

ECO-MPU

APPLICATION GUIDE



WARNING!
READ CAREFULLY CHAPTER 7
"CONNECTING THE
PROGRAMMER"

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REL.	DATE	R.T. Checking and Approval

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1 – INTRODUCTION

ECO-MPU is a microprocessor system designed, developed and produced by SMS for lifts operation. Compact and versatile, thanks to the types of functions integrated in its circuit board, it allows minimisation of the external components required on the control panel. It is suitable for both hydraulic and traction drive systems, with different types of driving (1 speed, 2 speed and with ACVV or VVVF speed regulator), with manual or automatic doors. ECO-MPU is suitable for lift operated by Automatic Push Button (A.P.B.), up to 8 stops, car with single entrance.

2- GENERAL DESCRIPTION

ECO-MPU consists of one microprocessor, which is the heart of the system, and the interface to power circuits of shaft and car .

The board comprises the following basic components:

- **16-bit microprocessor**, with integrated program memory.
- **E²PROM memory**, containing the system's programmable parameters (e.g. number of stops, type of doors, etc.) and any alarm codes.
Parameters can be modified or alarm codes read using the MPU CONSOLE keyboard (or MPU PROGRAMMER – see Chapter7). The data contained in the E²PROM are retained in the memory even in case of a power supply blackout.

ECO-MPU board has to be supplied by **3 ~ 18 VAC**: 24VDC voltage for interface circuits and 5VDC voltage for microprocessor supply are carried out inside the board itself.

The board needs 18VAC **three-phase** voltage, which is necessary to carry out the control on the 3 phases of main power supply (to check phase sequence or missing phase). Anyway, it is possible to supply the board by **single-phase** 18VAC (terminals 18R - 18S),but in this case you should disable the phase control on the board by means of the keyboard (Console or Programmer), and eventually install on the control panel a separate phase control device.

IMPORTANT Never supply the board at a voltage other than that specified; moreover note that **the negative of the 24 VDC voltage (terminal 0) must NOT be connected to ground.**

ECO-MPU has the following functions and components:

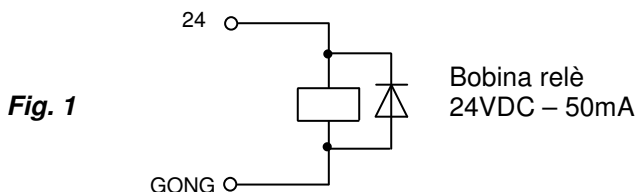
- **Checking of the phase sequence or missing phases** in the three-phase power supply voltage.
- **Motor protection by means of thermistors**, to be connected directly to the circuit board.
- **Monitoring of the status of the safety chain**, by means of 5 opto-coupled inputs in conformity with EN81 HARMONISED NORMS.
- **9 interface relays** for controlling of:
 - motor contactors (4 relays)
 - door motor contactors (1 entrance) (2 relays)
 - retiring cam contactor
 - "ENGAGED" signal
 - power supply consent (alarm relay)

"Clean" contacts of the interface relays are available on the terminal board; for terminals connected downstream of the safety chain, the insulation distances are in conformity with EN81 HARMONISED NORMS.

The contacts which control the contactor coils are electrically interlocked.

- **24 inputs 24V** for the signals coming from car and landing call buttons, deceleration and stop switches, service control board, door limit switches, photocells, etc. (see detailed list in Chapter 3). All input circuits are protected against interference and overvoltages.
- **8 transistor outputs (24V 250 mA)** for controlling the car position signalling (Terminal Boards M9 – see Chapter 3) . All output transistors are protected eventual short circuits by means of PCTs. The maximum current supplied by each output is 250 mA (which corresponds approximately to the electrical input of 2 lamps 24V 3W connected in parallel).
- **4 transistor outputs (24V 250 mA)** for optional functions: (gong, overload, car light, maintenance speed; available on Terminal Board M1→ see detailed list in Chapter 3). External relays with coil 24 VDC, maximum current 50 mA, must be provided for the operation of these outputs.

The remote relay coils must be connected across the relative terminal and 24, as shown in the example in Fig. 1 for GONG signal. Always connect a recycling diode in parallel with the coil, as shown in Fig. 1.



WARNING: The outputs connected to terminal board M1 do not have short-circuit protection, so any wrong connection may damage the circuits on the ECO-MPU board, and to the microprocessor on board itself.

- **Car movement control from the panel** by means of a switch (BEX) and two buttons (UP, DOWN) provided directly on the circuit board; this control disables calls and allows the car to be run between two or more floors chosen by the operator (see Chapter 4).
- **Inputs and outputs status displayed by means of LEDs.**
The car's position is shown by means of the 8-LEDS placed close to the terminal board M9 of this board. On the same LEDES can be read the codes of any alarms which have eventually occurred. This is possible by switching on DGN switch and pressing the UP or DOWN button to scroll them in sequence, if more than one.
- **Connector CN4 (9 pins)** for connection of the ECO keyboard; it is used for programming and diagnostic functions.

WARNING: Read carefully Chapter 7 – CONNECTING THE PROGRAMMER before connecting the keyboard to connector CN4.

2.1- ARRANGEMENTS

On the board we have foreseen one jumper and some solder point, in order to change easily and directly some functioning features.

The complete list is the following:

- J1 = Always in position 1
 SP1 = Operating with MPU CONSOLE → always in position 1 (see Chapter 7)
 SP2 – SP3 = Connection relay coils AU-AD → see Fig. 3 and Fig. 4 in Chapter 4

3 – INPUT/OUTPUT SIGNALS (TERMINAL BOARDS)

TERMINAL CODE	TERMINAL NUMBER	DESCRIPTION TERMINAL BOARD M1 (OUTPUTS)
24	M1 - 1	SUPPLY 24VDC(+): outputs common
LC	M1 - 2	CAR LIGHT / FAN CONTROL
MS	M1 - 3	MID-SPEED CONTROL
OCO	M1 - 4	CAR OVERLOAD WARNING SIGNAL
GONG	M1 - 5	GONG SIGNAL
HSD	M1 - 6	HIGH SPEED RELAY ENABLE (HS)
HSU	M1 - 7	FROM TOP/BOTTOM SLOW-DOWN SWITCHES (do <u>not</u> connect for single speed systems – see Picture 4)
AUP	M1 - 8	UP/DOWN RELAY ENABLE (AU, AD)
ADP	M1 - 9	FROM TOP/BOTTOM SLOW-DOWN SWITCHES

TERMINAL CODE	TERMINAL NUMBER	DESCRIPTION TERMINAL BOARD M2 (INPUTS)
EC	M2 - 1	CAR OCCUPIED (load ≥ 1 person)
PE	M2 - 2	PHOTOCELL
TDC	M2 - 3	CONTACTORS FOR DE-ENERGIZATION DELAY
OCI	M2 - 4	CAR OVERLOAD (load > 110% capacity)
ROP	M2 - 5	EMERGENCY
EA1	M2 - 6	OUTER ALLARM 1: if this input opens, the car will stop immediately; for example, you can connect here the VVVF fault contact. Connect to 24V if unassigned
EA2	M2 - 7	OUTER ALLARM 2: if this input opens, the car will stop at the end of the actual run; for example, you can connect here the oil thermostat contact. Connect to 24V if unass
THM1	M2 - 8	THERMISTORS
THM2	M2 - 9	

TERMINAL CODE	TERMINAL NUMBER	DESCRIPTION TERMINAL BOARD M3 (INPUTS)
24	M3 - 1	24VDC SUPPLY (+): input common
DOL1	M3 - 2	END OF RUN DOOR OPENING
DCL1	M3 - 3	END OF RUN DOOR CLOSING
URI	M3 - 4	INSPECTION UP BUTTON
DRI	M3 - 5	INSPECTION DOWN BUTTON
ULS	M3 - 6	TOP LANDING SLOW-DOWN SWITCH
DLS	M3 - 7	BOTTOM LANDING SLOW-DOWN SWITCH
USS	M3 - 8	UP STOP (DOWN DECELERATION) SWITCH
DSS	M3 - 9	DOWN STOP (UP DECELERATION) SWITCH

TERMINAL CODE	TERMINAL NUMBER	DESCRIPTION TERMINAL BOARD M4 (INPUTS)
24	M4 - 1	24VDC SUPPLY (+): common inputs
R0	M4 - 2	CALL/ SIGNAL LANDING 0
R1	M4 - 3	CALL/ SIGNAL LANDING 1
R2	M4 - 4	CALL/ SIGNAL LANDING 2
R3	M4 - 5	CALL/ SIGNAL LANDING 3
R4	M4 - 6	CALL/ SIGNAL LANDING 4
R5	M4 - 7	CALL/ SIGNAL LANDING 5
R6	M4 - 8	CALL/ SIGNAL LANDING 6
R7	M4 - 9	CALL/ SIGNAL LANDING 7

TERMINAL CODE	TERMINAL NUMBER	DESCRIPTION TERMINAL BOARD M5 and M6 (INPUTS)
SC1	M5 - 1	OPTO-INSULATED INPUT AT TOP OF SAFETY CHAIN (downstream of the OPERATING AUTOMATIC SWITCH)
SC1C	M5 - 2	CONTROL PANEL GROUND
SEX	M5 - 3	OPTO-INSULATED INPUT, SAFETY CHAIN 1 (downstream of OVERTRAVEL SWITCH, which must be the 1 st of the safety chain)
SEXC	M5 - 4	CONTROL PANEL GROUND
SC2	M5 - 5	OPTO-INSULATED INPUT, SAFETY CHAIN 2 (downstream of SPEED GOVERNOR, SAFETY GEAR, ETC, and the NORMAL / INSPECTION SERVICE switch) Input SC2 must stay EVER open during the INSPECTION service.
SC2C	M6 - 1	CONTROL PANEL GROUND
SC3	M6 - 2	OPTO-INSULATED INPUT, SAFETY CHAIN 3 (downstream of CAR STOP CONTROL (if present for existing lifts) and LANDING DOOR DRAWING IN contacts)
SC3C	M6 - 3	CONTROL PANEL GROUND
SC4	M6 - 4	OPTO-INSULATED INPUT, SAFETY CHAIN 4 (downstream of CAR DOORS and LANDING DOOR LOCKED contacts)
SC4C	M6 - 5	CONTROL PANEL GROUND

