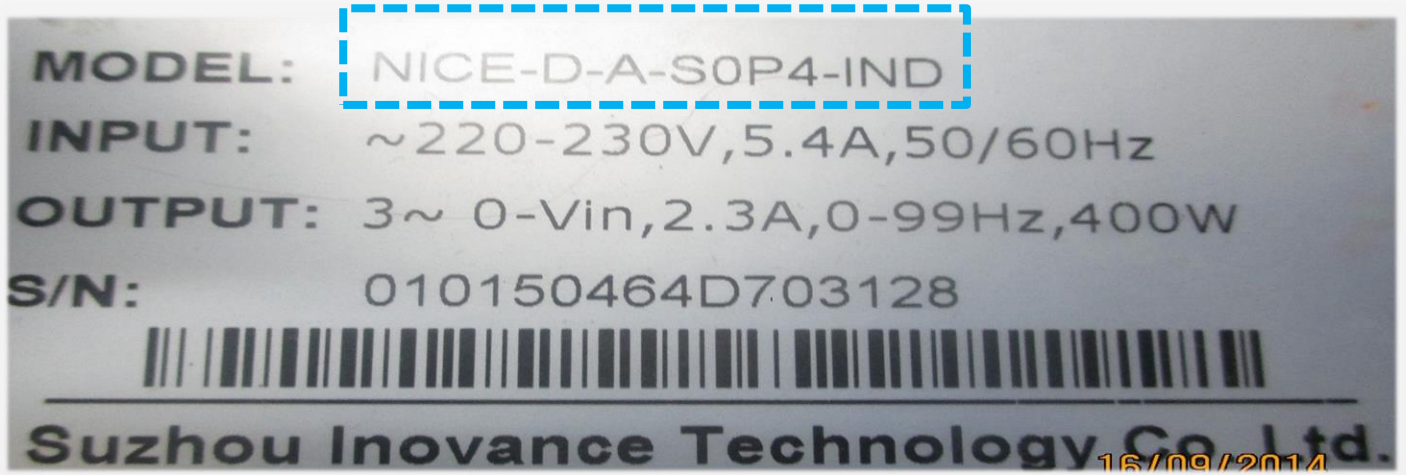
MONARCH- NICE 900
DOOR DRIVE
TRAINING - PRESENTATION

Product information …



NICE SERIES

SPECIALIZED FOR DOOR OPERATION

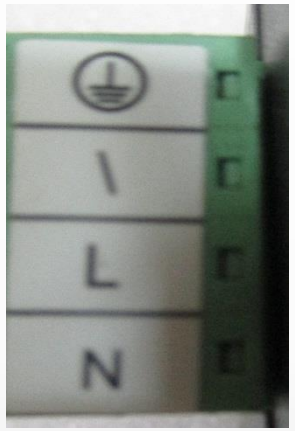
PLASTIC ENCLOSURE

OUTPUT POWER	
OP2	200 W
OP4	400 W
OP7	750 W

VOLTAGE RATING	
S	SINGLE PHASE

Terminals description and arrangement…

- Power circuit terminals :
  1. Input- single phase supply:



Earth
/
Line
Neutral

  2. 3 phase Output- To motor:

W terminal
V terminal
U terminal

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- Control circuit terminals: Distance control mode

Encoder terminals

+24V	+24 V dc
PGA	Encoder phase A
PGB	Encoder phase B
PGZ	Encoder signal Z (PM MOTOR only)
COM	Common terminal isolated from GND

Digital input terminals, DI1 to DI8

Configured by F9-01 to F9-08.

