



RAUCH

wir nehmen's genau

OPERATION MANUAL



**Please read carefully
before using the ma-
chine.**

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 A TWS

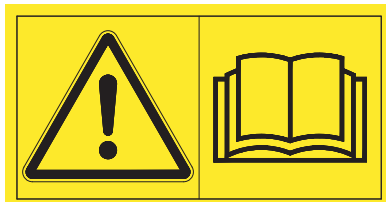
Original instructions

5901770-C-en-0316

Preface

Dear Customer

By purchasing the QUANTRON-A **control unit** you have shown confidence in our product. Thank you very much! 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 machine carefully before commissioning and follow the advice given.

This operator'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**.

Please note that damage caused by incorrect operation or improper use may not be covered by warranty claims.

NOTE

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

The QUANTRON-A control unit has been calibrated at the factory for the transfer vehicle with which it was supplied. It cannot be connected to another machine without requiring calibration.

Please enter the serial number of the control unit and of the machine here. When connecting the control unit to the machine, these numbers must be checked.

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

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Information on open source software

Terms/conditions of warranty

1 User instructions

1.1 About this operator's manual

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

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 an integral 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-A.

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	
	<p>Risk to life if warning is not observed</p> <p>Description of the danger and possible consequences.</p> <p>Ignoring these warnings will result in very serious or even fatal injury.</p> <p>► Measures to prevent the danger.</p>

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 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 item/s:

- **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 > corresponds to confirmation with the **Enter key**.

2 Layout and function

2.1 Overview of the supported transfer vehicles

Function/options	TWS 7010	TWS 85.1
Filling level indicator and monitoring during fertiliser transfer	•	•
Hydraulic control of the hopper cover, auger and TWS slide	•	•
Electronic control of the auger speed		•

In the following chapters, 2 machine types are distinguished:

- **TWS-M:** Universal drive shaft of the rear fertiliser spreader
- **TWS-H:** Hydraulic drive of the rear fertiliser spreader

2.2 Layout of the control unit - overview

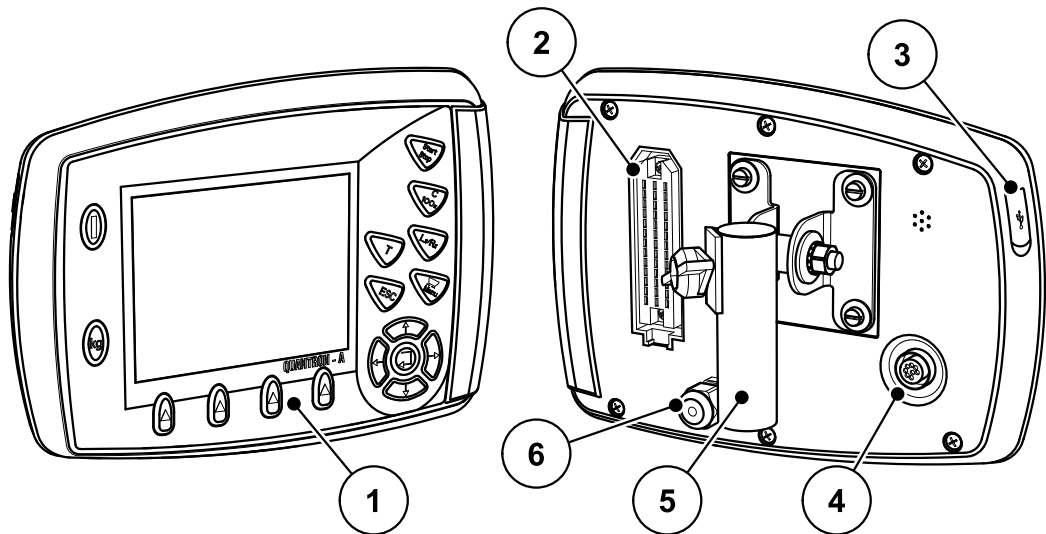


Figure 2.1: Control unit QUANTRON-A

No.	Designation	Function
1	Front	Consisting of the ON/OFF key, foil keys and function keys
2	Machine cable plug connector	39-pin plug connector for connection of sensors via the machine cable
3	USB interface	Currently not supported
4	Interface	Currently not supported
5	Mounting bracket	Attaches the control unit to the tractor
6	Power supply	Power supply of the QUANTRON-A control unit

2.3 Control elements

The QUANTRON-A is operated via **17 foil keys**.

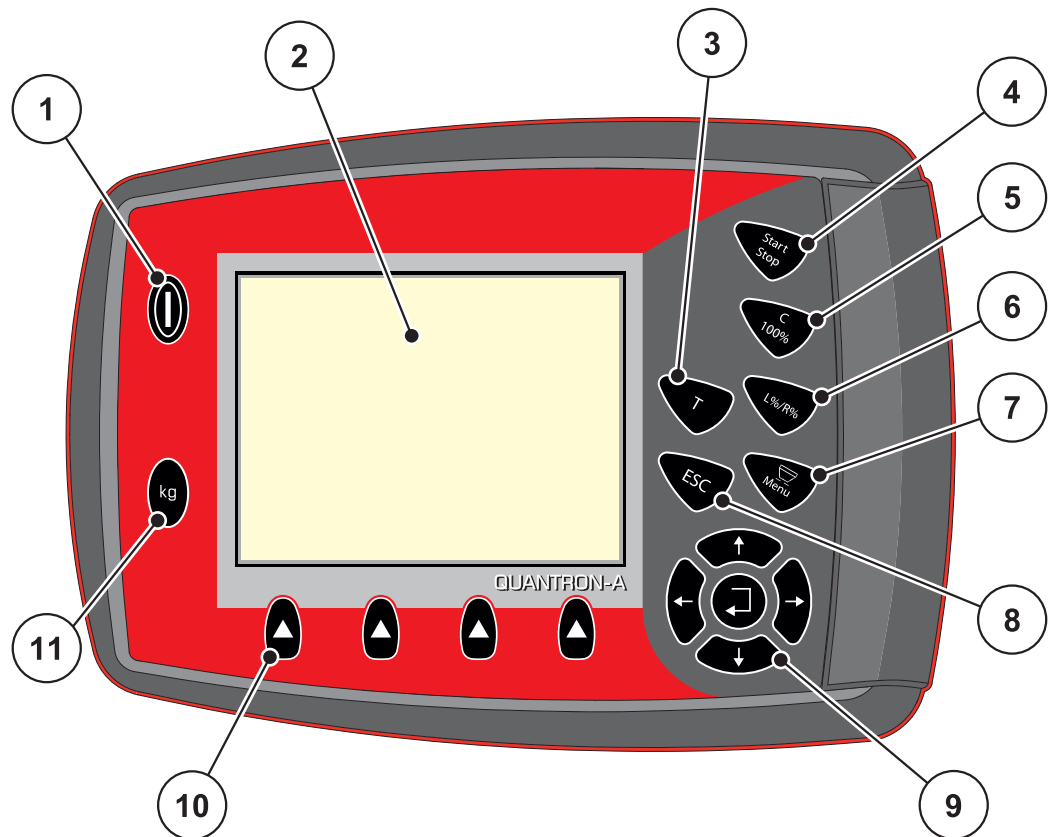


Figure 2.2: Control panel at the front of the unit

NOTICE

The operator's manual describes the functions of the QUANTRON-A control unit **as of software version 3.00.00**

No.	Designation	Function
1	ON/OFF	Switches the device on/off
2	Display	Display of operating screens
3	T key	Quick access to the hopper cover menu
4	Start/stop	Fertiliser conveyor start/stop
5	C/100%	Acknowledging of alarm messages
6	L%/R%	no function
7	Menu	Switch between operating screen and main menu.
8	ESC	Cancelling entries and/or returning to the previous menu at the same time.

No.	Designation	Function
9	Navigation field	<p>4 arrow keys and one enter key for navigation through menus and input fields.</p> <ul style="list-style-type: none">● 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	<p>Selection of the functions displayed above the function keys.</p> <ul style="list-style-type: none">● F1: Acoustic signal ON/OFF● F2: Acknowledging of error messages (acoustic signal deactivation)● F3: Acknowledging of alarm messages (acoustic signal deactivation)● F4: Transfer function operating mode selection
11	kg	no function

2.4 Display

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

The main information on the operation of the machine is provided on the **operating screen**.

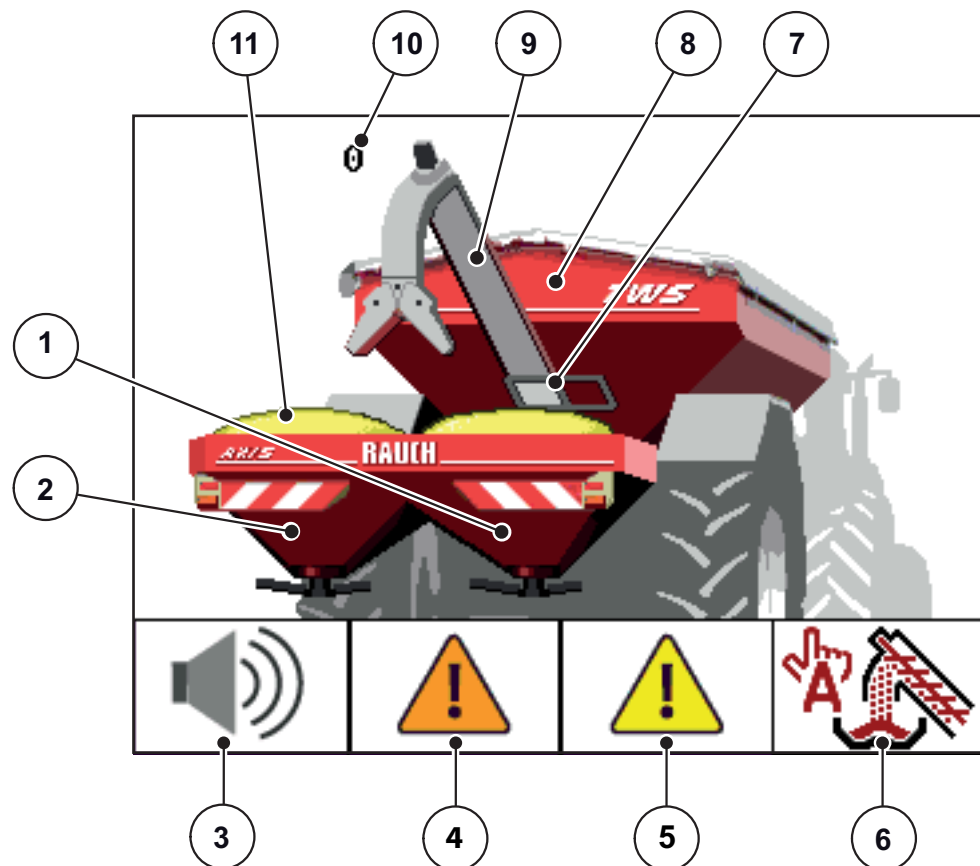


Figure 2.3: QUANTRON-A control unit operating screen

- [1] Indication of right fertiliser spreader filling level
- [2] Indication of left fertiliser spreader filling level
- [3] Acoustic signal ON/OFF (function key F1)
- [4] Acknowledge error message (function key F2)
- [5] Acknowledging of alarm messages (function key F3)
- [6] Operating mode selection for fertiliser conveyer (function key F4)
- [7] Display TWS slide
- [8] Indication of TWS filling level
- [9] Display fertiliser transfer via the auger
- [10] Display Auger speed
- [11] Overflow indicator

2.5 Sensors

NOTICE

Observe the operator's manual of the TWS transfer vehicle.

