Cross Over Prevention
NoMix

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Important:
All information and technical specifications in this documentation have been carefully checked and compiled by the author. However, we cannot completely exclude the possibility of errors. **F.A.Sening GmbH** is always grateful to be informed of any errors.
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1 General

1.1 How to Find Information in the Manual

To enable you to find the required information in this manual easily, we have come up with a few orientation aids to help you.

- Page numbering
- Pictograms

The information in this manual varies from crucial, necessary precautions and standard tasks, to actual steps to take in handling and advice. To make it easier to distinguish information in context, it is indicated by corresponding pictograms before the text.

These pictograms should not only draw attention to themselves, but also assist in finding the desired information quickly. For this reason each pictogram is symbolic of the textual content that follows it.

The following pictograms are used in this manual:

- **Danger**. Here: Danger of explosion from inflammable gases and fluids.
- **Risk of Malfunction**: Actions that damage the equipment.
- **Legal Advice**: Actions that bear legal consequences.
- **Step-by-Step Instruction**: Concrete work advice, e.g. “Please press <Enter>“
- **Feedback Positive**: e.g. “The main menu is now displayed“
- **Feedback Negative**: e.g. “Should an error message now be displayed...“
- **Background Information, Short Cut**: e.g. “Further information available in Chapter XX“
2 General description of the NoMix 2000 system

The NoMix 2000 system deals with control and monitoring functions on tank trucks during delivery of mineral oil products. The petrol stations and depots served have to be equipped with TAGs.

The NoMix 2000 system has the following main functions:

- Cross Over Prevention (COP)
- Sealed Parcel Delivery (SPD)

Additionally, NoMix 2000 contains a monitoring function that is currently not yet required by law, i.e.

- Vapour recovery hose monitoring

In principle, the system is configured according to the elementary diagram shown in drawing no. E11.351489 and is assembled from different interface modules depending on the configuration level, with the NM2MAIN main unit forming the central control unit. The individual interface modules are connected with each other and with the main unit via an internal CAN bus system.

2.1 Main functions

2.1.1 Cross Over Prevention

The Cross Over Prevention function of NoMix 2000 is intended to prevent mixing of product grades both during loading of tank trucks in depots and during product delivery from tank trucks into petrol station tanks.

NoMix is particularly intended for tank trucks that are used for the simultaneous delivery of different products to petrol stations and are equipped with bottom loading systems. During loading, NoMix stores the product grades that are loaded into the individual tank trucks compartments. To this end, the tank depot loading arms are equipped with a product code, realised through TAGs. The product code is transferred to NoMix 2000 when the loading arm is connected to the tank truck.

In order to avoid mixing of products caused by residues in the tank compartments, each compartment is equipped with a wetleg sensor (level sensor). NoMix permits only empty tank compartments to be filled or, if a compartment contains a residual quantity of product, only product with the same quality may be added.

During product delivery from the tank truck compartments into petrol station tanks that are equipped for the NoMix system (TAG installation), electronic identification generators (TAGs), in which the respective product grade of the particular petrol station tank is stored electronically, are supplied with a small intrinsically safe voltage via the conductive product or vapour recovery hoses (resistance less than 10 Ω). Via the hoses, the TAG immediately starts transferring its information to the NoMix system installed on the tank truck. The system compares the product grade of the tank truck compartment to be emptied with the product grade of the petrol station tanks.
2.1.2 Sealed Parcel Delivery (SPD) functionality

The concept of SPD functionality (Sealed Parcel Delivery) describes the delivery of low-viscosity mineral oil volumes/quantities that have been measured with calibrated instruments in a secured and monitored way ("sealed parcels") via tank trucks to the customer.

- The tank compartments are electronically sealed after loading. The loaded quantities are listed in the shipping documents.
- The status of the tank compartment man lids and valves is continuously monitored, and each change is recorded in a log file.
- Even if the vehicle battery is switched off, the power supply of the SPD sensor interface is maintained through an internal battery, so that monitoring can continue.
- The status of all compartments can thus be monitored for up to 100 hours, even without supply from the vehicle battery.
- After loading and prior to delivery at the customer, a status report with details of the sealing state of the compartments can be printed out.
- Any manipulation or removal of product during delivery from the loading station to the customer can be detected by comparing the printouts.
- If the comparison of the printouts does not reveal any manipulation, i.e. if none of the seals was broken, the tank truck compartments are confirmed to contain the loaded quantities according to the shipping documents.
- After delivery, the system indicates whether the compartments have been emptied completely, i.e. whether or not the compartments contain residual product.
- Any manipulation of a sealed compartment is logged directly. The compartment is then deemed to be "unsealed".

2.1.3 Vapour recovery hose monitoring

As an additional monitoring function, the NoMix 2000 system also monitors the vapour recovery hose. This prevents larger quantities of gas from escaping in the following cases:

- the vapour recovery hose is not connected to the tank
- the vapour recovery hose is not connected to the tank truck
- the vapour recovery hose is torn off

In these cases, discharge from the tank truck cannot be started or is automatically interrupted within a maximum of 5 seconds.
3 NoMix 2000 system components

All NoMix 2000 system components with their associated part numbers are listed in Chapter 9. The main components are:

- Main Unit (part no. NM2MAIN)
- Display-Interface (part no. NM2DISPLAY)
- Wetleg sensor interface (part no. NM2WET)
- TAG interface (part no. NM2TAG)
- I/O interface (part no. NM2IO)
- SPD sensor interface (part no. MSSPD)
- Optional: trailer cable, printer, on-board computer, temporary connection to printer or OBC

The Main Unit NM2MAIN and the Display Interface NM2DISPLAY can be replaced by Main Unit & Display part no. NM2MAIN_DISP e.g.

3.1 Electronic components

3.1.1 Main Unit (NM2MAIN)

The main unit (part no. NM2MAIN) is the central control unit of the NoMix 2000 system. Via the internal CAN bus connection it receives/sends data from/to the interface modules such as display interface, wetleg sensor interface, TAG interface, I/O interface and SPD sensor interface. The main unit stores and evaluates the data. A so-called "life test" is carried out continuously between the main unit and all connected interface modules. This ensures that all interface modules function properly. Internally stored data can be transmitted directly to a printer via the RS-232 printer interface (see also chapter 3.1.7). A future version will allow data to be sent to the EMIS interface via the external CAN bus connection. From here, they can be transferred to an on-board computer system (OBCS) via an RS-232 interface (see also Chapter 3.2).
3.1.2 Display interface (NM2DISPLAY)

The display interface must be installed using PG screw joints that point to the right!

The display interface is originally supplied with the label "MultiSeal". For use with NoMix 2000, the name must be changed from MultiSeal to NoMix 2000. This is done by pulling out the "name strip" from the slot, reversing it, pushing it back in again and fixing it with adhesive tape.

The keys have the following functions:

<table>
<thead>
<tr>
<th>Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function keys &lt;F1&gt;, &lt;F2&gt; and &lt;F3&gt;</td>
<td>The function keys will execute the function shown in the bottom row of the display.</td>
</tr>
<tr>
<td>&lt;Stop&gt; key</td>
<td>The &lt;Stop&gt; key enables all currently running discharge or loading processes to be stopped immediately. Menus can also be quit immediately.</td>
</tr>
<tr>
<td>&lt;Menu&gt; key</td>
<td>The menu control, e.g. for settings, execution of test, entering the loading plan, entering a override etc. is reached via the &lt;Menu&gt; key.</td>
</tr>
<tr>
<td>&lt;Print&gt; key</td>
<td>The print menu is reached via the &lt;Print&gt; key; Printing out of the setup, the log book, activity reports, status reports, event reports etc.</td>
</tr>
<tr>
<td>&lt;Enter&gt; key</td>
<td>The &lt;Enter&gt; key is used to confirm entries.</td>
</tr>
<tr>
<td>&lt;Numeric keys&gt; 0 to9</td>
<td>The &lt;numeric keys&gt; can be used to call up detailed information, start discharge and loading processes, and select submenus.</td>
</tr>
<tr>
<td>&lt;Arrow keys&gt; ← and →</td>
<td>Back / forward</td>
</tr>
</tbody>
</table>
Like all other interface modules, the display interface (part no. NM2DISPLAY) is connected with the main unit via the internal CAN bus.

The NoMix 2000 system is operated via the keypad.

- Entering the SETUP (adaptation of the NoMix 2000 system to different tank trucks variants)
- Execution of tests during commissioning and troubleshooting
- Printing out of NoMix 2000 reports
- Printing out of the SETUP
- Starting and stopping of discharge and loading
- Display of detailed error messages

The NoMix 2000 display interface is equipped with an independent setup facility. A detailed description of the setup can be found in Chapter 6.1.1.1.11.

All display interface modules delivered after August 2003 are equipped with an automatic contrast adjust. That means the contrast must not be adjusted by hand when it becomes cold. Display interface CPU-boards, hardware version 1.00, are marked with a blue dot. New CPU-boards, hardware version 2.00, have no marking.

### 3.1.2.1 Second display interface

In the interest of user-friendliness, certain tank truck types may require the installation of a second display interface. The address (node number) of the second display interface must be set in the display setup according to Chapter 6.1.1.1.11.
3.1.3 NoMix 2000 MainUnit / Display (NM2MAINDISP)

To save space and weight the NoMix 2000 Main Unit, part no. NM2MAIN, and the Display Interface, part no. NM2DISPLAY, are integrated in one box.

The CAN-Bus connection between Main Unit CPU-board and Display CPU-Board is done internally in the moulded common power supply.

At the same time also the Main Unit CPU-Board was changed to a new type. The main changes are:

- Bigger memory for the logbook
- An 8-pin dipswitch has been integrated. Now the setup switch is the dipswitch no. 8 (see also drawing no. 51.351675).
- 2 additional LED’s have been integrated (not relevant for NoMix 2000).

The wiring of Main Unit / Display has to be done according to drawing no. 51.351673. (See also the MultiSeal / NoMix 2000 system wiring diagram drawing no. 61.351676).
3.1.4 Wetleg sensor interface (NM2WET)

Via wetleg sensors (part no. NS-2E) installed in the pipe system of the individual tank truck compartments, the wetleg sensor interface (part no. NM2WET) monitors the fill level of the compartments. The compartment state can either be empty or not empty/filled. If a compartment is not empty, no statement about the residual volume of the product can be made. Short circuits and disruptions, such as unplugging of the connectors, leads to unsealing of the tank truck compartment. The states of the wetleg sensors or the state changes are transmitted to the main unit for further processing via the internal CAN bus.

Apart from the wetleg sensor connections, the wetleg sensor interface contains two intrinsically safe inputs. The pneumatic main pressure switch, part no. NM2DSS, is connected to the first input. Via the compressed air switch, the system detects whether the supply of the pneumatic system with compressed air is ensured. This information is also transmitted to the main unit via the internal CAN bus.
3.1.5 TAG interface (NM2TAG)

The TAG interface (part no. NM2TAG) is used for reading and evaluating the TAG signals. To this end, the TAGs are supplied with a small intrinsically safe voltage via the product and vapour recovery hoses.

The TAG scan channels are distributed as follows:

- TAG scan 1: Tank truck with direct discharge, compartment 1
- TAG scan 2: Tank truck with direct discharge, compartment 2
- TAG scan 3: Tank truck with direct discharge, compartment 3
- TAG scan 4: Tank truck with direct discharge, compartment 4
- TAG scan 5: Tank truck with direct discharge, compartment 5
- TAG scan 6: Tank truck with direct discharge, compartment 6
- TAG scan 7: (optional for tank truck measuring systems, measuring system 1)
- TAG scan 8: (optional for tank truck measuring systems, measuring system 2)
- TAG scan 9: (optional vapour recovery connection)
- TAG scan 10: (optional vapour recovery connection)
- TAG scan 11: (optional vapour recovery connection)
- TAG scan 12: (optional vapour recovery connection)
- TAG scan 13: 3" / 4" common vapour recovery connection
- TAG scan 14: (optional for extensions)

3.1.6 I/O interface

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The I/O interface (output driver interface) is used for controlling solenoid valves that start or stop the discharge/loading process pneumatically. The output driver interface receives the information for controlling a solenoid valve from the main unit. The output driver interface is able to control 8 solenoid valves. 6 solenoid valves (MV1 to MV6) are assigned to the tank truck compartments. They are used to start or stop product delivery. The two remaining solenoid valves (MV7 and MV8) are used for the switchover between loading and discharge (loading release valve and delivery release valve). (See also Chapter 4.1.1). Additionally, two non-intrinsically safe inputs are integrated in the I/O interface (optional).
3.1.7 SPD sensor interface (MSSPD)

Via the connected SPD sensors, the SPD sensor interface is used to monitor the openings through which product can be discharged, as required. The following sensors are installed:

- Inductive proximity sensors (API coupling type VKAP100-I2 or VKVP-I, man lid sensors optional)
- Foot valve sensors (pneumatically operated switches MSDSO)

The SPD sensor interface also has an internal built-in battery, which continues to supply the SPD sensor interface in random time intervals if the NoMix 2000 system is temporarily disconnected from the vehicle battery. The sensor states are then held in a buffer within the interface. Once the NoMix 2000 system is reconnected to the vehicle battery, the sensor information is transferred from the buffer to the main unit for further processing.

**Attention:** On delivery, the internal batteries are switched off via the dip switch on the CPU board (Dip 4 = OFF), in order to avoid unnecessary discharging the internal batteries during storing and commissioning. Dip switch 4 should only switched to the "ON" position immediately prior to start-up. This switches on the supply from the internal batteries (see also drawing no. E51.351372)!

**Attention:** If the processor, into which the software is integrated, has to be replaced, the supply from the internal batteries must be switched off, i.e. DIP switch 4 must be switched to the "OFF" position (see also drawing no. E51.351372)!

In the future the SPD sensor interface part no. MSSPD will be replaced by the SPD Namur sensor Interface part no. MSSPD-N. Externally there is no difference between the interface modules. The change is done on the CPU board. At MSSPD-N the sensor evaluation is done digitally and in combination with the NoMix main unit software version ≥ 1.40 three different analogue switch levels can be adjusted (see also SPD sensor setup in chapter 6.1.1.1.9).
3.1.8  Printer (DR-295 / DR-298)

**NOTE:** The NoMix 2000 system is optionally supplied with a printer, model DR-295 or DR-298. Printer operation is described below. Printer-specific special features are described separately.

- Switch on the printer via the switch on the left-hand side of the printer.
- The printer is operational if the **POWER** lamp is lit.
- Paper can only be inserted if the **PAPER OUT** and **RELEASE** lamps are on.
  - **PAPER OUT** comes on if there is no paper in the printing area of the printhead.
  - The **RELEASE** lamp indicates that the printhead has been lifted and the paper has been released.
- Press the **RELEASE** key to lift the printhead.
- The **RELEASE** lamp will come on, indicating that the paper has been released from the printhead and can be inserted or removed.
- Feed the paper into the printer from the front, along the guide edge on the right hand side and up to the end stop.
- The **PAPER OUT** lamp will go out.
- **DR-295:** Press the **FORWARD** key.
  - **DR-298:** The paper is automatically pulled in after no more than 5 seconds.
- The printhead is lowered, thus holding the paper in place. The **RELEASE** lamp goes out, and the printer is ready to print.

**Do not use paper with perforations along the edges. The printer would interpret the perforation as "paper end", and the printout would be interrupted.**
3.1.8.1 Printer configuration DR-295

The following factory settings should be checked on the DR-295 printer:

<table>
<thead>
<tr>
<th>Switch</th>
<th>Position</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW-1</td>
<td>ON</td>
<td>ignore transmission faults</td>
</tr>
<tr>
<td>SW-2</td>
<td>OFF</td>
<td>Input buffer, 512 bytes</td>
</tr>
<tr>
<td>SW-3</td>
<td>ON</td>
<td>Handshake XON/XOFF</td>
</tr>
<tr>
<td>SW-4</td>
<td>OFF</td>
<td>8 bits</td>
</tr>
<tr>
<td>SW-5</td>
<td>OFF</td>
<td>no parity</td>
</tr>
<tr>
<td>SW-6</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>SW-7</td>
<td>OFF</td>
<td>9600 baud</td>
</tr>
<tr>
<td>SW-8</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>SW-9</td>
<td>OFF</td>
<td>pin 6 reset deactivated</td>
</tr>
<tr>
<td>SW-10</td>
<td>ON</td>
<td>pin 25 reset deactivated</td>
</tr>
</tbody>
</table>

3.1.8.2 Printer configuration DR-298

The switches that determine the operating mode of the DR-298 are located in the interior of the unit (see manual).

The following factory settings should be checked on the DR-298 printer:

<table>
<thead>
<tr>
<th>Switch</th>
<th>Position</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW-1</td>
<td>ON</td>
<td>9600 baud</td>
</tr>
<tr>
<td>SW-2</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>SW-3</td>
<td>ON</td>
<td>8 bits</td>
</tr>
<tr>
<td>SW-4</td>
<td>ON</td>
<td>no parity</td>
</tr>
<tr>
<td>SW-5</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>SW-6</td>
<td>OFF</td>
<td>Handshake XON/XOFF</td>
</tr>
<tr>
<td>SW-7</td>
<td>ON</td>
<td>printer mode</td>
</tr>
<tr>
<td>SW-8</td>
<td>OFF</td>
<td>ESC/POS (295)</td>
</tr>
<tr>
<td>SW-9</td>
<td>OFF*</td>
<td>pin 6 reset deactivated</td>
</tr>
<tr>
<td>SW-10</td>
<td>OFF*</td>
<td>pin 25 reset deactivated</td>
</tr>
</tbody>
</table>

* switch setting arbitrary
3.1.8.3 Replacing ribbon

- Remove the cover.
- The cover has a grip area in the upper right corner and an arrow on the lower left rear corner. The cover can easily be removed by pulling carefully.

- Behind the cover is the black cartridge with the printer ribbon.
- For easy removal of the ribbon cartridge, the printer should be in RELEASE and PAPER OUT state.
- The release state is indicated via the RELEASE lamp.

- Press the RELEASE key, if the lamp is not lit.
  Now pull the cartridge slightly at the grip area until it disengages. Carefully move the cartridge towards the front, so that the ribbon can be pulled out under the transport rollers.
- The new ribbon cartridge can now be inserted.

- Prior to inserting it, tension the ink ribbon slightly with the knurling wheel on the left (DR-295) or right (DR-298) side of the cartridge in the direction of the arrow.
  During inserting, the ink ribbon must be pushed underneath the pressure rollers. Press the cartridge until the pins at the rear engage in the printer. After it has been inserted, tension the ribbon once again with the knurling wheel. Replace the cover.
- The ribbon cartridge can be ordered from F.A. Sening:
  DR-295: Order no. 7100031
  DR-298: Order no. 7100157
3.1.9 Fuse junction box

Since the NoMix 2000 & SPD system is supplied directly from the battery, an explosion-protected fuse must be installed near the vehicle battery. This is integrated in the fuse junction box, part no. MSKKFUSE. (see drawing no. E51.351418 and E51.351419).

3.1.10 Junction box for extending cables

A junction box, part no. CS-KA-EXT, is used if local conditions require sensor cables to be extended, e.g. the sensor of the API coupling (see drawing no. E51.351499).

3.2 Optional extensions

3.2.1 EMIS interface (CS-GW-EMIS)

The EMIS interface is used to connect the NoMix 2000 system with external electronic systems, for example an on-board computer (OBC). It is connected with the external CAN bus of the NoMix 2000 system. All relevant NoMix 2000 data are transferred from the main unit to the EMIS interface. The on-board computer (OBC) is connected with the EMIS interface via an RS232 interface. The installation of the EMIS interface is described in the workshop and installation manual DOK-418, DOK-432.
4 Tank truck types

The NoMix 2000 software currently only supports tank trucks with direct discharge and with a maximum of 6 compartments.

4.1 Tank trucks with direct discharge

In tank trucks with direct discharge, each compartment has a separate outlet:

- Loading and discharge are done via API couplings

Each isolated API coupling is connected with a direct discharge TAG scan line - TAG scan 1 (compartment 1) to TAG scan 6 (compartment 6). The connection of the TAG scan lines is shown on drawing no. E51.250226.

4.1.1 Solenoid valve control

Only one output driver interface is required for a direct discharge tank truck. The solenoid valves are assigned to the individual compartments / functions as follows:

- solenoid valve 1MV1: compartment 1, acts on the foot valve during loading, acts on the foot valve and the pneumatically driven API coupling during discharge.
- solenoid valve 1MV2: compartment 2, acts on the foot valve during loading, acts on the foot valve and the pneumatically driven API coupling during discharge.
- solenoid valve 1MV3: compartment 3, acts on the foot valve during loading, acts on the foot valve and the pneumatically driven API coupling during discharge.
- solenoid valve 1MV4: compartment 4, acts on the foot valve during loading, acts on the foot valve and the pneumatically driven API coupling during discharge.
- solenoid valve 1MV5: compartment 5, acts on the foot valve during loading, acts on the foot valve and the pneumatically driven API coupling during discharge.
- solenoid valve 1MV6: compartment 6, acts on the foot valve during loading, acts on the foot valve and the pneumatically driven API coupling during discharge.
- solenoid valve 1MV7: loading release solenoid valve
- solenoid valve 1MV8: discharge release solenoid valve
5 Installation

5.1 General

§ Only qualified installers may install the NoMix 2000 system on tank trucks. [Qualified installers are defined as companies according to TRbF 180 Chapter no. 1.7.] (See also national standards / requirements).

The qualified installer will install and check the complete system according to the criteria listed in the operating and installation instructions. Proper installation of the NoMix 2000 system must be confirmed in writing.

5.1.1 Preventive measures

5.1.1.1 For preventing accidents (caused by ignition of explosive mixtures):

Regulations for explosion-proof installation (e.g. EN 60079-14; VDE 0165) must be adhered to! (See also national Standards).

All components are explosion-proof electrical devices that have been safety-checked and certified.

*** No intervention, either mechanical or electrical, is permitted ***

RISK OF EXPLOSION

• The information provided on Ex-labels must be observed.
• In case of a fault, the complete module must be replaced.
• No additional components must be added to the housings or junction boxes (e.g. additional terminals), since this would void the device approval.
• Failure to observe these instructions will obviously lead to a loss of any right to claim under warranty.
• If cable entries have to be replaced on housings, only ATEX-approved types must be used.
• Unused cable entries must be sealed with "EEx e" approved blind plugs.
• Ex-cable must be used for non-intrinsically safe cabling.
• The printer is only suitable for operation outside Ex-areas. To protect it from the effects of the weather, it should preferably be installed in the driver's cabin.

5.1.1.2 To meet the requirements stipulated by standards:

• The wiring must be carried out according to the wiring diagrams supplied. The colours of the wires correspond to DIN 47100. The specified wire colours must be followed! Only the supplied cable, part no.: NM2KABEL, may be used for the wiring of the battery supply and of the internal CAN bus.
• The electrical installation must be carried out according to EN 60079-14; VDE 0165. (See also national standards / requirements).
• The manufacturer's EMC declaration of conformity is only valid if the system has been installed exactly according to the information provided by the manufacturer.
5.1.1.3 To ensure trouble-free operation:

- During welding work at the vehicle, the power supply (plus 24 Volts and 0 Volts) to all electronic components must be interrupted.
- All electronic devices and junction boxes must be mounted firmly and protected from vibration within a cabinet. If a module is intended for installation outside the cabinet, it is explicitly stated.
- During the installation, a reliable electrical connection that complies with the relevant standards must be established between each metal housing and the vehicle chassis. Corrosion-resistant screws (V2A) with additional toothed disks must be used.
- If possible, the cable entries should always be installed facing sideways or downwards.
- Unused cable entries should be sealed using "EEx e" blind plugs or sealing plugs, ensuring they are waterproof.
  - If wires have to be shortened, no cable residues must be allowed to fall into the open unit. This could lead to short circuits on the electronic board.
  - When connecting the cables to the individual electronic devices, the fitter must ensure that he or she is not electrostatically charged, since electrostatic discharge could destroy the electronic components. The relevant guidelines for handling electronic products must therefore be observed (e.g. earthing strap, touching of the tank truck chassis prior to connecting the cables).

5.1.1.4 To make the job of the service personnel easier:

- Install electronics housings such that they are easily accessible.
- Cables without plug connectors may be shortened.
- Slightly lubricate the fixing bolts of the covers prior to installation (copper paste, graphite grease). This is intended to prevent the bolts from corroding and becoming stuck after prolonged operation.
5.2 Vehicle wiring

The NoMix 2000 system was designed for installation on a vehicle.

In order to ensure trouble-free operation, the guidelines described in the preceding chapters must be followed. Failure to follow the guidelines may lead to malfunction during operation.

In case of demonstrable failure to observe the guidelines or improper installation (violation of current regulations) we cannot accept responsibility for any malfunctions that may occur and for any subsequent claims.

- All cables used must be fuel-resistant. Ex-cable must be used for wiring in non-intrinsically safe areas. Only the supplied cable, part no. NM2Kabel, may be used for wiring the battery and the CAN bus.
- All cables must be installed (protected) in such a way that they are not damaged during operation (operator method of working).
  - A separate supply line should be used for the power supply.
  - A cable with $\geq 1.5\text{mm}^2$ cross section should be used.
  - The cable does not have to be shielded.
  - Connect to the $+24\text{V}$ voltage via a secured cable via a switch in the drivers cabin directly from the plus terminal of the battery.
  - Use an 4 A fuse (part no. MSKKFUSE) to protect the system.
  - Connect to the 0V voltage as closely to the ground terminal of the battery as possible.
  - From here, only the NoMix 2000 system should be supplied.

The NoMix 2000 system is permanently supplied with power via the MSKKFUSE fuse junction box; optionally, a switch may be installed in the driver's cabin.

