DLV-A3 VALVE MANUAL

INSTALLATION AND USE

AVAILABLE WITH VALVE TYPE

3010 ¾", 1 1/4", 1 ½", 2", NGV ¾"
# INDEX

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0.1 INTRODUCTION
Assembling, installation, start-up and hydraulic lift maintenance should be performed by experienced personnel. Before starting any work on the hydraulic components, personnel should carefully read these instructions, particularly referring to 0.3 chap. “Safety precautions during installation”. This “Instruction Manual” is an integral part of the lift and should be protected and accessible.

DLV is a non return electrically-controlled valve, working in series with the main valve to stop the lift during an unintended car movement from the floor. DLV valve prevents only the downward unintended car movement. DLV valves are certified according to the European Machine Directive 2014/33/UE and comply with EN81-20 par. 5.6.7. The purpose of the valve is to work together with the main valve according to the Lift European Standards EN 81-20:2014 par. 5.6.7.3, which states that “in case of use of two managed electro-valves working in series for the levelling phase and the stop during the normal operation, the self control implies the separate check of the correct opening and closing of each single valve under the minimum static pressure”.

0.2 INSTALLATION RELATED DOCUMENTS
The documents to use for the installation are those required by the EN81-20 and by the rules in force, particularly the following:

THIS INSTALLATION MANUAL
Wiring and hydraulic diagrams (EN81-20 par 7.3.2 (a6 and a7)
All the documentation for a correct and safe installation, must be stored by the installation responsible. Please remember that this documentation is considered part of the plant and must be complete, well stored and unabridged in every part.
In order to maintain the readability, the documentation shouldn’t be damaged and shouldn’t have missing parts. Moreover, do not tear or deteriorate sheets during consulting.

0.3 SAFETY PRECAUTION DURING INSTALLATION
Installers and maintenance staff are completely responsible for their own safety during their activities. They should follow all the safety official rules to prevent accidents to the working staff. In these instructions, the major points concerning the working safety and prevention, will be marked by the following symbols:
0.4 GENERAL ORDERS
The valves shall be maintained in good working order in accordance with the European Standards.
To this effect, regular maintenance of the installation shall be carried out, to ensure, in particular, the safety of the installation.
The safety of an installation shall take into account the ability to be maintained without causing injury or damage to health.
Regular maintenance of the installation shall be carried out to ensure the reliability of the installation.
The access and the associated environment shall be maintained in good working order.
The competence of the maintenance person within the maintenance organization shall be continuously updated.

0.5 LIABILITY AND WARRANTY
These instructions are intended for people with experience in installation, adjustment and maintenance of hydraulic lifts.
GMV disclaims any liability for damage caused by improper or different use from what described in these instructions or inexperience or carelessness of those responsible to assemble, adjust or repair hydraulic components.
GMV's warranty is voided if you install any components or parts not original, if you make unauthorized changes or modifications or made by unauthorized or unqualified personnel.

Unless otherwise indicated, the following situations are forbidden for safety reasons:

- Any product modification;
- The installation of the product for purposes other than those described;
- Damage to the joints;
- Carrying out maintenance or inspections improper or inadequate;
- The use of improper accessories and not original spare parts or materials from GMV.

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

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

To install or replace system components, we should pay attention to the following measures:

- Make the car lift rest on the buffers
- Make sure the lift shouldn't be unintentionally powered, locking the main switch
- Bring to zero the pressure before opening the hydraulic circuit, removing cups, unscrewing fittings
- In case of welding, be care the slags do not get in touch with the fluid, the jask and the gaskets
- Remove the fluid in excess, the leakages, keep clean the system to find out and consequently remove the leakages

WARNING
Before starting all kind of installation operation:
ALWAYS verify that all the safety devices, mechanical or electrical, are active and working properly
1 FEATURES AND REQUIREMENTS

1.1 DLV A3 VALVE

The DLV A3 is a pilot-operated non-return valve that must be mounted between the cylinder and the 3010 control valve or any other control valve for lifts, traditional or electronic.

The valve should be installed as close as possible to the main hydraulic block but in special cases can be installed also close to the cylinder without compromising its function.

During the upward phase it works as a normal non-return valve. So the pressure of the oil sent from the pump can control the opening degree. However, DLV A3 can be energized also during the up-travel without compromising its functionality.

In down direction however, when energized, the valve allows the passage of oil from the cylinder to the main hydraulic block and then into the tank. When de-energized, it immediately closes and stops the lift.

DLV are manufactured in different sizes and can be used for the following range (see the tab. 1).

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DLV A3 - ¾&quot;</td>
<td>45</td>
<td>8 - 45</td>
<td>12 - 45</td>
<td>5 - 70</td>
<td>14-290 (ISO VG 46)</td>
<td>24-12</td>
<td>110</td>
<td>30</td>
</tr>
<tr>
<td>DLV A3 - 1&quot; ½</td>
<td>210</td>
<td>15 - 210</td>
<td>30</td>
<td></td>
<td></td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DLV A3 - 1&quot; ¾</td>
<td>430</td>
<td>25 - 430</td>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DLV A3 - 2&quot;</td>
<td>600</td>
<td>30 - 600</td>
<td></td>
<td></td>
<td></td>
<td>45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tab. 1

1.2 DELIVERY PACKAGING

Upon picking up the material, before signing the delivery, be care the goods match the packing list and the order list.

