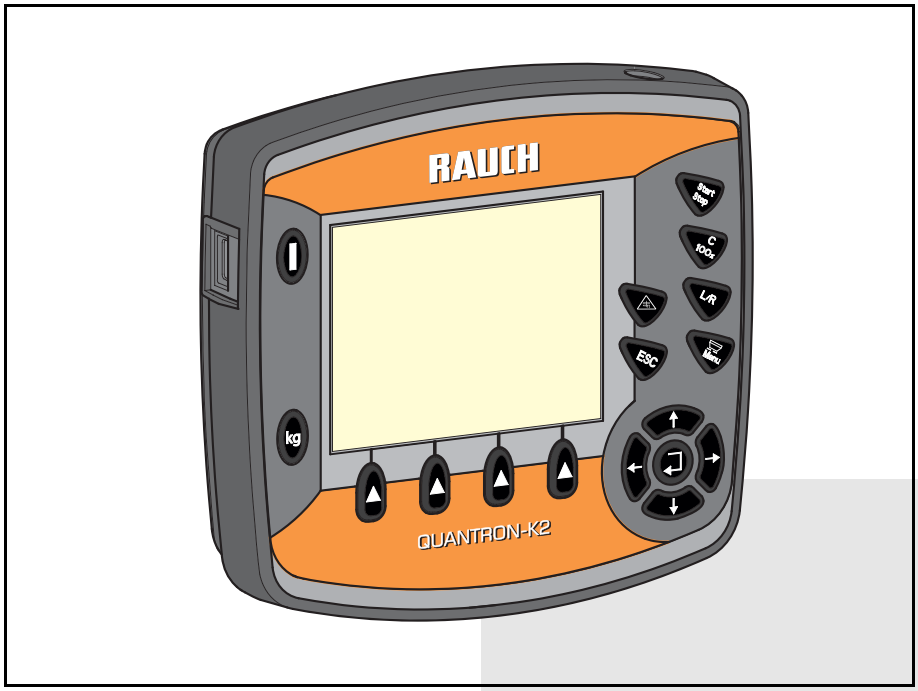
RAUCH

wir nehmen's genau

OPERATION MANUAL



Please read carefully before using the machine.

Keep for future reference.

This instruction manual/assembly instruction is to be considered as part of the machine. Suppliers of new and second-hand machines are required to document in writing that the instruction manual/assembly instruction was delivered with the machine and handed over to the customer.

QUANTRON K2

Original manual

5901382-b-en-0215

Preface

Dear customer

By purchasing the QUANTRON-K2 **control unit** for the AXEO winter spreader, you have shown confidence in our product. Thank you! We would like to justify this confidence. You have purchased a reliable, high-performance **control unit**. If, contrary to expectations, any problems occur: our customer service is always there for you.

Please read this operator's manual as well as the operator's manual of the winter spreader carefully before commissioning, and follow the advice given. Thisoperator's manual explains in detail how to operate the spreader and contains important information on operation, care and maintenance.

This manual may also describe equipment that is not included in your control unit.

You should be aware that damage caused by incorrect operation or improper use may not be covered by warranty claims.

NOTICE

Note the serial number of the control unit and of the machine.

The QUANTRON-K2 control unit has been calibrated at the factory for the winter spreader with which it was supplied. It cannot be connected to another winter spreader without requiring calibration.

Please always state this information when ordering spare parts or accessories, and in case of complaints.

Type	Serial number	Year of construction

Technical improvements

We are continuously improving our products. Therefore, we reserve the right to make any improvements and changes to our machine that we consider necessary without notice. This constitutes no obligation to make such improvements or changes on machines that have already been sold.

We will be pleased to answer any other questions that you might have.

Yours sincerely

RAUCH

Landmaschinenfabrik GmbH

1 User instructions

1.1 About this operator's manual

This operator's manual is an **integral part** of the control unit **QUANTRON-K2**.

The operator's manual contains important instructions for **safe**, **proper** and **economic use** and **maintenance** of the control unit. Compliance with its stipulations helps to **avoid risks**, reduce maintenance costs and downtime and to increase the machine's reliability and service life.

The operator's manual is a part of the machine. The complete documentation must be kept in an easily accessible location close to where the control unit is used (e. g. on the tractor).

The operator's manual does not replace your **own responsibility** as the operator and operating personnel of the QUANTRON-K2 control unit.

A quick reference guide is included in the scope of delivery of the QUANTRON-K2 control unit. If it is not included in the scope of delivery, please inform us.

1.2 Notes on the depiction of information in this manual

1.2.1 Significance of warnings

The warning instructions in this manual have been structured according to the degree of danger and the probability of their occurrence.

Danger signs and symbols inform the user about other construction-related and unavoidable residual risks that may be encountered when operating the machine. The warning notes used are structured as follows:

	Signal word
Symbol	Explanation

Example

⚠ DANGER

Risk to life if warning is not observed

Description of the danger and possible consequences.

Ignoring these warnings will result in very serious or even fatal injury.

▶ Measures to prevent the danger.

Warning severity level

The degree of danger is indicated by the signal word. The levels are classified as follows:

⚠ DANGER

Type and source of danger

This warning warns of a danger posing an immediate threat to the health and life of persons.

Ignoring these warnings will result in very serious or even fatal injury.

- ▶ Always observe the measures described to prevent this danger.

⚠ WARNING

Type and source of danger

This warning warns of a possible dangerous situation for the health of persons.

Ignoring these warnings will result in very serious injury.

- ▶ Always observe the measures described to prevent this danger.

⚠ CAUTION

Type and source of danger

This warning warns of a potentially dangerous situation for personal health or of material and environmental damage.

Ignoring this warning can result in injuries and damage to the product or the general area.

- ▶ Always observe the measures described to prevent this danger.

NOTICE

General information containing application tips and particularly useful information, but which constitutes neither warnings nor hazards.

1.2.2 Instructions and procedures

Steps that the operator must carry out are shown as a numbered list.

1. Instruction for action step 1
2. Instruction for action step 2

Instructions involving only one step are not numbered. The same applies for action steps that do not have a specific sequence.

A bullet is placed in front of these instructions:

- Handling instruction

1.2.3 Listings

Listings without a specific sequence are shown with bullet points (level 1) and dashes (level 2):

- Property A
  - Point A
  - Point B
- Property B

1.2.4 References

References to other text passages in the document are indicated with section number, headline text and page number:

- **Example**: See also Chapter 3: Safety, page 5.

References to other documents are indicated as note or instruction without exact chapter or page number:

- **Example**: Please also observe the instructions contained in the manual for the universal drive shaft.

1.2.5 Menu hierarchy, keys and navigation

Menus describe the entries listed in the **main menu** window.

In the menus, **submenus and/or menu items** are listed where you can make settings (selection lists, text or number entries, starting functions).

The different menus and keys of the control unit are illustrated in **bold** letters:

- Access the highlighted submenu by pressing the **Enter key**.

Hierarchy and the path to the requested menu item are marked with **>** (arrow) between menu, menu items:

- **System / Test > Test/Diagnosis > Voltage** means that you can access the menu item **Voltage** via the **System / Test** menu and the **Test/Diagnosis** menu item.
  - The arrow **>** correpsonds to confirmation with the **Enter key**.

2 Layout and function

2.1 Overview of supported AXEO versions

- AXEO 2.1 Q
- AXEO 2.1 Q-100
- AXEO 2.1 Q-100 HC

- AXEO 6.1 Q
- AXEO 6.1 Q-100
- AXEO 6.1 Q-100 HC

- AXEO 18.1 Q
- AXEO 18.1 Q-200
- AXEO 18.1 Q-200 HC

2.2 Layout of the control unit - overview

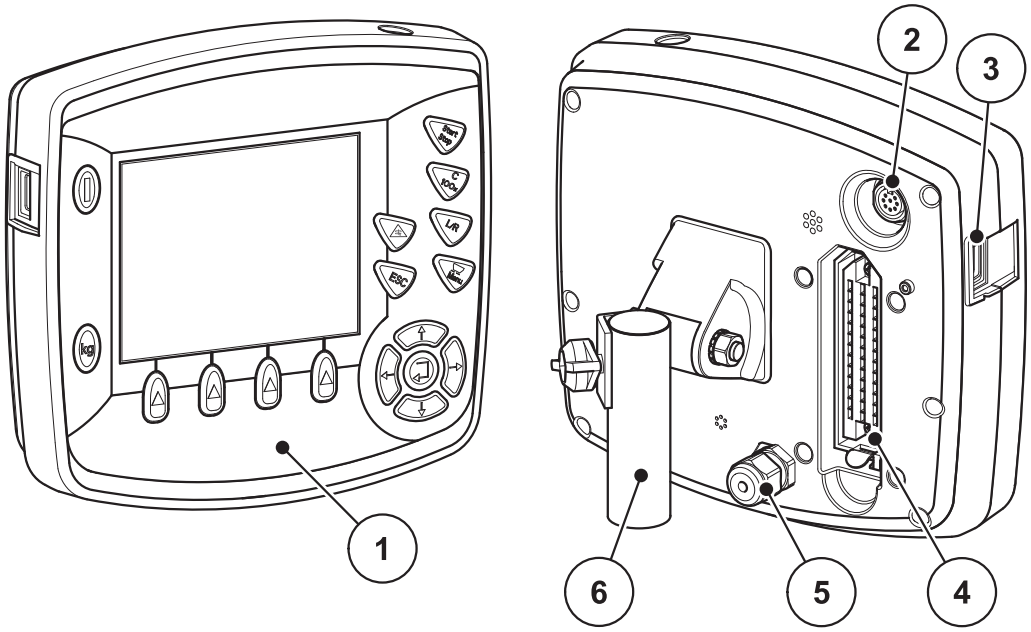


Figure 2.1: Control unit QUANTRON-K2

No.	Designation	Function
1	Operating panel	Consisting of foil buttons used to operate the device and the display for operating screens.
2	V24 data port	Serial interface (RS232) with LH 5000, designed for connecting a Y-RS232 cable for connection to a remote terminal. Plug connector (DIN 9684-1/ISO 11786) for 7-pin to 8-pin cable connection for the speed sensor.
3	USB port with cover	For exchanging data and updating the PC. Cover serves as a protection against contamination.
4	Machine cable plug connector	39-pin plug connector for connecting the machine cable to sensors and actuating cylinders.
5	Power supply	3-pin plug connector conforming to DIN 9680 / ISO 12369 for power supply connection.
6	Mounting bracket	Attaches the control unit to the tractor.

2.3 Control elements

The unit is operated by means of **17 foil buttons** (13 fixed and 4 freely configurable foil buttons).

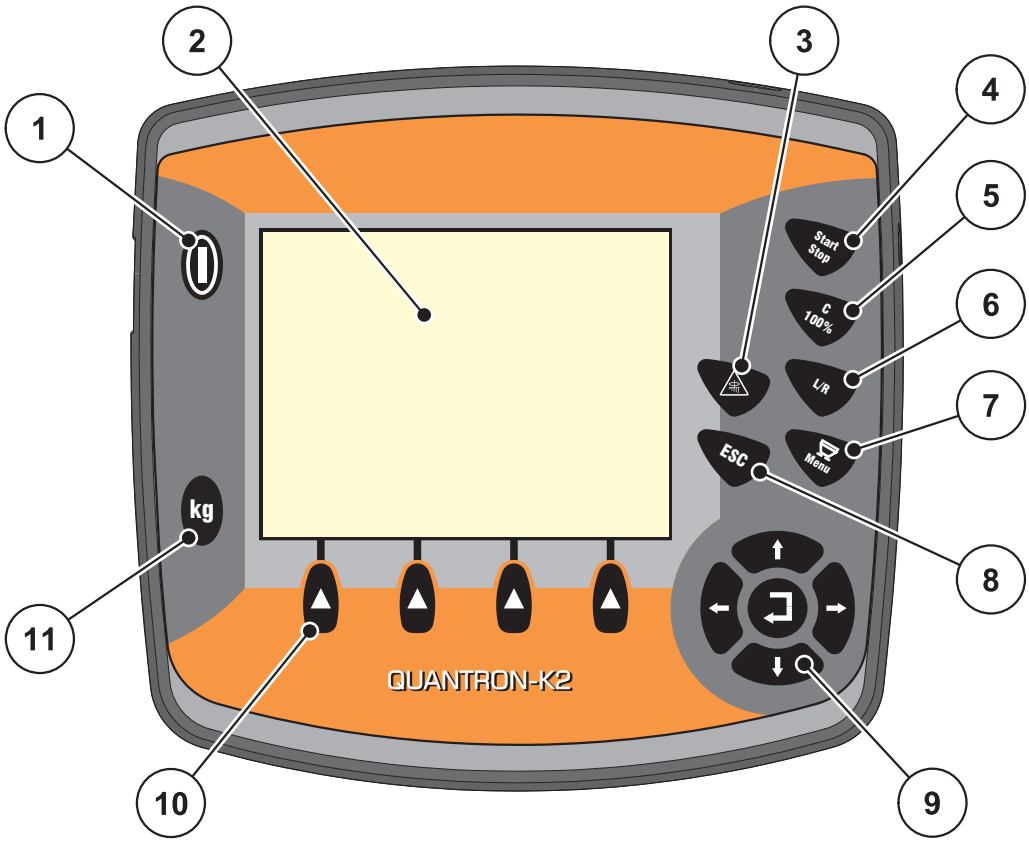


Figure 2.2: Operating panel at the front of the unit

NOTICE

The operator's manual describes the functions of the QUANTRON-K2 control unit **as of software version 1.00.00**.

No.	Designation	Function
1	ON/OFF	Switches the device on/off
2	Display	Display of operating screens
3	Special spreading	• For spreading with a pre-set special spreading quantity (percentage value of the additional quantity during normal spreading operation). • For spreading with simulated speed (starting at a crossing).
4	Start/Stop	Start/stop spreading.

No.	Designation	Function
5	C/100%	● Clearing an input in an input field; ● Resetting the excess quantity to 100%; ● Acknowledging alarm messages.
6	L/R	Switching between three adjustment options of the spreading width limiter plates. ● **L**eft ● **R**ight ● **L**eft **+** **R**ight Or, depending on the configuration, adjustment of: ● Working width ● RPM
7	Menu	Switch between operating screen and main menu.
8	ESC	Cancelling entries and/or returning to the previous menu at the same time.
9	Navigation field	4 **arrow keys** and one **enter key** for navigation through menus and input fields. ● Arrow keys for moving the cursor on the display or for highlighting an input field. ● Enter key to confirm an input.
10	Function keys F1 to F4	Selection of the functions displayed above the function keys.
11	kg	● Display of the remaining quantity in the hopper. ● Trip counter ● kg left ● Metre counter

2.4 Display

The display shows the current status information as well as the selection and input options for the control unit.

The most important information on the operation of the winter spreader is displayed in the **operating screen**.

Description of the operating screen

NOTICE

The exact representation of the operating screen depends on the actual settings selected. Refer to chapter 4.9.2: Display configuration, page 57.