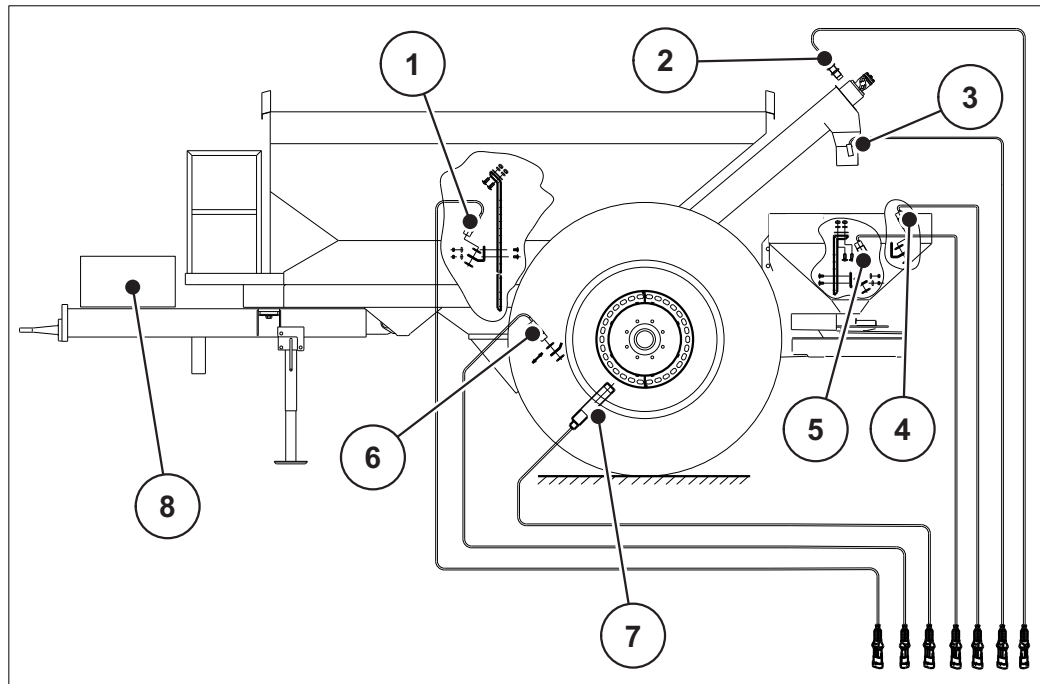


Figure 2.4: Sensors at the TWS transfer vehicle

- [1] TWS hopper level sensor (LTWS)
- [2] Fertiliser conveyor sensor (SSE)
- [3] Filling level sensor, fertiliser spreader full (VST)
- [4] Level sensor, right fertiliser spreader hopper (LRST)
- [5] Level sensor, left fertiliser spreader hopper (LLST)
- [6] TWS slide position sensor (SSI)
- [7] Forward speed sensor (KMH)
- [8] Hydraulic block

3 Attachment and installation

3.1 Tractor requirements

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

- A supply voltage **between 11 V and 15 V** must **always** be guaranteed, even if multiple loads are connected simultaneously (e.g. air conditioning system, lights).

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).

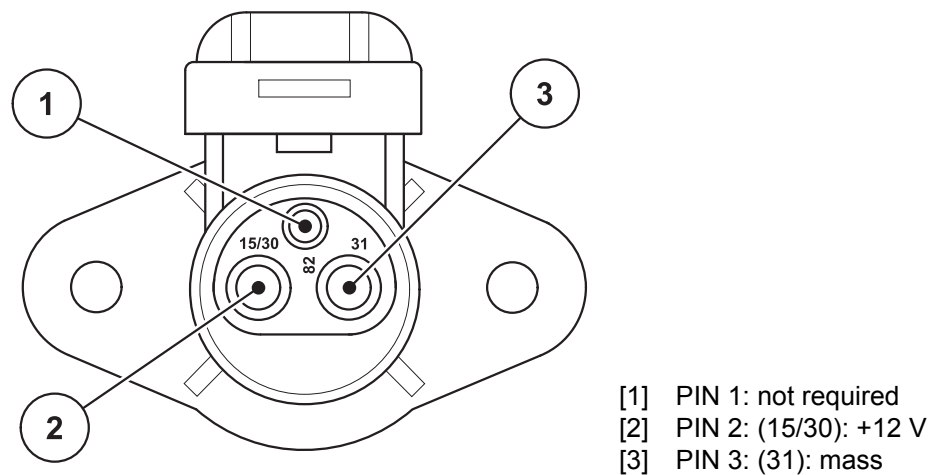


Figure 3.1: PIN assignment of power socket

3.3 Connecting the control unit

NOTICE

Note the machine number

Always connect the control unit to the dedicated transfer vehicle.

3.3.1 Schematic connection diagram

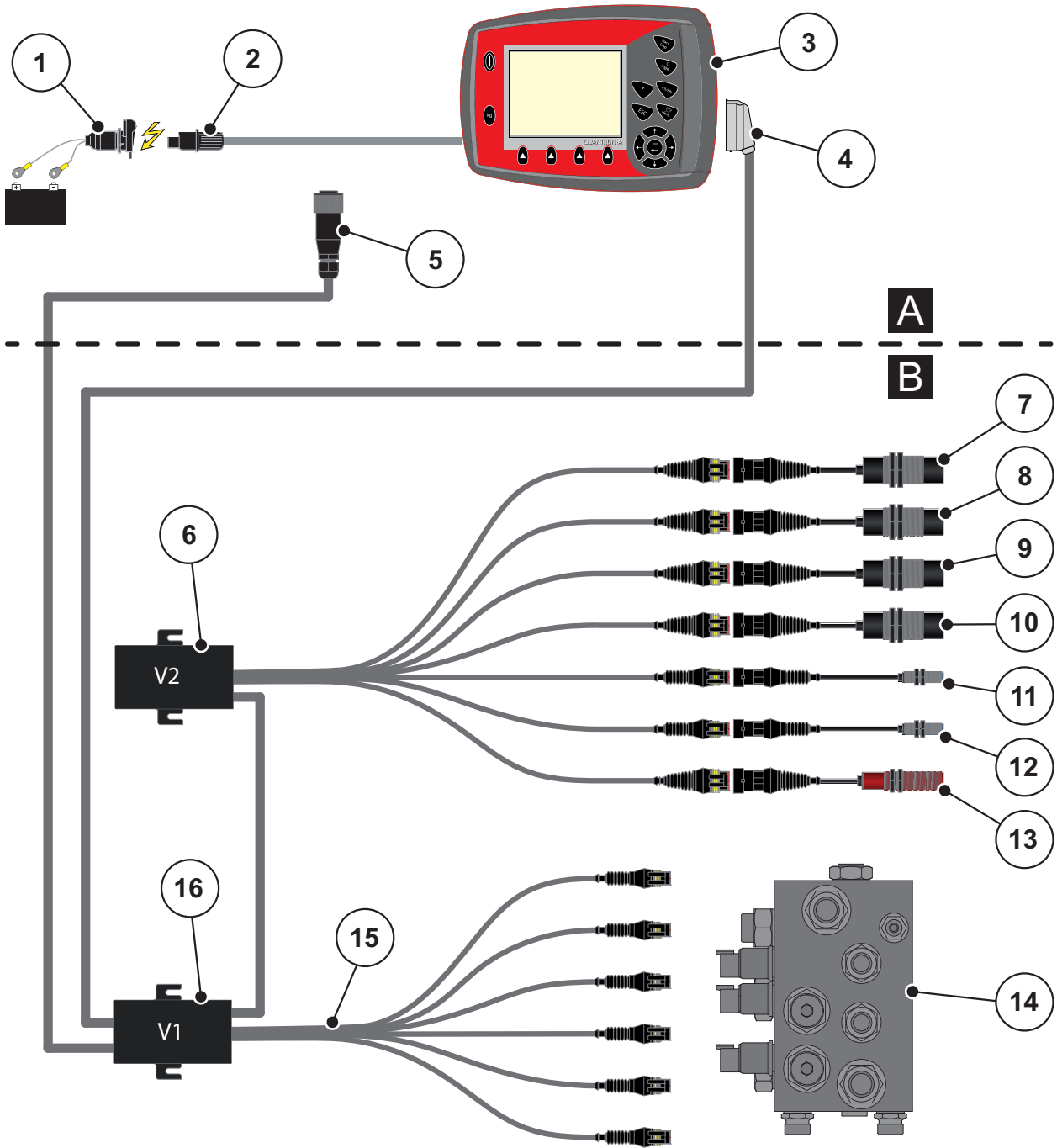


Figure 3.2: Schematic connection diagram

- | | |
|--|---|
| [1] Battery | [10] Level sensor, left fertiliser spreader hopper (LLST) |
| [2] Power supply | [11] Fertiliser conveyor sensor (SSE) |
| [3] Control unit QUANTRON-A | [12] TWS slide position sensor (SSI) |
| [4] Machine plug | [13] Forward speed sensor (KMH) |
| [5] Forward speed signal to fertiliser spreader control unit | [14] Hydraulic block |
| [6] Distribution box 2, sensors | [15] TWS valve cable harness |
| [7] TWS hopper level sensor (LTWS) | [16] Distribution box 1, valves |
| [8] Filling level sensor, fertiliser spreader hopper (VST) | [A] Tractor cabin |
| [9] Level sensor, right fertiliser spreader hopper (LRST) | [B] TWS |

3.3.2 Proceed as follows:

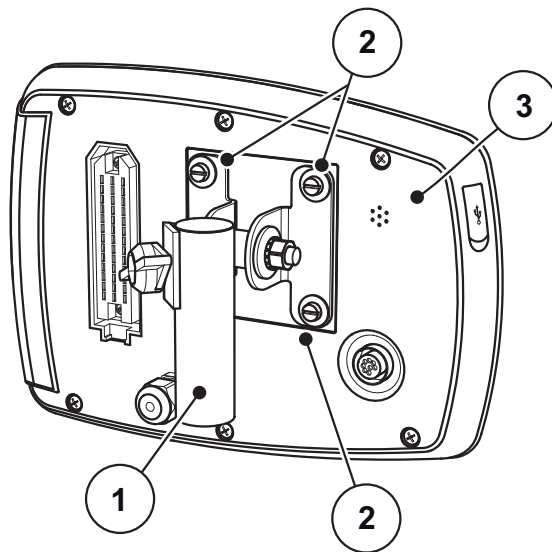


Figure 3.3: Mounting bracket

- | |
|-----------------------------|
| [1] Mounting bracket |
| [2] Screws |
| [3] Control unit QUANTRON-A |

Proceed in the following order.

