power off.

(2) Power supply loop must have breaker or fuse with over-current protection function to avoid malfunction expanding caused by failure of after device.

(3) AC input reactor

If high-order harmonics between inverter and power supply is biggish which can't fulfil system requirement, or need to improve input side power factor, AC input reactor is needed.

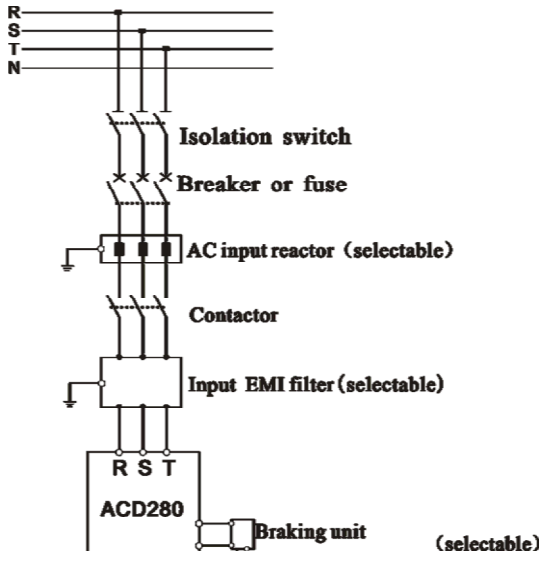
(4) Magnetic control conductor only be applied to power supply control and don't apply magnetic control conductor to controlling on/off of the inverter.

(5) Input side EMI filter

Can use EMI filter to inhibit high-frequency conduction disturbance from inverter power supply wire.

(6) Output side EMI filter

Can use EMI filter to inhibit emission disturbance noise and wire leaking current from output side.



(7) AC output reactor

Advise assembling AC output reactor to avoid motor insulation damage, too large over current and inverter frequent protection when connecting wire from inverter to motor exceeds 50m. But voltage drop of AC output reactor must be considered. Improve input output voltage of the inverter or let the motor in lower volume to avoid burning off the motor.

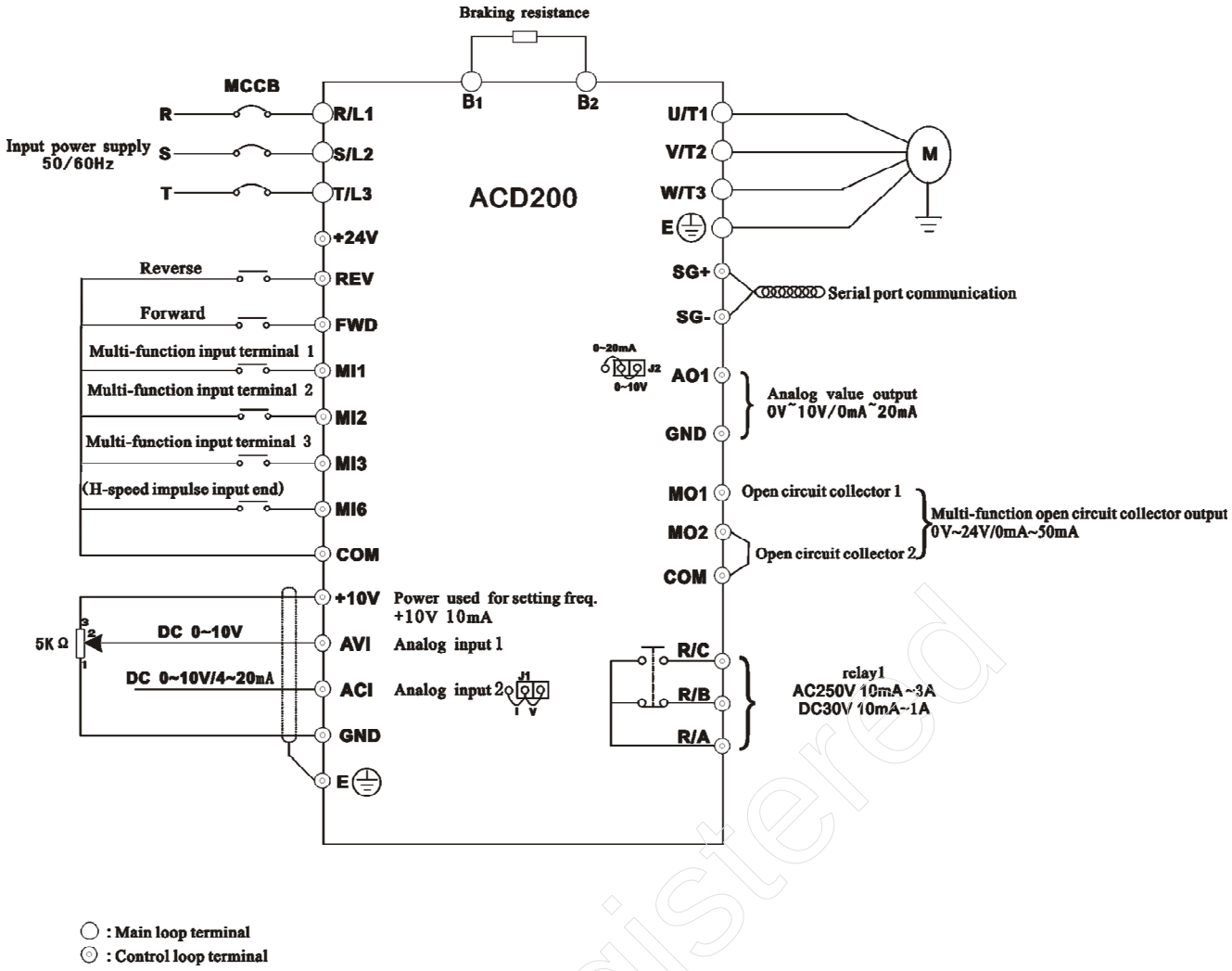
Fig.3-5 connection of inverter and fitting parts

(8) Complete ground wire

Inverter and motor must be earthed and grounding resistor smaller than 10Ω. Grounding wire should be shorter enough and wire diameter be bigger enough(not smaller than following standard): 7.5KW or below motor: 4mm² above cooper wire; 11~15KW motor: 6mm² above copper wire; 18.5~37KW motor: 16mm² above copper wire;
45~55KW motor: 25mm² above copper wire.

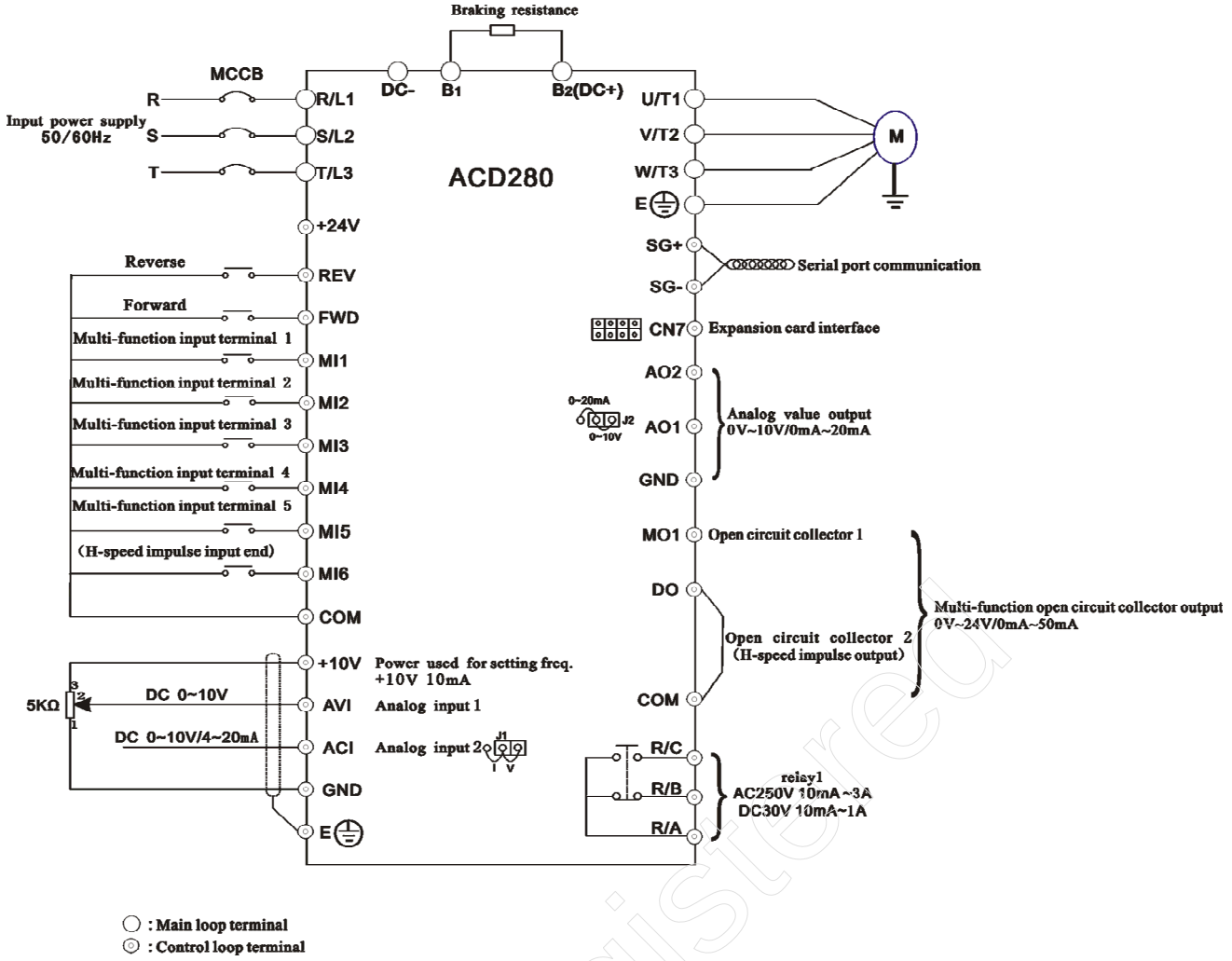
3.5 Basic running wiring diagram

3.5.1 ACD200 basic running wiring diagram

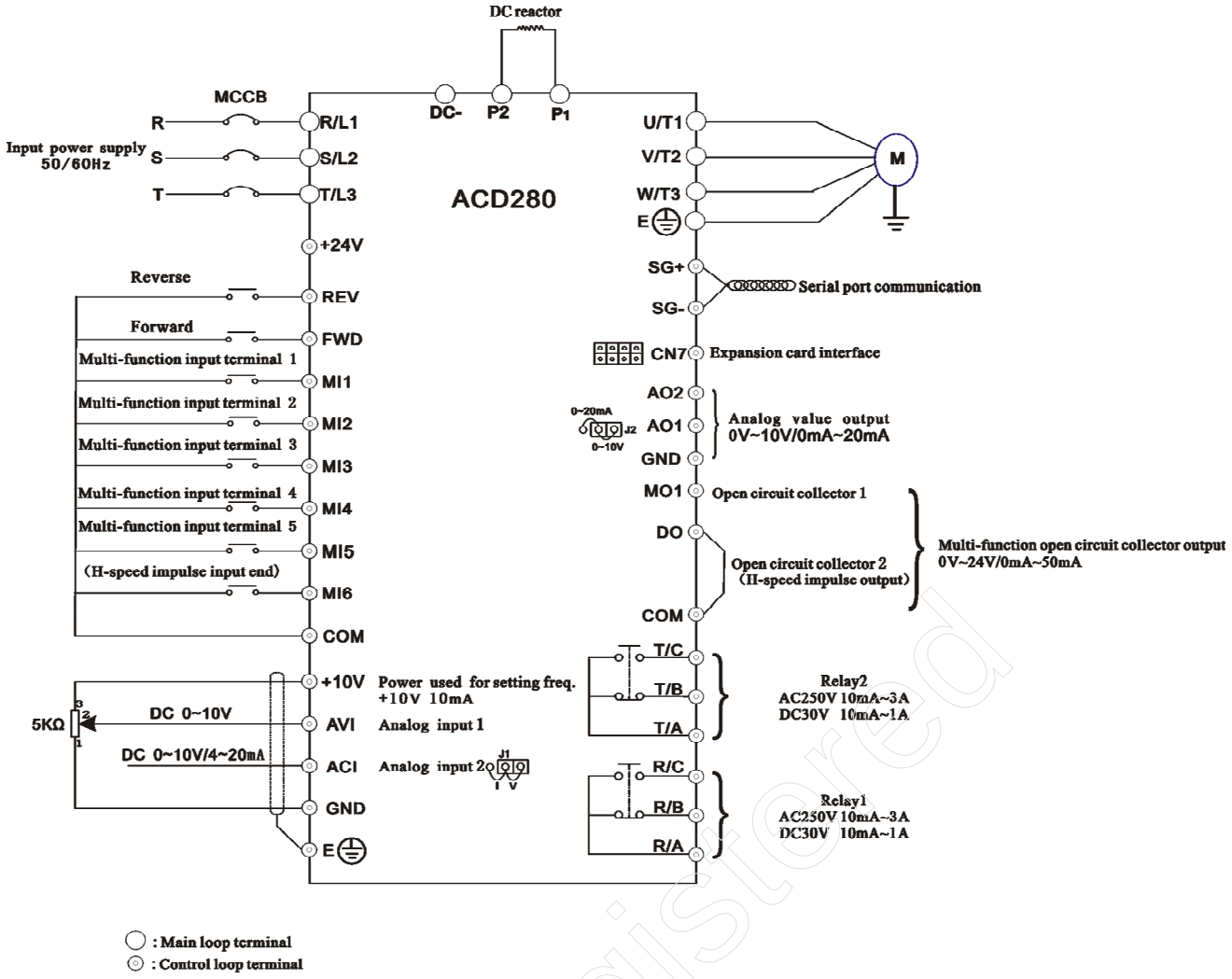


3.5.2 ACD280 basic running wiring diagram

below 15KW



18.5～30KW



Above 37KW

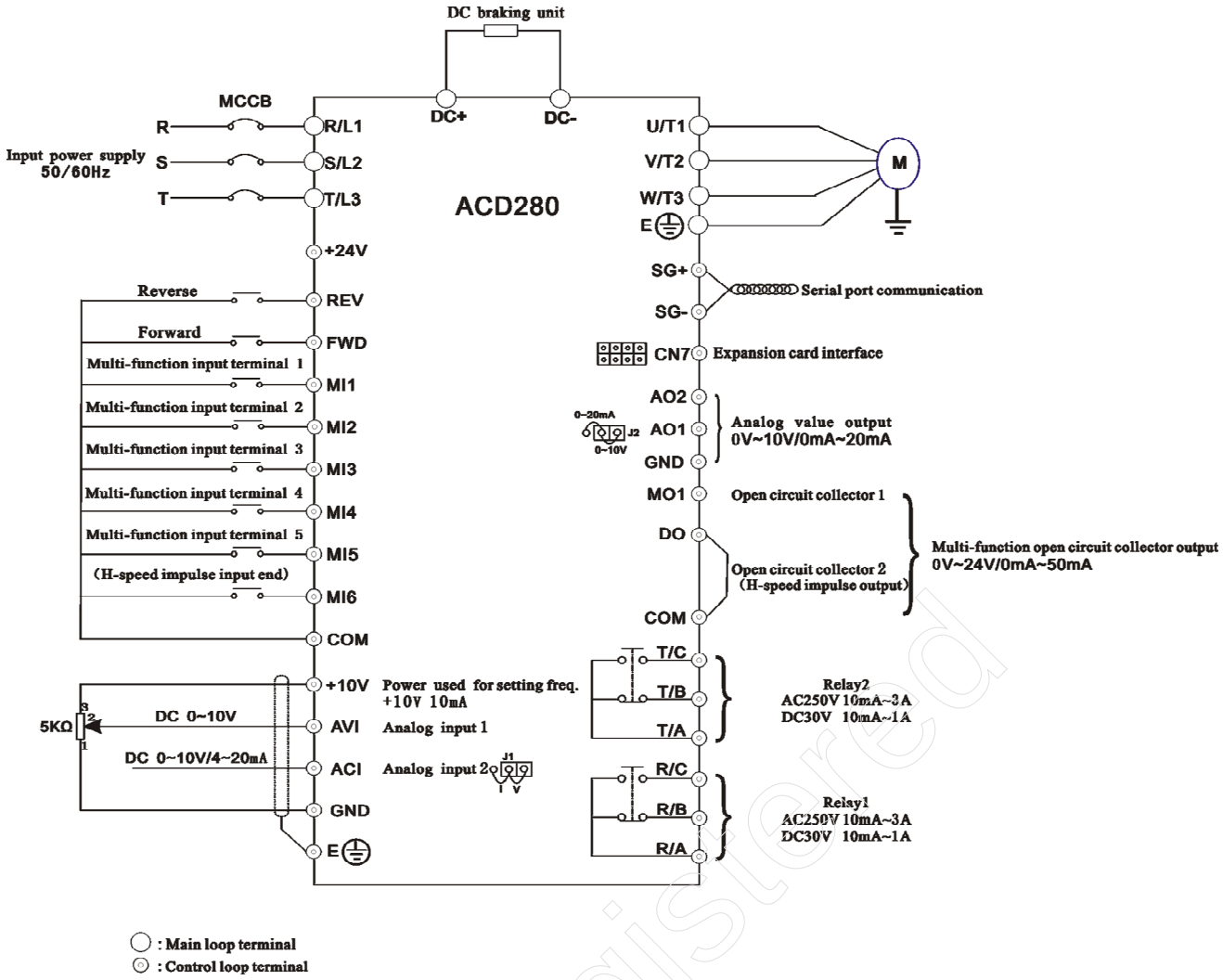


Fig.3-6 Basic running wiring diagram

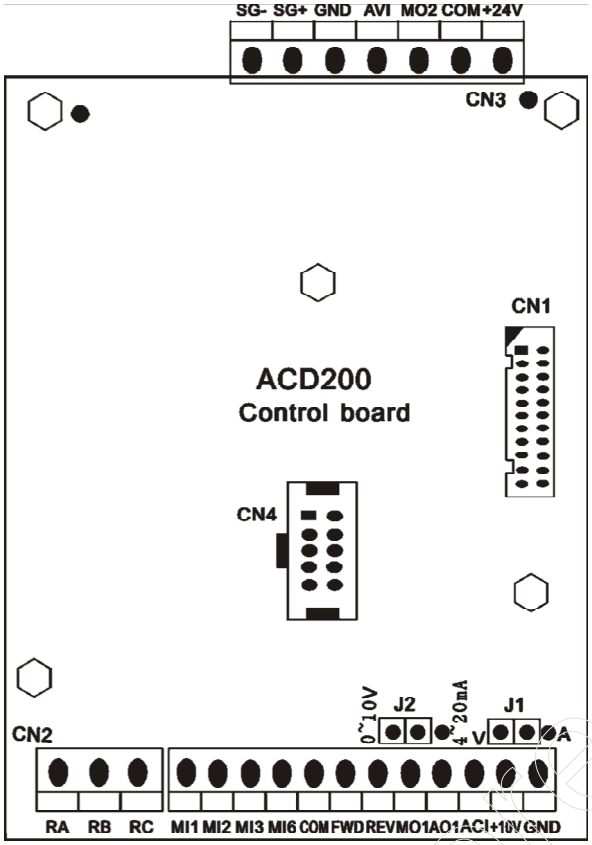
3.6 Control loop collocation and wiring

3.6.1 Location&function of terminal and jump-wire:

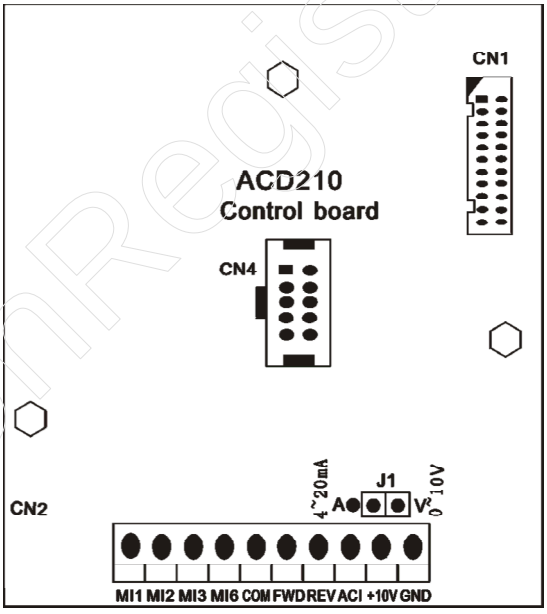
For location of terminal and jumping-wire switch on the CPU board, please see Fig.3-7

Function and set up description of jumping-wire switch, please see Table 3-1, should carry on terminal wiring correctly and set all jumping-wire switch on the CPU board before using the inverter, to use 1mm² above conducting wire as terminal wire is recommended.

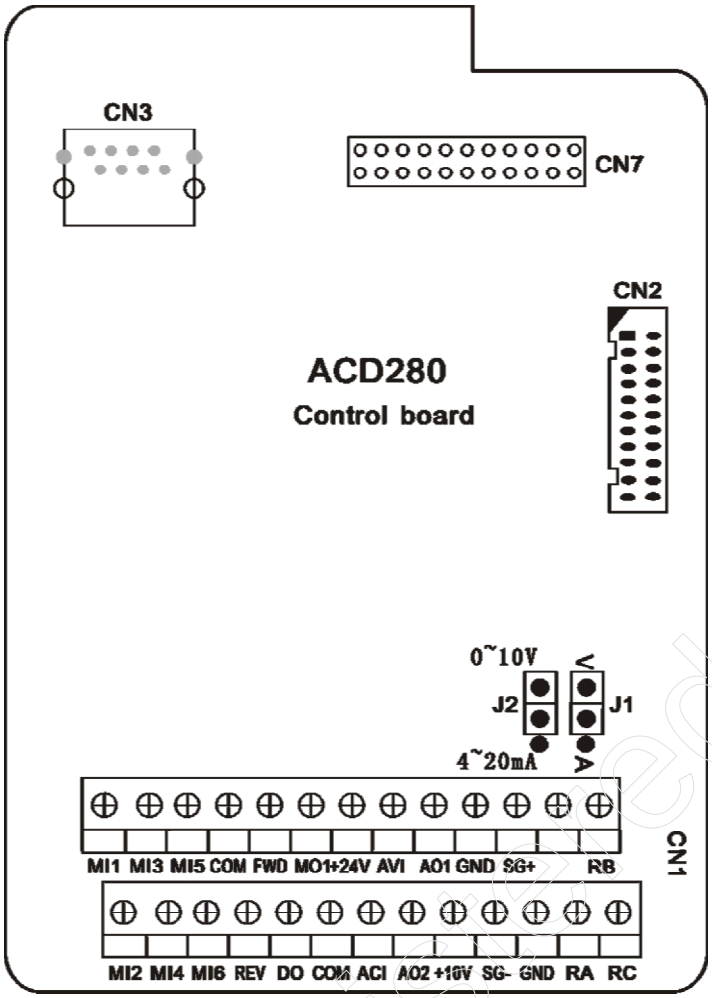
ACD200 CPU board is as follows:



ACD210 CPU board is as follows:



ACD280 15KW below CPU board is as follows:



ACD280 18.5KW above CPU board is as follows:

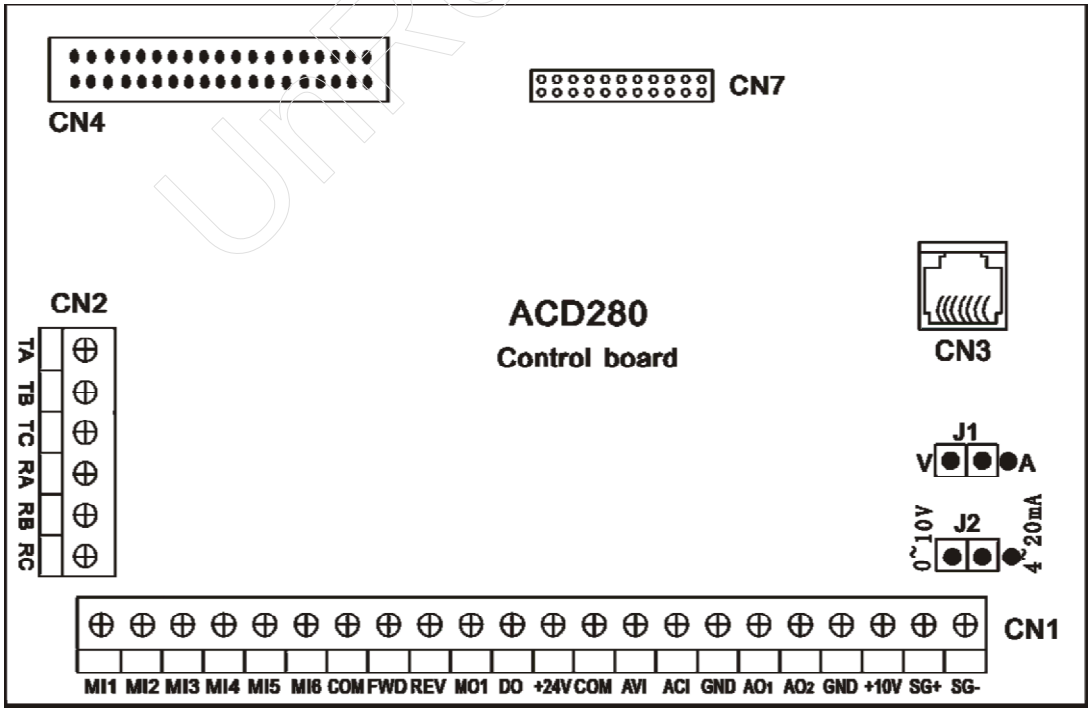


Fig.3-7 jumping-wire switch on CPU board

Table 3-2 function description of terminal provided for user

Symbol	Function	Setting-up	Factory value
J2	Optional switch of analog value output signal AO1	0~10V： 0~10V analog voltage output signal 4~20mA： 4~20mA analog current output signal	0~10V
J1	Optional switch of analog value input signal	A：4~20mA input current signal V：0~10V input voltage signal	0~10V

3.6.2 Analog input output terminal wiring

(1) AVI terminal accepts analog voltage signal input, wiring as follows:

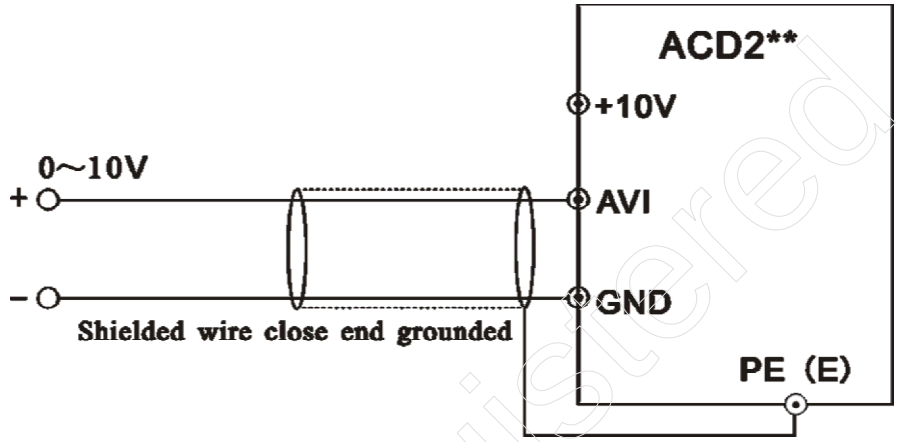


Fig.3-8 ACI terminal wiring diagram

(2) ACI terminal accepts analog signal input, jumping-wire decide to input voltage(0~10V) or input current(4~20mA), wiring mode as follows:

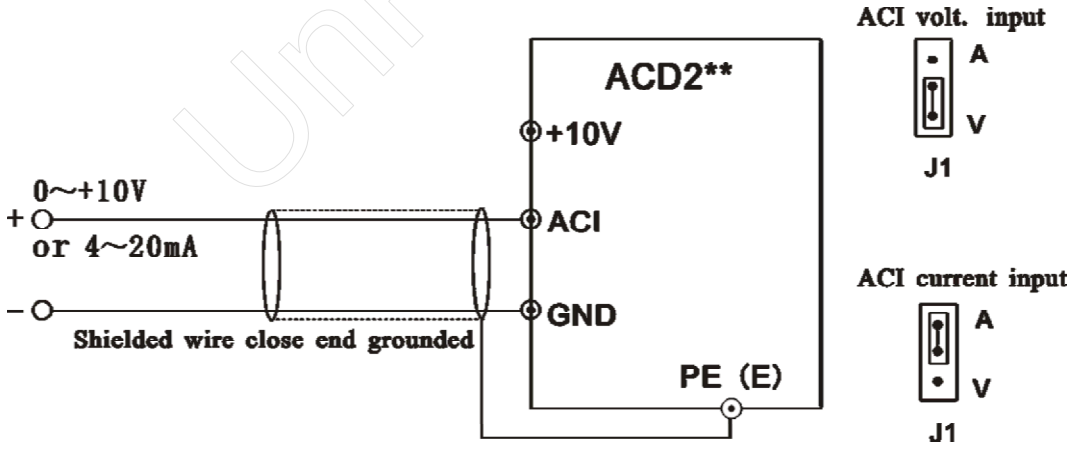


Fig.3-9 ACI terminal wiring diagram

(3) Wiring of analog output terminals AO1, AO2

Analog output terminal AO1, AO2 connected to analog meter and kinds of physical data can be indicated, thereinto AO1 can output current(4~20mA) or voltage(0~10V) decided by jumping-wire J2. Terminal wiring mode as Fig.3-10.

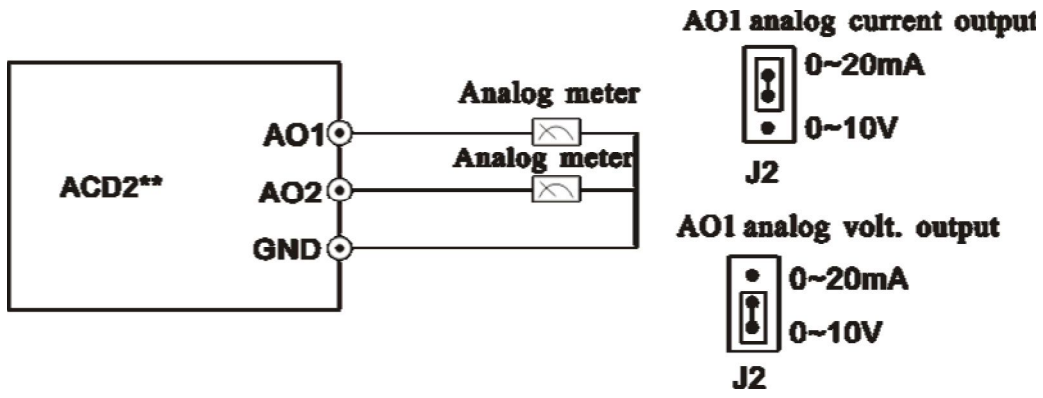


Fig.3-10 analog output terminal wiring diagram

Note

(1) When inputing analog signal, can connect filter capacitor or common module inductance between ACI and GND.

(2) Analog input, output signal is easy to be disturbed, so must use shielded cable when wiring and well grounded, wiring length should be short as possible.

3.6.3 Communication terminal wiring

ACD2** inverter provide RS485 serial communication interface for the user.

Following wiring methods make single-main single-sub control system or single-main multi-sub control system possible. Using upper machine(PC or PLC controller) software can realize real time supervision to inverter in the industrial control system so that realize complicated run control such as long-distance control, high automatization ect.; you can also take one inverter as mainframe and the others as submachine to form cascade or synchronous control network.

(1) When inverter RS485 interface connected to other devices with RS485 interface, you can connect wire as below figure.

