ELEVATOR CONTROL EXPERT, STEP WITH THE WORLD

NICE 3000
Synchronous motor adjusting manual

V1.01

MONARCH CONTROL TECHNOLOGY Co., LTD

Content

NICE3000 synchronous motor adjusting manual

Ⅰ Basic composition

The NICE 3000 integrated controller fall into the synchronous and asynchronous models, and the 2 models have different software as well as the hardware. This manual is focus on the synchronous model.

There are 2 parts in the NICE 3000 sync model: the integrated controller (fig 1) and Sin/Cos rotary encoder card (fig 2)

The Sin/Cos PG card has 2 types, namely the MCTC-PG-C and MCTC-PG-E, and the difference is the PG-C is wiring mode (see fig 3) while the PG-E is the terminal type. The following is focus on the PG-E.

Fig 1 NICE3000 integrated controller（include SIZE-D、SIZE-E）

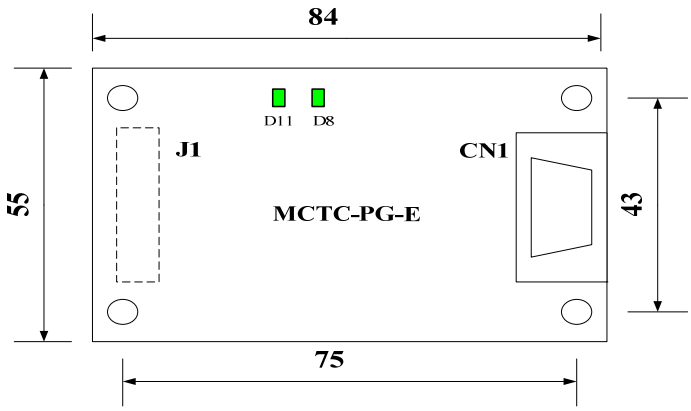


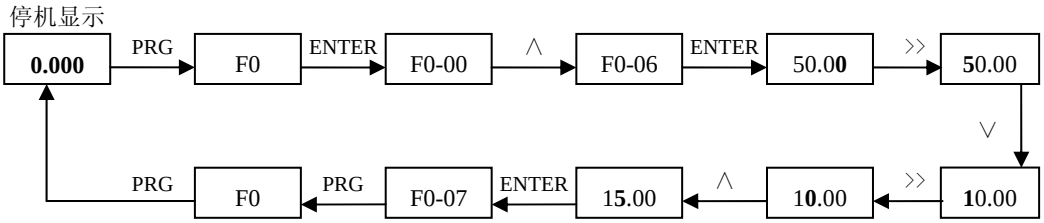
Fig 2 MCTC-PG-E

The external application of NICE 3000 sync and asynchronous including the car top board (MCTC-CTC-A) display board (MCTC-HCB-A), car call board (MCTC-CCB-A) and adjusting tools (see user's manual for details)

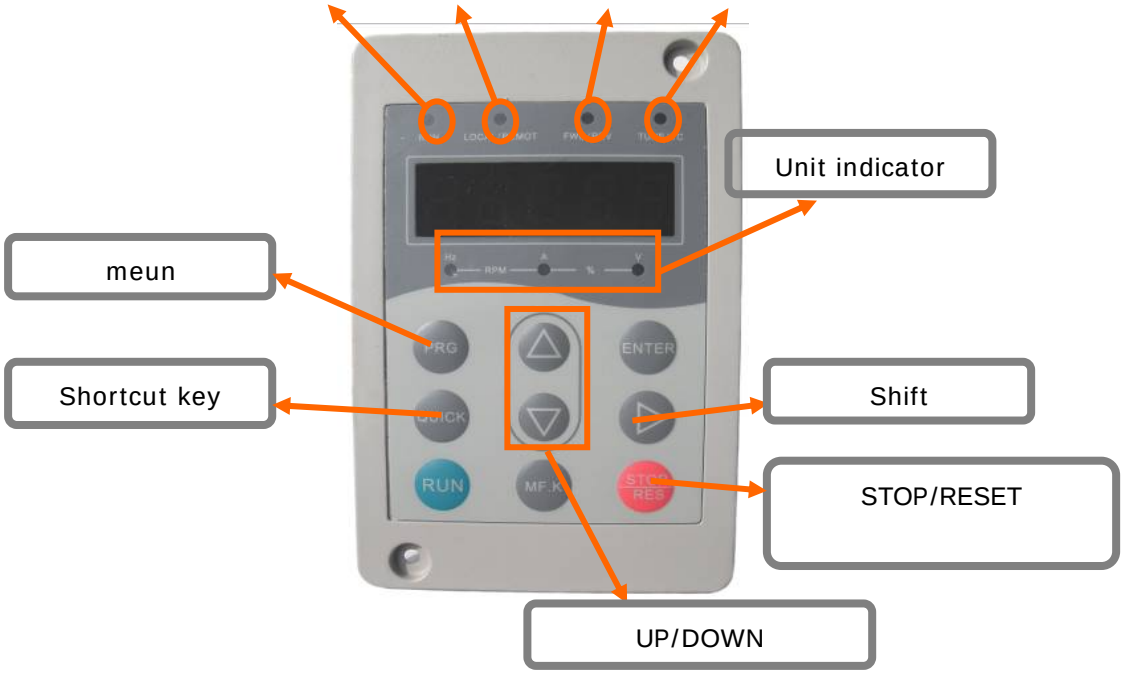
Operation description

key	name	function
PRG	Program key	Enter or exit the primary menu and delete quick menu
ENTER	Confirm	Enter the menu level by level and confirm setting parameter
∧	Up	Increase of date and function code
∨	Down	Decrease of date and function code
>>	Shift	It can select the displaying parameters circularly on the stop displaying state and the running displaying state. It can also select the modification bit of the parameters when modifying the parameters.
RUN	Running	In the keypad operation mode, it is used for running and operating the controller.
STOP/RESET	Stop/reset	The key is for stopping the running when the controller is in the running state, and for resetting the faulty status.
QUICK	Quick key	Enter or exit the quick menu
MF.K	Multi-function selection	Display and remove of error message

Example: Change function code F0-06 from 50.00Hz to 15.00Hz (bold means flash bit).



