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## **1. TYPES OF CONTROL PANELS FOR HYDRAULIC 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-HYDR/1: Control panel with detection of the uncontrolled movement of the cabin with doors open, equipped with automatic functional redundancy monitoring, according to requirements specified in the EN81-20/50:2014 reference standards, for hydraulic units equipped with two solenoid valves operating in series during normal operation.
- A3-HYDR/1B: Control panel provided with the same operating method as the configuration of A3-HYDR/1, specifically adapted for the control of START ELEVATOR hydraulic units with groups of modified valves type 93/E-2DS and 11/M or similar.
- A3-HYDR/H: Control panel with detection of the uncontrolled movement of the cabin with doors open, according to the requirements specified in the EN81-20/50:2014 reference standards, for hydraulic units equipped with one safety solenoid valve, not working during normal operation, used as a device to stop the uncontrolled movement.
- A3-HYDR/N: Control panel with detection of the uncontrolled movement of the cabin with doors open, according to the requirements specified in the EN81-20/50:2014 reference standards, specifically adapted for the control of GMV hydraulic units equipped with NGV-A3 control valves.
- A3-HYDR/M:Control panel specifically adapted for connection to the MORIS hydraulic units equipped with the KMI kit for detection of the uncontrolled movement and related blocking valve.

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 the 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, nonetheless guaranteeing the complete conformity of the specifications required.

| a) <u>CONTROLLER</u>   | MANUFACTURER                       |
|--|------------------------------------|
| <b>Programmable Logic Controller (PLC):</b><br>All models of groups: FX1S, FX1N, FX2N, FX3G, FX3U<br>In all their variants and including relative expansions | MITSUBISHI ELECTRIC<br>CORPORATION |
| <b>Microprocessor Control Boards:</b><br>All models of groups: EURO, SMART, CPU100<br>In all their variants and including relative expansions                | VEGA Srl                           |
| <b>Microprocessor Control Boards:</b><br>All models of groups : AM1, AM2<br>In all their variants and including relative expansions                          | AMCS ELETTRONICA Srl               |
| b) DUAL-CHANNEL SAFETY CIRCUIT   | MANUFACTURER                       |
| <b>Circuit K1-K2-K3 with Forced Control Contactors:</b> (cabled as in the attached electrical diagram)   | PELAZZA PEPPINO Srl                |
| Module CS AR-94V024<br>(connected as in the attached electrical diagram)   | PIZZATO ELETTRICA Sri              |



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





#### LEGENDA

K1,K2,K3 = CONTATTI 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
- 11,12 = INGRESSI DEI DUE CANALI DEL CIRCUITO DI SICUREZZA

CS1,CS2,CS3 = USCITE SICURE DEL CIRCUITO DI SICUREZZA





PER I QUADRI OLEODINAMICI IN CONFIGURAZIONE A3-HYDR/M L'INGRESSO SNS DELLA SCHEDA eKMI MORIS E L'INGRESSO X2 DEL CONTROLLORE DEL QUADRO VENGONO PILOTATI IN PARALLELO DALLA STESSA USCITA SICURA CS2. NON E' QUINDI NECESSARIA LA DISPONIBILITA' DELL'USCITA SICURA CS3 SEPARATA.



## **3. CONTROL PANEL FOR HYDRAULIC LIFTS TYPE A3-HYDR/1**

#### **3.1.** General specifications

The electric control panel includes the detection of uncontrolled movement of the cabin with doors open and is equipped with automatic functional redundancy monitoring, according to requirements specified in the EN81-20/50:2014 reference standards, for hydraulic units equipped with two solenoid valves operating in series during normal operation.

