Operating instructions
SEEPEX Pump Monitor (SPM)

Type
SPMXXT001Vxxx
SPMXXT002Vxxx
SPMXXT005Vxxx
SPMXXT006Vxxx
SPMXXT007Vxxx
SPMXXT008Vxxx
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1. Notes on these instructions

1.1 Validity of these instructions

This manual applies exclusively to devices bearing the type code specified on the cover page.

1.2 Other relevant documents

<table>
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<th>Manufacturer / type</th>
<th>Documentation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEEPEX SPM</td>
<td>Installation instructions</td>
<td>Installation instructions for the SEEPEX SPM</td>
</tr>
</tbody>
</table>

1.3 Symbols, notes and abbreviations

1.3.1 Information symbols

<table>
<thead>
<tr>
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<th>Application</th>
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<tr>
<td>➤</td>
<td>Instruction/measure</td>
</tr>
<tr>
<td>–</td>
<td>Supplementary instruction/measure</td>
</tr>
<tr>
<td>•</td>
<td>List item</td>
</tr>
<tr>
<td>![i]</td>
<td>Information</td>
</tr>
<tr>
<td>→</td>
<td>Cross-reference</td>
</tr>
</tbody>
</table>

1.3.2 Abbreviations

Abbreviations facilitate readability in drawings. These abbreviations are explained below:

<table>
<thead>
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<th>Abbreviation</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FI</td>
<td>Frequency inverter</td>
</tr>
<tr>
<td>SPM</td>
<td>SEEPEX Pump Monitor</td>
</tr>
</tbody>
</table>
2. Safety

2.1 Safety-related Information

SEEPEX devices are built in accordance with the state of the art. Nevertheless, there is residual risk, as the devices operate with electric voltage and currents, as well as with communication interfaces.

2.2 Designated use

The Pump Monitor is a device intended for the status monitoring of SEEPEX pumps during operation. This is performed by means of sensors which are assembled on and near the pump. The measured values are processed in order to provide the operator with early indication of the occurrence of any defects or deviations.

The measured values as determined can be stored in the device or transferred to the cloud platform SEEPEX Connected Services.

- Use the Pump Monitor for the status monitoring of SEEPEX pumps during operation.
- The Pump Monitor is assigned to a pump, as well as to individual components using the serial number of the Pump Monitor. Operate the Pump Monitor only with the assigned components.
  - Read the serial number on the type plate of the device or view it in the user interface.
- Operate the Pump Monitor only under the environmental conditions described in the technical data.

2.3 Foreseeable misuse

Any use other than the intended use or any other type of use of the Pump Monitor is regarded as misuse and could lead to serious physical injury or material damage of the Pump Monitor.

In particular, the following is not permitted:

- Use of the output signals of the Pump Monitor for process control. The Protection Stop is an exception to this (see → chapter "Sub-menu "Set sensors").
- Improper operations or modifications of the Pump Monitor could compromise safety and may damage the device. Do not repair the Pump Monitor yourself. Contact SEEPEX and coordinate any further action.
- Outdoor installation of the Pump Monitor without weather protection cover.
- Use of the Pump Monitor in ATEX areas.
2.4 Qualification of the personnel

In-depth expert knowledge is an indispensable requirement for any work on the Pump Monitor, in order to be able to identify and avoid potential hazards independently.

- The operator of the Pump Monitor must have specialist skills in handling control equipment.
- For other necessary information on qualifications, refer to the relevant documents and the sensor manufacturer’s documentation.
3. Description of the Pump Monitor

The use of the Pump Monitor creates an intelligent field device from the pump, which constantly monitors itself. Connected to flexibly combinable sensors, live data, such as temperature, pressure, flow rate, etc., are measured, displayed and evaluated. In addition, all data can be recorded for later analysis.

A signal light on the casing of the Pump Monitor displays the current pump and system status using different signal colours. For detailed analyses, the user can inspect the actual as well as the recorded measured values of the pump via a Bluetooth connection and the SEEPEX Pump Monitor App. Optionally, these measured values can also be read directly via a touch panel on the Pump Monitor.