RUN	LOCAL/REMOT	FEW/REV	TUNE
运行指示灯	保留	上、下行	调谐



Ⅰ Adjusting procedure

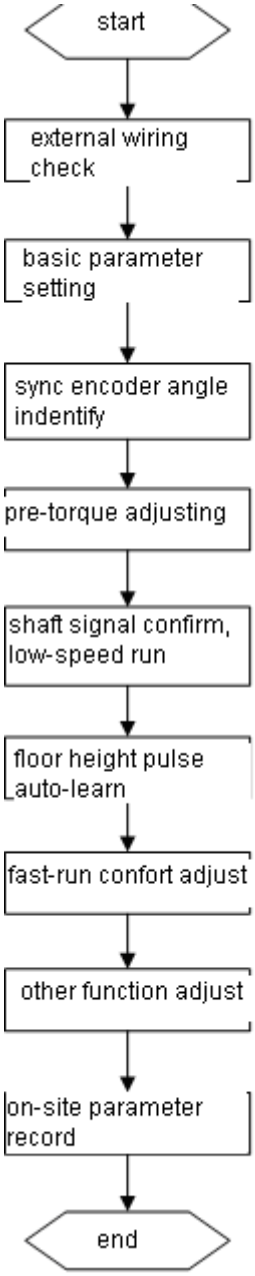


Fig 4 flow of adjusting procedure

1. External wiring check

This procedure is focus on the system mechanical, electrical wiring, power supply and grounded check. Etc. please refer to the user's manual for details.

2. Basic parameter setting

The basic parameter setting refers to the parameters that need to be checked before every on-site adjusting. The parameter setting should take the control cabinet's document and

motor parameter as the reference, see the chapter 6—parameter tables.

3. Sync motor rotary encoder angle identify

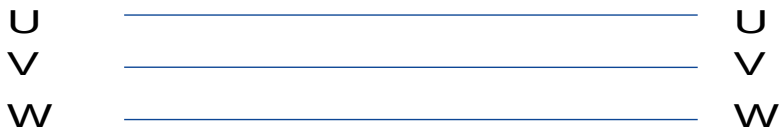
The change of encoder and the UVW sequence need to do self-learning again. The F1-06 and F1-08 need to be copy or do the self-learning again when the main board has been changed

4. Procedures of self-learning

1) Correct wiring

The inverter output power terminal UVW should be corresponding to the motor power terminal UVW.

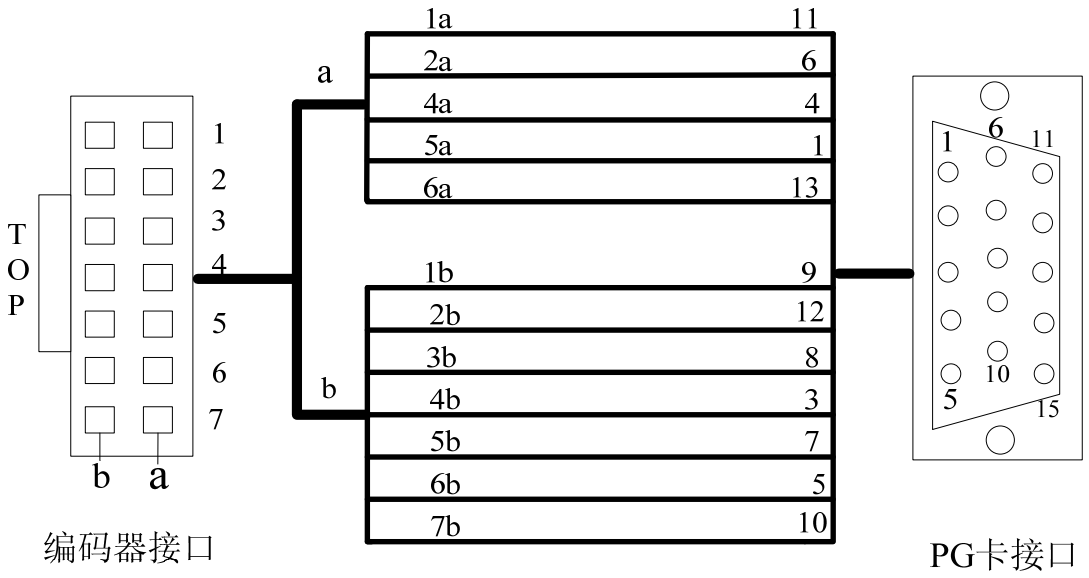
inverter output power terminal motor power terminal

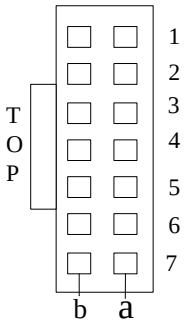


Connect the brake power correctly and make sure the brake can work normally.

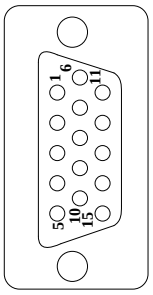
Confirm the PG card and encoder connects correctly.

The connection as following：



Encoder type	DB15 pin meaning		PG card model
ERN1387 SIN/COS encoder		1b：VCC(brown/green) 1a：C-(pink) 2b：D+(yellow) 2a：A-(yellow/black)3b：B+(blue/black) 3a：NC 4b：R+(red) 4a：R-(black) 5b：0V (white/green) 5a：B-(red/black)6b：A+(green/black) 6a：D-(purple)7b：C+(gray) 7a：NC	MCTC-PG-E

ERN1387 SIN/COS encoder pin meaning

PG card	DB15 pin meaning		Encoder model
MCTC-PG-E		1：B- 2：NC 3：Z+ 4：Z- 5：A+ 6：A- 7：COM 8：B+ 9：VCC 10：C+ 11：C- 12：D+ 13：D- 14：NC 15：NC	ERN1387 SIN/COS encoder

MCTC-PG-E

2) Short the safety and door-lock, short the up limit, down limit and car roof inspection.

