MoviLift

AUTOMAZIONE PER ASCENSORI

ATTACHED 2
INVERTER L1000A

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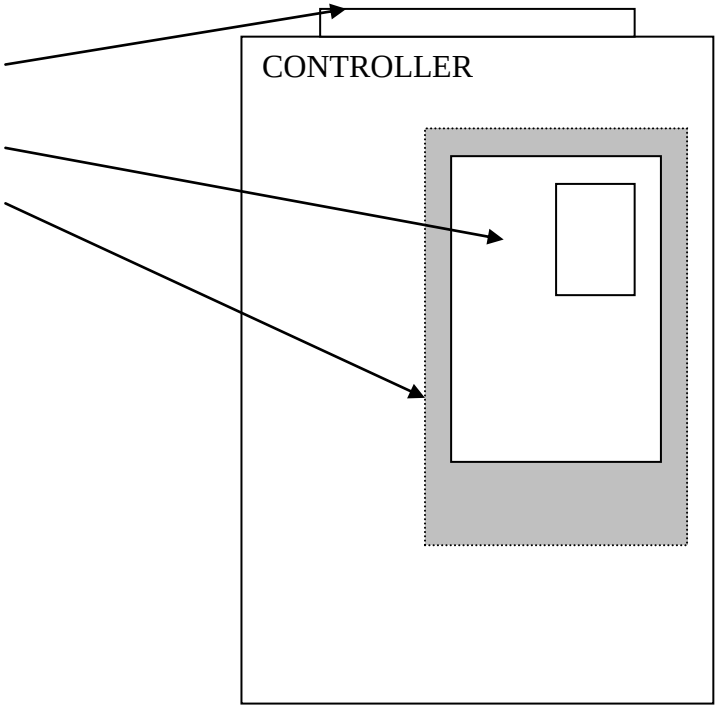
INVERTER L1000A

What is I' L1000A

It is a device that, allows to regulate the speed of motor modifying voltage and frequency without necessity to use an encoder.

Its Composition

- ☐ Brake Resistor
- ☐ Inverter Device
- ☐ IN/OUT filters



Application Field

- ☐ Triphase motor single polarity (4 or 6 poles)
- ☐ Triphase motor double polarity (4/16 - 6/24 poli) using 4 or 6 poles coil
- ☐ For cabin speed until 2,00m/s

Cautions

- **Dangerous Voltage:** wait for 3 minutes, after revomed power supply, before to make any work on the system or remove inverter cover;
- **Controller-motor connection:** use foiled cable. Connect the shielding to the ground clamps of controller and motor (as indicated in controller electrival drawings).
- **In/Out filters:** they reduce drive electromagnetic emission (noises) into hanno lo scopo di ridurre le emissioni elettromagnetiche dell'azionamento (disturbi) towards enviromental so we can respect European Standard.
- **Keypad:** please use only keys indicated into "Keypad Purpose" paragraph.
- **Insulation Test:** For megger-testing the external circuit, remove all the terminals and not apply the test voltage to the inverter; for megger-testing the inverter, measure the insulation resistance of the main circuit only with a 500VDC megger. **NEVER MAKE A CONDUCTION TEST OF THE CONTROL CIRUIT**

Please not modify parameters when device is running! With cabin stopped to floor, open automatic valve and then make changes ("VA" on controller).

Device Programming

Device is programming during the test in according to values into tables "MODIFIED PARAMETERS". If, during installation, it is necessary modifies some values please check the followings chapter::

1. "STRUCTURE OF PROGRAM";
2. "KEYPAD PURPOSE" ;
3. "REGULATION/EXAMPLES PARAMETERS MODIFICATION"

After Parameters modifies, before confirm with DATA/ENTER key, please check if value is exact!

Keypad Purpose

Keypad allow to the user to move into menu to can check and modify parameters showed on display.