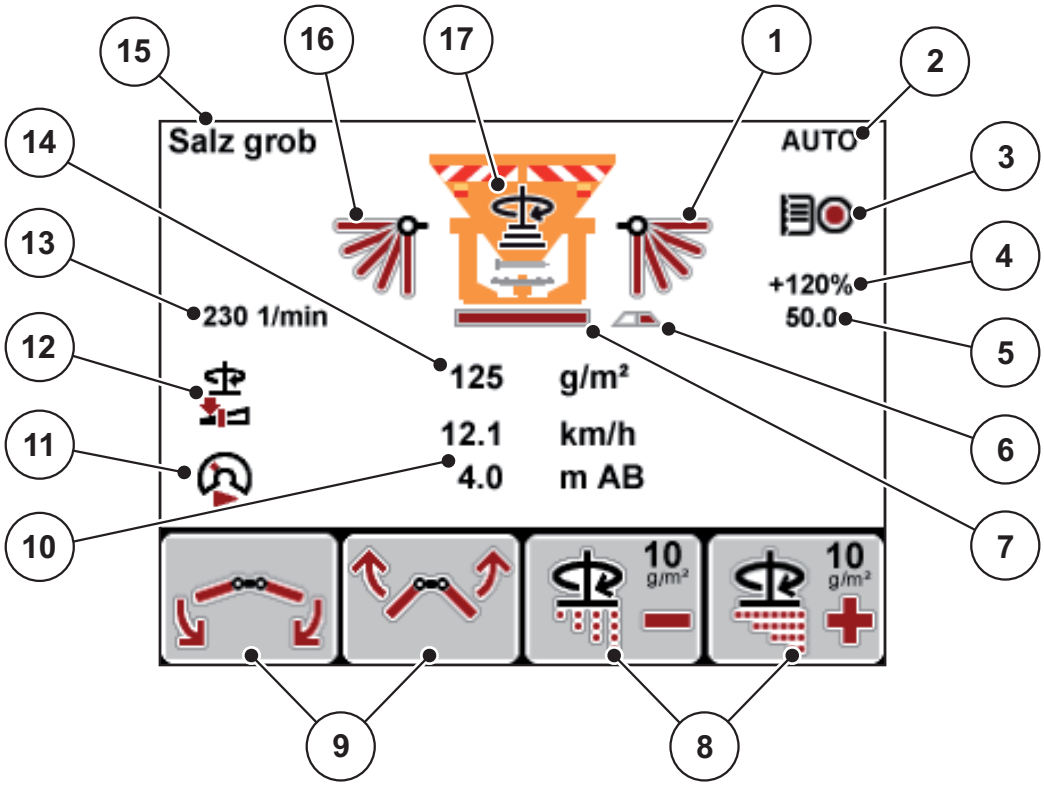


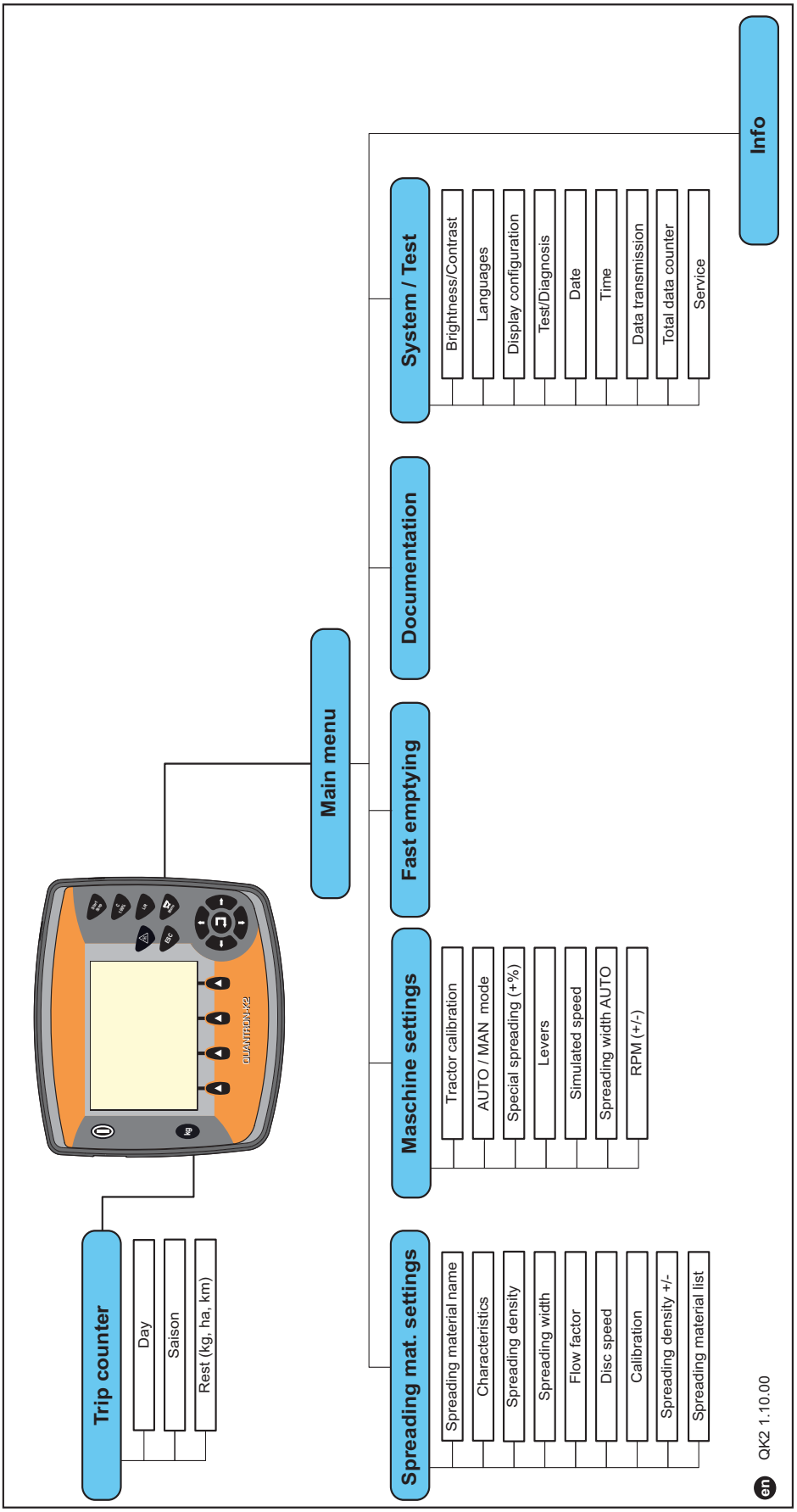
Figure 2.3: Control unit display (example)

The symbols and displays in the example have the following meaning:

No.	Symbol/Display	Meaning (in the example shown)
1	Position of the right spreading width limiter plate	Current open position of the **right** spreading width limiter plate, divided into 5 positions.
2	Operating mode	Display of the set operating mode (MAN scale, MAN km/h, AUTO)
3	Documentation	The symbol is displayed if Documentation is running.
4	Additional quantity, Special spreading	While pressing the **Special spreading** key (see figure 2.2), the additional percentage quantity indicated here is spread.
5	Metering slide position	Display of the metering slide position in a range of **0** to **56**.
6	Half-side slide open/closed	The symbol is displayed if the half-side slide is not in open position.
7	Metering slide open/closed	The frame is illustrated **red** if the metering slide is opened.
8	Spreading density adjustment	Spreading density increase (**+**) and decrease (**-**).
9	Spreading pattern adjustment	Adjustment of the spreading width limiter plates in 5 steps. Depending on the configuration, the following adjustment options are available: ● Only **right** ● Only **left** ● **Right** and **left** simultaneously Or, depending on the configuration, adjustment of: ● Working width ● RPM
10	Display fields	Individually configurable display fields; here, spreading width and speed. ● Possible configuration: see chapter 4.9.2: Display configuration, page 57.
11	Simulated speed	The symbol indicates that the simulated speed is active.
12	Minimum mass flow	Warning during spreading: the spreader works independently of the set spreading density with a minimum mass flow of **5 kg/min**.
13	Spreading disc speed	In the **Hydraulic drive** version, the symbol displays the current spreading disc speed.
14	Spreading density	Displays the set spreading density in grams per square meter (**g/m^2**).

No.	Symbol/Display	Meaning (in the example shown)
15	Spreading material	Display of the set spreading material. The display is limited to 10 characters.
16	Position of the left spreading width limiter plate	Current open position of the **left** spreading width limiter plate, divided into 5 positions.
17	Operational conditions symbol	The symbol is displayed if the single-disc spreader is operational.

2.5 Structural menu overview



3 Attachment and installation

3.1 Tractor requirements

Before installing the control unit, check to make sure the tractor meets the following requirements:

- A minimum voltage of **11 V** must **always** be guaranteed, even if multiple loads are connected simultaneously (e. g. air conditioning system, lights).

NOTICE

On tractors without load-switchable transmission, the forward speed must be selected by using the correct gear ratio in such a way that it corresponds to a PTO speed of 540 rpm.

- A 7-pin socket (DIN 9684-1/ISO 11786). Via this socket, the control unit receives the pulse for the current forward speed.

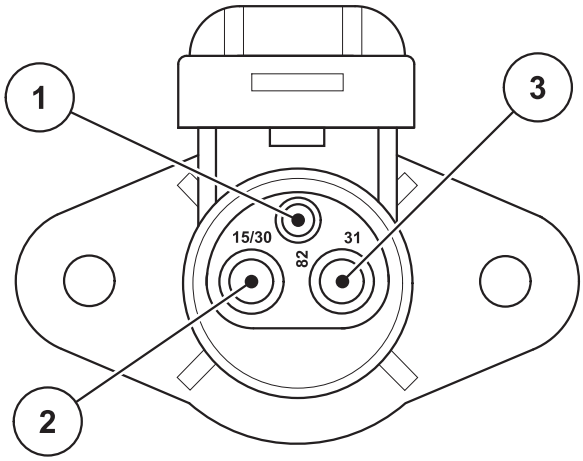
NOTICE

The 7-pin socket for the tractor and the forward speed sensor can be obtained as an expansion kit (option), see chapter on special equipment.

3.2 Connections, sockets

3.2.1 Power supply

The control unit is supplied with power from the tractor via the 3-pin power supply socket (DIN 9680/ISO 12369).

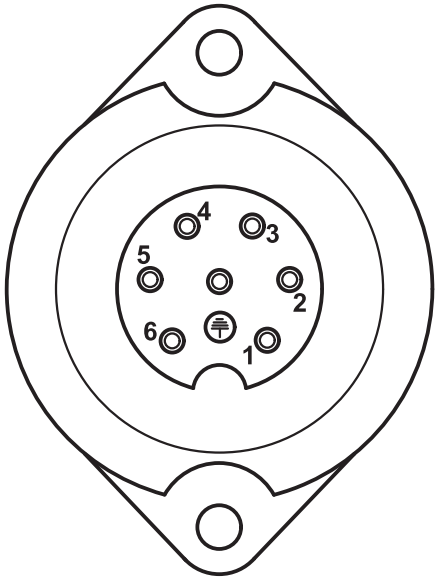


[1] PIN 1: not required
[2] PIN 2: (15/30): +12 V
[3] PIN 3: (31): mass

Figure 3.1: PIN assignment of power socket

3.2.2 7-pin plug connector

The control unit receives the pulses for the current forward speed via the 7-pin plug connector 9684-1/ISO 11786). For this purpose, the 7-pin to 8-pin cable (accessory) is connected to the forward speed sensor at the plug connector.



[1] PIN 1: actual forward speed (radar)
[2] PIN 2: theoretical forward speed (e. g. gearbox, wheel sensor)

Figure 3.2: PIN assignment for 7-pin plug connector

3.3 Connecting the control unit

NOTICE

Note the machine number

The QUANTRON-K2 control unit has been calibrated at the factory for the winter spreader with which it was supplied.

Connect the control unit to the correct winter spreader only.

Depending on the equipment, there are different methods of attaching the control unit to the winter spreader. Schematic connection diagrams:

- for the standard connection, see page 16,
- for the connection with the wheel sensor, see page 17,
- for the connection with the wheel sensor and machine cable, see page 18.

Carry out the process steps in the following order.

- Select a suitable position in the tractor cabin (within **the driver's field of vision**) to fix the control unit.
- Fix the control unit by means of **brackets** in the tractor cabin.
- Connect the control unit to the 7-pin socket or to the forward speed sensor (depending on the equipment, see figure 3.3 to figure 3.5).
- Connect the control unit to the actuators of the machine using the 39-pin machine cable.
- Connect the control unit to the tractor's power supply using the 3-pin plug connector.

Standard schematic connection diagram:

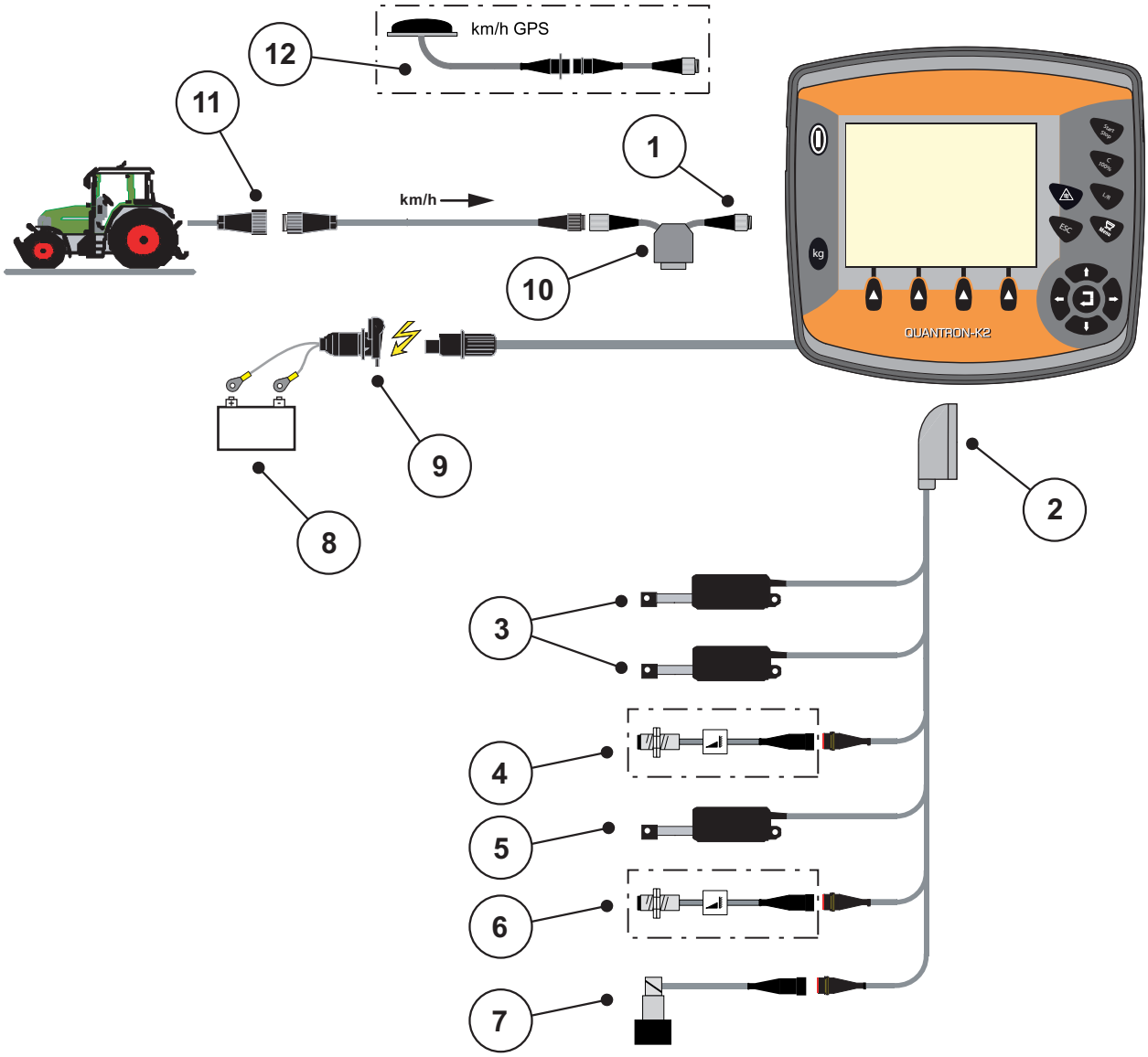


Figure 3.3: Standard schematic connection diagram QUANTRON-K2

[1] Serial interface RS232, 8-pin plug connector
[2] 39-pin machine plug
[3] Spreading width limiter actuators (EFQ-GT or EFG-GE option)
[4] Half-side slide sensor
[5] Metering slide actuator
[6] Spreading disc speed sensor (Hydraulic drive option)
[7] Proportional valve (Hydraulic drive option)
[8] Battery
[9] 3-pole plug connector according to DIN 9680/ISO 12369
[10] Y-cable option (V24 RS232 interface for storage medium)
[11] 7-pin plug connector conforming to DIN 9684
[12] Option (GPS cable and receiver)

Schematic connection diagram for wheel sensor:

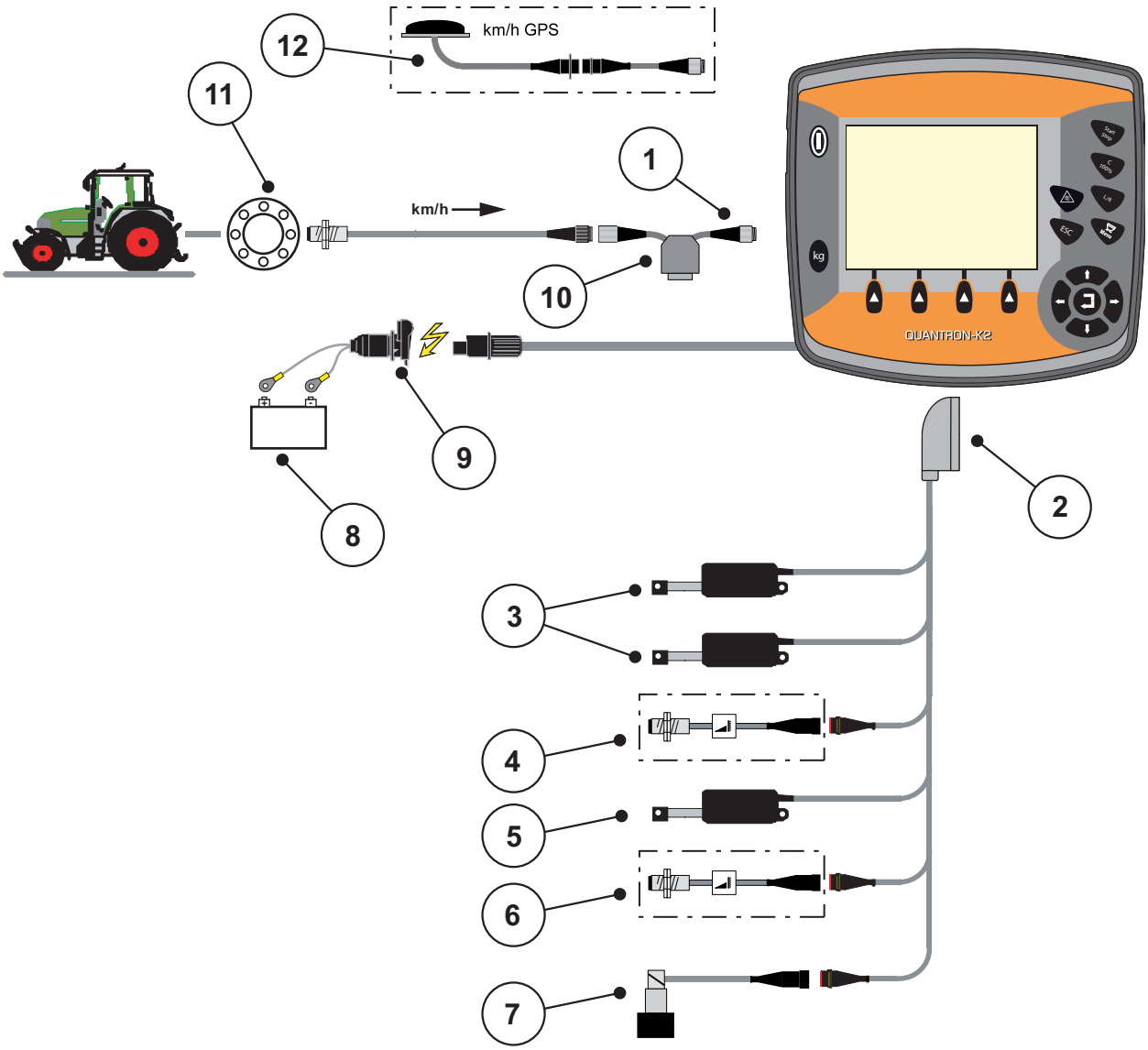


Figure 3.4: Schematic connection diagram QUANTRON-K2 (wheel sensor)