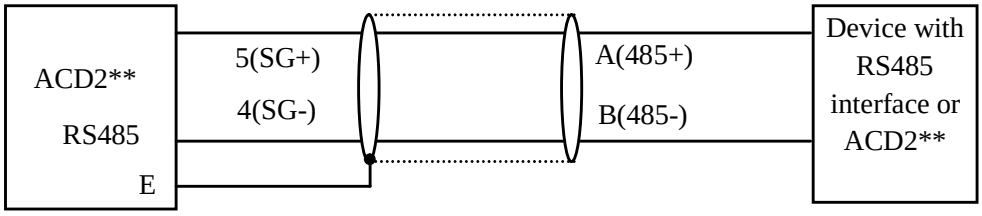


Fig.3-11 Communication terminal wiring

(2) Multiple inverter can be connected together per RS485 and 31 pcs inverter can be connected together at most. Communication system is more prone to disturbance as connected inverters increasing， following wiring is recommend：

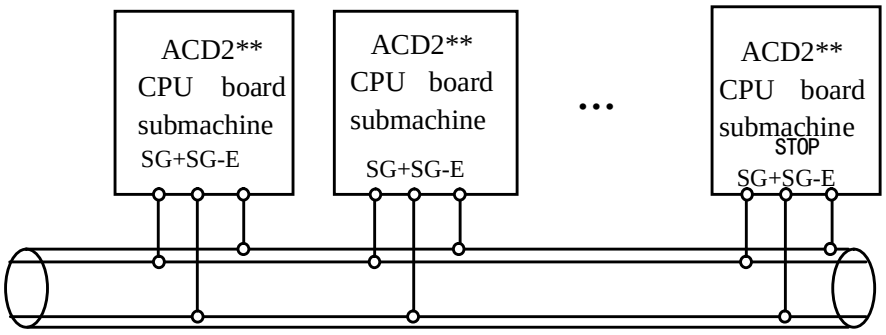


Fig.3-12 recommended wiring for multiple inverters communication(all inverters and motors well earthed)

Normal communication still not available if using above wiring, can try to take following measure:

1> Provide separate power supply for PLC(or upper machine) or isolate its power supply.

2> Apply magnetic circle on the communication wire.

3> Reduce inverter carrier wave frequency property.

Note For programming of RS485 interface, please refer to appendix communication protocol.

3.7 Installation guide for anti-jamming

Main circuit of the inverter is composed of high-power semiconductor switch gear,so some electromagnetic noise will arise during work, to reduce or stop disturbance to environment, show you assembling method of inverter disturbance suppressing from many aspects such as disturbance suppressing, spot wiring, system grounding, leak current, usage of power supply filter etc. in this section to be referred to during spot assembling.

3.7.1 Installation guide for anti-jamming

Disturbance brought by the working inverter may affect nearby electronic device, effect degree relates to surrounding electromagnetic environment of the inverter and anti-disturbance capacity of this device.

(1) Type of disturbance noise

According to work principle of the inverter, there are mainly 3 kinds of noise disturbance source:

1> Circuit conduction disturbance;

2> Space emission disturbance;

3> Electromagnetic induction disturbance;

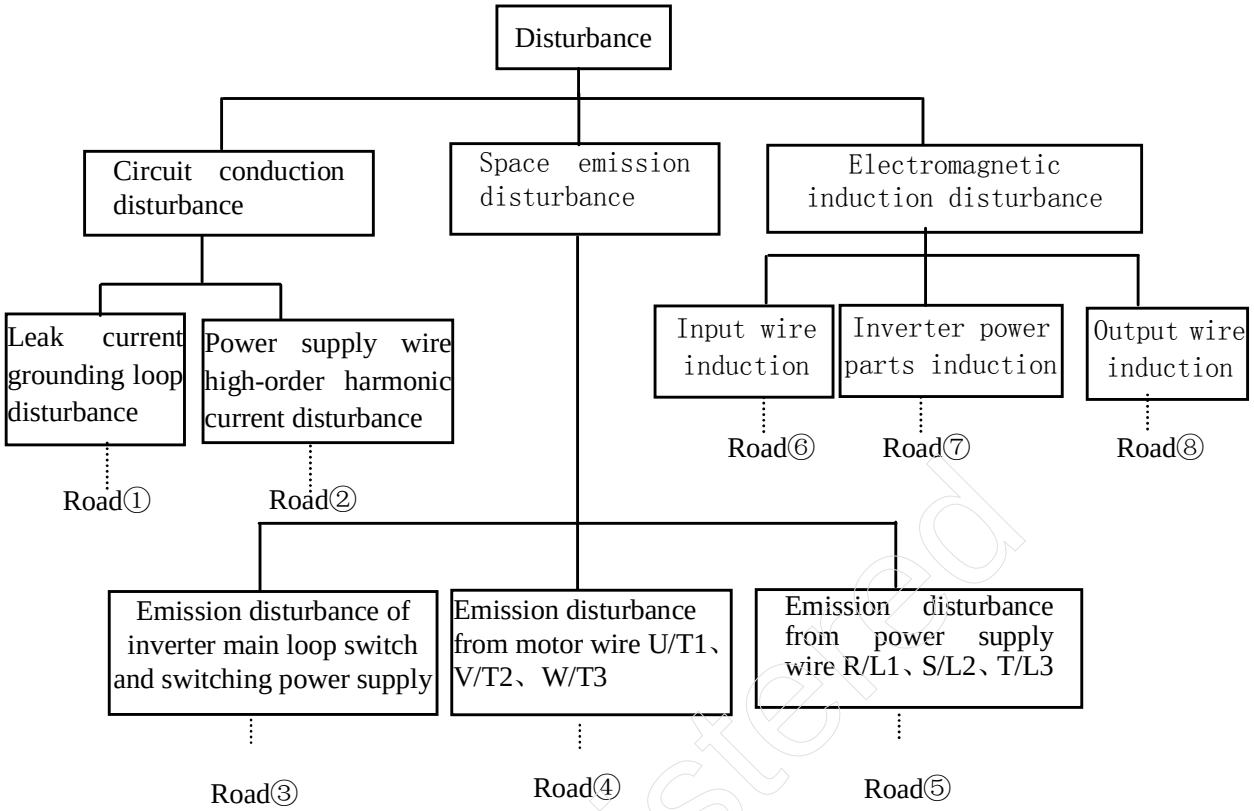


Fig.3-13 type of noise disturbance

(2) noise spread road

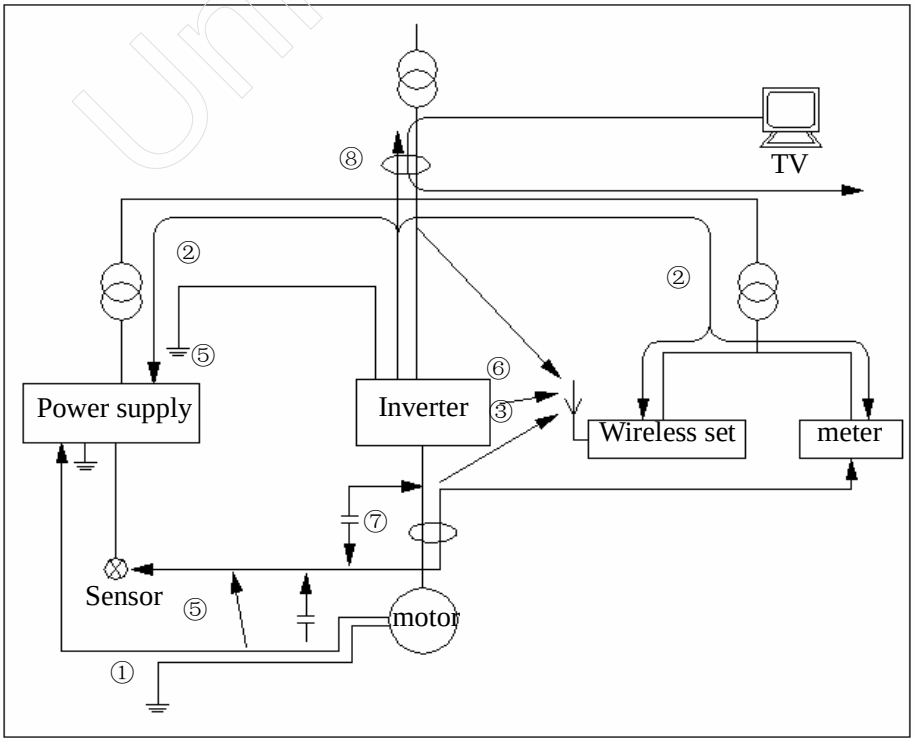


Fig.3-14 noise disturbance spread road sketch

(3) Basic countermeasure for suppressing disturbance

Table3-4 disturbance suppressing countermeasure table

Noise spread road	Countermeasure of weakening effect
①	When grounding wire of peripheral device and wiring of the inverter compose closed-loop, inverter grounding wiring leakage current would make the device do wrong action. Can reduce wrong action if the device is not earthed here.
②	High order harmonic from the inverter would make voltage and current transmit through power supply wire when peripheral device and the inverter electrified by same power supply, would disturb other devices in this same power supply system, can take following suppressing measure: assemble electromagnetic noise filter at inverter input end; isolate other device by isolation transformer; connect power supply for peripheral device with remote power source; install ferrite filter magnetic circle for R/L1、S/L2、T/L3 three-phase conducting wire of the inverter to suppress conduction of high-frequency harmonic current。
③④⑤	● Keep device and signal wire prone to disturbance from the inverter. Should use shielded signal wire, shielding layer signal end earthed and try best to keep away from the inverter and its input, output wire. If signal wire must intersect strong power cable, must keep them in real intersection and avoid parallel. ●Install high-frequency noise filter(ferrite common module choke, folksay magnetic circle) separately at input, output root, which can effectively suppress emission disturbance from dynamic wire. ● Should place motor cable shield of biggish thickness, for instance set it in tube with biggish thickness(above 2mm) or bury it in cement slot. Dynamic wire set into metal tube and use shielding wire to be grounded(use 4-core motor cable, one side is earthed through the inverter, the other side connect to motor shell).
⑥⑦⑧	To prevent parallel or bundled power and weak conducting wire; should keep away from inverter mounted device to the best and its wiring should keep away from power wire of the inverter such as R/L1、S/L2、T/L3、U/T1、V/T2、W/T3 etc.. Should pay attention to relative mounting place between device with strong electric field or strong magnetic field and the inverter, should keep distance and vertical intersection.

3.7.2 Local wiring and earthing

(1) Avoid parallel cable from inverter to motor(U/T1、V/T2、W/T3 terminal education wire) and power supply wire(R/L1、S/L2、T/L3 terminal input wire). Should keep Distance of 30cm above.

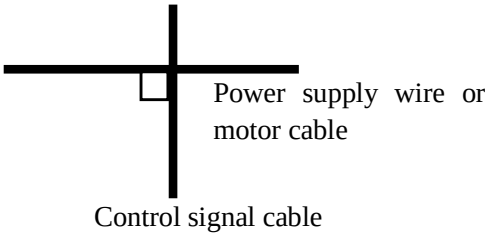


Fig.3-15 system wiring demand

(2) Try your best to place motor table from U/T1、V/T2、W/T3 terminal in metal tube or metal wiring solt.

(3) Should use shielded cable as common control signal cable, shielding layer close-to-inverter side earthed after connected with PE terminal of inverter.

(4) Cable educed from inverter PE terminal must be connected directly to earth-plate and can't be connected to ground through grounding wire of other devices.

(5) Powerfull cable(R/L1、S/L2、T/L3、U/T1、V/T2、W/T3) should not parallel control signal cable closely, say nothing of being bundled together, must keep distance of 20~60cm above(related to size of powerful current). Should cross each other vertically if intersection, as Fig.3-15.

(6) Powerful grounding wire must be connected to earth separately from weak grounding cable such as control signal and sensor cable etc..

(7) Forbid to connect other electricity consumption device to inverter power supply input end(R/L1、S/L2、T/L3).

3.7.3 Relation of long-distance wiring and current leak and the countermeasure

High-order harmonic will form between-line leak current through distributing capacitor and to-earth leak current when long-distance wiring between inverter and motor commence. Can adopt following method to suppress:

(1) Install ferrite magnetic circle or output reactor at inverter output side.

End voltage of the motor will be reduced markedly when installing reactor of 5% above rated voltage dropn and make long-distance wiring to U/T1、V/T2、W/T3. Fully loaded motor have the danger of burning itself, should work in lower volume or step up its input output voltage.

(2) Reduce carrier wave frequency but motor noise would increase accordingly.

3.7.4 Installation demand for electromagnetic on-off electronic device

Relay, magnetic control conductor and electromagnetic iron and so on, these electromagnetic on-off electronic device would bring lots of noise during work, so you should pay full attention to when installing them beside the inverter or in the same control chamber with the inverter and must install surge absorbing device as shown in Fig.3-16.

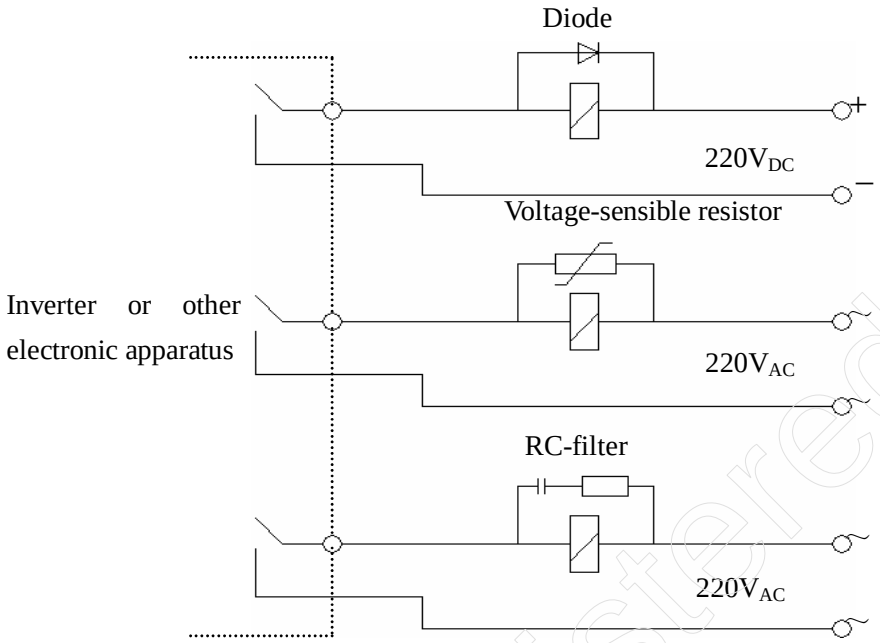


Fig.3-16 Installation demand for electromagnetic on-off device

Chapter 4 Run and operation explanation for inverter

4.1 Run of inverter

4.1.1 Running order channels

There are 3 kinds of order channel for controlling run action of the inverter such as run, stop, jog etc.:

0：keypad

Control by key RUN, STOP RESET, M on keypad(factory default).

1: control terminal

Use control terminal FWD, REV, COM to make of double-line control, or use one terminal of MI1, MI2, MI3, MI4, MI5 and FWD or REV to make of three-line control.

2: serial port

Control run and stop of the inverter through upper machine or other device which can communicate with the inverter.

Choose order channel by setting function code H0.03; and also can choose by multi-function input terminal(H6.00~H6.05 choose function 29, 30, 31).

Please make switching debugging in advance when switch the order channel tocheck if it can fulfil system requirement， otherwise have danger of damaging device and injuring personal.

4.1.2 Frequency-provision channel

ACD2** common run mode there are 8 kinds of provision channel:

0: direct digital frequency provision:

1: terminal UP/DOWN provision(store after power-off or stop);

2: terminal UP/DOWN provision（not store after power-off or stop）;

3： serial port provision;

4： analog vault AVI provision;

5： analog vault ACI provision;

6: keypad analog potentiometer provision;

7: terminal pulse(PULSE) provision;

8: combination set;

4.1.3 Work state

Work state of ACD2** is classified as waiting state and running state:

Waiting state: if there is no running command after the inverter electrified or after stop command during running state, the inverter enters into waiting state.

Running state: the inverter enters into running state after receiving run command.

4.1.4 Run mode

ACD2** inverter have 6 kinds of run mode, following is in turn according to their priority: jog run → losed-loop → PLC run → multisection speed run → swing frequency run → common run. Shown as Fig.4-1.

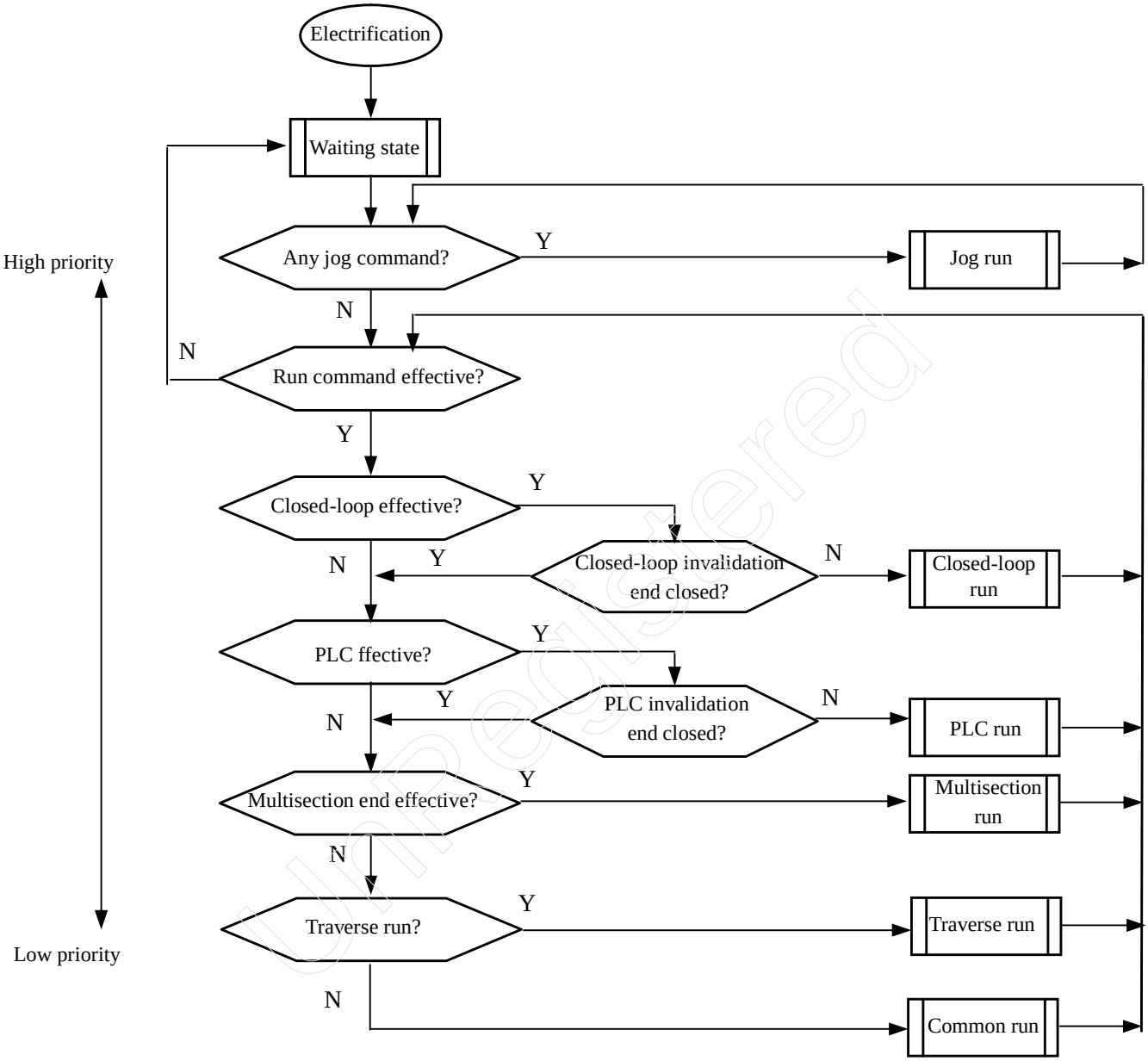


Fig.4-1 logic flow chart of ACD280 inverter run state

0: jog run

Upon receiving jog run command(for instance, press the M ey on keypad) during waiting state, the inverter run at jog frequency(see function code H3.04~H3.06)

1: closed-loop run

The inverter will come into closed-loop run mode when closed-loop run control effective parameter is set(H5.00=1). Namely carry on PID adjustment to specified value and feedback value(proportion integral differential calculation, see H5 group function code) and

PID adjustor output is inverter output frequency. Can make closed-loop run mode inefficientive and switch to lower level run mode by multi-function terminal(function 20).

2: PLC run

The inverter will enter into PLC run mode and run according to run mode preset(see F4 group function code description) through setting PLC function effective parameter(H4.00 last bit ≠0). Can make PLC run mode ineffective and switch to lower level run mode by multi-function terminal(function 21).

3: Muliti-section speed run

By nonzero combination of multi-function terminal(MI1、MI2、MI3、MI6 function), choose multisection frequency 1~8(H3.19~H3.26) to run at multisection speed.

4: Swing frequency run

The inverter will enter into swing frequency run mode when swing frequency function effective parameter(H7.00=1) is set. Set relevant swing frequency run special parameter according to textile swing frequency craft to realize swing frequency run.

5: Common run

Common open loop run mode of general inverter.

In above 6 kinds of run mode except “jog run” the inverter can run according to kinds of frequency setting method. In “PID run” “PLC run” “ multisection run” “common run” mode the inverter can also carry on pendular frequency adjustment.

4.2 Operation and use of key board

4.2.1 Keypad layout

Keypad is main unit for receiving command, displaying parameter. Outer dimension of keypad is as Fig.4-2:

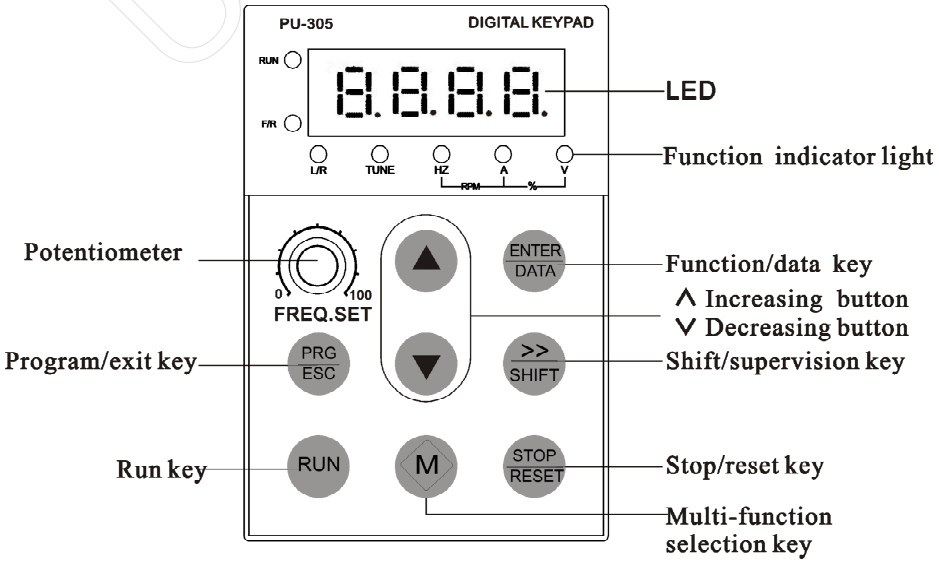


Fig.4-2 keypad layout sketch

(1) function indicator instructions

RUN The indicator is turn off that means the inverter in stopped status; while the indicator is turn on that means the inverter is in running status.

L/R indicator lights of keypad operation, terminal operation and remote operation (communication control): when the indicator light is turn off that means it under the control of keypad; when the indicator light is turn on that means it under the control of terminal operation; while the indictor light is glitter that means it under the control of remote operation.

F/R Positive &negative indicator light: the light is turn off that means it in the status of positive rotation; while the ligh is turn off that means it in the status of reverse rotation.

（2）unit indicator light instruction

HZ frequency unite **A** current unite

V voltage unite **RPM** revolving speed unite

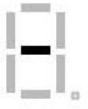
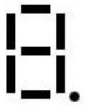
% percentage

（3）digital display

Four digit LED display can show the setting frequency, output frequency, all kinds of monitoring datas and alarming code, ect.

Digitron table

LED display	Character implication	LED display	Character implication	LED display	Character implication	LED display	Character implication
	**0**		**A**		**I**		**S**
	**1**		**b**		**J**		**T**
	**2**		**C**		**L**		**t**
	**3**		**c**		**N**		**U**
	**4**		**d**		**n**		**V**
	**5**		**E**		**O**		**y**

	**6**		**F**		**o**		**-**
	**7**		**G**		**P**		**8.**
	**8**		**H**		**q**		**.**
	**9**		**h**		**r**		

(4) Keypad function description

There are 8 key-press and one adjusting button for analog potentiometer on inverter keypad and function definition of each key is as shown in table 4-1.

Table 4-1 keypad function table

Key	Name	Function description
PRG ESC	Program/exit key	Enter into or exit programming state.
>> SHIFT	Shift/supervision key	Under the downtime interface and running interface, can choose the display parameters circularly; when update the parameters, can choose the update bit.
ENTER DATA	Function/data key	Enter into the next menu or setting parameter confirmation
M	Multi-function selection key	When H0.04 third bit = 0，it's reverse run key; When H0.04 third bit = 1，it's forward jog key; Deatailed operation methods please see the instruction of H0.04 thirt bit.
RUN	Run key	Enter into forward run under keypad mode
STOP RESET	Stop/reset key	In the running status, pressing the button can stop it; while in the failure alarm status, pressing this button can reset it. The function of this button is resitricted by the function code H0.03.
▲	Increasing button	To increase data or function code(to press it continuously can improve increasing speed)
▼	Decreasing button	To decrease data or function code(to press it continouously can improve decrease speed)

4.2.2 Key board display status

ACD280 keypad display status is classified as waiting status parameter display, function code parameter editing status display, malfunction alarm status display, run status parameter display in total 4 kinds of status. LED indicator light will all be lit after the inverter electrified, and digital display(LED) will display character "8.8.8.8.", then enter into set frequency display. As shown in Fig.4-3 a

(1) Waiting parameter display status

The inverter in waiting status and waiting status supervision parameter is displayed on keyboard, normally parameter H3.36 decide which status supervision parameter to be displayed. As shown in Fig.4-3 b, the unit is indicated by unit indicator light. Below.

To press >> SHIFT key, it can display different waiting status supervision parameter circularly(display 8 kinds of supervision parameter acquiescently)

(2) Run parameter display status

The inverter enter into run status when receiving effective run command and normally parameter H3.35 or H3.36 decide which status supervision parameter to be displayed on the keypad. As shown in Fig.4-3 c, unit is displayed by unit indicator light. below

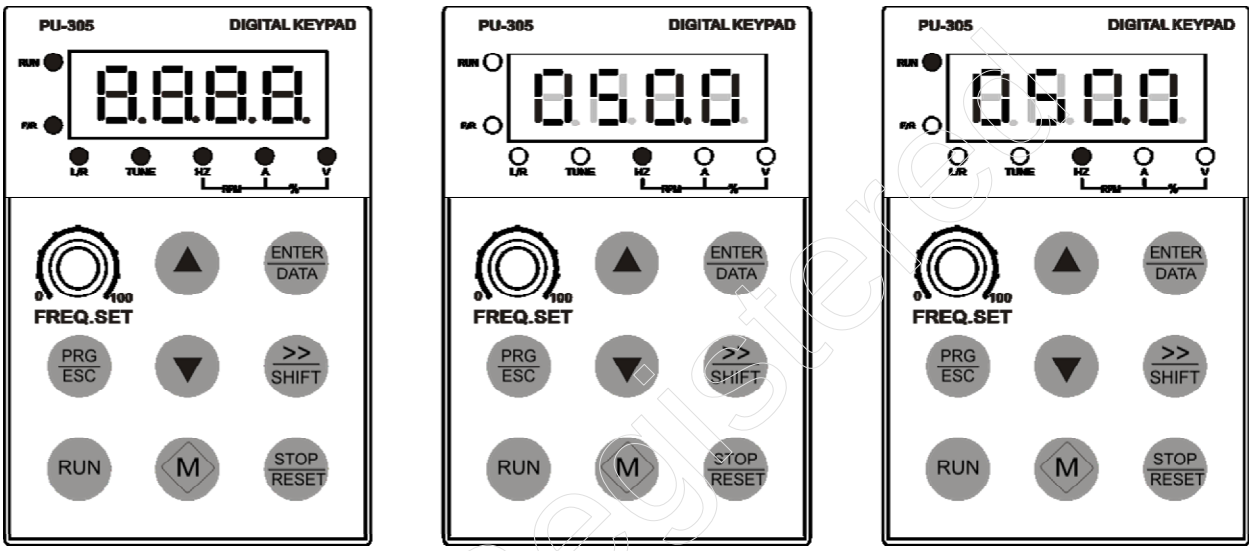


Fig.a Electrification, display 8.8.8.8.

Fig.b Waiting status, display waiting status parameter

Fig.c Run status, display run status parameter

Fig.4-3 inverter electrification, waiting, run status display

(3) Failure alarm display status

The inverter enter into failure alarm display status upon detecting failure single and display failure code sparking(as shown in Fig.4-4); To press >> SHIFT key can look over relative parameter after stopping running; Can press PRG ESC key to enter into program status to see about Hd group parameter if want to search failure information. Can carry on failure restora STOP RESET by key, control terminal or communication command on the keypad after troubleshooting. Keep displaying failure code if failure exist continuously.

For some serious failure, such as inverter module protect, over current, over voltage etc., must not carry on failure reset forcibly to make the inverter run again without failure elimination. Otherwise have danger of damaging the inverter!

(4) Function code editing status

Under waiting, run or failure alarm status, press PRG ESC key, can enter into editing status(if user password is set, can enter into editing status after inputting the password, see also HE.00 description and Fig.4-10), and editing status is displayed according to three classes menu mode, as shown in Fig.4-5. To press ENTER DATA key can enter into one class by one class. Under function parameter display status, to press ENTER DATA key to carry on parameter storage operation; To press PRG ESC key can only come back to upper class menu without storing modified parameter.

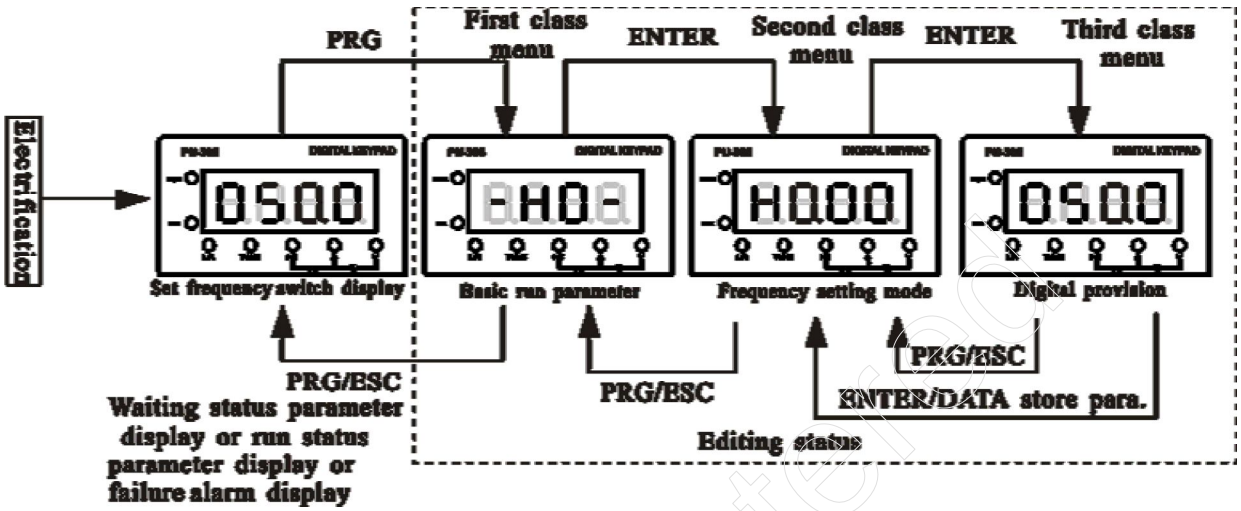


Fig.4-5 keypad display status switching

(5) Special display function

You can change set frequency under supervision state directly when keypad potentiometer is effective(H0.00=6) or keypad digital setting is effective(H0.00=1). Here the inverter displays set frequency if it's stop or display output frequency if it's running. After set frequency stops changing for 1 second the inverter will go back to normal display status.

4.2.3 Method for operating keypad

Can carry on various operation to the inverter through keypad, for example:

(1) Status parameter display switching:

After pressing key >> SHIFT display HF group status supervision parameter; after displaying one supervision parameter code for 1 second, will display this parameter value automatically.

