

E-MOD

INSTRUCTION MANUAL



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	TAKEDO-3VF NXL INSTRUCTION MANUAL (ATTACHED)		

1 – FOREWORD

SMS wishes to thank you for choosing our products.

E-MOD is a device that makes it possible to install an inverter on any existing system without having to replace the control panel, the gearbox motor, or the electrical system of the shaft and car.

E-MOD complies with European Directives 89/336EEC and 95/16EEC and has CE certification for EMC issued by a COMPETENT BODY (see attached declaration).

IMPORTANT

Included in E-MOD there are an inverter of the very latest generation and the interface board for connection with control panel. They both contain a specific lift application software, which includes:

- ✓ **Motor thermal protection.**
- ✓ **Lift max travel time protection.**

With these protections working, it is possible to replace the existing gear without installing neither the motor supply time governor device (as the point 12.10 of the Standard UNI 10411_1 prescribes), nor the motor thermistors.

2 – INSTALLATION

E-MOD is supplied complete with the following cables which are already connected to the relative terminals:

- one cable for connection of the device power supply to the A.C. mains.
- one shielded cable for connection of the device output to the panel.
- the shielded cables required for connection of the adaptation circuit board to the panel.

In addition, a further 8 meter length of shielded cable is supplied for the connection between the control panel and the motor.

1- To install E-MOD in an existing system with a single speed motor, the lift shaft must be transformed as though in the case of a 2-speed installation, considering that the default values of the drive have been set for a deceleration distance as specified in the “DECELERATION DISTANCES TABLE” in the TAKEDO 3VF NXL inverter drive manual.

The greater the deceleration distance, the more comfortable the lift running.

2- The stop switch must be fitted on the car (the connection of this switch calls for two extra conductors in the flexible cable) and the relative magnets in the shaft in correspondence with each floor. This material isn't supplied with the product, but it can be provided further to request from the Customer. The magnets must be of the same length, they must be centrally aligned with respect to the floor level, and exactly in the same position for all the floors (see the “STOPPING DISTANCES TABLE” in the TAKEDO 3VF NXL inverter drive manual).

IMPORTANT : **A free service is available: if the customer supplies, while ordering E-MOD, the circuit diagram of the control panel in which the device is to be installed, SMS indicates on this diagram all the modifications required for a correct application.**

3 – CONNECTIONS

CAUTION! Before making the connections bring the car to an intermediate floor and disconnect all the power circuits.

IMPORTANT : **EMOD is prearranged for connection to panels with control voltage of between 48Vdc and 120Vdc. If the control voltage is outside this range or AC, ensure you make a specific request for your application at the time of the order.**

3.1 POWER CIRCUIT

The power connection of E-MOD must be made up line of the power contactors: always check to ensure that the operation transformer supply is taken up line from E-MOD.

- Connect the three-phase power supply to the input cable (3 Core + Earth, unshielded), which is connected to terminals L1, L2, L3.
- Connect the output cable (3 Core + Earth, shielded, connected to drive terminals U, V, W) to the panel contactors.

IMPORTANT

The connection between contactors and motor (i.e. between control panel and motor) must be made using the shielded cable (3-core + Earth) supplied with the equipment.

The cable shield must be connected to earth at both ends.

- Bond the earth conductors and the shield to the control panel earth and to the gearbox earth.

CAUTION!

When E-MOD is connected, problems are created with type AC 30mA residual current devices. When installing an inverter drive, to avoid nuisance tripping of the residual current circuit breaker and ensure effective protection in compliance with regulations, proceed as follows:

- Make sure the building has an efficient earth circuit.
- **Install type B residual current devices rated 300mA.**
- Wire and bond earth connections efficiently (refer to the inverter drive manual).