3) Connect the power line R S T, if the PFR is abnormal then change the any 2 phases of the R S T.

4) **Check the motor parameter F1-00-F1-05, and set the F1-11 as 1(on-load self-learning), display TUNE, then press the Inspection up/down switch, automatically stop after 1 round, then release the Inspection Running switch, the F1-11 will be back as 0. Please make sure the wiring is correct before the auto-learning.**

5) If the auto-learning is abnormal, vibrate or slide, or the ERR20/02 occurred, then please exchange the UV power line then do the auto-learning again.

6) Do the auto-learning 3 times, and compare the angle difference and make sure the difference within 10 degrees.

7) Check the motor direction of up running according to the motor position; adjust the running direction and AB sequence by the F2-10 parameter.

0：same direction

1：running direction reversal, position pulse direction reversal

2： same running direction；position pulse direction reversal

3：running direction reversal；same position pulse direction

Record the control cabinet UVW and the motor UVW wiring method, and stick on the cabinet.

Remark：(make sure the wiring is correct, please re-check it)

1) According to the above method, the sync machine auto-learning has been finished on the factory. All the data and wiring method in tables ha been stuck on the control cabinet.

2) For the on-site installation, should strictly according to the contract No.: keep the control cabinet correspondence with the traction machine, otherwise the elevator can not run.

3) **There are other factors that may caused running failure, user need to analyze the reason and decide if the re-learning is needed, details refer to the user' s manual.**

Remark 1: before the rotary encoder angle identify, please set the motor nameplate parameter correctly, including F1-01(motor rated power), F1-02(motor rated voltage), F1-03(motor rated current), F1-04(motor rated power), F1-05(motor rated revolution) and rotary encoder's F1-12(pulse of every turn), the incorrect parameters may caused the angle identification error.(Err 20)

If the Err 21 occurs when the motor start to run, check the F1-06 and F1-08. If the motor and PG card wiring remained no change, user can input the 2 data of first identification directly or identify the angle again.

5. Start no-weighing auto compensation function

Set the parameters according to the following table and trial-run, the default parameters are suitable for most motors, but with slight difference, if the motor is abnormal then set the following 2 parameters as default value and observe the result.

1	**F3-19**	**0.6**	Start zero-speed delay	Start the no-weighing auto-compensation function, must set greater than 0.5.
2	F8-01	2	Start compensation select	Default as 0, no compensation, set as 2 to start no-weighing auto-compensation, the F8-02/03/04 are automatically changed when set as 2.
3	F8-02	15		When start vibrating, if less than 10, then decrease slowly, increase when start sliding
4	F8-03	0.5		When start vibrating, reduce to 0.2, increase when start sliding.
5	F8-04	0.6		

The start effect also influenced by the guide shoes and rails, if the sliding not occurred in zero-speed but not ok when start, user need to check shoes stress and rail distance and flatness.

There are many other factors like motor features will exert an influence on the start effect, please change the F8-02/03/04 if the starting effect is not well.

6. Shaft signal confirm, slow run

This tine can do the slow run, make sure the up/down limit and forced slowdown switch in the shaft are correctly acted according to the document with machine, if there is several leveling sensors, please confirm the sequences of up/down leveling signal, and door-zone signals action, the 1st forced deceleration means the forced deceleration switch that closest to the port terminal, and the up leveling refers to the top leveling sensor, vice versa.

7. Floor-height pulse auto-learning

The floor-height auto-learning is the base of hi-speed running; please confirm the following information before the learning:

1) The inspection switch should switch to the inspection position.

2) Whether the down forced deceleration switch 1 is valid (within the deceleration area)?

3) Whether the NICE 3000 is distance control (F1-01=1), close-loop (F0-00=1), the currently floor is the bottom floor(F4-01)=F6-01.

4) Whether the elevator is on the bottom floor leveling position

5) Whether the NICE 3000 is in Error state.

If the extra-long floor exist (when the inspection speed is default, extra-long refers to one that exceed 9 meters), set the F9-02 as 0 before the auto-learning and omit the running time protection detection, otherwise the ERR 35 may occur. Remember to set F9-02 back to default value after the auto-learning.

8. Fast-run comfort adjusting

Factors that influence the fast-run comfort

Serial No.	Function code	Setting range	Meaning	Description
1	F0-07	0.5~16KHz	Carrier frequency	The carrier frequency generally needs no modification
2	F2-00	0~100	Speed-loop proportional gain 1	40 or 60，try when the comfort is not well
3	F2-01	0.01~10.00s	Speed-loop integration time 1	0.3
4	F2-03	0~100	Speed-loop proportional gain 2	40 or 60，try when the comfort is not well
5	F2-04	0.01~10.00s	Speed-loop integration time 2	0.3
6	F2-06	10~100	Current-loop proportional gain	160 or 500，160 for mostly use
7	F2-07	10~100	Current-loop integration gain	40，

Generally speaking, the above parameters need some test during the sync machine adjustment, and demand different pi parameter table based on different traction machines.

9. Communication setting

After the correct wiring, the hall call set the address by the sl button on the hall call board, pressing once to display the currently floor, pressing once to add 1 till the required floor. When it reaches 40, it will back to 0 to cycle. Please inform us when the floor exceeds 40.

Please refer to the PE group parameters on the user's manual for floor display.

10. Base station setting

Fire-control, lift-locked base station is default as the bottom floor, the switches should be connected to the hall call board of the base station floor, otherwise it is valid

11. Other function adjusting

Same as the asynchronous machine adjustment, please refer to the User's Manual.

12. On-site parameter recording

After the on-site adjustment, download the parameters to the computer by the monitoring software, and fulfill the adjusting reports, keep one copy and one to the users, reserved for the future services.

Ⅱ Sync machine function description

1. Software version identify

The software version No of NICE 3000 integrated system is record on the FA-04, FA-05 and FA-06.

