Inverter User Manual

EDS2000 inverters
EDS2800 inverters
EDS2860 inverters

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Foreword

Our products are designed and produced according to EN61800-5-1: 2003, EN61800-3: 2004 standards under ISO9001:2008 quality management system.

EDS2000 series can fulfill all kinds of demand for general inverter by advanced control manner which make high torque, high precision and wide-range speed regulation drive be available. EDS2000 is organic combine of customer's general need and industrial requirement to provide practical PI adjuster, simple PLC, programmable input output terminal control, impulse frequency provision and other special inverter control with powerful function for customer and to provide highly-integrated incorporative solution of high value for reducing system cost and improving system reliability for device manufacturing and automatization engineering customers.

EDS2800/EDS2860 series inverters are specially designed for energy save of injection molding machine. There are 2 inter-isolated special channels (voltage or current) and the inverter can be connected to injection molding machine directly. We adopt original and advanced current vector control arithmetic for it and its output torque is very high. So this series inverters can also be applied to general big inertia load and super-over load (transient 200%). We believe that its excellent performance can fulfill your needs.

EDS2000/EDS2800/EDS2860's low noise and low electromagnetic disturbance during operation can fulfill customer's environmental protection requirement by space voltage vector PWM control technique and electromagnetic compatibility unitary design.

Assembling wiring, parameter setting, troubleshooting and daily maintenance notices are available in this manual. To make sure that you can correctly assemble and operate EDS2000/EDS2800/EDS2860

series inverter to exert its excellent performance, please read this user manual detailedly before you assemble the device and conserve the manual appropriately before the end-user get it.

Please contact our office or dealer in all places at any moment if you have any doubts or special demands when using this inverter, and you can also contact our after service center in our Headquarters directly. We will serve you with all our heart.

We reserve our right to notice you if we change contents of this manual.

Catalogue

1 Safety information and use notice points

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

1.1 Safety precautions

There are three kinds of safe relevant warnings in this service manual, they are as follows:


This symbol briefs on: If does not operate on request, may make the body injured or the equipment damaged.


This symbol is briefed on some useful information.

note


This symbol briefs on: If does not operate on request, may cause death, severely injured or serious property loss.


Forbid user directly power off when the inverter is under running, accelerating or decelerating, must only ensure that the drive has been completely shut down or in standby situation can perform power off operation. Otherwise, the users themselves afford the damage of the inverter, equipment damage and personal.


(1) Forbid to connect U, V, W output end to AC power supply, otherwise cause the complete damage of the inverter.

(2) Don't make P- and P + short-circuited, otherwise cause the inverter to be damaged.

(3) The inverter is forbidden to install on the flammables, otherwise have danger of fire.

(4) Don't install it in the environment with explosive gas, otherwise have danger of causing 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 check only after closing power for10 minutes.

(9) Only qualified personnel may carry on wiring and forbid leaving over any conductive thing in machine, otherwise have danger of getting an electric shock or causing damage of the inverter.

(10) Inverter stored for over 2 years, should be stepped up gradually with voltage regulator first while having the electricity, otherwise have danger of getting electric shock and explosion.

(1) It is prohibited that connect AC 220V signal to control ends except 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 to be injured.

(3) When installing, should choose a place where can endure the inverter, otherwise have danger of injuring personnel or damaging property while falling down.

1.2 Use range

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

(2) While applying inverter to such equipments that relate much to the life, great property, safety devices etc., must handle cautiously, and consult with producer, please.

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

1.3 Use notice points

(1) EDS2000/EDS2800 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 for use. 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 device needing lubricating as the gearbox and gear wheel, etc., after running at a low speed for a long time, may be damaged as lubrication result become poor, please take necessary measure in advance.

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

(5) For hoist and great inertia load, etc., the inverter would shut off frequently due

to over-current or over-voltage failure, in order to guarantee normal work, should consider choosing 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 to be damaged.

(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.

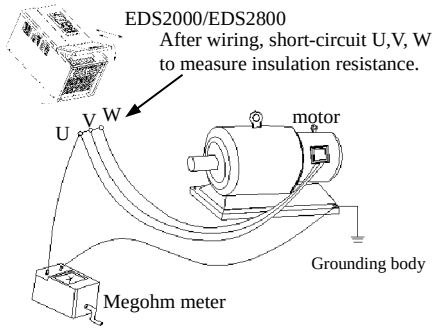
(8) The inverter may meet with mechanical resonance of the load within certain range of frequency output, can set up jumping frequency to evade.

(9) Before using, should confirm 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 5 MΩ, otherwise inverter may be damaged.

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



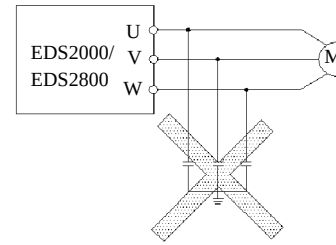


Fig.1-1 motor insulation measure **Fig.1-2 capacitor at output side forbidden**

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.

2 Type and specification of the inverter

2.1 Incoming inverter inspect

(1) Check if there is 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

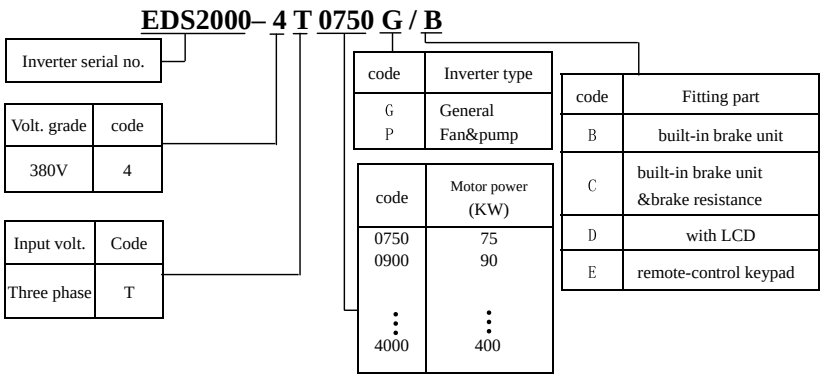


Fig. 2-1 type description

note If the inverter hasn't relevant content or can be defaulted, code after "/" will be ignored.

2.3 Series type explanation

Table 2-1 series type explanation

Inverter type （G: general with constant torque; P: special for blower water pump）		Rated power （KVA）	Rated output current （A）	Adapted motor （K）
——	EDS2800-4T0110G/0150P	17/21.7	25/33	11/15
——	EDS2800-4T0150G/0185P	21.7/25.7	33/39	15/18.5
——	EDS2800-4T0185G/0220P	25.7/29.6	39/45	18.5/22
——	EDS2800-4T0220G/0300P	29.6/39.5	45/60	22/30
——	EDS2800-4T0300G/0370P	39.5/49.4	60/75	30/37
——	EDS2800-4T0370G/0450P	49.4/60	75/91	37/45
——	EDS2800-4T0450G/0550P	60/73.7	91/112	45/55
——	EDS2800-4T0550G/0750P	73.7/99	112/150	55/75
EDS2000-4T0750G/0900P	——	99/116	150/176	75/90
EDS2000-4T0900G/1100P	——	116/138	176/210	90/110
EDS2000-4T1100G/1320P	——	138/167	210/253	110/132
EDS2000-4T1320G/1600P	——	167/200	253/304	132/160
EDS2000-4T1600G/2000P	——	200/250	304/380	160/200
EDS2000-4T2000G/2200P	——	250/280	380/426	200/220
EDS2000-4T2200G/2500P	——	280/318	426/474	220/250
EDS2000-4T2500G/2800P	——	318/342	474/520	250/280
EDS2000-4T2800G/3150P	——	342/390	520/600	280/315
EDS2000-4T3150G/3550P	——	390/430	600/650	315/355
EDS2000-4T3550G/3750P	——	430/447	650/680	355/375
EDS2000-4T3750G/4000P	——	447/493	680/750	375/400
EDS2000-4T4000G	——	493	750	400

2.4 Appearance and parts name explanation

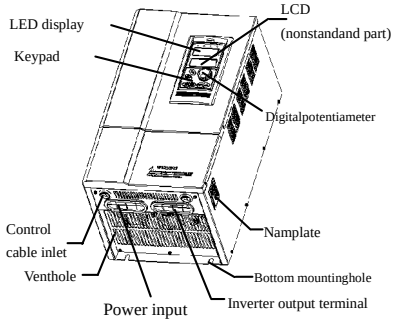


Fig. 2-3 Parts name sketch

2.5 Outer size and gross weight

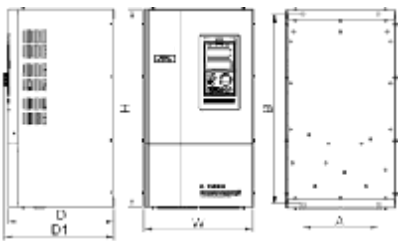


Fig.a outer dimension

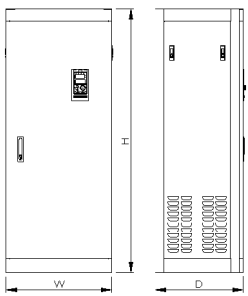


Fig.b outer dimension

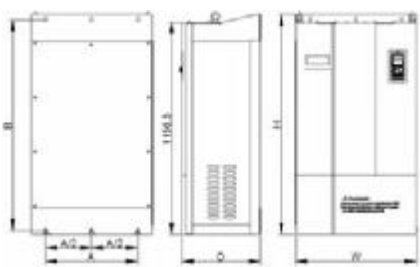


Fig.c outer dimension

Fig.2-4 outer dimension

Table 2-2 mounting size

Inverter type (G: general; P: special)		A (mm)	B (mm)	W (mm)	H (mm)	D (mm)	D1 (mm)	Fixing Aperture (mm)	Gross weigth (kg)	Fig.
——	EDS2800-4T0110	140	350	230	370	212	223	7	14.5	Fig.a
——	EDS2800-4T0150	180	440	260	460	252	261	9	18.5	Fig.a
——	EDS2800-4T0185									
——	EDS2800-4T0220									
——	EDS2800-4T0300	200	515	300	535	252	261	9	25.5	Fig.a
——	EDS2800-4T0370									
——	EDS2800-4T0450	250	620	370	645	258	267	12	52	Fig.a
——	EDS2800-4T0550								52	
EDS2000-4T0750G/4T0900P	——								53	
EDS2000-4T0900G/4T1100P	——	300	650	480	680	360	369	12	84	Fig.a
EDS2000-4T1100G/4T1320P	——	400	720	480	750	372	381	12	95	Fig.a
EDS2000-4T1320G/4T1600P	——								98	
EDS2000-4T1600G/PA	——	400	740	480	770	410	—	12	104	Fig.a
EDS2000-4T2000G/PA	——	420	1157	560	1200	430	—	14	165	Fig.c
EDS2000-4T2200G/PA	——									
EDS2000-4T2500G/PA	——	500	1157	660	1200	430	—	14	190	Fig.c
EDS2000-4T2800G/PA	——									
EDS2000-4T1600G/4T2000P	——	—	—	600	1500	500	—	—	165	Fig.b
EDS2000-4T2000G/4T2200P	——	—	—	600	1600	500	—	—	195	Fig.b
EDS2000-4T2200G/4T2500P	——									
EDS2000-4T2500G/4T2800P	——	—	—	700	1600	500	—	—	225	Fig.b
EDS2000-4T2800G/4T3150P	——									
EDS2000-4T3150G/4T3550P	——									
EDS2000-4T3550G/4T3750P	——	—	—	800	1750	550	—	—	250	Fig.b
EDS2000-4T3750G/4T4000P	——	—	—	900	1800	600	—	—	275	Fig.b
EDS2000-4T4000G	——									

2.6 Outer size of keypad and its fixing box (unit：mm)

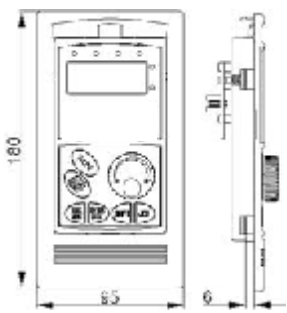


Fig.a EN-KB1 keypad

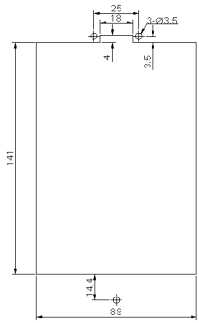


Fig.b keypad fitting box

2.7 Product technic index and spec

Item			Item description
Input	Rating volt., frequency		3 phase 380V；50Hz/60Hz
	Allowed work volt. range		Volt.：320V~460V
output	Voltage		0-380V
	Frequency		0Hz-400Hz
	Over loading capacity		**G type:** 150% of rated current for 1 minute，200% of rated current for 0.5s； **P type:** 90KW~132KW: 120% of rated current for 1 minute；160KW above: 110% of rated current for 1 minute，150% of rated current for 1s **EDS2800/EDS2860 type:** 150% of rated current for 3 minutes，200% of rated current for 5s
Control performance	Control mode		optimized space volt. vector PWM control mode for EDS2000; simple current vector control mode for EDS2800 and EDS2860 series
	Speed regulation range		1：100
	Start-up torque		150% of rating torque at 3 Hz frequency for EDS2000 series; 130% of rated torque at 1Hz frequency for EDS2800 and EDS2860 series
	Running speed stable state precision		≤±0.5% of rating synchronous speed
	Frequency precision		Digital setting: max. frequency×±0.01%；analog setting: max.frequency×±0.5%
	Frequency resolution	Analog setting	0.1% of max. frequency
		Digital setting	0.01Hz
		Exterior impulse	0.1% of max. frequency
		Keypad digital setting	0.01Hz
	Torque boost		Automatic torque boost，manual torque boost 0.1%~20.0%
	V/F curve (volt. frequency characteristic)		Set rating frequency randomly at range of 5~400Hz，can choose constant torque, degressive torque 1, degressive torque 2, degressive torque 3, user defined V/F curve in total 5 kinds of curve
	Accelerating decelerating curve		3 modes：straight line accelerating decelerating, S curve accelerating decelerating and automatic accelerating decelerating mode; 4 kinds of accelerating decelerating time (unit minute/second can be optioned), max. time 6000 minutes.
	brake	Powerconsumption brake	Interior or exterior brake resistance
		DC brake	Optional start-up and stop，action frequency 0~15Hz，action volt. 0~15%，action time 0~20.0 s

	Jog	Jog frequency range：0.50Hz~50.00Hz; 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 volt. regulation (AVR)	Can keep constant output volt. When power source voltage varies.
	Automatic current limiting	Limit running current automatically to avoid frequent over-current which will cause trip
Running function	Running order specified channel	Key pad 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 any time by kinds of method
	pulse output channel	Impulse square wave signal output of 0~50KHz，can realize output of physical parameter such as setting frequency, output frequency etc.
	Analog output channel	2 channel of analog signal output，optional 4~20mA or 0~10V separately，can realize output of physical parameter such as setting frequency, output frequency etc.
	Special channel for EDS2800	Inter-insulated 2 channel of 0~1A and 2 channel of 0~10V analog input signal
keypad	LED display	Can display setting frequency, output frequency, output voltage, output current etc. in total 20 kinds of parameter
	LCD display	optional，operation is noted by English
	Parameter copy	Use keypad and remote-control keypad to copy the parameter speedily
	Lock the button	Lock all the button
Protection function		Over-current protection, over-voltage protection, lack-voltage protection, over-heat protection, over-load protection, missing phase protection (in option)etc.
Fitting parts		LCD keypad, brake subassembly, remote-control keypad, connecting cable for remote-control keypad etc.
ambient	Use ambient	indoor，not bare to sunlight，no dust, no corrosive gas, no flammable gas, no oil fog, no vapor, 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
Mounting mode		Wall hanging for type of 132kwG/160kWP and below, cabinet standing for type of 160kwG/200kwP and above, wall hangning for all EDS2800 types.


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.

3 Installation and wiring

3.1 Installation ambient

3.1.1 Demand for installation ambient

(1) Installed in drafty indoor place，ambient temperature within -10 ºC~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 powder.

(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 5.9m/s²(0.6g).

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

3.1.2 Installation direction and space

(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.

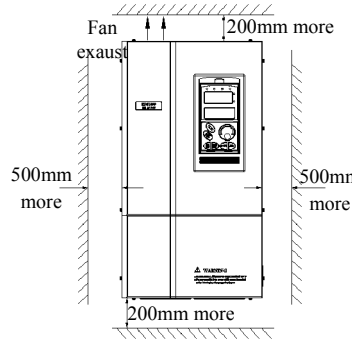


Fig. 3-1 mounting space

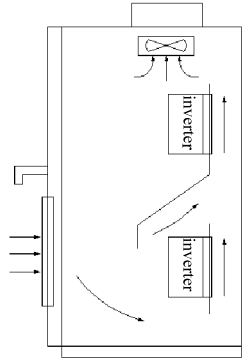


Fig. 3-2 mounting of multiple inverters

3.2 Parts disassembly and installation

3.2.1 Key board disassembly and installation

(1) disassembly

Let the forefinger press finger inlet on the keypad，depress fixing flexible plate on the top lightly, draw it outward, then you can disassemble the keypad.

(2) assembly

First place the fixing hook at the bottom of keypad onto mounting claw on keypad mounting hole, let forefinger press fixing flexible plate on top of keypad and then push it inside, release it in proper location(after a crisp sound), see fig. 3-3.

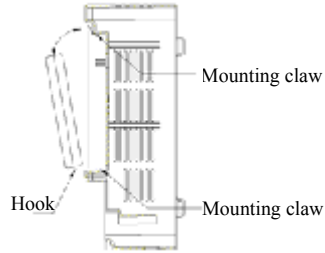


Fig.3-3 mounting sketch of keypad

3.2.2 Cover disassembly and installation

(1) Disassembly：

First take off 2 screws at sides of the cover and move it a bit outward horizontally, then tilt it at 15 degree and draw it outward at direction shown in right figure, now you can take the cover off.

(2) Assembly：

First put down the cover in parallel with unit body and make it just locked at 2 sides of the inverter, secondly force it ahead and make fixing part on its top inserted into fixing slot of unit body, at last screw the cover and finish assembly for the cover. As shown in Fig.3-5.

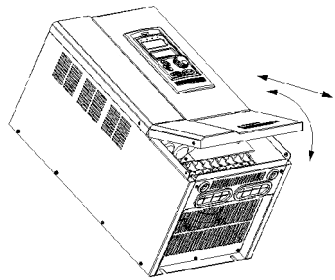


Fig. 3-5 disassembly and assembly for metal cover

3.3 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, V, W 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 3.5mm² above 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. 3-5.

(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(X1~X8, Y1, Y2, FWD, REV), should use above 0.75mm² glued wire or shielding wire，one shielding layer end hung in the air,the other connected to grounding end PE, connecting wire shorter than 50m.

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

(2)Before internal wiring, confirm that DC volt. Between main loop end P+ and P- fall down to below DC36V.

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

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

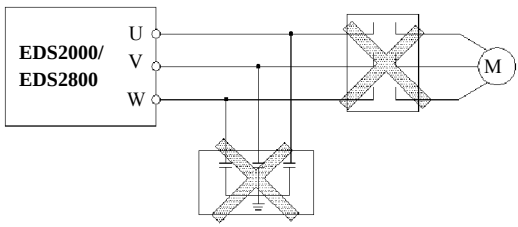


Fig.3-6 banned magnetic control conductor and absorbing capacitance between inverter and motor

3.4 Main loop terminal wiring

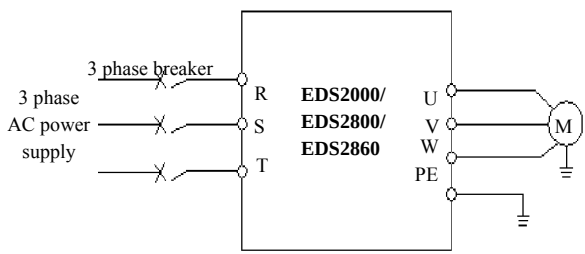


Fig.3-7 main loop simple wiring

3.4.1 Connection between inverter and fitting parts

(1) Must assemble disjunction device such as isolation switch etc. between powersource 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 protectionfunction to avoid malfunction expandingcaused 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 and emission disturbance from inverter power supply wire.

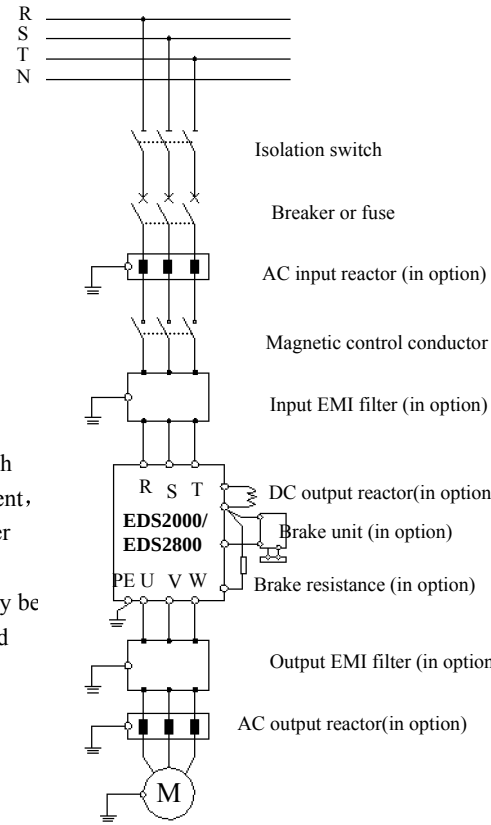


Fig.3-8 the connection betweem the inverter and fittings parts

(6) DC reactor

Built-in DC reactor as standard configuration for EDS2000-4T1600G/4T2000P and type of higher power, put-outside DC reactor as fitting part for type of power lower than EDS2000-4T11600G/EDS2000-4T1600P. To avoid effect tothe inverter from power supply and to protect the inverter and to inhibit high order harmonic, should deploy DC reactor under following situations.

① When there is on-off blind power compensation capacitor or controlled silicon

phase control load at the same power supply for the inverter, it's possible to damage input rectifying circuit of the inverter because on/off switching of capacitor may causesudden change of power network voltage and phase control load cause harmonic and power network wave-form aberration.

② When unbalance degree of 3 phase power supply for the inverter exceeds 3%.

③ When input side power factor of the inverter is required to reach above 0.9.

④ Under normal situation, DC reactor is needed for the inverter when capacitance of power supply is larger than 10 times of inverter capacitance.

(7) Output side EMI filter

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

(8) 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.

(9) Complete ground wire

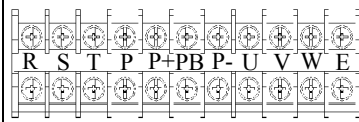
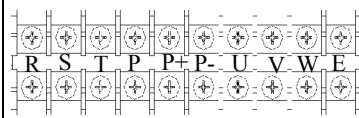
Inverter and motor must be earthed and grounding resistor smaller than 10Ω. Grounding wire should be shorter enough and wire diameter be bigger enough(not smaller than following standard):

75KW and above motor：38mm² above copper wire

3.4.2 Main loop terminal wiring

For main loop input output terminal, see table 3-1.

Table 3-1 main loop input output terminal description

Adapted type	Main loop terminal	Terminal name	Function description
EDS2800-4T0110		R, S, T P P+ P− PB U, V, W E	3 phase AC 380V input terminal DC side voltage positive terminal P, P+ can connect DC reactor DC side voltage negative terminal DC braking resistance can be connected between P and PB 3 phase AC output terminal Shield grounding terminal
EDS2000-4T0750G~ EDS2000-4T3750G EDS2000-4T0900P~ EDS2000-4T3750P EDS2800-4T0150~ EDS2800-4T0550		R, S, T P P+ P- U,V, W E	3 phase AC 380V input terminal DC side voltage positive terminal Reserved terminal for exterior DC reactor DC side voltage negative terminal 3 phase AC output terminal Shield grounding terminal

note

(1) Can connect braking unit between P+ and P- externally if necessary.

(2) Can connect DC braking resistor between PB and P+ externally if necessary.

(3) DC ractor can be connected between P and P+ if necessary.

(4) P and P+ must be short-circuited before shipment, otherwise the inverter can't work.

3.5 Basic running wiring diagram

Adapted type：EDS2000-4T0750G~EDS2000-4T3750G
EDS2000-4T0900P~EDS2000-4T3750P
EDS2800-4T0110~EDS2800-4T0550

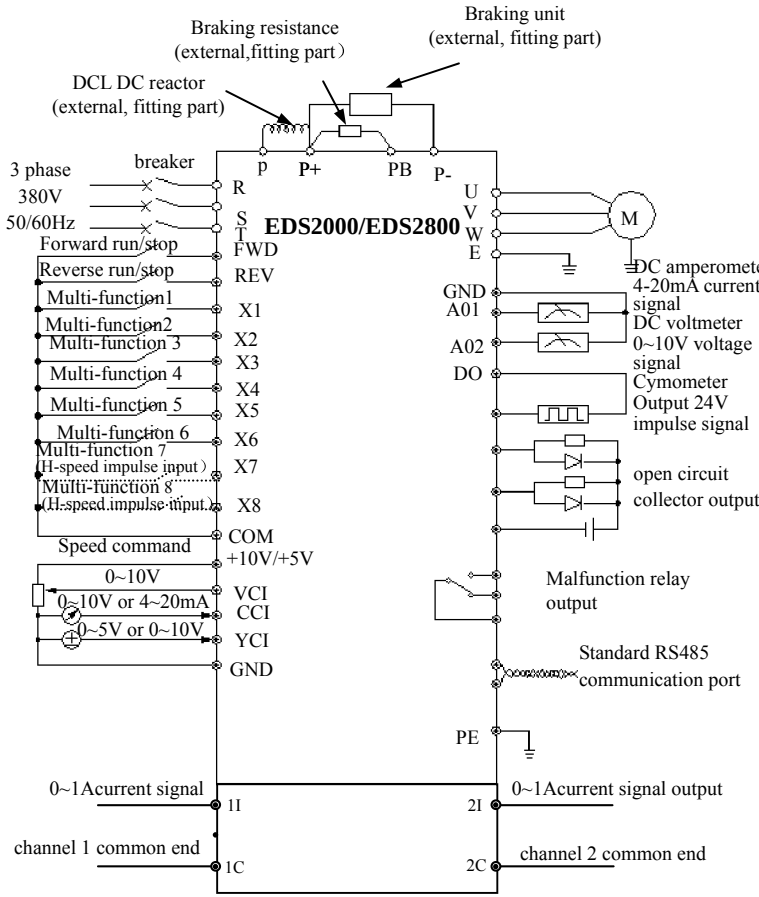


Fig. 3-9 Basic wiring diagram

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.3-9.

Function description of terminal provided for the user, please see Table 3-2，function and setup description of jumping-wire switch, please see Table 3-3，terminal CN1, CN2 and CN4 are for manufacturer's use. 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 connecting wire is recommended.

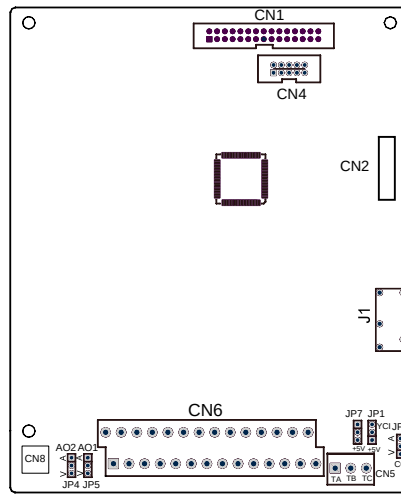


Fig. 3-10 jumping-wire switch on CPU board

Table 3-2 function description of terminal provided for user

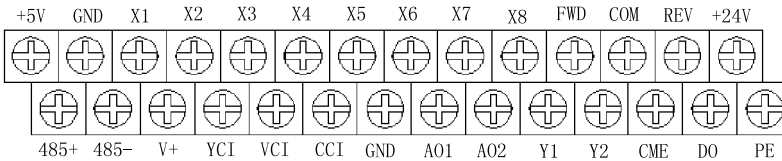
symbol	function	Description
CN3	RS485 communication port	Remote-control keypad and upper machine control connection port
CN5	Malfunction relay signal output	Always-open connect pin of the relay closed when malfunction in inverter occurs
CN6	External terminal input output control	Use this port when external terminal control inverter running
CN8	Special channel for injection molding machine	Special input channel for EDS2800 series

Table 3-3 function description of jumping-wire switch provided for user

symbol	function	setting	factory default
JP1	YCI 5V/10V voltage input mode selection	5V：0-5V voltage signal； 10V：0-10V voltage signal	0-5V
JP2	CCI current/voltage input mode selection	A：0/4~20mA current signal； V：0~10V voltage signal	0~10V
JP4 JP5	2 group of separate analog output terminal AO1, A02 output current/voltage type selection	A：4~20mA：AO1, AO2 terminal output current signal V：0~10V：AO1, AO2 terminal output voltage signal	0~10V

3.6.2 Explanation for control CPU board

(1) control loop terminal CN6 arranged as follows：



(2) CN6 terminal function description as Table 3-4.