The user can set individual warning and alarm thresholds in a multi-stage notification model, in order to be informed about deviations of the pump from the set behaviour. Optionally, the Pump Monitor can be attached to the local process control. In this way, alarms can be displayed, for example, in the control system, in order to make the pump condition operation accessible to the maintenance staff.

The optional additional functionality “Mobile Notification Service” can send warning and alarm messages from the system via email or SMS to mobile devices using push message. In this way, for example, the following problems can be detected:
• Drop in flow rate
• Stator/conveying product temperature too high
• Leakage
• Pump standstill
• Wear, etc.

A variety of sensors can be used on the Pump Monitor (SPM) for recording measured values, e.g.:
• Pressure sensor
• Temperature sensor
• Leakage sensor
• Flow meter
• Vibration sensor
• Level sensors
• Frequency inverter (digital data, such as speed, frequency, torque, power consumption, release time, etc.).
4. Operation and control of the Pump Monitor

The Pump Monitor is designed to record and evaluate pump data. During operation, this data can be displayed and analysed in various menus. This chapter describes the structure and function of the individual menus. In addition, various settings can be performed on the Pump Monitor, which are also described here.

4.1 Measures to be taken before switching on the Pump Monitor

- Note the required switch position before switching on the Pump Monitor.
  - To operate the Pump Monitor without a touch panel, enable Bluetooth.

- Select switch position to switch off the Bluetooth connection.
  Use of a touch panel on the Pump Monitor also possible.

- Select switch position for connecting with a Bluetooth device.
  Necessary if there is no touch panel available on the Pump Monitor.

- For future maintenance purposes. Bluetooth connections possible.
4. Operation and control of the Pump Monitor

4.2 Structure of user interface

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display range - Live data</td>
</tr>
<tr>
<td>2</td>
<td>Status bar</td>
</tr>
<tr>
<td>3</td>
<td>Open menu bar</td>
</tr>
<tr>
<td>4</td>
<td>System bar</td>
</tr>
</tbody>
</table>

![Figure similar](image-url)
4.3 Structure of menu bar

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tag name of the pump and the Pump Monitor</td>
</tr>
<tr>
<td>2</td>
<td>“Live data” menu (homepage)</td>
</tr>
<tr>
<td>3</td>
<td>“History” menu</td>
</tr>
<tr>
<td>4</td>
<td>“Event log” menu</td>
</tr>
<tr>
<td>5</td>
<td>“Information” menu</td>
</tr>
<tr>
<td>6</td>
<td>“Configuration” menu (available in the technician and admin user profile)</td>
</tr>
<tr>
<td>7</td>
<td>“App settings” menu</td>
</tr>
<tr>
<td>8</td>
<td>Information on SEEPEX</td>
</tr>
</tbody>
</table>

4.3.1 “Live data” menu

The “Live data” menu is the homepage of the Pump Monitor application. The live data of the connected sensors and the status of the pump and the system are displayed here.
4. Operation and control of the Pump Monitor

### 4.3.2 “History” menu

In the “History” menu, various graphs of measured values of selectable sensors are displayed.

<table>
<thead>
<tr>
<th>Item</th>
<th>Icon</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Current data of 3 selectable sensors</td>
</tr>
</tbody>
</table>
| 2    | ![Settings](settings-icon.png) | Settings button (available in the technician and admin user profile)  
- Click on settings button and go to the configuration menu “Set display”.  
  - Observe Chapter → "Sub-menu “Set display”".  
- Select sensors whose measured values need to be displayed on the homepage.  
  - Observe Chapter → "Sub-menu “Set sensors”".  
- Click on “Back” button to return to “History” menu. |
| 3    | ![Status](status-icon.png) | Status of the pump and the Pump Monitor application:  
- **Status Normal**  
  - Faultless operation of pump and control.  
- **Status Protection stop**  
  - Malfunction in the conveying process of the pump. Remove fault to disable protection stop.  
- **Status System fault**  
  - Fault in software or hardware of Pump Monitor. Remove fault to ensure proper operation of Pump Monitor. Contact SEEPEX, if required. |
4. Operation and control of the Pump Monitor