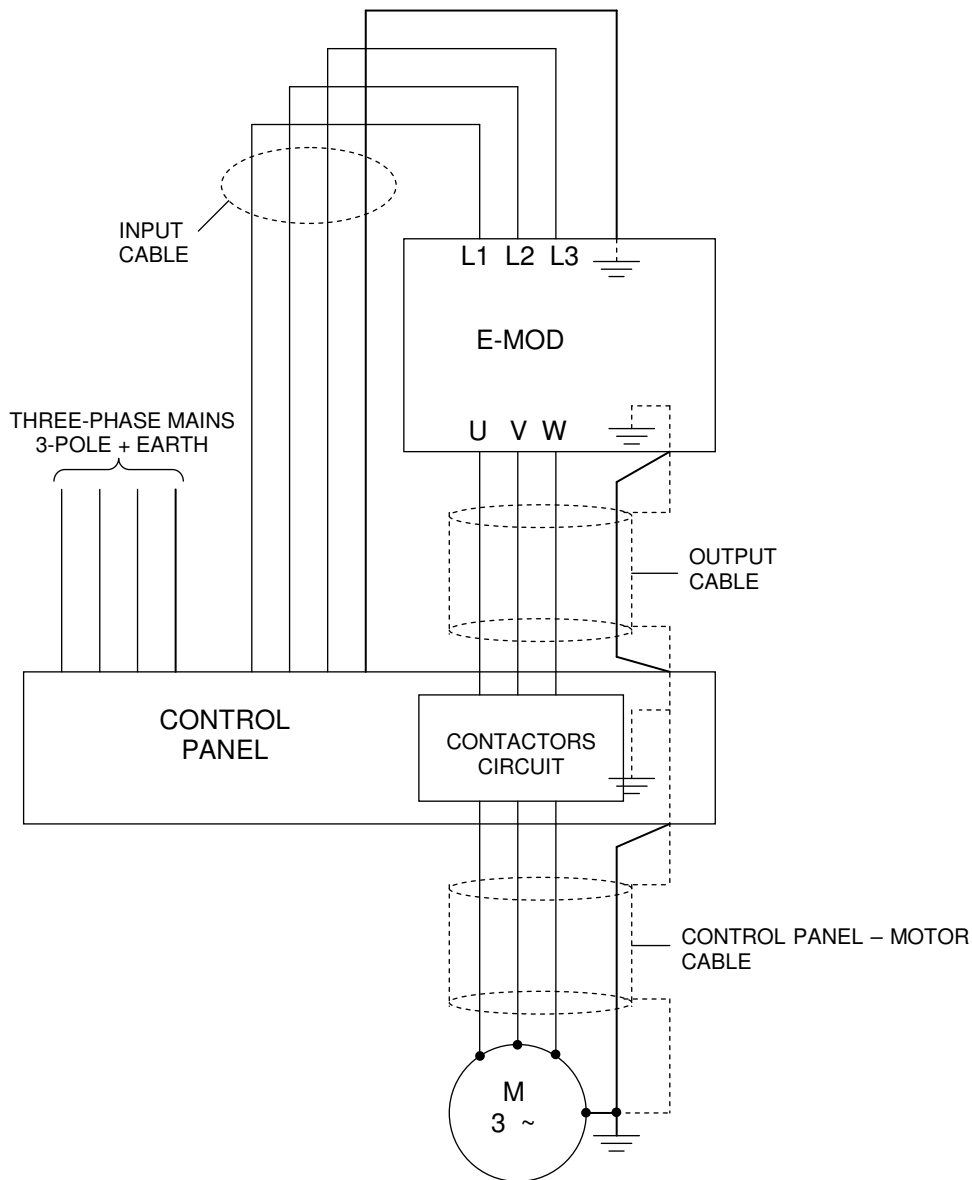


Fig. 1 : Power connection

3.2 ADAPTATION CIRCUIT BOARD

The EMOD adaptation circuit board is located inside the TAKEDO 3VF NXL inverter drive

List of conductors to connect to the adaptation circuit board:

- | | |
|--------|--|
| QC1 | Board power supply
Connect to the point of the safety chain at which the selector circuit or switches circuit is supplied. |
| QC2 | Board power supply common.
Connect the common wire of the control voltage feeding the selector circuit or floor switches circuit. |
| CF,CF1 | Stop command.
Connect a stop switch having an NC contact (open at the floor). |