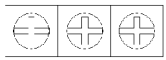
Table 3-4 CPU board CN6 terminal function table

item	symbol	name	Function description	Spec
run command	FWD	Forward run command	Forward reverse run command, see F5.08 group double-wire and three-wire control function description	Optocoupler isolation input Input impedance: R=2K Ω Max. input frequency: 200Hz
	REV	Reverse run command		
Multi-function input terminal	X1	Multi-function input 1	Used for multi-function input terminal, for detailed see Chapter 6 Section 6.6 terminal function parameter(F5 group)input end function description. X7, X8 can be set as H-speed pulse input port, for detailed see Chapter 6 Section 6.6 terminal function parameter (F5 group) input end function description. (common end: COM)	X1~X8 FWD, REV Close effect COM Input impedance of X7, X8 input channel:R=2K Ω Max. output Freq.: 50KHz Input voltage range:15~24V
	X2	Multi-function input 2		
	X3	Multi-function input 3		
	X4	Multi-function input 4		
	X5	Multi-function input 5		
	X6	Multi-function input 6		
	X7	Multi-function input 7		
	X8	Multi-function input 8		
Power supply	+24V	+24V power supply	Provide +24V power supply. (negative pole：COM)	Max. output current:150mA
	+10V/+5V	+10V/+5V power supply	Provide +10V/+5V power supply. (negative pole：GND)	Max. output current:50mA

	COM	Common end+24V power supply negative pole	Common end and reference ground of digital signal input	Internal one another isolating among CME, COM and GND
	GND	+10V power supply negative pole	Reference ground of analog signal and +10V power supply	
	CME	Y1, Y2output common end	Common end of multi-function output terminal Y1, Y2	
Analog value input	CCI	Analog value input CCI	Accept analog voltage/current input，voltage, current optioned by jumping-wire JP2，factory default is voltage. (reference ground：GND)	Input voltage range：0~10V (input impedance：70KΩ) Input current range：4~20mA (input impedance：250Ω) Resolution：1/1000
	YCI	Analog value input YCI	Accept analog voltage input,0~5V or 0~10V input optioned by JP1，factory default 0~5V (reference ground：GND)	Input voltage range：0~5V(input impedance 70KΩ), 0~10V(input impedance 36KΩ)
	VCI	Analog value input VCI	Accept analog voltage input (reference ground：GND)	Input voltage range：0~10V (input impedance：70KΩ) resolution：1/1000
Analog value output	AO1	Analog value output1	Provide analog voltage/current output，can express 6 kinds of parameter see F5.17 parameter description，output voltage/current optioned by JP4，factory default output voltage. (reference ground：GND)	Current output range：4~20mA voltage output range：0~10V
	AO2	Analog value output 2	Provide analog voltage/current output，can express 6 kinds of parameter，output voltage/current optioned by JP5，factory default output current. (reference ground：GND)	
Multi-function output terminal	Y1	Open circuit collector output terminal 1	Used for multi-function switch output terminal, for detailed see Chapter 6 Section 6.6 terminal function parameter (F5 group) output end function description. (common end: CME)	optocoupler isolation output Work voltage range: 15~30V Max. output current:50mA Use method see F5.10~F5.11 description of parameter
	Y2	Open circuit collector output terminal 2		
	DO	H-speed impulse output terminal	Used for multi-function impulse signal output terminal, for detailed see Chapter 6 Section 6.6 terminal function parameter(F5 group) output end function description. (common end: CME)	Output impulse voltage: 24V Output frequency range: depending on parameter F5.23, max.50KHz

shield	PE	Shield grounding	Used for terminal connecting wire shield layer grounding, analog signal wire, 485 shield layer of 485 communication wire can be connected to this terminal	Connect with mail loop connecting wire terminal E interiorly
communication interface	RS485+	RS485+ communication interface	485 difference signal positive end	For standard RS-485 communication interface please use twisted-pair or STP
	RS485-	RS485- communication interface	485 difference signal negative end	

(3) control terminal CN5，arranged as follows：

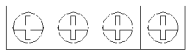


(4) CN5 terminal function description as Table 3-5.

Table 3-5 CPU board CN5 terminal function

Item	symbol	name	Function description	Spec
Relay output terminal	TA	Inverter malfunction output relay	Normal: TB-TC closed, TA-TC open Malfunction: TB-TC open, TA-TC closed	TB-TC: always-closed, TA-TC: always-open Contact capacity: AC250V/2A (COSΦ=1) AC250V/1A (COSΦ=0.4) DC30V/1A
	TB			
	TC			

(5) control terminal CN8，arranged as follows：



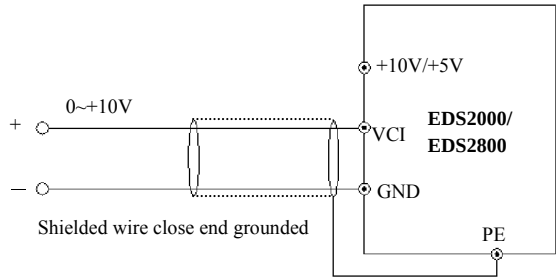
(6) CN8 terminal function description as Table 3-6.

Table 3-6 CPU board CN8 terminal function

Item	symbol	name	Function description	Spec.
Analog input	1I、2I	Special channel 1, channel 2 for injection molding machine signal	0~1A current input signal	Current and voltage signal don't use the same
	1C、2C		Current, voltage input signal common end（ground）	

3.6.3 Analog input output terminal wiring

(1) VCI terminal accepts analog voltage signal input，wiring as follow：



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

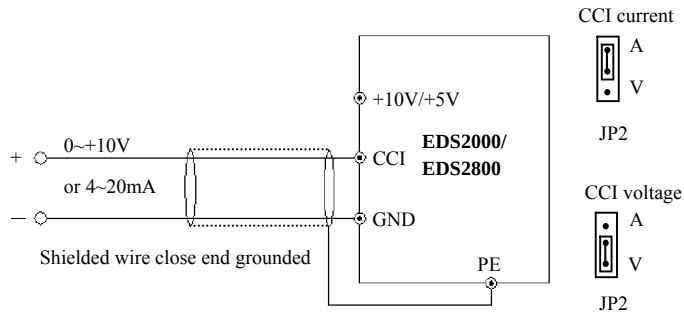


Fig.3-12 YCI terminal wiring diagram

(3) YCI terminal accepts analog voltage signal input，wiring mode as follows：

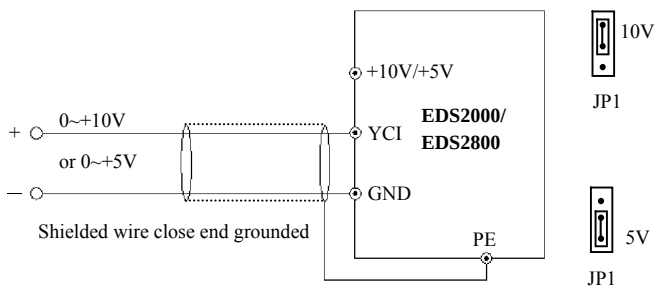


Fig.3-13 YCI terminal wiring diagram

(4) wiring of analog output terminals AO1, AO2

analog output terminals AO1, AO2 connected to analog meter and kinds of physical data can be indicated, jumping-wire decide to output current (4~20mA) or voltage (0~10V). Terminal wiring mode as Fig.3-13.

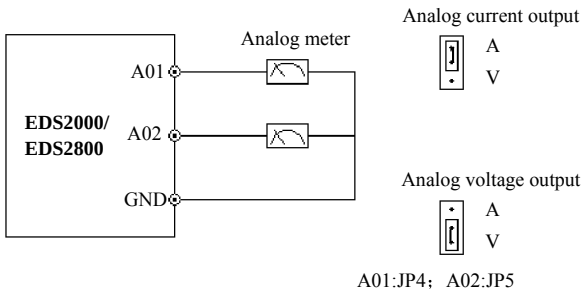


Fig.3-14 analog output terminal wiring

(5) special injection molding machine current switching signal 0~1A corresponds to 0~10V set frequency. As shown in Fig.3-14：

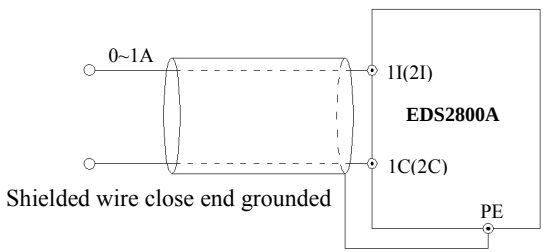


Fig.3-15 special wiring diagram for injection molding machines

note

(1) When inputing anglog signal，can connect filter capacitor or common module inductance between VCI and GND or between CCI and GND or between YCI and GND; between 1I(2I) and 1C(2C) or between 1V(2V) and 1C(2C).

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

3.6.4 Communication terminal wiring

EDS2000 inverter provides 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 etc.

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

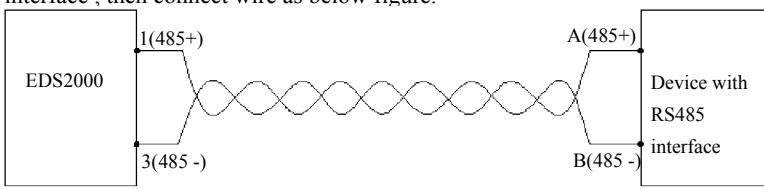


Fig.3-16 communication terminal wiring

(2) Please follow below figure when connecting remote control keypad .

Notice:

1）No need to set any parameter，inverter local keypad and remote control keypad can work at one time.

2）Users wiring as follow diagram:

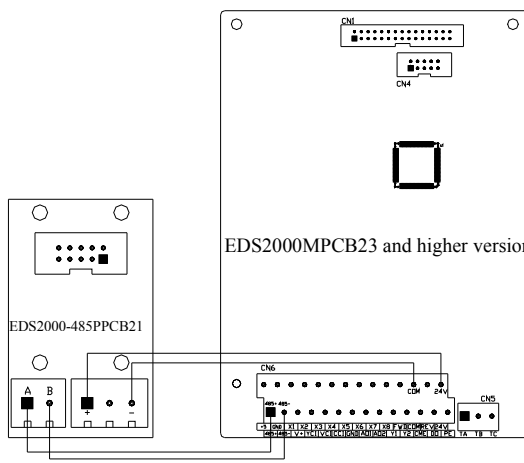


Fig.3-17 remote control keypad wiring

(3) Multiple inverters can be connected together per RS485 and 31pcs device with RS485 interface can be connected together at most. Communication system is more prone to disturbance as connected device increasing, following wiring is recommended：(fig3-18)

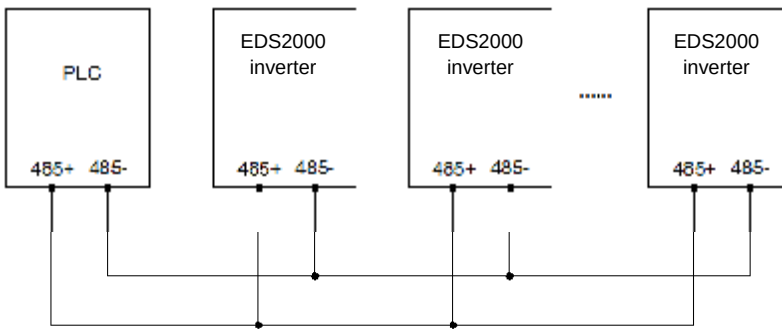


Fig. 3-18 recommended PLC and multiple inverters communication wiring

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 properly.

note RS485 interface of EDS2000/EDS2800 can only be used as interface of sub-device need to set PLC or PC as main unit，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 Restraining to noise disturbance

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；

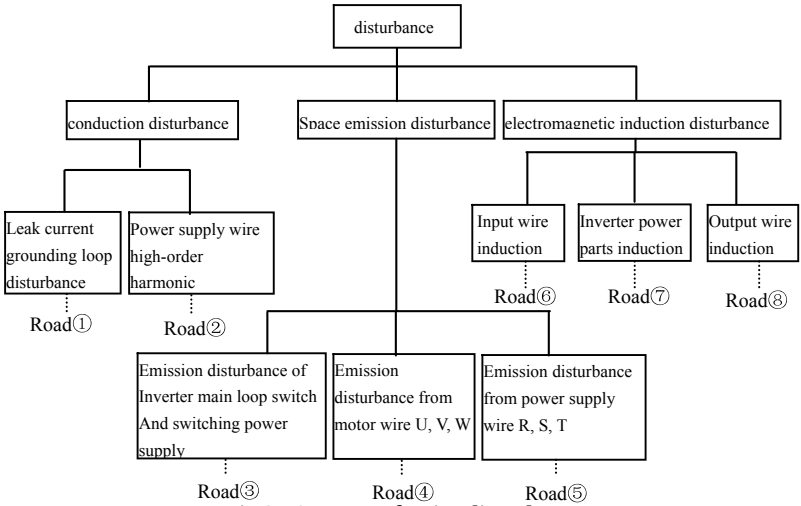


Fig.3-19 type of noise disturbance

(2) noise spread road

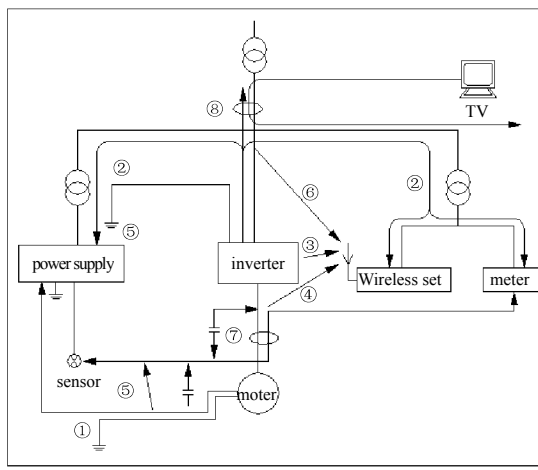


Fig.3-20 noise disturbance spread road sketch

(3) basic countermeasure for suppressing disturbance

Table 3-8 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 wire 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 devices by isolation transformer; connect power supply for peripheral device with remote power source; install ferrite filter magnetic circle for R, S, T 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 single 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 connected 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, S, T, U, V, W 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, V, W terminal education wire) and power supply wire (R, S, T terminal input wire). Should keep distance of 30cm above.

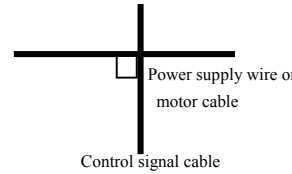


Fig.3-21 system wiring demand

(2) Try your best to place motor table from U, V, W terminals in metal tube or metal wiring slot.

(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) Powerful cable(R, S, T, U, V, W)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.3-19.

(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, S, T).

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 drop and make long-distance wiring to U, V, W. 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. 3-22.

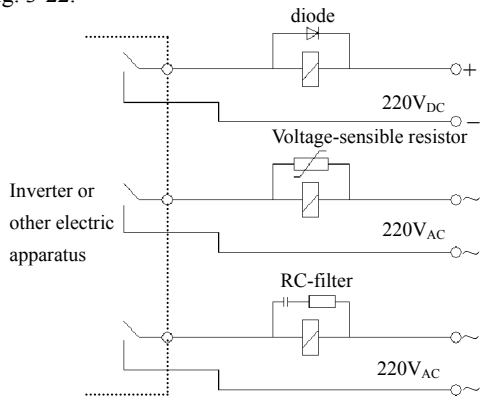


Fig.3-22 installation demand for electromagnetic on-off device

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 , JOG on keypad(factory default).

1: control terminal

Use control terminal FWD, REV, COM to make of double-line control， or use one terminal of X1～X8 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 F0.02；and also can choose by multi-function input terminal(F5.00~F5.07 choose 27, 28, 29 function).

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

4.1.2 Frequency-provision channel

Under EDS2000/EDS2800 common run mode there are 9 kinds of provision channel:

0：keypad digital potentiometer provision；

1：direct digital frequency provision；

2：terminal UP/DOWN provision；

3：serial port provision；

4：analog value VCI provision；

5：analog value CCI provision；

6：analog value YCI provision；

7：terminal pulse(PULSE) provision；

8：combination set.

4.1.3 Work state

Work state of EDS2000/EDS2800 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

EDS2000/EDS2800 inverter have 7 kinds of run mode，following is in turn according to their priority：jog run→closed-loop run→PLC run→ multi-section speed run→injection molding run→swing frequency run→common run. Shown as Fig.4-1

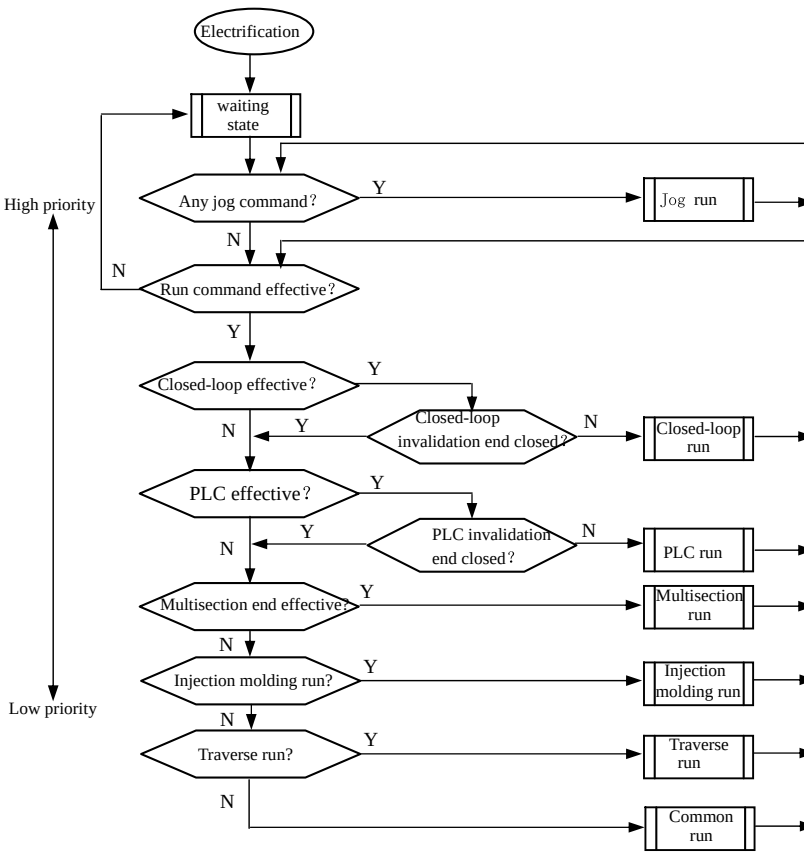


Fig.4-1 logic flow chart of EDS2000/EDS2800 inverter run state

Upon receiving jog run command (for instance, press the JOG key on keypad) during waiting state, the inverter run at jog frequency (see function code F2.06~F2.08).

1：closed-loop run

The inverter will come into closed-loop run mode when closed –loop run control effective parameter is set(F3.00=1). Namely carry on PID adjustment to specified value and feedback value(proportion integral differential calculation，see F3 group function code) and PID adjustor output is inverter output frequency. Can make closed-loop run mode ineffective and switch to lower level run mode by multi-function terminal (function 19).

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(F4.00 last bit≠0). Can make PLC run mode ineffective and switch to lower level run mode by multi-function terminal (function 20).

3：multi-section speed run

By nonzero combination of multi-function terminal(1, 2, 3, 4 function)， choose multisection frequency 1~15(F2.27~F2.41) to run at multisection speed.

4：injection molding run

The inverter will enter into special run for injection molding machine after injection molding machine function effective parameter is set(F6.00=1).

5：traverse run

The inverter will enter into swing frequency run mode when swing frequency function effective parameter（F7.00=1）is set. Set relevant swing frequency run special parameter according to textile swing frequency craft to realize swing frequency run.

6：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. It is classified as LED type and LCD type，thereinto LED type keypad is standard configuration. Can choose to deploy keypad with LCD display according to customer's need. Information in English is added by the latter and display data type is noted. Outer dimension and operation method of these 2 kinds of keypad is identical, as shown in Fig.4-2.

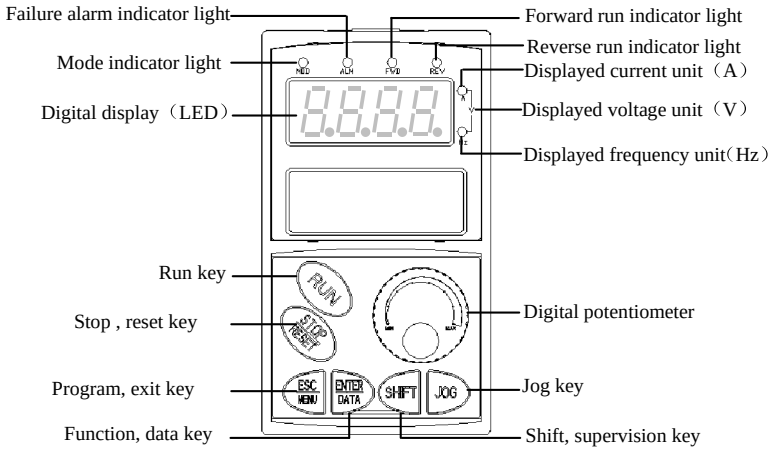


Fig.4-2 keypad layout sketch

4.2.2 Keypad function description

There are 6 key-presses and one adjusting button for digital 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
ESC MENU	Program/exit key	Enter into or exit programming state
SHIFT	Shift/supervision key	Can choose modification digit of set data under editor state；can switch display status supervision parameter under other state.
ENTER DATA	Function/data key	Enter into the next menu or data confirmation

JOG	Jog key	Jog run is available when pressing this key under keypad mode
RUN	Run key	Enter into run mode under keypad mode
STOP RESET	Stop/reset key	In common run status the inverter will be stopped according to set mode after pressing this key if run command channel is set as keypad stop effective mode. The inverter will be reset and resume normal stop status after pressing this key when the inverter is in malfunction status.
	Digital potentiometer	Be used to substitute for adding subtracting key and confirmation key, rotating leftward means subtracting, rotating rightward means addition, and pressing downward means confirmation(here function same as ENTER DATA key)

4.2.3 LED and indicator light

4 status indicator light：they are MOD（mode）, ALM（alarm）, FWD（forward run）, REV（reverse run）from left to right on the LED, their respective indicating meaning is as shown in table 4-2.

Table 4-2 status indicator light description

item			Function description	
Display function	Digital display		Display current run status parameter and set parameter	
	Status indicator light	A, Hz, V	unit for relevant current digital displayed physical parameter(for current is A, for voltage is V，for frequency is Hz)	
		MOD	This indicator light is lit in nonsupervision status and extinguished if no key pressed for a minute, then come back to supervision status	
		ALM	Alarm indicator light, indicate that the inverter is in over current or over voltage suppressing status or failure alarm status currently	
		FWD	Forward run indicator light，indicate that the inverter output forward phase order and the connected motor rotate in forward direction	The inverter work in DC brake status if FWD, REV indicator light is lit at the same time
		REV	reverse run indicator light, indicate that the inverter output reverse phase order and the connected motor rotate in reverse direction	

4.2.4 Key board display status

EDS2000 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 "-EN-", then enter into set frequency display. As shown in Fig.4-3 a.

(1) waiting parameter display status

The inverter is in waiting status and waiting status supervision parameter normally set frequency C-00 is displayed on keypad. As shown in Fig.4-3 b，unit is displayed by rightward unit indicator light.

To press SHIFT key，it can display different waiting status supervision parameter circularly(display C group fore 7 kinds of supervision parameter acquiescently，other supervision parameter can be defined by function code F2.14，F2.15, for detail please see C group status supervision parameter in function parameter schedule graph of chapter 5). Display status will be switched to constant supervision parameter C-00 (namely set frequency) display automatically if there's no key pressed within 1 minute.

(2) run parameter display status

The inverter enters into run status when receiving effective run command and run status supervision parameter normally output frequency C-01 is displayed on the keypad. As shown in Fig.4-3 c，unit is displayed by rightward unit indicator light.

To press SHIFT key，can display run status supervision parameter circularly (defined by function code F2.14 and F2.15). During displaying, can press ENTER DATA to switch to constant supervision parameter C-01 (namely output frequency) display, otherwise will display the last displayed parameter all along.

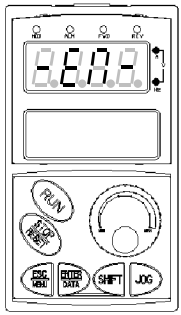


Fig.a electrification，display-EN -

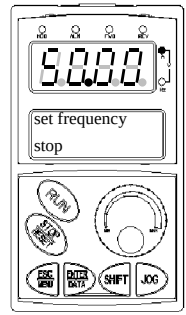


Fig.b waiting status，display waiting status parameter

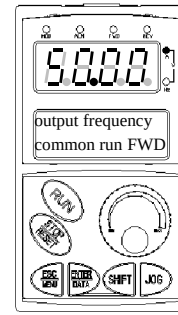


Fig.c run status, display run status parameter

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

(3) Failure alarm display status

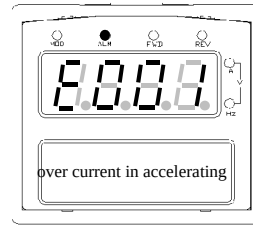


Fig.4-4 failure alarm

The inverter enters into failure alarm display status upon detecting failure signal and display failure code sparklingly(as shown in Fig.4-4); To press SHIFT key can look over relative parameter after stopping running；Can press ESC MENU key to enter into program status to see about Fd group parameter if want to search failure information.

Can carry on failure restoration by STOP RESET 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 inverse module protect，over current, over voltage etc.，must not carry on failure reset forcibly to make the inverter run again without failure elimination confirmed. Otherwise have danger of damaging the inverter!

(4) function code editing status

Under waiting, run or failure alarm status，press ESC MENU key，can enter into editing status(If user password is set，can enter into editing status after inputting the password，see also FF.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 digital potentiometer or ENTER DATA key can enter into one class by one class. Under function parameter display status，to press digital potentiometer or ENTER DATA key to carry on parameter storage operation；To press ESC MENU key can only come back to upper class menu without stroring modified parameter.(Fig4-5)

4.2.5 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 C group status supervision parameter; after displaying one supervision parameter code for 1 second, will display this parameter value automatically:(Fig4-6)

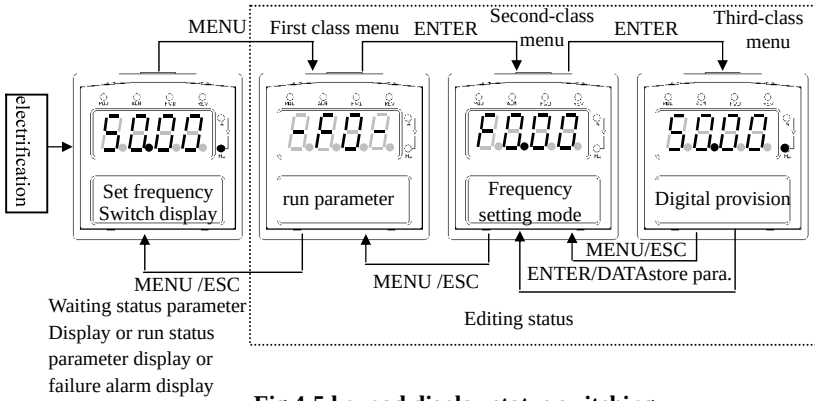


Fig.4-5 keypad display status switching

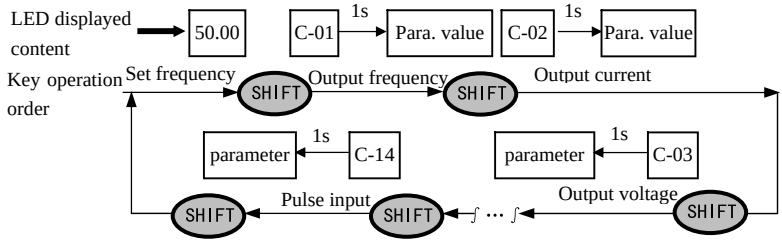


Fig. 4-6 waiting status parameter display operating example

Description：

1> Only C-00～C-06 7 status parameters can be displayed when shipping out the inverter，the user can see about other status parameter by modifying function code F2.14, F2.15 if want, for detail please refer to F2.14, F2.15 function code description.

2> Can press ENTER/DATA key to switch into constant supervision C-01 display status directly when the user see about status supervision parameter.

(2) function code parameter setting

Take function code F2.06 modified from 5.00Hz to 6.00Hz as example.

Boldface in Fig.4-7 shows flickering digit.(Fig4-7)

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

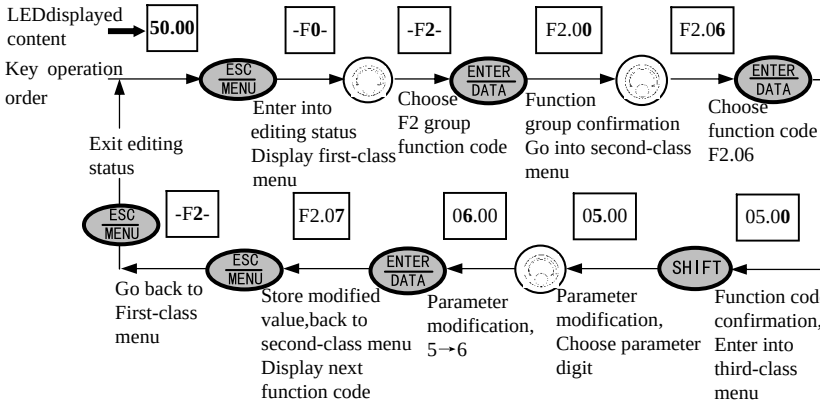


Fig.4-7 example for parameter setting and modification

after stopping running;

3> Parameter protected. All the function code can't be modified when function code F2.16=1 or 2, in order to avoid wrong operation. Need to set the function code F2.16 to 0 if you want to edit function code parameter.

