PELAZZA PEPPINO S.r.l.
20063 CERNUSCO SUL NAVIGLIO (MI) – ITALY
Via Ponchielli, 6/8
Tel. 02/92.31.694 Fax 02/92.42.706
Tel. 02/92.42.706 Web Site: www.pelazza.com
Tel. 338/733.64.61 E-mail: pelazza@pelazza.com

A3-Elec

ELECTRIC CONTROL PANELS FOR ELECTRIC LIFT SYSTEMS CONFORMING TO THE EN81-20/50:2014 REFERENCE STANDARDS IN RELATION TO THE PROTECTION OF UNCONTROLLED MOVEMENT OF THE CAR

USER MANUAL

Rev.06 – 11/2017

TABLE OF CONTENTS

1. TYPES OF CONTROL PANELS FOR ELECTRIC LIFT SYSTEMS

The above mentioned electric control panels are available in various configurations, depending on the type of installation to be managed.

Each configuration requires a different operating method of the control panel Controller which is identified by a corresponding denomination:

A3-ELEC/1: Control panel with independent monitoring of the functionality of the two safety brakes operating on the traction pulley.

A3-ELEC/1R: Control panel with the same operating method as the configuration of A3-ELEC/1, equipped with the re-levelling at floor and the detection of uncontrolled movement with open cabin doors functions.
This type of configuration is to be used by those systems where the levelling precision, during the cabin loading and unloading operations, do not conform to the requirements specified in the EN81-20/50:2014 reference standards.

A3-ELEC/L: Control panel preset for the command and the monitoring of an overspeed governor, certified as an anti-creeping device stop in case of uncontrolled movement, with an anti-creeping coil powered during the cabin run.

A3-ELEC/P: Control panel preset for the command and the automatic function monitoring of an overspeed governor, certified as an anti-creeping device stop in case of uncontrolled movement, with an anti-creeping coil constantly powered. This type of configuration includes the re-levelling at floor and the detection of uncontrolled movement with open cabin doors functions.

The particular configuration preset on each control panel is indicated in the title block of the relative electrical diagram in correspondence with the general specifications of the type of system managed.

2. GENERAL COMPOSITION OF ELECTRIC CONTROL PANELS

In general, the above mentioned electric control panels are equipped with two distinct elements directly involved in the running of the functions required for compliance with EN81-20/50:2014 reference standards in relation to the protection of uncontrolled movement of the car:

a) The control panel Controller
b) A Dual-Channel Safety Circuit

Both these elements may be of different constitution and by different manufacturers, although it is still guaranteed the complete conformity of the specifications required.

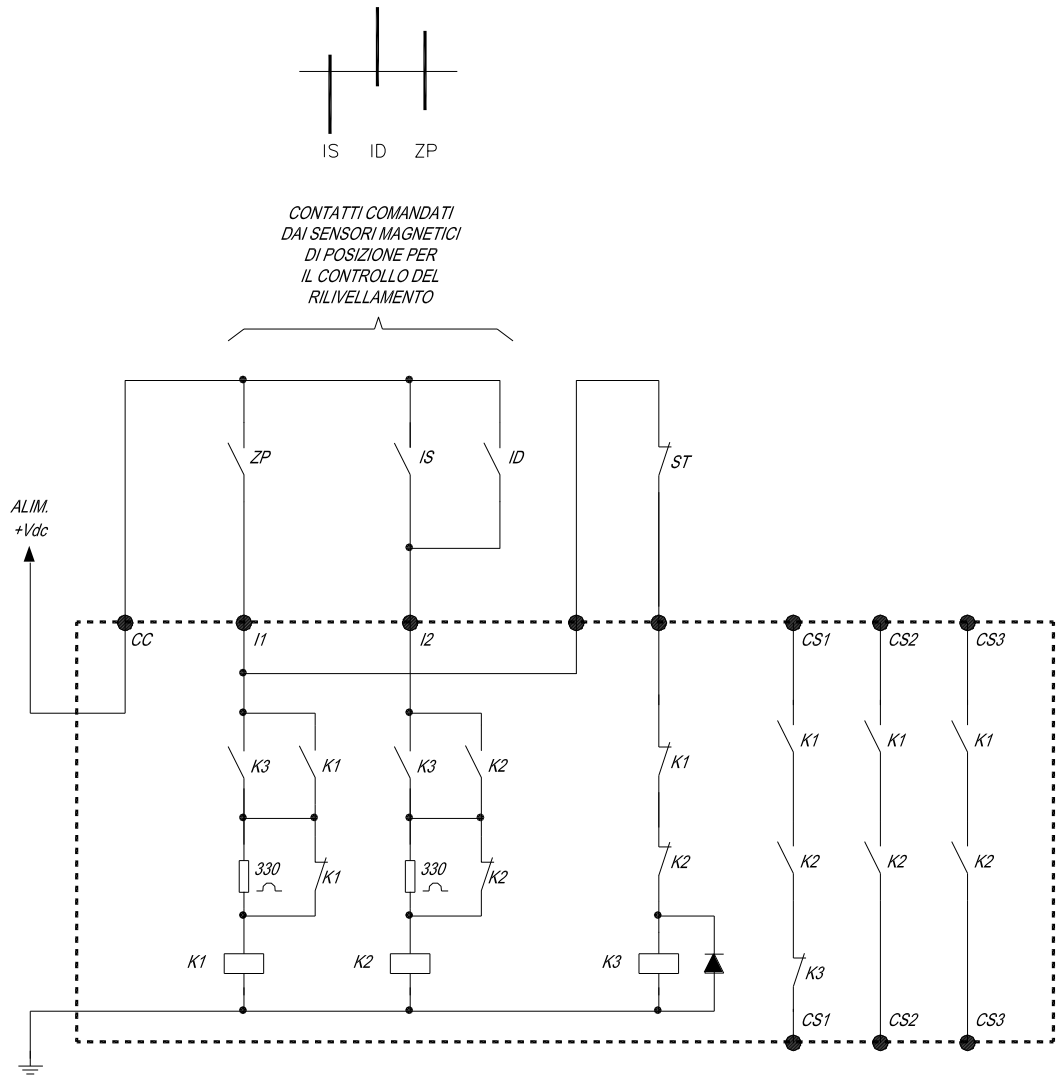
a) CONTROLLER	MANUFACTURER
Programmable Logic Controller (PLC): All models of groups: FX1S, FX1N, FX2N, FX3G, FX3U In all their variants and including relative expansions	**MITSUBISHI ELECTRIC CORPORATION**
Microprocessor Control Boards: All models of groups: EURO, SMART, CPU100 In all their variants and including relative expansions	**VEGA Srl**
Microprocessor Control Boards: All models of groups : AM1, AM2 In all their variants and including relative expansions	**AMCS ELETTRONICA Srl**

b) DUAL-CHANNEL SAFETY CIRCUIT	MANUFACTURER
Circuit K1-K2-K3 with Forced Control Contactors: (cabled as in the attached electrical diagram)	**PELAZZA PEPPINO Srl**
Module CS AR-94V024 (connected as in the attached electrical diagram)	**PIZZATO ELETTRICA Srl**

