



# POW-3VF

## INSTRUCTION MANUAL

<b>2</b>	15-10-2003	
REV.	DATE	R.T. Check and Approval

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## 1 – INTRODUCTION

**POW-3VF conforms to the 89/336/EEC directive relating to electromagnetic compatibility and to the 95/16/EEC directive relating to lifts (refer to attached declaration of conformity).**

POW-3VF is a device used for updating two-speed lift systems, adding an inverter to control the motor speed. It allows the existing control panel to be used and there is no need to replace the motor; it can also be used for new installation guaranteeing low emission of conducted and radiated disturbances.

POW-3VF system is made up of a metal cabinet, which contains an inverter complete with EMC filters and resistor, an interface board enabling motor and brake contactors to function with any type of control panel (relay or microprocessor). It also comes with 8 meters of shielded cabling for power connection from the POW-3VF outlet to the motor, and for connecting the panel to the POW-3VF.

## 2 – INSTALLATION

- 1- When installing POW-3VF in a new or existing system with a two-speed motor, use the deceleration distances shown in the "RECOMMENDED DECELERATION SPACES" table of this manual relating to the inverter mounted inside the POW-3VF. The wider the deceleration distance the more comfortable the system will be.
- 2- The operating voltage of the control panel to which POW-3VF has to be applied must be specified while placing the order, so that the contactors can be set with the appropriate coil voltage.
- 3- SMS has already foreseen the connection between the INTERFACE BOARD and the inverter with a shielded cable. The installer only needs to wire the commands between the panel and the interface board.
- 4- An emergency STOP button is located on the side of the panel, which enables any movement of the motor to be blocked. The button is needed when the POW-3VF is installed near the gear-box and far away from the panel.

### IMPORTANT

**SMS will supply, free of charge, together with the kit the wiring diagram with the necessary modification to make the application easier and correct. The diagram of the existing panel where the device has to be applied should be sent together with the order.**

## 3 – CONNECTION OF THE POWER CIRCUIT

- Connect the power supply directly to the L1, L2, L3 terminals of the inverter. Use the shielded cable for this connection and make sure the shield is earthed on the earth-terminal provided inside the inverter.
- Connect the U, V, W terminals of the motor directly to the POW-3VF contactors (U1, V1, W1 terminals).  
**The connection between the contactors and the motor (that is, between the POW-3VF and the motor) must be carried out using the shielded cable (3 poles + earth) supplied with the machine. The shield must be earthed on both sides.**
- Connect the earth to the earth bar located inside the cabinet.

### ATTENTION!

There are problems with the AC 30mA differential switch when connecting the POW-3VF.

When a frequency converter is installed, to prevent undesired trips of the differential switch and guarantee adequate protection (conforming to the Standards) it is necessary to:

- Make sure that the building is correctly earthed.
- Install Type B 300mA differential switches.
- Carry out a correct earth wiring (refer to inverter manual).
- Reduce (where possible) the switching frequency of the inverter.
- **ONLY SWITCH THE POW-3VF ON AFTER EARTHING.**