Components of this system are installed on a semitrailer. Only use trailer cable available from F.A. Sening for the power supply and the communication line between the tractor unit and the semitrailer.
5.3 Mechanical / pneumatic system

5.3.1 General Design

The valves required for the loading and emptying of a semi-trailer truck are pneumatically opened and closed by spring force. The valves are controlled from The NoMix 2000 system which is mounted on the vehicle accessible for the driver. A master switch is integrated in the pneumatic system.

An API coupling is mounted on the vehicle for each compartment for the loading and delivery of the product, which is connected to the foot valve via a pipe. Each compartment has a non-pressure balanced foot valve on the underside.

In order for the gas to be returned (vapour recovery), a compartment vent valve is mounted on the top side in each compartment. All compartment vent valves are connected to the vehicle coaming. The vehicle coaming is connected, via a pipe, to the vapour recovery valve, which is close to the API coupling. All compartments are supplied with air during delivery via the coaming vent valve, if no vapour recovery hose is connected.

A guard bar is mounted in front of the API coupling and the vapour recovery valve. If this guard bar is opened for loading or for delivery, the vehicle can no longer be moved. There is an emergency button close to the API coupling, which can be used to close all compartments in an emergency.

5.3.2 Installation of Individual Parts

It is the responsibility of the tank truck builder to comply with the legal requirements in the installation of the NoMix 2000 system. If the legal requirements are changed, the tank truck owner is responsible for compliance with these requirements.

The valves, control equipment and accessories must be installed as described in the following sections. Cleanliness and suitable tools for the assembly are important.

All valves must be mounted liquid-tight and vapour-tight using the supplied gaskets. This tightness must be checked after assembly.

The electrical conductivity from the valve across the gaskets to the pipelines must be ensured. The conductivity must be checked after assembly using suitable measuring equipment. The legal requirements must be complied with (e.g. BS 5958 "Control of Undesirable Static Electricity").

All product and vapour hoses have to be conductive. They must have a hose resistance $\leq 10 \ \Omega$ between the couplings.
5.3.2.1 Vapour Valves

5.3.2.1.1 Coaming Vent Valve

The coaming vent valve is mounted directly into the coaming wall of the vehicle. A mating flange must be used for this (minimum diameter 92 mm / maximum diameter 108 mm).

The valves (DO70, LK and gasket) must be mounted as shown in the figure.

An additional movement clearance of 20 mm minimum is required for the coaming vent valve.

The gasket used must be conductive.

The air connection for 6 mm air hose must point downwards.

The fixing screws must not be overtightened.

Test Procedure:

- The vapour tightness of the valve and the gasket must be checked up to opening of the relieve valve (approx. 80 mbar).
- The electrical conductivity from the vent valve across the gasket to the vehicle coaming must be checked.

The dimensions of the individual components are described in section 5.3.5.4.
5.3.2.1.2 Compartment Vent Valve

The compartment vent valve is mounted from the top directly into the compartments of the vehicle. A mating flange must be used for this (minimum diameter 92 mm / maximum diameter 108 mm).

The valves (DO70-F, RBS and gasket) must be mounted as shown in the figure.

An additional movement clearance of 20 mm minimum is required for the compartment vent valve.

The gasket used must be conductive.

The air connections for the 6 mm air hose must be easily accessible.

The fixing screws must not be overtightened.

The continuity straps must be connected with the steel webbing of the hose and clamped under the jubilee clips.

The vapour hose is installed with two jubilee clips

Each of the cable lugs of the jubilee clips must be connected at a flange screw.

The procedure described is repeated for all other compartments.

Test Procedure:

The vapour tightness of the valves and the gasket must be checked up to the opening of the relief valve (approx. 80 mbar).

The electrical conductivity from the vent valve across the gasket and the vapour hose to the vehicle coaming must be checked.

The dimensions of the individual components are described in section 5.3.5.4.
5.3.2.2 Vapour Recovery Valve

Figure 3: Vapour Recovery Valve

For the NoMix 2000 functionality the vapour recovery valve has to be isolated mounted. The description for the isolation can be seen in chapter 5.3.2.5 and 5.2.3.6 and drawing no. E61.351490.

- The vapour recovery valve is mounted directly onto the recovery pipe of the vehicle. A mating flange must be used for this.
- The valve (VRV and gasket) must be mounted as shown in the figure.
- The fixing screws must not be overtightened.
- The fittings for the 6 mm air hoses must be mounted at the VRV interlock.

Test Procedure:

- The vapour tightness of the valve and the gasket must be checked.
- The discharge of electrostatic charges checking is described in chapter 5.3.2.8.

The dimensions of the individual components are described in section 5.3.5.4.
### 5.3.2.3 Product Valves

#### 5.3.2.3.1 Footvalve

- The various foot valves (BO100-N, BO100-F1-N or BO100-F2-N) are selected in accordance with the space available.
- The foot valve is mounted from below directly into the compartment of the vehicle. A mating flange must be used for this.
- The connection to the run off pipe is made via a second flange.
- The valve (BO100-N and gasket) must be mounted as shown in the figure.
- The gasket used should be conductive. If a non-conductive gasket is used, a conductive connection must be established via the flange screws.
- The fixing screws must not be overtightened.
- If the foot valve BO100-F1-N is mounted, the two M12 hex cap screws must be removed. After mounting the foot valves into the compartment, the two M12 hex cap screws must be replaced.
- The process described must be repeated for all other compartments.

**Test Procedure:**

- The liquid tightness of the valves and of the gaskets must be checked.
- The electrical conductivity from the run off pipe across the gaskets and the foot valve to the compartment must be checked.

The dimensions of the individual components are described in section 5.3.5.4.

#### 5.3.2.3.2 Pneumatic API Coupling
Figure 5 : Pneumatic API Coupling

For the NoMix 2000 functionality the API coupling has to be isolated mounted. The description for the isolation can be seen in chapter 5.3.2.5 and drawing no. E61.351490.

- The pneumatic API couplings must be mounted horizontally to the ground. Coupling of the loading arm is possible only in a horizontal position and for the visual indication to fulfill its function.
- The pneumatic API coupling is mounted directly on the run off pipe of the vehicle. A mating flange must be used for this.
- The interlock (IN1/4-VKAP) must be mounted with the existing cap screws as shown in the figure.
- The fixing screws must not be overtightened.
- It must be ensured that a sufficient work range is provided for the loading and delivery on each API coupling.
- The procedure described is repeated for all other compartments.

Test Procedure:

- The liquid tightness of the valve and of the gaskets must be checked.
- The discharge of electrostatic charges checking is described in chapter 5.3.2.8.

The dimensions of the individual components are described in section 5.3.5.4.
5.3.2.4 Other Pneumatic Equipment

5.3.2.4.1 Emergency Button

The emergency buttons are mounted at accessible points on the vehicle. The end user should be consulted about the positioning.

A maximum of two emergency buttons only may be mounted.

The areas for the mounting of the emergency buttons are shown in the figure.

A support plate with 28 mm diameter holes is required for the mounting.

The emergency buttons should be clearly identified.

The dimensions of the individual components are described in section 5.3.5.4.
5.3.2.4.2 Guard Bar Interlock

- The guard bar interlocks are mounted on the vehicle in such a way that the locking pins can easily engage into the locking holes.
- The guard bar interlocks are mounted with the two 8 mm diameter holes.
- The locking holes must have a diameter of 20 mm.
- A plate must be attached to the guard bar in such a manner that the guard bar interlocks cannot come out in the open position. The guard bar interlocks must only come out in the closed guard bar position.
- The distance between the plate and the guard bar housing should not be greater than 5 mm.
- A manual interlocking must be available for the guard bar in both end positions.
- These locks secure the guard bar during the travel and in the open condition.

Test Procedure:

- It must be checked with a closed guard bar whether the guard bar interlock pins engage satisfactorily into the locking holes and disengage again.
- It must be checked that the guard bar can only be opened if there is air at the guard bar interlock (red port).
- If the guard bar is open and there is no longer any air signal available, the guard bar pins must only come out 5 mm (blocking plate).

The dimensions of the individual components are described in section 5.3.54.
5.3.2.4.3 Pneumatic Filter and Lubricator

- The pneumatic filter and lubricator must be mounted at a protected location on the vehicle. This is so that it cannot be damaged by impacts or wind during travelling.
- The pneumatic filter and the lubricator must be mounted as firmly as possible to the control cabinet and in a vertical position.
- The mounting must be done in such a way that the containers can be easily opened and the adjustment screws reached.
- The direction in which the air must flow through the filter and the lubricator is marked on the housing.
- When water is present in the filter bowl, squeeze the drain clamp to expel the water.
- The lubricator is filled to the maximum with the supplied lubricant.
- DO NOT USE WITH ANY OTHER TYPE OF LUBRICANT.
- In order to adjust the lubrication, a foot valve is opened and two to three drops of lubricant must be seen in the sight glass. The lube rate is adjusted using the adjustment screws.

The dimensions of the individual components are described in section 5.3.5.4.
5.3.2.4.4 Wetleg sensor (NS-2E)

The wetleg sensors, part no. NS-2E, should be installed with the aid of the welded nozzles at the lowest points of the piping that are still part of the respective compartments. This lowest point is located on the lower side of the loading coupling pipe or directly in the API coupling. The wetleg sensors must always be installed vertically from below. The wetleg sensors are electrically connected with the terminals of the wetleg sensor interface. If necessary, the detection level of the NS-2E wetleg sensors can be adjusted with the aid of different intermediate sleeves (see drawing no. E51.350839). To increase the detection level, the sleeve has to be shortened with a lathe, or it can be left out completely.

(see drawing no. E51.350839).

5.3.2.4.5 ESD resistors (ASS-GW-ESA, ASS-GW-ESU)

The electrostatic discharge resistors are used for discharging electrostatic loads. They are connected according to drawing E61.351490 between the insulated product and vapour recovery connector and the tank truck chassis.

5.3.2.4.6 Man lid (optional)

Opening of the man lid can also be monitored via inductive proximity sensors (optional).

5.3.2.4.7 Foot valve with pneumatically operated switch (foot valve with MSDSO)

The foot valves are controlled (opened or closed) via pneumatically operated switches. The pneumatically operated switches are shown in drawing no. E61.351480 and are pneumatically connected at “T-connections” to the footvalves.

5.3.2.5 Insulation of the API couplings

The API couplings are insulated from the vehicle via plastic insulating bushes (part no. ASS-GW-I80G, ASS-GW-I100G).

The flange screws M12 must be replaced with M10 and flange screws M10 with M8. Furthermore, approx. 10mm longer screws should be used.

The flanges are installed with insulating bushes (see E61.351490). If necessary, the insulating bushes have to be shortened. The joint of the two insulating bushes must not be at the same level as the flange insulation, since this could lead to bridging of the insulation caused by ageing.

Due to the insulation, any electrostatic charge can no longer be discharged. For this reason, a resistor cable must be connected for each flange. The cable bridges the insulation between the discharge connector and the vehicle chassis (see drawing no. E61.351490 and E51.350228). The "small" cable socket must be installed on the side of the discharge connector.

Attention: The flange screws should be retightened after approx. 24 hours if necessary.

The chains for the covers must not be in electrical contact with the insulated discharge connector. They should be installed either directly at the vehicle chassis, or the metal chain must be replaced with a plastic string.
5.3.2.6 Insulation of the vapour recovery connection

The vapour recovery valve is also insulated via insulating bushes (see Chapter 5.3.2.5).

5.3.2.7 Connection of the scan lines

The TAG scan lines are connected to the insulated API coupling via the two-core control line with tin-coated conductors, part no. ASS-GS-K25M. The two wires are twisted around each other and equipped with a circular cable lug or a wire end sleeve (see drawing no. E51.250226).

The following parts are required for the connection:

- Circular cable lugs type RB 5 (nylon insulation, blue)
- Crimp tool for circular cable lugs and for wire end sleeves

5.3.2.8 Checking the discharge of electrostatic charges

Resistance measurement between each insulated connection piece and the vehicle chassis. Both at the product connector and at the vapour recovery connector, a resistance to the vehicle chassis of \( \leq 0.5 \times 10^6 \Omega \) (typically approx. 100 K\( \Omega \)) must be present. Moisture (for example water in the tank truck compartment or saturated joint packings) can cause a reduction of the resistance. The resistance should always be \( \geq 20 \text{ K}\( \Omega \).

Attention: This measurement must only be carried out with the NoMix electronics switched off!

5.3.2.9 Product and vapour recovery hoses.

The product and vapour recovery hoses should have a resistance of \(< 10 \Omega\), measured between the two connector couplings. The internal wire filament is used for signal transmission and is connected electrically conductive with the two coupling pieces. The external wire filament is insulated from the internal wire filament within the connector couplings. For discharging of electrostatic charges, the insulation must be bridged at the two connector couplings with a resistance of \( \leq 500 \text{ K}\( \Omega \).
5.3.3 Installation of Pneumatics

5.3.3.1 General Instructions

- Only 6 mm air pipes may be used. Colour coded air pipes should be used as in the circuit diagrams.
- The air pipes must only be cut with the right air pipe cutter. Only this air pipe cutter cuts the air pipes cleanly and at an angle.
- The air hose must be held vertical to the cutter and it must be positioned in the provided notch of the cutter.
  IMPORTANT:
  Wrongly cut pneumatic pipes will lead to irreparable air leaks and possible system failure.
- The air pipes must be blown through prior to connection. Before making the final connection to the pipes, 2-3 cc of antifreeze should be injected into the 6 mm air pipe.
- The air pipes must be safely secured with cable bands. It must be ensured that the air pipes are not kinked and the pipes cannot be damaged on sharp edges.

Exhaust ports:

Short air pipes must be connected to the exhaust ports of all valves. These must point downwards and laid in a clean environment.
The air pipes of about 300 mm lengths must be connected to the exhaust ports of the emergency buttons, of the top operator buttons, of the vapour recovery interlock and to the master guard bar interlock.

Important:

Only the valves provided by F.A. Sening may be connected to the NoMix 2000 system. No additional equipment may be supplied with the air of the NoMix 2000 system.

5.3.3.2 Circuit Diagrams

See circuit diagrams in the appendix

5.3.3.3 Operating Instructions

See Driver Description DOK-440E and Driver Short Description DOK-441E.
5.3.3.4 Components Profile

5.3.3.4.1 Coaming Vent Valve

Description: Coaming Vent Valve
Part Number: DO70
Weight: 0.65 Kg
Material: Aluminium
Seal Material: Viton
5.3.3.4.2 Coaming Vent Valve Cover

Description: Coaming Vent Valve Cover
Part Number: LK
Weight: 0.22 Kg
Material: PA
5.3.3.4.3 Compartment Vent Valve

Description: Compartment Vent Valve
Part Number: DO70-F
Weight: 1.25 Kg
Material: Aluminium
Seal Material: Viton
5.3.3.4.4 Flame Arrestor

Description: Flame Arrestor
Part Number: RBS
Weight: 1.5 Kg
Material: Aluminium
5.3.3.4.5 Vapour Recovery Valve

Description: Vapour Recovery Valve
Part Number: VRV + IN1/4-VRV + 5300400
Weight: 4.35 Kg
Material: Aluminium
Seal Material: Viton
5.3.3.4.6 Foot valve

Description: Foot Valve
Part Number: BO100-N
Weight: 4.95 Kg
Material: Aluminium
Seal Material: Viton
5.3.3.4.7 Foot Valve F1

Description: Foot Valve
Part Number: BO100-F1-N
Weight: 6.6 Kg
Material: Aluminium
Seal Material: Viton
5.3.3.4.8 Footvalve F2

Description: Foot Valve
Part Number: BO100-F2-N
Weight: 5.2 Kg
Material: Aluminium
Seal Material: Viton
5.3.3.4.9 Pneumatic API Coupling

Description: Pneumatic API Coupling
Part Number: VKAP-100-I2
Weight: 
Material: Aluminium
Seal Material: Viton
SPD Sensor not shown
5.3.3.4.10 Emergency Button

**Description:** Emergency Button

**Part Number:** 5300423

**Weight:** Kg

**Material:**

**Seal Material:**
5.3.3.4.11 Master Guardbar Interlock

Description: Master Guardbar Interlock
Part Number: 5300402
Weight: 0.4 Kg
Material: Aluminium
Seal Material:
5.3.3.4.12 Auxiliary Guardbar Interlock

Description: Auxiliary Guardbar Interlock

Part Number: 5300403

Weight: 0.4 Kg

Material: Aluminium

Seal Material:
5.3.3.4.13 Pneumatic Filter and Lubricator

Description:

Part Number:

Weight:

Material:

Seal Material:
5.3.3.4.14 Gasket

**Description:** Conductive Gasket

**Part Number:** 6300100
  6300107

**Material:** Electrically conductive graphite laminate

**Material:** 2mm thick graphite laminate electrically conductive
Description: Gasket

Part Number: 6300119
6300108
19185

Material: Rubber bonded cork casket

MATERIAL: 2MM THICK RUBBER BONDED CORK GASKET
5.4 Electronic system

The NoMix 2000 main unit and the associated interface modules including the display interface are installed in instrument cabinets on the semitrailer. The semitrailer cable from F.A. Sening is used for the battery supply and the data exchange to the printer via the printer port, or optionally via the "external" CAN bus to the EMIS interface, to which an on-board computer is connected. Alternatively, the interface modules can be installed on a mounting plate (see drawing no. E11.351493 and E11.351498).

5.4.1 Wiring of the battery and the internal CAN bus

Only the appropriate cable (part no. NM2KABEL) may be used for wiring of the battery supply and of the internal CAN bus between the main unit and all interface modules. The shield of the connection cable only provides mechanical protection; it does not have to be fitted. The NoMix 2000 main unit and the associated interface modules are connected according to the following connection diagrams, depending on the version and configuration:

<table>
<thead>
<tr>
<th>NoMix 2000 connection diagrams</th>
<th>Drawing no.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic connection diagram</td>
<td>E11.351489</td>
</tr>
<tr>
<td>System wiring diagram</td>
<td>E11.351488</td>
</tr>
<tr>
<td>Main Unit &amp; Display system wiring diagram</td>
<td>E81.351676</td>
</tr>
<tr>
<td>Detailed connection diagram, main unit</td>
<td>E51.351351</td>
</tr>
<tr>
<td>Detailed connection diagram, display interface</td>
<td>E51.351352</td>
</tr>
<tr>
<td>Main Unit &amp; Display detailed wiring diagram</td>
<td>E51.351673</td>
</tr>
<tr>
<td>Detailed connection diagram, wetleg sensor-interface</td>
<td>E51.351346</td>
</tr>
<tr>
<td>Detailed connection diagram, TAG interface</td>
<td>E51.351478</td>
</tr>
<tr>
<td>Detailed connection diagram, I/O interface</td>
<td>E51.351468</td>
</tr>
<tr>
<td>Detailed connection diagram, SPD sensor interface</td>
<td>E51.351347</td>
</tr>
</tbody>
</table>

Additionally, the associated connection diagram has been stuck into each housing cover or onto the sealing compound of the display interfaces.
The terminal blocks for the battery, printer and CAN bus wiring are not screw-type terminals, but terminals with a tension spring connection. The cables are not screwed, but inserted from above.

A screwdriver with a blade width of 2.5 mm is required for opening the tension spring (included).

The following steps are required for the safe connection of the wires (see figure opposite):

- Strip the insulation off the wire.
- The use of wire sleeves is not required.
- Use the screwdriver to push open the terminal clamp.
  - Insert the wire into the opened terminal.
  - Remove the screwdriver.
  - Check proper fit by pulling the wire.

Attention: The display interface must always be installed having the cable glands pointing to the right. Display and terminals are not allowed to be mounted opposite to each other!

For the CAN bus connection, the main unit must form the start of the CAN bus chain; the connection of the other interface modules varies.

Example 1:

Main Unit ↔ Display-IF ↔ Wetleg Sensor-IF ↔ I/O-IF ↔ TAG-IF ↔ SPD-Sensor-IF

or:

Example 2:

Main Unit ↔ I/O-IF ↔ SPD-Senor-IF ↔ TAG-IF ↔ Display-IF ↔ Wetleg Sensor-IF
5.4.2 Sensor & I/O connections

5.4.2.1 Wetleg sensor interface

The wetleg sensors, type NS-2E, of the individual tank truck compartments (maximum 6) and the main pneumatically operated switches are connected according to drawing no. E51.351346. (see also connection diagram inside the housing cover).

5.4.2.2 TAG interface

The connection of the TAG scan signals with the insulated API couplings and vapour recovery connectors is established according to drawing no. E51.351478 using cable set part no. ASS-GS-K25M. The TAG scan required signals are shown in drawing no. E51.351478.

5.4.2.3 I/O interface

The connection of the solenoid valves and the optional input circuits is established according to drawing no. E51.351468.

5.4.2.4 SPD sensor interface

The SPD sensors are connected to the SPD sensor interface according to drawing E51.351347 (see also connection diagram inside the housing cover).

The SPD sensor interface can accommodate up to 20 SPD sensors or pneumatically operated switches for monitoring the:

- API couplings
- Foot valves
- Man lid (optional)

If all possible 20 sensors are connected, for interfaces of the first generation an additional junction box, part no. NM2KKSPD, has to be installed.

The sensors of the API couplings, foot valves etc. associated with the respective compartment should always be connected in blocks, e.g. API couplings: input 1 to 6; foot valves: input 7 to 13.

The actual sensor assignment must be recorded. An "S.P.D. sensor assignment" form is provided for this purpose in Chapter 12.2. Please copy this form, fill it in and add it to the tank truck documents. These data are required for setting up the NoMix 2000 system (see Chapter 6.1.1.1.9).
The polarity of the connection line can be found in the following table or in the table in Chapter 6.1.1.1.9:

<table>
<thead>
<tr>
<th>Coupling / valve / sensor</th>
<th>Wire (+)</th>
<th>Wire (-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>API coupling VKAP100-I2</td>
<td>brown (BN)</td>
<td>white (WH)</td>
</tr>
<tr>
<td>API coupling VKVP-I</td>
<td>brown (BN)</td>
<td>white (WH)</td>
</tr>
<tr>
<td>foot valve (MSDSO)</td>
<td>brown (BN)</td>
<td>white (WH)</td>
</tr>
<tr>
<td>Man lid</td>
<td>brown (BN)</td>
<td>white (WH)</td>
</tr>
</tbody>
</table>

### 5.4.2.4.1 Second SPD sensor interface

If more than 20 SPD sensor channels are required, a second or third etc. SPD sensor interface must be installed. The address / node number of the second and third etc. SPD sensor interface must be set at DIP switch SW1 on the CPU board of the SPD sensor interface.

The CAN bus node number of all SPD sensor interfaces is set in the factory to node number 1. This address is maintained if only one interface is operated or if it is the first of a possible four.

The second device is assigned node number 2, the third device node number 3 etc.

Set the node numbers of the individual devices according to the following table:

<table>
<thead>
<tr>
<th>Node Number</th>
<th>DIP switch no. 1 ([2^0])</th>
<th>DIP switch no. 2 ([2^1])</th>
<th>DIP switch no. 3 ([2^2])</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>3</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>4</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>
5.4.3 Printer connection / (EMIS interface connection: optional)

5.4.3.1 Connection of a permanently installed printer

A printer that is permanently installed in the driver's cabin is connected according to the electrical system diagram drawing no. E11.351488. The printer data are transferred to the tractor unit via the semitrailer cable and an RS232 interface. A 2A fuse integrated into the junction box for the semitrailer cable is used to protect the printer.

5.4.3.2 Temporary printer / laptop connection (optional)

If no permanently installed printer is provided in the driver's cabin, an external printer or a laptop can be connected via a connection socket, part no. SPD-DR-KA2.

Such a printer / laptop is not suitable for operation within Ex-areas. The socket of the connection cable to the main unit must be installed outside the Ex-area. The system must be switched off prior to connecting the printer.

5.4.3.3 EMIS interface connection (optional)

Instead of a printer, the data may be transferred to an on-board computer, which is permanently installed in the driver's cabin. The on-board computer is also supplied with data via the semitrailer cable from F.A. Sening. The EMIS forms the interface between the NoMix 2000 system and the OBC system. It is connected to the external CAN bus of the NoMix 2000 system.

Please refer to the relevant manual regarding the OBC connection details.
6 Start-up

Before switching the system on for the first time, re-check the wiring for correct connection and firm fit one more time.

If no text appears on the display interface or not all supply voltage LEDs are lit on the main unit and on the interface modules,

immediately switch off the system and check the complete wiring.

If everything is connected properly, the display will show, for example, the following screen, and all LEDs for indicating the supply voltage at the main unit and at all interface modules will be on.

---

**DISCHARGE**

<table>
<thead>
<tr>
<th>Compartment No.</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 LRP</td>
<td>L -</td>
</tr>
<tr>
<td>2 LRP</td>
<td>L -</td>
</tr>
<tr>
<td>3 ULG</td>
<td>L -</td>
</tr>
<tr>
<td>4 SULG</td>
<td>L -</td>
</tr>
<tr>
<td>5 DI</td>
<td>L -</td>
</tr>
<tr>
<td>6 ULG</td>
<td>L -</td>
</tr>
</tbody>
</table>

---

**LOADING**

<table>
<thead>
<tr>
<th>F1</th>
<th>F2</th>
<th>F3</th>
</tr>
</thead>
</table>

---

**DISCHARGE**

Discharge mode

**Status:**

(Ready, Discharge ...)

**Vapour:**

(C = Common vapour)

**Condition of compartments:**

(L = Loaded, E = Empty)

**Contents of compartments:**

(LRP, ULG, SULG ...)

**Compartment No.:**

(1, 2, 3, 4, 5, 6)

**LOADING:**

F1 → Loading mode
6.1 Menu structure of the NoMix 2000 system

The NoMix 2000 system comprises so-called "Pull Up and Pull Down" menus. Submenus are accessible from the main menu and vice versa.