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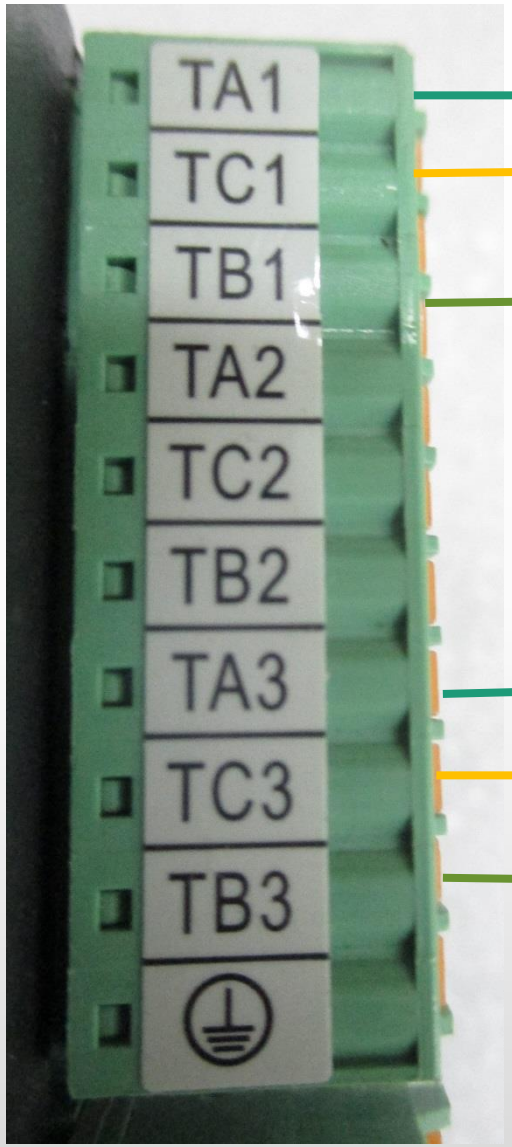
- Output terminals: Distance control mode



Door Close Limit relay- Programmable

Sensing type? Torque limit / pulses

Pulses: F9-09 = 2

Torque limit in F4:11 F9-09 = 8

Door Open Limit relay- Programmable

Sensing type? Torque limit / pulses

Pulses: F9-11 = 1

Torque limit in F3:07 F9-13 = 7

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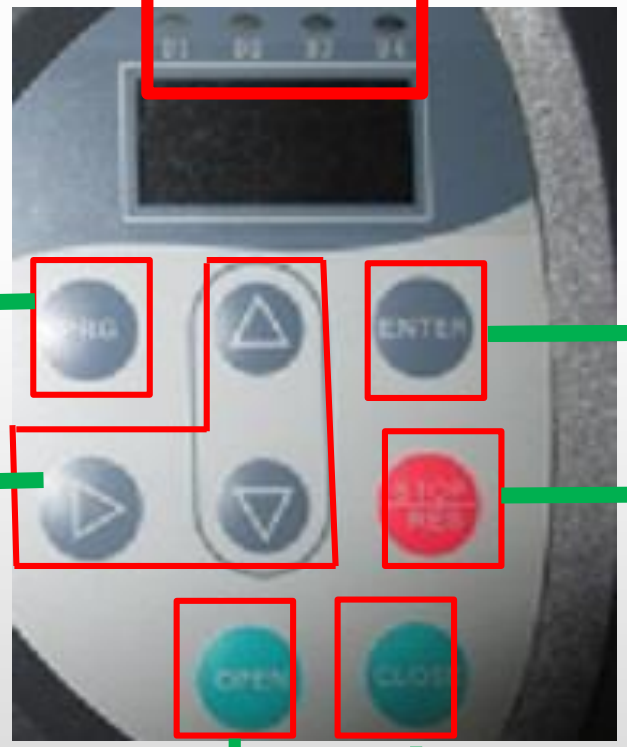
- On board key pad: features and use

LED	Status during stop
DI1	DI1 VALID
DI2	A,B VALID
DI3	Z VALID
DI4	DI4 VALID

DI1 DI2 DI3 DI4

LED	Status during running
DI1	door close valid
DI2	Door closing
DI3	Door opening
DI4	door open valid



Program

Direction keys- browsing

Open

Enter- confirm

Stop/ reset

Close

Auto-tuning …

Step 1: Selection of motor type:

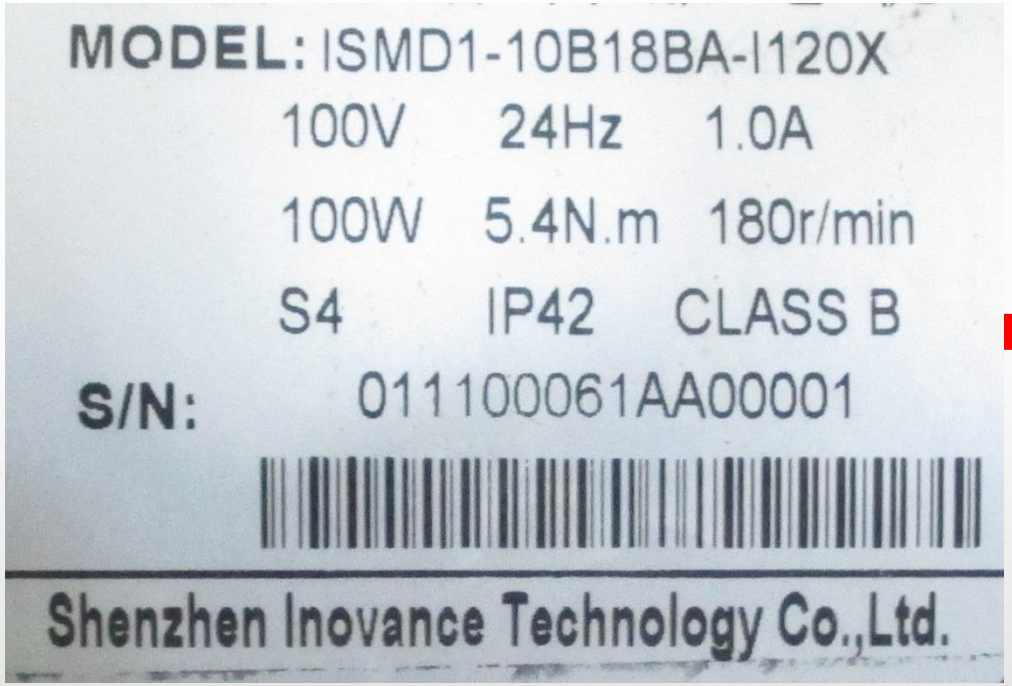
FUNCTION CODE	PARAMETER	SETTING RANGE
F1-00	Motor type selection	0: asynchronous motor 1: synchronous motor

Select 1 in F1-00 to choose PM motor.

Select 0 in F1-00 to choose Induction motor.

Step 2: Entering of motor parameters…

From the motor name plate, enter the following data:



FUNCTION CODE	PARAMETER	VALUE
F1-01	Motor Rated Power	100W
F1-02	Motor Rated Voltage	100 V
F1-03	Motor Rated Current	1.0 A
F1-04	Motor Rated frequency	24 Hz
F1-05	Motor Rated speed	180 RPM
F2-14	Encoder PPR	1024

- *Perform motor auto-tuning: Synchronous motor.*
  - *Set F0-02 = 0 → Operational panel mode.*
  - *Decide between no- load and loaded tuning.*

NOTE: For synchronous motors, both loaded and no load tuning are rotational.

- ***<u>For no load tuning</u>:***
  1. *Make sure the load is completely removed from the motor.*
  2. *Select F1-16=4. Press* Enter
  3. *Now* **"TUNE"** *will be displayed. Now press* Open *or* Close
  4. *After successful completion of tuning, F1-16 will be 0.*

- ***For loaded tuning:***
  1. *For loaded tuning, make sure the rotor does not get locked by being too close with door open/close limits.*
  2. *Select F1-16 = 3. Press* Enter
  3. *Now "**TUNE**" will be displayed. Now press* Open *or* Close
  4. *After successful completion of tuning, F1-16 will be 0.*

- *Perform motor auto-tuning: Asynchronous motor.*
  - ***Set F0-02 = 0 → Operational panel mode.***
  - ***Decide between no- load and loaded tuning.***
  - ***<u>For no load tuning</u>:***
    1. *Make sure the load is completely removed from the motor.*
    2. *Select F1-16=2. Press* Enter
    3. *Now* **"TUNE"** *will be displayed. Now press* Open *or* Close
    4. *After successful completion of tuning, F1-16 will be 0.*

