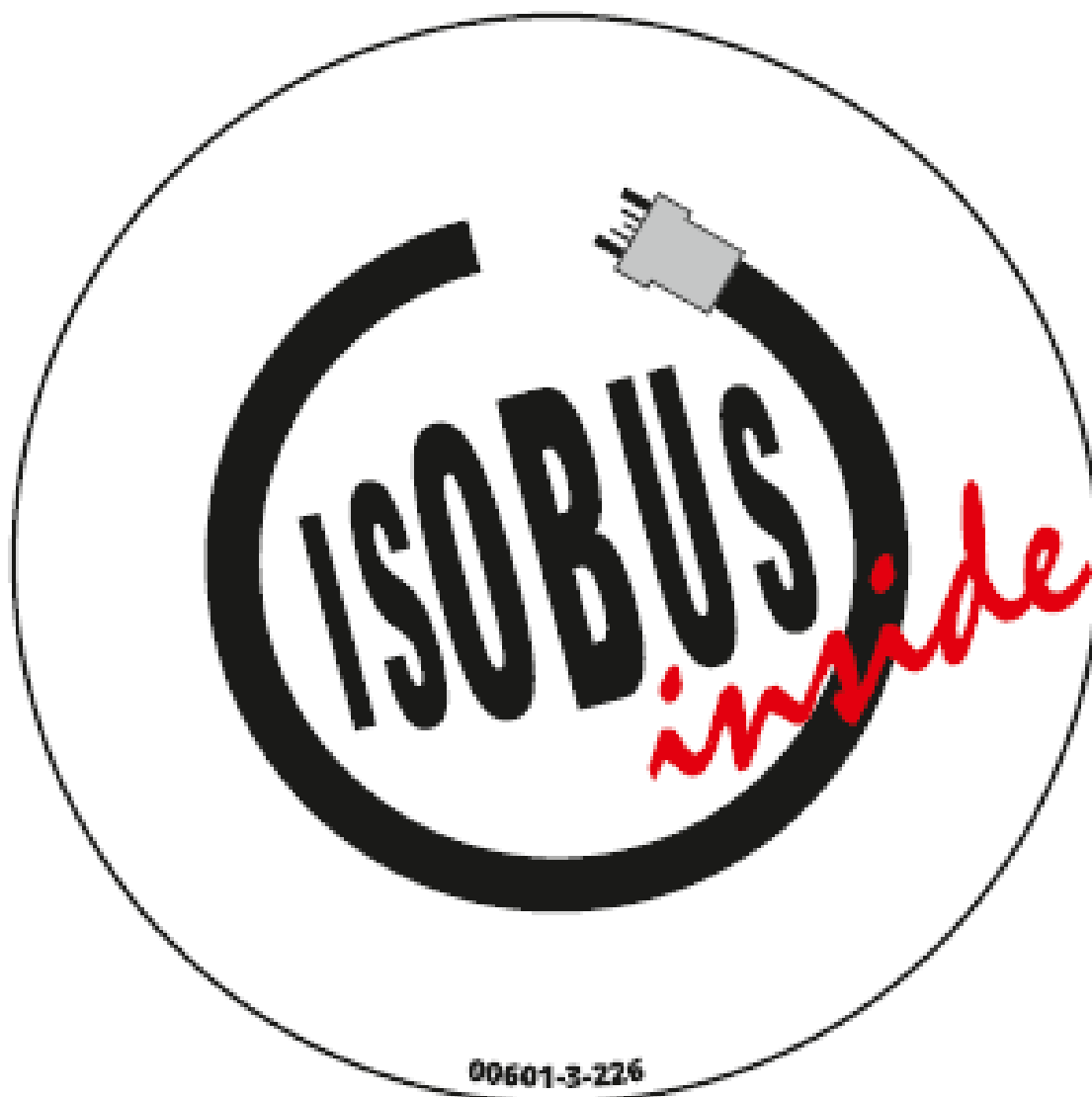


# ISOBUS M2

## OPERATING MANUAL



**PLEASE READ CAREFULLY BEFORE START-UP!**

Translation of the original operating manual

Version: 1.0 EN; item number: 00602-3-531



## TABLE OF CONTENTS

<b>1</b>	<b>IDENTIFICATION OF THE DEVICE</b>	<b>4</b>
<b>2</b>	<b>SERVICE</b>	<b>4</b>
<b>3</b>	<b>WARRANTY</b>	<b>4</b>
<b>4</b>	<b>SCOPE OF DELIVERY</b>	<b>5</b>
4.1	Controller ECU	5
4.2	Wiring harness	5
4.3	ISOBUS connection cable	6
4.4	Installation material and other accessories	6
<b>5</b>	<b>COMMISSIONING</b>	<b>6</b>
5.1	General information concerning the controller	6
5.1.1	Status bar	6
5.1.2	Stop button	7
5.2	Basic settings menu	7
<b>6</b>	<b>MENU STRUCTURE</b>	<b>10</b>
6.1	Start menu	10
6.2	Work menu	11
6.3	SET menu	13
6.3.1	Seed library	14
6.3.1.1	Seed menu	16
6.3.1.2	Seed info menu	17
6.3.2	Fill menu	18
6.3.3	Calibration menu	19
6.3.3.1	Calibration test results page	21
6.3.3.2	Performing a calibration test	22
6.3.4	Tractor settings menu	24
6.3.4.1	Performing calibration	25
6.3.5	Pre-metering menu	26
6.3.6	Task Controller menu	27
6.3.6.1	Task Controller menu for mounted implements	28
6.3.6.2	Task Controller menu for towed implements	29
6.3.7	Empty hopper	30
6.3.8	Fan menu	31
6.3.8.1	Electric fan / electric fan Plus	31
6.3.8.2	Hydraulic fan	31
6.4	Info menu	33
6.5	Diagnostic menu	34
<b>7</b>	<b>SPECIAL FEATURES PS TWIN</b>	<b>35</b>
7.1	Spreading two seed types	35
7.1.1	Work menu	35
7.1.2	Task Controller menu	37
7.1.2.1	Task Controller menu for mounted implements	37
7.1.2.2	Task Controller menu for towed implements	38
7.2	Spreading one seed type	38
7.2.1	Calibration menu	38
7.3	Empty hopper	39
<b>8</b>	<b>SPECIAL FEATURES OF THE LF600</b>	<b>40</b>
<b>9</b>	<b>CONTROLLER MESSAGES</b>	<b>40</b>

9.1	Suppressing / acknowledging messages .....	40
9.2	Warnings.....	41
9.3	Warnings — TC "AUTO" mode .....	42
9.4	Errors.....	42
9.5	Error – TC mode "ON" .....	43
<b>10</b>	<b>PROBLEM SOLVING .....</b>	<b>43</b>
<b>11</b>	<b>SOFTWARE UPDATE .....</b>	<b>44</b>
<b>12</b>	<b>ACCESSORIES .....</b>	<b>45</b>
12.1	Extension cable.....	45
12.2	Splitter cable APV external .....	45
12.3	Splitter cable APV-APV .....	45
12.4	Calibration button.....	46
12.5	Sensorfor the linkage chassis .....	46
12.6	Sensor for top link linkage .....	46
12.7	Sensor for linkage pull switch.....	46
12.8	Sensor for linkage hydraulic system.....	46
12.9	Fill level sensor for PS .....	47
<b>13</b>	<b>CONNECTION DIAGRAMS .....</b>	<b>47</b>
13.1	PS 120 to PS 500 .....	47
13.2	PS 300 TWIN.....	49
13.3	PS 800 to PS 1600 .....	52

# 1 IDENTIFICATION OF THE DEVICE

The controller can be uniquely identified through the following information on the type plate:

- 1: Hardware version
- 2.: Item number
- 3: Serial number
- 4: Software version

## Position of the type plate

The type plate is located directly on the controller.  
To read it, the control box cover must first be removed.

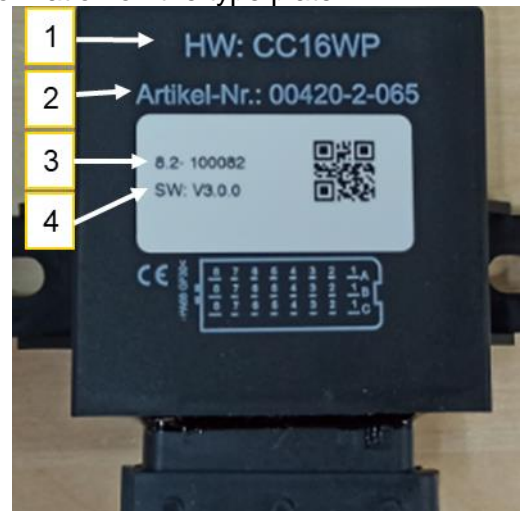


Figure 1



## NOTE!

For inquiries or warranty claims, always specify the serial number and software version of your controller.

# 2 SERVICE

Contact us at our Service address in the following cases:

- If, despite of the information in this operating manual, you have questions concerning the handling of this device
- For questions regarding spare parts
- To commission service and maintenance tasks

## Service address:

APV - Technische Produkte GmbH  
HEADQUARTERS  
Dallein 15  
3753 Hötzelndorf  
AUSTRIA

Telephone: +43 2913 8001-5500  
Fax: +43 2913 8002  
Email: [service@apv.at](mailto:service@apv.at)  
Web: [www.apv.at](http://www.apv.at)

# 3 WARRANTY

Check the controller/device for any transport damage immediately upon receipt. Subsequent complaints arising from transport damage can no longer be accepted.

Based on the invoice, we grant a six-month factory warranty starting on the date of initial operation. This warranty shall apply in the event of material or design errors and does not extend to parts that become damaged through normal or excessive wear.