TERMINAL CODE	TERMINAL NUMBER	DESCRIPTION TERMINAL BOARD M7 (INPUTS)
18R	M7 - 1	BOARD SUPPLY 18VAC 3-phase FROM TRANSFORMER If supplied by 18VAC single-phase, connect to terminals 18R – 18S
18S	M7 - 2	
18T	M7 - 3	
0	M7 - 4	24VDC for INPUTS / OUTPUTS SUPPLY or from BATTERY for BOARD EMERGENCY SUPPLY
24	M7 - 5	EMERGENCY SUPPLY
RC	M7 - 6	DRIVE CONTACTOR CONTROL It is possible to set if input has to be HIGH active (N.O. parallel contacts) or LOW active (N.C. series contacts)
	M7 - 7	Not connected
OS2	M7 - 8	ALARM RELAY - N.O. VOLTAGE FREE CONTACT
OS1	M7 - 9	(connect in series with operation voltage, <u>upstream</u> of the safety chain)

TERMINAL CODE	TERMINAL NUMBER	DESCRIPTION TERMINAL BOARD M8 (OUTPUTS)
CA	M8 - 1	COMMON UP/DOWN CONTROLS
AD	M8 - 2	DOWN CONTROL
AU	M8 - 3	UP CONTROL
	M8 - 4	Not connected
CS	M8 - 5	COMMON HIGH/LOW SPEED CONTROLS
HS	M8 - 6	HIGH SPEED CONTROL
LS	M8 - 7	LOW SPEED CONTROL
	M8 - 8	Not connected
CD	M8 - 9	COMMON DOOR AND RETIRING CAM CONTROLS
DO	M8 - 10	DOOR OPENING CONTROL
DC	M8 - 11	DOOR CLOSING CONTROL
CAM	M8 - 12	RETIRING CAM CONTROL

TERMINAL CODE	TERMINAL NUMBER	DESCRIPTION TERMINAL BOARD M9 (OUTPUTS)
CRE	M9 - 1	COMMON FOR LANDING BUTTONS
ECC	M9 - 2	
ECL	M9 - 3	"OCCUPIED" SIGNAL SUPPLY: N.O. VOLTAGE FREE CONTACT
+S	M9 - 4	COMMON CAR POSITION SIGNAL
S7	M9 - 5	CAR POSITION SIGNAL LANDING 7
S6	M9 - 6	CAR POSITION SIGNAL LANDING 6
S5	M9 - 7	CAR POSITION SIGNAL LANDING 5
S4	M9 - 8	CAR POSITION SIGNAL LANDING 4
S3	M9 - 9	CAR POSITION SIGNAL LANDING 3
S2	M9 - 10	CAR POSITION SIGNAL LANDING 2
S1	M9 - 11	CAR POSITION SIGNAL LANDING 1
S0	M9 - 12	CAR POSITION SIGNAL LANDING 0

4 - OPERATION

ECO-MPU control device is able to operate the **electronic floor selector** and lift operation in all the different conditions envisaged: **normal operation, inspection operation, adjustment operation and rescue operation.**

4.1 ELECTRONIC FLOOR SELECTOR

For this purpose the microprocessor uses the signals from two switches mounted on the car to determine the car position during any run.

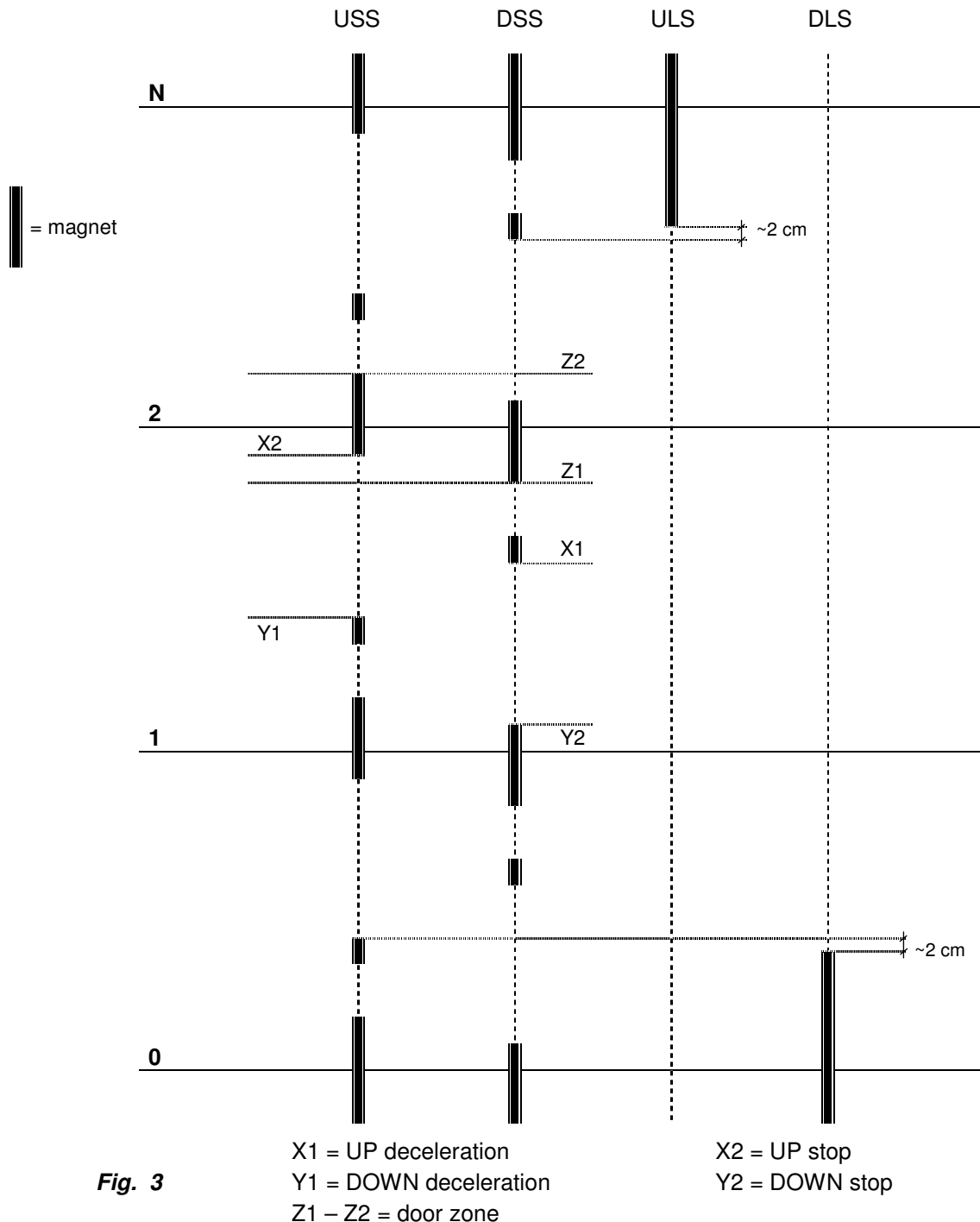
These switches are connected to the USS and DSS inputs.

The selector release and the eventual deceleration of the car, is controlled by DSS during UP travel and by USS opens during DOWN travel.

Car stop at the landing, if car has slowed down, is controlled by USS during UP travel and by DSS during DOWN travel (the complete stop occurs when both switches are engaged).

The floor selector resets its phase each time the car reaches the top or bottom floor: this is ensured by two switches, an upper limit switch (ULS) and a lower limit switch (DLS), which directly control deceleration and position the selector at the relative floor (top or bottom).

The explanations which follow and Figure 2, which shows the switching sequence of USS, DSS, ULS and DLS, refer to N.C. switches (normally closed, which opens when tripped by the magnet).



Limit switches ULS and DLS must only be of N.C. type, while for deceleration and stopping (USS and DSS) it is possible to program both type N.O. (normally opened, which closes when tripped by the magnet) or N.C. type, by means of MPU CONSOLE. In this case both switches must be provided of the same type SMS supplies the circuit boards already programmed for the N.C. type.

The floor selector automatically resets its phase by sending the car to the top or bottom floor every time power is returned after a shutoff or when normal operation restarts after an alarm reset; as for example after a travel time alarm or motor thermistor trip, incorrect phase sequence, etc..

The reset operation is different depending on car position and the type of driving:

- Car outside the bottom landing deceleration zone: starts down at high speed and stops when the switch DLS opens (1-speed lift); otherwise it decelerates when DLS opens and stops by opening of USS and DSS (2-speed lift).
- Car inside the bottom landing deceleration zone but not at exact floor level:
 - 1 or 2-speed Lift: starts up at high speed and stops when ULS opens (1-speed lift), or slows down when ULS opens, and stops completely when USS and DSS open (2-speed lift).
 - Hydraulic lift or with speed regulator (ACVV o VVVF) starts down at low speed and stops at the bottom landing when USS and DSS open.

If the phase reset cycle does not terminate successfully, due to door problems or other faults, the cycle repeats five times, after which the car remains out of service and an alarm message is generated.

4.2- NORMAL OPERATION

Provides full control of the logic operation in A.P.B. lifts.

4.3- INSPECTION OPERATION

During INSPECTION operation, the maintenance technician operates the elevator from the car roof (dead man).

The microprocessor monitors the inspection board control state via input SC2 (SC2 = 0 → inspection in progress) and controls car movement when inputs URI (UP) or DRI (DOWN) are activated via a contact of the pendant control buttons.