- ***For loaded tuning:***
  1. *For loaded tuning, make sure the rotor does not get locked by being too close with door open/close limits.*
  2. *Select F1-16 = 1. Press* Enter
  3. *Now "**TUNE**" will be displayed. Now press* Open *or* Close
  4. *After successful completion of tuning, F1-16 will be 0.*

Note:

1. *In case you get Err 19, during auto tuning, kindly cross check your motor parameters, Z signal (if PM motor) and motor type selection.*
2. *If you get, Err 20, try interchanging any two motor phases. If you still get Err 20, Please check your encoder.*
3. *You can do that by checking the encoder pulses and encoder angle (in case of PM motor). Make sure the rotor is rotated and check F4-03 parameter to observe the variation in encoder pulses. If not, kindly fix your encoder.*

Points to be checked after auto-tuning..

If you have successfully completed auto tuning, there are a few points to be checked before proceeding further :

- *Press* 

button. Check if the door is opening. Go to parameter FA-28, check if **"OPEN"** *is displayed.*

- *Press* 

button. Check if the door is closing. Go to parameter FA-28, check if **"CLOSE"** *is displayed.*

- *If* **"OPEN"** *is displayed while closing (or)* **CLOSE"** *is displayed while opening change F2-15 to 1.*

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Monarch- NICE 900 can be used for the following types of door types:

i. Distance control mode:.

- *closed loop with high resolution PPR encoder- For induction and PM motors*
- *Closed loop with low PPR encoder (Less than 50 pulses) – Induction motor only .*

ii. Speed control mode

- *Open loop with shaft position switches – Induction motor only*

Door width learning …

- *Distance control mode:*
  1. *Closed loop with high resolution PPR for both PM and Induction motors:*
     - ***Set F0-00 = 1. (Closed loop control mode)***
     - ***Set F0-02 = 2. (Door width learning mode)***
     - ***Set F6-00 =1. (Door width learning function enabled)***
     - ***Set the door width learning speed at F601.***
     - ***Now when you press*** Open ***or*** Close ***door width learning would take place.***
     - ***After completion, set F0-02 =1 to run in normal mode.***

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2. Closed loop with low PPR encoder for Induction motors only:

- ***Set F0-00 = 0. (Sensor-less Flux vector control mode)***
- ***Find the number of pulses consumed to cover the entire door width.***
  - ***Step 1: Roughly enter a high number of encoder pulses at F6-02 (say F6-02= 1000).***
  - ***Step 2: Manually close the door (Vane should be contracted also) and monitor FA-25.***
  - ***Step 3: Adjust the value of F6-02 such that when the door is fully closed, you get FA-25 =0 and when the door is fully opened FA-25 = F6-02 (Approximately)***

- ***Now check the door open/close functioning in demo mode. Set F0-02 = 3. Press*** Open ***or*** Close
- ***Adjust F6-02 if necessary.***
- ***Reduce the value of F6-14, if door open/ close limit is undetected.***
- ***Set F0-02=1 to run in normal mode.***