FA-04 is the auxiliary CPU program software version, this parameter of the sync machine should be 20XXX, the XXX means the software No..

FA-05 is the main CPU program version No, this parameter of the sync machine should be 20XXX, the XXX means the software No..

FA-06 is the DSP software version No； Asynchronous FA-06=22005

FB-01 is the car top board software version No.。

The software version No is the foremost information for the on-site error description.

2. Power-failure emergent run

NICE 3000 system has 3 power-failure running plans, refer to the User manual.

3. Car stopping self-locking contactor output

Short the UVW 3 power wires of the sync machine will make the stator coil has the brake function. On the elevator application, even if the brake is out of work, the sync machine power wire short device will prevent the elevator from fast-sliding, and reinforce the elevator safety.

Generally adopts the running contactor that self-equipped with UVW-short, if the contactor without the UVW-short:

The control cabinet provides the independent car-stopping self-locking contactor; this function is selected by the FE-33 bit 6; sync machine self-locking contactor car-stopping output; bit 8; and the self-locking contactor N.C output.

The car-stopping self-locking contactor output is in the options of F5-26~F5-31; 12; sync machine self-locking output, the feedback point is selected from the input options 62; sync machine self-locking feedback N.C input.

This function was added on the software 20640 version.

Ⅱ Sequence chart of running

For the actual adjusting, please take the following figure as reference:

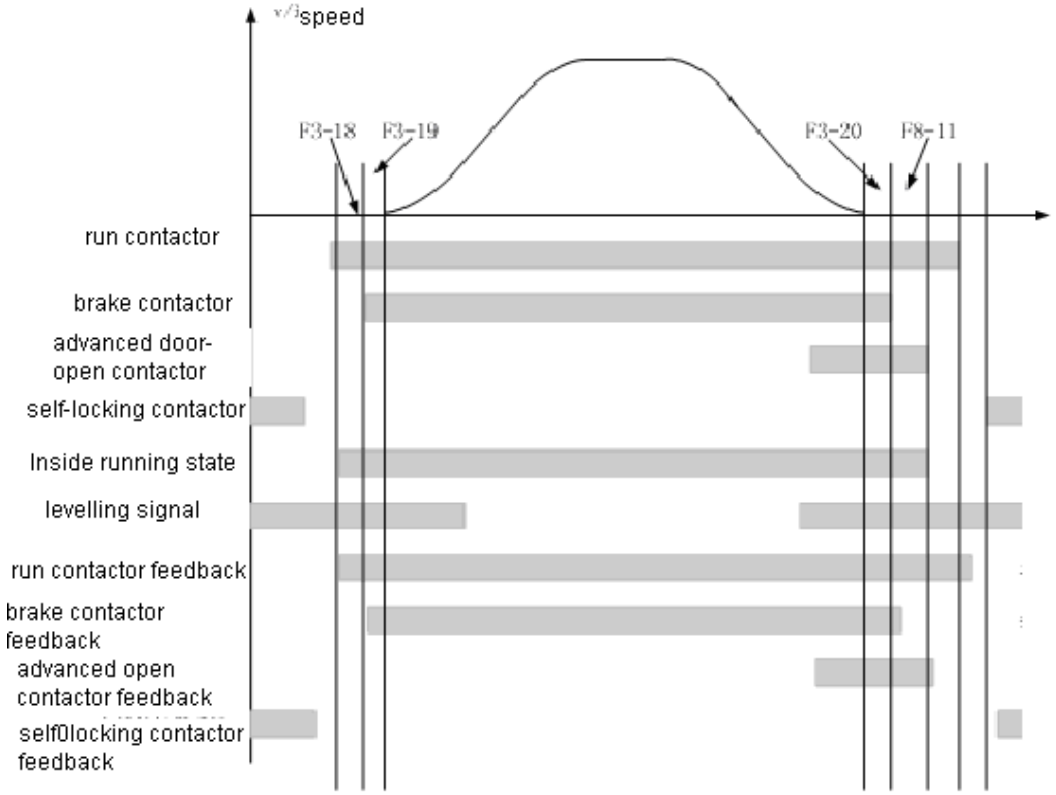


Fig 5 Sequence chart of running

There are 4 parameters for the NICE 3000 sequence chart, generally speaking, it can meet the needs of comfort adjusting on the sequence without the adjustment.

Ⅰ Parameter list

1. Tuning of PMSM：

A） Tuning description

1）The PMSM must have the magnet pole position identification before the 1st run, other wise the machine can not be normal.

2）Make sure the F0-00 set as 1(close-loop vector) and connect the PG card correctly, otherwise the err 20 may occurs, the elevator will be abnormal.

3）The system can select the non-load tuning by the operation panel and also the on-load tuning by the distance control mode (inspection mode).

4）set the parameters of（F1-00、F1-12）and motor nameplate parameters（F1-01、F1-02、F1-03、F1-04、F1-05 correctly before the tuning.

5）Make sure the F8-01 as 0, otherwise the reveling over-speed may occurs.

6.Make sure the ERN 1387 encoder ‘s AB and CDZ signals connect to the AB and CDZ ports of the PG card, UVW’ encoder’s AB and UVW signals connect to the AB and UVW ports of the PG card.

7. After the identification, F1-06, F1-08 are setting as motor control reference. Users needn’t modify it. Otherwise the lift can’t run normally.