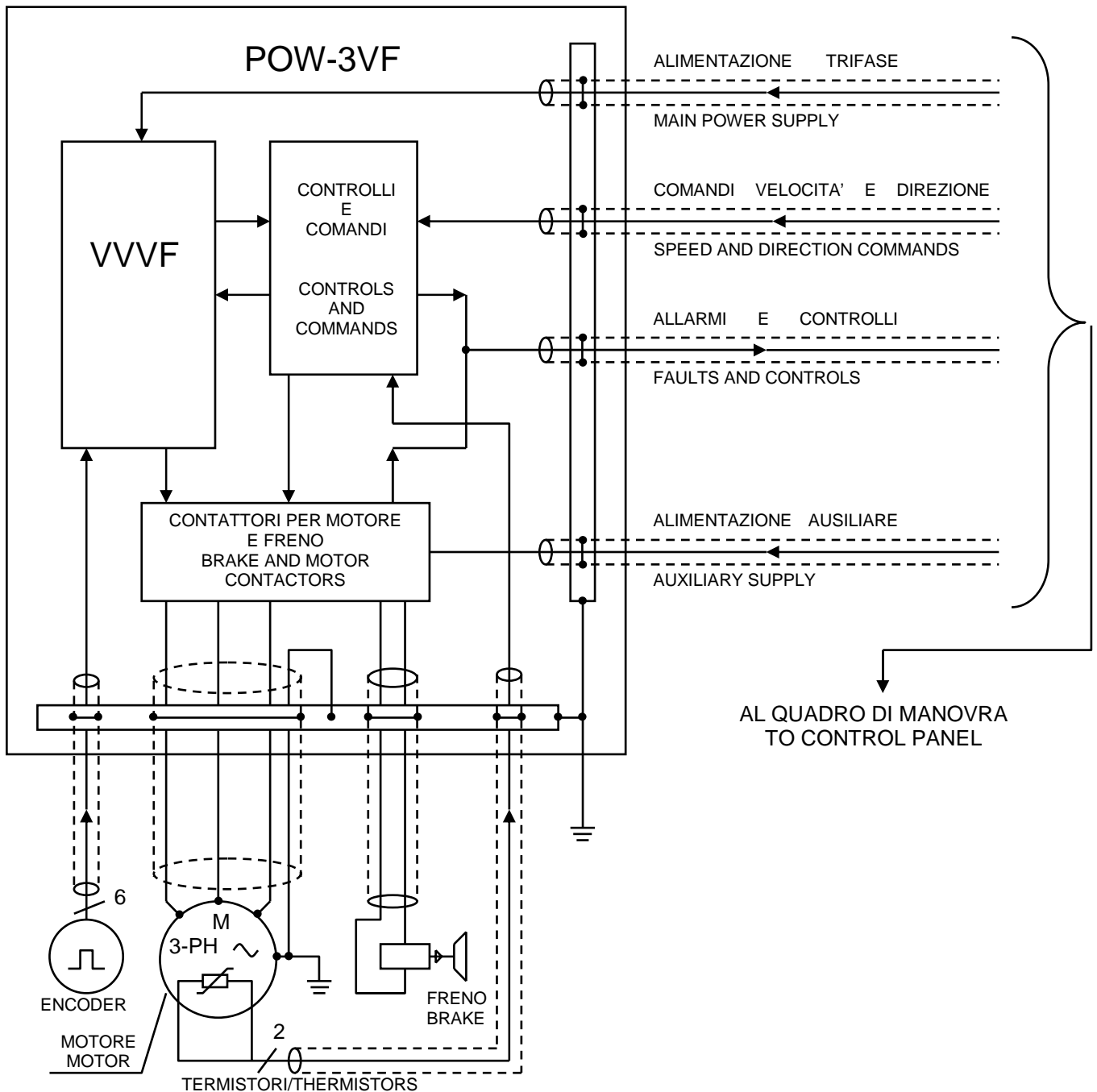


FIG. 1 : POW-3VF block and connection diagram

## 4 – CONNECTION OF THE CONTROL CIRCUITS

The connections between the interface board and the inverter are already set-up, do not modify them.

You only have to connect the board, the panel and the gear to the following terminals:

CS, HS, LS, VM, CD, UP, DW, TH1, TH2, AL, ALA/ALC, DT, DTA/DTC, S1, S2, VB+, VB-, B+, B-, T1, T2, T3, T4.

### EXPLANATION OF THE FUNCTIONS OF THE INTERFACE BOARD TERMINALS:

CS	Common for the speed levels commands
HS	High speed command
LS	Low speed command
VM	Inspection speed command
CD	Common for the direction commands
UP	Up direction command
DW	Down direction command

TH1\_TH2 Motor Thermistors. If the motor overheats, a contact between terminals 6 and 10 of QPOW board opens: this contact should be used to inform control panel about this condition. If motor thermistors are not connected, the contact 6-10 is always open.

**IMPORTANT**

Considering that the noise generated from the power part of the inverter is high, it is better to keep the two conductors of the thermistors as far away as possible from the shielded power cable.

You should use a shielded cable with two conductors for the connection of the thermistors.