(3) specified frequency adjustment for common run

Take example modifying specified frequency from 50.00Hz to 40.00Hz at F0.00=0 during running for explanation.

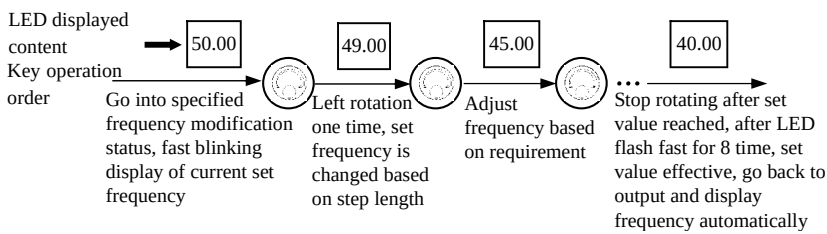


Fig. 4-8 set frequency adjustment operation example

Explanation: If the user press any key on the keypad during the process of specified frequency adjustment, current LED displayed set frequency become effective and exit from specified frequency adjustment status automatically.

(4) jog run operation

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

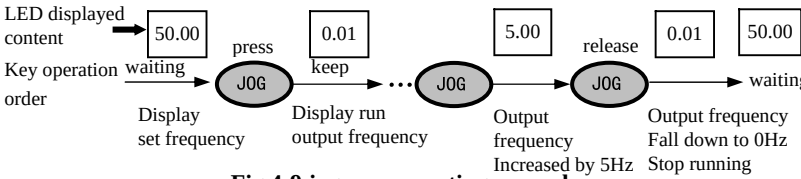


Fig.4-9 jog run operating example

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

"user password" FF.00 is set to "6886 ". Boldfaced digit in Fig.4-7 shows blinking bit.

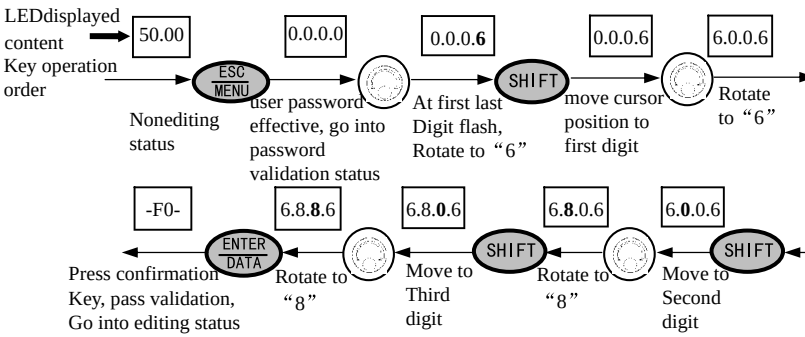


Fig.4-10 inputting password to go into function code operation

(6) See about failure parameter under failure status:

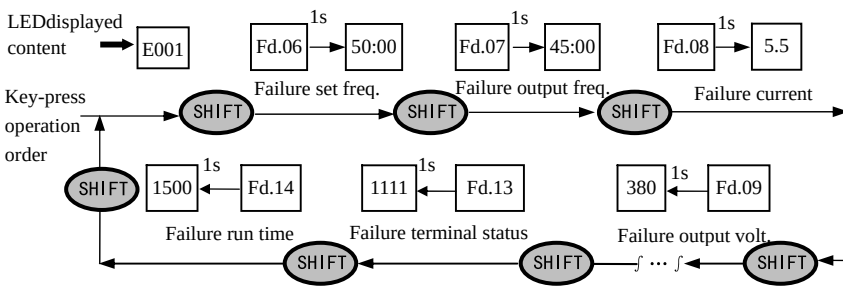


Fig.4-11 failure status searching operation example

Description:

1> If press SHIFT key under failure status the user can see about Fd group

function code parameter, search range Fd.06～Fd.14，LED first display function code number when the user press SHIFT key and display parameter digit of this function code after 1s.

2> When the user see about failure parameter，can press ENTER DATA key directly to switch back to failure alarm display status (E0XX)

(7) keypad key-press locking operation

Under unlocked keypad situation，press ESC MENU key for 5s to lock the keypad.

(8) keypad key-press unlocking operation

Under locked keypad situation，press ESC MENU key for 5s to unlock the keypad.

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 “-EN - ”, contactor closed normally, LED displayed set frequency shows that electrification is finished. First electrification operation process is shown as figure in next page.

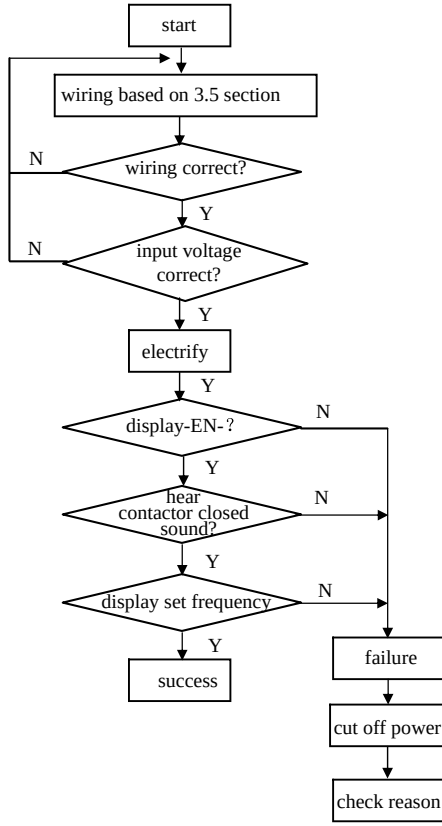


Fig. 4-12 first electrification operation flow

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

F0 –basic run function parameter group						
Function code	Name	LCD displayed content	Set range	Unit	Factory default	modifi-cation
F0.00	Frequency input channel selection	Frequency input channel	0: keypad potentiometer setting 1: keypad digit setting 2: terminal UP/DOWN adjust setting (stored after power off) 3: serial port setting 4: VCI analog setting (VCI-GND) 5: CCI analog setting (CCI-GND) 6: YCI analog setting (YCI-GND) 7: terminal pulse (PULSE)setting 8: combination setting (see F2.09 parameter) 9: terminal UP/DOWN adjust setting (not stored after power off)	1	0	○
F0.01	Freq. digit setting	Freq. digit setting	Lower limit freq.～upper limit freq	0.01Hz	0.00Hz	○
F0.02	Run command channel selection	Run command channel	0: keypad run control 1: terminal run command control 2: serial port run command control	1	0	○
F0.03	Run direction setting	Run direction setting	0: forward run 1: reverse run	1	0	○
F0.04	Preventing reverse run selection	Preventing reverse run	0: reverse run allowed 1: reverse run banned	1	0	×
F0.05	Load motor rated frequency	rated frequency	1.00－400.00Hz	0.01Hz	50.00Hz	×
F0.06	Load motor rated voltage	rated voltage	1－480V	1V	380V	×
F0.07	Load motor rated power	rated power	0.4－999.9KW	0.1KW	machine confirm	×
F0.08	Load motor rated current	rated current	0.1－999.9A	0.1A	machine confim	×
F0.09	Load motor rated speed	rated speed	1-9999	1	1440 (r/min)	×
F0.10	Accelerating	accelerating	0：linear accelerating decelerating	1	0	×

	decelerating mode selection	decelerating mode	mode 1：S curve accelerating decelerating mode			
F0.11	S curve start section time	S curve start section	10.0（%）－50.0（%）(accelerating decelerating time）F0.11+F0.12≤90（%）	0.1(%)	20.0(%)	○
F0.12	S curve risetime	S curve rise section	10.0（%）－80.0（%）(accelerating decelerating time） F0.11+F0.12≤90（%）	0.1(%)	60.0(%)	○
F0.13	accelerating decelerating time unit	accelerating decelerating unit	0：second 1：minute	1	0	×
F0.14	Acc time 1	Acc time 1	0.1－6000.0	0.1	20.0	○
F0.15	Dec time 1	Dec time 1	0.1－6000.0	0.1	20.0	○
F0.16	Upper limit freq.	Upper limit freq.	Lower limit freq.－400.00Hz	0.01Hz	50.00Hz	×
F0.17	Lower limit freq.	Lower limit freq.	0.00－Upper limit freq.	0.01Hz	0.00Hz	×
F0.18	Lower limit freq. run mode	Lower limit freq. mode	0：run at lower limit freq. 1：stop running	1	0	×
F0.19	Torque boost mode	Torque boost mode	0：manual boost 1：automatic boost	1	0	○
F0.20	Torque boost	Torque boost	0.0－20.0（%）	0.1(%)	2.0(%)	○
F0.21	V/F curve setting	V/F curve setting	0：constant torque curve 1：degressive torque curve 1（the 2.0nd power） 2：degressive torque curve 2（the 1.7th power） 3：degressive torque curve 3（the 1.2th power） 4：custom V/F curve (determined by F0.22 F0.27 function code)	1	0	×
F0.22	V/Ffreq. value F1	V/Ffreq. valueF1	0.00-F0.24	0.01Hz	0.00Hz	×
F0.23	V/F volt. valueV1	V/Fvolt. valueV1	0.00-F0.25	0.1(%)	0.0(%)	×
F0.24	V/Ffreq. value F2	V/Ffreq. valueF2	F0.22-F0.26	0.01Hz	0.00Hz	×
F0.25	V/Fvolt. valueV2	V/Fvolt. valueV2	F0.23-F0.27	0.1(%)	0.0(%)	×
F0.26	V/Ffreq. value F3	V/Ffreq. value F3	F0.24-upper limit frequency	0.01Hz	0.00Hz	×
F0.27	V/Fvolt. valueV3	V/Fvolt. valueV3	F0.25-100.0%(rated voltage)	0.1(%)	0.0(%)	×

F1 –start-up, stop, brake function parameter group						
Function code	Name	LCD displayed content	Set range	Unit	Factory default	Modifi-cation
F1.00	Start-up run mode	start-up run mode	0：start at start-up freq. 1：first brake, then start at start-up freq. 2：speed track start-up	1	0	×

F1.01	start-up freq.	start-up freq.	0.0—10.00Hz	0.01Hz	0.00Hz	○
F1.02	start-up freq. duration	start-up duration	0.0—20.0S	0.1s	0.0s	○
F1.03	DC brake volt. at start-up	start-up brake volt.	0—15（%）	1	0	○
F1.04	DC brake time at start-up	start-up brake time	0.0—20.0S	0.1s	0.0s	○
F1.05	Stop mode	Stop mode	0：Dec stop 1：free stop 2：Dec＋DC brake stop	1	0	×
F1.06	DC brake initiative freq. when stop running	Stop running brake freq.	0.0—15.00Hz	0.01Hz	0.00Hz	○
F1.07	DC brake time when stop running	Stop running brake time	0.0—20.0s	0.0s	0.0s	○
F1.08	DC brake voltage when stop running	Stop running brake voltage	0—15（%）	1	0	○

F2 –auxiliary run function parameter group						
Function code	Name	LCD displayed content	Set range	Unit	Factory default	Modifi-cation
F2.00	Analog filter time constant	filter time	0.00—30.00s	0.01s	0.20s	○
F2.01	Forward reverse run dead-section time	Forward reverse run dead-section	0.0—3600.0s	0.1s	0.0s	○
F2.02	Automatic energy save run	Automatic energy save run	0：no action 1：action	1	0	×
F2.03	AVR function	AVR function	0：no action 1：action all the time 2：no action only during Dec	1	0	×
F2.04	Slip frequency compensation	Slip compensation	0～150(%)0-no slip frequency compensation	1	0	×
F2.05	Carrier wave freq.	Carrier wave freq.	0.7—16.0K	0.1K	depend on machine type	×
F2.06	Jog run frequency	Jog run frequency	0.10—50.00Hz	0.01Hz	5.00Hz	○
F2.07	Jog Acc time	Jog Acc time	0.1—60.0s	0.1s	20.0s	○
F2.08	Jog Dec time	Jog Dec time	0.1—60.0s	0.1s	20.0s	○
F2.09	Frequency input channel combination	Frequency combination setting	0：VCI＋CCI 1：VCI—CCI 2：YCI＋CCI 3：YCI—CCI 4：VCI＋YCI 5：VCI—YCI 6：exterior pulse provision	1	0	×

			+CCI 7：exterior pulse provision −CCI 8：MAX（VCI，YCI） 9：MIN（VCI，YCI） 10：MAX（YCI，VCI，PULSE） 11：MIN（YCI，VCI，PULSE） 12：VCI，YCI any nonzero value effective，VCI preferred 13：VCI，CCI any nonzero value effective，VCI preferred 14：VCI+YCI(for controlling simple strain) 15：RS485+CCI 16：RS485-CCI 17：RS485+VCI 18：RS485-VCI 19：RS485+keypad potentiometer 20：RS485- keypad potentiometer 21：VCI+ keypad potentiometer 22：VCI- keypad potentiometer 23：CCI+ keypad potentiometer 24：CCI- keypad potentiometer 25：reserved 26：reserved 27：reserved			
F2.10	Principal subordinate machine communication frequency provision proportion	Principal subordinate machine communication frequency provision	0（%）−500（%）	1(%)	100(%)	○
F2.11	Output voltage emendation factor	Output voltage emendation factor	50−150（%）	1(%)	100(%)	○
F2.12	Heat sink temperature emendation factor	Heat sink temperature emendation factor	50−150（%）	1(%)	100(%)	○

F2.13	Load motor speed emendation factor	Load motor speed emendation factor	50—150（%）	1(%)	100(%)	○
F2.14	LED display control 1	Control 1	0000-1111 first bit：running time 0：not display 1：display second bit：accumulative time 0：not display 1：display third bit：input terminal 0：not display 1：display kilobit(fourth bit)：output terminal 0：not display 1：display	1	0000	○
F2.15	LED display control 2	Control 2	0000-1111 first bit：analog input VCI 0：not display 1：display second bit： analog input YCI 0：not display 1：display third bit：analog input CCI 0：not display 1：display kilobit(fourth bit)：exterior pulse input 0：not display 1：display	1	0000	○
F2.16	Parameter operation control	Parameter operation	0：all parameter allowed to be modified 1：except this parameter，all other parameter not allowed to be modified 2：except F0.01 and this parameter，all other parameter not allowed to be modified 3：clear history failure record 4：renew factory default 5：parameter uploading 6：parameter downloading	1	0	×

F2.17	Communication configuration	Communication configuration	LED first bit：baud rate option 0：300BPS 1：600BPS 2：1200BPS 3：2400BPS 4：4800BPS 5：9600BPS 6：19200BPS 7：38400BPS LED second bit：data format 0：1—8—1format，no checkout 1：1—8—1 format，even checkout 2：1—8—1 format，odd checkout	1	0005	×
F2.18	Local address	Local address	0—127，127 is broadcast address	1	1	×
F2.19	Communication overtime	Communication overtime	0.0—1000.0s	0.1s	0.0s	×
F2.20	Local responsion delay	Local responsion delay	0—1000ms	1ms	5ms	×
F2.21	Acc time 2	Acc time 2	0.1—6000.0	0.1	20.0	○
F2.22	Dec time 2	Dec time 2	0.1—6000.0	0.1	20.0	○
F2.23	Acc time 3	Acc time 3	0.1—6000.0	0.1	20.0	○
F2.24	Dec time 3	Dec time 3	0.1—6000.0	0.1	20.0	○
F2.25	Acc time 4	Acc time 4	0.1—6000.0	0.1	20.0	○
F2.26	Dec time 4	Dec time 4	0.1—6000.0	0.1	20.0	○
F2.27	Multisection freq. 1	Multisection freq. 1	Lower limit freq. — upper limit freq.	0.01Hz	5.00Hz	○
F2.28	Multisection freq. 2	Multisection freq. 2	Lower limit freq. — upper limit freq.	0.01Hz	10.00Hz	○
F2.29	Multisection freq. 3	Multisection freq. 3	Lower limit freq. — upper limit freq.	0.01Hz	20.00Hz	○
F2.30	Multisection freq. 4	Multisection freq. 4	Lower limit freq. — upper limit freq.	0.01Hz	30.00Hz	○
F2.31	Multisection freq. 5	Multisection freq. 5	Lower limit freq. — upper limit freq.	0.01Hz	40.00Hz	○
F2.32	Multisection freq. 6	Multisection freq. 6	Lower limit freq. — upper limit freq.	0.01Hz	45.00Hz	○
F2.33	Multisection freq. 7	Multisection freq. 7	Lower limit freq. — upper limit freq.	0.01Hz	50.00Hz	○
F2.34	Multisection freq. 8	Multisection freq. 8	Lower limit freq. — upper limit freq.	0.01Hz	5.00Hz	○

F2.35	Multisection freq. 9	multisection freq. 9	Lower limit freq. — upper limit freq.	0.01Hz	10.00Hz	○
F2.36	Multisection freq. 10	Multisection freq. 10	Lower limit freq. — upper limit freq.	0.01Hz	20.00Hz	○
F2.37	Multisection freq. 11	Multisection freq. 11	Lower limit freq. — upper limit freq.	0.01Hz	30.00Hz	○
F2.38	Multisection freq. 12	Multisection freq. 12	Lower limit freq. — upper limit freq.	0.01Hz	40.00Hz	○
F2.39	Multisection freq. 13	Multisection freq. 13	Lower limit freq. — upper limit freq.	0.01Hz	45.00Hz	○
F2.40	Multisection freq. 14	Multisection freq. 14	Lower limit freq. — upper limit freq.	0.01Hz	50.00Hz	○
F2.41	Multisection freq. 15	Multisection freq. 15	Lower limit freq. — upper limit freq.	0.01Hz	50.00Hz	○
F2.42	Jumping freq. 1	Jumping freq. 1	0.00—400.00Hz	0.01Hz	0.00Hz	×
F2.43	Jumping freq. 1 range	Jumping range 1	0.00—30.00Hz	0.01Hz	0.00Hz	×
F2.44	Jumping freq. 2	Jumping freq. 2	0.00—400.00Hz	0.01Hz	0.00Hz	×
F2.45	Jumping freq. 2 range	Jumping range 2	0.00—30.00Hz	0.01Hz	0.00Hz	×
F2.46	Jumping freq. 3	Jumping freq. 3	0.00—400.00Hz	0.01Hz	0.00Hz	×
F2.47	Jumping freq. 3 range	Jumping range 3	0.00—30.00Hz	0.01Hz	0.00Hz	×
F2.48	Setting run time	Setting run time	0—65535 hours	1	0	○
F2.49	Accumulative run time	Accumulative run time	0—65535 hours	1	0	*

F3 –closed-loop run function parameter group						
Function code	Name	LCD displayed content	Set range	Unit	Factory default	Modif-ication
F3.00	Closed-loop run control selection	Closed-loop function selection	0：closed-loop control ineffective 1：PID closed-loop control effective 2：reserved	1	0	×
F3.01	Provision channel selection	Provision channel selection	0：digital voltage provision 1：digital pressure provision 2：VCI analog 0—10V voltage provision 3：CCI analog provision 4：keypad potentiometer provision	1	1	○
F3.02	Feedback channel selection	Feedback channel selection	0：VCI analog input voltage 0—10V 1：CCI analog input 2：VCI+CCI 3：VCI-CCI 4：Min { VCI, CCI } 5：Max { VCI, CCI }	1	1	○

F3.03	Digital voltage setting	Digital voltage setting	0.00－10.00V	0.01	0.00V	○
F3.04	Digital pressure setting	Digital pressure setting	0.000－9.999Mpa	0.01	0.000Mpa	○
F3.05	Minimum specified value	Minimum specified value	0.0—maximum specified value; percentage relative to 10.00V	0.1(%)	0.0(%)	○
F3.06	feedback value responding to minimum specified value	Feedback of minimum specified value	0.0－100.0(%)	0.1(%)	0.0(%)	○
F3.07	pressure value responding to F3.06	pressure value responding to minimum provision	0.000－9.999Mpa	0.001	0.000Mpa	○
F3.08	maximum specified value	maximum specified value	Minimum specified value －100.0（％）	0.1(%)	100.0(%)	○
F3.09	feedback value responding to maximum specified value	Feedback of maximum specified value	0.0－100.0（％）	0.1(%)	100.0(%)	○
F3.10	pressure value responding to F3.09	pressure value responding to minimum provision	0.000－9.999Mpa	0.001	1.000Mpa	○
F3.11	proportion gain KP	proportion gain	0.000－9.999	0.001	0.050	○
F3.12	Integral gain KI	Integral gain	0.000－9.999	0.001	0.050	○
F3.13	Differential gain	Differential gain	0.000－9.999	0.001	0.000	○
F3.14	Sampling time T	Sampling time	0.01－1.00s	0.01s	0.10s	○
F3.15	Deviation margin	Deviation margin	0.0－20.0（％） remark：percentage relative to closed-loop specified maximum value	0.1(%)	2.0(%)	○
F3.16	Closed-lop preset frequency	Closed-lop preset frequency	0－upper limit frequency	0.01Hz	0.00Hz	○
F3.17	Closed-loop preset frequency holding time	Closed-loop preset frequency holding time	0.0-6000s	0.1s	0.0s	×
F3.18	Revival frequency	Threshold	0.00－400.00Hz	0.01Hz	0.00Hz	×
F3.19	Sleep frequency	Back difference	0.00－400.00Hz	0.01Hz	0.00Hz	×
F3.20	Integral separation PID adjusting threshold		0.0－100.0%	0.1%	100.0	○
F3.21	Closed-loop adjusting characteristic		0: positive 1: negative	1	0	×
F3.22	reserved					○
F3.23	reserved					○
F3.24	reserved					○
F3.25	failure relay delay time		Range: 0:no delay time 1:delay 5s			○

F4 –simple PLC function parameter group						
Function code	Name	LCD displayed content	Set range	Unit	Factory default	Modif-ication
F4.00	Simple PLC running setting	PLC run setting	LED first bit： 0：no action 1：stop after single circulation 2：keep final value after single circulation 3：consecutive circulation LED second bit： 0：start again from first section 1：continue to run at mid-section frequency LED third bit：PLC run time unit 0：second 1：minute	1	000	×
F4.01	Section 1 setting	Section 1 setting	000－322 LED first bit：frequency setting 0：multisection freq. i (i=1~7) 1：freq. determined by F0.00 function code 2：multisection closed-loop provision i (i=1~7) LED second bit：run direction selection 0：forward 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	○
F4.02	Section 1 run time	Section 1 time	0－6000.0	0.1	10.0	○
F4.03	Section 2 setting	Section 2 setting	000－322	1	000	○
F4.04	Section 2 run time	Section 2 time	0－6000.0	0.1	10.0	○
F4.05	Section 3 setting	Section 3 setting	000－322	1	000	○
F4.06	Section 3 run time	Section 3 time	0－6000.0	0.1	10.0	○
F4.07	Section 4 setting	Section 4 setting	000－322	1	000	○
F4.08	Section 4 run time	Section 4 time	0－6000.0	0.1	10.0	○
F4.09	Section 5 setting	Section 5 setting	000－322	1	000	○
F4.10	Section 5 run time	Section 5 time	0－6000.0	0.1	10.0	○
F4.11	Section 6 setting	Section 6 setting	000－322	1	000	○

F4.12	Section 6 run time	Section 6 time	0－6000.0	0.1	10.0	○
F4.13	Section 7 setting	Section 7 setting	000－322	1	000	○
F4.14	Section 7 run time	Section 7 time	0－6000.0	0.1	10.0	○

F5 –terminal correlative function parameter group						
Function code	Name	LCD displayed content	Set range	Unit	Factory default	Modif-ication
F5.00	Input terminal X1 function selection	X1 terminal function	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：external device failure input 10：external reset input 11：free shutdown input 12：external stop-running order 13：shutdown DC braking input command DB 14：inverter run banned 15：frequency increasing control (UP) 16：frequency degression control (DOWN) 17：Acc/Dec ban command 18：three-line run control 19：closed-loop ineffective 20：PLC ineffective 21：simple PLC pause control 22：PLC stop status reset 23：frequency provision channel option 1 24：frequency provision channel option 2 25：frequency provision channel option 3 26：frequency switched to CCI 27：command switched to terminal	1	0	×

			28：run command channel option 1 29：run command channel option 2 30：reserved 31：reserved 32：reserved 33：swing frequency jump-in 34：reserved 35：external interruption input 36：interior counter reset end 37：interior counter triggering end 38：pulse frequency input（only effective for X7,X8） 39：reserved 40：reserved 41：reserved			
F5.01	Input terminal X2 function selection	X2 terminal function	Same as above			×
F5.02	Input terminal X3 function selection	X3 terminal function	Same as above			×
F5.03	Input terminal X4 function selection	X4 terminal function	Same as above			×
F5.04	Input terminal X5 function selection	X5 terminal function	Same as above			×
F5.05	Input terminal X6 function selection	X6 terminal function	Same as above			×
F5.06	Input terminal X7 function selection	X7 terminal function	Same as above			×
F5.07	Input terminal X8 function selection	X8 terminal function	Same as above			×
F5.08	FWD/REV run mode selection	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	×
F5.09	UP/DOWN velocity	UP/DOWN velocity	0.01—99.99Hz/s	0.01Hz/s	1.00Hz/s	○
F5.10	Open circuit collector output terminal Y1 output setting	Y1function option	0：inverter running（RUN） 1：frequency arriving signal（FAR） 2：frequency level detect signal (FDT1) 3：frequency level detect signal (FDT2) 4：overload warning alarm signal (OL) 5：output frequency reach high limit（FHL） 6：output frequency reach low	1	0	×

			limit（FLL） 7：inverter lacking voltage blockage shutdown (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			
F5.11	Open circuit collector output terminal Y2 output setting	Y2 function option	Same as above	1	0	×
F5.12	Frequency arriving (FAR) checkout scope	equivalent frequency range	0.00—50.00Hz	0.01Hz	5.00Hz	○
F5.13	FDT1 (frequency level) electric level	FDT1 electric level	0.00—high limit frequency	0.01Hz	10.00Hz	○
F5.14	FDT1 lag	FDT1 lag	0.00—50.00Hz	0.01Hz	1.00Hz	○
F5.15	FDT2 (frequency level) electric level	FDT2 electric level	0.00—high limit frequency	0.01Hz	10.00Hz	○
F5.16	FDT2 lag	FDT2 lag	0.00—50.00Hz	0.01Hz	1.00Hz	○
F5.17	Analog output (AO1) selection	AO1 output	0：output frequency(0—high limit frequency) 1：output current(0—2×rated current) 2：output voltage(0—1.2×load motor rated voltage) 3：bus-bar voltage(0—800V) 4：PID provision (0.00-10.00V) 5：PID feedback (0.00-10.00V)	1	0	○
F5.18	Analog output (AO2) selection	AO2 output	Same as above	1	0	○
F5.19	Analog output (AO1) gain	AO1gain	0.50—2.00	0.01	1.00	○

F5.20	reserved					
F5.21	Analog output (AO2) gain	AO2 gain	0.50—2.00	0.01	1.00	○
F5.22	DO terminal output function selection	Digital output	Same as F5.17	1	0	○
F5.23	DO maximum pulse output frequency	maximum pulse output	0.1—50.0(max. 50KHz) DO maximum pulse output frequency corresponds to max. value choosed by F5.22	0.1KHz	10.0	○
F5.24	Set interior counting value reach provision	Set counting value	0--9999	1	0	○
F5.25	Specified interior counting value reach provision	Specified counting value	0--9999	1	0	○

F6 group 1—special function parameter group for injection molding machine (EDS2800)					
Function code	Name	Description	Min. unit	Factory default	Modific-ation
F6.00	Special parameter selection for injection molding machine	0：special parameter for injection molding machine ineffective 1：special parameter for injection molding machine effective	1	0	×
F6.01	combination selection	0：set 1I 1：set 2I 2：1I × weighting factor＋ 2I × weighting factor 3：VI_1+1I 4：VI_1+1I+2I 5：MAX{1I，2I } 6：MIN{1I，2I }	1	2	○
F6.02	External input 1I weighting factor	0.01~1.00	0.01	0.50	○
F6.03	External input 2I weighting factor	0.01~1.00	0.01	0.50	○
F6.04	1I Min. input quantity	0.01~1.00	0.01	0.20	○
F6.05	Frequency corresponding to 1I Min. input quantity	0.00~400.00	0.01	10.00	○
F6.06	1I Max. input quantity	0.01~1.00	0.01	1.00	○
F6.07	Frequency corresponding to 1I Max. input quantity	0.00~400.00	0.01Hz	50.00Hz	○
F6.08	2I Min. input quantity	0.01~1.00	0.01	0.20	○

F6.09	Frequency corresponding to 2I Min. input quantity	0.00~400.00	0.01Hz	10.00Hz	○
F6.10	2I Max. input quantity	0.01~1.00	0.01	1.00	○
F6.11	Frequency corresponding to 2I Max. input quantity	0.00~400.00	0.01Hz	50.00Hz	○
F6.12	Inflexion setting	0：inflexion ineffective 1：inflexion effective	1	0	×
F6.13	1I middle inflexion current/voltage 1	F6.04—F6.06	0.01	0.00	○
F6.14	Frequency corresponding to F6.13	0.0—F6.07	0.01Hz	0.00Hz	○
F6.15	1I middle inflexion current/voltage 2	0.0—F6.06	0.01	0.00	○
F6.16	Frequency corresponding to F6.15	0.0—F6.07	0.01Hz	0.00Hz	○
F6.17	2I middle inflexion current/voltage 1	0.0—F6.10	0.01	0.0	○
F6.18	Frequency corresponding to F6.17	0.0—F6.11	0.01Hz	0.00Hz	○
F6.19	2I middle inflexion current/voltage 2	0.0—F6.10	0.01	0.00	○
F6.20	Frequency corresponding to F6.19	0.0—F6.11	0.01Hz	0.00Hz	○