2.1. K1-K2-K3 dual-channel safety circuit with forced control contactors

CIRCUITO DI SICUREZZA BICANALE K1-K2-K3

CON CONTATTORI A GUIDA FORZATA



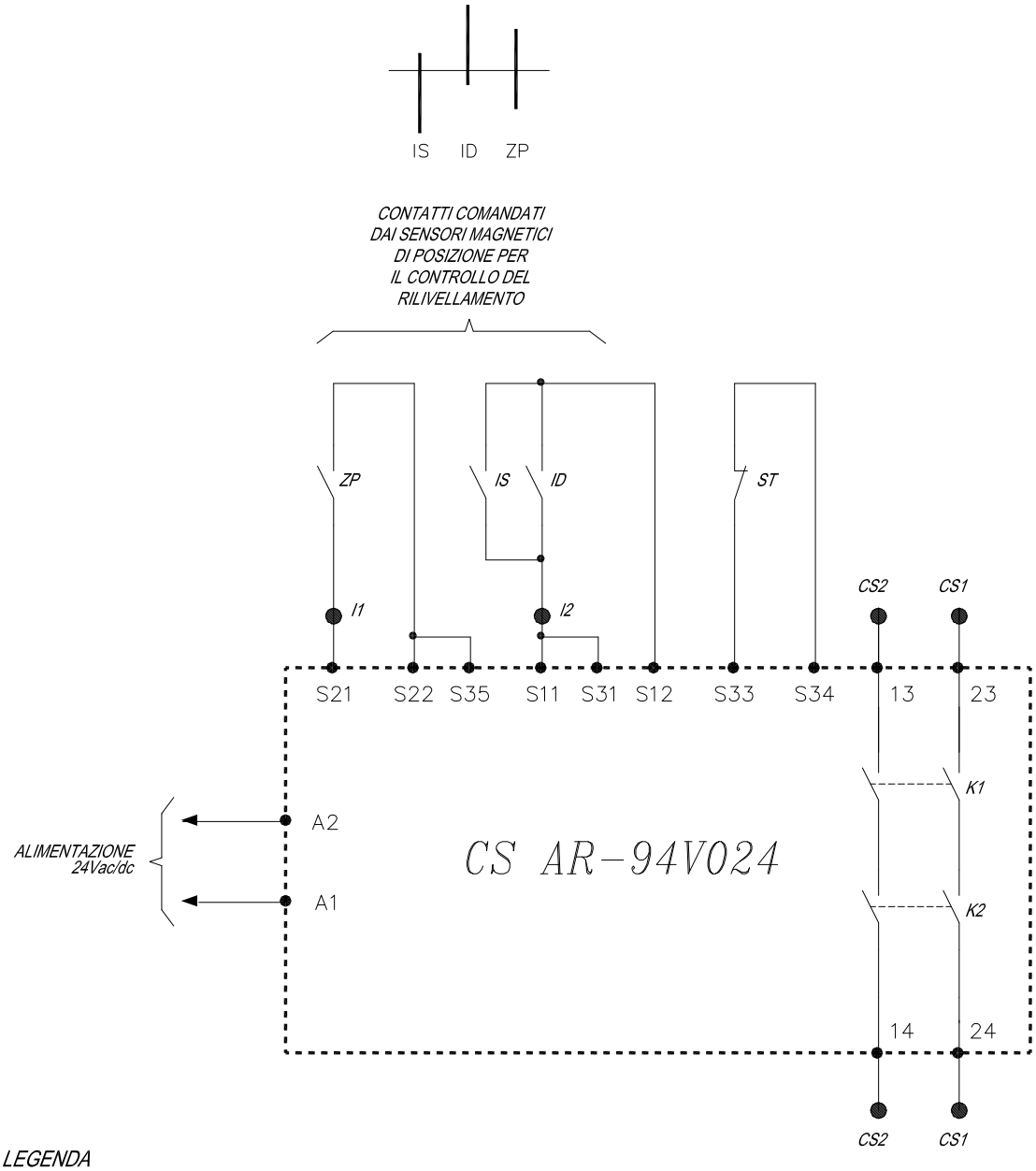
.EGENDA

K1,K2,K3	*= CONTATTORI A GUIDA FORZATA*
ST	*= CONTATTO DI START DEL CIRCUITO DI SICUREZZA OTTENUTO DA UN RELE' ECCITATO IN MARCIA CHE SI DISATTIVA ALLA FERMATA O AL RALLENTAMENTO*
I1,I2	*= INGRESSI DEI DUE CANALI DEL CIRCUITO DI SICUREZZA*
S1,CS2,CS3	*= USCITE SICURE DEL CIRCUITO DI SICUREZZA*

2.2. Pizzato Elettrica dual-channel safety circuit

CIRCUITO DI SICUREZZA BICANALE

PIZZATO ELETTRICA



LEGENDA

ST	*= CONTATTO DI START DEL CIRCUITO DI SICUREZZA OTTENUTO DA UN RELE' ECCITATO IN MARCIA CHE SI DISATTIVA ALLA FERMATA O AL RALLENTAMENTO*
I1,I2	*= INGRESSI DEI DUE CANALI DEL CIRCUITO DI SICUREZZA*
CS1,CS2	*= USCITE SICURE DEL CIRCUITO DI SICUREZZA*

3. CONTROL PANEL FOR ELECTRIC LIFTS TYPE A3-ELEC/1
(WITH DOUBLE BRAKE MONITORING)

3.1. General specifications

The electric control panel includes the independent monitoring of the two safety brake functionalities operating on the traction pulley.

- The control panel commands the simultaneous opening and closing of the two safety brakes through the auxiliary contacts TL and TL1 of the motor traction command contactors, and through a final consent TF contactor for the activation of the brakes.

- The stand-by state of all TL and TL1 travel contactors, including the TF contactor, is regularly tested by the control panel Controller which prevents any type of movement command of the cabin if one of any of the contactors is not resting with the cabin stationary.

- The control panel has two separate inputs, called BR1 (AUX1) and BR2 (AUX2), for the independent monitoring (both in normal manoeuvre as in inspection) of the corresponding contacts normally closed operated by the two safety brakes.

- The control panel Controller ensures the verification of the following conditions:

  a) with the system resting, both contacts must be closed
  b) during a run in normal manoeuvre, to each floor change of the selector, both contacts must be open
  c) during a run in inspection mode, after 6 seconds from the travel command both contacts must be open
  d) after 3 seconds from the stop of any travel both contacts must once again be closed

- In the event that one of the conditions outlined in a) and d) is not complied with, the control panel Controller will immediately block the system and take it out of service until the intervention of a competent technician.

- In the event that one of the conditions outlined in b) and c) is not complied with, the control panel Controller will allow the run to continue and will block the system only after the normal stop. The lift will however remain out of service until the intervention of a competent technician.

3.2. System block type

Permanent Out of Service:
- shown by an appropriate visual display on the panel, differentiated from other fault signalisations.
- the lift remains stopped and engaged with the doors open.

Recovery operation:
- activation of the reset fault button placed on the inside of the electric control panel.
- the recovery will not take place with either the switching off/switching on of the panel nor with the inspection mode activation.

3.3. Intervention tests

During the trial tests and the periodical checks, ensure that the function of the electric control panel conforms with the EN81-20/50:2014 reference standards in relation to the monitoring of the functionality of the safety brakes, using the following procedure:

3.3.1. Monitoring of the BR1 (Brake 1) contact

Equipped with the control panel electrical diagram,

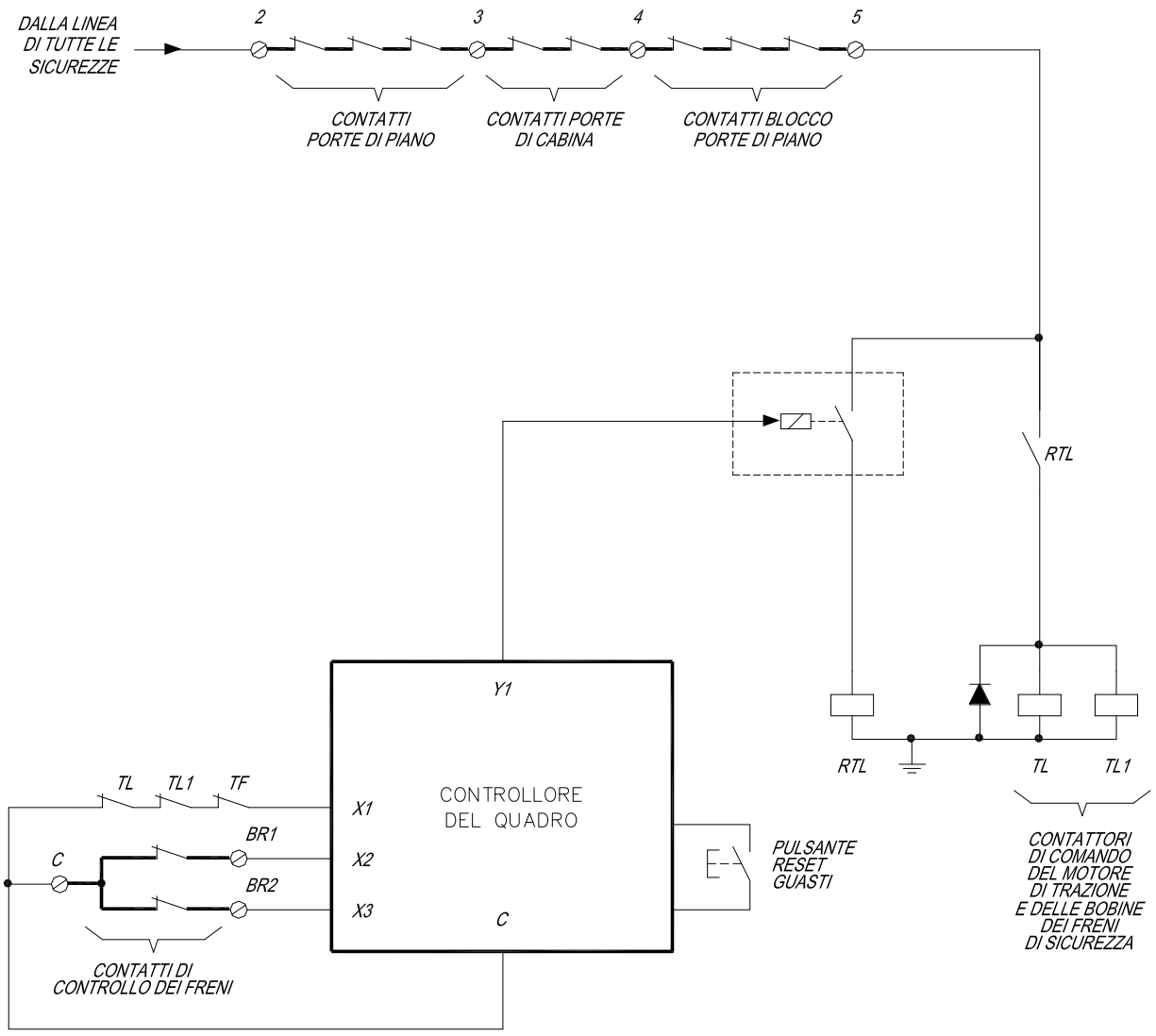
a) Position the cabin at the lowest floor.
b) Check that the BR1 (AUX1) and BR2 (AUX2) inputs of the control panel Controller are both active.
c) Disconnect the BR1 (AUX1) contact wire from the control panel.
d) After a few seconds from when the BR1 (AUX1) input of the Controller is off, the lift is put out of service with the appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
e) Reconnect the BR1 (AUX1) contact wire and short-circuit it with a shunt.
f) Check that the BR1 (AUX1) input is once again active.
g) Check that the fault indication is once again on.
h) Check that the system does not leave for any calls.
i) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
j) Perform a call to the highest floor and check that during the travel the BR1 (AUX1) input remains active.
k) The cabin should arrive regularly at the highest floor, after which the lift is put out of service (see the Fault Signalisation table shown in the electric control panel diagram).
l) Check that the system does not leave for any calls.
m) Remove the shunt which has short-circuited the BR1 (AUX1) contact.
n) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).