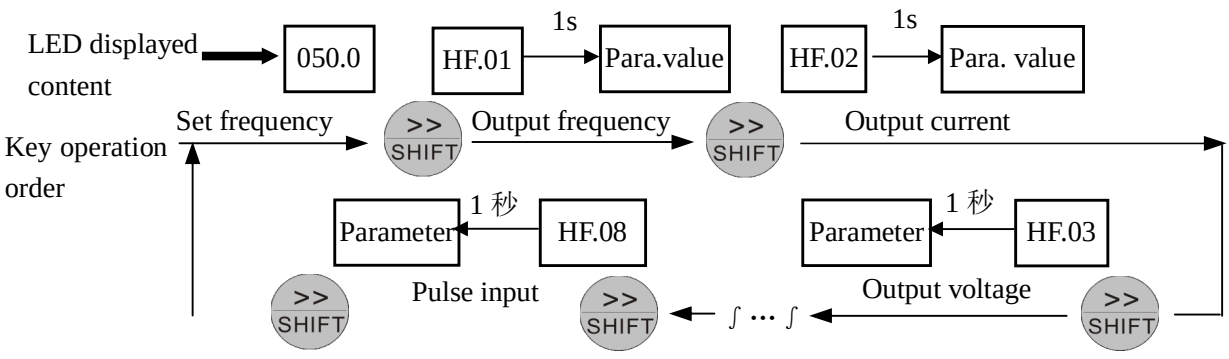


Fig.4-6 waiting status parameter display operating example

(2) Function code parameter setting

Take function code H3.04 modified form 5.0Hz to 6.0Hz as example. Boldface in Fig.4-7 shows flickering digit.

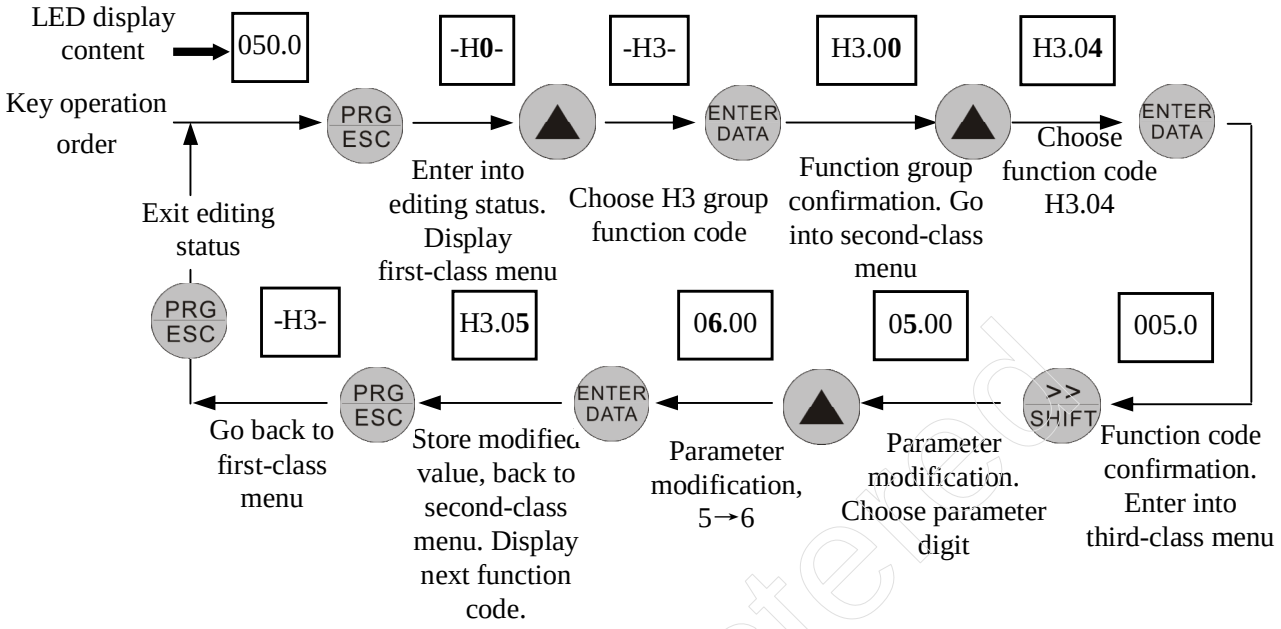


Fig.4-7 example for parameter setting and modification

Description: under third-class menu, if the parameter has no blinking digit, this function code can't be modified, possible reasons are as follows:

1> This function code shouldn't be modified, for example actual detected status parameter, run record parameter etc.;

2> This function code can't be modified under run status and can be changed after stopping running;

3> Parameter protected. All the function code can't be modified when function code H3.07=1 or 2, in order to avoid wrong operation. Need to set the function code H3.07 to 0 if you want to edit function code parameter.

(3) Specified frequency adjustment for common run

Take example modifying specified frequency from 50.0Hz to 40.0Hz at H0.00=0 during running for explanation.

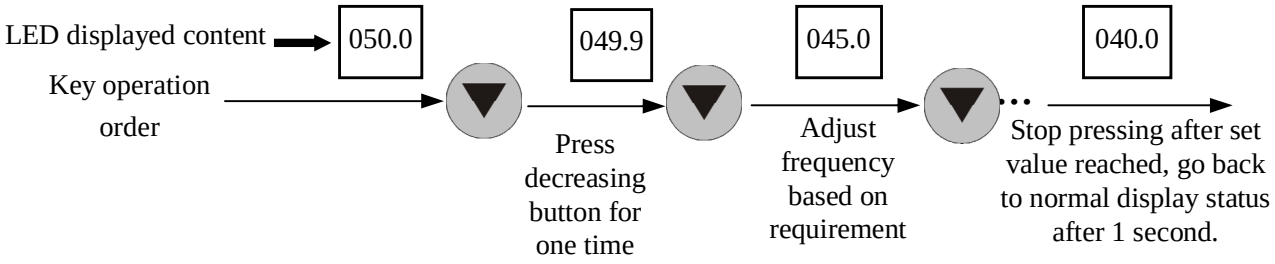


Fig.4-8 set frequency adjustment operation example

(4) Jog run operation

For example, keypad as current run command channel, jog run frequency 5Hz, waiting status

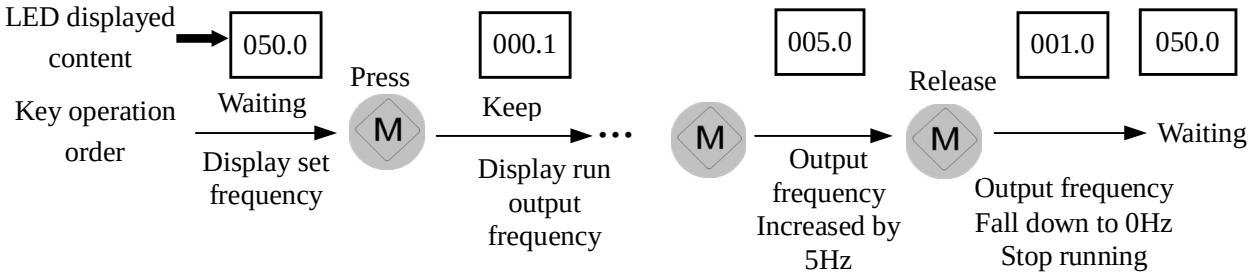


Fig.4-9 jog run operation example

(5) Operation for entering to function code editing status after setting user password

"User password" HE.00 is set to "1111". Boldfaced digit in Fig.4-7 shown blinking bit.

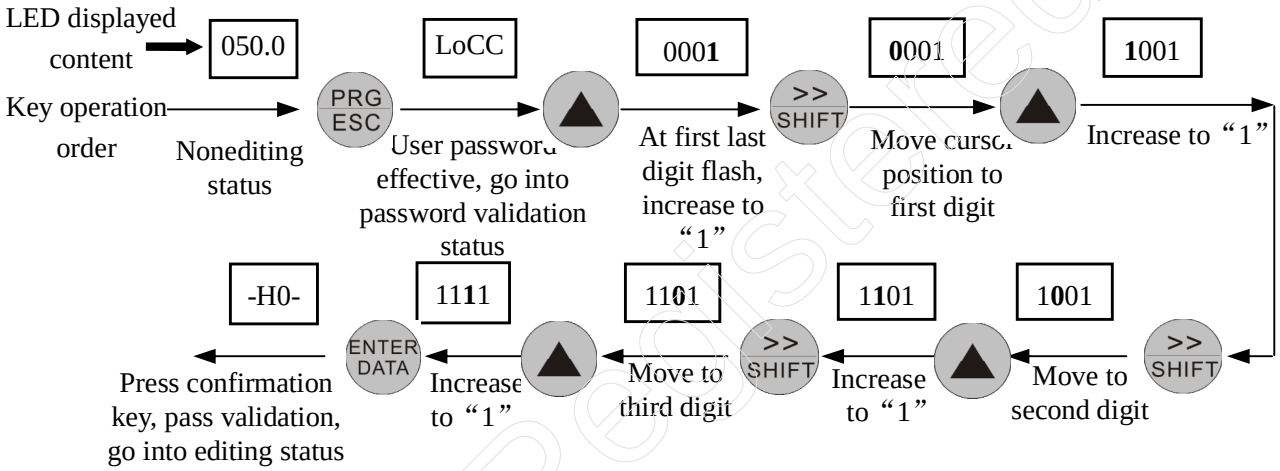


Fig.4-10 inputting password to go into function code operation example

(6) See about failure parameter under failure status:

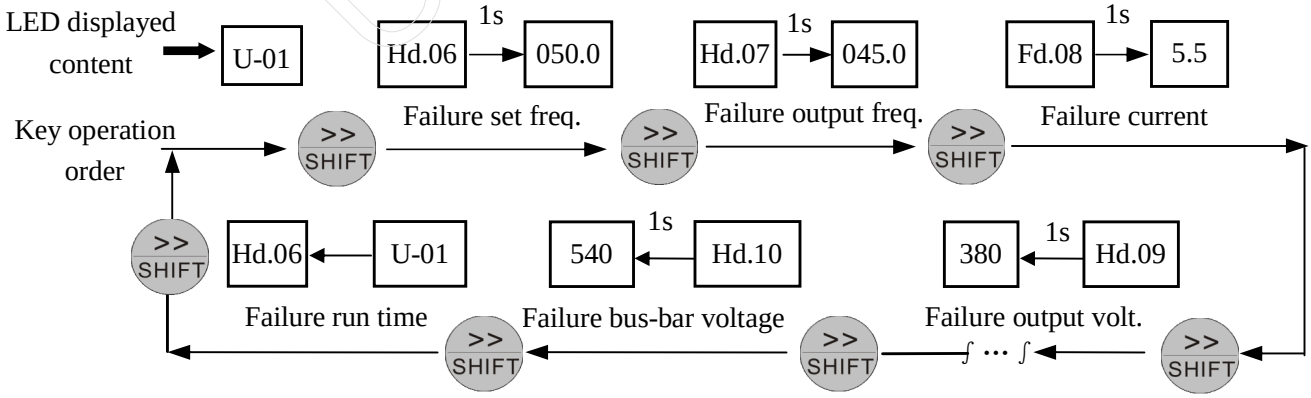


Fig.4-11 failure status searching operation example

Description:

1> If press >> SHIFT key under failure status the user can see about Hd group function code parameter, search range Hd.06~Hd.10, LED first display function code number when >> SHIFT

the user press key and display parameter digit of this function code after 1s.

2> when the user see about failure parameter, can press key directly to switch back to failure alarm display status(U-XX)

4.3 Inverter electrification

4.3.1 Check before electrification

Please carry on wiring based on operation requirement provided in “inverter wiring” of this service manual.

4.3.2 First electrification

Close input side AC power supply switch after correct wiring and power supply confirmed, electrify the inverter and keypad LED display “8.8.8.8.”， relay or contactor closed normally，LED display set frequency shows that electrification is finished. First electrification operation process is shown as Fig.4-12

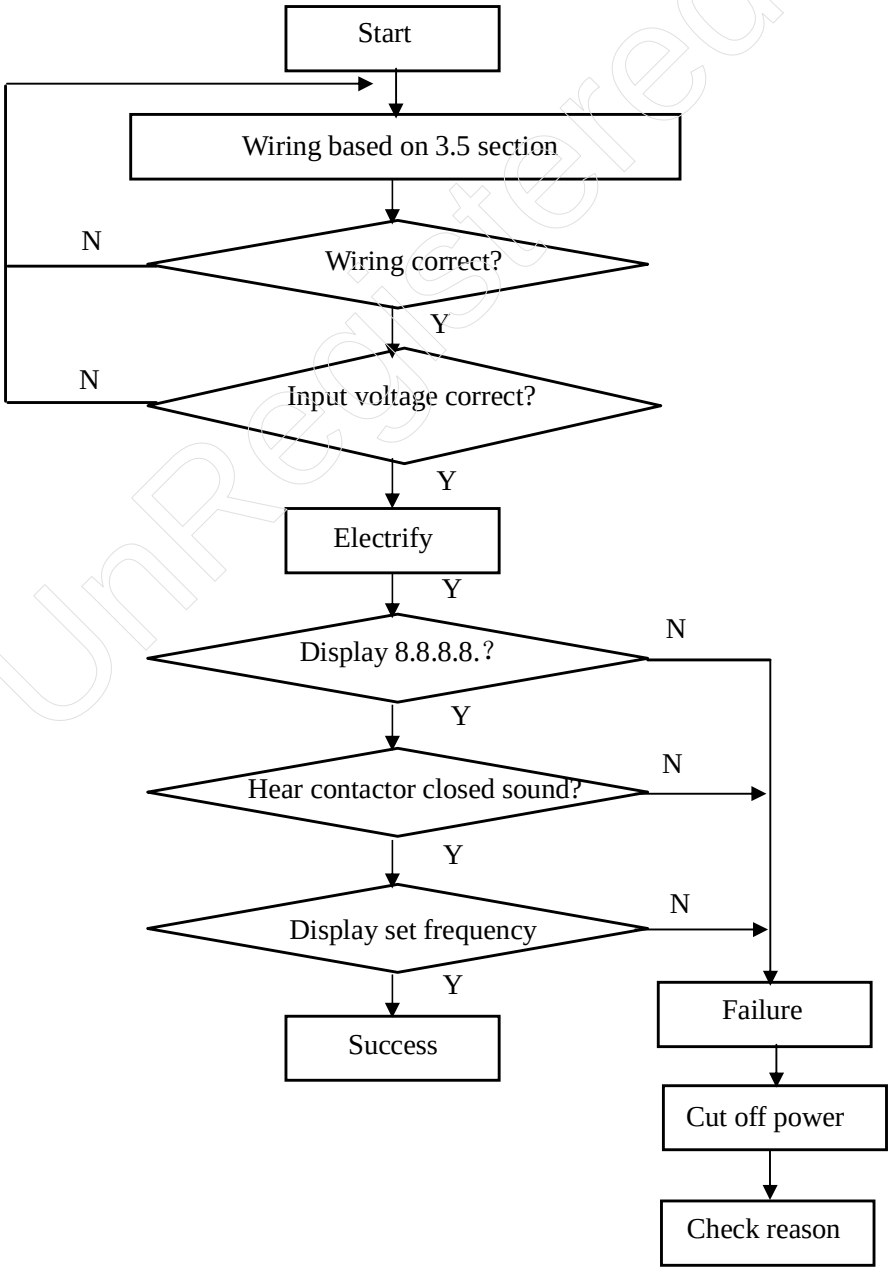


Fig.4-12 first electrification operation flow

Chapter 5 Function parameter schedule graph

5.1 Symbol description

× ---- parameter can't be changed in process of running

○ ---- parameter can be changed in process of running

* ---- read-only parameter, unmodifiable

5.2 Function parameter schedule graph

Function code	Name	Set range	Unit	Factory default	Modification	Communication Address
HD—Basic run function parameter group						
H0.00	Frequency input channel selection	0: keypad digital setting 1: terminal UP/DOWN adjust setting frequency (store after power off) 2:terminal UP/DOWN adjust setting frequency (not store after power off) 3: RS485 serial port setting(stored after power off) 4: AVI analog setting(AVI-GND) 5: ACI analog setting(ACI-GND) 6: keypad analog potentiometer setting 7: terminal pulse(PULSE) setting 8: combination setting	1	0	○	00H
H0.01	Freq. digit setting	Lower limit Freq.~ upper limit Freq.	0.1Hz	50.0Hz	○	01H
H0.02	frequency input channel combination(H0.00=8 xombination is defined)	13：AVI、ACI Arbitrary nonzero effective，AVI has priority 0：AVI+ACI 1：AVI-ACI 2: reserved 3: reserved 4: reserved 5: reserved 6: external pulse setting +ACI 7: external pulse setting -ACI	1	0	○	02H

		8: reserved 9: reserved 10: reserved 11: reserved 12: reserved 13: arbitrary nonzero of AVI、ACI is effective, AVI has priority 14: reserved 15：RS485+ACI 16：RS485-ACI 17：RS485+AVI 18：RS485-AVI 19: RS485+ keypad analog potentiometer 20: RS485- keypad analog potentiometer 21: AVI+ keypad analog potentiometer 22：AVI- keypad analog potentiometer 23：ACI+ keypad analog potentiometer 24：ACI- keypad analog potentiometer 25: reserved				
H0.03	Run command channel selection	0: keypad run control 1: terminal run command control(keypad STOP command ineffective) 2; terminal run command control(keypad STOP command effective) 3: serial port run command control(keypad STOP command ineffective) 4: serial port run command control(keypad STOP command effective)	1	0	○	03H
H0.04	Run direction setting	1st bit: reserved 2nd bit: 0: reverse run allowed 1: reverse run banned 3rd bit: M key selection	1	0	○	04H

		0: reverse run key 1: forward jog key				
H0.05	Acce. time 1	0.1－6000.0	0.1	20.0	○	05H
H0.06	Dece. time 1	0.1－6000.0	0.1	20.0	○	06H
H0.07	Acce/dece time unit	0：second 1：minute	1	0	×	07H
H0.08	Upper limit freq.	Lower limit freq.–3200.0Hz	0.01Hz	50.0Hz	×	08H
H0.09	Lower limit freq.	0.0-upper limit freq.	0.01Hz	0.0Hz	×	09H
H0.10	Lower limit freq. run mode	0: run at lower limit freq 1: stop	1	0	○	0AH
H0.11	Torque boost mode	0: manual boost 1: automatic boost	1	0	○	0BH
H0.12	Torque boost	0.0－20.0（%）	0.1(%)	2.0(%)	○	0CH
H0.13	Slip frequency compensation filter	0~4	1	2	×	0DH
H0.14	Motor speed adjust factor	1~9999	1	100	○	0EH
H0.15	V/F curve setting	0： constant torque curve 1: degressive torque curve 1(the 2.0nd power) 2: degressive torque curve 2(the 1.7nd power) 3: degressive torque curve 3(the 1.2nd power) 4: end-user sets VF curve himself 5~32: special VF curve, for detailed see Chapter 6	1	0	×	0FH
H0.16	V/F frequency value 3(F3)	H0.17~(lower limit frequency – 3.0Hz	0.1HZ	40.0	×	10H
H0.17	V/F voltage value 3(V3)	H0.18~95.0%	0.1%	80.0	×	11H
H0.18	V/F frequency value 2(F2)	H0.19~H0.17	0.1HZ	30.0	×	12H
H0.19	V/F voltage value 2(V2)	H0.20~H0.16	0.1%	60.0	×	13H
H0.20	V/F frequency value 1(F1)	3.0HZ~H0.17	0.1HZ	15.0	×	14H

H0.21	V/F voltage value 1(V1)	3.0~H0.18	0.1%	30.0%	×	15H
H0.22	Carrier wave frequency	2.0－15.0K	0.1K	Depend on machine type	×	16H
H0.23	Acce./dece mode selection	0: linear accelerating decelerating mode 1: S curve accelerating decelerating mode	1	0	×	17H
H0.24	S curve start section time	10.0（%）－50.0（%）（Acce/dece time） H0.24+H0.25≤90（%） 10.0（%）－50.0（%）（acce/dece time） H0.24+H0.25≤90（%）	0.1(%)	20.0(%)	○	18H
H0.25	S curve risetime	10.0（%）－80.0（%）（Acce/dece time ） H0.24+H0.25≤90（%）	0.1(%)	60.0(%)	○	19H
H0.26	G/L type setting	0: G type 1: L type	1	0	×	1AH
H0.27	Software edition	000.0~999.9	0.1	actual value	*	1BH
H0.28	recover to production status	0：no action 1：delete the accident information 2：return to production status 2 (universal inverter recover to production status)	1	0	×	1CH
H1—freq. specified function parameter group						
H1.00	Analog filter time constant	0.01－30.00s	0.01s	0.20s	○	1DH
H1.01	AVI min.provision	0.0－H1.03	0.1%	0.0%	○	1EH
H1.02	AVI min.provision corresponding freq.	0.0- upper limit freq.	0.1 Hz	0.0Hz	○	1FH
H1.03	AVI max. provision	0.0－100.0%	0.1%	100.0%	○	20H
H1.04	AVI max.provision corresponding freq.	0.0- upper limit freq.	0.1 Hz	50.0Hz	○	21H
H1.05	ACI min.provision	0.0－H1.07	0.1%	0.0%	○	22H
H1.06	ACI min.provision corresponding	0.0- upper limit freq.	0.1 Hz	0.0Hz	○	23H

	freq.					
H1.07	ACI max. provision	0.0－100.0%	0.1%	100.0%	○	24H
H1.08	ACI max.provision corresponding freq.	0.0- upper limit freq.	0.1 Hz	50.0Hz	○	25H
H1.09	PULSE max.input impulse	0.1－20.0K	0.1K	10.0K	○	26H
H1.10	PULSE min. provision	0.0－H1.12(PULSE max.provision)	0.1K	0.0K	○	27H
H1.11	PULSE min.provision corresponding freq.	0.0- upper limit freq.	0.1 Hz	0.0 Hz	○	28H
H1.12	PULSE max.provision	H1.10(PULSE min.provision)-H1.13(max. input impulse)	0.1K	10.0K	○	29H
H1.13	PULSE max.provision corresponding freq.	0.0- upper limit freq.	0.1 Hz	50.0Hz	○	2AH
H2—start-up, stop, brake function parameter group						
H2.00	Start-up mode	0; start at start-up frequency 1: firs brake, then start at start-up frequency 2: speed tracking start-up	1	0	×	2BH
H2.01	Start-up frequency	0.0－10.0Hz	0.1Hz	0.0Hz	○	2CH
H2.02	Start-up freq. duration	0.0－20.0S	0.1s	0.0s	○	2DH
H2.03	DC brake volt. at start-up	0－15（%）	1	0	○	2EH
H2.04	DC brake time at start-up	0.0－20.0S	0.1s	0.0s	○	2FH
H2.05	Stop mode	0: Dec Stop 1: free stop 2: Dec + DC brake stop	1	0	×	30H
H2.06	DC brake initiative freq. when	0.0－15.0Hz	0.1Hz	0.0Hz	○	31H

	stop running					
H2.07	DC brake time when stop running	0.0－20.0s	0.1s	0.0s	○	32H
H2.08	DC brake voltage when stop running	0－90（%）	1	0	○	33H
H3 –anxiliary run function parameter group						
H3.00	Forward reverse run dead-section time	0.0－3600.0s	0.1s	0.2s	○	34H
H3.01	Automatic energy save run	0: no action 1: action	1	0	×	35H
H3.02	AVR function	0; no action 1: action all the time 2: no action only during Dec.	1	0	×	36H
H3.03	Slip frequency compensation	0~150(%) 0-no slip frequency compensation	1	0	×	37H
H3.04	Joy run frequency	0.1－50.0Hz	0.1Hz	5.0Hz	○	38H
H3.05	Joy Acc time	0.1－60.0s	0.1s	20.0s	○	39H
H3.06	Joy Dec time	0.1－60.0s	0.1s	20.0s	○	3AH
H3.07	Parameter operation control	LED 1st bit: 0: all parameter allowed to be modified 1: except this parameter, all other parameter not allowed to be modified 2: except H0.01 and this parameter, all other parameter not allowed to be modified LED 2nd bit: 0: lock all buttons 1: lock all buttons but not STOP key 2: lock all buttons but not ▲,▼,STOP key	1	0	×	3BH

H3.08	Communication configuration	LED first bit: baud rate selection 2：1200BPS 3：2400BPS 4：4800BPS 5：9600BPS 6：19200BPS 7：38400BPS LED second bit: data format 0: 1-8-2 format, no checkout 1: 1-8-1 format, even checkout 2: 1-8-1 format, odd checkout	1	5	×	3CH
H3.09	Local address	0-247, 0 is broadcast address, the inverter only receive but not send when it is set to be 0, 0 is address for main device.	1	1	×	3DH
H3.10	Communication overtime	0.0－999.0s	0.1s	0.0s	×	3EH
H3.11	Local response delay	0－1000ms	1ms	5ms	×	3FH
H3.12	Master-slave machine communication frequency given ratio	0－500（%）	1(%)	100(%)	○	40H
H3.13	Acce time 2	0.1－6000.0	0.1	20.0	○	41H
H3.14	Dece time 2	0.1－6000.0	0.1	20.0	○	42H
H3.15	Acce time 2	0.1－6000.0	0.1	20.0	○	43H
H3.16	Acce time 3	0.1－6000.0	0.1	20.0	○	44H
H3.17	Acce time 4	0.1－6000.0	0.1	20.0	○	45H
H3.18	Dece time 2	0.1－6000.0	0.1	20.0	○	46H
H3.19	Multisection freq. 1	Lower limit freq. – upper limit freq.	0.01Hz	5.0Hz	○	47H
H3.20	Multisection freq. 2	Lower limit freq. – upper limit freq.	0.01Hz	10.0Hz	○	48H
H3.21	Multisection freq. 3	Lower limit freq. – upper limit freq.	0.01Hz	20.0Hz	○	49H
H3.22	Multisection freq. 4	Lower limit freq. – upper limit freq.	0.01Hz	30.0Hz	○	4AH
H3.23	Multisection freq. 5	Lower limit freq. – upper limit freq.	0.01Hz	40.0Hz	○	4BH
H3.24	Multisection freq. 6	Lower limit freq. – upper limit freq.	0.01Hz	45.0Hz	○	4CH
H3.25	Multisection freq.	Lower limit freq. – upper	0.01Hz	50.0Hz	○	4DH

	7	limit freq.				
H3.26	Multisection freq. 8	Lower limit freq. – upper limit freq.	0.01Hz	5.0Hz	○	4EH
H3.27	Jumping freq. 1	0.0 – upper limit freq.	0.01Hz	0.0Hz	×	4FH
H3.28	Jumping freq. 1 range	0.0 – upper limit freq.	0.01Hz	0.0Hz	×	50H
H3.29	Jumping freq. 2	0.0 – upper limit freq.	0.01Hz	0.0Hz	×	51H
H3.30	Jumping freq. 2 range	0.0 – upper limit freq.	0.01Hz	0.0Hz	×	52H
H3.31	Jumping freq. 3	0.0 – upper limit freq	0.01Hz	0.0Hz	×	53H
H3.32	Jumping freq. 3 range	0.0 – upper limit freq	0.01Hz	0.0Hz	×	54H
H3.33	Setting run time	0-65535 hours	1	0	○	55H
H3.34	Accumulative run time	0-65535 hours	1	0	*	56H
H3.35	LED initial supervision parameter selection during running	0: set frequency 1: output frequency 2: output current 3: output voltage 4: DC bus bar voltage 5: motor speed 6: heat sink temperature 7: analog input AVI 8: analog input ACI 9: MI、FWD、REV input terminal status 10:PID provision pressure 11:PID feedback pressure 12: setting speed	1	1	○	57H
H3.36	LED initial supervision parameter selection when stop running	the same as above	1	0		58H
H4 – simple PLC function parameter group						
H4.00	Simple PLC running setting	LED first bit; 0: no action 1:stop after single circulation 2: keep final value after single circulation LED second bit: 0: start again from first section 1: continue to run at mid-section frequency	1	000	×	59H

		LED third bit: PLC run time unit 0: second 1: minute				
H4.01	Section 1 setting	000-321 LED first bit: frequency setting 0: multisection freq.i(i= 1~7) 1: freq. determined by H0.00 function code LED second bit: run direction selection 0: forw run 1: reverse run 2: determined by run command LED third bit: Acc/Dec time selection 0: Acc/Dec time 1 1: Acc/Dec time 2 2: Acc/Dec time 3 3: Acc/Dec time 4	1	000	○	5AH
H4.02	Section 1 run time	0－6000.0	0.1	10.0	○	5BH
H4.03	Section 2 setting	000－321	1	000	○	5CH
H4.04	Section 2 run time	0－6000.0	0.1	10.0	○	5DH
H4.05	section 3 setting	000－321	1	000	○	5EH
H4.06	Section 3 run time	0－6000.0	0.1	10.0	○	5FH
H4.07	Section 4 setting	000－321	1	000	○	60H
H4.08	Section 4 run time	0－6000.0	0.1	10.0	○	61H
H4.09	Section 5 setting	000－321	1	000	○	62H
H4.10	Section 5 run time	0－6000.0	0.1	10.0	○	63H
H4.11	Section 6 setting	000－321	1	000	○	64H
H4.12	Section 6 run time	0－6000.0	0.1	10.0	○	65H
H4.13	Section 7 setting	000－321	1	000	○	66H
H4.14	Section 7 run time	0－6000.0	0.1	10.0	○	67H
H5 – close-loop run function parameter group						
H5.00	Closed-loop run control selection	0: closed-loop run control ineffective 1: PID closed-loop run control	1	0	×	68H

		effective				
H5.01	Provision channel selection	0: digital pressure provision H5.03 1: AVI analog provision 2: ACI analog provision 3: keypad potentiometer provision	1	1	○	69H
H5.02	Feedback channel selection	0: AVI analog input 1: ACI analog input 2: AVI+ACI 3: AVI-ACI 4:Min（AVI、ACI） 5:Max（AVI、ACI）	1	1	○	6AH
H5.03	Specified value digital pressure setting	0.0-100%, percentage relative to HA.02	0.1	50.0(%)	○	6BH
H5.04	Minimum specified value	0.0-maximum specified value; percentage relative to 10.00V	0.1(%)	0.0(%)	○	6CH
H5.05	Feedback value responding to minimum specified value	0.0(%)－100.0(%)	0.1(%)	0.0(%)	○	6DH
H5.06	Maximum specified value	Minimum specified value - 100.0(%)	0.1(%)	100.0(%)	○	6EH
H5.07	Feedback value responding to maximum specified value	0.0%－100.0（%）	0.1(%)	100.0(%)	○	6FH
H5.08	Proportion gain KP	0.000－9.999	0.001	0.050	○	70H
H5.09	Integral gain KI	0.000－9.999	0.001	0.050	○	71H
H5.10	Differential gain KD	0.000－9.999	0.001	0.050	○	72H
H5.11	Sampling cycle T	0.01－1.00s	0.01s	0.10s	○	73H
H5.12	Deviation margin	Percentige of 0.0 — 20.0(%)relative to 10.00V	0.1(%)	2.0(%)	○	74H
H5.13	Closed-loop adjusting characteristic	0: forward function 1: reverse function	1	0	○	75H
H5.14	Closed-loop preset frequency	0-upper limit frequency	0.01Hz	0.0Hz	○	76H
H5.15	Closed-loop preset frequency holding time	0.0－6000s	0.1s	0.0s	○	77H
H6—terminal correlative function parameter group						

H6.00	Input terminal MI1 function selection	0: leave control terminal unused 1: multisection speed control terminal 1 2: multisection speed control terminal 2 3: multisection speed control terminal 3 4: multisection speed control terminal 4 5:external forward run jog control 6: external reverse run jog control 7: Acc/Dec time option terminal 1 8: Acc/Dec time option terminal 2 9: Acc/Dec time option terminal 3 10: external device failure input 11: external reset input 12: free stop input 13: external stop-running order 14: stop DC braking input command DB 15: inverter run banned 16: frequency increasing control(UP) 17: frequency degression control(DOWN) 18: Acc/Dec ban command 19: three-line run control 20: closed-loop ineffective 21: PLC ineffective 22: simple PLC pause control 23: PLC stop status control 24: frequency provision channel option 1 25: frequency provision channel option 2 26: frequency provision channel option 3 27: frequency switched to ACI 28: command switched to	1	0	×	7CH

		terminal 29: run command channel option 1 30: run command channel option 2 31: run command channel option 3 32: swing frequency jump-in 33: external interruption input 34: interior counter reset end 35: interior counter triggering end 36: interior timer reset end 37: interior timer triggering end 38: pulse frequency input (only effective for MI6)				
H6.01	Input terminal MI2 function selection	Same as above	1	0	×	7DH
H6.02	Input terminal MI3 function selection	Same as above	1	0	×	7EH
H6.03	Input terminal MI4 function selection	Same as above	1	0	×	7FH
H6.04	Input terminal MI5 function selection	Same as above	1	0	×	80H
H6.05	Input terminal MI6 function selection	Same as above	1	0	×	81H
H6.06	DO output mode selection	0: H-speed impulse output 1: open-circuit collector output	1	0	×	82H
H6.07	DO-R open circuit collector output	Same as H6.10	1	0	×	83H
H6.08	FWD/REV run mode selection	0: double-line control mode 1 1: double-line control mode 2 2: three-line control mode 1 3: three-line control mode 2	1	0	×	84H
H6.09	UP/DOWN velocity	0.1－99.9Hz/s	0.1Hz/s	1.0Hz/s	○	85H
H6.10	Open circuit collector output terminal MO1 output setting	0: inverter running(RUN) 1: frequency arriving signal(FAR) 2: frequency level detect signal (FDT1) 3: reserved 4: overload warning alarm signal (OL) 5: output frequency reach high limit(FHL)	1	0	×	86H