Inspection run can be performed in high or low speed (programmable by MPU CONSOLE).

For 2-speed lift inspection is performed in high speed but low speed control is actuated for 3 seconds anyway, after which the system switches to high speed: this is to allow the operator to approach a specific point with low speed precision if necessary.

4.4- ADJUSTMENT OPERATION

During ADJUSTMENT operation, the maintenance technician can control the car movement from the control panel, while normal calls to the elevator and door opening are excluded. A switch (BEX) and two buttons (UP, DOWN) are provided for this purpose.

With the switch BEX ON the adjustment mode is enabled while normal operation is disabled.

If the BEX switch is closed during car movement, adjustment mode is enabled only after the car has arrived at the landing and the doors have been opened.

The UP/DOWN buttons control car movement UP or DOWN; the car moves at high speed while the button is held down. When the button (UP or DOWN) is released, high speed drive continues until the car encounters a deceleration zone, at which point it decelerates and stops at the relative landing.

If the button for the direction opposite to that of the lift's travel direction (e.g. DOWN while the lift is going up), is pressed, the system stops immediately.

4.5- RESCUE OPERATION

Emergency operation, to bring the car to the floor when the mains power has failed, is enabled by closing the ROP input.

When ROP=1, the phase control is immediately disabled, after which the operating mode is different for hydraulic and traction lifts.

- a) **Hydraulic lifts** 5 seconds after ROP is activated, the lift starts a downward travel as if automatically instructed to return to the bottom floor. When it reaches the floor, the automatic doors (if installed) open, and once they are open no further operation is possible until the ROP input returns to 0, after which the lift goes back into service, with a reset procedure.
- b) **Traction lifts** 5 seconds after ROP is activated, the circuit board gives the command for downward travel (though the direction the car will take depends on the load).
The lift stops (without deceleration) at the first stopping zone it reaches, i.e. when USS and DSS are both tripped; at this point, the automatic doors (if installed) open, and once they are open no further operation is possible until the ROP input returns to 0, after which the lift goes back into service, with a resynchronisation procedure.

In the different operating modes described above, the start cycle is initiated first of all by actuating the CAM output when the doors are closed and then, 200 milliseconds after closure of input SC4 (landing door locked), the drive starts, always at high speed (except for special cases) by actuating AU (UP) or AD (DOWN) together with HS (high speed).

Deceleration is controlled by opening HS and actuating output LS (low speed).

The car stops at the landing when LS opens. AU / AD can be opened at the same time as LS (for 2-speed or hydraulic lifts), or can be delayed for systems with speed regulator ACVV or VVVF. The delay can be programmed using a special internal timer (see Chapter 6 TIMERS - TOC timer), or if the ACVV or VVVF drive has an output which controls the opening of the contactors. In this case connect this contact (which must close when the lift is moving and open, with delay, when it stops at a floor) to input TDC: this means that opening of the AU / AD relays (and thus of the motor contactors) will be triggered by the speed regulator at the right moment.

To ensure stopping at the top and bottom landings even if the microprocessor is disabled, the top and bottom landing limit switches (ULS and DLS) act like input signals for the controller, but also directly trip the HS (high speed) output relay for 2-speed, speed-regulated or hydraulic lift systems, or directly trip the AU (UP) or AD (DOWN) output relays for 1-speed lifts.

For this purpose terminals AUP, ADP, HSU, HSD and solder points SP1 and SP3 are foreseen on the board. Figures 3 and 4 show the connections which must be wired in the above two cases.

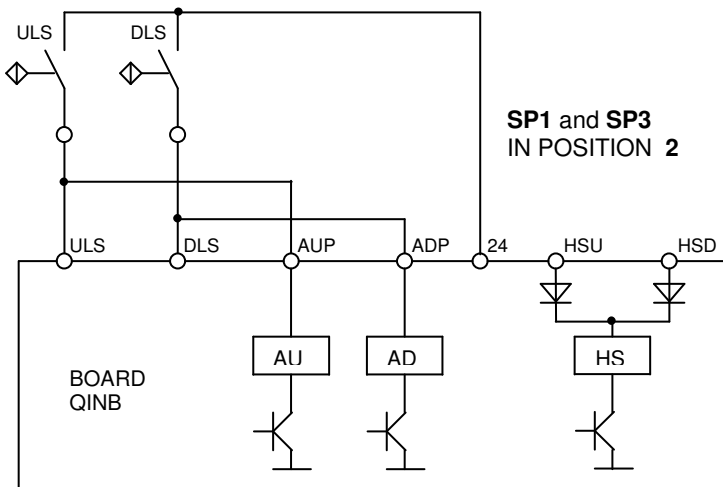


Fig.3: Connections for terminals AUP, ADP, HSU, HSD and solder points SP1 and SP3 for 1-speed systems

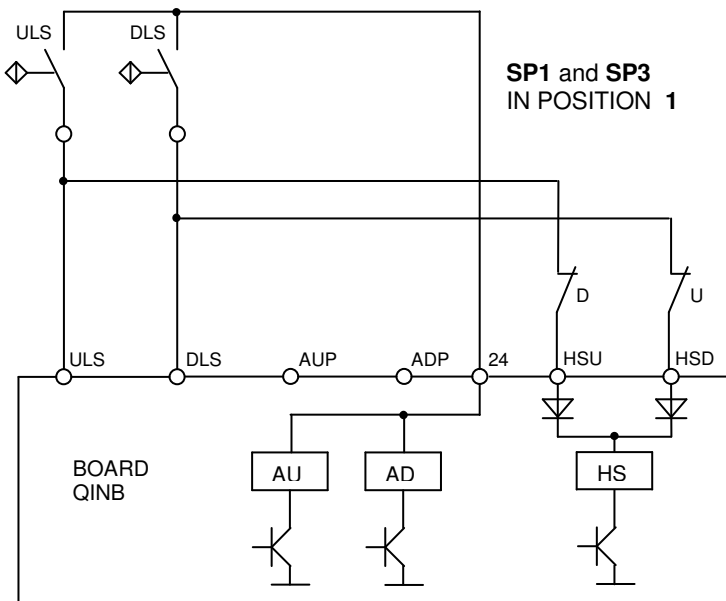


Fig.4: Connections for terminals AUP, ADP, HSU, HSD and solder points SP1 and SP3 for 2-speed, speed-regulated or hydraulic drive systems.

5 – TIMERS

For optimal control of the elevator during operation many timers are required; some of these are operational in the sense that they control operating sequences, while others are protective in function, that is, they monitor and detect faults which avoid successful termination of operational sequences.

Some can be programmed via keyboard, others are set, that is, the value is fixed in the CPU's internal program memory.

The following tables detail the functional timers:

5.1 – OPERATION TIMERS

CODE	DESCRIPTION	TIME	TYPE
TC	START DELAY It avoids immediate car start after a stop due to any cause (stop at landing, safety trip, alarm condition, etc.)	0 ÷ 20 sec	PROGR
TO	CAR OCCUPIED DELAY The classic delay which controls the "occupied" signal and excludes other calls from landing panels.	1 ÷ 60 sec	PROGR
TS	STOP DELAY The delay between opening of the stop switch and its actual effect, that is, the car stops after a time set by this delay. Using this delay, it's possible to have always the same length of stop magnets, whatever is the kind or speed of the lift.	0.0 ÷ 2.0 sec	PROGR
TRPR	RETIRING CAM DELAY The delay between the contactors opening and the opening of the relay which controls the retiring cam. For example it can be used in 1-speed systems, to control retiring cam de-energization when the car is already stopped at floor (at the stopping phase end).	0.0 ÷ 2.0 sec	PROGR
TAP	DOOR OPEN DELAY The delay between the opening of the contactors and the door open command. For example it can be used in systems with automatic doors and retiring cam, to have that the door opening starts when the retiring cam is already de-energized.	0.0 ÷ 2.0 sec	PROGR
TG	GONG TIME The time for which the car at landing gong control is active, from when the doors start to open, or from when the car is stopped, in case of manual doors.	0.1 ÷ 3.0 sec	PROGR
TFL	FAN AND/OR CAR LIGHT DELAY Controls the LC output and determines for how long this output is active after the occupied signal is disabled.	1 ÷ 255 sec	PROGR
TAR	AUTOMATIC RETURN ACTIVATION DELAY	1 ÷ 15 min	PROGR
TOC	CONTACTOR OPEN DELAY Used in speed regulated systems (type ACVV or VVVF) to allow contactor opening only when the motor has already stopped.	0.0 ÷ 2.0 sec	PROGR
TES	RESCUE OPERATION STOP DELAY The equivalent of the TS timer for rescue operation.	0.0 ÷ 2.0 sec	PROGR

5.2 – PROTECTION TIMERS

CODE	DESCRIPTION	TIME	TYPE
TDO	MAX. DOOR OPENING TIME If the doors do not terminate their opening travel within the set time, the door motor control is cancelled.	1 ÷ 60 sec	PROG
TDC	MAX. DOOR CLOSING TIME If the doors do not terminate their closing travel within the set time, the door motor closing command is cancelled, and doors reopen waiting for a new calls. If the timer trips while the doors are closing during the reset cycle, five attempts at closing are made, after which the car remains stopped with the doors open.	1 ÷ 60 sec	PROG
THS	HIGH SPEED MAX. TRAVEL TIME To ensure that the programmed time does not depend on the total travel of the lift, the counter starts again from zero every time a landing is passed.	1 ÷ 45 sec	PROG
TLS	LOW SPEED MAX. TRAVEL TIME Active even during hydraulic lift re-levelling	1 ÷ 45 sec	PROG
TRO	RESCUE OPERATION MAX. TIME If the rescue operation do not terminate its cycle within the set time, it is stopped. To resume normal operation, the opening of the ROP input is necessary.	2 ÷ 15 min	PROG
TPE	PHOTOCELL BEAM BROKEN TIME It doesn't make any effect, only an alarm code is shown.	20 sec	SET
TRC	CONTACTOR OPENING CONTROL The timer trips if the RC input (drive contactors) does not open within two seconds of the contactor open control (de-energising of outputs AU / AD).	2 sec	SET
TCB	CAR DOOR CLOSURE AND LANDING DOOR BLOCKAGES CONTROL The timer trips at drive start if, with the doors completely closed (input SC3 energised and input DCL1 not active), input SC4 does not energise within 2 seconds.	2 sec	SET
TAC	CONTACTOR CLOSURE CONTROL The timer trips at drive start if, with the doors blocked (input SC4 energised), input RC does not energise within 2 seconds.	2 sec	SET
TSM	DRIVE START CONTROL The timer trips at drive start if, after closure of the contactors, the car does not exit from the stop zone within a few seconds (5 seconds for traction lift, 8 seconds for hydraulic lift)	5 sec 8 sec	SET

If a protection timer trips an alarm message is issued.
The full list of alarm messages is given in the Chapter 6.

