MANUAL
INSTALLATION USE AND MAINTENANCE
ETC SYSTEM

MODEL:
- 80÷240 VAC
- 40÷60 VDC
- 80÷180 VDC
<table>
<thead>
<tr>
<th>Date</th>
<th>Rev</th>
<th>Description</th>
<th>GL</th>
<th>MC</th>
<th>DT</th>
<th>AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.05.2017</td>
<td>1.00</td>
<td>First issue</td>
<td>GL</td>
<td>MC</td>
<td>DT</td>
<td>AM</td>
</tr>
<tr>
<td>16.01.2019</td>
<td>1.02</td>
<td>Added 80÷180 Vdc</td>
<td>DT</td>
<td>MC</td>
<td>DT</td>
<td>DBA</td>
</tr>
</tbody>
</table>
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0 GENERAL PART

0.1 INTRODUCTORY INFORMATIONS

0.1.1 PRODUCT DESCRIPTION

Thank you for choosing this product; GMV, innovative company, world-wide leader in hydraulic components for lift design, production and sale, just created, to offer customers all the economic and technical advantages, but most of all to give more safety and comfort to daily users.

The ETC device is the result of the GMV research. It is applied to most of the GMV power units equipped with a 3010 valve and is able to reduce the total energy consumption of the lift system by reducing the leveling time.

The levelling time, is that where the motor runs but the system is in low speed phase. This means that the motor uses the available energy in small part for lifting, losing it into heat.

At this step starts the capability of the device in order to reduce the energy loss. As a result of this reduction, managed by ETC, we have the reduction of the FLY time, due to a longer high-speed travel time and a shorter levelling time, limiting all the energy loss. So we get the best system efficiency.

0.1.2 DEFINITIONS

In this manual you can apply the definitions as indicated in the following standards and regulations:

- EN81-20 e EN81-50  Safety regulations for the construction and installation of lifts
- EN ISO 12100  Safety of machinery - Principles for risk assessment
- UNI EN ISO 7010  Graphic symbols: Safety signs and colours
- EN12016 e EN12015  Electromagnetic compatibility
- CEI EN 61439-1  Low voltage switchgear and control gear assemblies (LV control panels)

0.1.3 TERMS AND SYMBOLS USED

NOTE
Indicates information which contents must be seriously taken in consideration.

WARNING
Indicates that the described operation is likely to cause, damages to the system or physical damages if performed without complying with the safety standards.

WARNING
Indicates that the described operation is likely to cause, damages to the system or physical damages if performed without switch off the main power and complying with the safety standards. (Electrocution, lightning, etc.).

Space for notes

0.1.4 CLEANING

WARNING
Do not use liquids to clean the electrical parts

0.1.5 DISPOSAL OF MATERIALS


In particular, the following materials, when replaced, must not be dispersed in the environment but must be delivered to authorized collection centers, the manufacturer or, preferably certified, specialized companies.

Electrical and electronic equipment, batteries and / or accumulators, lamps. (RAEE)
0.1.6 MAIN REFERENCE STANDARDS

For anything that is not expressly given in this manual, reference should be made to the local standards and regulations in force, observing in particular:

<table>
<thead>
<tr>
<th>Directive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014/33/UE</td>
<td>Lift Directive - on the harmonisation of the laws of the Member States relating to lifts and safety components for lifts</td>
</tr>
<tr>
<td>2014/35/CE</td>
<td>Low Voltage Directive – on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits</td>
</tr>
</tbody>
</table>

Norme EN-81 serie completa

Safety regulations for the construction and installation of lifts

Refer to the complete series and, in particular to:

- EN 81-20 Safety rules for the construction and installation of lifts – Lift for the transport of persons and goods - Part 20: Passengers and goods passenger lifts
- EN 81-50 Safety rules for the construction and installation of lifts – Examinations and tests - Part 50: Design rules, calculations, examinations and tests of lift components
- EN 81-70 Safety regulations for the construction and installation of lifts – Particular applications for lifts for the transport of persons and goods
- Part 70: Accessibility to lifts for persons, including persons with disabilities
- CEI EN 61439-1 Low voltage switchgear and control gear assemblies (LV control panels)
  Part 1: Type tested assemblies (AS) and partially type tested assemblies (ANS)
- EN 12015 Electromagnetic compatibility – Product family standard for lifts, escalators and moving walkways – Emission
- EN 12016 Electromagnetic compatibility – Product family standard for lifts, escalators and moving walkways – Immunity
- UNI EN 13015 Maintenance for lifts and escalators: Rules for maintenance instructions
- UNI EN ISO 7010 Graphic symbols – Safety signs and colours – Registered safety signs
- UNI EN ISO 13857 Machine safety – Safety distance to avoid access to dangerous areas with arms or legs
- UNI EN ISO 12100 Safety of machinery - Principles for risk assessment
- ISO 14798 Lifts (elevators), escalators and mobile walkways
  – Risks assessment and reduction methodology

0.1.7 SAFETY DURING INSTALLATION OR MAINTENANCE

During the installation and maintenance, it is compulsory to observe the applicable national job security regulations.

**WARNING**

Before beginning any of the installation operations, **ALWAYS** check that all the mechanical and electrical safety devices are, turned on and in perfect working order.

0.1.8 EQUIPMENT

No special tools are required unless expressly provided by component manufacturers supplied by third parties. In this case, the related features and operating instructions are indicated in the manuals attached to them.
0.1.9 MATERIALS OFF>Loading AND STORAGE

- Verify that all materials received are those ordered and are complete.
- Check the condition of all components and materials upon reception at the building yard, to verify if any damage occurred during transport; immediately inform GMV Spa in case any part is missing or in case of damage.
- Store the electrical and electronic components in a cool and dry place in their original packages.
- If, for any reason, it were not possible to install the plant immediately, periodically check the stored components to prevent possible damages due to a prolonged storage in bad conditions.
- Check if the documentation related to the plant is enclosed.

0.1.10 INSTALLATION DOCUMENTS

The documents to use for installation purposes are those required by the applicable standards, in particular:
- THIS MANUAL
- THE WIRING DIAGRAMS (EN81-1-2:2010)

To ensure correct and safe system maintenance, all the documentation must be carefully conserved by the installation manager. You must remember that this documentation is an integral part of the system and must be complete and carefully conserved.
Furthermore, to ensure it is always legible, it must not be damaged, incomplete or have any torn or ruined pages when it needs consulting.

GMV Spa will not assume any responsibility if the instructions included in this manual are not observed. GMV SpA remains available for any clarification regarding the use of the product.

0.2 FEATURES

Here are the ETC following features:
- It can be applied to most of the GMV power units equipped with a 3010 valve.
- It consists of two components: a module containing an electronic card with different terminal board connections and a temperature probe to connect.
- Simply to install thanks to the unified DIN guide.
- ETC module has a built-in software able to self-learning the system operating conditions: automatically manages the stroke distances and the levelling time by a fast self-tuning according to its pre-set parameters, both for up travel and down travel.
- It specifically manages the levelling time and distance, reducing and subsequently making them steady when the fluid temperature (and its viscosity) changes, thanks to the data sent from the temperature probe. Consequently, forces a balance by adjusting the FLY time in high-speed.
- It is not requested any further modification on the 3010 valve so as it could be in standard version and adjusted subsequently, more times in the mounting phase of the ETC module.
- Specific adjusting tools or potentiometer on the control panel are not needed.
- Built-in electronic feedback circuit.

0.3 ADVANTAGES

ETC device has the following advantages:
- Energetically optimizes the operation of the system, allowing the same amount of travels with less energy total consumption.
- At the same consumption, it allows a more intensive usage of the system.
- A lower thermal stress both for the motor and the fluid, takes to a longer duration of the system (at the same travel amount, the motor runs for less time).
- ETC device could be installed even on pre-existing plants.
- Plant modification is not necessary.
- It allows, in most cases, to remove oil and valve heaters, managing the performance of the lift in order to make the system free from the temperature variations.
- Any specific kind of fluid is not needed, because all the changes of viscosity will be identified and managed.
- Any specific skill of the technician is not needed because isn’t requested any parameter pre-setting.
1 TECHNICAL DATA