6.1.1 Main menu

The main NoMix 2000 menu is accessed by pressing the MENU key.

The submenus are accessed by pressing the numeric keys preceding the respective function. Pressing the <F1> key executes the "BACK" command, returning to the normal function display.

6.1.1.1 SETUP menu

6.1.1.1.1 General

During commissioning of the NoMix 2000 system, the tank truck supplier has to adapt the system to the respective tank truck type. This is done in the "SETUP" / "Settings" menu, which contains further submenus. To prevent safety-relevant parameters from being changed arbitrarily, certain parameters can only be changed after a hardware switch in the main unit has been activated (see drawing no. E51.350371 and E51.351675). If the associated LED is on, setup is enabled, and all parameters can be changed.

If safety-relevant parameters have been changed by a qualified installer during setup, the function tests relevant for these changes have to be repeated.

Proper setup has to be attested by the installer and recorded on an associated form.

Attention: Once the setup is complete, the switch has to be returned to its original position, i.e. the LED will go out.

Now only non-safety-relevant parameters can be changed by entering a "password". Once the cover of the main unit has been screwed on, one of the housing screws has to be sealed and the company logo affixed.
The setup menu looks as follows:

```
<table>
<thead>
<tr>
<th>SETUP MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - System</td>
</tr>
<tr>
<td>2 - Components</td>
</tr>
<tr>
<td>3 - Network</td>
</tr>
<tr>
<td>4 - Truck</td>
</tr>
<tr>
<td>5 - Product</td>
</tr>
<tr>
<td>6 - Load.</td>
</tr>
<tr>
<td>7 - Disch.</td>
</tr>
<tr>
<td>8 - Sensors</td>
</tr>
<tr>
<td>9 - Events</td>
</tr>
</tbody>
</table>
```

The submenus are accessed by pressing the numeric keys preceding the respective function. When the word "MORE" is readable above the `<F3>` key it means that a second setup page is available which can be achieved by pressing `<F3>`.

General procedure:

- If, for example, the SETUP Truck submenu has been accessed accidentally (wrong key was pressed), whereas a change was intended in the SETUP System, the SETUP Truck submenu can be quit immediately via the STOP key, without having to go through all the parameters.
- If you have advanced too far in one of the SETUP menus ("F1" key for Continue was pressed) and would like to change or review the previous parameter, you can step backward through the SETUP menu using the "<-key". You do not have to run through all the parameters of the SETUP menu and then start again from the beginning.
- For SETUP parameters that only require setting of a "0" or "1" in certain places, e.g. SETUP Disch., Parameter: "vapour recovery at discharge", the setting can optionally be made with the numeric keys "0" and "1". The "1" key, for example, is pressed twice to change from "00..." to "11...". Alternative procedure: After pressing the <Enter> key, select the parameter to be changed with the <F1> or <F3> key and change it with the <F2> key (switch-over) from "0" to "1" or from "1" to "0".
In principle, in all setup menus the parameters are changed or adjusted according to the instructions in the respective display. As the first step, a tank truck type should be pre-selected in Setup page 2, "1-Presets" that is closest to the tank truck being processed. This will correctly set most SETUP parameters. Some parameters will have to be adjusted for the individual tank truck.

**Parameters in Setup Presets**

The numeric keys can be used to select the respective tank truck type. The following display will appear:

The hatched tank truck types are German tank trucks.

The function keys <F1> and <F3> can be used to execute the functions shown in the last row of the display:
Example for a setup change in other submenus:

The function keys <F1> and <F3> can be used to execute the functions shown in the last row of the display:

- <F1> = PREV. → Back to the previous setup parameter
- <F3> = NEXT → Continue to next setup parameter

Apart from the function keys <F1> & <F3>, the arrow keys on the keypad can also be used to go to the next or previous parameter.

Changes:

The SETUP can be changed in all subsequent setup submenus as follows:

- Press the <Enter> key
- Make the change according to the text instruction
- Press the <Enter> key to confirm the change

Example for a SETUP change:

Enter a 6-digit number using the <numeric keys> and confirm with <Enter>.

The following display, for example, will appear, if the setup has been completed or the <STOP> key for exiting the setup has been pressed:
The function keys \(<\text{F1}>\) and \(<\text{F3}>\) can be used to execute the functions shown in the last row of the display:

- \(<\text{F1}>\) = YES $\rightarrow$ setup is stored, back to main setup menu
- \(<\text{F3}>\) = NO $\rightarrow$ The setup is repeated

In the following chapters, all setup parameter are listed in tabular form. If the setup parameter is not intuitive such as Language: German / English, it is described in detail below.

The hatched parameters shown in the following tables are only relevant for German vehicles.

The following parameters can be set in System setup. The procedure is described in Chapter 6.1.1.1.1 (General procedure).
Parameter description | Possible content | Security feature
--- | --- | ---
Serial number | 6-digit number | Switch
Operation language | German | password
| English
Date order | Day-month-year | Switch
| Month-day-year
Manual Sealing | Yes | Switch
| No
Power OFF breaks seal | Yes | Switch
| No
Printer access | Exclusive access | Switch
| Shared access
| Network
| Not installed
Baud rate | 9600 | password
No. of lines | 55 | Switch
No. of columns | 35 | Switch
Identification necessary | Yes | Switch
| No
Password | 5-digit number | **password**

6.1.1.1.2.1 Serial number

The serial number of the main unit (NM2MAIN) has to be entered here.

6.1.1.1.2.2 Manual sealing permitted

If this parameter is set to `<YES>`, the compartments may be manually re-sealed if loading was interrupted temporarily at the depot or in case of split discharge at two petrol stations.

6.1.1.1.2.3 Switching off breaks seal

With NoMix & SPD functionality, the SPD sensors must be monitored continuously. To this end, the system is connected with the permanent power supply. The system should not be switched off during operation. If the setup parameter is set to `<YES>`, the seals of all compartments are broken if the system is switched off.

6.1.1.1.2.4 Printer

- **Exclusive access:** only the NoMix 2000 system has access to the printer.
- **Shared access:** other devices apart from NoMix 2000 also have access to the printer.
- **Network:** The printer is connected to an on-board computer / TMC, for example, within a network. NoMix 2000 or others devices have no direct access to the printer.
- **Not installed:** no printer is installed.

Note: Shared access and network printing is not supported yet with software version 1.40
6.1.1.2.5 Baud rate / no. of rows / no. of columns /

The factory setting is as follows and should not be changed:

- Baud rate: 9600
- No. of rows: 55
- No. of columns: 35

If the printer data should be transferred to a laptop an individual baudrate of 4800, 9600, 19200, 38400, 57600 or 115200 can be used. For a quick data transfer it is recommended to use the highest Baudrate of 115200. The NoMix 2000 Baudrate has to be the same as the laptop baudrate.

6.1.1.2.5.1 Identification necessary

If this parameter is set to <Yes> the driver has to key in some data before changing into the loading or discharge mode. This data are used as a release for loading and discharge. Without doing this no loading or discharge can be carried out.

The following data have to be keyed in:

- Shift number: Format: max. 4-digit numeric
- Tour number: Format: max. 4-digit numeric
- Depot / Station number: Format: max. 8-digit numeric

The release will be cancelled automatically after a timeout of 60 minutes. The start point of the timeout is the moment when loading-/discharge-mode changes to passive. That is when no loading arm or discharge hose is connected.

An override is not possible and the identification data are recorded in the event logbook.

6.1.1.2.6 Password

Via the NoMix password, certain setup parts (non-safety-relevant parameters) can be changed. Other, safety-relevant parameters can only be changed after activating a hardware switch in the NM2MAIN main unit.

Possible selection: 5 numeric characters
6.1.1.3 Components setup

In the Components setup, the type and number of installed interface modules is specified. The procedure is described in Chapter 6.1.1 (General procedure).

<table>
<thead>
<tr>
<th>Description</th>
<th>No. of Possible</th>
<th>Security feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminals</td>
<td>1</td>
<td>Switch</td>
</tr>
<tr>
<td>Wetlegsensor-IF</td>
<td>1</td>
<td>Switch</td>
</tr>
<tr>
<td>Overfill-IF</td>
<td>0</td>
<td>Switch</td>
</tr>
<tr>
<td>Output-IF</td>
<td>1</td>
<td>Switch</td>
</tr>
<tr>
<td>TAG-Scan-IF</td>
<td>1</td>
<td>Switch</td>
</tr>
<tr>
<td>Hallsensor-IF</td>
<td>0</td>
<td>Switch</td>
</tr>
<tr>
<td>SPD-Sensor-IF</td>
<td>1</td>
<td>Switch</td>
</tr>
</tbody>
</table>

*) parameter not visible or only relevant for German tank trucks
6.1.1.4 Network setup

Among other features, the NoMix system also has a so-called external CAN bus. This is a communication connection, through which NoMix can send data to an EMIS interface. Via the EMIS interface, data can then be sent to other devices, e.g. an on-board computer.

**NETWORK**

**MENU/SETUP**

<table>
<thead>
<tr>
<th>Description</th>
<th>Possible Content</th>
<th>Security Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMIS-Interface-Communication</td>
<td>YES</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td></td>
</tr>
</tbody>
</table>

Whether or not the NoMix 2000 system is connected to an EMIS interface is specified in Network setup. If <YES> is set, further detailed settings are required. The procedure is described in Chapter 6.1.1.1 (General procedure).

Detailed settings if <YES> is set (not relevant for British tank trucks):

<table>
<thead>
<tr>
<th>Parameter description</th>
<th>Possible content</th>
<th>Security feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMIS-note number</td>
<td>21</td>
<td>Switch</td>
</tr>
<tr>
<td>Record events</td>
<td>YES</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>Events sent to:</td>
<td>21</td>
<td>Switch</td>
</tr>
<tr>
<td>Own note number</td>
<td>11</td>
<td>Switch</td>
</tr>
<tr>
<td>CAN-communication forced</td>
<td>YES</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td></td>
</tr>
</tbody>
</table>
6.1.1.1.4.1 EMIS interface communication possible

Possible selection: yes / no

specifies whether or not an EMIS interface is installed on the tank truck.

6.1.1.1.4.2 EMIS node number

On a tank truck with EMIS interface communication, several electronic systems can be connected with the communication line (CAN bus). Each connected electronic system has its own node number.

EMIS node number: 21

6.1.1.1.4.3 Save events

Possible selection: yes / no

If "yes" has been set, all events are registered and stored.

6.1.1.1.4.4 Events sent to:

Events should be sent to the EMIS Interface note number: 21

6.1.1.1.4.5 Own node number

NoMix 2000 has node number 11.

6.1.1.1.4.6 CAN bus connection required

Setting = yes: It is imperative that the CAN bus connection between NoMix and EMIS is intact. Otherwise the complete system goes into fault state.

Setting: = no: If a fault occurs in the CAN bus connection, NoMix continues to operate as a stand-alone system without EMIS connection.
6.1.1.1.5 Truck setup

Tank truck-specific parameters are set in Truck setup. The procedure is described in Chapter 6.1.1.1.1 (General procedure).

<table>
<thead>
<tr>
<th>Parameter description</th>
<th>Possible content</th>
<th>Security feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck-Type</td>
<td>Direct</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Measuring *)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hybrid *)</td>
<td></td>
</tr>
<tr>
<td>Number of compartments</td>
<td>1-6</td>
<td>Switch</td>
</tr>
<tr>
<td>No. of OP</td>
<td>0</td>
<td>Switch</td>
</tr>
<tr>
<td>No. of meter</td>
<td>0</td>
<td>Switch</td>
</tr>
<tr>
<td>No. of 2” vapour nozzles</td>
<td>0</td>
<td>Switch</td>
</tr>
<tr>
<td>Common vapour installed</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Footvalves pressure balanced</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Air pressure switch installed</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Supervise loading of pipes</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>DMS-Option</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

*) parameter not visible or only relevant for German tank trucks

6.1.1.1.5.1 Tank truck type

The tank truck type currently supported by the software is described in Chapter 4.
6.1.1.1.5.2 Pneumatically operated switch present

In general, all pneumatic control units equipped with F.A. Sening fittings require an air pressure between 3 bar and 7.5 bar for safe operation. To ensure safe operation of the pneumatic control, the system must be able to detect if the air pressure falls below the minimum required pressure of 3 bar. To this end, a main pressure switch is installed in the air line from the vent valves to the NoMix solenoid valves, directly behind the vent valves. The electrical connection is established at input 1 of the wetleg sensor interface according to drawing no.: E51.351346. The pressure switch, which is activated at an air pressure of 3.2 bar ± tolerances, is continuously monitored by the NoMix system. If the air pressure is below 3.2 bar, or if the air pressure falls below 3.2 bar, discharge / loading cannot be started or is immediately interrupted.

6.1.1.1.5.3 Hose supervision

NoMix 2000 is able to monitor the fill level of the pipe system. A distinction is made between the compartment level and the pipe level. However, since the compartment is not directly equipped with a level sensor, its state has to be determined via a "detour".

Level monitoring is an additional safety function that minimises the risk of mixing, even in case of incorrect operation.

Level monitoring is particularly significant in connection with the SPD system: To ensure that, during discharge from a sealed compartment, only the product volume is discharged that has been loaded at the depot according to the printout from the flow meter, the pipe must be empty. Otherwise the quantity would be exceeded by the volume contained in the pipe.

- **The level monitoring principle**

Level monitoring is based on the following basic principles:

- As long as a compartment is open and the wetleg sensor reports "dry", the compartment must be empty.
- If the wetleg sensor for an open compartment reports "wet", the compartment cannot be empty.
- If a compartment is closed, the state of the wetleg sensor is stored and forms a compartment filling state.

From this stored compartment filling state and the current state of the wetleg sensor, the following combination can be established:

<table>
<thead>
<tr>
<th>Stored compartment filling state</th>
<th>State of the wetleg sensor</th>
<th>Compartment state (also detailed display)</th>
</tr>
</thead>
<tbody>
<tr>
<td>not empty</td>
<td>wet</td>
<td>not empty</td>
</tr>
<tr>
<td>not empty</td>
<td>dry</td>
<td>not empty</td>
</tr>
<tr>
<td>empty</td>
<td>wet</td>
<td>Remaining volume</td>
</tr>
<tr>
<td>empty</td>
<td>dry</td>
<td>Empty</td>
</tr>
</tbody>
</table>
Comments:

- If the setup allows loading onto remaining quantities, only an identical product may be loaded.
- If the SPD functionality with pressure switch at the foot valve is also installed, the pressure switches are also monitored. This means that a compartment is only opened if NoMix 2000 has released the foot valve and the pressure switch simultaneously detects compressed air. Correspondingly, closing of a compartment can be initiated and detected either by deactivating of the NoMix 2000 solenoid valve or by a drop in air pressure at the foot valve.
- Once an "empty" compartment has been closed, drip quantities can no longer be considered.

6.1.1.5.4 DMS option installed

Setting = no only relevant for German tank trucks

6.1.1.6 Product setup

Product-specific parameters are set in the Product setup. The procedure is described in Chapter 6.1.1.1 (General procedure).

<table>
<thead>
<tr>
<th>Product Quality Description</th>
<th>Content</th>
<th>Protection by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used Uroducts</td>
<td>0010111000000000</td>
<td>Switch</td>
</tr>
<tr>
<td>Leaded Products</td>
<td>0000100000000000</td>
<td>Switch</td>
</tr>
<tr>
<td>Product No. 3: Diesel</td>
<td>Name: DI</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Danger Class: AI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ref. Code: 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TAG-Code: 68</td>
<td></td>
</tr>
<tr>
<td>Product No. 5: LRP (4 Star)</td>
<td>Name: LRP</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Danger Class: AI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ref. Code: 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TAG-Code: 98</td>
<td></td>
</tr>
<tr>
<td>Product No. 6: Unleaded 95</td>
<td>Name: ULG</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Danger Class: AI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ref. Code: 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TAG-Code: 95</td>
<td></td>
</tr>
<tr>
<td>Product No. 7: Super Unleaded 98</td>
<td>Name: SULG</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Danger Class: AI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ref. Code: 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TAG-Code: 98</td>
<td></td>
</tr>
</tbody>
</table>
### 6.1.1.6.1 Products used

**Table of products used**

<table>
<thead>
<tr>
<th>No.</th>
<th>Product</th>
<th>Leaded = L</th>
<th>Unleaded = U</th>
<th>Danger Class</th>
<th>Ref. Code</th>
<th>TAG Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3</td>
<td>Diesel</td>
<td>U</td>
<td>A II</td>
<td>2</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>5</td>
<td>4 Star / LRP</td>
<td>L</td>
<td>A I</td>
<td>4</td>
<td>98</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Unleaded 95</td>
<td>U</td>
<td>A I</td>
<td>5</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Super Unleaded 98</td>
<td>U</td>
<td>A I</td>
<td>6</td>
<td>98</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>9</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>10</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>11</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>12</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>13</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>14</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>15</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>16</td>
<td>Not used</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

This is where the type of products to be used is selected. Even during manual input of the loading plan, only the valid products will appear.

In the following example, only products 3, 5, 6 and 7 are enabled.

![PRODUCT MENU/SETUP](image)

After pressing the `<Enter>` key, the products to be used are set with the numeric keys `<0>` and `<1>.

- "0" = product **not** used
- "1" = product **used**
6.1.1.6.2 Leaded products

This screen is used to specify which products are unleaded or leaded.

In the following example, product 5 (LRP) is leaded, all others are unleaded.

After pressing the <Enter> key, leaded/unleaded products are specified with the numeric keys <0> and <1>.

- **0** = product unleaded
- **1** = product leaded

![PRODUCT MENU SETUP Image](image-url)
6.1.1.6.3 Product names

All product names are set in the "Product name" setup. For each product name, up to four characters can be used. This menu can only be opened if the tank truck is completely empty. This ensures that no product codes of products that are still loaded can be altered.

The following display appears after pressing the <Enter> key:

Example for a change from >Pr.7< to >ULG <:

- Press the <7 (STU)> key four times in short succession: → U
- Press the <F3> key to go to the next character
- Press the <4 (JKL)> key four times in short succession: → L
- Press the <F3> key to go to the next character
- Press the <3 (GHI)> key twice in short succession: → G
- Press the <Enter> key to confirm
### 6.1.1.6.4 Further product-specific parameters

Further product-specific parameters are now requested or set, such as:

- Hazard class
- Reference code
- TAG code (must be set according to Chapter 6.1.1.6.1)

### 6.1.1.7 Loading

<table>
<thead>
<tr>
<th>Parameter description</th>
<th>Possible content</th>
<th>Security feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading mode</td>
<td>Compartment</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Truck *)</td>
<td></td>
</tr>
<tr>
<td>No. of loadings</td>
<td>3 (1 – 6)</td>
<td>Switch</td>
</tr>
<tr>
<td>Manual loading plan allowed</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Manual loading plan timeout</td>
<td>60 (10 – 120 minutes)</td>
<td></td>
</tr>
<tr>
<td>Product code correction</td>
<td>Yes *)</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Permission valve ON</td>
<td>Loading mode</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Connected</td>
<td></td>
</tr>
<tr>
<td>Permission valve OFF</td>
<td>Comp. error</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>System error</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loading error</td>
<td></td>
</tr>
<tr>
<td>Open automatic</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Not at man. LPlan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Close compartments after loading</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Compartment permission</td>
<td>Not empty</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Empty compartments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rest amount</td>
<td></td>
</tr>
<tr>
<td>Comp. Empty test</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Yes with override</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Leave comp. Open after test</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>TAG disconnected delay (Sec.)</td>
<td>3 (0-10 seconds)</td>
<td>Switch</td>
</tr>
<tr>
<td>Magnet code delay (Sec.) *)</td>
<td>3-5</td>
<td>Switch</td>
</tr>
<tr>
<td>Wetleg to wet timeout (Sec)</td>
<td>5-10</td>
<td>Switch</td>
</tr>
<tr>
<td>Vapour recovery at loading</td>
<td>00000000000000000</td>
<td>Switch</td>
</tr>
</tbody>
</table>

*) parameter not visible or only relevant for German tank trucks
6.1.1.7.1 Loading mode: tank truck / compartment

This parameter specifies the loading mode. It affects the valve control during loading.

List of choices:
- **Tank truck**: loading is done through NoMix per tank truck. Only the loading release valve (1MV7) is switched. *(only relevant for German tank trucks)*:
- **Compartment**: loading is done through NoMix per compartment. The foot valves (solenoid valves 1MV1 to 1MV6) and additionally the loading release valve (1MV7) are switched.

6.1.1.7.2 Number of simultaneous loading processes: 1 to 6

This parameter can be used to limit the number of simultaneous loading processes.

Min. value: 1.
Max. value: Number of compartments.

**Note:**
only visible if loading is done on a compartment basis.
6.1.1.1.7.3 Manual input of loading plan permitted

Specifies whether manual input of the loading plan is permitted.

Possible selection:

- permitted: bottom loading without product code and top loading are possible. The loading plan must be entered directly prior to uncoded loading

  **Attention:** After setting of the loading plan, the NoMix system must not be switched off until loading occurs.

- not permitted: only bottom loading with product code is permitted.

6.1.1.1.7.4 Deactivation time for manual loading plan input: 10 to 120 minutes

A time between 10 and 120 minutes can be selected here. It determines when a compartment is closed automatically after the loading plan has been entered manually. A override is always reset if the NoMix system is switched off.

6.1.1.1.7.5 Product code correction

Setting = NO

**only relevant for German tank trucks**

6.1.1.1.7.6 Loading release valve ON: loading mode / connected

Controls the switch-on behaviour of the loading release valve (1MV7).

List of choices:

- **Loading mode:** The loading release valve is switched on, as soon as a fault-free loading mode is reached, even if no compartment is connected.

- **Connected:** The loading release valve is only switched on if at least one compartment is fully connected in fault-free loading mode.

**Note:**
Compartments are also deemed to be connected if the loading plan was entered manually (if permitted).
6.1.1.1.7.7 Loading release valve OFF: NoMix, loading, compartment fault

Controls the switch-off behaviour of the loading release valve (MV17).

List of choices:

- **System fault:** Only faults within the NoMix system (e.g. no I/O connection) lead to the loading release valve being switched off. (*only relevant for German tank trucks*).

- **Loading fault:** NoMix faults and loading faults that are not compartment-related (e.g. discharge hose connected) lead to the loading release valve being switched off. (*only relevant for German tank trucks*).

- **Comp. fault:** NoMix fault, loading fault and all compartment faults (e.g. compartment 1: wrong product) lead to the loading release valve being switched off.

6.1.1.1.7.8 Automatic opening: yes / not f. man. load. plan ent. / no

This parameter can be used to specify whether correctly connected compartments open automatically or only after the compartment number has been pressed.

List of choices:

- **Yes:** the compartments open automatically.

- **Not at manual loading plan is:** the compartments open automatically in case of coded loading, but not after manual input of the loading plan (uncoded loading).

- **No:** the compartments do not open automatically.

**Note:**
- only visible if loading is done on a compartment basis and with air pressure balanced foot valves.

6.1.1.1.7.9 Close compartment after loading: yes / no

This parameter is used to specify whether the compartment (foot valve) closes immediately after the loading arm has been detached or whether it remains open.

**Note:**
- only visible if loading is done on a compartment basis.
  A fault at a compartment that is still open leads to the compartment being closed.
6.1.1.7.10 Compartment loading

This parameter specifies the condition for which a compartment may not be filled. A distinction is made between the filling state of the compartment (above the foot valve) and the filling state of the pipeline (below the foot valve).

This parameter is mainly used for SPD functionality.

List of choices:

- **only empty compartment**: only empty compartments may be filled. A compartment may not be filled, if it is not empty or if there are product residues in the pipeline.
- **OK with residue**: a compartment may be filled, if the compartment itself is empty, but residue is present in the pipeline.
- **not empty OK**: any compartment may be filled (even if it is not empty), independent of the filling state of the compartment and the pipeline.

**Note:**

- If residues are present, they may only be topped up with an identical product (as for non-empty compartments).
- If no SPD system is installed, this parameter is normally set to "not empty OK".

6.1.1.7.11 Compartment empty test

The compartment empty test is used to detect any residue that may have collected in the compartments prior to loading. Obviously this means that all compartments / foot valves have to be opened prior to loading.

During the compartment empty test, all foot valves are opened for approx. 5 seconds via the NoMix 2000 solenoid valves. Depending on the Setting setup, they remain open in order to save air, or they are closed again.

**Important:** In case of a time-controlled compartment empty test, the main pressure switch must be installed, otherwise the test can be carried out, although the Master-block was not pulled and therefore the compartments could not be opened, despite the fact that NoMix had activated the solenoid valves.

If additionally a pneumatically operated switches are installed at the foot valves, they are also monitored.

If loading arms are connected during the compartment empty test, an error message appears immediately, and the compartments are closed.
Operation:

After changing into the loading mode, the compartment empty test display appears.

Start the compartment empty test by pressing the <Enter> key. If a hose connection is detected during the empty test, the following error message appears immediately: "Please disconnect hose". The empty test can be aborted at any time with the <STOP> key. If a override according to the Setup setting is permitted, the empty test can be overrided with the <F1> key. This is recorded in the log book.

If residue is detected during the compartment empty test, the following display appears:

Press the <F1> key and check in which compartment or compartments residue was detected.

6.1.1.7.12 Leave compartment open after empty test

This parameter can be used to specify whether the compartments should be closed after the compartment empty test, or whether they should remain open in order to save compressed air.

The compartments can be closed individually via the numeric keys or jointly via the STOP key.

If the parameter "loading release valve ON" is set to "connected", the compartments are closed independent of this parameter after the compartment empty test, since directly after the compartment empty test no compartment can be connected. This means that this parameter is only effective, if the parameter "loading release valve ON" is not set to "connected".
6.1.1.1.7.13  TAG switch-off time: 0 to 9 seconds.

