CROPLANDS

USER MANUAL
WEED-IT QUADRO

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USER MANUAL V4.20

BT-UMWEEDQ-D

WEED·IT
precision spraying

ROMETRON
intelligent agricultural solutions

The WEED-IT Quadro system is sold and supported in Australia and Canada by Croplands Equipment Pty Ltd

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Subject to change without prior notice. This WEED-IT Quadro USER Manual, Version 2.0, was last updated January 2023.

Table of contents

1. About this manual

This manual is intended for dealers and authorized service engineers of the WEED-IT system.

Please read this user manual and the safety instructions carefully before you start to use the WEED-IT system. Manuals for specific options (e.g. ISOBUS) are not included, but referred to in section 13

This manual contains:

- Section 1: General information about this manual.
- Section 2: General information about the WEED-IT system and important safety information.
- Section 3: Identification of parts in the system. Extensive information about the various parts and controls of the WEED-IT system.
- Section 4: General instructions for use of the WEED-IT system.
- Section 5: General maintenance instructions.
- Section 6: Instructions for cleaning, storage and transport.
- Section 7: User console reference section, with a description of available menus.
- Section 8: Troubleshooting information.
- Section 9: Specifications.
- Section 10: Menu options overview.
- Section 11: WEED-IT software information.
- Section 12: Calibration settings form.
- Section 13: Other information

An index has been added to make finding the required information easier.

1.1. Conventions

bold type	used for emphasis
`monospace type`	for display texts

1.2. Icons

The following icons are used in this manual to point out or to clarify information related to safety and safe use of the WEED-IT:

⚠	This sign draws attention to a WARNING or a CAUTION. WARNING: Personal injury may occur if you do not follow instructions. CAUTION: Damage to equipment may occur if you do not follow instructions.
𝐢	This icon draws attention to helpful information and/or tips & tricks for correct use of the WEED-IT system.

2. About WEED-IT

The WEED-IT is a weed control system that recognizes and sprays weeds based on the fluorescent properties of the chlorophyll molecules in the leaves of living plants. The WEED-IT uses highly sensitive and accurate sensors. By spraying exactly on top of living plants only, you will save herbicide while at the same time minimizing environmental load.
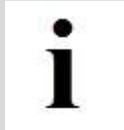
> **i** Please note that there may be variations in the actual setup of the WEED-IT system. It is up to the dealer to configure the system in such a way that the WEED-IT automatically senses which options are available.

2.1. Operating principle

A series of sensors on the WEED-IT detects where the weeds are and immediately sends a signal to the relevant nozzle to spray the weed with herbicide.

Each sensor has 4 channels; each channel covers 25 cm or 10" (100 cm/40" per sensor). Depending on the width of the vehicle used for the WEED-IT system, up to 48 sensors may be used (to treat 48 meters or 157 ft in one operation).

WEED-IT Sensor
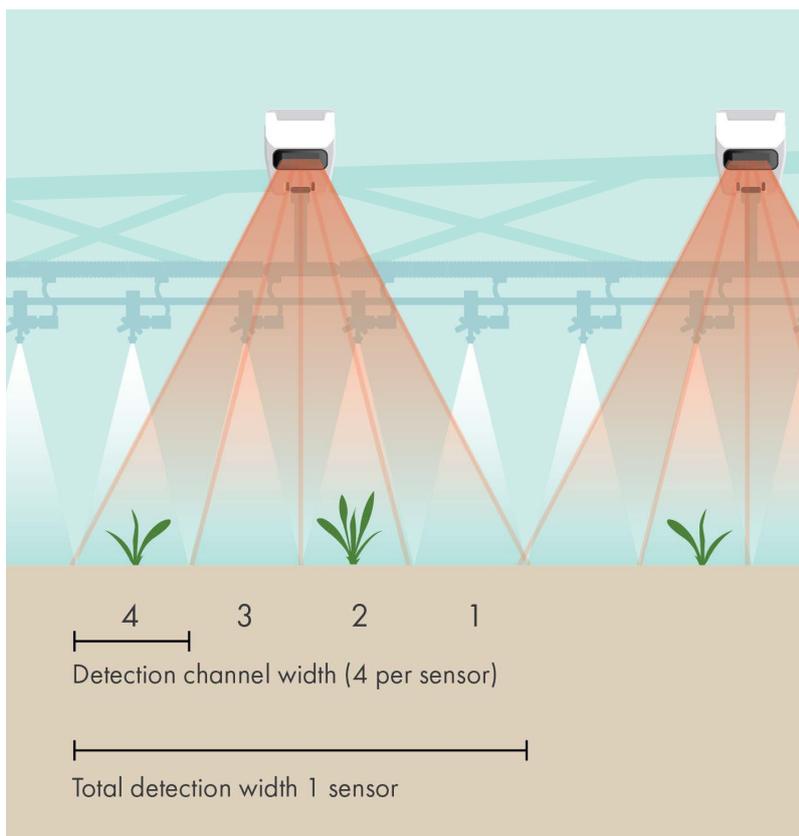
Figure 2-1 Schematic overview of 1 meter (40") working width per sensor, divided in four channels of 25 cm (10") each

A complete WEED-IT system consists of the following electronic components :
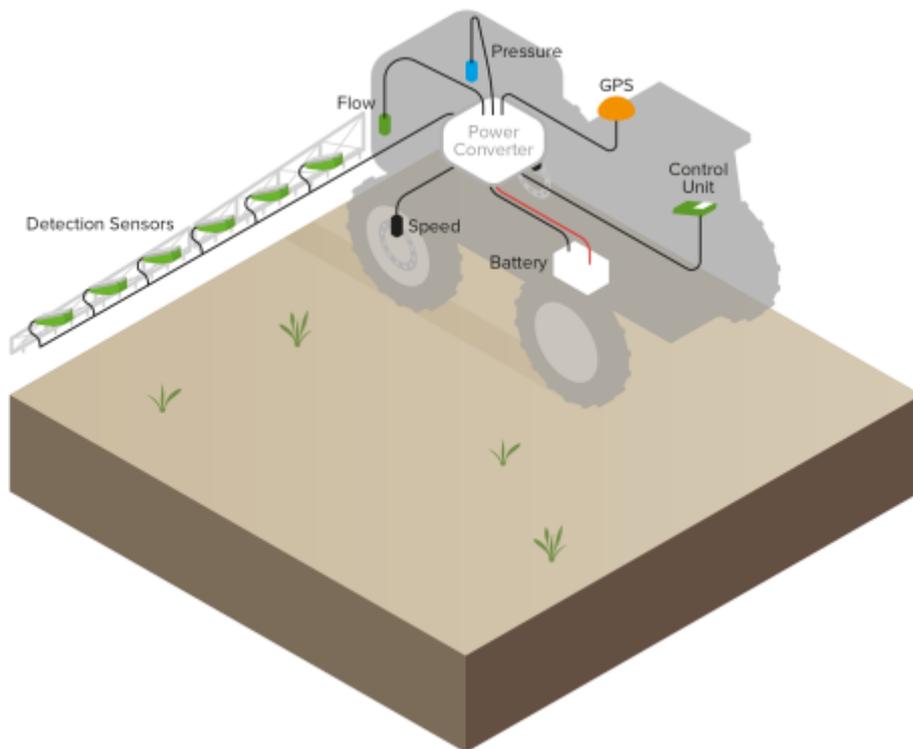
See "System overview" on page 18 for more information on individual components.

 Please read all instructions before you start working with a WEED-IT system. Refer to "Important safety information" on page 11 for an overview of safety instructions.

Please make sure that colleagues and/or customers read all safety instructions before they start using a WEED-IT system.

Use the User console for operating the system. The User console consists of a display and a series of buttons in a waterproof casing:

See "User console" on page 20 for more information on use of the User console.

2.2. Important safety information

2.2.1. General safety information

⚠️	Safety icons on the machine are used to mark hazardous areas. Anyone operating the machine must be aware of these warnings and what they entail. Warning symbols on the machine are always accompanied by a safety warning.

Some symbols give information about specific characteristics of the machine and are necessary for a correct operation.

- Always pay attention to any warnings, advice and symbols!

- Pass on all safety instructions to all other users!

- Make sure that the symbols and icons are always clean and legible! Damaged or missing symbols must be replaced immediately and are available from your supplier.

2.2.2. Safety and use of the WEED-IT

⚠️

- If the machine is not used as instructed in this manual, the manufacturer can never be held responsible for any damage resulting from that use. Any undocumented or unauthorized use is entirely at the user's own risk.

- Documented and authorized use also implies that the operator and safety instructions, as issued by the manufacturer, are followed strictly and that only original WEED-IT parts are used.

- The WEED-IT system may only be operated, maintained and repaired by people with the appropriate level of knowledge about the possible dangers. Any unauthorized changes and/or modifications to the machine are entirely at your own risk. The manufacturer can never be held responsible for any damage arising from such changes and/or modifications.

- All safety instructions, as well as any other commonly applicable safety instructions and instructions with respect to labor circumstances, traffic, etcetera, should always be followed strictly. You should also be aware of (and follow) any instructions and/or legal limitations of the use of certain herbicides. This may be subject to local law.

2.2.3. General safety instructions & how to avoid accidents

⚠️ **General safety rule**

Before using the WEED-IT, check the (traffic) safety of the machine and the vehicle. When in doubt, do not use the machine and consult your supplier.

⚠️	• Pay attention to the safety instructions in this manual and to any other general safety instructions.
	• Keep the machine clean to avoid the danger of fire!
	• Before starting and using the system, check the area carefully. Make sure that you have clear sight at all times!
	• When placing or removing supports, always place them in the prescribed position first (stability)!
	• Always pay attention to the maximum weight, axis load and dimensions!
	• Always check (and mount if necessary) any transport items, such as lights, safety signs, safety covers, etc.
	• Never leave the driver seat while driving the vehicle!
	• Note that the behavior of the vehicle, as well as steering and brake characteristics, are influenced by the WEED-IT system and the counterweights. Make sure you have sufficient steering and brake power.
	• Only put the machine into service when all safety covers are in place and in the right position.
	• Make sure that no people are present inside the virtual circle that the vehicle needs to turn around.
	• Never fill the tank above the specified maximum!
	• Read and follow the safety instructions of the manual of your sprayer.

2.2.4. Safety - electrical installation

⚠	• Only use approved fuses. Fuses that are too large may cause a system overload; this increases the possibility of a fire! • Always connect the battery in the proper order: first connect the (+) terminal, followed by the (-) terminal. When disconnecting, do the same in reverse order. • The (+) terminal should have a protective cover to avoid the possibility of a short-circuit (explosion)! • Avoid sparks and open fire close to the battery. • Make sure that no cables are trapped when working on the machine. Damage to the cables may cause a short-circuit; this increases the chance of a fire. • The output of the alternator should be more than 120A. (If necessary, put the vehicle in a lower gear, so the engine runs at a higher rpm, to ensure that the alternator generates more current.) • When using an extra battery on the spraying rig, place the voltage regulating line on the battery of the rig, to ensure that the voltage drop between the vehicle and the rig is compensated by the voltage regulator on the alternator. • When in doubt, contact your supplier.

2.2.5. Sensor operation

⚠ ☀	• WARNING: The light emerging from the detection sensors is focused and therefore intense. • WARNING: The light wavelength can be hazardous • WARNING: NEVER look into the light source emerging from the WEED-IT detection sensor • WARNING: Serious eye damage may occur

⚠ **WARNING**
BEWARE OF THE LIGHT SOURCE
Do not look directly at the WEED-IT Sensor's light
Failure to comply may result in serious eye injury!

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2.2.6. Crop Protection Solutions

> - Always follow the instructions of the manufacturer of the Crop Protection Solution!
>   - Wear protective clothing!
>   - Pay attention to any safety instructions and warnings!
>   - Follow the guidelines about the application of the solution, the amount to be used, and the cleaning instructions.
> - The use of certain herbicides may be subject to local law. Check for such laws and follow them strictly.
> - Never open a pipe or hose that is under pressure!
> - Repair the machine only after it has been cleaned extensively and always wear a protective mask.
> - Never fill the tank above the specified maximum level.
> - When handling herbicides or toxic agents, always wear protective clothing, such as protective gloves, protective clothing and protective glasses.
> - Check for a possible interaction between the herbicide and certain sensitive parts of the machine.
> - Don't use any herbicides that have the tendency to stick or coagulate.
> - Crop protection machines may not be filled with surface water, in order to protect humans, animals and the environment.

For **storage** instructions, and instructions for **cleaning** and **transport**, refer to "Cleaning, Storage and Transport" on page 39.

2.3. Intended use

The WEED-IT system is intended to be used as an add-on tool to a crop spraying system. Use the WEED-IT only as described in this manual.

> - Only use the system for spraying crop protection products.

Warnings when using certain crop protection products

⚠️	• Please note that the use of slow-effective crop protection products (i.e. 20 hours or longer) may cause damage to pump membranes, hoses, solenoid valves, pipes and tanks.
	• Do not use any unauthorized mixture of two or more different crop protection products.
	• Do not use crop protection products that have the tendency to stick or coagulate.
	• Regular cleaning of the spray line and solenoid valves is recommended.
	• When storing the WEED-IT for a longer period of time, flush the machine with clear water. In addition, clean all hoses carefully to prevent that the herbicide solution degrades the quality of the any hoses when it is not in motion.

2.4. Switching On/Off

2.4.1. To switch on the WEED-IT:

The WEED-IT system switches on automatically once it receives a sufficient voltage from the battery. So be aware that once the master switch is put on, the WEED-IT will switch on.

1. Press and hold ⏻ for 1 second. You will hear a short beep and the display activates. After a couple of moments, the Start-up screen opens:

2. The system performs a self-test; the User console connects to the Power Converter and all connected sensors.
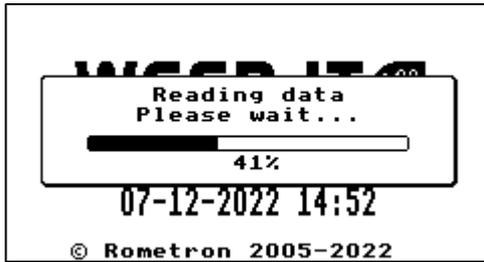
3. After self-test completion, the Main screen opens:
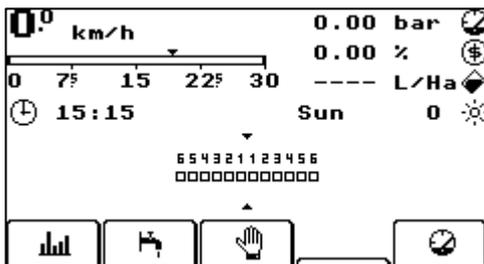
2.4.2. To switch off the WEED-IT:

1. Briefly press . All settings and counters are stored.

2. The screen shows the WEED-IT logo and the text `Shutting down…`

3. The machine switches off after a short delay.

If you accidentally press , restart the machine by pressing the **F1** key (Restart) within 2 seconds.
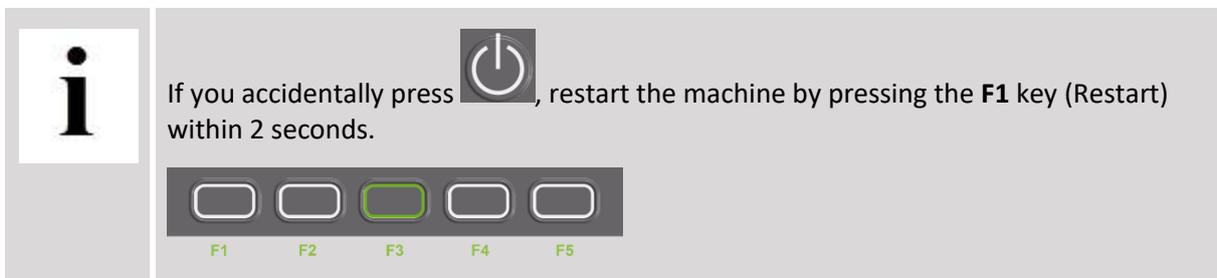
2.4.3. Forced shutdown

1. Press for 5 seconds or longer; the system switches off.

2. Wait for 5 seconds before you switch the WEED-IT on again.

2.5. Before each use

Before use of the WEED-IT on a vehicle:

1. Fill the tank with a sufficient amount of water.

2. Switch on the WEED-IT and the pump. The User console shows the Main screen and the (optional) air compressor starts.

3. Check that the pressure in the spray line is 3.0 bar (43.5 psi). If a pressure sensor is installed, the pressure indicated by the user console is binding.
    In case a PAV valve is used, the pressure can be adjusted by adjusting the air compressor pressure. Check the pressure at the manometer at the installed air compressor. The pressure indicated on the blue manometer is usually higher than the pressure in the spray line. If you need to adjust the pressure, pull and turn the dark red knob. Push the dark red knob when you have adjusted the pressure to a satisfactory level.

Figure 2-2 Air compressor feeding the PAV valve with compressed air

4. Check the system for leakages.

5. Press ⬚ (F2) to flush the system with water and check that the pressure remains 3.0 bar (43.5 psi) in the feeding lines.

6. Make sure that the pressure drop in the feeding lines is not too high: check the actual pressure at the nozzle outlet, for example with the help of a nozzle tester.

3. Identification of parts

This section describes the parts in the WEED-IT system.

3.1. System overview

WEED-IT consists of:

- The series of detection sensors, each with four detection channels and solenoid valves

- The user console

- The power converter (PSU)

In addition, the WEED-IT needs:

- A pump (spraying system), to provide the required amount of liquid to all the nozzles on the boom.

- A PAV valve (supplied with the system) and a small air compressor (optional), to maintain the pressure to all nozzles AND an air regulator (supplied with the system)

- OR if the sprayer is equipped with a hydraulically driven and regulated centrifugal pump, this could be used to maintain a constant pressure.

- Speed sensors (supplied with the system)

- A pressure sensor (supplied with the system)

Furthermore, the WEED-IT can be equipped with (optional):

- Flow sensor(s) (supplied with the system).

- Height sensors

- Section Control

- ISOBUS with UT, TC-SC and TC-GEO

For more information on these specific topics, refer to "Other manuals" on page 91.
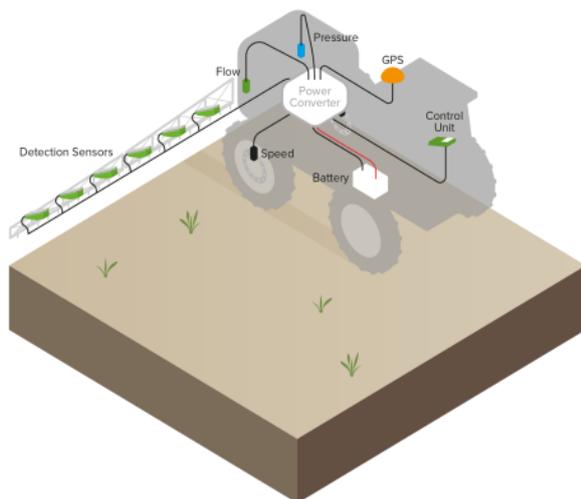
Figure 3-1 Electrical system overview

The WEED-IT will work with any type of pump, as long as it provides the required amount of liquid to feed all the nozzles along the boom. To maintain the pressure to all these nozzles, the WEED-IT either needs a hydraulic proportional controlled pump at the sprayer or the system needs a PAV valve (pressure accumulator, membrane valve) in the spray line. The air pressure is delivered by a small air compressor. If the spraying system already has an air compressor, this can also be used for the WEED-IT system. The PAV valve equals the liquid pressure to the air pressure. To get the desired pressure, an air regulator is installed between the air compressor and the PAV valve. The unused fluid flow goes back into the tank via a return line (dump line).

> ⚠️ Make sure that the primary valve (used to draw the liquid from the tank) and all couplings are absolutely water tight. Even the smallest leak will cause pressure variations or even pump failure. Leakage may also cause 'dripping' from the nozzles, instead of spraying. For all valves and fittings use plastic, stainless steel or chromed brass. Never use galvanized fittings, as the use of herbicides will cause corrosion.
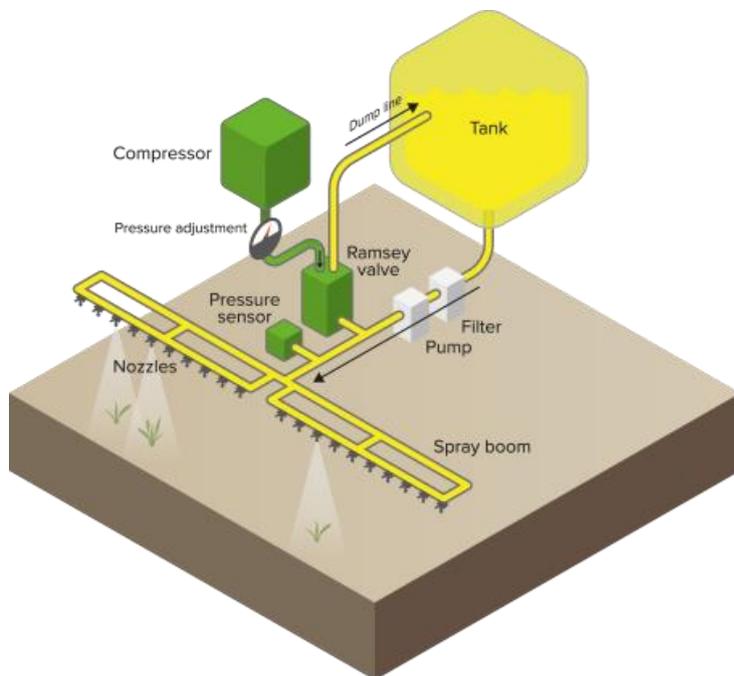
Figure 3-2 Flow in a standard WEED-IT installation

Pressure Accumulator Valve

3.2. User console

| ⚠️ | Make sure that every person who has access to the User console is familiar with all safety information provided in "Important safety information" on page 11 |
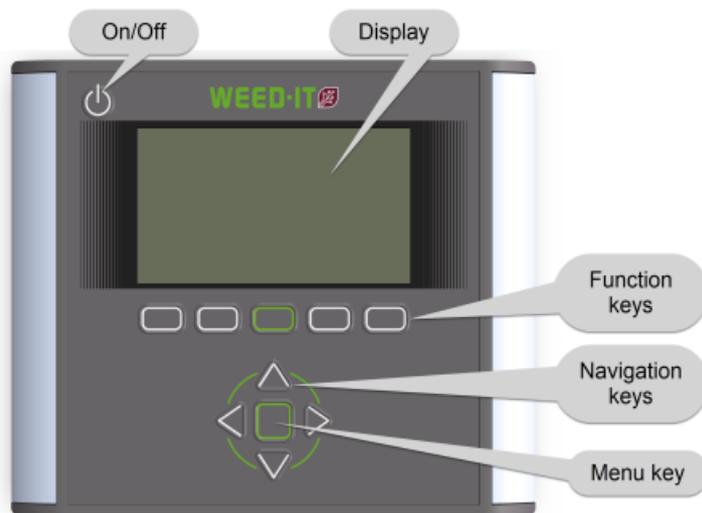
On/Off	Press the On/Off switch to turn the WEED-IT on or off.
Display See "Display" on page 21	At start-up, the display shows the Start-up screen. The display shows the system status and other relevant information such as warnings, errors, driving speed, pressure and several menu items.
Function keys See "Function keys" on page 24	The function of these five keys depends on the menu level. Each key corresponds with a function displayed in the screen.
Navigation keys See "Navigation keys" on page 24	Use the navigation keys to select a value or to move through the items in the menu.
Menu key	Use the Menu key to change the menu level, the menu within a level, or to access a different user mode.