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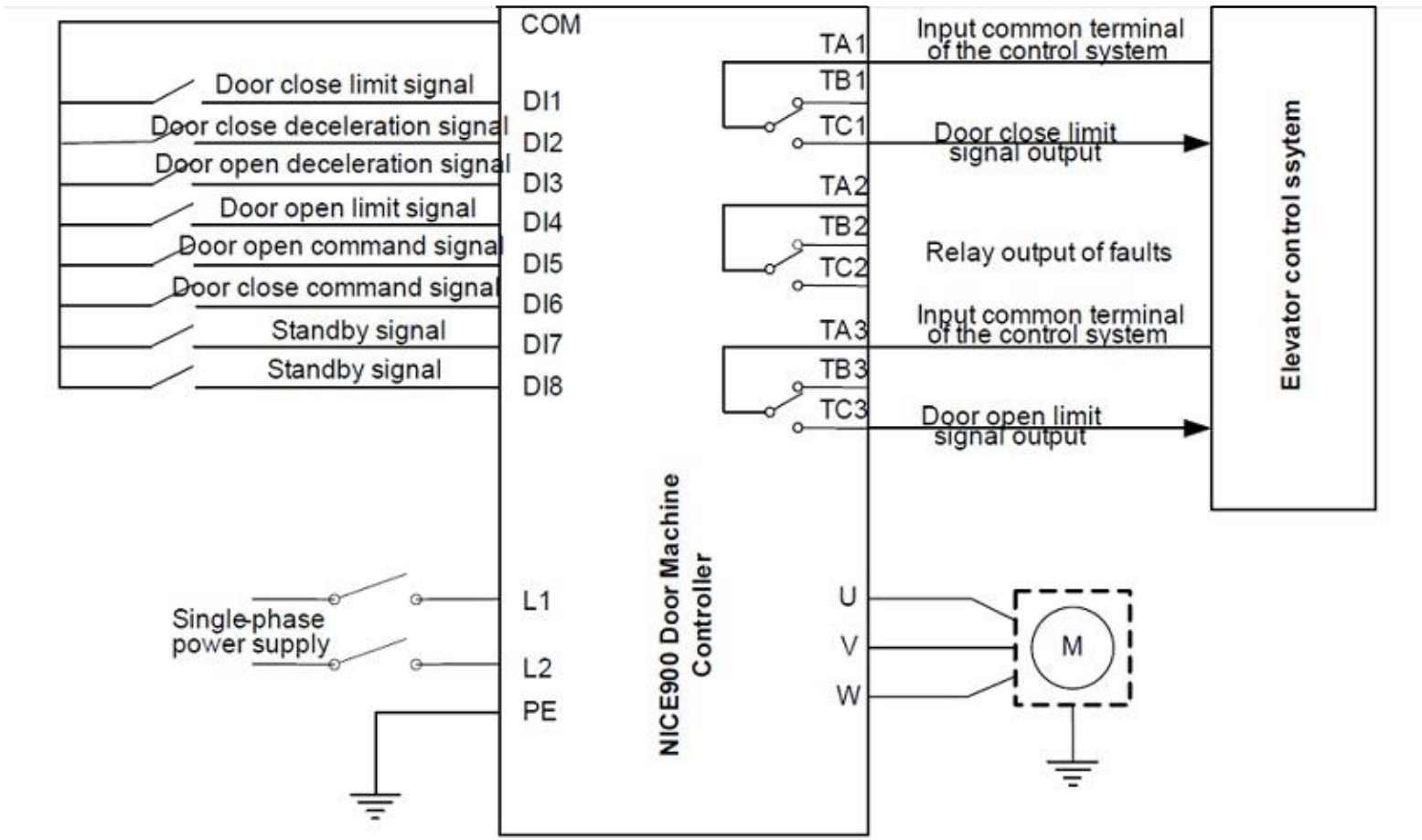