This parameter can be used to specify how long a TAG is deemed to be connected after it has been disconnected. This is used to catch loose contacts during connection of the loading arm.

Min. value: 0 seconds.
Max. value: 9 seconds.

In our experience, the time should be set to 3 seconds.

Note:
- The TAG switch-off time applies only for loading, not for discharge.

6.1.1.1.7.14  Magnet code delay

Setting = 3

only relevant for German tank trucks

6.1.1.1.7.15  Wetleg sensor switch-on time

The time that can be set here specifies the delay time between the time at which the wetleg sensor changes its state from empty to full and the time at which this change is processed, (residue detection during loading / transfer of the product code into the loading plan).

possible time: 10 seconds max.

In our experience, the time should be set to 5 seconds.

6.1.1.1.7.16  Vapour recovery during loading

This parameter is used to specify which products require vapour recovery.

After pressing the <Enter> key, the products to be used are set with the numeric keys <0> and <1>.

- “0” = no vapour recovery required
- “1” = vapour recovery required
6.1.1.1.8 Discharge

<table>
<thead>
<tr>
<th>Parameter description</th>
<th>Possible content</th>
<th>Security feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge mode</td>
<td>NoMix</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>NoMix &amp; COP-HSV *)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>COP-HSV *)</td>
<td></td>
</tr>
<tr>
<td>Discharge on load. side</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>No. of discharges</td>
<td>2 (1-6)</td>
<td>Switch</td>
</tr>
<tr>
<td>No. of A3 discharges</td>
<td>2 (1-6)</td>
<td>Switch</td>
</tr>
<tr>
<td>No. of A1 discharges</td>
<td>2 (1-6)</td>
<td>Switch</td>
</tr>
<tr>
<td>Override mode</td>
<td>HSV and COP</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Only HSV, not COP *)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HSV, COP w/o code *)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not allowed</td>
<td></td>
</tr>
<tr>
<td>Override disabled if HSV activ</td>
<td>*)</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Override meter with vapour rec.</td>
<td>*)</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>No. of overrides</td>
<td>2 (1-6)</td>
<td></td>
</tr>
<tr>
<td>Override timeout (Min.)</td>
<td>60 (10-120)</td>
<td>Switch</td>
</tr>
<tr>
<td>Override-Log-Info</td>
<td>Standard</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>detailed</td>
<td></td>
</tr>
<tr>
<td>Short override menu</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Wetleg to dry timeout (Sec.)</td>
<td>30 (0-60)</td>
<td>Password</td>
</tr>
<tr>
<td>Products over meter 1</td>
<td>*) 0000000000000000</td>
<td>Switch</td>
</tr>
<tr>
<td>Products over meter 2</td>
<td>*) 0000000000000000</td>
<td>Switch</td>
</tr>
<tr>
<td>Vap. rec. at discharge</td>
<td>0000111000000000</td>
<td>Switch</td>
</tr>
</tbody>
</table>

*) parameter not visible or only relevant for German tank trucks

Discharge-specific parameters are set in Discharge setup. The procedure is described in Chapter 6.1.1.1.1 (General procedure).
6.1.1.1.8.1 Discharge mode

possible selection:  

<table>
<thead>
<tr>
<th>NoMix</th>
<th>QSS</th>
<th>NoMix &amp; QSS-ASS</th>
<th>QSS-ASS</th>
</tr>
</thead>
</table>

*) only relevant for German tank trucks

- NoMix: Associated with the NoMix device, electronic identification generators are installed at the tank on the petrol station side. They contain an electronic device that stores the respective product quality. These components are called TAGs. With the connection of the product hose of the vapour recovery hose at the tank, the TAGs fitted to the product inlet connector and at the vapour recovery connector are supplied with a small, intrinsically safe voltage via the hoses. The TAG immediately starts transferring the data and information stored internally to the NoMix system installed on the tank truck via the conductive hoses. Provided the connection is correct, the products in the tank truck and the petrol station tanks have been assigned correctly and NoMix has enabled delivery, the tank truck driver can now request product delivery to start.

- QSS: only relevant for German tank trucks

- NoMix & QSS-ASS: only relevant for German tank trucks

- QSS-ASS: only relevant for German tank trucks

6.1.1.1.8.2 Delivery on loading side: yes / no

This parameter is used to specify whether delivery via the loading coupling is permitted.

6.1.1.1.8.3 Number of simultaneous deliveries

This parameter is used to specify how many deliveries are permitted at the same time.

6.1.1.1.8.4 Number of simultaneous A3 deliveries

This parameter is used to specify how many hazard class A3 deliveries are permitted at the same time.

6.1.1.1.8.5 Number of simultaneous A1 deliveries

This parameter is used to specify how many hazard class A1 deliveries are permitted at the same time.
6.1.1.1.8.6 Override mode

Possible selection:

- HSV and COP: Override is permitted, COP information is not evaluated, ---> override without cross over prevention.
- only HSV, not COP: only relevant for German tank trucks
- HSV and COP without code: only relevant for German tank trucks
- not permitted: The override is disabled.

HSV = Hose Super Vision (only used in Germany)

6.1.1.1.8.7 Disable override if HSV is detected: yes / no

Setting = no
only relevant for German tank trucks

6.1.1.1.8.8 Override measuring system with vapour recovery:

Setting = no
only relevant for German tank trucks

6.1.1.1.8.9 Number of simultaneous overrides

This parameter is used to specify how many discharges are permitted in override mode.

6.1.1.1.8.10 Override deactivation time: 10 to 120 min.

A time between 10 and 120 minutes can be selected here. It determines when a discharge started in override mode is terminated again. A override is always reset if the NoMix system is switched off.

6.1.1.1.8.11 Override log info: standard / detailed

- Standard: In override mode, the date, time, compartment no. and product grade are recorded in the log book.
- Detailed: In override mode, in addition to date, time, compartment no. and product grade, the location and reason for the override are also recorded. Location and reason must be entered by the tank truck driver.

6.1.1.1.8.12 Simplified override menu
Setting = yes

The override can be selected without sophisticated safety queries.

### 6.1.1.1.8.13 Wetleg sensor switch-off time: 0 to 60 seconds.

The time that can be set here specifies the delay time between the time at which the wetleg sensor changes its state from full to empty and the time at which this change is shown in the display.

### 6.1.1.1.8.14 Products via measuring system 1 / measuring system 2

Setting = 0000000000000000

only relevant for German tank trucks

### 6.1.1.1.8.15 Vapour recovery during discharge

This parameter is used to specify which products require vapour recovery during discharge.

<table>
<thead>
<tr>
<th>DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MENM / SETUP</td>
</tr>
<tr>
<td>Vap. rec. at disch.</td>
</tr>
<tr>
<td>0000111000000000</td>
</tr>
</tbody>
</table>

After pressing the <Enter> key, products requiring vapour recovery are set with the numeric keys 0 and 1.

- "0" = no vapour recovery required
- "1" = vapour recovery required

In the example above, the products 5, 6 and 7 require vapour recovery.
6.1.1.1.9 SPD sensor setup

At SPD sensor setup there are differences concerning the particular software version of the NoMix 2000 main unit and the hardware version of the SPD sensor interface. The configuration no. 4 described below is going to be the standard in the future.

- **Configuration 1**
  Main unit software version < 1.40 and SPD sensor interface part no. MSSPD
  The main unit software version < 1.40 supports only one switch level (analogue break / analogue make).
  The sensor evaluation at the SPD sensor interface part no. MSSPD is done analogue, only one switch level (analogue break / analogue make) is supported.

- **Configuration 2**
  Main unit software version ≥ 1.40 and SPD sensor interface part no. MSSPD
  At main unit software version ≥ 1.40 there are three different analogue switch level adjustable which for instance can be used to detect the opening of the API-coupling at different distances.
  Analogue break 1 / make 1: sensitive; detection after a short opening distance
  Analogue break 3 / make 3: less sensitive; detection after a larger opening distance
  But in combination with SPD sensor interface part no. MSSPD only switch level analogue break 1 / analogue make 1 is supported.

- **Configuration 3**
  Main unit software version < 1.40 and SPD sensor interface part no. MSSPD-N
  The main unit software version < 1.40 supports only one switch level (analogue break / analogue make).
  The sensor evaluation at the SPD sensor interface part no. MSSPD-N is done digital and three different switch level are supported which for instance can be used to detect the opening of the API-coupling at different distances.
  Analogue break 1 / make 1: sensitive; detection after a short opening distance
  Analogue break 3 / make 3: less sensitive; detection after a larger opening distance
  But in combination with main unit software version < 1.40 only switch level analogue break 1 / make 1 is supported.

- **Configuration 4**
  Main unit software version ≥ 1.40 and SPD sensor interface part no. MSSPD-N
  At main unit software version ≥ 1.40 there are three different analogue switch level adjustable which for instance can be used to detect the opening of the API-coupling at different distances.
  Analogue break 1 / make 1: sensitive; detection after a short opening distance
  Analogue break 3 / make 3: less sensitive; detection after a larger opening distance
  The sensor evaluation at the SPD sensor interface part no. MSSPD-N is done digital and three different switch level are supported which for instance can be used to detect the opening of the API-coupling at different distances.
  Analogue break 1 / make 1: sensitive; detection after a short opening distance
Analogue break 3 / make 3: less sensitive; detection after a larger opening distance

The API couplings are adjusted at F.A. Sening according the switch level analogue make 1. Because of that the switch level analogue make 1 should be used starting up the system.

**SPD sensors**

<table>
<thead>
<tr>
<th>SPD sensors</th>
<th>Polarity / wire colour (no.) of the connection line</th>
<th>Sensor type</th>
</tr>
</thead>
<tbody>
<tr>
<td>API coupling VKAP100-I2</td>
<td>Wire + Wire -</td>
<td>brown white</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analogue Make</td>
</tr>
<tr>
<td>API coupling VKVP-I</td>
<td>Wire + Wire -</td>
<td>brown white</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analogue Make</td>
</tr>
<tr>
<td>Foot valve MSDSO</td>
<td>Wire + Wire -</td>
<td>brown white</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analogue Break</td>
</tr>
<tr>
<td>Man lid (optional)</td>
<td>Wire + Wire -</td>
<td>brown white</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analogue Make</td>
</tr>
</tbody>
</table>

The Sensor setup is used to assign the sensors connected to the SPD sensor interface. The procedure is described in Chapter 6.1.1.1 (General procedure).

If an input channel for the first sensor of a sensor group ("man lid" in the above example) is set to "0" it means that no man lid sensors are installed. This applies for all sensors or sensor groups.
If sensors with a group, in the following example API coupling sensors, are installed, you should first specify which input the first sensor (compartment 1) is connected to, e.g. input "1". The sensors of the remaining compartments are then automatically assigned to the subsequent inputs. Overlapping of different sensor groups must be avoided.

In the next step, the sensor type is entered, see table "SPD sensors" in the table above.

The following sensor types can be selected:
- Digital Break
- Digital Make
- Analogue Break 1
- Analogue Make 1
- Analogue Break 2
- Analogue Make 2
- Analogue Break 3
- Analogue Make 3

The configuration of all sensors is now queried.

1. Filling enable sensor *)
2. Discharge enable sensor *)
3. API coupling sensor
4. Foot valve sensor
5. Line valve sensor *)
6. Man lid sensor
7. Hand brake *)

*) only relevant for German tank trucks
All connected sensors are configured here. The data to be entered here depend on the sensor assignment in the SPD sensor interface. Please use the previously filled in "S.P.D.-sensor assignment" below.

- For the API couplings, an API coupling delay time can additionally be set: 0 to 5 seconds. A setting of 1 second is recommended.
### Example of an SPD sensor assignment

Example for a 6-compartment tank truck with monitoring of the API couplings and the foot valves.

<table>
<thead>
<tr>
<th>SPD sensor interface input</th>
<th>Connected sensor / coupling</th>
<th>Tank truck compartment</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>API coupling (VKAP100-I2)</td>
<td>1</td>
</tr>
<tr>
<td>K2</td>
<td>API coupling (VKAP100-I2)</td>
<td>2</td>
</tr>
<tr>
<td>K3</td>
<td>API coupling (VKAP100-I2)</td>
<td>3</td>
</tr>
<tr>
<td>K4</td>
<td>API coupling (VKAP100-I2)</td>
<td>4</td>
</tr>
<tr>
<td>K5</td>
<td>API coupling (VKAP100-I2)</td>
<td>5</td>
</tr>
<tr>
<td>K6</td>
<td>API coupling (VKAP100-I2)</td>
<td>6</td>
</tr>
<tr>
<td>K7</td>
<td>foot valve (pneumatically operated switch MSDSO)</td>
<td>1</td>
</tr>
<tr>
<td>K8</td>
<td>foot valve (pneumatically operated switch MSDSO)</td>
<td>2</td>
</tr>
<tr>
<td>K9</td>
<td>foot valve (pneumatically operated switch MSDSO)</td>
<td>3</td>
</tr>
<tr>
<td>K10</td>
<td>foot valve (pneumatically operated switch MSDSO)</td>
<td>4</td>
</tr>
<tr>
<td>K11</td>
<td>foot valve (pneumatically operated switch MSDSO)</td>
<td>5</td>
</tr>
<tr>
<td>K12</td>
<td>foot valve (pneumatically operated switch MSDSO)</td>
<td>6</td>
</tr>
<tr>
<td>K13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### SPD sensor assignment form

<table>
<thead>
<tr>
<th>SPD sensor interface input</th>
<th>Connected sensor / coupling</th>
<th>Tank truck compartment</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.1.1.1.10 Event setup

When setting parameters in the event setup are setup to “Yes” additional events will be recorded in the event logbook. (See also chapter 6.1.1.8.4.2 / other events).

### EVENTS

![EVENTS Configuration](image)

The following parameters can be set in Event setup. The procedure is described in Chapter 6.1.1.1.1 (General procedure).

<table>
<thead>
<tr>
<th>Parameter description</th>
<th>Possible content</th>
<th>Security feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record TAG-Information</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Record QS-Information</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Record Vapour-Information</td>
<td>Yes</td>
<td>Switch</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

6.1.1.1.11 Display interface setup

The display interface is set up independently. To access the setup, the `<F1>` key must be pressed and held when the NoMix system is switched on. This will automatically call up the display setup. Additionally, this menu contains a display and keypad test.

![Display Interface Setup](image)

Press `<F1>` to access the SETUP
The function keys <F1> and <F2>, "UP" and "DOWN", are used to select the respective setup test parameter, e.g.: CAN address. Press the <ENTER> key to change the parameter; The following display appears.

The <F1> and <F2> keys, "plus" and "minus" are then used to set the respective CAN address. It is stored with <F3> "End".

- Display Interface 1: address 0
- Display Interface 2: address 1
- Display Interface 3: address 2
- Display Interface 4: address 3

Other settings:
- Contrast: 0 to 100
- Font: The selected font must not be changed!

Tests:
- Display test: all ASCII characters are displayed
- Keypad test: any keys that are pressed are shown in the display;
- The keypad test is terminated by pressing the <ENTER> key twice

The setup / test is terminated by selecting the line: "End" with the function keys and pressing the <Enter> key.
6.1.1.2 Override

The override menu is intended to allow product delivery during an interim period at petrol stations that are not yet equipped or at petrol stations where a fault has occurred. Each activation of an override is recorded in a log book. The following data are stored:

- Date
- Time
- Location (may be activated in SETUP)
- Reason (may be activated in SETUP)
- Compartment no.
- Product grade

6.1.1.2.1 Entering an override

An override is entered as follows:

- Press the <Menu> key for "main menu"
- Press key <2> for "override"
- Confirm override with any key
- Start delivery via the numeric keys

<table>
<thead>
<tr>
<th>DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

Start: 123456
Stop: ------

6.1.1.3 Manual input of loading plan

For top loading or uncoded bottom loading, the new loading plan has to be entered as follows:

- Press the <Menu> key to access the main menu.
- Press <3> for manual loading plan input.
- Change the product grade of compartment 1 and follow the instructions in the display.
- Press <F3> for the next compartment and continue as described above. If the product grade does not have to be changed, press <F3> directly to access the next compartment.
- Once the loading plan is complete, press <F1> 3 times to save the loading plan and to exit the loading plan and the main menu.
6.1.1.4 NoMix 2000 log book

The NoMix 2000 log book is an electronic memory that can store data that in some way deactivate or influence the NoMix monitoring functions (e.g. hardware fault, override, manual input of the loading plan, change-over of date and time…). These actions can then be viewed sequentially by date under a consecutive number via the log book function. The log book can only be viewed, it cannot be deleted. Once the log book has reached the maximum number of entries, the first entry will be overwritten during the next action. (ring buffer).

Example of a log book display:

```
LOGBOOK

MENU

1039/1039
LOG 001039
05.08.2001 22:50

Compartment 1:
Override, ULG

PREV. 1 NEXT
F1     F2     F3
```

The F1 or F2 keys can be used to scroll through the log book (backward or forward). The increment size for scrolling through the log book can be changed with the Enter key. Pressing the Enter key once sets an increment of 10, pressing it twice sets an increment of 100, pressing it three times of sets an increment of 1000, pressing it four times returns to an increment of 1.

The display mentioned above indicates that, on 05.08.2001 at 22:50, an override of compartment 1 was activated to deliver the product “ULG”.

Pressing the <STOP> key takes you back to the main menu.
6.1.1.5 Event log book

The event log book stores all events concerning the SPD functionality, such as:

- Opening / closing of the API couplings
- Opening / closing of the foot valves
- Wetleg sensor changes
- Starting or stopping of loading / discharge
- etc.

The configuration is identical to Chapter 6.1.1.4.

The display mentioned above indicates that, on 05.08.2001 at 22:50, the API coupling of compartment 6 was opened.

Pressing the <STOP> key takes you back to the main menu.

6.1.1.6 Date / time

The submenu for setting of the date and time is reached from the main menu. Any change of the date or the time is recorded in the NoMix 2000 log book.

Follow the display instructions for setting the date and time. Then enter the date and time via the numeric keys. After the day has been entered, e.g.: "12", the cursor automatically jumps to the month etc.
6.1.1.7 Test menu

The test menu enables comprehensive tests of the NoMix 2000 system modules to be carried out.

The relevant submenu is accessed by pressing the number preceding the respective function.

6.1.1.7.1 Main Unit Test

Depending on the hardware version different variants are displayed. Hardware version 1.00 correspond to the original Main Unit CPU-Board, predominantly used in Main Unit, part no. NM2MAIN, Hardware version 2 correspond to the Main Unit – Board used in Main Unit / Display, part no. NM2MAINDISP (see also chapter 3.1.3)

Note to hardware version 2.00:
• The setup switch is dipswitch no. 8 (see also drawing no. E51.351675)
• Numbering of the LEDs:
  1 = Setup-Switch (red)
  2 & 3 = software controlled (green)
  4 = Power indication (always lighting) (green)

6.1.1.7.2 TAG test

The TAG scan lines are arranged as follows:

• TAG scan 1: Tank truck with direct discharge, compartment 1
• TAG scan 2: Tank truck with direct discharge, compartment 2
• TAG scan 3: Tank truck with direct discharge, compartment 3
• TAG scan 4: Tank truck with direct discharge, compartment 4
• TAG scan 5: Tank truck with direct discharge, compartment 5
• TAG scan 6: Tank truck with direct discharge, compartment 6
• TAG scan 7: tank truck measuring systems, measuring system 1 *)
• TAG scan 8: tank truck measuring systems, measuring system 2 *)
• TAG scan 9: 2" vapour recovery 1 *)
• TAG scan 10: 2" vapour recovery 2 *)
• TAG scan 11: 2" vapour recovery 3 *)
• TAG scan 12: 2" vapour recovery 4 *)
• TAG scan 13: 3" / 4" common vapour recovery
• TAG scan 14: for expansion
  *) only relevant for German tank trucks
The information readable on the display:

| SN: 000-46402 | The TAG manufacturer is F.A. Sening |
| L: 0000: | The TAG serial no. is: 46402 |
| Qu: A1-SL98L: | The product grade is: A1 |
| SL98L: | Super Leaded 98 octane (LRP) |

TAG qualities (Texaco UK):

<table>
<thead>
<tr>
<th>Display</th>
<th>Product grade</th>
<th>Petrol station TAG</th>
<th>Depot TAG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Product</td>
<td>Vapour Recovery</td>
<td>Product</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DI</td>
<td>Diesel</td>
<td>A3-SL68</td>
<td>A3-DL68</td>
</tr>
<tr>
<td>LRP</td>
<td>LRP (4 Star)</td>
<td>A1-SL98L</td>
<td>A1-DL98L</td>
</tr>
<tr>
<td>ULG</td>
<td>Unleaded 95</td>
<td>A1-SL95U</td>
<td>A1-DL95U</td>
</tr>
<tr>
<td>SULG</td>
<td>Super Unleaded 98</td>
<td>A1-SL98U</td>
<td>A1-DL98U</td>
</tr>
</tbody>
</table>

The next scan line is accessed via the <F2> key.
6.1.1.7.3 Wetleg sensor test

Carry out the wetleg sensor test for all compartments. The display for the wetleg sensors of the respective compartment means:

- : Compartment state = empty
• : Compartment state = filled, not empty compartment
S : Short circuit in the sensor or in the sensor cable
D : Interruption in the sensor or in the sensor cable.

The display for the two intrinsically safe inputs means:

- : Input open, not active
• : Input closed, active

When the setup is released by the setup switch a disconnected wetleg sensor is taken as a compartment state filled. This is helpful for testing the loading functionality without having product. Therefore connect the respective compartment to the test unit. After disconnecting the wetleg sensor connector the loading plan will change to the connected product grade.

6.1.1.7.4 I/O interface test

Via the I/O interface test, the inputs and solenoid valve outputs can be checked.

- : input / output is inactive
• : input / output is active
X : Not empty compartment

The respective outputs / solenoid valves are switched on and off again via the numeric keys 1 to 8. Currently, only one solenoid valve output can be tested at a time.

The outputs only can be tested when the setup switch is released.

If a second I/O interface is installed, the second interface must be activated with the <F3> key for the test to be carried out.
6.1.1.7.5 Keypad test

```
TERMINAL 1

MENU/TEST

SW-Version:  1.05
HW-Version:  1.00

Press any key,
Cancel with `STOP`

NEXT

F1   F2   F3
```

This test menu is used for carrying out the keypad test. The currently pressed key appears in the display. The LCD test is carried out according to Chapter 6.1.1.1.11 in the setup menu of the display interface. If two display interfaces are installed, the test menu for the second display interface is accessed by pressing the <F3> key.

6.1.1.7.6 SPD sensor test

The SPD sensor test is described below:

```
SENSORS

MENU/TEST

SW-Version:  1.07
HW-Version:  1.00

0 0 0 0 0 0 0 0 0 1
1 2 3 4 5 6 7 8 9 0
- - - - S - D - -

1 1 1 1 1 1 1 1 1 2
1 2 3 4 5 6 7 8 9 0
- - - - - - - - -

BACK

F1   F2   F3
```
The display may show:

- : sensor not active, (e.g. coupling closed)
- : sensor active, (e.g. coupling open)
S : sensor short circuit
D : sensor disconnected /interruption

Activate the respective sensors for each compartment in turn by opening the valves or by supplying compressed air to the pressure switches.

The switch statuses shown on the display should change from "-" to "-".
The input to which the tested sensor is connected is also shown (input K1 to K20).

If the pneumatically operated switches for the foot valve cannot be pressurised in the test menu, normal loading or discharge may be carried out. The event log book should then be checked to verify whether all foot valves were opened and shut again.

6.1.1.7.7 CAN bus test

In case of serious faults in the communication to one or several interface modules, the CAN bus test is designed to switch off all interface modules with the exception of the display interface. This is done in Components setup. At the same time, the interface module that was switched off in the Component setup must also be physically separated from the CAN bus. To this end, the four cables for battery supply and CAN bus coming from the sealed power supply have to be disconnected at the terminal blocks.
6.1.1.8 Print Menu

If the NoMix 2000 System is connected to a printer / laptop, the print menu can be called up by pressing the <Print> key.

The following message is displayed.

![Print Menu]

You can get into the sub-menus by pressing the number key that precedes the function.

6.1.1.8.1 Setup

![Setup Menu]

You can start the printout of sub-menus by pressing the number key that precedes the sub-menu.
6.1.1.8.2 Status

To start the status report printout you have to press the key <2>. Immediately the printout of the status report starts.

The status report contains the particular seal conditions of the individual compartments.