3.3.2. Monitoring of the BR2 (Brake 2) contact

a) Call the cabin to the lowest floor again.
b) Check that the BR1 (AUX1) and BR2 (AUX2) inputs of the control panel Controller are both active.
c) Disconnect the BR2 (AUX2) contact wire from the control panel.
d) After a few seconds from when the BR2 (AUX2) input of the Controller is off, the lift is put out of service with the appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
e) Reconnect the BR2 (AUX2) contact wire and short-circuit it with a shunt.
f) Check that the BR2 (AUX2) input is once again active.
g) Check that the fault indication is once again on.
h) Check that the system does not leave for any calls.
i) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
j) Perform a call to the highest floor and check that during the travel the BR2 (AUX2) input remains active.
k) The cabin should arrive regularly at the highest floor, after which the lift is put out of service (see the Fault Signalisation table shown in the electric control panel diagram).
l) Check that the system does not leave for any calls.
m) Remove the shunt which has short-circuited the BR2 (AUX2) contact.
n) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).

3.4. Basic diagram of A3-ELEC/1 control panel

SCHEMA DI PRINCIPIO DEL QUADRO A3-ELEC/1



LEGENDA

X1,X2,X3	*= INGRESSI CONTROLLORE QUADRO*
Y1	*= USCITE CONTROLLORE QUADRO*
C	*= COMUNE INGRESSI CONTROLLORE QUADRO*
RTL	*= RELE' DI COMANDO DEI CONTATTORI DI MARCIA TL - TL1*
TF	*= CONTATTO DEL CONTATTORE DI CONSENSO ATTIVAZIONE FRENI*

4. CONTROL PANEL FOR ELECTRIC LIFTS TYPE A3-ELEC/1R
(WITH RE-LEVELLING AND DOUBLE BRAKE MONIORITING)

4.1. General Specifications

The electric control panel is equipped with the same operating method as the A3-ELEC/1 configuration as far as the independent monitoring of the two safety brake functionalities operating on the traction pulley is concerned.

It is also equipped with the re-levelling at floor with doors open function, in order to be used by those systems where the levelling precision of the system, during the cabin loading and unloading operations, necessitate the resetting of the requirements specified in the EN81-20/50:2014 reference standards.

The control panel therefore includes the detection of uncontrolled movement of the cabin with doors open, according to requirements specified in the EN81-20/50:2014 reference standards.

- The control panel commands the simultaneous opening and closing of the two safety brakes through the auxiliary contacts TL and TL1 of the motor traction command contactors, and through a final consent TF contactor for the activation of the brakes.

- The stand-by state of all TL and TL1 travel contactors, including the TF contactor, is regularly tested by the control panel Controller which prevents any type of movement command of the cabin if one of any of the contactors is not resting with the cabin stationary.

- The control panel has two separate inputs, called BR1 (AUX1) and BR2 (AUX2), for the independent monitoring (both in normal manoeuvre as in inspection) of the corresponding contacts normally closed operated by the two safety brakes.

- The control panel Controller ensures the verification of the following conditions:

  a) with the system resting, both contacts must be closed
  b) during a run in normal manoeuvre, to each floor change of the selector, both contacts must be open
  c) during a run in inspection mode, after 6 seconds from the travel command both contacts must be open
  d) after 3 seconds from the stop of any travel both contacts must once again be closed

- In the event that one of the conditions outlined in a) and d) is not complied with, the control panel Controller will immediately block the system and take it out of service until the intervention of a competent technician.

- In the event that one of the conditions outlined in b) and c) is not complied with, the control panel Controller will allow the run to continue and will block the system only

after the normal stop. The lift will however remain out of service until the intervention of a competent technician.

- The control panel is equipped with a Dual-channel Safety Circuit operated by the IS and ID magnetic position sensors for the re-levelling check, and by the ZP magnetic sensor for the enabling re-levelling area check.

- A first safe contact output of the Dual-channel Safety Circuit will short-circuit the safety contacts of both the floor and cabin doors, with the aim of allowing the activation of the travel contacts for the execution of the cabin re-levelling at low speed with doors open.

- A second safe contact output of the Dual-Channel Safety Circuit is sent to the control panel Controller which allows for the regular monitoring operation.

- In the case that an irregular elevation or drop of the cabin with doors open for an uncontrolled movement is detected, the safety brakes are released by the TL and TL1 contactors through the intervention of the Dual-Channel Safety Circuit which detects the movement.
  As a consequence the control panel Controller even in this case keeps the system out of service until the intervention of a competent technician.

4.2. Re-levelling operation specifications

Activation: with the cabin level at a distance between 10mm and 20mm from the exact floor level

.

Stop: with the cabin level at a distance less than 10mm from the exact floor level

4.3. Operation specifications of uncontrolled movement detection procedures

Activation conditions: cabin is engaged (doors open), stopped in normal manoeuvre in the activation zone of the Safety Circuit (not in inspection manoeuvre).

Detection area of uncontrolled movement: 85 mm above or below floor level, detected via the ZP sensor position which determines the deactivation of the Safety Circuit.

.

Intervention time for uncontrolled movement: max 100 ms from the instant of detection of the uncontrolled movement.

Example calculation of the total space of the intervention (with a speed of 1,5m/sec): max. 235 mm above or below floor level (85mm+1,5m/sec*100msec).

4.4. System block type

Permanent Out of Service:
- shown by an appropriate visual display on the panel, differentiated from other fault signalisations.
- the lift remains stationary in engaged mode with the re-levelling disabled.

Recovery operation:
- activation of the reset fault button placed on the inside of the electric control panel.
- the recovery will not take place either with the switching off/switching on of the panel nor with the inspection mode activation.

4.5. Intervention tests

During the trial tests and during the periodical checks, ensure that the function of the electric control panel conforms with the EN81-20/50:2014 for the detection of uncontrolled movement and the monitoring of the functionality of the safety brakes, using the following procedure:

4.5.1. Downward uncontrolled movement detection and the intervention of the safety brakes

During this test it is necessary to be able to lower the cabin to at least 85mm below floor level. If at the lowest floor this movement is not possible because the cabin is at final limit, position the cabin at the second stop instead of the lowest floor.

Equipped with the control panel diagram,

a) Position the cabin at the lowest floor and keep it in the engaged mode with the doors open in the following way:
   - for PLC control panels disconnect the wire from the PA input of PLC.
   - for Microprocessor Board control panels disconnect the wire from the CM1 input Board and send an impulse between the PAP and GND Board terminals (door opening command).
b) Load the cabin to its maximum capacity.
c) From this moment until the end of the test do not enter or exit the cabin, nor stay on the floor threshold.
d) Short-circuit the ID magnetic sensor by performing a shunt between the ID and IMP terminals (PLC control panels) or the ID and GND terminals (Board control panels).
e) Check that the ZP relay of the control panel is excited (PLC control panels) or that the K2 LED of the Dual-Channel Safety Circuit is on (Board control panels).
f) Open the IS magnetic sensor detaching the wire from the corresponding terminal. The control panel Controller will command a downward re-levelling movement which will stop as soon as an uncontrolled movement is detected.

g) From the moment the ZP relay is de-energized or the K2 LED is off, the security brakes will immediately stop the cabin and the lift is put out of service with an appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
h) Reconnect the IS magnetic sensor and remove the short-circuit from the ID magnetic sensor.
i) Reconnect the previously disconnected control panel Controller wire (PA or CM1).
j) Check that the system does not leave for any calls.
k) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
l) Perform a call to the last stop and wait whilst the cabin fully completes the run and returns to a disengaged mode.