- QU, QUA Command for the upward run contactor or auxiliary relay.
Interrupt the connection between the upward branch of the selector circuit and the coil of the upward run contactor or auxiliary relay. Now connect the wire from the selector circuit to terminal QU and the coil of the upward run contactor or auxiliary relay to terminal QUA.
- QD, QDA Command for the downward run contactor or auxiliary relay.
Interrupt the connection between the downward branch of the selector circuit and the coil of the downward run contactor or auxiliary relay. Now connect the wire from the selector circuit to terminal QD and the coil of the down contactor or auxiliary relay to terminal QDA.
- QP+, QP- Start permit.
Connect respectively to the positive and negative poles of the operation circuit, down line of the safety chain contacts.
- IM Command for operation in inspection mode.
Connect in such a way that, when the inspection service is enabled by means of the specific control station on the car roof, a contact closes between QC1 and IM.
In the following example the connection of IM is not shown, because it depends largely on the type of circuit layout of the control panel.
If IM is not connected, the inspection run will be executed at high speed (instead of medium speed); in addition, when the inspection run pushbutton is released, the car could decelerate until reaching the next floor instead of stopping instantly.
The first condition may be accepted (depending on the nominal speed of the system) but not the second. To eliminate both of these problems, even though IM remains unconnected, move switch SW1 on the adaptation board to the MAN before starting the inspection operation, and return it to RUN when the operations are concluded.

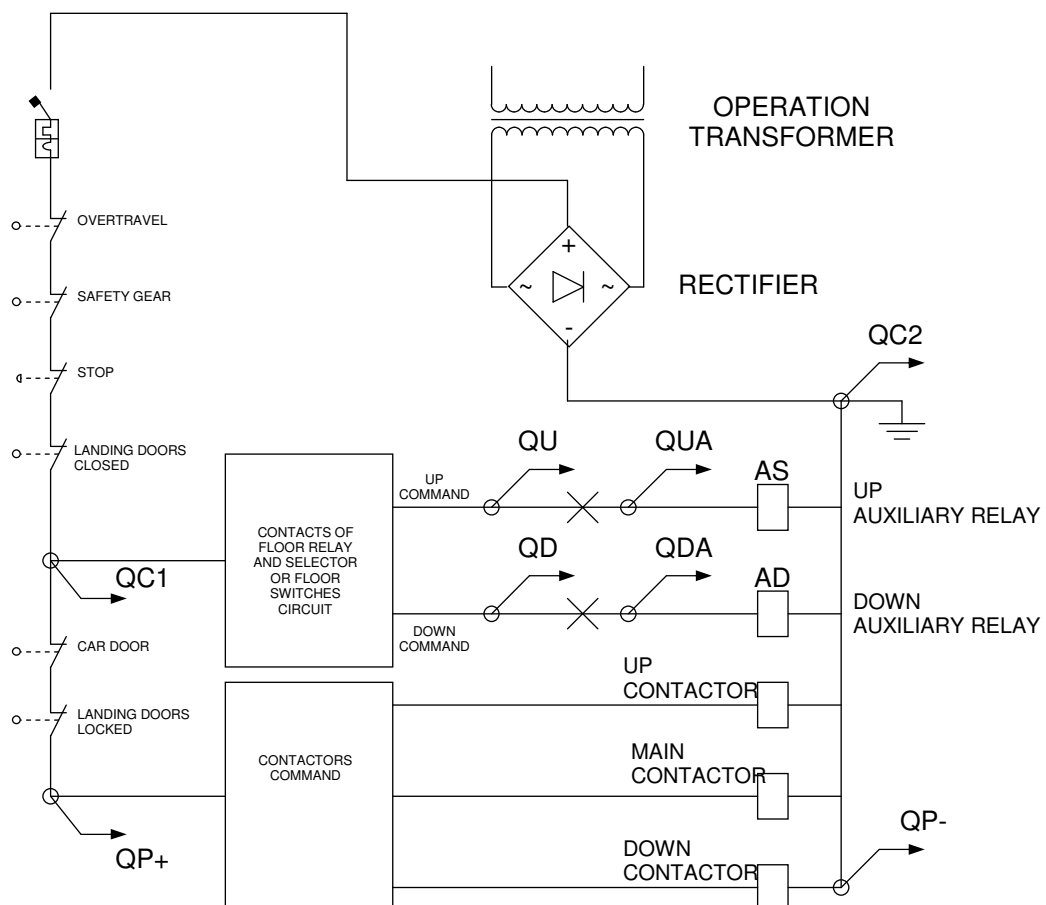


Fig. 2 : Example of connection of the adaptation board on a generic existing control panel for 1-speed installation with semiautomatic doors

CAUTION!