- The control panel has two separate outputs for the independent activation of the two solenoid valves operating in series during normal operation in the descent mode (called VMD and DN).
- Each of the two solenoid valves are operated by the series of two independent contactors:
  - TL and D for the VMD valve
  - TL and DN for the DN valve
- The stand-by state of all TL, D, DN travel contactors, including the upward S 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 automatic functional redundancy monitoring carried out by the control panel Controller with appropriate frequency, consists in the activation in sequence of one of the two solenoid valves at a time, and in the verification that the cabin has not undergone such a drop as to require the intervention of an upward re-levelling for two consecutive times for the same solenoid valve.
- In the case that an irregular drop of the cabin is detected, both during the first and second activation of one of the solenoid valves being monitored, the control panel Controller keeps the system out of service until the intervention of a competent technician.
- In the case that an irregular drop of the cabin with doors open for an uncontrolled movement is detected, shown by the deactivation of the Dual-Channel Safety Circuit, even in this case the control panel Controller keeps the system out of service until the intervention of a competent technician.



#### 3.2. Monitoring operation specifications

Frequency of execution: - at the end of each automatic return to the lowest floor (within 15 min from when the system is disengaged after having completed the last run to whichever other floor).

- at the end of the re-phasing procedure of the cabin at each restart of the system.

Instant of activation: from 2 to 15 sec after the completion of the automatic return or of the re-phasing with the consequent door closure.

Duration of VMD valve test: 10 sec

Time of pause between the VMD valve test and the DN valve test: 10 sec

Duration of DN valve test: 10 sec

Time of pause between consecutive tests for the same solenoid valve in case of an irregular drop during the first test: 10 sec

#### **3.3.** 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 below floor level, detected via the ZP sensor position which determines the deactivation of the Safety Circuit. |
|---|---|
| Intervention time for<br>uncontrolled movement: | max. 100 msec from the instant of detection of the uncontrolled movement.   |
| Total space of the interventio                  | n   |

(with a speed of 1.3m/sec): max. 215 mm below floor level (85mm+1.3m/sec\*100msec).



### 3.4. System block type

| Permanent Out of Ser | <ul> <li>vice: - shown by an appropriate visual display on the panel,<br/>differentiated from other fault signalisations</li> <li>- the lift remains stationary with the doors closed and the<br/>re-levelling disabled</li> </ul>                     |
|----------------------|--|
| Recovery operation:  | <ul> <li>activation of the reset fault button placed on the inside of the electric control panel</li> <li>the recovery will not take place with either the switching off/switching on of the panel nor with the inspection mode activation.</li> </ul> |

#### **3.5.** Optimisation of monitoring operating frequency

Upon request, it is possible to insert a timer which prohibits the execution of the monitoring following an automatic return, if less than 12 hours has passed since the previous monitoring.

#### **3.6.** 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, using the following procedure:

#### **3.6.1.** Uncontrolled movement detection

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 resting, position the cabin at the second stop instead of the lowest floor. Equipped with the control panel diagram,

- a) Position the cabin to 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 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) From this moment until the end of the test do not enter or exit the cabin, nor stay on the floor threshold.
- c) Disconnect the RS relay coil (PLC control panels) or the S contactor (Board control panels) power wire.
- d) Check that the ZP relay of the electric control panel is excited (PLC control panels) or that the K2 LED of the Dual-Channel Safety Circuit is on (Board control panels).
- e) Push the manual descend button on the unit, keeping it depressed until the ZP relay is de-energized or the K2 LED is off.



- f) From the moment the ZP relay is de-energized or the K2 LED is off, 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).
- g) Reconnect the RS relay coil or S contactor power wire.
- h) Reconnect the previously disconnected wire from the control panel Controller (PA or CM1).
- i) After a few seconds the lift should reclose its doors if stationary with doors closed.
- 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).
- I) If the cabin is positioned at the lowest floor, perform a call to the second stop and wait whilst the cabin fully completes the run and returns to a disengaged mode.