		6: output frequency reach low limit(FLL) 7: inverter under voltage blockage stop (LU) 8: external failure stop-runnin(EXT) 9: inverter zero rotate speed running 10: PLC running 11: simple PLC section running finished 12: PLC finish a cycle running 13: reserved 14: inverter ready to run (RDY) 15: inverter failure 16: swing frequency high and low limit restriction 17: interior counter reach final value 18: interior counter reach specified value 19: set run time arriving 20: interior timing arriving				
H6.11	TA、TB、TC relay 2 output function selection	Same as H6.12	1	0	×	87H
H6.12	Failure relay RA，RB，RC function selection	0: inverter running(RUN) 1: frequency arriving signal(FAR) 2: frequency level detect signal (FDT1) 3: reserved 4: overload warning alarm signal (OL) 5: output frequency reach high limit(FHL) 6: output frequency reach low limit(FLL) 7: inverter under voltage blockage stop (LU) 8: external failure stop-runnin(EXT) 9: inverter zero rotate speed running 10: PLC running		15	×	88H

		11: simple PLC section running finished 12: PLC finish a cycle running 13: reserved 14: inverter ready to run (RDY) 15: inverter failure 16: swing frequency high and low limit restriction 17: interior counter reach final value 18: interior counter reach specified value 19: set run time arriving 20: interior timing arriving				
H6.13	Frequency arriving (FAR) checkout scope	0.0－50.0Hz	0.1Hz	5.0Hz	○	89H
H6.14	FDT1 (frequency level) electric level	0.00-high limit frequency	0.1Hz	10.0Hz	○	8AH
H6.15	FDT1 lag	0.0－50.0Hz	0.1Hz	1.0Hz	○	8BH
H6.16	Analog output AO1 selection	0: output frequency(0.high limit frequency) 1: set frequency(0.high limit frequency) 2: output current(0.2×rated current) 3: output voltage(0.1.2×load motor rated voltage) 4: bus-bar voltage(0.800V) 5: PID provision (0.00-10.00V) 6: PID feedback (0.00-10.00V) 7: reserved 8: reserved 9: reserved	1	0	○	8CH
H6.17	Analog output (AO1) gain	0.10－2.00	0.01	1.00	○	8DH
H6.18	Analog output (AO1) offset	0.00－10.00V	0.01	0.00	○	8EH
H6.19	Analog output (AO2) selection	Same as H6.16	1	0	○	8FH
H6.20	Analog output (AO2) gain	0.10－2.00	0.01	1.00	○	90H
H6.21	Analog output (AO2) offset	0.00－10.00V	0.01	0.00	○	91H
H6.22	DO-P terminal	Same as H6.16	1	0	○	92H

	output function selection					
H6.23	DO-P maximum pulse output frequency	0.1KHz~50.0KHz	0.1	10.0	○	93H
H6.24	Set interior counting value reaches provision	0--9999	1	0	○	94H
H6.25	Specified interior counting value reaches provision	0---9999	1	0	○	95H
H6.26	Interior timer setting	0.1－6000.0s	0.1	60.0	○	96H
H7-- swing frequency special function parameter group						
H7.00	Traverse function selection	0: traverse function not used 1: traverse function used	1	0	×	97H
H7.01	traverse run mode	LED first bit: jump-in mode 0: automatic jump-in mode 1: terminal manual jump-in mode LED second bit: 0: changing traverse amplitude 1: fixed traverse amplitude Notice: traverse center frequency input channel set by H0.00 function parameter	1	00	×	98H
H7.02	Traverse amplitude threshold	0.0－50.0(%)	0.1(%)	0.0(%)	○	99H
H7.03	Sudden jumping frequency	0.0－50.0(%)	0.1(%)	0.0(%)	○	9AH
H7.04	traverse cycle	0.1－999.9s	0.1s	10.0s	○	9BH
H7.05	Triangle wave risetime	0.0－98(%)(traverse cycle)	0.1(%)	50.0(%)	○	9CH
H7.06	traverse preset frequency	0.0－400.0Hz	0.01Hz	0.00Hz	○	9DH
H7.07	traverse preset frequency latency time	0.0－6000s	0.1s	0.0s	○	9EH
H8--motor and vector control parameter group						
H8.00	Control mode setting	0-1 0: V/F control 1: vector control	1	0		9FH
H8.01	Motor rated voltage(the max. output voltage of	1－480V	1V	Depend on device type	×	A0H

	VF control decides VF curve)					
H8.02	Motor rated current	0.1－999.9A	0.1A	Depend on device type	×	A1H
H8.03	Motor rated frequency (the benchmark running frequency controlled by VF decides the curve of VF.	1.0－3200.0Hz	0.01Hz	Depend on device type	×	A2H
H8.04	Motor rated speed	1－24000r/min	1r/min	Depend on device type	×	A3H
H8.05	Motor pole	2-14	4	Depend on device type	×	A4H
H9--protection correlative function parameter group						
H9.00	the transient outage restarting waiting time	0－10.0S 0－ restart is ineffective 0- 10.0s	0.1S	0.0S	×	B1H
H9.01	Failure self-renew times	0-10 0 shows no automatic reset function Notice: overload and overheat is no automatic reset function	1	0	×	B2H
H9.02	Failure self-renew interval	0.5－20.0S	0.1S	5.0S	×	B3H
H9.03	Motor overload protection mode selection	0: no action 1: inverter close off output	1	1	×	B4H
H9.04	Motor overload protection coefficient	20.0-120.0（%）	0.1(%)	100.0(%)	×	B5H
H9.05	Overload warning alarm checkout level	20%－200（%）	1(%)	130(%)	○	B6H
H9.06	Overload warning alarmdelay time	0.0－20.0s	0.1s	5.0s	○	B7H
H9.07	Overvoltage stall selection	0: ban 1: allow	1	1	×	B8H
H9.08	Overvoltage stall point	120-150（%）	1(%)	140(%)	○	B9H
H9.09	Automatic current limit level	110－200（%）	1(%)	150(%)	×	BAH
H9.10	Frequency declining rate during current	0.0－99.9Hz/s	0.01Hz/s	10.00Hz/s	○	BBH

	limiting					
H9.11	Automatic current limiting action selection	0: constant speed ineffective 1: constant speed effective Remark: Acc/Dec always effective	1	0	×	BCH
HA –constant pressure water-supply parameters						
HA.00	Feedback disconnection assessment	0.0~100.0%	0.1	0.0	○	BDH
HA.01	Feedback disconnection delay time	0.0~999.9s	0.1	0.0	○	BEH
HA.02	long-distance pressure gage measurement range	0.00~20.00Mpa	0.01	1.00	○	BFH
HA.03	Sleep frequency	0.0~99.9Hz	0.1	0.0	○	C0H
HA.04	Sleep delay time	0.0~999.9s	0.1	0.0	○	C1H
HA.05	Revival pressure	0.0~20.00Mpa	0.01	0.0	○	C2H
HA.06	Revival delay time	0.0~999.9s	0.1	0.0	○	C3H
HA.07	one drive two water supply circle mode	0: ineffective 1; effective	1	0	○	C4H
HA.08	Pump switching distinguish time	0.0~999.9s	0.1s	300.0	×	C5H
HA.09	Electromagnetic	0.1~10.0s	0.1	0.5	×	C6H
Hb-constant pressure water supply parameters						
Hb.00	Timing switching interval	0000~9999minutes, 0 means timing switching function ineffective	1	0	×	C7H
Hb.01	Reserved					C8H
Hb.02	Reserved					C9H
Hb.03	Reserved					CAH
Hb.04	Reserved					CBH
Hb.05	Reserved					CCH

Hb.06	Water supply expansion card relay B1 always-open output function selection(B1-RCM)	0: inverter running(RUN) 1: frequency arriving signal(FAR) 2: frequency level detect signal (FDT1) 3: reserved 4: overload warning alarm signal (OL) 5: output frequency reach high limit(FHL) 6: output frequency reach low limit(FLL) 7: inverter under voltage blockage stop (LU) 8: external failure stop-runnin(EXT) 9: inverter zero rotate speed running 10: PLC running 11: simple PLC section running finished 12: PLC finish a cycle running 13: reserved 14: inverter ready to run (RDY) 15: inverter failure 16: swing frequency high and low limit restriction 17: interior counter reach final value 18: interior counter reach specified value 19: set run time arriving 20: interior timing arriving 28：When one drive two water supply cycle is effective, B1 is the frequency conversion of the first pump.	1	28	×	CDH
Hb.07	Water supply expansion card relay G1 always-open output function selection(G1-RCM)	same to Hb.06 28：When one drive two water supply cycle is effective, G1 is the prower frequency conversion of the first pump.	1	28	×	CEH

Hb.08	Water supply expansion card relay B2 always-open output function selection(B2-RCM)	same to Hb.07 28：When one drive two water supply cycle is effective, B2 is the inverter of the second pump.	1	28	×	CFH
Hb.09	Water supply expansion card relay G2 always-open output function selection(G2-RCM)	Same to Hb.07 28：When one drive two water supply cycle is effective, G1 is the prower frequency conversion of the first pump.	1	28	×	D0H
HC—parameter group						
HC.XX	Reserved					
Hd--failure record function parameter group						
Hd.00	The last failure record	The last failure record	1	0	*	DBH
Hd.01	The failure record before Hd.00	The failure record before Hd.00	1	0	*	DCH
Hd.02	The failure record before Hd.01	The failure record before Hd.01	1	0	*	DDH
Hd.03	The failure record before Hd.02	The failure record before Hd.02	1	0	*	DEH
Hd.04	The failure record before Hd.03	The failure record before Hd.03	1	0	*	DFH
Hd.05	The failure record before Hd.04	The failure record before Hd.04	1	0	*	E0H
Hd.06	Setting frequency of the last failure	Setting frequency of the last failure	0.1Hz	0	*	E1H
Hd.07	Output frequency of the last failure	Output frequency of the last failure	0.1Hz	0	*	E2H
Hd.08	Output current of the last failure	Output current of the last failure	0.1A	0	*	E3H
Hd.09	Output voltage of the last failure	Output voltage of the last failure	1V	0	*	E4H
Hd.10	DC bus bar voltage of the last failure	DC bus bar voltage of the last failure	1V	0	*	E5H
HE-- password and manufacturer function parameter group						
HE.00	User password	0000－9999	1	0000	×	EAH
HF-- supervision function parameter group						
HF.00	Set frequency	Current set frequency	0.1HZ	-	*	
HF.01	Output freq.	Current output freq.	0.1HZ	-	*	
HF.02	Output current	Virtual value of current output current	0.1A	-	*	
HF.03	Output voltage	Virtual value of current output voltage	1V	-	*	
HF.04	DC bus-bar voltage	Current DC bus-bar voltage	1V	-	*	
HF.05	Load motor speed	Product of output frequency and	1（r/m）	-	*	

		load motor speed emendation factor				
HF.06	Module temperature	IGBT heat sink temperature	1℃	-	*	
HF.07	Analog input AVI	Analog input value of AVI	V	-	*	
HF.08	Analog input ACI	Analog input value of ACI	V	-	*	
HF.09	MI、FWD、REV MI、FWD、REV input terminal	Input terminal status	-	-	*	
HF.10	PID set pressure	setting pressure	Mpa	-	*	
HF.11	PID feedback pressure	Feedback pressure	Mpa	-	*	
HF.12	Setting speed	Setting speed	1（r/m）	-	*	
HF.13	Reserved					
HF.14	Reserved					
HF.15	Reserved					

Chapter 6 Detailed function description

Listed column content for parameter function code description in this chapter is as follows:

Code	Name	Set range or description	Factory default

6.1 Basic run function parameter group: F0

H0.00	**Frequency input channel selection**	**Range: 0~8**	**1**

0: keypad frequency number setting. Initial set frequency value is H0.01. can change set frequency by changing H0.01 parameter through keypad.and you can also modify H0.01 by  ,  key.

1: terminal UP/DOWN adjust set frequency(stored after power off or stop). Initial set frequency value is the value stored during the last power off time, and you can adjust set running frequency by terminal UP/DOWN.

2: terminal UP/DOWN adjust set frequency(not stored after power off or stop). Initial set frequency value is H0.01, and you can adjust set running frequency by terminal UP/DOWN.

3: RS485 serial port provision. Serial port frequency set initial value is H0.01.change set frequency by setting H0.01 through serial port.

4: AVI analog setting(AVI-GND). Frequency setting determined by AVI terminal analog voltage, input voltage range: DC0~10V.

5: ACI analog setting (ACI-GND). Frequency setting determined by ACI terminal analog voltage /current, input range: DC0~10(ACI jumping wire choose V side). DC: 4~20mA (ACI jumping wire choose A side).

6: keypad analog potentiometer. Set running frequency by keypad analog potentiometer.

7: terminal pulse (PULSE) setting. Frequency set by terminal pulse(only input through MI6, see H6.05 definition), input pulse signal spec: voltage range15~24V.; frequency range 0~20.0KHz.

8: combination setting. See function parameter H0.02, set frequency by each channel combination setting.

H0.01	Freq. number setting	range: low limit ~high limit	**50.00Hz**

H0.01 parameter is original set frequency of the inverter when frequency setting channel is defined as number setting (H0.00=1, 3).

H0.02	**Frequence input channel combination**	**Range: 0～28**	**0**

0 : AVI+ACI

1 : AVI-ACI

2: reserved

3: reserved

4: reserved

5: reserved

6: exterior pulse provision

7: exterior pulse provision

8: reserved

9: reserved

10: reserved

11: reserved

12: reserved

13: AVI, ACI any nonzero value effective, AVI preferred

14: reserved

15：RS485+ACI

16：RS485-ACI

17：RS485++AVI

18：RS485-ACI

19: RS485+keypad potentiometer

20: RS485-keypad potentiometer

21：RS485+AVI

22：RS485-AVI

23: ACI+ keypad potentiometer

24: ACI-keypad potentiometer

25: reserved

26: reserved

27: reserved

28: reserved

H0.03	Run command channel	**range: 0~4**	**0**

	selection		

0: keypad run frequency command channel. Start and stop the inverter by

1: Terminal run command control (keypad stop command ineffective). Start and stop the inverter by exterior control terminal FWD, REV, MI1, MI2, MI3, MI4, MI5, MI6 etc..

2: terminal run command control (keypad stop command effective). Start and stop the inverter by exterior control terminal FWD, REV, MI1, MI2, MI3, MI4, MI5, MI6 etc.

3: Serial port run command control (keypad stop command ineffective). Start and stop the inverter by RS485 interface.

4: Serial port run command control (keypad stop command effective). Start and stop the inverter by RS485 interface.

The inverter can change run command channel by modifying H0.03 during waiting and running, please confirm that modification is allowed during running on the spot.

H0.04	**Run direction setting**	**Range: 0,1**	**0**

1st bit:

0: reserved

2nd bit:

0: reverse run allowed

1: reverse run banned. The inverter will stop output when there is reverse run command.

3rd bit: M key selection

0: as reverse run key

1: as jog key

Note

If the 2nd bit is set to "1", this function is effective for keypad run command channel and serial port run command channel.

H0.05	Acce time 1	**Range: 0.1－6000.0**	**20.0**
H0.06	Dece time 1	**Range: 0.1－6000.0**	**20.0**

Accelerating time is defined as time for inverter accelerating from 0Hz to 50.0Hz, see t_1 in Fig.6-1, Dec time is defined as time for inverter decelerating from 50.0Hz to 0Hz, see t_2 in Fig.6-1

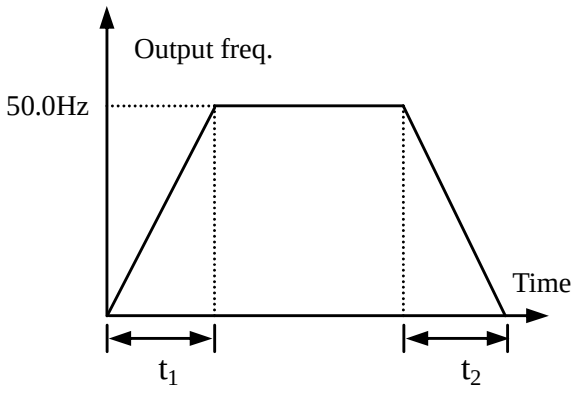


图 6-1 Acc/Dec time definition

Note

(1) In ACD280 series inverter 4 kinds of Acc/Dec time are defined in total, here are only define Acc/Dec time 1, Acc/Dec time 2~4 are defined in H3.13~H3.18,please refer to section 6.3
(2) Can choose time unit minute or second for Acc/Dec time 1~4 by H0.07, factory default is second.

H0.07	**Acc/Dec time unit**	**Range: 0, 1**	**0**

This function determines Acc/Dec time unit.

0: second 1: minute

Note

(1) This function is effective for all Acc/Dec process except for jog run
(2) To choose second as time unit is recommend.

H0.08	Upper limit freq.	**Range:** Lower limit freq.-3200.00Hz	**50.00Hz**
H0.09	Lower limit freq.	**Range; 0.00- Upper limit freq.**	**0.00Hz**
H0.10	Lower limit freq. run mode	**Range:** 0: run at lower limit freq. 1: run at 0Hz	**0**

The inverter will decrease output frequency gradually in set decelerating time when actual set frequency is lower than low limit frequency, after reaching low limit frequency, the inverter will run at low limit frequency if low limit frequency running mode set to 0. The inverter will reduce output frequency sequentially to zero frequency run if low limit frequency running mode set to 1.

H0.11	Torque boost mode	range: 0: manual 1: automatic	**0**

0: manual boost. Torque boost voltage is determined completely by parameter H0.12, its characteristic is boost voltage fixed, but the motor is prone to magnetic saturation when

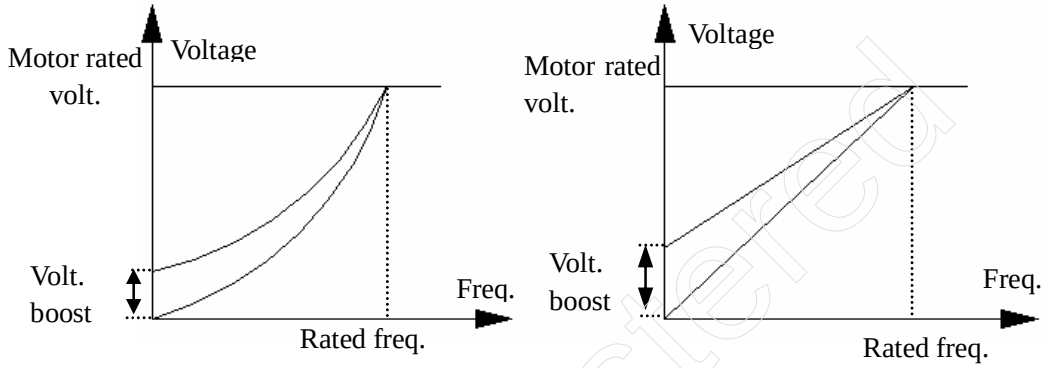
lightly loaded.

1: automatic torque boost. Torque boost voltage varies as stator current of the motor changes, bigger stator current corresponds to bigger boost voltage.

$$\text{Boost volt.} = \frac{\text{H0.12}}{100} \times \text{motor rated volt.} \times \frac{\text{Inverter output current}}{2 \times \text{inverter rated current}}$$

H0.12	Torque boost	**Range: 0.0-20.0(%)**	**2.0(%)**

To improve inverter's low frequency torque characteristic, can carry on boost compensation for output voltage, degressive torque curve and constant torque curve torque boost are separately, shown as Fig.6-2a, b.



(a)degressive torque curve torque boost graph (b) constant torque curve torque boost graph

Fig.6-2. torque boost graph

Note

(1) Improper setting to this parameter can cause motor heating or over current protection.
(2) Advise the user to adopt manual torque boost and to adjust V/F curve according to motor parameter and usage occasion when driving synchronous motor.

H0.13	Slip frequency compensation filter	**0~4**	**2**

The bigger H0.13 value is, the slower frequency compensation is.

H0.14	**Motor speed display adjusting**	**Range: 1-9999(%)**	**100(%)**

H0.15	**V/F curve setting**	**Range: 0~4**	**0**

This function code defines ACD280 flexible V/F setting mode to satisfy different load characteristic. Can choose 4 kinds of fixed curve and one custom curve according to definition of H0.15.

If H0.15=0, V/F curve bears constant torque characteristic, as curve 0 in Fig.6-3 .

If H0.15=1, V/F curve bears 2.0 order power degressive torque characteristic, as curve 3 in Fig.6-3.

If H0.15=2, V/F curve bears 1.7 order power degressive torque characteristic, as curve 2 in Fig.6-3.

If H0.15=3, V/F curve bears 1.2 order power degressive torque characteristic, as curve 1 in Fig.6-3.

If H0.15=4, V/F curve is custom VF curve characteristic; it is decide by H0.16~H0.21, concrete set observe following: (0.0Hz,Torque boost voltage) < (F1,V1) < (F2,V2) < (F3,V3) < (motor rated frequency, motor rated voltage)

If H0.15=5~32, parameter which special VF curve automatic set is shown as following table:

Use	H0.15	H0.08	H0.12	H0.16	H0.17	H0.18	H0.19	H0.20	H0.21	H8.03
constant torque	5	50.0	2.0	5.0	12.0	2.5	6.0	1.2	3.0	50.0
	6	50.0	2.0	5.0	12.0	3.0	6.0	1.5	4.0	50.0
	7	60.0	2.0	5.0	12.0	2.5	6.0	1.2	3.0	50.0
	8	72.0	2.0	5.0	12.0	3.0	6.0	1.5	4.0	60.0
	9	75.0	2.0	5.0	12.0	2.5	6.0	1.2	3.0	50.0
	10	90.0	2.0	5.0	12.0	3.0	6.0	1.5	4.0	60.0
	11	100.0	2.0	5.0	12.0	2.5	6.0	1.2	3.0	50.0
	12	120.0	2.0	5.0	12.0	2.5	6.0	1.2	3.0	60.0
High-start torque	13	50.0	2.0	5.0	12.0	2.5	6.0	1.2	3.5	50.0
	14	50.0	2.0	5.0	13.0	2.5	7.0	1.2	4.0	50.0
	15	50.0	2.0	5.0	14.5	2.5	8.0	1.2	4.5	50.0
	16	50.0	2.0	5.0	16.0	2.5	9.0	1.2	5.0	50.0
	17	50.0	2.0	5.0	17.5	2.5	10.0	1.2	6.0	50.0
	18	50.0	2.0	5.0	19.0	2.5	11.0	1.2	6.5	50.0
	19	60.0	2.0	5.0	12.0	2.5	6.0	1.2	3.5	60.0
	20	60.0	2.0	5.0	13.0	2.5	7.0	1.2	4.0	60.0
	21	60.0	2.0	5.0	14.0	2.5	8.0	1.2	4.5	60.0
	22	60.0	2.0	5.0	15.0	2.5	9.0	1.2	5.0	60.0
	23	400.0	2.0	100.0	35.0	70.0	22.0	15.0	10.0	400.0
Fan type	24	50.0	0.5	30.0	40.0	25.0	35.0	1.5	4.0	50.0
	25	50.0	0.5	30.0	35.0	25.0	30.0	1.5	3.5	50.0
	26	50.0	0.5	30.0	30.0	25.0	25.0	1.5	3.0	50.0

	27	50.0	0.5	30.0	25.0	25.0	20.0	1.5	2.8	50.0
	28	50.0	0.5	30.0	20.0	25.0	18.0	1.5	2.5	50.0
	29	50.0	0.5	30.0	18.0	25.0	16.0	1.5	2.2	50.0
	30	50.0	1.0	30.0	16.0	25.0	15.0	1.5	2.0	50.0
	31	50.0	1.0	30.0	15.0	25.0	14.0	1.5	1.6	50.0
	32	50.0	1.0	30.0	14.0	25.0	12.0	1.5	1.3	50.0

When frequency converter operating the air-blowing pump it descended the rotating torque in order to achieve the enrergy saving effect.And the customer can select mode 1,2,3or 24-32 V/F curve operation mode according to its loading.PAGE80

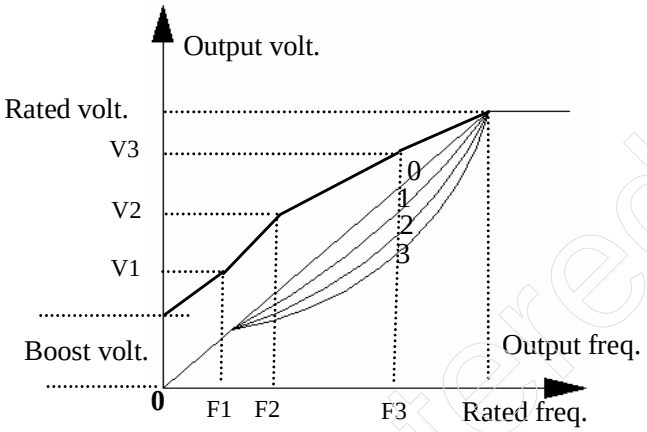


Fig.6-3 V/F curve

H0.16	**VF freq. value 3（F3）**	**F2<F3<motor rated freq.**	**40.0HZ**
H0.17	**VF volt. value 3（F3）**	**V2<V3<motor rated volt.**	**80.0%**
H0.18	**VF freq. value 2（F2）**	**F1<F2<F3**	**30.0HZ**
H0.19	**VF volt. value 2（F2）**	**V1<V2<V3**	**60.0%**
H0.20	**VF freq. value 1（F1）**	**0.0HZ<F1<F2**	**15.0HZ**
H0.21	**VF volt. value 1（F1）**	Torque boost **<V1<V2**	**30.0%**

H0.22	carrier frequency	**Range ： 2－15.0K**	Depend on device type

Carrier frequency is mainly affect the motor noise and hot consumption during running. The relationship between noise, leakage current, distraction is as following:

Carreier frequency increase(↑), noise decrease(↓), leakage current enlarge, distraction enlarge(↑);

Carreier frequency decrease(↓), noise decrease(↑), leakage current reduce(↓), distraction enlarge(↓);

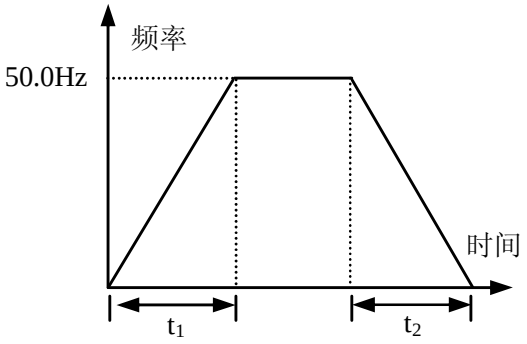
When the tempature is high, and the motor load is heavy, should reduce the carrier

frequency in order to reduce the inverter consumption.

H0.23	Acce./dece mode selection	**Range ： 0, 1**	**0**

0：straight line add and reduce mold: the output frequency should add or reduce according to the rated slope, see chart 6-4

1：S shape curve add and reduce mold: the output frequency should add or reduce according to the S shape curve, see chart 6-5.



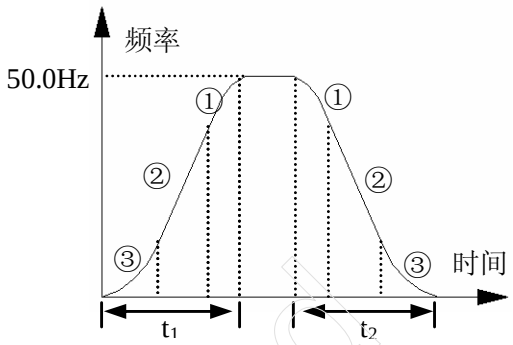


chart 6-4 straight line add and reduce speed **chart 6-5 S shape curve add and reduce curve**

H0.24	S curve start section time	**Range ： 10.0(%)－50.0(%)**（Acc/Dec time）**H0.24＋00.25≤90(%)**	**20.0(%)**
H0.25	S curve risetime	**range： 10.0(%)－80.0(%)**（Acc/Dec time）**H0.24＋H0.25≤90(%)**	**60.0(%)**

H0.24、H0.25 only be effective in descending when selecting s shape curveline decelerating mode （H0.23＝1）and H0.24、H0.25≤90%.

The start point in s shape curveline in the pic 6-5③ the chart on output effiency is ascending from o gradually.

the uprising line of s shape curveline in the pic 6-5② the chart for slope of output effectiveness is invariable.

the ending of s shape curveline in the pic6-5①, seeing from the chart changing gradully reduced to 0.

H0.26	G/L device type setting	**Range: 0,1**	**0**

O: G type

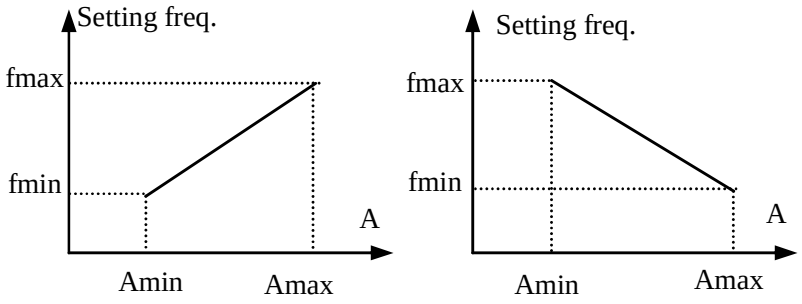
1: L type

H0.27	**Software edition**	**0.0~9.9**	actual value
H0.28	Return to factory default	**Range: 0~99** **0: no action** **1:clean up failure information** **2: Return to factory default**	**0**

6.2 Frequency provision function parameter group：H1

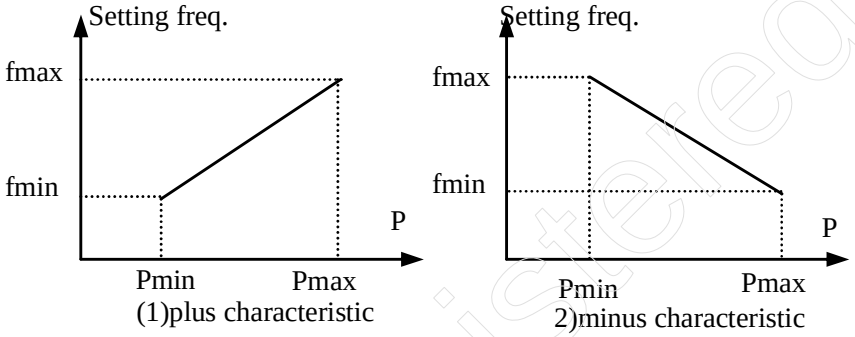
H1.00	Analog filter time constant	**Range: 0.00~30.00s**	**0.2S**
H1.01	AVI min.provision	**Range: 0.0-H1.03**	**0.00V**
H1.02	Corresponding freq. to AVI minimum provision	**Range: 0.00-upper limit freq.**	**0.0Hz**
H1.03	AVI max. provision	**Range: 0.0-100.0%**	**100.0%**
H1.04	Corresponding freq. to AVI maximum provision	**Range: 0.00-upper limit freq.**	**50.0Hz**
H1.05	ACI minimum provision	**Range: 0.0-H1.07**	**0.00V**
H1.06	Corresponding freq. to ACI minimum provision	**Range: 0.00-upper limit freq.**	**0.0Hz**
H1.07	ACI max. provision	**Range: 0.0-100.0%**	**100.0%**
H1.08	Corresponding freq. to ACI maximum provision	**Range: 0.00-upper limit freq.**	**50.0Hz**
H1.09	PULSE max. pulse input	**Range: 0.1-20.0K**	**10.0K**
H1.10	PULSE minimum provision	**Range: 0.0-H1.09**	**0.0K**
H1.11	Corresponding freq. to PULSE min. provision	**Range: 0.00- upper limit freq.**	**0.0Hz**
H1.12	PULSE max. provision	range: H1.10(PULSE min. provision). H1.09(max. input pulse)	**10.0K**
H1.13	Corresponding freq. to PULSE max. provision	**Range: 0.00-upper limit freq.**	**50.0Hz**

H1.00 sets the analog channel filtering time constant, to filter input signal, the more long filtering time is, the more great anti-jamming ability is, but response speed descend; the more short filtering time is, the more fast the inverter respond, but anti-jamming ability is weakened. See below relation curve of AVI, ACI and set frequency:



A:ACI provision
Amin:min.provision fmin:corresponding freq. to min.provision
Amax:max.provision fmax: corresponding freq. to max.provision

See below relation curve of PULSE and set frequency:



A:PULSE provision
Amin:min.provision fmin:corresponding freq. to min.provision
Amax:max.provision fmax: corresponding freq. to max.provision

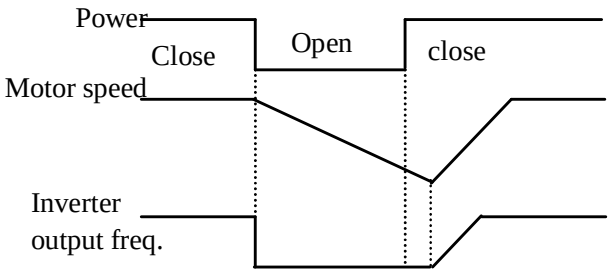
6.3 Start-up, stop, braking function parameter group: H2

H2.00	Start-up run mode	range: 0, 1, 2	**0**

0: start from starting frequency. The inverter start according to H2.01 starting frequency and H2.02 starting frequency holding time.