F6 group 2—constant pressure water supply parameter group (EDS2000)					
Function code	Name	Description	Min. unit	Factory default	Modific-ation
F6.00	Sleep delay time	0.0-6000.0s	0.1	0.0	○
F6.01	Revival delay time	0.0-6000.0s	0.1	0.0	○
F6.02	Start-up frequency of first sub-machine	0.00-400.0Hz	0.01	0.00	○
F6.03	Start-up frequency of second sub-machine	0.00-400.0Hz	0.01	0.00	○
F6.04	Start-up frequency of third sub-machine	0.00-400.0Hz	0.01	0.00	○
F6.05	Stop frequency of first sub-machine	0.00-400.0Hz	0.01	0.00	○
F6.06	Stop frequency of second sub-machine	0.00-400.0Hz	0.01	0.00	○
F6.07	Stop frequency of third sub-machine	0.00-400.0Hz	0.01	0.00	○
F6.08	Start-up delay of	0.0-6000.0s	0.01	0.00	○

	sub-machine				
F6.09	stop delay of sub-machine	0.0-6000.0s	0.01	0.00	○
F6.10	Quantity of sub-machine	0-3	1	0	×
F6.11	Automatic switching interval	0000-9999 minutes	1	0000	○
F6.12	Real value of link sub-machine automatic switching	0.0-100.0%	0.1	0.0	○
F6.13	Starting delay of speed regulating motor	0.000-9.999s	1	0000	○
F6.14	Water supply special relay status display	0000-9999	1	0000	*
F6.15	reserved				
F6.16	reserved				
F6.17	reserved				
F6.18	reserved				
F6.19	reserved				
F6.20	reserved				

F7 –swing frequency special function parameter group						
Function code	Name	LCD displayed content	Setting range	Min. unit	Factory default	Modific-ation
F7.00	traverse function selection	traverse function selection	0：traverse function not used 1：Swing frequency function used	1	0	×
F7.01	traverse run mode	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 F0.00 function parameter	1	00	×
F7.02	traverse amplitude	traverse amplitude	0.0—50.0（%）	0.1(%)	0.0(%)	○
F7.03	Sudden jumping frequency	Sudden jumping frequency	0.0—50.0（%）	0.1(%)	0.0(%)	○
F7.04	traverse cycle	traverse cycle	0.1—999.9s	0.1s	10.0s	○
F7.05	Triangle wave risetime	risetime	0.0—98（%）（traverse cycle）	0.1(%)	50.0(%)	○
F7.06	traverse preset frequency	traverse preset frequency	0.00—400.00Hz	0.01Hz	0.00Hz	○
F7.07	traverse preset frequency latency time	Traverse latency time	0.0—6000s	0.1s	0.0s	○

F8 –frequency provision function parameter group						
Function code	Name	LCD displayed content	Setting range	Min.unit	Factory default	Modific-ation
F8.00	VCI min. provision	VCI min. provision	0.00—F8.02	0.01V	0.00V	○
F8.01	VCI min. provision corresponding freq.	VCI small freq.	0.00—high limit frequency	0.01Hz	0.00Hz	○
F8.02	VCI max. provision	VCI max. provision	0.00—10.00V	0.01V	10.00V	○
F8.03	VCI max. provision corresponding freq.	VCI big freq.	0.00—high limit frequency	0.01 Hz	50.00Hz	○
F8.04	CCI min. provision	CCI min. provision	0.00—F8.06	0.01V	0.00V	○
F8.05	CCI min. provision corresponding freq.	CCI small freq.	0.00—high limit frequency	0.01 Hz	0.00Hz	○
F8.06	CCI max. provision	CCI max. provision	0.00—10.00V	0.01V	10.00V	○
F8.07	CCI max. provision corresponding freq.	CCI big freq.	0.00—high limit frequency	0.01 Hz	50.00Hz	○
F8.08	YCI min. provision	YCI min. provision	0.00—F8.10	0.01V	0.00V	○
F8.09	YCI min. provision corresponding freq.	YCI small freq.	0.00—high limit frequency	0.01 Hz	0.00 Hz	○
F8.10	YCI max. provision	YCI max. provision	0.00—10.00V	0.01V	10.00V	○
F8.11	YCI max. provision corresponding freq.	YCI big freq.	0.00—high limit frequency	0.01 Hz	50.00Hz	○
F8.12	PULSE max. input pulse	PULSE max. pulse	0.1—50.0K	0.1K	10.0K	○
F8.13	PULSE min. provision	PULSE min. provision	0.0—F8.12(PULSE max. provision)	0.1K	0.0K	○
F8.14	PULSE min. provision corresponding freq.	PULSE small freq.	0.00—high limit frequency	0.01 Hz	0.00 Hz	○
F8.15	PULSE max. provision	PULSE max. provision	F8.13 (PULSE min. provision) —F8.12 (max. output pulse)	0.1K	10.0K	○
F8.16	PULSE max. provision corresponding freq.	PULSE big freq.	0.00—high limit frequency	0.01 Hz	50.00Hz	○

F9 –protection correlative function parameter group						
Function code	Name	LCD displayed content	Setting range	Min.unit	Factory default	Modific-ation
F9.00	Instantaneous power off restarting latency time	Power off restarting time 0	0.0—10.0S 0 indicates ineffective power off restarting	0.1S	0.0S	×

F9.01	Failure self-renew times	Failure self-renew times	0—10 0 shows no automatic reset function remark: no automatic reset function for overload and overheat	1	0	×
F9.02	Failure self-renew interval	Failure self-renew time	0.5—20.0S	0.1S	5.0S	×
F9.03	Motor overload protection Mode selection	overload protection selection	0：no action 1：inverter close off output	1	1	×
F9.04	Motor overload protection coefficient	Electronic thermal relay	20.0-120.0（%）	0.1(%)	100.0(%)	×
F9.05	Overload warning alarm checkout level	Overload checkout level	20—200（%）	1(%)	130(%)	○
F9.06	Overload warning alarm Delay time	Overload checkout time	0.0—20.0s	0.1s	5.0s	○
F9.07	Overvoltage stall selection	Overvoltage stall selection	0：ban 1：allow	1	1	×
F9.08	Overvoltage stall point	Overvoltage stall point	120-150（%）	1(%)	140(%)	○
F9.09	Automatic current limit level	Automatic current limit level	110—200（%）	1(%)	150(%)	×
F9.10	Frequency declining rate during current limiting	Frequency declining rate	0.00—99.99Hz/s	0.01Hz/s	10.00Hz/s	○
F9.11	Automatic current limiting action selection	Automatic current limiting action	0：automatic current limiting is ineffective during constant speed 1：automatic current limiting is effective during constant speed remark：always effective during Acc/Dec	1	0	×
F9.12	protection action selection 1	Protection selection 1	LED first bit：communication Abnormal action 0：alarm and stop running free 1：not alarm and continue to run LED second bit：(reserved) LED third bit：E^2PROM abnormal action option 0：alarm and stop running free 1：not alarm and continue to run	1	000	×
F9.13	protection action selection 2	protection selection 2	LED first bit：lacking voltage Failure instruction action selection 0：no action 1：action（regard voltage lack	1	00	×

			as failure） LED second bit：G/P type machine 0：G type machine 1：P type machine			

Fd –failure record function parameter group						
Function code	Name	LCD displayed content	Setting range	Min.unit	Factory default	Modifi c-ation
Fd.00	Previous one time failure record	Previous one time failure	Previous one time failure record	1	0	*
Fd.01	Previous two time failure record	Previous two time failure	Previous two time failure record	1	0	*
Fd.02	Previous three time failure record	Previous three time failure	Previous three time failure record	1	0	*
Fd.03	Previous four time failure record	Previous four time failure	Previous four time failure record	1	0	*
Fd.04	Previous five time failure record	Previous five time failure	Previous five time failure record	1	0	*
Fd.05	Previous six time failure record	Previous six time failure	Previous six time failure record	1	0	*
Fd.06	Set freq. of previous failure	failure set freq.	Set freq. of previous failure	0.01Hz	0	*
Fd.07	output freq. of previous failure	Failure output failure	output freq. of previous failure	0.01Hz	0	*
Fd.08	output current of previous failure	Failure current	output current of previous failure	0.1A	0	*
Fd.09	output voltage of previous failure	Failure output voltage	output voltage of previous failure	1V	0	*
Fd.10	DC bus-bar voltage of Previous failure	Failure bus-bar voltage	DC bus-bar voltage of Previous failure	1V	0	*
Fd.11	Load motor speed of Previous failure	Failure motor speed	Load motor speed of Previous failure	1(r/m)	0	*
Fd.12	Module temperature of previousfailure	Failure module temperature	Module temperature of Previous failure	1℃	0	*
Fd.13	Input terminal status of previous failure	Failure terminal status	Input terminal status of previous failure		0	*
Fd.14	Accumulative run time of previous failure	Failure run time	Accumulative run time of previous failure		0	*

FF –password and manufacturer function parameter group						
Function code	Name	LCD displayed content	Setting range	Min.unit	Factory default	Modif-ic ation

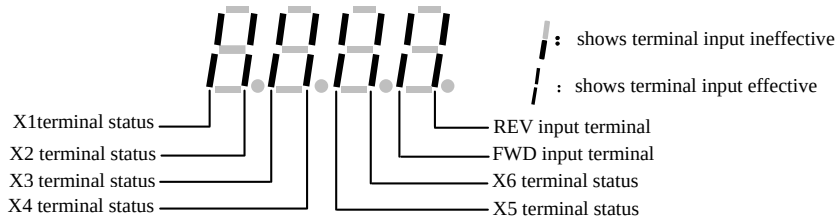
FF.00	User password	User password	0000－9999	1	0000	×
FF.01	Manufacturer password	Manufacturer password	0000－9999	1	0000	×
FF.02-FF.0X	Manufacturer's special parameter					×

C –supervision function parameter group						
Function code	Name	LCD displayed content	Description	Min.unit	Factory default	Modif-ication
C-00	Set frequency	Set frequency	Current set frequency	0.01HZ		
C-01	Output freq.	Output freq.	Current output freq.	0.01HZ		*
C-02	Output current	Output current	Virtual value of current output current	0.1A		*
C-03	Output voltage	Output voltage	Virtual value of current output voltage	1V		*
C-04	DC bus-bar voltage	bus-bar voltage	Current DC bus-bar voltage	1V		*
C-05	Load motor speed	Load motor speed	Product of output frequency and load motor speed emendation factor	1（r/m）		*
C-06	Module temperature	Module temperature	IGBT heat sink temperature	1℃		*
C-07	Run time	Run time	Inverter electrification run time	1h		*
C-08	accumulative run time	accumulative time	Inverter accumulative run time	1h		*
C-09	Input terminal status	Input terminal	Switch value input terminal status	－－		*
C-10	output terminal status	output terminal	Switch value output terminal status	－－		*
C-11	Analog input VCI	Analog input VCI	Analog input value of VCI	V		*
C-12	Analog input YCI	Analog input YCI	Analog input value of YCI	V		*
C-13	Analog input CCI	Analog input CCI	Analog input value of CCI	V		*
C-14	Exterior pulse input	Exterior pulse input	Exterior pulse input	－－		*

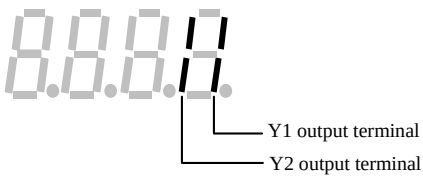
note

Factory default supervision parameter C-07~C-14 is hidden，please modify corresponding value of F2.14，F2.15 if need to supervise these parameters.

(1) Input terminal status corresponding relation is as follows：



(2) Output terminal status corresponding relation is as follows：



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

F0.00	Frequency input channel selection	range: 0~9	0

0: keypad digital potentiometer. Set running frequency by keypad digital potentiometer, reserve set frequency after power off.

1: keypad frequency number setting. Initial set frequency value is F0.01, can change set frequency by changing F0.01 parameter through keypad.

2: terminal UP/DOWN adjust set frequency(stored after power off). Initial set frequency value is F0.01, and adjust set running frequency by terminal UP/DOWN.

3: serial port provision. Serial port frequency set initial value is F0.01, change set frequency by setting F0.01 through serial port.

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

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

6: YCI analog setting (YCI－GND). Frequency setting determined by YCI terminal analog voltage, input range: DC0~10V (YCI jumping wire choose10V side) or DC0~5V(YCI jumping wire choose 5V side).

7: terminal pulse (PULSE) setting. Frequency set by terminal pulse (only input through X7 or X8, see F5.06~F5.07 definition), input pulse signal spec: voltage range15~30V; frequency range 0~50.0KHz.

8: combination setting. See function parameter F2.09, set frequency by each channel combination setting.

9: terminal UP/DOWN adjust set frequency (not stored after power off) Initial set frequency value is F0.01, and adjust set running frequency by terminal UP/DOWN.

note Relation between frequency and input information is determined by function code F8.00~F8.16 when frequency input channel is 4, 5, 6, 7, please see Section 6.9.

F0.01	Freq. number setting	range：low limit ～high limit	0.00Hz

F0.01 parameter is original set frequency of the inverter when frequency setting channel is defined as number setting (F0.00＝1, 2，3).

F0.02	Run command channel selection	range：0, 1, 2	0

0：keypad run frequency command channel. Start and stop the inverter by RUN , STOP, JOG key on the keypad.

1：terminal run command channel. Start and stop the inverter by exterior control terminal FWD, REV, X1~X8 etc..

2：serial port run command channel. Start and stop the inverter by RS485 or interface.

The inverter can change run command channel by modifying F0.02 during waiting and running，please confirm that modification is allowed during running on the spot.

F0.03	Run direction setting	Range：0, 1	0

This function is only effective for keypad and serial port run command channel，ineffective for terminal run command channel.

0：inverter forward run 1：inverter reverse run

F0.04	Preventing reverse run selection	range：0, 1	0

0：inverter reverse run allowed

1：inverter reverse run banned. The inverter will stop outputting if reverse run command available.

note

If this function is set to "1"，effective for keypad run command channel, terminal run command channel and serial port run command channel.

F0.05	Load motor rated freq.	range：0－high limit freq.	50.00Hz
F0.06	Load motor rated volt.	range：1－480V	380V

F0.07	Load motor rated	range：0.4－999.9KW	depend on
F0.08	Load motor rated	range：0.1－999.9A	depend
F0.09	Load motor rated speed	range：1-9999 (r/min)	1440(r/min)

Remark: "depend" means depending on device type in above table.
To let the inverter run safely，please set above parameter function code according to rated data of the motor drived by the inverter.

F0.10	Acc/Dec mode selection	range：0, 1, 2	0

0：linear Acc/Dec mode. Output frequency increase or decrease by degrees according to constant slope, as shown in Fig. 6-1.

1：S curve Acc/Dec mode. Output frequency increase or decrease by degrees according to S curve, as shown in Fig. 6-2.

2：reserved

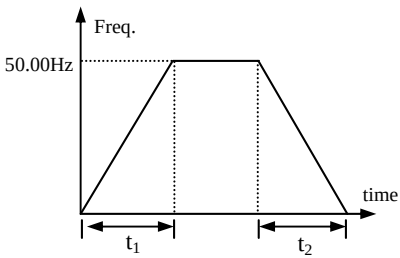


Fig.6-1 linear Acce/Dece

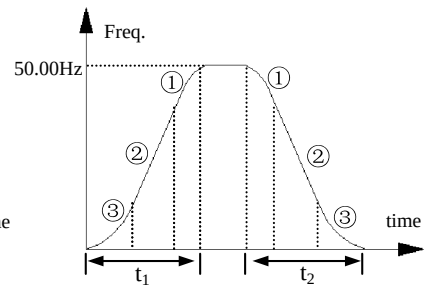


Fig.6-2 S curve Acce/Dece

F0.11	S curve starting time	range：10.0(%)－50.0(%) （Acc/Dec time）F0.11＋F0.12≤90(%)	20.0(%)
F0.12	S curve rising time	range：10.0(%)－80.0(%) （Acc/Dec time）F0.11＋F0.12≤90(%)	60.0(%)

F0.11, F0.12 is only effective when S curve Acc/Dec mode（F0.10＝1）is selected during Acc/Dec selection, and F0.11+F0.12≤90%.

S curve starting time is shown as Fig. 6-2③，slope of output frequency variation increases by degrees from 0.

S curve rising time is shown as Fig.6-2②，slope of output frequency variation is constant.

S curve ending time is shown as Fig.6-2①，slope of output frequency variation steps down to 0.

note S curve Acc/Dec mode，suitable for starting and stopping elevator, deferent belt, carrier transporter load etc..

F0.13	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 recommended.

F0.14	Acc time 1	range：0.1－6000.0	20.0
F0.15	Dec time 1	range：0.1－6000.0	20.0

Accelerating time is defined as time for inverter accelerating from 0Hz to 50.00Hz，see t_1 in Fig.6-3，Dec time is defined as time for inverter decelerating from 50.00Hz to 0Hz, see t_2 in Fig.6-3.

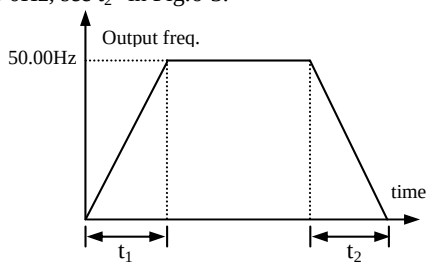


Fig.6-3 Acc/Dec time definition

note

(1) In EDS2000/EDS2800 series inverter 4 kinds of Acc/Dec time are defined in total，here we only define Acc/Dec time 1，Acc/Dec time 2~4 are defined in F2.21~F2.26，please refer to Section 6.3.

(2) Can choose time unit minute or second for Acc/Dec time 1~4 by F0.13, factory default is second.

F0.16	high limit frequency	range：low limit－400.00Hz	50.00Hz
F0.17	low limit frequency	range：0.00－high limit	0.00Hz
F0.18	Low limit freq. run mode	range：0:run at low limit freq. 1:stop running	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 F0.18 is set to 0；The inverter will reduce output frequency sequentially to zero frequency run if F0.18 is set to 1.

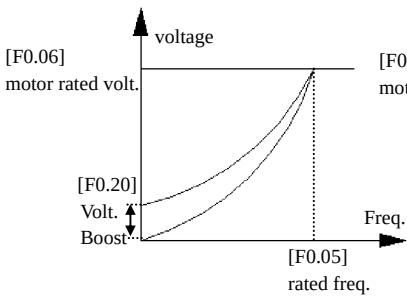
0：manual boost. Torque boost voltage is determined completely by parameter F0.20，its characteristic is boost voltage fixed，but the motor is prone to magnetic saturation when lightly loaded.

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

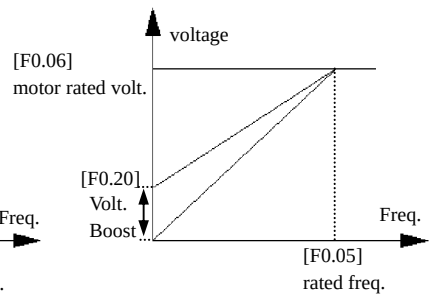
$$\text{Boost volt.}=\frac{\text{F0.20}}{100}\times\text{motor rated volt.}\times\frac{\text{inverter output current}}{2\times\text{inverter rated current}}$$

F0.20	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.6-4a, b.



(a)degressive torque curve torque boost graph



(b) constant torque curve torque boost graph

Fig.6-4 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.

F0.21	**V/F curve setting**	**range：0~4**	**0**
F0.22	**V/F freq. value F1**	**range：0.00-F0.24**	**0.00Hz**
F0.23	**V/F voltage value V1**	**range：0.00-F0.25**	**0.0(%)**
F0.24	**V/F freq. value F2**	**range：F0.22-F0.26**	**0.00Hz**
F0.25	**V/F voltage value V2**	**range：F0.23-F0.27**	**0.0(%)**
F0.26	**V/F freq. value F3**	**range：F0.24-high limit freq.**	**0.00Hz**
F0.27	**V/F voltage value V3**	**range：F0.25-100.0%**	**0.0(%)**

This function code group defines EDS2000/EDS2800 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 F0.21.

If F0.21=0，V/F curve bears constant torque characteristic；as curve 0 in Fig.6-5.

If F0.21=1，V/F curve bears 2.0 order power degressive torque characteristic；as curve 3 in Fig.6-5.

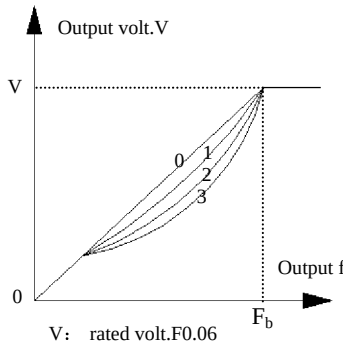
If F0.21=2，V/F curve bears 1.7 order power degressive torque characteristic；as curve 2 in Fig.6-5.

If F0.21=3，V/F curve bears 1.2 order power degressive torque characteristic；as curve 1 in Fig.6-5.

The user can choose 1, 2, 3 V/F curve run mode according to load characteristic to reach better energy save result while the inverter is driving degressive torque load such as blower and water pump etc..

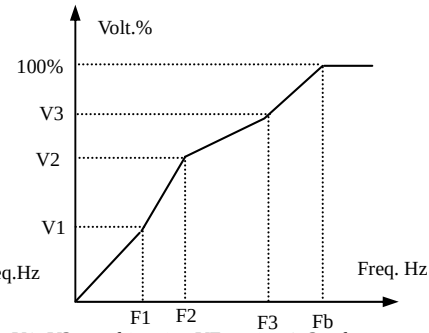
If F0.21=4 ， the user can set V/F curve by himself per setting F0.22-F0.27 parameter.

As shown in Fig.6-6，by setting three inflexion points（V1，F1），（V2，F2），（V3，F3），you can define V/F curve arbitrarily to apply to special load.



V： rated volt.F0.06
F_b：rated freq.F0.05

Fig.6-5 V/F curve



V1~V3：multisection VF section 1~3 voltage percent
F1~F3：multisection VF section 1~3 freq. point
Fb：rated frequency

Fig.6-6 V/F curve form set by user

6.2 Start-up, shutdown, braking function parameter group：F1

F1.00	Start-up run mode	range：0, 1, 2	0

0：start from starting frequency. The inverter start according to F1.01 starting frequency and F1.02 starting frequency holding time.

1：first braking then starting. First brake according to DC braking voltage and time (F1.03, F1.04)，then start at starting frequency.

2：speed tracking starting. Start-up process is effective to power supply revival after transient stop, external failure reset, starting process after free stop-running when F1.00=2, as shown in Fig.6-7.

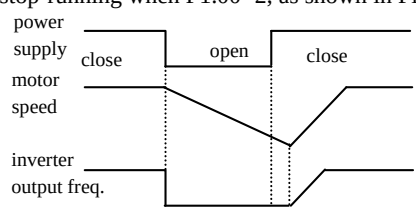


Fig.6-7 speed tracking starting

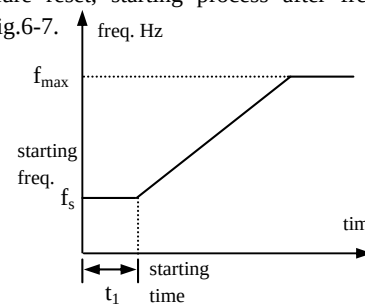


Fig.6-8 starting freq. and starting time

note

(1) start-up mode 0: Advise 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 load with forward run or reverse run phenomena when the moter doesn't drive any device，for big inertia load，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.

F1.01	**Starting frequency**	**range：0.0－10.00Hz**	**0.00 Hz**
F1.02	**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.6-8；Starting freq. holding time means consecutive run time during which the inverter run at starting frequency，as t_1 shown in Fig.6-8.

note Starting frequency is not limited by low limit frequency.

F1.03	**DC braking volt. when starting**	**range：0－15(%)**	**0(%)**
F1.04	**DC braking time when starting**	**range：0.0－20.0S**	**0.0S**

When F1.00=1，F1.03, F1.04 is effective，as shown in Fig.6-9.

F1.03 is percentage relative to inverter rated input voltage. Have no DC braking process when starting DC braking time is 0.0.

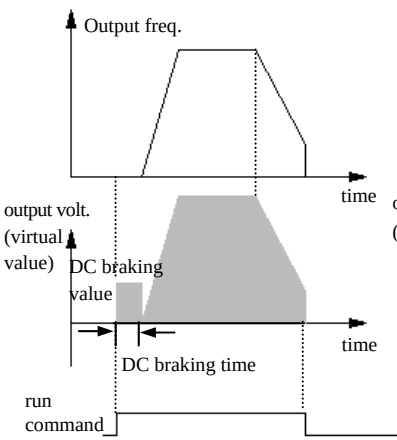


Fig.6-9 starting mode 1

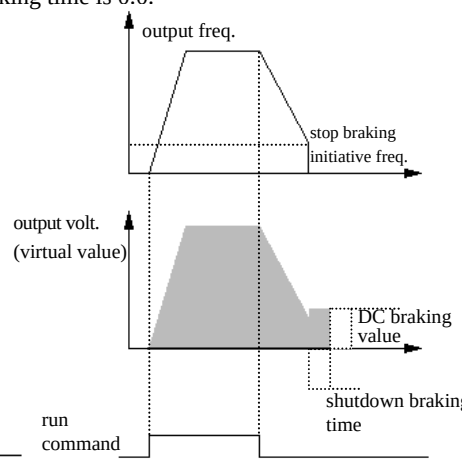


Fig.6-10 Dec shutdown+DC braking

F1.05	**Shutdown mode**	**Range：0, 1, 2**	**0**

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

2：Dec plus DC braking shutdown. The inverter reduces output frequency

gradually according to set Dec time upon receival of stop command and start DC braking when F1.06 shutdown braking initiative frequency is reached.

F1.06	**Shutdown DC braking initiative frequency**	**range：0.0－15.00Hz**	**3.00Hz**
F1.07	**Shutdown DC braking time**	**range：0.0－20.0S**	**0.0S**
F1.08	**Shutdown DC braking voltage**	**range：0－15（%）**	**0**

F1.08 is percentage relative to inverter rated input voltage. Have no DC braking process if stop braking time is 0.0s， as shown in Fig.6-10.

6.3 Auxiliary run function parameter group：F2

F2.00	**Analog filtering time constant**	**range：0.00－30.00S**	**0.20S**

The time constant used when the inverter filter sampled value when frequency is set by exterior analog channel. Can improve the situation by increasing this filtering time constant if connecting wire is long or disturbance is serious which cause unstable set frequency.

Analog filtering time constant must be bigger than F3.10 (sampling cycle), otherwise the system would run unsteadily.

F2.01	**FWD REV run dead-section time**	**range：0.0－3600.0S**	**0.0S**

During process of transiting from forward run to reverse run or from reverse run to forward run, transition time during which the inverter wait at zero output frequency, as t_1 shown in Fig.6-11.

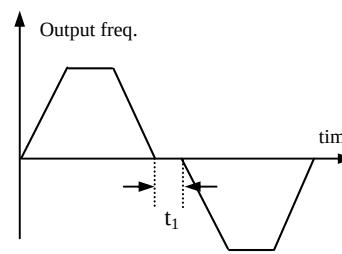


Fig.6-11 FWD REV run dead-section time

F2.02	**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.

F2.03	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 F2.03=1. When F1.05=0 namely inverter in decelerating shutdown，motor Dec time is short and running current would be bigger. But the motor decrease speed placidly with small run current and long Dec time if choose AVR action all the time.

（2） should set F2.03=0, namely AVR function ineffective when the motor system oscillates which caused by choosing AVR function.

F2.04	Slip freq. compensation	range：0～150(%)	0

This function can adjust output frequency properly as the load varies 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.6-12.

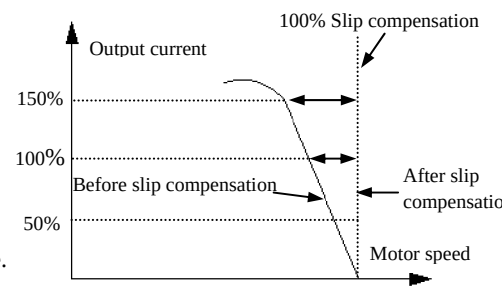


Fig.6-12 slip freq. compensation graph

F2.05	Carrier freq.	range：0.7－16.0K	Depend on device type

Carrier frequency mainly affects motor noise and heat consumption during running.

Relation between carrier frequency and motor noise, current leakage, disturbance is as follows：

Carrier frequency increase(↑)，motor noise decrease(↓)，motor current leakage increase(↑)，disturbance to environment increase(↑)；

Carrier frequency decrease (↓)，motor noise increase (↑)，motor current leakage decrease (↓)，disturbance to environment decrease (↓)。

Should decrease carrier frequency properly to reduce heat consumption of the inverter when ambient temperature is high and motor load is heavy. Relation of EDS2000 each type and carrier frequency is as shown in Table 6-1.