3.2.1. On/Off switch

The On/Off switch is located at the top left of the User console.

- Press for 1 second to switch on the WEED-IT system
- Press briefly to switch off the WEED-IT system.

At System startup:

1. You will hear a short beep. The Start-up screen opens.

It shows:

- User console serial number

- Firmware version number (the software inside the WEED-IT)

- Firmware release date

- Current date and time

2. The system does a self-test and the User console communicates with the Power converter (to which all components are connected).

3. Once the self-test is completed, the Main screen opens.

3.2.2. Display

When you switch on the WEED-IT system, the Start-up screen opens. Immediately after that, the Main screen opens:

- The screens above show a system that has 12 sensors and a system that has 48 sensors (six on either side, identified as 1 through 6. The other has 24 on either side, identified as 1 through 24).

- The top of the screen shows a number of important values (subject to system settings).

Refer to "Main menu options" on page 41 for information on specific main menu options.

Please note that Main screen content depends on the number of installed options, current settings and on the number of connected sensors.

Main screen content:

16⁵ km/h	The current **Speed** of the vehicle. Depending on settings, speed is shown in: • m/s (meters per second) • km/h (kilometers per hour) • mph (miles per hour) The moving bar graphically presents the speed. In the speed bar, there are speed indicators (refer to the previous page for screenshots): • A vertical stripe within the speed bar indicates the maximum speed for weed detection. It is until this speed that the WEED-IT is capable of detecting and spraying the weed on target. The maximum detection speed is reduced when choosing a higher spray margin. • One or two triangles referring to the ideal speed and maximum speed at which the set application rate (l/ha or gal/ac) can still be reached. The leftmost triangle indicates the ideal speed from menu 104/203. If there are two triangles, the rightmost indicates the maximum speed at which the set application rate (l/ha or gal/ac) can still be achieved. • A square is shown instead of two triangles when the maximum speed is lower than the ideal speed, which means that weeds cannot be sprayed correctly and the application rate cannot be achieved at the ideal speed. To solve, check the following: change the spray settings in menu 104, lower the margin or check the heights and distances in menu 206. • If the speed exceeds one of the indicators, a warning 'Too Fast' will occur. • If there are two speed sensors connected to the power converter, an arrow will be shown that indicates the driving direction. • Refer to "Changing the spray settings" on page 29 and "PWM/Nozzle selection menu (104)" on page 49
Values	Frequently used **Values** are at the top right of the display. Press (F5) to navigate to other measurement displays.
	Pressure: The pressure of the liquid in the spray boom (in bar or psi). A warning appears if the pressure is too high or too low.
	Surface: The total area that was sprayed (in Ha or Acres) from the moment the machine was turned **On**. The counter automatically resets when the machine is turned **Off**
	Trip distance: The total distance traveled (in km or miles) from the moment the machine was turned **On**. The counter automatically resets when the machine is turned **Off**.

⊕	**Uptime**: The time (in hours) that has passed since the machine was turned on. The counter automatically resets when the machine is turned **Off**
🖌	Spray mode set (Spot plain, Spot spraying, Full coverage, Dual function, GoG plain (optional), GoG spot (optional).
🖋	**Usage**: If a flow meter is connected, liquid use (in L/Ha or gal/acre) is displayed instead of the uptime clock.
🍃	**Sensitivity**: The currently selected sensitivity preset (default 1-5 available).
🍃🍃	**GoG Sensitivity:** Current selected sensitivity preset for Green on Green (optional) (default 1-6 available).
◷	**Flow**: The current liquid flow (in L/min or gal/min).
☼	**Sun**: The strength of the sunlight on a scale of 1 to 10. Extremely bright sunshine (9-10) causes noise and reduces system accuracy.
🚩	**Margin:** The margin (mm) preset indicates the distance that is sprayed in front and after a weed that has been detected. Margin preset 1-4 are available.
Sensors	All **Sensors** are shown in the center of the display. Sensors are named from the center outwards, as seen from the back of the sprayer. Each sensor is presented as a small square and is identified by a number (starting with 1 for the sensor nearest to the driver seat). Example: six sensors, three on either side of the boom: ▼ 4 3 2 1 1 2 3 4 ☐ ✗ ✗ · ! ☐ ☐ ☐ ▮▮ ▮▮▮ ▲ • each sensor has four nozzles that spray a corresponding lane of the surface. • in the example above, four sensors show activity: vertical bars indicate nozzle activity. Each nozzle shows a bar: three nozzles of sensor 2 on the right are currently spraying. • an exclamation mark indicates that there is a problem • a dot indicates a disabled sensor • a cross indicates an error • a dash below the sensor number indicates that a height sensor is connected

Menu bar	The lower part of the screen shows a menu bar with icons: These illustrate the function of each **Function key**. Please note that the function of each key changes depending on the selected menu. Refer to "Main menu options" on page 41 for more information.
Warnings and messages	In case of problems, a message appears in the screen, just below the speed bar. If there is more than one message or warning, the message bar changes every few seconds to present messages consecutively. Refer to "Warnings and errors overview" on page 58 for more information.

3.2.3. Function keys

The User console has 5 function keys:

The function of each of these keys depends on the selected menu and is identified by an icon at the bottom of the screen. For the Main screen, this is:
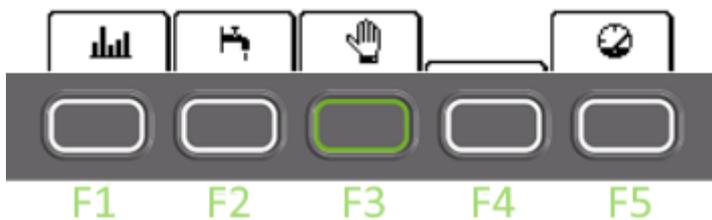
- If a key is not linked to a particular function in a menu, no icon is displayed.

- **F3** functions as the **Hold** key in the main menu. When driving the vehicle and using WEED-IT, press the key to temporarily disable (Hold) the WEED-IT system, for example when turning on the headlands.

- In other menus, the **F3** function key is mostly used to confirm a setting.

3.2.4. Navigation keys

The navigation keys consist of 4 arrow keys (Left, Right, Up, Down) and a Menu key in the middle:

- Use the arrow keys to select a value or to move through items in a menu.

- Press to select a menu.

- Press repeatedly to browse through available menus.

- Press and hold for one second to enter the Service mode.

Refer to "Main menu options" on page 41 for more information.

Refer to "Service mode" on page 44 for more information.

4. Using WEED-IT

Use the user console to control the WEED-IT system. The user console offers access to various menus that allow you to monitor and control the system. Please note that some features described in this section may not be available on your WEED-IT system. Contact your supplier for more information on installed options.

This section describes the procedures for regular use of the WEED-IT after installation on a spraying system.

Please refer to "Before each use" on page 17 if this is the first time you work with the WEED-IT.

⚠️	Make sure that the primary valve (used to draw liquid from the tank) and all couplings are watertight.
	• A leak will result in pressure variations or even complete pump failure.
	• Air in the lines may result in dripping (instead of spraying) from the nozzles.
	For all valves and fittings use plastic, stainless steel or chromed brass.
	Never use galvanized fittings, because the use of glyphosate (and related substances) will cause corrosion.
	The system has narrow fan nozzles for spot spraying. Check the nozzles regularly ("Nozzle cleaning menu (102)" on page 47).

The WEED-IT automatically adapts to changes in circumstances, for example the size of the plants, the soil type, ambient lighting and the weather situation (sun, rain, fog, etc.). Nevertheless, the sensitivity of the detectors may have to be adjusted. Several different presets are available from the Preset Menu for that purpose (see "Preset menu options" on page 43).

⚠️	Make sure that sensor windows are clean. The cleaner the sensor windows, the more accurate the detection.
	The system can operate at a maximum speed of 25 km/h (15.5 mph). To be able to drive the system at that speed:
	• the distance between the detection line and the nozzles must be at least 600 mm (24 inches)
	• the pressure must be constant and at least 2.0 bar(36.3 psi)
	• nozzle height must be less than 600 mm (24 inches)
	• margin must not be larger than 200 mm (8 inches)
	Battery voltage must be between 11.7 and 28V for proper operation. WEED-IT can be connected to a 12V or 24V electrical system. Whenever the battery voltage drops below 11.7V, a warning will be issued; the system switches off when the voltage drops below approx. 11.5V.

	The alternator must have a output of at least 120 A. For systems with more than 30 sensors, we recommend at least 150 A. For 36-meter systems, we recommend having a 200 A alternator.
	Flush the valves (nozzles) regularly with clean water to avoid clogging.
	Sensitivity of the sensors may have to be adjusted, depending on circumstances. Refer to "Changing sensitivity" on page 33 for more information.
	We recommend using at least a 100 mesh pressure filter in your sprayer to prevent solenoid valve clogging and or damage due to particles.

4.1. Main menu and service mode

Two User levels are available:

- Main menu: This is the default mode. With the main screen open, **briefly** press to navigate through available menus.

- Service mode: Use this mode to check and/or change system settings. Press and hold **for 1 second** to enter the Service mode. Refer to "Service mode" on page 44 for more information on available options.

4.2. Pressure check

Before each use, check system pressure by briefly flushing the WEED-IT system:

1. Switch on the system.

2. Press (F2):

3. Check that the pressure is 3.0 bar (43.5 psi). The top right of the Control Panel shows the pressure.

4.3. Sensors check

Before each use, check the functioning of the detection sensors:

1. Make sure there are no plants in the detection line (to prevent the corresponding nozzles from spraying continuously in step 6).

2. Switch on the system.

3. Wait for the Main screen to open.

4. Enter the Service mode.

5. Press [icon] repeatedly until menu 102 opens.

6. Press [icon] to activate Detection. As long as Detection is active, the leaf icon will flash.

7. Activate nozzles by supplying chlorophyll (green plant material) in the corresponding sensor channels.

8. Press [icon] again to stop.

9. Press [icon] to return to the Main screen.

Additionally, use one of the other Service mode options in "Nozzle cleaning menu (102)" on page 47.

Replace a faulty or damaged detection sensor with a new one, refer to "Sensor replacement" on page 36. Examples of detection sensor that needs to be replaced:

- Solenoid is controlled incorrectly.
- Light is flashing.
- Relative humidity (RH) warning.

<table>
<tr>
<td>**i**</td>
<td>If no replacement sensor is available, move a functioning sensor from the outside of the boom to the position of the faulty sensor. In this way, you can still continue spraying with the widest boom possible at that moment (even though it is not as wide as you would like it to be).

Make sure that the nozzle configuration is correct for this sensor (distance and height). Also adjust the offset, because this changes if the sensor's position on the boom is changed. Please contact your supplier to support you with this step.</td>
</tr>
</table>

4.4. Cleaning nozzles

Flush the nozzles regularly with clean water to avoid clogging.

1. Fill the tank with water or use the fresh water tank on the sprayer.

2. Start the system.

3. Wait until the Main screen opens.

4. Press [icon] to flush all nozzles.

Use one of the following methods to clean an individual nozzle more thoroughly:

Service Mode (100):

1. Make sure there are no plants in the detection line.

2. Stop the vehicle.

3. Enter the Service mode.

4. Use the Sensor information menu to switch off the sensors (press ⏻) that do not need to activate nozzles.

Use the nozzle cleaning menu (102):

1. Make sure there are no plants in the detection line (to prevent the corresponding nozzles from spraying continuously in step 6).

2. Stop the vehicle.

3. Enter the Service mode.

4. Press [icon] repeatedly until menu 102 opens.

5. Press [leaf icon] to activate Detection. . As long as Detection is active, the leaf icon will flash.

6. Activate the nozzle by supplying chlorophyll (green plant material) in the corresponding sensor channel.

7. Press [leaf icon] again to stop.

8. Press [icon] to return to the Main screen.

4.5. Reading job productivity

Several options are available to check job productivity apart from the information given on the Main screen.

1. Enter the Service mode.

2. Press [icon] repeatedly until menu 103 opens.

   Refer to "Job menu (103)" on page 48 for more information.

4.6. Changing the spray settings

WEED-IT can be used in various modes, see PWM/Nozzle selection menu (104) page 49:

- Spot plain
- Spot spraying
- Full coverage
- Dual function
- Spot plain Green on Green (optional)
- Spot spraying Green on Green (optional)

To change the spray settings:

1. Stop the vehicle.

2. Enter the Service mode. The global information screen opens:

```
┌─────────────────────────────────────┐
│ Information  L  Global      100       │
│ Temperature: 23/35    °C              │
│ Battery   : 13.18     V               │
│ Lowest    : 13.15     V               │
│ Uptime    : 10:54     hrs             │
│ Area      :  0.00     Ha              │
│ Total     :  0.04     Ha              │
│ Max speed : 30.00     km/h            │
│                                       │
│  ⇤    L↔R    ⌿⌿⌐         📝           │
└─────────────────────────────────────┘
```
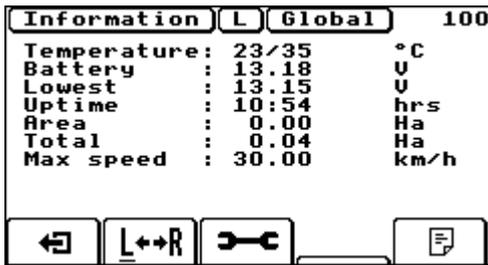
3. Press ⬜ briefly several times, until menu 104 opens:

```
┌─────────────────────────────────────┐
│ PWM/Nozzle selection      104         │
│ ◆Mode  : Spot plain          ◆        │
│ Nozzle: TeeJet TP 25-03               │
│ Press.: 3.00 bar                      │
│ Spot  : 136.6 L/Ha     100%           │
│ Speed : 20.01 km/h                    │
│                                       │
│   ⇤          OK                       │
└─────────────────────────────────────┘
```

4. Use the **Up/Down** navigation keys to select the Mode parameter, if necessary.

5. Use the **Left/Right** navigation keys to select the appropriate spray mode.

6. Press the **Down** navigation key to select the Nozzle parameter.

```
┌─────────────────────────────────────┐
│ PWM/Nozzle selection      104         │
│ Mode   : Spot spraying                │
│ ◆Nozzle: Wilger MR 65-03     ◆        │
│ Press.: 50.76 psi                     │
│ Spot  : 3.66 ga/a      90%            │
│ Speed : 14.00 mph                     │
│                                       │
│   ⇤          OK   50%  100%           │
└─────────────────────────────────────┘
```
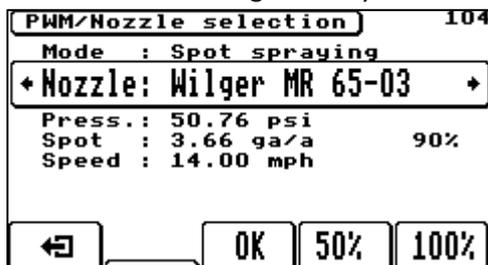
7. Use the **Left/Right** navigation keys to select the preferred nozzle type.

⚠️ Only use the nozzle types that you can select in the software. Refer to "Available nozzles" on page 92 or a list of all available nozzles.

Although PWM increases the application rate range with a nozzle, the right nozzle selection is still a crucial factor for a good spray result.

The nozzle type is usually engraved in the top surface of the nozzle. Make sure that you replace the nozzles on the spray boom by the new type!

8. Pressure selection is optional in menu 104. If not available, the pressure is set once by the dealer in menu 203 tab 6.
    Press the **Down** navigation key to select the Press. (pressure) parameter.

```
┌─PWM/Nozzle selection─┐    104
  Mode   : Full coverage
  Nozzle: Magnojet APS 30-03
◄Press.: 3.10 bar          ►
  Cover  : 131.6 l/Ha      99%
  Speed  : 21.60 km/h

  ┌──┬─────┬────┬─────┐
  │⬅│  ⏱  │ OK │ 50% │
  └──┴─────┴────┴─────┘
```

9. Use the **Left/Right** navigation keys to select the preferred pressure. If you press the gauge icon ⏱ (F2), the nominal pressure that belongs to the nozzle will be set. For most nozzle types this is 3.00 bar.

> **i** Note that the pressure set in menu 104 is only used to support the application rate calculation. The pressure setting is not adjusted. The pressure needs to be adjusted manually at the air compressor (when using a PAV valve) or in the spray computer of the sprayer itself. Always check that the pressure sensor reading matches the set pressure in menu 104 before start spraying.

10. Press the **Down** navigation key to select the Spot or Cover parameter.

```
┌─PWM/Nozzle selection─┐    104
  Mode   : Spot spraying
  Nozzle: Magnojet APS 30-03
  Press.: 3.00 bar
◄Spot   : 96.2 L/Ha    80%►
  Speed  : 20.01 km/h

  ┌──┬─────┬────┬─────┬──────┐
  │⬅│     │ OK │ 50% │ 100% │
  └──┴─────┴────┴─────┴──────┘
```

11. Use the **Left/Right** navigation keys to select the preferred application rate.

> **i** Ideally, the preferred application rate should be achieved with a 70-80% PWM at the ideal speed. This ensures that there is enough control range for the PWM to control the application rate when the vehicle is driving faster or slower or when it turns.
>
> If the application rate percentage is not between 70-80%, try a smaller or larger nozzle type or a different ideal speed.

> ⚠ Never select a spot or cover application rate with a percentage that is lower than 40% in menu 104. If the desired application rate is matching a low percentage, the nozzle should be changed!

PWM/Nozzle selection parameters explained

- The `Spot` parameter determines the application rate that is applied within the single nozzle spray width on the soil surface. The amount is only applied in the channels where weeds are detected by the system. The application rate is regulated for any speed up to the maximum speed, also while turning (if the WEED-IT has two speed sensors installed).

The spot rate is calculated as a bandwidth application. Refer to "Application rate calculations" on page 117 for more information on the application rate calculations.

- The `Cover` parameter determines the application rate that is applied to the entire field (Full coverage mode and Dual function mode). The Cover rate is calculated as a normal spray application (with overlap between neighboring nozzles). Note that WEED-IT uses 25 cm / 10 inch nozzle spacing. Refer to "Application rate calculations" on page 117 for more information on the application rate.

- Use the **50%**, **75%**, and **100%** (F4 and F5)buttons to quickly select these application rate percentages. If the mode Spot Plain is being used, the application rate percentage is fixed at 100%.

- If the mode Dual function is being used and the Spot parameter is equal to the Cover parameter, a warning will be shown. With these settings, the same application rate will be sprayed on weeds as on the rest of the field, so in this case, it would be better to select the mode Full Coverage. The difference between the application rate percentages of the `Spot` parameter and the `Cover` parameter should be at least 40%.

```
┌─PWM/Nozzle selection─┐      104
│◄Mode : Dual function        ►│
│ Nozzle: Wilger MR 65-03      │
│ Press.: 3.50 bar             │
│ Spot  : 90.5 l/Ha       75%  │
│ Cover : 90.4 l/Ha       75%  │
│ Speed : 24.01 km/h           │
│    WARNING: Spot = Cover     │
│ ┌─┐      ┌──────┐            │
│ │◄┘│      │  OK  │           │
└─┴──┴──────┴──────┴───────────┘
```
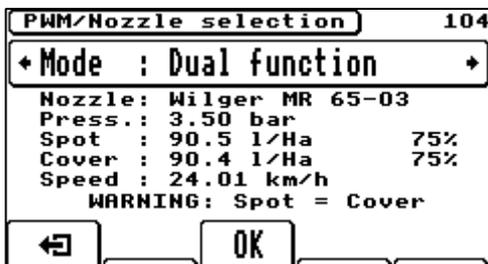
12. Press the **Down** navigation key to select the speed (ideal speed) parameter.

13. Use the **Left/Right** navigation keys to select the desired driving speed.

14. The application rate may change when you adjust the speed parameter.

15. Press **OK** to confirm. All sensors are reconfigured and the system restarts.

> **i** The maximum application rate and ideal speed are related to each other. If you increase the ideal speed, the maximum application rate will decrease automatically.

For more information, see "PWM/Nozzle selection menu (104)" 49.

4.7. Changing the margin during spraying

The WEED-IT system allows you to make changes to the spraying margin during use of the system, for example, to compensate for strong winds.

⚠	Please note that spraying during very strong winds is not advised

From the Main screen:

1. Press briefly to open the Preset menu:

2. Press 🏳 to change the margin. By default, the margin presets are defined as follows:

   - 1 = 200 mm

   - 2 = 235 mm

   - 3 = 270 mm

   - 4 = 300 mm

3. Press 🏳 repeatedly until the required margin is displayed.

4. Press briefly or wait for three seconds to return to the Main screen.

4.8. Changing sensitivity

The sensitivity of the sensors can be adjusted, depending on circumstances. Several different presets are available in the Preset menu to set the sensor sensitivity:

1. From the Main screen, press once to enter the **Preset** menu.

2. Use 🍃 to select the desired preset. This function allows the WEED-IT to be used under different conditions, for example on a wet surface after rain, in bright sunlight, or with very small plants. Each preset has a number; the number is displayed on the sensitivity key and in the top right of the screen. A low number means a high sensitivity and a high number means a low sensitivity:
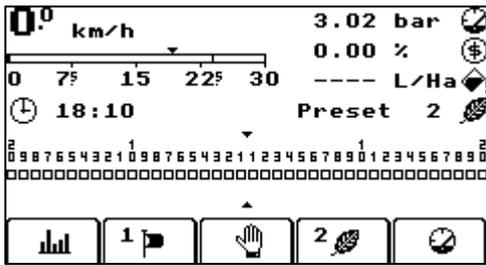
Figure 4-1 Sensitivity preset 2 selected

It might be necessary to experiment to find the appropriate setting. Check the display to verify sensor response. A series of vertical bars under the sensor icons indicates the activity of each sensor.

Refer to "Preset menu options" on page 43 for more information on presets.

4.9. Machine on hold

Use the Hold function to temporarily stop spraying, for example when turning on headlands:

- In the main screen, press the 🖐 (F3) function key.
- Press 🖐 (F3) once more to resume spraying.

If you have installed an external hold switch you can use this switch as well as the function key.

5. General maintenance

Make sure you follow the cleaning instructions after each use of the WEED-IT. See "Cleaning, Storage and Transport" on page 39 for more information.

- Service, repair and clean the machine only with the engine turned off!

- Always remove the key from the ignition.

- Check all bolts and nuts regularly and tighten them if necessary.

- When welding on the vehicle or close to it, always remove the cables from the alternator and the battery! Also, disconnect all cables from the WEED-IT sensors.

- When replacing any defective parts, make sure that the replacement parts conform to the specifications of the manufacturer of the WEED-IT system. Original WEED-IT spare parts always conform to these specifications and are available from your supplier. Using non-approved replacement parts voids warranty.

Safety – electrical installation

- Only use approved fuses. Fuses with a too-large current rating may cause a system overload and increase the possibility of fire!

- When servicing the electrical installation, always remove the (-) terminal of the battery.

- Always connect the battery in the proper order: first connect the (+) terminal, followed by the (-) terminal. When disconnecting, do the same in reverse order.

- The (+) terminal should have a protective cover to avoid the possibility of a short circuit (explosion)!

- Avoid sparks and open fire close to the battery.

- Make sure that no cables are trapped when working on the machine. Damage to the cables may cause a short-circuit and increases the chance of a fire.

- The output of the alternator should be more than 120A. (If necessary, put the vehicle in a lower gear, so that the engine makes more revolutions per minute, to ensure that the alternator generates more power.)