⚠注意 Cautions for the loaded tuning of sync machine:

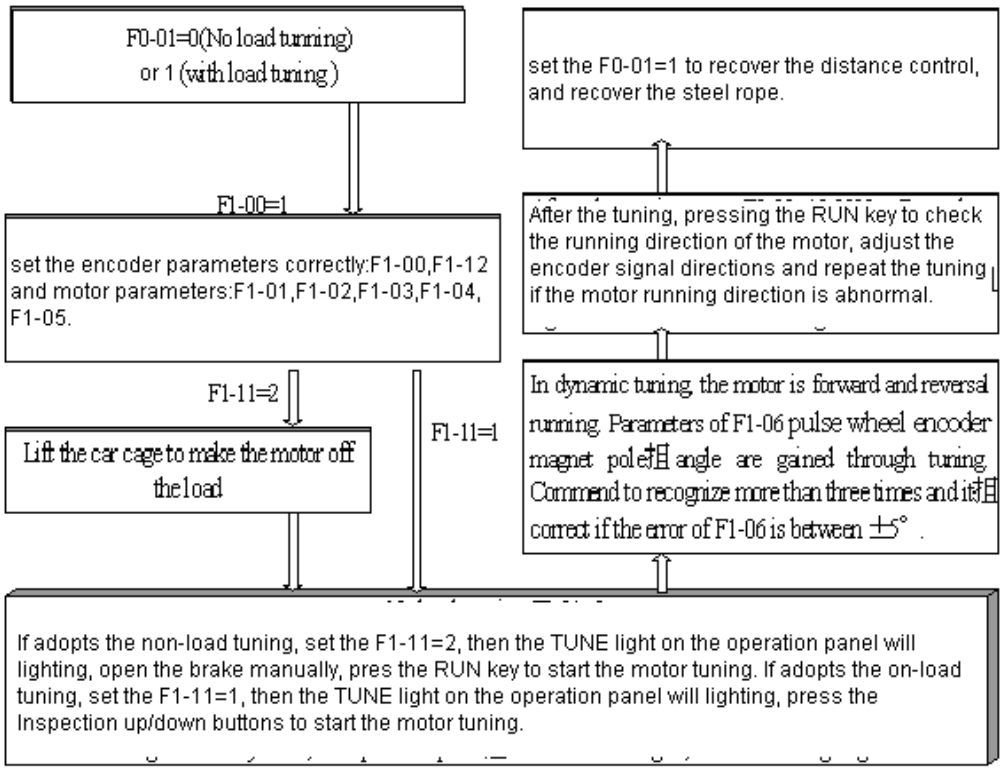
1）Make sure the power line UVW of the motor is connected to the inverter’s UVW correspondingly.

2） Make sure the AB, CDZ signals of the ERN 1387 SIN/COS encoder corresponding to the AB, CDZ ports of the PG card; The AB, UVW signals are corresponding to the AB, UVW ports of PG card.

3）Make sure the F8-01=0 before the tuning, otherwise the reveling over-speed may occur.

4） if the tuning still not successful (it may be the motor remained no running or suddenly stop) even the motor UVW power wiring is correct, please change any 2 output power wires of the inverter, then repeat the tuning.

5）The on-load tuning is of certain danger, please make sure there is nobody on the shaft.



Flow chart of synchronous machine tuning

B） Tuning with load

1）Check the motor power wire and encoder wiring, make sure the UVW power lines of the motor connected correspondingly to the inverter output UVW terminal, and the AB, UVW and CDZ signals of encoder connect correctly to the one of the PG card.

2）After the power-on, set the Inspection switch to the inspection position, confirm the F0-01=1(distance control);

3）Set the encoder parameter F1-00 correctly (0: SIN/COS; 1: UVW), f1-12 (pulse) and motor parameters F1-01, F1-02, F1-03, F1-04, F1-05, make sure the F8-01=0 (pre-torque invalid), if the encoder is ERN 1387 SIN/COS, also need to set the F1-10 (encoder signal verify selection) =1

4）Reset the current error, set F1-11=1 (motor on-load tuning), press the Inspection up or down button, the motor will give a electromagnetism sound, then run at the given direction for 1 round till detect out the encoder origin signal, when the operation panel do not display TUNE, the motor tuning has finished. After that, the system will stop for 8 seconds to save the parameters. Repeat the tuning for 3 times, make sure the F1-06

encoder initial angle differences are within ±5 degrees, and the results of F1-08 should be the same.

5） After the tuning, if the encoder is ERN 1387 SIN/COS type, the F1-10 should be set as 2, inspection trial running and check the current, elevator running and running direction and F4-03 pulse alternation (up increase, down decrease). If the elevator running with reversal direction or pulse alternation is abnormal, then please modify them by the means of F2-10 parameter.

⚠注意 When the on-load tuning is finished, system will forbid Inspection running for 8 seconds to save the parameter.

C） Tuning without load

1）Check the motor power wire and encoder wiring, make sure the UVW power lines of the motor connected correspondingly to the inverter output UVW terminal, and the AB, UVW and CDZ signals of encoder connect correctly to the one of the PG card.

2）System power-on, set F0-01 as 0, and select the operation panel command channel control mode.

3）Set the F1-00 on the basis of encoder type and encoder pulse (0; ERN 1387 SIN/COS encoder or 1: UVW encoder) and F1-12. Then set the F1-01, F1-02, F1-03, F1-04 and F1-05 according to the motor nameplate, if the encoder is ERN 1387 SIN/COS, the F1-10 also need to be set as 1.

4）disconnect the traction machine and load (steel wire), set F1-11 as 2 (tuning without load), open the brake manually, press the RUN key, the controller will automatically calculate the F1-06 angel and F1-08 wiring method, finish the motor tuning; repeat tuning for 3 times, and insure the differences of F1-06 should within ±5 degrees, and the results of F1-08 should be the same;

5）After the tuning, set the F0-01 as 1 (distance control) if the encoder is ERN 1387 SIN/COS type, the F1-10 should be set as 2, inspection trial running and check the current, elevator running and running direction and F4-03 pulse alternation (up increase, down decrease). If the elevator running with reversal direction or pulse alternation is abnormal, then please modify them by the means of F2-10 parameter.

▲ Shaft parameter self-tuning is used to record the position of well's opening and closing (Including leveling switch and force reducer switch). Requirements are as follows:

(1) Encoder and leveling feedback is normal; the switch of the well is installed well.

(2) The lift is in the ground floor, forced deceleration switch operation.

(3) The lift is in examination and can check running.

(4) The lowest and highest floors are set correctly.