The warranty shall become null and void under the following circumstances,

- If there is damage due to the effects of external force (e.g. opening the controller).
- If the prescribed requirements are not met.
- If the implement is altered, extended or fitted with third-party spare parts without our authorization.

## 4 SCOPE OF DELIVERY



### NOTE!

The items included may vary depending on the implement and its configuration!

### 4.1 CONTROLLER ECU



Figure 2

1	Type plate (see point 1)
2	24-pin plug connector, connection for wiring harness

### 4.2 WIRING HARNESS

The wiring harness is installed directly on the device and connects the ECU to all of the actuators, sensors, and the connection cable to the ISOBUS socket on the tractor.

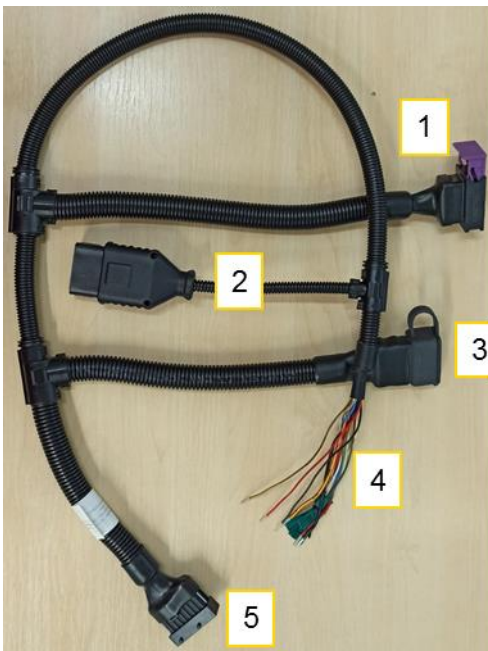


Figure 3

1	24-pin plug connector, connection to controller ECU
2	12-pin plug connector, connection to external sensors <ul style="list-style-type: none"><li>• Speed sensors</li><li>• Working position sensors</li></ul>
3	2-pin plug connector, supply to motor module
4	Open wire ends, connection terminals on the seeder for: <ul style="list-style-type: none"><li>• Seeding shaft motor</li><li>• Motor module (only for electric fan)</li><li>• Fill level sensor</li><li>• Calibration button</li><li>• Fan speed sensor</li><li>• Seeding shaft speed sensors</li></ul>
5	16-pin plug connector, connection cable for ISOBUS socket

### 4.3 ISOBUS CONNECTION CABLE

The connection cable connects the implement wiring harness to the ISOBUS socket of the tractor.



1	Connection with 16-pin plug connector (number 5 in Figure 3)
2	Connection to the ISOBUS socket of the tractor

Figure 4

#### CAUTION!

The ignition must always be switched off before the ISO bus connection cable can be disconnected from the tractor. If not, stored values could be lost!

### 4.4 INSTALLATION MATERIAL AND OTHER ACCESSORIES

Depending on the implement configuration, the appropriate installation material, covers and other parts will also be provided.

Details concerning the different versions are in the provided conversion instructions.

## 5 COMMISSIONING

### 5.1 GENERAL INFORMATION CONCERNING THE CONTROLLER

#### 5.1.1 STATUS BAR

The status bar is located in the upper area of the display. The status bar is shown in every menu:

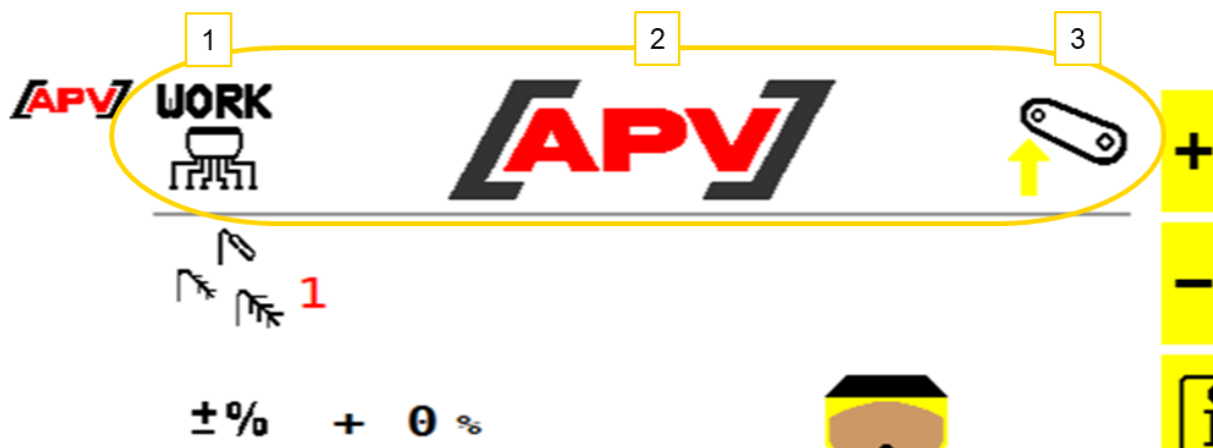


Figure 5

#### Description of display elements

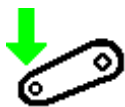
- 1 On the left in the status bar, the current menu is shown. In this case, it is the Work menu.

2

In the middle of the status bar, there is the APV logo. If errors occur, the logo will be replaced by the appropriate error message or warning.

3

On the right side of the status bar, there is the symbol for the current working position or the current position of the mounted implement.



The mounted implement is in working position.



The mounted implement is not in working position.

Point 6.3.4 describes how the position or the signal of the working position that is used is changed.

### 5.1.2 STOP BUTTON

The STOP button is provided in every menu. Use this button to execute a general STOP of all motors.



Figure 6

#### Description of button functions



Gray: No actuators are switched on.



Red: Actuators are switched on and can be stopped with this button.

### 5.2 BASIC SETTINGS MENU

During initial commissioning or by pressing and holding the Set button in the Start menu for five seconds, (see also point 6.1), the basic settings are made for the seeder that is used (e.g. setting the implement type and fan type and seeding shaft motor, etc.).

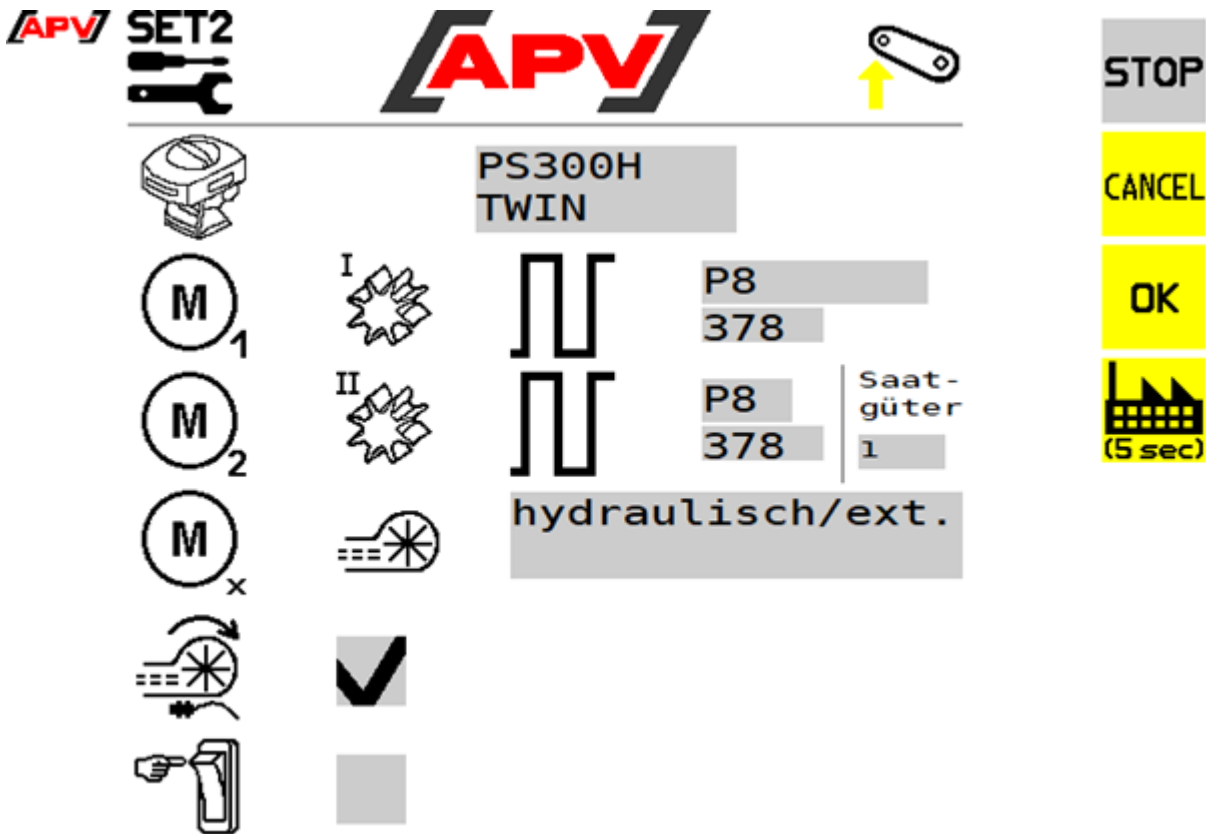


Figure 7

### Description of button functions



The Basic settings menu will be exited without saving the changed settings.

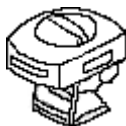


The Basic settings menu will be exited and the changed settings will be saved. When the settings are changed, the controller restarts.



Press and hold this button for 5 seconds to perform a factory reset, i.e. all settings will be reset to their original factory values and the Basic settings menu will be shown again.