4.5.2. Upward uncontrolled movement detection and the intervention of the safety brakes

During this test it is necessary to be able to raise the cabin to at least 85mm above floor level. If at the highest floor this movement is not possible because the cabin is at final limit, position the cabin at the penultimate stop instead of the highest floor.

a) Position the cabin at the highest floor and keep it in the engaged mode with the doors open in the following way:
   - for PLC control panels disconnect the wire from the PA input of PLC.
   - for Microprocessor Board control panels disconnect the wire from the CM1 input Board and send an impulse between the PAP and GND Board terminals (door opening command).
b) Completely unload the cabin.
c) From this moment until the end of the test do not enter or exit the cabin, nor stay on the floor threshold.
d) Short-circuit the IS magnetic sensor by performing a shunt between the IS and IMP terminals (PLC control panels) or the IS and GND terminals (Board control panels).
e) Check that the ZP relay of the control panel is excited (PLC control panels) or that the K2 LED of the Dual-Channel Safety Circuit is on (Board control panels).
f) Open the ID magnetic sensor detaching the wire from the corresponding terminal. The control panel Controller will command an upward re-levelling movement which will stop as soon as an uncontrolled movement is detected.
g) From the moment the ZP relay is de-energized or the K2 LED is off, the security brakes will immediately stop the cabin and the lift is put out of service with an appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
h) Reconnect the ID magnetic sensor and remove the short-circuit from the IS magnetic sensor.
i) Reconnect the previously disconnected control panel Controller wire (PA or CM1).
j) Check that the system does not leave for any calls.
k) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
l) Perform a call to the first stop and wait whilst the cabin fully completes the run and returns to a disengaged mode.

4.5.3. Monitoring of the BR1 (Brake 1) contact

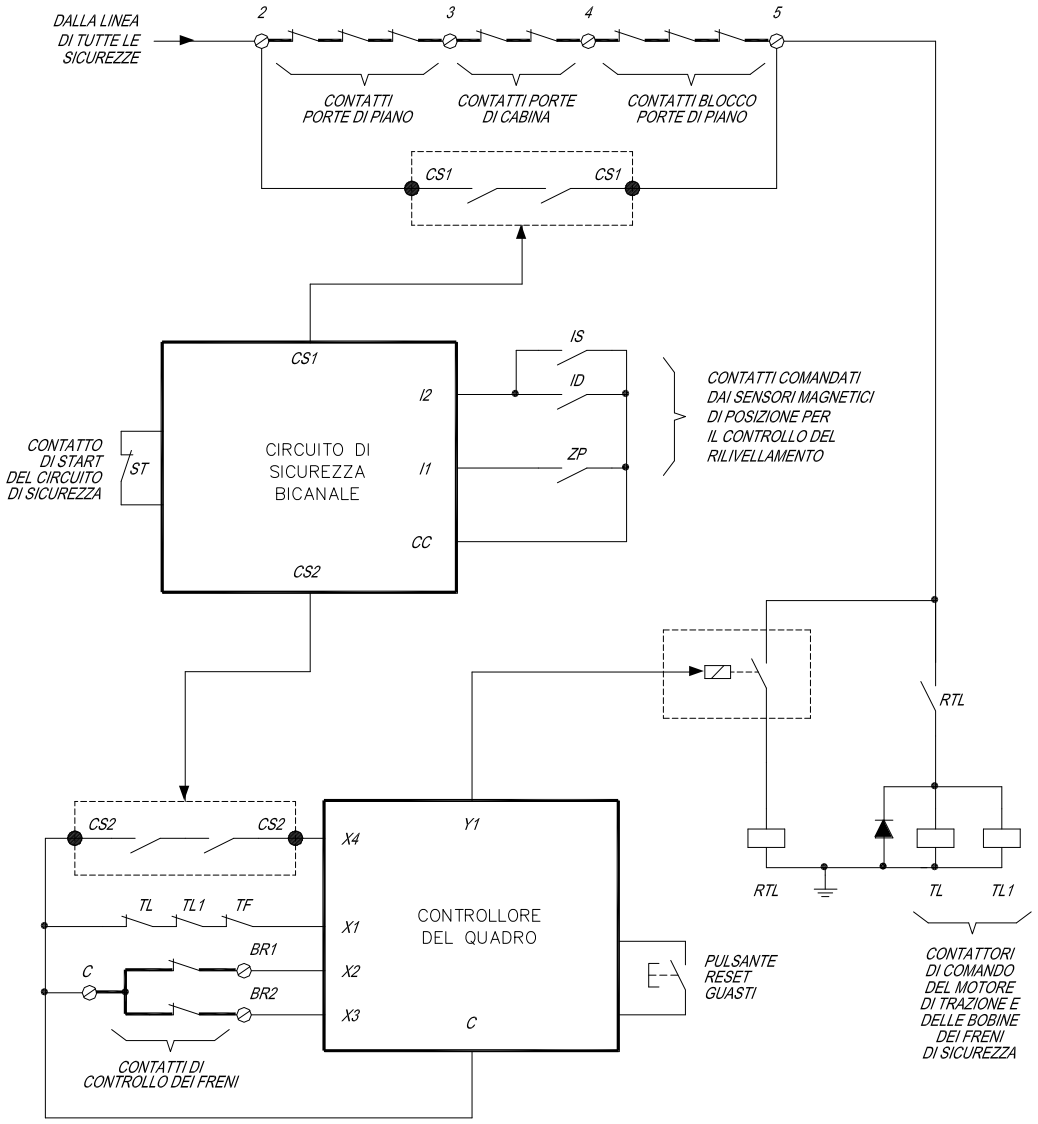
a) Position the cabin at the lowest floor.
b) Check that the BR1 (AUX1) and BR2 (AUX2) inputs of the control panel Controller are both active.
c) Disconnect the BR1 (AUX1) contact wire from the control panel.
d) After a few seconds from when the BR1 (AUX1) input of the Controller is off, the lift is put out of service with the appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
e) Reconnect the BR1 (AUX1) contact wire and short-circuit it with a shunt.
f) Check that the BR1 (AUX1) input is once again active.
g) Check that the fault indication is once again on.
h) Check that the system does not leave for any calls.
i) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
j) Perform a call to the highest floor and check that during the travel the BR1 (AUX1) input remains active.
k) The cabin should arrive regularly at the highest floor, after which the lift is put out of service (see the Fault Signalisation table shown in the electric control panel diagram).
l) Check that the system does not leave for any calls.
m) Remove the shunt which has short-circuited the BR1 (AUX1) contact.
n) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).

4.5.4. Monitoring of the BR2 (Brake 2) contact

a) Call the cabin to the lowest floor again.
b) Check that the BR1 (AUX1) and BR2 (AUX2) inputs of the control panel Controller are both active.
c) Disconnect the BR2 (AUX2) contact wire from the control panel.
d) After a few seconds from when the BR2 (AUX2) input of the Controller is off, the lift is put out of service with the appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
e) Reconnect the BR2 (AUX2) contact wire and short-circuit it with a shunt.
f) Check that the BR2 (AUX2) input is once again active.
g) Check that the fault indication is once again on.
h) Check that the system does not leave for any calls.
i) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
j) Perform a call to the highest floor and check that during the travel the BR2 (AUX2) input remains active.
k) The cabin should arrive regularly at the highest floor, after which the lift is once again put out of service (see the Fault Signalisation table shown in the electric control panel diagram).
l) Check that the system does not leave for any calls.
m) Remove the shunt which has short-circuited the BR2 (AUX2) contact.
n) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).

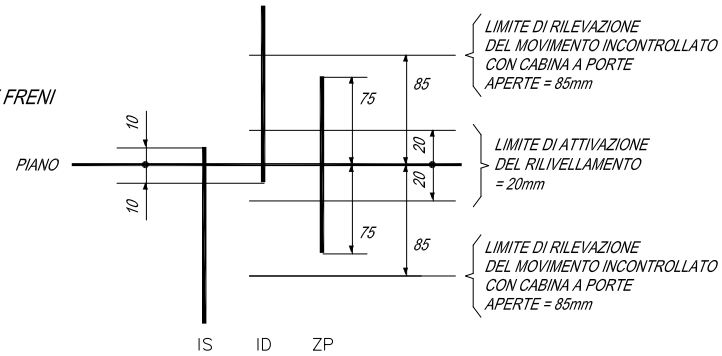
4.6. Basic diagram of A3-ELEC/1R control panel

SCHEMA DI PRINCIPIO DEL QUADRO A3-ELEC/1R



LEGENDA

X1,X2,X3,X4	= INGRESSI CONTROLLORE QUADRO
Y1	= USCITE CONTROLLORE QUADRO
C	= COMUNE INGRESSI CONTROLLORE QUADRO
RTL	= RELE' DI COMANDO DEI CONTATTORI DI MARCIA TL - TL1
TF	= CONTATTO DEL CONTATTORE DI CONSENSO ATTIVAZIONE FRENI
I1,I2	= INGRESSI DEI DUE CANALI DEL CIRCUITO DI SICUREZZA
CC	= COMUNE INGRESSI DEL CIRCUITO DI SICUREZZA
CS1,CS2	= USCITE SICURE DEL CIRCUITO DI SICUREZZA



5. CONTROL PANEL FOR ELECTRIC LIFTS TYPE A3-ELEC/L
(FOR OVERSPEED GOVERNORS WITH ANTI-CREEPING COILS POWERED DURING RUN)

5.1. General specifications

The electric control panel includes the command and the monitoring of an overspeed governors, certified as an anti-creeping stop device in the case of uncontrolled movement, with an anti-creeping coil powered during the cabin run.
The anti-creeping coil is only powered with the cabin travelling with doors closed, but not during any re-levelling manoeuvre with doors open.
The re-levelling of uncontrolled movement detection is assigned to the overspeed governor, complete with the anti-creeping stop device, which must guarantee the requested intervention spaces specified in the EN81-20/50:2014 reference standards.

