SISTEMI E MICROSISTEMI

TAKEDO® - 3VF NXL

INSTRUCTION MANUAL

5	16-01-2007	
REL.	DATE	T.M. Check and Approval

INDEX

1 – INTRODUCTION

TAKEDO-3VF NXL is an inverter drive **with built-in EMC filter and smoothing choke**, responding to European Directives 89/336/EEC (electromagnetic compatibility) and 73/23/EEC (low voltage equipment). **The inverter can operate only in open loop conditions.**

This manual provides you with the necessary information about putting on duty and the operation of NXL frequency converter. You can found further information about application and installation in a lift control panel in the **ANNEX NXL FOR PANEL WIRING SPECIALISTS**, available in electronic edition on our website: **www.sms.bo.it**.

2 – SAFETY WARNINGS AND CAUTIONS

Read this manual in its entirety before powering up the equipment, following the procedures step by step.
In detail, please read carefully the Chapters:
6 – ADJUSTMENT PROCEDURE
5.3 – ACTIVE FAULTS

2.1 SAFETY WARNINGS

Follow the procedures indicated below with care, to avoid any risk of serious accidents.

1- Do not use an oscilloscope or other such instrument to test the internal circuits of the inverter. This type of operation must be performed only by a specialist technician.

2- **The leakage current from the inverter to earth is greater than 30mA**, and accordingly, the power circuit must incorporate a residual current device with **I_d no less than 300mA, type B or type A**. Regulations require that the connection to earth be made with cable of not less than 10 mm² section. **If the residual current device should trip closing the main power switch, do not perform this operation repeatedly because this could lead to permanent damage to the inverter drive**. Check that the residual current device is rated at least 300mA.

3- If the parameters used in programming the drive are incorrect, the motor may rotate at a speed higher than synchronous. Do not run the motor beyond its specified electrical and mechanical limits. The installer is responsible for ensuring that movements are generated in conditions of safety, without exceeding specified operating limits.

4- Risk of electrocution. Power up the inverter only with the front cover fitted. **NEVER** remove the cover during operation. Before carrying out any operation on the equipment, isolate from the electrical power supply and wait a few minutes for the internal capacitors to discharge.

5- The external braking resistor heats up during operation. Do not install it close to or in contact with inflammable materials. To improve heat dissipation it is good practice to fix the resistor to a metal plate. Ensure it is properly protected and cannot be touched.

6- The inverter must be constantly supplied with mains power. In the event of an interruption in the mains power supply, wait at least 1 minute before reconnecting. **EXCESSIVELY RAPID RECONNECTION TO THE POWER SUPPLY CAN DAMAGE THE INVERTER.**

2.2 CAUTIONS

Follow the procedures indicated in the manual with care, to avoid risk of damaging or destroying the drive.

1- Do not connect the equipment to a voltage higher than the permissible input voltage. Excessive voltage can cause irreparable damage to internal components.

2- **To avoid damaging the inverter in the event of prolonged stoppages with no power supply, before restarting the drive proceed as follows:**
   - **If the inverter has been idle for several months, connect it to the power supply for at least 1 hour in such a way as to recharge the bus capacitors.**
   - **If the inverter has been idle for more than one year, supply it for 1 hour with a level of voltage 50% lower than the nominal input voltage, and then supply it with the nominal input voltage for 1 hour.**

3- Do not connect capacitors to the inverter outputs.

4- If any drive protection function trips, before resetting the fault establish beyond doubt what has caused the protection circuit to trip.

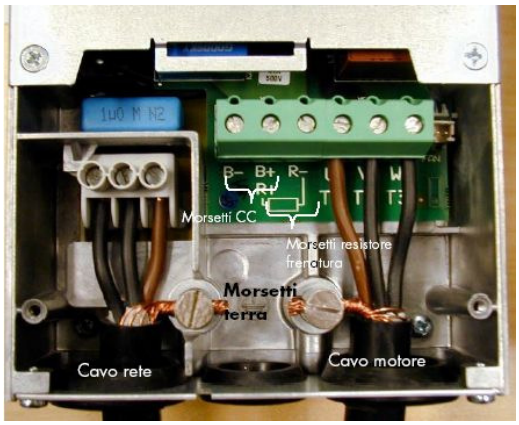
5- It is advisable to balance the system at 50%. If balanced at 40%, the UP current under full load will be greater, and it could become necessary to select a drive with a higher specification than would normally be sufficient.

6- Use an inverter having rated current equal to or greater than the rated current of the motor.

7- **The braking resistor must be connected between B+ and R-.**
If the resistor is connected between B+ and B– the inverter may be damaged.

3 – CONNECTING THE POWER CIRCUIT

L1;L2;L3	A.C. power input	Connect the three phases of the power supply to this three terminals, in any order.
U;V;W	Inverter output	Connect the three output phases to the contactors, then to the motor
B+;R-	External braking resistor	Connect the external braking resistor
⏚	Earth	Connect to the building earth system



Example of connection of the power circuit

3.1 SAFETY WARNINGS

1- Do not power up the inverter without first making the connection to earth.