### Description of display elements



Selection of the implement type. Choose from the following implement types: PS120E, PS120H, PS200E, PS200H, PS300E, PS300H, PS300E TWIN, PS300H TWIN, PS500E, PS500H, PS800H, PS1600H or LF600  
Here "E" stands for electric fan and "H" stands for hydraulic fan.





Selection of the seeding shaft motor or pump (installed in LF600) and its number of pulses per revolution. For the PS TWIN implement type, a second motor can be selected.

**Note:** When selecting the implement type and the seeding shaft motor, the default values are automatically displayed.

The following default values are stored:

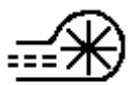
- P8 motor (installed in PS120 to PS500, PS TWIN): 378
- P17 motor (installed in PS800 to PS1600): 1024
- Pump (installed in LF600): 400

Saat-  
güter

1

Selection of the number of seed types to be sown for implement type PS TWIN:

- One seed type (with part-width section function)
- Two seed types (over the same working width)



Selection of the existing PS fan. The following selection possibilities are available: electric fan, electric fan PLUS, hydraulic fan/external fan or no fan (OFF).



When using a hydraulic fan, you must select whether a sensor is installed on the PS for fan monitoring (speed sensor).



The setting specifies whether a Calibration button is installed on the implement (available as an accessory).



**TIP!**

Depending on the selected settings, it is possible that all points will not be requested. The settings can be changed retroactively, as described in point 5.2.



**NOTE!**

When opening the Basic settings menu, a STOP is always executed.

## 6 MENU STRUCTURE

### 6.1 START MENU

This screen appears after the controller has started up. The different menus can be called up from this screen.



Figure 8

#### Description of button functions:



In the Work menu, all of the important information for field operation is displayed. Here, the motors can be switched on or off and information such as forward speed, working position and seeding shaft speed is displayed. The Work menu is described in more detail in point 6.2.



The implement settings are entered in the Set menu. Here, a calibration test is performed and seed is selected or forward speed is calibrated. The Set menu is described in more detail in point 6.3.

If the button is pressed and held for 5 seconds, the Basic settings menu is called up. Here, basic settings can be entered (e.g. motor type or fan type). The Basic settings menu is described in more detail in point 5.2.



In the Info menu, the area counters and hour counters are displayed. The Info menu is described in more detail in point 6.4.



In the Diagnostic menu, switching states of the sensors, supply voltage and power consumption of the motors are shown. The Diagnostic menu is described in more detail in point 6.5.

## 6.2 WORK MENU

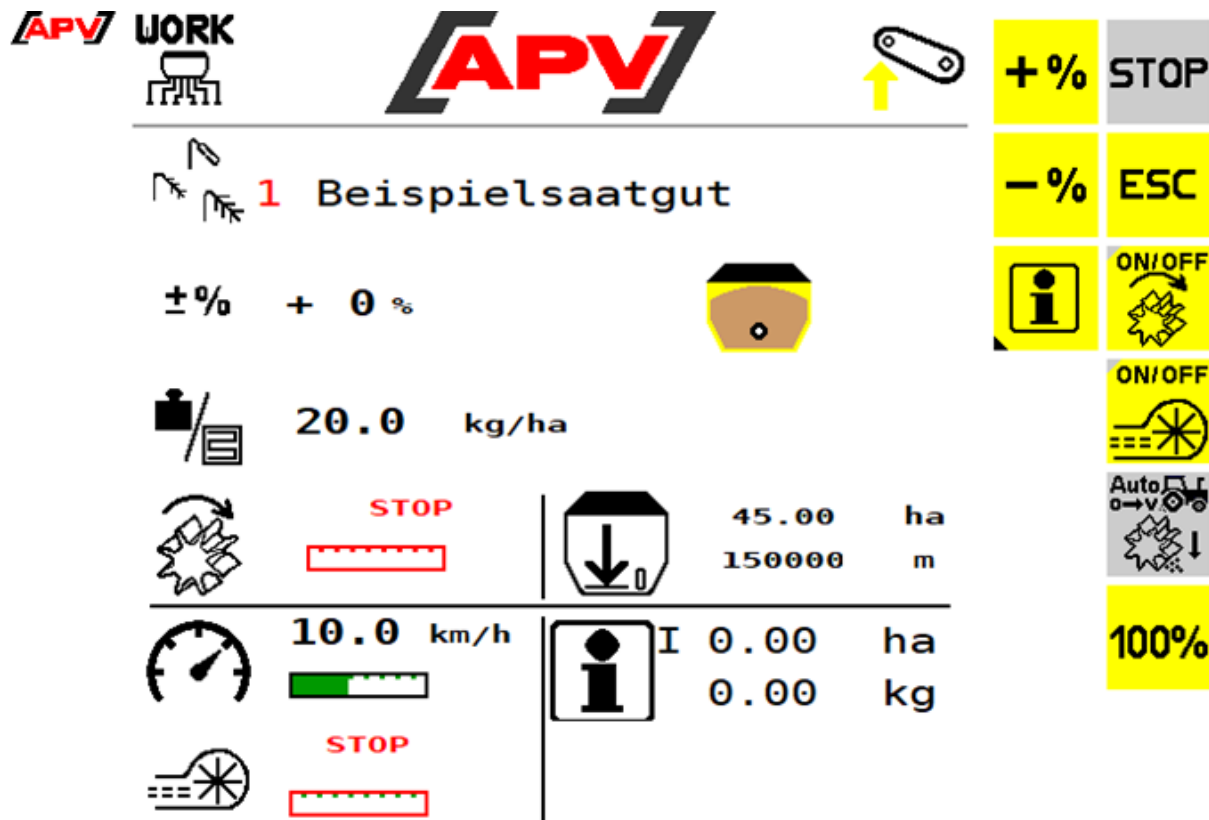
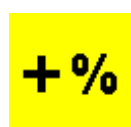
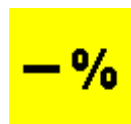


Figure 9

### Description of button functions



Use the +% button to increase the spread rate in 5% increments, up to max. 95%, in operation.



Use the +% button to reduce the spread rate in 5% increments, to a minimum of 85%, in operation.



Use the ESC button to go back one menu level, in this case, to the Start menu.



Use the Info button to show the Seed info menu for the currently selected seed type. The Seed info menu is described in more detail in point 6.3.1.2.



Use this button to switch the seeding shaft on or off.

If an electric fan is installed it will start running automatically. The seeding shaft will not start turning until after the electric fan is running.



If the seeding shaft is activated, the triangle top left on the button lights up green – at deactivation it is grayed-out.



Use this button to switch the electric fan on or off. If an electric fan is not installed this button is suppressed.



If the fan is activated, the triangle top right on the button lights up green – at deactivation it is grayed out.



Use this button to start pre-metering.

Press and hold the button and the seeding shaft will rotate at the forward speed set in the pre-metering menu. When the button is released, the current forward speed will be used again to regulate the seeding shaft.

This enables you to avoid gaps in the seeded area at the beginning of the field or at standstill on the field.



With the 100% button, the spread rate can be reset to the value determined in the calibration test.

In the basic settings (see point 5.2), if the implement type PS TWIN is selected, an extended work menu will be available. This is described in point 7.1.1.

### Description of display elements



Display of the currently selected seed type, including the number in the seed library.



Display of the currently set change of the spread rate.



Yellow-brown: According to the fill level sensor, the hopper is full.



Red: According to the fill level sensor, the hopper is empty. Settings for the fill level sensor are described in point 6.3.2.



Display of the currently set spread rate.

**NOTE:** In order to display a value, a valid calibration test must have been performed beforehand.



Display of current seeding shaft speed in %.

If the seeding shaft is switched off, STOP is displayed and the frame turns red. If the required seeding shaft speed cannot be reached, the bar turns yellow and an alarm is sounded (see point 7 for error messages).

If the seeding shaft is blocked (implement is lifted or forward speed is 0), the frame turns orange.



Display of the calculated remaining area / remaining distance that is still possible.

For calculation, the fill quantity of the hopper must be entered in the Set menu (see point 6.3.2).

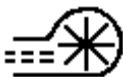


Display of the current forward speed.

The black mark shows the forward speed that was set in the calibration test. If the forward speed becomes too high or too low, so that the required speed for the seeding shaft can no longer be maintained, the bar turns red and an alarm is sounded (see point 7 for controller messages).



Display of the sown area and the quantity of the respective seed type that has been sown.



Display of the current fan speed.

The black mark shows the set speed.

When using an electric fan, the speed is displayed in %. When using a hydraulic fan, the speed is displayed in rpm.

If the set speed limits are exceeded or underranged, the bar turns red and an alarm is output (see point 7 for controller messages).

Detailed information for setting the fan speed or the speed limits is provided in point 6.3.8.

### 6.3 SET MENU



Figure 10

## Description of button functions



Pre-metering menu: Here, in addition to setting the pre-metering speed, you can also specify whether and for how long automatic pre-metering should be performed. The Pre-metering menu is described in more detail in point 6.3.5.



Task Controller menu: Here, all settings for the Task Controller such as mounting the implement, axle, and seeding rail distances as well as switch-on / switch-off times can be entered.

The Task Controller menu is described in more detail in point 6.3.6.



Use the ESC button to go back one menu level, in this case, to the Start menu.



Empty hopper menu: Here the hopper(s) can be emptied.

The Empty hopper menu is described in more detail in point 6.3.7.



Seed library: Here, a seed type that is already saved can be selected or a new seed type can be created.

The seed library is described in more detail in point 6.3.1.



Fan menu: Use this menu to set the rotational speed of the electric fan. When using a hydraulic fan with speed sensor, the alarm limits can be set here.