[1] Serial interface RS232, 8-pin plug connector
[2] Spreading width limiter actuators
[3] Spreading width limiter actuators (EFQ-GT or EFG-GE option)
[4] Half-side slide sensor
[5] Metering slide actuator
[6] Spreading disc speed sensor (Hydraulic drive option)
[7] Proportional valve (Hydraulic drive option)
[8] Battery
[9] 3-pin plug connector conforming to DIN 9680 / ISO 12369
[10] Option: Y-cable (V24 RS232 interface for storage medium)
[11] Forward speed sensor
[12] Option: GPS cable and receiver

Schematic connection diagram: Power supply via ignition lock

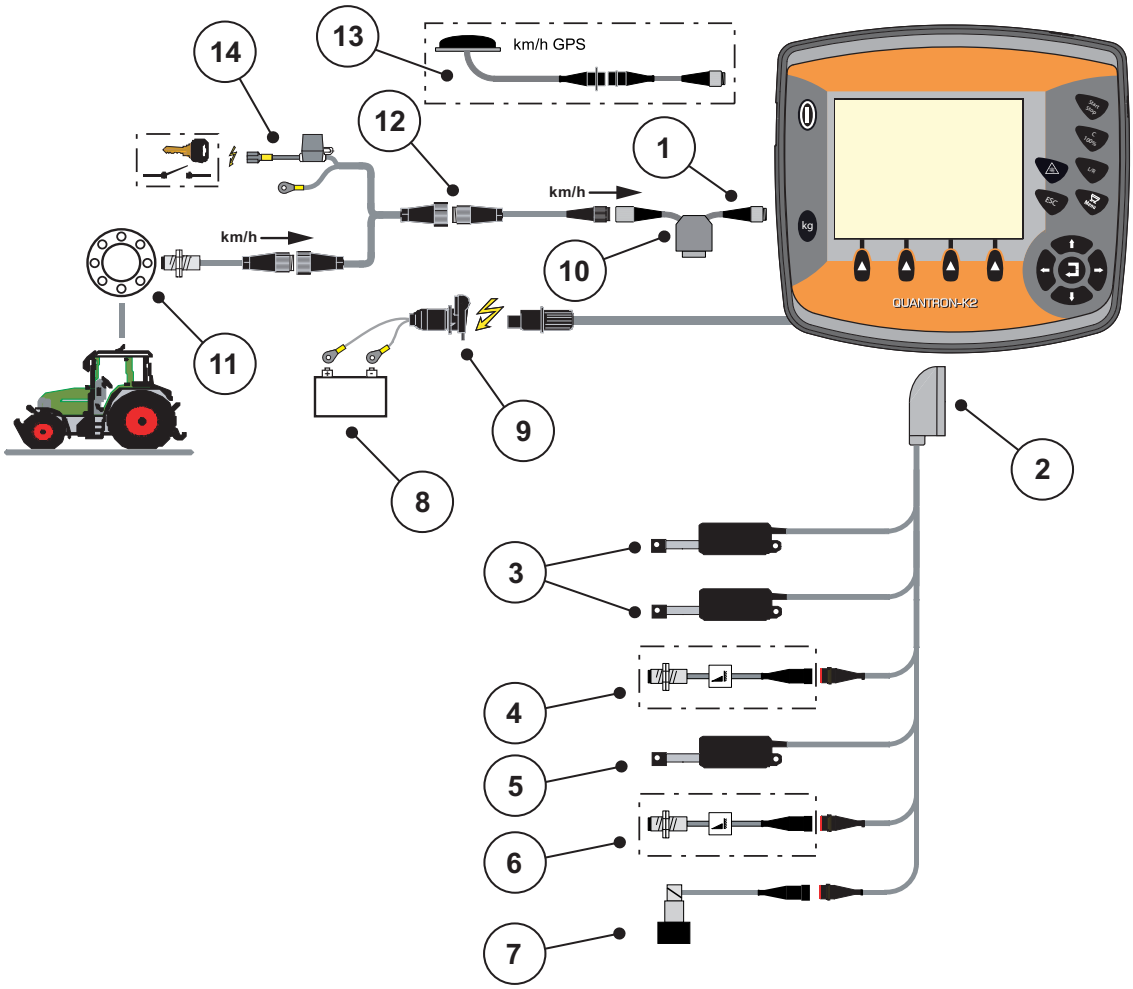


Figure 3.5: Schematic connection diagram QUANTRON-K2 (power supply via ignition lock)

[1] Serial interface RS232, 8-pin plug connector
[2] 39-pin machine plug
[3] Spreading width limiter actuators (EFQ-GT or EFG-GE option)
[4] Half-side slide sensor
[5] Metering slide actuator
[6] Spreading disc speed sensor (Hydraulic drive option)
[7] Proportional valve (Hydraulic drive option)
[8] Battery
[9] 3-pin plug connector conforming to DIN 9680 / ISO 12369
[10] Option: Y-cable (V24 RS232 interface for storage medium)
[11] Forward speed sensor
[12] 7-pin plug connector conforming to DIN 9684
[13] Option: GPS cable and receiver
[14] Option: QUANTRON-K2 power supply via ignition lock

3.4 Metering slide preparation

The AXEO Q winter spreader is fitted with an electric metering slide actuator for setting the spreading volume.

⚠ CAUTION

Observe the metering slide position

Operation of the actuator by means of the QUANTRON-K2 may damage the metering slide of the AXEO Q winter spreader if the stopper is positioned incorrectly.

▶ Always clamp the stopper at the maximum scale position.

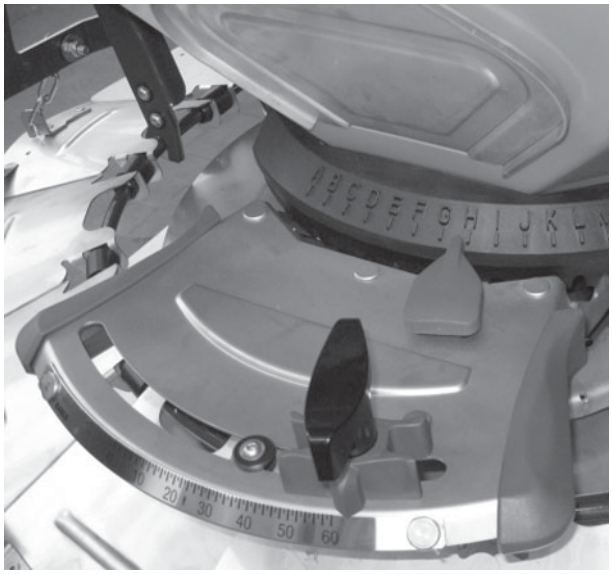


Figure 3.6: Preparation of the metering slide (example)

NOTICE

Observe the operator's manual of the fertiliser spreader.

4 Operation of QUANTRON-K2

⚠ CAUTION

Risk of injury due to ejected spreading material!

In the case of a fault, it is possible that the metering slide unexpectedly opens during road transport to the spreading location. There is a danger of slipping and injury of persons due to ejected spreading material.

▶ **Before leaving for the place of spreading** the electronic control unit QUANTRON-K2 must always be switched off.

4.1 Control unit activation

Requirements:

- The control unit is connected properly to the winter spreader and the tractor (for an example, see chapter 3.3: Connecting the control unit, page 15).
- A minimum voltage of **11 V** is guaranteed.

NOTICE

The operator's manual describes the functions of the QUANTRON-K2 control unit **as of software version 1.00.00**.

Activation:

- **Press the ON/OFF switch**.
  - ▷ After a few seconds, the **start-up screen** of the control unit appears.
  - ▷ Shortly after, the control unit will display the **activation menu** for a few seconds.
- **Press the Enter key**.
  - ▷ Then, the **start diagnostics** is displayed for a few seconds.
  - ▷ Subsequently, the **operating screen** appears.

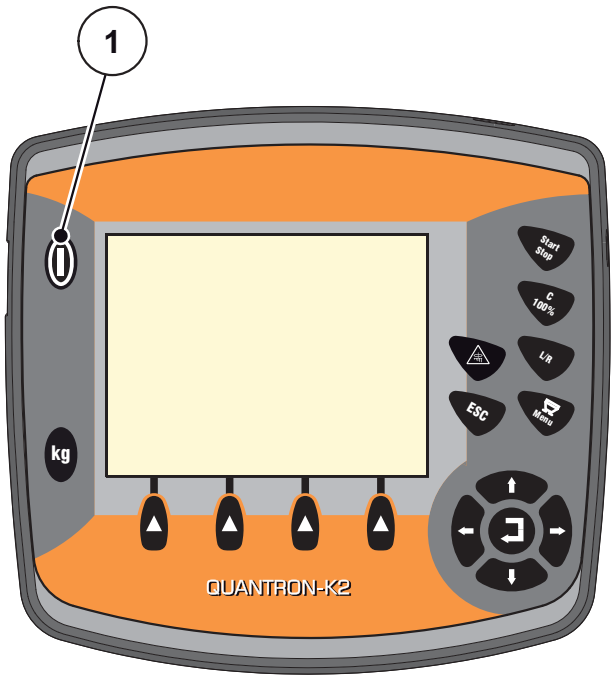


Figure 4.1: Start QUANTRON-K2

[1] ON/OFF switch

4.2 Menu navigation

NOTICE

Please refer to chapter 1.2.5: Menu hierarchy, keys and navigation, page 3 for important notes regarding the display and navigation between menus.

Accessing the main menu

- Press the **Menu key**. See 2.3: Control elements, page 7.
  - ▷ The main menu is displayed.
  - ▷ The black bar indicates the first submenu.

NOTICE

Not all parameters are displayed simultaneously in one menu window. The **Arrow keys** enable switching to the next or previous windows.

Accessing a submenu:

1. Move the bar up and down using the **Arrow keys**.
2. Highlight the desired submenu with the bar on the display.
3. Access the highlighted sub-menu by pressing the **Enter key**.

Windows appear which prompt various actions.

- Text input
- Value input
- Settings made in further sub-menus

Quitting menus

- Confirm settings by pressing the **Enter key**.
  - ▷ You will return to the **previous menu**.

  or
- press **ESC key.**
  - ▷ The previous settings are maintained.
  - ▷ You will return to the **previous menu**.
- Press the **Menu key**.
  - ▷ The **operating screen** is displayed.
  - ▷ Press the **Menu key** once more to return to the menu that you left.

4.3 Trip counter

This menu provides values on the spreading work carried out.

- Press the **kg** key at the control unit.
  ▷ The **Trip counter** menu appears.

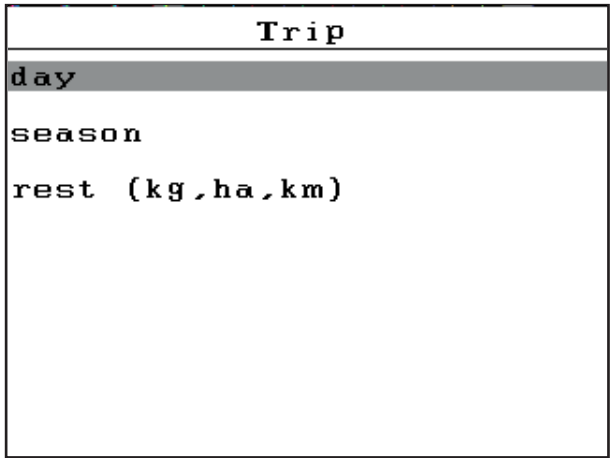


Figure 4.2: Trip counter menu

Submenu	Meaning	Description
day	Display of the daily values in spreading operation.	Page 25
season	Display of the season values in spreading operation.	
rest (kg, ha, km)	Display of the remaining available spreading area and distance.	Page 26

4.3.1 Day/Season

In this menu, values (quantity, distance, area) for the completed spreading work in the respective **day** and **season** period can be displayed.

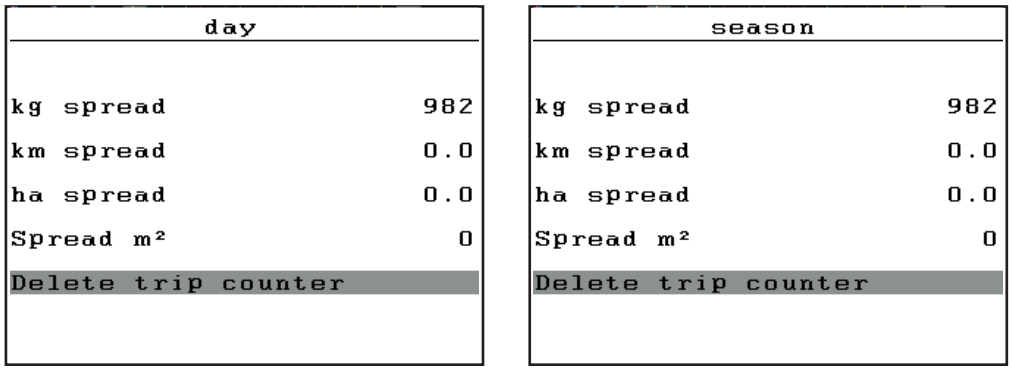


Figure 4.3: Day and season menu

Clearing the trip counter:

1. Open the **day** or **season** menu.
   ▷ The **Delete trip counter** field is highlighted on the display.
1. Press the **Enter key**.
   ▷ All values of the trip counter are reset to **0**.
2. Press the **kg** key.
   ▷ The operating screen is displayed again.

Checking the trip counter during spreading:

During spreading (with open sliders) the **Trip counter menu** can be opened to obtain the current values.

NOTICE

If the values need to be observed permanently during spreading, the freely selectable display fields on the operating screen can be assigned with **kg trip, km trip** or **ha trip**. Refer to chapter 4.9.2: Display configuration, page 57.

4.3.2 Displaying the remaining quantity

The menu displays the possible **area (ha)** and **distance (km)** that can still be spread with the remaining quantity. Both displays are calculated based on the following values:

- Spreading mat. settings:
  - Spreading density (g/m^2)
  - Dispersion (m)

NOTICE

The calculation of the remaining quantity depends on the spreading material and the machine setting as well as the drive signal. The filling quantity has to be entered **manually**.

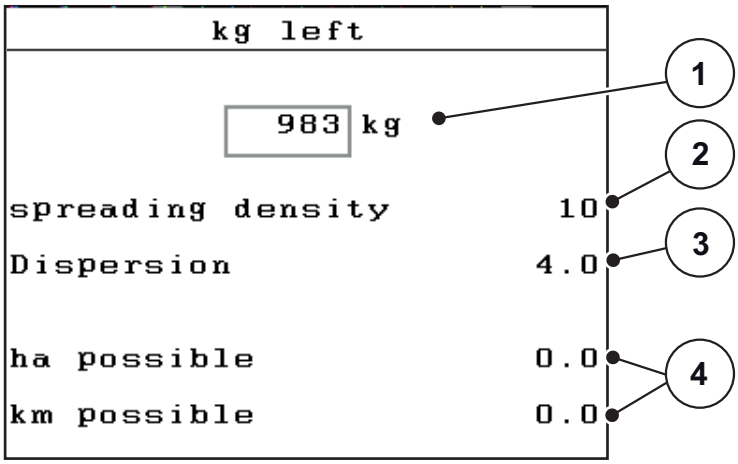


Figure 4.4: Left (kg, ha, km) menu

[1] Residual quantity input field
[2] Spreading density (display field from the spreading material settings menu)
[3] Dispersion (display field from the spreading material settings menu)
[4] Display of the possible area and display that can be spread with the remaining quantity

Entering the residual quantity when refilling:

1. Open the **Trip counter > Rest (kg, ha, m)** menu.
   ▷ The residual quantity from the last spreading process is displayed.
2. Fill the hopper.
3. Enter the new total weight of the spreading material in the hopper.
   See also chapter 4.10.2: Entering values with the cursor keys, page 63.
4. Confirm the input by pressing the **Enter key**.
   ▷ The device calculates the values for the possible spread area and the possible spread distance.

NOTICE

The values for spreading density and working width **cannot** be changed in this menu. **These values are for information only.**

5. Press the **kg** key.

▷ **The operating screen is displayed again.**

Calling up the residual quantity during spreading:

During spreading, the residual quantity is continuously recalculated and displayed. See chapter 5: Spreading operation with the QUANTRON-K2 control unit, page 65.

4.4 Main menu

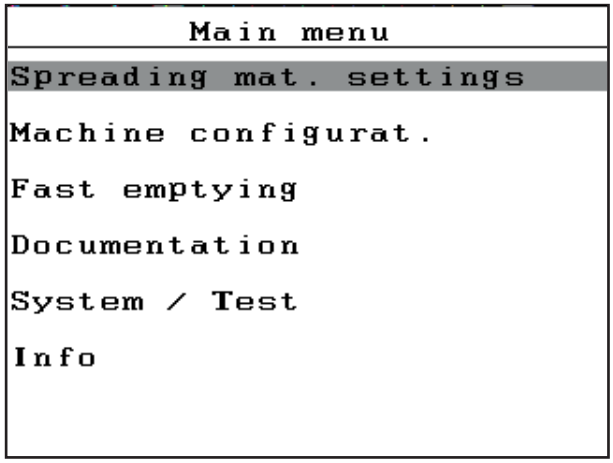


Figure 4.5: Main menu QUANTRON-K2

The main menu offers the following submenus.

Submenu	Meaning	Description
Spreading mat. settings	Settings for spreading material and spreading operation.	Page 29
Machine configurat.	Settings for tractor and winter spreader.	Page 41
Fast emptying	Direct access to the menu for fast emptying of the winter spreader.	Page 49
Documentation	• Import and export of files between PC and control unit • Opens the menu for selecting, creating or deleting a documentation.	Page 50
System / Test	Settings and diagnosis of the control unit.	Page 55
Info	Display of the serial number of the spreader, software version, hardware version and settings in the control unit	Page 60

4.5 Spreading material settings

You can adjust the settings for spreading material and spreading operation in this menu.

- Open the **Main menu > Spreading mat. settings** menu.