6 – ALARM MESSAGES

ALARM MESSAGE	DESCRIPTION	DGN CODE LED S7+S0 S7 S6 S5 S4 S3 S2 S1 S0
PHASE SEQUENCE ERROR OR PHASE FAILURE	Any of these alarm messages shuts down the system immediately.	☺☺☺☺☺☺☺☺
OPERATING VOLTAGE FAILURE	When normal operation is resumed, the elevator automatically resets before returning to service.	---
EXTERNAL ALARM 1	The number of alarm events is counted (up to 31).	---
HIGH SPEED TRAVEL TIME TRIP	Any of these alarm messages shuts down the system immediately.	☺☺☺☺☺☺☺☺
LOW SPEED TRAVEL TIME TRIP	The lift can return to normal operation only after a manual RESET using the BEX switch on the board.	☺☺☺☺☺☺☺☺
HYDRAULIC RE_LEVELLING	By closing and opening the BEX switch, the elevator will be reset and return to normal operation	☺☺☺☺☺☺☺☺
TIME TRIP		☺☺☺☺☺☺☺☺
CONTACTOR OPENING FAILURE		☺☺☺☺☺☺☺☺
OVERTRAVEL MEMORY		☺☺☺☺☺☺☺☺
DOOR CLOSING TIMER TRIPPED		☺☺☺☺☺☺☺☺
DOOR OPENING TIMER TRIPPED		☺☺☺☺☺☺☺☺
WRONG OPERATION OF	These alarm messages do NOT shut down the system.	☺☺☺☺☺☺☺☺
RESET SWITCH	The number of alarm events is counted (up to 31).	☺☺☺☺☺☺☺☺
TDC INPUT CLOSURE FAILURE	(from ACVV or VVVF speed gulator)	☺☺☺☺☺☺☺☺
PHOTOCELL BEAM BROKEN OR		---
NOT ACTIVE		---
FOR MORE THAN 20 SECONDS		---
DOOR CLOSURE OR	These alarm messages do NOT shut down the system.	☺☺☺☺☺☺☺☺
LANDING DOOR LOCK FAILURE	The number of alarm events is counted (up to 31).	☺☺☺☺☺☺☺☺
CONTACTOR CLOSURE FAILURE	The landing at which the alarm event has occurred is also stored in the memory	☺☺☺☺☺☺☺☺
NO MOVEMENT AT START		☺☺☺☺☺☺☺☺
THERMISTOR TRIPPED	This alarm message shuts down the system, immediately or only at the end of the current travel (programmable). When normal operating conditions are achieved, that is, the motor temperature drops below the trip threshold, the elevator can return to service automatically after 15 minutes, or await a manual RESET by means of the BEX switch: this choice can be made with the keyboard. When the elevator returns to normal operation the reset cycle is run anyway. The number of alarm events is counted (up to 31).	☺☺☺☺☺☺☺☺
EXTERNAL ALARM 2	This alarm message shuts down the system only at the end of the current travel. When normal operating conditions are achieved the elevator returns to service automatically without running a reset cycle. The number of alarm events is counted (up to 31).	---
RESET CYCLE FAILURE	This alarm signal indicates that the elevator cannot enter service because the reset cycle will not terminate successfully. To try again, it's necessary to switch the power supply off and then on. The number of alarm events is counted (up to 31).	☺☺☺☺☺☺☺☺

DGN CODE = Indicates which number is shown on a series of LEDS which normally indicate the car position, when the DGN switch is ON.

No Led on means <<NO ALARM>>

☺ = Led OFF , ☹ = Led ON

It is important to underline that for hydraulic lifts in an alarm condition (even alarms which put the lift out of service) the automatic return to bottom landing within 15 minutes, remains active.

7 – CONNECTING THE PROGRAMMER

Lift specification can be programmed on ECO-MPU by means of 2 different keyboard: MPU CONSOLE, with alphanumeric display, or with MPU-PROGRAMMER with 5 7 segments numeric display .

To connect correctly the keyboard **MPU CONSOLE** simply connect it with the cable supplied by SMS, checking, check that the following conditions are met:

- Jumper JP1 set on 1
- Solder point SP1 set on 1

To connect correctly the keyboard **MPU PROGRAMMER**, check that the following conditions are met:

- Jumper JP1 set on 1
- Solder point SP1 set on 2

In addition, an adapter to which the MPU PROGRAMMER cable can be connected must be fitted to connector CN4.

This adapter, code 302.06.ADAT1 (see Fig. 5), must be ordered separately from SMS.

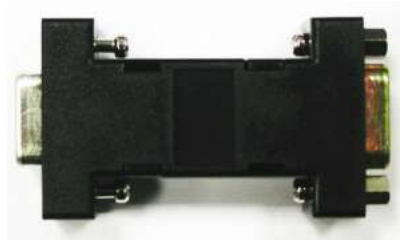
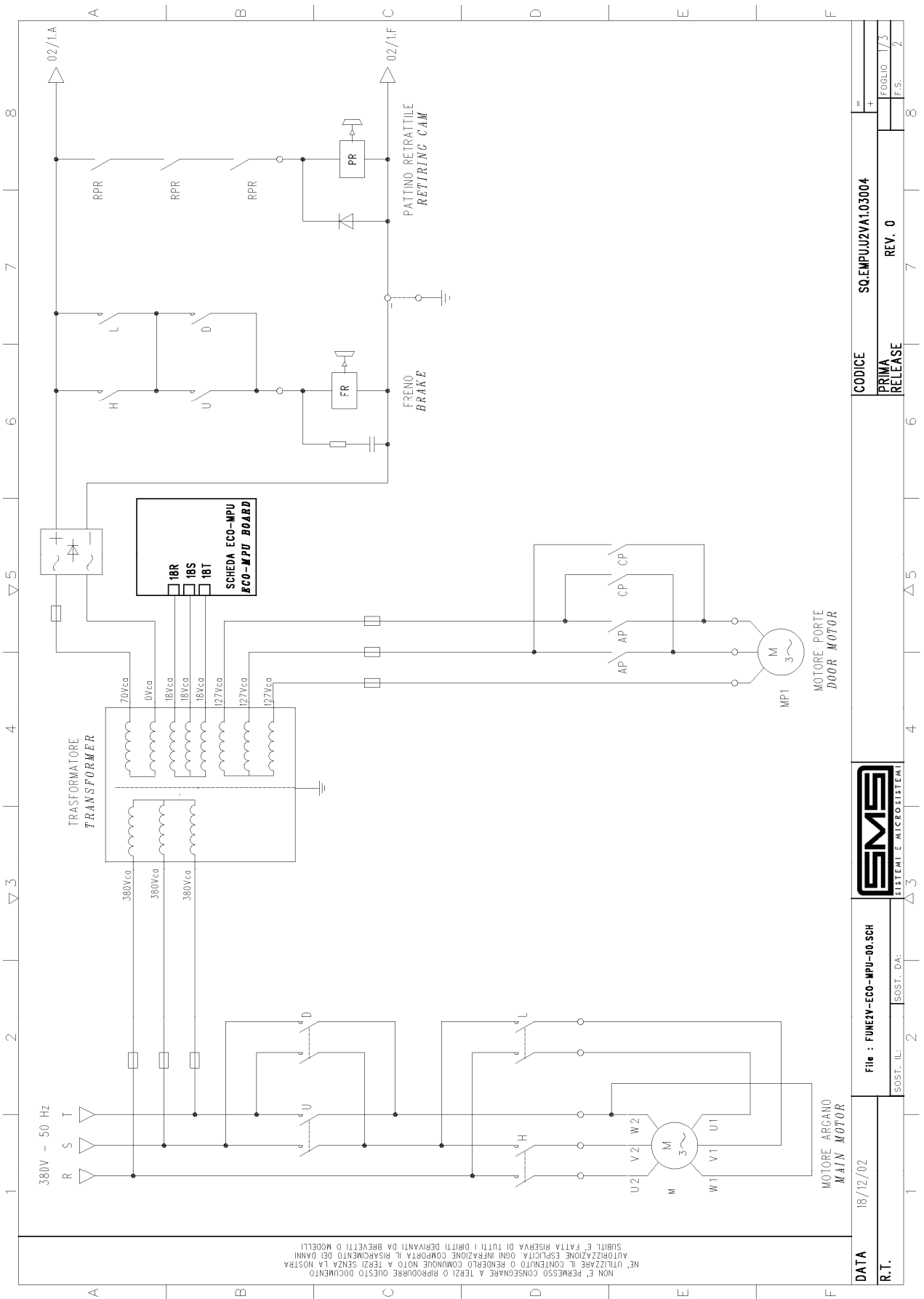


Fig. 6 – MPU PROGRAMMER ADAPTER, code 302.06.ADAT1

For more detailed information about the operation of the MPU PROGRAMMER, refer to the user's manual supplied with the programmer itself.