- The control panel operates the traction motor through the TL and TL1 contactors.
  The winch brake is activated by the same TL and TL1 contactors and by a TF final consent contact

- The stand-by state of the TL and TL1 travel contactors, including the TF contact, is regularly tested by the control panel Controller which prevents any type of movement command of the cabin if one of any of the contactors is not resting with the cabin stationary.

- The control panel has one output, operated by an ALL relay, dedicated to powering the overspeed governor anti-creeping coil.

- The control panel Controller powers the overspeed governor anti-creeping coil before giving the travel command to the traction motor, and to keeping it powered for the duration of the run.
  The electromagnet is never active during any eventual re-levelling to floor with open cabin doors manoeuvres.

- The control panel has one input, called BR1 (AUX1), for the monitoring (both in normal manoeuvre as in inspection) of the anti-creeping device (normally closed) control contact.

- The stationary state of the anti-creeping device control contact is continually monitored by the control panel Controller.
  If this contact should be open, the activation of the anti-creeping coil is blocked before the system starts for any runs in both normal or inspection travel.

- The control panel Controller also ensures the verification of the following conditions:

    a. with the system resting, the anti-creeping device control contact must be closed and must not open for more than 4 seconds.
    b. following a power command for the anti-creeping coil, the control contact must open within 4 seconds and, only after having opened, the system's travel will be activated
    c. after 4 seconds from the stop of a travel, the contact must once again be closed

- In the event that any of the above conditions are not complied with, the control panel Controller will immediately block the system and keep it out of service until the intervention of a competent technician.

5.2. Possible re-levelling operation specifications

Activation: with the cabin level at a distance between 10mm and 20mm from the exact floor level

.

Stop: with the cabin level at a distance less than 10mm from the exact floor level

5.3. System block type in the case of failure of the anti-creeping device

Permanent Out of Service:
- shown by an appropriate visual display on the panel, differentiated from other fault signalisations.
- the lift remains stationary in the engaged mode with any re-levelling manoeuvre disabled.

Recovery operation:
- activation of the reset fault button placed on the inside of the electric control panel.
- the recovery will not take place either with the switching off/switching on of the panel nor with the inspection mode activation.

5.4. Intervention tests

During the trial tests and during the periodical checks, ensure that the electric control panel regularly performs the anti-creeping device control contact monitoring and that its function as a stop device conforms with the EN81-20/50:2014 reference standards, using the following procedure:

5.4.1. Monitoring of the control contact of the anti-creeping device

Equipped with the control panel electrical diagram,

a) Position the cabin at the lowest floor.
b) Check that the BR1 (AUX1) input of the control panel Controller is active.
c) Disconnect the wire BR1 (AUX1) from the control panel.
d) After 4 seconds from when the BR1 (AUX1) input of the Controller is off, the lift is put out of service with the appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
e) Reconnect the BR1 (AUX1) contact wire.
f) Check that the BR1 (AUX1) input is once again active.
g) Check that the fault indication is once again on.
h) Check that the system does not leave for any calls.
i) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
j) Perform a call to the second floor and check that during the run the BR1 (AUX1) input switches off regularly, that it switches back on at the stop and that the run is completed without any fault indication.
k) Perform a shunt between the BR1 and IMP terminals (PLC control panels) or the BR1 and GND (Board control panels), so as to short-circuit the anti-creeping device contact control.
l) Perform a call to the lowest floor and check that, despite the ALL relay which powers the anti-creeping coil and the principal TL and TL1 contactors are regularly excited, the BR1 (AUX1) input remains active.
During this phase the traction motor and the winch brake must not be activated.
m) After 4 seconds the control panel Controller cancels the call, interrupts the power to the anti-creeping coil and releases the main contactors, putting the lift out of service (see the Failure Report table shown in the electrical diagram).
n) Check that the system does not leave for any calls.
o) Remove the shunt which has short-circuited the BR1 contact of the anti-creeping device.
p) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).

5.4.2. Detection of the downward uncontrolled movement and the Intervention of the anti-creeping device stop

Equipped with the overspeed governor manual,

a) Position the cabin at the highest floor.
b) Load the cabin to its maximum capacity.
c) Disconnect the anti-creeping coil wire from the BL+ terminal of the control panel.
d) Perform a call to the penultimate stop and, within 4 seconds from the ALL relay excitation and of the TL and TL1 contactors, disconnect the BR1 (AUX1) contact wire from the control panel.

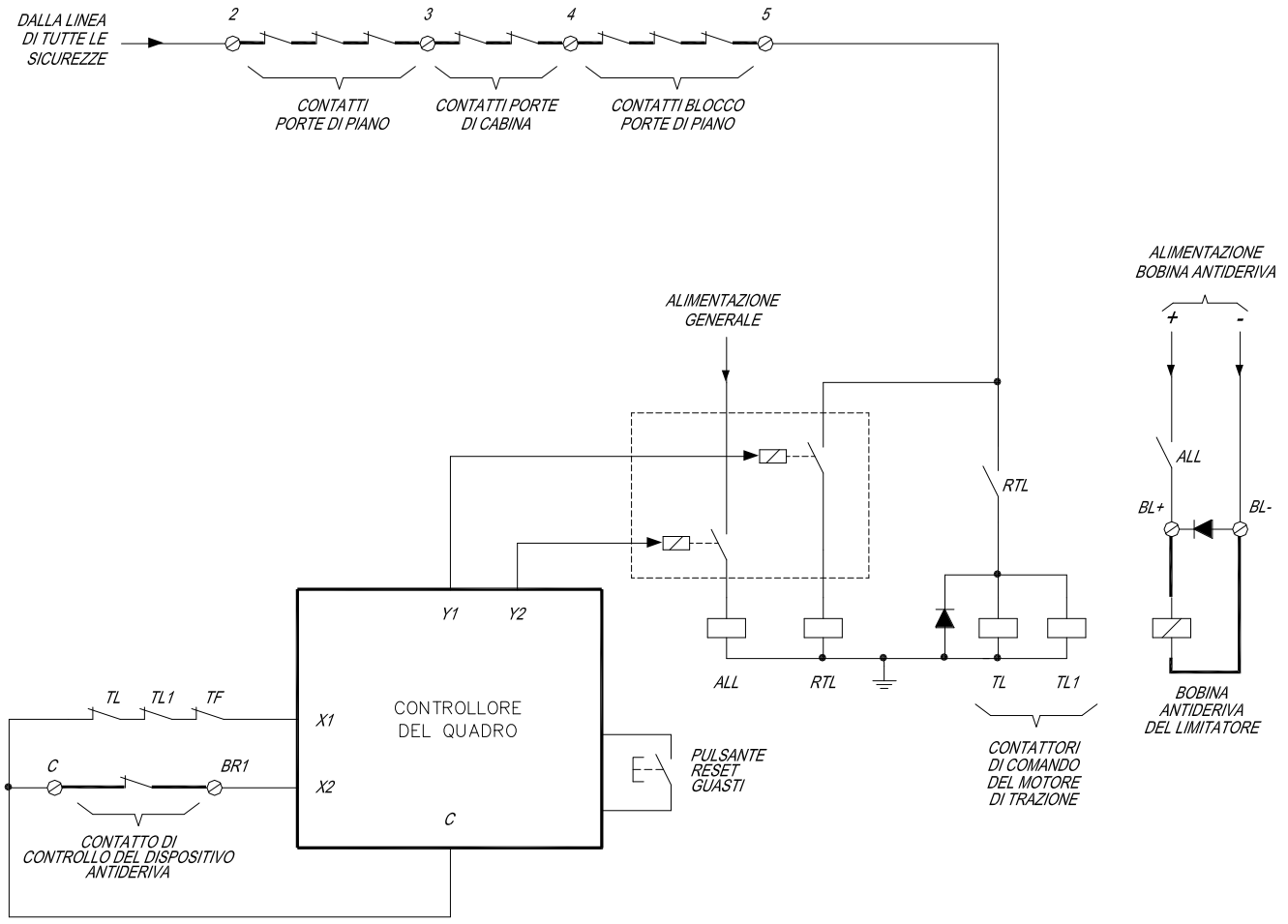
e) The control panel supplies the travel commands to the traction motor and excites the winch brake, but, not having powered the anti-creeping coil, as soon as the cabin moves from floor the anti-creeping device will intervene stopping the system in the space and time given by the overspeed governor certificate.
f) Reconnect the two wires to the BL+ and BR1 terminals.
g) Check that the system does not leave for any calls whilst the overspeed governor safety contact remains open until the intervention of a competent technician.
h) Reset the overspeed governor.