- Status report number
- Software version of NoMix 2000 Main Unit
- Date of printout
- Time of printout
- Series number of NoMix 2000 Main Unit
- Sealed compartments: date and time of sealing
- Manual sealed compartments: date and time of sealing at loading
- Manual sealed compartments: date and time of sealing at discharge
- Unsealed compartments: date and time of unsealing, event which causes the unsealing

6.1.1.8.2.1 Status report before loading (Example)

<table>
<thead>
<tr>
<th>Status report printout</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status rep. No. 000005</td>
<td>Heading with report no., Main Unit software version no. and series no., Date and Time of printout.</td>
</tr>
<tr>
<td>NoMix 2000 Ver. 1.32</td>
<td>Product grade Compartment 1 = LRP</td>
</tr>
<tr>
<td>11.11.2002</td>
<td>Status Compartment 1 = Empty, Date/Time</td>
</tr>
<tr>
<td>S/N: 000001</td>
<td>Product grade Compartment 2 = DI</td>
</tr>
<tr>
<td>14:25:27</td>
<td>Status Compartment 2 = Empty, Date/Time</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Compartment 1: LRP</td>
<td>Product grade Compartment 3 = LRP</td>
</tr>
<tr>
<td>EMPTY 17.09.2002 13:40</td>
<td>Status Compartment 3 = Empty, Date/Time</td>
</tr>
<tr>
<td>Compartment 2: DI</td>
<td>Product grade Compartment 4 = ULG</td>
</tr>
<tr>
<td>EMPTY 17.09.2002 13:40</td>
<td>Status Compartment 4 = Empty, Date/Time</td>
</tr>
<tr>
<td>Compartment 3: LRP</td>
<td>Product grade Compartment 5 = LRP</td>
</tr>
<tr>
<td>EMPTY 17.09.2002 13:41</td>
<td>Status Compartment 5 = Empty, Date/Time</td>
</tr>
<tr>
<td>Compartment 4: ULG</td>
<td>Product grade Compartment 6 = DI</td>
</tr>
<tr>
<td>EMPTY 17.09.2002 13:41</td>
<td>Status Compartment 6 = Empty, Date/Time</td>
</tr>
<tr>
<td>Compartment 5: LRP</td>
<td>--- End of print ---</td>
</tr>
<tr>
<td>Compartment 6: DI</td>
<td></td>
</tr>
</tbody>
</table>
### 6.1.18.2.2 Status report after loading / before discharge (Example)

<table>
<thead>
<tr>
<th>Status report printout</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statusrep. No.</strong> 000006</td>
<td>Heading with report no., Main Unit Software version no. and series no., Date and Time of printout.</td>
</tr>
<tr>
<td><strong>NoMix 2000 Ver. 1.32</strong> 11.11.2002</td>
<td></td>
</tr>
<tr>
<td><strong>S/N:</strong> 000001 14:28:54</td>
<td></td>
</tr>
<tr>
<td><strong>Compartment 1:</strong> LRP SEALED 11.11.2002 14:28</td>
<td>Product grade Compartment 1 = LRP Status Compartment 1 = Sealed, Date/Time</td>
</tr>
<tr>
<td><strong>Compartment 2:</strong> DI SEALED 11.11.2002 14:28</td>
<td>Product grade Compartment 2 = DI Status Compartment 2 = Sealed, Date/Time</td>
</tr>
<tr>
<td><strong>Compartment 3:</strong> LRP SEALED 11.11.2002 14:28</td>
<td>Product grade Compartment 3 = LRP Status Compartment 3 = Sealed, Date/Time</td>
</tr>
<tr>
<td><strong>Compartment 4:</strong> ULG SEALED 11.11.2002 14:28</td>
<td>Product grade Compartment 4 = ULG Status Compartment 4 = Sealed, Date/Time</td>
</tr>
<tr>
<td><strong>Compartment 5:</strong> LRP SEALED 11.11.2002 14:28</td>
<td>Product grade Compartment 5 = LRP Status Compartment 5 = Sealed, Date/Time</td>
</tr>
<tr>
<td><strong>Compartment 6:</strong> DI SEALED 11.11.2002 14:28</td>
<td>Product grade Compartment 6 = DI Status Compartment 6 = Sealed, Date/Time</td>
</tr>
</tbody>
</table>

--- End of print ---
### 6.1.1.8.2.3 Status report, other possible compartment status entries (Example)

<table>
<thead>
<tr>
<th>Status report printout</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statusrep. No. 000008</td>
<td>Heading with report no., Main Unit Software version no. and series no., Date and Time of printout.</td>
</tr>
<tr>
<td>NoMix 2000 Ver. 1.32</td>
<td>Product grade Compartments 1 = LRP</td>
</tr>
<tr>
<td>S/N: 000001</td>
<td>Status Compartments 1 = Sealed, Date/Time</td>
</tr>
<tr>
<td>11.11.2002 14:43:13</td>
<td></td>
</tr>
<tr>
<td>Compartment 1: LRP</td>
<td></td>
</tr>
<tr>
<td>SEALED 11.11.2002 14:41</td>
<td></td>
</tr>
<tr>
<td>Compartment 2: DI</td>
<td></td>
</tr>
<tr>
<td>MAN. LOAD.SEAL 11.11.2002 14:41</td>
<td>Product grade Compartments 2 = DI</td>
</tr>
<tr>
<td>Compartment 3: LRP</td>
<td></td>
</tr>
<tr>
<td>MAN.DEL.SEAL 11.11.2002 14:41</td>
<td>Manual Seal at Discharge, Date/Time</td>
</tr>
<tr>
<td>Compartment 4: ULG</td>
<td></td>
</tr>
<tr>
<td>UNSEALED 11.11.2002 14:42</td>
<td>Product grade Compartments 4 = ULG</td>
</tr>
<tr>
<td>API-Coupling 4: Opened</td>
<td>Status Compartments 4 = Unsealed, Date/Time, Reason for Unsealing: API-Coupling</td>
</tr>
<tr>
<td>11.11.2002 14:42</td>
<td>Compartment 4 was opened, Date/Time</td>
</tr>
<tr>
<td>Compartment 5: LRP</td>
<td></td>
</tr>
<tr>
<td>EMPTY 11.11.2002 14:42</td>
<td>Product grade Compartments 5 = LRP</td>
</tr>
<tr>
<td>Compartment 6: DI</td>
<td></td>
</tr>
<tr>
<td>SEALED 11.11.2002 14:41</td>
<td>Product grade Compartments 6 = DI</td>
</tr>
<tr>
<td>--- End of print ---</td>
<td></td>
</tr>
</tbody>
</table>
6.1.1.8.3 Logbook

To start the Logbook printout you have to press the key <3>. The following message is displayed.

LOGBOOK

PRINT

1 - By Number
2 - By Date/Time

BACK

F1 F2 F3

1 - Printout of Logbook entries by number.
2 - Printout of Logbook entries by date/time.

After pressing key <1> enter a start number and an end number.

- Enter the start logbook number using the <numeric keys>.
- Press <ENTER> for acknowledge.
- Enter the end logbook number using the <numeric keys>.
- Press <ENTER> for acknowledge.
- Press <F1> „BACK“, for correction.
- Press <F3> „PRINT“, to start the printout

After pressing key <2> enter a period from start date / time to end date / time.

- Enter the start date using the <numeric keys>.
- Press <ENTER> for acknowledge.
- Enter the start time using the <numeric keys>.
- Press <ENTER> for acknowledge.
- Enter the end date using the <numeric keys>.
- Press <ENTER> for acknowledge.
- Enter the end time using the <numeric keys>.
- Press <ENTER> for acknowledge.
- Press <F1> „BACK“, for correction.
- Press <F3> „PRINT“, to start the printout
### 6.1.1.8.3.1 Logbook Printout (Example)

<table>
<thead>
<tr>
<th>Logbook Printout</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Logbook</strong></td>
<td>Heading with Main Unit Software</td>
</tr>
<tr>
<td><strong>NoMix 2000 Ver. 1.32 12.11.2002</strong></td>
<td>version no. and series no., Date and Time of printout</td>
</tr>
<tr>
<td><strong>S/N: 000001 13:55:37</strong></td>
<td></td>
</tr>
<tr>
<td><strong>000001 12.11.2002 13:54</strong></td>
<td>Defect / fault on EEPROM (storage of logbook) on main unit CPU-board</td>
</tr>
<tr>
<td><strong>Hardware defect</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Logbook Recording gaps</strong></td>
<td></td>
</tr>
<tr>
<td><strong>000002 12.11.2002 13:54</strong></td>
<td>Defect / fault on real time clock circuit on main unit CPU-board</td>
</tr>
<tr>
<td><strong>Hardware defect</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Real time clock Internal error</strong></td>
<td></td>
</tr>
<tr>
<td><strong>000003 12.11.2002 13:54</strong></td>
<td>Defect / fault on battery buffered RAM (storage of Loading plan) on main unit CPU-board. Ribbon cable between power supply and CPU-board was disconnected</td>
</tr>
<tr>
<td><strong>Hardware defect</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Loadingplan Inv.Content/Checksum</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004803 12.11.2002 13:50</strong></td>
<td>No communication to EMIS Interface</td>
</tr>
<tr>
<td><strong>Hardware defect</strong></td>
<td></td>
</tr>
<tr>
<td><strong>EMIS switched off</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004804 12.11.2002 13:50</strong></td>
<td>Defect / fault on main unit CPU-board</td>
</tr>
<tr>
<td><strong>Hardware defect</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Stack Overflow</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004808 12.11.2002 13:50</strong></td>
<td>No communication to wetleg sensor interface 1</td>
</tr>
<tr>
<td><strong>No Response: Restm.-Sensor 1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004816 12.11.2002 13:51</strong></td>
<td>No communication to SPD sensor interface 1</td>
</tr>
<tr>
<td><strong>No Response: Sensor IF 1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004821 12.11.2002 13:51</strong></td>
<td>No communication to display interface 1</td>
</tr>
<tr>
<td><strong>No Response: Terminal 1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004822 12.11.2002 13:51</strong></td>
<td>No communication to I/O interface 1</td>
</tr>
<tr>
<td><strong>No Response: Valve Driver 1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004755 12.11.2012 10:14</strong></td>
<td>Hand input of loading plan, change from DI to LRP for compartment 5</td>
</tr>
<tr>
<td><strong>Compartment 5: DI Input L-Plan: LRP</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004756 12.11.2002 10:14</strong></td>
<td>Compartment 5, DI was discharged with the Override functionality, no COP</td>
</tr>
<tr>
<td><strong>Compartment 5: Override, DI</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004757 12.11.2002 10:14</strong></td>
<td>The compartment empty test was overridden</td>
</tr>
<tr>
<td><strong>Empt. Over.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOG 004757 12.11.2002 10:14</strong></td>
<td>The date was changed to: 21.08.2003</td>
</tr>
<tr>
<td><strong>Inp. Date/time</strong></td>
<td>The time was changed to: 07:16:00</td>
</tr>
</tbody>
</table>
6.1.1.8.4 Events

To start the event printout you have to press the key <4>.

The following message is displayed.

```
EVENTS

1 - By Number
2 - By Date/Time

BACK
  F1  F2  F3
```

1 - Printout of Logbook entries by number.
2 - Printout of Logbook entries by date/time.

The printout has to be done according to chapter 6.1.1.8.3 (Logbook printout).
6.1.1.8.4.1 Printout of Events (Example)

Below an event printout of a discharge and a loading is shown for only one compartment.

6.1.1.8.4.1.1 Discharge (Example)

**Discharge: (Begin)**

<table>
<thead>
<tr>
<th>Event Printout</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event rep.</td>
<td>Heading with Main Unit Software version no. and series no., Date and Time of printout</td>
</tr>
<tr>
<td>LOG 004486 11.11.2002 14:28 Operation mode: Menu</td>
<td>&lt;Print&gt; key pressed, --&gt; Print Menu</td>
</tr>
<tr>
<td>LOG 004487 11.11.2002 14:28 Status report No. 000006 printed</td>
<td>Status report no. 6 was printed</td>
</tr>
<tr>
<td>LOG 004490 11.11.2002 14:29 Operation mode: Status</td>
<td>Print Menu was left → Status screen</td>
</tr>
<tr>
<td>LOG 004491 11.11.2002 14:29 Air Pressure: High</td>
<td>Main air pressure switch was activated</td>
</tr>
<tr>
<td>LOG 004492 11.11.2002 14:29 Operation mode: Discharge</td>
<td>&lt;F3&gt; key for discharge pressed, discharge mode</td>
</tr>
<tr>
<td>LOG 004493 11.11.2002 14:29 Magnetvalve 8: Aktiv</td>
<td>Discharge release Magnet valve 8 was activated</td>
</tr>
<tr>
<td>LOG 004494 11.11.2002 14:29 Loading Plan 1:S 2:S 3:S 4:S 5:S 6:S DI LRP ULG SULG DI LRP</td>
<td>Loading Plan before discharge, all compartments sealed (S)</td>
</tr>
<tr>
<td>LOG 004495 11.11.2002 14:30 Compartment 1: Discharge Ready Connected: DI</td>
<td>Compartment 1 connected to a DI station tank, → discharge ready.</td>
</tr>
<tr>
<td>LOG 004496 11.11.2002 14:30 Compartment 1: Discharge Started</td>
<td>Compartment 1 discharge started</td>
</tr>
<tr>
<td>LOG 004497 11.11.2002 14:30 Magnetvalve 1: Aktiv</td>
<td>Magnet valve compartment 1 activated, → discharge started</td>
</tr>
<tr>
<td>LOG 004498 11.11.2002 14:30 API-Coupling 1: Opened</td>
<td>API-Coupling compartment 1 opened</td>
</tr>
<tr>
<td>LOG 004499 11.11.2002 14:30 Compartment 1: Unsealed</td>
<td>Compartment 1 unsealed</td>
</tr>
<tr>
<td>LOG 004500 11.11.2002 14:30 Bottomvalve 1: Opened</td>
<td>Footvalve compartment 1 was opened</td>
</tr>
</tbody>
</table>
LOG 004514 11.11.2002 14:30 Wet.Sensor 1: Dry  
Wetleg sensor compartment 1 changed from wet condition to dry condition

LOG 004515 11.11.2002 14:30 Compartment 1: Empty  
Compartment 1 declared to empty

LOG 004521 11.11.2002 14:30 Compartment 1: Discharge Stopped  
Discharge of compartment 1 stopped at the display interface

LOG 004522 11.11.2002 14:30 Magnetvalve 1: Passiv  
Magnet valve compartment 1 deactivated, discharge stopped

LOG 004523 11.11.2002 14:30 Compartment 1: Discharge Disconn.  
Product hose compartment 1 disconnected

LOG 004524 11.11.2002 14:30 Bottomvalve 1: Closed  
Footvalve compartment 1 was closed

LOG 004525 11.11.2002 14:30 API-Coupling 1: Closed  
API-Coupling compartment 1 closed

LOG 004526 11.11.2002 14:31 Magnetvalve 8: Passiv  
Discharge release Magnet valve 8 was deactivated

LOG 004556 11.11.2002 14:31 Operation mode: Menu  
<Print> key pressed --> Print Menu

LOG 004557 11.11.2002 14:31 Statusreport No. 000007 printed  
Status report no. 7 was printed

LOG 004558 11.11.2002 14:32 Worksheet No. 000005 printed  
Worksheet no. 5 was printed

**End of Discharge**
6.1.1.8.4.1.2 Loading (Example)

**Loading: (Begin)**

<table>
<thead>
<tr>
<th>Event Printout</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event rep.</td>
<td>Heading with Main Unit Software version no. and series no., Date and Time of printout</td>
</tr>
<tr>
<td>NoMix 2000 Ver. 1.40 12.11.2002</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>LOG 004459 11.11.2002 14:28</td>
<td>&lt;Print&gt; key pressed --&gt; Print Menu</td>
</tr>
<tr>
<td>Operation mode: Menu</td>
<td></td>
</tr>
<tr>
<td>LOG 004460 11.11.2002 14:28</td>
<td>Status report no. 8 was printed</td>
</tr>
<tr>
<td>Status report No. 000008 printed</td>
<td></td>
</tr>
<tr>
<td>LOG 004461 11.11.2002 14:29</td>
<td>Print Menu was left → Status screen</td>
</tr>
<tr>
<td>Operation mode: Status</td>
<td></td>
</tr>
<tr>
<td>LOG 004562 11.11.2002 14:39</td>
<td>Main air pressure switch was activated</td>
</tr>
<tr>
<td>Air Pressure: High</td>
<td></td>
</tr>
<tr>
<td>LOG 004563 11.11.2002 14:39</td>
<td>&lt;F1&gt; key for loading pressed, loading mode</td>
</tr>
<tr>
<td>Operation mode: Loading</td>
<td></td>
</tr>
<tr>
<td>LOG 004564 11.11.2002 14:39</td>
<td>Loading release Magnet valve 7 was activated</td>
</tr>
<tr>
<td>Magnetvalve 7: Aktiv</td>
<td></td>
</tr>
<tr>
<td>LOG 004565 11.11.2002 14:39</td>
<td>Loading Plan before loading, all compartments empty</td>
</tr>
<tr>
<td>Loading Plan</td>
<td></td>
</tr>
<tr>
<td>DI LRP ULG SULG DI LRP</td>
<td></td>
</tr>
<tr>
<td>LOG 004566 11.11.2002 14:39</td>
<td>Compartment 1 connected to a DI loading arm → loading ready.</td>
</tr>
<tr>
<td>Compartment 1: Loading Ready</td>
<td></td>
</tr>
<tr>
<td>Connected: DI</td>
<td></td>
</tr>
<tr>
<td>LOG 004567 11.11.2002 14:40</td>
<td>API-Coupling compartment 1 opened</td>
</tr>
<tr>
<td>API-Coupling 1: Opened</td>
<td></td>
</tr>
<tr>
<td>LOG 004568 11.11.2002 14:40</td>
<td>Compartment 1 loading started</td>
</tr>
<tr>
<td>Compartment 1: Loading Started</td>
<td></td>
</tr>
<tr>
<td>LOG 004569 11.11.2002 14:40</td>
<td>Magnet valve compartment 1 activated, → loading started</td>
</tr>
<tr>
<td>Magnetvalve 1: Aktiv</td>
<td></td>
</tr>
<tr>
<td>LOG 004570 11.11.2002 14:40</td>
<td>Footvalve compartment 1 was opened</td>
</tr>
<tr>
<td>Bottomvalve 1: Opened</td>
<td></td>
</tr>
<tr>
<td>LOG 004597 11.11.2002 14:40</td>
<td>Wetleg sensor compartment 1 changed from dry condition to wet condition</td>
</tr>
<tr>
<td>Wet.Sensor 1: Wet</td>
<td></td>
</tr>
<tr>
<td>LOG 004598 11.11.2002 14:40</td>
<td>Compartment 1 declared to not empty</td>
</tr>
<tr>
<td>Compartment 1: Not Empty</td>
<td></td>
</tr>
<tr>
<td>LOG 004599 11.11.2002 14:30</td>
<td>Loading of compartment 1 stopped</td>
</tr>
</tbody>
</table>
### End of Loading

#### 6.1.1.8.4.2 Other Events

<table>
<thead>
<tr>
<th>Event Printout</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOG 004393 11.11.2002 14:22 Power On</td>
<td>The NoMix 2000-System power from the truck battery was switched On</td>
</tr>
<tr>
<td>LOG 004396 11.11.2002 14:22 Power Off</td>
<td>The NoMix 2000-System power from the truck battery was switched Off</td>
</tr>
<tr>
<td>LOG 004397 11.11.2002 14:22 Setupswitch On</td>
<td>The NoMix 2000-Setup was released by activating the setup switch</td>
</tr>
<tr>
<td>LOG 004398 11.11.2002 14:22 Setupswitch Off</td>
<td>The NoMix 2000-Setup was locked by deactivating the setup switch</td>
</tr>
<tr>
<td>LOG 004399 11.11.2002 14:22 Setup changed: Manual loading plan Allowed: Yes</td>
<td>The hand input loading plan was released by setup change</td>
</tr>
<tr>
<td>LOG 004400 11.11.2002 14:22 Setup changed:</td>
<td>The hand input loading plan was locked by setup change</td>
</tr>
</tbody>
</table>
Manual loading plan
Allowed: No

LOG 004401 11.11.2002 14:22
Setup changed:
Override Mode:
HSV and COP

LOG 004402 11.11.2002 14:22
Setup changed:
Override Mode:
Not allowed

LOG 004403 11.11.2002 14:22
TAG 5: A1-DL95U (ULG)

LOG 004404 11.11.2002 14:22
TAG 5: No Code

LOG 004405 11.11.2002 14:22
TAG 13: CM-DVCM

LOG 004406 11.11.2002 14:22
TAG 13: No Code

LOG 004407 11.11.2002 14:22
TAG 5: A1-SL95U (ULG)

LOG 004408 11.11.2002 14:22
TAG 5: No Code

LOG 004409 11.11.2002 14:22
TAG 13: A1-SVCM

LOG 004410 11.11.2002 14:22
TAG 13: No Code

LOG 004394 11.11.2002 14:22
Air Pressure: High

LOG 004395 11.11.2002 14:22
Air Pressure: Low

6.1.1.8.5 Reports (Worksheet)

To start the worksheet report printout you have to press the key \(<5\>\). Immediately the printout of the report starts.

All reports that have taken place after the last printout will be printed. In this manner it is possible to create a complete tour or shift report.

6.1.1.8.5.1 Report of a Loading and Discharge (Example)
Loading: (Begin)

Report Printout

Worksheet. No. 000005
NoMix 2000 Ver. 1.40  11.11.2002
S/N: 000001       14:32:07

---

<table>
<thead>
<tr>
<th>Truck</th>
<th>Sign</th>
</tr>
</thead>
</table>

Loading

Begin: 11.11.2002 14:26 004406
End: 11.11.2002 14:28 004483

LRP LRP ULG DI DI LRP

Compartment state before loading: E = empty
Loading plan before loading

Comp. 1, LRP: Connected: DI
14:27-14:28 Not empty

Comp. 2, LRP: Connected: ULG
14:27-14:28 Not empty

Comp. 3, ULG: Connected: LRP
14:27-14:28 Not empty

Comp. 4, DI: Connected: ULG
14:27-14:28 Not empty

Comp. 5, DI: Connected: LRP
14:27-14:28 Not empty

Comp. 6, LRP: Connected: DI
14:28-14:28 Not empty

Compartment state after loading: S = Sealed
Loading plan after loading

---

Discharge

Begin: 11.11.2002 14:29 004493
End: 11.11.2002 14:31 004554

1:S 2:S 3:S 4:S 5:S 6:S
DI ULG LRP ULG LRP DI

Compartment state before discharge: S = Sealed
Loading plan before discharge

Comp. 1, DI: Connected: DI
14:30-14:30 Empty

Comp. 2, ULG: Connected: ULG
14:30-14:30 Empty

---

Heading with worksheet no., Main Unit Software version no. and series no., Date and Time of printout

Hand written truck identification, e.g. number plate, sign of the driver

Begin of loading, date/time, log. No.
End of loading, date/time, log. No.

Compartments state before loading: E = empty
Loading plan before loading

Coded loading, change from LRP to DI
Loading time compartment 1, state: not empty

Coded loading, change from LRP to ULG
Loading time compartment 2, state: not empty

Coded loading, change from ULG to LRP
Loading time compartment 3, state: not empty

Coded loading, change from DI to ULG
Loading time compartment 4, state: not empty

Coded loading, change from DI to LRP
Loading time compartment 5, state: not empty

Coded loading, change from LRP to DI
Loading time compartment 6, state: not empty

Compartment state after loading: S = Sealed
Loading plan after loading

Begin of discharge, date/time, log. No.
End of discharge, date/time, log. No.

Compartment state before discharge: S = Sealed
Loading plan before discharge

Coded discharge compartment 1, (DI)
Discharge time compartment 1, state: empty

Coded discharge compartment 2, (ULG)
Discharge time compartment 2, state: empty
Comp. 3, LRP: Connected: LRP
14:30-14:30 Empty
Coded discharge compartment 3, (LRP)
Discharge time compartment 3, state: empty

Comp. 4, ULG Connected: ULG
14:30- 14:31 Empty
Coded discharge compartment 4, (ULG)
Discharge time compartment 4, state: empty

Comp. 5, LRP: Connected: LRP
14:31-14:31 Empty
Coded discharge compartment 5, (LRP)
Discharge time compartment 5, state: empty

Comp. 6, DI: Connected: DI
14:31-14:31 Empty
Coded discharge compartment 6, (DI)
Discharge time compartment 6, state: empty

Compartment state after discharge: E = empty
Loading plan after discharge

--- End of Printout ---
1 - Printout of reports by number.
2 - Printout of reports by date/time.

The printout has to be done according to chapter 6.1.8.3 (Logbook printout).

6.1.1.8.6 Print data to Laptop

It is also possible to send the print data not to a printer but to a laptop. The connection to the laptop is done with socket cable, part no. SPD-DR-KA2. How to configure and use the laptop is described in an extra documentation, DOK-433.
7 Checking the functionality

The test procedure is to be performed, to ensure proper operation of a newly installed NoMix 2000 System. The test procedure should be followed step by step and in its entirety. Should any faults occur with the operation of the pneumatic system during testing, please refer to the indicated fault finding section.

7.1 Test device: depot / petrol station simulation

7.1.1 Short description

The test device, part no. "NM2TEST" (see drawing no. E51.351529) is a depot / petrol station simulation and is required for checking the NoMix 2000 system. It simulates both a depot loading arm equipped with TAGs including vapour recovery line, and a petrol station equipped with TAGs including a product connector and a vapour recovery connector. The depot connector is labelled with: Depot, Product / Vapour, the petrol station connector is labelled with: Forecourt, Product / Vapour.