8 – EXAMPLE WIRING DIAGRAM FOR PANEL WITH A.P.B. OPERATION, 2-SPEED

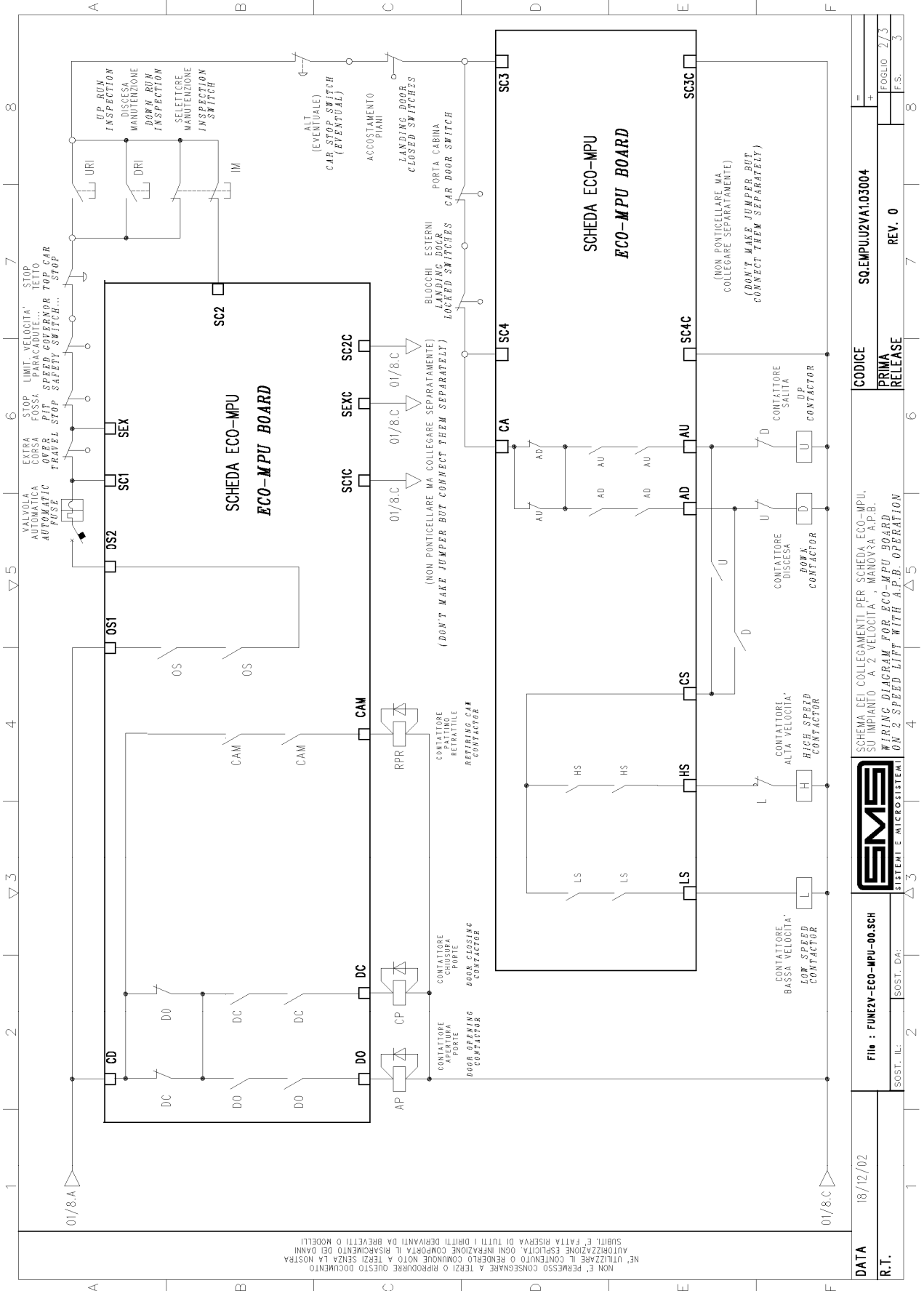


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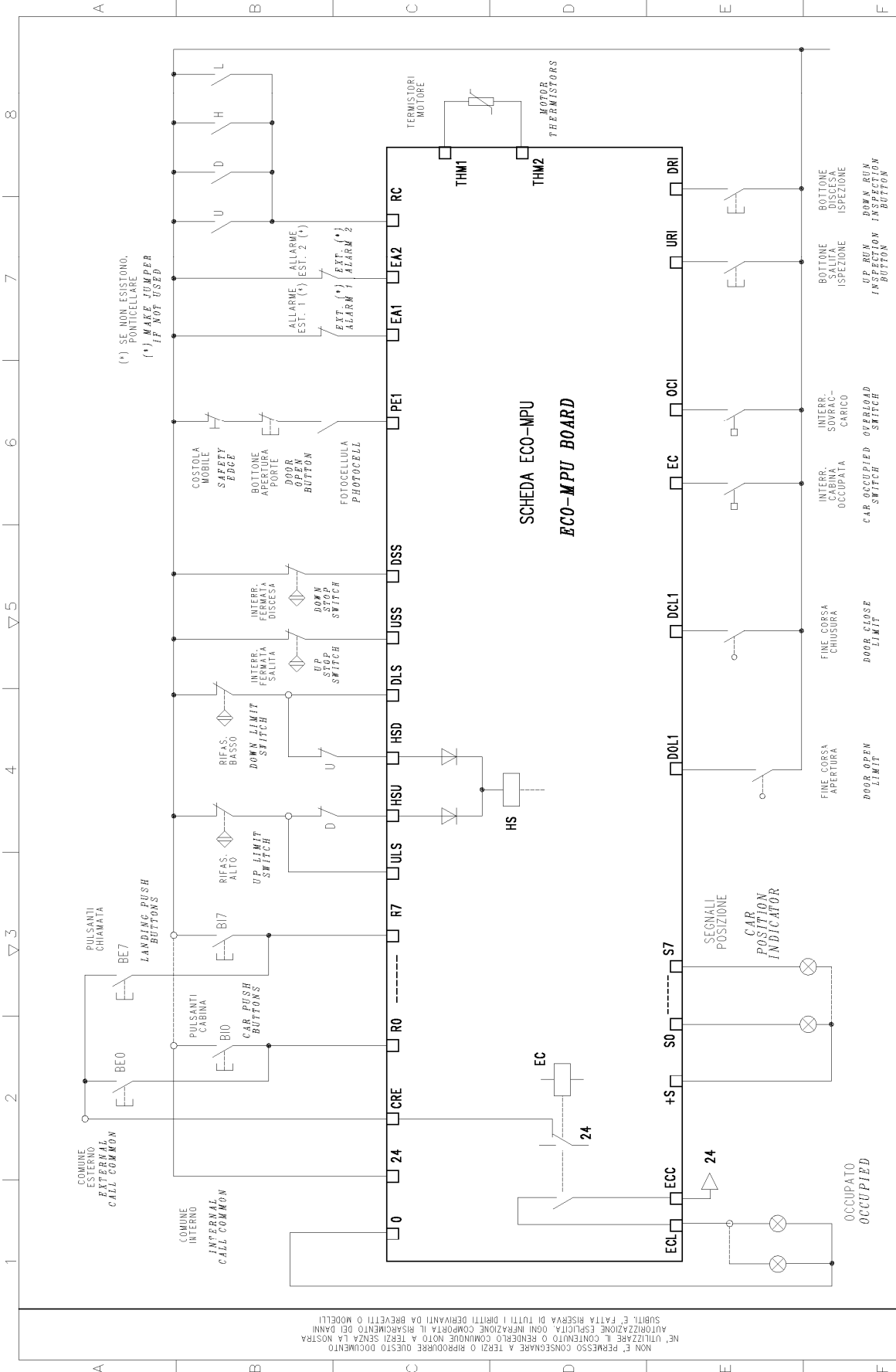
DATA 18/12/02
 R.T.

CODICE SQ.EMPUU2VA1.03004
 PRIMA RELEASE REV. 0

FOLIO 1/3
 F.S. 2



DATA	18/12/02	CODICE	SG.EMP.U02V1.03004
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	SOST. DA:	REV. 0	F.S. 3