MODE	CONTENTS	DISPLAY	DESCRIPTION
Power Uo	Speed Reference (default)		This display screen allows the user to monitor and change the speed reference while the drive is running. .**LED DRV = ON**
Drive Mode	Up/Down		This display shows the direction that has been selected when the drive is controlled by a REMOTE source.When the drive is set for LOCAL, the user can switch between FWD and REV as shown below. **LED DRV = ON**
	Output Speed Display		Displays the speed that is output from the drive.; **LED DRV e FOUT = ON**
	Output Current Display		Monitors the output current of the drive.; **LED DVR = ON**
	Output Voltage Reference (default)		Shows the data that selected for display by the user in parameter o1-01. The default setting displays drive output voltage (o1-01 = 106).; **LED DRV = ON**
Drive Mode	Monitor Display		Lists the monitor parameters (U1-10 and U1-11 parameters) available in the drive. **LED DRV = ON**

MODE	CONTENTS	DISPLAY	DESCRIPTION
Programming Mode			
	Verify Menu		Lists all parameters that have been edited or changed from default settings
	Setup Group		A select list of parameters necessary to get the drive operating quickly.
	Parameter Setting Mode		Allows the user to access and edit all parameter settings.
Programming Mode	Auto-Tuning Mode		Motor parameters are calculated and set automatically.
Drive Mode	Speed Reference		Returns to the speed reference display screen.

Regulation/Examples Parameters modification

		DISPLAY/RESULT
1	Turn on the power to the drive. The initial display appears.	
2	Press the ∧ or ∨ key until the Parameter Setting Mode screen appears.	
3	Press the ENTER key to enter the parameter menu tree.	
4	Press the ∧ or ∨ key to select the C parameter group.	
5	Press the ENTER key two times	
6	Press the ∧ or ∨ key to select the parameter C1-02.	
7	Press the ENTER to view the current setting value (1.50 s). Left digit flashes	
8	Press the RESET until the desired number is selected. “1” flashes.	
9	Press the ∧ key and enter 0020.0.	
10	Press the ENTER and the drive will confirm the change.	
11	The display automatically returns to the screen shown in Step4	
12	Press the ESC key until back at the initial display.	

Parameters to set

Please check elevator balance is 50% between cabin and counterweight. Then check ampere absorption on motor phases executing a complete travel in up and down direction with load in cabin 50% of capacity.

Example: cabin capacity 360Kg, load in cabin 180Kg and verify that amperes are the same with tolerance (0,5 A) in up and down direction. If you can't have this balance, please load and unload counterweight.

NB: IF AN INITIALIZATION WILL BE MADE, PLEASE INSERT THE FOLLOWINGS PARAMETERS TO CAN HAVE A RIGHT WORKING OF INVERTER:

INDICE	DESCRIZIONE	VALORE
A1-00	Language Selection	4: Italiano
A1-02	Control Mode Selection	3: anello chiuso
C1-01	Acceleration Ramp 1	1,80sec
C1-02	Deceleration Ramp 1	1,80sec
D1-19	Nominal Speed	50,00Hz
D1-24	Inspection Operation Speed	25,00Hz
D1-26	Leveling Speed	6,00Hz
H1-05	Terminale S5 Selezione Funzione	F: Through mode
E1-05	Max Voltage (VMAX)	400,0V
E1-07	Mid Output Frequency (FB)	4,5Hz
E1-08	Mid Output Frequency Voltage (VC)	50,0V
E1-09	Minimum Output Frequency (FMIN)	1,0Hz
E1-10	Minimum Output Frequency Voltage (VMIN)	25,0V
E2-01	Motor Rated Current	12,80 A
E2-03	Motor No-Load Current	4,00A
H1-07	Terminal S7 Function Selection	55: feedback contatto motore
H1-08	Terminal S8 Function Selection	9: Comando di blocco delle basi
L4-02	Speed in agreement with relieved width	2,0%
L4-04	Speed in agreement with relieved width (+/-)	2,0%
L5-01	Output Error during Auto restart	2
L5-02	Output error management after automatic restart	Errore in Output durante Auto Restart
L8-07	Output Phase Loss Protection	2: Abilitata (si innesca quando vengono perse 2 fasi)
L8-12	Environmental temperature setting	45°C