1: first braking then starting. First brake according to DC braking voltage and time (H2.03, H2.04), then start at starting frequency.

2: speed tracking starting. Start-up process is effective to power supply revival after transient stop, externalfailure reset, starting process after free stop-running when H2.00=2, as shown in Fig.6-6.



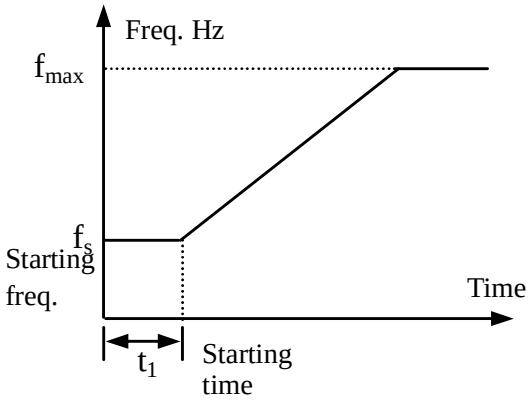


Fig.6-6 speed tracking starting **Fig.6-7 starting freq. and starting time**

Note

(1) start-up mode 0: Advice the user to adopt start-up mode 0 in common application occasion and when driving synchronous motor.

(2) Start-up mode 1: Be applicable to small inertia lode with forward run or reverse run phenomenon when the motor doesn't drive any device, for big inertia lode, advise not to adopt start-up mode 1.

(3) Start-up mode 2: Be applicable to motor starting during free stop-running or starting after transient power off.

H2.01	Starting frequency	**Range: 0.0－10.00Hz**	**0.00Hz**
H2.02	Starting freq. holding time	**Range; 0.0－20.0s**	**0.0S**

Starting frequency means initial frequency at which the inverter start up, as fs shown in Fig.6-7. Starting freq. holding time means consecutive run time during which the inverter run at starting frequency, as t1 shown in Fig.6-7.

Note

Starting frequency is not limited by low limit frequency

H2.03	**DC barking volt. when starting**	**Range: 0-15(%)**	**0(%)**
H2.04	DC braking time when starting	**Range: 0.0-20.0s**	**0.0S**

When H2.00=1, H2.03, H2.04 is effective, as shown in Fig.6-8

H2.03 is percentage relative to inverter rated input voltage. Have no DC braking process when starring DC braking time is 0.0.

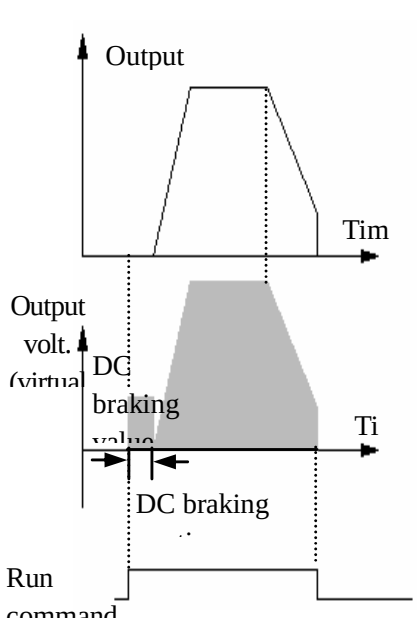


Fig.6-8 starting mode 1

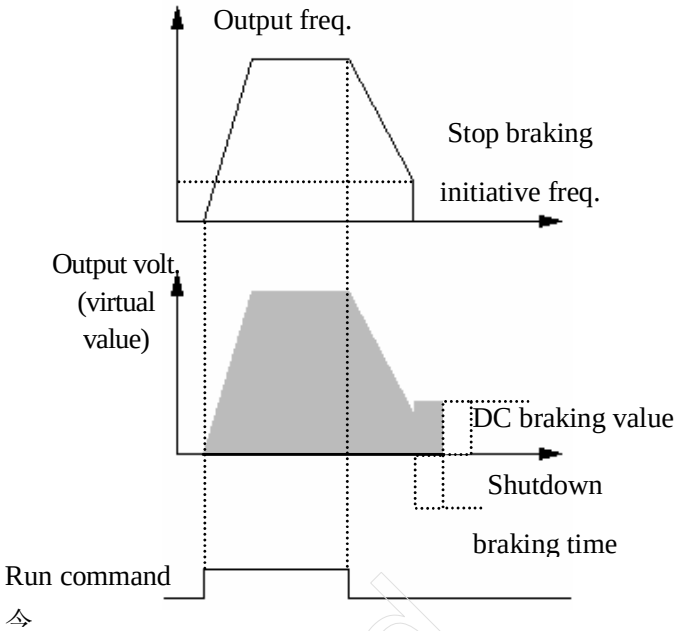


Fig.6-9 Dec stop+DC braking

H2.05	Stop mode	Range: 0, 1, 2	**0**

0: Dec stop. The inverter reduces output frequency gradually according to set Dec time upon receival of stop command and stops running after frequency is reduced to 0.

1: Free stop. The inverter stop outputting at once when receiving stop command and the load stops freely according to mechanical inertia.

2: Dec plus DC braking stop. The inverter reduces output frequency gradually according to set Dec time upon receival of stop command and start DC braking when F1.06 stop braking initiative frequency is reached.

H2.06	Stop DC braking initiative frequency	**Range: 0.0－15.0Hz**	**0.00Hz**
H2.07	Stop DC braking time	**Range: 0.0-20.0s**	**0.0S**
H2.08	Stop DC braking voltage	**Range: 0-90(%)**	**0**

H2.08 is percentage relative to inverter rated input voltage. Have no DC braking process if stop braking time is 0.0s.as shown in Fig.6-9.

6.4 Auxiliary run function parameter group: H3

H3.00	FWD REV run dead-section time	**Range: 0.0-3600.0s**	**0.2S**

During process of transiting from Output frequency forward run to reverse run or from reverse run to forward run, transition time during which the inverter wait at time zero output frequency, as t_1 shown in t1Fig.6-10.

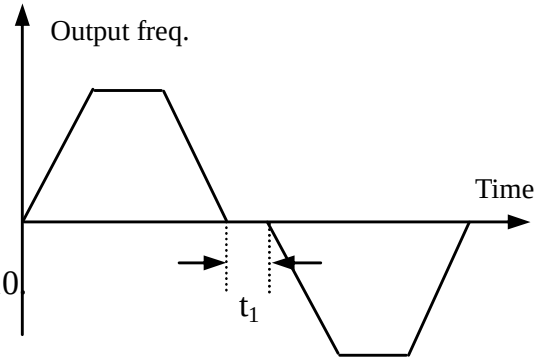


Fig.6-10 FWD REV run dead-section time

H3.01	Automatic energy save run	**Range: 0,1**	**0**

To reach better energy save result, the inverter would detect load current to get the purpose of automatic energy save.

0: no action

1: action

Empty or lightly loaded motor can get the purpose of energy save by detecting load current to adjust output voltage properly. Automatic energy save run is mainly applied to occasion of stable load, speed.

Note

This function commonly applied to load such as blower and water pump etc.

H3.02	**AVR function**	**Range: 0, 1, 2**	**0**

AVR namely automatic voltage adjusting function. Indicate that the inverter can output constant voltage by AVR function when the inverter input voltage fluctuates.

0: no action

1: action all the time

2: no action only during Dec

Note

(1) when input voltage is higher than rated value, under normal situation should set H3.03=1, when H2.05=0 namely inverter in decelerating stop, motor Dec time is short and running current and long Dec time if choose AVR action all the time.

(2) Should set H3.02=0, namely AVR function ineffective when the motor system oscillates which caused by choosing AVR function.

H3.03	Slip frequency compensation	**Range: 0~150(%)**	**0**

This function can adjust output Frequency properly as the load various to compensate slip frequency of the asynchronous motor dynamically, so that control motor speed in constant value.

If act with automatic torque boost function, can get better low speed moment characteristic. As shown in Fig.6-11.

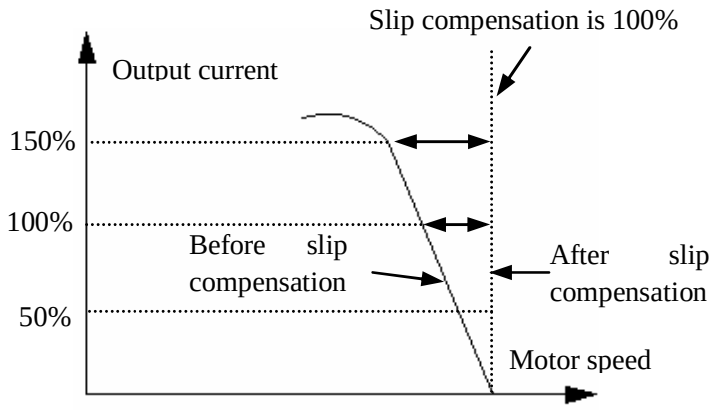


Fig.6-11 Slip frequency compensation graph

H3.04	Jog run frequency	**Range: 0.1－50.0Hz**	**5.0Hz**
H3.05	Jog Acc time	**Range: 0.1－60.0s**	**20.0S**
H3.06	Jog Dec time	**Range: 0.1－60.0s**	**20.0S**

Jog frequency has the highest priority. Under any status, the inverter would transit to run at jog frequency at once according to set jog accelerating, decelerating time as long as jog command is inputted, as shown in Fig.6-12.

Jog accelerating time means time during which the inverter accelerate from 0Hz to 50.0Hz, jog Dec time means time during which the inverter decelerate from 50.0Hz to 0Hz.

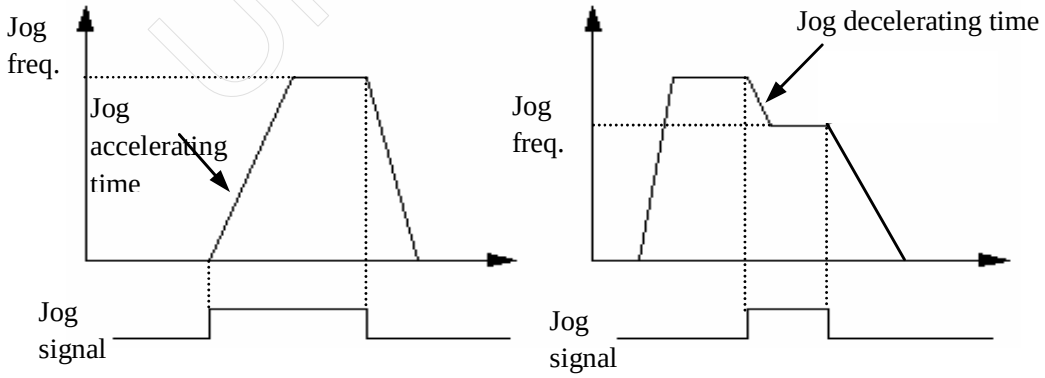


Fig.6-12 Jog run

Note

(1) Keypad, control terminal and serial port can do jog control all.

(2) The inverter will stop according to Dec stop mode after jog run command is withdrawn.

H3.07	**Parameter operation control**	**Range: LED 1st bit: 0~2 LED 2nd bit: 0~4**	**0**

LED 1st bit

0: all parameter allowed to be modified

1: except this parameter.all other parameter not allowed to be changed

2: except H0.01 and this parameter.all other parameter not allowed to be changed

LED 2nd bit

0: all the buttons locked

1: all the buttons locked except STOP key

2: all the buttons locked except ,  , STOP key

3: all the buttons locked except RUN, STOP key

4: all the buttons locked except SHIFT, STOP key

H3.08	communication deployment	range: LED 1st bit: 0~5 LED 2nd bit: 0, 1, 2	**05**

H3.08 make use of 1st bit, 2nd bit to set baud rate and data format of serial communication.thereinto LED 1st bit represents communication baud rate, set value as follows:

2：1200BPS

3：2400BPS

4：4800BPS

5：9600BPS

6：19200BPS

7：38400BPS

LED 2nd bit: represents data format, set value as follows:

0: 1-8-2 format, no checkout. Namely: 1 bit for starting, 8 bits for data, 2 bit for stop, no checkout.

1: 1-8-1 format, even checkout. Namely: 1 bit for starting, 8 bits for data, 1 bit for stop, even checkout.

2: 1-8-1 format, odd checkout. Namely: 1 bit for starting, 8 bits for data, 1 bit for stop, odd checkout.

H3.09	Local address	Range: 0~247, 0 is broadcast address, 247 is main device address	**1**

This function code is used to identify address of this inverter during serial port communication. 0 is for main inverter during main and sub device communication between inverters

0 is broadcast address, can only receive and execute broadcast command from upper machine but not respond to upper machine when 0 is set to broadcast address.

H3.10	Communication overtime checkout time	**Range: 0.0－1000.0s**	**0.0s**

When serial port communication fails and its continuous time exceed set value of this function code, the inverter judge it as communication failure. The inverter would not detect serial port communication signal, namely this function ineffective when set value is 0.

H3.11	**Local response dalay time**	**Range: 0-1000ms**	**5ms**

Local response delay time represents the time within which the inverter serial port receive and execute command from upper device and then respond to upper device, this function is just used for setting this delay time.

H3.12	main and sub device communication frequency provision proportion	**Range: 0-500(%)**	**100(%)**

The proportion of inverter main and sub device communication frequency, sub device need to be set this parameter, and main device needn't.

H3.13	Accelerating time 2	**Range: 0.1－6000.0**	**20.0**
H3.14	Decelerating time 2	**Range: 0.1－6000.0**	**20.0**
H3.15	Accelerating time 3	**Range: 0.1－6000.0**	**20.0**
H3.16	Decelerating time 3	**Range: 0.1－6000.0**	**20.0**
H3.17	Accelerating time 4	**Range: 0.1－6000.0**	**20.0**
H3.18	Decelerating time 4	**Range: 0.1－6000.0**	**20.0**

Can define 3 kinds of accelerating decelerating time and can choose accelerating decelerating time 1~4 during inverter run process by different combination of control terminal. Please see definition for function of accelerating decelerating time terminal in H6.00, H6.01, H6.02, H6.05.

H3.19	Multi-step freq. 1	Range: low limit - high limit	**5.0Hz**
H3.20	Multi-step freq. 2	Range: low limit - high limit	**10.0Hz**

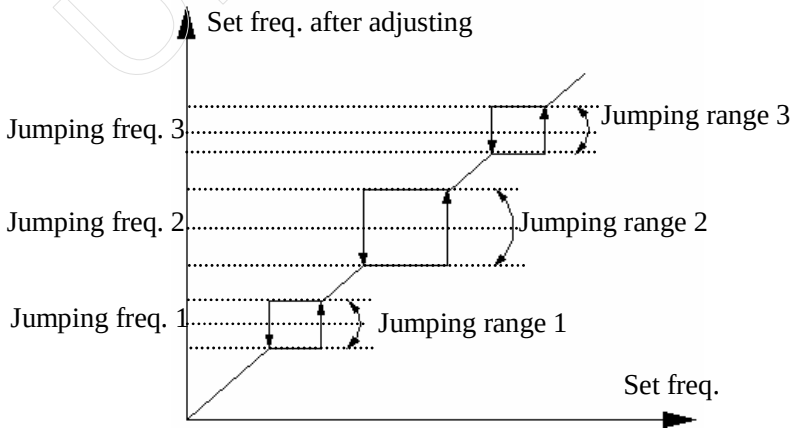
H3.21	Multi-step freq. 3	Range: low limit - high limit	**20.0Hz**
H3.22	Multi-step freq. 4	Range: low limit - high limit	**30.0Hz**
H3.23	Multi-step freq. 5	Range: low limit - high limit	**40.0Hz**
H3.24	Multi-step freq. 6	Range: low limit - high limit	**45.0Hz**
H3.25	Multi-step freq. 7	Range: low limit - high limit	**50.0Hz**
H3.26	Multi-step freq. 8	Range: low limit - high limit	**5.0Hz**

These set frequency will be used in multi-step speed run mode and simple PLC run mode, please refer to multi-step speed run terminal function of H6.00, H6.01, H6.02, H6.05 and H4 group simple PLC function.

H3.27	Jumping freq. 1	Range: 0.00 – upper limit freq.	**0.0Hz**
H3.28	Jumping freq. 1 range	Range: 0.00 – upper limit freq.	**0.0Hz**
H3.29	Jumping freq. 2	Range: 0.00 – upper limit freq.	**0.0Hz**
H3.30	Jumping freq. 2 range	Range: 0.00 – upper limit freq.	**0.0Hz**
H3.31	Jumping freq. 3	Range: 0.00 – upper limit freq.	**0.0Hz**
H3.32	Jumping freq. 3 range	Range: 0.00 – upper limit freq.	**0.0Hz**

H3.27~H3.32 function is set for keeping inverter output frequency away from resonance frequency of mechanical load.

Inverter set frequency can jump around some frequency point according to mode shown in following fig., at most 3 jumping range can be defined



Jumping frequency and range graph

H3.33	**Set run time**	**Range: 0-65535h**	**0**
H3.34	**Run time accumulation**	**Range: 0-65535h**	**0**

After run accumulative time reach set run time (H3.33).the inverter will output indicator signal.please refer to H6.10~H6.13 function introduction. H3.34 denotes accumulative run time of the inverter from leaving factory to now.

H3.35	LED initial supervision parameter selection during running	**Range: 0~8**	**1**
H3.36	LED initial supervision parameter selection when stop running	**Range: 0~8**	**0**

This parameter refer to no matter in the status of running or stop, the selection of initial supervision parameter, for example: H3.35=3, the LED initinal display is the output voltage value. If need to look up the other paramters, please press "SHIFT"

0: set frequency
1: output frequency
2: output current
3: output voltage
4: DC bus bar voltage
5: motor speed
6: heat sink temperature
7: analog input AVI
8: analog input ACI
9: MI、FWD、REV input terminal
10:PID provision pressure
11:PID feedback pressure
12: setting speed

6.5 Simple PLC run function parameter group: H4

The user can set by himself the output frequency direction and running time of the inverter during a running cycle by simple PLC function according to spot craft demand, as shown in Fig.6-13.

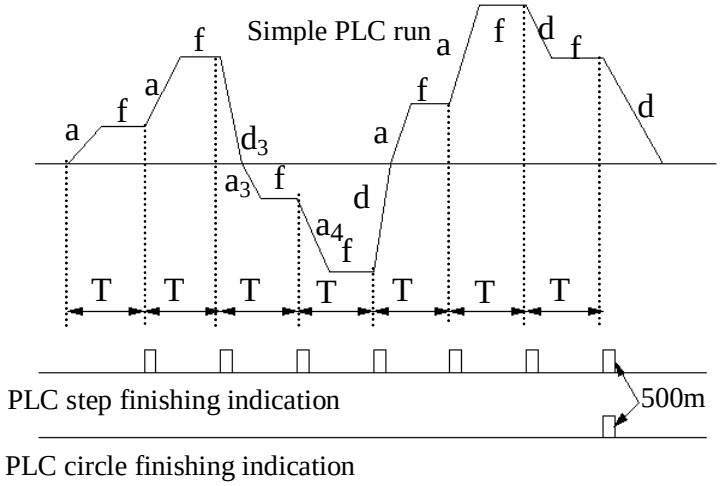


Fig. 6-13 simple PLC run

ACD280 serial inverter simple PLC run function provide 7 kinds of multi-step speed run mode, see below an example of 7 step speed. In Fig.6-26. a_1~a_5, d_1~d_5 is accelerating or decelerating time of relative step. Set by accelerating decelerating time parameter in total 4 kinds of parameter, f_1~f_7, T_1~T_7 indicating set frequency and run time set by function code H4.01~H4.14.

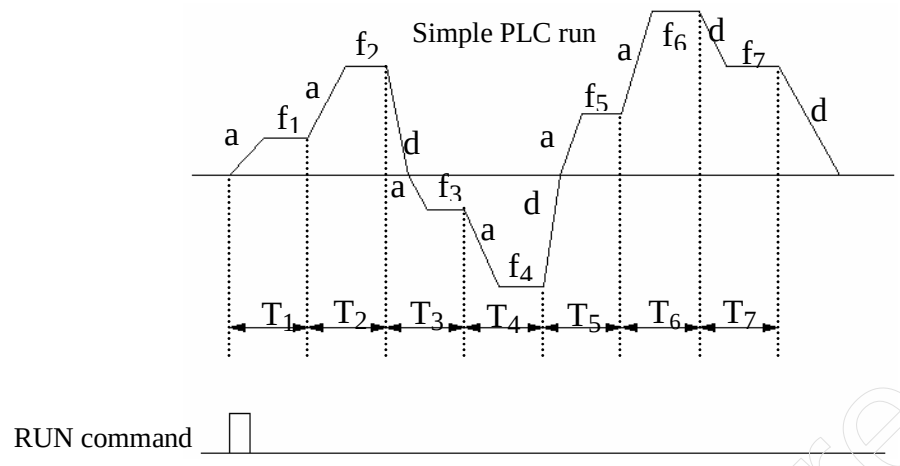


Fig. 6-14 stop after PLC single circle

PLC step finishing and circle finishing indication can be realized by outputting 500mS pulse indicator signal through open circuit collector terminal MO1, detailed function defined by H6.10~H6.13.

H4.00	**Simple PLC run setting**	**Range: LED 1st bit: 0~3 LED 2nd bit: 0,1 LED 3rd bit: 0,1**	**000**

This function code make use of its 1st bit, 2nd bit, 3rd bit to set PLC run mode, PLC rerun mode after interruption.set run time unit.detail as follows:

LED 1st bit:

0: no action. PLC run mode ineffective.

1: stop after single circle. As shown in Fig.6-14.the inverter stops automatically after finishing a circle.can only start when another run command is available.

2: keep final value after single circle. As shown in Fig.6-15, the inverter keep running according to frequency, direction of final step after finishing a circle.the inverter won't stop according to set decelerating time until the stop command is available.

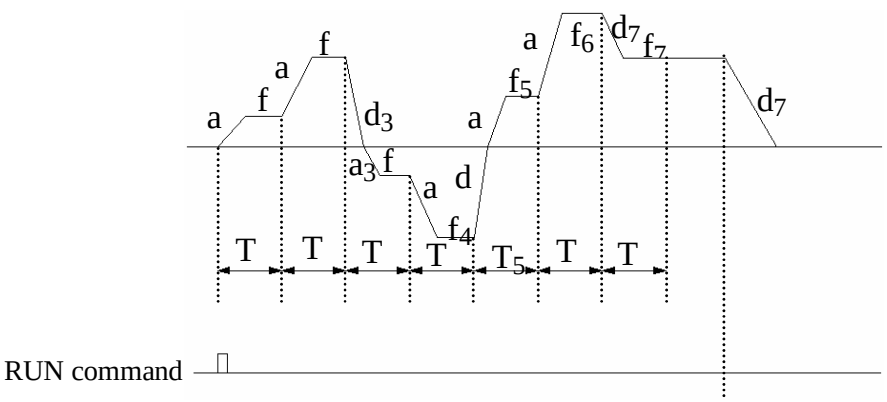


Fig. 6-15 Holding mode after PLC single circle

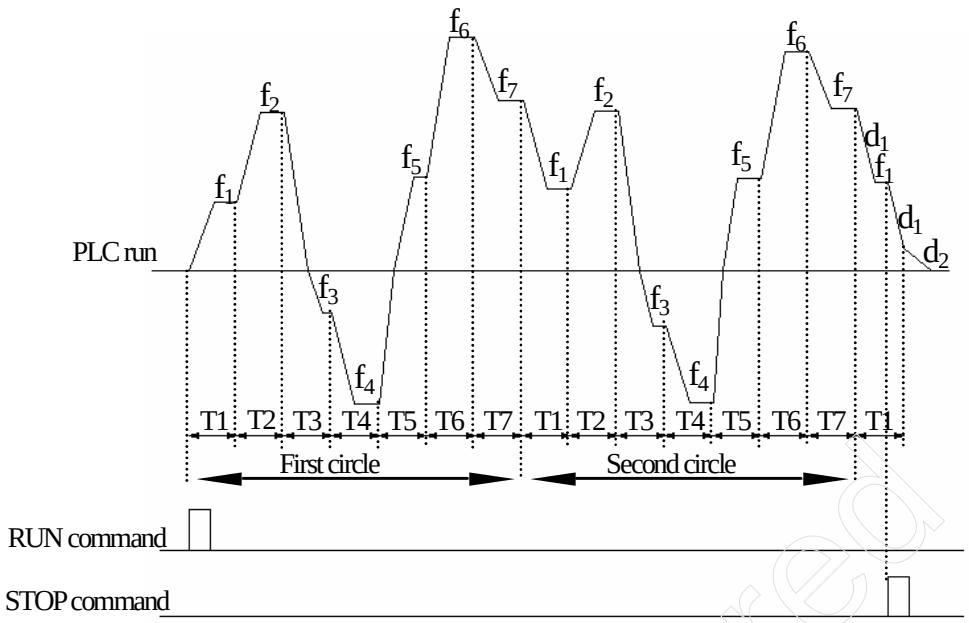


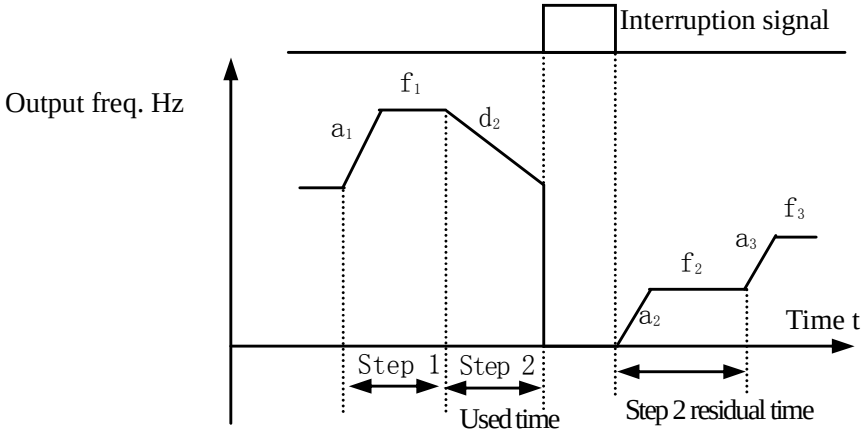
Fig. 6-16 PLC consecutive circle mode

3: consecutive circle. As shown in Fig.6-16, the inverter start next circle automatically after finishing a circle.until there is stop command.

LED 2nd bit:

0: start from first step. Stop during running caused by stop command, failure or power off.after restarting the inverter will run from first step.

1: continue to run from step frequency of interruption moment. When stop during running caused by stop command or failure.the inverter will record current step used time automatically and enter into this step automatically after restarting.continue to run for residual time according to defined frequency of this step, as shown in Fig.6-17. The inverter will rerun from first step after restarting if power off.



a_1: step 1 accelerating time a_2: step 2 accelerating time

a_3: step 3 accelerating time d_2: step 2 decelerating time

f_1: step 1 frequency f_2: step 2 frequency

f_3: step 3 frequency

Fig.6-23 PLC starting mode 1

LED 3rd bit : PLC run time unit

0: second. 1: minute

This unit is only effective to PLC run step time.for accelerating decelerating time of PLC run period, their unit selection is determined by H0.07.

Note

(1) If run time of PLC segment is set to 0, this segment is ineffective.

(2) Can make PLC process a pause, ineffective, work etc. through terminal, for detail, please refer to terminal correlative function parameter group H6.

H4.01	Step 1 setting	**Range: 000－321**	**000**
H4.02	Step 1 runtime	**Range: 0.0－6000.0**	**10.0**
H4.03	Step 2 setting	**Range: 000－321**	**000**
H4.04	Step 2 runtime	**Range: 0.0－6000.0**	**10.0**
H4.05	Step 3 setting	**Range: 000－321**	**000**
H4.06	Step 3 runtime	**Range: 0.0－6000.0**	**10.0**
H4.07	Step 4 setting	**Range: 000－321**	**000**
H4.08	Step 4 runtime	**Range: 0.0－6000.0**	**10.0**
H4.09	Step 5 setting	**Range: 000－321**	**000**
H4.10	Step 5 runtime	**Range: 0.0－6000.0**	**10.0**
H4.11	Step 6 setting	**Range: 000－321**	**000**
H4.12	Step 6 runtime	**Range: 0.0－6000.0**	**10.0**
H4.13	Step 7 setting	**Range: 000－321**	**000**
H4.14	Step 7 runtime	**Range: 0.0－6000.0**	**10.0**

H4.01~H4.13 utilize LED 1st bit, 2nd bit, 3rd bit to separately define frequency setting.direction and accelerating decelerating time of PLC Run, see following for detail:

LED1st bit: frequency setting

0: multi-step frequency i i=1~7

1: frequency is determined by function code H0.00

LED 2nd bit: run direction selection

0: forward run

1: reverse run

2: determined by run command (FWD,REV)

LED 3rd bit: accelerating decelerating time selection

0: accelerating decelerating time 1

1: accelerating decelerating time 2

2: accelerating decelerating time 3

3: accelerating decelerating time 4

6.6 Closed-loop run control parameter group: F3

Analog feedback control system:

Input pressure specified value through digital voltage provision, send 4~20mA feedback value of pressure sensor to inverter ACI input port.make up of analog closed-loop control system by built-in PID adjustor.as shown in Fig.6-18.