1. Attach the mounting bracket [1] with the four provided screws [2] at the control unit [3].
2. Select a suitable position in the tractor cabin (within **the driver's field of vision**) to secure the control unit.
3. Fix the control unit by means of brackets in the tractor cabin.

NOTICE

For a schematic connection diagram of the QUANTRON-A control unit, refer to chapters [3.3.1: Schematic connection diagram, page 12](#).

4. Connect the power supply of the electronic system of the fertiliser spreader.
 5. Connect the speed cable of the fertiliser spreader electronic system to the cable with 7-pin signal socket.
 6. Connect the machine cable to the control unit QUANTRON-A.
 7. Connect the power supply of the QUANTRON-A control unit
- ▷ **The QUANTRON-A control unit is ready for operation.**

4 Operation QUANTRON-A

⚠ CAUTION



Risk of injury due to ejected fertiliser

In the case of a fault, the TWS slide may open unexpectedly during road transport to the spreading location and/or the auger may start up. There is a risk of slipping and personal injury due to ejected fertiliser.

- ▶ **Before leaving for the place of spreading** always switch off the electronic control unit QUANTRON-A.
- ▶ Disconnect the QUANTRON-A control unit from the on-board power supply.
- ▶ Deactivate the hydraulic supply to the TWS transfer vehicle.

4.1 Switching on the control unit

Requirements

- The control unit is correctly connected to the tractor (refer to chapter [3.3: Connecting the control unit, page 12](#)).

NOTICE

Observe the operator's manuals of the TWS transfer vehicle and the attached fertiliser spreader.

- The supply voltage is between **11 V and 15 V**.

NOTICE

The operator's manual describes the functions of the QUANTRON-A control unit **as of software version 3.00.00**.

Switching on

- Press the **ON/OFF** key.
 - ▷ The QUANTRON-A control unit is now ready for operation.
 - ▷ The operating screen is displayed.

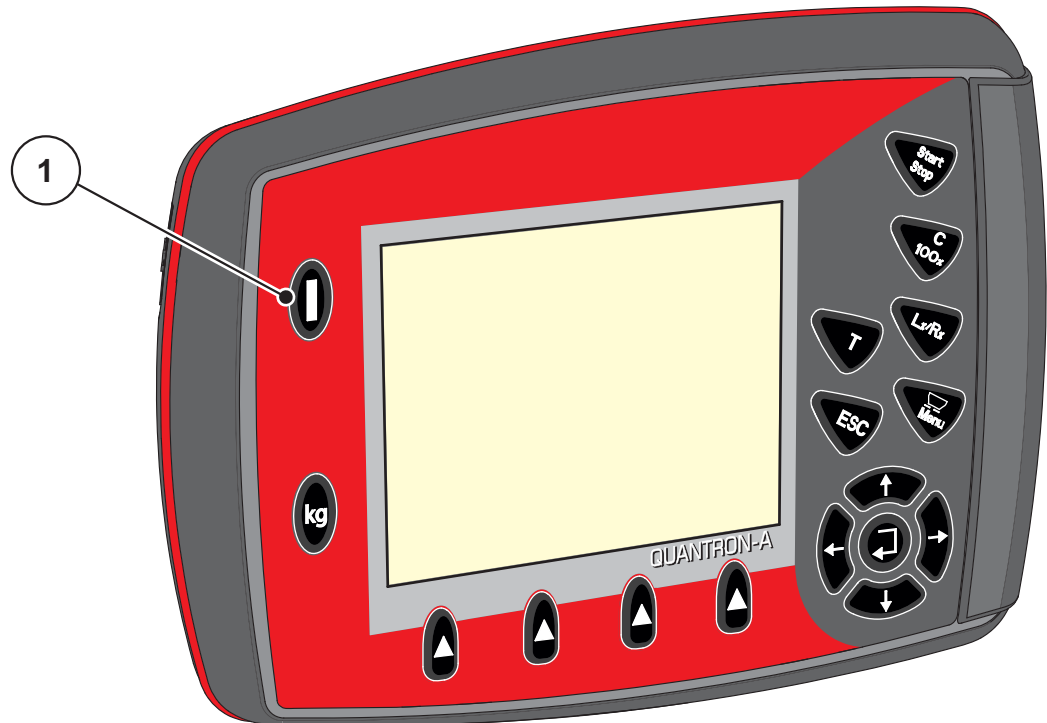


Figure 4.1: Start QUANTRON-A

[1] ON/OFF key

- Select the transfer function mode.

NOTICE

On start-up, the **Semi-automatic** or **Manual** operating mode is active for control of the load transfer function.

- To switch from **Manual** to **Automatic** or **Semi-automatic** operating mode, open the **Machine settings** menu.
 - Refer to [Deactivating the manual operating mode on page 24](#).
- To switch from **Semi-automatic** to **Automatic** operating mode, press F4.
 - Refer to [QUANTRON-A control unit operating screen on page 9](#).

4.2 Menu navigation

NOTICE

Please refer to chapter [1.2.4: 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**. Refer to [2.3: Control elements, page 7](#).
 - ▷ The main menu is displayed.
 - ▷ The black bar indicates the first sub-menu.

NOTICE

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

Accessing a sub-menu:

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

Windows appear prompting various actions.

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

Exiting menus

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

4.3 QUANTRON-A functional description: Status indicator

The QUANTRON-A control unit provides information on the current filling levels and sensor conditions of the TWS transfer vehicle and the attached fertiliser spreader.

4.3.1 TWS fertiliser conveyor status indicator

Auger pre-running/post-running

Before opening and after closing of the TWS slide, the auger is post-running for a programmed time period. This way, clogging in the slide opening or the fertiliser conveyor unit is prevented. This status is indicated at the display by an animated empty auger.

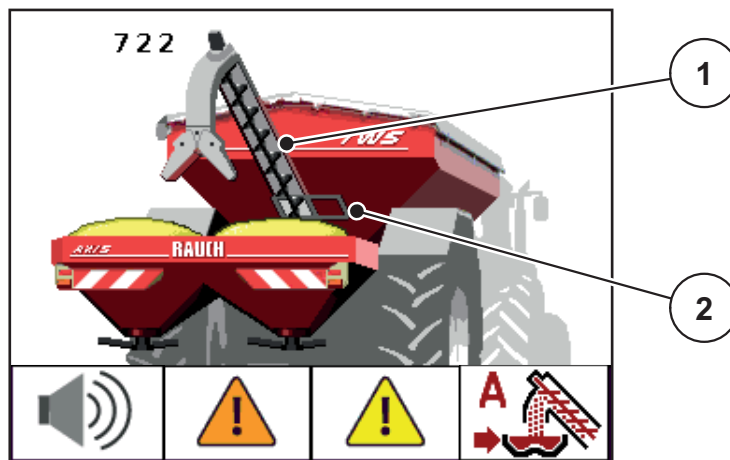


Figure 4.2: Auger pre-running/post-running indicator

- [1] Auger pre-running/post-running in the fertiliser conveyor unit
- [2] Closed TWS slide

Fertiliser load transfer

As soon as the TWS slide is opened, the fertiliser flows through the outlet of the fertiliser conveyor tube into the fertiliser spreader.

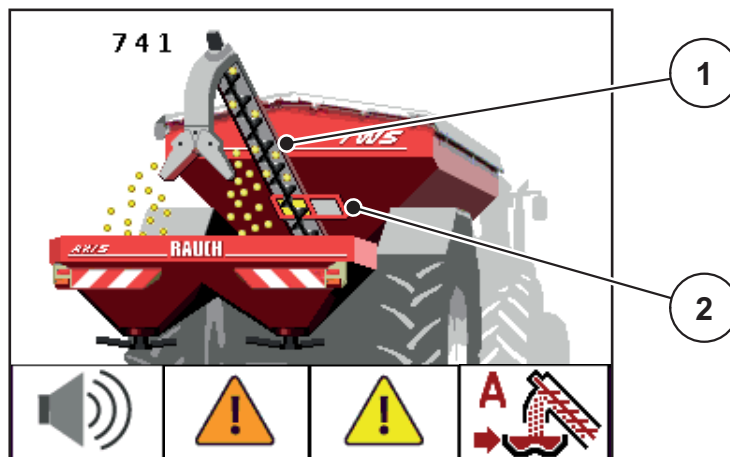


Figure 4.3: Fertiliser conveyor indicator

- [1] Fertiliser transfer via auger
- [2] Open TWS slide

4.3.2 Alarm messages

Alarm messages provide information on a filling level status change. At the alarm position, a yellow warning triangle is displayed.

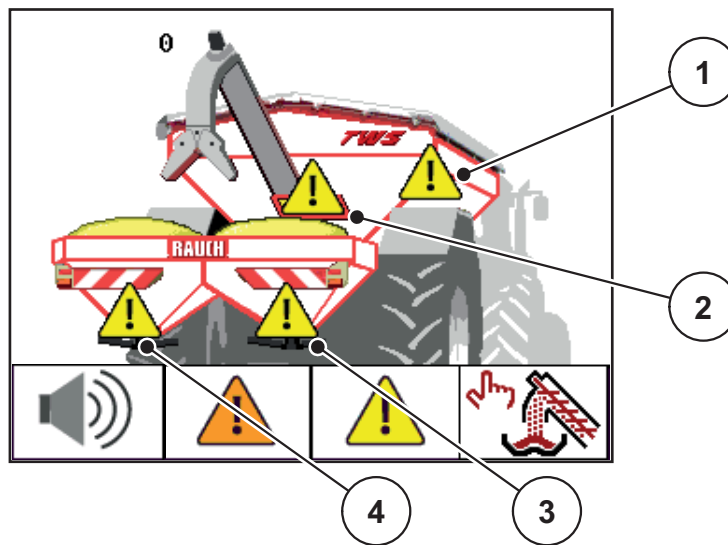


Figure 4.4: Display of empty notification

No.	Sensor	Meaning
1	TWS filling level sensor	The TWS hopper is empty,
2	TWS slide position sensor	After pre-running of the auger, the TWS slide was not opened.
3	Right fertiliser spreader level sensor	The right side of the fertiliser spreader hopper is empty.
4	Left fertiliser spreader level sensor	The left side of the fertiliser spreader hopper is empty.

Acknowledging messages

1. Press and hold the **F3** function key (yellow triangle) for at least 3 seconds.
Refer to [2.3: Control elements, page 7](#).
 - ▷ **The message is still displayed.**
 - ▷ **The acoustic signal is deactivated once.**

NOTICE

If a new alarm message occurs, the acoustic signal of the control unit is activated again.

- For complete deactivation of acoustic signals, refer to [4.11.2: Deactivating acoustic signals, page 44](#).