INDICE	DESCRIZIONE	VALORE
O1-03	Digital operator visualisation selction	0: 0.01 Hz
S1-01	Zero Speed Level at Stop	0,500%
S1-04	DC Injection/Position Lock Time at Start	0,50sec
S1-05	DC Injection/Position Lock Time at Stop	0,70sec
S1-06	Brake Release Delay Time	0,10sec
S1-07	Brake Close Delay Time	0,20sec
S4-08	UPS: Operation Speed Limit Selection	0: Disabled
S4-12	DC Bus Voltage during Rescue Operation	96V

During installation please check the followings parameters:

- **Max Speed:** to can modify it change parameter Dl – 19;
- **Low Speed:** to can modify it change parameter Dl – 26;
- **Acceleration:** to can modify it change parameter C1-01;
- **Deceleration:** to can modify it change parameter o C1-02;
- **Nominal Current:** to can modify it change parameter E2-01
- **Shape Curve Parameters:** C2-01 soft start, C2-03 change speed starting;

DECELERATION DISTANCE TABLE:

Cabin Speed m/s	0.6	0.7	**0.8**	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
Deceleration distance (m)	0.8	0.9	1.0	1.2	1.3	1.4	1.6	1.7	1.9	2.1	2.4
Acceleration Time (C1-01)	**1.0**	**1.1**	**1.2**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**	**1.9**	**2.0**	**2.1**
Deceleration Time (C1-02)	**1.1**	**1.2**	**1.4**	**1.6**	**1.8**	**1.9**	**2.0**	**2.1**	**2.2**	**2.3**	**2.4**

Motor Auto-tuning

WARNING: During autotuning (before insert T1 parameters) it is necessary to have inserted motor contactors by hand otherwise i twill be error ER2.

In the first step of installation please make motor autotuning:

- Move down manoeuvre automatic Valve;
- Check inverter is in OPEN LOOP mode (Parameter A1-02=02);
- Insert motor contactors by hand;
- Press UP arrow until “A-tun”;
- Press ENTER;
- Press Enter at parameter t1-01,
- Set value ‘1’ (auto tuning not rotating), then press Enter;
- Move by arrows passing from T1-02 to T1-09, setting the followings table:

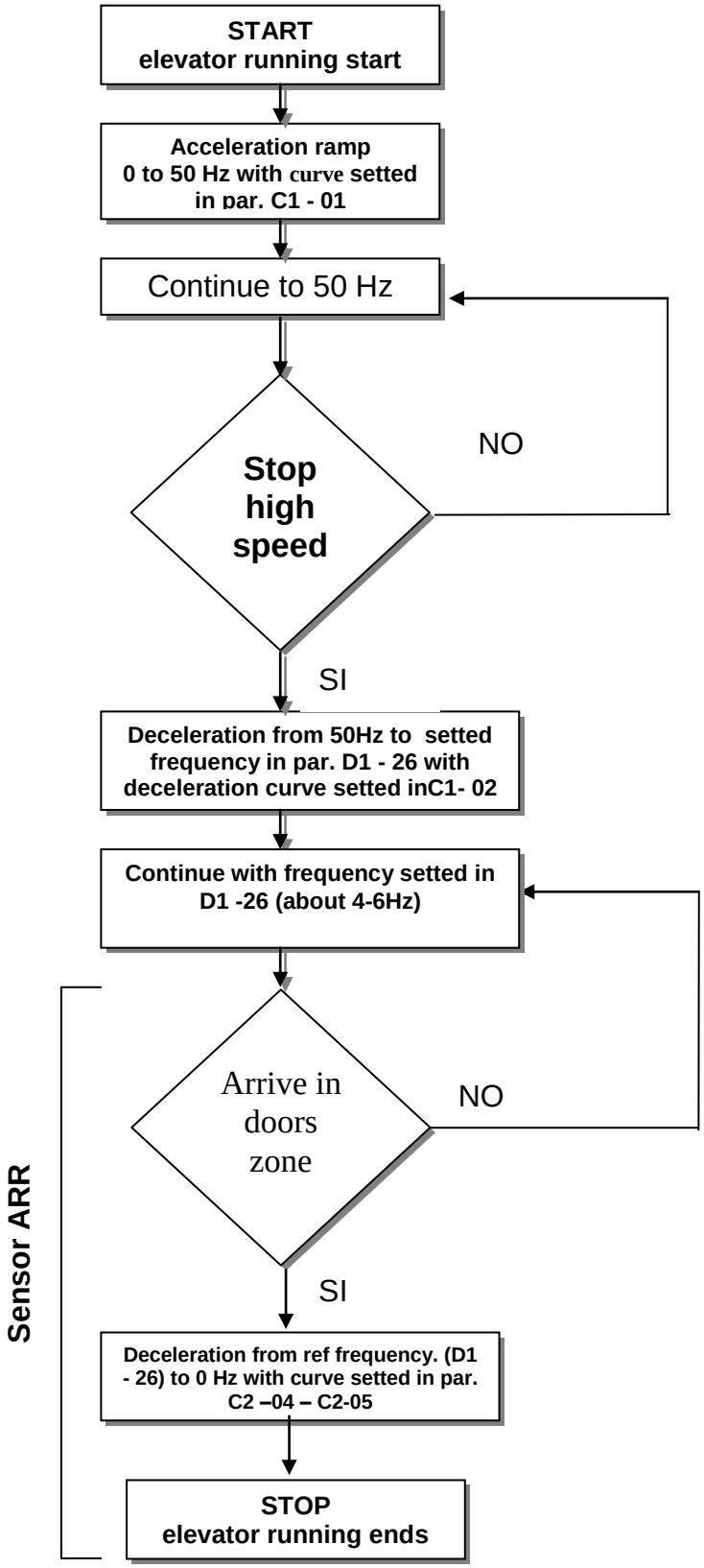
PAR.	DESCRIPTION	VALUE
T1-01	Auto tuning not rotating	1
T1-02	Motor Power (kw)	(kw)
T1-03	Motor Nominal Voltage (V)	380 o 400
T1-04	Motor Nominal Current (A)	(A)
T1-05	Motor Nominal Frequency (Hz)	(Hz)
T1-06	Number of poles	2-48
T1-07	Rpm (Rear/min)	(Giri/min)
T1-09	Motor load current (A)	(A)