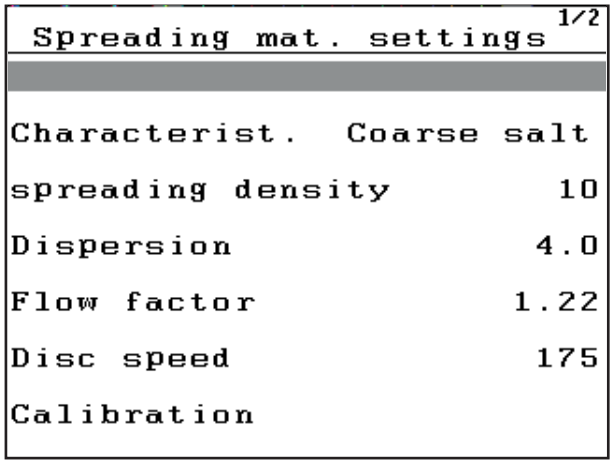


Figure 4.6: Spreading mat. settings menu, page 1

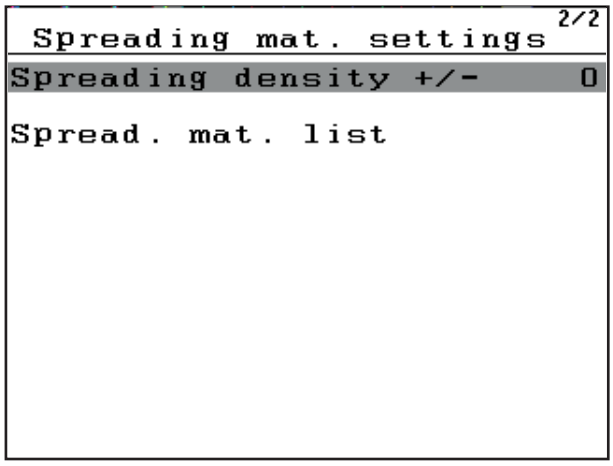


Figure 4.7: Spreading mat. settings menu, page 2

NOTICE

The **Disc speed** submenu is **only** displayed, if the **Hydraulic drive** option is activated. See 4.5.4: Disc speed (Hydraulic drive option), page 34.

Submenu	Meaning/possible values	Description
Spreading material name	Manually entering the name of a new spreading material.	
Characteristics	Selection of one of six spreading material or fertiliser types for determining the mass flow characteristic: ● Salt, fine ● Salt, coarse ● Salt, damp ● Sand ● Grit ● Fertiliser	
Spreading density	Entering of the spreading density based on the pre-selected characteristic curve.	
Dispersion	Entering the dispersion (working width)	Page 32
Flow factor	Entering the flow factor for the spreading material used.	Page 33
Disc speed	Selection of the disc speed.	Page 34
Calibration	Implementation of the calibration and new calculation of the flow factor.	Page 35
Spreading density +/-	Specification of the step width by which the spreading density can be manually increased or decreased later.	Page 38
Spreading mat. list	Management of fertiliser charts.	Page 39

4.5.1 Spreading density

In the **Spreading density** submenu, the required spreading density for the spreading material can be entered.

1. Open the **Spreading mat. settings > Spreading density** submenu.
   ▷ The **currently applicable** spreading density is displayed.
2. Enter the new value into the input fielding using the **Arrow keys**:
   Please also refer to 4.10.2: Entering values with the cursor keys, page 63.

Spreading material (property)	Spreading density (g/m^2)
Salt, coarse / fine (damp)	5-40
Sand, grit (blunting)	75-300
Fertiliser	1-300

3. Confirm the input by pressing the **Enter key**.

▷ **The new value is saved in the control unit.**

▷ **The Spreading mat. settings menu is displayed.**

NOTICE

The programmed ranges are **only reference values**. The spreading density can be adapted to individual requirements.

If a value outside the range is entered, an alarm message is displayed.

- **Press the C/100%** key: the entered value is saved.

4.5.2 Dispersion

NOTICE

The **Dispersion** can only be set to a value between **1** and **10 metres**.

You can set the working width (in metres) in this menu.

1. Open the **Spreading mat. settings > Dispersion** menu.
   ▷ The **currently set** dispersion is displayed.
2. Enter the new value in the input field.
   See chapter 4.10.2: Entering values with the cursor keys, page 63.
3. Confirm the input by pressing the **Enter key**.

▷ **The new value is saved in the control unit.**

NOTICE

If the **Dispersion AUTO** function is **activated**, the following values are automatically adjusted if the dispersion is changed:

- Spreading width limiter.
- Disc speed (**Hydraulic drive option only**).

If the **Dispersion AUTO function is deactivated**, the values have to be entered manually in the respective menu.

4.5.3 Flow factor

The flow factor is within the range of **0.4** to **2.10**. At identical basic settings (km/h, working width, kg/ha), the following applies:

- If the flow factor is **increased**, the application rate is **decreased**.
- If the flow factor is **locked**, the application rate is **increased**.

If the flow factor is known from earlier calibrations or from the fertiliser chart, it can be entered **manually** in this menu.

NOTICE

Via the **Calibration** menu, the flow factor can be determined and entered by means of the QUANTRON-K2. See chapter 4.5.5: Calibration, page 35.

NOTICE

The flow factor calculation depends on the operating mode used. For further information about the flow factor, refer to chapter 4.6.2: AUTO/MAN mode, page 45.

Entering the flow factor:

1. Open the **Spreading mat. settings > Flow factor** menu.
   ▷ The **currently set** flow factor is displayed.
2. Enter the new value in the input field.
   See chapter 4.10.2: Entering values with the cursor keys, page 63.

NOTICE

If your spreading material is not listed in the fertiliser chart, a flow factor of **1.00** is to be entered.

In the **AUTO km/h operating mode**, we highly recommend executing a **calibration** in order to be able to accurately determine the flow factor the spreading material.

3. Confirm the input by pressing the **Enter key**.

▷ **The new value is saved in the control unit.**

4.5.4 Disc speed (Hydraulic drive option)

In the **Disc speed** submenu, the spreading disc speed can be entered.

NOTICE

If the **Dispersion AUTO function is activated**, the QUANTRON-K2 control unit will determine the disc speed depending on the selected spreading material and working width.

If the **Dispersion AUTO function is deactivated**, the disc speed has to be entered manually.

- See 5.2.3: Dispersion adjustment with the Dispersion AUTO function, page 71
- See 5.10: Disc speed adjustment (Hydraulic drive only), page 78

1. Open the **Spreading mat. settings > Disc speed** submenu.
   ▷ The **currently set** spreading disc speed is displayed.
2. Enter a new value.
3. Press the **Enter** key.

▷ **The new value is saved in the control unit.**

▷ **The Spreading mat. settings menu is displayed.**

NOTICE

To ensure sufficient accuracy during spreading, a speed of at least **150 RPM** is to be entered.

4.5.5 Calibration

In this menu, you can determine the flow factor based on a calibration and save it in the control unit.

⚠ WARNING

Risk of injury during calibration

Rotating machine components, the moving spreading width limiter and ejected spreading material may cause injury.

- ▶ **Before starting, when cancelling and finishing** calibration, it has to be ensured that all requirements are fulfilled.
- ▶ Please observe the **Calibration** chapter in the operator's manual of the single-disc spreader.

Execute the calibration:

- Before spreading for the first time.
- If the spreading material quality has changed significantly (moisture, high dust content, cracked grain).
- If a new type of spreading material is used.

The calibration must be conducted with running agitator at standing machine **or** during travel over a test track.

- Place a collection container (tray, foil, etc.) on the ground under the single-disc spreader.

Entering the working speed:

1. Open the **Spreading mat. settings > Calibration** menu.
2. Enter the average working speed.

   This value is required for calculating the slide position during calibration.
3. Press the **Enter** key.
   - ▷ The new value is saved in the control unit.
   - ▷ The **Calibration** operating screen is displayed.

Running the calibration:

NOTICE

Hydraulic drive option: after pressing the **Start/Stop** key, a alarm window is displayed.

- To activate the disc, press the **Enter key**.

4. **Press the Start/Stop** key (and the enter key with Hydraulic drive).
   - ▷ The metering slide opens and calibration is started.
   - ▷ **Hydraulic drive** option: Agitator and spreading disc are started.

NOTICE

The calibration can be stopped at any time by pressing the **ESC** key. The metering slide is closed and the **Spreading mat. settings** menu is displayed.

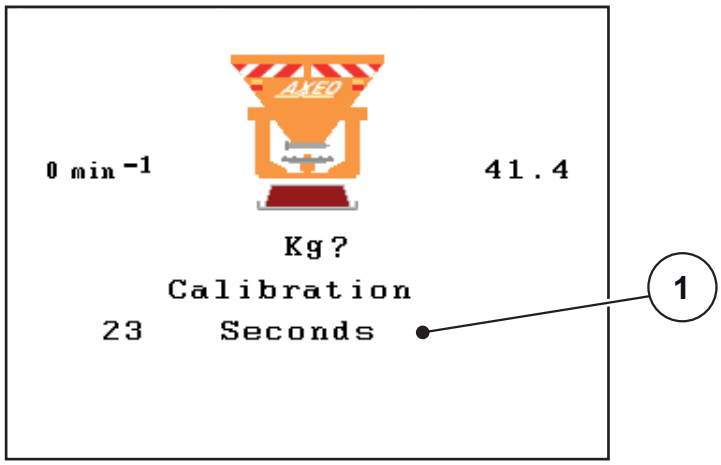


Figure 4.8: Run calibration operating screen

[1] Display of elapsed time since starting the calibration

NOTICE

The calibration time is not relevant for the accuracy of the results. However, **a minimum of 20 kg** should be calibrated.

5. Press the **Start/Stop** key once more.
   - ▷ Calibration is finished.
   - ▷ The metering slide will be closed.
   - ▷ **Hydraulic drive** option: Agitator and spreading disc are stopped.
   - ▷ The display shows the **Input collected weight** menu.

New calculation of the flow factor

⚠ WARNING

Risk of injury due to rotating machine components.

Contact with rotating machine components (agitator, spreading disc) may cause bruises, abrasions and crushing injuries. Body parts or objects may be caught or pulled in.

- ▶ Switch off the tractor motor.
- ▶ Switch off the PTO and secure it against unauthorised activation.

6. Weigh the collected weight (taking into account the empty weight of the collecting vessel).

7. Input collected weight.

   See chapter 4.10.2: Entering values with the cursor keys, page 63.

8. Press the **Enter** key.

   ▷ The new value is saved in the control unit.

   ▷ The **Flow factor calculation** menu is displayed.

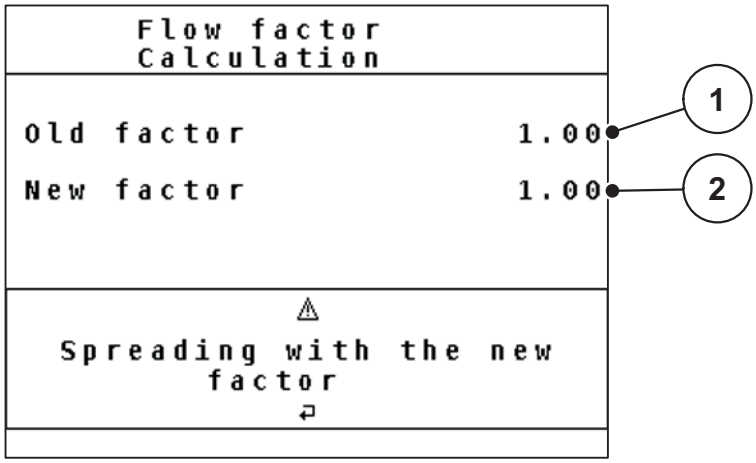


Figure 4.9: Flow factor calculation window

[1] Display of previously saved flow factor
[2] Display of newly calculated flow factor

NOTICE

The flow factor must be between 0.4 and 1.9.

9. Determine the flow factor.

   For taking over the **newly calculated** flow factor, press the **Enter key**.

   For confirming the **previously saved** flow factor, press the **ESC key**.

▷ **The flow factor is saved.**

▷ **The Spreading mat. settings menu is displayed.**

4.5.6 Spreading density +/-

In the **Spreading density +/-** submenu, the **step width** increase and decrease of the **spreading density** in the operating screen can be set.

Spreading density step width adjustment:

1. Open the **Spreading mat. settings > Spreading density +/-** submenu.
2. Select one of the required step widths (**5**, **10**, **25** or **50 g/m^2**).
3. Press the **Enter** key.

▷ **The step width of the spreading density selected is automatically taken over by the control unit.**

▷ **The Spreading mat. settings menu is displayed.**

During spreading, the spreading density can be adjusted in the operating screen by pressing the **F3** and **F4** function keys.

- Please also refer to 5: Spreading operation with the QUANTRON-K2 control unit, page 65

4.5.7 Spreading material list

In these menus, user-defined **spreading material lists** can be created and managed.

NOTICE

If a spreading material list is selected, the spreading material settings at the control unit and at the winter spreader are influenced. The application rate setting remains unaffected.

Creating a new spreading material list

You have the option of creating up to **30** fertiliser charts in the control unit.

1. Open the **Spreading mat. settings > Spread. mat. list** submenu.

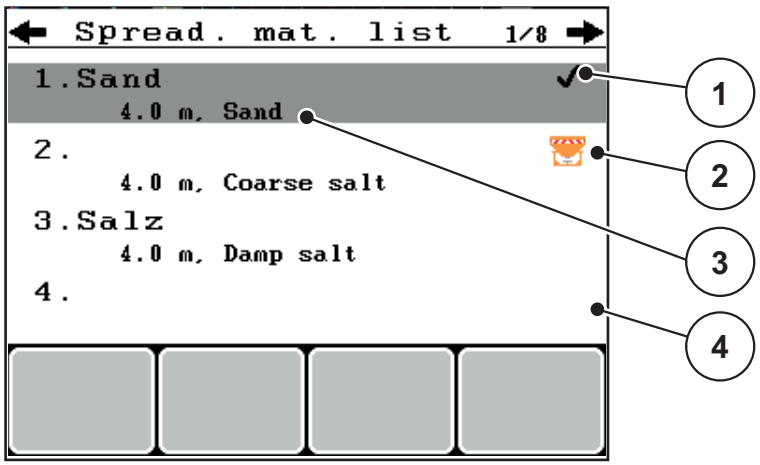


Figure 4.10: Spreading material list menu

[1] Display of the spreading material list filled with values
[2] Display of the active spreading material list
[3] Spreading material list name field
[4] Empty spreading material list

2. **Highlight the name field** of an empty spreading material list.
3. Press the **Enter** key.
   ▷ The display shows the selection window.
4. Highlight the **Open element...** option.
5. Press the **Enter** key.
   ▷ The **Spreading mat. settings** menu is displayed and the selected element is loaded into the spreading material settings as **Active spreading material list**.
6. Highlight the **Spreading material name** menu item.
7. Press the **Enter** key.
8. Enter the name for the spreading material list.

NOTICE

We recommend giving the spreading material list the name of the spreading material. Thus it is easier for you to assign a spreading material to the spreading material list.

9. Editing the parameters of the **spreading material list**.

   See chapter 4.5: Spreading material settings, page 29

Selecting a spreading material list:

1. Open the **Spreading mat. settings > Spread. mat. list** submenu.
2. Highlight the required spreading material list.
3. Press the **Enter** key.
   ▷ The display shows the selection window.
4. Highlight the **Open element...** option.
5. Press the **Enter** key.

▷ **The Spreading mat. settings menu is displayed and the selected element is loaded into the spreading material settings as Active spreading material list.**

NOTICE

When selecting an existing spreading material list, all values in the **Spread mat. settings** menu will be overwritten with the stored values obtained from the selected spreading material list, including the spreading density and width.

Copying an existing spreading material list

1. Highlight the required spreading material list.
2. Press the **Enter key**.
   ▷ The display shows the selection window.
3. Highlight the **Copy element** option.
4. Press the **Enter key**.

▷ **A copy of the spreading material list is now on the first free position of the list.**

Deleting an existing spreading material list:

1. Highlight the required spreading material list.
2. Press the **Enter key**.
   ▷ The display shows the selection window.
3. Highlight the **Delete element** option.
4. Press the **Enter key**.

▷ **The spreading material list is deleted from the list.**

NOTICE

The active spreading material list **cannot** be deleted.

4.6 Machine settings

You can adjust the settings for the tractor and machine in this menu.

- Open the **Machine settings** menu

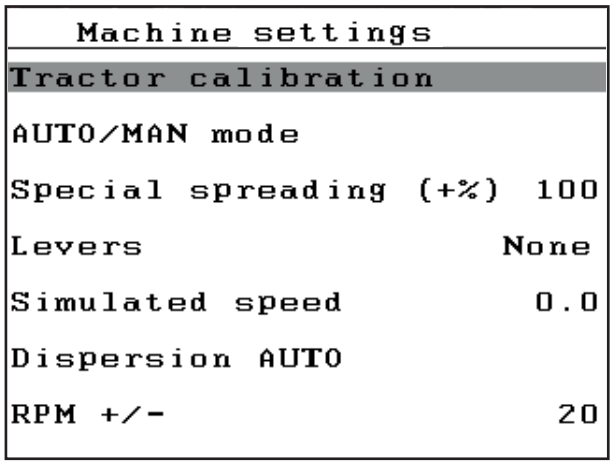


Figure 4.11: Machine settings menu

Submenu	Meaning	Description
Tractor calibration	Determining or calibrating the speed signal.	Page 42
AUTO/MAN mode	Determining the automatic or manual operating mode.	Page 45
Special spreading (+%)	Presetting for special spreading.	Page 46
Levers	Settings for the display of the spreading width limiter plates actuators.	Page 46
Simulated speed	Pre-settings for spreading with simulated speed when starting at crossings	Page 47
Dispersion AUTO	Activating/deactivating the Dispersion AUTO function	Page 48
RPM +/-	Presetting the RPM-adjustment (**Hydraulic drive** option).	Page 48

4.6.1 Forward speed calibration

The speed calibration is the basic requirement for an exact spreading result. Factors such as tyre size, a different tractor, all-wheel drive, slippage between tyres and ground, ground characteristics and tyre pressure influence the speed measurement and therefore the spreading result.

Preparing the speed calibration:

The exact calculation of the number of speed pulses over 100 m is very important for the precise application rate.