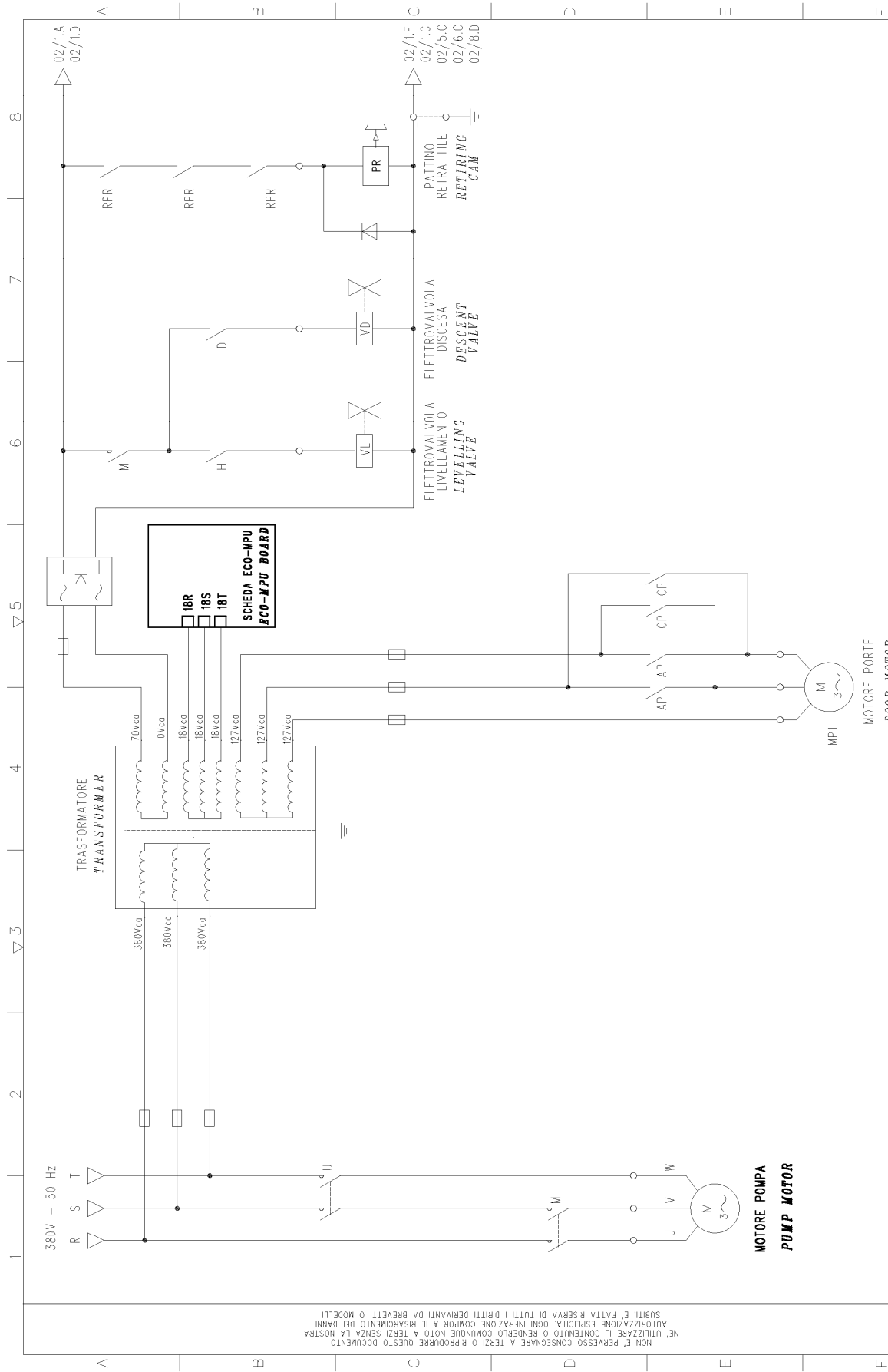


DATA	18/12/02	CODICE	SQ.EMPLU2VA1.03004
R.T.	SOST. IL: 2	PRIMA RELEASE	REV. 0
	SOST. DA:		F.S. //
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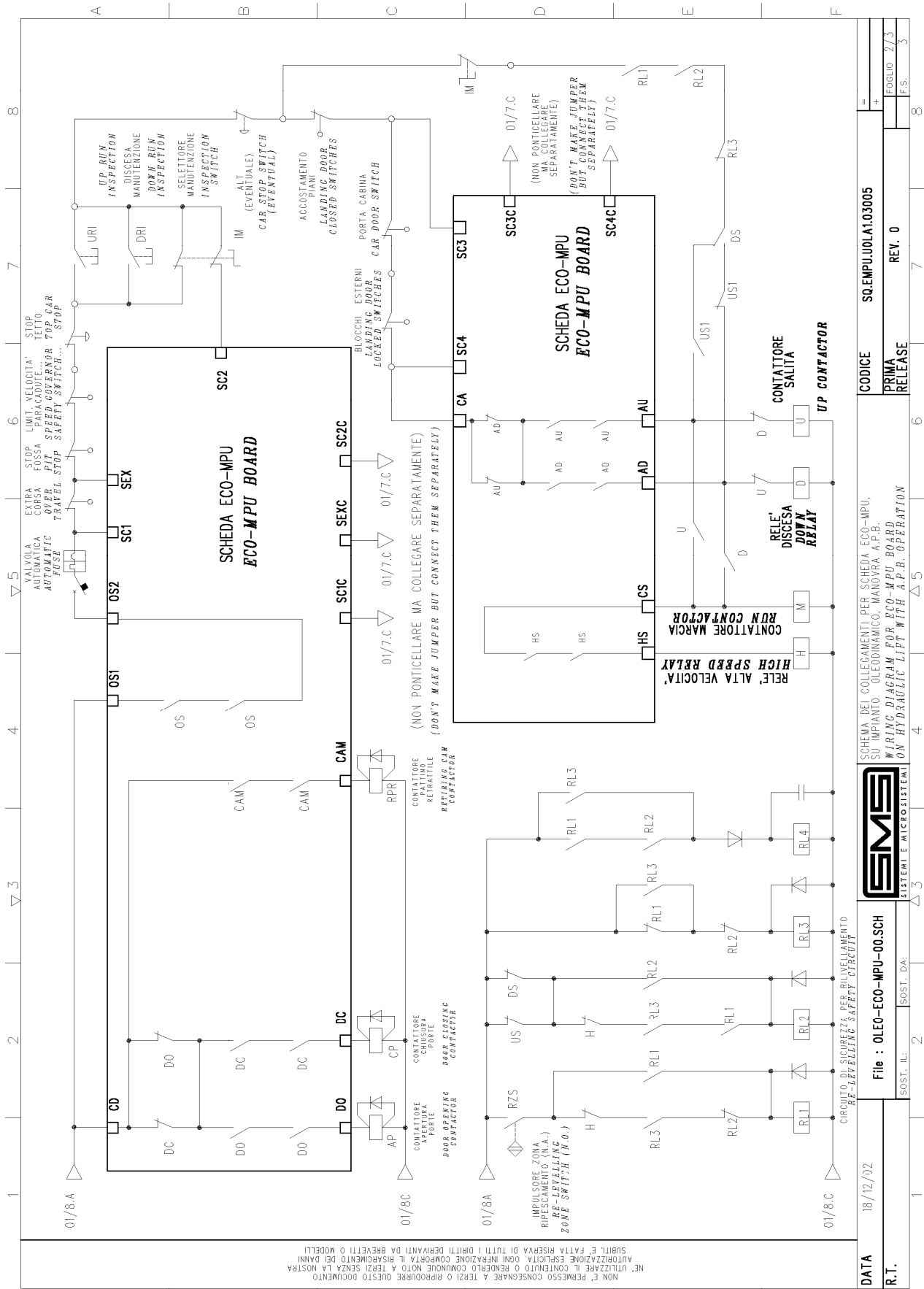
SCHEMA DEI COLLEGAMENTI PER SCHEDA ECO-MPU, SU IMPIANTO A 2 VELOCITÀ, MANOVRA A.P.B.
WIRING DIAGRAM FOR ECO-MPU BOARD ON 2 SPEED LIFT WITH A.P.B. OPERATION

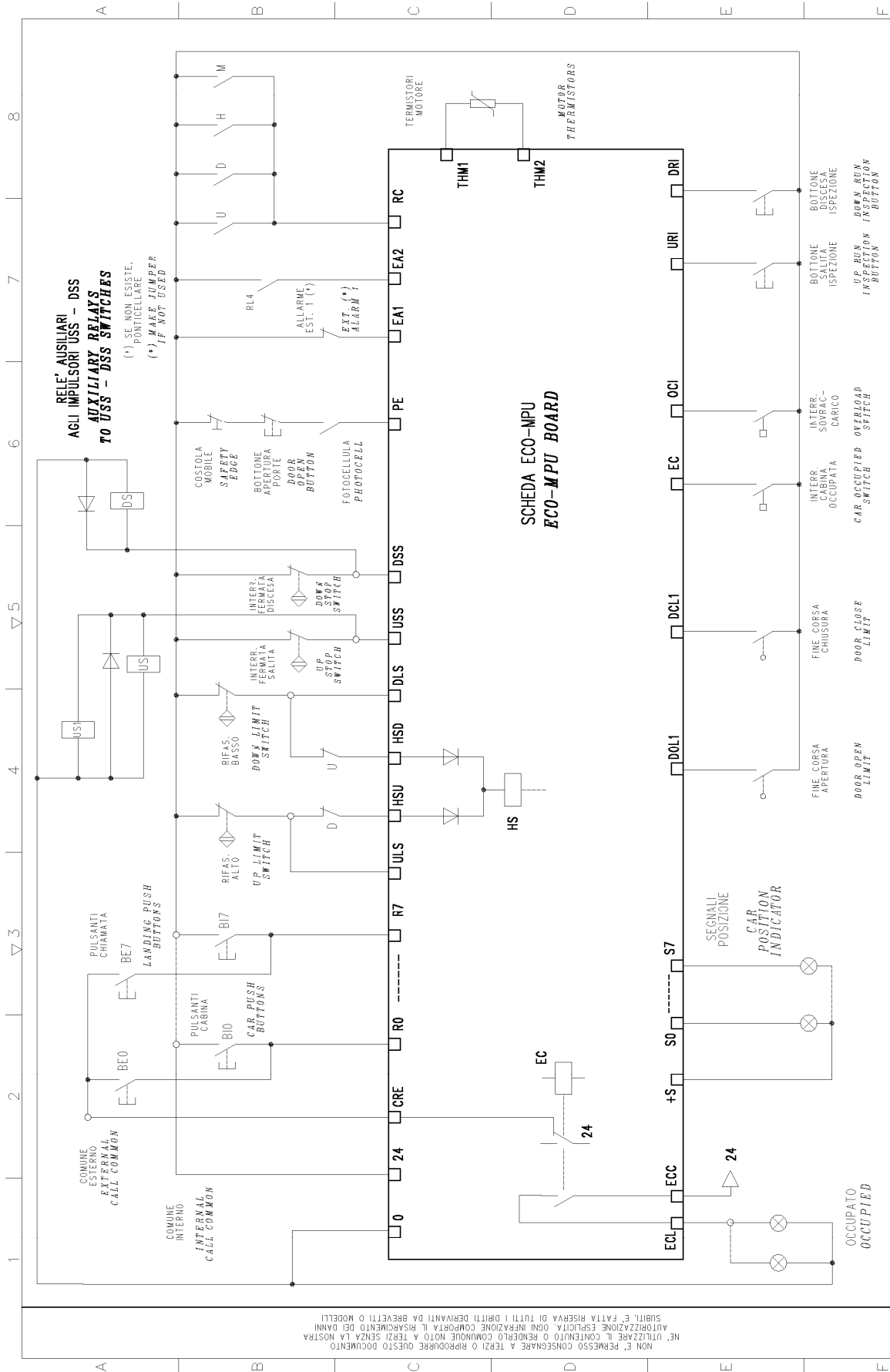
9 – EXAMPLE WIRING DIAGRAM FOR PANEL WITH A.P.B. OPERATION, HYDRAULIC



NON E' PERMESSO CONSERVARE A TERZI O RIPRODURRE QUESTO DOCUMENTO
 NE' UTILIZZARE IL CONTENUTO O RENDERSI RESPONSABILI SENZA LA MOSTRA
 AUTORIZZAZIONE ESPlicitA. OGNI INFRAZIONE COMPORTA IL RISARCIMENTO DEI DANNI
 SUBITI, E' FATTA RISERVA DI TUTTI I DIRITTI DERIVANTI DA BREVETTI O MODELLI