- Move to TUN11 (motor contactors always inserted) and press RUN. At this point inverter start to read motor values with a light whistle; after a few minutes display shows END; now you can release motor contactors;

Remover power supply from drive and restart the system..

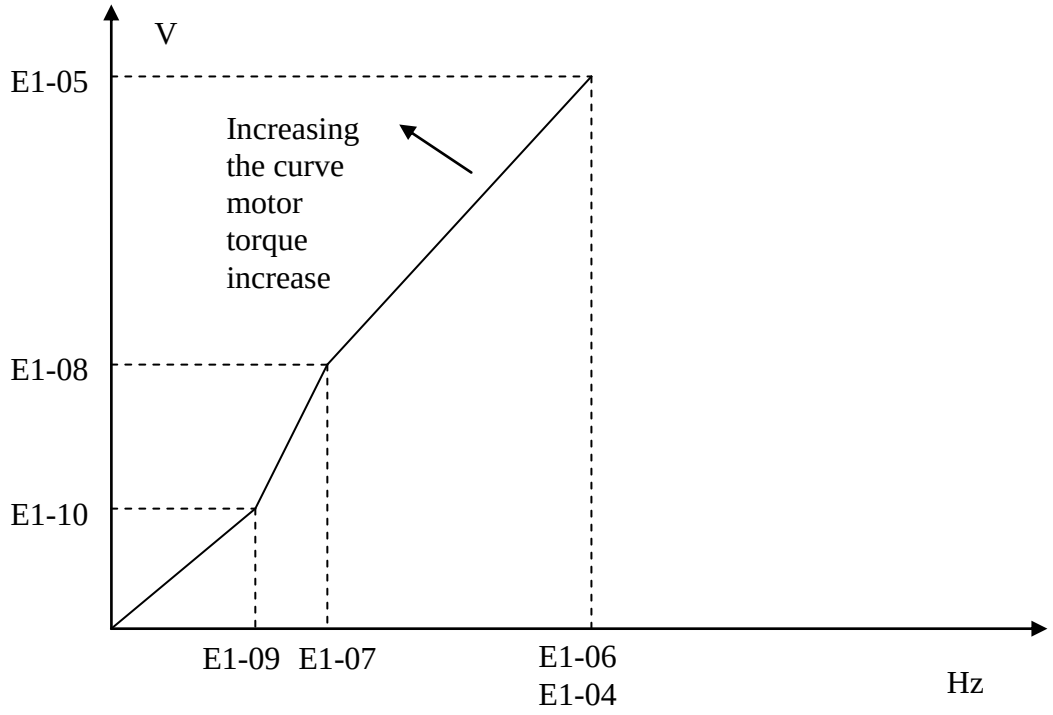
- When autotuning is finished, check these parameters:
  - E1-07 = 4.5;
  - E1-08 = 50;
  - E1-09 = 1;
  - E1-10 = 25;