5.4.3. Detection of the upward uncontrolled movement and the intervention of the anti-creeping device stop

a) Position the cabin at the lowest floor.
b) Completely unload the cabin.
c) Disconnect the anti-creeping coil wire from the BL+ terminal of the control panel.
d) Perform a call to the second stop and, within 4 seconds from the ALL relay excitation and of the TL and TL1 contactors, disconnect the BR1 (AUX1) contact wire from the control panel.
e) The control panel supplies the travel commands to the traction motor and excites the winch brake, but, not having powered the anti-creeping coil, as soon as the cabin moves from floor the anti-creeping device will intervene stopping the system in the space and time given by the overspeed governor certificate.
f) Reconnect the two wires to the BL+ and BR1 terminals.
g) Check that the system does not leave for any calls whilst the overspeed governor safety contact remains open until the intervention of a competent technician.
h) Reset the overspeed governor.

5.5. Basic control panel diagram of A3-ELEC/L

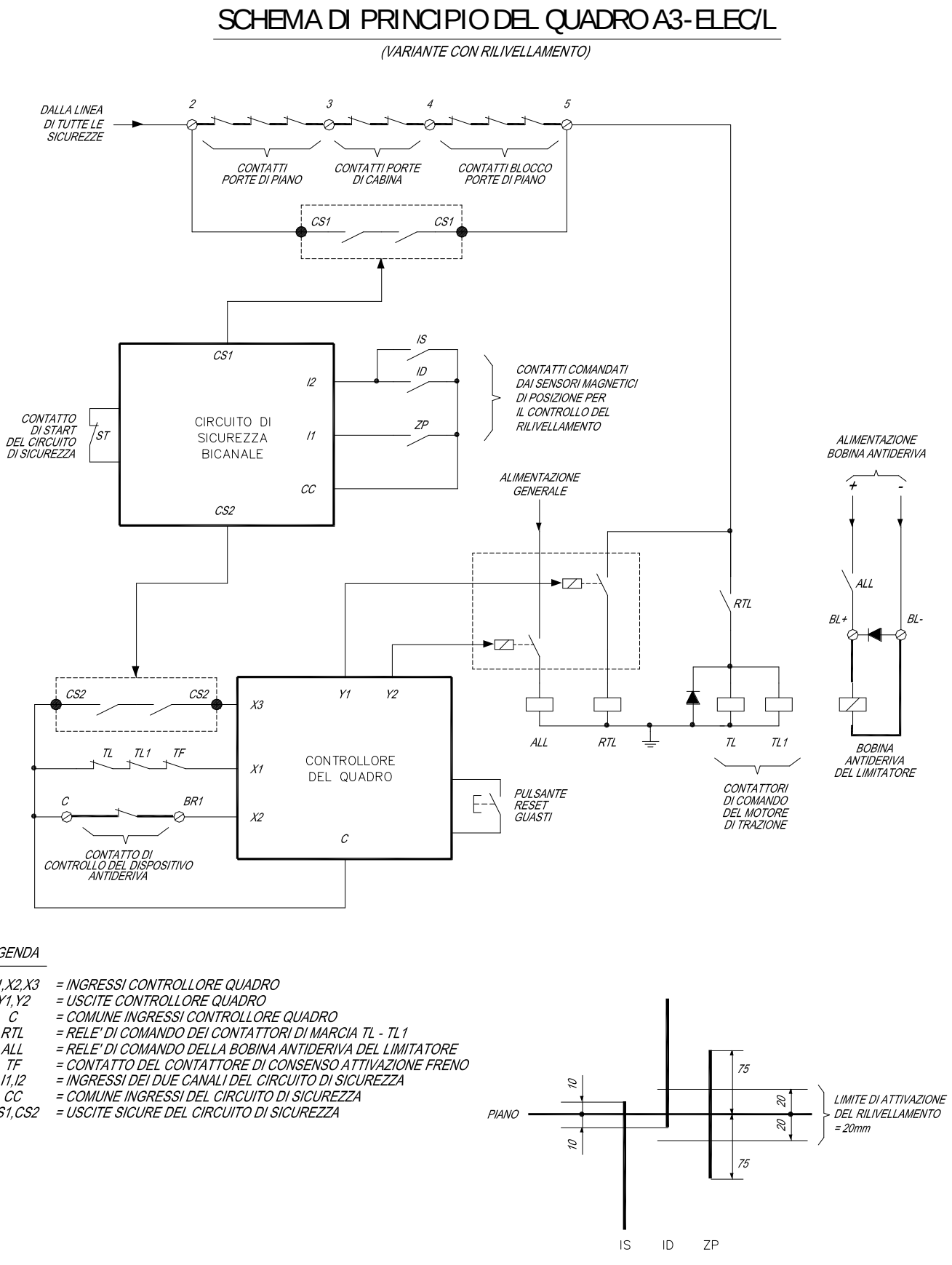
SCHEMA DI PRINCIPIO DEL QUADRO A3-ELEC/L



LEGENDA

X1,X2	*= INGRESSI CONTROLLORE QUADRO*
Y1,Y2	*= USCITE CONTROLLORE QUADRO*
C	*= COMUNE INGRESSI CONTROLLORE QUADRO*
RTL	*= RELE' DI COMANDO DEI CONTATTORI DI MARCIA TL - TL1*
ALL	*= RELE' DI COMANDO DELLA BOBINA ANTIDERIVA DEL LIMITATORE*
TF	*= CONTATTO DEL CONTATTORE DI CONSENSO ATTIVAZIONE FRENO*

5.6. Basic control panel diagram of A3-ELEC/L
(differing with the re-levelling at floor with doors open function)



LEGENDA

X1,X2,X3	= INGRESSI CONTROLLORE QUADRO
Y1,Y2	= USCITE CONTROLLORE QUADRO
C	= COMUNE INGRESSI CONTROLLORE QUADRO
RTL	= RELE' DI COMANDO DEI CONTATTORI DI MARCIA TL - TL1
ALL	= RELE' DI COMANDO DELLA BOBINA ANTIDERIVA DEL LIMITATORE
TF	= CONTATTO DEL CONTATTORE DI CONSENSO ATTIVAZIONE FRENO
I1,I2	= INGRESSI DEI DUE CANALI DEL CIRCUITO DI SICUREZZA
CC	= COMUNE INGRESSI DEL CIRCUITO DI SICUREZZA
CS1,CS2	= USCITE SICURE DEL CIRCUITO DI SICUREZZA

6. CONTROL PANEL FOR ELECTRIC LIFTS TYPE A3-ELEC/P
(FOR OVERSPEED GOVERNORS WITH ANTI-CREEPING COILS CONSTANTLY POWERED)

6.1. General specifications

The electric control panel includes the command and the automatic function monitoring of an overspeed governor, certified as an anti-creeping device stop in case of uncontrolled movement, with an anti-creeping coil constantly powered.

This type of configuration includes the re-levelling at floor and the detection of uncontrolled movement with open cabin doors functions according to requirements specified in the EN81-20/50:2014 reference standards.

The powering of the anti-creeping coil, in order to allow the anti-creeping stop device to intervene, must be interrupted as soon as an uncontrolled movement is detected.

- The control panel operates the traction motor through the TL and TL1 contactors.
  The winch brake is activated by the same TL and TL1 contactors and by a TF final consent contact.

- The stand-by state of the TL and TL1 travel contactors, including the TF contactor, is regularly tested by the control panel Controller which prevents any type of movement command of the cabin if one of any of the contactors is not resting with the cabin stationary.

- The control panel has one output, dedicated to the permanent powering of the overspeed governor anti-creeping coil, operated during a run by a TAL contactor, and in the re-levelling by a CSM Mono-channel Safety Circuit.
  In normal conditions the anti-creeping coil is powered at the starting of the system.
  The anti-creeping coil is not powered if the cabin should be stopped outside a floor with doors open or with any other safety protection open.

- The TAL contactor is directly operated by the control panel Controller, whilst the CSM Mono-Channel Safety Circuit command, directly taken downstream of the complete security line, is conditioned by a control panel Controller consensus.

- The stand-by state of the TAL contactor powering of the anti-creeping coil during the runs is also tested by the control panel Controller which prevents any cabin movement command if this contactor is not resting with the system stationary.