Table 6-1 relation table of device type and carrier frequency

carrier freq. / Power	Max. carrier freq. (KHz)	Min. carrier freq. (KHz)	factory default (KHz)
75KW	5.0	0.7	4.7
90KW	4.0	0.7	4.0
110KW	3.5	0.7	3.0
132KW	3.5	0.7	3.0
160KW	3.0	0.7	3.0
200KW	2.5	0.7	2.5
220KW	2.5	0.7	2.5
280KW	2.0	0.7	2.0
315KW	2.0	0.7	2.0
350KW	2.0	0.7	2.0
375KW	2.0	0.7	2.0
400KW	2.0	0.7	2.0

note

(1) To get better control characteristic，suggest that the ratio of carrier frequency to inverter max. run frequency be not smaller than 36.

(2) Error exists in current displayed value when carrier frequency is small.

F2.06	**Jog run frequency**	**range：0.10－50.00Hz**	**5.00Hz**
F2.07	**Jog Acc time**	**range：0.1－60.0S**	**20.0S**
F2.08	**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.6-13.
Jog accelerating time means time during which the inverter accelerate from 0Hz to 50.00Hz，Jog Dec time means time during which the inverter decelerate from 50.00 Hz to 0Hz.

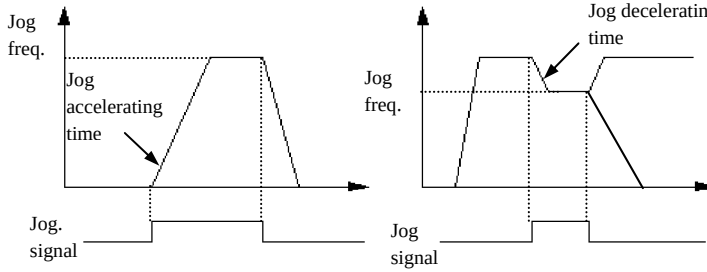


Fig.6-13 jog run

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.

F2.09	Freq. input channel combination	range：0～27	0

0：VCI＋CCI
1：VCI－CCI
2：YCI＋CCI
3：YCI－CCI
4：VCI＋YCI
5：VCI－YCI
6：external pulse provision＋CCI
7：external pulse provision－CCI
8：MAX（VCI，YCI）
9：MIN（VCI，YCI）
10 ：MAX（YCI，VCI，PULSE）
11：MIN（YCI，VCI，PULSE）
12 ：VCI，YCI any nonzero value effective，VCI preferred
13 ：VCI，CCI any nonzero value effective，VCI preferred
14 ：VCI+YCI（for controlling simple strain）
Here YCI input 0～＋10V corresponds to frequency -50.00Hz~+50.00Hz，

0~5V corresponds to frequency -50.00～0Hz，5~10V corresponds to 0~+50.00Hz.

15 ： RS485+CCI
16 ： RS485-CCI
17 ： RS485+VCI
18 ： RS485-VCI
19 ： RS485+keypad potentiometer
20 ： RS485- keypad potentiometer
21 ： VCI+ keypad potentiometer
22 ： VCI- keypad potentiometer
23 ： CCI+ keypad potentiometer
24 ： CCI- keypad potentiometer
25 ： reserved 26 ： reserved 27 ： reserved

F2.10	**main&sub inverter communication freq. provision proportion**	**range：0—500(%)**	**100(%)**

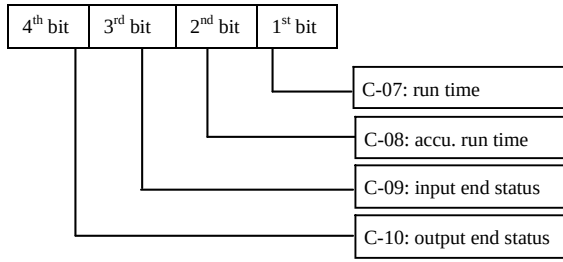
Main&sub inverter communication freq. provision proportion，this parameter need to be set in sub inverter but not need in main inverter.

F2.11	**Output volt. emendation factor**	**range：50—150(%)**	**100(%)**
F2.12	**Heat sink temp. emendation factor**	**range：50—150(%)**	**100(%)**
F2.13	**Load motor speed emendation factor**	**range：50—150(%)**	**100(%)**

Above 3 function codes are for emendating display error，no effect to actual value.

F2.14	**LED display control 1**	**range：0000-1111**	**0000**

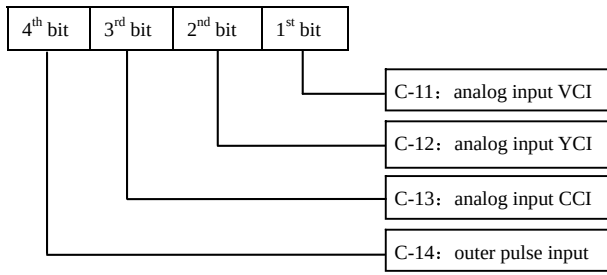
F2.14 make use of 4 bits of the parameter to set if C-07—C-10 is displayed in parameter, thereinto 0 indicates not displayed, 1 indicates displayed. Set parameter of 4 bit is as following figure：



Remark: accu. is abbreviation of accumulative.

F2.15	LED display control 2	range：0000-1111	1111

F2.15 make use of 4 bit of the parameter to set if C-11—C-14 is displayed in parameter, thereinto 0 indicates not displayed, 1 indicates displayed. Set parameter of 4 bit is as following figure：



F2.16	Parameter operation control	range：0~6	0

0：all parameter allowed to be modified

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

2： except F0.01 and this parameter，all other parameter not allowed to be changed

3：to clear history failure record

4：renew factory default

5：parameter uploading. Namely upload inverter parameter to keypad

6：parameter downloading. Namely download keypad parameter to inverter

F2.17	communication deployment	range：LED 1st bit：0~7 LED 2nd bit： 0, 1, 2	05

F2.17 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：**0：300BPS**

1：600BPS
2：1200BPS
3：2400BPS
4：4800BPS
5：9600BPS
6：19200BPS
7：38400BPS

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

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

F2.18	**Local address**	**range：0－126，127 is broadcast address**	**1**

This function code is used to identify address of this inverter during serial port communication. 0 use as main address during main and sub device communication. If set 127, the inverter only receive no send.

127 is broadcast address，can only receive and execute broadcast command from upper machine but not respond to upper machine when 127 is set to broadcast address.

F2.19	**Communication overtime checkout time**	**range：0.0－1000.0S**	**1S**

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.

F2.20	**Local response delay 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.

F2.21	**Accelerating time 2**	**range：0.1－6000.0**	**20.0**
F2.22	**Decelerating time 2**	**range：0.1－6000.0**	**20.0**
F2.23	**Accelerating time 3**	**range：0.1－6000.0**	**20.0**
F2.24	**Decelerating time 3**	**range：0.1－6000.0**	**20.0**
F2.25	**Accelerating time 4**	**range：0.1－6000.0**	**20.0**
F2.26	**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 F5.00～F5.07.

note Accelerating decelerating time 1 is defined in F0.14 and F0.15.

F2.27	**Multi-step freq. 1**	**range：low limit －high limit**	**5.00Hz**
F2.28	**Multi-step freq. 2**	**range：low limit －high limit**	**10.00Hz**
F2.29	**Multi-step freq. 3**	**range：low limit －high limit**	**20.00Hz**
F2.30	**Multi-step freq. 4**	**range：low limit －high limit**	**30.00Hz**
F2.31	**Multi-step freq. 5**	**range：low limit －high limit**	**40.00Hz**
F2.32	**Multi-step freq. 6**	**range：low limit －high limit**	**45.00Hz**
F2.33	**Multi-step freq. 7**	**range：low limit －high limit**	**50.00Hz**
F2.34	**Multi-step freq. 8**	**range：low limit －high limit**	**5.00Hz**
F2.35	**Multi-step freq. 9**	**range：low limit －high limit**	**10.00Hz**
F2.36	**Multi-step freq. 10**	**range：low limit －high limit**	**20.00Hz**
F2.37	**Multi-step freq. 11**	**range：low limit －high limit**	**30.00Hz**
F2.38	**Multi-step freq. 12**	**range：low limit －high limit**	**40.00Hz**
F2.39	**Multi-step freq. 13**	**range：low limit －high limit**	**45.00Hz**
F2.40	**Multi-step freq. 14**	**range：low limit －high limit**	**50.00Hz**
F2.41	**Multi-step freq. 15**	**range：low limit －high limit**	**50.00Hz**

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 F5.00～F5.07 and F4 group simple PLC function.

F2.42	**Jumping freq. 1**	**range：0.00－400.00Hz**	**0.00Hz**
F2.43	**Jumping freq. 1 range**	**range：0.00－30.00Hz**	**0.00Hz**
F2.44	**Jumping freq. 2**	**range：0.00－400.00Hz**	**0.00Hz**
F2.45	**Jumping freq. 2 range**	**range：0.00－30.00Hz**	**0.00Hz**
F2.46	**Jumping freq. 3**	**range：0.00－400.00Hz**	**0.00Hz**
F2.47	**Jumping freq. 3 range**	**range：0.00－30.00Hz**	**0.00Hz**

F2.42～F2.47 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 Fig. 6-14, at most 3 jumping range can be defined.

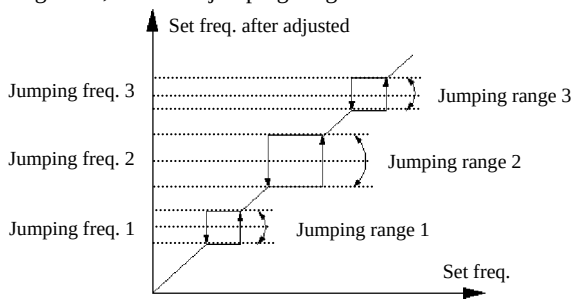


Fig.6-14 jumping frequency and range graph

F2.48	**Set run time**	**range：0－65535h**	**0**
F2.49	**Run time accumulation**	**range：0－65535h**	**0**

After run accumulative time reach set run time (F2.48)，the inverter will output indicator signal，please refer to F5.10～F5.11 function introduction.

F2.49 denotes accumulative run time of the inverter from leaving factory to now.

6.4 Closed-loop run control parameter group：F3

Analog feedback control system：

Input pressure specified value through VCI port, send 4~20mA feedback value of pressure sensor to inverter CCI input port，make up of analog closed-loop control system by built-in PID adjustor，as shown in Fig.6-15.

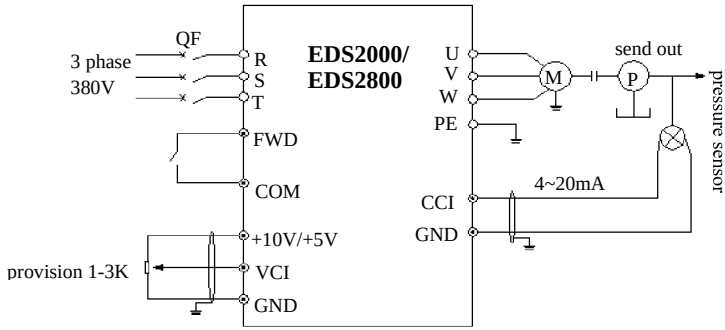


Fig.6-15 built-in PID analog feedback control system graph

note Specified value can also be provided with option by F0.00 function code.

EDS2000/EDS2800 built-in PID adjustor make up of control system and its work principle chart is as follows：

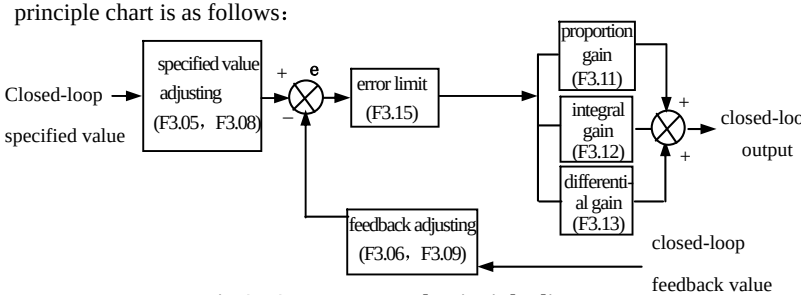


Fig.6-16 PID control principle diagram

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

In above Fig.6-16 ,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 (F3.01~F3.15) definition，relation of specified value and expected feedback value is as shown in Fig.6-17. Thereinto specified value take 10V as reference and feedback take 20mA as reference.

Specified value adjusting and feedback value adjusting in Fig.6-16 is for confirming corresponding relation and unitive dimension between specified value and feedback value.

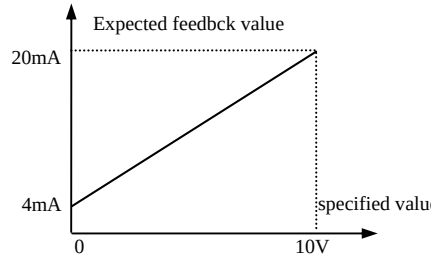


Fig.6-17 specified value and expected feedback value

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 (F3.05~F3.09)

(3) set closed-loop presetting frequency function (F3.16~F3.17)

(4) set closed-loop proportion gain, integral gain, differential gain, sampling cycle, error limit (F3.11~F3.15)

F3.00	Closed-loop run control selection	range：0, 1, 2	0

0：closed-loop run control ineffective

1：PID closed-loop run control effective

2：reserved

F3.01	provision channel selection	range：0~4	1

0：digital voltage provision. Refer to function code F3.03

1：digital pressure provision. Refer to function code F3.04

2：VCI analog 0－10V voltage provision

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

4：keypad potentiometer provision

F3.02	Feedback channel selection	range：0~5	1

0：VCI analog input voltage 0－10V

1：CCI analog input

2：VCI+CCI **3：VCI-CCI**

4：Min { VCI, CCI } **5：Max { VCI, CCI }**

Remark: When choose CCI analog input as current input, current is converted into voltage.

F3.03	**Digital voltage setting**	**range：0.00－10.00V**	**0.00V**

When F3.01=0, figure provision F3.03 will be as specified value of closed-loop control system directly. Therefore when control closed-loop system through keypad or serial port, can change system specified value by modifying F3.03.

F3.04	**Digital pressure setting**	**range：0.000－9.999Mpa**	**0.000Mpa**

This parameter is to set digital pressure setting value
Only effective when F3.01=1(digital pressure provision)

F3.05	**min. specified value**	**range: 0.0－max. specified value**	**0.0(%)**
F3.06	**corresponding feedback value of min. specified value**	**range：0.0－100.0(%)**	**0.0(%)**
F3.07	**corresponding pressure value of F3.06**	**range：0.000－9.999Mpa**	**0.000Mpa**
F3.08	**max. specified value value**	**range：min. specified value -100.0(%)**	**100.0(%)**
F3.09	**corresponding feedback value of max. specified value**	**range：0.0%－100.0(%)**	**100.0(%)**
F3.10	**corresponding pressure value of F3.09**	**Range：0.000－9.999Mpa**	**0.000Mpa**

F3.05, F3.06, F3.08, F3.09 define relation curve of analog closed-loop provision and expected feedback. Their set value is percentage of provision and feedback actual value relative to reference (10V or 20mA).

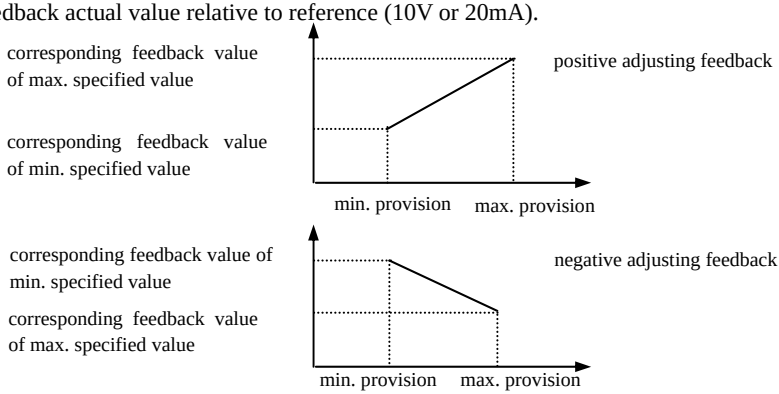


Fig.6-18 provision, feedback curve

F3.11	**Proportion gain KP**	**range：0.000－9.999**	**0.050**
F3.12	**Integral gain KI**	**range：0.000－9.999**	**0.050S**
F3.13	**Differential gain Kd**	**range：0.000－9.999**	**0.000**
F3.14	**Sampling cycle T**	**range：0.01－10.00S**	**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.

F3.15	**Offset limit**	**range：0.0－20.0(%)**	**2.0(%)**

For Max. offset of closed-loop specified value，as shown in Fig.6-19，PID adjustor stops adjusting when feedback value is within this range. To utilize this function reasonably redound to harmonizing the conflict between system outputprecision and stabilization.

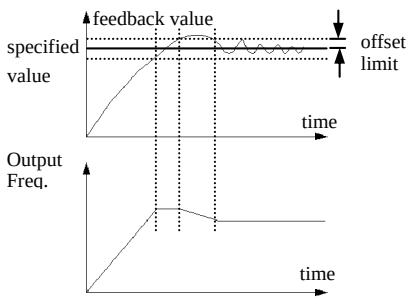


Fig.6-19 offset limit

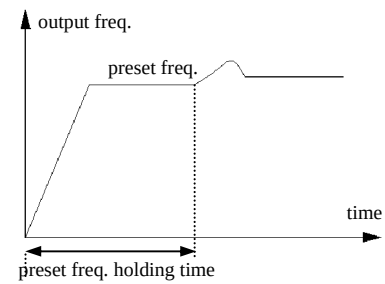


Fig.6-20 closed-loop preset freq. run

F3.16	**closed-loop preset frequency**	**range：0-high limit freq.**	**0.00Hz**
F3.17	**closed-loop preset frequency holding time**	**range：0.0-6000S**	**0.1S**

This function can make closed-loop adjusting enter into stable phase quickly.
After closed-loop run starts, the inverter first accelerates to preset frequency F3.16 in terms of accelerating time，and after running at this frequency for a period of time F3.17, it runs according to closed-loop characteristic. As shown in Fig.6-20.

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

F3.18	**Revival frequency**	**range：0.00－400.00Hz**	**0.00Hz**
F3.19	**Sleep frequency**	**range：0.00－400.00Hz**	**0.00Hz**

Revival frequency define frequency limit from sleep status to work status. If set frequency is bigger than this limit and the situation sustains for a revival delay time, the inverter will enter into work status from sleep status.
Sleep frequency define frequency limit from work status to sleep status. If set frequency is smaller than this limit and the situation sustains for a sleep delay time, the inverter will enter into sleep status from work status.
This function can realize sleep function and make energy save run possible, avoid the inverter staring at threshold frequency frequently.

F3.20	**integral separation PID adjusting threshold**	**range：0.0－100.0%**	**100.0**

PID integral separation，integral don't react when specified value and feedback value are bigger than this limit，only when specified value and feedback value are smaller than or equal to this limit，integral react. Can adjust system response speed by adjusting this parameter.

F3.21	**Closed-loop adjusting characteristic**	**range: 0~1**	**0**

0: plus action. When provision increases, motor speed increases.
1: minus action. When provision increases, motor speed decreases.

F3.22	**reserved**		
F3.23	**reserved**		
F3.24	**reserved**		
F3.25	**Failure relay delay time**	**range: 0:no delay 1:delay 5s**	

6.5 Simple PLC run function parameter group：F4

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.6-21.

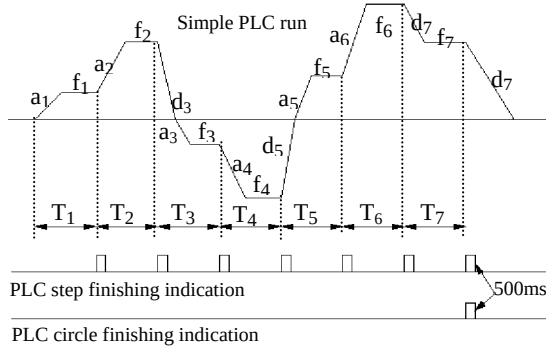


Fig.6-21 simple PLC run

EDS2000 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.6-22，a_1~a_5, d_1~d_5 is accelerating or decelerating time of relative step，set by accelerating decelerating time parameter F0.14, F0.15 and F2.21~F2.26 in total 4 kinds of parameter，f_1~f_7, T_1~T_7 indicating set frequency and run time set by function code F4.02~F4.14.

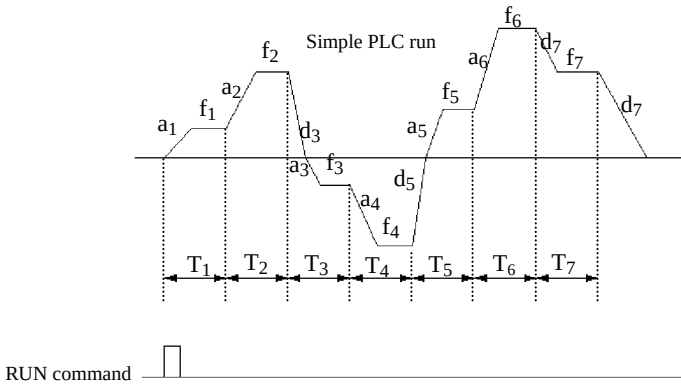


Fig.6-22 stop after PLC single circle

PLC step finishing and circle finishing indication can be realized by outputting 500mS pulse indicator signal through open circuit collector terminal Y1, Y2, detailed function defined by F5.10, F5.11.

F4.00	**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: **0: no action.** PLC run mode ineffective.

1: stop after single circle. As shown in Fig.6-22, 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 -23 , 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.

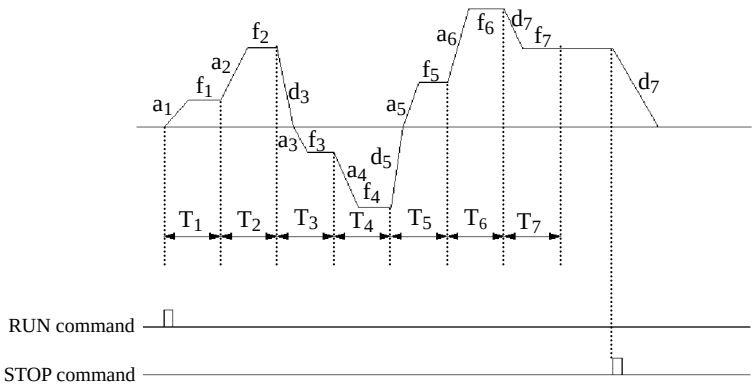


Fig.6-23 holding mode after PLC single circle

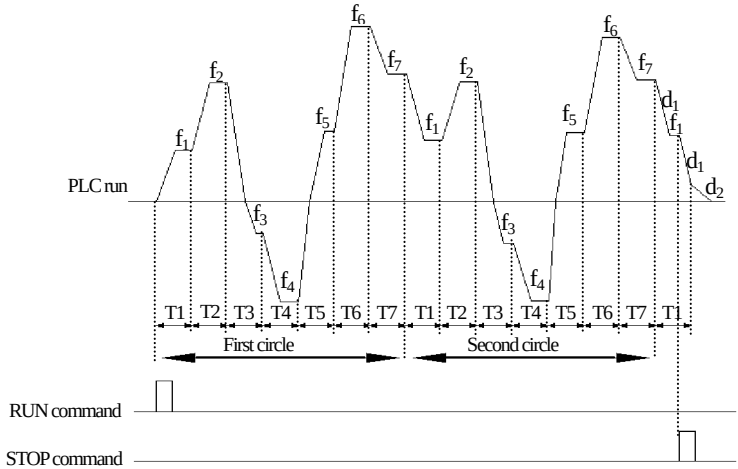


Fig.6-24 PLC consecutive circle mode

3：consecutive circle. As shown in Fig.6-24，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.6-25. The inverter will rerun from first step after restarting if power off.

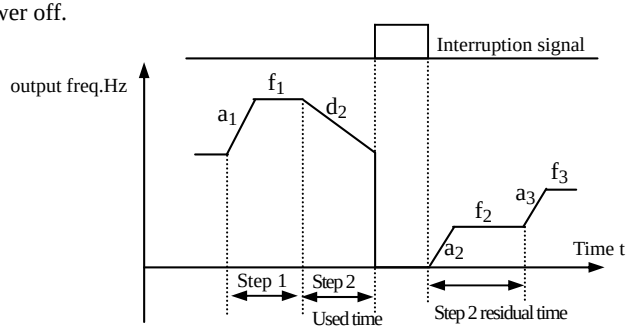


Fig.6-25 PLC starting mode 1

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 F0.13.

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 F5.

F4.01	**Step 1 setting**	**range：000－322**	**000**
F4.02	**Step 1 runtime**	**range：0－6000.0**	**10**
F4.03	**Step 2 setting**	**range：000－322**	**000**
F4.04	**Step 2 runtime**	**range：0－6000.0**	**10**
F4.05	**Step 3 setting**	**range：000－322**	**000**
F4.06	**Step 3 runtime**	**range：0－6000.0**	**10**
F4.07	**Step 4 setting**	**range：000－322**	**000**
F4.08	**Step 4 runtime**	**range：0－6000.0**	**10**
F4.09	**Step 5 setting**	**range：000－322**	**000**
F4.10	**Step 5 runtime**	**range：0－6000.0**	**10**
F4.11	**Step 6 setting**	**range：000－322**	**000**
F4.12	**Step 6 runtime**	**range：0－6000.0**	**10**
F4.13	**Step 7 setting**	**range：000－322**	**000**
F4.14	**Step 7 runtime**	**range：0－6000.0**	**10**

F4.01~F4.14 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 is defined by F2.27~F2.41.

1：frequency is determined by function code F0.00

2：multi-step closed-loop provision i i =1~7 is defined by F3.17~F3.23.

LED 2nd bit：run direction selection

0：forward run

1：reverse run

2：determined by run command (FWD,REV)

LED3rd 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 Terminal correlative function parameter group：F5

F5.00	**Input terminal X1 function selection**	**range：0~41**	**0**
F5.01	**Input terminal X2 function selection**	**range：0~41**	**0**
F5.02	**Input terminal X3 function selection**	**range：0~41**	**0**
F5.03	**Input terminal X4 function selection**	**range：0~41**	**0**
F5.04	**Input terminal X5 function selection**	**range：0~41**	**0**
F5.05	**Input terminal X6 function selection**	**range：0~41**	**0**
F5.06	**Input terminal X7 function selection**	**range：0~41**	**0**
F5.07	**Input terminal X8 function selection**	**range：0~41**	**0**

Multi-function input terminal X1~X8 provides 42 kinds of selection mode for the user，can choose based on spot requirement. For parameter function table please see Table 6-2.

Table 6-2 multifunction input function selection table

item	corresponding function	item	corresponding function
0	Leave control terminal unused	1	Multi-step speed control terminal 1
2	Multi-step speed control terminal 2	3	Multi-step speed control terminal 3
4	Multi-step speed control terminal 4	5	External forward run jog control
6	External reverse run jog control	7	Accel/Decel time selecting terminal 1
8	Accel/Decel time selecting terminal 2	9	External device failure input
10	External restoration input	11	Free shutdown input（RRS）
12	External shutdown command	13	Stop DC braking input command DB
14	Inverter run prohibition	15	Frequency increasing command（UP）
16	frequency descending command（DOWN）	17	Accel/Decel prohibited command
18	Three-wire run control	19	Closed-loop ineffective
20	PLC ineffective	21	Simple PLC pause command
22	PLC stop status restoration (reset variable of PLC interruption moment, make it restart from first segment)	23	Frequency provision channel selection 1
24	Frequency provision channel selection 2	25	Frequency provision channel selection 3

26	Frequency switched to CCI	27	Command switched to terminal
28	Run command channel selection 1	29	Run command channel selection 2
30	reserved	31	reserved
32	reserved	33	Swing frequency run-in
34	reserved	35	External interruption input
36	interior counter clearing end	37	interior counter triggering end
38	Pulse frequency input（only effective for X7,X8）	39	Reserved
40	Reserved	41	Reserved

Now explain listed function in Table 6-2 as follows：

1~4：Multi-step speed control terminal. Can set 15 step speed run frequency by choosing ON/OFF combination of these function terminal.

Table 6-3 multi-step speed run selection table

K_4	K_3	K_2	K_1	Frequency setting
OFF	OFF	OFF	OFF	Common run frequency
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
ON	OFF	OFF	ON	Multi-step frequency 9
ON	OFF	ON	OFF	Multi-step frequency 10
ON	OFF	ON	ON	Multi-step frequency 11
ON	ON	OFF	OFF	Multi-step frequency 12
ON	ON	OFF	ON	Multi-step frequency 13
ON	ON	ON	OFF	Multi-step frequency 14
ON	ON	ON	ON	Multi-step frequency 15

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 X1, X2, X3, X4 separately as follows：

After set F5.00=1, F5.01=2, F5.02=3, F5.03=4, X1, X2, X3, X4 are used for

realizing multi-step run，as shown in Fig.6-26.