Flow Chart


START
elevator running start
Acceleration ramp
0 to 50 Hz with curve setted
in par. C1 - 01
Continue to 50 Hz
Stop
high
speed
NO
SI
Deceleration from 50Hz to setted
frequency in par. D1 - 26 with
deceleration curve setted inC1- 02
Continue with frequency setted in
D1 -26 (about 4-6Hz)
Arrive in
doors
zone
NO
SI
Sensor ARR
Deceleration from ref frequency. (D1
- 26) to 0 Hz with curve setted in par.
C2 –04 – C2-05
STOP
elevator running ends

Setting example

Insert in cabin max value of capacity and make some running between extreme floors. If inverter not gives necessary strength at motor to can arrive at floor, it is necessary modifies some parameters. Increase motor torque by V/F curve increasing E1-08, E1-10, D1-26 values:



Please check that before stop on sensors, the elevator has at least 15cm with levelling speed settend in parameter D1 – 26 (~ 5 Hz).

To improve performances

To can have a better brake performance it is possible change “S” parameters. In the next table some info to improve performances.

Winch with 50Hz motor	
PAR	**DESCRIPTION**
C3-01	To improve stop precision (0->2,5)
E2-02	Load Current
D1-25	Emergency speed (0 – 6HZ)
S1-03	Braking injection rate
S1-05	Braking Current time
S1-07	Brake release on floor
C5-01	(Open Loop) decrease if oscillations are presents
C5-02	(Close Loop) increase if oscillations are presents
E1-06 D1-19	Plate Motor frequency set **(Only for motor not 50Hz)**
A1-02	=2 without encoder (open loop)
	=3 with encoder (close loop)

To get more info please refer to **Controller User Manual**.

Errors and Alarms

Errors and alarms indicate normal conditions of inverter/application. An alarm not turn off necessarily the inverter, but it gives a message on display and generate an alarm on multifunction exits (H2-01 ... H2-03), if they are programmed. An alarm disappear automatically if alarm condition it is solved. An error cause the immediate inverter switching off, a message appear on display and the commutation of output in error. Error must be resett by hand after solved the cause.

Table shows a list of error/alarm::

DISPLAY	NAME	DISPLAY	NAME
boL	Braking Transistor Overload	FrL	Speed Reference Missing
bUS	Option Communication Error	GF	Ground Fault
CE	MEMOBUS/Modbus Communication Error	LF	Output Phase Loss
CF	Control Fault	LF2	Output Current Imbalance
CPF00, CPF01 <1>	Control Circuit Error	oC	Overcurrent
CPF02	A/D Conversion Error	oFA00	Option Card Not Supported
CPF03	Control Board Connection Error	oFA01	Option Card Connection Error
CPF06	EEPROM Data Error	oFA05, oFA06	Option Card Error Occurred at Option Port CN5-A
CPF07, CPF08	Terminal Board Connection Error	oFA10, oFA11	
CPF20, CPF21 <1>	Control Circuit Error	oFA12 to oFA17	
CPF22	A/D Conversion Error	oFA30 to oFA43	
CPF23	Control Board Connection Error	oFb00	Option Card Connection Error (CN5-B)
CPF24	Drive Unit Signal Fault	oFb01	Option Card Fault (CN5-B)
CPF26 a CPF34	Control Circuit Error	oFb02	Option Card Fault (CN5-B)
dEv	Speed Deviation (for Control Mode with Encoder)	oFb03, oFb11	Option Card Error (CN5-B)
Dv1	Encoder Z Pulse Fault	oFb12 to oFb17	Option Card Connection Error (CN5-B)
dv2	Encoder Z Pulse Phase Fault	oFC00	Option Card Connection Error (CN5-C)
dv3	Rotation Direction Fault	oFC01	Option Card Fault (CN5-C)
dv4	Rotation Direction Fault	oFC02	Option Card Fault (CN5-C)
dv6	Overacceleration Detection	oFC03, oFC11	Option Card Error (CN5-C)
dv7	Rotor Polarity Detection Timeover	oFC12 to oFC17	Option Card Connection Error (CN5-C)