1.1 TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static pressure with full load in car</td>
<td>45 bar</td>
</tr>
<tr>
<td>Pressure with empty car</td>
<td>12 bar</td>
</tr>
<tr>
<td>Fluid temperature</td>
<td>-5 ÷ 75 °C</td>
</tr>
<tr>
<td>Maximum car speed</td>
<td>1,00 m/s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fluid Temperature</th>
<th>Speed</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ÷ 70 °C</td>
<td>≤ 0,63 m/s</td>
<td>2,0 m</td>
</tr>
<tr>
<td>&lt; 15 °C</td>
<td>≤ 1,00 m/s</td>
<td>2,8 m</td>
</tr>
<tr>
<td>≥ 15 °C</td>
<td>≤ 1,00 m/s</td>
<td>2,0 m</td>
</tr>
</tbody>
</table>

Minimum distance between floor and acceleration contacts

<table>
<thead>
<tr>
<th>Up $D_{ral}$, S [m]</th>
<th>$V_n$ [m/s]</th>
<th>Down $D_{ral}$, D [m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,25</td>
<td>0,00 &lt; $V$ ≤ 0,30</td>
<td>0,35</td>
</tr>
<tr>
<td>0,35</td>
<td>0,30 &lt; $V$ ≤ 0,40</td>
<td>0,45</td>
</tr>
<tr>
<td>0,45</td>
<td>0,40 &lt; $V$ ≤ 0,50</td>
<td>0,55</td>
</tr>
<tr>
<td>0,60</td>
<td>0,50 &lt; $V$ ≤ 0,60</td>
<td>0,70</td>
</tr>
<tr>
<td>0,80</td>
<td>0,60 &lt; $V$ ≤ 0,70</td>
<td>0,90</td>
</tr>
</tbody>
</table>

1.2 HOW IT WORKS

ETC device works processing the pre-set delays for VML cursor, acquiring the temperature readings sent by the probe, in order to reduce the levelling distances while adjusting the FLY time in high-speed phase, both in up-travel and in down-travel.

---

3010 VALVE WORKING

**INPUT SIGNALS**

**CONTROL PANEL**
- Up signal (VMP)
- Down signal (VMD)
- Speed signal

**OUTPUT SIGNALS**

**MAIN VALVE**
- VML Electrovalve

ETC DEVICE WORKING

**INPUT SIGNALS**

**CONTROL PANEL**
- Up signal (VMP)
- Down signal (VMD)
- Speed signal

**EXTERNAL CONDITION**
- Temperature Probe

**OUTPUT SIGNALS**

**MAIN VALVE**
- VML Electrovalve

In the power unit standard operating mode, signals directly control the main valve. So the system is always affected by the change of temperature and viscosity.

ETC device controls the signals to the VML electrovalve, (that produces the switch between high and low speed) in order to minimize both FLY time and energy consumption, depending on external conditions.
LED LIGHTS IN THE WORKING PHASE:

The ETC System has 3 leds:
- the led n.13, green for Upward
- the led n.14, yellow to check the device status
- the led n.15, green for Downward

DEVICE POWERING ON:
- the green led n.15 (downward), quickly flashes for few seconds.
- As a first test, the system checks the temperature is between 15°C – 50°C,
  - In case the temperature does not match the range, the led n.14 yellow led blinks-The lift could start running regularly.
  - Once the temperature reaches the range limit, the device checks that there are no signals (up, down, error) and starts tuning the values if necessary.

WORKING ERRORS:
- Up and Down signals (leds 13 and 15) flash simultaneously
- Up or Down signals are off when when high speed signals is on
- Levelling phase too short
- Travel time too short

Any abnormal working, put in error the ETC card and the yellow led n.14 starts blinking to the next travel.

At the floor, the yellow led n.14 is on. The remaining leds stay off. At the start, the device clears the timer of the high speed travel. It turns into a listening mode to acquire the low speed signal. In the high speed phase the green led n.13 in on and n.15 flashes. There is any tuning if the high speed time travel is less than 3,5 seconds.

At the end of the delay calculation, the yellow led turns on and the “in-travel” leds n.13 or 15 turn in fixed mode.

In the landing phase (without any signals) the yellow error led n.14 turns in fixed mode and the green “in-travel” leds n.13 and 15 stay off.