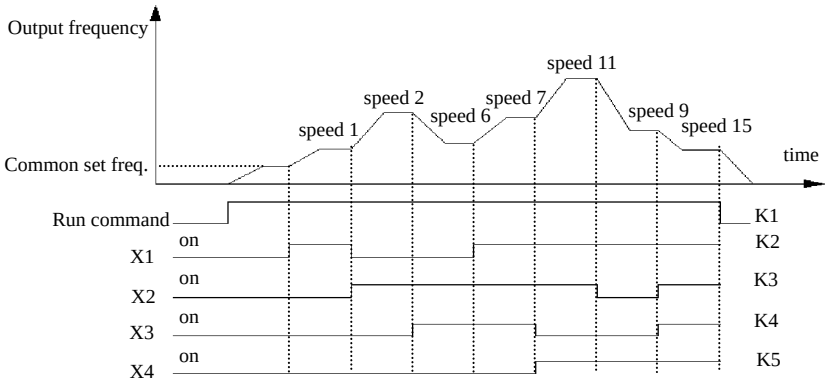
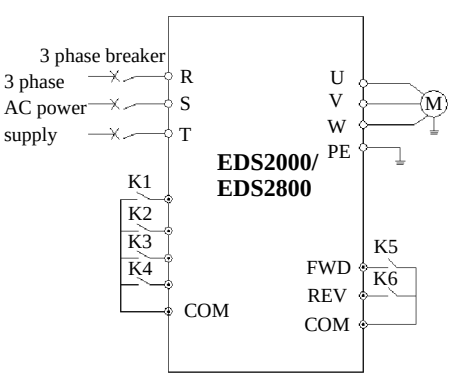


Fig.6-26 multi-step speed run

In fig.6-27 see an example of terminal run command channel，can make forward, reverse run control by K_5, K_6. In Fig.6-26, by different logic combination of K_1, K_2, K_3, K_4，the inverter can run according to common set frequency or multi-step frequency based on above table.



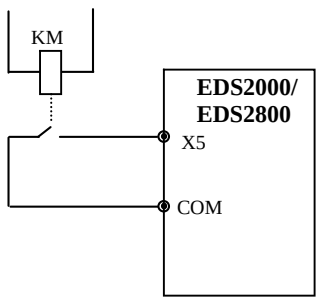


Fig.6-27 multi-step speed run **Fig.6-28 exterior device failure always-open input**

5~6：external jog run control input JOGF/JOGR. When run command channel is set to terminal run command channel F0.02=1，JOGF is jog forward run，JOGR is jog reverse run，jog operation frequency, jog accelerating decelerating time is defined in F2.06~F2.08 (remark：jog run command channel is determined by F0.02)

7~8：Accel&Decel time terminal selection

Table 6-4 Accel&Decel time terminal selection logic mode

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

9：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 "E0.14", namely external equipment fault alarm after receiving the external equipment fault signal.

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

11 ： free stop input. This function is same as free stop during running defined in F1.05，but it's realized by control terminal to be convenient for long-distance control.

12 ：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 F1.05.

13 ： 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 current are defined in F1.06~F1.07.

14 ： 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.

15~16 ： 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 F0.00=2.Increasing descending speed is set by F5.09.

17 ： 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 shutdown.

18 ：three-wire run control. Please refer to function description of F5.08 run mode (three-wire run mode).

19 ： 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(F3.00=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.

20 ： 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 only during PLC run(F4.00≠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.

21 ：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 F4.00~F4.14.

22 ： 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 F4 group function description.

23~25：terminal frequency provision channel selection. Through ON/OFF combination of frequency provision channel selection terminal 23, 24, 25，can realize frequency provision channel switch shown in Table 6-5. For relation of terminal switch and function code F0.00 setting, that is, latter effective.

Table 6-5 terminal frequency provision channel selection logic mode

frequency provision channel selection end 3	frequency provision channel selection end 2	frequency provision channel selection end 1	frequency provision channel selection
OFF	OFF	OFF	hold freq. setting
OFF	OFF	ON	potentiometer provision
OFF	ON	OFF	keypad number provision

OFF	ON	ON	terminal UP/DOWN adjusting provision provision
ON	OFF	OFF	serial port provision
ON	OFF	ON	VCI
ON	ON	OFF	CCI
ON	ON	ON	end PULSE provision

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

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

28~29 ： terminal select run command channel

Table 6-6 run command channel logic mode

Run command channel selection terminal 2	Run command channel selection terminal 1	Run command channel
OFF	OFF	hold run command channel
OFF	ON	keypad run command channel
ON	OFF	end run command channel
ON	ON	serial port run command channel

Can realize control command selection shown in Table 6-6 by ON/OFF combination of run command channel selection terminal，For relation of terminal switch and function code F0.00 setting, that is, latter effective.

30~32 ： reserved

33 ：swing frequency jump-in. When swing frequency start mode is manual jump-in，swing frequency function effective if this terminal effective，see F7 function parameter description.

34 ： reserved

35 ： 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 tracking start-up to resume running once external interruption signal is relieved.

36 ： interior counter clearing end. To clear built-in counter in the inverter

with cooperation of counter triggering signal.

37 ： interior counter triggering end. Counting pulse input port of built-in counter，pulse max. frequency：200Hz，see function code F5.24, F5.25.

38 ： pulse frequency input（only effective to X7,X8）. Only effective for multifunction input terminal X7, X8，this function terminal receive pulse signal as frequency provision, for relation between inputted signal pulse frequency and set frequency in detail, please refer to F8 group parameter.

39 ： reserved

40 ： reserved

41 ： reserved

F5.08	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

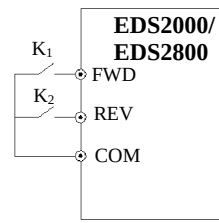


Fig.6-29 2-wire run mode 1

1：2-wire control mode 2

K2	K1	run command
0	0	stop
1	0	stop
0	1	forward run
1	1	reverse run

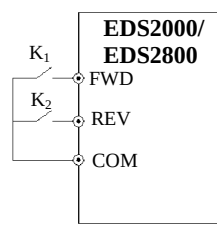


Fig.6-30 2-wire run mode 2

2：3-wire control mode 1

thereinto：

SB1：stop button

SB2：forward run button

SB3：reverse run button

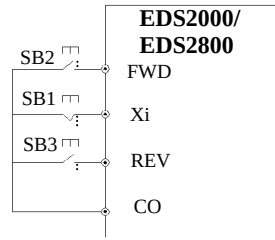


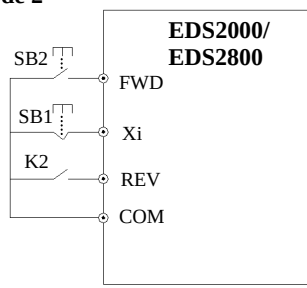
Fig.6-31 3-wire run mode 1

Xi is multifunction input terminal of X_1~X_8，here should define its corresponding terminal function as No. 18 “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.6-32 3-wire run mode 2

Xi is multifunction input terminal X_1~X_8, here should define its corresponding terminal function as No. 18 “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 shutdown.

F5.09	UP/DOWN speed	range：0.01－99.99Hz/S	1.00 Hz/S

This function code defines varying rate of the set frequency when it’s modified by

F5.10	Open collector output terminal Y1 output setting	range：0~19	0
F5.11	Open collector output terminal Y1 output setting	range：0~19	0

Y1, Y2 open collector output terminal，Table 6-7 shows option of above 2 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)	1	Frequency arriving signal (FAR)
2	Frequency level detecting signal (FDT1)	3	Frequency level detecting signal (FDT2)
4	Overload warning signal（OL）	5	Output Freq. reach high limit（FHL）
6	Output Freq. reach low limit（FLL）	7	Inverter stops for lacking voltage blockage (LU)
8	Stop for exterior failure（EXT）	9	Inverter zero speed running
10	In PLC run process	11	Simple PLC segment run finished
12	PLC finish one cycle run	13	reserved
14	Inverter is ready for run（RDY）	15	Inverter failure
16	Swing Freq. high&low limit restriction	17	Interior counter final value arrive
18	Interior counter specified value arrive	19	Set runtime arrive

Now introduce function listed in Table 6-7 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 F5.12.

2 ：Frequency level detecting signal（FDT1）. Refer to function description of F5.13~F5.14.

3 ：Frequency level detecting signal（FDT2）. Refer to function description of F5.15~F5.16.

4 ： overload warning signal（OL）. Inverter output current exceed F9.05 overload detect level and time exceed F9.06 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 lacking voltage blockage（LU）. When the inverter is running, LED displays“P.OFF”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 (E014)
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).

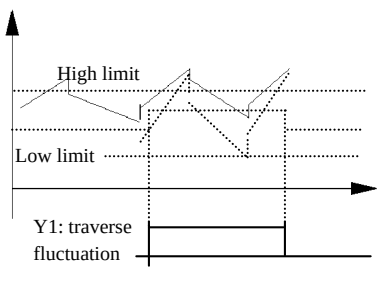
12 ： PLC finish one cycle run

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 F0.16 or under low limit frequency F0.17, the inverter will output indicator signal, as shown in Fig. 6-33.



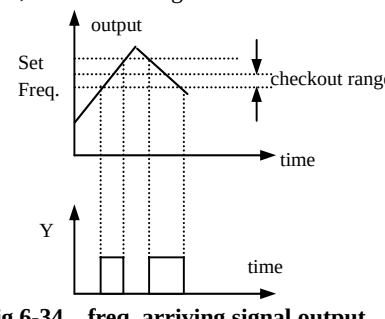


Fig.6-33 swing freq. range restriction Fig.6-34 freq. arriving signal output

17 ： Interior counter final value arrive

18 ： Interior counter specified value arrive

17~18 please refer to function description of F5.24~F5.25.

19 ：Set runtime arrive. When accumulative runtime of the inverter (F2.49) reach set runtime(F2.48)， output indicator signal.

F5.12	**Freq. arriving(FAR)detect range**	**range：0.00－50.00Hz**	**5.00Hz**

This parameter is supplementary definition to No. 1 function in Table 6-7.As shown in Fig.6-34 ，when output frequency of the inverter is within high&low detect range of set frequency，output pulse signal.

F5.13	**FDT1（freq. level）electric level**	**range：0.00－high limit frequency**	**10.00Hz**
F5.14	**FDT1 lag**	**range：0.00－50.00Hz**	**1.00Hz**
F5.15	**FDT2（freq. level）electric level**	**range：0.00－high limit frequency**	**10.00Hz**
F5.16	**FDT2 lag**	**range：0.00－50.00Hz**	**1.00Hz**

F5.13~F5.14 is supplementary definition to No.2 function in Table 6-7,while F5.15~F5.16 is supplementary definition to No.3 function in Table 6-7. Usage of both is identical, below take F5.13~F5.14 for an example. 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.6-35.

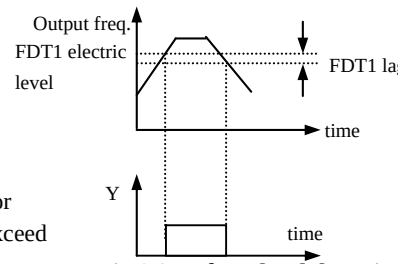


Fig.6-35 freq. level detecting

F5.17	**Analog output（AO1）selection**	**range：0－5**	**0**
F5.18	**Analog output（AO2）selection**	**range：0－5**	**0**

0：output frequency（0－high limit frequency）

1：output current（0－2×rated current）

2：output voltage（0－1.2×load motor rated voltage）

3：bus-bar voltage（0－800V）

4：PID provision (0.00-10.00V)

5：PID feedback (0.00-10.00V)

F5.19	**Analog output（AO1）gain**	**range：0.50－2.00**	**1.00**
F5.20	**reserved**		
F5.21	**Analog output（AO2）gain**	**range：0.50－2.00**	**1.00**

For AO1 and AO2 analog output, the user can modify display measuring range or emend meter head error by adjusting output gain if necessary.

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

F5.22	**DO terminal output function selection**	**range：0~5**	**0**

0：output frequency（0－high limit frequency）
1：output current（0－2×rated current）
2：output voltage（0－1.2×load motor rated voltage）
3：bus-bar voltage（0－800V）
4：PID provision (0.00-10.00V)
5：PID feedback (0.00-10.00V)

F5.23	**DO max. pulse output freq.**	**range：0.1－50.0（max. 50KHz）**	**10.00**

DO port max. output pulse frequency corresponds to maximum value optioned by F5.22，for example 0：output frequency，then max. Output pulse frequency corresponds to high limit frequency.

F5.24	**Set interior count number arriving provision**	**range：0－9999**	**0**
F5.25	**Specified interior count number arriving provision**	**range：0－9999**	**0**

F5.24, F5.25 is supplementary definition to No. 17, 18 function in Table 6-7.
Set count number provision，shows that when some number of pulse are inputted to Xi(count triggering signal input function terminal), Yi (open collector Output terminal) output a indicator signal.
As shown in Fig.6-36，Y1 output an indicator signal when the 8th pulse is inputted to Xi. Here F5.24=8.
Specified count number provision，shows that when some number of pulse are inputted to Xi, Y2 output a indicator signal，till set count number is reached.

As shown in Fig.6-36，Y2 start to output an indicator signal when the 5th pulse is inputted to Xi. Until set count number 8 is reached. Here F5.25=5. Specified count number is ineffective when it is bigger than set count number.

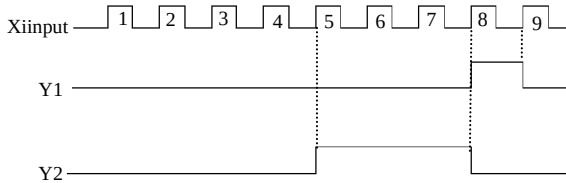


Fig.6-36 set count number and specified count number provision

6.7 Special parameter for injection molding machine and constant pressure water supply parameter

6.7.1 Special parameter for injection molding machine: F6（EDS2800）

F6.00	Injection molding machine special parameter	range：0—	0

0：Injection molding machine special parameter ineffective

1：Injection molding machine special parameter effective

F6.01	Selection combination	range：0—6	2

0：channel 1I sets frequency.

1：channel 2I sets frequency.

2：combination of 1I and 2I sets frequency. Set frequency=1I×[S-1]+2I×[S-2].

When parameter F6.01 is set to 2，namely sets frequency by combination of 1I and 2I：

3：VI_1+1I

4：VI_1+1I+2I

5：MAX{1I，2I}

6：MIN{1I，2I}

Set frequency=frequency set singly by channel 1I×F6.02+ frequency set singly by channel 2I×F6.03.

For setting frequency singly by each channel, please see Fig. 6-37 and Fig. 6-40.

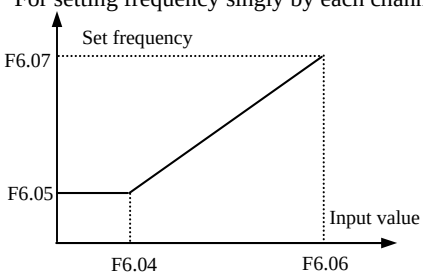


Fig. 6-37 set frequency 1 when inflexion ineffective

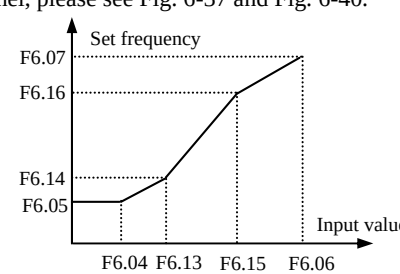


Fig. 6-38 set frequency 1 when inflexion effective

F6.02	**External input 1I weighting coefficient**	**range：0.01－1.00**	**0.50**
F6.03	**External input 2I weighting coefficient**	**range：0.01－1.00**	**0.50**

When F6.01=2, i.e., frequency is set by combination of 1I and 2I：
Set frequency=frequency set singly by channel 1I×F6.02+ frequency set singly by channel 2I×F6.03, frequency solely set by each channel is as shown in Fig. 6-37 and Fig. 6-40.

F6.08	**2I Min. input value**	**range：0.01－1.00**	**0.20**
F6.09	**Corresponding Freq. of 2I Min. input value**	**range：0.00－400.00**	**10.00**
F6.10	**2I Max. input value**	**range：0.01－1.00**	**1.00**
F6.11	**Corresponding Freq. of 2I Max. input value**	**range：0.01－400.00**	**50.00**

When set F6.01 to 0, namely let 2I set frequency.
When parameter F6.12 is set to 0，namely inflexion is set to be ineffective，set frequency of the inverter is decided completely by parameters F6.04~F6.07，as shown in Fig. 6-37. When parameter F6.12 is set to 1，namely inflexion effective，here set frequency is as shown in Fig. 6-38.

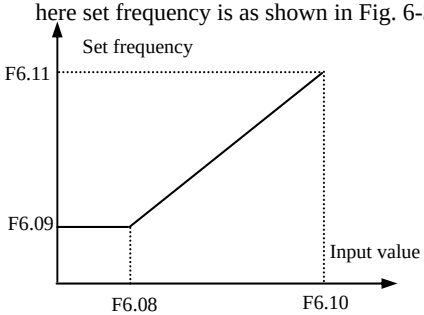


Fig. 6-39 set frequency 2 when inflexion ineffective

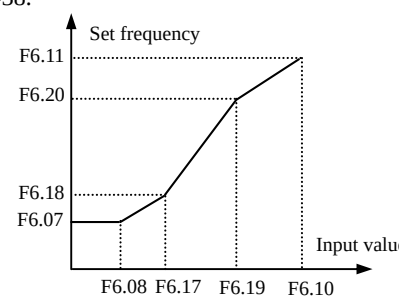


Fig. 6-40 set frequency 2 when inflexion effective

F6.08	**2I Min. input value**	**range：0.01－1.00**	**0.20**
F6.09	**Corresponding Freq. of 2I Min. input value**	**range：0.00－400.0**	**10.00Hz**
F6.10	**2I Max. input value**	**range：0.01－1.00**	**1.0**
F6.11	**Corresponding Freq. of 2I Max. input value**	**range：0.00－400.00**	**50.00**

When set F6.01 to 1, namely let 2I set frequency.
When parameter F6.12 is set to 0，namely inflexion is set to be ineffective，set

frequency of the inverter is decided completely by parameters F6.08~F6.11，as shown in Fig. 6-40. When parameter F6.12 is set to 1，namely inflexion effective，here set frequency is as shown in Fig. 6-39.

0：inflexion ineffective

1：inflexion effective

F6.13	**1I middle inflexion current/voltage 1**	**range：0.00－F6.06**	**0.0**
F6.14	**Corresponding frequency of F6.13**	**range：0.0－F6.07**	**0.0**
F6.15	**1I middle inflexion current/voltage 2**	**range：0.0－F6.06**	**0.0**
F6.16	**Corresponding frequency of F6.15**	**range：0.0－F6.07**	**0.0**
F6.17	**2I middle inflexion current/voltage 1**	**range：0.0－F6.10**	**0.0**
F6.18	**Corresponding frequency of F6.17**	**range：0.0－F6.11**	**0.0**
F6.19	**2I middle inflexion current/voltage 2**	**range：0.0－F6.10**	**0.0**
F6.20	**Corresponding frequency of F6.19**	**range：0.0－F6.11**	**0.0**

6.7.2 Constant pressure water supply parameter group:F6 (EDS2000)

F6.00	**Sleep delay time**	**Range：0.0－6000.0s**	**0.0**

This parameter is used for setting holding time in sleep status. EDS2000 will stop automatically if EDS2000 output frequency is smaller than sleep frequency and holding time is longer than sleep delay time set by this parameter.

F6.01	**Revival delay time**	**range：0.0－6000.0s**	**0.0**

This parameter is used for setting holding time in revival status.

F6.02	**start-up freq. of the 1st sub-motor**	**range：0.00－400.0Hz**	**0.00**

This parameter set the start-up frequency. Start-up holding time counter start counting when EDS2000 output frequency exceeds value of (F6.02+1Hz) and no other sub-motor is running. The 1st sub-motor start up when time set by parameter F6.08 passed and output frequency is still bigger than value of (F6.02-1Hz).

After the 1st sub-motor starts up, decrement of EDS2000 output frequency is F6.02-F6.05.

F6.03	**start-up freq. of the 2nd sub-motor**	**range：0.00－400.0Hz**	**0.00**

This parameter set the start-up frequency. Start-up holding time counter start counting when EDS2000 output frequency exceed value of (F6.03+1Hz) and there

is one sub-motor which is running. The 2nd sub-motor start up when time set by parameter F6.08 passed and output frequency is still bigger than value of (F6.03-1Hz).

After the 2nd sub-motor starts up, decrement of EDS2000 output frequency is F6.03-F6.06.

F6.04	start-up freq. of the 3rd sub-motor	range：0.00－400.0Hz	0.00

This parameter set the start-up frequency. Start-up holding time counter start counting when EDS2000 output frequency exceed value of (F6.04+1Hz) and there are two sub-motors which are running. The 3rd sub-motor start up when time set by parameter F6.08 passed and output frequency is still bigger than value of (F6.04-1Hz).

After the 3rd sub-motor starts up, decrement of EDS2000 output frequency is F6.04-F6.07.

F6.05	Stop freq. for the 1st sub-motor	range：0.00－400.0Hz	0.00

This parameter set a low limit frequency. Stop holding time counter start counting when EDS2000 output frequency is smaller than value of (F6.05-1Hz) and there is one sub-motor which is running. The 1st sub-motor stops when time set by parameter F6.09 passed and output frequency is still smaller than value of (F6.05+1Hz).

After the 1st sub-motor stops, increment of EDS2000 output frequency is (F6.02-F6.05).

F6.06	Stop freq. for the 2nd sub-motor	range：0.00－400.0Hz	0.00

This parameter set a low limit frequency. Stop holding time counter start counting when EDS2000 output frequency is smaller than value of (F6.06-1Hz) and there are 2 sub-motors which are running. The 2nd sub-motor stops when time set by parameter F6.09 passed and output frequency is still smaller than value of (F6.06+1Hz).

After the 2nd sub-motor stop, increment of EDS2000 output frequency is (F6.03-F6.06).

F6.07	Stop Freq. for the 3rd sub-motor	range：0.00－400.0Hz	0.00

This parameter set a low limit frequency. Stop holding time counter start counting when EDS2000 output frequency is smaller than value of (F6.07-1Hz) and there are 3 sub-motors which are running. The 3rd sub-motor stops when time set by parameter F6.09 passed and output frequency is still smaller than value of (F6.07+1Hz).

After the 3rd sub-motor stop, increment of EDS2000 output frequency is

(F6.04-F6.07).

F6.02<F6.03<F6.04, F6.05<F6.06<F6.07, F6.02>F6.05, F6.03>F6.06,F6.03>F6.07.

F6.08	**start-up holding time of sub-motor**	**range：0.0－6000.0s**	**0.00**

This parameter sets start-up holding time of sub-motor.

F6.09	**stop holding time of sub-motor**	**range：0.0－6000.0s**	**0.00**

This parameter sets stop holding time of sub-motor.

F6.10	**quantity of sub-motor**	**range： 0－3**	**0**

This parameter sets quantity of sub-motor. Can modify this parameter only when EDS2000 stops.

F6.11	**automatic switch interval**	**range：0000－9999minute**	**0000**

This parameter sets automatic switch function interval, for more information about automatic switch please see parameter F6.12.
If set 0h00min, will close automatic switch function.

This time only includes EDS2000 runtime.

F6.12	**Linkage actual value of sub-motor automatic switch**	**range：0.0－100.0%**	**0.0**

This parameter sets a percentage, based on this parameter can work out the output frequency utmost of automatic switch logic.

$$\textbf{Allowed output freq. of automatic switch} = \frac{\frac{F6.12}{100\%}}{1+F6.10} \textbf{*max. freq.}$$

Motor start-up frequency is changed if there is one automatic switch interval from previous automatic switch and output frequency is lower than result educed from above formula.
Change start-up order when following conditions are fulfilled：

1. EDS2000 output frequency lower than39Hz=25%/(100%/(1+2))*52Hz;
2. There’s one automatic switch interval from previous automatic switch;

Execute automatic switch function when above 2 conditions are fulfilled at the same time：

1. All motors stop;
2. Start-up order changed;

3．Contactor connecting speed regulating motor and EDS2000 opened;

4．Wait for setting time by F6.13;

5．Speed regulating motor supply power，normal constant pressure water supply logic running starts;

start-up order changed as follows：

the 1st start-up ： the 1st motor，the 2nd motor，the 3rd motor

the 2nd start-up ： the 2nd motor，the 3rd motor，the 1st motor

the 3rd start-up ： the 3rd motor，the 1st motor，the 2nd motor

hereinafter analogise in the same way.

Can't change start-up order by a single external signal.

Switch when the inverter is in stop status (namely, sleep function is effective) if automatic switch level is 0 and automatic switch interval passed.

note

After this parameter is set，should apply above formula to checking if interrelated frequency output value is within allowed range ,namely between min. frequency and max. frequency. Otherwise it's impossible to realize automatic switch function.

Can cancel automatic switch logic by setting parameter F6.11 to 0.

F6.13	Start-up holding time of speed regulator motor	range：0, 1	0

Set value does not delay start-up of constant speed motor (direct industory frequency connecting). Function of holding time is as follows:

1．Contactor connecting high-speed motor and EDS2000 switched on （output by a relay）;

2．Waiting for constant pressure water supply start-up;

3．Speed regulating motor supply power，normal constant pressure water supply operate automatically.

If there is **Y / Δ** starter assembled for the motor，should set constant voltage water supply start-up delay time and it must be longer than set time of **Y / Δ** starter; after the motor is started up by EDS2000 relay output，there must be enough time to make **Y / Δ** starter finish **Y / Δ** transform.

F6.14	status display of water supply special relay	0000-9999	0000

This parameter shows relay status of water feeder and its value should be transformed to binary system when automatic switch is ineffective.

F6.15	**reserved**		
F6.16	**reserved**		
F6.17	**reserved**		
F6.18	**reserved**		
F6.19	**reserved**		
F6.20	**reserved**		

6.8 Traverse special function parameter group：F7

F7.00	**traverse function selection**	**range：0, 1**	**0**

0：traverse function ineffective

1：traverse function effective

F7.01	**traverse run mode**	**range：0000－5111**	**0000**

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 Xi（Xi=X1~X8）to function 33 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 F7.02 definition.

1：fixed amplitude. Amplitude AW is determined by high limit frequency and F7.02.

Traverse center frequency input setting channel is set by F0.00 function.

F7.02	**traverse amplitude**	**range：0.0－50.0(%)**	**0.0(%)**

changing amplitude:AW=center frequency×F7.02

fixed amplitude：AW=high limit frequency×F7.02

note

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

F7.03	**Sudden jumping freq.**	**range：0.0－50.0**	**0.0(%)**

As shown in Fig.6-41.If this parameter is set to 0, no jumping frequency.

F7.04	**traverse cycle**	**range：0.1－999.9S**	**10.0S**

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

F7.05	**Triangle wave rising time**	**range：0.0－98.0(%)（traverse cycle）**	**50.0(%)**

Define runtime of traverse rising segment=F7.04 × F7.05 (s)， runtime of descending segment = F7.04 × (1-F7.05) (s). Please refer to description in Fig.6-41.

F7.06	**Traverse preset frequency**	**range：0.00－400.00Hz**	**0.00Hz**
F7.07	**Traverse preset frequency latency time**	**range：0.0－6000S**	**0.0S**

F7.06 is used for defining inverter run frequency before entering into traverse operation.

When automatic start-up mode is optioned，F7.07 is used for setting holding time running at traverse preset frequency before enter into traverse operation；When manual start-up mode is optioned，F7.07 setting is ineffective. Please see description in Fig.6-41.

