



**Pelazza**  
*Peppino*

Quadri di Manovra per Ascensori  
*Lifts Control Panels*

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## USER INSTRUCTION FOR PROGRAMMING INVERTER FUJI FRENIC LIFT

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The inverter assembled in the control panel is already programmed to work correctly, but doing the motor auto-tuning is always required as described at pages 3 and 4.

Sometimes, to improve performance, it is necessary to change the value of some parameters for adapting it to the specific motor.

All parameters are changed and modified using the keypad supplied with the inverter.

As a precaution, it is important to know that inside the inverter there are some very high capacitors: therefore, after main input voltage cut-off, it is necessary waiting a few minutes before touch wires and connectors concerned the power supply input and output circuits. A red light near connectors inside the inverter check the capacitors charge:

**until red light is on, avoid any contact with the power supply input and output circuits.**

## **PARAMETERS CHANGE**

At power on the inverter display shows "STOP". This indication means that inverter is in steady state and ready to work.

### **PHASE A: entry in programming mode**

- Press PRG button.
- Using arrows choose menu 2 "DATA CHECK"
- Press "FUNC/DATA" button to entry in parameter list: at this time the value of each parameter is already showed.

### **PHASE B: choice of the interested parameter**

- Pressing arrows to search the parameter.  
Holding down "SHIFT" button and one of the two arrows, it is possible to change parameter group without scrolling through all parameters.
- When interested parameter is highlighted press "FUNC/DATA" to enable the modification of the parameter value.

### **PHASE C: changing the value**

- Modify the shown value using arrows; the "SHIFT" button could be used for shifting to the thousands, hundreds or tens of interested value.
- To memorize the new value press "FUNC/DATA" button. Doing so the next parameter is highlighted.
- For not memorizing and leaving the previous value of parameter press "PRG" button instead of "FUNC/DATA" button: the display returns to show "STOP" leaving the programming mode.

### **PHASE D: return in operation**

- Pressing "PRG" button the display shows "STOP" and the inverter is ready to work.

## AUTO-TUNING PROCEDURE FOR ASYNCHRONOUS MOTOR

The inverter has been already programmed during the control panel test, following the order form.

It is recommend to compare the data on motor nameplate with data stored in the inverter; only if different modify them with values specified on the motor nameplate:

- P01= motor poles
- P02= motor rated power [kW]
- P03= motor rated current [A]
- F03= motor speed regulation [rpm]
- F04= motor rated speed [Hz ]
- F05= motor rated voltage [V]
- L02= encoder resolution [ppr]

### AUTO-TUNING START PROCEDURE FOR ASYNCHRONOUS MOTOR

- Enable "MAINTENANCE" mode by control panel switch.
- Move cabin outside the re-phase magnets. Check that, giving a short maintenance up or down command, the main contactors are activated.
- Set parameter P04 =3, following steps A,B,C of paragraph "PARAMETERS CHANGE". The inverter will wait any maintenance command. Activate a maintenance up or down command. Important: release the maintenance command only when inverter has finished the auto-tuning procedure indicated by the message: "CLOSE BY RUN COMMAND OFF". In case of procedure failure, repeat the auto-tuning procedure setting parameter P04=1 instead of 3.
- Pressing "PRG" button the display shows "STOP" and the inverter is ready to work.
- In case of auto-tuning procedure execution with parameter P04=1, P06 (no load motor current) and P12 (rated slip frequency) parameters must be set manually, following the instructions further indicated in the: "LIST OF PARAMETER PROGRAMMABLE BY CUSTOMER"

## **OFFSET POLE -TUNING PROCEDURE FOR SYNCHRONOUS MOTOR (permanent magnets)**

The inverter has been already programmed during the control panel test, following the order form.

It is recommend to compare the data on motor nameplate with data stored in the inverter; only if different modify them with value specified on the motor nameplate:

- P01= motor poles
- P02= motor rated power [kW]
- P03= motor rated current [A]
- F03= motor speed regulation [rpm]
- F04= motor rated speed [rpm]
- F05= motor rated voltage [V]
- L02= encoder resolution [ppr]

## **OFFSET POLE-TUNING START PROCEDURE FOR SYNCHRONOUS MOTOR (permanent magnets)**

- 1) Enable "MAINTENANCE" mode by control panel switch.
- 2) Move cabin outside the re-phase magnets. Check that, giving a short maintenance up or down command, the main contactors are activated.
- 3) Set parameter L03 =1, following steps A,B,C of paragraph "PARAMETERS CHANGE". The inverter will wait any maintenance command. Activate a maintenance up or down command. Important: release the maintenance command only when inverter has finished the offset pole-tuning procedure indicated by the message: "CLOSE BY RUN COMMAND OFF".
- 4) The result of the offset pole-tuning is stored in L04 parameter:  
take note this value expressed in degrees.  
Rotate the motor pulley through a maintenance command and execute again another offset pole-tuning (point 3).  
The new value stored in L04 parameter, must not have a difference greater than 20°(degrees) compared to value found with the first offset pole-tuning.  
If difference is greater than 20°degrees the pole-tuning result is not correct.  
In this case exchange two motor phases and execute again the entire procedure (points 3 and 4).
- 5) At the end of the offset pole-tuning press "PRG" button. The display shows "STOP" and the inverter is ready to work.