AL\_ALA/ALC Inverter fault contact

AL\_ALA = N.A. contact, closed with inverter OK and open with inverter in fault

AL\_ALC = N.C. contact, closed with inverter in fault and open with inverter OK

DT\_DTA/DTC Contact of the speed detector. It can be used, for example, for the early door opening, for the deceleration control at top and bottom floor, etc.

DT\_DTA = N.A. contact, closed when the inverter output frequency is below the limit set

DT\_DTC = N.C. contact, open when the inverter output frequency is below the limit set.

**EXPLANATION OF FUNCTIONS OF THE TERMINALS ON THE DIN BAR:**

S1\_S2 Control voltage taken downstream of the safety chain, to supply the motor contactors that are controlled by the board (for rectified current: S1=positive, S2=negative).

VB+\_VB- Voltage to supply the electromechanical brake coil (from the panel).

B+\_B- Supply for the brake coil.

T1\_T2 Series of normally closed contacts of the two motor contactors and brake contactor, to advise the control panel about contactor de-energization.

T3\_T4 Series of normally closed contacts of one motor contactor and brake contactor, to use for other controls needed in the control panel (for example enabling of the door opening, etc.).

## 5 –FUNCTIONS AND SIGNALS OF THE INTERFACE BOARD

The INTERFACE BOARD consists of:

- 1- Timer for contactor de-energization delay (not adjustable) to enabling the de-energization of the contactors with zero current (inverter off).
- 2- SW1 switch:
  - With SW1 in RUN position, the system operates normally.
  - With SW1 in MAN position the system is preset for inspection mode and the car can be moved up or down by pressing the UP or DOWN buttons.

**IMPORTANT**

The car moves only if the contacts of safety chain are closed.

The movement in inspection, controlled from the car roof inspection board, occurs independently of the position of the SW1 switch, so that if the SWITCH of the car roof inspection board is in the INSPECTION position, the car cannot be moved from the machine room.

- 3- LEDs:

DL1 = Down run

DL2 = Up run

DL3 = Brake opening command

DL4 = Inspection speed

DL5 = Low speed

DL6 = High speed

DL7 = Inverter fault (if ON, the inverter is OK; if OFF, the inverter is in FAULT state).

DL8 = Control of the motor thermistors (if ON, it means that thermistors are connected and the motor temperature is normal; if OFF, it means that thermistors are not connected or that motor has overheated and operation has to be stopped)