- When using an extra battery on the spraying rig, place the voltage regulating line on the battery of the rig, to ensure that the voltage drop between the vehicle and the rig is compensated by the voltage regulator on the alternator.

- When in doubt, contact your supplier.

5.1. Sensor maintenance

5.1.1. Regular maintenance

Regularly clean the windows of the sensors with a soft clean cloth.

⚠️	Make sure you use a clean cloth; sand will scratch the sensor windows.

After system start-up, any leaking sensors will be indicated by the system. A leakage warning will be displayed, including which sensor(s) is suffering from this issue. If the leakage warning is still present when the sensors are at operating temperature, the sensor has a leak. Ignoring the warning can result in corrosion on the sensor PCB which cannot be repaired.

Possible causes:

- Cracked window

- Sensor housing (seal) damage.

- Damaged breather plug, located behind the sensor connector.

- Missing sensor cable. This cable must be connected to the sensor at all times, and the orange seal in this connector must be intact.

If the sensor cable is removed, place a connector dust cap in the connector on the sensor. Always return a leaking sensor to your supplier/dealer for further diagnosis.

5.1.2. Sensor replacement

If you need to replace a sensor, the sensor needs to be configured. Please contact your supplier.

5.2. Nozzle and solenoid valve maintenance

⚠️	We recommend using at least a 100 mesh pressure filter in your sprayer to prevent solenoid valve clogging or damage due to particles. Do not leave your sprayer with chemicals in the spray line. Always rinse the spray line and nozzles with clean water before storing the machine, even if you will use it again the next day.

Regularly flush nozzles to make sure that they are not clogged. Refer to "Cleaning nozzles" on page 28 for more information. Always replace faulty nozzles. To replace a nozzle:

1. Twist the nozzle cap counterclockwise.

2. Push the nozzle and nozzle seal out of the nozzle cap. Undamaged nozzle caps may be re-used.

3. Fit a new nozzle and nozzle seal into the cap.

4. Twist the cap, nozzle and seal back on clockwise.

> ⚠️ Even if the WEED-IT nozzles have not been used during an application (e.g. when regular nozzle bodies are installed for conventional spray applications on the same spray line as the WEED-IT nozzle bodies).
>
> Make sure that you flush and clean the WEED-IT solenoids afterwards because spray liquid remains inside the solenoid if not cleaned!

A leaking nozzle might be caused by a clogged or worn solenoid. Only open a solenoid when the solenoid or nozzle is leaking. The procedure to check/clean a solenoid is as follows:

1. Make sure that the system is flushed with clean water.

2. Make sure that there is no pressure in the spray line.

3. Disconnect the 2-way SuperSeal connector

4. Turn the nut counterclockwise. Be careful not to damage the plastic nut

5. Check the inside of the solenoid on debris and clogged chemicals/sand. Use water to clean the inside.

6. Open the solenoid by unscrewing the nut of the coil and the plastic body.

7. Clean the disassembled parts with clean water and/or pressurized air.

8. Dry the parts with a clean cloth and assemble the solenoid again. Make sure that there is no water inside the coil! Make sure that the tube operator is properly tightened to the plastic body.

9. Mount the solenoid back on the nozzle body. Tighten it by hand, hand-tight is tight enough!

10. The coil should be able to rotate freely around the tube operator. If that is not the case, Check the tightening of the tube operator to the body and unloosen the coil nut a little.

6. Cleaning, Storage and Transport

> ⚠️ Turn off the engine and remove the key from the ignition before you start cleaning, storage, or transport procedures.

When storing the machine for a longer period or time:

1. Flush the machine with clean water and if sticky chemicals are used, use a cleaning agent before cleaning the machine with clean water.

2. Clean the machine on the outside to prevent that the herbicide solution degrades sensitive materials[HB7].

General storage instructions

- Always store the machine in a dry warm place.

- Ensure that all pressure is released from the system before storing it. Stop the pump and press 🚰 (F2).

- When the machine is stored for a longer period or time, disconnect the system from the battery. The easiest way to do this is to disconnect the main power plug. Use of a master switch is recommended.

- Once the spraying season is over, remove the user console and store it in a dry warm place:

  - Disconnect the console connection cable from the user console.

  - Put the dust cap on the open user console connector.

- Always clean the filters of your sprayer before storage. Refer to your sprayer's manual.

- Storage in freezing circumstances requires adding anti-freeze fluid to the fluid system. Make sure the anti-freeze fluid is appropriate for the circumstances and that it is well distributed through your sprayer's fluid system. This includes the added WEED-IT spray-related parts such as the solenoid valves and the PAV valve.

General cleaning and transport instructions

- Do not clean the system with a high-pressure nozzle (user console, power converter box, sensors, etc.).

- Regularly clean the sensor windows with a soft cloth. Note that sand will scratch the windows.

⚠ Cleaning the system with a high-pressure nozzle will cause serious damage to system components.

7. User console – reference

Use the keys on the user console to control the WEED-IT. All options are grouped in menus.

Please note that available menu options depend on the options installed on the system.

Two menu levels are available which will be described in this chapter:

1. Main menu
2. Service mode

7.1. Main menu

If the Main menu is active, the Main screen is open and the main menu is selected
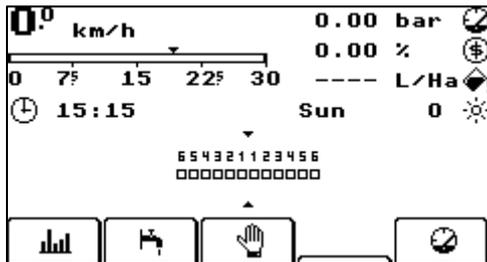
- Press [ ] briefly to browse through available menus (Main menu and Preset menu).

For more information about the main menu, refer to "Display" on page 21.

7.1.1. Main menu options

The main menu offers the options for regular use of the WEED-IT system.

📊	**Activity (histogram)**: Use this key to toggle between the standard activity display and three different types of usage histograms. The standard usage display shows the activity of each individual sensor in small vertical bars under the sensor. Histograms can be used to display the level of activity over time and per nozzle. The normal histogram scales automatically: the shown level of activity is relative to the level of activity of all other sensors.
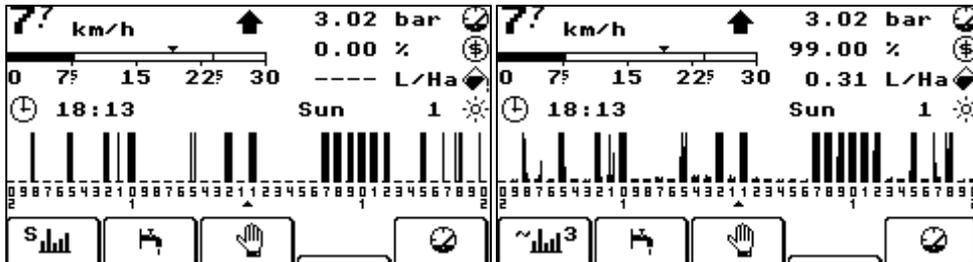	
	Repeatedly press 📊 to select a different histogram level:
	
	   • **F** fast; the display shows the short-term activity in a histogram
	
	   • **S** slow; the display shows the long-term activity in a histogram
	
	   • **+** All; the display shows all activity from the moment the machine was switched on.
	
	   • **~3** CDD; the display shows the crop density data **that** the detection sensors measure for each individual channel. **The scale can be adjusted by using the navigation arrow keys.**

🚰	**Flush**: Use this key to flush the system. During flushing, all nozzles are opened simultaneously. Use this option for cleaning the system, or for checking that all nozzles are functioning.
✋	**Hold**: Use this key to temporarily put the machine on hold, for example when you cross a street, or when turning on the headlands. The buzzer will sound intermittent.
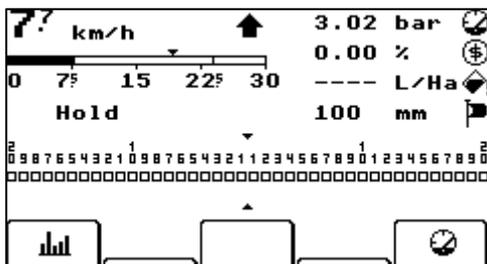
⊘	**Measurement toggle**: Use this key to toggle between various types of measurement displays in the top right corner of the display:

Note that when the default measurement display is selected, the bottom line changes every three seconds.

Press briefly to move to the next menu.

7.1.2. Preset menu options

Use the Preset menu to change the spraying margin and sensitivity of the WEED-IT.

⏼	Histogram: see description Main menu.
⚑	**Margin**: WEED-IT uses a certain margin when spraying a target. This margin varies from 200 to 300 mm and specifies the distance before and after the weed that will be sprayed. One of four predefined margins can be selected while driving the vehicle. The number of the selected margin preset is displayed to the left of the icon. The margin-setting is often used to compensate for the spray displacement caused by heavy winds, or uneven terrain / strong variation in terrain. By default, the margin presets are defined as follows: 1. 200 mm 2. 235 mm 3. 270 mm 4. 300 mm
✋	**Hold**: see description Main menu

🍃	**Sensitivity**: The WEED-IT will automatically adjust to changes in circumstances, e.g. the size of the plants, the color of the soil, ambient light and the weather situation (sun, rain, fog, etc.). You may have to manually adjust the sensitivity of the sensors under special circumstances. Several pre-programmed sensitivity presets are available for that purpose, depending on the type of detection sensor. Presets are numbered; preset number 1 is the most sensitive:
🍃	**GoG Sensitivity:** Current selected sensitivity preset for Green on Green spray modes (optional) (Default 1-6 available)
◔	**Measurement toggle**: see description Main menu.
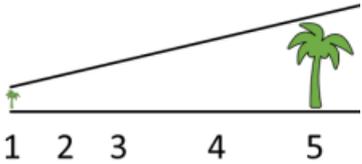
Press briefly or wait three seconds to return to the main menu.

7.2. Service mode

Press and hold for 1 second to enter the Service mode. A long beep confirms that you are in Service mode. The global information screen opens.

Press briefly a number of times to browse through the available menus.

Service mode offers the following menus:
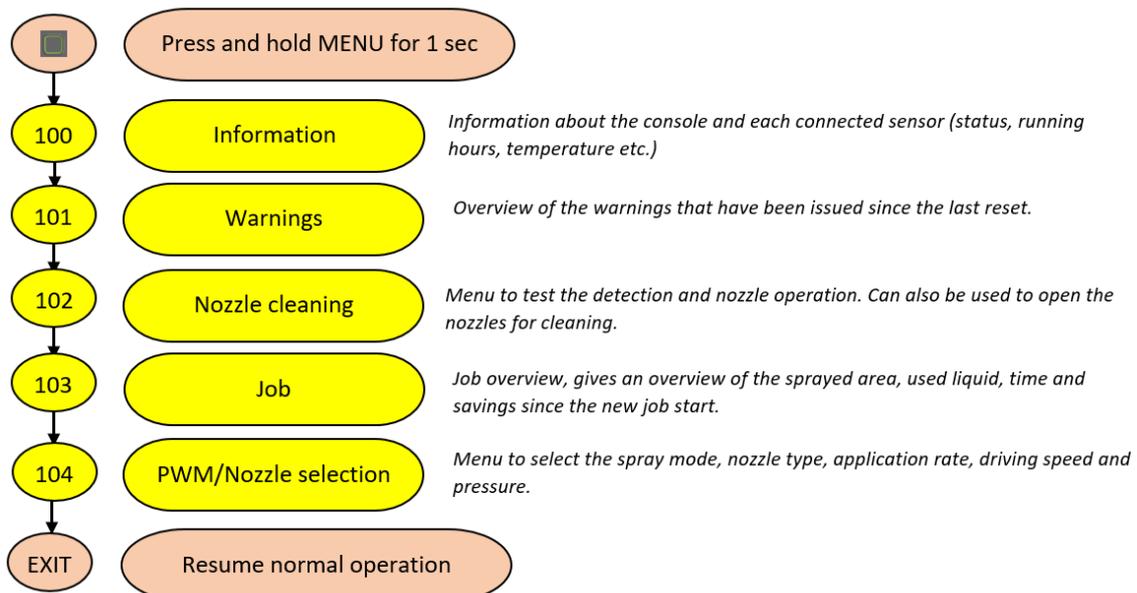
7.2.1. Information menu)

The Information menu offers general information about the WEED-IT system, plus information about each sensor. The information is spread over several pages/screens.

- Use $\underline{\mathsf{L}}$↔R to toggle between information on the left or the right boom.

The first page shows general system information:

Figure 7-1 Global information screen

Temperature	Shows two values. The first one is the temperature measured inside the User console. The second one is the temperature measured in the Power converter.
Battery	Shows the current battery voltage.
Lowest	Shows the lowest battery voltage measured during this session.
Uptime	Total hours of use of this unit
Area	Sprayed area during this session.
Total	Total sprayed area (during machine life).
Max speed	Maximum speed that is possible with current machine settings.

⏏	Press this key to leave the Service mode and to return to the Main screen.
L↔R	Press this key to select the Left boom (L) or the Right boom (R). The underlined one is the selected one.
⚙	Press this key to enter the user configuration menu.
📄	First sensor. Press this key to open information on the first sensor. Note that the Function keys change when you access the **Sensor information** menu!

The sensor information menu
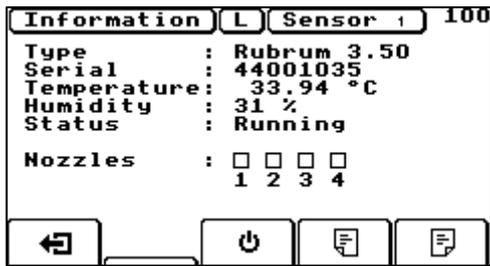
Figure 7-2 Information Left Boom, Sensor 1

Type	Sensor model and firmware version.
Serial	Serial number of the sensor.
Temperature	Temperature inside the sensor.
Humidity	Relative humidity of the air inside the sensor. If the value is too high, a message opens in the screen. Have the sensor replaced by your supplier.
Status	Current status of the sensor
Nozzle	Status of the individual nozzles. Nozzle failures are indicated with a cross (see nozzle number 3):
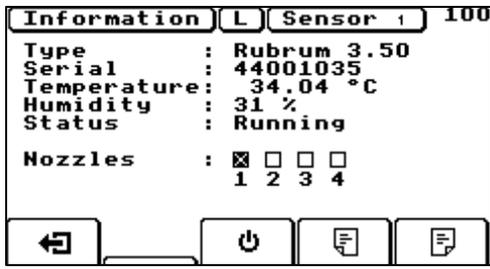
Function keys in the **Sensor Information** menu have the following meaning:

←	Press this key to **leave the Service mode** and to return to the Main screen.
⏻	Press this key to turn the selected sensor **on** or **off**.
🗐	Press this key to go to the **Previous** sensor.
🗎	Press this key to go to the **Next** sensor.

7.2.2. Warnings menu (101)

In the Main screen, warnings are displayed directly below the speed bar. If there are no warnings or messages to display, a clock is shown. Only one message at a time can be shown:

⚠ ▣ 11.28 V

Because the screen is rather small, messages/warnings will be very short. If more than one message is pending, or if multiple errors occur at the same time, each message is shown for a few seconds.
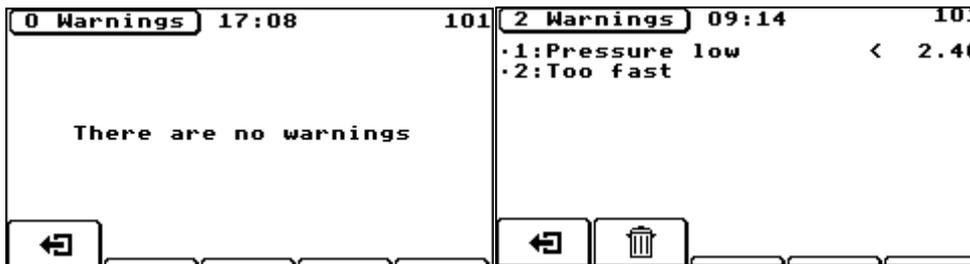
Figure 7-3 Warnings Global screen. Left: no warnings or error messages, right: two warnings

Warnings are shown in a list. If the list is too long to fit the screen, use the ▤ and ▥ keys to access the rest of the list.

- All warnings and error messages are stored when the WEED-IT is switched off. To clear the list of warnings, press the 🗑 key.

- Errors or warnings that are persistent will re-appear (e.g. `Pressure low`).

7.2.3. Nozzle cleaning menu (102)

The Nozzle cleaning menu is only available when the vehicle is **not** moving.

Use the Nozzle cleaning menu to:

- flush nozzles
- test detection
- test solenoid valves
- check nozzles
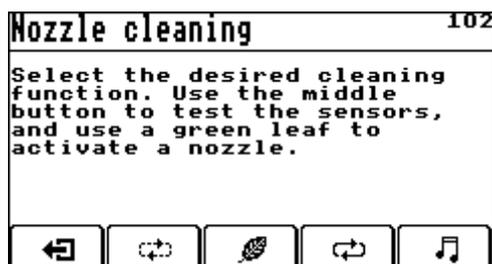
⬅️	Press the **Exit** key to leave the Service mode. The main screen opens.
↻	Press the **Chase** key to activate nozzles one by one with a short burst.
🍃	Press the **Detection** key test nozzles. Holding a leaf under a sensor should activate the corresponding nozzle.
↻	Press the **Sequencing** key to activate nozzles one by one with a long burst.
♫	Press the **Melody** key to activate nozzle cleaning at a variety of frequencies, simulating PWM control.

7.2.4. Job menu (103)

Use the Current job menu to view the recorded data of the current job.

Liquid can be determined if at least one flow meter has been installed that registers the liquid flow to the nozzles. To determine the amount of herbicide, Dose must be correctly set (e.g. 10 % means 10 liters of herbicide per 100 liters of liquid). The Liquid, Usage and Saving parameters are shown if a flow sensor is connected.

WEED-IT remembers usage parameters of the seven previous jobs (or seven previous days, depending on settings).

When you enter menu 103, the screen shows the current job totals (or the current day totals), indicated as page 8/8:

Time	Duration of the current job
Active	Current job covered distanced
Area	Current job covered area
Dose	Volume percentage of the herbicide used in the mixture. Use the **Left/Right** navigation keys to adapt the value. Press **OK** to confirm.
Liquid	Total volume of liquid sprayed for the current job

`Usage`	Total volume of liquid used per Ha (Liquid / Area) for the current job
`Saving`	Percentage of herbicide saved compared to the selected application rate.
⬅	Use this key to return to the Main menu
⌐ New ⏎ 💾	Use this key to start a new job. Please note that a maximum of 8 jobs can be saved. If you start a new job, the data for the first job is deleted. By default, the details in menu 103 are stored per **job**. If you save data per job, you can monitor multiple jobs on a single day. To store data per **day, change the appropriate setting in menu 152.**
`OK`	Use this key to confirm a setting
▤	The first screen shows the current job. However, you can also view totals of the previous 7 jobs on which the WEED-IT was used. Press ▤ and ▤ to scroll through the screens. The top of each screen shows the date on which the data was recorded.
♻	When viewing the current job, the screen is not refreshed to make sure that you can read the values. Press ♻ at any time to refresh the screen.

7.2.5.   PWM/Nozzle selection menu (104)

Use menu 104 to select the spraying mode, nozzle type, pressure, and ideal speed to be used.

- WEED-IT can be used in various modes:

- Spot plain

- Spot spraying

- Full coverage

- Dual function (spot & cover)

- Plain Green/Green (optional)

- Spot Green/Green (optional)

By default, menu 104 looks like this:

```
┌─────────────────────────────────┐
│ ⌐PWM/Nozzle selection⌐    104    │
│ ┌─────────────────────────────┐  │
│ │◆Mode  : Spot plain       ◆│  │
│ └─────────────────────────────┘  │
│   Nozzle: TeeJet TP 25-03        │
│   Press.: 3.00 bar               │
│   Spot  : 136.6 L/Ha      100%   │
│   Speed : 20.01 km/h             │
│                                  │
│  ┌──────┐      ┌──────┐          │
│  │  ⬅  │      │  OK  │          │
│  └──────┘      └──────┘          │
└─────────────────────────────────┘
```

After changing the spray mode or the application rate, all sensors must be reconfigured. Press the **OK** key to confirm the new settings and update all sensors. This may take a couple of seconds:

The system automatically restarts.

Spot plain mode

Stop the vehicle and navigate to menu 104.

To change settings:

1. Use the **Down** navigation key to select the nozzle (type) parameter. The parameter is highlighted:
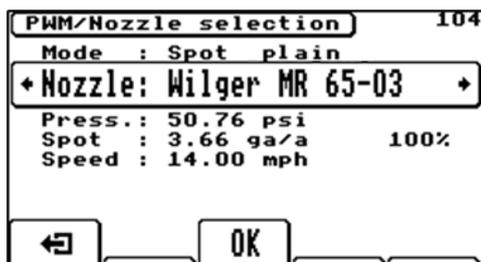
2. To correctly calculate how much spraying liquid is applied, WEED-IT needs to know which nozzle type is used. When mounting a different type of nozzle, use menu 104 to select the appropriate type before proceeding.

3. Use the **Left/Right** navigation keys to select the appropriate nozzle type.

⚠️ Only use the nozzle types that you can select in the software.

The nozzle type is usually engraved in the top surface of the nozzle.

4. Use the **Down** navigation key to select the `Press.` (pressure parameter).

5. Use the **Left/Right** navigation keys to select the preferred pressure. If you press the gauge icon 🕐 (F2), the nominal pressure of the selected nozzle will be set. For most nozzle types this is 3.00 bar (43psi).

ℹ️ The spray mode Spot plain does not use PWM, which means that the application rate can only be adjusted by changing the pressure and ideal speed.

This also means that the application rate will be higher when the driving speed is lower than the set speed in menu 104.

6. Use the **Down** navigation key to select the `Speed` parameter.

7. Use the **Left/Right** navigation keys to change the ideal speed. The `Spot` parameter changes when the ideal speed is being changed.

8. Press **OK** to confirm. All sensors are reconfigured and the system restarts.

Spot spraying mode

Stop the vehicle and navigate to menu 104. Press the **Right** navigation key to select **Spot spraying**. The screen changes:

```
┌─PWM/Nozzle selection─┐    104
│◆Mode  : Spot spraying    ◆│
│ Nozzle: TeeJet TP 25-03    │
│ Press.: 3.00 bar           │
│ Spot  : 109.3 L/Ha    80%  │
│ Speed : 20.01 km/h         │
│                            │
│ ⬅┃    ┃ OK ┃ 50% ┃ 100% ┃  │
└────────────────────────────┘
```

To change settings:

- Use the **Up/Down** navigation keys to select a parameter. Use the **Left/Right** navigation keys to change the value of the parameter.

- The mode Spot spraying uses PWM, so the `Spot` parameter can be changed without changing the pressure or ideal speed. The application rate percentage is shown on the right of the screen. This is the percentage of the maximum application rate at this pressure and speed. Use the **Left/Right** navigation keys to change the application rate. This amount of herbicide mix is only applied to the weeds that are detected by the system. The Spot rate is calculated as a band with calculation. The herbicide is applied at the same application rate for any speed up to 25km/h and also while turning (if two speed sensors are used and the option `Speed sensors at L & R` is enabled[HB11]). Use the **F4** and **F5** keys to quickly select the shown application rate percentages.

- Use the **Left/Right** navigation keys to change the ideal speed. The `Spot` [HB12]parameter changes when the ideal speed is being changed.