7.1.2 Connections

see appendix drawing no. E51.351529

- Identification: Depot / Product
  Connection of the API coupling (test line with banana plug) for loading

- Identification: Depot / Vapour
  Connection of the Vapour Recovery Valve (test line with banana plug) for loading

- Identification: Forecourt / Product
  Connection of the API coupling (test line with banana plug) for discharge

- Identification: Depot / Vapour
  Connection of the Vapour Recovery Valve (test line with banana plug) for discharge
### 7.2 System Test

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>System Response</th>
<th>Fault Finding Section</th>
</tr>
</thead>
</table>
| 1    | Pull MASTER switch  
Raise and lock guardbar | Each vent valve will open  
Guardbar interlock pins will retract  
Vehicle immobilisation will engage  
Master switch indicator will change colour | F1 / F2  
F3  
F5 |
| 2    | Depress emergency knock off buttons | Master switch will retract  
Vent valves will close  
Guardbar pins will extend  
Vehicle immobilisation will disen-gage | F6  
F4 |
| 3    | Pull MASTER switch | See step 1 | See step 1 |
| 4    | Fit the vapour recovery adapter to the VRV | VRV will fully depress  
Coaming vent valve will close | F7 |
| 5    | Remove vapour recovery adapter from VRV | Interlock will fully extend  
Coaming vent valve will open | F2 |
| 6    | Repeat Step 4 | See step 4 | See step 4 |
| 7    | Open foot valve: Start filling compartment 1 according to the driver's short instructions and description of the test device part no. NM2Test (depot / petrol stations simulation) | Footvalve will open | F8 |
| 8    | Close foot valve: Stop filling compartment 1 according to the driver's short instructions and description of the test device part no. NM2Test (depot / petrol stations simulation) | Footvalve will close | F9 |
| 9    | Repeat step 7 and 8 for each compartment | See step 7 and 8 | See step 7 and 8 |
| 10   | Open the foot valve and the API coupling: Start discharge from compartment 1 according to the driver's short instructions and description of the test device part no. NM2Test (depot / petrol stations simulation) | Foot valve and API will open | F8  
F10 |
| 11   | Close the foot valve and the API coupling: Stop discharge from compartment 1 according to the driver's short instructions and description of the test device part no. NM2Test (depot / petrol stations simulation) | Foot valve and API will close | F9  
F11 |
| 12   | Repeat Step 10 and 11 for each compartment | See step 10 and 11 | See step 10 and 11 |
### 7.2.1 Fault Finding (Pneumatic)

<table>
<thead>
<tr>
<th>No.</th>
<th>Fault</th>
<th>Possible Reasons</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>A compartment vent valve is not opening</td>
<td>Master switch is not pulled</td>
<td>Pull the Master switch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical obstruction to the valve</td>
<td>Provide ample clearance for the valve to open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air leak or blockage in pipe</td>
<td>Repair leaks or replace pipes / check pneumatic installation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compartment vent valve is dirty or damaged</td>
<td>Inspect and possibly replace the compartment vent valve</td>
</tr>
<tr>
<td>F2</td>
<td>The coaming vent valve is not opening</td>
<td>Master switch is not pulled</td>
<td>Pull the Master switch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical obstruction to the valve</td>
<td>Provide ample clearance for the valve to open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air leak or blockage in pipe</td>
<td>Repair leaks or replace pipes / check pneumatic installation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coaming vent valve is dirty or damaged</td>
<td>Inspect and possibly replace the coaming vent valve</td>
</tr>
<tr>
<td>F3</td>
<td>Guardbar interlock pins do not retract and so the guardbar will not raise</td>
<td>Master switch is not pulled</td>
<td>Pull the Master switch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air leak or blockage in pipe</td>
<td>Repair leaks or replace pipes / check pneumatic installation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guardbar interlocks damaged</td>
<td>Inspect and possibly replace the guardbar interlock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A Guardbar interlock pin is unable to retract</td>
<td>Make sure that the guardbar interlock pin has enough clearance to easily retract out of the guardbar locking hole</td>
</tr>
<tr>
<td>F4</td>
<td>Guardbar interlock pins do not extend when the guardbar is in the „lowered“ position</td>
<td>Master switch is not pushed in</td>
<td>Push the Master switch in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air signal exists on the guardbar interlock (RED Port)</td>
<td>Check pneumatic installation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guardbar interlocks damaged</td>
<td>Inspect and possibly replace the guardbar interlock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The hole in the guardbar is not lined up with the guardbar interlock pins</td>
<td>Readjust the guardbar / Remount the guardbar interlocks</td>
</tr>
<tr>
<td>F5</td>
<td>The vehicle immobilisation does not engage when the master switch is pulled</td>
<td>Master guardbar interlock pin has not retracted</td>
<td>See F3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>System is incorrect piped</td>
<td>Check pneumatic installation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Damaged master guardbar interlock</td>
<td>Inspect and possibly replace the guardbar interlock</td>
</tr>
<tr>
<td>No.</td>
<td>Fault</td>
<td>Possible Reasons</td>
<td>Solutions</td>
</tr>
<tr>
<td>-----</td>
<td>-------</td>
<td>-----------------</td>
<td>-----------</td>
</tr>
<tr>
<td>F6</td>
<td>Emergency buttons do not shut the system down</td>
<td>Emergency buttons are incorrectly installed</td>
<td>Check pneumatic installation for errors</td>
</tr>
<tr>
<td>F7</td>
<td>Coaming vent valve will not close</td>
<td>Coaming vent valve is dirty or damaged, Air pipe is kinked or damaged</td>
<td>Inspect and possibly replace the coaming vent valve, Repair or re-install pipe</td>
</tr>
<tr>
<td>F8</td>
<td>Footvalve will not open</td>
<td>Master switch is not pulled, Air leak in pipe of relevant compartment, Footvalve is dirty or damaged</td>
<td>Pull the Master switch, Repair leaks or replace relevant pipes / check pneumatic installation, Inspect and possibly replace the footvalve</td>
</tr>
<tr>
<td>F9</td>
<td>Footvalve will not close</td>
<td>Footvalve is dirty or damaged (jammed), Air pipe is kinked or blocked</td>
<td>Inspect and possibly replace the footvalve, Repair or re-install pipe</td>
</tr>
<tr>
<td>F10</td>
<td>A compartment API coupling will not open</td>
<td>Master switch is not pulled, Air leak in pipe of relevant compartment</td>
<td>Pull the Master switch, Repair leaks or replace relevant pipes / check pneumatic installation</td>
</tr>
<tr>
<td>F11</td>
<td>API coupling will not close</td>
<td>API coupling is dirty or damaged (jammed), Exhaust pipe is blocked, Air pipe is kinked or blocked</td>
<td>Inspect and possibly replace the API coupling, Inspect, clean and possibly replace the pipe, Repair or re-install pipe</td>
</tr>
<tr>
<td>F12</td>
<td>Master switch does not stay out when pulled</td>
<td>System air pressure is too low, Air leak in pipe, Filter / Lubricator is clogged</td>
<td>Check air pressure at the air source and increase to above 3 bar, Repair leaks or replace relevant pipes / check pneumatic installation, Clean the filter</td>
</tr>
<tr>
<td>F13</td>
<td>Valves leak product and/or vapour</td>
<td>Bolts are loose, Gasket have been overly compressed and damaged</td>
<td>Tighten bolts, Replace the damaged gasket</td>
</tr>
</tbody>
</table>
7.2.2 Fault Finding (Electronic)

Fault finding and corrective action must be carried out by a service workshop. The warnings on the housings, and generally EN 60079-14 and VDE 0165 must be followed (see also national standards / requirements). An appropriate measuring instrument must be used. If necessary, this should be Ex-protected (e.g. digital multi-meter from EX-ELEC, type DIGEX-A). Prior to disconnecting or connecting of plug connectors or cables, the electronic system must be switched off.

7.2.2.1 NoMix 2000 fault

<table>
<thead>
<tr>
<th>Fault (message)</th>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
</table>
| No display - the LEDs for indicating the supply voltage in the main unit and in the interface modules are not lit. | • No supply voltage 24 V in the main unit and in the interface modules (drawing E51.351351 / E51.351673 between terminal 1 & 2).  
• Power supply unit of the display interface is faulty  
• Serious CAN bus fault. | • Ensure supply voltage is present, check supply line from the on-board supply system to the main unit and to the interface modules.  
• If only the LED for displaying the supply voltage in the display interface is not lit → replace the display interface.  
• Procedure according to Chapter 6.1.1.7.6, CAN bus test. |

Display:  
Generic Terminal FMC F.A.SENING DC elektronik ab  
F1=Setup Display

<table>
<thead>
<tr>
<th>Fault (message)</th>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
</table>
| Display:  
Generic Terminal FMC F.A.SENING DC elektronik ab  
F1=Setup Display | • No communication connection between the main unit and the operating unit(s), or the operating unit is faulty. Drawing no. E51.351351 E51.351352 | • Check the cabling of the internal CAN bus (green and yellow wire) between the main unit and all interface modules.  
• If the wiring is OK → replace the display interface.  
• If the fault has not been rectified → replace the main unit. |

Display:  
FAULT  
No connection to interface wetleg sensor 1.

<table>
<thead>
<tr>
<th>Fault (message)</th>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
</table>
| Display:  
FAULT  
No connection to interface wetleg sensor 1. | • The wetleg sensor interface receives no supply voltage, or there is no communication connection between the main unit and the wetleg sensor interface, or the wetleg sensor interface is faulty. Drawing no. E51.351346 | • Check the cabling of the supply voltage (white and brown wire) and of the internal CAN bus (green and yellow wire) between the main unit and all interface modules.  
• If the wiring is OK → replace the wetleg sensor interface. |
<table>
<thead>
<tr>
<th>Fault (message)</th>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
</table>
| Display: FAULT No connection to interface TAG scanner 1.                      | • The TAG scan interface receives no supply voltage, or there is no communication connection between the main unit and the TAG scan interface, or the TAG scan interface is faulty. Drawing no. E51.351478                                                                                                                                   | • Check the cabling of the supply voltage (white and brown wire) and of the internal CAN bus (green and yellow wire) between the main unit and all interface modules.  
• If the wiring is OK → replace the TAG scan interface.                                                                                                                                                                                                                                                                                          |
| Display: FAULT No connection to interface I/O 1 (2).                          | • The I/O interface receives no supply voltage, or there is no communication connection between the main unit and the I/O interface, or the I/O interface is faulty. Drawing no. E51.351468                                                                                                                                 | • Check the cabling of the supply voltage (white and brown wire) and of the internal CAN bus (green and yellow wire) between the main unit and all interface modules.  
• If the wiring is OK → replace the I/O interface.                                                                                                                                                                                                                                                                                          |
| Display: FAULT No connection to interface sensor 1                             | • The SPD sensor interface receives no supply voltage, or there is no communication connection between the main unit and the SPD sensor interface, or the SPD sensor interface is faulty. Drawing no. E51.351347                                                                                                                                 | • Check the cabling of the supply voltage (white and brown wire) and of the internal CAN bus (green and yellow wire) between the main unit and all interface modules.  
• If the wiring is OK → replace the SPD sensor interface.                                                                                                                                                                                                                                                                                         |
| A wetleg sensor reports "not empty"                                           | • When “supervise filling of pipes” is activated the wetleg sensor only change to status empty when the footvalve is opened  
• Residue in the compartment.  
• Glass prism of the wetleg sensor is heavily soiled.  
• Wetleg sensor is faulty.  | • Open footvalve  
• Empty compartment  
• Unscrew wetleg sensor and clean with a soft, clean and lint-free cloth.  
• Connect the wetleg sensor to the wetleg sensor cable of a compartment for which "empty" had been displayed. If the level sensor still shows not empty, the wetleg sensor has to be replaced. |
### Fault (message) Possible cause Corrective action

**A wetleg sensor reports "not empty" (cont’d)**
- Connection line or wetleg sensor interface NM2WET is faulty. Drawing E51.350346
  - If the wetleg sensor was isolated according to the above test, reconnect the level sensor with the associated wire and connect it to a different input terminal in the level sensor interface that had previously reported "empty". If the wetleg sensor now does not show "empty", first of all the connection line should be replaced. If the fault is still not rectified, the wetleg sensor interface has to be replaced.

**Display in the wetleg sensor test menu "S" or "D"**
- Short circuit or interruption in the wetleg sensor wire
  - Disconnect the wetleg sensor wire in the wetleg sensor interface and disconnect the plug connector to the wetleg sensor. Check the cable with an ohmmeter for short circuit and interruption, replace the cable if necessary.
  - If the wetleg sensor wire is not faulty, check the wetleg sensor with an ohmmeter for short circuit and interruption; replace the wetleg sensor if necessary.
- Wetleg sensor is faulty
  - If the wetleg sensor wire and the wetleg sensor are not faulty, a wetleg sensor from another compartment should be connected for testing purposes. If short circuit or interruption continues to be displayed, the wetleg sensor interface has to be replaced.

**Wetleg sensor interface faulty**

**One or several keys of an operating unit are not working.**
- The keypad of the operating unit is faulty
  - Carry out a keypad test (see Chap. 6.1.1.7.4 and 6.1.1.1.10). If keys are still not functioning, the operating unit has to be replaced.

**Printer not printing**
- Printer is not connected correctly
  - Check the printer and the printer cable according to Chapter 3.1.7.
  - If the printer connection (printer cable) does not show a fault, replace the printer.
- Printer faulty

**Modified SETUP is not stored, the preset values are re-displayed**
- Fault in the EEPROM memory (electrically erasable, programmable memory) in the main unit, saving of the SETUP
  - Replace main unit

### 7.2.2.2 Operator error / information for users

*Sening® is a registered trademark of FMC Technologies*
<table>
<thead>
<tr>
<th>Fault (message)</th>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error: Wrong prod. (Discharge)</td>
<td>• The selected tank truck product does not correspond with the product of the buried tank</td>
<td>• Inspect the loading plan and select a compartment containing the same product as the buried tank.</td>
</tr>
<tr>
<td>Not connected</td>
<td>• Short circuit of the &quot;scan line&quot; at the tank truck&lt;br&gt; • Short circuit of the &quot;scan line&quot; at the petrol station&lt;br&gt; • Resistance of the delivery hoses is too high (Target: ≤ 10 Ω)</td>
<td>• Rectify the short circuit between the insulated API coupling and the tank truck chassis.&lt;br&gt; • The insulation of the flanges is faulty. Check the insulation of the product and vapour recovery connectors.&lt;br&gt; • Check the hose resistance and renew the connections if necessary</td>
</tr>
<tr>
<td>Error. No vapour</td>
<td>• No vapour recovery line connected</td>
<td>• Check the connection</td>
</tr>
<tr>
<td>Wrong prod. (Loading)</td>
<td>• A product loading arm with a different quality was been connected with a non-empty tank truck compartment</td>
<td>• Disconnect the product loading arm and connect a different product loading arm (same product quality as residue product quality) or discharge residue</td>
</tr>
</tbody>
</table>
8 Maintenance

The electronic NoMix 2000 components are maintenance-free. The devices must not be modified mechanically or electronically in any way.

⚠️ During cleaning with a steam cleaner or with pressurised water, the devices should be protected from the water jet.
Never aim the steam jet directly onto the devices!

§ We cannot accept responsibility for any damage caused by moisture in the equipment as a result of improper cleaning procedures.

NOTE: All devices must be visually inspected regularly according to ElexV§12 (see also national standards / requirements).
### Part numbers of the NoMix 2000 modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electronic modules</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Unit</td>
<td>NM2MAIN</td>
<td>Main unit / central processing unit, electronics for NoMix 2000 main unit is completed at F.A.S. (burn EPROM, print and stick on type plate).</td>
</tr>
<tr>
<td>Display Interface</td>
<td>NM2DISPLAY</td>
<td>Display and operating unit</td>
</tr>
<tr>
<td>Main Unit / Display</td>
<td>NM2MAINDISP</td>
<td>Main Unit &amp; Display</td>
</tr>
<tr>
<td>Wetleg sensor interface</td>
<td>NM2WET</td>
<td>Wetleg sensor interface</td>
</tr>
<tr>
<td>SPD sensor interface</td>
<td>MSSPD or MSSPD-N</td>
<td>SPD sensor interface, SPD Namur sensor interface</td>
</tr>
<tr>
<td>TAG interface</td>
<td>NM2TAG</td>
<td>TAG scan interface</td>
</tr>
<tr>
<td>I/O interface</td>
<td>NM2IO</td>
<td>I/O interface, solenoid valve driver</td>
</tr>
<tr>
<td>Fuse junction box</td>
<td>MSKKFUSE</td>
<td>Junction box with integrated fuse</td>
</tr>
<tr>
<td>Ex-fuse 4A</td>
<td>7100090</td>
<td>Ex-fuse 4A installed in fuse junction box part no. MSKKFUSE</td>
</tr>
<tr>
<td>Junction box for extension</td>
<td>CS-KA-EXT</td>
<td>Junction box for sensor cable extension</td>
</tr>
<tr>
<td>EMIS Interface *)</td>
<td>CS-GW-EMIS</td>
<td>Interface to an <strong>On-Board-Computer</strong> system</td>
</tr>
<tr>
<td>Printer</td>
<td>DR-295 or DR-298</td>
<td>Report printer</td>
</tr>
<tr>
<td><strong>Electrical / mechanical components</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensor for remaining quantity</td>
<td>NS-2E</td>
<td>Wetleg Sensor</td>
</tr>
<tr>
<td>ESD discharge resistance</td>
<td>ASS-GW-ESA</td>
<td>ESD resistor for flange</td>
</tr>
<tr>
<td>ESD discharge resistance</td>
<td>ASS-GW-ESU</td>
<td>ESD resistor with cable</td>
</tr>
<tr>
<td>Solenoid valve</td>
<td>QMVBS</td>
<td>Filling release solenoid valve</td>
</tr>
<tr>
<td>Solenoid valve</td>
<td>QMV1D</td>
<td>Solenoid valve single</td>
</tr>
<tr>
<td>Solenoid valve</td>
<td>QMV2D</td>
<td>Solenoid valve dual</td>
</tr>
<tr>
<td>Solenoid valve</td>
<td>QMV6R</td>
<td>Solenoid valve 6-way</td>
</tr>
<tr>
<td>Pneumatic indicator</td>
<td>7100160</td>
<td>Rotowink pneumatic indicator</td>
</tr>
<tr>
<td>Air connection</td>
<td>5300190</td>
<td>Air connection for pneumatic indicator</td>
</tr>
<tr>
<td>Insulating bush</td>
<td>ASS-GW-IB80</td>
<td>Insulating bush for thread G3</td>
</tr>
<tr>
<td>Insulated cord</td>
<td>ASS-GS-SEIL-V</td>
<td>Insulated cord</td>
</tr>
<tr>
<td>Insulation for flange</td>
<td>ASS-GW-I80G</td>
<td>Insulation for flange NW80</td>
</tr>
<tr>
<td>Insulation for flange</td>
<td>ASS-GW-I100G</td>
<td>Insulation for flange NW100</td>
</tr>
<tr>
<td>Or-valve</td>
<td>PWV</td>
<td>Or-valve</td>
</tr>
<tr>
<td>Main pneumatically operated switch</td>
<td>NM2DSS</td>
<td>Main pneumatically operated switch, analogue make</td>
</tr>
<tr>
<td>Pneumatically operated switch</td>
<td>MSDSO</td>
<td>Foot valve pneumatically operated switch, analogue break</td>
</tr>
<tr>
<td>Pneumatically operated switch</td>
<td>MSDSO-6M</td>
<td>6-way foot valve pneumatically operated switch, analogue break, and main pneumatically operated switch, analogue make</td>
</tr>
</tbody>
</table>

*Sening® is a registered trademark of FMC Technologies*
## Part numbers of the NoMix 2000 modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x cable set</td>
<td>NM2KABEL</td>
<td>Cable set for wiring the power supply and the internal CAN bus</td>
</tr>
<tr>
<td>Cable set</td>
<td>ASS-GS-K25M</td>
<td>Connection cable between TAG interface and insulated couplings</td>
</tr>
<tr>
<td>SPD junction box (optional) *)</td>
<td>NM2KKSPD</td>
<td>If all 20 SPD sensor inputs are used, 2 sensors must be bundled into 1 line (6-compartment direct discharger / left / right).</td>
</tr>
<tr>
<td>Sealing Caps</td>
<td>NM2PG</td>
<td>Sealing Cap Set for PG7, PG9 and PG11</td>
</tr>
<tr>
<td>Printer connection socket *)</td>
<td>SPD-DR-KA2</td>
<td>Printer connection socket</td>
</tr>
<tr>
<td>Connection cable OBC to EMIS *)</td>
<td>MS-OBC-KA</td>
<td>connection cable OBC EMIS, 3-pole connection line between semitrailer junction box and 9-pole Sub-D-plug for connection with the OBC</td>
</tr>
<tr>
<td>Connection cable laptop to main unit or EMIS via SPD-DR-KA2 *)</td>
<td>MS-PC-KA</td>
<td>connection cable laptop to main unit or EMIS, 3-pole connection line between printer connection socket SPD-DR-KA2 and 9-pole Sub-D-plug for connection with the laptop</td>
</tr>
<tr>
<td>Semitrailer cable</td>
<td>AK</td>
<td>F.A.S semitrailer cable</td>
</tr>
<tr>
<td>API coupling</td>
<td>VKVP-I</td>
<td>pneumatically driven API coupling with inductive proximity sensor</td>
</tr>
<tr>
<td>API coupling</td>
<td>VKAP100-I2</td>
<td>pneumatically driven API coupling with inductive proximity sensor</td>
</tr>
</tbody>
</table>

### Manuals

- DOK-415E Workshop & installation manual
- DOK-440E Driver's Instructions
- DOK-441E Driver's short instructions

*) optional components / modules
10 Software replacement

10.1 Main Unit

Prior to each software replacement, the tank truck setup must be recorded or printed, so that during re-commissioning with the new software all vehicle-specific parameters can be reproduced in the setup.

The EPROM (contains software) can be found in the main unit on the main CPU board (drawing no. 51.351339, no. E51.351371 and no. E51.351675). It has a 32-PIN “PLCC” housing (rectangular housing with one bevelled corner) and a sticker showing the software version number (e.g. 1.00). One of the corners of the socket on the board is also bevelled. A special, commercially available “PLCC removal tool” is required for removing the EPROM from the socket, in order to avoid damaging the EPROM during removal. The two claws of the removal tool must be inserted into the two recesses of the EPROM socket. The two arms of the removal tool are then pushed together. This causes the EPROM to be lifted from the socket. Prior to inserting the new EPROM, its connection contacts should be checked for damage (“bent connection legs?”). The new EPROM is inserted into the socket and pressed in with your fingers without canting, until it noticeably engages.

The bevelled corner of the EPROM must be aligned with the bevelled corner of the socket.

After an EPROM on the main CPU board has been replaced, the complete SETUP menu has to be reset / checked.

10.2 Interface modules

The software for all interface modules is integrated into the microprocessor. The microprocessor has to be replaced if software needs replacing. As an example, drawing no. E51.351372 shows the SPD sensor interface. The procedure is identical to that described in Chapter 10.1.

Attention: If it is necessary to replace the processor of the SPD sensor interface into which the software is integrated, the "dip switch no. 4 on the CPU board must be switched to "OFF" before removing the processor, in order to interrupt the supply from the internal battery (see also drawing no. E51.351372)!
11 Extract from ElexV (§12) (see also national standards)

Tests

(1) The operator is responsible for having the electrical systems checked for proper condition in terms of the mounting, the installation and the operation by a qualified electrician or under the supervision of a qualified electrician.
   1. Prior to first start-up
   2. At certain intervals.
   The operator has to specify the intervals in such a way that any faults that are to be expected will be detected in time. The tests according to clause 1, no. 2, have to be carried out every three years; they are not required, if the electrical systems are continuously monitored under the supervision of a responsible engineer.
(2) During the checks, the relevant and state of the art regulations must be followed.
(3) The authority responsible may request that a test log book containing certain entries be kept.
(4) In the event of damage or loss, or for other special reasons, the regulatory authority may request special tests to be carried out by a technical expert in individual cases. The operator is responsible for ensuring that a check according to clause 1 is arranged.
12 Warranty and Service

The following conditions apply in respect of a warranty to the end user for this equipment - in addition to the dealer’s legal warranty in the purchase contract:

1. The warranty period is 12 months and starts at the time of delivery of the device by Sening. For electronic products the registration forms must be fully completed and must arrive at Sening signed off by the installation organisation.

2. The warranty includes the correction of all damage to or faults in the equipment arising during the warranty period that demonstrably relate to material or manufacturing defects.

Not covered under the warranty:

- small deviations from the desired quality that are not significant for the value or the suitability for use of the equipment
- Damage or defects arising from connection other than to specification, improper handling and non-observance of the installation specification and instructions for use
- Damage from chemical and electrochemical effects of water or other liquids, electrical or electromagnetic influences, as well as generally from abnormal ambient conditions.
- Damage arising from external effects such as transport damage, damage by shock or impact, damage by weather effects or other natural phenomena.

3. The warranty claim is void if repairs or interventions are undertaken by persons that are not authorised by us or if our equipment is provided with amendments or accessories that are not suitable for our equipment and are not passed by us for the equipment.

4. Warranty work is performed in the manner that faulty parts are repaired by us free of charge or replaced with correct parts at our choice. Replaced parts become our property.

5. Warranty work is carried out free of charge in the first six months of the warranty period. Thereafter travelling time, travel costs and labour of the service personnel as well as any transport costs arising are charged or not reimbursed.

6. Warranty work neither causes an extension of the warranty period nor sets a new warranty period in progress. The warranty period for fitted replacement parts ends with the warranty period for the entire equipment.

7. On-going or other claims, especially those for replacement of damages or consequential damages arising outside the equipment, insofar as an obligation is not mandatory in law, are explicitly excluded.
13 Address and Contact

Important Note
All explanations and technical details given in this documentation have been produced and edited by the author with the greatest care. However, the possibility of errors cannot be completely eliminated. We would be very grateful for the notification of any errors found.

Our service department would be pleased to advise and help you. They can be reached under:

![FMC Technologies](image)

**Measurement Solutions**
**F. A. Sening GmbH**
Regentstrasse 1
D-25474 Ellerbek

Tel.: +49 (0) 4101 304 - 0 (Switchboard)
Fax: +49 (0) 4101 304 - 152 (Service)
Fax: +49 (0) 4101 304 - 133 (Sales)
Fax: +49 (0) 4101 304 - 255 (Customer Service)
E-Mail: info.ellerbek@intl.fmcti.com
Web: www.fmctechnologies.com/measurementsolutions
14 Setup: 6-compartment direct discharger truck

In the following the preset setup for an direct discharge truck “1-Int. Direct” is listed (see also preset setup chapter 6.1.1.1.1).

⚠ A preceding (+) at the parameter means that this parameter has to be adjusted.

A preceding (-) at the parameter means that this parameter has not to be adjusted.