### **3.6.2.** Monitoring of the first descending solenoid valve (VMD)

- a) Turn the power of the system off and wait until the control panel Controller is off (if necessary also disconnect the positive pole of the 12V battery buffer of the Controller).
- b) Restart the control panel power supply and wait until the lift goes to the lower floor to re-phase.
- c) After a maximum of 15 seconds the control panel will command only the VMD valve (TL and D contactors excited).
- d) Check that the ID (IF) input of the control panel Controller is active.
- e) During the 10 seconds in which this valve remains excited, push the manual descend button of the unit until the ID (IF) input switches off.
- f) The system will perform an upward re-levelling and take the cabin up to floor.
- g) After a further 10 seconds the control panel will once again command only the VMD valve (TL and D contactors excited).
- h) During the 10 seconds in which this valve remains excited, once again push the manual descend button of the unit until the ID (IF) input switches off.
- i) From the moment the ID (IF) input is off, the VMD valve is deactivated 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).
- 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).
- I) The system will perform an upward re-levelling and take the cabin up to floor.
- m) Perform a call to the second stop and wait whilst the cabin fully completes the run and returns to a disengaged mode.



#### **3.6.3.** Monitoring of the second descending solenoid valve (DN)

- a) Turn the power of the system off and wait until the control panel Controller is off.
- b) Restart the control panel power supply (if the battery buffer has been disconnected, reconnect it) and wait until the lift goes to the lower floor to re-phase.
- c) After a maximum of 15 seconds the control panel will command only the VMD valve (TL and D contactors excited).
- d) Check that the ID (IF) input of the control panel Controller is active.
- e) Wait 10 seconds at the end of which the VMD valve is deactivated without the system having carried out an upward re-levelling.
- f) After a further 10 seconds the control panel will command only the DN valve (TL and DN contactors excited).
- g) During the 10 seconds in which this valve remains excited, push the manual descend button of the unit until the ID (IF) input switches off.
- h) The system will perform an upward re-levelling and take the cabin up to floor.
- i) After a further 10 seconds the control panel will once again command only the DN valve (TL and DN contactors excited).
- j) During the 10 seconds in which this valve remains excited, once again push the manual descend button of the unit until the ID (IF) input switches off.
- k) From the moment the ID (IF) input is off, the DN valve is deactivated 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).
- I) Check that the system does not leave for any calls.
- m) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
- n) The system will perform an upward re-levelling and take the cabin up to floor.







SCHEMA DI PRINCIPIO DEL QUADRO A3-HYDR/1

## 4. CONTROL PANEL FOR HYDRAULIC LIFTS TYPE A3-HYDR/1B

#### **4.1.** General specifications

The electric control panel is equipped with the same operating method as the A3-HYDR/1 configuration but is also preset to be specifically adapted to control the hydraulic START ELEVATOR units with group of modified valves types 93/E-2DS and 11/M or similar.

The control panel therefore includes the detection of uncontrolled movement of the cabin with doors open and is equipped with automatic functional redundancy monitoring, according to requirements specified in the EN81-20/50:2014 reference standards, for hydraulic units equipped with two solenoid valves operating in series during normal operation.

- The control panel has two separate outputs for the independent activation of the two solenoid valves operating in series during normal operation in the descent (called VMD and DN) mode.
- The DN solenoid value is also activated at the upward start for 0.5 seconds before supplying the pump and is only kept activated for a further 0.5 seconds after having supplied the pump.
- Each of the two solenoid valves are operated from the series of two independent contactors:
  - TL and D for the VMD valve
  - TL and DN for the DN valve
- The stand-by state of all TL, D, DN travel contactors, including the upward S 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 automatic functional redundancy monitoring carried out by the control panel Controller with appropriate frequency, consists in the activation in sequence of one of the two solenoid valves at a time, and in the verification that the cabin has not undergone such a drop as to require the intervention of an upward re-levelling for two consecutive times for the same solenoid valve.

In the case that an irregular drop of the cabin is detected, both during the first and second activation of one of the solenoid valves being monitored, the control panel Controller keeps the system out of service until the intervention of a competent technician.



#### 4.2. Monitoring operation specifications

Frequency of execution: - at the end of each automatic return to the lowest floor (within 15 min from when the system is disengaged after having completed the last run to whichever other floor).
- at the end of the re-phasing procedure of the cabin of each restart of the system.

Instant of activation: from 2 to 15 sec after the completion of the automatic return or of the re-phasing with the consequent door closure.