> ℹ **i** Ideally, the preferred application rate should be achieved with a 70-80% PWM at the ideal speed. This ensures that there is enough control range for the PWM to control the application rate when the vehicle is driving faster or slower or when it turns.
>
> If the application rate percentage is not between 70-80%, try a smaller or larger nozzle type or a different ideal speed.

- Press **OK** to confirm. All sensors are reconfigured and the system restarts.

Full coverage mode

Full coverage mode will spray liquid continuously, like in a regular spraying application. The `cover` parameter determines the application rate that is applied to the entire field. It is calculated as normal spray application (with overlap between neighboring nozzles).

Stop the vehicle and navigate to menu 104. Press the **Right** navigation key to select **Full coverage.** The screen changes:

```
┌PWM/Nozzle selection┐      104
  Mode  : Full coverage
  Nozzle: Wilger MR 110-04
  Press.: 3.00 bar
  Cover : 200.2 L/Ha       85%
┌Speed : 15.01 km/h         ┐

┌──┐ ┌───┐┌───┐┌────┐
│←┘│ │ OK││50%││100%│
└──┘ └───┘└───┘└────┘
```

- Use the **Up/Down** navigation keys to select a parameter. Use the **Left/Right** navigation keys to change the value of the parameter.

Dual function

The Dual function combines Spot spraying and Full Coverage; it applies a fixed amount of herbicide to the whole field (Cover). When a weed is detected, a larger amount (Spot) is applied. The Spot rate must be higher than the Cover rate.

Stop the vehicle and navigate to menu 104. Press the **Right** navigation key to select **Dual function.** The screen changes:
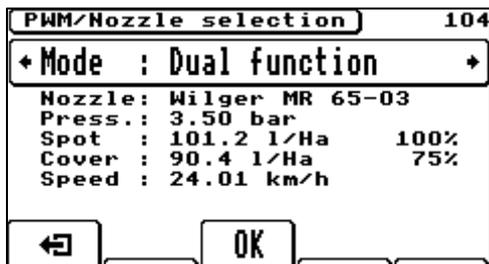

```
┌PWM/Nozzle selection┐      104
┌Mode  : Dual function      ┐
  Nozzle: Wilger MR 65-03
  Press.: 3.50 bar
  Spot  : 101.2 l/Ha      100%
  Cover : 90.4 l/Ha        75%
  Speed : 24.01 km/h

┌──┐ ┌───┐
│←┘│ │ OK│
└──┘ └───┘
```

- Use the **Up/Down** navigation keys to select a parameter. Use the **Left/Right** navigation keys to change the value of the parameter.

- The difference between the application rate percentages of the Spot parameter and the Cover parameter should be at least 40%. If both application rates are equal, a warning will be shown that the rates are equal. In that case, it would be better to use the mode Full coverage.


```
┌PWM/Nozzle selection┐      104
┌Mode  : Dual function      ┐
  Nozzle: Wilger MR 65-03
  Press.: 3.50 bar
  Spot  : 90.5 l/Ha        75%
  Cover : 90.4 l/Ha        75%
  Speed : 24.01 km/h
     WARNING: Spot = Cover
┌──┐ ┌───┐
│←┘│ │ OK│
└──┘ └───┘
```
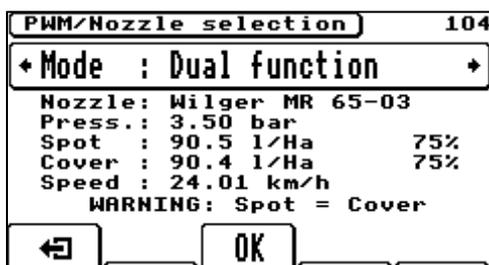
Plain Green on Green (optional)

This spray mode works similar to **Spot plain**, but uses different sensitivity presets.

Stop the vehicle and navigate to menu 104. Press the **Right** navigation key to select **Plain Green on Green.** The screen changes:

- Use the **Up/Down** navigation keys to select a parameter. Use the **Left/Right** navigation keys to change the value of the parameter.

Spot Green on Green (optional)

This spray mode works similar to **Spot spraying**, but uses different sensitivity presets.

Stop the vehicle and navigate to menu 104. Press the **Right** navigation key to select **Spot Green on Green**. The screen changes:

- Use the **Up/Down** navigation keys to select a parameter. Use the **Left/Right** navigation keys to change the value of the parameter.

Mode	Spraying mode
Nozzle	Nozzle type on the spray boom. For a list of all available nozzles, refer to "Available nozzles" on page 92.
Press.	Pressure in the spray line
Spot	Spot spraying application rate. Amount of herbicide mix that is applied when a weed is detected by the system.
Cover	Full coverage application rate. Amount of herbicide mix that is applied to the whole field.
Speed	Ideal driving speed. Indicated by a small triangle above the speed bar in the main menu

7.3. User settings menu

The User settings menu allows you to set basic configurations for your WEED-IT system.

To access the User settings menu:

1. Enter Service mode.
2. Press ⟊.

7.3.1. Configuration

```
Configuration              150

→ Lang      : English ← English
  Volume         : 255
  Contrast       : 42




   ⇤               OK
```

- Use the **Up/Down** navigation keys to select the parameter you wish to change.
- Use the **Left/Right** navigation keys to change the setting.
- Press the **OK** key to confirm settings.

Lang	Select the display language you would like to use. The available languages are English, French, German, Dutch, Spanish, Russian, and Portuguese.
Volume	Select the volume for alarms etc. If the value is set to 1, the volume is turned off.
Contrast	Change the display contrast

7.3.2. Units (151)

```
Units                      151

→ Speed     : km/h ← km/h
  Dist.     : km
  Fluid     : l
  Area      : Ha
  Pressure  : bar


   ⇤               OK
```

- Use the **Up/Down** navigation keys to select the parameter you wish to change.
- Use the **Left/Right** navigation keys to change the setting.
- Press the **OK** key to confirm settings.

Speed	Select the unit for speed that you would like to use
Dist.	Select the unit for distance that you would like to use

`Fluid`	Select the unit for Fluid that you would like to use
`Pressure`	Select the unit for Pressure that you would like to use

7.3.3. Options (152)
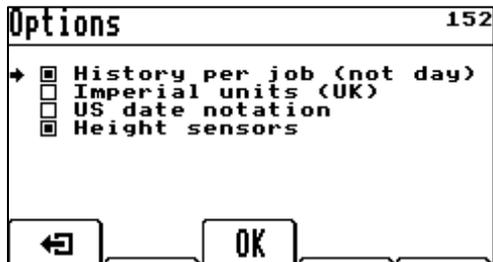
- Use the **Up/Down** navigation keys to select the setting you wish to change.

- Use the **Left/Right** navigation keys to change the setting.

- Press the **OK** key to confirm settings.

`History per job (not day)`	Select if you wish to show the history per job instead of per day.
`Imperial Units (UK)`	Select if you wish to use UK Imperial units
`US date notation`	Select if you wish to use US date notation
`Height sensors`	Select if you wish to enable the height sensors when the WEED-IT is equipped with BodoHeight

7.3.4. Set time/date (153)

WEED-IT has an internal clock that keeps track of the current date and time, even when the system is turned off or when the battery is disconnected for a longer period of time. The clock is powered by its own lithium battery that will keep the clock running for approximately one year.

When the battery has been replaced, you will have to set the clock to the current date and time. If WEED-IT detects an impossible date when it is turned on, menu 153 will automatically open.
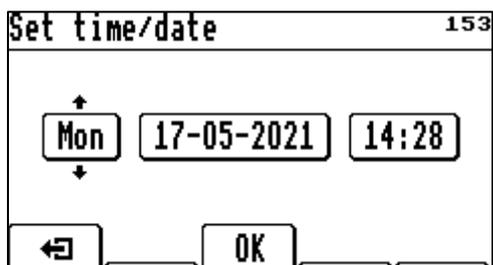
- Use the **Left/Right** navigation keys to select the parameter you wish to change.

- Use the **Up/Down** navigation keys to change the setting.

- Press the **OK** key to confirm settings.

i	If the 153 screen opens immediately after starting WEED-IT, the User-console battery is empty.
	If the 153 screen keeps appearing after a restart, even after setting the clock correctly, the battery is definitely empty.
	Contact your supplier if the battery is empty.

8. Troubleshooting

This section offers information on:

- Errors
- Warnings
- Advanced problem solving

8.1. Messages

WEED-IT identifies the following types of messages (highest priority first):

1. Errors
2. Warnings
3. Messages

In case of problems or errors, a message appears on the screen. In the Main menu, a message is displayed immediately below the speed bar:
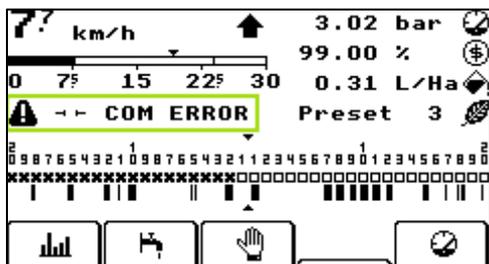
In the Main menu, only one message can be displayed at a time. If more than one message is pending, or if multiple errors occur at the same time, the messages are shown alternately for a few seconds. Use the **Message** menu to check for any other messages. To access the Message menu:

1. Press for 1 second to enter the Service mode.

2. Repeatedly press until menu 101 opens.

3. The header indicates the number of warnings that has occurred. Each line in the display shows one message:

4. An error is automatically removed from the Main screen when a problem is solved. The error will still be visible in this screen (101) as a non-persistent error.

- When, for example, the pressure is low because the pump was not running, the error message will disappear from the Main screen when the pump is turned on and the pressure is above the lower limit.

←	Press this key to return to the Main screen.
🗑	Press this key to clear any temporary errors and messages. In case of a permanent error, the message for that error will re-appear immediately.
📄📄	These keys are available if the list is too long for the screen. Use the keys to access the rest of the list.

⚠️	When WEED-IT is turned off, all messages are deleted. Only the dealer can then retrieve 'old' messages from a special dealer menu.

8.2.   Warnings and errors overview

Errors & Warnings	Details	How to resolve
Nozzle PSU error	- One or multiple sensors have failed to control the solenoid valve. - Each sensor controls four solenoid valves. When the maximum power draw is exceeded, the power supply drops. - The sensor cannot control solenoid valves correctly anymore. Some nozzles will not open correctly or at all. - A cross is shown below the sensor(s) that has the problem	- Switch off the system, wait for 30 seconds and turn the WEED-IT back on. - Check if the problem is solved. - Restart the spray operation and keep a look on the sensor that indicated the Nozzle PSU Error. - If the problem occurs again, check if the solenoid valve is installed properly. - If the problem is persistent, contact your supplier.

Errors & Warnings	Details	How to resolve
ERROR	A serious problem has occurred. This message appears whenever a serious internal malfunction has occurred in the User console's firmware.	Contact your supplier immediately and report when and how the error occurred. Also make a note of the circumstances under which the error occurred, as well as the precise text in the error report (Messages menu - 101)
No PSU	- The power converter does not reply - If the power converter does not start, the console will beep several times during start-up in order to try to establish communication with the PSU. - In most cases this is caused by a broken PSU. If the PSU is causing the problem, most of the times the green PWR LED (on the left low PSU PCB) is blinking fast, together with several other LED's on the PSU and smaller CPU PCB's. - The console itself will start, but is not able to power up the PSU, neither it is able to shut it down. There is no communication with the PSU and sensors (sensor communication runs through the PSU to the sensors).	- Disconnect the main power cable from the battery to the PSU. Wait for 30 seconds and reconnect it. Try to start the system. - Check if the power supply voltage from the battery is at least 12V while the WEED-IT system is starting. - If the power supply is OK and the power converter is still not starting/responding, please contact your supplier/dealer for support.

Errors & Warnings	Details	How to resolve
Power off	Sensors have been switched off due to low voltage	Check the machine's battery supply voltage when the WEED-IT is turned on. Preferably also switch on flush mode to simulate the system's power consumption under normal operating conditions. Check that the WEED-IT power cables are connected directly to the battery! In some cases it may help to install 2 battery's at your machine to provide extra buffer in the power supply. If the voltage drops under the lower limit (also described below), recharge or replace the battery. Also check the alternator capacity.
Battery low	Battery voltage too low. Appears whenever battery voltage drops below a certain (pre-determined) value. The message reports the lowest voltage measured during this session. For example: ⚠ 🔋 11.20 v	Even though the battery voltage seems to be sufficient, it is possible that the voltage sometimes briefly drops below the lower limit. Check the lowest battery voltage in the Message menu (101). The lower limit is displayed to the right of the message. The lower limit is preset by the manufacturer and cannot be changed. A typical message in menu 101: ⚠ 🔋 11.55 v‹11.70 This means that the lowest measured battery voltage is 11.28 Volt, while the lower limit is for example 11.50 Volt. This may be an indication that the battery is running low; recharge or replace the battery. Refer to " Using WEED-IT" on page 26 for alternator requirements.
Battery too high	Battery voltage too high. As soon as the voltage becomes dangerously high, the unit will turn itself off without warning.	Check or replace the alternator and/or voltage regulator. Typical maximal loading in a 12 VDC system is 14.3 VDC, in a 24VDC this is 28.2VDC

Errors & Warnings	Details	How to resolve
COM error	• A communication failure has occurred in one or more sensors. • The WEED-IT uses serial communication. Each sensor receives communication messages and also passes them on to the next sensor. • With this serial principle it is easy to find the sensor that has problems. It also means that all sensors beyond the broken sensor are not working anymore as long as the broken sensor is in place.	Find the first sensor from the center of the sprayer that shows this issue (for example left 4). Try swapping one sensor closer to the middle (left 3) with the outermost sensor (left 9). If this solves your problem, put sensor I back in place and contact your supplier/dealer to install a replacement sensor. If this doesn't solve the problem, try swapping the next sensor on the boom (left 4) with this sensor. If this does not solve the problem: • Replace the detection sensor adapter harness (BQS12). • Replace any detection sensor (extension) harnesses leading to the first faulty sensor. If one of these steps fixes the problem keep the replaced component in place and replace all of the original components in reverse order. When one entire boom side is not working please contact your supplier/dealer for support.

Errors & Warnings	Details	How to resolve
Sync error	• Synchronization failure between sensors • The sync signal is needed for proper operation of the active LED light source in each sensor. The power converter creates the sync signal and each sensor receives it and passes it on. • A sensor with a sync error is visual recognizable on a low light intensity or flickering blue or red LED's.	Find the first sensor from the center of the sprayer that shows this issue (for example left 4). Try swapping one sensor closer to the middle (left 3) with the outermost sensor (left 9). If this solves your problem, put sensor I back in place and contact your supplier/dealer to install a replacement sensor. If this doesn't solve the problem, try swapping the next sensor on the boom (left 4) with this sensor. If this does not solve the problem: Replace the detection sensor adapter harness (BQS12). Replace any detection sensor (extension) harnesses leading to the first faulty sensor. If one of these steps fixes the problem keep the replaced component in place and replace all of the original components in reverse order. If the problem still persists, please contact your supplier/dealer for support.
PSU ERROR	The Power Converter has reported a serious problem.	• Switch the WEED-IT off, wait for 30 seconds and turn it on again. • Disconnect the main battery cable and reconnect it again. • If the problem persists, please contact your supplier/dealer for support.

Errors & Warnings	Details	How to resolve
ERROR Max sensor 24[HB14]	• The maximum number of sensors has been exceeded. • This message also occurs when there is an issue with the RS232 communication to the external device. In that case, the message 'control comms' will be shown at the same time.	• This setting can only be changed by the manufacturer. Please contact us. • Also check 'control comms'.
Control comms	• There is a problem with the RS232 communication port that is connected to the external device. • The WEED-IT sends messages to the external device when to start and stop communicating. If those messages are not respected by the external device, often the warning 'control comms' occurs. • The message 'control comms' usually occurs simultaneously with the message 'ERROR Max sensor 20'.	• Disconnect the external device by unplugging the 8-way Souriau connector at the WEED-IT console. • Try to restart the WEED-IT system and check if the messages are not showing up anymore. • Contact the supplier of the external device and indicate that the communication protocol for the WEED-IT is not implemented correctly. Contact your distributor and Rometron and report the problem.
Serial # invalid	The User console does not have a valid serial number	Contact your supplier/dealer for support.
Sensor firmware too old	The version of the firmware inside the sensor is too old	Contact your supplier/dealer for support.
Sensor serial number	One of the sensors does not have a valid serial number	Contact your supplier/dealer for support.
Configure	Restored to factory default	Contact your supplier/dealer for support.

Errors & Warnings	Details	How to resolve
Pressure too low	Fluid pressure below lower limit	• Check the pressure in your spray line, using the sprayer's user console or a pressure gauge. Preferably mounted as close as possible to the WEED-IT pressure sensor. • Check the supply pressure on the pressure regulator to the PAV valve (should be within 0.5-1 bar of the pressure on the spray line. • Increase the pump flow. • Increase the PAV valve air pressure. • If none of the above steps solve your problem, contact your supplier.

Errors & Warnings	Details	How to resolve
Pressure too high	Fluid pressure above upper limit	- Check the pressure in your spray line, using the sprayer's user console or a pressure gauge. Preferably mounted as close to the WEED-IT pressure sensor as possible. - Check the supply pressure on the pressure regulator (should be within 0.5-1 bar of the pressure on the spray line) - Decrease the pump flow - Decrease the PAV valve air pressure - Check the return line from your PAV valve and make sure this is free of obstructions and unclogged. - If none of the above steps solve your problem, contact your supplier.
Too fast	One or more detection sensors exceed the maximum speed. The desired application rate is not achieved or the speed is exceeding the maximum weed detection speed.	- Slow down! - Check the spray settings in menu 104. - Check the speed sensor installation.

Errors & Warnings	Details	How to resolve
Wheel sensor	• One of the wheel sensors have not passed on a signal for a while. • One wheel sensor is broken. • The GPS speed sensor is broken.	• Restart the WEED-IT console and drive in a straight line. • Check if the error occurs again. • Check the speed sensor installation • Check the cabling from the speed sensor to the power converter • Note: if there is no spare speed sensor available, the WEED-IT can operate with one speed sensor. In that case, the single speed sensor must be connected to the LEFT speed sensor at the PSU AND the RIGHT speed sensor must be disconnected at the PSU. • If none of the above steps solve your problem, contact your supplier
Sensor order changed	The sequence of the sensors has been altered.	If a sensor was exchanged, reconfigure the new sensor with the values from the previously used sensor. Contact your supplier/dealer for support.
New sensor found	A new sensor has been detected.	If a sensor was exchanged, reconfigure the new sensor with the values from the previously used sensor. Contact your supplier/dealer for support.
Sensor missing	A sensor that was previously there, is now missing	If a sensor was exchanged, reconfigure the new sensor with the values from the previously used sensor. Contact your supplier/dealer for support.

Errors & Warnings	Details	How to resolve
No sensors	No sensors have been found	- Shut down the system and restart it. - Disconnect the battery cable from the battery and reconnect it. - Check if a BQ12 is installed as first sensor harness to the power converter. If the problem persists, contact your supplier/dealer for support.
Direction arrow does not point upwards while driving on a straight track. Direction arrow wiggles while driving on a straight track	The speed sensors are faulty, or the speed sensors are not correctly configured.	Install a new speed sensor. Contact your supplier/dealer for support.

Errors & Warnings	Details	How to resolve
Leakage	- One or more detection sensors have detected a high humidity. - Each detection sensor is equipped with a Temperature and Relative Humidity sensor to indicate leakages. - A warning is shown in the main screen with the sensor and RH value.	- Go to menu 100 and check the T and RH value for the indicated sensor. Wait until the sensor is at operating temperature. - Compare the T and RH with other sensors. - If deviating much, check the sensor visually on condense at the window or moisture. Also check if the window is not broken. - If the window is broken, ask the dealer to replace the cover. This should be done in a clean and dry environment. - Check the orange seal around the 26-way connector. If it is not neatly around the connector, replace the seal. - Replace the sensor if it is leaking or has collected water.
HOLD	WEED-IT is in HOLD mode	Press function key 3, refer to "Function keys" page 24.
Flushing	The nozzles are being flushed	Press function key 2, refer to "Function keys" page 24.
Simulation	Speed simulation is active	Deactivate the speed simulation by restarting the WEED-IT.

9. Specifications

WEED-IT Quadro detection sensor is able to detect living plants of at least 2 cm^2 containing a certain amount of chlorophyll (depending on the environmental conditions and plant type and - health) The sensing principle is based on chlorophyll fluorescence.

The system scans lanes of 250 mm / 10-inch width. A measurement is made every millimeter in the driving direction. When living chlorophyll is detected the sensor will open the corresponding solenoid that trails the sensor. As this valve passes over the plant it is opened and the nozzle will spray onto the plant.

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WEED-IT Quadro sensor specifications

Sensor electronic specifications	
Supply voltage	48 VDC
Typical Sensor Power Consumption for blue or red LED's and PCB	8,50 W per sensor (excl. solenoid control)
Typical Sensor Power Consumption for controlling solenoid valves	0,3 – 2,5W per solenoid
Operating Temp. Range	- 30 ~ + 60 °C
Ingress Protection (IP)[1]	IP69k (when sensor is connected to BQ sensor harness)
Weight	+- 700 gr
LED color sensor	475 +- 10 nm (blue) +655 +- 10 nm (red)
Typical light intensity (luminous flux)	+- 160 lm

[1]) Tested by Eurofins Maser, test report issued on 09 December 2022 according to ISO 20653. Report available on request.