(5) NICE 3000 is not in the error alarming state.

Note: Well self-tuning can also be realized by the small keyboards on the main control panel. Two floor self-tuning needs the lift run under the first leveling which means there's one leveling sensor under the leveling plate..

F1-12	**Encoder pulse number per rotation**	Default	1024	Min. Unit	1
	Setting Range	0～10000			

It can set the pulse number of each rotation of the encoder, according to the nameplate of encode.

Note: it must set the encoder pulse number correctly when it's in the closed loop vector control. Otherwise it cannot work normally. If the asynchronous motor still cannot work normally after the encoder pulse number set correctly, please exchange the connection line between the phase A and B of the encoder.

3. F2 group Vector control parameter

Function code	Name	Recommend setting value
F2-00	Proportional gain 1 of speed loop	50
F2-01	Integration time 1 of speed loop	0.5
F2-02	Switching frequency 1	2
F2-03	Proportional gain 2 of speed loop	50
F2-04	Integration time 2 of speed loop	0.5
F2-05	Switching frequency 2	5

The parameters of F2-00 and F2-01 decide the dynamic response characteristic of the frequency that is smaller than the switching frequency 1 (F2-02), while the parameters of F2-03 and F2-04 decide the dynamic response characteristic of the frequency that is larger than the switching frequency 2 (F2-05). The dynamic response characteristic parameters of the frequency between the switching frequency 1 and switching frequency 2 equal to the weighted average value of two set of F2-00、F2-01 and F2-03、F2-04. As shown in Chart 6-2:

It can regulate the speed dynamic response characteristic of the vector control by setting the proportional coefficient and integrating time of the speed regulator. It can accelerate the dynamic response of the speed loop by increasing the proportional gain or decreasing the integrating time. Too large the proportional gain or too small the integrating time will cause the system to vibrate.

The regulating methods are recommended as follows:

If the factory parameters cannot satisfy the requirements, conduct minor adjustment on the basis of the factory parameters:

Enlarge the proportional gain first to prevent the system from vibrating, and then diminish the integrating time to ensure that the system has fast response characteristic and small overshoot.

If switching frequency 1 and switching frequency 2 are set as 0 at the same time, only F2-03 and F2-04 are virtual value.

Note: Once the PI parameters are set inappropriately, it will cause large overshoot speed and even voltage fault when the overshoot returns to the normal level.

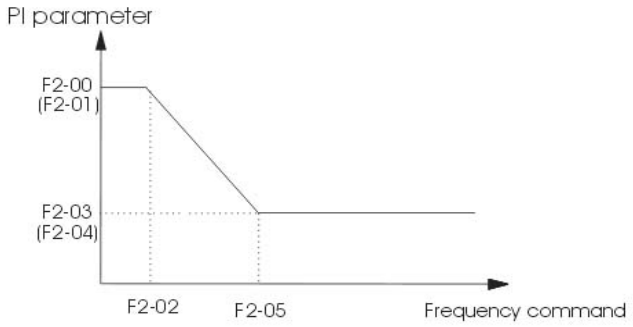


Fig 6-2 PI parameter diagram

Function code	Name	Factory default	Min. unit	Setting range
F5-25	Car top board input type select	64	1	0～255

0：N.C input ；1：N.O. input 。

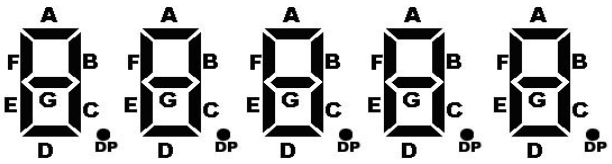
2. Car top board parameter

For instance, an elevator needs to set the car top input signal according to the following table:

Binary bit	parameter	Setting	Binary bit	Parameter	Setting
BIT0	Light-curtain1	N.C.	BIT4	Door-close limit 1	N.C.
BIT1	Light-curtain 2	N.C.	BIT5	Door-close limit 2	N.C.
BIT2	Door-open limit 1	N.C.	BIT6	Switch value weighing 3（full）	N.O.
BIT3	Door-open limit 2	N.C.	BIT7	Switch value weighing 4 （over-load ）	N.C.

Function code	Name	Factory default	Min. unit	Setting range
F5-32	Hall call state display			

When the user enters the F5-32 menu, the state of nixie tube on the keypad shows the current hall call communication state. The sequence of the tubes from the left to right is 5, 4,3,2,1. The definition of the tube as the following:



Tube Serial number	Tube passage marker	Meaning of tube passage “light”	Meaning of tube passage “No light”
1	A	Hall call communication of address dial-up 1 normal	hall call communication of address dial-up 1 deviant

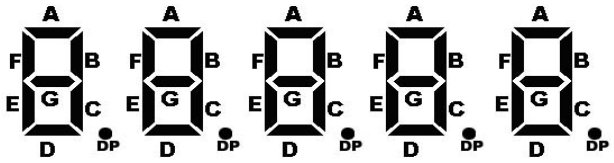
	B	Outside call communication of address dial-up 2 normal	Outside call communication of address dial-up 2 deviant
	C	Hall call communication of address dial-up 3 normal	Outside call communication of address dial-up 3 deviant
	D	Hall call communication of address dial-up 4 normal	Outside call communication of address dial-up 4 deviant
	E	Hall call communication of address dial-up 5 normal	Outside call communication of address dial-up 5 deviant
	F	Hall call communication of address dial-up 6 normal	Outside call communication of address dial-up 6 deviant
	G	Hall call communication of address dial-up 7 normal	Outside call communication of address dial-up 7 deviant
	DP	Hall call communication of address dial-up 8 normal	Outside call communication of address dial-up 8 deviant
2	A	Hall call communication of address dial-up 9 normal	Outside call communication of address dial-up 9 deviant
	B	Hall call communication of address dial-up 10 normal	Outside call communication of address dial-up 10 deviant
	C	Hall call communication of address dial-up 11 normal	Outside call communication of address dial-up 11 deviant
	D	Hall call communication of address dial-up 12 normal	Outside call communication of address dial-up 12 deviant
	E	Hall call communication of address dial-up 13 normal	Outside call communication of address dial-up 13 deviant
	F	Hall call communication of address dial-up 14 normal	Outside call communication of address dial-up 14 deviant
	G	Hall call communication of address dial-up 15 normal	Outside call communication of address dial-up 15 deviant
	DP	Hall call communication of address dial-up 16 normal	Outside call communication of address dial-up 16 deviant