2- To increase the inverter protection (especially against overvoltage resulting from electrical storms) three fast-acting fuses (one for each phase) can be installed in series with the A.C. power input terminals. The fuses must be rated in accordance with the various sizes, in accordance with the **TABLE -** *Fuses and braking resistors*.
The set of fuses, complete with protective box, can be supplied to order (the fuses are not indispensable!).

3- To avoid irreparable damage to the inverter, **do not connect braking resistors with resistance or power ratings lower than those indicated in the TABLE**. For systems with long runs or highly reversible gearboxes, install a braking resistance with higher power but with the same resistance value (contact SMS for suggestions if required).

4- The inverter drive is connected <<up line>> of the power contactors. The drive is able to control motor operation in two directions; accordingly, the system can incorporate only two power contactors, as prescribed by safety regulations.

5- The external braking resistor heats up during operation. Do not install the braking resistor close to or in contact with inflammable materials, and protect it to eliminate the risk of direct contact.

6- Wire and bond earth connections in accordance with professional standards (as indicated under heading 3.2) to avoid problems with EMC interference.

7- Take particular care over the power connections. If the input and output connections are reversed, **the inverter will inevitably be damaged.**

INVERTER DRIVE - 400 VOLT SERIES (380 ÷ 500V)					
RATED CURRENT (A)	**SIZE (kW)**	**FAST-ACTING FUSES (A)**	**BRAKING RESISTOR**		
			SUPPLIED BY SMS (Ω) - (W)	**MINIMUM VALUE (Ω)**	**DIMENSIONS WxDxH (mm)**
8	3	25	65 – 350 W	61	200x35x30
10	4	25	65 – 350 W	61	200x35x30
13	5.5	25	130+130 – 350 W	61	200x70x30
18	7.5	55	50 - 1500 W	42	320x95x30

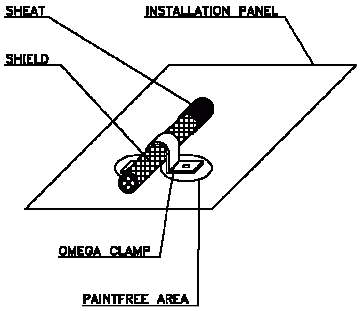
TABLE – *Fuses and braking resistors*

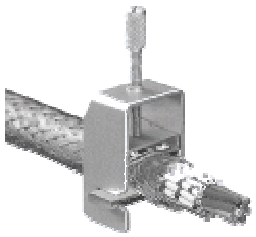
3.2 RULES FOR EMC COMPLIANT DRIVE - MOTOR WIRING

To ensure the DRIVE – MOTOR assembly is wired correctly, proceed as follows:

1- Both the inverter and the motor must be connected directly to the earth system of the building.

2- The power connections between inverter drive and contactors and between contactors and motor must be as short as possible and made using shielded four-core cable (three phases plus yellow/green earth wire), or alternatively, four unshielded cables bound together and routed through a raceway or a metal conduit connected to earth. In other words, an earth wire must be incorporated into the cable or included in the conduit, running as close as possible to the power conductors. If shielded cable is used, ensure continuity of the earth braid between inverter drive and contactors and between contactors and motor. It is advisable to connect the shield to earth at both ends by means of a U-clip or by means of special terminals that can be supplied by SMS.





In the event that the shield cannot be bonded with a fully encircling clamp or clip inside the motor terminal box, the connection must be made by securing the shield to the frame at a point before the cable enters the box.

3- It is also advisable, though not indispensable, to use shielded cable on the power input line, to preclude any possibility of disturbance being radiated externally of the cable.
The A.C. power input and inverter drive output cables must <u>not</u> be housed in the same raceway and should be kept as far apart as possible (at least 50 cm).

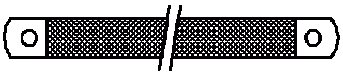
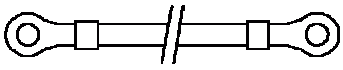
4- The power cables (input and output) must be kept as far apart as possible and <u>must not run parallel</u>, even if shielded; if the cables happen to cross over, they should be arranged at an angle of 90°.

5- Irrespective of any connection to the earth system of the building, the frame of the motor MUST be connected both to the shield of the power cable and to the yellow/green earth conductor of the shielded cable.

6- The inverter emits radiated disturbance, which can therefore be picked up and carried to the exterior of the cabinet or mounting panel by means of the cables. This is particularly true of flexible cables, which tend to radiate the disturbance into the lift shaft.
To avoid this problem, the control connections between the control panel and the drive must be made using shielded cable with the shield bonded to earth at both ends. Shielded cable must not be used without the shield connected to earth, as in this situation, any disturbance will be greater than with an unshielded cable.
Any unused conductors in a multicore cable must be connected to earth at both ends.

7- Auxiliary cables, whether control cables or external connections serving the shaft and lift car, must never run near to and parallel with the power cable, even if shielded; if parallel routing cannot be avoided, the different cables must be housed in separate metal raceways.