The packing list should includes:
- Installation use and maintenance manual
- DLV device (factory assembled)
- Connection fittings
- Cartboard box

1.3 IDENTIFICATION PLATE

The indentification plate with the main factory data (see picture below), is directly placed on DLV.

The plate should include:
- Type of DLV device
- Serial number
- Year manufacturing
- Flow range
- Max static pressure

1.4 THE FLUID

The hydraulic fluid is very important for an hydraulic lift. Especially in systems with medium or intensive traffic, choosing a good fluid increases the temperature range of comfortable working and enhances the service life of the components.
When we choose the fluid we must take into account both the characteristics of the elevator (temperature, power unit ventilation room, amount of traffic) and the characteristics of the fluid (temperature-viscosity). In case of replacement, follow the local pollution. Waste should be placed in a proper box to protect the environment.

GMV use and recommend an hydraulic fluid ISO VG 46 that:

- Thanks to classification as category HEES, as rule ISO-UNI 6743-4 and its biodegradability index > 70%, according to standard OECD-301-B, is acceptable from an environmental point of view.
- Thanks to the synthetic base (ISO VG 46) and its viscosity index (>140), higher than the traditional mineral oil, allowing greater stability, ensuring better performance against wear and aging on systems as lifts for persons and goods, in accordance with the environmental directive 2006/118/EC.
- Thanks to a flash point above 300°C compared to the 140°C of the traditional mineral oil it is safer and reduces the risk of fire.

1.5 CLEANING AND SAFETY PROTECTIONS

Ensure there is no dirty inside. The impurities could damage the sealing of the piston and of the valve block and can cause failures. All the components to remove for control and repair, should be clean before the re-installation. Any leakage of fluid should be adsorbed with rags during the maintenance to avoid any release.

2 DLV A3 WORKING DESCRIPTION

2.1 DESCRIPTION

The DLV A3 is a pilot-operated downward non-return valve, normally closed, primarily made by an aluminium body.

The F side must be connected to the primary valve. The H side must be connected to the ball valve and then to the jack (see pict. 1 in sect.). Here below is shown the flow upward.

So let’s see what must be done during the normal working of the lift:

**Upward:** If the DLV A3 works as a standard non-return valve opening by the oil pressure, nothing is requested.

**Downward:** the valve DLV A3, has two working ways:

1. Contemporaneous

   The DLV A3 is energized and de-energized at the same time of the main downward solenoid valve VMD. In this way both valves are working as hydraulic valves in series and they require to be monitored. The monitoring requires the type examination certificate. This monitoring must be done once a day by performing (automatically) a specific sequence of actions.
2. Timed
The DLV A3, respect to the main downward solenoid valve VMD, is energized about 1 second before and de-energized almost 2 seconds after the arrival at landing.
In this way the DLV A3 is not an element working to control the lift and consequently does not require any kind of monitoring. Its correct working can be verified during the standard maintenance operations every 6 months.

**A3 intervention state of DLV**
In the shaft must be present a system (ex. two contacts/switches) able to detect the unintended movement of the car with open doors in up or down direction.

**During an unintended movement in down direction**, when the unintended movement is detected, the system de-energize the DLV A3 valve to let it close and stop the lift.

**During an unintended movement in up direction** the system must switch off the motor/pump to stop this movement. Consequently the valve will stop the car. In every case, after this phase, the system should go out of service and it should be restored only by an authorized and properly trained person. The system which detects the unintended movement and energizes the stopping device can be the existing one just used to define the opening doors zone. The intervention zone, according to the EN 81-20 par. 5.6.7.5 must be at maximum ± 200 mm from the landing

### 2.2 HYDRAULIC SCHEME

Here below (pict.3) follows the DLV hydraulic scheme to show the placing of DLV, between the main valve and the jack.

**Legend**

<table>
<thead>
<tr>
<th>PT</th>
<th>Pressure trasducer</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLV</td>
<td>Non return pilot-operated valve</td>
</tr>
<tr>
<td>R/S</td>
<td>Shut off valve/Silencer</td>
</tr>
<tr>
<td>VC</td>
<td>Check valve</td>
</tr>
<tr>
<td>ISP</td>
<td>Inspection pressure gauge fitting</td>
</tr>
<tr>
<td>MAN</td>
<td>Pressure gauge</td>
</tr>
<tr>
<td>Pmax</td>
<td>Maximum pressure switch</td>
</tr>
<tr>
<td>Pmin</td>
<td>Minimum pressure switch</td>
</tr>
<tr>
<td>OLD</td>
<td>Overload pressure switch</td>
</tr>
<tr>
<td>J</td>
<td>Jack</td>
</tr>
<tr>
<td>[F]</td>
<td>DLV connection main valve side</td>
</tr>
<tr>
<td>[H]</td>
<td>DLV connection main jack side</td>
</tr>
</tbody>
</table>