Duration of VMD valve test: 10 sec

Time of pause between the VMD valve test and the DN valve test: 10 sec

Duration of DN valve test: 10 sec

Time of pause between consecutive tests for the same solenoid valve in case of an irregular drop during the first test: 10 sec

#### **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 below floor level, detected via the ZP sensor position |
|                        | which determines the deactivation of the Safety Circuit.     |

Intervention time for uncontrolled movement:

max. 100 msec from the instant of detection of the uncontrolled movement.

| Total space of the interventic | n                             |
|--------------------------------|-------------------------------|
| (with a speed of 1.3m/sec):    | max. 215 mm below floor level |
|                                | (85mm+1.3m/sec*100msec).      |



### 4.4. System block type

| <ul> <li>Permanent Out of Service: - shown by an appropriate visual display on the pane<br/>differentiated from other fault signalisations.</li> <li>- the lift remains stationary with the doors closed and<br/>re-levelling disabled.</li> </ul> |   |
|--|---|
| Recovery operation:  | <ul> <li>activation of the reset fault button placed on the inside of the electric control panel.</li> <li>the recovery will not take place either with the switching off/switching on of the panel nor with the inspection mode activation.</li> </ul> |

#### 4.5. Optimisation of monitoring operating frequency

Upon request, it is possible to insert a timer which prohibits the execution of the monitoring following an automatic return, if less than 12 hours has passed since the previous monitoring.

#### **4.6.** 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 reference standards, using the following procedure:

#### 4.6.1. Uncontrolled movement detection

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 resting, position the cabin at the second stop instead of the lowest floor. Equipped with the control panel diagram,

- a) Position the cabin to 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) From this moment until the end of the test do not enter or exit the cabin, nor stay on the floor threshold.
- c) Disconnect the RS relay coil (PLC control panels) or the S contactor (Microprocessor board control panels) power wire.
- d) Check that the ZP relay of the electric control panel is excited (PLC control panels) or that the K2 LED of the Dual-Channel Safety Circuit is on (Board control panels).
- e) Push the manual descend button on the unit, keeping it depressed until the ZP relay is de-energized or the K2 LED is off.



- f) From the moment the ZP relay is de-energized or the K2 LED is off, 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).
- g) Reconnect the RS relay coil or S contactor power wire
- h) Reconnect the previously disconnected wire from the control panel Controller (PA or CM1).
- i) After a few seconds the lift should reclose its doors if stationary with doors closed.
- 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).
- I) If the cabin is positioned at the lowest floor, perform a call to the second stop and wait whilst the cabin fully completes the run and returns to a disengaged mode.

### 4.6.2. Monitoring of the first descending solenoid valve (VMD)

- a) Turn the power of the system off and wait until the control panel Controller is off (if necessary also disconnect the positive pole of the 12V battery buffer of the Controller).
- b) Restart the control panel power supply and wait until the lift goes to the lower floor to re-phase.
- c) After a maximum of 15 seconds the control panel will command only the VMD valve (TL and D contactors excited).
- d) Check that the ID (IF) input of the control panel Controller is active.
- e) During the 10 seconds in which this valve remains excited, push the manual descend button of the unit until the ID (IF) input switches off.
- f) The system will perform an upward re-levelling and take the cabin up to floor.
- g) After a further 10 seconds the control panel will once again command only the VMD valve (TL and D contactors excited).
- h) During the 10 seconds in which this valve remains excited, once again push the manual descend button of the unit until the ID (IF) input switches off.
- i) From the moment the ID (IF) input is off, the VMD valve is deactivated 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).
- 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).
- I) The system will perform an upward re-levelling and take the cabin up to floor.
- m) Perform a call to the second stop and wait whilst the cabin fully completes the run and returns to a disengaged mode.