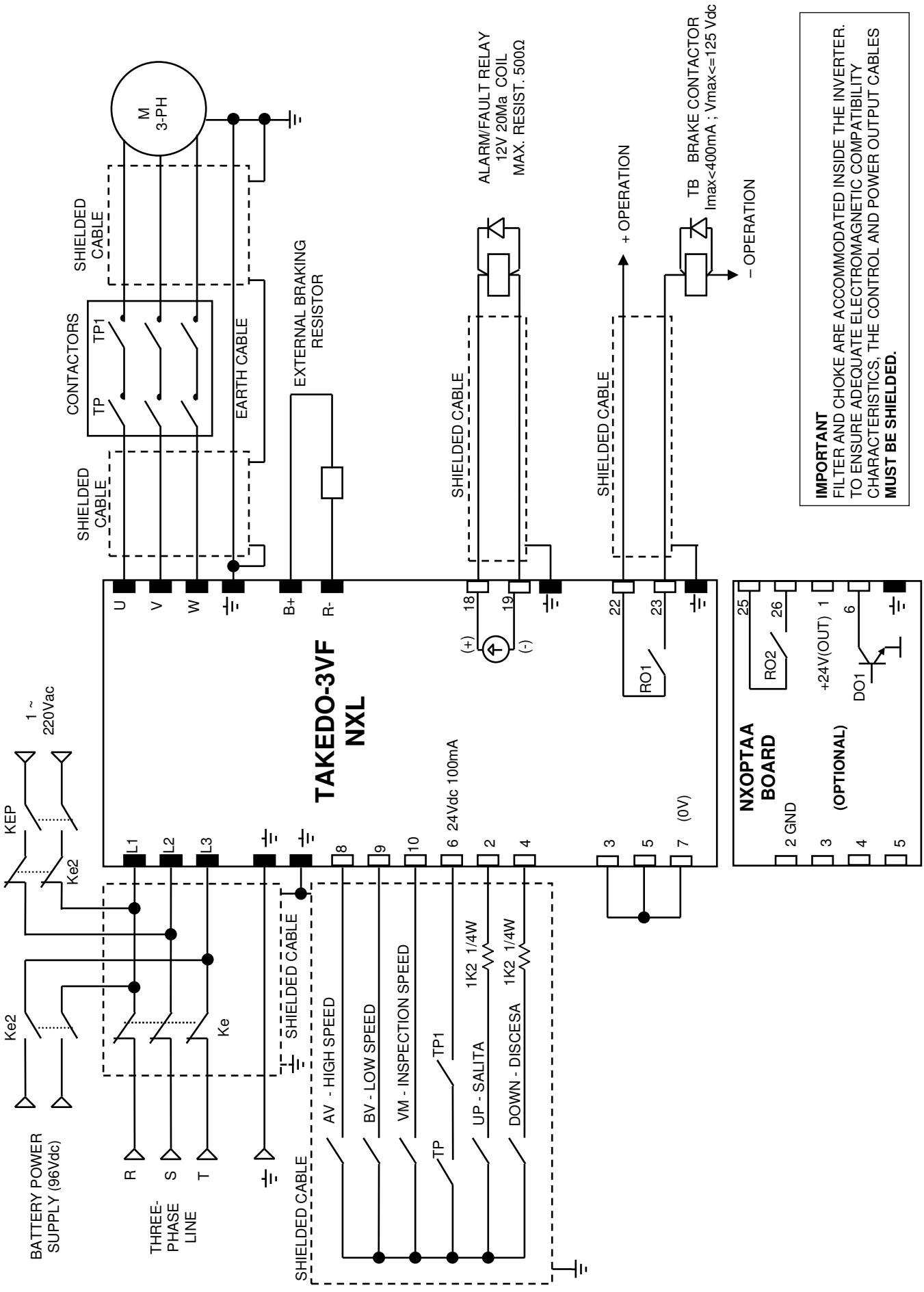
8- All earth connections must be as short as possible and with the greatest possible cross-section.

(a)  ***(b)*** 

Solution (a) (copper braid) is preferable to solution (b) (conductor).

9- To avoid unwarranted activation of the residual current circuit breaker:
Make the power connection as short as possible
Use suitable residual current devices (type B or type A rated 300mA)
Lower the inverter carrier frequency (where possible): the lower the frequency, the greater the noise from the motor, although currents leaking to earth and any EMC disturbance will also be reduced; with this solution the motor windings are less stressed.

4 – BASIC CONFIGURATION APPLICATION EXAMPLE



5 – KEYPAD AND PROGRAMMING

Left Menu key
Scroll back through menus. Move the cursor to left (in the parameters menu). Exit from edit mode. Hold down the key for 2…3 seconds to return to the main menu.

Right Menu key
Scroll forward through menus. Move cursor to right (in the parameters menu). Access edit mode.

Up arrow
Scroll through the main menu and the pages of various submenus. Edit parameter values in an upward direction.

Down arrow
Scroll through the main menu and the pages of various submenus. Edit parameter values in a downward direction.

start **START** key
(NOT Used).

stop **STOP** key
(NOT Used).

Reset enter **Reset/enter** key:
This key performs three separate functions. It is used to confirm selections, reset active faults or reset the faults memory (2…3 sec.)

