INSTALLATION MANUAL
NGV VALVE

AVAILABLE WITH
TANK TYPE

- GL
- F1
- T2
- MRL-T
- MRL-H

COD. 1 0991 447/B
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1 HYDRAULIC CIRCUIT

K  Check valve
ISP  Inspection gauge fitting
MAN  Manometer
PT  Pressure transducer
VB  Flow control valve
VMD  Down solenoid valve
VR1  Check valve (inlet)
VR2  Check valve (outlet)
PAM  Hand pump
  1  VS valve adjustment
  2  VS1 valve adjustment (hand pump)
  3  Ram pressure adjustment (only for indirect acting jacks 2:1)
ML  Manual lowering button
VS  Overpressure valve
VSMA  Manual lowering valve
VC  Pipe rupture valve
SM  Stepping motor
VRP  Pilot operated check valve
VS1  Overpressure valve (hand pump)
VR  Check valve
TT  Temperature transducer
  4  Manometer shut-off valve
  5  Shut-off valve for rupture valve test
For the overpressure valve adjustment:
1. Refer to the hydraulic circuit of the NGV valve
2. Close the ball valve (B), the lever must be found to 90° regarding the ball valve
3. Open the manometer shut-off valve (4)
4. Unscrew and remove the protection cap of the adjusting screw of the overpressure valve (1)
5. Loosen the locknut 1
6. Start the motor-pump group
7. Start the Overpressure Value control procedure on the PT01 programmer (please refer to the section 9.1 of the Programming chapter)
8. Read the pressure on the programmer
9. If the read value is different then the calibration one:
   - Press the manual lowering button (ML) in order to decrease the pressure on the valve block
   - Screw the adjustment screw 1 for increase the pressure on the VS; unscrew the adjustment screw 1 for reduce the pressure.
   - Start the motor-pump group
   - Start the Overpressure Value control procedure on the PT01 programmer
   - Read the pressure on the programmer
   - Repeat this procedure until the pressure value on the programmer is the same than the calibration one
10. Tighten the locknut 1
11. Put back and tighten the protection cap of the adjusting screw 1
12. Re-open the ball valve
For the ram pressure on the VSMA adjustment:
1. Close the ball valve (B), the lever must be found to 90° regarding the ball valve
2. Unscrew and remove the protection cap of the adjusting screw of the VSMA valve (3)
3. Press the manual lowering button (ML)
4. Check the pressure gauge on the manometer (MAN) is around 5 bar. If it is 5 bar go to point 6, if it is less then 5 bar go to point 5
5. 
   a) Re-open the ball valve B
   b) Loosen the locknut 3
   c) Tighten the screw 3 – one turn
   d) Tighten the locknut 3
   e) Close the ball valve B
   f) Press the manual lowering button ML
   g) Repeat this procedure until the pressure is close to 5 bar
   h) Go to point 6
6. Put back and tighten the protection cap of the adjusting screw 3
7. Re-open the ball valve B
CAUTION!
GENERAL DANGER:
Before testing the pipe rupture valve, adjust this valve on the cylinder (refer to the technical data on the plant)

To test the pipe rupture valve follow the next procedure:
1. Move the elevator to the highest floor at full load (refer to plant operation manual)
2. After the car comes to a full stop loosen the locknut 5 and unscrew the screw 5 – 3 turns
3. Start the Pipe Rupture test procedure on the PT01 programmer (please refer to the section 9.2 of the Programming chapter)
4. At the end of the test fully tighten the screw 5 and tighten the locknut 5
The distance between the deceleration sensor and the floor must be regulated according to the chart above.
If the levelling space is greater is possible to make an adjustment using the programmer as shown in the chapter Programming.
6 ELECTRICAL PART

6.1 NGV01 control board features

The hardware features of the NGV01 control board are:

- Supply: 40Vdc not stabilized, obtained from a 30Vac ±15% source rectified. For different supplies refer to the wiring schemas section
- Signals from controller interface:
  - 24...50Vdc isolated, Upward signal (VS), Nominal speed signal (V0), Intermediate speed signal (V1), Inspection speed signal (V2). For greater voltages refer to the wirings with existing controllers section
  - 24...100Vdc, 110...180Vdc selected by a jumper (J2) for Downward signal/command (VMD)
- N° 4 output relè without voltage and programmable for monitoring and fault check (refer to the Output Programmable Functions Chart)
- Pressure transducer interface 4...20mA, supply 12Vdc
- PTC temperature transducer interface (1000Ω 25°C)
- Inductive sensor for VRP position check (IND) interface, supply 12Vdc, signal 12Vdc max
- Stepping motor driver: 52Vdc max @2A RMS
- VMD command, in series with D signal, max. 2A, EN81.2 surface isolation distances and in air compliant
- RS232 interface by RJ45 connector, suitable both for PT01 programmer and for PC connection
• N°2 diagnostic led:
  o supply state, GREEN led:
    ▪ SWITCHED OFF: no supply voltage
    ▪ BLINKING: supply voltage out of the ranges
    ▪ ON (FIXED): correct supply voltage
  o alarm state, RED led:
    ▪ SWITCHED OFF: no alarm
    ▪ BLINKING: alarm that blocks the lift
    ▪ ON (FIXED): alarm that doesn’t block the lift

6.2 Wiring specifics

6.2.1 Controller interface

The interface to the controller is made by removable terminal connectors as described below:

**Connector X1**

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Mark</th>
<th>Features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>10mA…1A</td>
<td>Programmable output relè (refer to programming menu and programmable functions chart)</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>125Vdc</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>10mA…1A</td>
<td>Programmable output relè (refer to programming menu and programmable functions chart)</td>
</tr>
<tr>
<td>4</td>
<td>22</td>
<td>125Vdc</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>31</td>
<td>10mA…1A</td>
<td>Programmable output relè (refer to programming menu and programmable functions chart)</td>
</tr>
<tr>
<td>6</td>
<td>32</td>
<td>125Vdc</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>41</td>
<td>10mA…1A</td>
<td>Programmable output relè (refer to programming menu and programmable functions chart)</td>
</tr>
<tr>
<td>8</td>
<td>42</td>
<td>125Vdc</td>
<td></td>
</tr>
</tbody>
</table>

**Connector X2**

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Mark</th>
<th>Features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VS</td>
<td>24…60Vdc</td>
<td>Upward direction (VS) input</td>
</tr>
<tr>
<td></td>
<td></td>
<td>isolated</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>V0</td>
<td>Nominal speed (V0) input</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>V1</td>
<td>Intermediate speed for short floors (V1) input</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>V2</td>
<td>Inspection speed (V2) input, if it's not equal to nominal speed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V-</td>
<td>Common (0V) could be A-</td>
<td>Common V0, V1, V2 e VS input</td>
</tr>
</tbody>
</table>

**Connector X3**

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Mark</th>
<th>Features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A+</td>
<td>40…48Vdc levelled (obtained from 30…33Vac)</td>
<td>Board supply inputs 0,5A (1,5A if it has to supply also the VMD valve)</td>
</tr>
<tr>
<td>2</td>
<td>A-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>D+</td>
<td>24…100Vdc</td>
<td>Downward VMD command input</td>
</tr>
<tr>
<td></td>
<td>D-</td>
<td>110…180Vdc</td>
<td>Selectable range by J2 jumper</td>
</tr>
<tr>
<td>5</td>
<td>E+</td>
<td>48Vdc max.</td>
<td>Emergency lowering valve inputs, support terminals</td>
</tr>
<tr>
<td>6</td>
<td>E-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The input circuits are divided into two groups, both isolated from the board supply:
- V0, V1, V2, VS in common with V-
- D+ in common with D-

**Jumper J2**

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VMD downward input and command 24…100Vdc</td>
</tr>
<tr>
<td>2</td>
<td>VMD downward input and command 110…180Vdc</td>
</tr>
</tbody>
</table>

**6.2.2 Valve interface**

The interface to the valve is described below:

**Connector X4**

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Mark</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E-</td>
<td>Emergency lowering valve outputs</td>
</tr>
<tr>
<td>2</td>
<td>E+</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>D-</td>
<td>VMD downward command outputs</td>
</tr>
<tr>
<td>4</td>
<td>VMD</td>
<td></td>
</tr>
</tbody>
</table>