The Fan menu is described in more detail in point 6.3.8.



Fill menu: The fill quantity can be entered here. This can be used to calculate the possible remaining distance/area and display this information in the Work menu.

The Fill menu is described in more detail in point 6.3.2.



Calibration menu: In the Calibration menu, in addition to the desired spread rate, the forward speed, the working width, the seeding shaft that is used and the desired calibration time are set. Subsequently, the correct seeding shaft speed is determined. The calibration test is always performed for the currently set seed type.

The Calibration menu is described in more detail in point 6.3.3.



Tractor settings menu: Use this menu to select the source for the forward speed and to calibrate the working position. In addition, a signal when changing the working position can be selected and deselected.

The Tractor settings menu is described in more detail in point 6.3.4.

### 6.3.1 SEED LIBRARY

In this menu all of the saved seed types are listed. Seed types can be created and saved by means of a calibration test, see point 6.3.3.2).

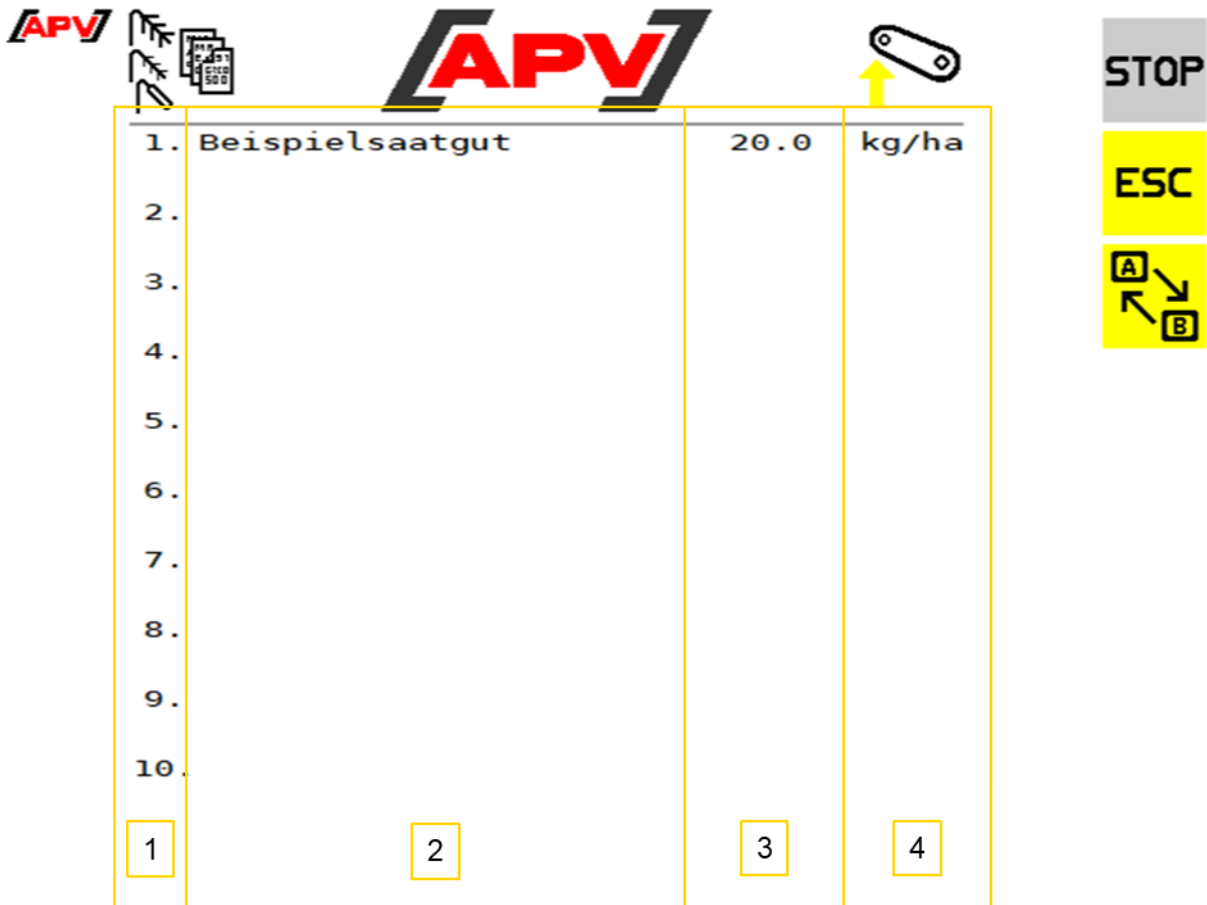


Figure 11

### Description of button functions

**ESC**

Use the ESC button to go back one menu level; in this case, to the Start menu.

### Description of display elements

1

Memory location

2

Seed type name

3

Spread rate

4

Unit (kg/ha, seeds/m<sup>2</sup>, l/ha)

### 6.3.1.1 SEED MENU

In this menu, all set parameters that were saved at last use of the seed type are displayed.

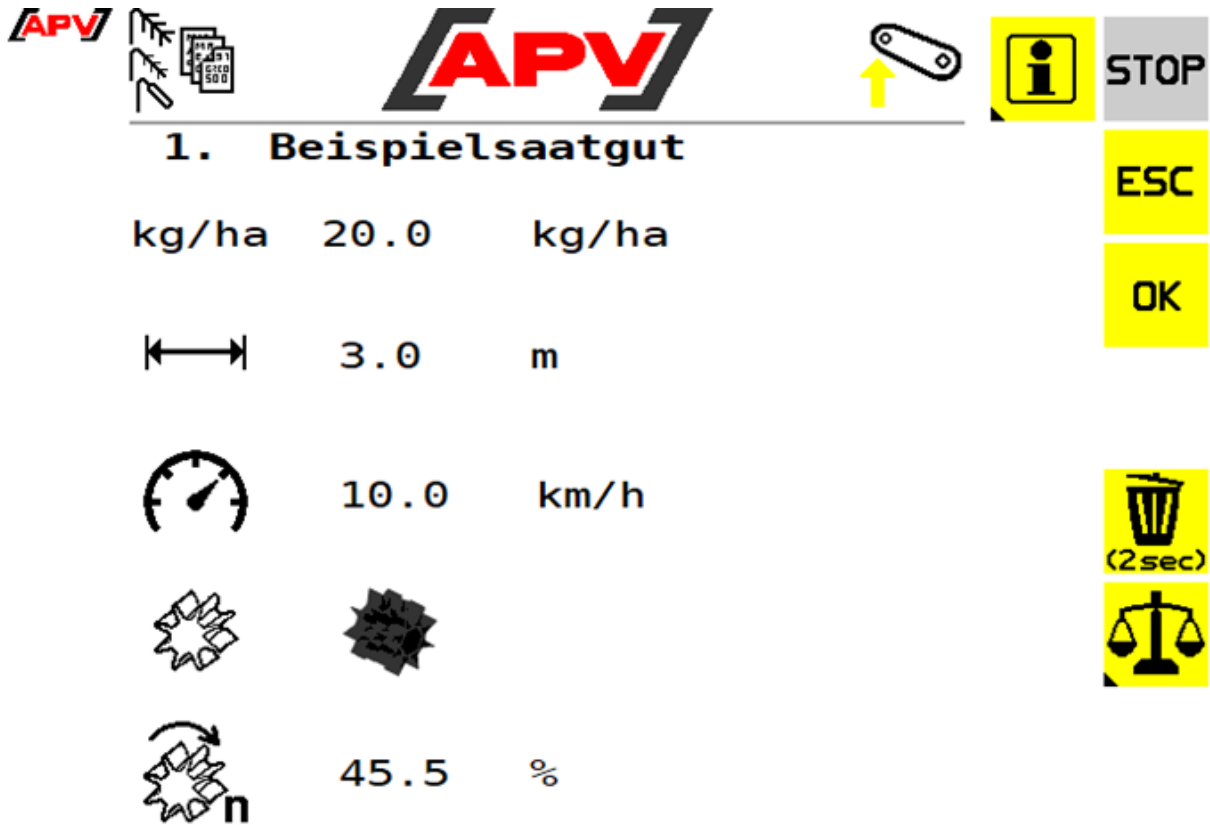


Figure 12

#### Description of button functions



Use this button to go to the Seed info menu. This is where the sown area, hours, spread quantity and area output are displayed.  
The Seed info menu is described in more detail in point 6.3.1.2.



Use the ESC button to go back one menu level, in this case, to the seed library.



Use the OK button to apply the seed type and go to the Work menu.  
The Work menu is described in more detail in point 6.2.



Press and hold this button for two seconds to delete the seed type and go to the seed library.  
The seed library is described in more detail in point 6.3.1.



Use this button to go to the Calibration menu. This is where the parameters can be changed and a new calibration test can be performed.  
The Calibration menu is described in more detail in point 6.3.3.



## Description of display elements



Display of the number and the seed type name.

**kg/ha**

Display of the spread rate in kg/ha or seeds/m<sup>2</sup>.



Display of the working width of the implement.



Display of the working speed.



Display of the seeding shaft that is used.



Display of the calculated seeding shaft speed in %.

### 6.3.1.2 SEED INFO MENU

This menu shows seed type-specific trip counters and total counters.

**APV** **[APV]**

---

**1 . Beispielsaatgut**

**Tageszähler**

	0.00	ha
	0.00	h
	0.00	ha/h

**Summenzähler**

	0.00	ha
	0.00	h
	0.00	ha/h

**STOP**

**ESC**

**1**  
(2sec)

Figure 13

## Description of button functions



Use the ESC button to go back one menu level, in this case to the Seed menu.



Use the Delete button to reset the trip counter to 0.