# QPOW INTERFACE BOARD SILK-SCREEN

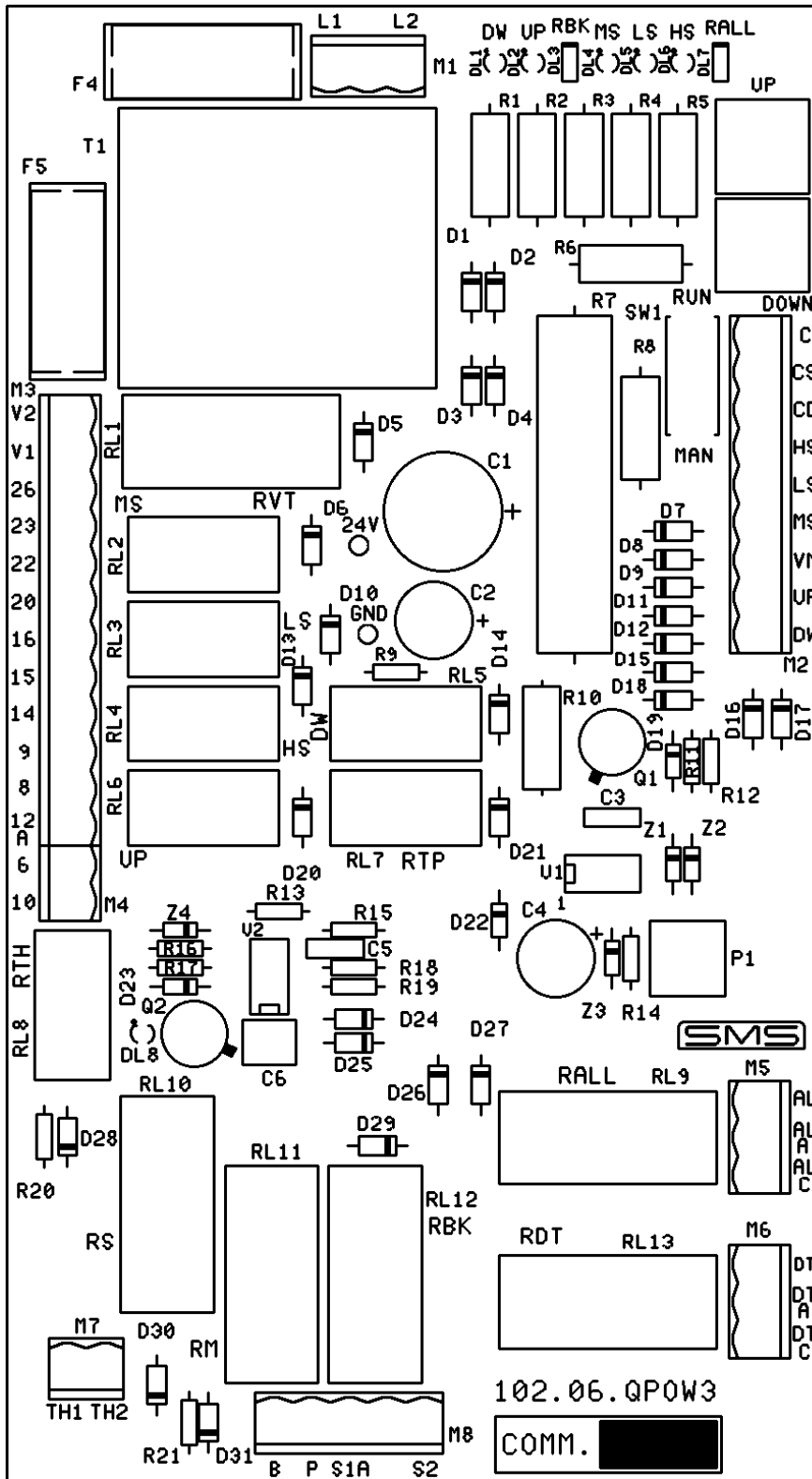


FIG. 2 : Silk-screen of the interface board

# 6 – POW-3VF FUNCTIONAL DIAGRAM

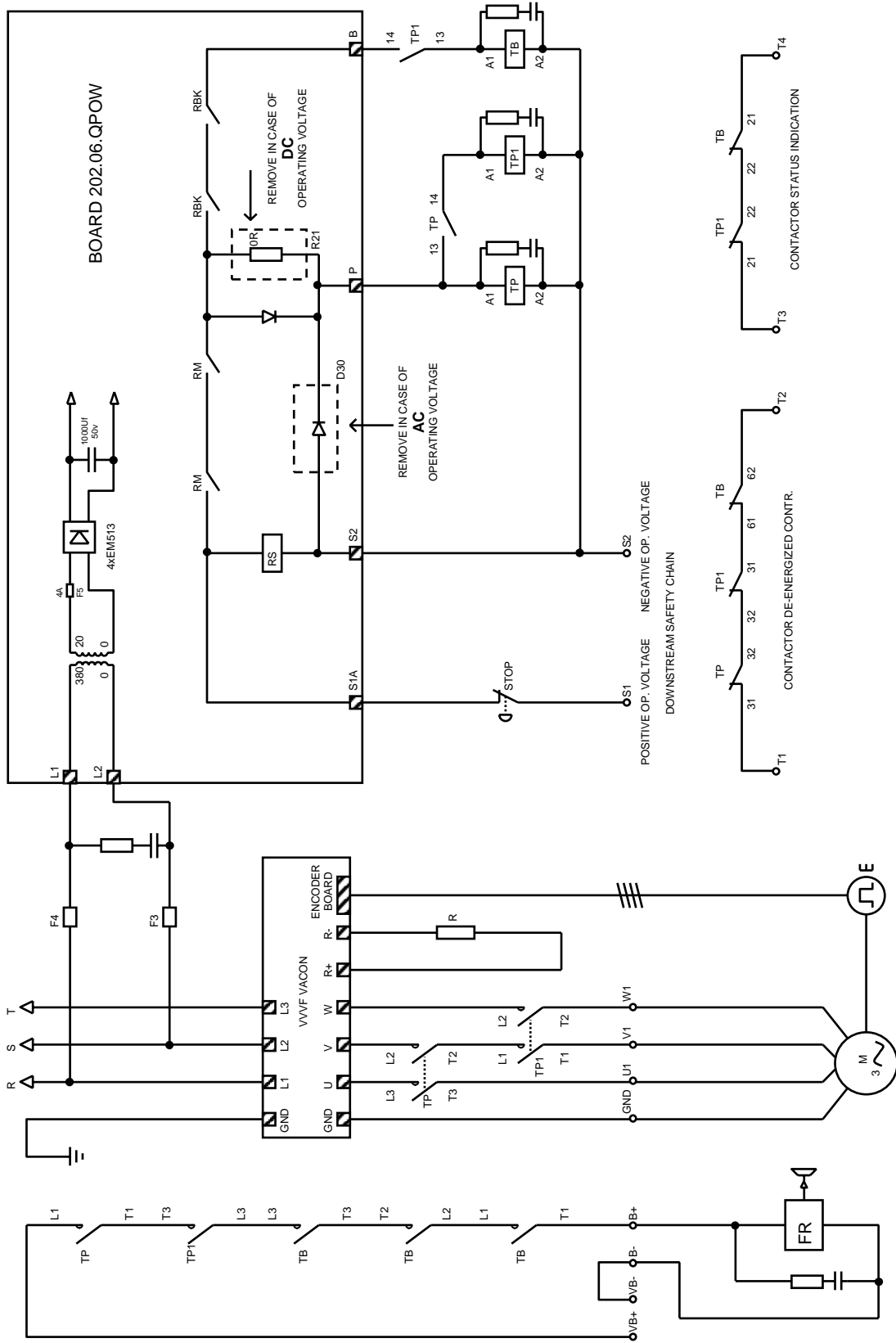


FIG. 3 : POW-3VF power part diagram



# DRAWING LEGEND

M	MAIN MOTOR	
FR	BRAKE	
E	ENCODER	
R	BRAKING RESISTOR	
STOP	EMERGENCY STOP SWITCH	
TP,TP1	MOTOR CONTACTORS	
TB	BRAKE CONTACTOR	
RS	SAFETY CHAIN STATUS RELAY	
RM	RUN RELAY	
RBK	BRAKE COMMAND RELAY	
RTP	CONTACTOR DE-ENERGIZING DELAY RELAY	
RALL	VVVF FAULT RELAY	
RDT	SPEED DETECTOR RELAY	
UP	UP COMMAND RELAY	
DW	DOWN COMMAND RELAY	
HS	HIGH SPEED RELAY	
LS	LOW SPEED RELAY	
MS	INSPECTION SPEED RELAY	
RTH	THERMISTOR PROTECTION RELAY	
S	UP CONTACT	} FROM CONTROL PANEL
D	DOWN CONTACT	
AV	HIGH SPEED CONTACT	
BV	LOW SPEED CONTACT	
VM	INSPECTION SPEED CONTACT	
SW1	RUN / INSPECTION SWITCH (RUN/MAN)	} ON QPOW INTERFACE BOARD
UP	UP PUSH-BUTTON	
DW	DOWN PUSH-BUTTON	

For further clarification 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: **POW – 3VF**

The above mentioned product is in conformity to the requirements of the following European Directives:

- **95/16/CE** 'LIFTS'
- **89/336/CEE** 'ELECTROMAGNETIC COMPATIBILITY'

when installed following the instructions from the instruction manual.

To evaluate the conformity, the following STANDARDS have been taken into consideration:

- **EN 81.1:1998**
- **EN 12015:1999**
- **EN 12016:1999**
- **EN 61800-3:1997**

DATA: 12/03/2001

SMS Sistemi e Microsistemi s.r.l.

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