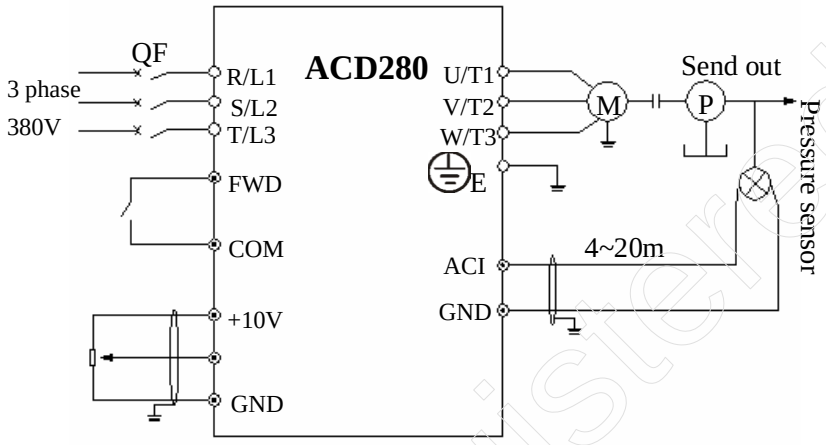


Fig.6-18 built-in PID analog feedback control system

ACD built-in PID adjustor make up of control system and its work

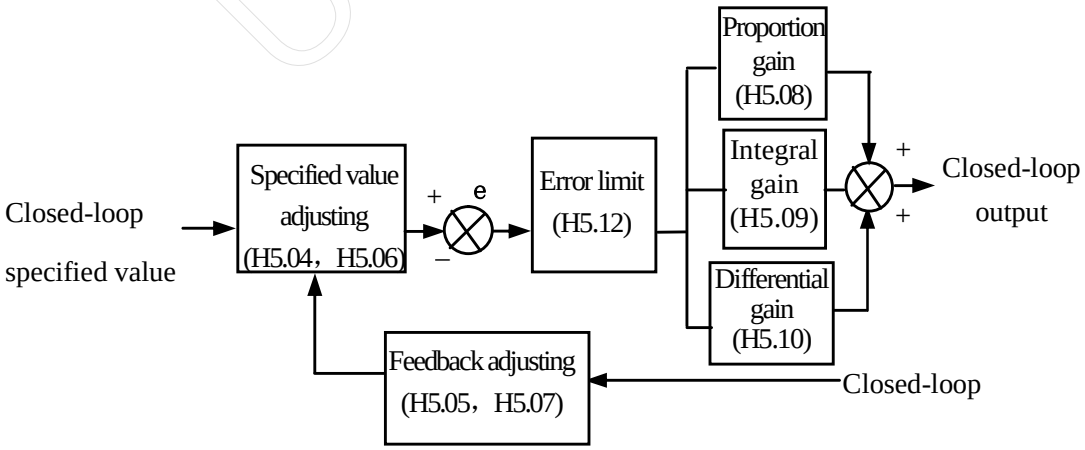


Fig.6-19 PID control principle diagram

In above diagram Kp: proportion gain. Ki: integral gain. Kd: differential gain

In above Fig.6-19, definition of closed-loop specified value, feedback value, error limit and proportion integral differential parameter is same as that of common PID adjustor

parameter, see respectively (H5.01~H5.12) definition. relation of specified value and expected feedback value is as shown in Fig.6-20. Thereinto specified value take 10V as reference and feedback take 20mA as reference.

Specified value adjusting and feedback value adjusting in Fig.6-19 is for confirming corresponding relation and unitive dimension between specified value and feedback value.

Expected feedbck value 20mA specified value 4mA

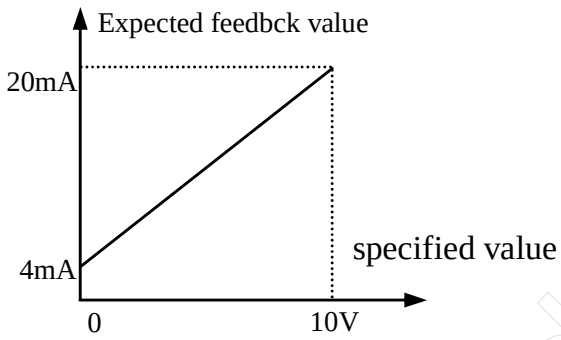


Fig.6-20 specified value and expected feedback value

When the system is determined, basic steps for setting closed-loop parameter are as follows:

(1) determine closed-loop provision and feedback channel(F3.01, F3.02)

(2) need to set relation between closed-loop provision and feedback for analog closed-loop (H5.04~H5.07)

(3) set closed-loop presetting frequency function (H5.14, H5.15)

(4) set closed-loop proportion gain, integral gain, differential gain, sampling cycle, error limit (H5.08~H5.12)

H5.00	Closed-loop run control selection	**Range: 0, 1**	**0**

0: closed-loop run control ineffective

1: PID closed-loop run control effective

H5.01	provision channel selection	**Range: 0~3**	**1**

0: digital provision.

1: AVI analog provision

2: ACI analog provision. Can choose 0~10V voltage or 4~20mA current provision

3: keypad analog potentiometer provision

H5.02	Feedback channel selection	**Range: 0~6**	**1**

0: AVI analog input voltage 0.10V

1: ACI analog input

2: AVI+ACI

3: AVI-ACI

4: Min（AVI、ACI）

5: Max（AVI、ACI）

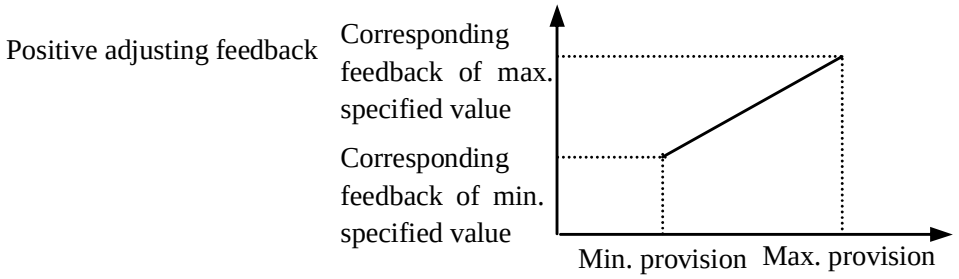
When ACI analog input is selected to be current input, it will be converted to voltage value in the inverter.

H5.03	Specified value digital pressure setting	**Range: 0.0－100.0%**	**50.0**

When H5.03=0, digital pressure defined H5.03 as the defined pressure of closed- loop control sustem. When the value =H5.03×HA.02/100,HA.02, it is distance pressure gauge range. So to use the keypad control closed-loop system, can modify H5.03 to change the difined pressure of system.

H5.04	min. specified value	range: 0.0-max. specified value	**0.0(%)**
H5.05	corresponding feedback value of min. specified value	range: 0.0-100.0(%)	**0.0(%)**
H5.06	max. specified value value	range: min. specified value -100.0(%)	**100.0(%)**
H5.07	corresponding feedback value of max. specified value	range: 0.0%-100.0(%)	**100.0(%)**

H5.04~H5.07 define relation curve of analog closed-loop provision and expected feedback. Their set value is percentage of provision and feedback actual value relative toreference (10V or 20mA)



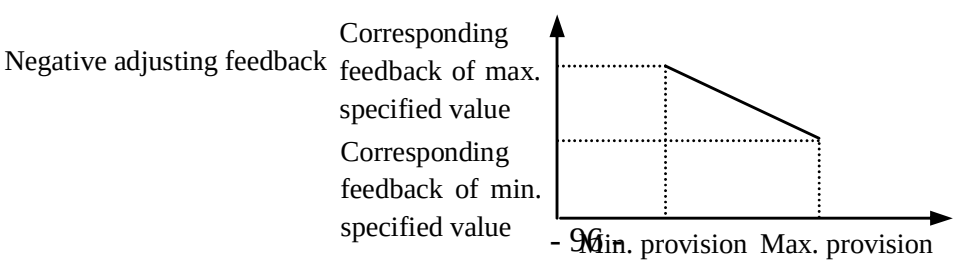


Fig.6-21 Provision, feedback curve

H5.08	Proportion gain Kp	**Range: 0.000~9.999**	**0.050**
H5.09	Integral gain Ki	**Range: 0.000~9.999**	**0.050**
H5.10	Differential gain Kd	**Range: 0.000~9.999**	**0.000**
H5.11	Sampling cycle T	**Range: 0.01－1.00S**	**0.10S**

The more big Kp proportion gain is, the more quick the response is.but overbig is prone to bringing surge.

Only applying proportion gain Kp adjustment can't eliminate offset completely.can apply integral gain Ki and differential gain to make up of PID control in order to eliminate residual offset. The bigger Ki is, the more quickly the system responds to changing offset, but overbig is prone to bringing surge.

Sampling cycle T is sampling cycle for feedback value, during each sampling cycle PID adjustor calculate for one time.the longer the sampling cycle is, the slower the system responds.

H5.12	Offset limit	**Range: 0.0－20.0(%)**	**2(%)**

For Max. offset of closed-loop specified value.as shown in Fig.6-22. PID adjustor stops adjusting when feedback value is within this range. To utilize this function reasonably redound to harmonizing the conflict between system output precision and stabilization.

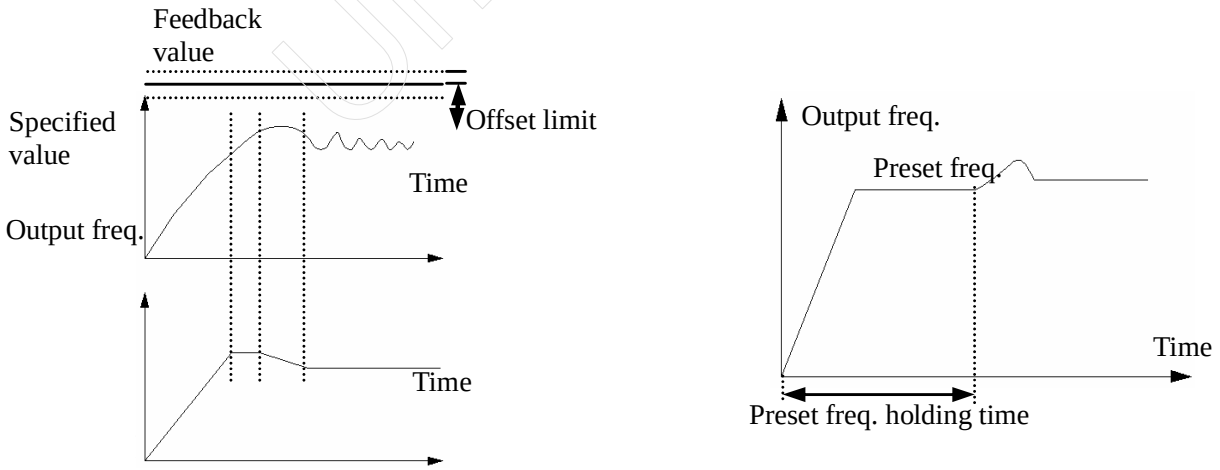


Fig.6-23 Closed-loop preset freq.

H5.13	**Closed-loop adjusting characteristic**	**Range: 0, 1**	**0**

0:positive role: when the defined is increases, can select it when need running speed in crease.

1:adverse effect. when the defined is increases, can select it when need running speed decrease.

H5.14	closed-loop preset frequency	range: 0-high limit freq.	**0.00Hz**
H5.15	closed-loop preset frequency holding time	range: 0.0-6000s	**0.0S**

This function can make closed-loop adjusting enter into stable phase quickly.

After closed-loop run starts, the inverter first accelerates to preset frequency H5.14 in terms of accelerating time, and after running at this frequency for a period of time H5.15, it runs according to closed-loop characteristic. As shown in Fig.6-23.

Note

Set preset freq. and holding time to "0", if closed-loop preset freq. function is not needed

6.7 Terminal correlative function parameter group: H6

H6.00	Input terminal MI1 function selection	**Range: 0~42**	**0**
H6.01	Input terminal MI2 function selection	**Range: 0~42**	**0**
H6.02	Input terminal MI3function selection	**Range: 0~42**	**0**
H6.03	Input terminal MI4 function selection	**Range: 0~42**	**0**
H6.04	Input terminal MI5 function selection	**Range: 0~42**	**0**
H6.05	Input terminal MI6 function selection	**Range: 0~42**	**0**
H6.06	**DO output mode selection**	Range: 0: H-speed impulse output 1: open circuit collector output	**0**
H6.07	**DO-R output function selection**	**Same as H6.10**	**0**

Multi-function input terminal MI1、MI2、MI3、MI4、MI5、MI6 provides 38 kinds of selection mode for the user.can choose based on spot requirement. For parameter function table please see Table 6-1.

Table 6-1 multifunction input function selection table

item	corresponding function	item	corresponding function

0	Leave control terminal unused	22	Simple PLC pause command
1	Multi-step speed control terminal 1	23	PLC stop status restoration (reset variable of PLC interruption moment, make it restart from first segment)
2	Multi-step speed control terminal 2	24	Frequency provision channel selection 1
3	Multi-step speed control terminal 3	25	Frequency provision channel selection 2
4	Multi-step speed control terminal 4	26	Frequency provision channel selection 3
5	External forward run jog control	27	Frequency switched to ACI
6	External reverse run jog control	28	Command switched to terminal
7	Accel/Decel time selecting terminal 1	29	Run command channel selection 1
8	Accel/Decel time selecting terminal 2	30	Run command channel selection 2
9	Accel/Decel time selecting terminal 3	31	Run command channel selection 3
10	External device failure input	32	Swing frequency runin
11	External restoration input	33	External interruption input
12	Free stop input	34	interior counter clearing end
13	External stop command	35	interior counter triggering end
14	stop DC braking input command DB	36	Interior timer clearing end
15	Inverter run prohibition	37	interior timer triggering end
16	Frequency increasing command(UP)	38	Pulse frequency input(only effective for MI6)
17	frequency descending command(DOWN)	39	Reserved
18	Accel/Decel prohibited command	40	Reserved
19	Three-wire run control	41	Reserved
20	Closed-loop ineffective	42	Reserved
21	PLC ineffective		

Now explain listed function in Table 6-1 as follows:

1~4: Multi-step speed control terminal. Can set 8 step speed run frequency by choosing ON/OFF combination of these function terminal.

Table 6-2 multi-step speed run selection table

K_4	K_3	K_2	K_1	Frequency setting
OFF	OFF	OFF	OFF	Common run freq.
OFF	OFF	OFF	ON	Multi-step frequency 1
OFF	OFF	ON	OFF	Multi-step frequency 2

OFF	OFF	ON	ON	Multi-step frequency 3
OFF	ON	OFF	OFF	Multi-step frequency 4
OFF	ON	OFF	ON	Multi-step frequency 5
OFF	ON	ON	OFF	Multi-step frequency 6
OFF	ON	ON	ON	Multi-step frequency 7
ON	OFF	OFF	OFF	Multi-step frequency 8

Above multi-step frequency can be used in multi-step speed run and simple PLC run, please see below an example of multi-step speed run:

We now define control terminal MI1、MI2、MI3、MI6, separately as follows:

After set H6.00=1、H6.01=2、H6.03=3, X1, X2, X3 are used for realizing multi-step run.as shown in Fig.6-24.

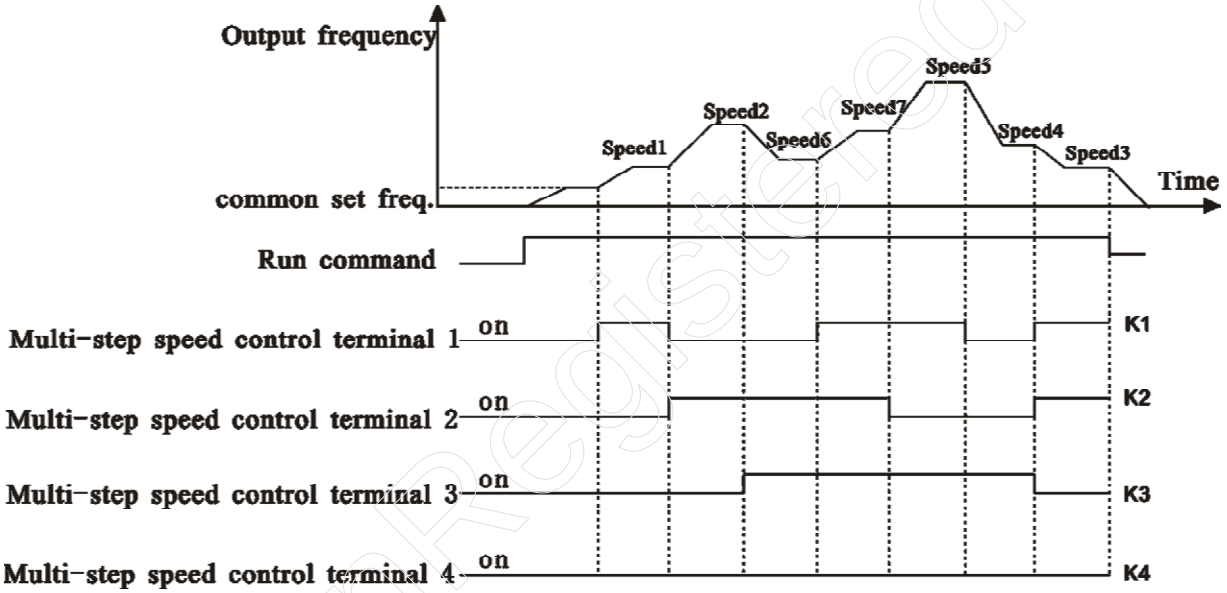


Fig.6-24 multi-step run

In fig.6-25 see an example of terminal run command channel, can make forward, reverse run control by K_5, K_6. In Fig.6-24, by different logic combination of K_2, K_3, K_4, the inverter can run according to common set frequency or 1~8multi-step frequency multi-speed operation based on above table.

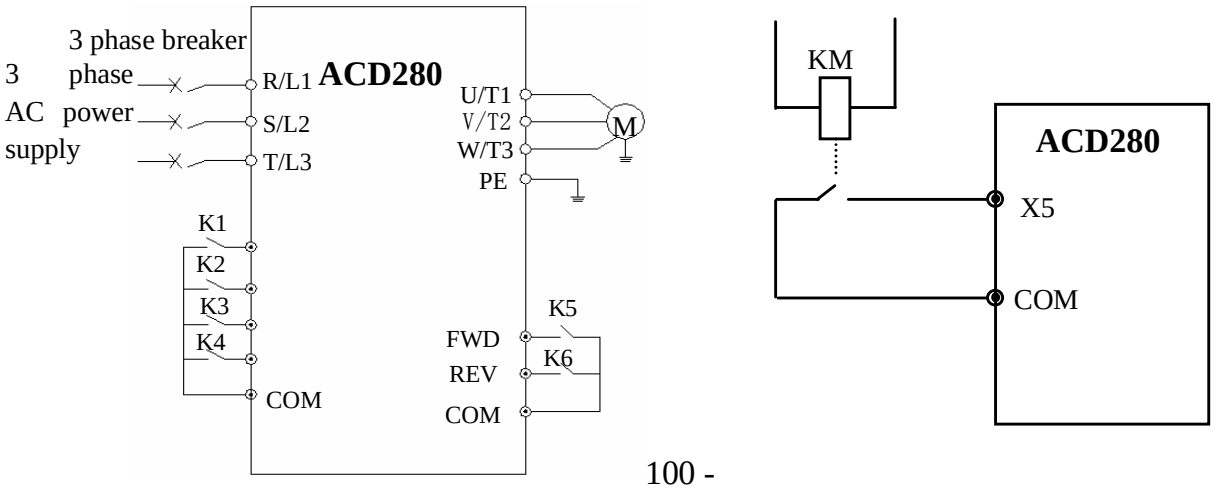


Fig.6-25 multi-step speed run Fig.6-26 exterior device failure always-open input

5~6: external jog run control input JOGF/JOGR.When run command channel is set to terminal run command channel H0.03=1. JOGF is jog forward run, JOGR is jog reverse run, jog operation frequency, jog accelerating decelerating time is defined in H3.04~H3.06.

7~9: Accel&Decel time terminal selection

Accel&Decel time terminal selection logic mode

Terminal 3	Terminal 2	Terminal 1	Accel/Decel time selection
OFF	OFF	OFF	Accel time 1/ Decel time 1
OFF	OFF	ON	Accel time 2/ Decel time 2
OFF	ON	OFF	Accel time 3/ Decel time 3
OFF	ON	ON	Accel time 4/ Decel time 4

Can realize selection for Accel&Decel time1~4 by ON/OFF combination of Accel&Decel time terminal.

10: external equipment fault input. Can input fault signal of external equipment by this terminal to be convenient for the inverter to monitor fault of external equipment. The inverter displays U-15, namely external equipment fault alarm after receiving the external equipment fault signal.

11: exterior restoration input. After the fault alarm takes place in the inverter, can restore the inverter through this terminal. Its function is same as func of key on the operation panel.

12: free stop input. This function is same as free stop during running defined in H2.05, but it's realized by control terminal to be convenient for long-distance control.

13: exterior stop command. This command is effective to all run command channel, when this function is effective the inverter stops running in mode set by H2.05.

14: DC injection braking input command DB during stop. Implement DC injection braking to the motor during stop by control terminal.in order to realize urgent parking and accurate orientation of the motor. Braking initial frequency, braking time are defined in H2.06，H2.07.

15: inverter run forbiddance. The inverter during running stops freely when this terminal is effective and forbidden to start in waiting status. Mainly applied to occasion needing safe linkage.

16~17: frequency increasing command UP/descending command DOWN. Realize frequency increasing or descending by control terminal, which substitute for keypad to realize long-distance control. Effective during common run if H0.00=2.Increasing descending speed is set by H6.09.

18: Accel&Decel speed forbidden command. Let the motor not effected by any foreign signal(except stop command).keep running at current frequency.

Note

Ineffective during normal decelerating stop.

19: three-wire run control. Please refer to function description of H6.08 run mode (three-wire run mode).

20: closed-loop ineffective. Realize flexible switch to lower level run mode under closed-loop run status

Note

(1)can switch between closed-loop and lower level run mode only during closed-loop run (H5.00=1).
(2)start stop control, direction and Accel&Decel time are subject to setting of corresponding run mode when it's switched to lower level run mode.

21: PLC ineffective. Realize flexible switch to lower level run mode under PLC run status.

Note

(1) can switch between PLC and lower level run mode ony during PLC run (H4.00≠0).
(2) start stop control, direction and Accel&Decel time are subject to setting of corresponding run mode when it's switched to lower level run mode.

22: simple PLC pause command. Implement pause control to PLC process during running.run at zero frequency when this terminal is effective.not time for PLC run.after ineffective implement automatic speed tracking start and continue PLC run. For application method please refer to function description of H4.00~H4.14.

23: PLC stop status restoration. Under stop status of PLC run mode, will clear PLC run step, runtime, run frequency etc. recorded when PLC run stops if this terminal is effective.please see H4 group function description.

24~26: terminal frequency provision channel selection. Through ON/OFF combination of frequency provision channel selection terminal 24, 25, 26.can realize frequency provision channel switch shown in Table 6-3. For relation of terminal switch and function code H0.00 setting, that is, latter effective.

Table 6-3 terminal frequency provision channel selection logic mode

frequency provision	frequency provision	frequency provision	frequency provision

channel selection end 3	channel selection end 2	channel selection end 1	channel selection
OFF	OFF	OFF	hold freq. setting
OFF	OFF	ON	keypad number provision
OFF	ON	OFF	terminal UP/DOWN provision(store)
OFF	ON	ON	terminal UP/DOWN provision(not store)
ON	OFF	OFF	serial port provision
ON	OFF	ON	AVI
ON	ON	OFF	ACI
ON	ON	ON	potentiometer provision

27: switch frequency to ACI. Frequency provision channel is switched to ACI provision compulsorily when this function terminal is effective, frequency provision channel come back to previous status when this function terminal is ineffective.

28: command switched to terminal. Run command channel is switched to terminal run command channel compulsorily when this function terminal is effective.

29~31: terminal select run command channel

Table 6-4 run command channel logic mode

Run command channel selection terminal 3	Run command channel selection terminal 2	Run command channel selection terminal 1	Run command channel
OFF	OFF	OFF	hold run command channel
OFF	OFF	ON	keypad run command channel
OFF	ON	OFF	end run command channel (keypad STOP command ineffective)
OFF	ON	ON	end run command channel (keypad STOP command effective)
ON	OFF	OFF	serial port run command channel(keypad STOP command ineffective)
ON	OFF	ON	serial port run command channel(keypad STOP command effective)

Can realize control command selection shown in Table 6-4 by ON/OFF combination of run command channel selection terminal, for relation of terminal switch and function code H0.03 setting, that is, latter effective.

32：swing frequency jumping-in. when swing frequency start mode is manul jump-in, swing frequency function effective if this terminal effective,see H7 function parameter description.

33: exterior interruption input. The inverter close off output and run at zero frequency during running upon receiving exterior interruption signal. The inverter implement automatic

speed stacking start-up to resume running once external interruption signal is relieved.

34: interior counter clearing end. To clear built-in counter in the inverter with cooperation of counter triggering signal.

35: interior counter triggering end. Counting pulse input port of built-in counter, pulse max.frequency: 200Hz, see function code H6.24、H6.25.

36: interior timer clearing end. To clear built-in timer in the inverter with cooperation of timer triggering signal.

37: interior timer triggering end. Please see function description for parameter H6.27.

38: pulse frequency input(only effective to MI6). Only effective for multifunction input terminal MI6, this function terminal receive pluse signal as frequency provision, for relation between inputted signal pulse frequency and set frequency in detail, please refer to H1 group parameter.

H6.08	FWD/REV run mode selection	Range: 0－3	0

This parameter defines 4 kinds of exterior terminal control mode for inverter running.

0: 2-wire control mode 1

K2	K1	Run command
0	0	Stop
1	0	Reverse run
0	1	Forward run
1	1	Stop

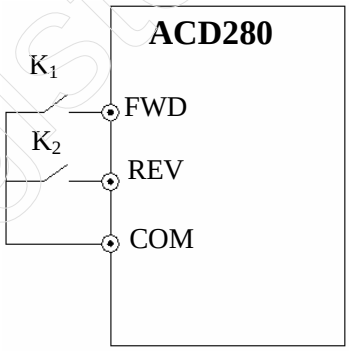


Fig.6-27 2-wire run mode 1

1: 2-wire control mode 2

K2	K1	Run command
0	0	stop
1	0	Stop
0	1	Reverse run
1	1	Forward run

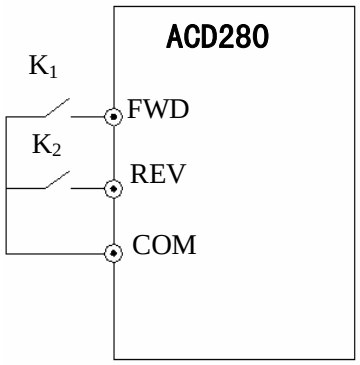


Fig.6-28 2-wire run mode 2

2: 3-wire control mode 1

thereinto:

SB1: stop button

SB2: forward run button

SB3: reverse run button

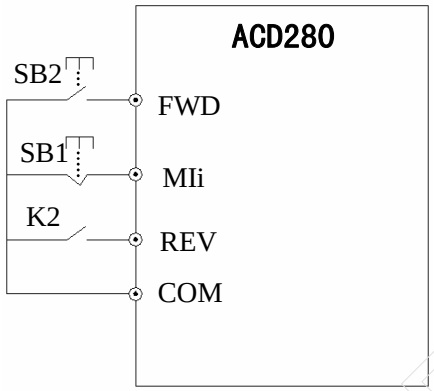
Fig.6-29 3-wire run mode 1

MIi is multifunction input terminal of MI1, MI2, MI3, MI4, MI5, MI6, here should define its corresponding terminal function as No. 19 “3-wire run control” function.

3: 3-wire control mode 2

SB1: stop button

SB2: run button



K2	run direction selection
0	Forward run
1	Reverse run

Fig.6-30 3-wire run mode 2

MIi is multifunction input terminal MI1, MI2, MI3, MI4, MI5, MI6, here should define its corresponding terminal function as No. 19 “3-wire run control” function.

The inverter restores after failure and start at once if run command channel selecting terminal and terminal FWD/REV is effective during warning alarm stop.

H6.09	UP/DOWN speed	**Range: 0.01－99.99Hz/S**	**1.00Hz/S**

This function code defines varying rate of the set frequency when it’s modified by UP/DOWN terminal.

H6.10	Open collector output terminal MO1 output setting	**Range: 0~24**	**0**
H6.11	**TA, TB, TC relay 2 output**	**Range: 0~24**	**0**
H6.12	**RA , RB , RC failure relay output**	**Range: 0~24**	**0**

MO1 open collector output terminal, **TA, TB, TC relay 2 output, RA, RB, RC failure relay output,** Table 6-5 shows option of above 3 function parameter, choosing same output terminal function repeatedly is allowed.

Table 6-7 output terminal function selection table

Item	Corresponding function	Item	Corresponding function
0	Inverter running signal (RUN)	13	reserved
1	Frequency arriving signal (FAR)	14	Inverter is ready for run(RDY)
2	Frequency arriving signal (FAR)	15	Inverter failure
3	reserved	16	Swing Freq. high&low limit restriction
4	Overload warning signal(OL)	17	Interior counter final value arrive
5	Output Freq. reach high limit(FHL)	18	Interior counter specified value arrive
6	Output Freq. reach low limit(FLL)	19	Set runtime arrive
7	Inverter stops for under voltage blockage (LU)	20	Interior timer timing arrive
8	Stop for exterior failure(EXT)	21	reserved
9	Inverter zero speed running	22	reserved
10	In PLC run process	23	reserved
11	Simple PLC segment run finished	24	
12	PLC finish one cycle run		

Now introduce function listed in Table 6-5 as follows:

0: inverter during running(RUN). The inverter is in run status, output indicator signal.

1: frequency arriving signal(FAR). Refer to function description of H6.13.

2: Frequency level detecting signal(FDT1). Refer to function description of H6.14~H6.15.

3: Reserved

4: overload warning signal(OL). Inverter output current exceed H9.05 overload detect level and time exceed H9.06 overload detect time.output indicator signal.

5: output frequency reach high limit(FHL). When set frequency, high limit frequency and run frequency reach high limit frequency, output indicator signal.

6: output frequency reach low limit(FLL). When set frequency, low limit frequency and run frequency reach low limit frequency, output indicator signal.

7: Inverter stops for under voltage blockage(LU). When the inverter is running, LED displays LU, and output indicator signal if DC bus-bar voltage is lower than

limitative level.

8: stop for exterior failure(EXT). When the inverter give the alarm (U-15) and stops for exterior failure, output indicator signal.

9: inverter zero speed running. When the inverter output zero frequency but in run status, output indicator signal.

10: In PLC run process.

11: Simple PLC segment run finished. After simple PLC current segment run is finished, output indicator signal(single pulse signal.width 500ms).

12: PLC finish one cycle run

13: reserved

14: Inverter is ready for run(RDY). If this signal is effective, shows that bus-bar voltage is normal and run prohibition terminal is ineffective, the inverter can receive start-up command.

15: Inverter fault. If failure takes place when the inverter is running, the inverter output indicator signal.

16: Swing freq. high&low limit restriction. After choosing swing frequency function, if frequency fluctuant range based on center frequency of swing frequency is above high limit frequency or under low limit frequency, the inverter will output indicator signal, as shown in Fig.6-31.

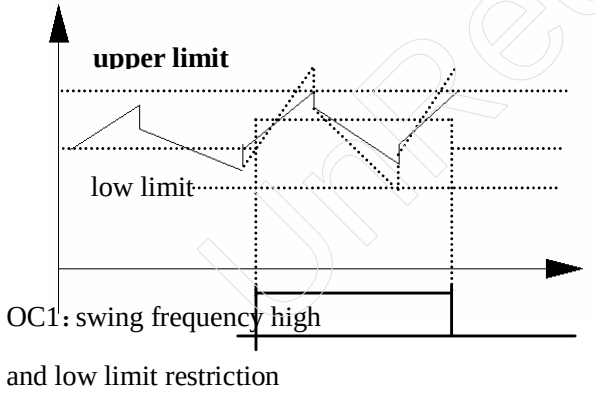


Fig.6-31 swing freq. range restriction

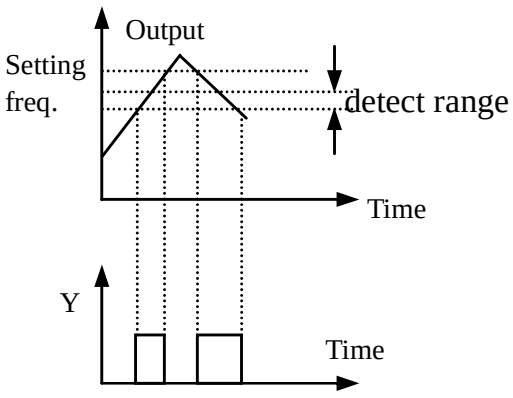


Fig.6-32 freq. arriving signal output

17: Interior counter final value arrive

18: Interior counter specified value arrive

17~18 please refer to function description of H6.24~H6.25.

19: Set runtime arrive. When accumulative runtime of the inverter (H3.34) reach set runtime(H3.33).output indicator signal.

20: Interior timer timing arrive. Refer to function description for H6.26.

H6.13	Freq. arriving(FAR)detect	**Range:0.00－50.00Hz**	**5.00Hz**

	range		

This parameter is supplementary definition to No. 1 function in Table 6-5. As shown in Fig.6-32, when output frequency of the inverter is within high&low detect range of set frequency, output pulse signal.