The submenus are accessible from the main menu using the *key*. The symbol **M** on the first text line indicates the **main menu**. It is followed by a number that refers to the **submenu** or parameter in question. To go back to the **main menu** from the submenu, simply press the key.
Data on the keypad are divided into Menus and Submenus. The main menus are organized on seven levels from M1 to E6.
To go from one menu to the next, use the increase/decrease keys or .

M1= Visualizzazione / Monitor

P2= Parametri / Parameters

F3= Guasti attivi / Active faults

H4= Storico guasti / Fault history

S5= Menu di sistema / System menu

E6= Schede espansione / Expander boards

Each menu contains submenus, which can also be on several levels. To access the submenus, press the key, then use the +/- keys to show the various quantities; to quit the submenu, press the key.

5.1 M1 = MONITOR

CODE	NAME OF SIGNAL	CODE	NAME OF SIGNAL
V1.1	Frequenza uscita / Output frequency	V1.11	. 0 0 0 Inputs 8 – 9 – 10 (High, Low, Inspection Speed - without NXOPTAA board) (Up, Down, Evacuation - with NXOPTAA board)
V1.2	Rif. Frequenza / Freq. Reference		
V1.3	Velocità motore / Motor Speed	V1.12	. 0 0 0 Inputs N.U. – 2 – 4 (Not Used, Up, Down - without NXOPTAA board)
V1.4	Corrente motore / Motor Current		
V1.5	Coppia motore / Motor Torque	V1.13	. 0 Output Relay, terminals 22-23 (BRAKE Control Relay - without NXOPTAA board) (FAULT Relay - with NXOPTAA board)
V1.6	Potenza motore / Motor Power		
V1.7	Tensione motore / Motor Voltage	V1.14	N° of anticipated openings of the contactors at stop
V1.8	Tensione bus C.C. / DC-link Voltage	V1.15	. 0 0 0 Inputsi 3 – 4 – 5 (NXOPTAA board) (High, Low, Inspection Speed - with NXOPTAA board)
V1.9	Temperatura inverter / Unit Temperature		
V1.10	AO1 Output (20mA)	V1.16	. 1 1 1 Outputs RO2 – N.U. – DO1 (NXOPTAA) (BRAKE Control Relay, Not Used, CONTACTOR Opening - - with NXOPTAA board)

5.2 P2 = PARAMETERS

IMPORTANT
The parameters with grey background can only be changed after SMS advice!

BASIC PARAMETERS AND RUN CONFIGURATION

Par.	Description		unit/meas	Def.	Value
P2.1.1	Limite corrente / Current Limit		A	1,8 x Inv	
P2.1.2	Tensione Nom Motor / Motor Nom Volt		V	400	
P2.1.3	Frequen Nom Motore / Motor Nom Freq		Hz	50	
P2.1.4	Velocità Nom Motor / Motor Nom Speed		rpm	1380	
P2.1.5	Corrente Nom Motor / Motor Nom Current		A	Inv	
P2.1.6	Cos fi Motore / Motor Cos Phi			0,76	
P2.1.7	Autoapprendimento / Identification			0	
P2.1.8	Controllo Ventilatore / Fan Control			1/Run	
P2.1.9	Password / Unlock Menu			0	
P2.2.1	Frequenza Massima / Max Frequency		Hz	50	
P2.2.2	Rampa Acceleraz / Acceleration		s	2,5	
P2.2.3	Rampa Deceleraz / Deceleration		s	2,0	
P2.2.4	Dec.finale/Final Decelerat		s	0,5	
P2.2.5	v1 100 alta / high	IN 8	Hz	50	
P2.2.6	v2 010 bassa / low	IN 9	Hz	5	
P2.2.7	v3 110 alta+bass / high+low	IN 8+9	Hz	30	
P2.2.8	v4 001 ispezione / inspect.	IN 10	Hz	25	
P2.2.9	v5 101 alta+isp / high+insp	IN 8+10	Hz	0	
P2.2.10	v6 011 bassa+isp / low+insp	IN 9+10	Hz	0	
P2.2.11	emerg. / evacuation	IN 8+9+10		0	
P2.2.12	Arrot Inizio Accel / Acc Inc Jerk		s	1,2	

CONTROLLO FRENATURA / BRAKE CONTROL

Par	Description	unit/meas.	Def	Value
P2.3.1	Corrente FrenatCC / DC-Brake Current	A	0,7 Iinv	
P2.3.2	Tempo FrCC Start / Start DC-brake Tm	s	0,0	
P2.3.3	Tempo FrCC Arresto / Stop DC-Brake Tm	s	0,4	
P2.3.4	Freq FrCC arresto / Stop DC-Brake Fr	Hz	1,5	
P2.3.5	Corrente Min Apert / Min Curr Brake Open	%	10	
P2.3.6	Ritar.AperturaFreno/Brake Open Delay	s	0	
P2.3.7	Ritar.Chius Freno / Brake Close Delay	s	0,3	