In the event of uncertainty or control panels having layouts that differ from the example given in the above Fig. 2, consult SMS for advice about the correct connection of the adaptation board.

3.3 BRAKE CONTROL

E-MOD features internal contactor TF to control the BRAKE: the TAKEDO 3VF NXL drive manages the brake control logic directly so that the relative contactor opens only in conditions of safety (motor supplied with power with current balanced on all three phases) and closes when the motor stops as the car reaches a floor.

Contactors TF is wired by SMS; the two conductors TFL2 – TFL3 must be connected in series with the brake coil power supply.

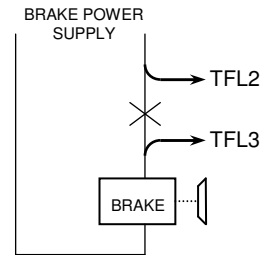


Fig. 3: Connection of the brake control contactor

4 – OPERATION

When it receives an up or down run command from the control panel, E-MOD activates the contactors and, via the inverter drive, causes the car to move.

When switch SW1 is set to RUN, the movement is performed at high speed; when the command from the control panel (QU or QD) opens, the movement switches to low speed, the car arrives at the floor, the drive stops the motor electrically and subsequently E-MOD commands the brake deactivation and then contactors deactivation.

When switch SW1 is set to MAN, the car moves in the selected direction at the inspection speed as long as the command from the panel or from the ↑ or ↓ buttons on the circuit board remains active; when the command ceases, the car stops instantly and the brake is engaged again.

During all operations, E-MOD controls brake contactor TF. When the drive detects an alarm situation, the brake closes instantly.

E-MOD performs the maximum travel time protection:

If the run between one floor and the next one needs more than 25 seconds, the lift stops. This condition is reported on the interface board by means of the MR green led, which cyclically stays off then flashes 4 times. To resume the normal operation, you have to switch off then on again the supply voltage, or move the SW1 switch in MAN position, then in RUN position again.

E-MOD performs also the low speed travel time control:

If the car slows down but it doesn't reach the next floor level (CF opening) in 10 seconds, the lift stops. This condition is reported on the interface board by means of the MR green led, which cyclically stays off then flashes 2 times. The normal operation is resumed simply operating a new call.

4.1 SETUP

After having made the CONNECTIONS, open the cover of E-MOD and close the main power switch, keeping the operation valve open.

The first task is to enter the motor data in the drive in the "BASIC PARAMETERS" group – P2.1.2 - P2.1.6. Instructions on how to edit parameters are provided in the attached TAKEDO 3VF NXL Manual.

The green IOK Led must illuminate on the circuit board; the green MR Led flashes and the CF Led illuminates if the car is not aligned with a floor.

Check that switch SW1 is set to RUN and close the operation valve.

Make a call for an upper floor, checking that the motor rotates in the correct direction. If the motor turns in the wrong direction, invert two of the conductors in the motor terminal box.

Once you have checked the correct direction of rotation, return the car to an intermediate floor. Make another call: the following Led will illuminate on the board: QU/QD, QUA/QDA, QP (if not already lit), RUN and TF; the CF Led illuminates when the car is not aligned with a floor.

The deceleration and stopping sequence is as follows: the QU/QD Led switches off in the deceleration zone, the car slows and arrives at the floor (opening of stop contact CF – CF1) Led CF switches off and then the following leds switches off in sequence (with a short delay from one to the next): TF, RUN, QUA/QDA and QP.

Set switch SW1 to MAN; Led IM should illuminate. In this condition E-MOD controls the motor in up or down directions by pressing one of the buttons on the circuit board.