Sensor housing and mounting specifications	
Sensor connection	TE SuperSeal 1.0 26-way PCB mount with pin contacts
Sealing sensor housing	1x in alu base part, 1x around connector
Pressure equalization	Breather plug, High Airflow
Mounting nuts (inside sensor housing) and bolt size	M6 (4x)
Mounting bolt length	8 mm + steel plate thickness
⚠️	Do not exceed bolt length of 8 mm in the sensor part! Longer bolt lengths will damage the sensor housing.
Mounting angle sensor	Horizontal up to 22 forward
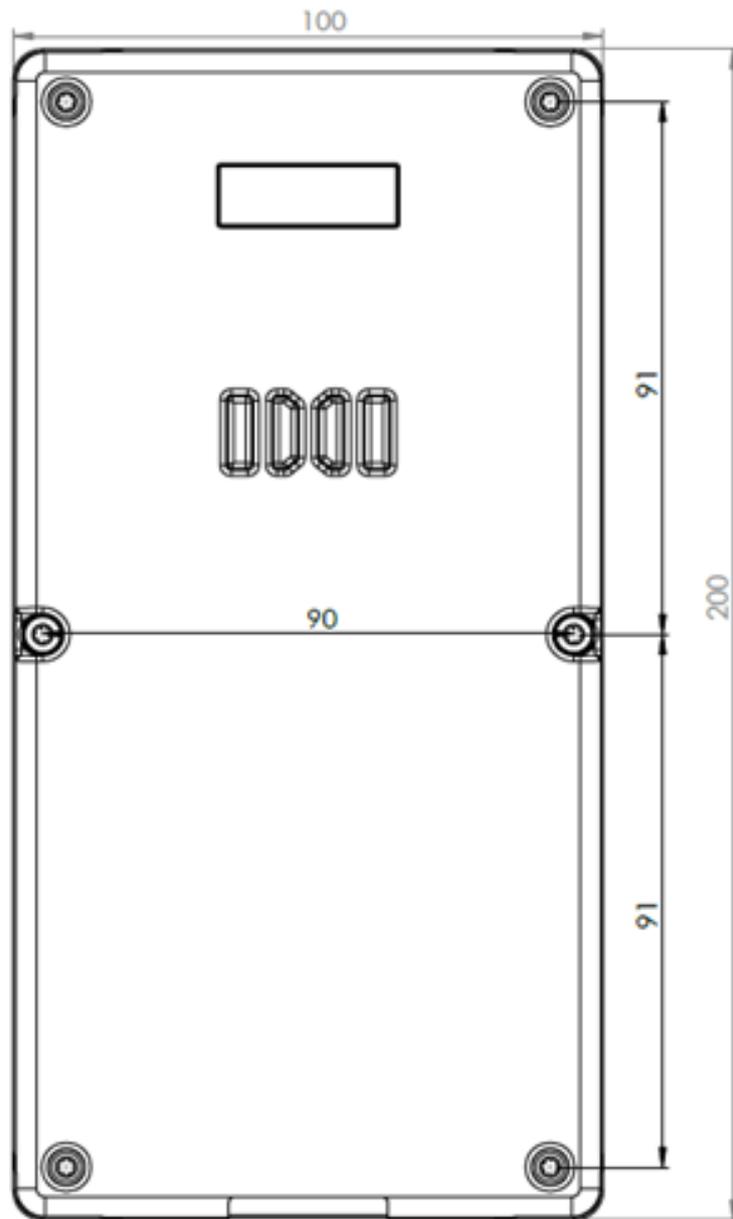
Figure 9-1 Sensor back housing dimensions [mm]

Sensor detection and solenoid control specifications	
Detection channels	4 per sensor
Optimal sensor detection height	1100 mm / 43-inch
Detection width at optimal height	1000 mm / 40-inch
Number of solenoid valves	4 per sensor
Nozzle spacing	250 mm / 10-inch
Max. nozzle size	06 nozzle (Grey ISO 16025)
Operating pressure	2-6 bar / 30-87 psi
PWM used frequency control range	20 - 55 Hz
PWM used Duty Cycle control range	~ 20 – 100 %

WEED-IT Quadro solenoid valve specifications

Solenoid valve specifications	
Valve type	2/2 NC
Compatible with / retrofittable to	ARAG, Hypro, TeeJet, Wilger (various types) Check the *WEED-IT Quadro PARTS LIST* for the right Part Number BT-PMWEEDQ-C (Update 1)
Nominal constant operating voltage	6V = 5W
Typical resistance	7.2Ω
Connection	TE SuperSeal 1.5 2-way tab with pin contacts
Ingress protection (IP)	67
Advised filtering	200 mesh / 74 (suction and press filter)
Minimum required filtering	100 mesh / 149 micron (suction and press filter)
⚠	Use hard solvable chemicals and/or mixes with care! Use clean, properly filtered water to prevent damage!

WEED-IT Quadro Power converter (PSU) specifications

Converter type	400W, S	800W, M	1200W, L	1200W, XL
Max. detection sensors to be connected	18	36	40	48
Battery supply voltage (to PSU)	12-24 VDC	12-24 VDC	12-24 VDC	24 VDC or 12 VDC + Victron 12-24V
Wire diameter battery power cable	10 mm^2	35 mm^2	35 mm^2	35 mm^2
Fuse battery power cable @ 12 VDC input	40 A	80 A	80 A	125 A
Fuse battery power cable @ 24 VDC input	20 A	40 A	50 A	60 A
Absolute max current input	80 A	80 A	80 A	80 A
Converter type	DC/DC	DC/DC	DC/DC	DC/DC
Peak power consumption (input)	490 W	960 W	1430 W	1430 W
Nominal power constant output	400 W	800 W	1100 W	1100 W
Supply voltage from PSU to det. sensors	48 VDC regulated (1x Left & 1x Right boom)			
Fuses on primary side converter PCB @ 12 VDC	2 x 20 A	2 x 40 A	2 x 40 A	2 x 40 A
Supply voltage from PSU to external sensors (speed, flow, pressure)	12 VDC regulated			
Fuse on PCB for external sensors and console	7,5 A			
Converter efficiency	~85%			

Converter type	400W, S	800W, M	1200W, L	1200W, XL
Standby-Current	~40mA			
Operating Temperature Range	~ - 30 - + 75 °C			
Ingress protection (IP)	67			
Housing dimensions (L x W x H) [mm]	240 x 360 x 120	240 x 360 x 120	240 x 360 x 120	240 x 360 x 160
Weight	~ 6,2 kg	~ 9,0 kg	~ 9,0 kg	~ 12 kg
Mounting	4x M8 x 30 mm SS	4x M8 x 30 mm SS	4x M8 x 30 mm SS	4x M8 x 90 mm SS + Polyamide spacer 44 mm
⚠️	It is recommended to put some grease on the bolts before mounting the PSU, as the bolts are stainless steel and the housing aluminum.			

⚠️ The Power Converter 1200W XL requires a few extra attention points, especially on machines with a 12V electrical system as this requires the Victron 12-24V converter to be installed.

⚠️ The optional air compressor which can be controlled by the power converter will only work if the power converter is supplied with ~12VDC.
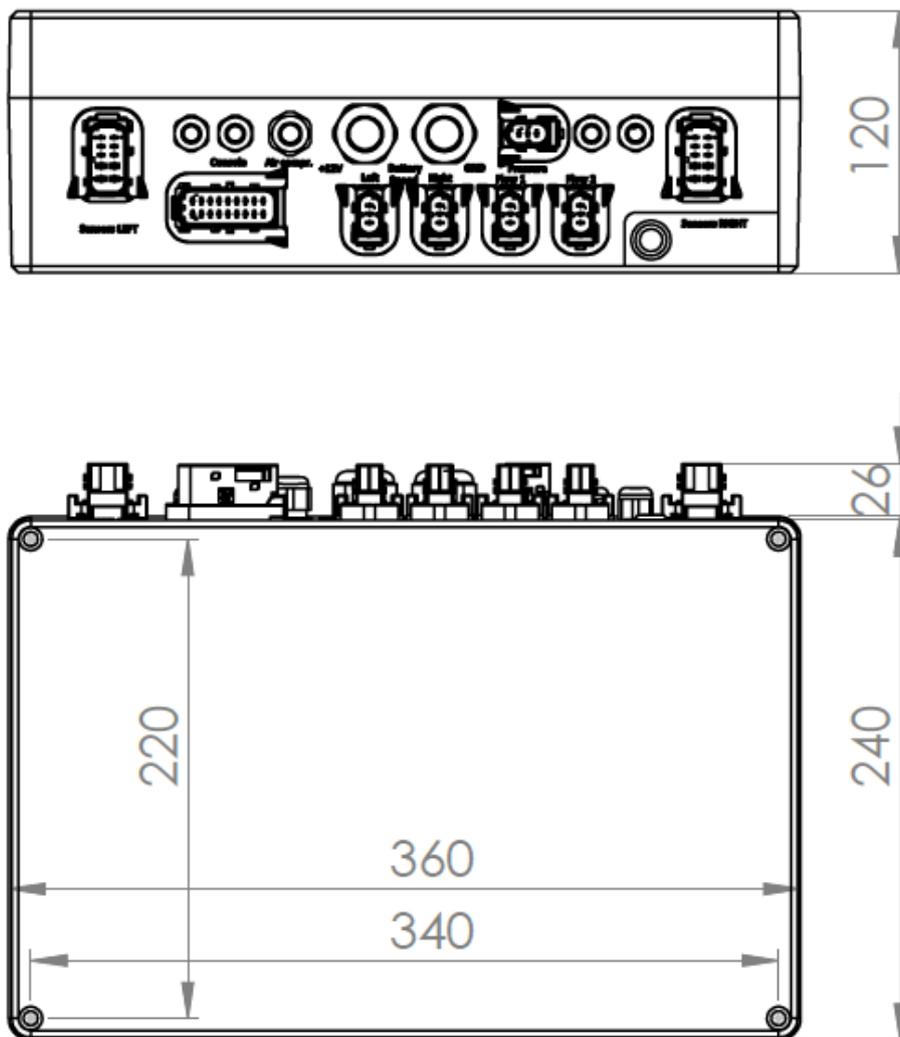
Figure 9-2 PSU dimensions for more information see Other manuals page 91 [mm]

User console specifications	
Supply voltage	11,8 – 24 VDC
Power consumption	330 mA @ 12 V = 4W nominal
Peak Power consumption	<= 6W
Operating Temperature Range	~ 10 ~ 50 °C
Ingress Protection (IP)	67
Dimensions (L x W x H)	150 x 180 x 60 mm
Time-Date Back Up Battery	3V Lithium CR2450

On/Off	Digital over communication
Reset	Hold on/off for 5 seconds

10. Menu options overview

Main menu				
𝗂𝗅𝗅	🖦	✋		◔
Histogram	Flush	Hold	---	Measurement toggle

Preset menu				
𝗂𝗅𝗅	🖦	✋	🍃	◔
Histogram	Flush	Hold	Preset	Measurement toggle

10.1. Service mode
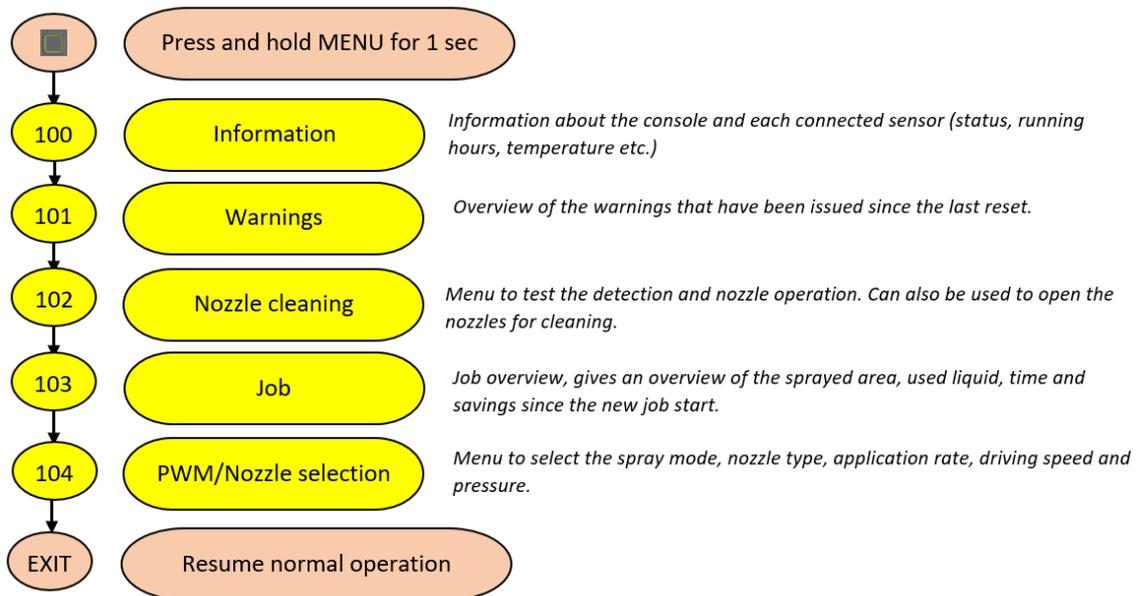
Information (100)				
⬅	L↔R	⚊		🗊
Back to the main screen	Select the Left or right boom	Configure	---	First sensor

Information (100) - sensor selected				
⬅		⏻	🗐	🗋
Back to the main screen		Turn the selected Sensor on or off	Go to the previous sensor	Go to the next sensor

Warnings (101)				
⬅	🗑			
Back to the main screen	Clear warnings	---	---	---

Nozzle cleaning (102)				
⬅	↻	🌿	↻	♪
Back to the main screen	Nozzles activated one by one (short)	Activate detection	Nozzles activated one after the other	Activate nozzles in random order, simulating PWM control

Job (103)				
⬅	💾 New	OK	🗐	♻
Back to the main screen	New job / Reset	Confirm	Go to the previous job	Refresh information

Job (103) - Previous Jobs				
⬅			🗐	🗋
Back to the main screen	---	---	Go to the previous job	Go to the next job

PWM / Nozzle selection (104)				
←	◔	OK	50%	100%
Back to the main screen	Set nominal pressure	Confirm setting	Set application rate percentage	Set application rate percentage

10.2. User settings

Configuration (150)				
←		OK		
Back to the main screen		Confirm setting		

Units (151)				
←		OK		
Back to the main screen		Confirm setting		

Options (152)				
←		OK		
Back to the main screen		Confirm setting		

Set time/date (153)				
←		OK		
Back to the main screen		Confirm setting		

11. WEED-IT software information (User Manual)

This form needs to be filled in in every user manual to keep track of the firmware versions used.

First installation

Detection sensors	User console	Power Converter

Installation date   _____

Dealer   _____

Update

Detection sensors	User console	Power Converter

Installation date   _____

Dealer   _____

Update

Detection sensors	User console	Power Converter

Installation date   _____

Dealer   _____

12. Calibration settings form (User manual)

This section should be filled in after installation of the machine in the User manual of the customer.

12.1. General Machine Information

Your dealer uses this page to write down the current settings of your WEED-IT system. You may need these settings when replacing a sensor or after resetting the system to factory defaults.

This form is intended to be filled in during setup and testing at the customer; this form must be kept with the machine.

Machine type   _____

Boom width   _____

Serial   _____

Dealer   _____

Customer   _____

12.2. Dealer menu configuration settings

12.2.1. Menu 200 Console and sensor information

Menu 200 Console and sensor information

Console serial _____

Sensor serial numbers:

Left Boom		Right boom	
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	

Left Boom		Right boom	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	

12.2.2. Menu 201 Power Supply Unit (PSU)

PSU serial _____

Orbus Brains CPU serial _____

12.2.3. Menu 203 Configuration

Speed

Unit   _____

Source   _____

Pulses   _____

Ideal   _____

Input   _____

Smooth   _____

```
Dealer menu          2/16   203
Configure  Speed
→ Unit   : km/h        ← km/h
  Source: Speed
  Pulses: 400     p/hm
  Ideal :   8.33  m/s
  Input : 12V ↓
  Smooth: 8

  Ideal speed       : 29.99 km/h

  ←]        OK    ⬚    ⬚
```
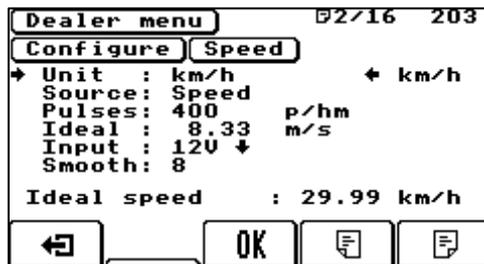
Check speed sensor functioning in menu 211.

Flow 1

Enable   _____

Pulses   _____

Pull   _____

Limits   _____

Smooth   _____

Interval   _____

```
Dealer menu          3/16   203
Configure  Flow 1
→ Enable    : On       ← On
  Pulses    : 18 p/l
  Pull      : Up
  Limits ±  : 20 %
  Smooth    : 20 %
  Interval  : 10 m

! Flow compensation = OFF

  ←]        OK    ⬚    ⬚
```

Flow 2/3

Role   _____

Pulses   _____

Pull   _____

```
Dealer menu          4/16   203
Configure  Flow 2
→ Role   : Subtract  ← Subtract
  Pulses: 18 p/l
  Pull  : Up




  ←]        OK    ⬚    ⬚
```
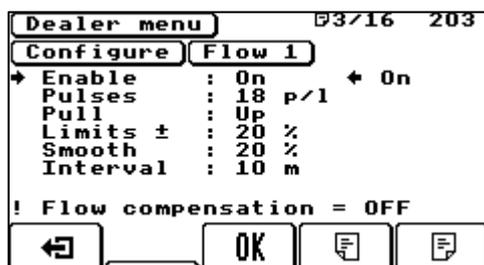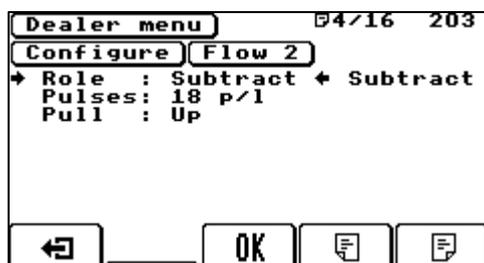
The setting 'Role' can be programmed as: OFF / On / Add / Subtract.

 'Add' means Flow 2 will be added to Flow 1

 'Subtract' means Flow 2 will be subtracted from Flow 1

Flows per sensor are indicated in the main screen. Total flow (e.g. Flow 1 – Flow 2) is indicated in th 103 Job menu

If Flow 3 is enabled at 'Add' or 'Subtract' it will be added or subtracted from Flow 1 as well. Flow meter functioning can be checked in menu 211.

Pressure 1

Role   _____

Nominal   _____

Limits±   _____

Cal.   _____

Offset   _____

Smooth   _____

Type V/I   _____

```
┌─Dealer menu─┐      ▣6/16   203
├─Configure─┤├─Pressure 1─┤
➧ Role    : View        ← View
  Nominal : 3.00 bar
  Limits± : 20 %
  Cal.    : 1225 x
  Offset  : 0
  Smooth  : 50.00 %
  Type V/I: V

┌──┐      ┌────┐ ┌──┐ ┌──┐
│←┘│      │ OK │ │ ⊟│ │ ⊟│
└──┘      └────┘ └──┘ └──┘
```

Mostly, a pressure sensor is a voltage sensor (V), not a current sensor (I). Smooth is 50.00% by default.

Pressure 2

Role   _____

Nominal   _____

Limits±   _____

Cal.   _____

Offset   _____

Smooth   _____

Type V/I   _____

```
┌─Dealer menu─┐      ▣7/16   203
├─Configure─┤├─Pressure 2─┤
➧ Role    : Low         ← Low
  –       : 3.00 bar
  –       : 20 %
  Cal.    : 1225 x
  Offset  : 0
  Smooth  : 50.00 %
  Type V/I: V

┌──┐      ┌────┐ ┌──┐ ┌──┐
│←┘│      │ OK │ │ ⊟│ │ ⊟│
└──┘      └────┘ └──┘ └──┘
```
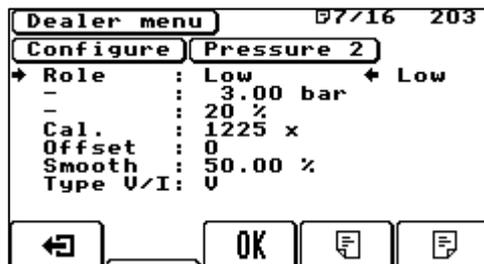
If the *Role* of Pressure 2 is *Low*, *High*, or *avg.*, then *Nominal* and *Cal.* cannot be adjusted. Their values are equal to those of Pressure 1. It is recommended to only use *OFF* or *View* as a role for pressure sensor 2.

Pump[HB20]

Pump refers to the small ARB air compressor to supply air to the PAV valve. This menu is only applicable when the system has a PSU with compressor switch.

Enable   _____

Off in Hold   _____

Max on   _____

Delay   _____

```
┌─Dealer menu─┐        ▽8/16  203
┌─Configure─┐┌Pump┐
➤ Enable    : Auto  ← Auto
  Off in HOLD : YES
  Max. on     : 180 s
  Delay       : 20 s


┌─←┐ ┌───┐ ┌─OK─┐ ┌─┐ ┌─┐
```
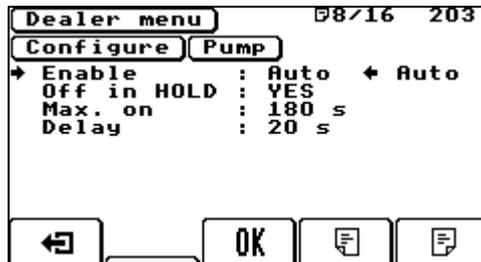
Height sensors[HB21]

This menu is only applicable when the system has height sensors.

Enable   _____

Flush   _____

Flush at ↑   _____

Flush at ↓   _____

Window   _____

Smooth   _____

```
┌─Dealer menu─┐        ▽10/16  203
┌─Configure─┐┌Height sensors┐
➤ Enable      : On    ← On
  Flush       : (↑/↓)
  Flush at ↑:   0.40 m
  Flush at ↓:   0.40 m
  Window      :   2.00 m
  Smooth      :  50.00 %

┌─←┐ ┌─⚙─┐ ┌─OK─┐ ┌─┐ ┌─┐
```
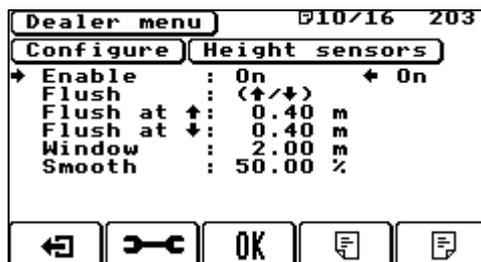
Alarm

This menu indicates temperature and humidity tolerances accepted in the sensor. It is designed to track sensors with problems (e.g. cracked window) in an early stage to prevent excessive damage on the electronics.

Humidity ± refers to the relative humidity inside a sensor compared to the average of all sensors.

Humidity + is the maximum accepted relative humidity in each individual sensor.

Humidity ±   _____

Humidity+   _____

Temperature ±   _____
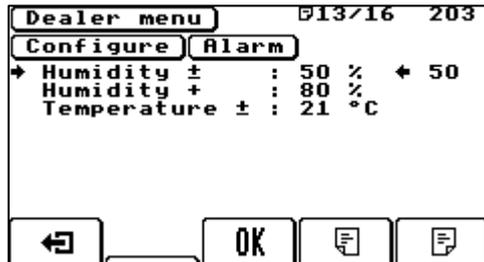
12.2.4. Menu 205 Sensor settings

Configure the menu 205 position of each sensor; Configure the track for the whole system.

Margin   _____   (same for each sensor, 'Preset' is indicated if 4 margin presets are enabled')

Track   _____   (make sure you press **OK** for 2 seconds to confirm for all sensors)

Fluid   _____   (make sure you press **OK** for 2 seconds to confirm for all sensors)
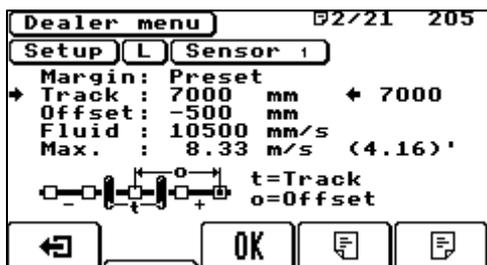
For offset per sensor, see below.
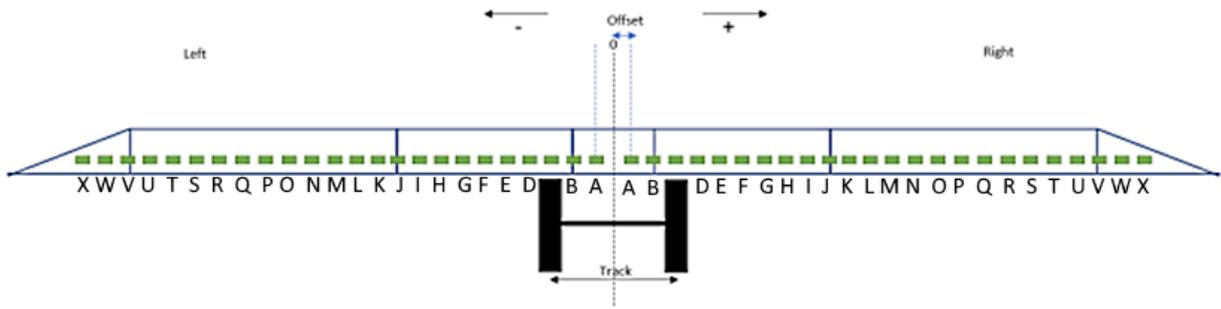
Menu 205 Offset settings (all in mm)

Left Boom		Right boom	
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	

Left Boom		Right boom	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	

12.2.5. Menu 206 Sensor Setup

Program the correct nozzle height (h) and distance (d) from the detection line to the nozzle line.