CONTROLLO MOTORE / MOTOR CONTROL

Par	Description	unit/meas.	Def	Value
P2.4.1	Chopper Frenatura / Brake Chopper		1 / NoTestUsed	
P2.4.2	Stato Contr Motore / Motor Ctrl Mode		1 / OpenLoop	
P2.4.3	Freq Commutazione / Switching Freq	kHz	8	
P2.4.4	Control Sottotens / Undervolt Control		1 / Active	
P2.4.5	Ottimizzaz V/f / V/f Optimization		1 / Boost autom	
P2.4.6	Sel Rapporto V/f / V/f Ratio Select		2 / Programmable	
P2.4.7	PntoIndebolCampo/ Field Weakng Pnt	Hz	50	
P2.4.8	Tensione al PIC/ Volt At FWP	%	100	
P2.4.9	V/f Freq Intermedia / V/f Mid Freq	Hz	1,75	
P2.4.10	V/f Tens Intermedia / V/f Mid Voltg	%	5,0	
P2.4.11	Tensione A Freq 0 / Zero Freq Voltg	%	3,5	
P2.4.12	Errore velocità / Speed error ramp	ms	2000	
P2.4.13	Freq. di preavv. / SmoothStartFreq	Hz	0,3	
P2.4.14	Tempo di preavv. / SmoothStartTime	s	0,3	
P2.4.15.1	TensioneIdentif.Motore / Ident RS VltDrop		Not 0 it depends on size	
P2.4.15.2	Corrente a 0Hz / Current at 0 Hz	%	50	
P2.4.16	FreqSwitchBasVel / LowSp.SwitchFreq	kHz	5	
P2.4.17	Soglia BasVel / LowSp. Level	Hz	5	
P2.5.1	Max Vel Emergenza / Max Evacuation Speed	Hz	5	
P2.5.2	Modo Emergenza / Evacuation Mode		1 / Automatic	
P2.5.3	Freq.Commutazione / Switching Freq	kHz	3	
P2.5.4	Stato Controllo Motore / Motor Control Mode		0 / Frequency	

5.3 F3 = ACTIVE FAULTS

Listed below are the most common fault messages. Be careful not to reset the alarm or fault without first having investigated the problems that caused the protection mechanism to trip.

Always deselect the run command before resetting any fault.

1	Overcurrent: The inverter has detected excessively high current.
2	Overvoltage: DC voltage of the intermediate circuit is above the specified limits.
3	Earth fault: The current measurement system has detected that the sum of motor phase current values is not equal to 0.
5	Charge contact: The charge contact is open when the START command is active.
8	System fault: Component fault. Defective operation. Braking resistor not connected.
9	Undervoltage: DC voltage of the intermediate circuit is below the specified limits.
11	Output phases: Missing current in one or more output phases.
13	Inverter undertemperature: Temperature of the heat sink is lower than –10°C.
14	Inverter overtemperature: Temperature of the heat sink is above 90°C.
15	Motor stall: The motor stall protection has tripped.
16	Motor overtemperature: The inverter's motor temperature module has detected overheating of the motor. The motor is overloaded.
17	Motor underload: The motor underload protection has tripped.
22	Checksum error: Failed parameters retrieval from EEPROM, Component fault.
24	Counter fault: The value displayed by the counters is incorrect.
25	Watchdog fault: Microprocessor fault.
26	Start inhibit: Starting of the drive has been inhibited.
29	Thermistor.
34	Internal bus communication.
39	Removal of device: The optional circuit board has been removed. Power unit removed.
40	Device not recognised: Optional circuit board or power unit not recognised.
41	IGBT Temperature: The IGBT overtemperature protection device has detected excessively high short-term overload current.
44	Modification of device: The optional circuit board has been changed.
45	Addition of device: The optional circuit board has been added.
50	Current at the analog input is < 4mA.
51	External fault: Fault signal at the digital input.
52	Panel communication fault: Interrupted connection between control panel and inverter.
53	Field bus fault: The data connection between field bus Master and field bus board is interrupted
59	Run error: no speed command received after 5 seconds from direction command.
60	Levelling response: Anticipated stop referred to low speed. Car reaches floor while still decelerating.
61	Low current. Brake timeout. Motor current too low and brake fails to open.
63	Output phases: Missing current in one or more output phases.
64	Low reference: With a speed level active and below the DC electrical braking start frequency (P2.3.4), the inverter stops and, after three trips, this error code is generated.
67	Overspeed: The inverter, due to some malfunctioning, exceeds the maximum allowed speed.
68	Anticipated opening of the contactors: **(See Alarm 68 NOTE)** Contactors between inverter and motor opened before the end of the electrical DC braking current.
69	No Enable: It can occur only If you use the ENABLE input (P2.7.1.6=4), indicates that the Enable input has not been activated within 2 seconds from contactor command.

Alarm 68 NOTE After 20 trips of this alarm, the drive gos out of service and you need to use RESET key to resume the operation.
Eliminate the malfunctioning by delaying the contactors opening. If you can't do this (for example, in lifts with manual doors, where people opens the car door while car stopping, set parameters P2.3.3 and P2.3.7 to 0.
If the alarm still occurs, please contact SMS.