✂ When for instance in SPD sensor setup the first sensor of API is activated (set to an input channel) then the following parameter concerning the type and delay time is also visible and has to be adjusted.
Setup: 6-compartment direct discharger truck

Description: International direct discharger truck

(*) SYSTEM
- Serial number: 1
- Operation Language: ENGLISH
- Date order: day-month-year
- Manual Sealing enabled: NO
- Power off breaks seal: NO
- Printer: Exclusive access
- Printer connected at node: 21
- Printer Baudrate: 9600
- Nr. of lines: 55
- Nr. of columns: 35
- Identification: NO
- Password: *****

(*) COMPONENTS
- Nr. of Terminals: 1
- Nr. of Wetleg-IF: 1
- Nr. of Overfill-IF: 0
- Nr. of Output-IF: 1
- Nr. of TAG Scan-IF: 1
- Nr. of Hall-IF: 0
- Nr. of SPD-IF: 1

(*) NETWORK
- EMIS communication enabled: NO
- EMIS node number: 21
- Record events: NO
- Events stored by: 21
- Own node number: 11
- CAN communication forced: NO

(*) TRUCK
- Truck type: DIRECT
- Number of compartments: 6
- Number of OP: 0
- Number of meters: 2
- Number of 2" vapour nozzles: 0
- Common vapour installed: YES
- Bottomvalves press. balanced: NO
- Air pressure switch installed: YES
- Supervise filling of pipes: YES
- GPSÜ-Option installed: NO

(*) PRODUCT
- Used products 0011011000000000
- Leaded products 0000000000000000
- Product No. 3 Name: DK
- Product No. 3 Danger Class: AII
- Product No. 3 Ref-Code: 2
- Product No. 3 TAG-Code: 68
- Product No. 3 OP-Code: 12
- Product No. 3 HALL-Code: 12
- Product No. 4 Name: BI
- Product No. 4 Danger Class: AI
- Product No. 4 Ref-Code: 3
- Product No. 4 TAG-Code: 92
- Product No. 4 OP-Code: 9
- Product No. 4 HALL-Code: 10
- Product No. 5 Name: SU
- Product No. 5 Danger Class: AI
- Product No. 5 Ref-Code: 5
- Product No. 5 TAG-Code: 95
- Product No. 5 OP-Code: 3
- Product No. 5 HALL-Code: 9
- Product No. 6 Name: SU
- Product No. 6 Danger Class: AI
- Product No. 6 Ref-Code: 5
- Product No. 6 TAG-Code: 95
- Product No. 6 OP-Code: 3
- Product No. 6 HALL-Code: 9

(*) EVENTS
- Record TAG-Informationen: NO
- Record COP-Informationen: NO
- Record Vap.-Informationen: NO

(*+ LOADING
- Loading mode: Compart.
- Number of loadings: 6
- Manual loading plan allowed: YES
- Manual loading plan timeout (min): 60
- Product code correction: NO
- Permission valve ON: Loading mode
- Permission valve OFF: Comp. Error
- Open automatic: Not at. Man. LPPlan
- Close comp. after loading: YES
- Compartment permission: Not empty
- Comp. empty test: NO
- Leave comp. open after test: NO
- TAG disconnect delay (sec): 2
- Wetleg to-wet- timeout (sec): 7
- Vap. rec. at loading 0000000000000000

(*) DISCHARGE
- Discharge mode: NoMix
- Discharge on load.- side: YES
- Number of discharges: 6
- Number of A3-discharges: 6
- Number of A2-discharges: 6
- Number of A1-discharges: 6
- Override Mode: HSV and COP
- Override disabled if HSV active: NO
- Overr. Meter with Vapour rec.: NO
- Number of overrides: 5
- Override timeout (min): 60
- Override log-info: Standard
- Short override menu: YES
- Use DMS: NO
- Wetleg to-dry- timeout (sec): 30
- Products over met1 0011011000000000
- Products over met2 0011011000000000
- Vap. rec. at disch. 0001011000000000

(*) SENSORS
- Ext. Load.Signal: 0
- Type Load.Signal: Digital/Make
- Ext. Disch.Signal: 0
- Type Disch.Signal: Digital/Make
- 1.Sensor man lid: 0
- Type man lid: Digital/Make
- 1.Sensor API: 0
- Type API: Digital/Make
- API Delaytime (sec): 2
- 1.Sensor BV: 0
- Type BV: Digital/Make
- 1.Sensor LV: 0
- Type LV: Digital/Make
- Parking Brake: 0
- Type Parking Brake: Digital/Make

(*) EXT.
- Type Load.Signal: Digital/Make
- Type Disch.Signal: Digital/Make
- 1.Sensor man lid: 0
- Type man lid: Digital/Make
- 1.Sensor API: 0
- Type API: Digital/Make
- API Delaytime (sec): 2
- 1.Sensor BV: 0
- Type BV: Digital/Make
- 1.Sensor LV: 0
- Type LV: Digital/Make
- Parking Brake: 0
- Type Parking Brake: Digital/Make

(*) Events
- Record TAG-Informationen: NO
- Record COP-Informationen: NO
- Record Vap.-Informationen: NO
15 Appendix

15.1 Elementary / Block diagrams

<table>
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<th>Drawing no.</th>
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</tr>
<tr>
<td>Truck-Trailer Spiral Cable</td>
<td>E61.351449</td>
</tr>
<tr>
<td>Positioning of Junction Boxes (example)</td>
<td>E11.351493</td>
</tr>
<tr>
<td>Drilling Scheme (Positioning of Junction Boxes)</td>
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15.2 Tender drawings

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<th>Drawing no.</th>
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<td>E51.351339</td>
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<td>E61.351301</td>
</tr>
<tr>
<td>Main Unit / Display NM2MAINDISP</td>
<td>E61.351549</td>
</tr>
<tr>
<td>Wetlegsensor Interface</td>
<td>E51.351334</td>
</tr>
<tr>
<td>TAG-Interface</td>
<td>E51.351335</td>
</tr>
<tr>
<td>I/O-Interface</td>
<td>E51.351466</td>
</tr>
<tr>
<td>SPD-Sensor Interface</td>
<td>E51.351333</td>
</tr>
<tr>
<td>SPD-Namur Sensor Interface</td>
<td>E51.351706</td>
</tr>
<tr>
<td>Junction Box with Fuse</td>
<td>E51.351418</td>
</tr>
<tr>
<td>Junction Box for Extension of Wires</td>
<td>E51.351499</td>
</tr>
<tr>
<td>Printer</td>
<td>E51.350757</td>
</tr>
<tr>
<td>NoMix 2000 Depot / Forecourt Simulation Unit</td>
<td>E51.351529</td>
</tr>
</tbody>
</table>

15.3 Electrical circuit diagrams

<table>
<thead>
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<th>Drawing no.</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>System wiring diagram NoMix 2000 with NM2MAINDISP</td>
<td>E81.351676</td>
</tr>
<tr>
<td>Wiring Diagram Main Unit</td>
<td>E51.351351</td>
</tr>
<tr>
<td>Wiring Diagram Display Interface</td>
<td>E51.351352</td>
</tr>
<tr>
<td>Wiring diagram Main Unit / Display</td>
<td>E51.351673</td>
</tr>
<tr>
<td>Wiring Diagram Wetlegsensor Interface</td>
<td>E51.351346</td>
</tr>
<tr>
<td>Wiring Diagram TAG-Interface</td>
<td>E51.351478</td>
</tr>
<tr>
<td>Wiring Diagram I/O-Interface</td>
<td>E51.351468</td>
</tr>
<tr>
<td>Wiring Diagram SPD-Sensor Interface</td>
<td>E51.351347</td>
</tr>
<tr>
<td>Wiring Diagram Junction Box with Fuse</td>
<td>E51.351419</td>
</tr>
<tr>
<td>Main Unit Setup Switch / Software Change</td>
<td>E51.351371</td>
</tr>
<tr>
<td>Main Unit / Display Setup-Switch / Software Change</td>
<td>E51.351675</td>
</tr>
<tr>
<td>Interface Software Change</td>
<td>E51.351372</td>
</tr>
</tbody>
</table>
15.4 Electromechanical components

- Wetlegsensor: E51.351307
- Wetlegsensor Adjustment: E51.350839
- Flange / API Coupling Isolation: E61.351490
- TAG Scan Wire Connection: E51.250226
- ESD Resistor for Flange: E51.350228
- ESD Resistor with Cable: E51.350229
- Rail with Air Pressure Switches: E61.351480
- Solenoid Valve BS: E51.24070
- Solenoid Valve 1D: E51.24090
- Solenoid Valve 2D: E51.24169
- Solenoid Valve 6R: E51.24068
- Pneumatic operated Footvalve: E51.250469
- Pneumatic API Coupling with Position Monitoring: E51.250970
- API Cover: 51.22377
- Vent Valve 80 with Sequence Control: E61.250644
- Pneumatic two Way Valve: E51.22570
- Interlock for VKAP100: E51.250608

15.5 Pneumatic circuit diagrams truck with direct discharge

- Pneumatic circuit diagram: E61.251317

15.6 EC-Type Examination Certificate

- Main Unit Type NM2-MAIN.-...: TÜV 00 ATEX 1599
- Display Interface Type NM2-DISPLAY.-...: TÜV 00 ATEX 1601
- Main Unit / Display Type NM2-Main/Disp.-....: TÜV 03 ATEX 2022
- Wetlegsensor Interface Type NM2-WET.-....: TÜV 00 ATEX 1603
- SPD-Sensor Interface Type NM2-SPD.-....: TÜV 00 ATEX 1602
- TAG Interface Type NM2-TAG.-....: TÜV 01 ATEX 1706
- I/O-Interface Type NM2-I/O.-....: TÜV 01 ATEX 1707
- Electronic encoder, type TAG: TÜV 02 ATEX 1981
- Wet-leg Sensor Type S-NS-2.-....: TÜV 02 ATEX 1982
- Inductive proximity sensor: PTB 03 ATEX 2013

15.7 EC Declaration of Conformity
The wiring has to be done by the customer!

Cable length 10 m  
Length of spiral cable with connector 7.5 m 
Socket with cable, cable length 7 m 

Spiral cable, complete with Junction Boxes 

"Schutzvermerk nach DIN 34 beachten" 

Bestell-Nr.  AK 

E61.351449
Important Note: Mounting plate is not part of delivery

Material: Aluminium
a thickness of 5mm is recommended

to be used with:
Fiber Control Box
500 x 830 x 550 (DWG No SK 310552 SH 2/4)
mounted on the back side of the cabinet

× oval hole recommended for wiring
Material: Aluminium
A thickness of 5mm is recommended.

All dimensions in mm

The drilling diameter has to be executed according to respective demands.

× oval hole recommended for wiring

Important Note: Mounting plate is not part of delivery.
Main Unit (NoMix2000), complete

Order No. NM2MAIN
For use at NoMix 2000 the name has to be changed from MultiSeal to NoMix 2000. Therefore take out the stripe with the name, insert it in the mirrored position and fix it with tape.

Pg11, Ex e (2x)
black

Display–Interface, complete

Bestell-Nr. NM2DISPLAY
Restmengensensor-Interface, complete

Order No. NM2WET
TAG-Interface, complete

Order No. NM2TAG

FMC Energy Systems
F.M. C. Sening GmbH
D-23474 Eilbek, Germany

Weight: 3 kg
Date: 29.01.2003
Name: Benthack

Changes: 
Drawing No: E51.351335
Rev: 

Pg11 (2x) black
Pg7 (15x) blue
Pg11 (1x) blue
SPD-Sensor-Interface, complete

Order No.  
MSSPD
Connection diagram: 51.351502

Junction box for extension of wires

Bestell-Nr. CS-KA-EXT

All dimensions in mm
Printer TM-295, 24 V complete

Reverse of printer

Cable length 15m

All dimensions in mm / m
Drilling for Screw M4 x .....
To the other NoMix 2000 / MultiSeal Interface Units

Battery
Int. CAN-Bus

For the battery / Int. CAN-bus wiring the F.A. Sening cable, part no. NM2KABEL, must be used.

MultiSeal Mainunit / Display (MSMAINDISP)
NoMix 2000 Main Unit / Display (NM2MAINDISP)

LCD

Battery
Int. CAN-Bus

RS232
Printer

Cross Section of the
Conduction Wire ≥ 1.5mm²

Trailer Junction Box
(351441)

Caution!
The trailer junction box
must be installed
outside the hazardous
area!

Spiral Cable

System Wiring Diagram with
NM2MAINDISP / MSMAINDISP
For use at NoMix 2000 the name has to be changed from MultiSeal to NoMix 2000. Therefore take out the stripe with the name, insert it in the mirrored position and fix it with tape.

Caution: The display Interface must be installed with right hand cable glands (Explosion protection)

Battery / CAN-Bus
Caution: The display interface must be installed with right hand cable glands (Explosion protection)
Wiring diagram
SPD-Sensor-Interface
(MSSPD)
MultiSeal / NoMix 2000

Wiring diagram
Junction Box with Fuse
CAUTION: To remove the EPROM from the base, a special PLCC removal tool must be used (see also instruction).
CAUTION: To remove the EPROM from the base, a special PLCC removal tool must be used (see also instruction DOK-415E and DOK-416E).
IMPORTANT: Before removal of the processor the DIP switch 4 must be moved to "OFF" (Internal Battery switched off).

CAUTION: To remove the EPROM from the base, a special PLCC removal tool must be used (see also instruction).
necessary height = 140

Caution: Protect plug connection with fixing straps before opening and reassembling.

Height of detection = 50 - X

X_{min} = 0; X_{max} = 40
Figure: Rest volume of liquid behind the NS-2E / NS-2A

Table: Calculated rest volume of liquid

<table>
<thead>
<tr>
<th>Height of operation [mm]</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>0.5</td>
<td>0.3</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>30</td>
<td>1.4</td>
<td>0.7</td>
<td>0.5</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>40</td>
<td>2.8</td>
<td>1.4</td>
<td>0.9</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>50</td>
<td>4.8</td>
<td>2.4</td>
<td>1.6</td>
<td>1.2</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Rest volume of liquid behind the NS-2E / NS-2A in [Liter]
Screws with resistor cable installation for ESD
Outlet side (API-Coupling)  Vehicle side (Chassis)

Screw with angle bracket
Outlet side (API-Coupling)  Vehicle side (Chassis)

All other screws
Outlet side (API-Coupling)  Vehicle side (Chassis)

1. Resistor cable with cable eyes
2. Isolation bush
3. Washer
4. Gasket
5. Cock plate
6. Angle bracket (part. no. ASS-GW-AW80)
7. TAG-Scan wire

Installation
- dismantle flange / API-coupling
- replace screws M12 with M10 and M10 with M8
- in case of less room for fitting use flat nuts and if needed also threaded rods instead of screws
- always take new gaskets
- mount all screws and isolation bushes according the drawing above. The isolation bushes have to be shortened when necessary. Tighten the screws with a maximum of 20 Nm.

Important: resistor cable installation
- to ensure electrostatic discharge (ESD) the isolated flange / API-coupling must be connected with the chassis of the vehicle using a resistor cable, part no. ASS-GW-ESA [Pos. 1]
- mount screws according to the drawing on the left
- install the small cable eye always towards the isolated flange / API-coupling
- install the big cable eye always towards the chassis of the vehicle / cock plate
- a value of 100 KOhm must be measured between the isolated flange / API-coupling and chassis using a standard ohmmeter

"Schutzvermerk nach DIN 34 beachten"
Fix angle at underside of flange. Protect cable with fixing straps.

TAG-Scan wire:
Connect TAG-Scan wire at TAG-Interface NM2TAG

Angle for TAG-Scan wire connection at flange

Bestell-Nr. ASS-GW-AW80
Truck Chassis

Elektronic is moulded inside the cable eye

isolated outlet

All dimensions in mm

ESD-Resistor flange

Bestell-Nr. ASS-GW-ESA

F.A. Sening GmbH
Frenkendorf, Germany

E51.350228
Truck Chassis

Elektronic is moulded inside the cable eye

isolated outlet

All dimensions in mm
Part-No. | Master switch | Compartment switch | Length of angle |
--- | --- | --- | ---
MSDSO-2M | 1x | 2x | 120
MSDSO-4M | 1x | 4x | 200
MSDSO-5M | 1x | 5x | 240
MSDSO-6M | 1x | 6x | 280

All dimensions in mm

Small rail with air pressure switch

Bestell-Nr. MSDSO-...M

"Schutzvermerk nach DIN 34 beachten"
Solenoid valve BS, complete/QSS

Bestell-Nr. QMVBS

Gewicht: 3 kg
Datum: 20.11.2001
Name: Benthack
Zeichnungs-Nr. E51.24070
Solenoid valve 1D, complete/QSS

Bestell-Nr. QMV1D

FMC Energy Systems
F.A. Sening GmbH
Ettelbruck, Germany

3 Gewicht: kg 20.11.2001 Name: Benthack
Gesnd. am: Zeichnungs-Nr.: E51.24090
Solenoid valve 2D, complete

Bestell-Nr. QMV2D

Gewicht: 3 kg
Datum: 03.12.2001
Name: Benthack
Solenoid valve 6R, complete

Bestell-Nr. QMV6R
sealing rings and head cap screws are supplied
this locking screws and sealing rings are part of items covered by the contract screws must removed for assembly

welding flange 51.22756
req. number: FL 100 V

welding flange 51.19432
req. number: FL 80/100

O-Ring 105x4 (NBR)

\[ \phi 220 \]
\[ \phi 190 \]
\[ \phi 160 \]
\[ 335 \]
\[ 4 \times \phi 13 \]
\[ 15 \]
\[ 106 \]
\[ 130 \]
\[ 25 \]

pneumatic connector for plastic-hose 6x1 drawn shifted

- Material of construction:
  Aluminium body, FKM and NBR seals
- Weight: 6.3 kg
- Temperature range: -20°C to +60°C
- Nominal size: DN 100
- Nominal pressure: PN 10
- Service working Pressure: 250 kPa to 750 kPa

All dimensions in mm

Pneumatic Operated Footvalve
Non-Pressure Balanced (with strainer)

Bestell-Nr. B0100-F1-N1
Pneumatic Operated Footvalve
Non-Pressure Balanced
(with strainer)

- Nominal size: DN 100
- Nominal pressure: PN 10
- Service working Pressure: 250 kPa to 750 kPa
- Material of construction: Aluminium body, FKM and NBR seals
- Weight: 4.6 kg
- Temperature range: -20°C to +60°C
- All dimensions in mm

Bestell-Nr. BO100-N1
Pneum. API-Coupling with position monitoring

Bestell-Nr. VKAP100-I2

PN 10 component note: TÜ.AGG.176-93

All dimensions in mm

pneum. indicator

Dimensions according "API"

Cover VKK

Optional IN1/4-VKAP

Throttle nonreturn valve, preadjusted

Extension possibility:
3/2 way valve (Interlock) IN1/4-VKAP
Not part of delivery

NAMUR-Sensor for position monitoring

Screwing for plastic tube 6x1

Plastic pipe for protection against dirt (length 500)
Verschlußkappe VKK
Closing cap VKK

All dimensions in mm
6 mm Push-In Connector
For Air Outlet
(Sequenced) Tube

6 mm Push-In Connector
For Air Inlet Tube

4 Holes \( \phi 11 \) Equally
Spaced On 130 PCD
for M10 Capscrews

SENING
VV80-F
PN4 XX
EN 13082
250637

ca. 125

ca. 70

\( \phi 90 \) (3.5)

ca. 123

\( \phi 102 \)

Min. Hole Diameter In Tank
ca. \( \phi 154 \)

- Nominal Size: DN 80
- Nominal pressure: PN 4
- Max. Air Pressure: 8 bar
- Min. Air Pressure: 3 bar
- Operation Temperature: \(-30 \degree C \) to \(+60 \degree C\)
- Material Of Construction:
  - Aluminium Body, FKM And NBR Seals,
  - POM, Stainless Steel
- All dimensions in mm

Pressure Drop Curve see drawing 51.250811

Vent Valve 80
With Sequence Control

F.A. Sening GmbH
An FMC Corporation subsidiary

Bestell-Nr.
VV80-F

Mortensen

2 2.5
17.06.1998

Rev.
D
E61.250644

*Schutzvermerk nach DIN 34 beachten*
Horizontal fitting position

for plastic tube 6x1

All dimensions in mm

Pneum. two way valve PWV

Bestell-Nr. PWV
Interlock for VKAP-100

All dimensions in mm

Thrust washer

3/2 Way valve

Threaded pipe angle for plastic tube Ø6x1

Angle

100

46

4.5

R80

R87

φ32

A

A
Translation

EC-TYPE EXAMINATION CERTIFICATE

(2) Equipment or Protective System intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number

TÜV 00 ATEX 1599

(4) Equipment or Protective System: Main Unit type NM2-Main.-

(5) Manufacturer: F.A. Sening GmbH

(6) Address: Regentstraße 1
D-25474 Ellerbek

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Hannover/Sachsen-Anhalt e.V., TÜV Certification Body N° 0032 in accordance with Article 9 of the Council Directive 94/9/EC of March 23, 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report N° 00 PX 12500.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:


(10) If the sign "X" is placed after the certification number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

(12) The marking of the equipment or protective system shall include the following:

\[ \text{Ex I 2 G EEx e la m IIB T4} \]

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Head of the Certification Body

Hannover, 2000-08-18

This certificate may only be reproduced without any change, schedule included.
Excerpts or changes shall be allowed by the TÜV Hannover/Sachsen-Anhalt e.V.
(14) **EC-TYPE EXAMINATION CERTIFICATE Nº TÜV 00 ATEX 1599**

(15) Description of equipment or protective system

The Main Unit type NM2-Main-... is the central electronic controller of the NoMix 2000 system which provides control and monitoring functions on tank trucks transporting mineral oil products. The device meets the requirements of category 2 and may be used in potentially explosive areas of zone 1 resp. 2. The non intrinsically safe components and assemblies are in the type of protection encapsulation “m” and the terminal box is in the type of protection increased safety “e”. The internal intrinsically safe supply EEx ia is realized by an associated apparatus in the encapsulation.

The permissible ambient temperature range is –20°C to 60°C.

**Electrical data**

Supply circuit, external............... Nominal voltage 24 V d.c., 15 V to 30 V d.c. (terminal 1 and 2) \( P \leq 30 \text{ W} \) from internal installed battery of the associated tank truck

CAN bus circuit, internal............. \( U \leq 24 \text{ V} \) (terminal 4 and 5) \( I \leq 1 \text{ A} \)

CAN bus circuit, external............. \( U \leq 24 \text{ V} \) (terminal 8 and 9) \( I \leq 1 \text{ A} \)

Printer circuit ......................... \( U \leq 24 \text{ V} \) (terminal 11 and 12) \( I \leq 1 \text{ A} \)

The non intrinsically safe input circuits are safely galvanically separated from the internal intrinsically safe circuit up to a peak crest value of the nominal voltage of 60 V.

(16) Test documents are listed in the test report Nº 00 PX 12500.

(17) Special condition for safe use

none

(18) Essential Health and Safety Requirements

no additional ones
Translation

1. SUPPLEMENT to

EC TYPE-EXAMINATION CERTIFICATE No. TÜV 00 ATEX 1599

of the company: F.A. Sening GmbH
Regentstraße 1
D-25474 Ellerbek

In the future, the Main Unit type NM2-Main:... may also be manufactured according to the test documents listed in the test report.

The electrical data and all other details apply unchanged for this supplement.

(16) Test documents are listed in the test report No. 00 PX 12501.

(17) Further special conditions for safe use
none

(18) Essential Health and Safety Requirements
no additional ones

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hanover, 2000-10-26

Head of the Certification Body
Translation

EC-TYPE EXAMINATION CERTIFICATE

(1)

(2) Equipment or Protective System intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number

TÜV 00 ATEX 1601

(4) Equipment or
Protective System: Display Interface type NM2-Display,...

(5) Manufacturer: F.A. Sening GmbH

(6) Address: Regentstraße 1
D-25474 Ellerbek

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Hannover/Sachsen-Anhalt e.V., TÜV Certification Body N° 0032 in accordance with Article 9 of the Council Directive 94/9/EC of March 23, 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report N° 00 PX 12600.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:


(10) If the sign "X" is placed after the certification number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

(12) The marking of the equipment or protective system shall include the following:

II 2 G Ex e ia m IIB T4

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-25819 Hannover

Head of the Certification Body

Hannover, 2000-08-18

This certificate may only be reproduced without any change, schedule included. Excerpts or changes shall be allowed by the TÜV Hannover/Sachsen-Anhalt e.V.
EC-TYPE EXAMINATION CERTIFICATE N° TÜV 00 ATEX 1601

Description of equipment or protective system

The Display Interface type NM2-Display-... is the indicating and operating device of the NoMix 2000 system.
The device meets the requirements of category 2 and may be used in potentially explosive areas of zone 1 resp. 2.
The non intrinsically safe components and assemblies are in the type of protection encapsulation "m" and the terminal box is in the type of protection increased safety "e". The internal intrinsically safe supply EEEx ia is realized by an associated apparatus in the encapsulation.
The permissible ambient temperature range is −20°C to 60°C.

Electrical data

Supply circuit, external............... Nominal voltage 24 V d.c., 15 V to 30 V d.c.
(terminal 1 and 2) \( P \leq 30 \text{ W} \)
from internal installed battery of the associated tank truck

CAN bus circuit, internal.............. \( U \leq 24 \text{ V} \)
(terminal 4 and 5) \( I \leq 1 \text{ A} \)

The non intrinsically safe input circuits are safely galvanically separated from the internal intrinsically safe circuits up to a peak crest value of the nominal voltage of 60 V.

Test documents are listed in the test report N° 00 PX 12600.

Special condition for safe use

none

Essential Health and Safety Requirements

no additional ones
Translation

1. SUPPLEMENT to

EC TYPE-EXAMINATION CERTIFICATE No. TÜV 00 ATEX 1601

of the company:  F.A. Sening GmbH
Regentstraße 1
D-25474 Ellerbek

In the future, the Display Interface type NM2-Display.-... may also be manufactured according to the test documents listed in the test report.