## **OUTPUT FREQUENCY, VOLTAGE, CURRENT VALUES VISUALIZATION**

As default mode the display shows output frequency or revolutions per minute. Pressing “FUNC/DATA” button is possible to visualize: output current [A], output voltage [V], output frequency [Hz].

## **FAULTS HISTORY**

Press “PRG” button, using arrows select the menu 6 “INFO ALARM”, press “FUNC/DATA” button: doing so, the history of found errors will be shown, from the most recent to the oldest.

## **LIST OF PARAMETERS PROGRAMMABLE BY CUSTOMER**

Annexed with the electrical diagram, a list of the programmable parameters is supplied. Of these parameters, only someone could be modify without compromise the proper operation of elevator. For this reason we present the parameters list programmable by customer:

- C11: NOMINAL SPEED (HIGH SPEED) [Hz] or [rpm]

It is already calibrated according to the required elevator speed.  
Only for “short floor” or difficulty during stop, try to decrease its value.

- C07: LEVELLING SPEED (LOW SPEED) [Hz] or [rpm]

It is already calibrated according to the elevator speed.  
Do not decrease the factory set value (some torque decrease could be generated).  
Increase this value of a few Hz or rpm if cabin does not succeed to reach the floor level.

- C06: INSPECTION SPEED [Hz] or [rpm]

It is already calibrated according to the elevator speed, paying attention not exceeding 0,63 m/s according to EN 81.

- F07: ACCELERATION TIME [s]

A slow acceleration and a motor current reduction during acceleration are obtained increasing this value.

- E13: DECELERATION TIME [s]

A slow deceleration is obtained increasing this value, but in this case an increasing of deceleration space is required.

- L36: SPEED LOOP P GAIN AT HIGH SPEED

Increase it if lift oscillates during travel at high speed.  
Decrease it if motor becomes noisy during travel at high speed.

- L38: SPEED LOOP P GAIN AT LOW SPEED

Increase it if elevator exceeds the floor level.  
Decrease it if motor becomes noisy during travel at low speed.

- L68: COMPENSATION P GAIN AT START (Anti-rollback for synchronous motor only)

Increase it if motor has counter-rotation at start.  
Decrease it if motor becomes noisy during start.

- P06: NO LOAD MOTOR CURRENT

Usually it is not necessary to modify it, because the auto-tuning procedure automatically calculates this value. Eventually increase it one ampere per time if motor does not succeed to move the cabin at start, or during levelling speed the cabin does not succeed to reach the floor level.

In case of P04=1 auto-tuning procedure for asynchronous motor was executed, set manually the P06 parameter as following:

P06= 50% of the motor rated current (parameter P03).

- F11: MOTOR THERMAL PROTECTION CURRENT

Set up equal to the motor rated current (parameter P03).

- H06: COOLING FAN CONTROL

0.0 = cooling fan automatic activation depending on the inverter temperature.

0.5 ÷ 10.00 = cooling fan is activated during inverter operation and is deactivated after the set time value expressed in minutes.

999 = cooling fan is always active.

- F42: CONTROL MODE SELECTION

0= asynchronous motor with encoder (closed loop)

1= synchronous motor with encoder (closed loop)

2= asynchronous motor without encoder (open loop)

- P12: RATED SLIP FREQUENCY (for asynchronous motor only)

Usually it is not necessary to modify it, because the auto-tuning procedure automatically calculates this value.

In case of P04=1 auto-tuning procedure was executed, set manually the P12 parameter as following:

Motor type:

2 Poles → 3000 r/min  
4 Poles → 1500 r/min  
6 Poles → 1000 r/min  
8 Poles → 750 r/min

} Synchronous speed

rpm or r/min 1430 } Rated speed (specified on motor nameplate)

Slip = Synchronous speed (r/min) – Rated speed (r/min)

Ex. Slip = 1500 – 1430 = 70 (r/min)

P12 = Slip (r/min) \* Rated frequency (Hz) \* 0.7 / Synchronous speed (r/min)

Ex. P12 = 70 \* 50 \* 0.7 / 1500 = **1.63 Hz** (set this value in P12 parameter)

- E98 and E99: ROTATION DIRECTION REVERSAL

In case of necessity to reverse the motor direction of rotation, modify the values of the following parameters: E98=99 and E99=98.

In case of control panel provided with brake manual command for electrical emergency manouvre, the lift travel direction indicated on inverter display becomes the following:

FWD = DOWN }  
REV = UP } CORRECT the travel direction indicated on the  
"EMERGENCY ELECTRICAL MANOUVRE" instruction sheet  
and in the  
"MANUAL COMMAND BRAKE PROCEDURE" note on the electrical diagram

In case of control panel provided with automatic emergency manouvre with the recommended running direction by inverter relation, it is also necessary to modify E21 parameter from value 1109 to value 109.