5.4 H4 = FAULT HISTORY

The inverter drive memory can store up to 5 faults in the order in which they occur. The most recent fault is designated H4.1, the penultimate is H4.2 etc. If the memory contains 5 faults that have not been erased, the next fault to occur will replace the oldest fault present in the memory.

5.5 S5 = SYSTEM MENU

SMS advises against modifying parameters relative to this MENU.

5.6 E6 = EXPANSION BOARDS

SMS advises against modifying parameters relative to this MENU.

6 – ADJUSTMENT PROCEDURE

Before changing or adjusting parameters proceed as follows:

6.1 – SET THE MOTOR DATA IN PARAMETERS P2.1.2/3/4/5/6

If the motor speed is not known, or if the nominal value on data plate is 1500 rpm:

- if the motor is 1 or 2 speed, or for conventional ACVV regulator, set 1350/1380 rpm
- if it is for a VVVF speed regulator, set 1440 rpm.

If the cos phii value is not known:

- if the motor is 1 or 2 speed, or for conventional ACVV regulator, set 0,76
- if it is for a VVVF speed regulator, set 0,80.

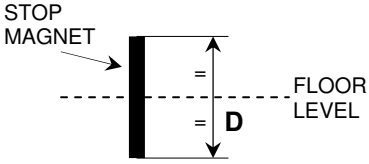
6.2 – PLACE THE DECELERATION COMMANDS AT A DISTANCE FROM FLOOR AS INDICATED IN THE TABLE

(GREATER THE DISTANCE, MORE SMOOTHLY THE LIFT SYSTEM WILL OPERATE)

DECELERATION DISTANCES TABLE			
System nominal speed (m/s)	**0.7**	**1.0**	**1.2**
Required deceleration distance (mm)	**1000**	**1400**	**1700**

In addition, position the stop switch centrally with respect to the floor.

The STOPPING DISTANCES TABLE shows guideline values to consider in order to define activation distance of the stop switch (or switches):



STOPPING DISTANCES TABLE			
System nominal speed (m/s)	**0.7**	**1.0**	**1.2**
Total stopping distance (D) (mm)	**60**	**80**	**100**

The stopping adjustment is performed using the inverter parameters as illustrated below (Heading **6.8-5**).

6.3 – SET THE EXACT VALUES FOR MAXIMUM FREQUENCY P2.2.1 (CORRESPONDING TO THE NOMINAL SPEED OF THE SYSTEM) AND NOMINAL SPEED (HIGH SPEED) P2.2.5.

6.4 – ADJUST THE INSPECTION FREQUENCY P2.2.8 IN SUCH A WAY THAT CAR SPEED DOES NOT EXCEED 0.63 m/s.

6.5 – ALWAYS ENSURE THAT THE FREQUENCY VALUES PROGRAMMED UNDER PARAMETERS P2.2.1 AND P2.2.5 ÷ P2.2.10 ARE COMPATIBLE WITH THE NOMINAL MOTOR FREQUENCY.

For example, gearboxes may be equipped with motors whose rated frequency can be 30Hz, 38Hz, 45Hz, 55Hz, 60Hz, etc.

6.6 – IDENTIFICATION (IMPORTANT!)

After setting the correct motor data, **it is essential to perform the IDENTIFICATION routine**.

- Set parameter **2.1.7** to 1 and transmit a call command: the contactors energizes, the brake doesn't open, and on the keypad appear the "RUN" message.
- When the "STOP" message appears, deactivate the call (e.g. by opening the operation valve)
- The boost parameters are now updated.

If you modify any motor data, it is essential to perform the IDENTIFICATION routine again.