The 'Max.' indicates the maximum speed that is possible with the WEED-IT; it is based on the smallest distance and highest height set amongst all sensors. The speed that is shown in between the parentheses is the hiSpeed (programmed in menu's 104 and 203).
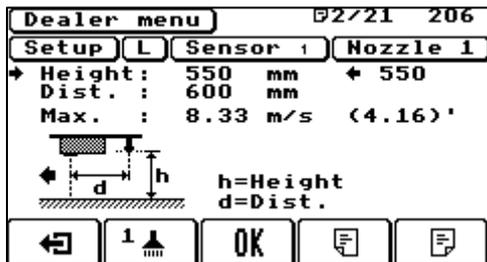
Left boom	Height [mm]	Distance [mm]	Right boom	Height [mm]	Distance [mm]
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		

Left boom	Height [mm]	Distance [mm]	Right boom	Height [mm]	Distance [mm]
11			11		
12			12		
13			13		
14			14		
15			15		
16			16		
17			17		
18			18		
19			19		
20			20		
21			21		
22			22		
23			23		
24			24		

12.2.6. Menu 213 Margin presets[HB23]

Only applicable when menu 204-5 option 'user/wind margin' is enabled.

Preset 1 _____

Preset 2 _____

Preset 3 _____

Preset 4 _____
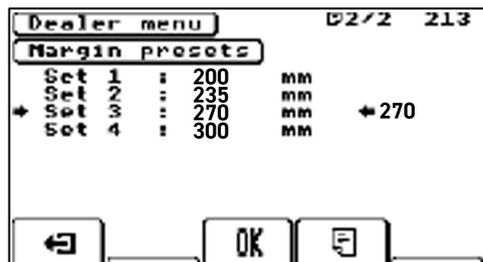
12.2.7. Menu 216 Height sensors

Only applicable when the system has height sensors. The maximum allowed number of height sensors is currently five.

Nominal Left-1	_____
Clearance Left-1	_____
Pulse Left 1	_____
Nominal Left-2	_____
Clearance Left-2	_____
Pulse Left 2	_____
Nominal Right-1	_____
Clearance Right-1	_____
Pulse Right 1	_____
Nominal Right-2	_____
Clearance Right-2	_____
Pulse Right 2	_____
Nominal Left-3	_____
Clearance Left-3	_____
Pulse Right 3	_____

```
Height sensor Right-22
→ Nominal   :  809    mm ←
  Clearance:  350    mm
  Pulse    :  150    µs

  Version  :  1.13
  Type     :  1
  Height   :  780    mm

  [←]  [...]  [OK]  [▤]
```
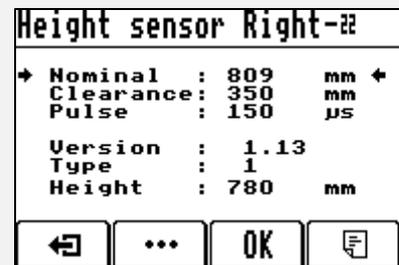
This WEED-IT Quadro system was configured and tested.

Date confirmed

13. Other manuals

13.1. Other manuals

Next to this User manual, there are other (technical) documents available.

Table 1 ISOBUS manuals

Part number	Description
BT-OMWEED-ISO-B	ISOBUS user manual, WEED-IT Quadro

Table 2 Other manuals

Part number	Description
BT-PMWEEDQ-C (Update 1)	WEED-IT Quadro PARTS LIST ENGLISH

For manuals and information that is not listed in this manual, please contact your supplier.

13.2. Available nozzles

Nozzle	100% Flow (l/min)	Pressure (bar)	Min flow (l/min)	Recommended spray mode	Available from	Nozzle body	Filler plug
Agrotop SF 40-03	1,18	3,00	0,28	Spot Spraying	4.00	Arag	No
Wilger SR 35-015	0,60	3,00	0,15	Spot Spraying	4.10	Wilger	No
Wilger SR 65-015	0,60	3,00	0,15	Dual Function / Full Coverage [1]	4.10	Wilger	No
Wilger MR 35-015	0,58	3,00	0,15	Spot Spraying	4.10	Wilger	No
Wilger MR 35-03	1,12	3,00	0,28	Spot Spraying	4.10	Wilger	No
Wilger MR 65-015	0,58	3,00	0,15	Dual Function / Full Coverage [1]	4.10	Wilger	No
Wilger MR 65-03	1,12	3,00	0,28	Dual Function / Full Coverage [1]	4.10	Wilger	No
Wilger SR 110-02	0,80	3,00	0,22	Full Coverage	4.10	Wilger	No
Wilger SR 110-025	1,02	3,00	0,25	Full Coverage	4.10	Wilger	No
Wilger SR 110-03	1,23	3,00	0,34	Full Coverage	4.10	Wilger	No
Wilger SR 110-04	1,51	3,00	0,38	Full Coverage	4.10	Wilger	No
Wilger SR 110-05	1,76	3,00	0,42	Full Coverage	4.10	Wilger	No

Nozzle	100% Flow (l/min)	Pressure (bar)	Min flow (l/min)	Recommended spray mode	Available from	Nozzle body	Filler plug
Wilger MR 110-02	0,78	3,00	0,21	Full Coverage	4.10	Wilger	No
Wilger MR 110-025	1,02	3,00	0,25	Full Coverage	4.10	Wilger	No
Wilger MR 110-03	1,12	3,00	0,30	Full Coverage	4.10	Wilger	No
Wilger MR 110-04	1,48	3,00	0,36	Full Coverage	4.10	Wilger	No
Wilger MR 110-05	1,86	3,00	0,48	Full Coverage	4.10	Wilger	No
TeeJet TP 25-02	0,76	3,00	0,18	Spot Spraying	4.12	Arag	Yes
TJ TP 25-02 HP	1,40	10,00	0,37	Spot Spraying	4.12	Arag	Yes
TeeJet TP 25-03	1,11	3,00	0,27	Spot Spraying	4.12	Arag	Yes
TJ TP 25-03 HP	2,02	10,00	0,55	Spot Spraying	4.12	Arag	Yes
TeeJet TP 25-04	1,46	3,00	0,34	Spot Spraying	4.12	Arag	Yes
TJ TP 25-04 HP	2,70	10,00	0,68	Spot Spraying	4.12	Arag	Yes
TeeJet TXA 80-015	0,56	3,00	0,15	Full Coverage [2]	4.12	Arag	Yes
TJ TXA 80-015 HP	1,00	10,00	0,25	Full Coverage [2]	4.12	Arag	Yes
TeeJet TXA 80-02	0,75	3,00	0,27	Full Coverage [2]	4.12	Arag	Yes

Nozzle	100% Flow (l/min)	Pressure (bar)	Min flow (l/min)	Recommended spray mode	Available from	Nozzle body	Filler plug
TJ TXA 80-02 HP	1,33	10,00	0,35	Full Coverage [2]	4.12	Arag	Yes
MagnoJet APS 60-03	1,18	3,00	0,29	Spot Spraying / Dual Function [3]	4.14	Arag	Yes
MagnoJet APS 30-03	1,14	3,00	0,30	Spot Spraying	4.14	Arag	Yes
TeeJet TP 40-03	1,13	3,00	0,29	Spot Spraying	4.14	Arag	Yes
TeeJet TP 40-04	1,46	3,00	0,36	Spot Spraying	4.14	Arag	Yes
TeeJet TP 80-08[4]	2,20	2,00	0,50	Full Coverage / Dual Function [4]	4.14	Special	No
Lechler IDK 80-02	0,75	3,00	0,21	Full Coverage / Dual Function [5]	4.14	Arag	Yes
Lechler IDK 80-03	1,12	3,00	0,26	Full Coverage / Dual Function [5]	4.14	Arag	Yes
BfS PulZar 100-03	1,20	3,00	0,31	Full Coverage / Dual Function	4.14	Wilger	No
TeeJet DG 65-055	1,98	3,00	0,50	Spot Spraying	4.15	Arag	Yes
TeeJet TG 3.5[6]	2,04	3,00	**1,00**	Spot Spraying	4.15	Arag	Yes
MagnoJet APS 30-02	0,77	3,00	0,20	Spot Spraying	4.15	Arag	Yes

Nozzle	100% Flow (l/min)	Pressure (bar)	Min flow (l/min)	Recommended spray mode	Available from	Nozzle body	Filler plug
TeeJet TP 40-02	0,77	3,00	0,20	Spot Spraying	4.16	Arag	No
TeeJet TXA 80-03	1,04	3,00	0,28	Full Coverage	4.16	Arag	Yes
TJ TTI 110-025	0,96	3,00	0,24	Full Coverage	4.16	Arag	No
Agrotop SF 40-04	1,49	3,00	0,39	Spot Spraying	4.16	Arag	No
Conventional[7]	1,15	3,00	-	FC - 100% open - No PWM	4.18	Arag	No
Magnojet MGA 40-01 NP[8]	0,39	3,00	0,10	Spot Spraying	4.18	Arag	No
Magnojet MGA 40-015 NP[8]	0,59	3,00	0,15	Spot Spraying	4.18	Arag	No
Magnojet APS 30-02 NP[8]	0,77	3,00	0,20	Spot Spraying	4.18	Arag	No

[1]) Be aware of sufficient overlap for Full coverage . This depends on boom height. Check the WEED-IT Quadro application rate calculations for full coverage for sufficient overlap or calculate/check it yourself.

[2]) Be aware that 80 degrees cones cannot be used with standard WEED-IT Quadro nozzle spacing of 25 cm. In that case, the cones will interfere, and a poor spray distribution will be the result. In cases this nozzle is used, the nozzle distance is decreased to 50 cm and the other solenoid valves are disabled. This can be done via the RS232 protocol with Section Control messages or physical by disconnecting half of the solenoid valves.

[3]) Be aware of sufficient overlap for Dual Function . This depends on boom height. Check the WEED-IT Quadro application rate calculations for full coverage for sufficient overlap or calculate/check it yourself.

[4]) **TeeJet TP 80-08** Special, high flow nozzle only for hot water weed applications with WEED-IT. A lower pressure is used and special solenoid valves. This nozzle should **NOT** be selected for Ag sprayers or other applications!

[5]) Added for the use of Full Coverage and Spot Spraying in orchard sprayers.

[6]) The TeeJet TG3.5 is not suitable to be used with PWM duty cycles < 50%. Low duty cycles result in a bad build-up of the spray cone. Be aware of this when using this nozzle.

[7]) Conventional nozzle is added to spray in Full Coverage mode like a traditional sprayer without PWM. Note that the flow and application rate indicated is based on an 03 nozzle as a nozzle size must be chosen to display l/ha.

[8]) 'NP' nozzles are specials added for PWM trials in South America

13.3. Nozzle flow rate charts

This paragraph contains nozzle flow charts of the following series:

Spot spraying nozzle series

- Agrotop SpotFan 40

- TeeJet TP 25

- TeeJet TP 40

- Magnojet APS 30

- Magnojet APS 60

- Magnojet MGA 40 (both with and without *NP* addition)

- Wilger SR 35

- Wilger SR 65

- Wilger MR 35

- Wilger MR 65

- TeeJet DG 55

- TeeJet TG

Full coverage nozzle series

- TeeJet TXA 80

- Wilger SR 110

- Wilger MR 110

- Lechler IDK 80

- BfS PulZar

- TeeJet TTI 110

Because of PWM technology, the flow rate charts contain application rate ranges from 25% duty cycle (DC) up to 100% DC. Ideally the set application rate percentage in menu 104 is 70-80%! The ranges are given for a series of different pressures (2-4 bar) and a series of driving speeds (5-25 km/h).

The nozzle flow rate charts for spot spraying nozzles contain application rate ranges for two or three different nozzle heights. As the spot spraying application rate is calculated as a band application, this gives a quick insight in the effect of nozzle height on the application rate. Many other combinations of settings are possible. To calculate the application rate with a different combination of settings, please refer to "Application rate calculations" page 117. The droplet size cells for nozzle types of which the droplet sizes were not available are left blank.

Indicated droplet sizes were provided by the nozzle manufacturer. The effect of PWM on droplet sizes and drift is not incorporated here.

Note: Dual function combines the cover and spot functionality and affect each other.

Agrotop SpotFan 40 series

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare) @ Speed (km/h)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
SF 40-03	2		40	0,91	94 - 375	47 - 188	31 - 125	23 - 94	19 - 75	109 - 437	55 - 219	36 - 146	27 - 109	22 - 87
	2		50	0,91	75 - 300	38 - 150	25 - 100	19 - 75	15 - 60					
	2		60	0,91	63 - 250	31 - 125	21 - 83	16 - 63	13 - 50					
	2,5		40	1,02	105 - 420	52 - 210	35 - 140	26 - 105	21 - 84	122 - 489	61 - 244	41 - 163	31 - 122	24 - 98
	2,5		50	1,02	84 - 336	42 - 168	28 - 112	21 - 84	17 - 67					
	2,5		60	1,02	70 - 280	35 - 140	23 - 93	17 - 70	14 - 56					
	3		40	1,12	115 - 460	57 - 230	38 - 153	29 - 115	23 - 92	134 - 536	67 - 268	45 - 179	33 - 134	27 - 107
	3		50	1,12	92 - 368	46 - 184	31 - 123	23 - 92	18 - 74					
	3		60	1,12	77 - 307	38 - 153	26 - 102	19 - 77	15 - 61					
	3,5		40	1,21	124 - 497	62 - 248	41 - 166	31 - 124	25 - 99	145 - 578	72 - 289	48 - 193	36 - 145	29 - 116
	3,5		50	1,21	99 - 397	50 - 199	33 - 132	25 - 99	20 - 79					
	3,5		60	1,21	83 - 331	41 - 166	28 - 110	21 - 83	17 - 66					
	4		40	1,29	133 - 531	66 - 265	44 - 177	33 - 133	27 - 106	155 - 618	77 - 309	52 - 206	39 - 155	31 - 124
	4		50	1,29	106 - 425	53 - 212	35 - 142	27 - 106	21 - 85					
	4		60	1,29	88 - 354	44 - 177	29 - 118	22 - 88	18 - 71					
SF 40-04	2		40	1,22	125 - 501	63 - 251	42 - 167	31 - 125	25 - 100	146 - 584	73 - 292	49 - 195	36 - 146	29 - 117
	2		50	1,22	100 - 401	50 - 201	33 - 134	25 - 100	20 - 80					
	2		60	1,22	84 - 334	42 - 167	28 - 111	21 - 84	17 - 67					
	2,5		40	1,36	140 - 561	70 - 280	47 - 187	35 - 140	28 - 112	163 - 653	82 - 326	54 - 218	41 - 163	33 - 131
	2,5		50	1,36	112 - 448	56 - 224	37 - 149	28 - 112	22 - 90					
	2,5		60	1,36	93 - 374	47 - 187	31 - 125	23 - 93	19 - 75					
	3		40	1,49	154 - 614	77 - 307	51 - 205	38 - 154	31 - 123	179 - 715	89 - 358	60 - 238	45 - 179	36 - 143
	3		50	1,49	123 - 491	61 - 246	41 - 164	31 - 123	25 - 98					
	3		60	1,49	102 - 409	51 - 205	34 - 136	26 - 102	20 - 82					
	3,5		40	1,61	166 - 663	83 - 332	55 - 221	41 - 166	33 - 133	199 - 773	97 - 386	64 - 258	48 - 193	39 - 155
	3,5		50	1,61	133 - 531	66 - 265	44 - 177	33 - 133	27 - 106					
	3,5		60	1,61	111 - 442	55 - 221	37 - 147	28 - 111	22 - 88					
	4		40	1,72	177 - 709	89 - 355	59 - 236	44 - 177	35 - 142	206 - 826	103 - 413	69 - 275	52 - 206	41 - 165
	4		50	1,72	142 - 567	71 - 284	47 - 189	35 - 142	28 - 113					
	4		60	1,72	118 - 473	59 - 236	39 - 158	30 - 118	24 - 95					

TP 25 series

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)

@ Speed (km/h)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
TP 25-02	2	F	60	0,63	71 - 283	35 - 141	24 - 94	18 - 71	14 - 57	75 - 301	38 - 150	25 - 100	19 - 75	15 - 60
	2	F	70	0,63	61 - 242	30 - 121	20 - 81	15 - 61	12 - 48					
	2	F	80	0,63	53 - 212	27 - 106	18 - 71	13 - 53	11 - 42					
	2,5	F	60	0,70	79 - 316	40 - 158	26 - 105	20 - 79	16 - 63	84 - 337	42 - 168	28 - 112	21 - 84	17 - 67
	2,5	F	70	0,70	68 - 271	34 - 136	23 - 90	17 - 68	14 - 54					
	2,5	F	80	0,70	59 - 237	30 - 119	20 - 79	15 - 59	12 - 47					
	3	F	60	0,77	87 - 346	43 - 173	29 - 115	22 - 87	17 - 69	92 - 369	46 - 184	31 - 123	23 - 92	18 - 74
	3	F	70	0,77	74 - 297	37 - 148	25 - 99	19 - 74	15 - 59					
	3	F	80	0,77	65 - 260	32 - 130	22 - 87	16 - 65	13 - 52					
	3,5	F	60	0,83	94 - 374	47 - 187	31 - 125	23 - 94	19 - 75	100 - 398	50 - 199	33 - 133	25 - 100	20 - 80
	3,5	F	70	0,83	80 - 321	40 - 160	27 - 107	20 - 80	16 - 64					
	3,5	F	80	0,83	70 - 281	35 - 140	23 - 94	18 - 70	14 - 56					
	4	F	60	0,89	100 - 400	50 - 200	33 - 133	25 - 100	20 - 80	106 - 426	53 - 213	35 - 142	27 - 106	21 - 85
	4	F	70	0,89	86 - 343	43 - 171	29 - 114	21 - 86	17 - 69					
	4	F	80	0,89	75 - 300	38 - 150	25 - 100	19 - 75	15 - 60					
TP 25-03	2	F	60	0,91	102 - 408	51 - 204	34 - 136	26 - 102	20 - 82	109 - 435	54 - 217	36 - 145	27 - 109	22 - 87
	2	F	70	0,91	88 - 350	44 - 175	29 - 117	22 - 88	18 - 70					
	2	F	80	0,91	77 - 306	38 - 153	26 - 102	19 - 77	15 - 61					
	2,5	F	60	1,01	114 - 457	57 - 228	38 - 152	29 - 114	23 - 91	121 - 486	61 - 243	40 - 162	30 - 121	24 - 97
	2,5	F	70	1,01	98 - 391	49 - 196	33 - 130	24 - 98	20 - 78					
	2,5	F	80	1,01	86 - 342	43 - 171	29 - 114	21 - 86	17 - 68					
	3	F	60	1,11	125 - 500	63 - 250	42 - 167	31 - 125	25 - 100	133 - 532	67 - 266	44 - 177	33 - 133	27 - 106
	3	F	70	1,11	107 - 429	54 - 214	36 - 143	27 - 107	21 - 86					
	3	F	80	1,11	94 - 375	47 - 188	31 - 125	23 - 94	19 - 75					
	3,5	F	60	1,20	135 - 540	68 - 270	45 - 180	34 - 135	27 - 108	144 - 575	72 - 287	48 - 192	36 - 144	29 - 115
	3,5	F	70	1,20	116 - 463	58 - 232	39 - 154	29 - 116	23 - 93					
	3,5	F	80	1,20	101 - 405	51 - 203	34 - 135	25 - 101	20 - 81					
	4	F	60	1,28	144 - 578	72 - 289	48 - 193	36 - 144	29 - 116	154 - 615	77 - 307	51 - 205	38 - 154	31 - 123
	4	F	70	1,28	124 - 495	62 - 248	41 - 165	31 - 124	25 - 99					
	4	F	80	1,28	108 - 433	54 - 217	36 - 144	27 - 108	22 - 87					

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)

@ Speed (km/h)

Nozzle type	Pressure (bar)	Droplet size	height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
TP 25-04	2	M	60	1,20	135 - 540	67 - 270	45 - 180	34 - 135	27 - 108	144 - 574	72 - 287	48 - 191	36 - 144	29 - 115
	2	M	70	1,20	116 - 462	58 - 231	39 - 154	29 - 116	23 - 92					
	2	M	80	1,20	101 - 405	51 - 202	34 - 135	25 - 101	20 - 81					
	2,5	M	60	1,34	151 - 603	75 - 302	50 - 201	38 - 151	30 - 121	160 - 642	80 - 321	53 - 214	40 - 160	32 - 128
	2,5	M	70	1,34	129 - 517	65 - 259	43 - 172	32 - 129	26 - 103					
	2,5	M	80	1,34	113 - 452	57 - 226	38 - 151	28 - 113	23 - 90					
	3	M	60	1,47	165 - 661	83 - 330	55 - 220	41 - 165	33 - 132	176 - 703	88 - 352	59 - 234	44 - 176	35 - 141
	3	M	70	1,47	142 - 566	71 - 283	47 - 189	35 - 142	28 - 113					
	3	M	80	1,47	124 - 496	62 - 248	41 - 165	31 - 124	25 - 99					
	3,5	F	60	1,20	178 - 714	89 - 357	59 - 238	45 - 178	36 - 143	190 - 760	95 - 380	63 - 253	47 - 190	38 - 152
	3,5	F	70	1,58	153 - 612	76 - 306	51 - 204	38 - 153	31 - 122					
	3,5	F	80	1,58	134 - 535	67 - 268	45 - 178	33 - 134	27 - 107					
	4	F	60	1,69	191 - 763	95 - 382	64 - 254	48 - 191	38 - 153	203 - 812	101 - 406	68 - 271	51 - 203	41 - 162
	4	F	70	1,69	164 - 654	82 - 327	55 - 218	41 - 164	33 - 131					
	4	F	80	1,69	143 - 572	72 - 286	48 - 191	36 - 143	29 - 114					