- The control panel has one input, called BR1 (AUX1), for the monitoring of the anti-creeping device (normally closed) control contact.

- The state of the anti-creeping device control contact is continually monitored by the control panel Controller.
  If this contact should be closed (anti-creeping device set), the activation of any cabin movement command is stopped.

- The automatic monitoring function of the overspeed governor, performed by the control panel Controller with appropriate frequency, periodically checks the regular functioning of the control contact following an interruption and successive reactivation of the anti-creeping coil powering.

- The control panel Controller ensures the verification of the following conditions:

  a) at the start up of the system the anti-creeping device control contact must be closed with the coil not yet powered.
  b) with the system resting, the anti-creeping device control contact must be open and not close for at least 4 seconds.
  c) following a power interruption command to the anti-creeping coil, the control contact must close within 4 seconds
  d) after 4 seconds from the power reactivation to the anti-creeping coil, the control contact must once again be open.

- In the event that any of the above conditions are not complied with, the control panel Controller will immediately block the system and take it out of service until the intervention of a competent technician.

- The control panel is equipped with a Dual-channel Safety Circuit operated by the IS and ID position magnetic sensors for the re-levelling check, and from the ZP magnetic sensor for the qualification zone re-levelling check.

- A first safe contact output of the Dual-channel Safety Circuit will short-circuit the safety contacts of both the floor and the cabin doors, with the aim of allowing the activation of the travel contacts for the execution of the cabin re-levelling at low speed with doors open.

- A second safe contact output of the Dual-Channel Safety Circuit is sent to the control panel Controller which allows the regular operation monitoring.

- In the case that an irregular elevation or drop of the cabin with doors open for an uncontrolled movement is detected, the power to the anti-creeping coil is interrupted by the intervention of the Dual-Channel Safety Circuit which detects the movement.
  As a consequence the control panel Controller even in this case keeps the system out of service until the intervention of a competent technician.

- The Mono-Channel Safety Circuit, equipped with forced control contactors, guarantees the interruption of power to the anti-creeping coil when it needs to be deactivated from the CS1 safe output of the Dual-Channel Safety Circuit.

6.2. Re-levelling operation specifications

Activation: with the cabin level at a distance between 10mm and 20mm from the exact floor level

.

Stop: with the cabin level at a distance less than 10mm from the exact floor level

6.3. Automatic monitoring function operation specifications

Frequency of execution: once in approximately every 24 hours after having brought the cabin back to the lowest floor

.

Instant of activation: after the completion of the automatic return and the consequent disengagement of the cabin.

Duration of the release of the anti-creeping coil test: from 1 to 2 sec

Total time for the test execution: from 3 to 6 sec

6.4. Operation specifications of uncontrolled movement detection procedures resulting in the de-energizing of the anti-creeping coil

Activation conditions: cabin is engaged (doors open), stopped in normal manoeuvre in the activation zone of the Safety Circuit (not in inspection manoeuvre).

Detection area of uncontrolled movement: 85 mm above or below floor level, detected via the ZP sensor position which determines the deactivation of the Dual-Channel Safety Circuit and the consequent de-energising of the CSM Mono-Channel Safety Circuit.

Intervention time for uncontrolled movement: max 50 ms from the instant of detection of the uncontrolled movement

.

Example calculation of the Total space of the intervention (with a speed of 2,0m/sec): max 185 mm above or below floor level (85mm+2,0m/sec*50msec).

6.5. System block type

Permanent Out of Service: - shown by an appropriate visual display on the panel, differentiated from other fault signalisations
- the lift remains stationary in the engaged mode with the re-levelling disabled

Recovery operation: - activation of the reset fault button placed on the inside of the electric control panel
- the recovery will not take place with either the switching off/switching on of the control panel nor with the inspection mode activation.

6.6. Intervention tests

During the trial tests and during the periodical checks, ensure that the electric control panel regularly performs the anti-creeping device control contact monitoring and that its function as a stop device conforms with the A3 amendment, using the following procedure:

6.6.1. Monitoring of the control contact of the anti-creeping device

Equipped with the control panel electrical diagram,

a) Position the cabin at the lowest floor.
b) Check that the BR1 (AUX1) input of the control panel is off.
c) Perform a shunt between the BR1 and IMP terminals (PLC control panels) or the BR1 and GND terminals (Board control panels), so as to short-circuit the anti-creeping device contact control.
d) After 4 seconds from when the BR1 (AUX1) input of the Controller is on, the lift is put out of service with the appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram)
e) Remove the shunt which has short-circuited the BR1 (AUX1) contact of the anti-creeping device.
f) Check that the BR1 (AUX1) input is once again off.
g) Check that the fault display is once again on and that the system does not leave for any calls.
h) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
i) Perform a call to the second floor and check that the BR1 (AUX1) input of the Controller is always off and that the run is completed without any fault indication.
j) Turn the power of the system off and wait until the control panel Controller is off (if necessary also disconnect the positive 12V battery pole buffer from the Controller.
k) Disconnect the BR1 (AUX1) contact wire from the control panel.
l) Turn the control panel manoeuvre power back on and check that the BR1 (AUX1) input of the Controller is not active.

m) The lift is kept out of service with the appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
n) Reconnect the BR1 (AUX1) contact wire and check that the corresponding input is once again active.
o) Check that the fault indication is once again on and that the system does not leave for any calls.
p) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
q) As soon as the cabin starts its downward descent in order to rephrase at the lowest floor, once again disconnect the wire from the BR1 (AUX1) contact.
r) The cabin stops regularly at floor without opening the doors at the stop and, after a few seconds the power to the anti-creeping coil is interrupted, de-energising the CSM Mono-Channel Safety Circuit.
s) After a further 4 seconds, with the control contact of the anti-creeping device not having been detected, the lift is put out of service with the appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
t) Reconnect the BR1 (AUX1) contact wire and check that the corresponding input is once again active.
u) Check that the fault indication is once again on and that the system does not leave for any calls.
v) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).

6.6.2. Detection of downward uncontrolled movement and the de-energizing of the anti-creeping coil

During this test it is necessary to be able to lower the cabin to at least 85mm below floor level. If at the lowest floor this movement is not possible because the cabin is at final limit, position the cabin at the second stop instead of the lowest floor.

Equipped with the control panel diagram,
.

a) Position the cabin at the lowest floor and keep it in the engaged mode with the doors open in the following way:
   - for PLC control panels disconnect the wire from the PA input of PLC.
   - for Microprocessor Board control panels disconnect the wire from the CM1 input of the Board and send an impulse between the PAP and GND Board terminals (door opening command).
b) Load the cabin to its maximum capacity.
c) From this moment until the end of the test do not enter or exit the cabin, nor stay on the floor threshold.
d) Short-circuit the ID magnetic sensor by performing a shunt between the ID and IMP terminals (PLC control panels) or the ID and GND terminals (Board control panels).
e) Check that the K2 LED of the Dual-Channel Safety Circuit is on.

f) Open the IS magnetic sensor, detaching the wire from the corresponding terminal.
The control panel Controller will command a downward re-levelling movement which will stop as soon as an uncontrolled movement is detected.
g) From the moment the K2 LED switches off, the power to the anti-creeping coil is interrupted by the intervention of the Dual-Channel Safety Circuit which detects the movement and de-energises the CSM Mono-Channel Safety Circuit.
The lift is put out of service with an appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
h) Reconnect the IS magnetic sensor and remove the short-circuit of the ID magnetic sensor.
i) Reconnect the previously disconnected wire from the control panel Controller (PA or CM1).
j) Reset the overspeed governor.
k) Check that the system does not leave for any calls.
l) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
m) Perform a call to the last stop and wait whilst the cabin fully completes the run and returns to a disengaged mode.

6.6.3. Detection of upward uncontrolled movement and the de-energizing of the anti-creeping coil

During this test it is necessary to be able to raise the cabin to at least 85mm above floor level. If at the highest floor this movement is not possible because the cabin is at final limit, position the cabin at the penultimate stop instead of the highest floor.