4.3.3 Overflow alarm (manual operating mode)

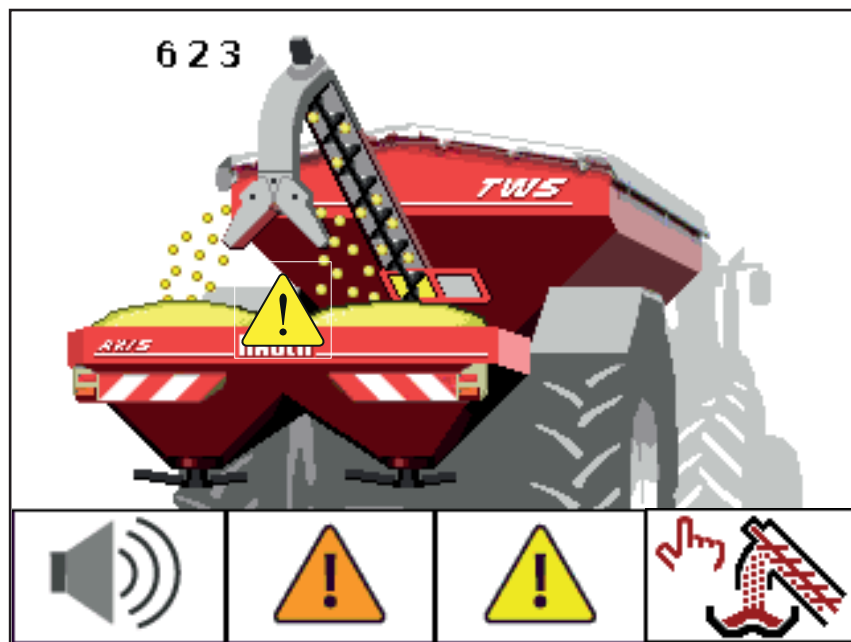


Figure 4.5: Overflow alarm

In manual operating mode:

1. Press the **Start/Stop** key.
 - ▷ The TWS slide closes.
 - ▷ The auger is post-running.
 - ▷ **The yellow triangle is no longer displayed and the acoustic signal is switched off.**

4.3.4 Empty TWS hopper

The filling level sensor for the TWS hopper is not at the hopper base.

At the time of empty notification, the remaining fertiliser in the TWS hopper is usually sufficient for a few load transfer operations.

Despite the alarm message, the QUANTRON-A control unit attempts full transfer of the residual material.

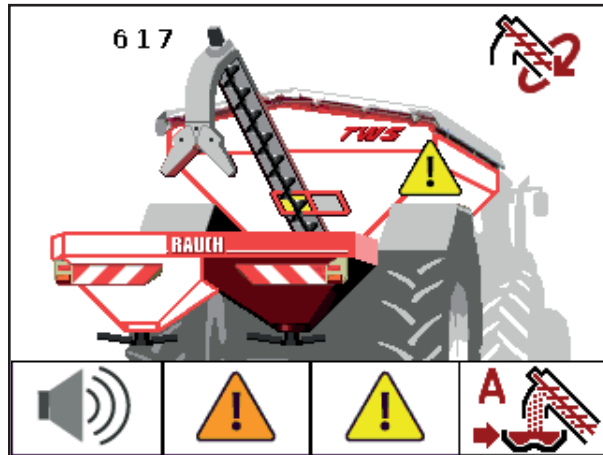


Figure 4.6: Discharging residual material from the TWS hopper

- If the QUANTRON-A control unit receives notification within 120 s indicating that the fertiliser spreader is full, load transfer is stopped.
 - On the next alarm message of the filling level sensor (LLST or LRST), load transfer is restarted from the beginning (depending on operating mode).
- If the QUANTRON-A control unit does not receive any notification within 120 s indicating that the fertiliser spreader is full, the TWS slide is closed.
 - The TWS hopper is empty,
 - The auger is post-running for 30 s.
 - The semi-automatic operating mode is activated.

NOTICE

Depending on the set auger speed, fertiliser may still be present inside the TWS hopper after 120 s.

- Press **Start/Stop** in **Semi-automatic** operating mode to carry out complete emptying.

4.3.5 TWS slide

⚠ CAUTION



Material damage due to clogging of the conveyor unit

If the TWS slide is opened and fertiliser is not conveyed, fertiliser may be compressed in the bottom of the conveyor unit due to vibrations during travel or long standstill of the machine.

Fertiliser may cause clogging and damage of the fertiliser conveyor unit.

- ▶ **Do not** open the slide while the auger is not running.
- ▶ **Do not** close the slide before stopping the auger.
- ▶ Regularly check the condition of the valves of the TWS slide.

The TWS slide is opened if the auger has reached the minimum speed of 30 RPM. This way, start-up of the auger by additional load of the fertiliser is prevented. If this minimum speed is not reached within 8 s, an alarm message is displayed.

4.4 Operating mode of fertiliser supply

NOTICE

The load transfer function with different operating modes is described in chapter [5: Load transfer with the QUANTRON-A control unit, page 45](#).

- Observe the operator's manual of the TWS transfer vehicle.

You control fertiliser load transfer into the fertiliser spreader via three optional operating modes.

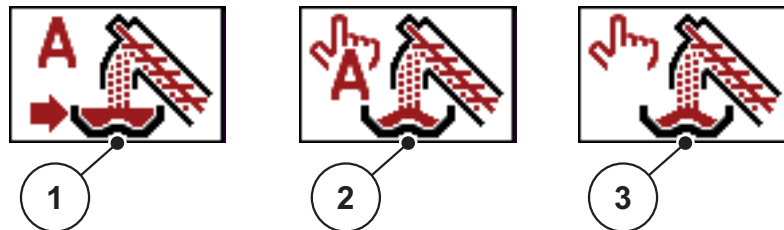


Figure 4.7: Operating mode symbols (function key F4 in operating screen)

- [1] Automatic
- [2] Semi-automatic
- [3] Manual

- It is recommended to always work in **automatic** operating mode. The control unit **fully automatically** controls the valves for fertiliser supply according to sensor information.
- In **Semi-automatic** operating mode, you decide when load transfer is starting. The process and stopping of load transfer is then realized automatically.
- In **Manual** operating mode you start and stop load transfer by pressing the **Start/stop** key. The sensor conditions signal the required steps.

NOTICE

On start-up of the control unit, the **Semi-automatic** or **Manual** operating mode is active for control of the load transfer function.

- To switch from **Manual** to **Automatic** or **Semi-automatic** operating mode, open the **Machine settings** menu.
 - Refer to [Deactivating the manual operating mode on page 24](#).
- To switch from **Semi-automatic** to **Automatic** operating mode, press **F4**.
 - Refer to [QUANTRON-A control unit operating screen on page 9](#).

4.4.1 Automatic

NOTICE

On start-up of the control unit, the **Semi-automatic** or **Manual** operating mode is active for control of the load transfer function.

- Observe the symbols over the F4 function key. Also refer to [Figure 4.7](#).

Deactivating the manual operating mode

1. Open the **Machine settings** menu.
2. Press the Enter key.
 - ▷ The function is disabled.

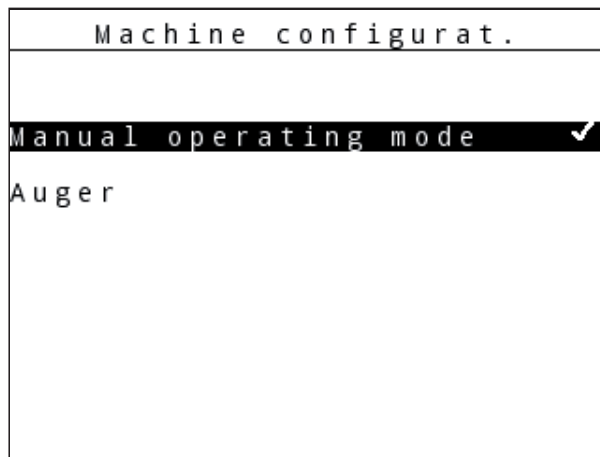


Figure 4.8: Machine settings menu

- ▷ **The manual operating mode is deactivated.**

Automatic operating mode selection

1. Switch to the operating screen
Also refer to [4.2: Menu navigation, page 17](#).
2. Press the **F4** function key.
 - ▷ Before switching to **Automatic** operating mode, a warning message is displayed.

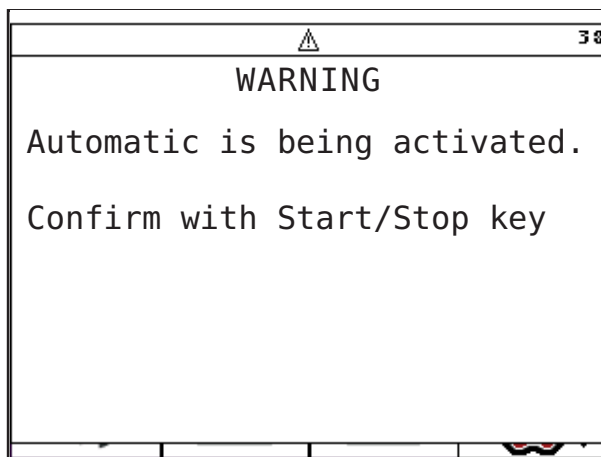


Figure 4.9: Automatic operating mode warning message

▲ WARNING
Danger of crushing and shearing due to components operated by an external force

The TWS slide and auger move unexpectedly and may cause injury.

- ▶ Ensure that nobody is present in the hazard zone.

3. Press the **Start/Stop key.**

- ▷ The warning message is acknowledged.

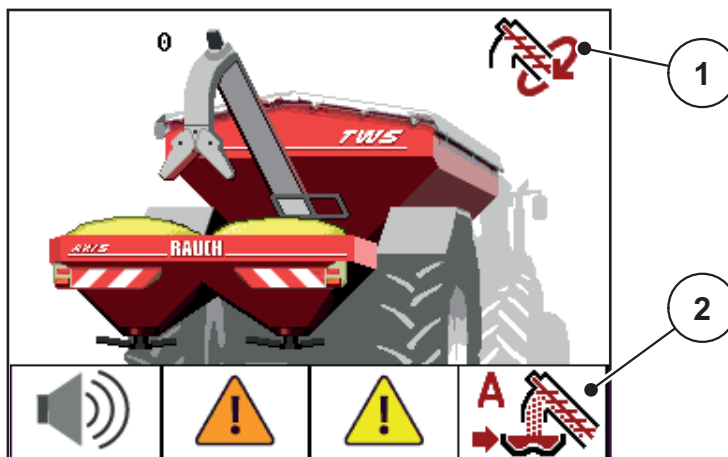
▷ The automatic operating mode is activated.


Figure 4.10: Operating screen in automatic

- [1] Active operating mode symbol
- [2] Automatic operating mode symbol

- Or: Press the **ESC** key.
 - The **Semi-automatic** operating mode is activated.
- Also refer to [5.1: Load transfer in automatic operating mode, page 45.](#)

4.4.2 Semi-automatic

Semi-automatic operating mode selection

1. Switch to the operating screen

Also refer to [4.2: Menu navigation, page 17](#).