**Connector X5**

Stepping motor connector made by a pre-assembled AMP terminal

**Connector X6**

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Mark</th>
<th>Features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TS1</td>
<td>+Ref</td>
<td>Temperature transducer inputs</td>
</tr>
<tr>
<td>2</td>
<td>TS2</td>
<td>2KΩ max.</td>
<td>Pressure transducer inputs</td>
</tr>
<tr>
<td>3</td>
<td>TP1</td>
<td>+12Vdc</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>TP2</td>
<td>4…20mA return</td>
<td></td>
</tr>
</tbody>
</table>

**Connetitore X7**

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Mark</th>
<th>Features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TP4</td>
<td>+12Vdc</td>
<td>Inductive sensor power supply</td>
</tr>
<tr>
<td>2</td>
<td>TP5</td>
<td>0…12Vdc</td>
<td>Inductive sensor input signal (IND)</td>
</tr>
<tr>
<td>3</td>
<td>TP6</td>
<td>0V</td>
<td>Inductive sensor common</td>
</tr>
</tbody>
</table>
Jumper J3
For the correct working of the inductive sensor, the J3 jumper must be wired between the position 1 and 2 as shown in the picture below:

Connector X8
Optional connector

Connector X9
Optional connector

Connector X10
Board programming and diagnosis connector

Connector X11
RS232 interface connector for PC or PT01 programmer

6.3 Controller wiring schemas
In this section will be described the wiring schemas between the NGV control board and the lift controllers.
Two different situations are shown:
- optimal configuration (no added devices are needed)
- adapting of existing controllers (modernizations)

In the first case are presented four kind of wiring schemas according to the power supply source, the signals source ad the downward VMD valve source.

In the second case are presented two different kind of wirings for modernizations. GMV provides specific adapting boards in order to simplify the connection between the NGV01 control board and the existing controllers.
6.3.1 Optimal configuration

6.3.1.1 Schema 1

Features:

- VMD voltage independent from the board supply voltage
- Signals voltage in common with the board supply voltage
6.3.1.2 Schema 2

Features:
- Independent board supply voltage
- Independent signals voltage (PLC, custom board, etc.)
- Independent VMD voltage
6.3.2 Adapting of existing controllers

6.3.2.1 Schema 1 – Modernization with supply up to 60Vdc
6.3.2.2 Schema 2 – Modernization with supply greater than 60V
6.4 Signals sequence and timing

NGV01 input signals sequence and timing both for upward and for downward lift runs are shown below:

6.4.1 Upward

Time $T^*$ depends on motor starting. VS signal must be switched ON when the motor is completely started.

The chart below shows the meaning of the various combinations of the input signals:

<table>
<thead>
<tr>
<th>$V_S$</th>
<th>$V_0$</th>
<th>$V_1$</th>
<th>$V_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Where:

1  Energized
0  Not Energized
X  Anything

N.B. It is necessary to have 2,5 " sec. delay before changing direction of travel.
6.4.2 Downward

The chart below shows the meaning of the various combinations of the input signals:

<table>
<thead>
<tr>
<th>D</th>
<th>V₀</th>
<th>V₁</th>
<th>V₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Where:

1    Energized
0    Not Energized
X    Anything

N.B. It is necessary to have 2.5 " sec. delay before changing direction of travel.
It is possible to dialog with the NGV01 control board by the programmer PT01. The connection between the programmer and the board is made by a network UTP RJ45 straight cable. The programmer power supply comes from the control board through the connection cable. It is possible to navigate into the menus and change the numeric values using the arrow keys ↑ ↓, it is possible to enter into the sub-menus and confirm the input data by the ENT key and finally it’s possible exit and move the cursor left side by the ESC key.
DIAGNOSTICS

NGV VER XX.XXX
1 DIAGNOSTICS

1.1 PRESSURE
XX.X bar

1.2 TEMPERATURE
XX.X °C

1.3 REF. SPEED
X.XXX m/s

1.4 INPUT S012DI
000000

1.5 OUTPUT 1234D
00000

1.6 SUPPLY
XX.X V

1.7 FLY TIME

1.7.1 TOTAL
XXX.X s

1.7.2 START->DEC
XXX.X s

Pressure gauge [bar] read by the pressure transducer

Temperature gauge [°C] read by the temperature transducer

Set point speed [m/s]