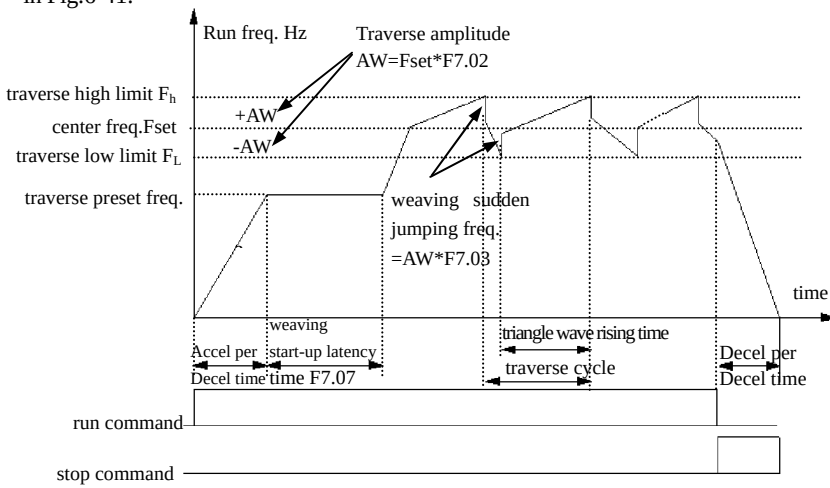


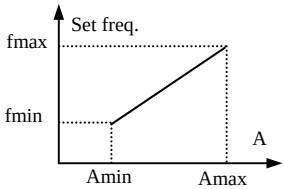
Fig. 6-41 Traverse

6.9 Frequency provision function parameter group：F8

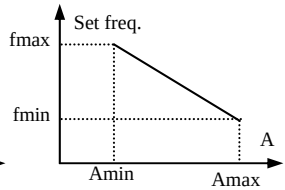
F8.00	**VCI minimum provision**	**range：0.00－F8.02**	**0.0V**
F8.01	**Corresponding freq. to VCI minimum provision**	**range：0.00－high limit frequency**	**0.00Hz**
F8.02	**VCI max. provision**	**range：0.00－10.00V**	**10.0V**
F8.03	**Corresponding freq. to VCI maximum provision**	**range：0.00－high limit frequency**	**50.00Hz**
F8.04	**CCI minimum provision**	**range：0.00－F8.06**	**0.00V**
F8.05	**Corresponding freq. to CCI minimum provision**	**range：0.00－high limit frequency**	**0.00Hz**
F8.06	**CCI max. provision**	**range：0.00－10.00V（V side）/4-20mA**	**10.00V**
F8.07	**Corresponding freq. to CCI max. provision**	**range：0.00－high limit frequency**	**50.00Hz**
F8.08	**YCI minimum provision**	**range：0.00－F8.10**	**0.00V**
F8.09	**Corresponding freq. to YCI minimum provision**	**range：0.00－high limit frequency**	**0.00Hz**
F8.10	**YCI max. provision**	**range：0.00－10.00V/5V**	**10.00V**
F8.11	**Corresponding freq. to YCI max. provision**	**range：0.00－high limit frequency**	**50.00Hz**
F8.12	**PULSE max. pulse input**	**range：0.1－50.0K**	**10.0K**
F8.13	**PULSE minimum provision**	**range：0.0－F8.15(PULSE max. provision)**	**0.0K**
F8.14	**Corresponding freq. to PULSE min. provision**	**range：0.00－high limit frequency**	**0.00Hz**
F8.15	**PULSE max. provision**	**range：F8.13(PULSE min. provision)－F8.12(max. input pulse)**	**10.0K**
F8.16	**Corresponding freq. to PULSE max. provision**	**range：0.00－high limit frequency**	**50.00Hz**

F2.00 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 VCI and set frequency:



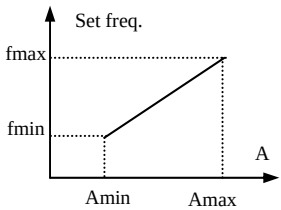
(1)plus characteristic



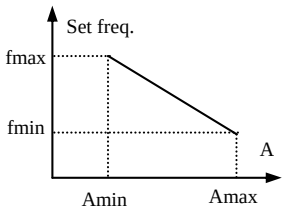
(2)minus characteristic

A:VCI provision
Amin:min. provision fmin:corresponding freq. of min. provision
Amax:max. provision fmax:corresponding freq. of max. provision

See below relation curve of CCI and set frequency:



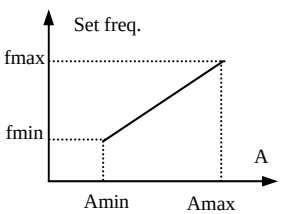
(1) plus characteristic



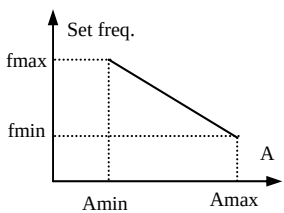
(2) minus characteristic

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

See below relation curve of YCI and set frequency:



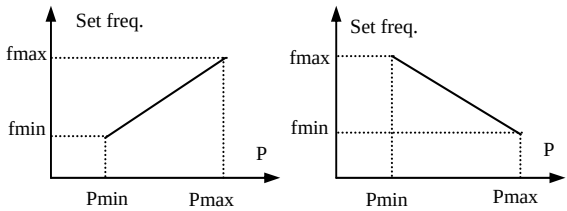
(1) plus characteristic



(2) minus characteristic

A:CCI 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:



(1) plus characteristic (2) minus characteristic

P: PULSE provision
Pmin: min. provision fmin: corresponding freq. to min. provision
Pmax: max. provision fmax: corresponding freq. to max. provision

6.10 Protection function parameter: F9

F9.00	**restart waiting time after transient power off**	**range：0.0－10.0S**	**0.0S**

If F9.00=0，restart function after transient power off is ineffective.

If transient power off takes place in power network（namely, inverter LED displays P.oFF），the inverter will start up automatically in speed checking restart mode when set waiting time(set by F9.00) passed after power supply resume normal. The inverter wouldn't start up even if run command is inputted in restart waiting time and would relieve speed checking restart state if stop command is inputted.

F9.01	**failure self-restoration times**	**range：0－10**	**0**
F9.02	**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.

F9.03	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.

F9.04	motor overload protection coefficient	range：20.0-120.0(%)	100.0(%)

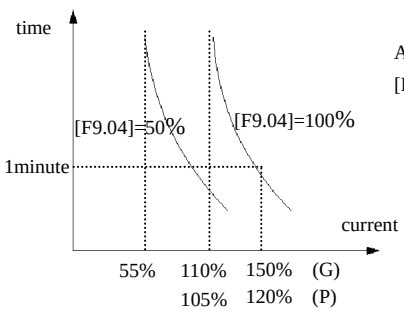
This parameter sets sensibility of the inverter implementing thermal relay protection to load motor, can implement correct heat protection to the motor by setting this value when output current value of load motor don't match rated current of the inverter, as shown in Fig.6-42.

Value of this parameter can be determined by following formula：

$$[F9.04]=\frac{\text{motor rated current}}{\text{inverter rated output current}}\times 100$$

note

The inverter will 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 effectively.



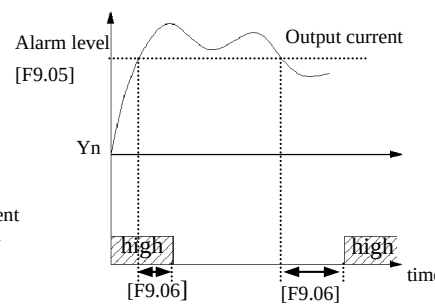


Fig.6-42 electronic thermal relay protection Fig.6-43 overload alarm

F9.05	overload alarm checkout level	range：20 －200(%)	130(%)
F9.06	overload alarm delay time	range：0.0－20 .0S	5.0S

If output current exceeds electric level set by parameter F9.05 continuously，open collector outputs effective signal(Y1 or Y2 terminal，refer to Fig.6-43 and interrelated description of parameter F5.10, F5.11) after delay time set by F9.06 passed.

F9.07	**Over-voltage stall selection**	**range：0, 1**	**1**
F9.08	**Stall over-voltage 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, over-voltage protection will takes place if not take steps.

Over-voltage stall protection function, indicates that output frequency of the inverter stops descending if bus-bar voltage detected during run process exceed stall voltage point defined by F9.08 (relative to standard bus-bar voltage) and the inverter continue to implement decelerating run when bus-bar voltage detected over-voltage point. As show in Fig. 6-44.

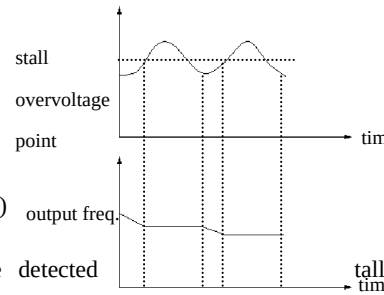


Fig.6-44 over-voltage stall function

F9.09	**automatic current limiting level**	**range：110－200(％)**	**150(%)**
F9.10	**frequency descending rate during current limiting**	**range：0.00－99.99Hz／S**	**0.00Hz/S**
F9.11	**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 F9.09 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 (F9.09) 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 (F9.10) defines adjusting rate to output frequency during automatic current limiting action.

If frequency descending rate during automatic current limiting F9.10 is too small，inverter isn't easy to get rid of automatic current limiting state which may cause overload failure finally；If descending rate F9.10 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 (F9.11).

F9.11=0 indicates that automatic current limiting is ineffective during constant speed running ；

F9.11=1 indicates that automatic current limiting is effective during constant speed running ；

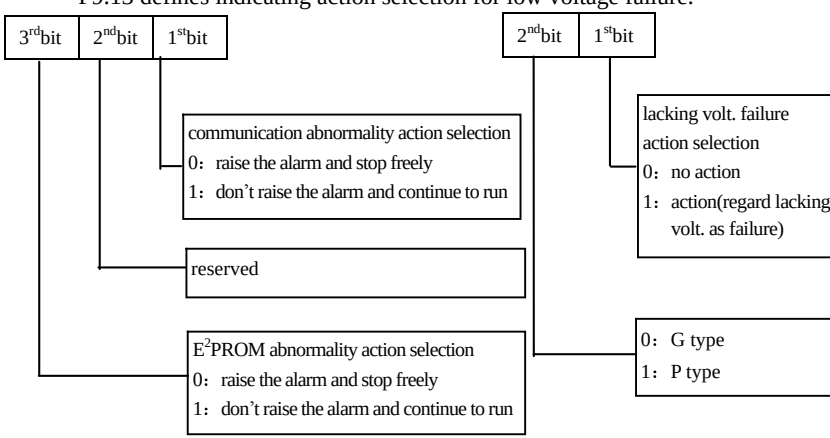
Output frequency may varies during automatic current limiting action，so automatic current limiting function is not suitable for occasion demanding stable output frequency during constant speed run.

F9.12	**protecting action selection 1**	**range：LED 1st bit：0, 1 LED 2nd bit：0, 1 LED 3rd bit：0, 1**	**000**
F9.13	**protecting action selection 2**	**range：LED 1st bit：0, 1 LED 2nd bit：0, 1**	**00**

The inverter can keep running stably in some abnormal state by setting protecting action selection (F9.12 and F9.13) in order to screen failure alarm and stop.

F9.12 defines protection action selection for communication unwonted and E^2PROM unwonted.

F9.13 defines indicating action selection for low voltage failure.



Remark：Need to modify F0.07 and F0.08 except for modifying 2nd bit of F9.13 when change G type to P type，for example, to modify 11KWG to15KWP，need to change 2nd bit of F9.13 to 1 and set F0.07＝15.0，F0.08＝33.0.

Please choose protection action selection function with caution，must choose correctly after reason of the failure is confirmed, otherwise may cause accident range extended, personnel and property damaged.

6.11 Failure record function parameter：Fd

Fd.00	**previous one failure record**	**range： 0~23**	**0**
Fd.01	**previous two failure record**	**range： 0~23**	**0**
Fd.02	**previous three failure record**	**range： 0~23**	**0**
Fd.03	**previous four failure record**	**range： 0~23**	**0**
Fd.04	**previous five failure record**	**range： 0~23**	**0**
Fd.05	**previous six failure record**	**range： 0~23**	**0**

0：no failure

1－23：failure E0.01-E0.23，please see chapter 7 for specified failure type

Fd.06	**Set freq. at previous failure**	**range： 0-high limit**	**0**
Fd.07	**Output freq. at previous failure**	**range： 0-high limit**	**0**
Fd.08	**output current at previous failure**	**range： 0-999.9A**	**0**
Fd.09	**output volt. at previous failure**	**range：0-999V**	**0**
Fd.10	**DC bus-bar vlot. at previous failure**	**range：0~800V**	**0**
Fd.11	**Load motor speed at previous failure**	**range：0~9999**	**0**
Fd.12	**Module temp. at previous failure**	**range：0~100**	**0**
Fd.13	**Input end state at previous failure**		**0**
Fd.14	**Accu. runtime at previous failure**	**range：0~65535h**	**0**

6.12 Code and manufacturer function parameter：FF

FF.00	user password	range： 0000 －9999	1

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 ESC/MENU 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.

FF.01	manufacturer password	range： 0000 －9999	0000

Setting function for the manufacturer, user need not modify it.

7 Troubleshooting

7.1 Failure and countermeasure

Possible failure types in EDS2000/EDS2800 are shown in Table 7-1 and failure code is from E001 to E023. 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
E001	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
E002	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
E003	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
E004	overvoltage during	Unwonted input voltage	Check input power supply
		Accel time is set to too short	Prolong accelerating time properly

	accelerating process	Restart rotating motor	Set speed checking restart function
E005	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
E006	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 consumptio subassembly
E007	control power supply overvoltage	Unwonted input voltage	Check input power supply or look for service
E008	Inverter overload	Accel time is set to 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
E009	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
E010	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
E011	reserved	reserved	reserved
E012	reserved	reserved	reserved
E013	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
E014	external device failure	use sudden stop key STOP in non-keypad run mode	Look up operation mode
		Use sudden stop key STOP under condition of stall	Set running parameter correctly
		Sudden stop terminal for external failure closed	Open external failure terminal after external failure is settled
E015	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
		Honeywell component damaged	Look for service from manufacturer or agent
		Unwonted amplifying circuit	Look for service from manufacturer or agent

E016	RS485 communication failure	Baud rate set improperly	set Baud rate properly
		Serial port communication error	press STOP RESET key to reset，look for service
		Failure warning parameter set improperly	Modify F2.19, F2.20 and F9.12
		Upper device doesn't work	Check if upper device work and wiring is correct
E017	reserved	reserved	reserved
E018	reserved	reserved	reserved
E019	Lacking voltage failure	Lacking voltage	check spot input voltage
E020	System disturbance	Serious disturbance	Reset by pressing STOP RESET key or Add mains filter at power supply input side
		Main control DSP read and write wrongly	Reset by the key-press, look for service
E021	reserved	reserved	reserved
E022	reserved	reserved	reserved
E023	E^2PROM read and write wrongly	Mistake take place when read or write control parameter	Reset by pressing STOP RESET Look for service from manufacturer or agent
POFF	Lacking voltage failure	Lacking voltage	check spot input voltage

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 Fd group parameter，please enter into Fd group parameter to see about information by referring to keypad operation method.

code	content	code	Content
Fd.00	previous one failure record	Fd.08	output current at previous failure
Fd.01	previous two failure record	Fd.09	output volt. at previous failure
Fd.02	previous three failure record	Fd.10	DC bus-bar vlot. at previous failure
Fd.03	previous four failure record	Fd.11	load motor speed at previous failure
Fd.04	previous five failure record	Fd.12	module temp. at previous failure
Fd.05	previous six failure record	Fd.13	input end state at previous failure
Fd.06	set freq. at previous failure	Fd.14	Accu. runtime at previous failure
Fd.07	output freq. at previous failure	—	—

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) Set any one terminal of X1~X8 to external RESET input (F5.00~F5.07=10), 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.

8 Maintenance

8.1 Routine maintenance

When you use ESD2000 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) If failure caused by inverter itself under normal conservation and usage, we will provide free repair service. Reasonable maintenance cost will be charged if it's beyond warranty period.

(2) We will charge reasonable maintenance fee when one of following situations occure within period of warranty period.

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.

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.

9 Fitting parts

9.1 LCD keypad

Type： EN - KB2

Language：English

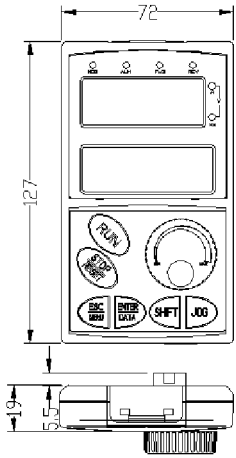
Outline is as shown in Fig.9-1

EN-KB1 keypad and EN-KB2 LCD keypad all can realize quick copy of parameter.

Interface configuration of EN-KB2 keypad：as shown in Fig.9-2，it has 2 parts which are main display area and operation description：

Main display area：display and explain current state parameter corresponding to LED displayed content；

Operation description：description of displayed content



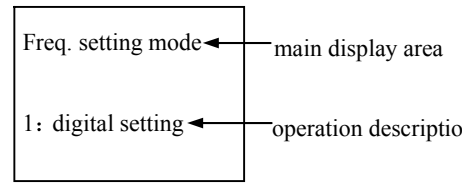


Fig.9-1 EN-KB2 LCD keypad Fig.9-2 EN-KB2 LCD display interface

9.2 Brake subassembly

9.2.1 Brake unit

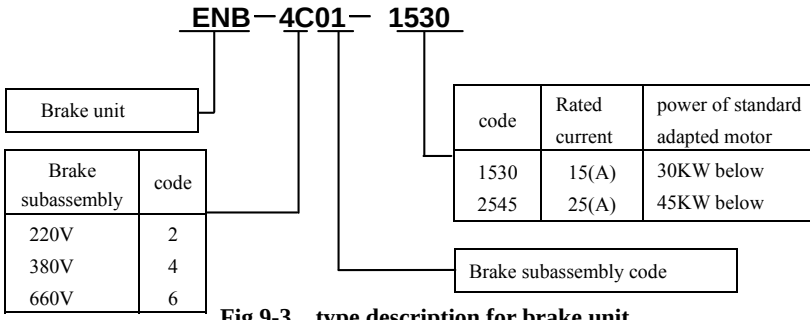


Fig.9-3 type description for brake unit

For motor of 45KW above, you can connect multiple brake units in parallel (at most 10 brake units can be connected in parallel) to brake.

9.2.2 Brake resistance

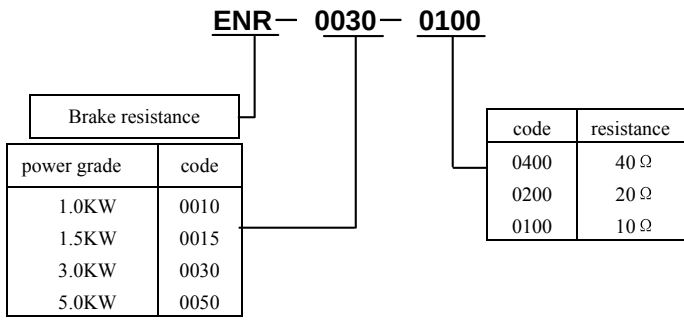


Fig.9-4 type description for brake resistance

9.2.3 Configuration

Table 9-1 brake subassembly configuration

Motor rated power(KW)	Brake resistance type and quantity		Use ratio(%)	Brake torque(%)	Brake unit type and quantity	
11	ENR-0010-0500	1	10	100	ENR-4C01-1530	1
15	ENR-0015-0400	1	10	100	ENR-4C01-1530	1
18.5	ENR-0050-0320	1	10	100	ENR-4C01-1530	1
22	ENR-0050-0272	1	10	100	ENR-4C01-1530	1

30	ENR-0050-0200	1	10	100	ENR-4C01-1530	1
37	ENR-0100-0160	1	10	100	ENR-4C01-2545	1
45	ENR-0100-0136	1	10	100	ENR-4C01-2545	1
55	ENR-0100-0200	2	10	100	ENR-4C01-2545	2
75	ENR-0100-0136	2	10	100	ENR-4C01-2545	2
90	ENR-0100-0200	3	10	100	ENR-4C01-2545	3
110	ENR-0100-0200	3	10	100	ENR-4C01-2545	3
132	ENR-0100-0136	4	10	100	ENR-4C01-2545	4
160	ENR-0100-0136	4	10	100	ENR-4C01-2545	4
200	ENR-0100-0136	5	10	100	ENR-4C01-2545	5
220	ENR-0100-0136	5	10	100	ENR-4C01-2545	5
250	ENR-0100-0136	6	10	100	ENR-4C01-2545	6
280	ENR-0100-0136	7	10	100	ENR-4C01-2545	7
315	ENR-0100-0136	8	10	100	ENR-4C01-2545	8

9.2.4 Brake unit outline and assembling dimension

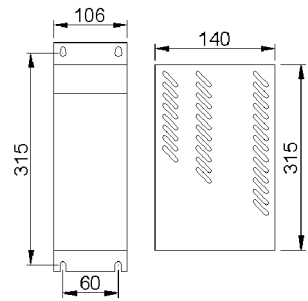


Fig.9-5 assembling dimension of brake unit

Table 9-2 brake unit parameters

spec	outline	Rated brake current	Max. brake current	Fixing hole dimension	end	weight (Kg)	wiring (mm^2)
ENB-4CO1-1530	Fig.9-5	15A	45A	Φ6	M4	3.6	4-6
ENB-4CO1-2545		25A	60A	Φ6	M4	3.6	4-6

9.2.5 Brake resistance outline and dimension

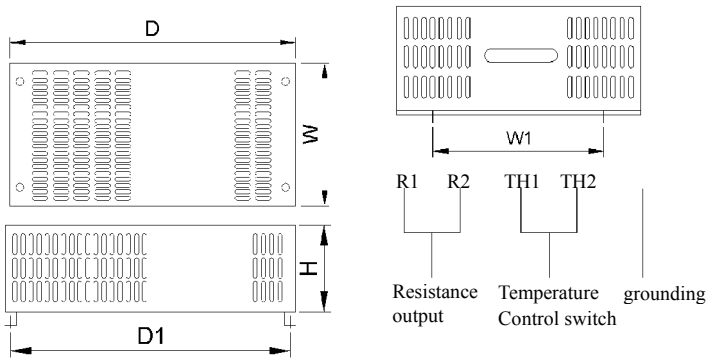


Fig.9-6 brake resistance outline and dimension

Table 9-3 brake resistance dimension parameter

spec	power (KW)	dimension(mm^2)						weight	wire (mm^2)	combination
		W	D	H	D1	W1	end			
ENR	1	250	500	125	475	200	M4	5.3	4	1.0KW*1
	2	250	500	125	475	200	M4	6.5	4	1.0KW*2
	3	280	500	140	475	240	M5	7.8	4	1.5KW*2
	4.5	340	600	140	585	280	M5	12.0	4	1.5KW*3
	6	340	600	140	580	280	M5	14.0	6	1.5KW*4
	8	410	700	140	685	340	M6	16.5	6	2.0KW*4
	10	410	700	140	685	340	M6	18.5	6	2.5KW*4

9.3 Communication subassembly

9.3.1 Long-distance operation key board

Type：EN -KB3（without crystal）

EN -KB4（with crystal）as shown in Fig.9-7

Maximum electric distance from local keypad EN-KB1 and EN-KB2 to inverter is 2m.

RS485 communication mode is adopted between inverter and long-distance keypad EN -KB3 and EN-KB4，only a four-core cable is needed between them and maximum electric distance can reach 1000m.They communicate with each other in main-auxiliary mode, namely take long-distance keypad as main device

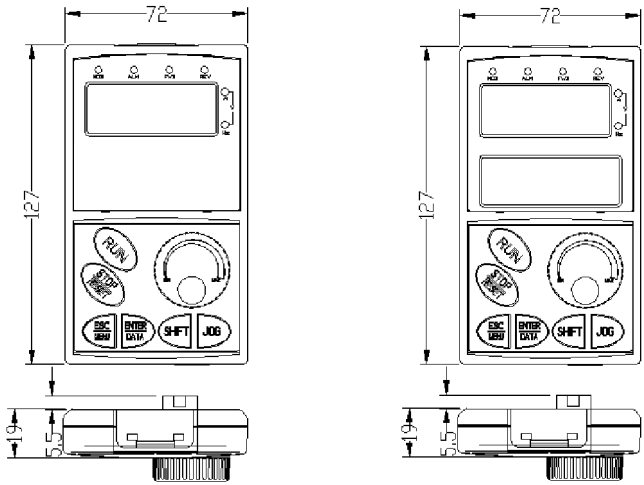
and inverter as auxiliary one. Connecting wire end is fixed by common screw which is easy to maintain.

This series of inverter support usage of local keypad and long-distance keypad at the same time，no priority order，both can operate the inverter synchronously.

Following function can be realized by long-distance keypad：

(1) Can control run, stop, jog, failure restoration, changing set frequency modifying function parameter and run direction of auxiliary device.

(2) Can identify auxiliary device type and monitor run frequency, set frequency output voltage, output current, analog closed loop feedback, analog closed loop setting and exterior counting value of auxiliary device.



(a) KB3 long-distance keypad **(b) KB4 long-distance keypad**

Fig.9-7 long-distance keypad

9.3.2 Communication cable

(1) long-distance keypad communication cable

Type：EN -LC0030 (3.0m)

Used for connecting between long-distance keypad and inverter.

Remark：1m, 2m, 3m, 5m, 10m, 15m are standard deployment for our company's inverter，it's needed to subscribe for the cable if it exceeds 15m.

10 Examples

10.1 Common speed regulation running

10.1.1 Basic wiring diagram

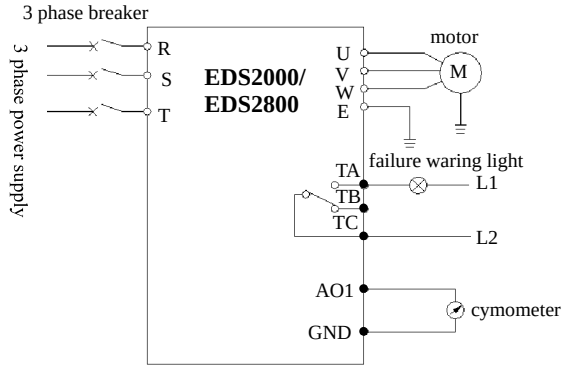


Fig.10-1

10.1.2 Set following basic parameter：

(1) set parameter F0.05-F0.09 according to rated value of the motor

(2) set F0.00 parameter to 0，choose keypad digital potentiometer to set frequency.

(3) set F0.02 parameter to 0， choose keypad to control start-up, stop.

(4) use F0.03 parameter to set run direction.

note

（1） press key to adjust parameter value，turning left means subtraction, turning right means addition, pressing down means confirmation(can also press ENTER DATA key to confirm).

(2) To press STOP RESET key，the inverter will stop.

(3) To press ENTER DATA key，inverter enter into next menu or confirm data.

10.1.3 Realized function

(1) realize stepless speed regulation to the motor, use keypad to control start/stop and keypad digital potentiometer to adjust frequency.

(2) bear failure warning function.

(3) connect with cymometer，which indicates output frequency of the inverter.

10.1.4 Application field

Used for common speed regulation field，such as：transportation machine, china

machine, baccy machine, metallurgy machine etc.

10.2 Terminal control running

10.2.1 Basic wiring diagram

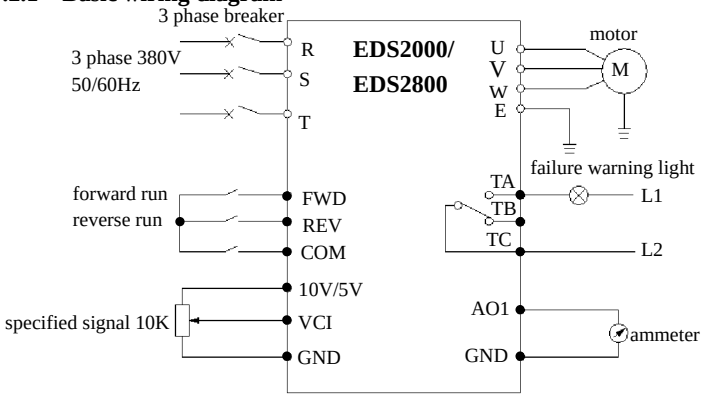


Fig.10-2

10.2.2 Parameter setting

(1) set parameter F0.05-F0.09 according to rated value of the motor

(2) set F0.00 parameter to 4~6 to choose VCI, CCI, YCI accordingly, can accept frequency set signal within 0~10V.

(3) set F0.02 parameter to 1， to choose terminal run command channel.

note

(1) if F5.08=0,namely 2 wire control mode 1：FWD and COM are closed，moter is in forward run；REV and COM are closed，motor is in reverse run；FWD, REV and COM are closed or opened together，the inverter stop.

(2) set frequency is specified through VCI analog channel.

10.2.3 Realized function

(1) control forward run/reverse run of the motor by external on-off quantum.

(2) control speed of the motor by 0~10V signal.

(3) bear failure warning and output current indication function.

10.2.4 Application field

Used in field where need long-distance control to start/stop of the motor such as blower, food, chemical machine, packing machine, transportation machine etc.

10.3 Multi-step speed control running

10.3.1 Parameter setting

(1) set parameter F0.05-F0.09 according to rated value of the inverter.

(1) set F0.02 parameter to 1，to choose terminal run command channel.

(3) F2.27-F2.41：multi-step speed frequency setting.

(4) F5.00-F5.05 set multi-step speed terminal control function.

(1) If F5.08=0,namely 2 wire control mode 1：FWD and COM are closed，moter is in forward run；REV and COM are closed，motor is in reverse run；FWD, REV and COM are closed or opened together，the inverter stop.

(2)If any one or more terminal of X1, X2, X3 and COM are closed together, the inverter will run according to multi-step speed frequency determined by X1, X2, X3 (multi-step speed frequency set value are determined by F2.27-F2.41).Can realize manual control and automatic control for multiple frequency，and also control for forward run, reverse run, free shutdown, reset, warning protection.

10.3.2 Basic wiring diagram

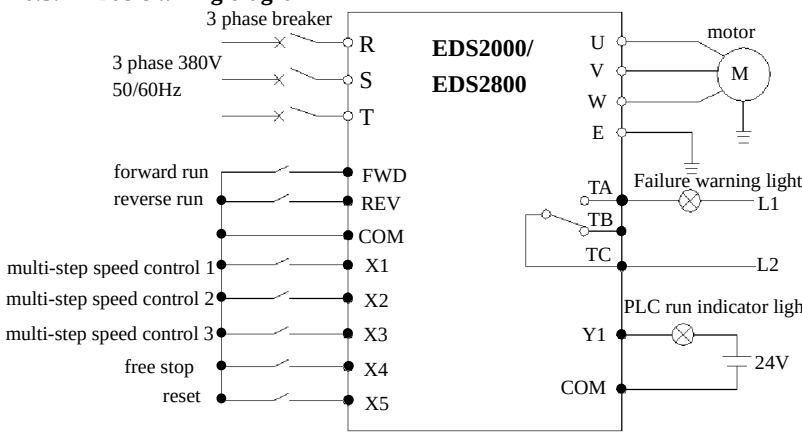


Fig.10-3

10.3.3 Realized function

(1) make use of external on-off quantum signal to control start/stop of the motor.

(2) make use of external on-off quantum signal to make the motor run at set frequency.

(2) bear free shutdown and reset function by utilizing external on-off quantum

signal.

(4) bear warning alarm and PLC run indication function.