6.7 – FAN CONTROL

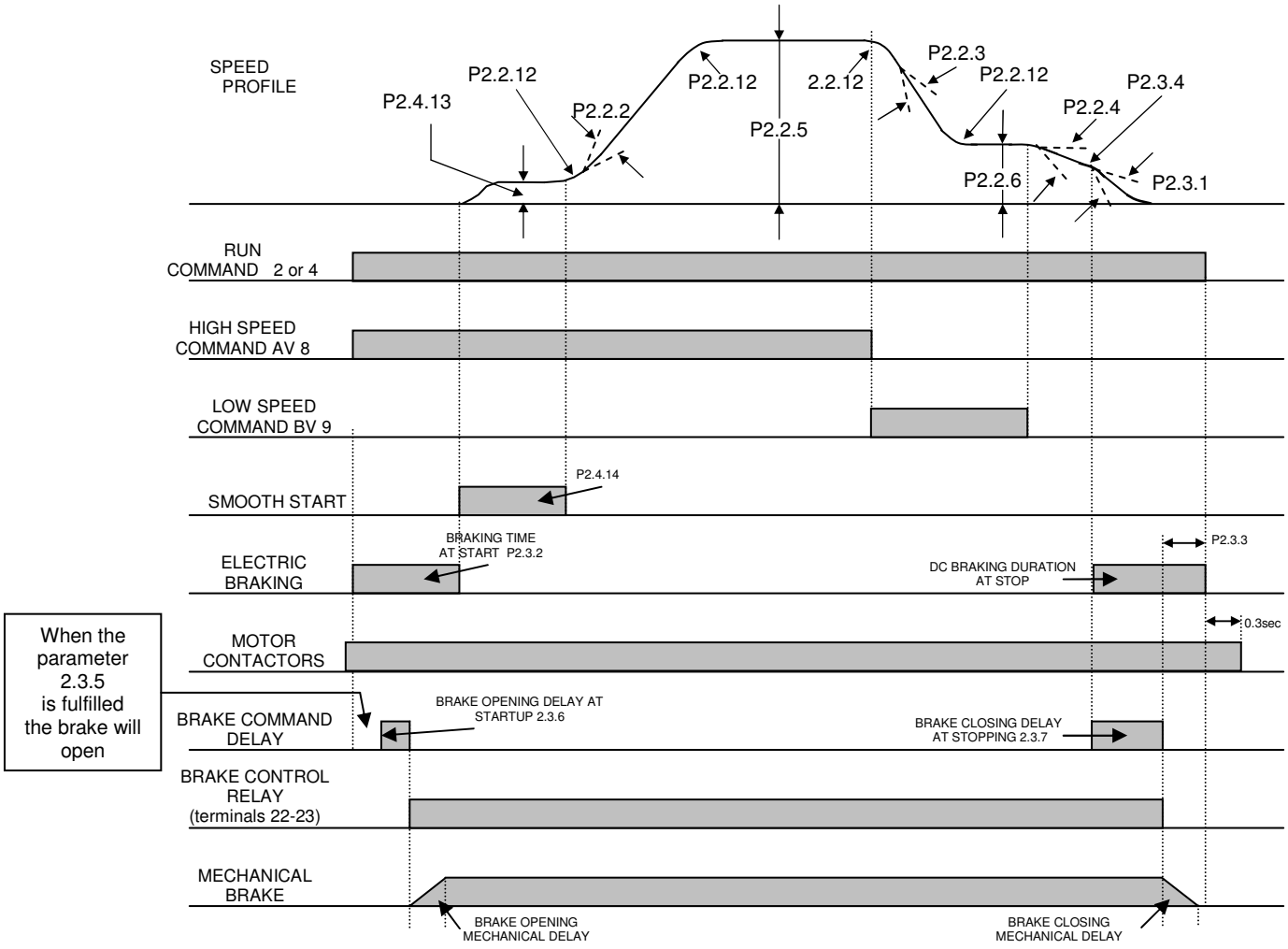
Set parameter P2.1.8 (fan control) as desired:

0 = continuous duty.

1 = the fan runs during run and for 1 further minute after the stop.

2 = the fan starts only when the drive temperature reaches 45°C.

6.8 – ADJUSTMENTS



After having performed the operations described in points 6.1/2/3/4/5/6/7, proceed as follows:

IMPORTANT

Always change no more than ONE PARAMETER AT A TIME

1 - Adjust **starting** by means of the braking control parameters

		JERK	CONTRA-ROTATE
2.3.6	Brake open delay	▲▼	▲
2.4.13	Smooth start frequency	▼	▲
2.4.14	Smooth start time	▲	▲

- The departure must be "smooth", without sudden movements or opposite rotations.
- If an higher torque at starting is needed, seti the starting current at 0Hz in P2.4.15.2 (default=50%) to a greater value (do not set a value over 60%) and **perform the IDENTIFICATION routine again.**

2 - Ensure that motor rpm is as requested and speed is constant at **high speed.**
If the speed is not constant (fluctuating) adjust parameter 2.1.4. (motor speed), reducing or increasing rpm.

3 - Now check the **deceleration phase**: the lift must reach the floor after covering a short distance at constant speed (max. 10 cm) without any fluctuation or vibration, and maintaining the same speed both in up and down travel, with the car full or empty.
Adjust the distance travelled at low speed by means of parameter 2.2.3 (deceleration ramp).

4 - **If the motor stops when the deceleration phase terminates,** and the car is unable to reach the floor, adjust the following parameters:

2.1.4	Motor speed	▼
2.4.9	V/F mid frequency	▼
2.4.10	V/F mid voltage	▲
2.4.11	Voltage at zero frequency	▲
2.2.6	Low speed level	▲

5 - **On arrival at the floor** the alignment between floor and car is not perfect:

The parameters to adjust are:		Stops **BEFORE**	Stops **AFTER**	Error from **NO-LOAD** to **LOAD**
2.2.4	Final deceleration	▲	▼	-
2.2.6	Low speed	▲	▼	-
2.3.1	DC-Brake current	▼	▲	▲
2.3.4	Stop DC-Brake Frequency	▼	▲	-

IMPORTANT
For the low speed frequency, we recommend a value of approximately 1/10 of nominal frequency: e.g. 5Hz in the case of a nominal 50Hz motor.

6 - If **the motor runs noisily**, increase switching frequency P2.4.3, considering that the more the frequency is increased, the greater the risk of EMC disturbances and the more stressed the motor insulation and the power section of the inverter.

6.9 – ALARMS THAT MAY APPEAR DURING THE SYSTEM SET-UP PHASE

59 = Start error:
an up/down run command has been transmitted with no speed level.