IMPORTANT

The buttons on the circuit board which control car movement when switch SW1 is set to MAN, only operate if Led QP is illuminated, i.e. only if the safety chain contacts are closed.

Once the operations described above have been concluded successfully, operation of the installation can be optimized. Acceleration, deceleration, and final deceleration can all be adjusted.

To reduce installation times it is good practice to make the adjustments on just one floor, performing up and down runs until obtaining satisfactory stopping performance. The magnets for the other floors must be identical and positioned in the same place, perfectly centred with respect to the floor.

4.2 OPERATION IN CASE OF 2 SPEED ELECTRONIC CONTROL PANELS

When E-MOD is installed in 2-speed lifts with electronic control panel, in order to make the application easier, you should activate the 2 SPEED OPERATION SOFTWARE.

Before you switch-on the device, on the EMOD Board you have to insert a Jumper between the two terminals of the CN2 connector near the print "CN2" (on the left).

The default position for the Jumper is on the other two terminals of the CN2 connector, near the print "T1" (on the right), which provides the standard operation for 1-speed systems or generic relay control panel.

With the 2 SPEED OPERATION SOFTWARE, the connection changes, because the wire CF1 must be connected to the LOW SPEED command (generally the low speed contactor coil). The wire CF, unless there are different indications, must be kept insulated.

The wires U-V-W must be always connected to the high-speed circuit, while the low-speed winding must be insulated.

MODIFICATION TO THE OPERATION REFERRING TO THE 1-SPEED STANDARD CONTROL PANEL

The inverter receives the run command following the QU/QD and QP activation.

If the CF1 command is OFF, the car runs in high speed, when the CF1 command goes ON, the inverter makes the car to slow-down to the low speed.

When the car reaches the floor, CF1 and QU/QD go OFF: the inverter stops the motor electrically and next E-MOD commands the brake closing and then the contactor opening.

There is no control about the RUN TIME, neither in high nor in low speed, in order to avoid inopportune trips of these protections during long run, in normal operation or for example in low speed during set-up, as the maximum run time control is normally provided in the electronic control panels.

4.3 KEY TO SIGNALLING LEDS

MR	= flashing: indicates that the board is working correctly:
	- One shot blink after a long time in Standard 1-speed Operation,
	- Two shot blink after a long time in 2-speed Operation,
	= OFF for a while, then flashing 2 times: indicates that after the slow-down, the car has not reached the floor level in 10 seconds
	= OFF for a while, then flashing 4 times: indicates that the maximum travel time protection has tripped
IM	= inspection service
IOK	= drive ready
QD	= down command
QU	= up command
QUA	= up contactor command
QDA	= down contactor command
QP	= safety chain contacts closed
RUN	= start command for drive
TF	= brake contactor command
CF	= stop command

5 – DIMENSIONS AND WEIGHT

SIZE (kW)	5,5	7,5 – 11 (*)
Width (mm)	210	210
Height (mm)	480	480
Depth (mm)	240	240
Approx. Weight (kg)	15	14,5

(*) EXTERNAL Braking Resistor

For further information and advice contact:

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DECLARATION OF CONFORMITY

Manufacturer: **SMS SISTEMI E MICROSISTEMI s.r.l.**

Address: **Via Guido Rossa, 46/48/50 – 40056 Crespellano (BO)**

Product: **E-MOD (equipped with VACON NXL inverter drive)**

The above product complies with the following EUROPEAN DIRECTIVES:

- **95/16/EC** **LIFTS**
- **2004/108/EEC** **ELECTROMAGNETIC COMPATIBILITY**

when installed as prescribed by the relative user manual.

To evaluate the product's compliance, reference was made to the following STANDARDS:

- **UNI EN 81.1: 2008**
- **UNI EN 81.2: 2008**
- **UNI EN 12015: 2005**
- **UNI EN 12016: 2008**

DATE: 21-12-2010

SMS SISTEMI E MICROSISTEMI s.r.l.

VITTORIO MAZZONI
CHIEF EXECUTIVE OFFICER