State of the input signals
S012DI  S012DI
100000=VS  000010=D
010000=V0  000100=V2
001000=V1  000001=IND

State of the output signals
1234D  1234D
10000=OUTPUT #1  00010=OUTPUT #4
01000=OUTPUT #2  00001=VMD
00100=OUTPUT #3

Supply voltage [V] of the control board

Fly time of the lift

Total time of the lift trip [s]

Time between the start of the lift end the start of the deceleration phase [s]
1.7.3 DEC->STOP
XXX.X s

Time between the start of the deceleration phase and the stop of the lift [s]

ALARM

NGV VER XX.XXX
2-ALARM

2.1 ALARM
00: No Alarm

Active alarms. Each alarm is identified by a code explained in the Failure Chart. Last 8 alarms are stored in memory

ALARM AND FAULT RESET

NGV VER XX.XXX
3-AL/FLT RESET

3.1 FAULT RESET

Pressing the ENT key on the programmer all the faults and the alarms are deleted
ADJUSTMENTS

NGV VER XX.XXX
4-ADJUSTMENTS

4.1 START UP MIN
±XX.X

UPWARD start adjustment (-99 ÷ +99)

4.2 SLOW. UP MIN
±XX.X

UPWARD levelling speed adjustment (-99 ÷ +99)

4.3 HIGH DN MIN
±XX.X

DOWNWARD high speed adjustment (-99 ÷ +99)

4.4 SLOW. DN MIN
±XX.X

DOWNWARD levelling speed adjustment (-99 ÷ +99)
4.5 START. UP MAX
±XX.X

UPWARD start adjustment (-99 + +99)

4.6 SLOW. UP MAX
±XX.X

UPWARD levelling speed adjustment (-99 + +99)

4.7 HIGH DN MAX
±XX.X mm

DOWNWARD high speed adjustment (-99 + +99)

4.8 SLOW DN MAX
±XX.X mm

DOWNWARD levelling speed adjustment (-99 + +99)
4.9 OFFSET V0 UP
XXX mm

UPWARD levelling space adjustment in NOMINAL speed (0 ÷ 600 mm)

4.10 OFFSET V0 DN
XXX mm

DOWNWARD levelling space adjustment in NOMINAL speed (0 ÷ 600 mm)

4.11 OFFSET V1 UP
XXX mm

UPWARD levelling space adjustment in INTERMEDIATE speed (0 ÷ 600 mm)

4.12 OFFSET V1 DN
XXX mm

DOWNWARD levelling space adjustment in INTERMEDIATE speed (0 ÷ 600 mm)
### SETTINGS
Data inserted by GMV robe checked during the installation of the unit.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NGV VER XX.XXX</td>
<td>5-SETTINGS</td>
</tr>
<tr>
<td>5.1 LIFT RATIO</td>
<td>Ratio of the lift system (1:1; 2:1; 3:1)</td>
</tr>
<tr>
<td>X:X</td>
<td></td>
</tr>
<tr>
<td>5.2 JACK DIAM.</td>
<td>Equivalent piston diameter (SEE TABLE). [mm]</td>
</tr>
<tr>
<td>XXX mm</td>
<td></td>
</tr>
<tr>
<td>5.3 PUMP FLOW</td>
<td>Flow rate of the pump [l/min]</td>
</tr>
<tr>
<td>XXX l/min</td>
<td></td>
</tr>
<tr>
<td>5.4 MAP</td>
<td>Map code of the power unit</td>
</tr>
<tr>
<td>XXXX</td>
<td></td>
</tr>
<tr>
<td>5.5 PSTAT MIN.</td>
<td>Minimum static pressure (5.0 ÷ 45.0 bar)</td>
</tr>
<tr>
<td>XX.X bar</td>
<td></td>
</tr>
<tr>
<td>5.6 Pstat Max.</td>
<td>Maximum static pressure (Pstat Min. ÷ 45.0 bar)</td>
</tr>
<tr>
<td>XX.X bar</td>
<td></td>
</tr>
<tr>
<td>5.7 P MIN.</td>
<td>Minimum pressure (1.0 ÷ 10.0 bar)</td>
</tr>
<tr>
<td>XX.X bar</td>
<td></td>
</tr>
<tr>
<td>5.8 P FULL LOAD</td>
<td>Full load pressure, 80% of nominal load (12.0 ÷ 45.0 bar)*</td>
</tr>
<tr>
<td>XX.X bar</td>
<td></td>
</tr>
<tr>
<td>5.9 P OVERLOAD</td>
<td>Overload pressure, 110% of nominal load (12.0 ÷ 45.0 bar)*</td>
</tr>
<tr>
<td>XX.X bar</td>
<td></td>
</tr>
<tr>
<td>5.10 P MAX</td>
<td>Maximum pressure, 140% of nominal load (15.0 ÷ 70.0 bar)*</td>
</tr>
<tr>
<td>XX.X bar</td>
<td></td>
</tr>
<tr>
<td>5.11 COOL TEMP.</td>
<td>Maximum fluid temperature (5.0 ÷ 70.0 °C)</td>
</tr>
<tr>
<td>XX °C</td>
<td></td>
</tr>
</tbody>
</table>