- Carry out the calibration on the street. This reduces the influence of the ground characteristics on the calibration result.
- Determine a **100 m** long reference track as precisely as possible.
- Switch on four-wheel drive.
- Fill only half of the machine, if possible.

Opening the speed settings:

In the QUANTRON-K2 control unit, up to **4 different profiles** for the type and number of pulses can be saved. You can assign names to these profiles (e.g. tractor name).

Before spreading, check that the correct profile is opened in the control unit.

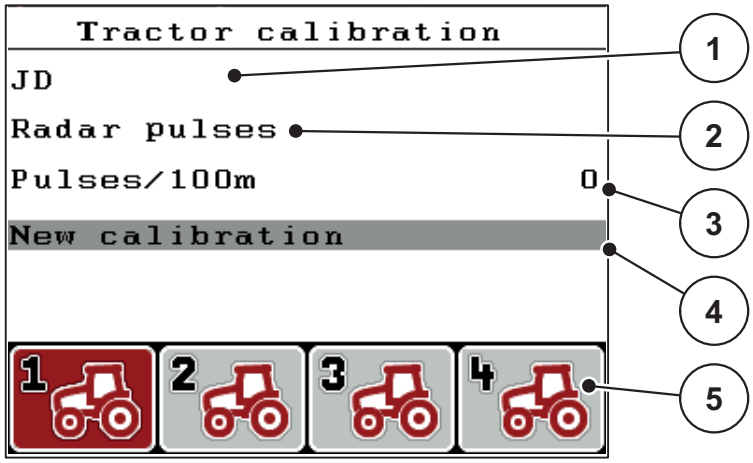


Figure 4.12: Tractor calibration menu

[1] Tractor type
[2] Transducer display for the speed signal
[3] Display of number of pulses over 100m
[4] New calibration submenu
[5] Symbols for memory locations of profiles 1 to 4

1. Open the **Machine settings > Tractor calibration** menu.

   The displayed values for name, origin and number of pulses refer to the profile highlighted in red.

2. Press the function key (**F1-F4**) under the memory location symbol.

New calibration of the forward speed signal:

You can either overwrite an existing profile or create a profile in an empty memory location.

1. Select the desired memory location in the **Tractor calibration** menu using the function key below.
2. Select the **New calibration** field.
3. Press the **Enter key**.

▷ **The calibration menu is displayed.**

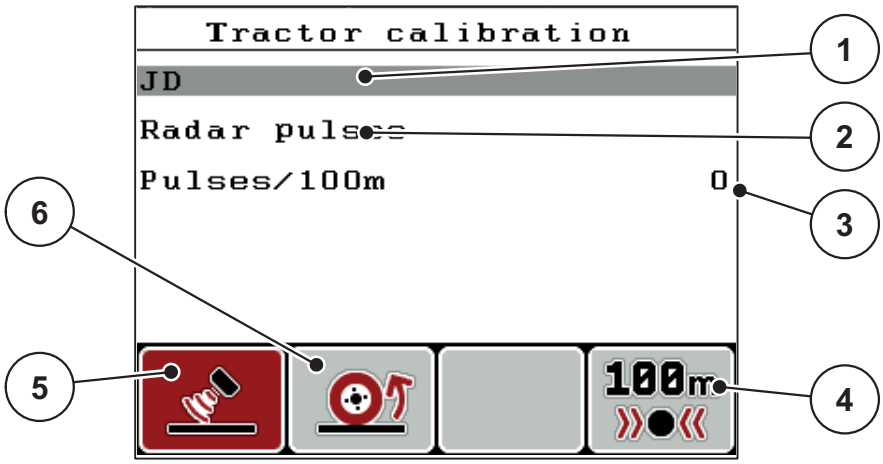


Figure 4.13: Calibration menu

[1] Tractor type
[2] Display of origin of speed signal
[3] Display of number of pulses over 100m
[4] F4 function key: Automatic calibration submenu
[5] F2 function key: Radar pulse transducer
[6] F1 function key: Wheel pulses transducer

4. Select the **Tractor type** [1].
5. Press the **Enter** key.
6. Input the name of the profile.

NOTICE

The input of the name is restricted to **16 characters**.

We recommend using the name of the tractor for ease of understanding.

Entering text into the control unit is described in section 4.10.1: Text input, page 61.

7. Select the pulse transducer for the forward speed signal.
   - For **Radar pulses**, press the **F1** [5] function key.
   - For **Wheel pulses**, press the **F2** [6] function key.

▷ **The pulse transducer is displayed [2].**

The number of pulses of the speed signal must still be specified below. If the exact pulse count is **known**, it can be entered directly:

8. Open the **Tractor calibration > New calibration** menu.

9. Select the Pulses/100 m [3] menu entry.

10. Press the **Enter** key.

▷ **The Pulses menu for manual pulse count input is displayed.**

Entering values into the control unit is described in section 4.10.2: Entering values with the cursor keys, page 63.

If the exact pulse count **is unknown**, a **calibration** has to be started.

11. Press the **F4** function key.

▷ The calibration screen is displayed.

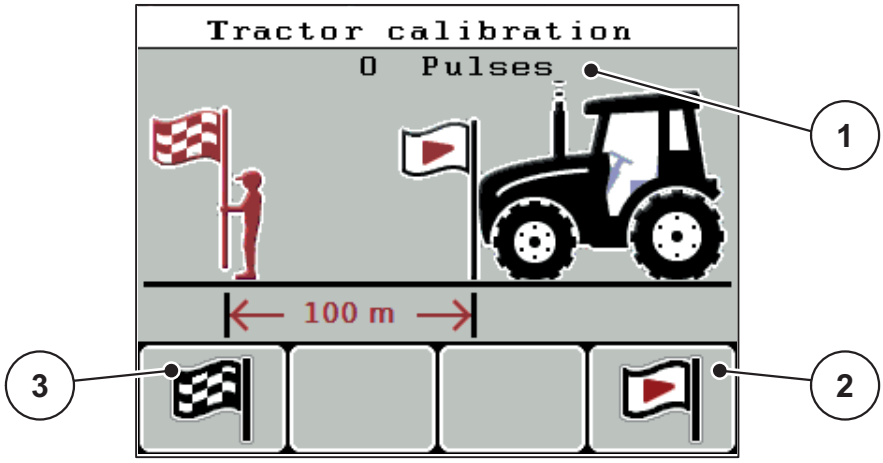


Figure 4.14: Calibration screen

[1] Pulse display
[2] F4 function key: Start recording pulses
[3] F1 function key: Stop recording pulses

12. Press **F4 [2]** at the starting point of the reference distance.

▷ The pulse display is now on zero.

▷ The control unit is ready for counting pulses.

13. Drive along the 100m long reference distance.

14. Stop tractor at the end of the reference distance.

15. Press the **F1 [3]** function key.

▷ The display shows the number of received pulses.

16. Press the **Enter** key.

▷ **The new pulse count is saved.**

▷ **The calibration menu is displayed again.**

4.6.2 AUTO/MAN mode

By default, you will work in the **AUTO km/h** operating mode. The control unit automatically controls the actuators based on the speed signal.

The **manual** mode is only applied in the following cases:

- there is no speed signal (radar, GPS receiver or wheel sensor not available or defective),

NOTICE

For regular spreading of the spreading material, it is imperative to work with a **constant forward speed** in manual operating mode.

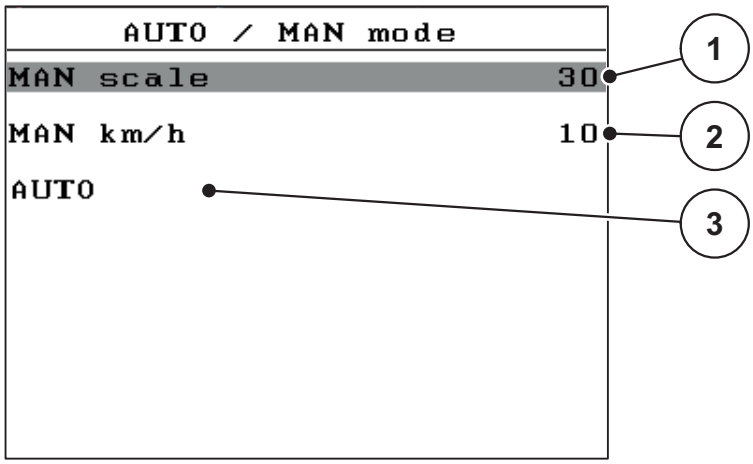


Figure 4.15: AUTO/MAN mode menu

[1] Metering slide adjustment for manual mode
[2] Forward speed adjustment for manual mode
[3] Selection of automatic mode

Selecting the operating mode

1. Switch on the QUANTRON-K2 control unit.
2. Open the **Machine settings > AUTO/MAN mode** menu.
3. Highlight the desired menu item.
4. Press the **Enter** key.
5. Follow the instructions on screen.

- Important information on the use of operating modes for the spreading operation is provided in chapter 5: Spreading operation with the QUANTRON-K2 control unit, page 65.

NOTICE

The specified operating mode is displayed in the operating screen. See 2.4: Display, page 9.

4.6.3 Special spreading (+%)

Via the **Special spreading (+%)** submenu, the percentage of **quantity change** for standard spreading can be specified.

- The basis is the pre-set value of the spreading density.
- **100 %** special spreading density correspond to **twice** the set spreading density.

NOTICE

During operation, the spreading quantity can be adjusted at any time by pressing the **Special spreading** key. The spreading quantity **can only be increased**, and **not decreased**.

Setting the quantity change:

1. Open the **Machine settings > Special spreading (+%)** menu.
2. Enter the percentage by which you wish to increase the spreading quantity.

   Entering values into the control unit is described in section 4.10.2: Entering values with the cursor keys, page 63
3. **Press the Enter key**.

4.6.4 Levers (option)

NOTICE

The **Levers** submenu is only active if **only 1** actuator is connected.

In the **Levers** submenu, the installation position of the actuator at the spreading width limiter plates is defined.

NOTICE

According to the definition in the **Levers** submenu, the current position of the spreading width limiter plates besides the spreader is displayed.

Setting	Description
R	The actuator installed at the right side of the single-disc spreader controls the right side of the spreading width limiter plates.
L	The actuator installed at the left side of the single-disc spreader controls the right side of the spreading width limiter plates.
R/L	The actuator installed at the right or left side of the single-disc spreader controls the right and left side of the spreading width limiter plates **via levers**.

4.6.5 Simulated speed

In the **Simulated speed** submenu, a simulated speed for standard spreading is specified.

The simulated speed can be activated when starting at crossings or traffic lights. By means of the simulated speed function, the metering slide opens immediately and the spreading starts with the first metre.

NOTICE

The simulated speed function can **only** be activated when the tractor is at a standstill.

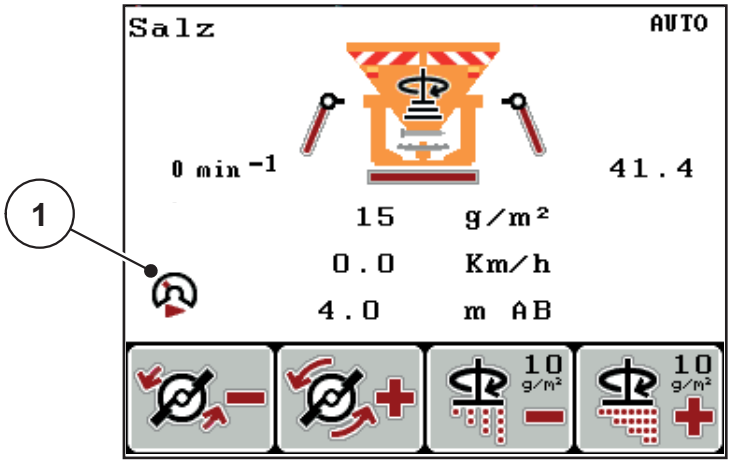


Figure 4.16: Simulated speed

Defining the simulated speed:

NOTICE

The factory setting for the simulated speed is 0.0 km/h!

1. Open the **Machine settings > Simulated speed** submenu.
2. Enter the speed to be simulated.

   Entering values into the control unit is described in chapter 4.10.2: Entering values with the cursor keys, page 63.
3. Press the **Enter** key.

NOTICE

Spreading with the different functions of the QUANTRON-K2 control unit is described in chapter 5: Spreading operation with the QUANTRON-K2 control unit, page 65.

4.6.6 Dispersion AUTO

If the **Dispersion AUTO** function is activated, the position of the dispersion limitation and the spreading disc speed are automatically adjusted on adjusting the working width (**Hydraulic drive** option).

1. Open the **Machine settings > Dispersion AUTO** submenu.
2. Press the **Enter** key.

▷ **A check mark is displayed.**

▷ **The function is activated.**

4.6.7 RPM +/- (Hydraulic drive option)

NOTICE

The **RPM +/-** function can **ONLY** be set if the **Dispersion AUTO** function is deactivated!

Under **RPM +/-**, a value can be preconfigured by which the spreading disc speed is decreased on pressing **F1** or increased by pressing **F2**.

1. Open the **Machine settings > RPM +/-** submenu.
2. Enter the RPM by which the disc speed is to be increased/decreased.

Entering values into the control unit is described in chapter 4.10.2: Entering values with the cursor keys, page 63.

3. Press the **Enter** key.

4.7 Fast emptying

To clean the machine after spreading or to quickly empty residual spreading material, select the **Fast emptying** menu.

Before storing the machine, we recommend **completely opening** the metering slides by fast emptying and switching off the QUANTRON-K2 control unit in this state. By doing so, you can prevent accumulation of moisture in the hopper.

NOTICE

Before starting the fast emptying process, it has to be ensured that all preconditions have been met. Please observe the operator's manual of the winter spreader (discharging residual material).

Carrying out the fast emptying process:

1. Open the **Main menu > Fast emptying** menu.

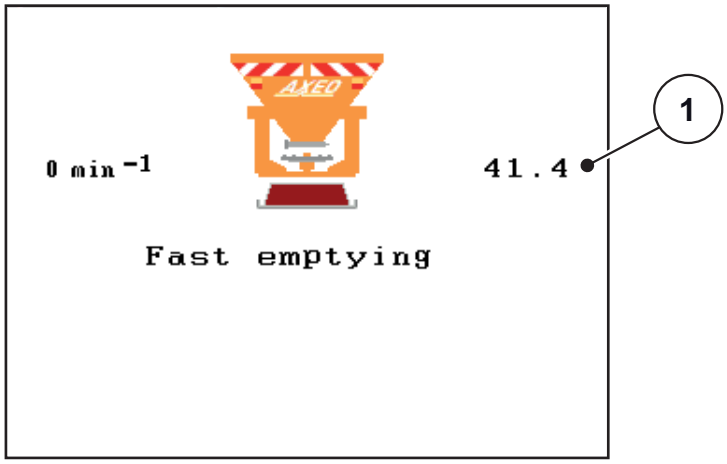


Figure 4.17: Fast emptying menu

[1] Metering slide opening display

2. **Press the Start/Stop** key (and the enter key with Hydraulic drive).
   ▷ The fast emptying starts.
3. **Press the Start/Stop key** again.

▷ **Fast emptying is completed.**

4.8 Documentation

In the **Documentation** menu, up to **200 files** can be created and managed.

- Open the **Main menu > Documentation** menu.

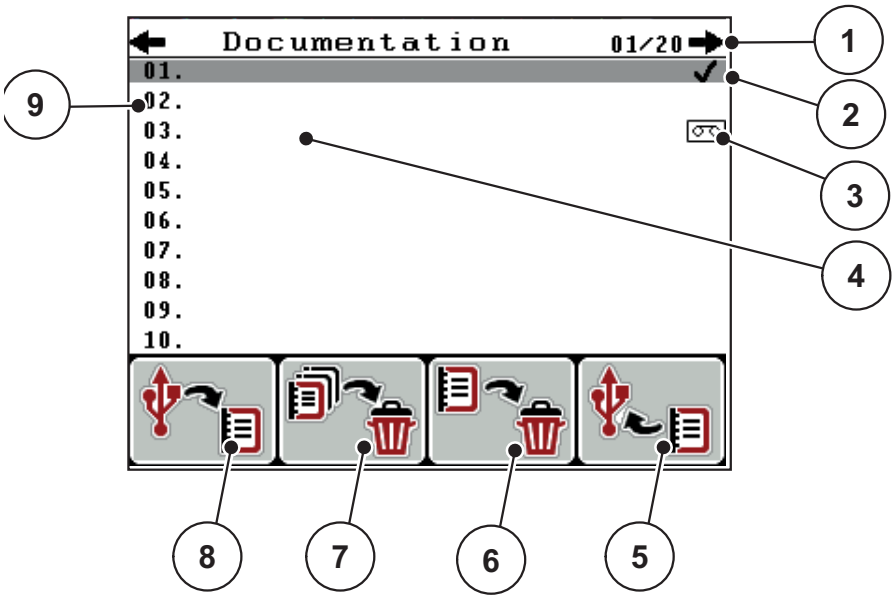


Figure 4.18: Documentation menu

[1] Display of page number
[2] Display of the documentation filled with values
[3] Display of the active documentation
[4] Documentation name
[5] F4 function key: Export
[6] F3 function key: Delete documentation
[7] F2 function key: Delete all documentations
[8] F1 function key: Import
[9] Display of memory location

4.8.1 Select Documentation

You can re-select a previously saved documentation and proceed with it. The data already saved in the documentation are **not overwritten**, but instead the new values are **added**.

NOTICE

Using the **left/right arrow keys** you can jump forward and back through the pages in the **Documentation** menu.

1. Select the required documentation.
2. Press the **Enter** key.
   ▷ The display shows the first page of the current documentation.