DISPLAY	NAME	DISPLAY	NAME
dv8	PM Rotor Position Estimation Error	oFC50	Encoder Option AD Conversion Error
EF0	Option Card External Fault	Pgo	Encoder Disconnected (for Control Mode with Encoder)
EF3 to EF8	External Fault (input terminal S3 to S8)	PgoH	Encoder Disconnected (when using encoder)
Err	EEPROM Write Error	rr	Internal Braking Transistor Fault
oFC51	Encoder Option Analog Circuit Error	SE1	Motor Contactor Response Error
oFC52	Encoder Communication Timeout	SE2	Starting Current Error
oFC53	Encoder Communication Data Error	SE3	Output Current Error
oFC54	Encoder Error	SE4	Brake Response Error
oH	Heatsink Overheat	Sto	Pull-Out Detection
oH1	Heatsink Overheat	SvE	Position Lock Error
oL1	Motor Overload	UL3	Undertorque Detection 1
oL2	Drive Overload	UL4	Undertorque Detection 2
oL3	Overtorque Detection 1	Uv1	DC Bus Undervoltage
oL4	Overtorque Detection 2	Uv2	Control Power Supply Undervoltage
oPr	Operator Connection Fault	Uv3	Soft Charge Circuit Fault
oS	Overspeed (for Control Mode with Encoder)	voF	Output Voltage Detection Error
ov	DC Bus Overvoltage		
PF	Input Phase Loss		
PF5	Rescue Operation Power Supply Deterioration Error		

Next table shows minor fault and alarm display:

DISPLAY	DESCRIZIONE	WARNING
AEr	Node ID Setting Error (CANopen)	SI
bb	Drive Baseblock	NO OUTPUT
boL	Braking Transistor Overload	SI
bUS	Option Communication Error	SI
CALL	Serial Communication Stand By	SI
CE	MEMOBUS/Modbus Communication Error	SI
CrST	Cannot Reset	SI
dEv	Speed Deviation (for Control Mode with Encoder)	SI
EF	Up/Down Command Error	SI
EF0	Option Card External Fault	SI
EF3 to EF8	External Fault (input terminal S3 to S8)	SI
Hbb	Safe Disable	L8-88 = 0 SI; L8-88 = 1 NO (default);
HbbF	Safe Disable Circuit Fault	L8-88 = 0 SI; L8-88 = 1 NO (default);
HCA	High Current Alarm	SI
LT-1	Cooling Fan Maintenance Time	NO OUTPUT
LT-2	Capacitor Maintenance Time	NO OUTPUT
LT-3	Soft Charge Bypass Relay Maintenance Time	NO OUTPUT
LT-4	IGBT Maintenance Time (90%)	NO OUTPUT
oH	Heatsink Overheat	SI
oL3	Overtorque Detection 1	SI
oL4	Overtorque Detection 2	SI
oS	Overspeed (for Control Mode with Encoder)	SI
ov	DC Bus Overvoltage	SI
PASS	MEMOBUS/Modbus Self Test Successful	NO OUTPUT
PGo	Encoder Disconnected (for Control Mode with Encoder)	SI
PGoH	Encoder Disconnected (when using an encoder)	SI
SE	MEMOBUS/Modbus Self Test Failed	SI
TrPC	GBT Maintenance Time (90%)	SI
UL3	Undertorque Detection 1	SI
UL4	Undertorque Detection 2	SI
Uv	Undervoltage	SI
voF	Output Voltage Detection Error	SI

**** NB: When inverter is in stanby, red led "ALM" bliking and display shows "bb". When inverter noti s working led ALM not indicate inverter error.***

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