TP 40 series

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)
@ Speed (km/h)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
TP 40-02	2	F	40	0,63	65 - 259	32 - 130	22 - 86	16 - 65	13 - 52	76 - 302	38 - 151	25 - 101	19 - 76	15 - 60
	2	F	50	0,63	52 - 208	26 - 104	17 - 69	13 - 52	10 - 42					
	2	F	60	0,63	43 - 173	22 - 86	14 - 58	11 - 43	9 - 35					
	2,5	F	40	0,70	73 - 290	36 - 145	24 - 97	18 - 73	15 - 58	84 - 338	42 - 169	28 - 113	21 - 84	17 - 68
	2,5	F	50	0,70	58 - 232	29 - 116	19 - 77	15 - 58	12 - 46					
	2,5	F	60	0,70	48 - 193	24 - 97	16 - 64	12 - 48	10 - 39					
	3	F	40	0,77	79 - 318	40 - 159	26 - 106	20 - 79	16 - 64	93 - 370	46 - 185	31 - 123	23 - 93	19 - 74
	3	F	50	0,77	64 - 254	32 - 127	21 - 85	16 - 64	13 - 51					
	3	F	60	0,77	53 - 212	26 - 106	18 - 71	13 - 53	11 - 42					
	3,5	F	40	0,83	86 - 343	43 - 172	29 - 114	21 - 86	17 - 69	100 - 400	50 - 200	33 - 133	25 - 100	20 - 80
	3,5	F	50	0,83	69 - 275	34 - 137	23 - 92	17 - 69	14 - 55					
	3,5	F	60	0,83	57 - 229	29 - 114	19 - 76	14 - 57	11 - 46					
	4	F	40	0,89	92 - 367	46 - 183	31 - 122	23 - 92	18 - 73	107 - 427	53 - 214	36 - 142	27 - 107	21 - 85
	4	F	50	0,89	73 - 294	37 - 147	24 - 98	18 - 73	15 - 59					
	4	F	60	0,89	61 - 245	31 - 122	20 - 82	15 - 61	12 - 49					
TP 40-03	2	F	40	0,92	95 - 380	48 - 190	32 - 127	24 - 95	19 - 76	111 - 443	55 - 221	37 - 148	28 - 111	22 - 89
	2	F	50	0,92	76 - 304	38 - 152	25 - 101	19 - 76	15 - 61					
	2	F	60	0,92	63 - 253	32 - 127	21 - 84	16 - 63	13 - 51					
	2,5	F	40	1,03	106 - 425	53 - 213	35 - 142	27 - 106	21 - 85	124 - 495	62 - 248	41 - 165	31 - 124	25 - 99
	2,5	F	50	1,03	85 - 340	43 - 170	28 - 113	21 - 85	17 - 68					
	2,5	F	60	1,03	71 - 283	35 - 142	24 - 94	18 - 71	14 - 57					
	3	F	40	1,13	116 - 466	58 - 233	39 - 155	29 - 116	23 - 93	136 - 542	68 - 271	45 - 181	34 - 136	27 - 108
	3	F	50	1,13	93 - 373	47 - 186	31 - 124	23 - 93	19 - 75					
	3	F	60	1,13	78 - 310	39 - 155	26 - 103	19 - 78	16 - 62					
	3,5	F	40	1,22	126 - 503	63 - 252	42 - 168	31 - 126	25 - 101	146 - 586	73 - 293	49 - 195	37 - 146	29 - 117
	3,5	F	50	1,22	101 - 402	50 - 201	34 - 134	25 - 101	20 - 80					
	3,5	F	60	1,22	84 - 335	42 - 168	28 - 112	21 - 84	17 - 67					
	4	F	40	1,30	134 - 538	67 - 269	45 - 179	34 - 134	27 - 108	157 - 626	78 - 313	52 - 209	39 - 157	31 - 125
	4	F	50	1,30	108 - 430	54 - 215	36 - 143	27 - 108	22 - 86					
	4	F	60	1,30	90 - 358	45 - 179	30 - 119	22 - 90	18 - 72					

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)

@ Speed (km/h)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
TP 40-04	2	M	40	1,19	123 - 491	61 - 245	41 - 164	31 - 123	25 - 98	148 - 571	71 - 286	48 - 190	36 - 143	29 - 114
	2	M	50	1,19	98 - 392	49 - 196	33 - 131	25 - 98	20 - 78					
	2	M	60	1,19	82 - 327	41 - 164	27 - 109	20 - 82	16 - 65					
	2,5	M	40	1,33	137 - 549	69 - 274	46 - 183	34 - 137	27 - 110	160 - 639	80 - 319	53 - 213	40 - 160	32 - 128
	2,5	M	50	1,33	110 - 439	55 - 219	37 - 146	27 - 110	22 - 88					
	2,5	M	60	1,33	91 - 366	46 - 183	30 - 122	23 - 91	18 - 73					
	3	M	40	1,46	150 - 601	75 - 300	50 - 200	38 - 150	30 - 120	175 - 700	87 - 350	58 - 233	44 - 175	35 - 140
	3	M	50	1,46	120 - 481	60 - 240	40 - 160	30 - 120	24 - 96					
	3	M	60	1,46	100 - 401	50 - 200	33 - 134	25 - 100	20 - 80					
	3,5	F	40	1,57	162 - 649	81 - 325	54 - 216	41 - 162	32 - 130	189 - 756	94 - 378	63 - 252	47 - 189	38 - 151
	3,5	F	50	1,57	130 - 519	65 - 260	43 - 173	32 - 130	26 - 104					
	3,5	F	60	1,57	108 - 433	54 - 216	36 - 144	27 - 108	22 - 87					
	4	F	40	1,68	173 - 694	87 - 347	58 - 231	43 - 173	35 - 139	202 - 808	101 - 404	67 - 269	51 - 202	40 - 162
	4	F	50	1,68	139 - 555	69 - 278	46 - 185	35 - 139	28 - 111					
	4	F	60	1,68	116 - 463	58 - 231	39 - 154	29 - 116	23 - 93					

Magnojet APS 30 series

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	@ Speed (km/h) 5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
APS 30-02	2	F	50	0,63	71 - 283	35 - 142	24 - 94	18 - 71	14 - 57	76 - 303	38 - 152	25 - 101	19 - 76	15 - 61
	2	F	60	0,63	59 - 236	29 - 118	20 - 79	15 - 59	12 - 47					
	2	F	70	0,63	51 - 202	25 - 101	17 - 67	13 - 51	10 - 40					
	2,5	F	50	0,71	79 - 316	40 - 158	26 - 105	20 - 79	16 - 63	85 - 339	42 - 170	28 - 113	21 - 85	17 - 68
	2,5	F	60	0,71	66 - 264	33 - 132	22 - 88	16 - 66	13 - 53					
	2,5	F	70	0,71	57 - 226	28 - 113	19 - 75	14 - 57	11 - 45					
	3	F	50	0,77	87 - 347	43 - 173	29 - 116	22 - 87	17 - 69	93 - 372	46 - 186	31 - 124	23 - 93	19 - 74
	3	F	60	0,77	72 - 289	36 - 144	24 - 96	18 - 72	14 - 58					
	3	F	70	0,77	62 - 248	31 - 124	21 - 83	15 - 62	12 - 50					
	3,5	F	50	0,84	94 - 374	47 - 187	31 - 125	23 - 94	19 - 75	100 - 401	50 - 201	33 - 134	25 - 100	20 - 80
	3,5	F	60	0,84	78 - 312	39 - 156	26 - 104	20 - 78	16 - 62					
	3,5	F	70	0,84	67 - 267	33 - 134	22 - 89	17 - 67	13 - 53					
	4	F	50	0,89	100 - 400	50 - 200	33 - 133	25 - 100	20 - 80	107 - 429	54 - 214	36 - 143	27 - 107	21 - 86
	4	F	60	0,89	83 - 334	42 - 167	28 - 111	21 - 83	17 - 67					
	4	F	70	0,89	71 - 286	36 - 143	24 - 95	18 - 71	14 - 57					
APS 30-03	2	M	50	0,96	108 - 431	54 - 216	36 - 144	27 - 108	22 - 86	116 - 462	58 - 231	39 - 154	29 - 116	23 - 92
	2	M	60	0,96	90 - 359	45 - 180	30 - 120	22 - 90	18 - 72					
	2	M	70	0,96	77 - 308	38 - 154	26 - 103	19 - 77	15 - 62					
	2,5	M	50	1,08	121 - 482	60 - 241	40 - 161	30 - 121	24 - 96	129 - 517	65 - 258	43 - 172	32 - 129	26 - 103
	2,5	M	60	1,08	100 - 402	50 - 201	33 - 134	25 - 100	20 - 80					
	2,5	M	70	1,08	86 - 344	43 - 172	29 - 115	22 - 86	17 - 69					
	3	F	50	1,18	132 - 528	66 - 264	44 - 176	33 - 132	26 - 106	141 - 566	71 - 283	47 - 189	35 - 141	28 - 113
	3	F	60	1,18	110 - 440	55 - 220	37 - 147	28 - 110	22 - 88					
	3	F	70	1,18	94 - 377	47 - 189	31 - 126	24 - 94	19 - 75					
	3,5	F	50	1,27	143 - 570	71 - 285	48 - 190	36 - 143	29 - 114	153 - 611	76 - 306	51 - 204	38 - 153	31 - 122
	3,5	F	60	1,27	119 - 475	59 - 238	40 - 158	30 - 119	24 - 95					
	3,5	F	70	1,27	102 - 407	51 - 204	34 - 136	25 - 102	20 - 81					
	4	F	50	1,36	152 - 610	76 - 305	51 - 203	38 - 152	30 - 122	163 - 653	82 - 327	54 - 218	41 - 163	33 - 131
	4	F	60	1,36	127 - 508	64 - 254	42 - 169	32 - 127	25 - 102					
	4	F	70	1,36	109 - 435	54 - 218	36 - 145	27 - 109	22 - 87					

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	@ Speed (km/h)					5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
					5	10	15	20	25					
APS 60-03	2	M	30	0,91	79 - 315	39 - 158	26 - 105	20 - 79	16 - 63	109 - 437	55 - 218	36 - 146	27 - 109	22 - 87
	2	M	40	0,91	59 - 236	30 - 118	20 - 79	15 - 59	12 - 47					
	2,5	M	30	1,02	88 - 352	44 - 176	29 - 117	22 - 88	18 - 70	122 - 488	61 - 244	41 - 163	31 - 122	24 - 98
	2,5	M	40	1,02	66 - 264	33 - 132	22 - 88	17 - 66	13 - 53					
	3	F	30	1,11	96 - 386	48 - 193	32 - 129	24 - 96	19 - 77	134 - 535	67 - 267	45 - 178	33 - 134	27 - 107
	3	F	40	1,11	72 - 289	36 - 145	24 - 96	18 - 72	14 - 58					
	3,5	F	30	1,20	104 - 417	52 - 208	35 - 139	26 - 104	21 - 83	144 - 578	72 - 289	48 - 193	36 - 144	29 - 116
	3,5	F	40	1,20	78 - 313	39 - 156	26 - 104	20 - 78	16 - 63					
	4	F	30	1,29	111 - 446	56 - 223	37 - 149	28 - 111	22 - 89	154 - 617	77 - 309	51 - 206	39 - 154	31 - 123
	4	F	40	1,29	84 - 334	42 - 167	28 - 111	21 - 84	17 - 67					

Wilger SR 35 series

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)

@ Speed (km/h)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
SR 35-015	2	M	40	0,49	58 - 233	29 - 117	19 - 78	15 - 58	12 - 47	59-236	29-118	20-79	15-59	12-47
	2	M	50	0,49	47 - 187	23 - 93	16 - 62	12 - 47	9 - 37					
	2	M	60	0,49	39 - 156	19 - 78	13 - 52	10 - 39	8 - 31					
	2,5	F	40	0,55	65 - 261	33 - 131	22 - 87	16 - 65	13 - 52	66-263	33-132	22-88	16-66	13-53
	2,5	F	50	0,55	52 - 209	26 - 104	17 - 70	13 - 52	10 - 42					
	2,5	F	60	0,55	44 - 174	22 - 87	15 - 58	11 - 44	9 - 35					
	3	F	40	0,60	71 - 286	36 - 143	24 - 95	18 - 71	14 - 57	72-288	36-144	24-96	18-72	14-58
	3	F	50	0,60	57 - 229	29 - 114	19 - 76	14 - 57	11 - 46					
	3	F	60	0,60	48 - 191	24 - 95	16 - 64	12 - 48	10 - 38					
	3,5	F	40	0,65	77 - 309	39 - 154	26 - 103	19 - 77	15 - 62	78-312	39-156	26-104	19-78	16-62
	3,5	F	50	0,65	62 - 247	31 - 124	21 - 82	15 - 62	12 - 49					
	3,5	F	60	0,65	51 - 206	26 - 103	17 - 69	13 - 51	10 - 41					
	4	F	40	0,69	83 - 330	41 - 165	28 - 110	21 - 83	17 - 66	83-333	42-167	28-111	21-83	17-67
	4	F	50	0,69	66 - 264	33 - 132	22 - 88	17 - 66	13 - 53					
	4	F	60	0,69	55 - 220	28 - 110	18 - 73	14 - 55	11 - 44					

Wilger SR 65 series

<u>NOTE: WEED-IT uses 25 cm nozzle spacing!</u>

Application Rate Range (liters/hectare)

@ Speed (km/h)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
SR 65-015	2	M	20	0,49	58 - 231	29 - 116	19 - 77	14 - 58	12 - 46	59 - 236	29 - 118	20 - 79	15 - 59	12 - 47
	2	M	30	0,49	39 - 154	19 - 77	13 - 51	10 - 39	8 - 31					
	2	M	40	0,49	29 - 116	14 - 58	10 - 39	7 - 29	6 - 23					
	2,5	F	20	0,55	65 - 258	32 - 129	22 - 86	16 - 65	13 - 52	66 - 263	33 - 132	22 - 88	16 - 66	13 - 53
	2,5	F	30	0,55	43 - 172	22 - 86	14 - 57	11 - 43	9 - 34					
	2,5	F	40	0,55	32 - 129	16 - 65	11 - 43	8 - 32	6 - 26					
	3	F	20	0,60	71 - 283	35 - 142	24 - 94	18 - 71	14 - 57	72 - 288	36 - 144	24 - 96	18 - 72	14 - 58
	3	F	30	0,60	47 - 189	24 - 94	16 - 63	12 - 47	9 - 38					
	3	F	40	0,60	35 - 142	18 - 71	12 - 47	9 - 35	7 - 28					
	3,5	F	20	0,65	76 - 306	38 - 153	25 - 102	19 - 76	15 - 61	78 - 312	39 - 156	26 - 104	19 - 78	16 - 62
	3,5	F	30	0,65	51 - 204	25 - 102	17 - 68	13 - 51	10 - 41					
	3,5	F	40	0,65	38 - 153	19 - 76	13 - 51	10 - 38	8 - 31					
	4	F	20	0,69	82 - 327	41 - 163	27 - 109	20 - 82	16 - 65	83 - 333	42 - 167	28 - 111	21 - 88	17 - 67
	4	F	30	0,69	54 - 218	27 - 109	18 - 73	14 - 54	11 - 44					
	4	F	40	0,69	41 - 163	20 - 82	14 - 54	10 - 41	8 - 33					

Wilger MR 35 series

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	@ Speed (km/h)					5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
					5	10	15	20	25					
MR 35-015	2	C	40	0,48	57 - 226	28 - 113	19 - 75	14 - 57	11 - 45	57 - 228	29 - 114	19 - 76	14 - 57	11 - 46
	2	C	50	0,48	45 - 181	23 - 90	15 - 60	11 - 45	9 - 36					
	2	C	60	0,48	38 - 151	19 - 75	13 - 50	9 - 38	8 - 30					
	2,5	C	40	0,53	63 - 253	32 - 126	21 - 84	16 - 63	13 - 51	64 - 255	32 - 128	21 - 85	16 - 64	13 - 51
	2,5	C	50	0,53	51 - 202	25 - 101	17 - 67	13 - 51	10 - 40					
	2,5	C	60	0,53	42 - 169	21 - 84	14 - 56	11 - 42	8 - 34					
	3	C	40	0,58	69 - 277	35 - 138	23 - 92	17 - 69	14 - 55	70 - 279	35 - 140	23 - 93	17 - 70	14 - 56
	3	M	50	0,58	55 - 222	28 - 111	18 - 74	14 - 55	11 - 44					
	3	M	60	0,58	46 - 185	23 - 92	15 - 62	12 - 46	9 - 37					
	3,5	M	40	0,63	75 - 299	37 - 150	25 - 100	19 - 75	15 - 60	75 - 302	38 - 151	25 - 101	19 - 75	15 - 60
	3,5	M	50	0,63	60 - 239	30 - 120	20 - 80	15 - 60	12 - 48					
	3,5	M	60	0,63	50 - 199	25 - 100	17 - 66	12 - 50	10 - 40					
	4	M	40	0,67	80 - 320	40 - 160	27 - 107	20 - 80	16 - 64	81 - 323	40 - 161	27 - 108	20 - 81	16 - 65
	4	M	50	0,67	64 - 256	32 - 128	21 - 85	16 - 64	13 - 51					
	4	M	60	0,67	53 - 213	27 - 107	18 - 71	13 - 53	11 - 43					
MR 35-03	2	VC	40	0,91	109 - 435	54 - 218	36 - 145	27 - 109	22 - 87	110 - 439	55 - 219	37 - 146	27 - 110	22 - 88
	2	VC	50	0,91	87 - 348	44 - 174	29 - 116	22 - 87	17 - 70					
	2	VC	60	0,91	73 - 290	36 - 145	24 - 97	18 - 73	15 - 58					
	2,5	VC	40	1,02	122 - 486	61 - 243	41 - 162	30 - 122	24 - 97	123 - 491	61 - 245	41 - 164	31 - 123	25 - 98
	2,5	VC	50	1,02	97 - 389	49 - 195	32 - 130	24 - 97	19 - 78					
	2,5	VC	60	1,02	81 - 324	41 - 162	27 - 108	20 - 81	16 - 65					
	3	C	40	1,12	133 - 533	67 - 266	44 - 178	33 - 133	27 - 107	134 - 538	67 - 269	45 - 179	34 - 134	27 - 108
	3	C	50	1,12	107 - 426	53 - 213	36 - 142	27 - 107	21 - 85					
	3	C	60	1,12	89 - 355	44 - 178	30 - 118	22 - 89	18 - 71					
	3,5	C	40	1,21	144 - 576	72 - 288	48 - 192	36 - 144	29 - 115	145 - 581	73 - 290	48 - 194	36 - 145	29 - 116
	3,5	C	50	1,21	115 - 460	58 - 230	38 - 153	29 - 115	23 - 92					
	3,5	C	60	1,21	96 - 384	48 - 192	32 - 128	24 - 96	19 - 77					
	4	C	40	1,29	154 - 615	77 - 308	51 - 205	38 - 154	31 - 123	155 - 621	78 - 310	52 - 207	39 - 155	31 - 124
	4	C	50	1,29	123 - 492	62 - 246	41 - 164	31 - 123	25 - 98					
	4	C	60	1,29	103 - 410	51 - 205	34 - 137	26 - 103	21 - 82					

Wilger MR 65 series

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)
@ Speed (km/h)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
MR 65-015	2	C	40	0,47	28 - 112	14 - 56	9 - 37	7 - 28	6 - 22	57 - 227	28 - 114	19 - 76	14 - 57	11 - 45
	2	C	50	0,47	22 - 89	11 - 45	7 - 30	6 - 22	4 - 18					
	2	C	60	0,47	19 - 74	9 - 37	6 - 25	5 - 19	4 - 15					
	2,5	C	40	0,53	31 - 125	16 - 62	10 - 42	8 - 31	6 - 25	64 - 254	32 - 127	21 - 85	16 - 64	13 - 51
	2,5	C	50	0,53	25 - 100	12 - 50	8 - 33	6 - 25	5 - 20					
	2,5	C	60	0,53	21 - 83	10 - 42	7 - 28	5 - 21	4 - 17					
	3	C	40	0,58	34 - 137	17 - 68	11 - 46	9 - 34	7 - 27	70 - 278	35 - 139	23 - 93	17 - 70	14 - 56
	3	M	50	0,58	27 - 109	14 - 55	9 - 36	7 - 27	5 - 22					
	3	M	60	0,58	23 - 91	11 - 46	8 - 30	6 - 23	5 - 18					
	3,5	M	40	0,63	37 - 148	18 - 74	12 - 49	9 - 37	7 - 30	75 - 301	38 - 150	25 - 100	19 - 75	15 - 60
	3,5	M	50	0,63	30 - 118	15 - 59	10 - 39	7 - 30	6 - 24					
	3,5	M	60	0,63	25 - 98	12 - 49	8 - 33	6 - 25	5 - 20					
	4	M	40	0,67	39 - 158	20 - 79	13 - 53	10 - 39	8 - 32	80 - 321	40 - 161	27 - 107	20 - 80	16 - 64
	4	M	50	0,67	32 - 126	16 - 63	11 - 42	8 - 32	6 - 25					
	4	M	60	0,67	26 - 105	13 - 53	9 - 35	7 - 26	5 - 21					
MR 65-03	2	VC	40	0,91	54 - 215	27 - 108	18 - 72	13 - 54	11 - 43	110 - 439	55 - 219	37 - 146	27 - 110	22 - 88
	2	VC	50	0,91	43 - 172	22 - 86	14 - 57	11 - 43	9 - 34					
	2	VC	60	0,91	36 - 143	18 - 72	12 - 48	9 - 36	7 - 29					
	2,5	VC	40	1,02	60 - 241	30 - 120	20 - 80	15 - 60	12 - 48	123 - 490	61 - 245	41 - 163	31 - 123	25 - 98
	2,5	VC	50	1,02	48 - 192	24 - 96	16 - 64	12 - 48	10 - 38					
	2,5	VC	60	1,02	40 - 160	20 - 80	13 - 53	10 - 40	8 - 32					
	3	C	40	1,12	66 - 263	33 - 132	22 - 88	16 - 66	13 - 53	134 - 537	67 - 269	45 - 179	34 - 134	27 - 107
	3	C	50	1,12	53 - 211	26 - 105	18 - 70	13 - 53	11 - 42					
	3	C	60	1,12	44 - 176	22 - 88	15 - 59	11 - 44	9 - 35					
	3,5	C	40	1,21	71 - 285	36 - 142	24 - 95	18 - 71	14 - 57	145 - 580	73 - 290	48 - 193	36 - 145	29 - 116
	3,5	C	50	1,21	57 - 228	28 - 114	19 - 76	14 - 57	11 - 46					
	3,5	C	60	1,21	47 - 190	24 - 95	16 - 63	12 - 47	9 - 38					
	4	C	40	1,29	76 - 304	38 - 152	25 - 101	19 - 76	15 - 61	155 - 620	78 - 310	52 - 207	39 - 155	31 - 124
	4	C	50	1,29	61 - 243	30 - 122	20 - 81	15 - 61	12 - 49					
	4	C	60	1,29	51 - 203	25 - 101	17 - 68	13 - 51	10 - 41					

TeeJet DG 65 series

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)
@ Speed (km/h)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
DG 65-055	2	C	40	1,62	95 - 381	48 - 191	32 - 127	24 - 95	19 - 76	194 - 778	97 - 389	65 - 259	49 - 194	39 - 156
	2	C	50	1,62	76 - 305	38 - 153	25 - 102	19 - 76	15 - 61					
	2	C	60	1,62	64 - 254	32 - 127	21 - 85	16 - 64	13 - 51					
	2,5	C	40	1,81	107 - 426	53 - 213	36 - 142	27 - 107	21 - 85	217 - 869	109 - 435	72 - 290	54 - 217	43 - 174
	2,5	C	50	1,81	85 - 341	43 - 171	28 - 114	21 - 85	17 - 68					
	2,5	C	60	1,81	71 - 284	36 - 142	24 - 95	18 - 71	14 - 57					
	3	C	40	1,98	117 - 467	58 - 234	39 - 156	29 - 117	23 - 93	238 - 952	119 - 476	79 - 317	60 - 238	48 - 190
	3	C	50	1,98	93 - 374	47 - 187	31 - 125	23 - 93	19 - 75					
	3	C	60	1,98	78 - 311	39 - 156	26 - 104	19 - 78	16 - 62					
	3,5	M	40	2,14	126 - 505	63 - 252	42 - 168	32 - 126	25 - 101	257 - 1029	129 - 514	86 - 343	64 - 257	51 - 206
	3,5	M	50	2,14	101 - 404	50 - 202	34 - 135	25 - 101	20 - 81					
	3,5	M	60	2,14	84 - 336	42 - 168	28 - 112	21 - 84	17 - 67					
	4	M	40	2,29	135 - 539	67 - 270	45 - 180	34 - 135	27 - 108	275 - 1100	137 - 550	92 - 367	69 - 275	55 - 220
	4	M	50	2,29	108 - 432	54 - 216	36 - 144	27 - 108	22 - 86					
	4	M	60	2,29	90 - 360	45 - 180	30 - 120	22 - 90	18 - 72					

TeeJet TG series

NOTE: WEED-IT uses 25 cm nozzle spacing! **Application Rate Range (liters/hectare)**

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
TG 3.5	2		30	1,67	357 - 714	179 - 357	119 - 238	89 - 179	71 - 143	400 - 800	200 - 400	133 - 267	100 - 200	80 - 160
	2		40	1,67	268 - 536	134 - 268	89 - 179	67 - 134	54 - 107					
	2		50	1,67	214 - 429	107 - 214	71 - 143	54 - 107	43 - 86					
	2,5		30	1,86	399 - 799	200 - 399	133 - 266	100 - 200	80 - 160	447 - 894	223 - 447	149 - 298	112 - 223	89 - 179
	2,5		40	1,86	300 - 599	150 - 300	100 - 200	75 - 150	60 - 120					
	2,5		50	1,86	240 - 479	120 - 240	80 - 160	60 - 120	48 - 96					
	3		30	2,04	437 - 875	219 - 437	146 - 292	109 - 219	87 - 175	490 - 979	245 - 490	163 - 326	122 - 245	98 - 196
	3		40	2,04	328 - 656	164 - 328	109 - 219	82 - 164	66 - 131					
	3		50	2,04	262 - 525	131 - 262	87 - 175	66 - 131	52 - 105					
	3,5		30	2,20	473 - 945	236 - 473	158 - 315	118 - 236	95 - 189	529 - 1058	264 - 529	176 - 353	132 - 264	106 - 212
	3,5		40	2,20	354 - 709	177 - 354	118 - 236	89 - 177	71 - 142					
	3,5		50	2,20	284 - 567	142 - 284	95 - 189	71 - 142	57 - 113					
	4		30	2,36	505 - 1010	253 - 505	168 - 337	126 - 253	101 - 202	565 - 1131	283 - 565	188 - 377	141 - 283	113 - 226
	4		40	2,36	379 - 758	189 - 379	126 - 253	95 - 189	76 - 152					
	4		50	2,36	303 - 606	152 - 303	101 - 202	76 - 152	61 - 121					

@ Speed (km/h)

NOTE: WEED-IT uses 25 cm nozzle spacing!