4.8.2 Starting the recording

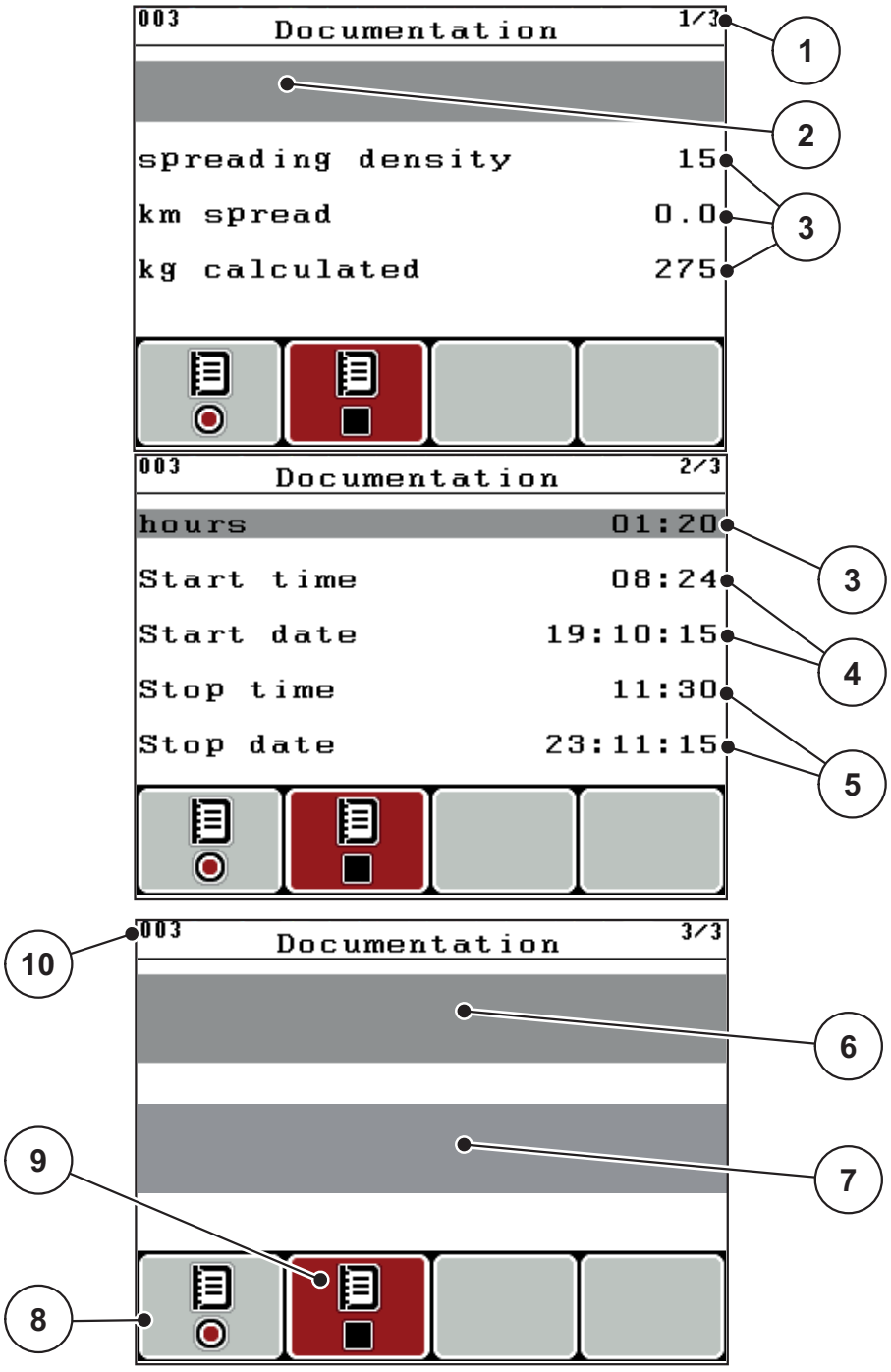


Figure 4.19: Display of current documentation

[1] Display of the page number
[2] Documentation name field
[3] Value fields
[4] Display of the start time/date
[5] Display of the stop time/date
[6] Spreading material name field
[7] Spreading material manufacturer name field
[8] Function key Start
[9] Function key Stop
[10] Display of memory location

3. Press the **F1** function key below the start symbol.
   ▷ The recording starts.
   ▷ The **Documentation** menu displays the **recording symbol** for the current documentation.
   ▷ The **operating screen** displays the **recording symbol**.

NOTICE

If a different documentation is opened, the current recording is stopped. The active documentation cannot be deleted.

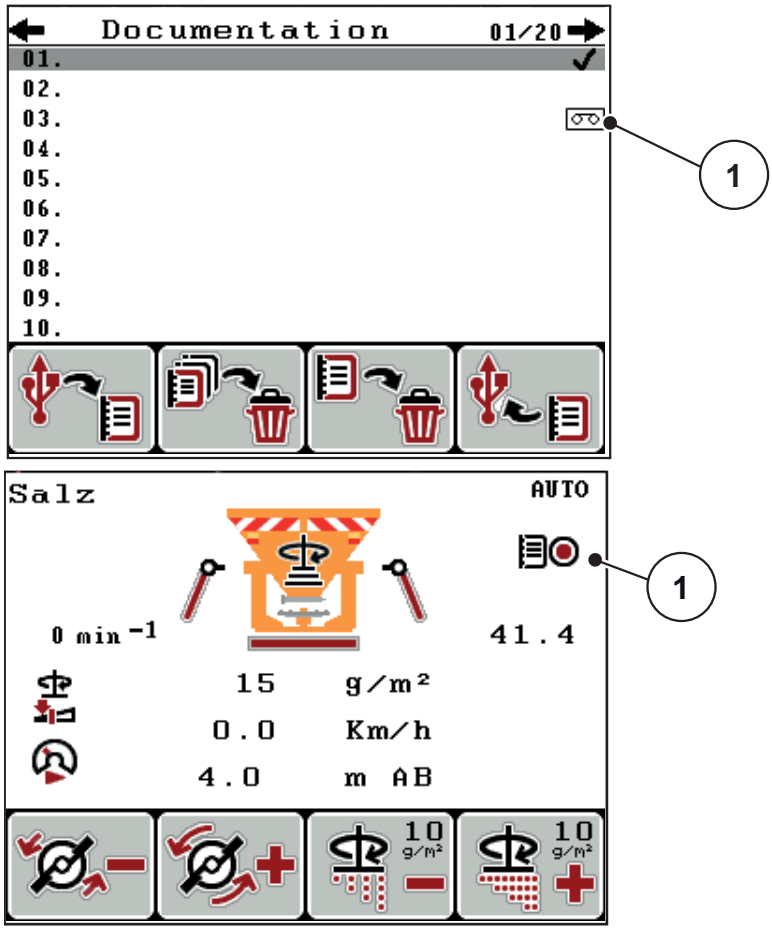


Figure 4.20: Recording symbol display

[1] Recording symbol

4.8.3 Stopping the recording

1. In the **Documentation** menu, access the 1st Page of the active documentation
2. Press the **F2** function key below the stop symbol.
   ▷ Recording is finished.

4.8.4 Importing and exporting documentations

The QUANTRON-K2 control unit allows for importing and/or exporting the recorded documentations.

Exporting documentations (QUANTRON-K2 to PC)

Requirements:

- Use the USB stick supplied.
- **Do not** alter the directory structure on the USB stick.
  - The data on the USB stick are available in the “\\USB-BOX\Quantro-nE\Dokumentationen\Export” directory.

1. Open the **Documentation** menu.
2. Press **F4** function key (see Figure 4.18).

NOTICE

We recommend using the **DataManager Street** software in combination with the QUANTRON-K2 control unit.

- Please contact your distributor for further information.
- Please observe the **DataManager** operator's manual.

Importing documentations (PC to QUANTRON-K2)

NOTICE

Delete the existing files in your QUANTRON-K2 prior to the import. In this way you can avoid continuing the existing documentations and prevent faults in time recording.

Requirements:

- Use the USB stick supplied.
- **Do not** alter the directory structure on the USB stick.
  - The data on the USB stick are available in the “\\USB-BOX\Quantro-nE\Dokumentationen\Import” directory.

1. Open the **Documentation** menu.
2. Press **F1** function key (see Figure 4.18).
   ▷ Error message no. 7 appears indicating that the current files will be over-written. See 6.1: Meaning of alarm messages, page 79.
3. **Press the Start/Stop** key.

NOTICE

You can interrupt the documentation import at any time by pressing the **ESC** key!

The consequences of importing documentations are as follows

- All documentations currently stored in the QUANTRON-K2 control unit are overwritten.
- If you have defined the spreading density on the PC, the spreading density is automatically transferred and immediately activated in the **Spreading mat. settings** menu when starting the documentation.
- If you enter an application rate outside the range of 10-3000, the value in the **Spreading mat. settings** menu is not overwritten.

4.8.5 Delete documentations

The QUANTRON-K2 control unit allows for deleting the recorded documentations.

NOTICE

Only the content of the documentations will be deleted, the documentation name will still be displayed in the name field!

Delete documentations

1. Open the **Documentation** menu.
2. Select a documentation from the list.
3. Press the **F3** function key below the **Delete** symbol (see Figure 4.18).
   ▷ The selected documentation has been deleted.

Delete all documentations

1. Open the **Documentation** menu.
2. Press the **F2** function key below the **Delete all** symbol (see Figure 4.18).
   ▷ A message appears indicating that all data will be deleted. See 6.1: Meaning of alarm messages, page 79.
3. **Press the Start/Stop** key.
   ▷ All documentations are deleted.

4.9 System / Test

Use this menu for the system and test settings of the control unit.

- Open the **Main menu > System / Test** menu.

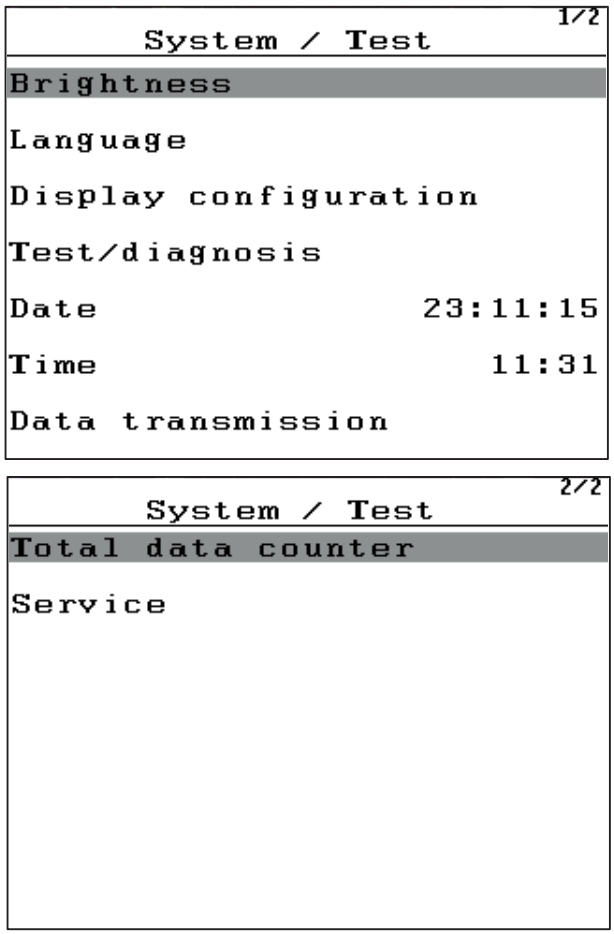


Figure 4.21: System / Test menu

Submenu	Meaning	Description
Brightness	Display settings (Brightness/Contrast).	The settings can be adjusted with the function keys **+** or **-**.
Language	Language setting for the menu navigation.	Page 56
Display configuration	Determining the displays on the operating screen.	Page 57
Test/Diagnosis	Check of actuators and sensors.	Page 58
Date	Setting the current date.	Selection and modification of the settings by means of the **Arrow keys**; confirmation with the **Enter key**
Time	Setting the current time.	Selection and modification of the settings by means of the **Arrow keys**; confirmation using the **Enter key**

Submenu	Meaning	Description
Data transmission	Menu for data exchange and serial protocols	Page 60
Total data counter	Displaying/Deleting all counters ● Spread quantity in kg ● Spread area in m^2 and ha ● Spread time in h ● Distance travelled in km	To delete all data, an enable code is required. It can only be deleted by service personnel.
Service	Service settings	Password-protected; only accessible to service personnel

4.9.1 Setting the language

In the QUANTRON-K2 control unit, **several languages** are available.

The language package for your country is preloaded at the factory.

1. Open the **System / Test > Languages** menu.
   ▷ The first page is displayed.

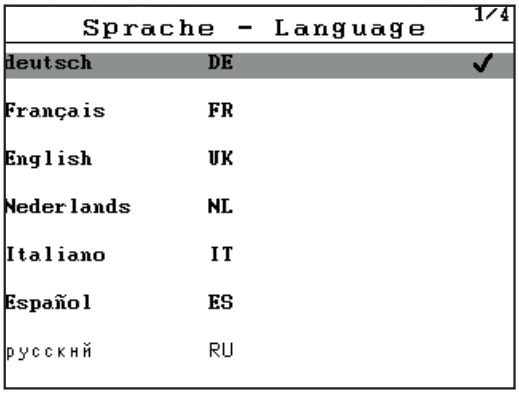


Figure 4.22: Language submenu, page 1

2. Select the respective menu language

NOTICE

The languages are listed in several menu windows. The **Arrow keys** enable switching to the next or previous windows.

3. Press the **Enter** key.

▷ **The selection is confirmed.**

▷ **The QUANTRON-K2 control unit restarts automatically.**

▷ **The menus are displayed in the selected language.**

4.9.2 Display configuration

The display fields in the operating screen of the control unit can be configured as desired. If necessary, two display fields can be set to the following values:

- Forward speed
- Flow factor (FF)
- Time
- ha trip
- kg trip
- km Trip
- kg left
- km left
- ha left
- m AB (working width)

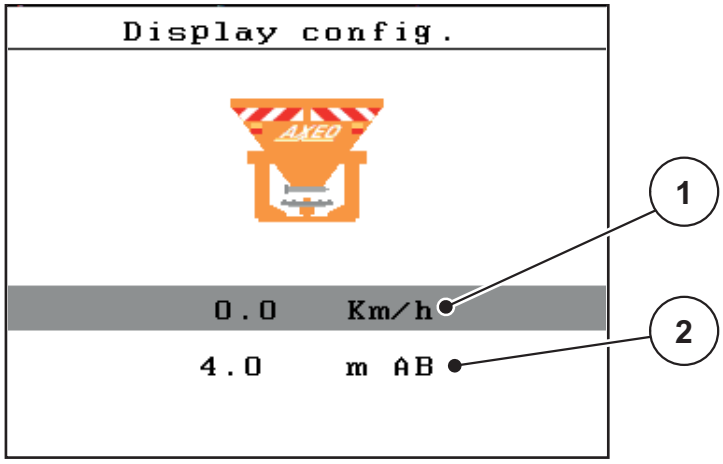


Figure 4.23: Display configuration menu

[1] Display field 1
[2] Display field 2

Display configuration

1. Open the **System / Test > Display config.** menu.
2. Select the required **display field**.
3. Press the **Enter** key.
   ▷ The possible displays are listed in the display.
4. Highlight the new value which is to be assigned to the display field.
5. Press the **Enter** key.
   ▷ The **operating screen** is displayed. The respective **display field** displays the new value.

4.9.3 Test/Diagnosis

The **Test/Diagnosis** menu enables function monitoring and checking of specific sensors/actuators.

NOTICE

This menu is for information purposes only.

The list of the sensors depends on the equipment of the machine.

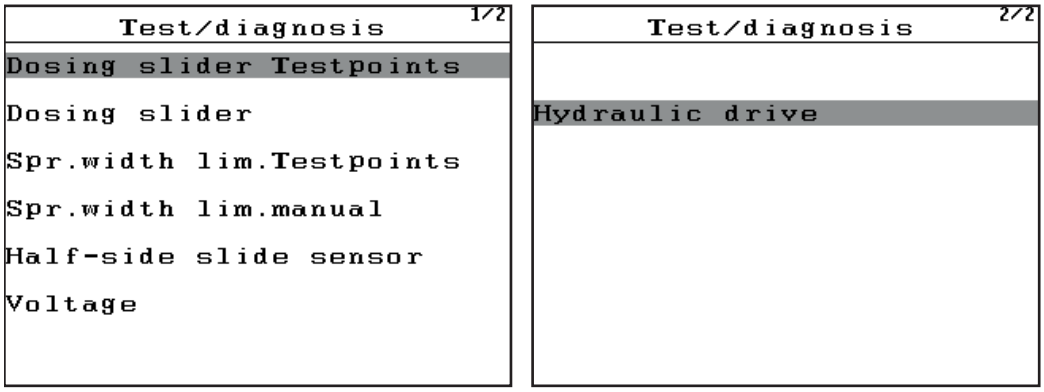


Figure 4.24: Test/Diagnosis menu

Submenu	Meaning	Description
Dosing slider Testpoints	Test for starting the various position points of the metering slide.	
Metering slide	Manual actuation of the metering slide	Page 59
Spr. width lim.Testpoints	Test for setting the various position points of the spreading width limiter plates.	
Spr. width lim.manual	Manual actuation of the spreading width limiter plates.	
Half-side slide sensor	Checking the sensors of the half-side slide.	
Voltage	Checking the operating voltage.	
Hydraulic drive	Test and checking of the Hydraulic drive function	

Example test/diagnosis of the slides

⚠ CAUTION

Risk of injury due to moving machine parts.

During the tests, machine parts may start to move automatically.

▶ Ensure that there is no one in the vicinity of the machine before carrying out the tests.

1. Open the **System / Test > Test/Diagnosis** menu.
2. Select the **Slide manual** menu item.
3. **Press the Enter key**.

   ▷ The status of the actuators/sensors is displayed.