4.3.3 “Event log” menu

In the “Event log” menu, various events, which are described below, are logged.
4. Operation and control of the Pump Monitor

4.3.4 “Information” menu

In the “Information” menu, the most important data of the pump and the Pump Monitor are displayed.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Log for changes in the sensor settings</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Information on a started service of the Pump Monitor</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Alert</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Warning of impending fault</td>
</tr>
</tbody>
</table>
4. Operation and control of the Pump Monitor

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Technical data of the pump</td>
</tr>
<tr>
<td>2</td>
<td>System data of the Pump Monitor</td>
</tr>
<tr>
<td>3</td>
<td>Debug information (available in the admin user profile)</td>
</tr>
</tbody>
</table>

Figure similar
4. Operation and control of the Pump Monitor

4.3.5 “Configuration” menu (technician/admin)

The “Configuration” menu contains various sub-menus in which a detailed configuration of the signal inputs can be carried out. The following figure shows an overview of the configuration menu:

![Configuration menu]

Sub-menu “Set display”

In the “Set display” sub-menu, all sensors, which are read by the Pump Monitor, are listed. In this menu, the display of sensor data in the “Home” and “History” menu can be selected.

![Set display sub-menu]
4. Operation and control of the Pump Monitor

<table>
<thead>
<tr>
<th>Display sensor data</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Click and move the slider to select sensors for the live data display on the homepage.</td>
</tr>
<tr>
<td>➢ Slider to the right and red means enabled.</td>
</tr>
<tr>
<td>➢ Slider to the left and grey means disabled.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Display measured values in the “History” menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Select sensors by clicking and moving the slider, so as to have the measured values displayed in the graph.</td>
</tr>
<tr>
<td>➢ Slider to the right and marked red means enabled.</td>
</tr>
<tr>
<td>➢ Slider to the left and marked grey means disabled.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Change sequence on homepage</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Click on “Change sequence” button and move the entire line up or down to the desired position.</td>
</tr>
</tbody>
</table>

Sub-menu “Set pump tag”

The tag name can be changed in the “Change pump tag” sub-menu.

Change pump tag and commission No. of the pump

➢ Click on line “Tag” (1) or “Commission No.” (1) to open the keyboard and change the input (2).
➢ Click on “Save” button (3) to save process.

Sub-menu “Set sensors”

The “Set sensors” sub-menu contains a list of all sensors.
4. Operation and control of the Pump Monitor

➢ To change the setting of the sensors, click on the line with the corresponding sensor designation.
  ➢ Menu for setting the sensors opens.

➢ To record data of the sensor, click on the tick (1) in the check box to enable this.
  ➢ The data of the sensor is displayed in the “History” menu as a curve.

➢ To change the recording interval [s], click on “Arrow up” and “Arrow down” buttons (2) until the desired value appears.

➢ Finally, click on “Save” button to save input.
4. Operation and control of the Pump Monitor

Add data for cloud upload

- To add data of the sensor to cloud upload, click on the tick (1) in the check box to enable this.
  - The data of the sensor is uploaded to the cloud at specific intervals.
- To change the recording interval, click on “Arrow up” and “Arrow down” buttons (2) until the desired value appears.
- Finally, click on “Save” button to save input.

Set the threshold values of the selected sensor

The threshold value checks can be enabled using the check boxes in the “Alarm” and “Warning” lines. These lead to the creation of events which are displayed in the “Event log” menu when the values are exceeded or undershot:

<table>
<thead>
<tr>
<th>Type of alert</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning</td>
<td>A possible malfunction lies ahead</td>
</tr>
<tr>
<td>Alarm</td>
<td>Malfunction occurs</td>
</tr>
</tbody>
</table>

Set alarm

- To have malfunctions displayed in the “Event log” menu, click on the tick in the check box (1) to enable this.
- Set minimum and maximum threshold values for the “Alarm” message on the slider (2).
  - Click on the points of the slider (2) and move to desired position or enter the desired value by typing the numerical values (3) using the keyboard.
  - The set values on the slider (2) are displayed as a numerical value (3).
- Click on “Save” button to save process.
4. Operation and control of the Pump Monitor