#### 4.6.3. Monitoring of the second descending solenoid valve (DN)

- a) Turn the power of the system off and wait until the control panel Controller is off.
- b) Restart the control panel power supply (if the battery buffer has been disconnected, reconnect it) and wait until the lift goes to the lower floor to re-phase.
- c) After a maximum of 15 seconds the control panel will command only the VMD valve (TL and D contactors excited).
- d) Check that the ID (IF) input of the control panel Controller is active.
- e) Wait 10 seconds at the end of which the VMD valve is deactivated without the system having carried out an upward re-levelling.
- f) After a further 10 seconds the control panel will command only the DN valve (TL and DN contactors excited).
- g) During the 10 seconds in which this valve remains excited, push the manual descend button of the unit until the ID (IF) input switches off.
- h) The system will perform an upward re-levelling and take the cabin up to floor.
- i) After a further 10 seconds the control panel will once again command only the DN valve (TL and DN contactors excited).
- j) During the 10 seconds in which this valve remains excited, once again push the manual descend button of the unit until the ID (IF) input switches off.
- k) From the moment the ID (IF) input is off, the DN valve is deactivated 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).
- I) Check that the system does not leave for any calls.
- m) Restart the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).
- n) The system will perform an upward re-levelling and take the cabin up to floor.



#### 4.7. Basic diagram of A3-HYDR/1B control panel

#### SCHEMA DI PRINCIPIO DEL QUADRO A3-HYDR/1B



## 5. CONTROL PANEL FOR HYDRAULIC LIFTS TYPE A3-HYDR/H

#### **5.1.** General specifications

The control panel includes the detection of uncontrolled movement of the cabin with doors open, according to requirements specified in the EN81-20/50:2014 reference standards, for hydraulic units equipped with one security solenoid valve not working during normal operation, used as a device to stop the uncontrolled movement.

- The control panel has two separate outputs for the independent activation of the downward solenoid valve and the security solenoid valve (called VMD and DN).
- The downward VMD solenoid value is normally controlled by a series of the two independent TL and D contactors.
   The DN safety solenoid value is controlled by the single DN contactor in that it is not considered operating for the normal cabin movement check.
- The stand-by state of TL, D travel contactors, as well as the upward S contactor, are 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 stand-by state of the DN security solenoid valve command contactor is also tested by the control panel Controller which prevents any type of movement command of the cabin (with the exception of re-levelling) if this contactor is not resting with the cabin disengaged.
- The control panel Controller provides for an excitation of the security valve each time the cabin is engaged (disengaged start or doors open at floor where located) and to de-energize each time the cabin is disengaged (at the beginning of door closure or at the end of the re-phasing and automatic return).
- The security value is activated even for a downward re-levelling, but not for the upward re-levelling with the cabin disengaged (doors closed).
- The control panel Controller also ensures that, for whatever movement of the cabin for which is foreseen the excitation of the security valve, this will be activated 0.4 seconds before giving the travel command and is also deactivated 1.0 seconds after stopping.
- In the case that an irregular drop of the cabin with doors open for an uncontrolled movement is detected, the security valve is de-energized by the intervention of the Safety Circuit which detects the drop.

As a consequence the control panel Controller keeps the system out of service until the intervention of a competent technician.



| 5.2. Operation specifications of uncontrolled movement detection<br>procedures resulting in the de-energizing of the safety valve |   |  |
|---|---|--|
| Activation conditions: cabir<br>the a<br>man  | n is engaged (doors open), stopped in normal manoeuvre in activation zone of the Safety Circuit (not in inspection peuvre). |  |
| Detection area of<br>uncontrolled movement: 85<br>wl  | 5 mm below floor level, detected via the ZP sensor position<br>hich determines the deactivation of the Safety Circuit.      |  |
| Intervention time for<br>uncontrolled movement:   | max. 100 msec from the instant of detection of the uncontrolled movement.   |  |
| Total space of the intervention (with a speed of 1.3m/sec):   | on<br>max. 215 mm below floor level<br>(85mm+1.3m/sec*100msec).   |  |

#### 5.3. System block type

| Permanent Out of Ser | <ul> <li>vice: - shown by an appropriate visual display on the panel,<br/>differentiated from other fault signalisations</li> <li>- the lift remains stationary with the doors closed and the<br/>re-levelling disabled</li> </ul>                      |
|----------------------|---|
| Recovery operation:  | <ul> <li>activation of the reset fault button placed on the inside of the electric control panel.</li> <li>the recovery will not take place either with the switching off/switching on of the panel nor with the inspection mode activation.</li> </ul> |