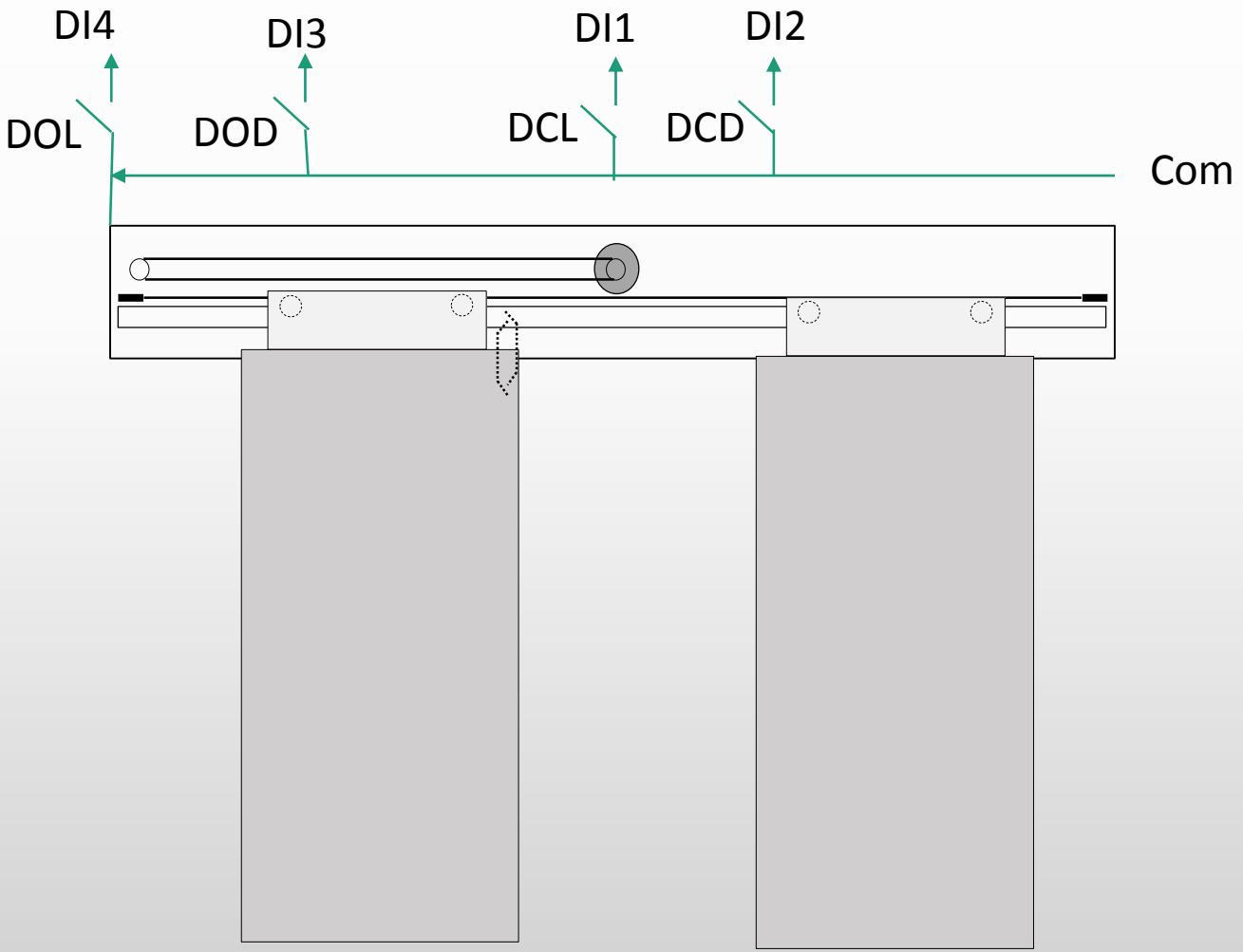
2. Speed Control Mode- Configuration