Application Rate Range (liters/hectare)

Nozzle type	Pressure (bar)	Droplet size	Nozzle height (cm)	Flow (l/min) @ 100% DC	5	10	15	20	25	5 Full cover	10 Full cover	15 Full cover	20 Full cover	25 Full cover
MGA 40-01 NP	2	MF	40	0,32	32 - 131	16 - 65	11 - 44	8 - 33	6 - 26	38 - 152	19 - 76	13 - 51	9 - 38	8 - 30
	2	MF	50	0,32	26 - 105	13 - 52	9 - 35	6 - 26	5 - 21					
	2	MF	60	0,32	22 - 87	11 - 44	7 - 29	5 - 22	4 - 17					
	2,5	MF	40	0,36	36 - 146	18 - 73	12 - 49	9 - 37	7 - 29	42 - 170	21 - 85	14 - 57	11 - 43	8 - 34
	2,5	MF	50	0,36	29 - 117	14 - 59	10 - 39	7 - 29	6 - 23					
	2,5	MF	60	0,36	24 - 98	12 - 49	8 - 33	6 - 24	5 - 20					
	3	MF	40	0,39	40 - 160	20 - 80	13 - 53	10 - 40	8 - 32	46 - 187	23 - 93	15 - 62	12 - 47	9 - 37
	3	MF	50	0,39	32 - 128	16 - 64	11 - 43	8 - 32	6 - 26					
	3	MF	60	0,39	26 - 107	13 - 53	9 - 36	7 - 27	5 - 21					
	3,5	MF	40	0,42	43 - 173	21 - 87	14 - 58	11 - 43	9 - 35	50 - 202	25 - 101	17 - 67	12 - 50	10 - 40
	3,5	MF	50	0,42	34 - 139	17 - 69	11 - 46	9 - 35	7 - 28					
	3,5	MF	60	0,42	28 - 115	14 - 58	9 - 38	7 - 29	6 - 23					
	4	MF	40	0,45	46 - 185	23 - 93	15 - 62	11 - 46	9 - 37	53 - 216	27 - 108	18 - 72	13 - 54	11 - 43
	4	MF	50	0,45	37 - 148	18 - 74	12 - 49	9 - 37	7 - 30					
	4	MF	60	0,45	30 - 123	15 - 62	10 - 41	8 - 31	6 - 25					
MGA 40-015 NP	2	MF	40	0,48	49 - 198	25 - 99	16 - 66	12 - 50	10 - 40	57 - 231	29 - 115	19 - 77	14 - 58	11 - 46
	2	MF	50	0,48	39 - 159	20 - 79	13 - 53	10 - 40	8 - 32					
	2	MF	60	0,48	33 - 132	16 - 66	11 - 44	8 - 33	7 - 26					
	2,5	MF	40	0,54	55 - 222	27 - 111	18 - 74	14 - 55	11 - 44	64 - 258	32 - 129	21 - 86	16 - 65	13 - 52
	2,5	MF	50	0,54	44 - 177	22 - 89	15 - 59	11 - 44	9 - 35					
	2,5	MF	60	0,54	37 - 148	18 - 74	12 - 49	9 - 37	7 - 30					
	3	MF	40	0,59	60 - 243	30 - 121	20 - 81	15 - 61	12 - 49	70 - 283	35 - 141	23 - 94	18 - 71	14 - 57
	3	MF	50	0,59	48 - 194	24 - 97	16 - 65	12 - 49	10 - 39					
	3	MF	60	0,59	40 - 162	20 - 81	13 - 54	10 - 40	8 - 32					
	3,5	MF	40	0,64	65 - 262	32 - 131	22 - 87	16 - 66	13 - 52	76 - 305	38 - 153	25 - 102	19 - 76	15 - 61
	3,5	MF	50	0,64	52 - 210	26 - 105	17 - 70	13 - 52	10 - 42					
	3,5	MF	60	0,64	43 - 175	22 - 87	14 - 58	11 - 44	9 - 35					
	4	MF	40	0,68	69 - 280	35 - 140	23 - 93	17 - 70	14 - 56	81 - 326	40 - 163	27 - 109	20 - 82	16 - 65
	4	MF	50	0,68	56 - 224	28 - 112	19 - 75	14 - 56	11 - 45					
	4	MF	60	0,68	46 - 187	23 - 93	15 - 62	12 - 47	9 - 37					

Full cover nozzle flow rate charts

TeeJet TXA 80 series

Nozzle type	Pressure (bar)	Droplet size	Flow (l/min) @ 100% DC	5	10	15	20	25
TXA 80-15	2		0,46	55 - 219	27 - 110	18 - 73	14 - 55	11 - 44
	2,5		0,51	61 - 245	31 - 123	20 - 82	15 - 61	12 - 49
	3		0,56	67 - 269	34 - 134	22 - 90	17 - 67	13 - 54
	3,5		0,60	73 - 290	36 - 145	24 - 97	18 - 73	15 - 58
	4		0,65	78 - 310	39 - 155	26 - 103	19 - 78	16 - 62
TXA 80-02	2		0,61	74 - 295	37 - 148	25 - 98	18 - 74	15 - 59
	2,5		0,69	82 - 330	41 - 165	27 - 110	21 - 82	16 - 66
	3		0,75	90 - 361	45 - 181	30 - 120	23 - 90	18 - 72
	3,5		0,81	98 - 390	49 - 195	33 - 130	24 - 98	20 - 78
	4		0,87	104 - 417	52 - 209	35 - 139	26 - 104	21 - 83
TXA 80-03	2		0,85	74 - 295	37 - 148	25 - 98	18 - 74	15 - 59
	2,5		0,95	82 - 330	41 - 165	27 - 110	21 - 82	16 - 66
	3		1,04	90 - 361	45 - 181	30 - 120	23 - 90	18 - 72
	3,5		1,12	98 - 390	49 - 195	33 - 130	24 - 98	20 - 78
	4		1,20	104 - 417	52 - 209	35 - 139	26 - 104	21 - 83

Wilger SR 110 series

Nozzle type	Pressure (bar)	Droplet size	Flow (l/min) @ 100% DC	5	10	15	20	25
SR 110-02	2	M	0,66	79 - 317	40 - 158	26 - 106	20 - 79	16 - 63
	2,5	F	0,74	89 - 354	44 - 177	30 - 118	22 - 89	18 - 71
	3	F	0,81	97 - 388	48 - 194	32 - 129	24 - 97	19 - 78
	3,5	F	0,87	105 - 419	52 - 209	35 - 140	26 - 105	21 - 84
	4	F	0,93	112 - 448	56 - 224	37 - 149	28 - 112	22 - 90
SR 110-025	2	M	0,83	100 - 399	50 - 199	33 - 133	25 - 100	20 - 80
	2,5	M	0,93	112 - 446	56 - 223	37 - 149	28 - 112	22 - 89
	3	M	1,02	122 - 489	61 - 244	41 - 163	31 - 122	24 - 98
	3,5	F	1,10	132 - 528	66 - 264	44 - 176	33 - 132	26 - 106
	4	F	1,18	141 - 564	71 - 282	47 - 188	35 - 141	28 - 113
SR 110-03	2	C	1,00	120 - 482	60 - 241	40 - 161	30 - 120	24 - 96
	2,5	C	1,12	135 - 539	67 - 269	45 - 180	34 - 135	27 - 108
	3	C	1,23	147 - 590	74 - 295	49 - 197	37 - 147	29 - 118
	3,5	M	1,33	159 - 637	80 - 319	53 - 212	40 - 159	32 - 127
	4	M	1,42	170 - 681	85 - 341	57 - 227	43 - 170	34 - 136
SR 110-04	2	C	1,23	148 - 593	74 - 296	49 - 198	37 - 148	30 - 119
	2,5	C	1,38	166 - 663	83 - 331	55 - 221	41 - 166	33 - 133
	3	C	1,51	181 - 726	91 - 363	60 - 242	45 - 181	36 - 145
	3,5	M	1,63	196 - 784	98 - 392	65 - 261	49 - 196	39 - 157
	4	M	1,75	210 - 838	105 - 419	70 - 279	52 - 210	42 - 168
SR 110-05	2	C	1,44	172 - 689	86 - 345	57 - 230	43 - 172	34 - 138
	2,5	C	1,61	193 - 771	96 - 385	64 - 257	48 - 193	39 - 154
	3	C	1,76	211 - 844	106 - 422	70 - 281	53 - 211	42 - 169
	3,5	C	1,90	228 - 912	114 - 456	76 - 304	57 - 228	46 - 182
	4	C	2,03	244 - 975	122 - 487	81 - 325	61 - 244	49 - 195

Wilger MR 110 series

Nozzle type	Pressure (bar)	Droplet size	Flow (l/min) @ 100% DC	5	10	15	20	25
MR 110-02	2	C	0,64	77 - 306	38 - 153	26 - 102	19 - 77	15 - 61
	2,5	C	0,71	86 - 342	43 - 171	29 - 114	21 - 86	17 - 68
	3	C	0,78	94 - 375	47 - 187	31 - 125	23 - 94	19 - 75
	3,5	M	0,84	101 - 405	51 - 202	34 - 135	25 - 101	20 - 81
	4	M	0,90	108 - 433	54 - 216	36 - 144	27 - 108	22 - 87
MR 110-025	2	C	0,83	100 - 400	50 - 200	33 - 133	25 - 100	20 - 80
	2,5	C	0,93	112 - 447	56 - 223	37 - 149	28 - 112	22 - 89
	3	C	1,02	122 - 490	61 - 245	41 - 163	31 - 122	24 - 98
	3,5	C	1,10	132 - 529	66 - 264	44 - 176	33 - 132	26 - 106
	4	C	1,18	141 - 565	71 - 283	47 - 188	35 - 141	28 - 113
MR 110-03	2	VC	1,00	110 - 439	55 - 219	37 - 146	27 - 110	22 - 88
	2,5	C	1,12	123 - 491	61 - 245	41 - 164	31 - 123	25 - 98
	3	C	1,23	134 - 538	67 - 269	45 - 179	34 - 134	27 - 108
	3,5	C	1,33	145 - 581	73 - 290	48 - 194	36 - 145	29 - 116
	4	C	1,42	155 - 621	78 - 310	52 - 207	39 - 155	31 - 124
MR 110-04	2	VC	1,21	145 - 578	72 - 289	48 - 193	36 - 145	29 - 116
	2,5	VC	1,35	162 - 647	81 - 323	54 - 216	40 - 162	32 - 129
	3	C	1,48	177 - 708	89 - 354	59 - 236	44 - 177	35 - 142
	3,5	C	1,59	191 - 765	96 - 383	64 - 255	48 - 191	38 - 153
	4	C	1,70	205 - 818	102 - 409	68 - 273	51 - 205	41 - 164
MR 110-05	2	XC	1,52	183 - 730	91 - 365	61 - 243	46 - 183	37 - 146
	2,5	VC	1,70	204 - 816	102 - 408	68 - 272	51 - 204	41 - 163
	3	VC	1,86	224 - 894	112 - 447	75 - 298	56 - 224	45 - 179
	3,5	VC	2,01	241 - 966	121 - 483	80 - 322	60 - 241	48 - 193
	4	C	2,15	258 - 1033	129 - 516	86 - 344	65 - 258	52 - 207

Lechler IDK 80 series

Nozzle type	Pressure (bar)	Droplet size	Flow (l/min) @ 100% DC	5	10	15	20	25
IDK 80-02	2	VC	0,61	73 - 294	37 - 147	24 - 98	18 - 73	15 - 59
	2,5	VC	0,68	82 - 329	41 - 164	27 - 110	21 - 82	16 - 66
	3	VC	0,75	90 - 360	45 - 180	30 - 120	23 - 90	18 - 72
	3,5	C	0,81	97 - 389	49 - 194	32 - 130	24 - 97	19 - 78
	4	C	0,87	104 - 416	52 - 208	35 - 139	26 - 104	21 - 83
IDK 80-03	2	VC	0,91	110 - 439	55 - 219	37 - 146	27 - 110	22 - 88
	2,5	VC	1,02	123 - 491	61 - 245	41 - 164	31 - 123	25 - 98
	3	VC	1,12	134 - 538	67 - 269	45 - 179	34 - 134	27 - 108
	3,5	C	1,21	145 - 581	73 - 290	48 - 194	36 - 145	29 - 116
	4	C	1,29	155 - 621	78 - 310	52 - 207	39 - 155	31 - 124

BfS PulZar series

Nozzle type	Pressure (bar)	Droplet size	Flow (l/min) @ 100% DC	5	10	15	20	25
PulZar 03	2	C	0,98	117 - 468	59 - 234	39 - 156	29 - 117	23 - 94
	2,5	C	1,09	131 - 524	65 - 262	44 - 175	33 - 131	26 - 105
	3	C	1,20	143 - 574	72 - 287	48 - 191	36 - 143	29 - 115
	3,5	C	1,29	155 - 620	77 - 310	52 - 207	39 - 155	31 - 124
	4	M	1,38	166 - 662	83 - 331	55 - 221	41 - 166	33 - 132

TTI 110 series

Nozzle type	Pressure (bar)	Droplet size	Flow (l/min) @ 100% DC	5	10	15	20	25
TTI 110-025	2	UC	0,78	94 - 376	47 - 188	31 - 125	23 - 94	19 - 75
	2,5	UC	0,88	105 - 420	53 - 210	35 - 140	26 - 105	21 - 84
	3	UC	0,96	115 - 460	58 - 230	38 - 153	29 - 115	23 - 92
	3,5	UC	1,04	124 - 497	62 - 249	41 - 166	31 - 124	25 - 99
	4	UC	1,11	133 - 532	66 - 266	44 - 177	33 - 133	27 - 106

13.4. Application rate calculations

Spot Spraying formulas (1)

In Spot Spraying, the WEED-IT Quadro only sprays the green plants that are detected with the chlorophyll fluorescence principle. WEED-IT regulates the application rate via PWM, considering a constant pressure. The spot spraying application can be seen as a band application with a single nozzle. Therefor the spot spraying application rate is calculated as:

$$Spot\ rate = \frac{60000 * Flow}{Speed * W}$$

With:
- Spot rate the application rate in l/ha for spot spraying
- Flow in l/min
- Speed in km/h
- W the spray width of the nozzle in cm (readable in the table at the next page)

The flow is calculated as:

$$Flow = \frac{\%\ Spot}{100} * Max.\ flow$$

With:
- Flow in l/min
- The max. flow is the flow of the chosen nozzle at a constant pressure
- The % Spot is the control % for the PWM in the WEED-IT

The % Spot is calculated as:

$$\%\ Spot = \frac{Spot\ rate * Speed * W}{Max.\ flow * 600} * 100\%$$

The % Spot is also the value for the spot application rate that is used in the WEED-IT communication protocol for the connection with external devices.

The maximum spot rate is calculated as:

$$Max.\ spot\ rate = \frac{Max.\ flow * 100\ \% * 600}{Ideal\ Speed * W}$$

With:
- Max. spot rate the maximum application rate in spot spraying
- 100% is the maximum % Spot
- The Ideal Speed is the desired driving speed, as set in menu 104 and/or menu 203 tab 2

Spot Spraying formulas (2)

The spray width nozzle is the spray width of one nozzle at the soil surface, and is important for an optimal spot spray result. The following table indicates in green what configurations are best suitable for spot spraying.
Each detection channel is 25 cm wide, and so the spray width must be at least 25 cm.
Note that the nozzle height is configured in the WEED-IT by your dealer and that the spray boom must stay at this nozzle height to ensure the weed is detected and hit with herbicide optimally.
In the table spray widths up to 45 cm (so with 10 cm overlap at both sides) are indicated as suitable. However, rough conditions, such as uneven terrain or unstable spray booms may require a larger spray width.
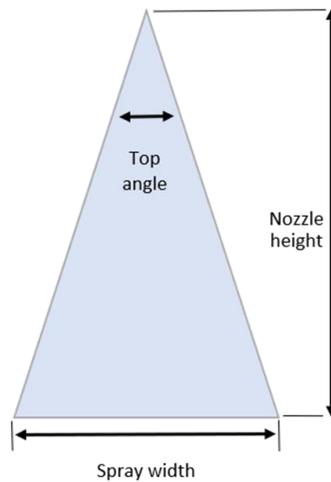
Spray width

Top angle (°)	Spray width with diverse nozzle heights (cm)													
	20	30	40	50	55	60	65	70	75	80	85	90	95	100
15	5	8	11	13	14	16	17	18	20	21	22	24	25	26
20	7	11	14	18	19	21	23	25	26	28	30	32	34	35
25	9	13	18	22	24	27	29	31	33	35	38	40	42	44
30	11	16	21	27	29	32	35	38	40	43	46	48	51	54
35	13	19	25	32	35	38	41	44	47	50	54	57	60	63
40	15	22	29	36	40	44	47	51	55	58	62	66	69	73
45	17	25	33	41	46	50	54	58	62	66	70	75	79	83
50	19	28	37	47	51	56	61	65	70	75	79	84	89	93
55	21	31	42	52	57	62	68	73	78	83	88	94	99	104
60	23	35	46	58	64	69	75	81	87	92	98	104	110	115
65	25	38	51	64	70	76	83	89	96	102	108	115	121	127
73	30	44	59	74	81	89	96	104	111	118	126	133	141	148
80	34	50	67	84	92	101	109	117	126	134	143	151	159	168
85	37	55	73	92	101	110	119	128	137	147	156	165	174	183
90	40	60	80	100	110	120	130	140	150	160	170	180	190	200
95	44	65	87	109	120	131	142	153	164	175	186	196	207	218
100	48	72	95	119	131	143	155	167	179	191	203	215	226	238
110	57	86	114	143	157	171	186	200	214	229	243	257	271	286
120	69	104	139	173	191	208	225	242	260	277	294	312	329	346
130	86	129	172	214	236	257	279	300	322	343	365	386	407	429
140	110	165	220	275	302	330	357	385	412	440	467	495	522	549
150	149	224	299	373	411	448	485	522	560	597	634	672	709	746

Full Coverage Spraying formulas

In Full Coverage spraying mode, the WEED-IT Quadro operates like a normal sprayer. The only difference is that the WEED-IT Quadro regulates the application rate via PWM, considering a constant spray pressure.
The cover application rate is calculated as:

$$Cover\ rate = \frac{60000 * Flow}{Speed * S}$$

With:
- Cover rate the application rate in l/ha
- Flow in l/min
- Speed in km/h
- S the nozzle spacing in cm, which is always 25 cm with WEED-IT

The nozzle flow (l/min) is calculated as:

$$Flow = \frac{\%\ Cover}{100} * Max.\ flow$$

With:
- Flow in l/min
- The max. flow is the flow of the chosen nozzle at a constant pressure
- The % Cover is the control % for the PWM in the WEED-IT

The % Cover is calculated as:

$$\%\ Cover = \frac{Cover\ rate * Speed * S}{Max.\ flow * 600} * 100\%$$

The % Cover is also the value for the spot application rate that is used in the WEED-IT communication protocol for the connection with external devices.

The maximum cover rate is calculated as:

$$Max.\ cover\ rate = \frac{Max.\ flow * 100\ \% * 600}{Ideal\ Speed * S}$$

With:
- Max. cover rate the maximum application rate in cover spraying
- 100% is the maximum % Cover
- The Ideal Speed is the desired driving speed, as set in menu 104 and/or menu 203 tab 2.

Dual Spraying formulas

The Dual Spraying mode is an unique spray tech feature. It combines full coverage spraying with spot spraying by applying a low cover application rate, like 30 l/ha, followed by a spot application rate, like 100 l/ha, when a plant is detected. Unique is that both cover and spot application rates are regulated via PWM.

For the Dual Spraying mode the calculations from the Spot Spraying and Full Coverage mode are used.

The only thing that is different is the Spot Spraying rate, as the weed receives an add up of the cover application rate and spot application rate, called the effective spot application rate.

The Effective Spot rate (l/ha) is calculated as:

$$Effective\ Spot\ rate\ = Spot\ rate + \frac{Cover\ rate * (W - C)}{W}$$

With:
- Spot rate the application rate for spot spraying in l/ha
- Cover rate the application rate for cover spraying in l/ha
- W the spray width of the nozzle in cm (readable in the table in the Spot Spraying formulas)
- C the channel width of the detection sensor, which is fixed at 25 cm

In this way the fluid from neighbouring nozzles ending up in the detection channel area are summed up to the spot spray rate resulting in the effective spot rate. This effective spot rate is set in the WEED-IT user console.

The % Spot for Dual Mode is calculated as:

$$\%\ Spot\_Dual\ = \frac{Spot\ rate * Speed * W}{Max.\ flow * 600}$$

With:
- The % Spot_Dual is the value that is passed on the communication protocol.
- The Spot rate the application rate in spot spraying without reckoning overlap. This can be calculated with the effective spot rate formula.
- The speed in km/h
- The max. flow in l/min
- W the spray width in cm

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