* Re-calculated value when the $P_{stat,MIN}$ value (parameter 5.5) or the $P_{stat,MAX}$ value (parameter 5.6) are modified
## UPWARD PARAMETERS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 NOM.SPEED V0</td>
<td>X.XX m/s</td>
<td>Nominal speed [m/s] referred to the nominal pump flow, piston diameter and size, value not modifiable.</td>
</tr>
<tr>
<td>6.2 INT.SPEED V1</td>
<td>X.XX m/s</td>
<td>Intermediate speed [m/s] (15 ÷ 75 % x Nominal Speed)</td>
</tr>
<tr>
<td>6.3 INS.SPEED V2</td>
<td>X.XX m/s</td>
<td>Inspection speed (0.15 ÷ 0.63 m/s)</td>
</tr>
</tbody>
</table>
DOWNWARD PARAMETERS

| NGV VER XX.XXX  |
| 7-DN PARAMETERS |

7.1 NOM.SPEED V0
X.XX m/s

Enter required nominal downward speed (m/s…) . ex: 0,63

7.2 INT.SPEED V1
X.XX m/s

Indicates the Intermediate speed [m/s] 
(15 ÷ 75 % x Nominal Speed)

7.3 RELEV. SPEED
X.XXX m/s

Re-levelling speed (0.010 ÷ 0.150 m/s))
### OUTPUT FUNCTIONS

<table>
<thead>
<tr>
<th>NGV VER XX.XXX</th>
<th>8-OUTPUT FUNC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 OUTPUT 11-12</td>
<td>Function identified by a code described in <strong>Output Programmable Functions Chart</strong></td>
</tr>
<tr>
<td>8.2 OUTPUT 21-22</td>
<td>Function identified by a code described in <strong>Output Programmable Functions Chart</strong></td>
</tr>
<tr>
<td>8.3 OUTPUT 31-32</td>
<td>Function identified by a code described in <strong>Output Programmable Functions Chart</strong></td>
</tr>
<tr>
<td>8.4 OUTPUT 41-42</td>
<td>Function identified by a code described in <strong>Output Programmable Functions Chart</strong></td>
</tr>
</tbody>
</table>

As default, the outputs are set up with the following functions:

- **Output 11-12**: Maximum pressure or minimum pressure (03NC)
- **Output 21-22**: Overload (08NO)
- **Output 31-32**: Maximum temperature oil (05NC)
- **Output 41-42**: Fault (09NO)
CALIBRATION

NGV VER XX.XXX
9-CALIBRATION

9.1 OVERP. VALUE
ENT=Start

Starts the routine for the control of the adjusted pressure on the overpressure valve. For the overpressure value test please refer to the Overpressure Valve (VS) Adjustment chapter. This routine needs VS and V0 input signals for working. Press ENT to start the routine. The display blinks while the routine is working, at the end of the routine the fixed value is the adjustment value of the overpressure valve. Press ESC to exit and ENT to start again.

9.2 PIPE RUPTURE
ENT=Start

Starts the routine for the test of the pipe rupture valve. For the pipe rupture valve test please refer to the Pipe Rupture (VC) Test chapter. This routine needs D and V0 input signals for working. Press ENT to start the routine. The routine is ended when the D signal falls down. Press ESC to exit and ENT to start again.