The amendments concern the internal design.

The electrical data and all other details apply unchanged for this supplement.

Test documents are listed in the test report N° 02 YEX 175480b.

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Certification Body
Am TÜV 1
D-30519 Hannover
Tel.: 0511 966-1470
Fax: 0511 966-2585

Hannover, 2002-05-29

Head of the Certification Body
Translation

EC-TYPE EXAMINATION CERTIFICATE

(1) Equipment or protective system intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number

TÜV 03 ATEX 2022

(4) Equipment: Main Unit type NM2-Main/Disp.-...

(5) Manufacturer: F.A. Sening GmbH

(6) Address: Regentstraße 1
D-25474 Ellerbek

(7) This equipment or protective system and any acceptable variation thereon are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH & Co. KG, TÜV CERT-Certification Body, notified body number N° 0032 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential report N° 03 YEX 550270.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:


(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

II 2 G Ex m ia e IIB T4

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Certification Body
Am TÜV 1
D-30519 Hannover
Tel.: 0511 986-1470
Fax: 0511 986-2555

Head of the Certification Body

Hanover, 2003-01-27

This certificate may only be reproduced without any change, schedule included.
Excerpts or changes shall be allowed by the TÜV NORD CERT GmbH & Co. KG
(14) EC-TYPE EXAMINATION CERTIFICATE Nº TÜV 03 ATEX 2022

(15) Description of equipment

The Main Unit NM2-Main/Disp... is the central control-, display- and operator device of the NoMix 2000 system, which carries out control and monitoring functions on tank trucks transporting mineral oil products.

Non-intrinsically safe components and assemblies are realized in the type of protection encapsulation “m” and the terminal box is in the type of protection increased safety “e”. The internal intrinsically safe supply EEx “ia” is realized by an associated apparatus inside of the encapsulation.

The permissible ambient temperature range is -20°C to 60°C.

Electrical Data

Supply............................................. Nominal voltage 24 V d.c., 15 V to 30 V d.c.
(terminals 1 and 2) P ≤ 30 W
from internal installed battery of the associated tank truck

CAN bus circuit, external .............. U ≤ 24 V
(terminals 3 and 7) I ≤ 1 A

CAN bus circuit, internal .............. U ≤ 24 V
(terminals 3 and 6) I ≤ 1 A

Printer circuit .................................... U ≤ 24 V
(terminals 2, 5 and 8) I ≤ 1 A

The non-intrinsically safe input circuits are safely galvanically separated from the internal intrinsically safe circuit up to a peak crest value of the nominal voltage of 60 V.

(16) Test documents are listed in the test report No.: 03 YEX 550270.

(17) Special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones
EC-TYPE EXAMINATION CERTIFICATE

Equipment or Protective System intended for use in potentially explosive atmospheres - Directive 94/9/EC

EC-Type Examination Certificate Number

TÜV 00 ATEX 1603

Equipment or Protective System: Level Sensor Interface type NM2-Wet-....
Manufacturer: F.A. Sening GmbH
Address: Regentstraße 1
D-25474 Ellerbek

This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

The TÜV Hannover/Sachsen-Anhalt e.V., TÜV Certification Body N° 0032 in accordance with Article 9 of the Council Directive 94/9/EC of March 23, 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report N° 00 PX 12700.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with:


If the sign "X" is placed after the certification number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

The marking of the equipment or protective system shall include the following:

Il 2 G EEx e ia [ia] m IIB T4
EC-TYPE EXAMINATION CERTIFICATE N° TÜV 00 ATEX 1603

Description of equipment or protective system

The Level Sensor Interface type NM2-Wet-.... is part of the NoMix 2000 system and is used for the identification of product quantities remaining in the chambers of the tank truck. The device meets the requirements of category 2 and may be used in potentially explosive areas of zone 1 resp. 2. The non intrinsically safe compounds and assemblies are in the type of protection encapsulation “m” and the terminal box is in the type of protection increased safety “e”. The internal intrinsically safe supply EEEx ia is realized by an associated apparatus in the encapsulation.

The permissible ambient temperature range is −20°C to 60°C.

Electrical data

Supply circuit, external................. Nominal voltage 24 V d.c., 15 V to 30 V d.c.
(terminal 1 and 2) P ≤ 30 W from internal installed battery of the associated tank truck

CAN bus circuit, internal............. U ≤ 24 V
(terminal 4 and 5) I ≤ 1 A

Wetlegsensor sensor circuit.......... in type of protection “Intrinsic Safety” EEEx ia IIB
(terminal K2 ... K7) maximum values:

U₀ = 7,14 V
I₀ = 42 mA
P₀ = 75 mW
characteristic line: linear
max. permissible outer capacitance: C₀ = 260 µF
max. permissible outer inductance: L₀ = 70 mH

Input circuit ......................... in type of protection “Intrinsic Safety” EEEx ia IIB
(terminal K1) maximum values:

U₀ = 7,14 V
I₀ = 18 mA
P₀ = 32 mW
characteristic line: linear
max. permissible outer capacitance: C₀ = 260 µF
max. permissible outer inductance: L₀ = 300 mH

The non intrinsically safe input circuits are safely galvanically separated from the intrinsically safe circuits up to a peak crest value of the nominal voltage of 60 V. The intrinsically safe circuits are galvanically connected.
(16) Test documents are listed in the test report N° 00 PX 12700.

(17) Special condition for safe use
none

(18) Essential Health and Safety Requirements
no additional ones
1. SUPPLEMENT to

EC TYPE-EXAMINATION CERTIFICATE No. TÜV 00 ATEX 1603

of the company: F.A. Sening GmbH
Regentstraße 1
D-25474 Ellerbek

In the future, the Level Sensor Interface type NM2-Wet.-... may also be manufactured according to the test documents listed in the test report. The amendments concern the internal design. The electrical data and all other details apply unchanged for this supplement.

(16) Test documents are listed in the test report № 02 YEX 184250a.

(17) Special conditions for safe use
none

(18) Essential Health and Safety Requirements
no additional ones

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Certification Body
Am TÜV 1
D-30519 Hannover
Tel.: 0511 986-1470
Fax: 0511 986-2555

Hannover, 2002-09-09

[Signature]
Head of the Certification Body
Translation

EC-TYPE EXAMINATION CERTIFICATE

(2) Equipment or Protective System intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number

TÜV 00 ATEX 1602

(4) Equipment or Protective System: SPD Sensor Interface type NM2-SPD-....

(5) Manufacturer: F.A. Sening GmbH

(6) Address: Regentstraße 1
D-25474 Ellerbek

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Hannover/Sachsen-Anhalt e.V., TÜV Certification Body No 0032 in accordance with Article 9 of the Council Directive 94/9/EC of March 23, 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report No 00 PX 12800.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:


(10) If the sign "X" is placed after the certification number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

(12) The marking of the equipment or protective system shall include the following:

II 2 G Ex e ia [Ia] m IIB T4

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Head of the Certification Body

Hannover, 2000-08-18

This certificate may only be reproduced without any change, schedule included. Excerpts or changes shall be allowed by the TÜV Hannover/Sachsen-Anhalt e.V.
(14) EC-TYPE EXAMINATION CERTIFICATE N° TÜV 00 ATEX 1602

(15) Description of equipment or protective system

The SPD Sensor Interface type NM2-SPD-... is the part of the NoMix 2000 system that is responsible for the Sealed Parcel Delivery function. The device meets the requirements of category 2 and may be used in potentially explosive areas of zone 1 resp. 2. The non intrinsically safe compounds and assemblies are in the type of protection encapsulation “m” and the terminal box is in the type of protection increased safety “e”. The internal intrinsically safe supply EEx ia is realized by an associated apparatus in the encapsulation.

The permissible ambient temperature range is −20°C to 60°C.

Electrical data

Supply circuit, external.................. Nominal voltage 24 V d.c., 15 V to 30 V d.c.
(terminal 1 and 2) P ≤ 30 W from internal installed battery of the associated tank truck

CAN bus circuit, internal.......... U ≤ 24 V
(terminal 4 and 5) I ≤ 1 A

SPD sensor circuit ..................... in type of protection “Intrinsic Safety” EEx ia IIB
(maximum values: terminal K1 ... K20)
U₀ = 7,14 V
I₀ = 41 mA
P₀ = 73 mW
characteristic line: linear
max. permissible outer capacitance: C₀ = 260 µF
max. permissible outer inductance: L₀ = 70 mH

The non intrinsically safe input circuits are safely galvanically separated from the intrinsically safe circuit up to a peak crest value of the nominal voltage of 60 V.

(16) Test documents are listed in the test report N° 00 PX 12800.

(17) Special condition for safe use

none

(18) Essential Health and Safety Requirements

no additional ones
Translation

1. SUPPLEMENT to

EC TYPE-EXAMINATION CERTIFICATE No. TÜV 00 ATEX 1602

of the company: F.A. Sening GmbH
Regentstraße 1
D-25474 Ellerbek

In the future, the SPD-Sensor Interface type NM2-SPD-... may also be manufactured according to the test documents listed in the test report.

The electrical data and all other details apply unchanged for this supplement.

(16) Test documents are listed in the test report N° 00 PX 12801.

(17) Further special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hanover, 2000-10-26

Head of the Certification Body
Translation

EC-TYPE EXAMINATION CERTIFICATE

(1)

(2) Equipment or Protective System intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number

TÜV 01 ATEX 1706

(4) Equipment or Protective System: TAG Interface type NM2-TAG-

(5) Manufacturer: F.A. Sening GmbH

(6) Address: Regentstraße 1
D-25474 Ellerbek

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Hannover/Sachsen-Anhalt e.V., TÜV Certification Body No. 0032 in accordance with Article 9 of the Council Directive 94/9/EC of March 23, 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report No. 01 PX 13100.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:


(10) If the sign "X" is placed after the certification number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

(12) The marking of the equipment or protective system shall include the following:

EX II 2 G Ex ia [ia] e IIB T4

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Head of the Certification Body

Hannover, 2001-07-09

This certificate may only be reproduced without any change, schedule included. Excerpts or changes shall be allowed by the TÜV Hannover/Sachsen-Anhalt e.V.
(14) EC-TYPE EXAMINATION CERTIFICATE N° TÜV 01 ATEX 1706

(15) Description of equipment or protective system

The TAG Interface type NM2-TAG-... is part of the NoMix 2000 system and is used for the evaluation of TAG sensors which detect the product quality during the filling and unloading. The device meets the requirements of category 2.

The non intrinsically safe compounds and assemblies are in the type of protection encapsulation “m” and the terminal box is in the type of protection increased safety “e”. The internal intrinsically safe supply EEx ia is realized by an associated apparatus in the encapsulation.

The permissible ambient temperature range is –20°C to 60°C.

**Electrical data**

Supply circuit, external................... Nominal voltage 24 V d.c., 15 V to 30 V d.c.
(terminal 1 and 2) \( P \leq 30 \text{ W} \)
from internal installed battery of the associated tank truck

CAN bus circuit, internal............... U \leq 24 \text{ V} 
(terminal 3 and 4) \( I \leq 1 \text{ A} \)

TAG sensor circuits...................... in type of protection “Intrinsic Safety” EEx ia IIB
(terminal K1 ... K6) Maximum values:
\( U_0 = 14,7 \text{ V} \)
\( I_0 = 298 \text{ mA} \)
\( P_0 = 1,1 \text{ mW} \)
characteristic line: linear
max. permissible outer capacitance: \( C_o = 3,86 \text{ µF} \)
max. permissible outer inductance: \( L_o = 1,8 \text{ mH} \)

The non intrinsically safe input circuits are safely galvanically separated from the intrinsically safe circuits up to a peak crest value of the nominal voltage of 60 V. The intrinsically safe circuits are galvanically connected.

(16) Test documents are listed in the test report N° 01 PX 13100.

(17) Special condition for safe use

none

(18) Essential Health and Safety Requirements

no additional ones
1. SUPPLEMENT to

EC TYPE-EXAMINATION CERTIFICATE No. TÜV 01 ATEX 1706

of the company: F.A. Sening GmbH
Regentstraße 1
D-25474 Ellerbek

In the future, the TAG Interface type NM2-TAG-...may also be manufactured according to the test documents listed in the test report. The amendments concern the internal design. The electrical data and all other details apply unchanged for this supplement.

(16) Test documents are listed in the test report N° 02 YEX 184250b.

(17) Special conditions for safe use
none

(18) Essential Health and Safety Requirements
no additional ones

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Certification Body
Am TÜV 1
D-30619 Hannover
Tel.: 0511 986-1470
Fax: 0511 986-2555

Hannover, 2002-09-09

Head of the Certification Body
Translation

EC-TYPE EXAMINATION CERTIFICATE

(1) Equipment or Protective System intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number

TÜV 01 ATEX 1707

(4) Equipment or Protective System: I/O Interface type NM2-I/O-...

(5) Manufacturer: F.A. Sening GmbH

(6) Address: Regentstraße 1
D-25474 Ellerbek

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Hannover/Sachsen-Anhalt e.V., TÜV Certification Body N° 0032 in accordance with Article 9 of the Council Directive 94/9/EC of March 23, 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report N°01 PX 13000.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:


(10) If the sign "X" is placed after the certification number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

(12) The marking of the equipment or protective system shall include the following:

Ex II 2 G Ex m ib e IIB T4

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hannover, 2000-07-09

Head of the Certification Body

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EC-TYPE EXAMINATION CERTIFICATE N° TÜV 01 ATEX 1707

Description of equipment or protective system

The I/O Interface type NM2-I/O-... is part of the NoMix 2000 system and is used for the drive of magnetic valves.
The device meets the requirements of category 2.
The non intrinsically safe compounds and assemblies are in the type of protection encapsulation “m” and the terminal box is in the type of protection increased safety “e”. The internal intrinsically safe supply EEx ib is realized by an associated apparatus in the encapsulation.
The permissible ambient temperature range is –20°C to 60°C.

Electrical data

Supply circuit, external............... Nominal voltage 24 V d.c., 15 V to 30 V d.c.
(terminal 1 and 2) \[ P \leq 40 \text{ W} \]
from the internal installed battery of the associated tank truck

CAN bus circuit, internal............. \[ U \leq 24 \text{ V} \]
(terminal 3 and 4) \[ I \leq 1 \text{ A} \]

Output circuits....................... \[ U \leq 24 \text{ V} \]
(terminals 5 to 20) \[ I \leq 1 \text{ A} \]

Input circuits......................... \[ U \leq 24 \text{ V} \]
(Kiemme 21 to 24) \[ I \leq 1 \text{ A} \]

Test documents are listed in the test report N° 01 PX 13000.

Special condition for safe use

none

Essential Health and Safety Requirements

no additional ones
Translation

1. SUPPLEMENT to

EC TYPE-EXAMINATION CERTIFICATE No. TÜV 01 ATEX 1707

of the company: F.A. Sening GmbH
Regentstraße 1
D-25474 Ellerbek

In the future, the I/O Interface type NM2-I/O:-...may also be manufactured according to the test documents listed in the test report.

The amendments concern the internal design.

The electrical data and all other data apply unchanged for this supplement.

Test documents are listed in the test report No. 02 YEX 175480a.

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Certification Body
Am TÜV 1
D-30519 Hannover
Tel.: 0511 986-1470
Fax: 0511 986-2555

Hannover, 2002-05-29

[Signature]

Head of the Certification Body
(1) EG-Baumusterprüfbescheinigung

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - Richtlinie 94/9/EG

(3) EG Baumusterprüfbescheinigungsnummer

TÜV 02 ATEX 1981

(4) Gerät: Elektronischer Geber Typ TAG 1,....

(5) Hersteller: F.A. Sening GmbH

(6) Anschrift: D-25474 Ellerbek, Regentstraße 1

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.


Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht Nr. 02 YEX 550234 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit


(10) Falls das Zeichen "X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.


(12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

Ex II 2 G EEx ia IIB T4

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover
Tel.: 0511 986-1470
Fax: 0511 986-2555

Hannover, 19.12.2002

Der Leiter

TÜV CERT A4 04/02 10.003 L0

Diese EG-Baumusterprüfbescheinigung darf nur unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung der TÜV NORD CERT GmbH & Co. KG
(14) EG-Baumusterprüfbescheinigung Nr. TÜV 02 ATEX 1981

(15) Beschreibung des Gerätes

Technische Daten

<table>
<thead>
<tr>
<th>Zulässiger Bereich der Umgebungstemperatur</th>
<th>- 20 °C bis 60 °C</th>
</tr>
</thead>
</table>

Typ TAG 1.-...
TAG-Stromkreis (Anschlüsse L,+,-) in der Zündschutzart Eigensicherheit EEx ia IIB
nur zum Anschluss an einen bescheinigten eigensicheren Stromkreis mit folgenden Höchstwerten:
\[ U_0 = 15 \text{ V} \]
\[ I_0 = 300 \text{ mA} \]
\[ P_0 = 1,1 \text{ W} \]
Die wirksame innere Kapazität beträgt: \(\leq 600 \text{ nF}\)
Die wirksame innere Induktivität ist vernachlässigbar klein

Typ TAG 1.-...
TAG-Stromkreis (Anschlüsse G,L,+,-) in der Zündschutzart Eigensicherheit EEx ia IIB
nur zum Anschluss an einen bescheinigten eigensicheren Stromkreis mit folgenden Höchstwerten:
\[ U_0 = 15 \text{ V} \]
\[ I_0 = 300 \text{ mA} \]
\[ P_0 = 1,1 \text{ W} \]
Die wirksame innere Kapazität beträgt: \(\leq 600 \text{ nF}\)
Die wirksame innere Induktivität ist vernachlässigbar klein

Typ TAG 1 ESD.-...
TAG-Stromkreis (Anschlüsse G,L,+,-) in der Zündschutzart Eigensicherheit EEx ia IIB
nur zum Anschluss an einen bescheinigten eigensicheren Stromkreis mit folgenden Höchstwerten:
\[ U_0 = 15 \text{ V} \]
\[ I_0 = 300 \text{ mA} \]
\[ P_0 = 1,1 \text{ W} \]
Die wirksame innere Kapazität beträgt: \(\leq 100 \text{ nF}\)
Die wirksame innere Induktivität ist vernachlässigbar klein
Typ TAG 1Z-... bzw. Typ TAG 1-... mit vorgeschalteter Schutzschaltung Typ 3Z-....

TAG-Stromkreis(e) (Anschlüsse +,-) in der Zündschutzart Eigensicherheit EEx ia IIB
nur zum Anschluss an einen bescheinigten eigensicheren Stromkreis mit folgenden Höchstwerten:

\[ \begin{align*}
U_o &= 15 \text{ V} \\
I_o &= 400 \text{ mA} \\
P_o &= 1,475 \text{ W}
\end{align*} \]

Die wirksame innere Kapazität beträgt: \(\leq 600 \text{ nF}\)

Die wirksame innere Induktivität ist vernachlässigbar klein

Die Höchstwerte ergeben sich aus der Zusammenschaltung des TAG-Stromkreises des NOMIX-Steuergerätes und eines eigensicheren Stromkreises (z.B. Erdungstestgerätes) mit folgenden Höchstwerten:

\[ \begin{align*}
U_o &= 15 \text{ V} \\
I_o &= 100 \text{ mA} \\
P_o &= 0,375 \text{ W}
\end{align*} \]

Typ TAG 1.-P....

TAG-Stromkreis (Anschlüsse 1,2,3,4) in der Zündschutzart Eigensicherheit EEx ia IIB
nur zum Anschluss an einen bescheinigten eigensicheren Stromkreis mit folgenden Höchstwerten:

\[ \begin{align*}
U_o &= 15 \text{ V} \\
I_o &= 300 \text{ mA} \\
P_o &= 1,1 \text{ W}
\end{align*} \]

Die wirksame innere Kapazität beträgt: \(\leq 600 \text{ nF}\)

Die wirksame innere Induktivität ist vernachlässigbar klein

(16) Prüfungsunterlagen sind im Prüfbericht Nr. 02 YEX 550234 aufgelistet.

(17) Besondere Bedingung

keine

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

keine zusätzlich
EG-Baumusterprüfbescheinigung

Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - Richtlinie 94/9/EG.

EG Baumusterprüfbescheinigungsnummer

TÜV 02 ATEX 1982

Gerät: Niveau-Sensor Typ S-NS-2.....
Hersteller: F.A. Sening GmbH
Anschrift: D-25474 Ellerbek, Regentstraße 1

Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.


Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht Nr. 02.YEX 502035 festgelegt.

Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit


Falls das Zeichen "X" hinter der Bescheinigungsziffer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf Konzeption und Prüfung des festgelegten Gerätes gemäß Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen dieses Gerätes. Diese Anforderungen werden nicht durch diese Bescheinigung abgedeckt.

Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

II 1 G Ex ia IIB T4

Hannover, 19.12.2002

Der Leiter

Diese EG-Baumusterprüfbescheinigung darf nur unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung der TÜV NORD CERT GmbH & Co. KG
(13) A N L A G E

(14) EG-Baumusterprüfbescheinigung Nr. TÜV 02 ATEX 1982

(15) Beschreibung des Gerätes

Der Niveau-Sensor Typ S-NS-2..... dient als optoelektronische Einrichtung zur Feststellung von Restmengen in Tanks von Tankfahrzeugen.

Technische Daten

<table>
<thead>
<tr>
<th>Zulässiger Bereich der Umgebungstemperatur</th>
<th>-20 °C bis 60 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Versorgungs- und Signalstromkreis</td>
<td>in der Zündschutzart Eigensicherheit EEx ia IIB</td>
</tr>
<tr>
<td></td>
<td>nur zum Anschluss an bescheinigte eigensicheren Stromkreise mit folgenden Höchstwerten:</td>
</tr>
<tr>
<td></td>
<td>$U_0 = 7,5$ V</td>
</tr>
<tr>
<td></td>
<td>$I_0 = 45$ mA</td>
</tr>
<tr>
<td></td>
<td>$P_0 = 85$ mW</td>
</tr>
</tbody>
</table>

Die wirksame innere Induktivität und Kapazität sind vernachlässigbar klein.

(16) Prüfungsunterlagen sind im Prüfbericht Nr. 02 YEX 550235 aufgelistet.

(17) Besondere Bedingung

Keine;

die folgenden Bedingungen sind bei der Installation und beim Betrieb zu beachten:

Der Druck im Tank und der Temperaturbereich der Flüssigkeiten muss bei Anwendungen, die Kategorie-1-Betriebsmittel erfordern, zwischen 0,8 bar bis 1,1 bar und -20 °C bis 60 °C liegen.

Der Niveau-Sensor, der als Leermelder eingesetzt wird, darf nur lotgerecht an der Behälterunterseite angebracht werden.

Der Niveau-Sensor ist mit dem 1,5fachen max. möglichen Betriebsdruck auf Dichtheit zu prüfen.

Der Niveau-Sensor ist in die wiederkehrende Druckprüfung des Behälters mit einzubeziehen.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

keine zusätzlichen
Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

KONFORMITÄTSBEScheinigung

PTB Nr. Ex-00.E.2131

(3) Diese Bescheinigung gilt für das elektrische Betriebsmittel Überwachungssensor Typ INS 1...

(4) der Firma F.A. Sening GmbH
D-25470 Ellerbek

(5) Die Bauart dieses elektrischen Betriebsmittels sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Konformitätsbescheinigung festgelegt.


Elektrische Betriebsmittel für explosionsgefährdete Bereiche

EN 50014:1992
EN 50020:1994

nachdem das Betriebsmittel mit Erfolg einer Bauartprüfung unterzogen wurde. Die Ergebnisse dieser Bauartprüfung sind in einem vertraulichen Prüfprotokoll festgelegt.

(7) Das Betriebsmittel ist mit folgender Kennzeichnung zu versehen:

EEx ia IIC T4

(8) Der Hersteller ist dafür verantwortlich, daß jedes derart gekennzeichnete Betriebsmittel in seiner Bauart mit den in der Anlage zu dieser Bescheinigung aufgeführten Prüfungsunterlagen übereinstimmt und daß die vorgeschriebenen Stückprüfungen erfolgreich durchgeführt wurden.


Im Auftrag

Dr.-Ing. Wehinger
Direktor und Professor


ANLAGE
zur Konformitätsbescheinigung PTB Nr. Ex-00.E.2131

Der Überwachungssensor Typ INS 1... dient zur Kontrolle von metallischen Teilen z.B. Klappen, Ventilen, Hebbern und Schaltern im explosionsgefährdeten Bereich.

Der zulässige Umgebungstemperaturenbereich beträgt –60 °C bis +85 °C.

Elektrische Daten

Versorgungs- und Signalstromkreis: in Zündschutzart Eigensicherheit EEx ia IIC bzw. EEx ia IIB bzw. EEx ib IIC bzw. EEx ib IIB Nur zum Anschluß an einen bescheinigten eigensicheren Stromkreis.

Höchstwerte:

\[ U_i = 16 \text{ V} \]
\[ I_i = 76 \text{ mA} \]
\[ P_i = 242 \text{ mW} \]
\[ L_i = 50 \mu \text{H} \]
\[ C_i = 30 \text{ nF} \]

Prüfungsunterlagen

1. Beschreibung (3 Blatt) 
2. Zeichnung Nr. 44-Ex-001.0
44-Ex-002.0

unterschrieben am

2000-01-13
2000-01-13
2000-01-13

Im Auftrag

Dr.-Ing. Wehinger
Direktor und Professor

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

Contact information is subject to change. For the most current contact information, visit our website at www.fmctechnologies.com/measurementsolutions and click on the “Contact Us” link in the left-hand column.

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- Burnham, England +44 (1628) 603205
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- Los Angeles, CA USA +1 (310) 328 1236
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