### Description of display elements

#### Tageszähler



0.00	ha	Display of the trip counter.
0.00	h	The trip counter can be reset by pressing and holding the Delete button (for 2 seconds).
0.00	ha/h	

#### Summenzähler



0.00	ha	Display of the total counter.
0.00	h	The total counter can only be set to 0 by deleting the seed type.
0.00	ha/h	

### 6.3.2 FILL MENU

This is where the actual hopper fill level can be entered. This is the basis for the calculated possible remaining distance / remaining quantity that is displayed in the Work menu (see point 6.2).

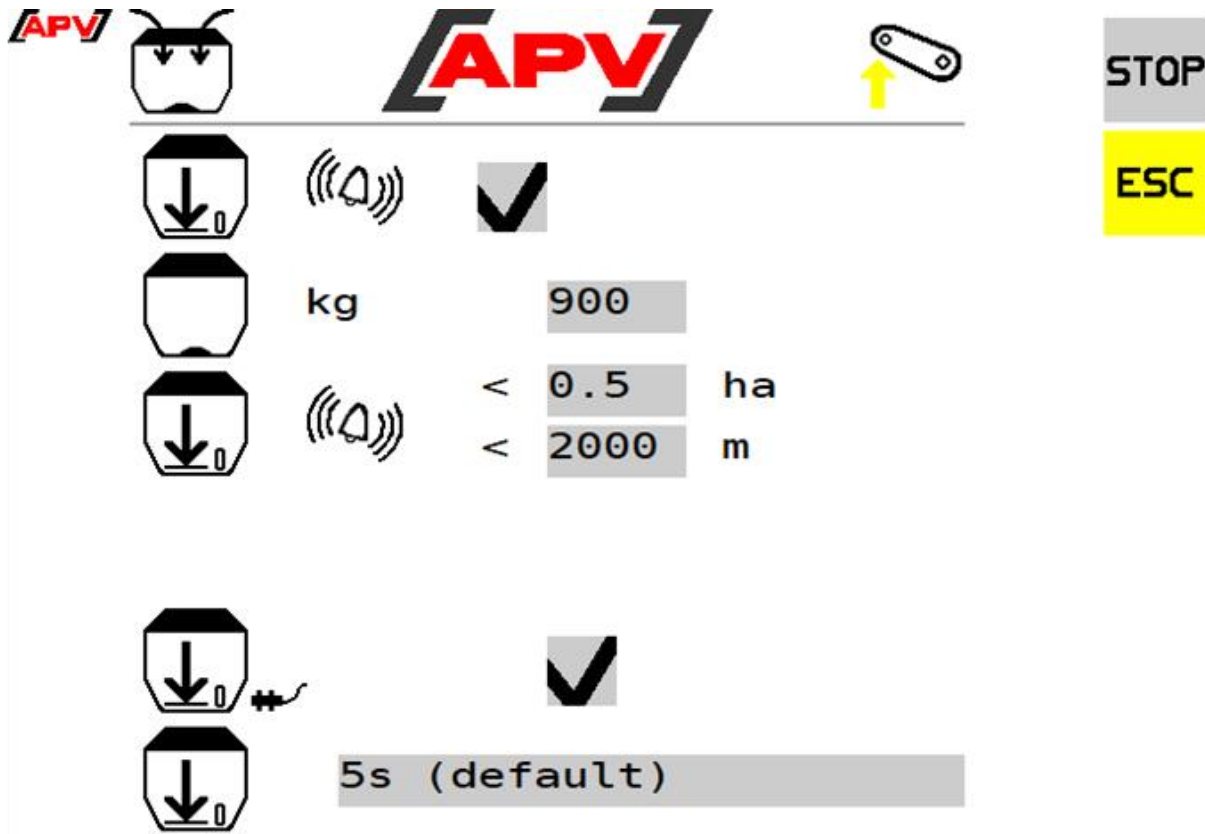


Figure 14

### Description of button functions

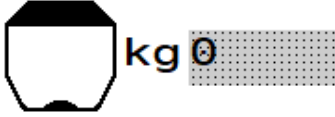


Use the ESC button to go back one menu level; in this case, to the Start menu.

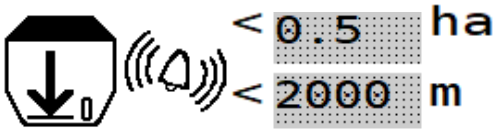
## Description of display elements



This is where calculation of the remaining area/distance can be switched on and off.



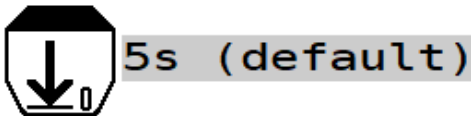
Here, the current fill quantity of the hopper can be entered or displayed.



Here, you can set the calculated still possible remaining area/distance at which the fill level message should appear.



This is where output of the warning of the fill level sensor can be activated or deactivated.



This is where the delay of the fill level sensor message can be set, after which the sensor is no longer covered with seed.

### 6.3.3 CALIBRATION MENU

Use this menu to enter the parameters required for the calibration test.

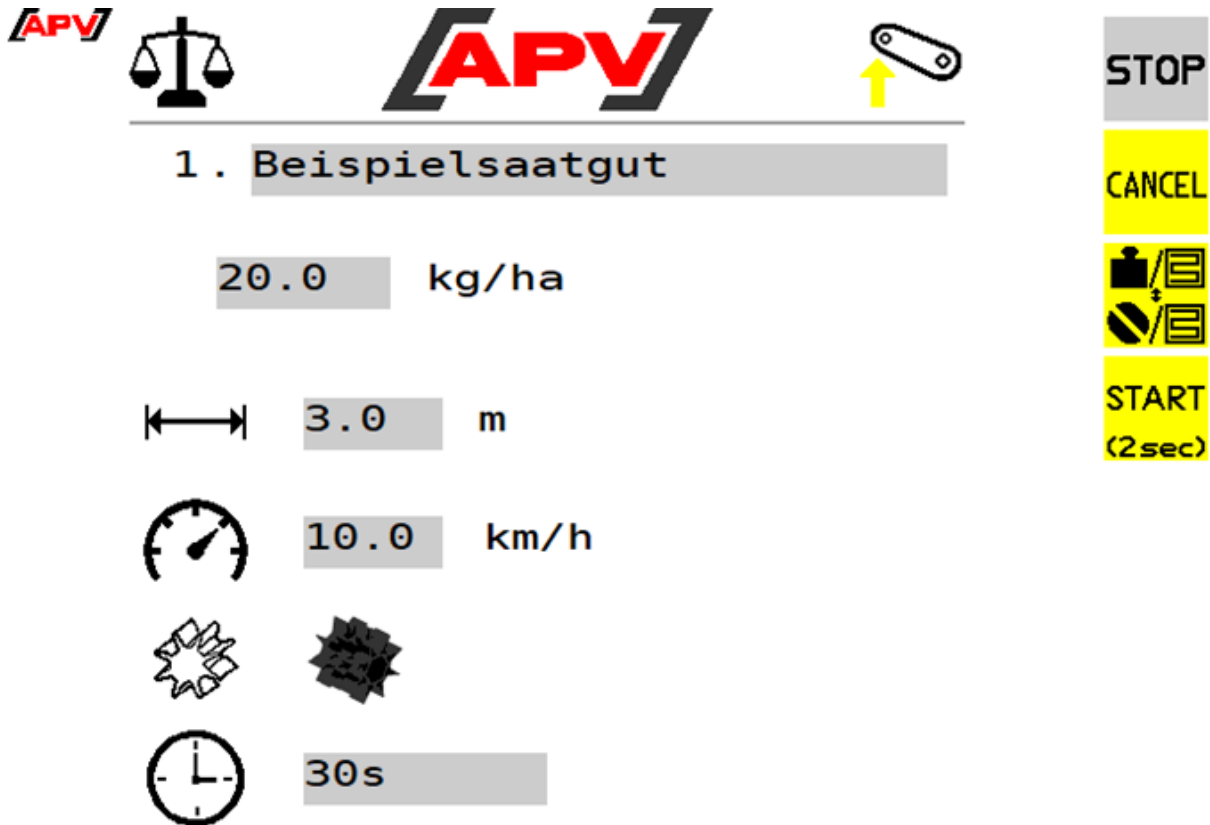


Figure 15

## Description of button functions

CANCEL

Use this button to go back one menu level. Either to the Set menu, the seed library or the Seed menu, depending on the point from which you entered the Calibration menu.



Here, you can select whether the calibration test will be performed in kg/ha or seeds/m<sup>2</sup>.

START  
(2sec)

Press and hold the Start button (for 2 seconds), to start the calibration test.

## Description of display elements

### 1. Beispielsaatgut

This is where the current number in the seed library as well as the name of the seed type are shown. If a name has not yet been assigned, the seed type can be named or renamed here.

20.0 kg/ha

This is where the desired spread rate in kg/ha is set.

Körner /m<sup>2</sup>    Tausend-    Keim-    Soll-  
                  korngew.    fähigk.    ausbring-  
  menge

100 K X 19.0 g / 95 % = 20.0 kg/ha

If you want to perform the calibration test in seeds/m<sup>2</sup>, you must set the desired number of grains per square meter, the thousand grain weight, and the germination capacity.

3.0 m

This is where the working width of the mounted implement is set.

**Note:** Subtract any overlaps from the working width!



10.0 km/h

This is where the forward speed is set. If you are working with a speed sensor, the average working speed is entered.



This is where seeding shaft that is used is set. This is saved in the seed library along with the seed type.

When calling up the seed type again, ensure that the stored seeding shaft is used again; if not, the calibration test must be repeated.