H6.14	FDT1(freq. level) electric level	range: 0.00-high limit frequency	**10.00Hz**
H6.15	FDT1 lag	**Range: 0.00－50.00Hz**	**1.00Hz**

H6.14~H6.15 is supplementary definition to No.2 function inTable 6-5, introduce as follows: When output frequency exceed the set frequency (FDT1 electric level), output indicator signal, till output frequency descend to be some frequency(FDT1 electric level-FDT1 lag) lower than FDT1 electric level. as shown in Fig.6-33.

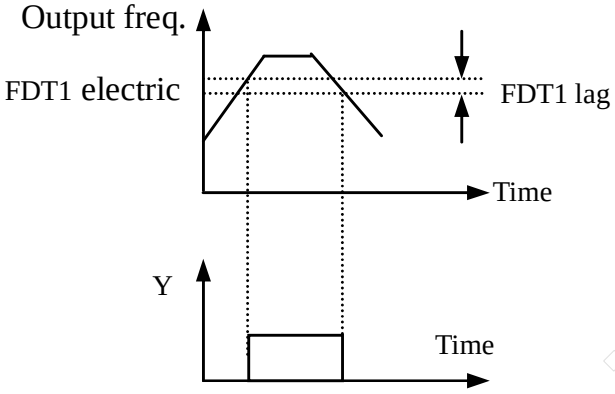


Fig.6-33 freq. level detecting

H6.16	Analog output(AO1)selection	**Range: 0－9**	**0**

0: output frequency(0.high limit frequency)

1: set frequency(0.high limit frequency)

2: output current(0.2.rated current)

3: output voltage(0.1.2.load motor rated voltage)

4: bus-bar voltage(0.800V)

5: PID provision (0.00-10.00V)

6: PID feedback (0.00-10.00V)

7: reserved

8: reserved

9: reserved

H6.17	Analog output(AO1)gain	**Range: 0.10－2.00**	**1.00**
H6.18	Analog output(AO1) offset	**Range: 0.00－10.00V**	**0.00**

For AO1 analog output, the user can modify display measuring range or emend meter head error by adjusting output gain if necessary.

H6.19	Analog output(AO2)selection	**Range: 0-9, same as H6.16**	**0**
H6.20	Analog output(AO2)gain	**Range: 0.10－2.00**	**1.00**
H6.21	Analog output(AO2) offset	**Range: 0.00－10.00V**	**0.00**

提示 This function makes real-time effect to analog output when it's being modified.

H6.22	DO-P terminal output function selection	**Same as H6.16**	**0**
H6.23	DO max. pulse output freq.	**0.1KHz~50.0KHz**	**10.0**
H6.24	Set interior count number arriving provision	**Range: 0--9999**	**0**
H6.25	Specified interior count number arriving provision	**Range: 0--9999**	**0**

H6.24, H6.25 is supplementary definition to No. 17, 18 function in Table 6-5.

Set count number provision.shows that when some number of pulse are inputted to MIi(count triggering signal input function terminal), MO1 (open collector Output terminal) output a indicator signal.

As shown in Fig.6-34. MO1 output an indicator signal when the 8th pulse is inputted to MIi, Here H6.24=8.

Specified count number provision, shows that when some number of pulse are inputted to MIi, MIi output a indicator signal.till set count number is reached.

As shown in Fig.6-34, RA/RB/RC start to output an indicator signal when the 5th pulse is inputted to MIi, Until set count number 8 is reached. Here H6.26=5. Specified count number is ineffective when it is bigger than set count number.

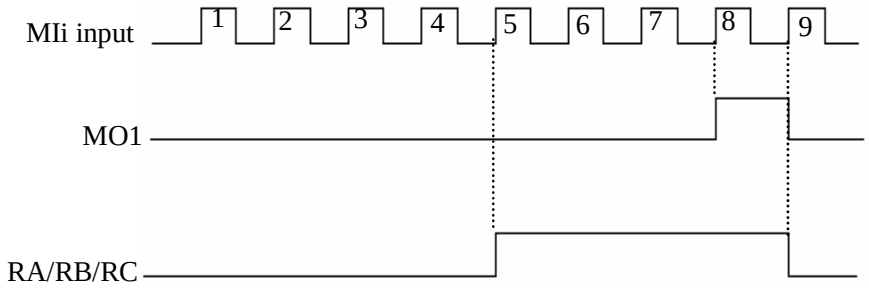


Fig.6-34 set count number and specified count number provision

H6.26	Interior timer timing setting	**Range: 0.1－6000.0s**	**60.0**

This parameter is used to set timing time of interior timer of the inverter. The timer is

activated by exterior triggering end(triggering end selected by H6.00~H6.02 and H6.05), the timer begins timing upon receiving exterior triggering signal, after it's up to timing time one effective pulse signal of 0.5s will be outputted from relative MO end.

6.8 Traverse special function parameter group: H7

H7.00	traverse function selection	**Range: 0, 1**	**0**

0: traverse function ineffective

1: traverse function effective

H7.01	traverse run mode	Range: LED 1st bit: 0, 1 LED 2nd bit: 0, 1	**00**

LED 1st bit: jump-in mode

0: automatic jump-in mode. After start-up run at traverse preset frequency for a period of time, then enter into traverse operation automatically.

1: terminal manual run mode. When set the multifunction terminal MIi(MIi= MI1, MI2, MI3, MI6) to function 32 and it's effective, enter into traverse state, quit traverse state, if ineffective and run frequency is at traverse preset frequency.

LED 2nd bit:

0: changing amplitude. Amplitude AW varies with center frequency.for its changing rate please see H7.02 definition.

1: fixed amplitude. Amplitude AW is determined by high limit frequency and H7.02.

Traverse center frequency input setting channel is set by H0.00 function.

H7.02	traverse amplitude	**Range: 0.0－50.0(%)**	**0.0(%)**

Changing amplitude:AW=center frequency×H7.02

Fixed amplitude: AW=high limit frequency×H7.02

Note

Traverse run frequency is restricted by high limit, low limit frequency; if set improperly, abnormal traverse operation arise.

H7.03	Sudden jumping freq.	**Range: 0.0－50.0(%)**	**0.0(%)**

As shown in Fig.6-35. If this parameter is set to 0, no jumping frequency.

H7.04	traverse cycle	**Range: 0.1－999.9S**	**10.0S**

Whole time for a cycle including traverse rising, descending process.

H7.05	Triangle wave rising time	range: 0.0-98.0(%)(traverse cycle)	**50.0(%)**

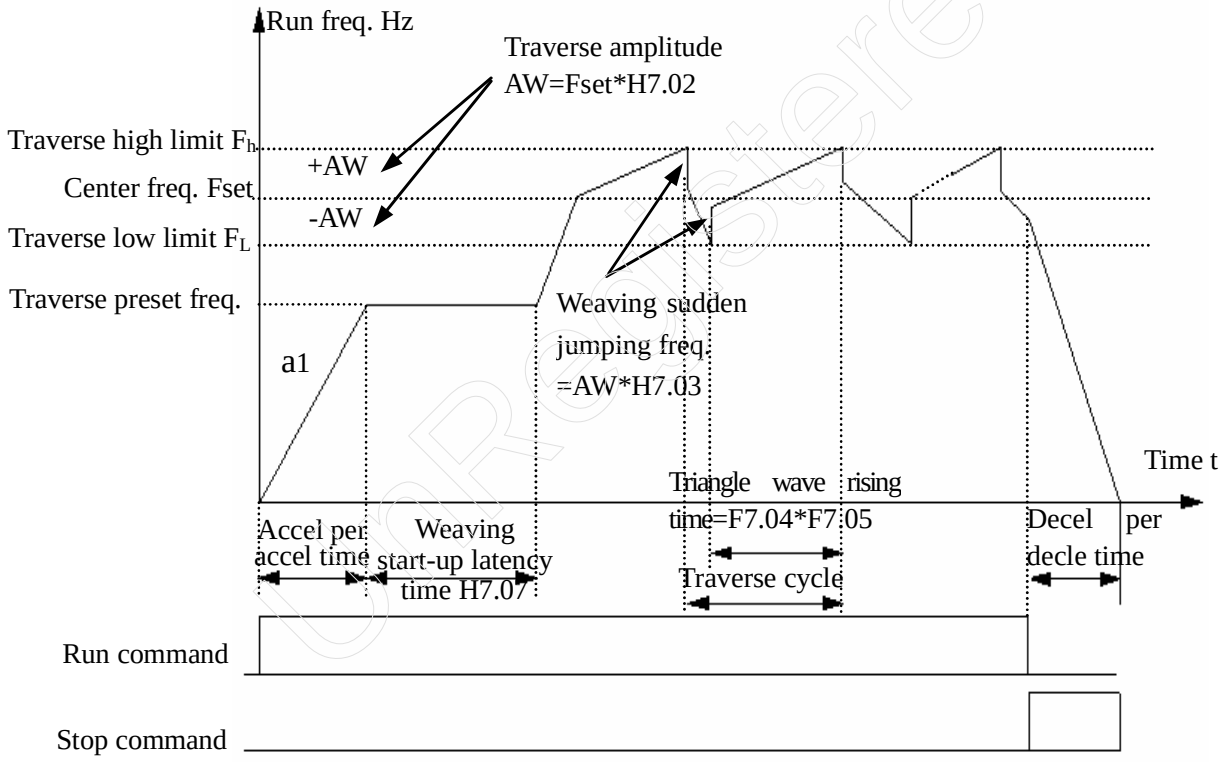
Define runtime of traverse rising segment=H7.04×H7.05(s), runtime of descending

segment = H7.04×(1- H7.05) (s). Please refer to description in Fig.6-35.

H7.06	Traverse preset frequency	**Range: 0.00－400.00Hz**	**0.00Hz**
H7.07	Traverse preset frequency latency time	**Range: 0.0－6000S**	**0.0S**

H7.06 is used for defining inverter run frequency before entering into traverse operation.

When automatic start-up mode is optioned. H7.07 is used for setting holding time running at traverse preset frequency before enter into traverse operation.When manual start-up mode is optioned. H7.07 setting is ineffective. Please see description in Fig.6-35.



6.9 Motor and vector control function parameter group: H8

H8.00	**Control mode setting**	**Range: 0, 1**	**0**

0: V/F control

Please select V/F control mode if you need to use single inverter to drive more than one motor.

1: slip vector control

H8.01	Motor rated voltage	**Range: 1－480V**	Depend on device type
H8.02	Motor rated current	**Range: 0.1－999.9A**	Depend on device type
H8.03	Motor rated frequency	**Range: 1.0－400.0Hz**	Depend on device type
H8.04	Motor rated speed	**Range: 1－9999r/min**	Depend on device type
H8.05	Motor pole quantity	**Range: 2-14**	Depend on device type

Please set above parameters according to rated data of motor drived by the inverter for the sake of safe running.

6.10 Protection function parameter: H9

H9.00	Shot power cut restart waiting time	**Range: 0.0－10.0S**	**0.0S**

When H9.00 equals to 0 the instantaneous restart button is invalid.

when the power grid shot off for instantaneous ,after normal power supply the frequency will automatically strat again setting the waiting time.In this time ,even the code is dataed into computer the machine won't start ,if typewrite the cancel code the it will start the machine again.

H9.01	failure self-restoration times	**Range: 0－10.0 S**	**0**
H9.02	failure self-restoration interval	**Range: 0.5－20.0S**	**5.0S**

During run process, failure will take place accidently due to load fluctuation and the inverter will cut off output, here failure self-restoration function can be applied in order to let the device continue to run. During self-restoration, the inverter will try to resume running in speed checking restart mode but stop outputting and failure protected if the inverter can’t resume running successfully within set times. Self-restoration function will be shut down if failure self-restoration times is set to 0.

(1) To use failure self-restoration function must take device allowance and no essential failure in the inverter as preconditions.

(2) Self- restoration function is ineffective to failure protection caused by overload and over heat.

H9.03	**Motor overload protection mode selection**	**Range: 0, 1**	**1**
H9.03	**Motor overload protection mode selection**	**Range: 0, 1**	**1**

This parameter defines protecting action mode when overload, overheat take place in the inverter.

0: no action. No motor overload protection characteristic(apply with caution).here the inverter have no overload protection for load motor.

1: inverter cut off output at once. The inverter cut off output and motor stop freely when overload, overheat take place.

H9.04	**Motor overload protection corfficient**	**Range: 20.0-120.0(%)**	**100.0(%)**

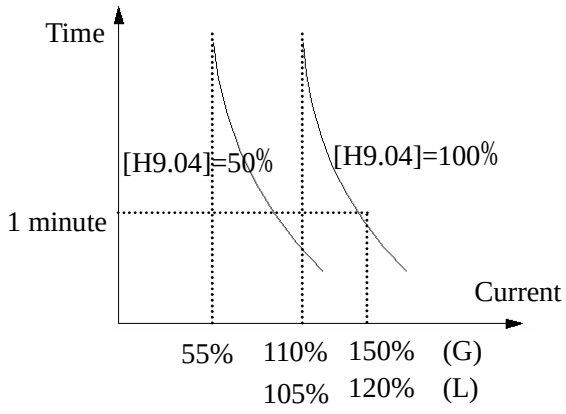
This parameter sets sensibility of the inverter implementing thermal relay protection to load motor, can implement correct heat protection to the motor by setting this value when output current value of load motor don't match rated current of the inverter, as shown in Fig.6-36.

Value of this parameter can be determined by following formula:

$$\textbf{H9.04}=\frac{\textbf{Motor rated current}}{\textbf{Inverter rated output current}}\times 100$$

Note

The inverter will be lose thermal relay protection function when a piece of inverter drive multiple motors in parallel. Please assemble heat protection relay at input side of each motor to protect them effectiveiy.



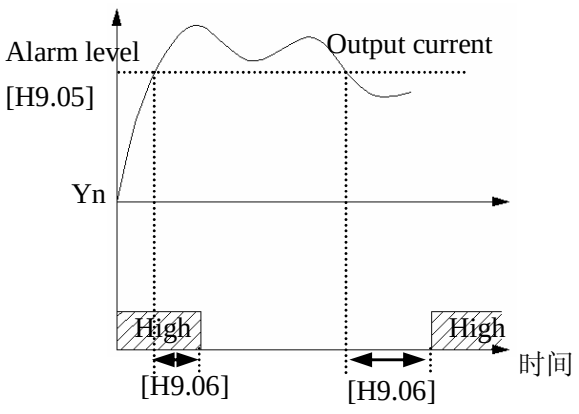


Fig.6-36 electronic thermal relay protection **Fig.6-37 overload alarm**

H9.05	overload alarm checkout level	**Range: 20－200(%)**	**130(%)**

H9.06	overload alarm delay time	**Range: 0.0－20.0S**	**5.0S**

If output current exceeds electric level set by parameter H9.05 continuously, open collector outputs effective signal(refer to Fig.6-37 and interrelated description of parameter H6.10) after delay time set by H9.06 passed.

H9.07	Overvoltage stall selection	**Range: 0, 1**	**1**
H9.08	Stall overvoltage point	**Range: 120-150(%)**	**140(%)**

0: banned

1: allowed

Actual descending rate of motor speed may be lower than that of output frequency due to effect from load inertia when the inverter is in decelerating run process, here the motor will feed electric energy back to inverter which will make DC bus-bar voltage of the inverter increase, overvoltage protection will takes place if not take steps.

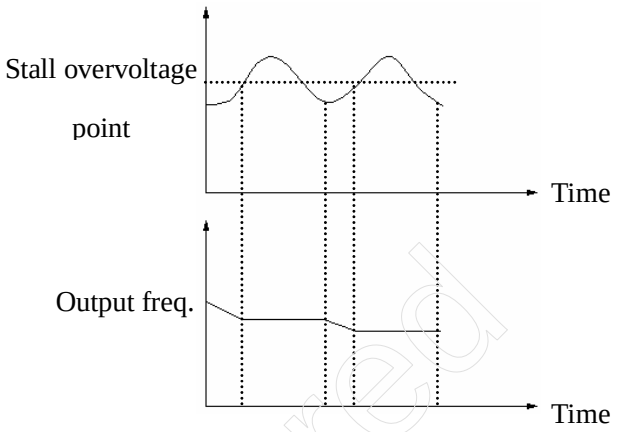


Fig.6-38 overvoltage stall function

Overvoltage stall protectionfunction, indicates that output frequency point of the inverter stops descending if bus-bar voltage detected during run process exceed output freq, stall voltage point defined by H9.08 (relative to standard bus-bar voltage) and the inverter continue to implement decelerating run when bus-bar voltage detected again is lower than stall overvoltage point. As show in Fig. 6-38.

H9.09	**automatic current limiting level**	**Range: 110－200(%)**	**150(%)**
H9.10	**frequency descending rate during current limiting**	**Range: 0.00－99.99Hz / S**	**10.00Hz/S**
H9.11	**automatic current limiting action selection**	**Range: 0, 1**	**0**

By automatic current limiting function the inverter can limit load current not to exceed automatic current limiting level set by H9.09 to avoid tripping out for failure caused by rushing current. This function is especially suitable for some biggish inertia or acutely changing load occasion.

Automatic current limiting (H9.09) defines current threshold value of automatic current limiting action, its value is the percentage relative to inverter rated current.

Frequency descending rate during current limiting (H9.10) defines adjusting rate to output frequency during automatic current limiting action.

If frequency descending rate during automatic current limiting H9.10 is too small.inverter isn't easy to get rid of automatic current limiting state which may cause overload failure finally.If descending rate H9.10 is too big, the inverter may be in generating state for long time which will cause overvoltage protection.

Automatic current limiting function is effective in accelerating decelerating state and whether it's effective in constant speed run state is determined by automatic current limiting action selection (H9.11).

H9.11=0 indicates that automatic current limiting is ineffective during constant speed running.

H9.11=1 indicates that automatic current limiting is effective during constant speed running.

Output frequency may varies during automatic current limiting action.so automatic current limiting function is not suitable for occasion demanding stable output frequency during constant speed run.

6.11 consistant pressure water supply function group A：HA

HA.00	**Feedback disconnection assessment**	**range：0.0~100.0%**	**0.0**
HA.01	**Feedback disconnection delay time**	**range：0.0~999.9s**	**1.0**

Feedback disconnection assessment: it is relative to full range(10V or 20mA). The system will check the feedback of PID. When it is smaller than the feedback disconnection assessment and consistently like this, the system will begain to checking and timing. When the cheking time is more than feedback disconnection delay time, the system will display PID feedback disconnection failure.

HA.02	**Distance pressure gauge**	**range：0.00~20.00Mpa**	**1.00**

It is relative to 10V or 20mA

HA.03	**Dormant frequency**	**Range ：0.0~99.9Hz**	**0.0**
HA.04	**Dormant delay time**	**range：0.0~999.9s**	**0.0**

When the deviation between system water supply defined pressure and feedback pressure is smaller than H5.12(Deviation limit), while the running frequency is smaller HA.03(dormant freuency), the inverter begains to time. When the timing is more than HA.04(dormant delay time), the inverter will go to the dormant status, and the running frequency reduce to 0.0HZ which can save power and protect motor.

Note: HA.03 abitary zero, the dormant function is ineffective.

HA.05	**Revise pressure**	**range：0.00~20.00Mpa**	**0.00**

HA.06	**Revise delay time**	**range：0.0~999.9s**	**0.0**

When the system is in the status of dormant, and the water supply feedback pressure is smaller tha HA.05(revise pressure), the inverter begains to check and time. When the timing is more than HA.06(revise delay time), enter into normal running status.

Note: HA.05, HA.06 arbitary zero, revise function is ineffective.

HA.07	**“one drive two ” water supply circulate mold selection**	**range：0~1**	**0**

0：ineffective

1：effective – “one drive two” water supply circulate mold is effectibe.

HA.08	**pump switching time**	**range：0.0~999.9s**	**300.0**

To setup the stable judgement time for the output frequency of the inverter to reach upper limit to add pump and to the output frequency to reach bottom limit.

HA.09	**Electromagnetic switch**	**range：0.0~10.0s**	**0.5**

The parameter defined the elctromagnatic switch dely time from power frequency to changed prequency or from changed frequency to power frequency.

6.12 consistant pressure water supply parameter group B：Hb

Hb.00	**Timing switching time interval**	**rang：0000~9999min**	**0**

The parameter defined the timing switching time of two pupms. To setup this parameter effective can protect the other one from rust.

To setup 0min will turn off the timing switching time interval.

Hb.06	**Relay B1 output function selection**	**range：0~28**	**28**
Hb.07	**Relay G1 output function selection**	**range：0~28**	**28**
Hb.08	**Relay B2 output function selection**	**range：0~28**	**28**
Hb.09	**Relay G2 output function selection**	**range：0~28**	**28**

Other functions are same to H6.10。

Relay B1：Hb.06=28 the first pump changes frequency

Relay G1：Hb.07=28 the first pump is power frequency

Relay B2：Hb.08=28 the sencond pump changes frequency

Relay G2：Hb.09=28 the second pump is power frequency

6.13 Function parameter group HC（reserved）

6.14 Failure record function parameter: Hd

Hd.00	previous one failure record	**Range: 0~29**	**0**
Hd.01	previous two failure record	**Range: 0~29**	**0**
Hd.02	previous three failure record	**Range: 0~29**	**0**
Hd.03	previous four failure record	**Range: 0~29**	**0**
Hd.04	previous five failure record	**Range: 0~29**	**0**
Hd.05	previous six failure record	**Range: 0~29**	**0**

0: no failure

1~23: failure U-01-U-29, please see chapter 7 for specified failure type.

Hd.06	Set freq. at previous failure	range: 0-high limit	**0**
Hd.07	Output freq. at previous failure	range: 0-high limit	**0**
Hd.08	output current at previous failure	**Range: 0-999.9A**	**0**
Hd.09	output volt. at previous failure	**Range: 0-999V**	**0**
Hd.10	DC bus-bar vlot. at previous failure	**Range: 0~800V**	**0**

6.15 Code and manufacturer function parameter: HF

HE.00	User password	**Range: 0000－9999**	**0000**

User password setting function is used for prohibiting unauthorized personnel from consulting and modifying function parameter.

Set this function code to 0000 when user password function isn't wanted.

First input 4 bits number as user password and press ENTER DATA key to confirm, then the password will come into effect at once.

Password modification:

Enter into password verification state by pressing PRG ESC key, after inputting primary 4 bits password parameter editing state is available.choose FF.00(here FF.00=0000).input new password and press ENTER DATA key to confirm.then the password come into effect at once.

Note Please keep the password you set without fail, in case the password is missing please consult the manufacturer.

Chapter 7 Troubleshooting

7.1 Failure and countermeasure

Possible failure types in ACD280 are shown in Table 7-1 and failure code is from U-01 to U-23. Some failure code is reserved for intelligent automatic diagnosis function which will be executed continuously in future. When failure takes place in the inverter, the user should check according to note of this table first and record failure phenomena detailedly. Please contact our after-sale service and technical support Department or agent in your local place when technical service is needed

Table 7-1 failure type and the countermeasure

failure code	failure type	possible reason	countermeasure
U-01	Inverting module protection	Transient overcurrent of the inverter	Refer to countermeasure for overcurrent
		phase to phase short circuit or earthing short circuit of output 3 phase	wiring again
		Air-path blocked or fan damaged	To clear air-path or replace the fan
		Ambient temperature is too high	Lower ambient temperature
		Connecting wire or insert on control board loose	Check and connect the wire again
		Unwonted current wave caused by missing output phase etc.	Check wiring
		Assistant power supply damaged and drive voltage lacking	Look for service from manufacturer or agent
		Unwonted control board	Look for service from manufacturer or agent
U-02	Overcurrent during accelerating process	Accelerating time is too short	Prolong accelerating time
		Improper V/F curve	Adjust V/F curve setting.adjust manual torque boost or change to automatic torque boost
		Restart rotating motor	Set speed checking restart function
		Low power source voltage	Check input power supply
		Too small power of the inverter	Choose inverter with high-power
U-03	Overcurrent during decelerating process	Decelerating time is too short	Prolong decelerating time
		Have potential energy load or big Inertia load	Increase braking power of external energy consumption braking subassembly
		Power of inverter is a bit small	Choose inverter with high-power
U-04	overcurrent during constant speed process	Load change suddenly or Have unwonted phenomena	Check or reduce break of the load
		Accel/Decel time is set to too short	Prolong accelerating decelerating time properly
		low power source voltage	Check input power supply
		Power of inverter is a bit small	Choose inverter with high-power

U-05	overvoltage during accelerating process	Unwonted input voltage	Check input power supply
		Accel time is set to too short	Prolong accelerating time properly
		Restart rotating motor	Set speed checking restart function
U-06	Overvoltage during decelerating process	Decelerating time is too short	Prolong decelerating time
		Have potential energy load or big inertia load	Increase braking power of external energy consumption braking subassembly
U-07	Overvoltage during constant speed process	Unwonted input voltage	Check input power supply
		Accel/Decel time is set to too short	Prolong accelerating decelerating time properly
		Input voltage change abnormally	Assemble reactor
		Load inertia is a bit big	Use energy consumption subassembly
U-08	Control power failure	Unwonted input voltage	Check input power supply or look for service
U-09	Under voltage failure	Under voltage	Check spot input voltage
U-10	Inverter overload	Accel time is too short	Prolong accelerating time
		DC injection braking is too big	Reduce DC injection braking current.prolong braking time
		Improper V/F curve	Adjust V/F curve and torque boost
		Restart rotating motor	Set speed checking restart function
		power source voltage is too low	check power source voltage
		Load is too big	Choose inverter with high-power
U-11	Motor overload	Improper V/F curve	Adjust V/F curve and torque boost
		power source voltage is too low	check power source voltage
		General motor run at low speed with big load	Can choose frequency conversion motor for long time low speed run
		motor overload protection factor set incorrectly	to set motor overload protection factor correctly
		motor blocked up or load change too suddenly and quickly	Check the load
U-12	input side lack phase	Input lack one phase	check power input wiring
		the power driven plate failure	change the power driven plate
		main control plate failure	change the main control plate
U-13	Reserved	Reserved	Reserved
U-14	inverter over heating	Air-path blocked	To clear air-path or improve ventilation condition
		Ambient temperature is too high	Improve ventilation condition, lower carrier frequency

		Fan damaged	Replace the fan
U-15	external device failure	Use sudden stop key in non-keypad run mode	Look up operation mode
		Use sudden stop key under condition of stall	Set running parameter correctly
		Sudden stop terminal for external failure closed	Open external failure terminal after external failure is settled
U-16	RS485 communication failure	Baud rate set improperly	set Baud rate properly
		Serial port communication error	press key to reset.look for service
		Failure warning parameter set improperly	Modify H3.08、H3.09
		Upper device doesn't work	Check if upper device work and wiring is correct
U-17	Reserved	Reserved	Reserved
U-18	current detecting circuit failure	Connecting wire or insert on control board loose	Check and connect the wire again
		Assistant power supply damaged	Look for service from manufacturer or agent
U-19	Reserved	Reserved	Reserved
U-20	Reserved	Reserved	Reserved
U-21	E2PROM read and write wrongly	Mistake take place when read or write control parameter	Reset by pressing Look for service from manufacturer or agent
U-22	inverter hardware failure	Over-voltage or over-current hardware circuit failure	Look for service from manufacturer or agent
U-23	Reserved	Reserved	Reserved
U-25	PIDfeedback disconnection	PIDfeedback disconnection failure	Check the deedback wiring
PoFF	Lack voltage when stop	appear when power shut down	normal phenomenon
		appear when normal use	check the input power
LoCC	The password is effective.	The password is getting effective.	To display LoCC, press and insert password. If forget the password, please inquiry the supplier or the agent for service.

7.2 Failure record lookup

This series inverter can record latest 6 failure code and inverter run parameter of the last failure, to search these informations can redound to finding out reason of the failure.

Failure information is all stored in Hd group parameter.please enter into Hd group parameter to see about information by referring to keypad operation method.

Code	Content	Code	Content
Hd.00	previous one failure record	Hd.06	set freq. at previous failure
Hd.01	previous two failure record	Hd.07	output freq. at previous failure
Hd.02	previous three failure record	Hd.08	output current at previous failure
Hd.03	previous four failure record	Hd.09	output volt. at previous failure
Hd.04	previous five failure record	Hd.10	DC bus-bar vlot. at previous failure
Hd.05	previous six failure record		

7.3 Failure reset

(1) Before reset you must find out reason of failure downright and eliminate it, otherwise may cause permanent damage to the inverter.

(2) If can't reset or failure takes place again after resetting, should look for reason and continuous resetting will damage the inverter.

(3) Reset should take place 5 minutes after overload, overheat protection action.

To resume normal running when failure takes place in the inverter, you can choose following any kind of operation:

(1) After you set any terminal of MI1~MI6 to be inputted by external RESET (H6.00~H6.05=10), you can open it after connected to COM.

(2) When failure code is displayed, press STOP RESET key after restoration is confirmed.

(3) Cut off power supply.

Chapter 8 Maintenance

8.1 Routine maintenance

When you use ACD280 series you must assemble and operate it according to demand listed in this《service manual》strictly. During run state, temperature, humidity, vibration and aging parts may affect it. To avoid this, it is recommended to perform routine inspections.

Table 8-1 Daily inspection items

Period		Inspection item	Inspection content	Criterion
Daily	Periodic			
√		Run state parameter	(1)output current	(1)within range of rated value
			(2)output voltage	(2)within range of rated value
			(3)inside temp	(3)temp. increment < 35.
√		Cooling system	(1)installing ambient	(1)good ventilation, unblocked air-path
			(2)local fan	(2)rotate normally without abnormal noise
√		Motor	(1)heating	(1)no abnormality
			(2)noise	(2)even
	√	Inverter	(1) vibration, heating	(1)vibration balanced, proper wind temp.
			(2)noise	(2) without abnormal sound
			(3)fixation of lead, terminal	(3)fixed screw don't loose
√		Run ambient	(1)temperature, humidity	(1)-10.~+40. 40.~50.used in lower volume or execute compulsory heat dissipating
			(2)dust, water and leakage	(2)no water leakage imprint, no dust
			(3)gas	(3)no peculiar smell

Recommend to inspect with following instrument:

Input voltage: electric voltmeter.output voltage: rectifying voltmeter.input output current: pincers ammeter.

8.2 Inspection and replacement of damageable parts

Some component parts in the inverter will be abraded or bear descending performance for long-term usage.to assure that the inverter can run stably and reliably, it is recommended to perform defending maintenance and replace corresponding parts if necessary.

(1) cooling fan

Abnormal noise, even oscillation may take place if the fan have wearing bearing, aging blade, here replacement of the fan should be considered.

(2) filter electrolyte capacitance

When frequent-changing load causes increasing pulsant current and aging electrolyte under high ambient temperature, the electrolyte capacitance may be damaged and here should replace it.

8.3 Repair guarantee

(1) Within 18 months from purchasing date(based on the code information on the equipment), if failure caused by inverter itself takes place under normal conservation and usage, we will provide free repair service.

(2) We will take some upkeep if one of following situations takes place within period of repair guarantee.

a. If did not use the inverter according to.service manual.strictly or did not use it under ambient demanded in.service manual., which cause failure.

b. Failure caused by applying the inverter to non-normal function;

c. Failure caused by self-repair, refit which is not already allowed;

d. Damage caused by bad keeping, falling down from high place or other extrinsic factor after purchasing the inverter;

e. Failure caused by natural disaster or its reason such as unwonted voltage, thunderbolt, water fog, fire, salt corroding, gas corroding, earthquake and storm etc.;

f. Make bold to tear up product logo (such as: nameplate etc.); Body serial number don't accord with that in repair guarantee card.

(3) We calculate service fee based on actual cost, which is subject to contract if any.

(4) You can contact the agent and also our company directly if you have questions. After repair guarantee period, we shall also provide lifetime charged repair service for our product.

Note

Our company will also provide lifetime repair service with fee for inverter which is not within period of repair guarantee.

8.4 Storage

The user must pay attention to following points for temporary storage and long-term storage after purchasing the inverter:

(1) Avoid storing the inverter in high temperature, moist place and place of dust, metal powder and assure good ventilation.

(2) Longtime storage will cause electrolyte capacitance of low quality, so must assure that it's electrified for one time within 2 years and electrification time is not shorter than 5 hours and input voltage must be increased to rated value gradually by voltage adjustor.

Chapter 9 Appendix

Appendix 1 ACD2**(ACD200~ACD299) Communication Protocol

ACD280 series of inverter provides RS485 communication interface, User can carry out centralized monitoring through PC/PLC to get operating requirements. （ Set the inverter running command, function code parameters and read the work status and fault information,etc）

1. Relative function parameter

H3-10: Communication overtime checkout time, When serial port communication fails and its continuous time exceed set value of this function code, the inverter judge it as communication failure. The inverter would not detect serial port communication signal, namely this function ineffective when set value is 0.