2. Press **F4** several times until the semi-automatic symbol is displayed.

Refer to [Figure 4.7: Operating mode symbols \(function key F4 in operating screen\)](#).

- ▷ **The semi-automatic operating mode is activated.**

If one side of the hopper of the fertiliser spreader is empty, an acoustic signal occurs. You can select the right time for load transfer, e.g. in the headlands.

- Press the **Start/Stop** key.

▷ Load transfer is started.

Load transfer is realized in the same order as for the automatic operating mode.

- Load transfer is stopped automatically if the full notification is displayed.
- Also refer to [5.2: Load transfer in semi-automatic operating mode, page 47](#).

4.4.3 Manual

▲ CAUTION



Risk of slipping and environmental damage due to ejected fertiliser

Only activate the **Manual** operating mode in exceptional cases. If load transfer is active, the fertiliser spreader may overflow and excessive fertiliser may leak unexpectedly from the hopper. Risk of slipping can lead to personal injury. Risk for the environment.

- ▶ Continuously check manual load transfer during spreading operation.
- ▶ The manual operating mode is only to be used temporarily in exceptions.
- ▶ It is recommended to use the **Automatic** or **Semi-automatic** operating mode.

Manual operating mode selection

1. Open the **Main menu > Mach. settings** menu.
Also refer to [4.2: Menu navigation, page 17](#).
 - ▷ The **Manual mode** menu entry is highlighted.
2. Press the Enter key.
 - ▷ The display shows a tick.
 - ▷ Warning message no. 39 is displayed.
See [6.1: Meaning of alarm messages, page 51](#)
3. Press the C/100% key.
 - ▷ The warning message is acknowledged.
4. Press the **ESC** key.
 - ▷ The operating screen is displayed.

If one side of the hopper of the fertiliser spreader is empty, an acoustic signal occurs. You decide for the right time of load transfer and stop manually the load transfer.

1. Press the **Start/Stop** key.

▷ Load transfer **is started**.

Load transfer is realized in the same order as for the **automatic** operating mode.

2. Press the **Start/Stop** key.

▷ **Load transfer is stopped**.

- Also refer to [5.3: Load transfer in manual operating mode, page 49](#).

4.5 Set the auger speed (TWS 85.1 only)

The auger speed has been preset **at the factory**. Usually, no additional adjustment is required. If the hydraulic capacity of your tractor is too low, the speed can be set.

▲ WARNING



Risk of injury due to moving parts

There is a risk of injury during auger operation.

▶ Ensure that nobody is in the hazard zone.

1. Open the menu **Machine settings > Auger** .

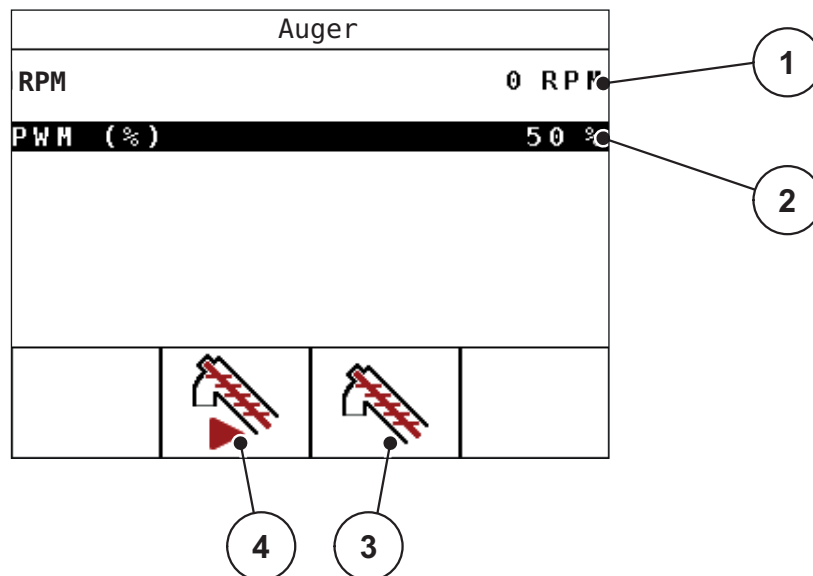


Figure 4.11: Controlling the hydraulic system

- [1] Auger speed in RPM
- [2] Performance value of the auger in %
- [3] F2 function key: Continuous operation
- [4] F3 function key: Jogging mode

2. Turn the hydraulic system of the tractor to full power.
3. Start the auger by pressing the F2 [4] function key.
4. Set the required speed by means of the PWM value.
5. Turn the hydraulic system of the tractor down until the auger speed is below the minimum value.
6. Slightly increase the volume flow at the tractor.
 - ▷ The control block runs in saturated state (all hydraulic components are operating).
7. Stop the auger by pressing the F2 [4] function key.

NOTICE

If the auger speed is too low in respect to the selected spreading quantity of the fertiliser spreader there is no indication of full fertiliser spreader hopper. This may lead to spreading errors or underfertilisation in the spread areas due to possible empty spreading.

- Increase the auger speed.
-

4.6 Main menu

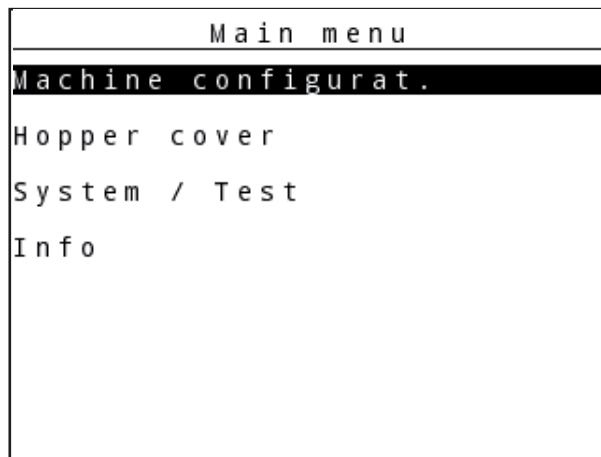


Figure 4.12: Main menu QUANTRON-A (TWS-H)

The main menu shows the following submenus.

Sub-menu	Meaning	Description
Machine settings	<ul style="list-style-type: none"> • Activation or deactivation of manual operating mode 	Page 27
	<ul style="list-style-type: none"> • Auger speed control 	Page 28
Hopper cover	Opening/closing the hopper cover	Page 31
System / Test	<ul style="list-style-type: none"> • Control unit settings • Diagnosis and checking of sensors 	Page 33
Info	Machine configuration display	Page 39

4.7 Hopper cover

▲ WARNING**Danger of crushing and shearing due to components operated by an external force**

The hopper cover move without warning and can cause personal injury.

- ▶ Ensure that nobody is present in the hazard zone.

The transfer vehicle is equipped with an hydraulically controlled hopper cover. During the refilling process at the end of the field, the hopper cover can be opened and/or closed via the control unit and 2 hydraulic valves.

NOTICE

The menu is only used for activating the valves to open or close the hopper cover. The QUANTRON-A control unit does not detect the exact position of the hopper cover.

- Observe the movements of the hopper cover.
- Check the valve status in the **Test/Diagnosis** menu. Refer to [Sensor/valve status message on page 35](#).

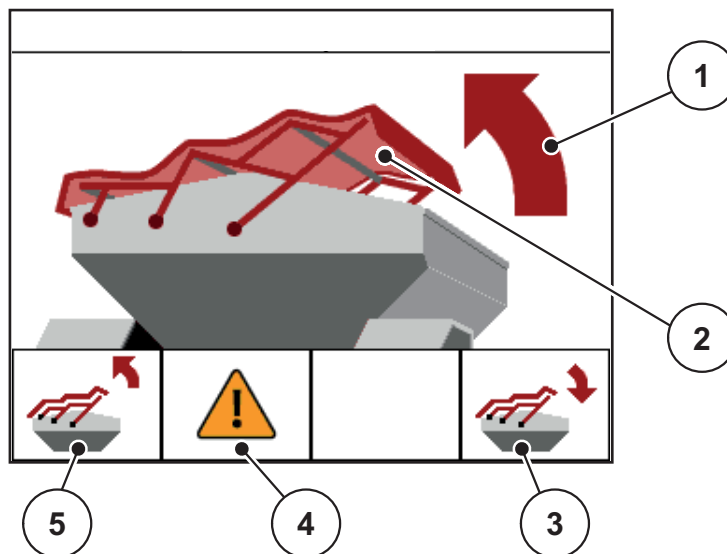


Figure 4.13: Hopper cover menu

- [1] Display of opening process
- [2] Static display of hopper cover
- [3] F4 function key: Close hopper cover
- [4] F2 function key: Acknowledging of hopper cover valve error messages
- [5] F1 function key: Open hopper cover

NOTICE

If an error message is displayed, check the cabling and the function of the hydraulic valves.

- Refer to [4.10: Error messages, page 40](#).

⚠ CAUTION



Material damage due to insufficient clearance

Opening and closing the hopper cover requires sufficient clearance over the TWS hopper. If the clearance is insufficient, the hopper cover may tear. The rods of the hopper cover may be damaged and the hopper cover may damage the environment.

- ▶ Ensure that a sufficient clearance above the hopper cover is given.
-

There are 2 options for accessing the **Hopper cover** menu:

- Press **T** (quick access) or
- press **Menu** and select the **Hopper cover** menu.

Moving the hopper cover

1. Keep **F1** pressed until the hopper cover is fully opened.
 - ▷ During the movement, an arrow appears which indicates the **OPEN** direction.
2. Release **F1**.
 - ▷ Operation of the valve is stopped.
 - ▷ The hopper cover is stopped.
3. Fill in fertiliser.
4. Keep **F4** pressed until the hopper cover is fully closed.
 - ▷ During the movement, an arrow appears which indicates the **CLOSED** direction.
5. Release **F4**.
 - ▷ Operation of the valve is stopped.
6. Press the ESC key.

NOTICE

Keep the **F1** and **F4** function keys only pressed as long as necessary. Otherwise, there is the risk of **component overheating**.

4.8 System / Test

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

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

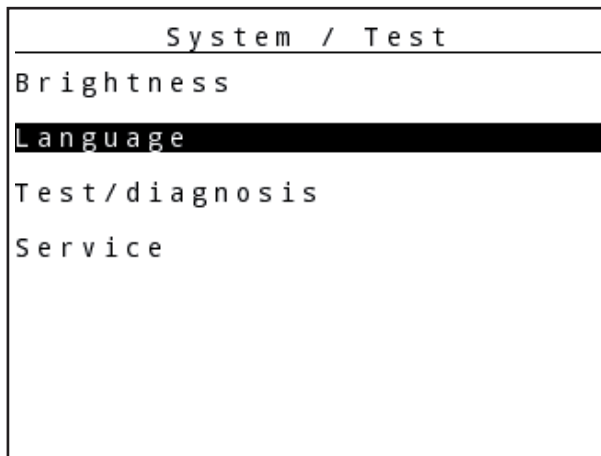


Figure 4.14: System/Test menu

Sub-menu	Meaning	Description
Brightness	Display and key illumination settings.	Page 43
Language	Language setting for menu navigation	Page 34
Test/Diagnosis	Checking of actuators and sensors	Page 35
Service	Service settings	Password-protected; only accessible to service personnel

4.8.1 Setting the language

The QUANTRON-A control unit interface is available in **24 different languages**. Your language has been preset at the factory.