1min

This is where the desired calibration time (0.5 min, 1 min or 2 min) or area (1/40 ha, 1/20 ha, 1/10 ha) can be set. When selecting an area the calibration time will be automatically calculated and displayed.

When using a Calibration button (available as an accessory), this menu item is suppressed.

## CAUTION!

If values are changed in the Calibration menu, a new calibration test must be performed.

## TIP!

For small seed types (e.g. canola, phacelia, poppy, etc.), a calibration time of 2 minutes is recommended. For larger seed types (e.g. wheat, barley, peas etc.), a calibration time of 0.5 minutes is sufficient.

If implement type PS TWIN is selected in the Basic settings menu (see point 5.2), then in addition the information specified in point 7.2.1 must be complied with.

If implement type LF600 is selected in the basic settings (see point 5.2), then a calibration test is not required. In this case, proceed as specified in point 8.

### 6.3.3.1 CALIBRATION TEST RESULTS PAGE



Figure 16

#### Description of display elements



This is where the calculated spread rate is displayed.



This is where the determined weight of the calibrated seed is entered.



This is where the calculated minimum and maximum working speed are shown.

### 6.3.3.2 PERFORMING A CALIBRATION TEST

With the calibration test, the suitable seeding shaft speed is determined for the selected settings (see point 6.3.3).



#### NOTE!

**A proper calibration test is important, as it is the only way to ensure that your desired spread rate is achieved.**

The calibration test must be performed as follows:

1. Press the Calibration button (see Figure 17). The button is provided directly in the Set menu or in the Seed menu when selecting a seed type.
2. Enter the settings described in point 6.3.3.
3. The hopper must be filled with a sufficient quantity of seed.



Figure 17: Calibration button



#### CAUTION!

**Ensure that there is enough seed in the seeder hopper for the calibration test. The results would be falsified if the hopper runs out of seed during the calibration test.**

4. The calibration lid of the seeder is removed and a calibration bag or a suitable container is placed on the seeder (in this case, proceed as specified in the operating manual for the seeder).
5. Press and hold the Start button for 2 seconds (see point 6.3.3) – this automatically displays the calibration test results page (see point 6.3.3.1).
6. Without Calibration button: The seeding shaft starts rotating, the calculated spread rate (see 6.3.3.1) starts counting up.

#### With Calibration button:

- The controller waits until the Calibration button is activated. The message "Activate Calibration button!" appears on the screen.
  - The Calibration button is activated at least long enough that the calculated quantity is greater than 0.2 kg. If this weight is not reached, the following message appears: "Low calibration quantity. Longer calibration time recommended!" . In this case, the calibration test can be resumed by pressing the Calibration button again.
  - When the Calibration button is pressed, the seeding shaft starts rotating and the calculated spread rate (see point 6.3.3.1) starts counting up.
7. Calculation of the spread rate will be stopped automatically as soon as the set calibration time has elapsed or the Calibration button is released.
  8. The calibrated seed will be weighed and the determined weight is entered in the grayed-out input field in the Calibration test results page (see point 6.3.3.1).



#### CAUTION!

**The weight of the calibration bag or calibration box must be subtracted!**

9. After entry, the message "Calibration successful, confirm calibration test with the "OK button" will be displayed; confirm with the OK button.

This calibrates the seeding shaft to the entered values. The control box then calculates the seeding shaft speed resulting from the settings and the entered weight as well as the minimum and maximum working speed.

If the calculated seeding shaft speed is within the possible motor speeds, the calibration test was successful.

If the message "Repeat calibration test" is output this means that the deviation between the calculated spread rate and the weight of the calibrated seed is greater than 20%.

**If this is the case, the calibration test must always be repeated to ensure a correct spread rate.** To do this, press the displayed Calibration button, the calibration test must be repeated as specified in point 6.3.3.2. Afterwards, the control box will automatically re-adjust the seeding shaft speed to counter the deviation.

If the calibration test is unsuccessful even after multiple repeats, see point 9 for the cause of the error.

10. After pressing the OK button, the seed data is displayed (see Figure 18, the display elements are explained in point 6.3.1.1). If the calibration test was successful, all of the settings are already saved at this time.
11. Confirm with the OK button to go to the Work menu. Press the ESC button to go to the seed library.

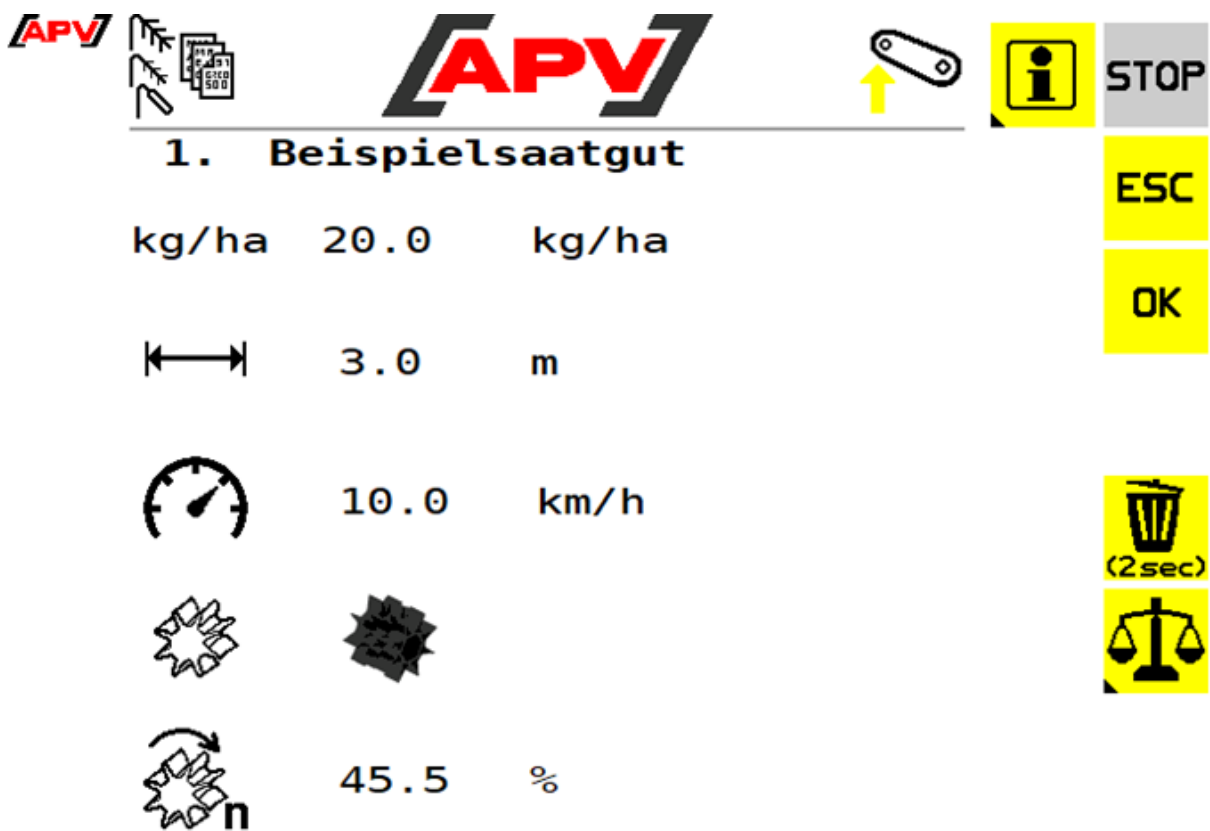


Figure 18



**NOTE!**

Any changes to the saved calibration parameters require a repeat of the calibration test.

### 6.3.4 TRACTOR SETTINGS MENU

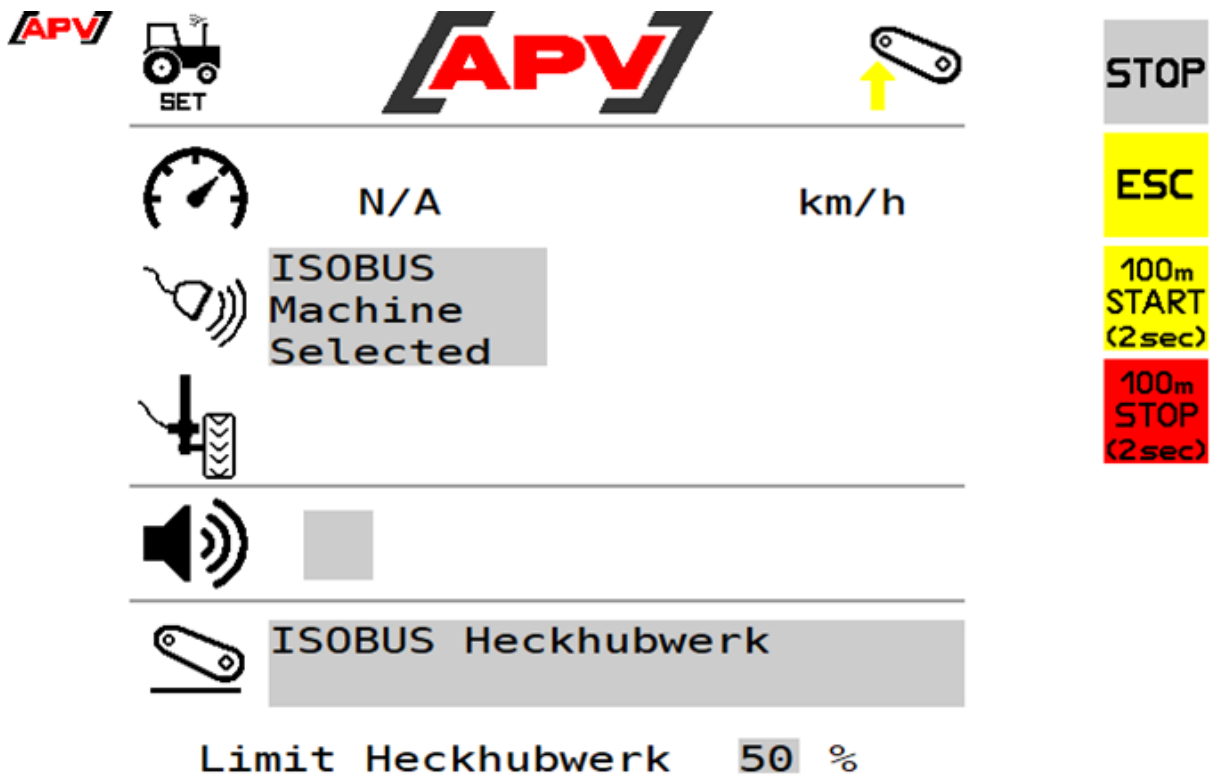


Figure 19

Use this menu to set the source of the forward speed and of the working position signal. External speed sensors (wheel sensor, radar sensor, GPS sensor) can also be calibrated. When using a speed sensor, it is necessary to calibrate the forward speed (except with the GPS sensor), since the seeding shaft speed is regulated based on the forward speed.