60 = Anticipated stop:
the system has arrived at the floor before low speed has been reached, i.e. when the system is still decelerating; in this case reduce deceleration time 2.2.3.

2 = Overvoltage:
the internal bus has reached excessively high voltage levels. Check that the braking resistor is connected and that the relative resistance value is in accordance with the table. Increase the deceleration distance if necessary.

61= Low current:
The brake fails to open because motor current is too low (change 2.3.5=minimum brake opening current).

63= Output phases:
Inverter has detected the lack of current in one or more output phases.

68= <u>ANTICIPATED OPENING OF THE CONTACTORS:</u>
<u>The contactors between inverter and motor have been opened during the DC current injection at stop.</u>
<u>A repeated intervention of this alarm can permanently damage the inverter and decreases significantly the contactors lifetime.</u>

6.10 – PARAMETERS FOR EMERGENCY OPERATION

WITH BATTERY POWER SUPPLY(MINIMUM 96VDC) EFFECTIVE ONLY IN EVACUATION RUN

2.5.2 EVACUATION MODE:
0= MANUAL (DOES NOT SELECT FAVOURABLE RUN DIRECTION)
1 = AUTOMATIC (SELECTS FAVOURABLE RUN DIRECTION)

2.5.1 MAXIMUM SPEED IN EVACUATION: this is the maximum speed of the motor, whatever the level effectively activated (high, low, inspection, etc.).

2.5.3 SWITCHING FREQUENCY. (maintain the default value).

2.5.4 MOTOR CONTROL MODE: (FREQUENCY, OPEN LOOP) if the input is 96V, frequency control is the preferred mode in an evacuation situation.

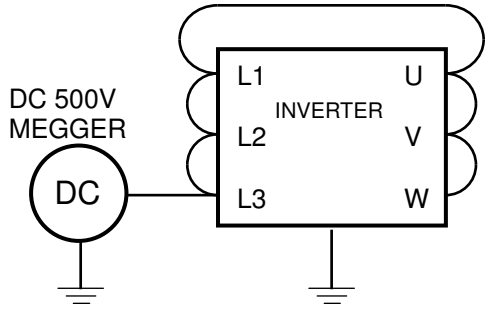
7 – CHECKS AND MAINTENANCE

To ensure long service life and smooth operation of the drive, carry out the following checks at regular intervals. Always isolate the drive from the power supply and make certain the keypad is off before proceeding.

1- Remove the dust that collects on the cooling fans and on the control circuit board, preferably by means of compressed air or using a vacuum cleaner.
2- Check that there are no screws loose at the power or control terminals.
3- Check that the operation of the inverter drive is <<normal>> and that there are no signs of overheating.

7.1 MEGGER TEST

When performing insulation tests using a Megger tester on the input/output cables or on the motor, remove all the connections to all terminals of the drive and perform the test only on the power circuit, in accordance with the adjacent diagram. Do not Megger test the control circuits.



8 – PARAMETER SUMMARY TABLES - SASSI MOTORS FOR VVVF

PARAMETERS FOR SASSI MOTORS TYPE WF4-400V-50Hz-4-POLEs				
MOTOR		MOTOR RPM 2.1.4	MOTOR CURRENT 2.1.5	MOTOR COSφ 2.1.6
200120A	5,5kW	1443	11.6	0.83
240095A	3kW	1440	7.8	0.77
240095A	4kW	1420	9	0.82
240095A	5.5kW	1425	13	0.75
240095A	5.9kW	1420	14	0.78
240118A	7.35kW	1430	17	0.78

PARAMETERS FOR SASSI MOTORS TYPE WF4-400V 4-POLES FOR FREQUENCIES OTHER THAN 50 Hz				
MOTOR	NOMINAL FREQUENCY 2.1.3	MOTOR RPM 2.1.4	MOTOR CURRENT 2.1.5	MOTOR COSφ 2.1.6
240095 3kW Y	29	798	7.8	0.84
240095 5.5kW Δ	50	1420	13	0.84
240142 5.5kW	30	825	12.6	0.82

EU DECLARATION OF CONFORMITY

We

Manufacturer's name: Vacon Oyj

Manufacturer's address: P.O.Box 25
Runsorintie 7
FIN-65381 Vaasa
Finland

hereby declare that the product

Product name: Vacon NXL Frequency Converter

Model designation: Vacon NXL 0001 5...to 0061 5...
Vacon NXL 0002 2...to 0006 2

has been designed and manufactured in accordance with the following standards:

Safety: EN 50178 (1997), EN 60204-1 (1996)
EN 60950 (3rd edition 2000, as relevant)

EMC: EN 61800-3 (1996)+A11(2000), EN 61000-6-2 (1999), EN 61000-6-4 (2001)

and conforms to the relevant safety provisions of the Low Voltage Directive (73/23/EEC) as amended by the Directive (93/68/EEC) and EMC Directive 89/336/EEC.

It is ensured through internal measures and quality control that the product conforms at all times to the requirements of the current Directive and the relevant standards.

In Vaasa, 6th of September, 2002

Vesa Laisi
President

The year the CE marking was affixed: 2002

For further information and advice contact:

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