1. Open the **System / Test > Language - Language** menu.
 - ▷ The display shows the first of four pages.

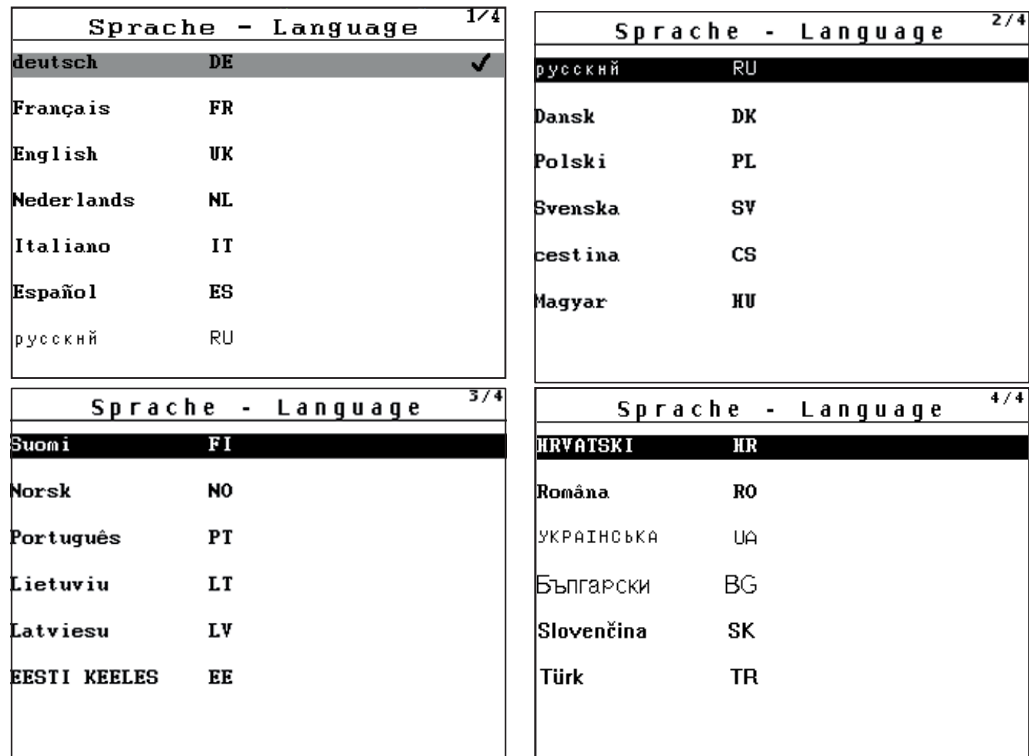


Figure 4.15: Language selection menu

2. Select the language for the menus.
3. Confirm by pressing the **Enter key**.
 - ▷ The QUANTRON-A control unit restarts automatically.

4.8.2 Test/Diagnosis

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

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

Sensor/valve status message

The sensors/valves are in different conditions:

- OK: no error
- n.c. (not connected): Cable breakage
- s.c. (short circuit): Short-circuit

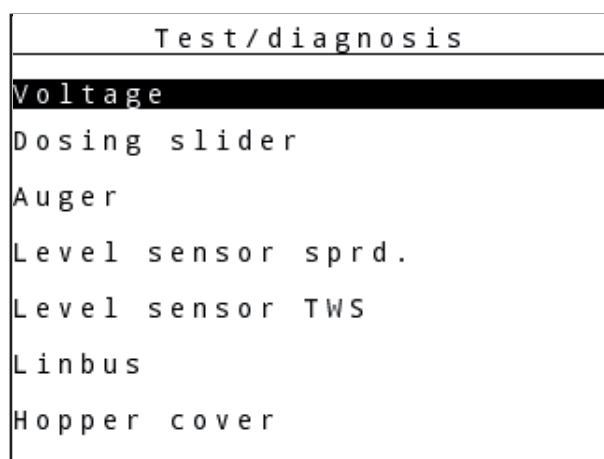


Figure 4.16: Test/Diagnosis menu

Sub-menu	Meaning	Description
Voltage	Checking the operating voltage.	
Dosing slider	<ul style="list-style-type: none"> ● TWS slide condition ● TWS slide test 	Page 36
Auger	<ul style="list-style-type: none"> ● Auger status ● Auger speed test 	Page 37
Spreader level sensor	Checking the level sensor at the fertiliser spreader (left/right)	
TWS level sensor	<ul style="list-style-type: none"> ● Checking the level sensor in the TWS hopper. ● Checking the overflow sensor 	Page 38
LIN-Bus	Information on address assignment of the hopper cover coil	
Hopper cover	<ul style="list-style-type: none"> ● Test function for opening/closing the hopper cover ● Valve condition 	

Example: Slide

1. Open the **System / Test > Test/Diagnosis** menu.
2. Highlight the **Dosing slider** menu item.
3. Press the **Enter** key.
 - ▷ The status of the sensors/actuators is displayed.

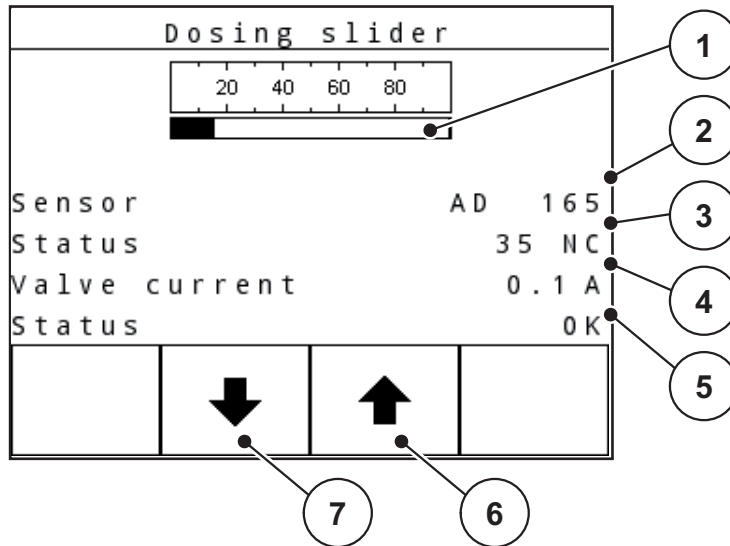


Figure 4.17: Test/Diagnosis, example: Dosing slider

- [1] Slide sensor status indication (in percent)
- [2] Slide sensor AD value indication
- [3] Sensor status
- [4] Slide valve power level
- [5] Valve status
- [6] F3 function key: Open the slide
- [7] F4 function key: Close the slide

▲ CAUTION



Risk of injury due to moving machine parts

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

- ▶ Ensure that nobody is present in the hazard zone of the machine.

The TWS slide is opened or closed with the **F2** or **F3** function keys.

Auger example

1. Open the **System / Test > Test/Diagnosis** menu.
2. Highlight the **Auger** menu item.
3. Press the **Enter** key.
 - ▷ The status of the sensors/actuators is displayed.

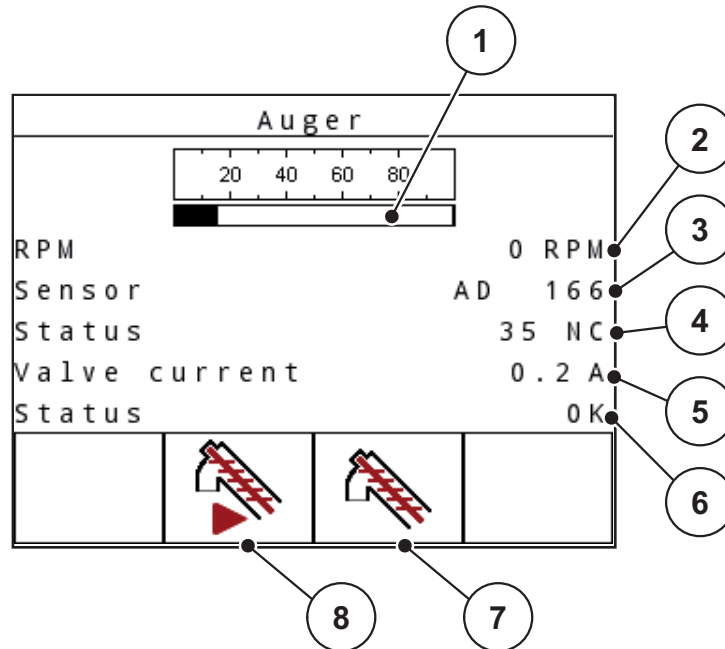


Figure 4.18: Test/Diagnosis, example: Auger

- [1] Auger speed indicator (in percent)
- [2] Auger speed indicator
- [3] Speed sensor AD value indicator
- [4] Sensor status
- [5] Valve power level
- [6] Valve status
- [7] F3 function key: Continuous operation
- [8] F4 function key: Jogging mode

▲ CAUTION



Risk of injury due to moving machine parts

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

- ▶ Ensure that nobody is present in the hazard zone of the machine.

1. Press **F2**.
 - ▷ The auger is started up in continuous operation.
2. Press **F2**.
 - ▷ The auger stops.

Or:

1. Press and hold **F3**.
 - ▷ The auger is started up.
2. Release **F3**.
 - ▷ The auger stops.

TWS level sensor example

1. Open the **System / Test > Test/Diagnosis** menu.
2. Highlight the **Level sensor TWS** menu item.
3. Press the **Enter key**.
 - ▷ The status of the sensors/actuators is displayed.

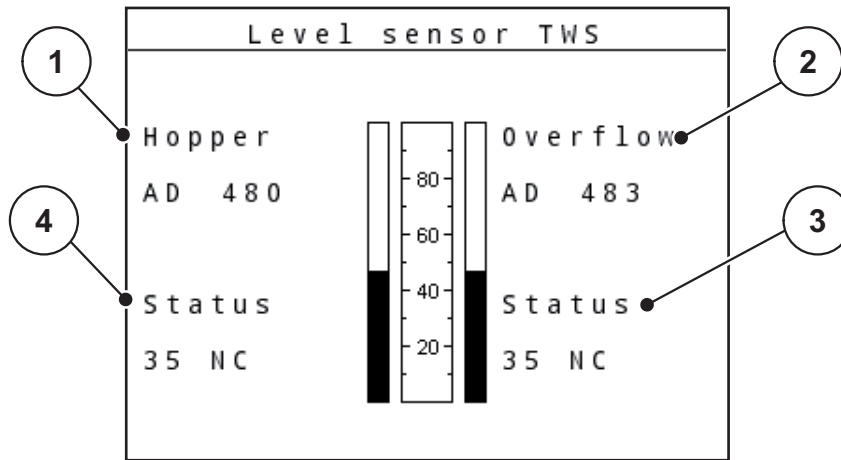


Figure 4.19: Test/Diagnosis, example: TWS hopper

- [1] Level sensor status indicator in the TWS hopper
- [2] Overflow sensor status indicator
- [3] Overflow sensor status
- [4] Level sensor status

4.8.3 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.