Speed control mode: Necessary parameter settings:

- Set F0-00 = 0 (Sensorless flux vector control).
- Set F0-01 = 0 (Speed control).
- Set F0-03 as 1 , if N/O switches are used, as 2, if N/C switches are used.
- Adjust F4-03 if Door close high speed wants to be adjusted.
- Adjust F3-03 is Door open High speed wants to be adjusted.
- Adjust F3-05 and F4-05, if you want to adjust open and close low speeds.

Speed Control Mode- Wiring and switch positions:



DOL- Door open Limit
DCL- Door Close Limit
DOD- Door Open Deceleration
DCD- Door Close Deceleration

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Frequently Asked Questions (FAQs):

1. *How to do motor auto tuning?*

   Refer easy setup manual flowchart for guidance.

2. *The butterfly/ vane does not close, which parameter to adjust ?*

   Please increase F4-09 (Vane retraction speed) , if you still feel you need more push, increase the torque value at F2-10 (Torque boost level).

3. *My controller cannot adjust the door open / close times. How to increase the power on reset auto – door width learning frequency?*

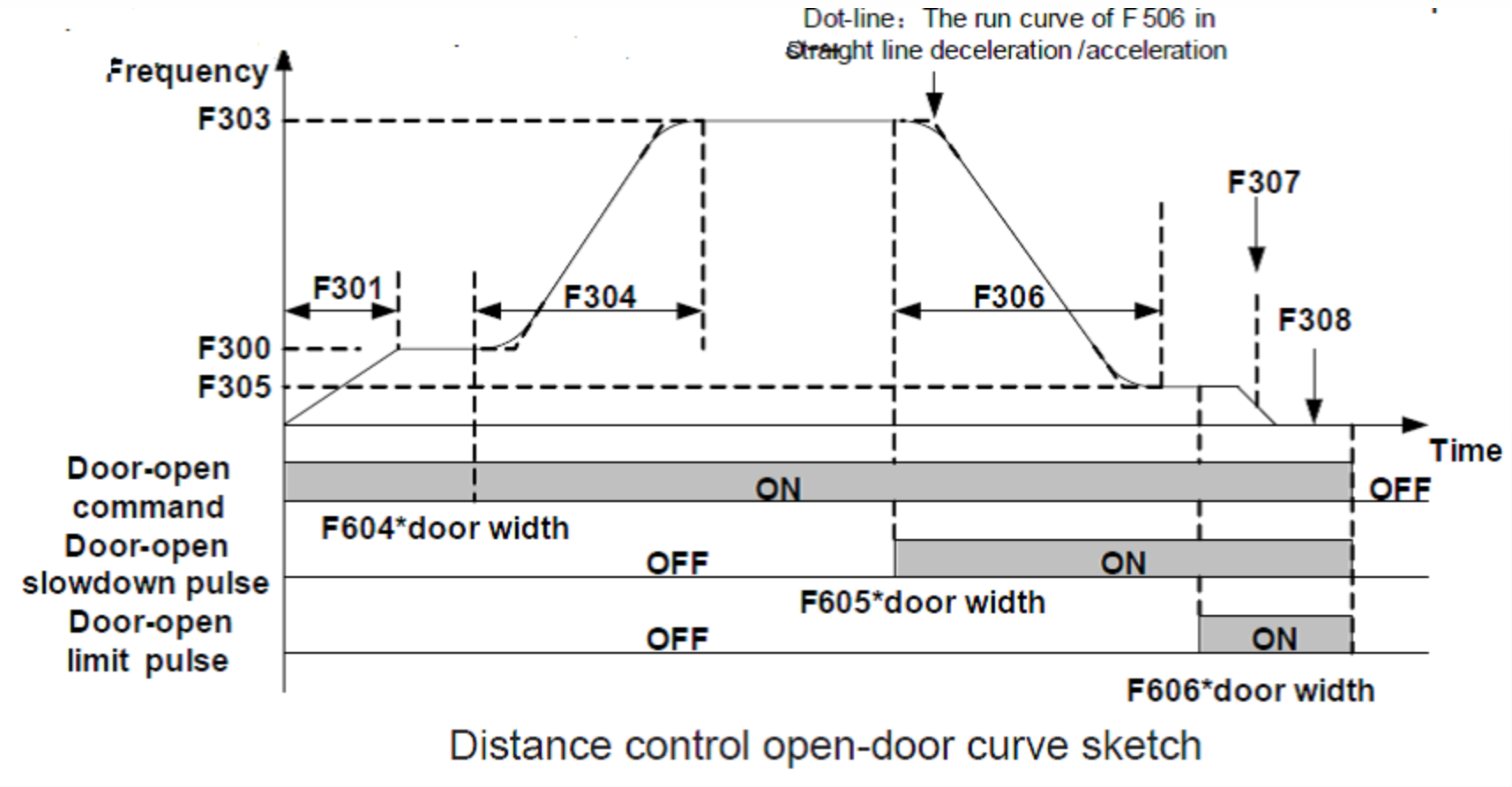
   Good question. Kindly increase F 0-06 (Power On reset run frequency-Door width learning).

4. *How to adjust the opening / closing high speeds and slow speeds depending on my customer priorities?*

   Follow the following procedure.