Set warning

- To have warnings displayed in the “Event log” menu, click on the tick in the check box (4) to enable this.
- Set minimum and maximum threshold values for the “Warning” message on the slider (5).
  - Click on the points of the slider (5) and move to the desired position.
  - The set values on the slider (5) are also displayed as a numerical value (6).
  - The admissible values lie within the threshold values for the “Warning” message.
- Click on “Save” button to save process.

Set widget

The display of sensor values on the homepage and in the “History” menu can be displayed in the Pump Monitor in different ways.

Change display

- To change the display of the sensor values on the homepage of the sensors, click on the pull-down menu in the line “Type” (1).
  - A pull-down menu opens.
- Select type “Standard” (1.1) (numerical values) or “Tachometer” (1.2).
- Click on “Save” button to save process.
4. Operation and control of the Pump Monitor

Change colour

- To change the colour display of the sensor values in the “History” menu, click on the colour field (2.1) in the line “Colour” (2).
  - A pull-down menu opens.
- Select desired colour and confirm input.
- Click on “Save” button to save process.

Sub-menu “Set notifications”

- In the “Set notifications” sub-menu, communication channels for notifications during malfunctions and warnings can be set.

For a notification during malfunctions and warnings via email or SMS, enter email address and/or mobile number in the fields provided for the same.
  - Only one email address and one mobile number can be specified.
  - Enter mobile number in an international format (e.g. +49 1234 5678910)
- Click on “Save” button to save input.
Sub-menu “Data export”

In the “Data export” sub-menu, the data recorded can be read out of the Pump Monitor.

- To export the data from the Pump Monitor, click on the line “Data export” (1).
  - “Data export” window opens.
- Click on “OK” to confirm data export or cancel the process with “Cancel”.
  - If “OK” is clicked, the export file is saved at the selected location as SQLite file.
4. Operation and control of the Pump Monitor

Sub-menu “Restore factory setting”

The Pump Monitor can be reset to the delivery state using the “Restore factory setting” button.

- Click on “Restore factory setting” button (1) to select this.
  - Selection window opens
- Click on the tick in the check box “Configuration” (2) to enable this, to reset all configurations (e.g., threshold values, curves, settings).
- Click on the tick in the check box “Data” (3) to enable this, to reset all saved data (events, measurements).
- Confirm selection by clicking on “OK” or cancel with “Cancel”.

Figure similar

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4. Operation and control of the Pump Monitor

Sub-menu “Restart devices”

The Pump Monitor can be restarted in the “Restart device” sub-menu.

- To restart the Pump Monitor, click on “Restart device” line (1).
  - “Restart device” window opens.
- Click on “Yes” to confirm restart or cancel the process with “No”.

4.3.6 “App settings” menu

In the “App settings” menu, the operating options of the Pump Monitor for different user groups are determined and the selection of the language is specified.

Change user groups

The Pump Monitor distinguishes different user groups:
- User
- Technician
- Admin
4. Operation and control of the Pump Monitor

- Click on line “Change pump access data” (1) to change user group.
- Enter user group and password and save with “Save” or cancel the process with “Cancel”.

Change language
The following languages can be selected:
- English
- German
- French

- To change the language in the Pump Monitor, click on the button with the language name (e.g., English) in the line “Language” (2) and select the desired language in the menu or cancel the process with “Cancel”.

Figure similar
5. Malfunctions, causes and rectifications

Malfunctions of the locally installed components
- Note the specifications and instructions on troubleshooting in the corresponding manufacturer documentation.
- Contact SEEPEX if the malfunction can not be rectified using the previously mentioned measures.

Malfunctions when using the cloud or the SEEPEX database or when sending messages
- Please contact SEEPEX.

A malfunction in the Pump Monitor has no influence on the customer process except the protection stop by the selected sensors. It can be operated further without restriction.
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