3	A	Outside call communication of address dial-up 17 normal	Outside call communication of address dial-up 17 deviant
	B	Hall call communication of address dial-up 18 normal	Outside call communication of address dial-up 18 deviant
	C	Hall call communication of address dial-up 19 normal	Outside call communication of address dial-up 19 deviant
	D	Hall call communication of address dial-up 20 normal	Outside call communication of address dial-up 20 deviant
	E	Hall call communication of address dial-up 21 normal	Outside call communication of address dial-up 21 deviant
	F	Hall call communication of address dial-up 22 normal	Outside call communication of address dial-up 22 deviant
	G	Hall call communication of address dial-up 23 normal	Outside call communication of address dial-up 23 deviant
	DP	Hall call communication of address dial-up 24 normal	Outside call communication of address dial-up 24 deviant
4	A	Hall call communication of address dial-up 25 normal	Outside call communication of address dial-up 25 deviant
	B	Hall call communication of address dial-up 26 normal	Outside call communication of address dial-up 26 deviant
	C	Hall call communication of address dial-up 27 normal	Outside call communication of address dial-up 27 deviant
	D	Hall call communication of address dial-up 28 normal	Outside call communication of address dial-up 28 deviant
	E	Hall call communication of address dial-up 29 normal	Outside call communication of address dial-up 29 deviant
	F	Hall call communication of address dial-up 30 normal	Outside call communication of address dial-up 30 deviant
	G	Hall call communication of address dial-up 31 normal	Outside call communication of address dial-up 31 deviant

	DP	Reserved	Reserved

F5-34 **F5-35**	**Terminal state display**	Factory default		Min. unit	
	Setting				

The F5-34 means the I/O terminal state of the main board, The sequence of the tubes from the left to right is 5, 4,3,2,1.



Tube Serial number	Tube passage marker	Tube passage meaning	Tube passage "light" meaning
1	B	Up leveling signal	Up leveling signal availability
	C	Down leveling signal	Down leveling signal availability
	D	door zone signal	Door zone signal availability, at the leveling station
	E	Safety circuit feedback 1	Safety circuit pass
	F	Lock circuit feedback 1	Lock circuit pass
	G	Run output feedback 1	Contactor close state
	DP	Brake output feedback 1	Brake open state
2	A	Inspection signal	Inspection signal availability
	B	Inspection up signal	Inspection up signal availability
	C	Inspection down signal	Inspection down signal availability
	D	Fire signal	Fire signal availability
	E	Up end signal	Up end signal availability, at up end state
	F	Down end signal	Down end signal availability, at down end state
	G	Over load signal	Main control terminal over load input availability
	DP	Full load signal	Main control terminal full load Input availability

3	A	NO.1 up forced deceleration signal	Signal availability, at the NO. 1 up force reducer area
	B	NO.1 down forced deceleration signal	Signal availability, at the NO. 1 down force reducer area
	C	NO.2 up force deceleration signal	Signal availability, at the NO. 2 up force reducer area
	D	NO.2 down force deceleration signal	Signal availability, at the NO. 2 down force reducer area
	E	NO.3 up force deceleration signal	Signal availability, at the NO. 3 up force reducer area
	F	NO.3 down forced deceleration signal	Signal availability, at the NO. 3 down force reducer area
	G	advanced door-open output feedback	Advanced door-open contactor pick-up state
	DP	Motor overheated signal	Motor temperature is too high
4	A	Front light curtain	Front light curtain shut out
	B	Back light curtain	Back light curtain shut out
	C	Brake output feedback 2	Brake open state
	D	UPS input	Main control panel signal availability
	E	Lift-locking input	Main control panel signal availability
	F	Safety circuit feedback 2	Safety circuit pass
	G	Self-locking synchronous motor feedback	Self-locking contactor close
	DP	Door lock circuit feedback 2	Door lock circuit pass
5	A	Reserved	
	B	Run contactor output	Run contactor close
	C	Brake contactor output	Brake open
	D	advanced door-open contactor output	Advanced door-open contactor pick-up
	E	Fire back to the base floor signal	Fire back to base floor output

F8 Group Reinforce Function Parameters

F8-00	**Weighing self-tuning**	Default	0%	Min. Unit	1%
	Setting Range	0～100%			

It means the weighing self-tuning setting. There are three steps of the weighing self-tuning:

1、Ensure **F8-01 setting is 0 and F5-36 choose 2 or 3.** This means that the system allow the weighing self- tuning.

2、Let lift stop at any floor, car is in non-load state, input F8-00 by setting 0,and press ENTER to input.

3、Put N% load into the car, set F8-00=n, and press ENTER to input. For example: put 100Kg heavy into lift of the rated load 1000Kg, and input F8-00=10.

After weighing self-tuning, the data of non-load and full load are written into F8-06 and F8-07.User can input data by hand based on the fact.

Note: please accord to this order. Otherwise the weighing self-tuning is invalidation.

F8-01	**Preset torque selection**	Default	0	Min. Unit	1
	Setting Range	0、1, 2			

0：Preset torque is invalidation, weighing self-tuning is allowable.

1：Weighing pre-torque compensation: need to use weighing sensor

2: pre-torque auto-compensation: this is only applied to the ERN 1387 encoder, the system will automatically adjust the compensate torque when start.

When use preset torque bias function, the system can output torque with suited load, to assure comfortable feeling of the lift. But output torque is limited by Upper limit of torque(F2-08).When load torque is over the upper limit of torque setting, the system output torque is the upper limit of torque.