1.3 VERSIONS

There are different versions of ETC device
- **Version AC** cod. 70205637 to connect coils from 80 to 240 Volt AC;
- **Version DC** cod. 70205638 to connect coils from 40 to 60 Volt DC;
  - cod. 70205693 to connect coils from 80 to 180 Volt DC.
1.3.1 TERMINAL MAPPING FOR Wiring

<table>
<thead>
<tr>
<th>ID</th>
<th>Initials</th>
<th>Description</th>
<th>Version</th>
<th>AC</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(*) DW+</td>
<td>Input of Down travel signal</td>
<td></td>
<td>Phase</td>
<td>+ Positive</td>
</tr>
<tr>
<td>2</td>
<td>(*) COM</td>
<td></td>
<td></td>
<td>Neutral</td>
<td>- Negative</td>
</tr>
<tr>
<td>3</td>
<td>(*) COM</td>
<td>Input of Up travel signal</td>
<td></td>
<td>Neutral</td>
<td>- Negative</td>
</tr>
<tr>
<td>4</td>
<td>(*) UP+</td>
<td></td>
<td></td>
<td>Phase</td>
<td>+ Positive</td>
</tr>
<tr>
<td>5</td>
<td>JACK</td>
<td>Programming interface (Jack-in 3,5 mm)</td>
<td></td>
<td>Phase</td>
<td>+ Positive</td>
</tr>
<tr>
<td>8</td>
<td>HI-SPD</td>
<td>Input of High speed signal</td>
<td></td>
<td>Neutral</td>
<td>- Negative</td>
</tr>
<tr>
<td>9</td>
<td>COM</td>
<td></td>
<td></td>
<td>Neutral</td>
<td>- Negative</td>
</tr>
<tr>
<td>10 Nero</td>
<td>0V</td>
<td>Thermal probe wire</td>
<td></td>
<td>0V</td>
<td></td>
</tr>
<tr>
<td>11 Nero</td>
<td>IN</td>
<td></td>
<td></td>
<td>IN</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Not used</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 (**) DC 24V -</td>
<td>DC 24V -</td>
<td>- Negative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 (**) DC 24V+</td>
<td>DC 24V +</td>
<td>+ Positive</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LED**
- LED UP: Up travel: Green
- LED DW: Down travel: Green
- ERR: Error: Yellow

**Output**
- 6 COM: VML coil: Neutral, - Negative
- 7 VML: Phase, + Positive

(*): The VMP "UP travel" input (n.3, n.4 clamps) and the VMD "DOWN travel" input (n.1, n.2 clamps) must never be active at the same time. In the absence of the input signal of the upward command (VMP not included), produce throw a normally open contact ("N.O." from the UP travel control panel switch) the UP signal input loss for the n.4- clamp and connect for DC current the negative (COM) to n.3 clamp or in case of alternate current, the Neutral wire to n.3 clamp.

(**): If the control panel could not provide 24 VDC power, you should provide an optional power (24 Vdc, 1A)

2 INSTALLATION

2.1 INSTALLATION INSTRUCTION

1. Power off the control panel
2. Place the ETC device in the control panel on the DIN standard guide
3. Perform the electrical wiring following the mapping according to the type of device supplied (AC / DC)
4. Place the end of the thermal probe (black colored) in the power unit tank.
   Attention: the probe must be under the minimum fluid level of the power unit, taking care to position it, far from the motor windings and any heating resistors of the fluid.
   e.g.: Place it on the outlet grid filter.
5. Move the leveling contacts, to **obtain the same slow-down levelling distance for all the stops** (distance-set)
   Note: you can get different distance-sets between UP and DOWN travel according to the different speed between the two directions.
6. Power ON the control panel and restart the system
7. Make an UP travel call and a DOWN travel call between two floors (not extreme) to verify the operating.
8. ETC system will self-learn the operating conditions and it will star the correct adjusting after 3-4 travels.
9. Let the system run regularly
2.2 CONNECTION DIAGRAM

Connect to the ETC device (§ 1.3.1):
- The alternate current coils according to AC mapping version
- The direct current coils according to DC mapping version

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LEGEND:

- SB: Tank
- STT: Temperature probe
- QM: Control panel
- J: mini-jack TRS 3,5 mm
- 3010: 3010 distributor
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