#### **5.4.** 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 reference standards, using the following procedure:



# **5.4.1.** Uncontrolled movement detection and the de-energizing of the safety valve

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 resting, position the cabin at the second stop instead of the lowest floor. Equipped with the control panel diagram,

- a) Position the cabin to 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 wire of the 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) From this moment until the end of the test do not enter or exit the cabin, nor stay on the floor threshold.
- c) Disconnect the RS relay coil (PLC control panels) or the S contactor (Board control panels) power wire.
- d) Check that the ZP relay of the electric control panel is excited (PLC control panels) or that the K2 LED of the Dual-Channel Safety Circuit is on (Board control panels).
- e) Check that the DN security valve is active (DN contactor excited).
- f) Push the manual descend button of the unit, keeping it depressed until the ZP relay is de-energized or the K2 LED is off.
- g) From the moment the ZP relay is de-energized or the K2 LED is off, the DN contactor is also de-energized, and therefore the DN security value is immediately deactivated.
- h) 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).
- i) Reconnect the RS relay coil or S contactor power wire.
- j) Reconnect the previously disconnected wire from the panel Controller (PA or CM1).
- k) After a few seconds the lift should reclose its doors if stationary with doors closed.
- I) Check that the system does not leave for any calls.
- m) Reactivate the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).







#### SCHEMA DI PRINCIPIO DEL QUADRO A3-HYDR/H

Pelazza A3-Hydr

PIANO

= CONTATTORI DI COMANDO DELLE VALVOLE DISCESA = CONTATTORE PRINCIPALE DI MARCIA = CONTATTI DEI CONTATTORI DI MARCIA SALITA:

- S PER AVVIAMENTO DIRETTO O SOFT STARTER

- Y E △ PER AVVIAMENTO STELLA TRIANGOLO

D,DN TL S

10

10

IS

ID

ZΡ

75

75

85

LIMITE DI RILEVAZIONE DEL MOVIMENTO INCONTROLLATO CON CABINA A PORTE APERTE

= 85mm

## 6. CONTROL PANEL FOR HYDRAULIC LIFTS TYPE A3-HYDR/N

#### **6.1.** General specifications

The control panel includes the detection of uncontrolled movement of the cabin with doors open, according to requirements specified in the EN81-20/50:2014 reference standards, and is specifically adapted for the control of the GMV hydraulic units equipped with NGV-A3 control valves.

- As specified in the said hydraulic unit instruction manual, the control panel has two separate inputs (called RDY and RUN) for a continual monitoring (in both normal manoeuvre as in inspection) of the corresponding contacts exiting the NGV-A3 unit control board.
- In the case that the RDY contact (normally closed and at rest and open during travel) and the RUN contact (normally open at rest and closed during travel) result in the same state for over 2 seconds, the control panel Controller will block the system and take it out of service until the intervention of a competent technician.
- In the two cases for which the failure condition occurs during a command movement of the cabin, the control panel will block the system with different methods:
  - a) in the case where the two contacts are both closed, the control panel carries on as normal with the travel and will block the system only after the normal stop
  - b) in the case where the two contacts are both open, the control panel will immediately terminate the travel and block the system.
- In the case that an irregular drop of the cabin with doors open for an uncontrolled movement is detected, shown by the deactivation of the Dual-Channel Safety Circuit, the control panel Controller once again in this case keeps the system out of service until the intervention of a competent technician.

#### **6.2.** 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 below floor level, detected via the ZP sensor position which determines the deactivation of the Safety Circuit.



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

Total space of the intervention

(with a speed of 1.3m/sec): max. 215 mm below floor level (85mm+1.3m/sec\*100msec).

### 6.3. 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 with the doors closed and 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.