4.9 Information

Information on the machine control can be obtained from the **Info** menu.

NOTICE

This menu provides information on the configuration of the machine.
The information list depends on the equipment of the machine.

I n f o	
S / N :	1 1 3 2 4
SW V	1 . 0 2 . 0 4
HW V	1 . 0
GUI	0 0 . 1 0 0
Hydraulik	✓

Figure 4.20: Info menu

4.10 Error messages

▲ CAUTION



Material damage due to cable breakage or short-circuit

In case of a cable breakage, short-circuit or interruption at a sensor/valve, there is a risk of excessive fertiliser filling of the fertiliser spreader.

Escaping fertiliser may fall on the road and cause accidents and pollution.

- ▶ Immediately close the TWS slide.
- ▶ Switch off the load transfer function of the TWS.

The function test serves for checking of sensors and valves. Function tests are permanently carried out by the software.

NOTICE

The function tests run in the background and do not affect load transfer and spreading operation.

During the function tests, sensors and valves are checked for the following errors:

- Cable breakage or sensor/valve not connected
- Short-circuit

NOTICE

The forward speed sensor at the wheel is not checked!

Information on potential sources of errors can be found in menu **System/Test > Test/Diagnosis**.

- Open the **Test/Diagnosis** menu. Refer to [4.8.2: Test/Diagnosis, page 35](#)
- Check the status of the sensor/valve in the respective menu entry.

Sensor/valve status message

The sensors/valves are in different conditions:

- OK: no error
- n.c. (not connected): Cable breakage
- s.c. (short circuit): Short-circuit

If an error message is recognised at the QUANTRON-A control unit, the software is switched to **Manual** operating mode. Operation may be continued with defective components.

This also means that no liability will be accepted for damage resulting from spreading errors.

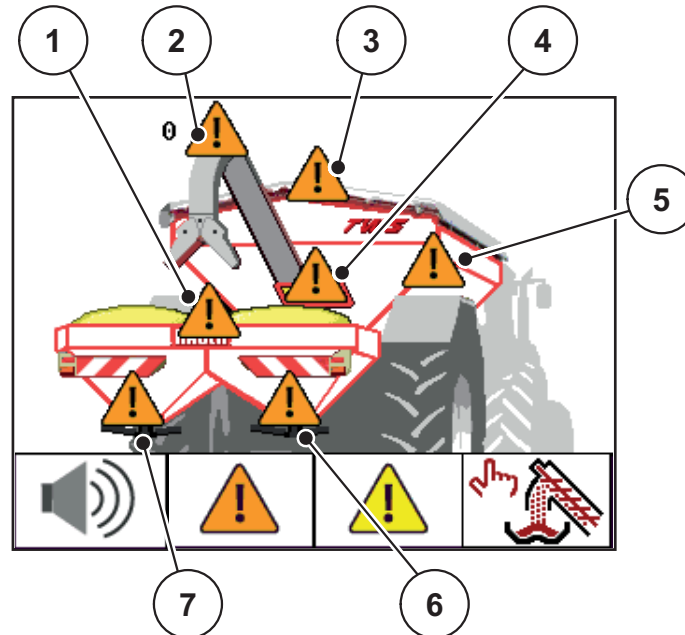


Figure 4.21: Sensor short-circuit or cable breakage indicator

- [1] Filling level sensor, excessive fertiliser spreader filling
- [2] Auger valve rev counter
- [3] TWS hopper cover valves
- [4] TWS slide sensor
- [5] TWS hopper filling level sensor
- [6] Right fertiliser spreader filling level sensor
- [7] Left fertiliser spreader filling level sensor

Acknowledging messages

1. Press and hold the **F2** function key for at least 3 seconds.
- ▷ **The error is still displayed. The acoustic signal is deactivated once.**

Troubleshooting

1. Switch off the QUANTRON-A control unit.
2. Wait for 5 seconds.
3. Switch on the QUANTRON-A control unit.
4. Check if the error still occurs.

If the error still occurs, proceed as follows:

1. Stop spreading with attached fertiliser spreader (refer to the fertiliser spreader operating instructions).
2. Switch off the fertiliser spreader control unit.
3. Switch off the QUANTRON-A control unit.
4. Switch off the tractor drive (refer to the tractor operating instructions).
5. Check for any potential interruption, cable breakage and for secure fitting of the respective sensor.
6. Replace the sensor as necessary.
7. Switch on the tractor drive (refer to the tractor operating instructions).
8. Switch on the QUANTRON-A control unit.
9. Switch on the fertiliser spreader control unit.
10. Start spreading with the fertiliser spreader (refer to the fertiliser spreader operating instructions).

▷ **Spreading can be continued.**

If the error still occurs, please contact your dealer.

NOTICE

Any corrected errors are displayed until the unit is restarted.

4.11 Special functions

4.11.1 Setting the brightness

The QUANTRON-A control unit is equipped with adjustable background lighting for display and keys. The brightness can be adjusted to the light condition inside the cabin.

1. Open the **System / Test > Brightness** menu.

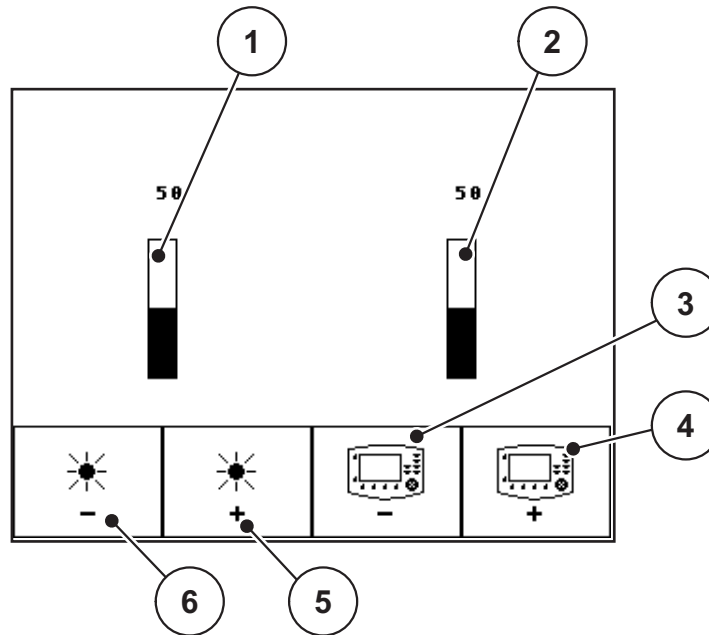


Figure 4.22: Brightness menu

- [1] Current display brightness value
- [2] Current keypad brightness value
- [3] Keypad brightness value reduction
- [4] Keypad brightness value increase
- [5] Display brightness value increase
- [6] Display brightness value reduction

2. Setting the brightness.
 3. Press the **ESC** key.
- ▷ **The settings are applied.**

4.11.2 Deactivating acoustic signals

Messages are indicated by an acoustic signal. These acoustic signals can be deactivated.

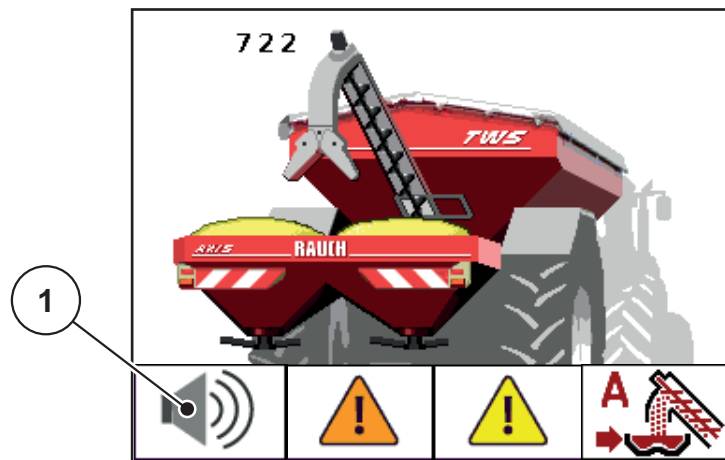


Figure 4.23: Deactivating acoustic signals

1. Press and hold the **F1** [1] function key for at least 3 seconds.
- ▷ **All acoustic signals are deactivated.**

▲ CAUTION



Risk of slipping and environmental damage due to ejected fertiliser

In **Manual** operating mode, overflow in the fertiliser spreader may occur and excessive fertiliser may leak unexpectedly from the hopper. If it becomes loose, this can lead to personal injury. Risk for the environment.

- ▶ Continuously check manual load transfer during spreading operation.
- ▶ The manual operating mode is only to be used temporarily in exceptions.
- ▶ It is recommended to use the **Automatic** or **Semi-automatic** operating mode.

NOTICE

Any alarm and error messages are only indicated **optically**.

- Check the display with care. Overflow may occur at any time.

5 Load transfer with the QUANTRON-A control unit

5.1 Load transfer in automatic operating mode

Load transfer is fully automatic and always in the same sequence.

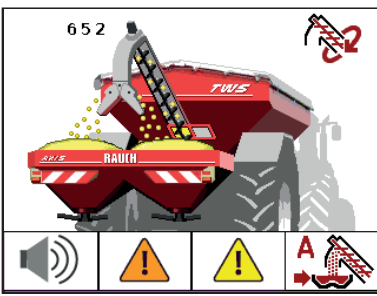
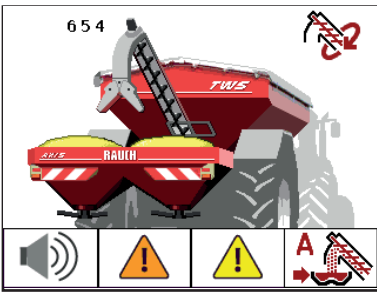
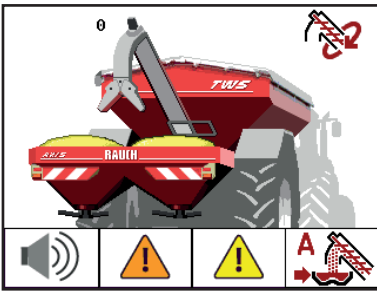
NOTICE

The sensor conditions and load transfer can be observed on the operating screen. However, the messages are displayed **without sound**.

Requirement:

- The **automatic** operating mode is active.
 - Refer to [4.4.1: Automatic, page 24](#).

Function/control	Operating screen display
<ul style="list-style-type: none"> ● One or both level sensors (LLST or LRST) reports empty. ● The auger operates for the preset time. ● The auger reaches the required speed. 	
<ul style="list-style-type: none"> ● The TWS slide opens. ● The fertiliser flows in the fertiliser spreader. 	
<ul style="list-style-type: none"> ● Both level sensors (LLST or LRST) are dampened. 	