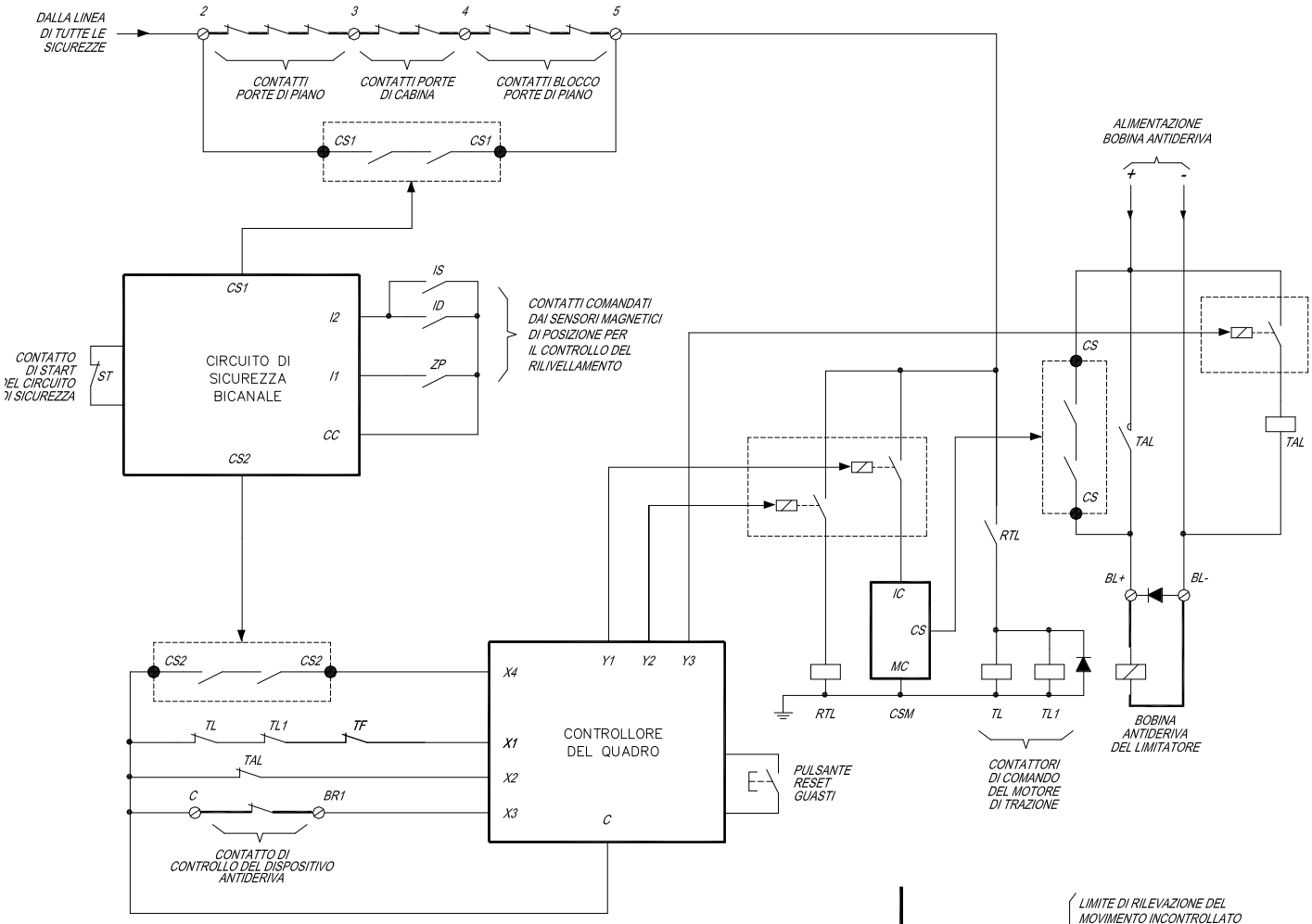
a) Position the cabin at the highest floor and keep it in the engaged mode with the doors open in the following way:
   - for PLC control panels disconnect the wire from the PA input of PLC.
   - for Microprocessor Board control panels disconnect the wire from the CM1 input of the Board and send an impulse between the PAP and GND Board terminals (door opening command).
b) Completely unload the cabin.
c) From this moment until the end of the test do not enter or exit the cabin, nor stay on the floor threshold.
d) Short-circuit the IS magnetic sensor by performing a shunt between the IS and IMP terminals (PLC control panels) or the IS and GND terminals (Board control panels).
e) Check that the K2 LED of the Dual-Channel Safety Circuit is on.
f) Open the ID magnetic sensor, detaching the wire from the corresponding terminal.
The control panel Controller will command an upward re-levelling movement which will stop as soon as an uncontrolled movement is detected.
g) From the moment K2 LED switches off, the power to the anti-creeping coil is interrupted by the intervention of the Dual-Channel Safety Circuit which detects the movement and de-energises of the CSM Mono-Channel Safety Circuit.
The lift is put out of service with an appropriate visual display on the control panel (see the Fault Signalisation table shown in the electrical diagram).
h) Reconnect the ID magnetic sensor and remove the short-circuit IS of the magnetic sensor.

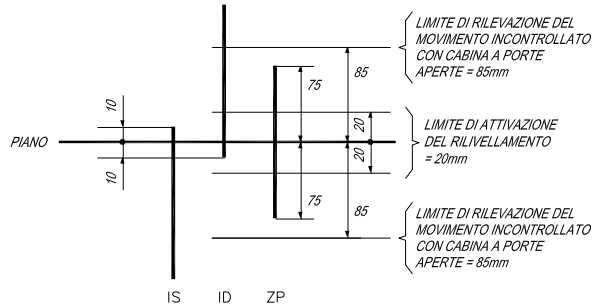
i) Reconnect the previously disconnected wire from the control panel Controller (PA or CM1).
j) Reset the overspeed governor.
k) Check that the system does not leave for any calls.
l) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
m) Perform a call to the first stop and wait whilst the cabin fully completes the run and returns to a disengaged mode.

6.7. Basic control panel diagram of A3-ELEC/P

(In the following page the CSM Mono-Channel Safety Circuit is shown)

SCHEMA DI PRINCIPIO DEL QUADRO A3-ELEC/P



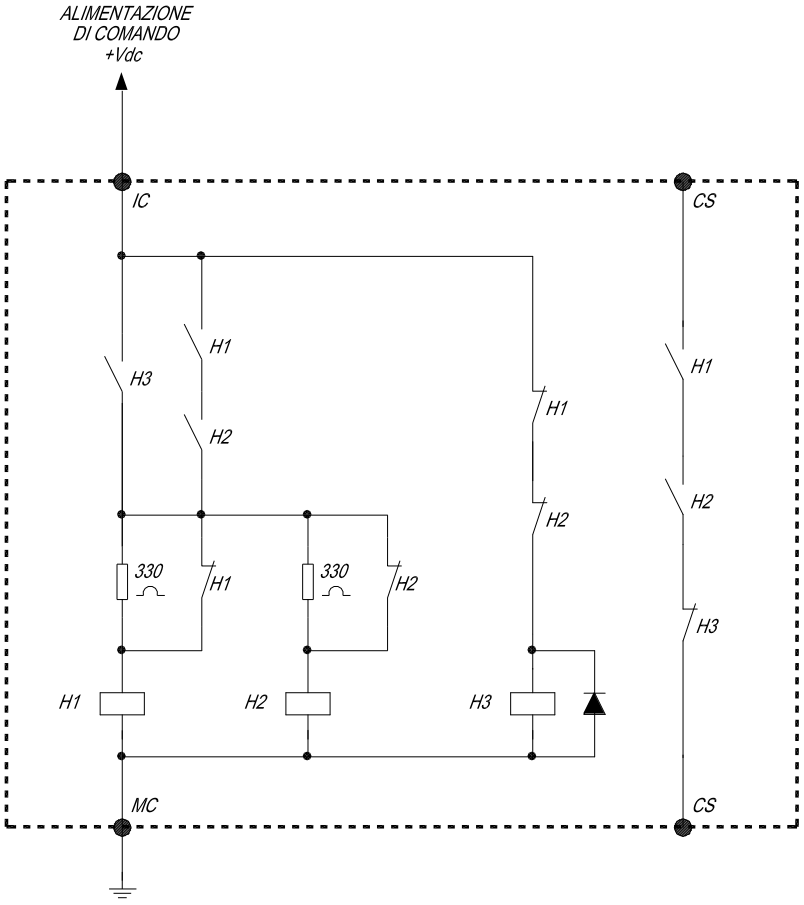


LEGENDA

X1,X2,X3,X4	= INGRESSI CONTROLLORE QUADRO
Y1,Y2,Y3	= USCITE CONTROLLORE QUADRO
C	= COMUNE INGRESSI CONTROLLORE QUADRO
RTL	= RELE' DI COMANDO DEI CONTATTORI DI MARCIA TL - TL1
TAL	= CONTATTORE COMANDO BOBINA ANTIDERIVA IN MARCIA
TF	= CONTATTO DEL CONTATTORE DI CONSENSO ATTIVAZIONE FRENO
I1,I2	= INGRESSI DEI DUE CANALI DEL CIRCUITO DI SICUREZZA
CC	= COMUNE INGRESSI DEL CIRCUITO DI SICUREZZA
CS1,CS2	= USCITE SICURE DEL CIRCUITO DI SICUREZZA
CSM	= CIRCUITO DI SICUREZZA MONOCANALE
CS	= USCITA SICURA DEL CIRCUITO DI SICUREZZA MONOCANALE

6.8. Single channel (CSM) safety circuit with forced control contactors

CIRCUITO DI SICUREZZA MONOCANALE CSM
CON CONTATTORI A GUIDA FORZATA



LEGENDA

H1,H2,H3	*= CONTATTORI A GUIDA FORZATA*
CSM	*= USCITA SICURA DEL CIRCUITO DI SICUREZZA*