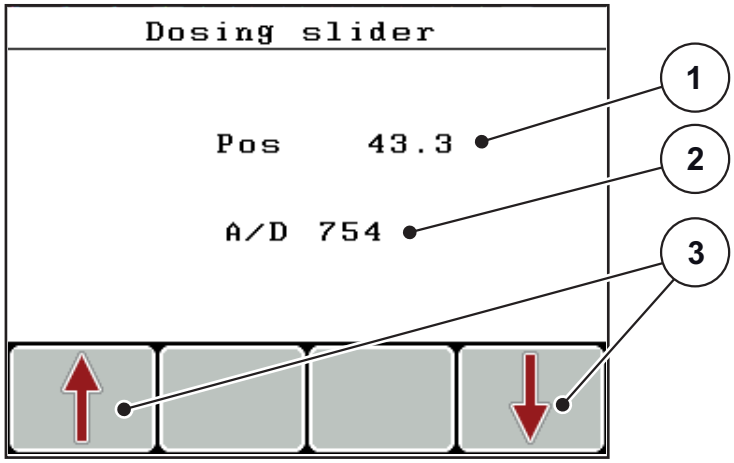


Figure 4.25: Test/Diagnosis example: Slide

[1] Metering slide position display
[2] Signal display
[3] Actuator function keys

Actuators can be extended and retracted by pressing the **F1 - F4** function keys.

4.9.4 Data transmission

Data transmission is carried out using data protocol LH5000.

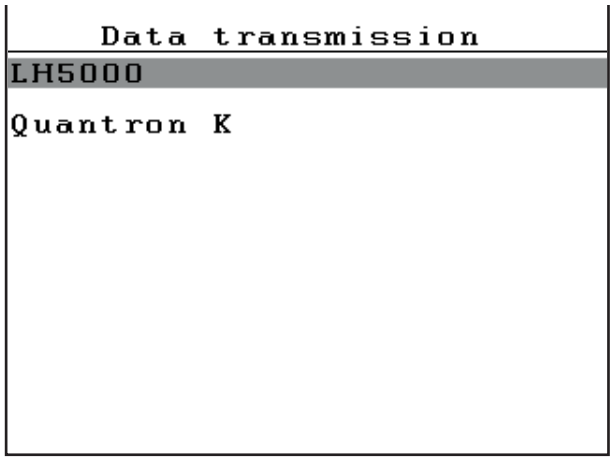


Figure 4.26: Data transmission menu

LH5000: Serial communication e.g. spreading using application cards

4.9.5 Total data counter

In this menu, all of the spreader's counter readings are displayed.

- Spread quantity in kg
- Spread area in ha and m²
- Spread time in h
- Distance travelled in km

NOTICE

This menu is for information purposes only.

4.9.6 Service

NOTICE

An input code is required to adjust the settings in the **Service** menu. These settings can only be modified by authorised service personnel.

As a general rule, we recommend that all settings in this menu are carried out by authorized service personnel.

4.9.7 Info

The **Info** menu provides information on the control unit.

NOTICE

This menu provides information on the configuration of the machine.

The information list depends on the equipment of the machine.

4.10 Special functions

4.10.1 Text input

In some menus, you can input freely editable text.

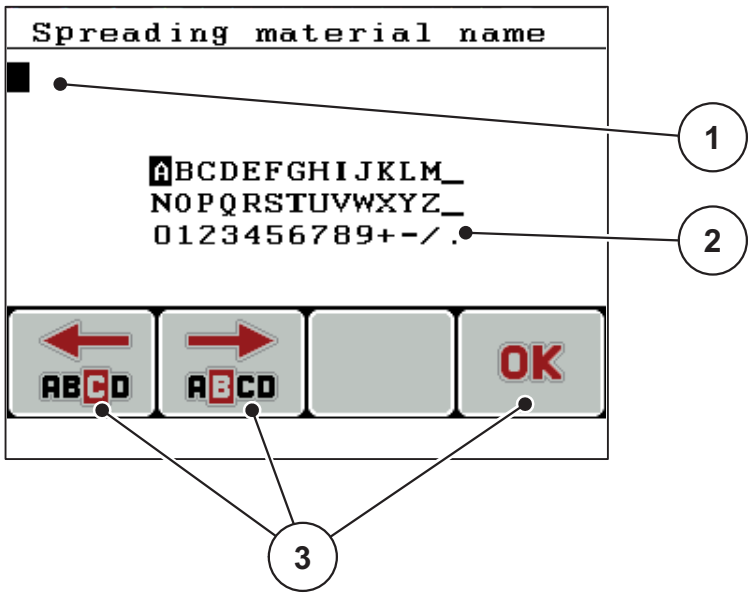


Figure 4.27: Text input menu

[1] Input field
[2] Character field, display of available characters (language-dependent)
[3] Function keys for navigation in the input field

Entering text:

1. Switch from the superordinate menu to the **Text input** menu.
2. Use the **F1 and F2 function keys** to move the cursor to the position of the character to be written first in the input field.
3. Use the **Arrow keys** to highlight the character to be written in the character field.
4. **Press the Enter key**.
   ▷ The highlighted character appears in the input field.
   ▷ The cursor jumps to the next position.

Continue until you have entered the entire text.

5. To **confirm** the input, press the **OK** [F4] function key.
   ▷ The control unit saves the text.
   ▷ The display shows the previous selection window.

Overwriting characters:

A single character can be overwritten by another character.

1. Use the **F1 and F2 function keys** to move the cursor to the position of the character to be deleted first in the input field.
2. Use the **Arrow keys** to select the character to be written in the character field.
3. Press the **Enter** key.
   ▷ The character is overwritten.
4. To **confirm** the input, press the **OK** function key.
   ▷ The text will be stored in the control unit.
   ▷ The previous menu is shown on the display.

NOTICE

Individual characters can only be deleted by replacing them with blank spaces (underline at the end of the first 2 character lines).

Deleting an input:

The complete input can be deleted.

1. Press the **C 100 % key**.
   ▷ The complete input is deleted.
2. Enter new text, if necessary.
3. Confirm the entered value by pressing the **OK** function key.

4.10.2 Entering values with the cursor keys

In some menus, numerical values can be entered.

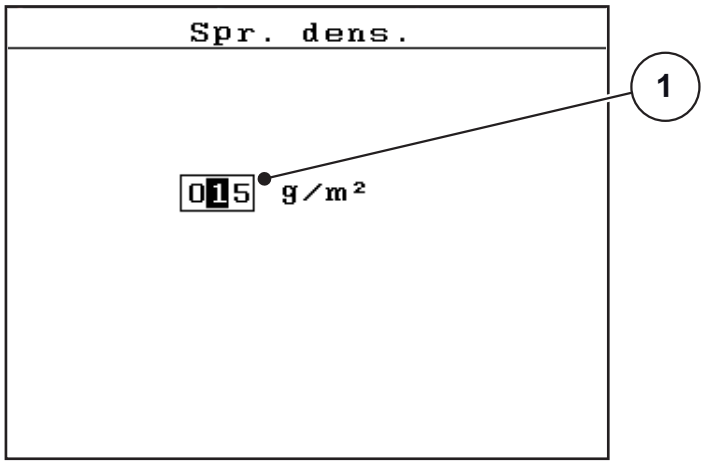


Figure 4.28: Input of numerical value (example spreading density)

[1] Input field

Requirements:

You are already in the menu in which you can enter numerical values.

1. Use the **horizontal arrow keys** to move the cursor to the position of the numerical value to be written first in the input field.
2. Use the vertical **arrow keys** to enter the required numerical value.

   Arrow up: Value increases.

   Arrow down: Value decreases.

   Arrow left/right: Cursor moves to the left/right.
3. Press the **Enter** key.

Deleting an input:

The complete input can be deleted.

1. Press the **C 100 %key**.

   ▷ The complete input is deleted.

5 Spreading operation with the QUANTRON-K2 control unit

The QUANTRON-K2 control unit supports you with the setting of your machine before you start your work. During spreading, functions of the control unit are also active in the background. With these functions, the spreading quality can be checked.

5.1 Minimum mass flow

On the **operating screen** and in the **Calibration** submenu, a symbol may be displayed when adjusting certain settings at the single-disc spreader indicating a minimum mass flow.

- If the mass flow is below 5 kg/min due to the settings, a minimum mass flow of **5 kg/min** is **automatically** applied for spreading.
- In this case, the configured spreading density is **not** applied.
- The actual spreading density exceeds the set one.

NOTICE

The minimum mass flow warning message is only displayed in the **MAN km/h** and **AUTO km/h** operating modes.

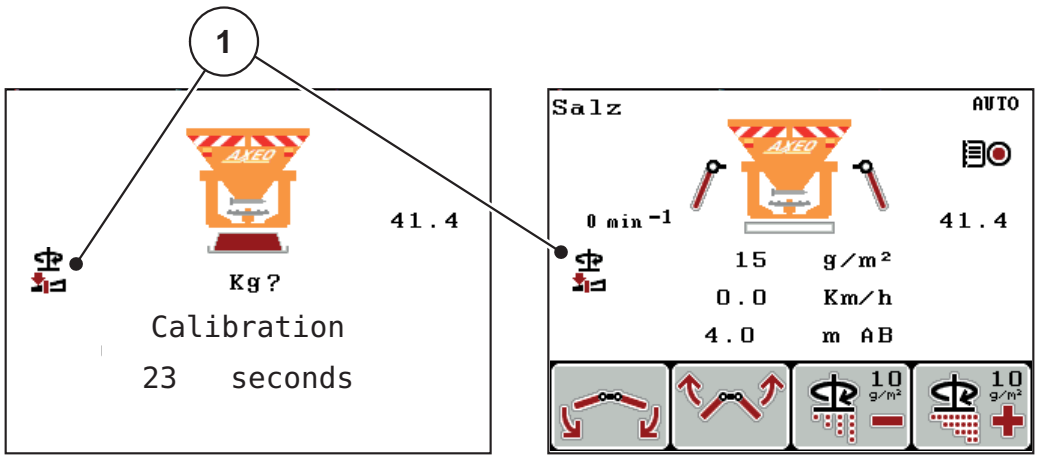


Figure 5.1: Warning symbol in the Calibration submenu and on the operating screen

[1] Minimum mass flow symbol

The mass flow can also be calculated using the following formula:

$$\text{Mass flow (kg/min)} = \frac{\text{spreading density (g/m}^2\text{)} \times \text{Dispersion (m)} \times \text{Speed (km/h)}}{60}$$

Example: For example, to work above a minimum mass flow of 5 kg/min, the following values have to be set:

$$\frac{25\ g/m^2 \times 4\ m \times 5\ km/h}{60} = 8.33\ kg/min$$

NOTICE

If a different minimum mass flow than **5 kg/min** is required, please contact your dealer or the manufacturer. The control unit can be configured on request.

5.2 Dispersion adjustment during spreading operation

By means of different positions, the spreading width limiter enables dispersion of **1 m to 10 m** at an mounting height of **approx. 55 cm** (refer to the AXEO winter spreader operator's manual).

Depending on the equipment of your machine, various dispersion configurations are available.

⚠ CAUTION

Environmental damage due to incorrect machine settings

If the **Dispersion AUTO** function is deactivated, the disc speed and the position of the spreading width limiter plates **are not automatically** adjusted to the reduced dispersion. There is a risk of environmental damage due to incorrect configurations.

- ▶ Adjust the RPM of the spreading disc / the position of the spreading width limiter plates at the operating screen using the F1 and F2 function keys. The symbols can be accessed by pressing the L/R key repeatedly.
- ▶ Deactivate the **Dispersion AUTO** only if required.

5.2.1 Winter spreader with one actuator for the spreading width limiter

Without levers (Dispersion AUTO deactivated)

By default, the actuator for the spreading width limiter is installed on the right side (in the direction of travel). See 4.6.4: Levers (option), page 46.

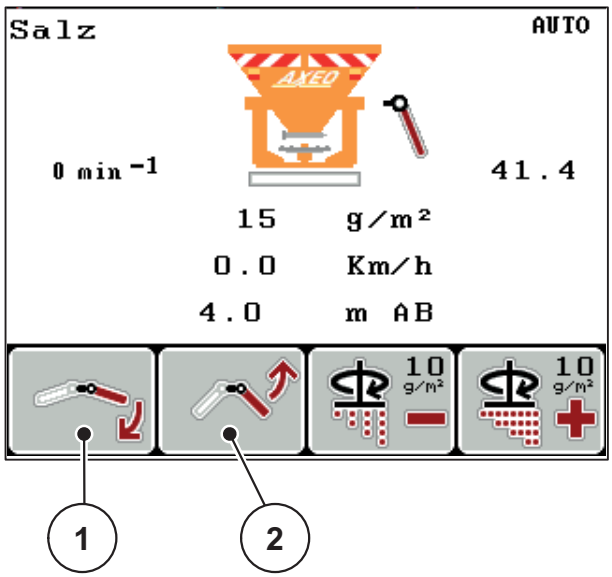


Figure 5.2: Dispersion adjustment with one actuator

- To actuate the right spreading width limiter plates, press the F1 or F2 function key.
  - F1 [1]: Lowering the right spreading width limiter plates
  - F2 [2]: Raising the right spreading width limiter plates

With levers (Dispersion AUTO deactivated)

The actuator is connected to both sides of the spreading width limiter plates by the optionally available levers. This option enables symmetrical dispersion adjustment.

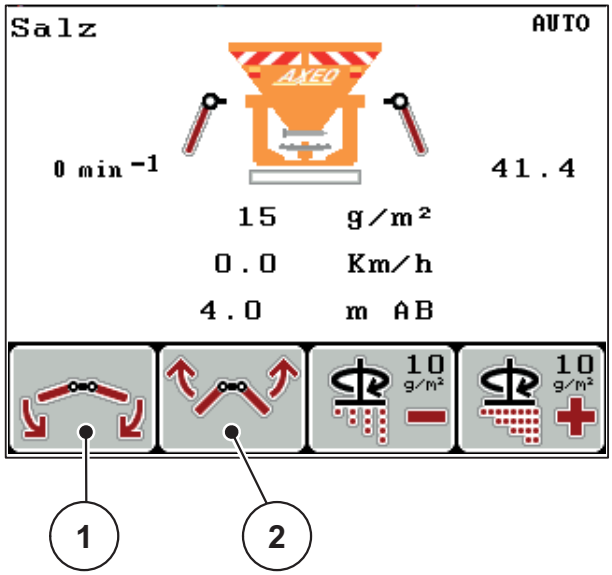


Figure 5.3: Dispersion adjustment with levers

[1] F1: Lowering the spreading width limiter plates
[2] F2: Raising the spreading width limiter plates

5.2.2 Winter spreader with two actuators for the spreading width limiter (Dispersion AUTO deactivated)

The option with 2 installed actuators enables switching from a symmetric to an asymmetric spreading pattern while spreading.

1. Select the desired spreading width limiter function by pressing the **L/R** key.

   Press the **L/R** key repeatedly to select the side of the spreading width limiter plates to be adjusted.

   - left
   - right

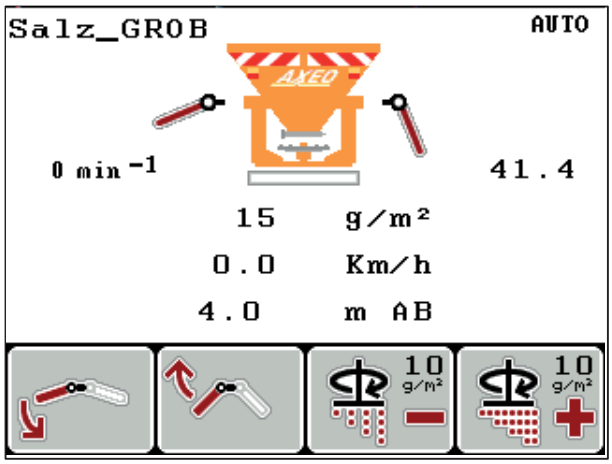


Figure 5.4: Asymmetric spreading pattern (example)

Dispersion adjustment to the road during spreading operation.

- F1: Lowering the spreading width limiter plates on the respective side.
- F2: Raising the spreading width limiter plates on the respective side.

To restore a symmetrical spreading pattern, proceed as follows.

1. Select the desired adjustment function with the **L/R** key.
2. Adjust the left or right side to the same position by pressing the **F1** or **F2** function key.
3. Press **L/R** until both sides can be adjusted simultaneously (refer to figure 5.5)

▷ **The spreading pattern is symmetrical.**

NOTICE

The symmetrical spreading pattern is active as soon as both sides can be adjusted simultaneously (refer to figure 5.5) and the actuators are set to one of the limit stops (bottom or top).

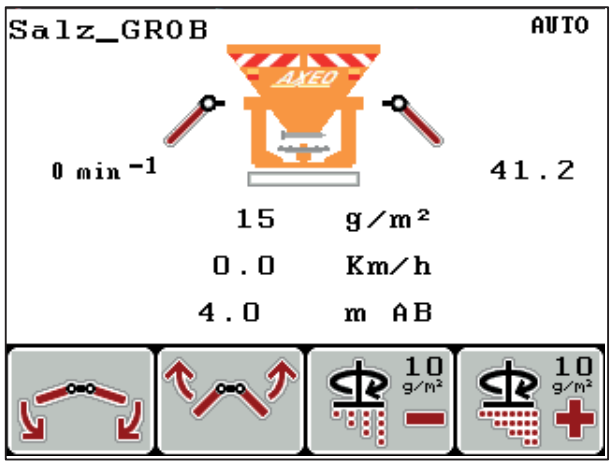


Figure 5.5: Symmetrical spreading pattern

5.2.3 Dispersion adjustment with the Dispersion AUTO function

Winter spreader with Hydraulic drive (Q-100-HC, Q-200-HC)

- Press the **L/R** key repeatedly until the symbols [1] for working width adjustment are displayed.