10.3.4 Application field：

Applied in field where need frequent multi-speed adjustment to motor speed such as toughened glass, weaving, paper making, chemical etc..

10.4 Closed-loop control system

10.4.1 Parameter setting

(1) set parameter F0.05-F0.09 according to rated value of the inverter.

(2) F3.00=1：Closed loop control selection，here PID closed loop run control is effective.

(3) F3.01=1：provision channel selection，here choose VCI as provision channel of PID adjustor.

(4) F3.02=1：feedback channel selection，here choose CCI as feedback channel, 4-20mA/0-10V feedback signal.

(5) F3.08-F3.10, set according to spot requirement.

10.4.2 Basic wiring diagram

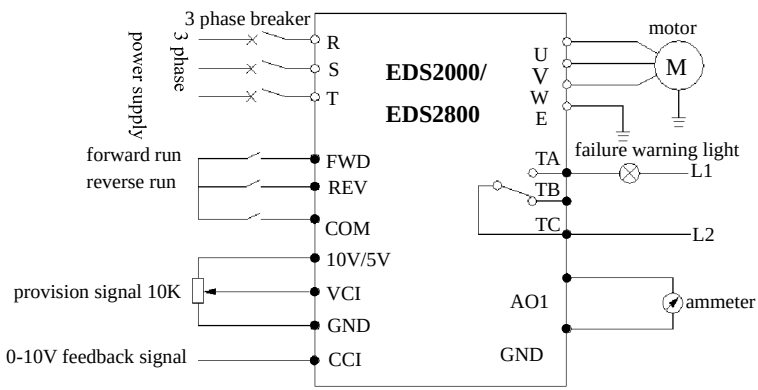


Fig.10-4

10.4.3 Realized function

(1) The inverter can adjust output automatically according to feedback signal to make constant voltage, constant temperature, constant current etc. available.

(2) can control start/stop of the motor from long distance.

(3) bear failure alarm and current indicator function.

10.4.4 Application field

Applied in field where need stable system, pressure, flux such as blower pump, constant pressure water supply, air compressor, air conditioner, freezer cooling tower, music fountain, heat supply etc..

10.5 Consecutive action running

10.5.1 Basic wiring diagram

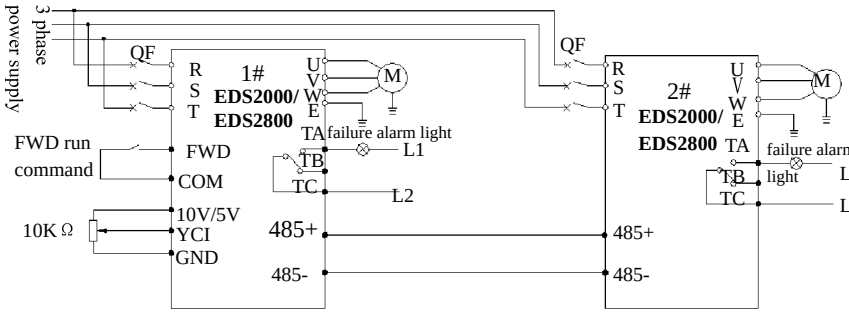


Fig.10-5

10.5.2 Parameter setting

set 1# inverter as follows：

(1) F0.00=6：YCI analog setting is frequency provision for 1# inverter.

(2) F0.02=1：terminal run command control.

(3) F2.18=0：1#inverter become host ID.

set 2# inverter as follows：

(4) F0.00=3：serial port frequency will be set by 2# inverter

(5) F0.02=2：serial port run order

After above setting, can use digital/pulse output quantum of 1# inverter to realize consecutive action of 2# inverter.

10.5.3 Operation description

After receive forward run command from external switch(closed) and frequency specified value（0~10V）from analog input terminal YCI, 1# inverter run at this frequency value. At the same time, already running state of 1# inverter，make 2# inverter get forward run command through open circuit collector output end Y1，

here，run frequency value from high-speed pulse output terminal of 1# inverter is passed to 2# inverter through X8 terminal.

10.5.4 Application field

Applied in field such as conveyer belt, coiler, factory production line, food chemistry etc.

10.6 Energy save engineering for injection molding machine

10.6.1 Basic wiring diagram

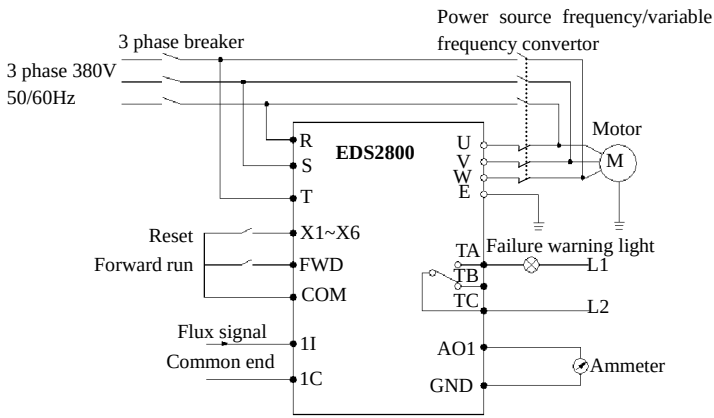


Fig. 10-6

10.6.2 parameter setting

(1) Set parameters F0.05-F0.09 according to rated data of the motor.

(2) Special parameters for injection molding machine are effective if special parameters for injection molding machine selection F6.00 is set to 1.

(3) Choose frequency specifying channel according to your needs through F6.01.

10.6.3 Realized function

(1) Control forward run of the motor by start-up button.

(2) Control speed of the motor by using current or voltage signal acquired by injection molding machine.

(3) Bear failure warning output function.

10.7 Constant pressure water supply application

10.7.1 Basic wiring diagram

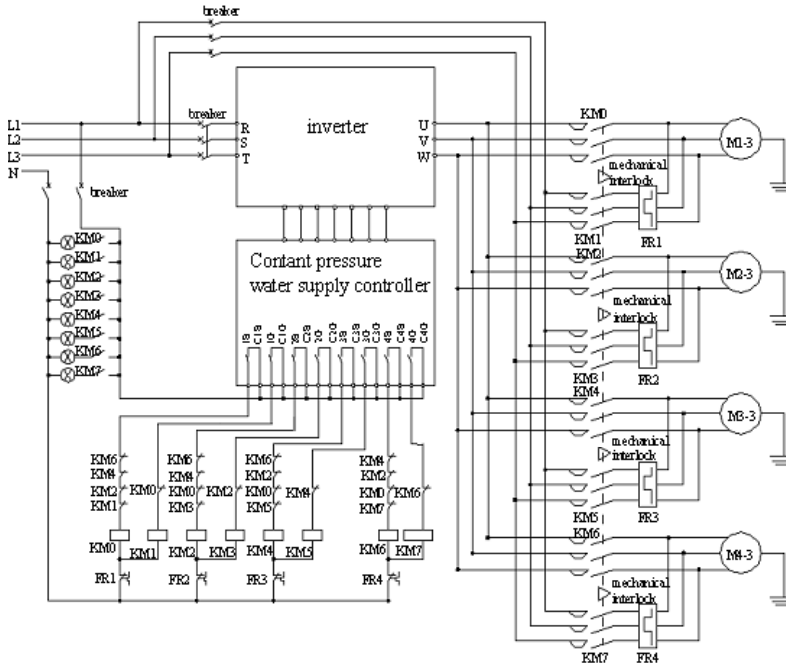


Fig.10-7 basic wiring diagram for constant pressure water supply controller

Description：

(1B,C1B), (1G,C1G), (2B,C2B), (2G,C2G), (3B,C3B), (3G,C3G), (4B,C4B), (4G,C4G) denote respectively 2 terminals corresponding to control terminal"No.1 variable frequency","No.1 power source", " No.2 variable frequency"," No.2 power source"," No.3 variable frequency"," No.3 power source"," No.4 variable frequency"," No.4 power source" on constant pressure water supply controller.

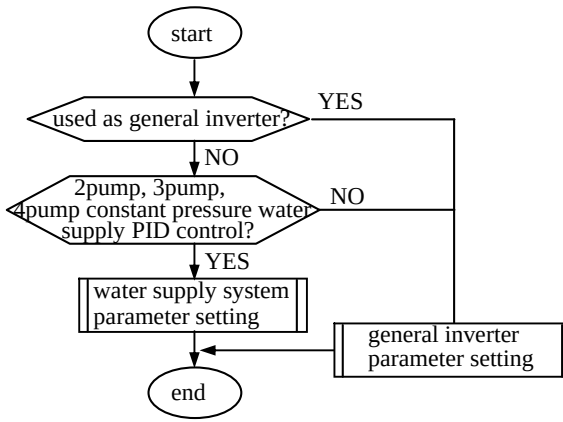
(1) Should apply AC contactor with mechnical interlock between inverter output and power source bypass beside the motor, and perform logic interlock in electric control loop to avoid short circuit between inverter output and power source which will damage the inverter and interrelated device;

(2) Phase order of power source L1,L2,L3 connected with the motor should be the same as that of inverter output U, V, W，please operate after confirm with phase order table to avoid motor reverse run caused during converted frequency/ power source switch.

(3) There should be over current protection device in power source bypass to the motor.

10.7.2 Parameter setting

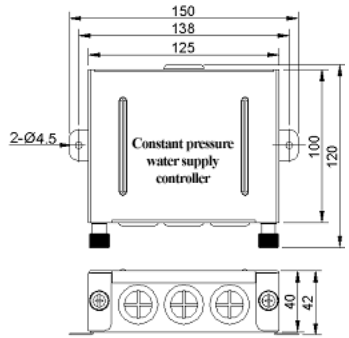
For constant pressure water supply special parameter please refer to detailed description in F6 group(EDS2000 constant pressure water supply parameter) of Chapter 6.



10.7.3 Applicable to

This constant pressure water supply controller is multi-pump constant pressure water supply controller, need to work with EDS2000 series inverter to realize effective control to multi-pump constant pressure water supply system.

10.7.4 Outer dimension



10.7.5 Connection between constant pressure water supply controller and inverter

Constant pressure water supply controller is collected with the inverter by 8PIN cable and with the contactor by control terminal, as shown in Fig.10-8:

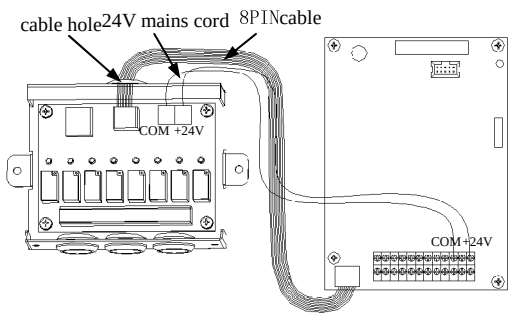


Fig.10-8 connection between water supply controller and inverter(external)

10.7.6 Water supply control and its mode

(1) variable frequency/ power source run and switch

Variable frequency run means that the motor is controlled by inverter output frequency. Power source run means that the motor is connected to power source directly. Variable frequency/ power source switch means process from inverter drive to power source drive or from power source drive to inverter drive.

(2) operation mode

Inverter drive frequency conversion pump to run at variable frequency. Inverter can determine running pump quantity (within set range) according to pressure closed loop control requirement and only one pump can be drived by variable frequency at one time.

11 Serial port (RS485) communication protocol

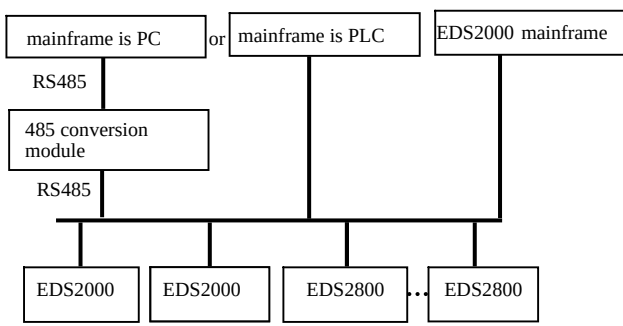
11.1 Summarization

We provide general RS485/ communication interface in our inverters(such as EDS2000 series，EDS2800 series，EDS1000 series etc.) for the user. Through this communication interface upper device (such as PC, PLC controller etc.) can perform centralized monitor to the inverter (such as to set inverter parameter, control run of inverter, read work state of the inverter) and also long-distance control keypad can be connected to realize various usage requirement of the user.

This communication protocol is interface criterion file designed for realizing above-mentioned function, please read it earnestly and program according to it so that realize long-distance and network control to the inverter.

11.2 Protocol content and description

11.2.1 Communication net buildup mode



A. single mainframe multiple auxiliary B. single mainframe single auxiliary

Fig.11-1 net buildup graph

11.2.2 Communication mode

At present, EDS2000/EDS2800 inverter can be controled by PC mainframe or PLC .and the inverte can be used not only as a auxiliary device but also as a mainframe in RS485 network.but there is only one can be consided as mainframe if in the same network .Specific communication mode is as mentioned below：

(1) PC or PLC as mainframe，inverter as auxiliary device，point-to-point

communication between mainframe and auxiliary device.

(2) Auxiliary device don't response when mainframe send out command by broadcast address.

(3) User can set local address, baud rate and data format of the inverter through auxiliary device keypad or serial communication mode.

(4) Auxiliary device report current failure information to mainframe in the last response frame.

11.2.3 Interface mode

RS485 interface can be connected by CN6 terminal on inverter CPU board.

11.2.4 Transport mode

Asynchronous serial，semiduplex transport mode. Default format and transport rate：8-N-1，9600bps.For specific parameter setting please see description for F2.17~F2.20 group function code.

11.2.5 Data command frame format

main device command frame format																		
sending order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	frame head	auxiliary device address	auxiliary device address	main device command	main device command	assistant index	assistant index	command index	command index	set data	set data	set data	set data	checkout sum	checkout sum	checkout sum	checkout sum	frame end
Definit-ion	head	address		command area		Index area				setting data area				checkout area				end
sending byte	1	2		2		4				4				4				1

auxiliary device response frame format																		
sending order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

	frame head	auxiliary device address	auxiliary device address	auxiliary device reponse	auxiliary device reponse	failure index	failure index	command index	command index	run data	run data	run data	run data	checkout sum	checkout sum	checkout sum	checkout sum	frame end
definit-ion	head	address		reponse area		Index area				Run data area				Checkout area				end
sending byte	1	2		2		4				4				4				1

Fig.11-2 command/response frame format

Remark：

(1) "Setting data area" and "run data area" may not be existent in some command/data frame format, so in protocol command list it's marked with "nothing".

(2) In protocol effective character set is：~, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F and hex data 0DH，ASCII lowercase a, b, c, d, e, f are invalid.

(3) Effective command frame length is 14 or 18 byte.

11.2.6 Explanation and description for format

(1) frame head

It's character "~"（namely hex 7E）,single byte.

(2) auxiliary device address

Data meanings：local address of auxiliary device, double byte. ASCII format. Inverter factory default is 01.

(3) mainframe command/auxiliary device respond

Data meanings：mainframe send out command and auxiliary device respond to the command. Double byte, ASCII format.

Response code function classification：

Species 1>： command code= "10"，mainframe ask auxiliary device to report current preparation state and control situation.

Appendix table 11-1 response code meanings for command code "10"

response code ASCII	meanings		
	preparation state of auxiliary device	Control from mainframe is allowed	To set frequency is allowed

10	Don't get ready	no meaning	
11	get ready	allow	allow
12	get ready	allow	allow
13	get ready	don't allow	don't allow
14	get ready	don't allow	don't allow
20	frame error		

Species 2>：command code=“11”~“15”, 5 kinds of function command which mainframe send to auxiliary device, for detail please see protocol command list.

Appendix table 11-2 response code meanings for command code “11~15”

response code ASCII	Meanings of response code	description
00	Auxiliary device communication and control is normal；function code modification is effective；password is correct.	
20	(1) frame checkout error； (2)“command area”data overrun； (3)“index area”data overrun； (4) frame length error/non ASCII byte exist in area except frame head, frame end.	When this response code is reported, data of “command area”, “index area” and “running data area” are not reported.
30	(1) control to auxiliary device is ineffective； (1) ineffective function code parameter modification； (3)“setting/running data”area data overrun. (4) password error.	Whether report this response code relate to current set state of auxiliary device. When report data of area”, “index area” and “run data area” are reported according to protocol requirement.

(4) auxiliary index/command index/failure index

Data meanings：include auxiliary index byte and command index byte.

For mainframe, auxiliary index, command index are used for cooperating mainframe command in realizing specific function.

For auxiliary device, auxiliary index, command index are used for reporting failure state code, command index are reported without modification.

Data type：hex，4 byte, ASCII format.
Command index occupy 2 low byte, data range：“00”～“FF”.
Auxiliary index occupy 2 high byte, data range：“00”～“FF”.
Auxiliary device failure state occupy“auxiliary index”byte，see Appendix table 11-3.

Appendix table 11-3 failure type description

failure code	description	failure code	description
1	Accelerating run over current	13	Converting module protection
2	decelerating run over current	14	External device failure
3	Constant speed run over current	15	current detecting circuit failure
4	accelerating run over voltage	16	485 communication failure
5	decelerating run over voltage	17	reserved
6	Constant speed run over voltage	18	reserved
7	Controller power supply over voltage	19	Lacking voltage
8	Inverter overload	20	System disturbance
9	Motor overload	21	Reserved
10	Inverter over heat	22	Reserved
11	reserved	23	E^2PROM read and write error
12	reserved		

(5) checkout sum
Data meanings：frame checkout, 4 byte, ASCII.
Calculation method：accumulative sum of ASCII code value of all byte from“auxiliary device address”to“run data”.
(6) frame end
Hex 0D，single byte.

11.2.7 Protocol command list

Frame 7E and frame end 0D, address, checkout sum，ASCII character format are omitted in following description.

Appendix 11-4 protocol command table

Name		Main-frame order	Auxi-liary index	order index	run data setting range	Mainframe sending example，such as PC control operation of inverter(C language cluster format，auxiliary device address is set to 01)	run data precision	description
look up auxiliary motor state		10	00	00	no	~010A00000192\r	1	
Read parameter of auxiliary motor	current run freq.	11	00	00	no	~010B00000193\r	0.01Hz	
	current set freq.	11	00	01	no	~010B00010194\r	0.01Hz	
	Output voltage	11	00	02	no	~010B00020195\r	1V	
	Output current	11	00	03	no	~010B00030196\r	0.1A	
	Bus-bar voltage	11	00	04	no	~010B00040197\r	1V	
	Load motor speed	11	00	05	no	~010B00050198\r	1rpm	
	Module temp.	11	00	06	no	~010B00060199\r	1^0C	
	Runtime	11	00	07	no	~010B0007019A\r	1h	
	accumulative time	11	00	08	no	~010B0008019B\r	1h	
	Input terminal	11	00	09	no	~010B0009019C\r	no	
	output terminal	11	00	0A	no	~010B000A01A4\r	no	
	analog input VCI	11	00	0B	no	~010B000B01A5\r	0.01V	
	analog input YCI	11	00	0C	no	~010B000C01A6\r	0.01V	
	analog input CCI	11	00	0D	no	~010B000D01A7\r	0.01V	
	exterior pulse input	11	00	0E	no	~010B000E01A8\r	0.01Hz	
	read inverter state	11	00	0F	no	~010B000F01A9\r	no	
adjusti	auxiliary device run command	12	00	00	no	~010C00000194\r	no	

	set current run frequency provision of auxiliary device	12	00	01	0Hz~high limit freq.	~010C00010FA0027C\r	0.01Hz	Set freq. =40.00Hz
	auxiliary device run with run freq. provision	12	00	02	0Hz~ high limit freq.	~010C00020FA0027D\r	0.01Hz	auxiliary device run set freq. =40.00Hz
	auxiliary device forward run	12	00	03	no	~010C00030197\r	no	
	auxiliary device reverse run	12	00	04	no	~010C00040198\r	no	
	auxiliary device forward run with run freq. provision	12	00	05	0Hz~ high limit freq.	~010C00050FA00280\r	0.01Hz	forward run boot-strap set freq. =40.00Hz
	auxiliary device reverse run with run freq. provision	12	00	06	0Hz~ high limit freq.	~010C00060FA00281\r	0.01Hz	reverse run boot-strap set freq. =40.00Hz
	auxiliary device stop	12	00	07	no	~010C0007019B\r	no	
	auxiliary device jog run	12	00	08	no	~010C0008019C\r	no	
	auxiliary device forward jog run	12	00	09	no	~010C0009019D\r	no	
	auxiliary device reverse jog run	12		0A	no	~010C000A01A5\r	no	
	auxiliary device stop jog run	12	00	0B	no	~010C000B01A6\r	no	
	auxiliary device failure restoration	12	00	0C	no	~010C000C01A7\r	no	
	auxiliary device urgent shutdown	12	00	0D	no	~010C000E01A8\r	no	

Read function code parameter	Run freq. digital setting F0.01	13	00	01	no	~010D00010196\r	0.01Hz	
	Run direction setting F0.03	13	00	03	no	~010D00030198\r	1	
	accelerating time1 F0.14	13	00	0A	no	~010D000E01AA\r	0.1S	
	decelerating time1 F0.15	13	00	0B	no	~010D000F01AB\r	0.1S	
Set function code parameter	Run freq. digital setting F0.01	14	00	01	0Hz~ high limit freq.	~010E00011388026B\r	0.01Hz	Set function code F0.01=50.00Hz
	Run direction setting F0.03	14	00	03	0, 1	~010E00030001025A\r	1	Set function code F0.03 to reverse run
	accelerating time1 F0.14	14	00	09	0~8CA0	~010E000E03E8028B\r	0.1S	Set function code F0.14 to 10.0s
	decelerating time1 F0.15	14	00	0A	0~8CA0	~010E000F03E8028C\r	0.1S	Set function code F0.15 to 10.0s
Software version query order	Query auxiliary device software version	15	00	00	no	~010F00000197\r	1	

Appendix table 11-5 response state word meanings of reading inverter state command

bit	signification		
	description	0	1
Bit0	Stop/run state	stop	run
Bit1	Logo for lacking voltage	normal	Lacking voltage
Bit2	FWD/REV run logo	Forward run	Reverse run

Bit3	Swing freq. run mode logo	ineffective	effective
Bit4	Common run mode logo	ineffective	effective
Bit5	jog run mode logo	no	jog
Bit6	PLC run mode logo	no	yes
Bit7	multi-step freq. run mode logo	no	yes
Bit8	PI closed loop run mode logo	no	yes
Bit9	Set counting value arriving logo	no	yes
Bit10	specified counting value arriving logo	no	yes
Bit11~15	reserved		

Appendix table 11-6 read auxiliary device function code parameter

function definition	Read auxiliary device function code parameter: all function code parameter except user password and manufacturer password						
meanings	frame	address	order	order index	run data	checkout sum	frame end
mainframe order	7EH	ADDR	13	see remark	none	BCC	0DH
byte quantity	1	2	2	4	0	4	1
auxiliary device respond	7EH	ADDR	06	see remark	Function code para.	BCC	0DH
byte quantity	1	2	2	4	4	4	1
remark	Command index=combinated by function code group number and hex code of function code number. For instance： If want to read parameter of F0.11 function code, order index=000B； If want to read parameter of F2.11 function code, order index =020B； If want to read parameter of F2.18 function code, order index =0212； If want to read parameter of F2.16 function code, order index =0210；						
	Corresponding relation between decimal and hex value of function code group						

	function group	decimal	hex	function group	decimal	hex
	F0	0	00H	F8	8	08H
	F1	1	01H	F9	9	09H
	F2	2	02H	FD	14	0DH
	F3	3	03H	FF	15	0FH
	F4	4	04H			
	F5	5	05H			
	F6	6	06H			
	F7	7	07H			
virtual data	0~FFFF (namely 0~65535)					

Must input correct “user password” before you set user function code parameter.

Appendix table 11-7 set auxiliary device function code parameter

function definition	Set auxiliary device function code parameter: all function code parameter except user password and manufacturer password						
meanings	frame head	address	order	order index	run data	checkout sum	frame end
mainframe order	7EH	ADDR	14	see remark	Functiom code para.	BCC	0DH
byte quantity	1	2	2	4	4	4	1
auxiliary device respond	7EH	ADDR	06	see remark	Function code para.	BCC	0DH
byte quantity	1	2	2	4	4	4	1

<table>
<tr><td>remark</td><td colspan="6">Command index=combinated by function code group number and hex code of function code number. For instance：
If want to set parameter of F0.11 function code, order index=000B；
If want to set parameter of F2.11 function code, order index =020B；
If want to set parameter of F2.18 function code, order index =0212；
If want to set parameter of F2.16 function code, order index =0210；</td></tr>
<tr><td></td><td colspan="6">Corresponding relation between decimal and hex value of function code group No.</td></tr>
<tr><td></td><td>function group</td><td>decimal</td><td>hex</td><td>function group</td><td>decimal</td><td>hex</td></tr>
<tr><td></td><td>F0</td><td>0</td><td>00H</td><td>F8</td><td>8</td><td>08H</td></tr>
<tr><td></td><td>F1</td><td>1</td><td>01H</td><td>F9</td><td>9</td><td>09H</td></tr>
<tr><td></td><td>F2</td><td>2</td><td>02H</td><td>FD</td><td>14</td><td>0DH</td></tr>
<tr><td></td><td>F3</td><td>3</td><td>03H</td><td>FF</td><td>15</td><td>0FH</td></tr>
<tr><td></td><td>F4</td><td>4</td><td>04H</td><td></td><td></td><td></td></tr>
<tr><td></td><td>F5</td><td>5</td><td>05H</td><td></td><td></td><td></td></tr>
<tr><td></td><td>F6</td><td>6</td><td>06H</td><td></td><td></td><td></td></tr>
<tr><td></td><td>F7</td><td>7</td><td>07H</td><td></td><td></td><td></td></tr>
<tr><td>Virtual data</td><td colspan="6">0~FFFF (namely 0~65535)</td></tr>
</table>

12 Use explanation for EDS2860 series

12.1 outer dimension and gross weight

Adaptable type：EDS2860-4T0075~EDS2860-4T0750

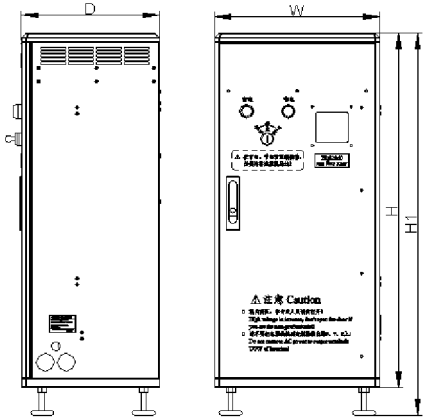


Fig. 12-1 EDS2860-4T0075~EDS2860-4T0750 outline figure

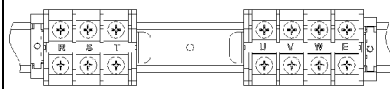
Table 12-1 outline dimension

Inverter type	W(mm)	D(mm)	H(mm)	H1(mm)	Cross weight(kg)
EDS2860-4T0075 EDS2860-4T0110	260	255	570	620	26
EDS2860-4T0150	280	255	600	660	28
EDS2860-4T0185 EDS2860-4T0220	320	300	675	735	36
EDS2860-4T0300 EDS2860-4T0370	360	300	770	830	43
EDS2860-4T0450 EDS2860-4T0550	435	340	875	935	63
EDS2860-4T0750	520	450	1200	1250	125

12.2 wiring for main loop terminal

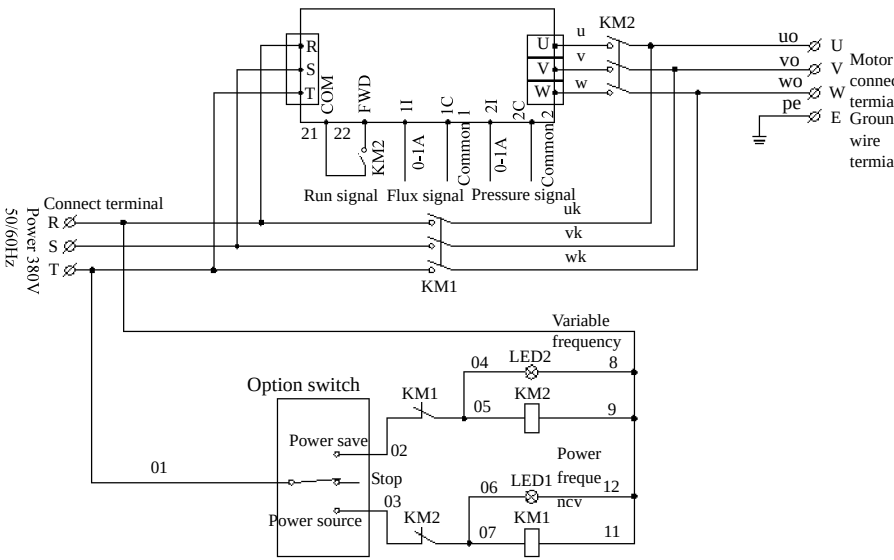
main loop input output terminals are as shown in Table 12-2.

Table 12-2 description for main loop input output terminals

Adaptable type	Main loop terminals	Terminals name	Function description
EDS2860-4T0075 ~ EDS2860-4T0750		R, S, T U, V, W E	3 phase AC 380V input terminal 3 phase AC output terminal shield grounding terminal

12.3 Basic control circuit diagram

Adaptable type：EDS2860-4T0075~EDS2860-4T0750



Description：For control function of EDS2860 series, please refer to that of EDS2800 series.