**17. Alarm messages**

Alarm message Displayed	Description	Possible causes
OC	Motor overloaded: OC1= Overload during acceleration OC2= Overload during deceleration OC3= Overload during constant speed	a) Check if the motor used in the application has been selected properly b) Check if the inverter used in the application has been selected properly c) Check if brake opens d) Has the pole tuning procedure been completed successfully?
OU	Overvoltage in inverter DC link: OU1= Overvoltage during acceleration OU2= Overvoltage during deceleration OU3= Overvoltage during constant speed	a) Braking resistor not connected or defective b) Counterweight not counterbalanced c) Deceleration time too short d) Check connection e) Check mains connection
LU	Undervoltage in inverter DC link	a) Supply voltage too low b) Mains supply failure c) Acceleration too fast d) Load too high e) Check connection of the input signal
L in	Input phase loss	a) Check inverters input protections b) Check input connections
OPL	Output phase loss	a) Misconnection on inverters side b) Misconnection on motors side c) Misconnection on main contactors
OH 1	Inverter heat sink temperature too high	a) Inverter fan defective b) Ambient temperature too high
OH2	External Alarm	Digital input programmed with value 9 (THR) is not active.
OH3	Ambient temperature around inverter too high	Check temperature inside electrical cabinet
OH4	Motor over temperature detected from temperature sensor (PTC). See H26	a) Motor fan too small b) Ambient temperature too high c) Check setting of H26,H27
PG	Encoder error	a) Check encoder cable b) Motor is blocked c) Brake did not open
OL 1	Motor overload	a) Check brake b) Motor, car or counterweight blocked c) Inverter at current limit, possibly too small d) Check functions F10~F12
OLU	Inverter overload	a) Over temperature in IGBT b) Failure in the cooling system c) Switching frequency (function F26) too high d) Cabin load too high
Er 1	Save error	Data has been lost
Er2	Keypad communication error	Keypad was removed while inverter in operation (RUN)
Er3	CPU error	Failure in the inverter CPU
Er4	Option card communication error	A communication error occurred between the option card and the inverter. a) Check option card installation b) Check cables and shield connection
Er5	Option card error	A communication error occurred between the option card and the encoder. a) Check encoder b) Check cables and shield connection

**17. Alarm messages**

Alarm message Displayed	Description	Possible causes
Er6	Operation error	<ul style="list-style-type: none"> <li>a) Check function L11-L18: One/many binary combinations are repeated</li> <li>b) Check brake signal status if BRKE function is used</li> <li>c) Check MC signal status if CS-MC function is used</li> <li>d) Check function L84</li> <li>e) Check function L80,L82,L83</li> <li>f) If F42=1 and L04=0.00. Pole tuning not done</li> <li>g) EN81-1+A3 function is active but another related function is missed</li> </ul>
Er7	Error during Auto Tuning / Pole tuning	<ul style="list-style-type: none"> <li>a) Connection between inverter and motor interrupted during auto tuning procedure (main contactors open?)</li> <li>b) Enable input interrupted</li> <li>c) Check encoder cable</li> <li>d) Check encoder</li> </ul>
Er8	RS 485 Communications error	<ul style="list-style-type: none"> <li>a) Cable is interrupted</li> <li>b) High noise level</li> </ul>
ErE	Speed error (disagreement)	<ul style="list-style-type: none"> <li>a) Check brake</li> <li>b) Motor, car or counterweight blocked</li> <li>c) Check functions L90~L92</li> <li>d) Current limiter active</li> <li>e) Has been completed successfully the pole tuning procedure?</li> </ul>
ErH	Option card hardware error	<ul style="list-style-type: none"> <li>a) Option</li> <li>b) Option card not correctly installed</li> <li>c) Inverter software version not compatible with option card</li> </ul>
ErE	CAN bus communication error	<ul style="list-style-type: none"> <li>a) CAN bus disconnected from the inverter</li> <li>b) Electrical noise, connect cable shield</li> </ul>
EEF	EN1 and EN2 terminals circuit error	The inverter detects an error on the enable terminals circuit, and stops itself. Contact with Fuji Electric.
OS	Motor speed greater than $\frac{L32 \times F03}{100}$ (rpm)	<ul style="list-style-type: none"> <li>a) Check encoder resolution setting in function L02</li> <li>b) Check value of function F03</li> <li>c) Check value of function P01</li> <li>d) Check value of function L32</li> </ul>
PbF	Charging circuit fault	Default in charging circuit of 37kW 400V inverters or more. Check power supply in R0/T0 terminals. Contact with Fuji Electric.
bBE	Brake status monitoring according to EN81-1+A3	Brake state differs from expected. For additional information, please contact Fuji Electric.