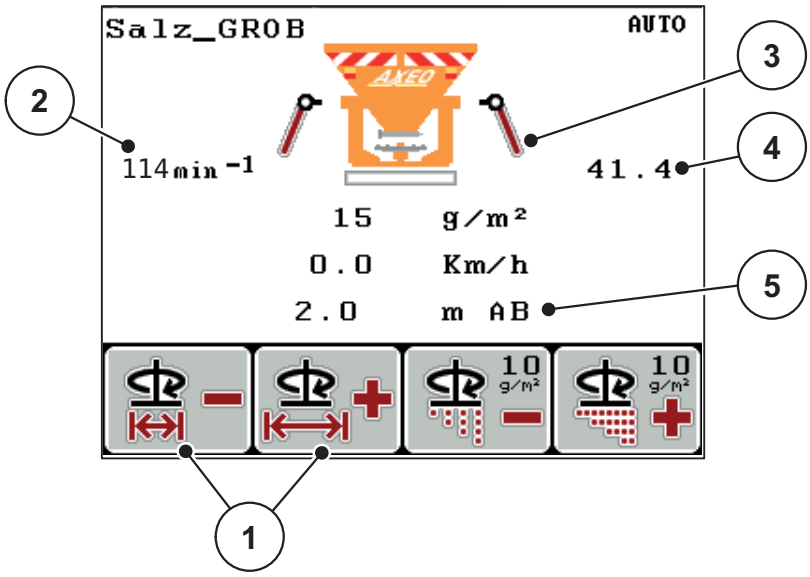


Figure 5.6: Working width adjustment (Dispersion AUTO activated)

When adjusting the working width [5] using the F1 and F2 [1] function keys, the QUANTRON-K2 control unit automatically sets the disc speed [2], the position of the metering slide [4] (depending on the forward speed) as well as the spreading width limiter plates [3].

Winter spreader without Hydraulic drive (Q-100-HC, Q-200-HC)

- Press the **L/R** key repeatedly until the symbols [1] for working width adjustment are displayed.

When adjusting the working width [5] using the F1 and F2 [1] function keys, the QUANTRON-K2 control unit automatically sets the position of the metering slide [4] (depending on the forward speed) as well as the dispersion limiter plates [3].

5.3 Half-side slide

If the half-side slide at the winter spreader is adjusted (closed position), the QUANTRON-K2 control unit displays the respective symbol on the operating screen.

- Refer to figure 2.3 in the 2.4: Display, page 9 sub-chapter.

NOTICE

The half-side slide cannot be controlled by the QUANTRON-K2 control unit. The symbol on the operating screen is only for information.

- Please note the operator's manual of the AXEO winter spreader and particularly the **Machine settings** chapter.

5.4 Spreading with AUTO km/h operating mode

In AUTO km/h operating mode, the control unit automatically controls the position of the metering slide based on the speed signal.

1. Switch on the QUANTRON-K2 control unit.
2. Spreading material settings:
   - Spreading density (g/m²)
   - Dispersion (m)
3. Fill in the spreading material.

NOTICE

In order to achieve an optimum spreading result in the AUTO km/h operating mode, a calibration is to be carried out before starting the spreading work.

4. Carry out calibration for flow factor determination

   or

   Obtain the flow factor from the fertiliser chart.
5. Enter the flow factor manually.
6. Press the **Start/Stop** key (and the enter key with Hydraulic drive).

▷ **The spreading starts.**

5.5 Spreading in the MAN km/h operating mode

If there is no speed signal, the MAN km/h operating mode is active.

1. Switch on the QUANTRON-K2 control unit.
2. Open the **Machine settings > AUTO/MAN mode** menu.
3. Select **MAN km/h** in the menu.
4. Press the **Enter key**.
5. Enter the forward speed.
6. Press the **Enter key**.
7. Spreading material settings:
   - Spreading density (g/m²)
   - Dispersion (m)
8. Fill in the spreading material.

NOTICE

In order to achieve an optimum spreading result in the MAN km/h operating mode, a calibration is to be carried out before starting the spreading.

9. Carry out calibration for flow factor determination

   or

   Obtain the flow factor from the fertiliser chart.
10. Enter the flow factor manually.
11. Press the **Start/Stop** key (and the enter key with Hydraulic drive).

▷ **The spreading starts.**

NOTICE

Always observe the set speed during spreading.

5.6 Spreading in the MAN scale operating mode

The **MAN scale** operating mode enables manual adjustment of the metering slide opening during spreading.

Requirements:

- The metering slide is open (activation with the **Start/Stop key**).

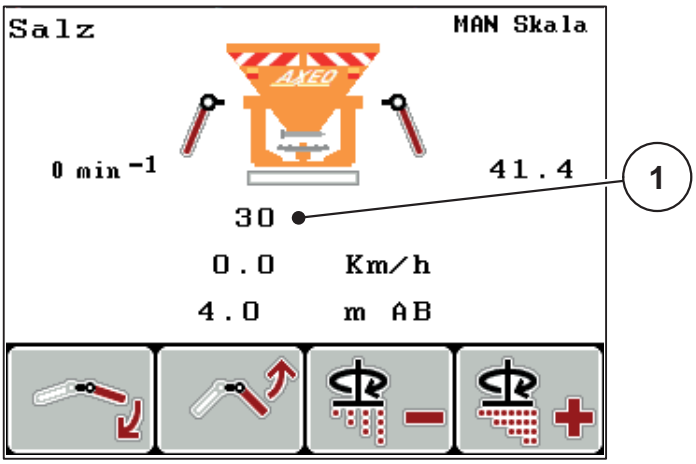


Figure 5.7: MAN scale operating screen

[1] Display of current metering slide scale position

1. Switch on the QUANTRON-K2 control unit.
2. Open the **Machine settings > AUTO/MAN mode** menu.
3. Select **MAN scale** in the menu.
4. Press the **Enter key**.
5. Enter the position of the metering slide.
6. Press the **Enter** key.
7. Switch to the **operating screen**.
8. Press the **Start/Stop** key (and the enter key with Hydraulic drive).

▷ **The spreading starts.**

9. To change the metering slide opening, press the **F3** or **F4** function key.

   F3: **MAN-** to reduce the metering slide opening

   F4: **MAN+** to increase the metering slide opening

NOTICE

In order to achieve an optimum spreading result in manual mode as well, it is recommended to apply the metering slide opening and forward speed values provided in the fertiliser chart.

5.7 Spreading with the special spreading function

- For proportional adjustment of the quantity change, refer to chapter 4.6.3: Special spreading (+%), page 46.

1. Switch to the **operating screen**.

   See 4.2: Menu navigation, page 23.

2. During spreading, keep the **Special spreading** key pressed.

   See 2.3: Control elements, page 7.

▷ **Spreading with the preconfigured additional quantity is activated.**

NOTICE

The additional quantity is only spread as long as the **Special spreading** key is pressed.

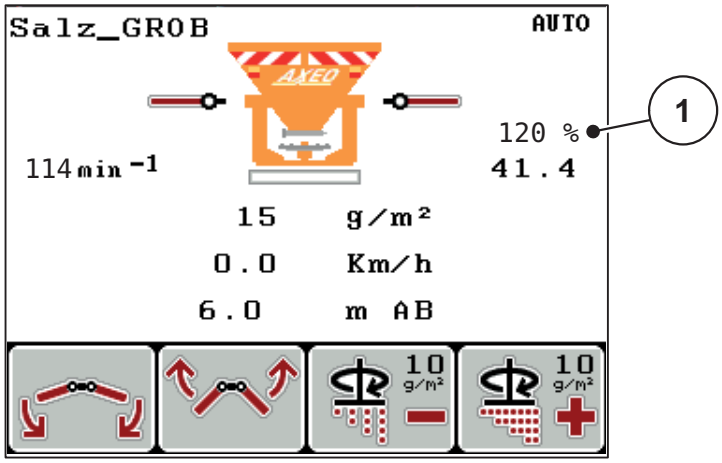


Figure 5.8: Special spreading

5.8 Spreading with simulated speed:

NOTICE

The simulated speed function can **only** be activated when the tractor is at a standstill.

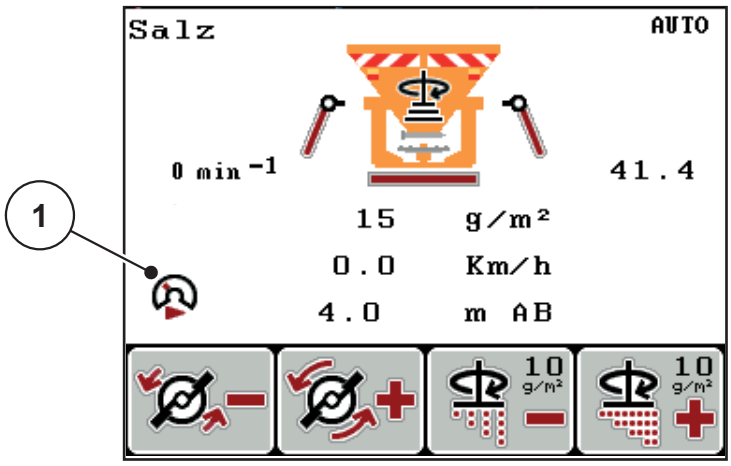


Figure 5.9: Simulated speed

1. Switch to the operating screen.

   See 4.2: Menu navigation, page 23

2. When stationary, press the **Special spreading** key once.

   See 2.3: Control elements, page 7).

   ▷ On the display, the [1] symbol is displayed.

▷ **The simulated speed is activated.**

NOTICE

The simulated speed remains active until it is exceeded by the actual speed. After having exceeded the simulated speed, the metering quantity is calculated based on the actual speed.

NOTICE

Press the **Special spreading** key again to deactivate the simulated speed function.

5.9 Spreading density adjustment

During spreading, the spreading density can be adjusted in the operating screen by pressing the **F3** and **F4** function keys.

Requirements

- The desired step width was set in the **Spread. mat. settings > Spreading density +/-** submenu. See 4.5.6: Spreading density +/-, page 38.

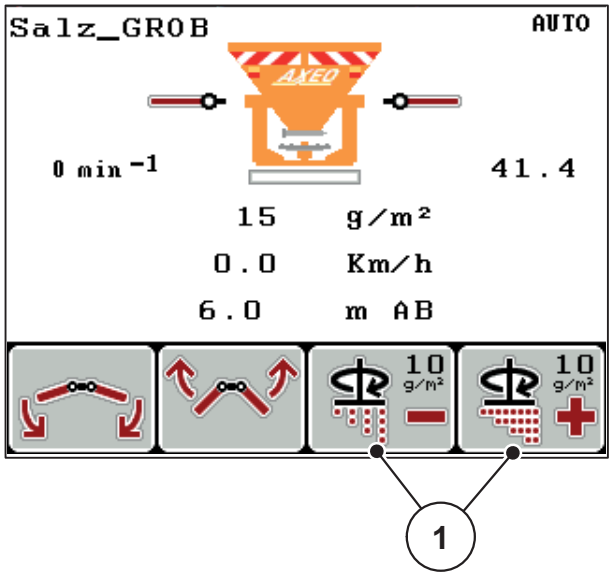


Figure 5.10: Spreading density adjustment

5.10 Disc speed adjustment (Hydraulic drive only)

NOTICE

RPM adjustment is only available if **Dispersion AUTO is deactivated**!

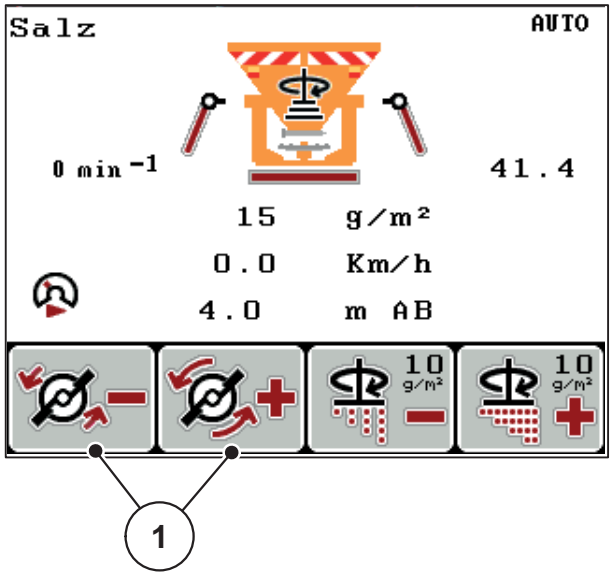


Figure 5.11: Disc speed adjustment

1. Press the **L/R** key until the function RPM +/- is displayed over the F1/F2 function keys.

   F1: **RPM -** to reduce the disc speed.

   F2: **RPM +** to increase the disc speed

6 Alarm messages and possible causes

Various alarm messages can be displayed on the QUANTRON-K2 control unit display.

6.1 Meaning of alarm messages

No.	Message in display	Meaning ● **Possible cause**
1	Fault in dosing system. Stop!	The actuator for the metering system cannot reach the target value it is to be moved to. ● Blockage ● No position feedback
2	Maximum outlet reached! Speed or application rate too high	Metering slide alarm ● The maximum metering opening is reached. ● The set application rate exceeds the maximum metering opening.
3	Flow factor is outside limits.	The flow factor must lie within a range between **0.40 - 2.10**. ● The newly calculated or entered flow factor is outside this range
4	Hopper empty.	Level sensor indicates empty hopper.
7	Data will be deleted! Delete = START Cancel = ESC	Safety alarm to prevent the unintentional deletion of data.
8	Spreading density Min.setting = 5 Max. setting = 40	Reference to the **spreading density** value range for dewing spreading material. ● The set value exceeds the reference values.
9	Spreading density Min. setting = 75 Max. setting = 300	Reference to the **spreading density** value range for blunting spreading material. ● The set value exceeds the reference values.
10	Spreading density Min. setting = 1 Max. setting = 300	Reference to the **spreading density** value range for fertiliser. ● The set value exceeds the reference values.
11	Working width Min. setting = 1 Max. setting = 10	Reference to **working width** value range. ● The set value exceeds the reference values.

No.	Message in display	Meaning ● Possible cause
12	Flow factor Min. setting = 0.40 Max. setting = 2.10	Reference to the **flow factor** value range. ● The set value exceeds the reference values.
13	Transmission fault. No RS232 connection	An error has occurred during data transmission to the control unit. The data have not been transmitted.
14	Error at spreading width limiter	The actuator cannot reach the target value it is to be moved to. ● Blockage ● No position feedback
15	Memory full. Delete one spreading material	A maximum of 30 spreading materials can be saved. ● No additional saving possible
17	Discs are started up without activation.	An RPM pulse is applied although the spreading disc drive has not been started, i.e., the RPM exceed 20 1/min
18	Activate disc start. Confirm with ENTER	Before the PWM outlet is activated, a confirmation prompt is displayed
19	Meter. slider ist closed. Turn off agitator	The metering slide is closed, the speed sensor reports a RPM over 20 1/min.
20	max. RPM reached! Max. setting = 250	In the coarse salt, fine salt, damp salt, grit and sand characteristic curves, an RPM over 250 min is supposed to be reached.
21	Disc speed not reached.	The hydraulic motor cannot reach the set RPM! ● Not enough oil in the motor

6.2 Clearing an error/alarm

6.2.1 Acknowledging an alarm message

Alarm messages are highlighted on the display and displayed with a warning symbol.

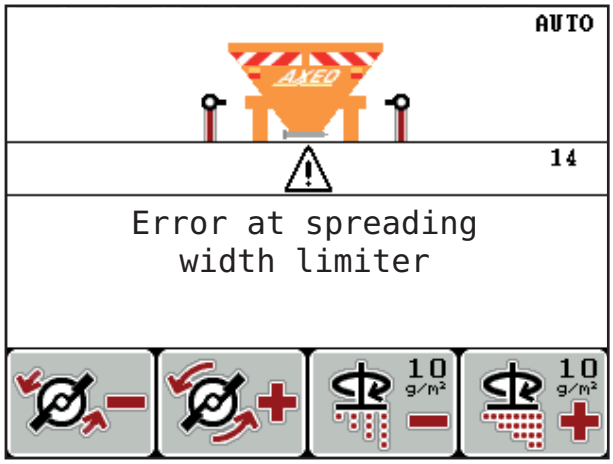


Figure 6.1: Alarm message (example: spreading width limiter)

Acknowledging an alarm message:

1. Correct the cause of the alarm message.

   Please note the winter spreader operating manual and section 6.1: Meaning of alarm messages, page 79.

2. Press the **C/100%** key.

▷ **The alarm message is cleared.**

7 Special equipment/options

Illustration	Designation
	GPS cable and receiver
	Universal holder
	Forward speed sensor
	Perforated disc parts set (forward speed sensor accessory)
	Extension cable 4.5 m
	DataManager Street Documentation management and data transmission software

Index

Terms/conditions of warranty

RAUCH units are manufactured with modern production methods and with the greatest care and are subject to numerous inspections.

Therefore RAUCH offers a 12-month warranty subject to the following conditions:

- The warranty begins on the date of purchase.
- The warranty covers material and manufacturing faults. Our liability for third-party products (hydraulic system, electronics) is limited to the warranty of the manufacturer of the equipment. During the warranty period, manufacturing and material faults are corrected free of charge by replacement or repair of the affected parts. Other rights extending beyond the above, such as claims for conversion, reduction or replacement for damages that did not occur in the object of supply are explicitly excluded. Warranty services are provided by authorised workshops, by RAUCH factory representatives or the factory.
- The following are excluded from coverage by the warranty: natural wear, dirt, corrosion and all faults caused by improper handing and external causes. The warranty is rendered void if the owner carries out repairs or modifications to the original state of the supplied product. Warranty claims are rendered void if RAUCH original spare parts were not used. Therefore, the directions in the operating manual must be observed. In all cases of doubt contact our sales representatives or the factory directly. Warranty claims must be submitted to the factory by 30 days at the latest after occurrence of the problem. The date of purchase and the serial number must be indicated. If repairs under the warranty are required, they must be carried out by the authorised workshop only after consultation with RAUCH or the company's appointed representatives. The warranty period is not extended by work carried out under warranty. Shipping faults are not factory faults and therefore are not part of the warranty obligation of the manufacturer.
- No claims for compensation for damages that are not part of RAUCH machines themselves will be accepted. This also means that no liability will be accepted for damage resulting from spreading errors. Unauthorised modifications of RAUCH machines may result in consequential damage, for which the manufacturer will not accept any liability. The manufacturer's liability exclusion will not apply in case of wilful intent or gross negligence by the owner or a senior employee, and in cases where – according to the product liability law – there is liability for personal injury or material damage to privately used objects in the event of defects in the supplied product. It will also not apply in the event that assured properties are absent, if the purpose of the assured properties was to protect the purchaser against damage that does not involve the supplied product itself.

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