DATA	18/12/02	FILE : OLEO-ECO-MPU-00.SCH	SISTEMIE MICROSYSTEMI	SHEMA DEL COLLEGAMENTI PER SCHEDA ECO-MPU, SU IMPIANTO OLEODINAMICO MANOVRA A.P.B. WIRING DIAGRAM FOR ECO-MPU BOARD ON HYDRAULIC LIFT WITH A.P.B. OPERATION	CODICE	SQ.EMPU.UOLA.103005
R.T.	SOST. IL: 2	SOST. DA:			PRIMA RELEASE	REV. 0
						F.S. 1/3
						F.S. 2





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 NE' UTILIZZARE IL CONTENUTO O RENDERSLO' COMUNE, NOTO A TERZI SENZA LA NOSTRA
 AUTORIZZAZIONE. L'ESPRESA OMISSIONE INFRASCRITTA' E' IL RISPETTO DEI DIRITTI
 SUOI, E' FATTA RISERVA DI TUTTI I DIRITTI DERIVANTI DA BREVETTI O MODELLI.

DATA 18/12/02
 R.T.

File : OLEO-ECO-MPU-00.SCH
 SOST. IL: 2 SOST. DA: 1



SCHEMA DEI COLLEGAMENTI PER SCHEDA ECO-MPU,
 SU IMPIANTO OLEODINAMICO, MANOVRA A.P.B.
 WIRING DIAGRAM FOR ECO-MPU BOARD
 ON HYDRAULIC LIFT WITH A.P.B. OPERATION

CODICE SQ.EMPUIUL1.03005
 PRIMA RELEASE
 REV. 0

Foglio 3/3
 F.S.

With regard to this example of control panel for hydraulic system, note that relays RL1, RL2 and RL3, which make up the safety circuit for re-levelling operation, must be "forced guided" or "linked contact" safety relays, or mini contactors.

RL4, on the other hand, is simply a control relay and may be a mini-relay: it must always be excited, except when the safety circuit which allows the re-levelling operation is out of service. In this case, the MPU board detects the potential danger through breaking of the RL4 contact connected to input EA2.

11.1 - HYDRAULIC SYSTEM SWITCHES

Compared to electric systems (see Fig.2), for hydraulic systems there is an extra switch to control the re-levelling zone with safety circuit (RZS). The contact of this switch must be N.O. (closed at the floor).

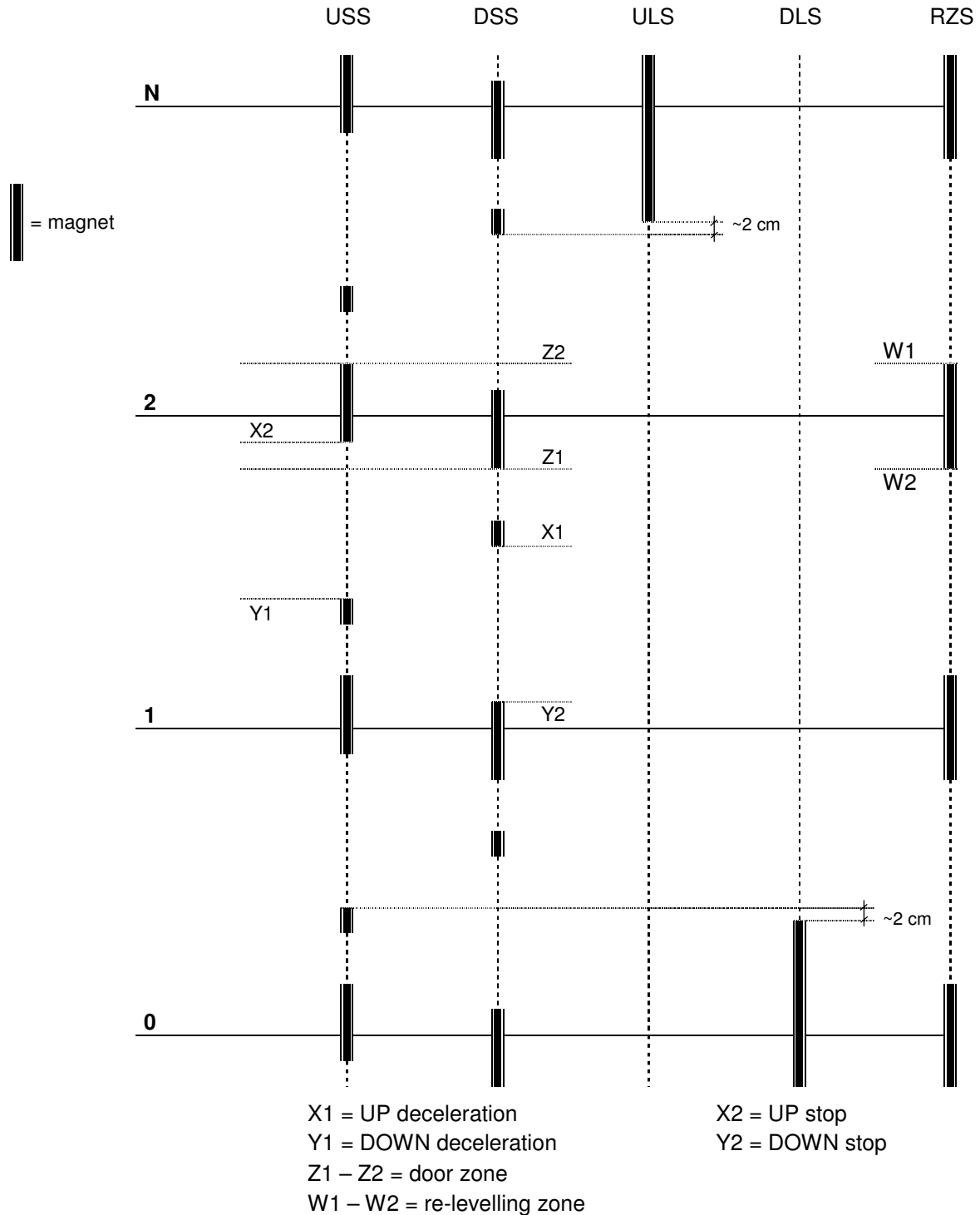
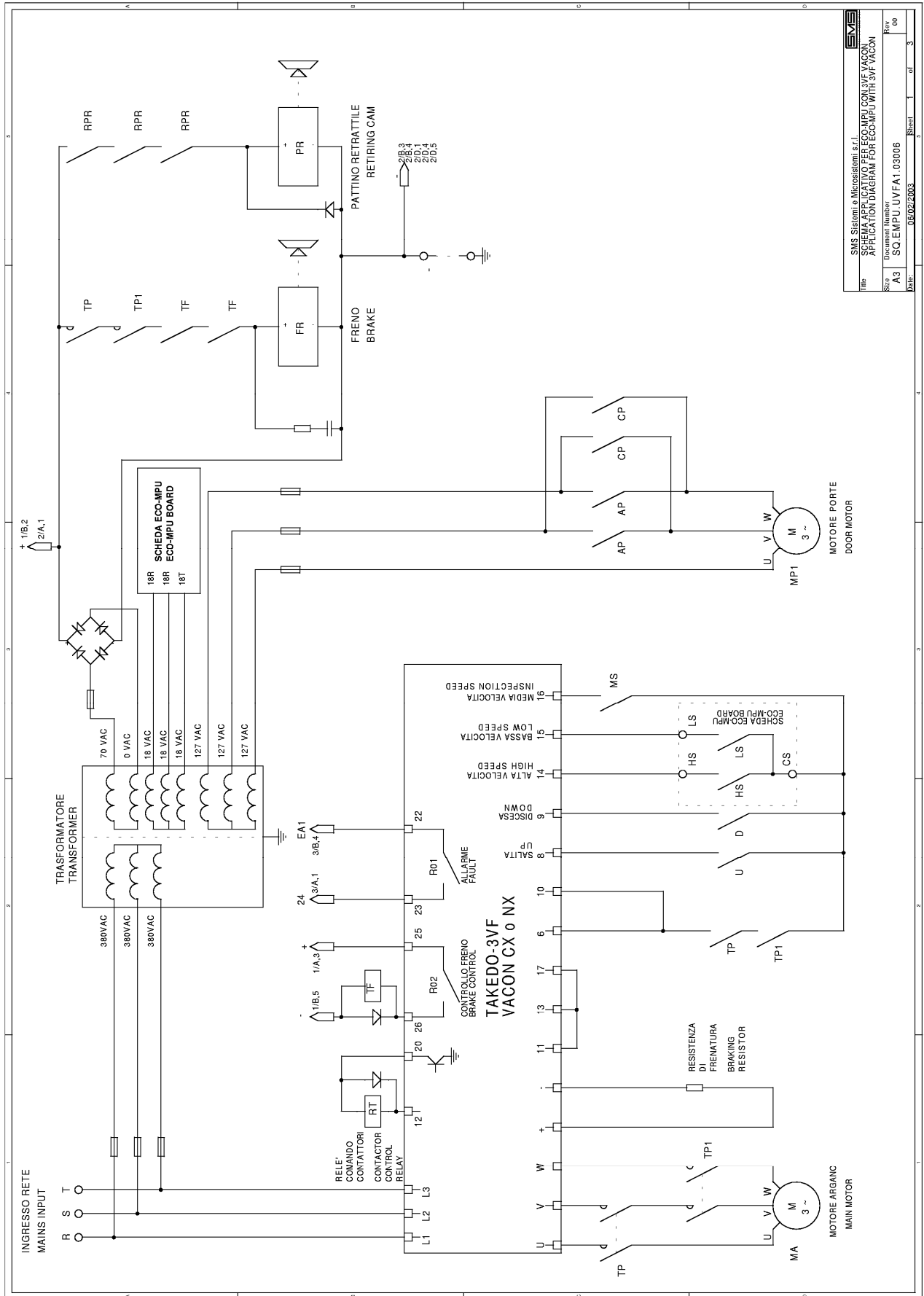
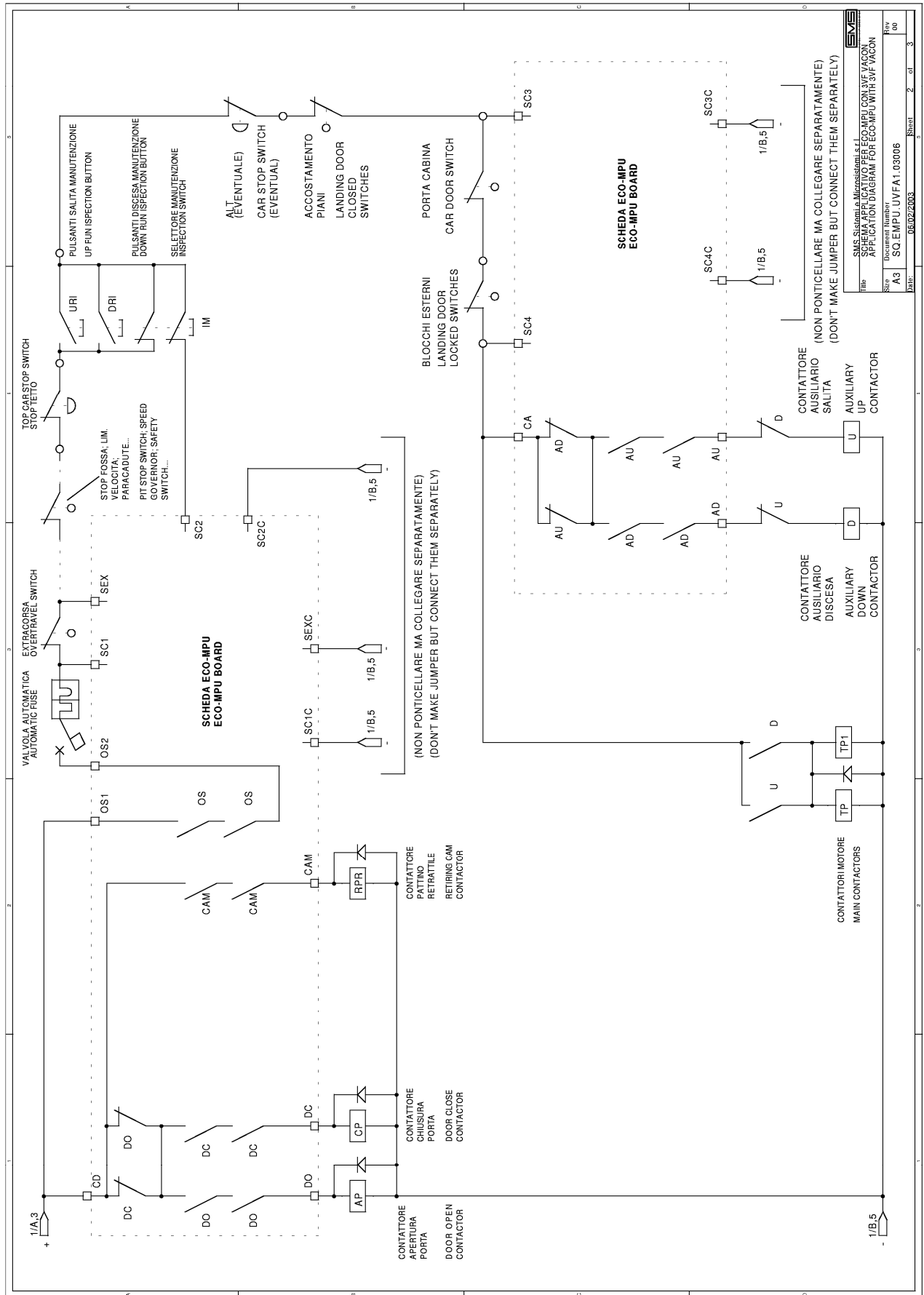