Function/control	Operating screen display
<ul style="list-style-type: none"> The overflow is reached. 	
<ul style="list-style-type: none"> The TWS slide closes. The auger is post-running for the programmed time (30 s) to prevent clogging. 	
<ul style="list-style-type: none"> The auger is stopped. 	

5.2 Load transfer in semi-automatic operating mode

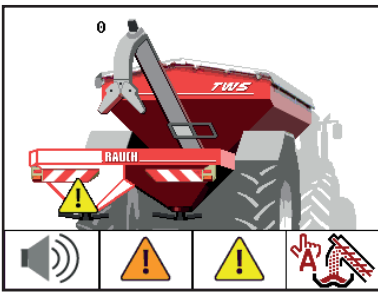
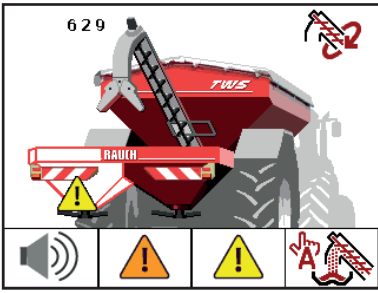
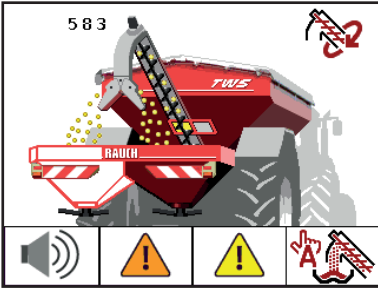
If one side of the fertiliser spreader is empty, an acoustic signal occurs. The time of load transfer can be individually selected, e.g. in the headlands.

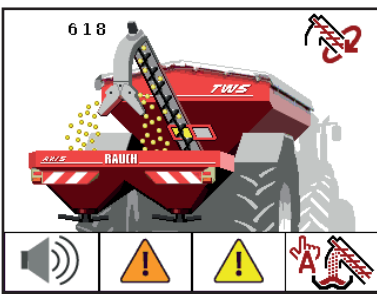
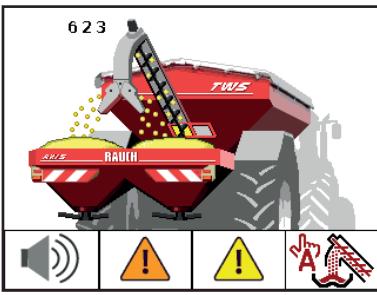
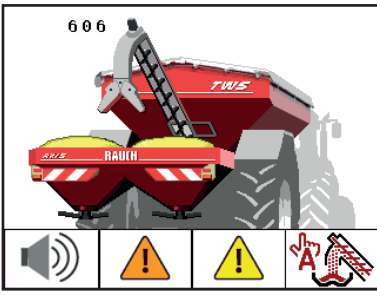
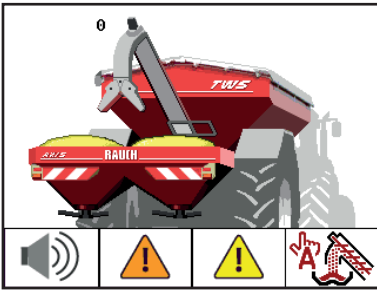
- Press Start/Stop key.
 - ▷ Load transfer is started.

Load transfer is realized in the same order as for the automatic operating mode.

Requirement:

- The **Semi-automatic** operating mode is activated.
 - Refer to [4.4.2: Semi-automatic, page 26](#).
- The spreading operation is started.

Function/control	Operating screen display
<ul style="list-style-type: none"> ● One or both level sensors (LLST or LRST) reports empty. ● An empty notification with acoustic signal occurs. 	
<ul style="list-style-type: none"> ● Acknowledging an alarm message (not required). ● Press the Start/Stop key at the desired time of load transfer. 	
<ul style="list-style-type: none"> ● The semi-automatic operating mode is activated. ● The auger operates for the preset time. 	
<ul style="list-style-type: none"> ● The auger reaches the required speed. 	
<ul style="list-style-type: none"> ● The TWS slide opens. ● The fertiliser flows in the fertiliser spreader. 	

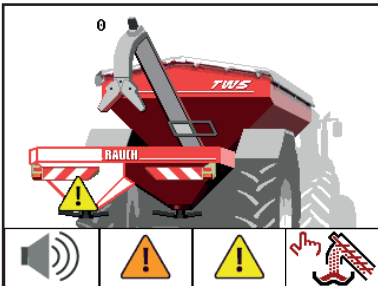
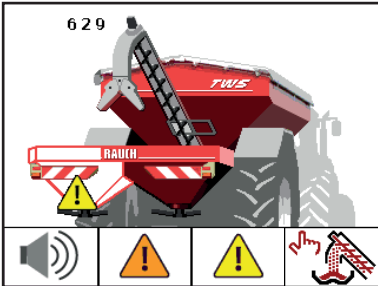
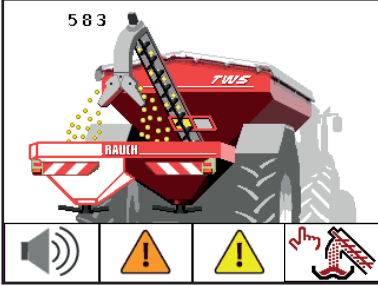
Function/control	Operating screen display
<ul style="list-style-type: none"> Both level sensors (LLST or LRST) are dampened. 	
<ul style="list-style-type: none"> The overflow is reached. 	
<ul style="list-style-type: none"> The TWS slide closes. The auger is post-running for the programmed time (30 s) to prevent clogging. 	
<ul style="list-style-type: none"> The auger is stopped. 	

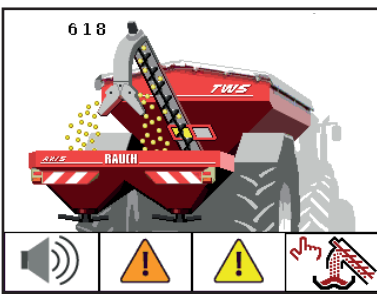
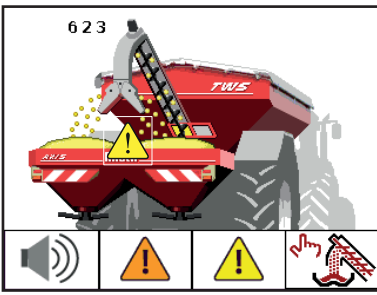
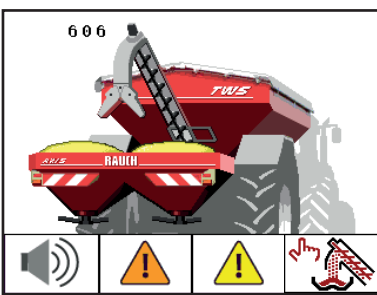
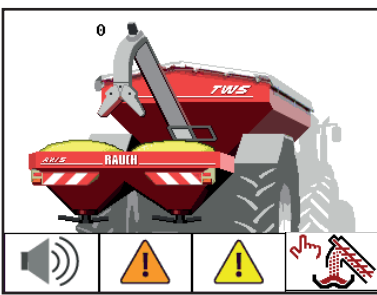
5.3 Load transfer in manual operating mode

If one side of the fertiliser spreader is empty, an acoustic signal occurs. Load transfer is started and stopped with the **Start/Stop** key. The sensor conditions signal the required steps.

Requirement:

- The **Manuel** operating mode is selected.
 - See: [Manual operating mode selection, page 27](#).
- The spreading operation is started.

Function/control	Operating screen display
<ul style="list-style-type: none"> ● One or both level sensors (LLST or LRST) reports empty. ● An empty notification with acoustic signal occurs. 	
<ul style="list-style-type: none"> ● Acknowledging an alarm message (not required). ● Press the Start/Stop key. 	
<ul style="list-style-type: none"> ● The auger is started up. 	
<ul style="list-style-type: none"> ● The auger reaches the required speed. ● The TWS slide opens. 	
<ul style="list-style-type: none"> ● The fertiliser flows in the fertiliser spreader. 	

Function/control	Operating screen display
<ul style="list-style-type: none"> Both level sensors (LLST or LRST) are dampened. 	
<ul style="list-style-type: none"> The overflow is reached. A message with acoustic signal occurs. 	
<ul style="list-style-type: none"> Press the Start/Stop key. The TWS slide closes. 	
<ul style="list-style-type: none"> The auger is post-running for the programmed time (30 s) to prevent clogging. 	
<ul style="list-style-type: none"> The auger is stopped. 	

6 Alarm messages and possible causes

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

6.1 Meaning of alarm messages

No.	Message in display	Meaning/possible causes
	Externally controlled parts may move. Risk of injury through squeezing and shearing! Direct ALL persons out of the danger zone. Read the instruction manual. Confirm with ENTER	Warning on start-up of the QUANTRON-A control unit <ul style="list-style-type: none"> Observe instructions. Press the Enter key.
20	Error on LIN bus participant: [Name].	Cable breakage, defective component etc. <ul style="list-style-type: none"> Restart the system. If the error still occurs after restarting, please contact your salesperson.
38	Automatic mode will be activated. Confirm with Start/Stop	Automatic menu is activated. The TWS slide and auger move unexpectedly.
39	Manual mode active. Risk of fertiliser overflow.	Manual operating mode menu is activated. On restart, the control unit indicates that the manual operating mode is activated.
40	Metering slider open! Risk of clogging! Press Start/Stop to close	On restart, the metering slide is open. <ol style="list-style-type: none"> Press Start/Stop key. <ul style="list-style-type: none"> ▷ The slide is closed. Press the C/100 % key.
41	Overload LIN bus. Please let cool down.	Too long opening or closing of the hopper cover. After approx. 120 s cooling time, press the C/100 % key.
42	No reaction from slider	During load transfer, the sensor at the slide does not report closed position. <ul style="list-style-type: none"> Clogging Hydraulic system not switched on

6 Alarm messages and possible causes

No.	Message in display	Meaning/possible causes
43	Incorrect screw conveyor speed	<ul style="list-style-type: none">● Fertiliser conveyor clogging● Missing hydraulic supply
44	Minimum screw conveyor speed could not be reached	<ul style="list-style-type: none">● The hydraulic system at the tractor is not switched on.● Issue at hydraulic system● Speed sensor defective. <ol style="list-style-type: none">1. Check the status indicator. 4.10: Error messages, page 402. Check the hydraulic system. 4.8.2: Test/Diagnosis, page 35

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Information on open source software

General information

The software technologies and firmware programs applied in RAUCH QUANTRON-A are partly bound to the following licenses. The source code of the RAUCH QUANTRON-A firmware bound to these licenses is available on request from Eckelmann AG.

Eckelmann AG
Berliner Straße 161
65205 Wiesbaden, Germany

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Appendix

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