### **6.4.** 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 reference standards, using the following procedure:

#### 6.4.1. Uncontrolled movement detection

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 resting, position the cabin at the second stop instead of the lowest floor. Equipped with the control panel diagram,

- a) Position the cabin to 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 the 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) From this moment until the end of the test do not enter or exit the cabin, nor stay on the floor threshold.
- c) Disconnect the RS relay coil (PLC control panels) or the S contactor (Board control panels) power wire.
- d) Check that the ZP relay of the electric control panel is excited (PLC control panels) or that the K2 LED of the Dual-Channel Safety Circuit is on (Board control panels).



- e) Push the manual descend button of the unit, keeping it depressed until the ZP relay is de-energized or the K2 LED is off.
- f) From the moment the ZP relay is de-energized or the K2 LED is off, the lift is put out of service with an appropriate visual display on the control panel (see the Failure Report table shown in the electrical diagram).
- g) Reconnect the RS relay coil or S contactor power wire.
- h) Reconnect the previously disconnected wire from the control panel Controller (PA or CM1).
- i) After a few seconds the lift should reclose its doors if stationary with doors closed.
- j) Check that the system does not leave for any calls.
- k) Reactivate the system using the appropriate reset fault button (according to the procedure shown in the electric control panel diagram).

#### 6.4.2. Monitoring of the NGV-A3 control board

Perform all the failure simulation tests on the RDY and RUN outputs of the NGV-A3 control board as specified in the GMV manual at paragraph Regulations and Tests.

Every time that a control panel has to recognise an error, the lift is put out of service with an appropriate visual display on the control panel (see the Fault Signalisation table as shown in the electrical diagram).

- a) Check that the system does not leave for any calls.
- b) Reactivate the system using the appropriate reset failure push button (according to the procedure shown in the control panel electrical diagram)



#### 6.5. Basic diagram of A3-HYDR/N control panel

SCHEMA DI PRINCIPIO DEL QUADRO A3-HYDR/N



Pelazza 🔽 A3-Hydr

## 7. CONTROL PANEL FOR HYDRAULIC LIFTS TYPE A3-HYDR/M

#### 7.1. General specifications

The electric control panel is preset to be specifically adapted for the connection to the MORIS hydraulic unit equipped with the KMI detection of uncontrolled movement kit and of the relative blocking valve.

- As specified in the said hydraulic unit instruction manual, the control panel has the following inputs and outputs to connect to the eKMI electronic board of the unit:
  - Output of a safe auxiliary contact of the Dual-Channel Safety Circuit to communicate the abandonment of the door zone from the cabin (SNS) to the eKMI board.
  - Output of an auxiliary contact of the main travel TL contactor to inform the eKMI board when a cabin command (MOV) is in movement.
  - Output socket of the safety chain upstream of the cabin door (SF2).
  - Output socket of the safety chain downstream of the cabin door (SF1).
  - Input for a blocking contact system which keeps the lift out of service every time the eKMI board shows whichever anomaly (TMO).
- When the blocking contact system is open (TMI-TMO), exiting the eKMI board, the control panel keeps the lift stationary with doors closed with the re-levelling disabled.
- Concerning the method of intervention of the blocking valve in the case of uncontrolled movement detection, in keeping the system out of service, and the relative recovery procedure, refer to the user manual of the KMI kit supplied by MORIS.



# **7.2.** Door area abandonment signalization specifications sent to the eKMI board for the detection of uncontrolled movement

| Abandonment of the door zone area:                | 85 mm below floor level, detected via the ZP sensor position which determines the deactivation of the Safety Circuit. |
|---|---|
| Intervention time of the Safety Circuit:          | max. 30 msec from the instant of detection of the abandonment of the door zone.                                       |
| Total space of the inte<br>(with a speed of 1.3m/ | rvention<br>sec): max. 124 mm below floor level<br>(85mm+1.3m/sec*30msec).  |

#### **7.3.** 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 reference standards, using the procedures outlined in the MORIS manual at paragraph Intervention Tests.

Verify every time that the eKMI board shows such an irregularity for which the system has to be kept out of service (TMI-TMO contact open), the system does not leave for any call.





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A3-Hydr