Fig. 6

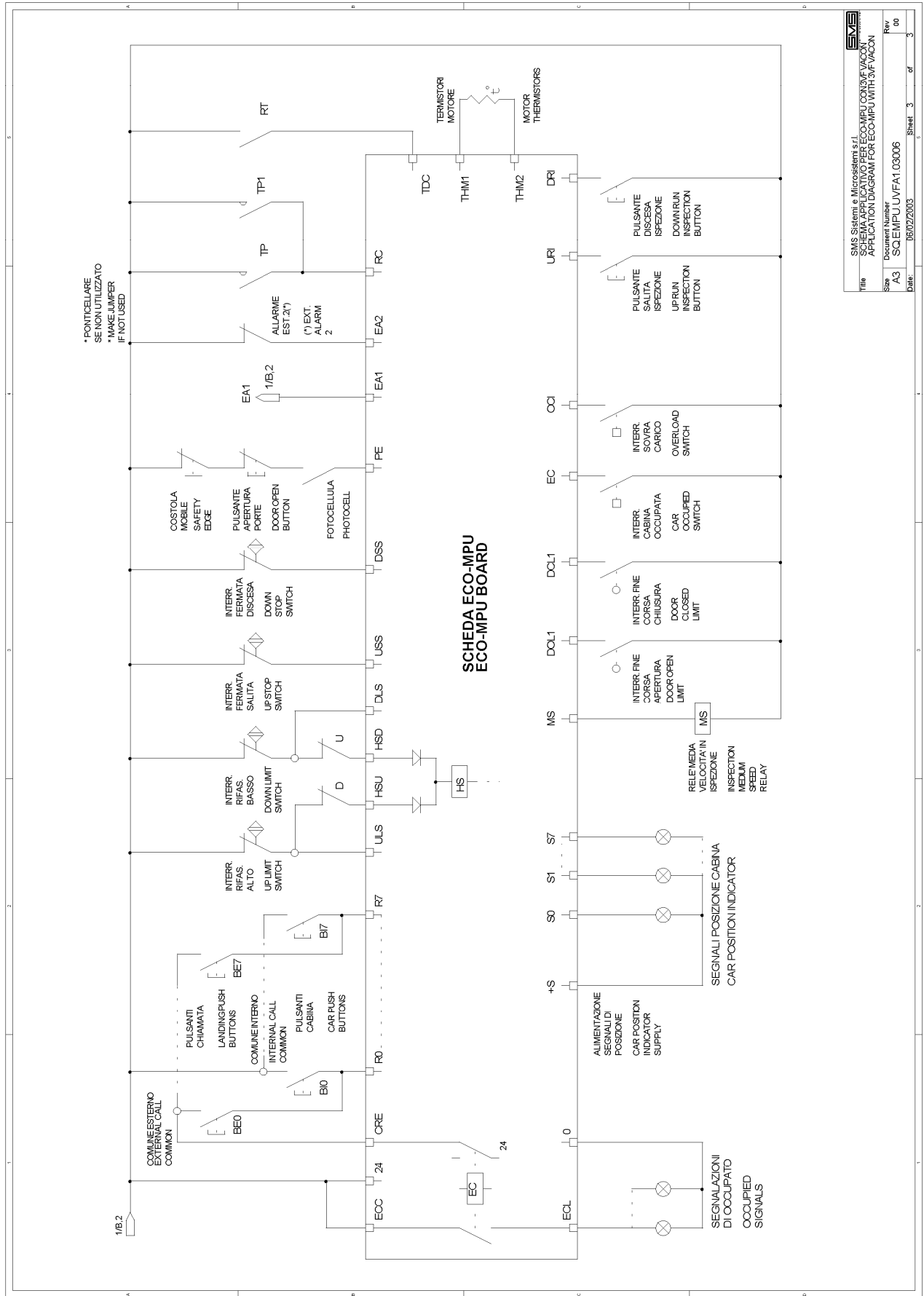
10 - EXAMPLE WIRING DIAGRAM FOR PANEL WITH A.P.B. OPERATION, WITH VACON FREQUENCY CONVERTER



SMS S.p.A. e Microsistemi s.r.l.	
SCHEMA APPLICATIVO PER ECO-MPU CON 3VF VACON	
APPLICATION DIAGRAM FOR ECO-MPU WITH 3VF VACON	
Size	Document Number
A3	SO.EMPU UVFA1.03006
Rev	00
Sheet	1 of 3
Date:	06/02/2003



File	06.02.2003
Size	A3
Document Number	SQ EMPU UVFA1.03006
Date	06.02.2003
Sheet	2 of 3



Title	SMS Sistemi & Macchinari s.r.l. SCHEMA APPLICATIVO PER ECO-MPU CON VAVACON APPLICATION DIAGRAM FOR ECO-MPU WITH VAVACON
Size	A3
Document Number	SQEMPU UVFA1.03006
Date	06/02/2003
Sheet	3 of 3
Rev.	00

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