ADVANCED PROGRAMMING

NGV VER XX.XXX
10-ADVANCED

10.1 PASSWORD
00000

Entering the password it’s possible to read and modify the entire parameters of the NGV valve
The outputs 11-12; 21-22; 31-32; 41-42 are programmable with a specific function. Each function could be used as NO or as NC.

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>PT01 Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No function, output OFF</td>
<td>FUN00</td>
</tr>
<tr>
<td>1</td>
<td>Minimum pressure (see parameter 5.7 into the Programming section)</td>
<td>FUN01NC, FUN01NO</td>
</tr>
<tr>
<td>2</td>
<td>Maximum pressure (see parameter 5.10 into the Programming section)</td>
<td>FUN02NC, FUN02NO</td>
</tr>
<tr>
<td>3</td>
<td>Maximum pressure or minimum pressure</td>
<td>FUN03NC, FUN03NO</td>
</tr>
<tr>
<td>4</td>
<td>Minimum temperature (&lt;5°C)</td>
<td>FUN04NC, FUN04NO</td>
</tr>
<tr>
<td>5</td>
<td>Maximum temperature (see parameter 5.11 into the Programming section)</td>
<td>FUN05NC, FUN05NO</td>
</tr>
<tr>
<td>6</td>
<td>Maximum temperature or minimum temperature</td>
<td>FUN06NC, FUN06NO</td>
</tr>
<tr>
<td>7</td>
<td>Full load (see parameter 5.8 into the Programming section)</td>
<td>FUN07NC, FUN07NO</td>
</tr>
<tr>
<td>8</td>
<td>Overload (see parameter 5.9 into the Programming section)</td>
<td>FUN08NC, FUN08NO</td>
</tr>
<tr>
<td>9</td>
<td>Fault: High/Low supply; DriverSM; VRP Check; contemporaneous Upward and Downward commands</td>
<td>FUN09NC, FUN09NO</td>
</tr>
<tr>
<td>10</td>
<td>Fault or minimum pressure</td>
<td>FUN10NC, FUN10NO</td>
</tr>
<tr>
<td>11</td>
<td>Fault or maximum pressure</td>
<td>FUN11NC, FUN11NO</td>
</tr>
<tr>
<td>12</td>
<td>Fault or minimum pressure or maximum pressure</td>
<td>FUN12NC, FUN12NO</td>
</tr>
<tr>
<td>13</td>
<td>Busy (VS signal must be forbidden)</td>
<td>FUN13NC, FUN13NO</td>
</tr>
<tr>
<td>14</td>
<td>Busy or Fault</td>
<td>FUN14NC, FUN14NO</td>
</tr>
<tr>
<td>15</td>
<td>Busy or Overload</td>
<td>FUN15NC, FUN15NO</td>
</tr>
<tr>
<td>16</td>
<td>Busy or Fault or Overload</td>
<td>FUN16NC, FUN16NO</td>
</tr>
</tbody>
</table>
The failure list is:

<table>
<thead>
<tr>
<th>Failure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Low supply</td>
</tr>
<tr>
<td>02</td>
<td>High supply</td>
</tr>
<tr>
<td>03</td>
<td>Downward start/run dynamic pressure</td>
</tr>
<tr>
<td>04</td>
<td>Downward stop dynamic pressure</td>
</tr>
<tr>
<td>05</td>
<td>Driver stepping motor</td>
</tr>
<tr>
<td>06</td>
<td>Inductive sensor opened when the lift is stopped</td>
</tr>
<tr>
<td>07</td>
<td>Inductive sensor opened at the end of downward run</td>
</tr>
<tr>
<td>08</td>
<td>Contemporaneous upward and downward commands</td>
</tr>
<tr>
<td>09</td>
<td>Minimum pressure</td>
</tr>
<tr>
<td>10</td>
<td>Maximum pressure</td>
</tr>
<tr>
<td>11</td>
<td>Minimum fluid temperature</td>
</tr>
<tr>
<td>12</td>
<td>Maximum fluid temperature</td>
</tr>
</tbody>
</table>