H3-11: Local response dalay time, local response delay time represents the time within which the inverter serial port receive and execute command from upper device and then respond to upper device, this function is just used for setting this delay time.

2. About Protocol

This serial communication protocol defines the transmission information and use format in the series communication and it includes master-polling (or broadcasting) format, master coding method and the content includes function code of action, transferring data and error checking. The response of slave is the same structure, and it includes action confirmation, returning the data and error checking etc. If slave takes place the error while it is receiving the information or cannot finish the action demanded by master, it will send one fault signal to master as a response.

3. Application Method

The inverter will be connected into a “Single-master Multi-slave” PC/PLC control net with RS485 bus.

3. Bus structure

1）Interface mode

RS485 Hardware interface.

2）Transmission mode

There provide asynchronous series and half-duplex transmission mode. At the same time, just one can send the data and the other only receives the data between master and slave. In the series asynchronous communication, the data is sent out frame by frame in the form of message.

3）Topological mode

In Single-master system, the setup range of slave address is 0 to 247. Zero refers to broadcast communication address. The address of slave must is exclusive in the network. That is one condition of one slave machine.

5. Protocol Description

ACD280 series inverter communication protocol is a asynchronous serial master-slave communication protocol, in the network, only one equipment, and master can build a protocol, (Named as “Inquire/Command”). Otherequipments, slave’s response “Inquire/Command” of master only by providing the data or doing the action according to the master’s “Inquiry/ Command”. Here, master is Personnel Computer, Industrial Machine or Programmable logical controller, and the slave is inverter. Master not only visits some slave, but also sends the broadcast information to all the slaves. For the single master “Inquiry/Command”, all of slaves will return a signal that is a response; for the broadcast information provided by master, slave needs not feedback a response to master machine.

5. Communication Data Structure

ModBus protocol communication data format of ACD280 series of inverter is shown as following: （In RTU mode, messages start with a interval of at least 3.5 character times. The first field then transmitted is the device address.The allowable characters transmitted for all fields are hexadecimal 0 ... 9, A ... F. Networked devices monitor the network bus continuously, including during the silent intervals. When the first field (the address field) is received, each device decodes it to find out if it is the addressed device. Following the last transmitted character, a similar interval of at least 3.5 character times marks the end of the message. A new message can begin after this interval） The entire message frame must be transmitted as a continuous stream. If a silent interval of more than 1.5 character times occurs before completion of the frame, the receiving device flushes the incomplete message and assumes that the next byte will be the address field of a new message. Similarly, if a new message begins earlier than 3.5-character times following a previous message, the receiving device will consider it a continuation of the previous message. This will set an error, as the value in the final CRC field will not be valid for the combined messages. A typical message frame is shown below.

● **RTU Frame Format**

START	3.5-character time
ADDR	Communication addr. : 0 to 247
CMD	03:Read slave parameters 06: Write slave parameters

DATA（N-1）	Function code parameter address, the number of function code parameter, Function code parameter,etc.
DATA（N-2）	
……	
DATA0	
CRC CHK low order	Detection Value: CAC value
CRC CHK high order	
END	At least 3.5-character time

2）CMD and DATA

Command code: 03H reads N words. (There are 12 characters can be read at the most.)

For example: The inverter start address 002 of the slave 01 continuously reads two consecutive values.

Master command information

ADR	01H
CMD	03H
Byte number high order	F0H
Byte number low order	02H
Register number high order	00H
Register number low order	02H
CRC CHK low order	CRC CHK values are to be calculated
CRC CHK high order	

Slave responding information

ADR	01H
CMD	03H
Byte number	04H
Data F002H high order	00H
Data F002H low order	00H
Data F003H high order	00H
Data F003H low order	01H
CRC CHK low order	CRC CHK values are to be calculated
CRC CHK high order	

Command code: Command Code：06H，write a word.

For example:Write 5000（1388H）into F00AH which slave address is 02H.

Master command information

ADR	04H
CMD	06H
Data addr. high order	F0H
Data addr. low order	01H
Data content high order	13H
Data content low order	88H
CRC CHK low order	CRC CHK values are to be calculated
CRC CHK high order	

Slave responding information

ADR	04H
CMD	06H
Data address high order	F0H
Data address low order	01H
Data Content high order	13H
Data Content low order	88H
CRC CHK low order	CRC CHK values are to be calculated
CRC CHK high order	

- Cyclical Redundancy Check

In RTU mode, messages include an error-checking field that is based on a CRC method. The CRC field checks the contents of the entire message. The CRC field is two bytes, containing a 16-bit binary value. The CRC value is calculated by the transmitting device, which appends the CRC to the message. The receiving device recalculates a CRC during receipt of the message, and compares the calculated value to the actual value it received in the CRC field. If the two values are not equal, an error results.

The CRC is started by 0xFFFF.Then a process begins of applying successive eight-bit bytes of the message to the current contents of the register. Only the eight bits of data in each character are used for generating the CRC. Start and stop bits, and the parity bit, do not apply to the CRC.

During generation of the CRC, each eight-bit character is exclusive ORed with the register contents. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position.The LSB is extracted and examined.If the LSB was a 1, the register is then exclusive ORed with a preset, fixed value. If the LSB was a 0, no exclusive OR takes place. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is exclusive ORed with the

register's current value, and the process repeats for eight more shifts as described above. The final contents of the register, after all the bytes of the message have been applied, is the CRC value.

When the CRC is appended to the message, the low byte is appended first, followed by the high byte.

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

● Communication Parameter Address

The chapter is about communication contents, it's used to control the inverter operation, the status of the inverter and related parameter setup.

Read and write function-code parameters (Some functional code is not changed, only for the manufacturer use.)

The mark rules of Function code parameters address:

The parameter address for indicating the rules.

High byte：F0H

High byte：fixed F0H

Low byte: 00~FFH, please refer to address column of function code parameter table. If address column is decimal number DCH，the low byte is hexadecimal number DCH.

Note：

Group HE: parameters are neither read nor change except HE.00. Some parameters can not be changed during operation, some parameters regardless of what kind of state the inverter

in, the parameters can not be changed.Change the function code parameters, pay attention to the scope of the parameters, units, and relative instructions.

Besides, due to EEPROM is frequently stored, it will reduce the lifetime of EEPROM.In the communication mode, and some function code needn't be stored as long as change the RAM value. To achieve this function, change high order F of the function code into zero.

Corresponding function code addresses are indicated below:

High byte: 00 to 0F

Low byte: 00 to FF

For example: Function code address column 7EH can not be stored into EEPROM, address indicates to be 007EH. This address can only act writing RAM, it can not act reading, when act reading, it is invalid address.

Stop/stop parameter:

Parameter addr.	Parameter description
1000	**Communication setup value(-10000 to 10000)(Decimal)**
1001	**Running frequency**
1002	**Bus voltage**
1003	**Output voltage**
1004	**Output current**
1005	**Reserved**
1006	**Reserved**
1007	Run speed
1008	**MI input status**
1009	**DO output status**
100A	**Reserved**
100B	**ACI voltage**
100C	**Reserved**
100D	**Counting value input**
100E	**Reserved**
100F	**Reserved**
1010	**PID setup**
1011	**PID feedback**
1012	**PLC process**
1013	**Reserved**

For the patameters of this part, the communication setup frequency value is the percentage of

the maximum frequency (-100.00% to 100.00%), which can be communication read and write.

Control command input to inverter (write-only)

Command word address	Command function
2000	**0001： Forward operation**
	0002： Reverse operation
	0003： Forward jog
	0004： Reverse jog
	0005： Free stop
	0006： Speed-down stop
	0007： Fault reset

Read the inverter status(read only)

Status word address	Status word function
3000	**0001： Forward rotation**
	0002： Reverse rotation
	0003： Stop

Inverter fault description:

Inverter fault address	Inverter fault information
8000	0000H： No fault 0001H : Inverting module protection 0002H：Speed-up over current 0003H： Speed-down over current 0004H： Contant over current 0005H： Speed-up over voltage 0006H： Speed-down over voltage 0007H：Contant speed over voltage 0008H：Control power failure 0009H：Under voltage failure 000AH： Inverter overload 000BH： Motor overload 000CH：reserved 000DH：reserved 000EH：inverter overheating 000FH： External fault 0010H： RS485 communication fault 0011H：reserved 0012H： Current detection fault 0013H: reserved 0014H：reserved

	0015H： EEPROM read and write fault 0016H: inverter hardware failure 0017H: reserved

Descriptive data of communication fault information (fault code)

Communication fault address	Fault function description
8001	0000： No fault 0001： Password error 0002： Command code error 0003： CRC check error 0004： Invalid address 0005： Invalid parameter 0006： Parameter change invalid 0007： The system is locked

7. Group H3 Communication Parameter Description

H3.08	**Communication deployment**	**Range： LED first bit: 2~7 LED second bit: 0,1**	**05**

2：1200BPS

3：2400BPS

4：4800BPS

5：9600BPS

6：19200BPS

7：38400BPS

H3.08 make use of 1st bit, 2nd bit to set baud rate and data format of serial communication.thereinto LED 1st bit represents communication baud rate, set value as follows:

2：1200BPS

3：2400BPS

4：4800BPS

5：9600BPS

6：19200BPS

7：38400BPS

LED 2nd bit: represents data format, set value as follows:

0: 1-8-2 format, no checkout. Namely: 1 bit for starting, 8 bits for data, 2 bit for stop, no checkout.

1: 1-8-1 format, even checkout. Namely: 1 bit for starting, 8 bits for data, 1 bit for stop,

even checkout.

2: 1-8-1 format, odd checkout. Namely: 1 bit for starting, 8 bits for data, 1 bit for stop, odd checkout.

H3.09	Local address	Range: 0~247, 0 is broadcast address	**1**

This function code is used to identify address of this inverter during serial port communication. 0 is for main inverter during main and sub device communication between inverters

0 is broadcast address, can only receive and execute broadcast command from upper machine but not respond to upper machine when 0 is set to broadcast address.

H3.10	Communication overtime checkout time	**Range: 0.0－1000.0s**	**0.0S**

When serial port communication fails and its continuous time exceed set value of this function code, the inverter judge it as communication failure. The inverter would not detect serial port communication signal, namely this function ineffective when set value is 0

When the function code is setted as the effective value, and the communication interval time between the first and second communication is exceed the communication delay time, the system will show communication failure(U-16). In general, we shall setup them ineffective. In the case of consistant communication system, to setup it, can monitor the comminucation stutas.

H3.11	**Local response dalay time**	**Range: 0-1000ms**	**5ms**

Local response delay time represents the time within which the inverter serial port receive and execute command from upper device and then respond to upper device, this function is just used for setting this delay time.

8. The following C code is the serial interface communication imitate program on the PC. It can be used for the reference(To implement under the condition of TURBO C2.0)

8.

```
/*RS485&RS232 communication test program*/
#include<stdio.h>
#include<conio.h>
#include<process.h>
```

```
#include<dos.h>
unsigned int crc_chk_value(unsigned char *data_value,unsigned char length);
#define PORT 0x03F8 /*the address of COM1*/
/*the address offset value relative to COM1*/
#define IER 0x0001
#define BRDH 0x0001
#define LCR 0x0003
#define MCR 0x0004
#define LSR 0x0005
#define MSR 0x0006
unsigned char send_data_table[8]={0x01,0x06,0x20,0x00,0x00,0x02};
unsigned char receive_data_table[50];
void main()
{
unsigned int i;
unsigned char *p;
unsigned int crc_value;
outportb(PORT+MCR,0x08); /*interrupt enable*/
outportb(PORT+IER,0x01); /*interrupt as data in*/
outportb(PORT+LCR,(inportb(PORT+LCR)|0x80));
outportb(PORT,12); /*set baudrate=9600,12=115200/9600*/
outportb(PORT+BRDH,0x00);
outportb(PORT+LCR,0x1b); /*<8,N,2>=07H;<8,E,1>=1BH;<8,O,1>=0BH*/
p=send_data_table;
crc_value=crc_chk_value(p,6);
send_data_table[6]=crc_value&0x00ff;
send_data_table[7]=(crc_value>>8)&0x00ff;
i=0;
for(i=0;i<8;i++)
{
while(!(inportb(PORT+LSR)&0x20)); /*wait until THR empty*/
{
outportb(PORT,send_data_table[i]); /*send data to THR*/
printf("send data table %x = %x\n",i,send_data_table[i]);
```

```
}
}
i=0;
while(!kbhit())
{
if(inportb(PORT+LSR)&0x01)
{
receive_data_table[i]=inportb(PORT); /*read data from RDR*/
printf("receive data table %x = %x\n",i,receive_data_table[i]);
i++;
}
}
clrscr();
}
/*****************************************************/
unsigned int crc_chk_value(unsigned char *data_value,unsigned char length)
{
unsigned int crc_value=0xFFFF;
int i;
while(length--)
{
crc_value^=*data_value++;
for(i=0;i<8;i++)
{
if(crc_value&0x01)
{
crc_value=(crc_value>>1)^0xa001;
}
else
{
crc_value=crc_value>>1;
}
}
}
```

```
return(crc_value);
}
```

Appendix 2 braking unite and the selection of brake resistor

Power of inverter		Braking unit		Compound brake resister			Braking torgue 10%ED
voltage	Max Capacity KW （HP）	Type 70BR	quntity （set）	Recommend resistance	Unit resistor specificaion	quantity	
Single –phase 220Vseries	0.5(0.7)	Built-in		80W 200Ω	80W 120Ω	1	100%
	0.75(1.0)	Built-in		80W 200Ω	80W 120Ω	1	
	1.5(2.0)	Built-in		150W 100Ω	150W 100Ω	1	
	2.2(3.0)	Built-in		200W 80Ω	200W 68Ω	1	
	3.7(5.0)	Built-in		300W 50Ω	300W 50Ω	1	
Three-phase 380Vseries	0.75(1.0)	Built-in		80W 400Ω	80W 400Ω	1	
	1.5(2.0)	Built-in		120W 330Ω	180W 300Ω	1	
	2.2(3.0)	Built-in		160W 250Ω	250W 250Ω	1	
	3.7(5.0)	Built-in		300W 150Ω	400W 150Ω	1	
	5.5(7.5)	Built-in		400W 100Ω	600W 100Ω	1	
	7.5(10)	Built-in		550W 75Ω	800W 75Ω	1	
	11(15)	Built-in		1000W 50Ω	1000W 50Ω	1	
	15(20)	Built-in		1500W 40Ω	1500W 40Ω	1	
	18.5(25)	4030	1	2500W 35Ω	2500W 35Ω	1	
	22(30)	4030	1	3000W	1200W	4	
	30(40)	4045	1	5000W	2500W 35Ω	2	
	37(50)	4045	1	9600W 16Ω	1200W 8Ω	8	
	45(60)	4045	1	9600W	1200W	8	
	55(75)	4030	2	6000W 20Ω	1500W 5Ω	4	
	75(100)	4045	2	9600W 15Ω	1200W	8	
	90(125)	4045	2	9600W	1200W	8	
	110(150)	4045	3	9600W 16Ω	1200W 8Ω	8	
	132(175)	4045	3	9600W	1200W	8	
	160(220)	4045	4	9600W	1200W	8	
	220(300)	4045	5	9600W	1200W	8	
	250(330)	4045	6	9600W	1200W	8	

Note:

- please choose the power and resistance as recommened.

●The recommened power and resistance are all be counted according to braking torque100% and using frequency 10%. In the case of meeting load and system relibility, can appropriately increase or decrease resistance power and resistance; As for increasing braking torque or high using frequency, can appropriately changed the power braking resistance and electrical resistance, or contact our company.

●When install braking resistance, be sure to consider surrounding environment of safety and inflammable.

Appendix 3 "one drive two"consistant pressure water supply control card

ACD280 inverter installed D28WS water supply control card and realize “one drive two” pumps cycle consistant pressure water supply. It also can realize the “one using and one back-up” consistant pressure water supply which can provide the convinience and costs reduce to cusomer.

1. type introduce

name	type
“one drive two” consistant pressure water supply control card	D28WS

2．Dimentions and installation

Installation methods：

（1）please cut down the power of inverter completely；

（2）install the PC segregation column on the control plate, and install the isolated spacer on the PC segregation column.

（3）to connect the interface of the “one drive two” consistant pressure water supply and the expandation card interface of the inverter. At the same time, install the isolated spacer on the PC segregation column.

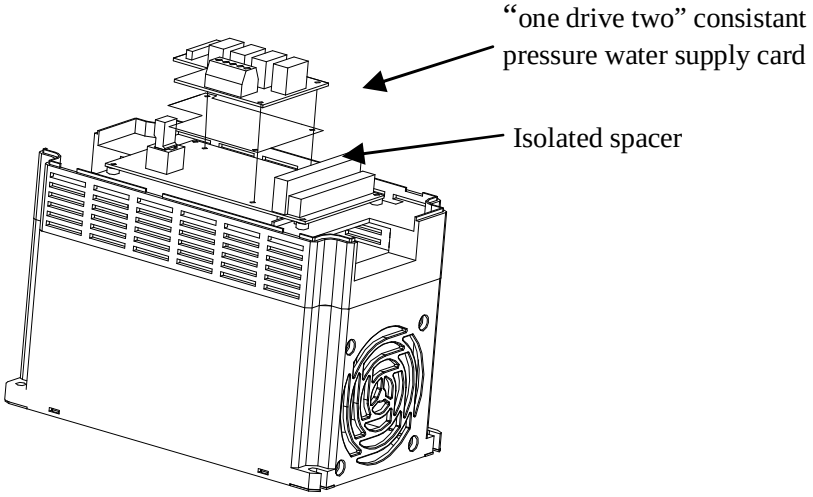


Fig 9-1 “one drive two” consistant pressure water supply assembly drawing

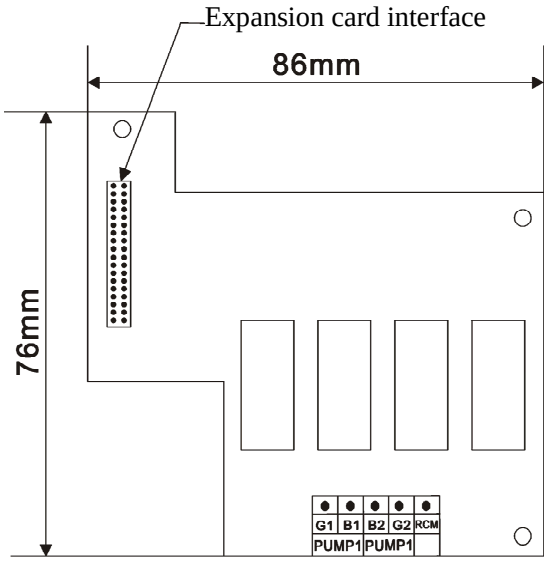


Fig 9-2 “one drive two” consistant pressure water supply card outline dimention drawing

3. Control terminal and wiring

G1	B1	G2	B2	RCM
PUMP1		PUMP2		RCM

item	Terminal symbols	Terminal name	Function instruction
Relay output	B1-RCM	Relay output terminal, the first pump changes frequency.	1. contactor controlling node output 2. capacity:AC380V/3A、DC30V/1A、
	G1-RCM	Relay output terminal, the first pump is power frequency.	
	B2-RCM	Relay output terminal, the second pump changes frequency.	
	G2-RCM	Relay output terminal, the second pump is power frequency.	

4. Function parameters

Detailed information see the Chaper Six: H5、HA、Hb group parameter.

5. Application example

5.1 process requirement

（1）“one use one back-up” circulate water supply

（2）dormant and revise function, save power

（3）two pumps to rotate timingly, to avoid the pupe det rust

5.2 Pump configuration

The second water supply system, configuration is as following:

15KW（rated current 29A，rated voltage280V）inverter 1 set；

5.3 pressure gauge selection

didtance pressure gauge，DC：0~10V output，range 1Mpa。

5.4 inverter selection

According to the type of inverting pump, to select the ACD280-4T15LB inverter and D28WS water supply control card.

5.5 hardware connection

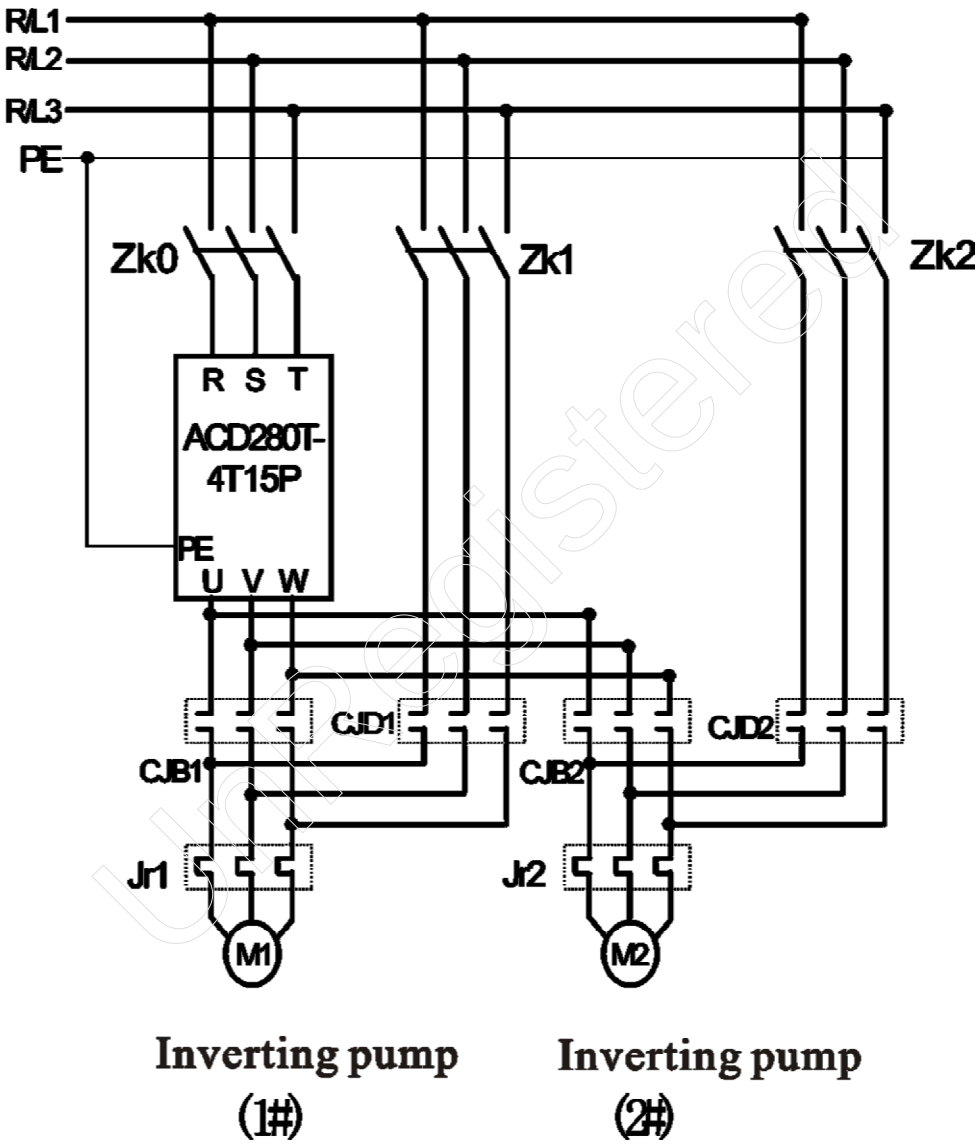


Fig 9-3 The first wiring drawing

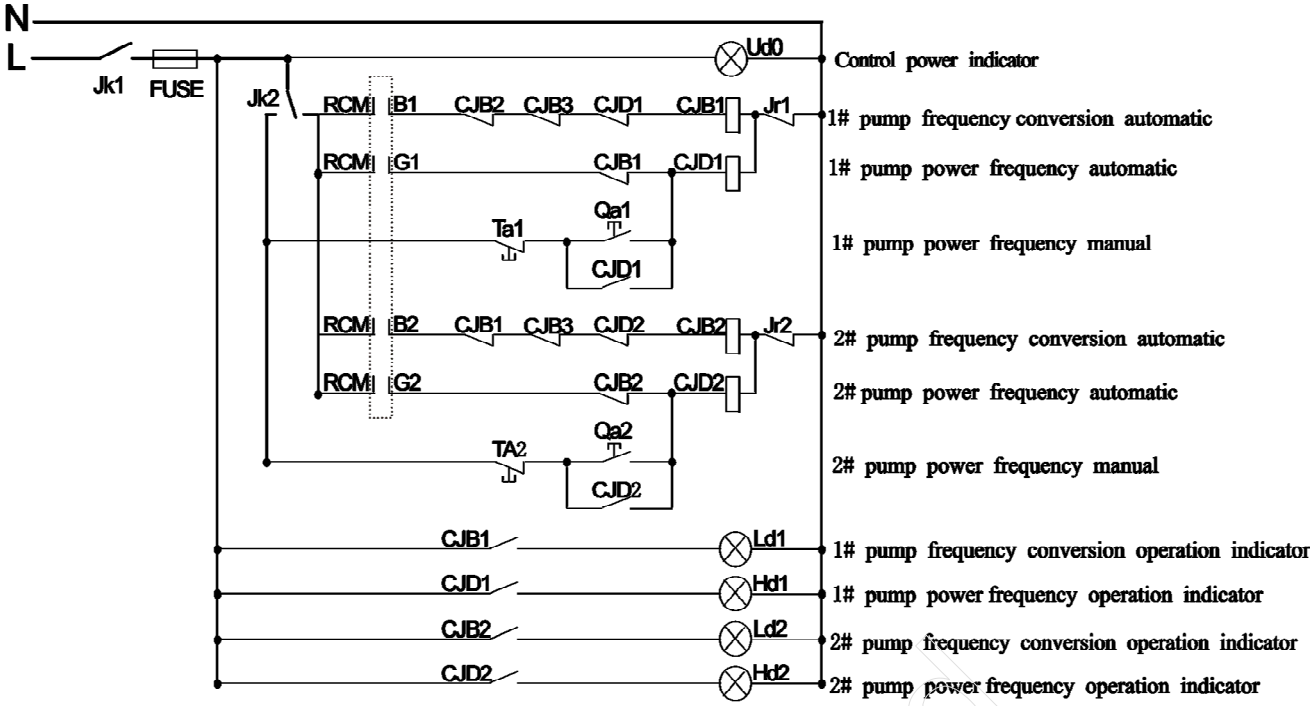


Fig 9-4 The second wiring drawing

5.5 Parameters set-up

Paramters No.	Set-up value	instruction
H5.00	1	PID closd-loop running control is effective.
H5.01	0	Defined channel- digital pressure defined is effective
H5.02	1	Feedback channel - ACI analog output is effcetive
H5.03	50.0	Digital pressure defined
H5.04	0.0	the corresponding relation between feedback and defined
H5.05	0.0	
H5.06	100.0	
H5.07	100.0	
H5.08	0.500	Percentage gain KP
H5.09	0.100	Intergral dain KI
H5.10	0.000	Differential gain KD
H5.11	0.10	Samples cycle
H5.12	2.0	deviation limit
H5.13	0	positive role
HA.00	1.0	Feedback disconnection assessment
HA.01	20.0	Feedback disconnection delay time

HA.02	1.00	Distance pressure gauge range
HA.03	30.0	dormant frequency
HA.04	300.0	Dormant delay time
HA.04	0.20	Revive pressure
HA.05	200.0	Revive delay time
HA.07	1	“one drive two” consistant water supply is effective.
HA.08	300.0	pump switching time
HA.09	0.5	Electromagnetic switch delay time
Hb.00	5760	Timing rotation time
Hb.06	28	Relay B1-RCM output function selection, the first pump changes frequency
Hb.07	28	Relay G1-RCMoutput function selection,the first pump power frequency
Hb.08	28	Relay B2-RCM output function selection, the second pump changes frequency
Hb.09	28	Relay G2-RCM output function selection, the second pump changes frequency.

Appendix 4 using inverter constitute a closed-loop control system

Parameters setup

1.To modify the H18 group parameter according to the data of motor driven by inverter 2.必须 The parameters are setted as following：

H5.00：1 closed-loop running control selection

H5.01：0 The given channel adopts keypad given

H5.02：1 The feedback channel adopts voltage feedback.

H5.03：___ To set according to the prssure

HA.02：___ pressure gauge range

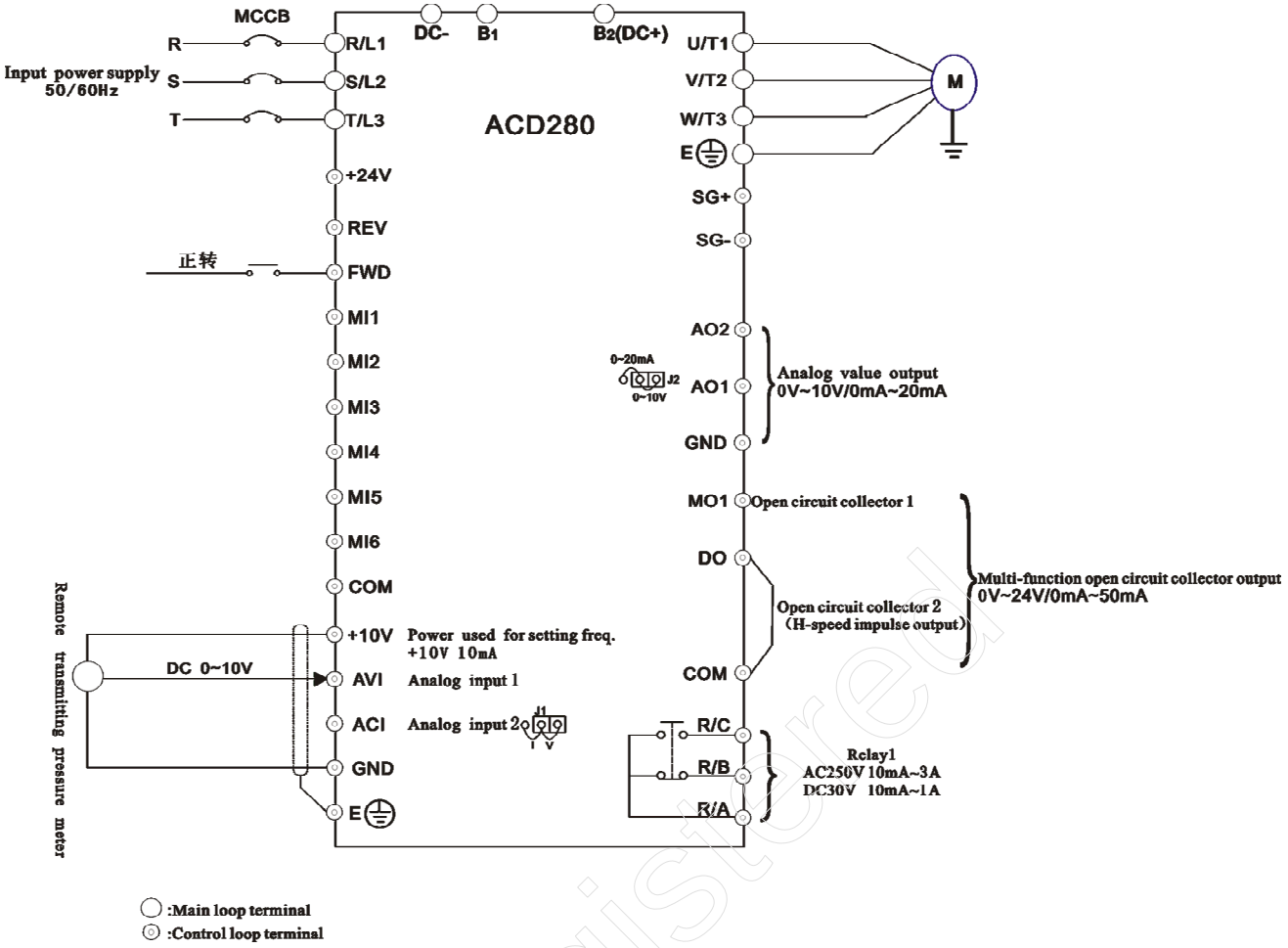
.03： 20Hz dormant frequency

HA.04：300S dormant delay time

HA.05：Revive pressure

HA.06：20S revive delay time

The pressure gauge wiring drawing is as following:



Note: pressure gauge wiring method, + 10V connects the high-end of pressure gauge, AVI gauge connects the center tap, GND connects low-end of the pressure gauge.

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