**2.1 SEMPLIFIED HYDRAULIC SCHEME**

![Simplified Hydraulic Scheme](image-url)
3 INSTALLATION

**WARNING**
During the installation: never exclude safety devices and never power-on the motor pump.

3.1 HYDRAULIC CONNECTION SAMPLES

- DLV A3 - 3010 – MR with cabinet up to 150 lt
- DLV A3 - 3010 – MR no cabinet from 180 to 210 lt
- DLV A3 - 3010 - MRL MC with cabinet up to 150 lt
- DLV A3 - 3010 - MRL MC no cabinet 180/210 lt
3.2 DIMENSIONS

<table>
<thead>
<tr>
<th>DLV</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>H</th>
<th>H_t</th>
<th>D_A, D_B</th>
<th>A_A, A_B</th>
<th>B_A</th>
<th>B_B</th>
<th>A_F, B_F</th>
</tr>
</thead>
<tbody>
<tr>
<td>¾&quot;</td>
<td>120</td>
<td>54</td>
<td>6,5</td>
<td>54</td>
<td>175</td>
<td>¾&quot; G</td>
<td>26</td>
<td>48</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>1&quot; ¼</td>
<td>153,5</td>
<td>80</td>
<td>13</td>
<td>70</td>
<td>192</td>
<td>1&quot; ¼ G</td>
<td>35</td>
<td>67,5</td>
<td>28,5</td>
<td>53</td>
</tr>
<tr>
<td>1&quot; ½</td>
<td>185</td>
<td>90</td>
<td>9</td>
<td>90</td>
<td>212</td>
<td>1&quot; ½ G</td>
<td>45</td>
<td>73</td>
<td>32</td>
<td>-</td>
</tr>
<tr>
<td>2&quot;</td>
<td>204</td>
<td>90</td>
<td>15</td>
<td>115</td>
<td>237</td>
<td>2&quot; G</td>
<td>57,5</td>
<td>89,25</td>
<td>39,5</td>
<td>-</td>
</tr>
</tbody>
</table>

4 ELECTRICAL CONNECTIONS

Mode 1

- Contemporaneous

EN81-20

Safety chain

Mode 2

- Timed

EN81-20

Car door safety

LD

Landing door safety
INSTALLATION NOTES

Mode 1: to correctly install the DLV A3 on the valves 3010, 3100, GEV or similar, the following devices (if presents) must be mounted, or transferred on the DLV:

- Pressure overload (installation on the DLV A3 optional if Mode 2)
- Pressure transducer (installation on the DLV A3 optional if Mode 2)
- Pressure gauge and pressure gauge inspection EN (installation on the DLV A3 recommended)

All above to provide a correct reading of the pressure value.

4.1 ELECTRICAL GETTING STARTED: ICONS

5 TEST AND ADJUSTMENTS

5.1 MONITORING SYSTEM CHECK

To assure the correct working of the monitoring system of the DLV A3 the control panel should perform a check operation behind closed doors, at least once a day.

The control panel, during the test, must:

1. To move the car to the lower floor
2. To close the doors
3. Wait that the system turns into the “Free” status
4. Start the test following the scheme ->
5. At the end of the test, if the system is not in the “Out of service” status, turn the system in normal use.

If the control panel receives a command from a push-button panel during the test, stop the test, execute the command (order / call) and at the end, restart from point 1.

| | = Close  
| ] | = Open  
| ✗ | = NO  
| ✓ | = YES  
| R | = Relevelling  
| L | = Return at landing

Diagram:

START

DLV ] [  

VMD ] [ ?  

VMD OK  

STOP

DLV ] [  

VMD ] [  

STOP

END
With the car stopped at landing, energize only the DLV A3 valve, holding the main valve VMD de-energized. If all the components work correctly, the car must stop at landing position. A timed check starts for two sec. to verify a car movement. In case of movement detection without landing, the system must go into alarm and put the lift out of service. In case of back-lancing, another 2 seconds timed check starts, energizing the the DLV. If the relevelling does not start, the system is ok. Otherwise, a VMD failure is confirmed (DLV de-energized). In the same way, is energized only the main valve VMD, holding the DLV A3 valve de-energized. If all the components work correctly, the car must stop at landing position. A timed check starts for two sec. to verify a car movement. In case of movement detection without landing, the system must go into alarm and put the lift out of service. In case of back-lancing, another 2 seconds timed check starts, energizing the VMD. If the relevelling does not start, the system is ok. Otherwise, a DLV failure is confirmed (VMD de-energized).
DLV VALVE MANUAL
INSTALLATION, USE

FLUID DYNAMICS EQUIPMENTS
AND COMPONENTS FOR LIFTS

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For all the data not included in this manual refer to the documents of any single part.
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