F8-02	**Preset torque bias Zero-servo current coefficient**	Default	50.0% 15.0%	Min. Unit	0.1%
	Setting Range	0.0～100.0% 0.20%~50.0%			
F8-03	**Drive side gain Zero-servo speed-loop KP**	Default	0.60 0.50	Min. Unit	0.01
	Setting Range	0.00～2.00 0.00~1.00			

F8-04	**Brake side gain Zero-servo speed-loop TI**	Default	0.60 0.60	Min. Unit	0.01
	Setting Range	0.00～2.00 0.00~2.00			

If it is in full loading, the lift runs up, the motor is in drive running state; the lift runs down, the motor is in brake running state.

If it is in non-loading state, the lift runs up , the motor is in brake running state; the lift runs down, the motor is in drive running state.

The parameters for the pre-torque bias are actually the balance coefficient of the lift and it is also the percentage of the weight in the car and the rated weight when the car is in balance with the counterweight; Drive gain and brake gain are the pre-torque coefficients when the motor is in driving or brake running. The larger the compensation of the pre-torque in starting, the larger the gain will be in the same condition. The controller can identify the driving and brake state according to the signals of weight conductor, and then work out desirable torque compensation values.

When the system uses analog weighing, these group parameters are used for adjusting starting. Details of adjusting ways are as follows:

When motor is in driving state, If the lift rolls back when starts, increase F8-03; if the lift rushes to start, reduce F8-03.

When motor is in brake state, if the lift rolls back when starts, increase F8-04; if the lift rushes to start, reduce F8-04.

The second row definition of function codes F8-02~F8-04 are used for the no-weighing elevator starting adjusting, it will be valid when the F8-01 was set as 2 for the first time,

F8-11	**Car stopping torque output delay**	Default	0.200	Min. Unit	0.001
	Setting Range	0.200～1.500s			

After setting the commands of outputting brake close when the lift stops running, time for zero speed running depends on the brake.

Annex：reference files of solutions for the general errors：

1. Error solutions for the control cabinet power-on detection：

The integrated controller nixie tube gives no display after power-on

A. First, check if the safety contactor has pick-up, if it has pick-up, then confirm if there is AC 380v voltage on the controller power input side R, S, T. If it is not,

check the power supply.

ERR 41 occurs when power-on.

A. please insure the controller input point X4 is normal, whether the voltage of X4 point and com end is DC 24v (if it is not lighting, then check safety contactor feedback circuit)

ERR 35 occurs when power-on.

A. Before the shaft auto-tuning, the ERR 35 will be occurs, this has no influence on motor auto-tuning and Inspection running. The error will disappear automatically after the shaft learning.

ERR 51 occurs when the control cabinet power-on

A. Before the controller connect to the car top board, the ERR 51 and CAN communication error will be reported, this will not influence the motor auto-tuning and Inspection run.

ERR 20 occurs when control cabinet power-on.

A. Check the encoder circuit carefully (main board and 16P cable on the bottom floor, PG card and main board connection, encoder connection cable)

2. Error solutions of motor tuning with load.

Before the on-load auto-tuning, please insure the following:

1) Controller power output terminal UVW should correspond to the UVW of motors.
2) encoder circuit connection is correct and reliable (main board and bottom floor 16P cable is reliable, PG card and main board connection is reliable, encoder connection cable is reliable)
3) Estimate the elevator balance coefficient, 40%~50% will be safe, keep the car empty and place the counter-weight on the buffer.
4) Elevator meets the requirements of Inspection running.
5) Motor and encoder parameters are correct.

After the above checking, user can do the on-load tuning accord to the slow-run adjusting.

A. ERR 02 occurs in on-load tuning. First, please make sure the brake is open, if the brake is ok, then exchange the U,V of the 3 phase power output terminal U, V, W.

B. ERR 20 occurs in on-load tuning. First, check the encoder connection cable and installation. If the motor is like BLUE LIGHT or TURUN this special model, user can increase F1-03 by 5A then do the auto-tuning.

C. ERR 17 occurs in on-load tuning, check the motor grounding, if it is not reliable, then cut the shielding layer of encoder connection cable 2 ends or decrease the carrier frequency to reduce the interference that caused by the poor grounding.

3. Error solutions during shaft auto-tuning

A. Pre-running judgment

1、Whether the 1st down forced deceleration is valid.
2、Whether the current floor is 1.
3、Whether the Inspection running is ok.
4、Whether it is the open-loop

B. Enter the running mode:

1、judge whether it is Inspection state once running, if it is not, the ERR 35 will be reported.(the run contactor has pick-up but the brake is not)

C. judge when reach the first leveling position. :

1、 Whether the current position is less than the min. value (1 million pulse), that means whether the F4-03 is increase when run upward.

2、The result of leveling plug-board length is 65535, and error occurs as soon as the board leaves.

D. Judge during running

1、Whether the running time is enough for F9-02, error occurs as soon as the time is up.

2、Error occurs at once as soon as the auto-learned floor distance is less than 50cm.

E. Running to the top floor:

1、 1st up forced deceleration is valid and judge when arrival the door-zone, whether the learned floor number is equals to the F6-00 and F6-01.

2、 If the learned lifting height is less than 50cm, this error occurs. 。

4. Error solutions during the normal running.

A. ERR 45 occurs when normally running to the bottom/top floor，1）Check the position and verticality of leveling insulating board, especially the second one from the bottom floor, then do the shaft auto-learning again; 2) make sure the steel wire is not slipping; 3) make sure the forced slowdown switch installation position is ok.

B. ERR 30 occurs during the normal running. 1) leveling checking error is greater than 40% and BIT 0, BIT 1 of F6-11 were selected the error occurs, if not select, it will back to the base floor without error report; generally speaking it caused by the steel wire slipping. 2) back-leveling meets position limit. 3) running more than 9-02 setting but receive no leveling signal.

C. ERR 53 occurs during the door opening/closing. 1) check the N.O/N.C. settings of door open/close arrival the right position; 2) whether the door-lock is shorted.

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