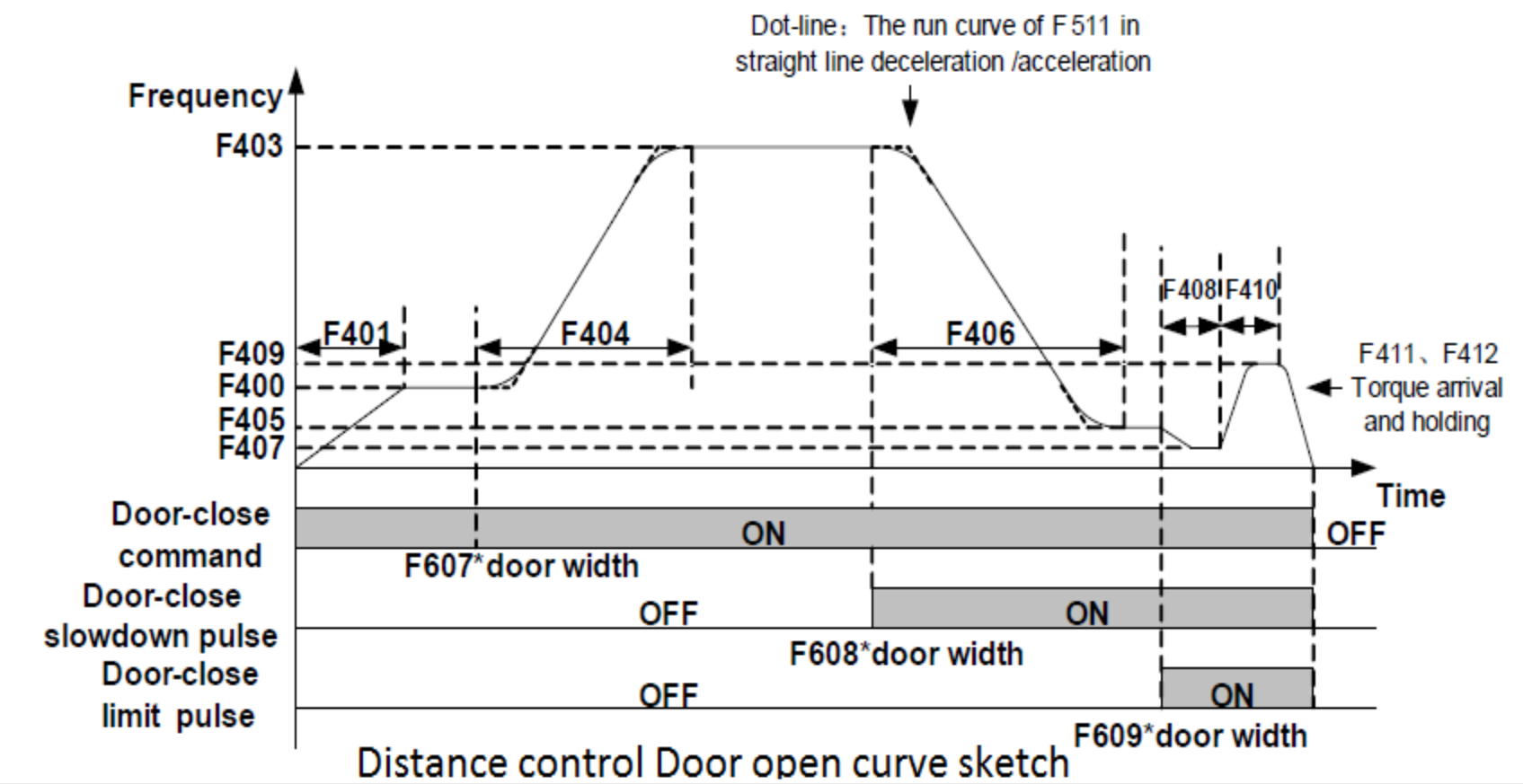
Continued…

Door Open Curve:



Distance control open-door curve sketch

Door Close Curve…



Distance control Door open curve sketch