**CAUTION!**  
Note that all speed signals on ISOBUS are not available on every tractor.

#### Description of button functions

**ESC**

Use the ESC button to go back one menu level; in this case, to the Start menu.

**100m  
START  
(2sec)**

Press and hold this button (for 2 seconds) to start the 100-meter calibration. The following INFO appears: "Drive for 100 m, then press 100 m STOP". This button only appears when the speed source is set to external radar/GPS or external wheel.

**100m  
STOP  
(2sec)**

The 100 m Stop button appears as soon as the calibration has been started. Press this button (for 2 seconds) to end the 100-meter calibration and save the value. If the value is permitted, the message "Calibration successful, value accepted" appears; if not, the message "Calibration invalid, original value restored" appears.



## Description of display elements



Displays the currently measured forward speed.  
If "N/A" is displayed, the selected speed source is not available.



Displays the currently set speed source. The following parameters can be set:  
ISOBUS Machine Selected: The speed is adopted from the tractor. With this function, signals will be scanned in the following sequence and the most accurate available signal will be selected automatically (the sequence corresponds to signal accuracy): ISOBUS Ground Based, ISOBUS Wheel Based, and ISOBUS GNSS Based.

- ISOBUS Ground Based: The speed is adopted from the tractor. The actual speed is used for this purpose, usually from a radar sensor.
- ISOBUS Wheel Based: The speed is adopted from the tractor. The theoretical speed from the gearbox is used for this purpose.
- ISOBUS GNSS Based: The speed is adopted from the tractor. The determined speed of a GNSS signal is used for this purpose.
- External radar/GPS: The speed is taken from a radar or GPS sensor, which is installed on the implement, for this purpose.
- External wheel: The speed is taken from a wheel sensor, which is installed on the implement for this purpose
- Simulated: The speed is adopted from the speed set in the calibration test.



Displays the current calibration value for the wheel sensor, radar sensor or GPS sensor. This symbol only appears when the speed source is set to external radar/GPS or external wheel.



Shows whether an acoustic signal is activated when the working position is changed.



Shows the current working position source. The following parameters can be set:

- ISOBUS rear linkage: The working position signal is adopted from the tractor.
- External: The working position signal is taken from a working position sensor that is installed on the implement.
- External inverted: The working position signal is taken from a working position sensor that is installed on the implement. In this process the input is inverted.
- Not available/OFF: A working position signal is not available. The working position is always assumed to be "In operation".

**Limit Heckhubwerk** **50** % This is where you can set the linkage position, above which the mounted implement will be switched to "Working position" or "Lifted". This display only appears if the working position source is set to ISOBUS rear linkage.

### 6.3.4.1 PERFORMING CALIBRATION

There are two methods for calibrating the speed signal of the sensors:

- Manual calibration.
- Automatic calibration over a traveled distance of 100 meters.

## Manual calibration

If the pulses per 100 meters are known for the respective sensor, this value can be directly entered under the calibration value symbol.



Figure 20: calibration value

## Automatic calibration

With automatic calibration, the calibration value is determined automatically while driving a distance of 100 meters.

The procedure is as follows:

1. A straight distance of 100 meters is measured. The beginning and end of this distance are marked.
2. The tractor is positioned precisely at the beginning mark, e.g. the front axle is exactly over the mark.
3. Select the Tractor settings menu.
4. Press the 100 m Start button and hold it for 2 seconds.
5. As soon as the message "Drive 100 m, then press 100 m STOP" appears, start driving. The controller now counts the pulses coming from the sensor.
6. Drive the tractor to the end mark, e.g. once more with the front axle precisely over the mark.
7. As soon as the tractor comes to a stop, the 100 m Stop button is pressed and held for 2 seconds.



Figure 21: Tractor settings menu



Figure 22: 100 m Start button



Figure 23: 100 m Stop button

If the calibration was successful, the message "Calibration successful, value accepted" will be displayed. The calibration value is now saved.

If the calibration was not successful, the message "Calibration invalid, original value restored" is shown and the original value is set (see point 7 for possible causes of error).

8. The calibration must be tested by driving the tractor over a distance and comparing the speed displayed on the Control Box with that of the tractor. If the speeds do not match, the calibration test must be repeated.

## 6.3.5 PRE-METERING MENU

Use this menu to enter the settings for pre-metering. For pre-metering, as soon as a speed of 0.1 km/h or faster is reached, the set speed for regulating the seeding shaft will be used. This enables you to avoid gaps in the seeded area at the beginning of the field or at standstill on the field.

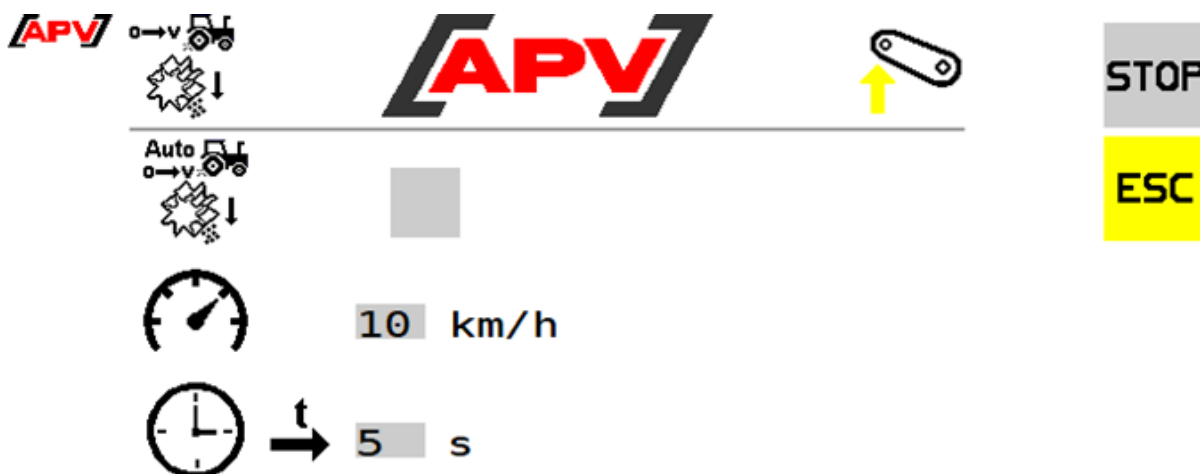


Figure 24

## Description of button functions

**ESC**

Use the ESC button to confirm entries and go back one menu level; in this case, to the Set menu.

## Description of display elements



This is where automatic pre-metering can be activated. When it is activated, every time the implement is lowered at the beginning of the field (at transition of the implement into working position), pre-metering will be started with the set speed for the set duration.



**10** km/h

This is where the speed at which pre-metering should be performed is set. This speed is also used for manual pre-metering.



**5** s

This is where the time during which automatic pre-metering should run is set.

### 6.3.6 TASK CONTROLLER MENU

The settings required for the Task Controller differ depending on the set Connector Type.



#### **CAUTION!**

The tractor settings must always be complied with.



#### **NOTE!**

If there is no valid calibration test, TC mode cannot be used.

### 6.3.6.1 TASK CONTROLLER MENU FOR MOUNTED IMPLEMENTS

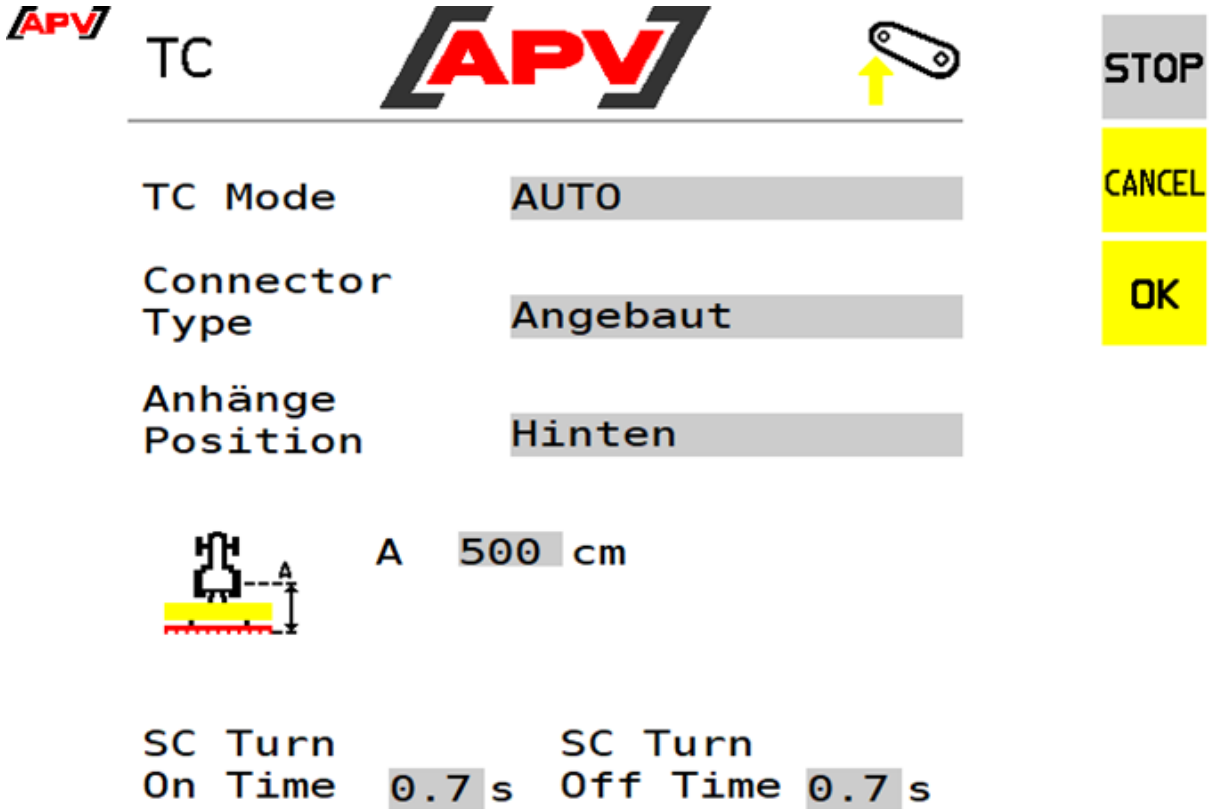


Figure 25

#### Description of button functions

**CANCEL** Use the CANCEL button to discard the values and go back one menu level; in this case, to the Set menu.

**OK** Use the OK button to apply the set value.

#### Description of display elements

**TC Mode** This is where the desired mode can be set. The choices are ON, OFF or AUTO.

**Connector Type** This is where the implement connection to the tractor can be set.

**Anhänge Position** If the implement is "mounted", a selection can still be made as to whether it is mounted on the rear "Rear" or on the front "Front".

**A 500 cm** This is where the horizontal distance (A) from the reference point of the tractor to the seeding rail is entered. For a rigidly mounted implement, the reference point is the center-point of the lower link hook.

SC Turn  
On Time

This is where the time is entered that the seed requires to reach the soil after the seeding shaft is switched on. As a result, the implement can be switched on precisely at the field boundaries.

SC Turn  
Off Time

This is where the time is entered that the remaining seed requires to reach the soil after the seeding shaft is switched off. As a result, the implement can be switched off precisely at the field boundaries.

If implement type PS TWIN is selected in the basic settings (see point 5.2), an extended Task Controller menu is available. This is described in point 7.1.2.

### 6.3.6.2 TASK CONTROLLER MENU FOR TOWED IMPLEMENTS

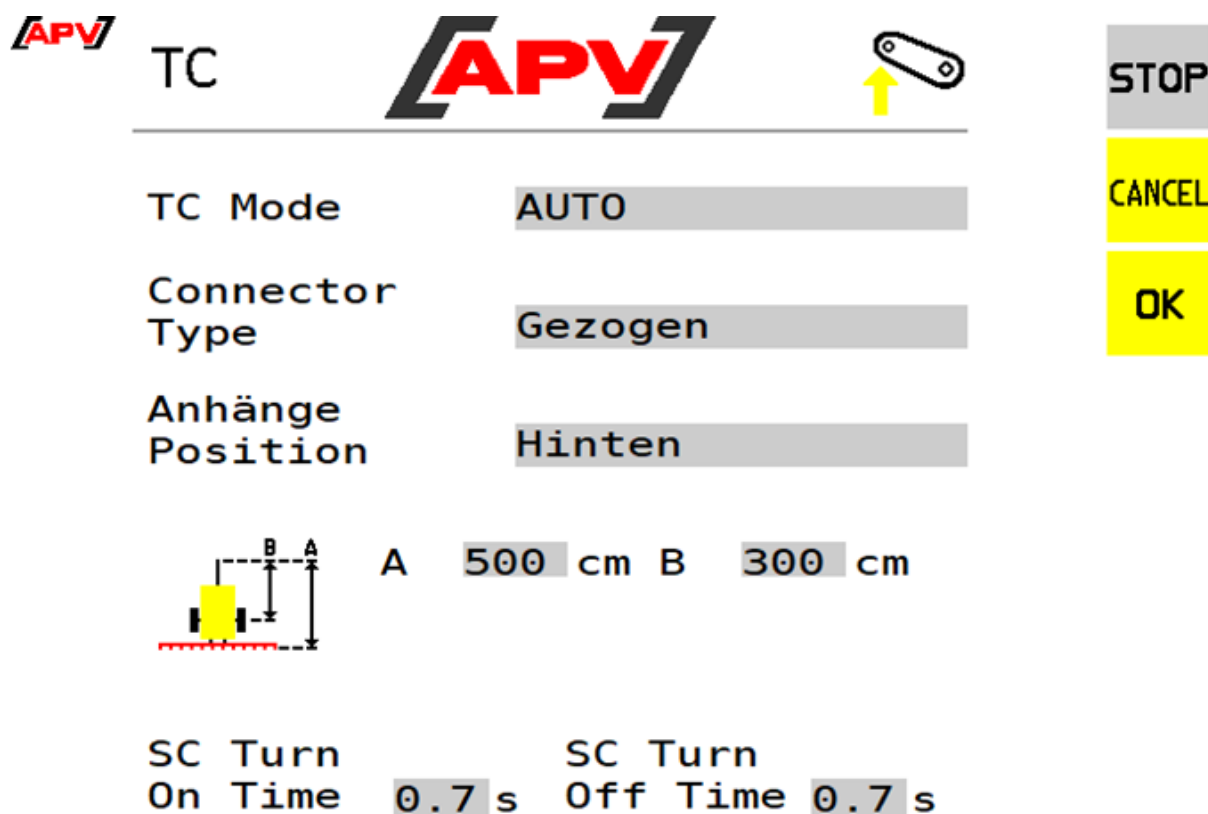
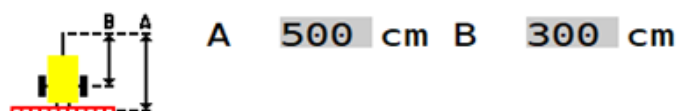


Figure 26

#### Description of button functions

The functions correspond to the button functions for mounted implements (see 6.3.6.1).

#### Description of display elements



This is where the horizontal distance (A) from the reference point of the tractor to the trailer axle and the horizontal distance (B) from the reference point of the tractor to the seeding rail are entered. For a towing coupling attachment, the reference point of a towed implement is the center point of the towing coupling pin; for a ball-head attachment, it is the center point of the ball head or of the lower link.

All other elements correspond to the display elements for mounted implements (see 6.3.6.1).

If implement type PS TWIN is selected in the basic settings (see point 5.2), an extended Task Controller menu is available. This is described in point 7.1.2.

### 6.3.7 EMPTY HOPPER

Use this menu to empty the residual seed out of the hopper.

**CAUTION!**  
**CAUTION: Before emptying, the calibration lid must be removed and the calibration bag must be attached (see operating manual for the seeder).**



Figure 27

#### Description of button functions



Use the STOP button to terminate emptying; the screen remains displayed.



Use the ESC button to terminate emptying and automatically go back one menu level; in this case, to the Set menu.



If this button is pressed and held for 2 seconds, the emptying procedure is started and the seeding shaft rotates at 100%.

If in the basic settings (see point 5.2) the implement type PS TWIN is selected, an extended Empty hopper menu is available. This is described in point 6.3.7.

#### Description of display elements

Entleeren läuft!



Indicates that the emptying procedure has been started.

If your implement is additionally equipped with a Calibration button, the message "Activate Calibration button!" appears. If the Calibration button is then activated, the seeding shaft rotates at full speed.

## 6.3.8 FAN MENU

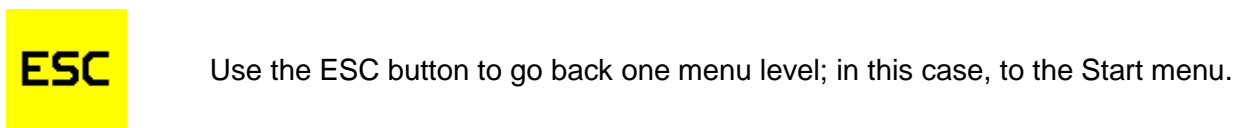
### 6.3.8.1 ELECTRIC FAN / ELECTRIC FAN PLUS

Use this menu to set the rotational speed of the electric fan.

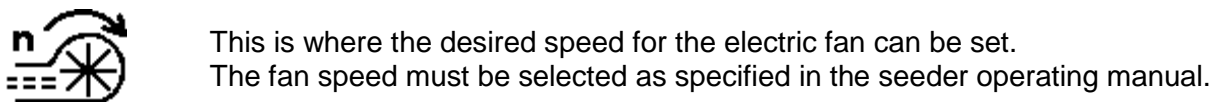


Figure 28

#### Description of button functions



#### Description of display elements



### 6.3.8.2 HYDRAULIC FAN

Use this menu to enter various settings for the hydraulic fan. The number of pulses from the speed sensor and the speed limits for the hydraulic fan can be set.

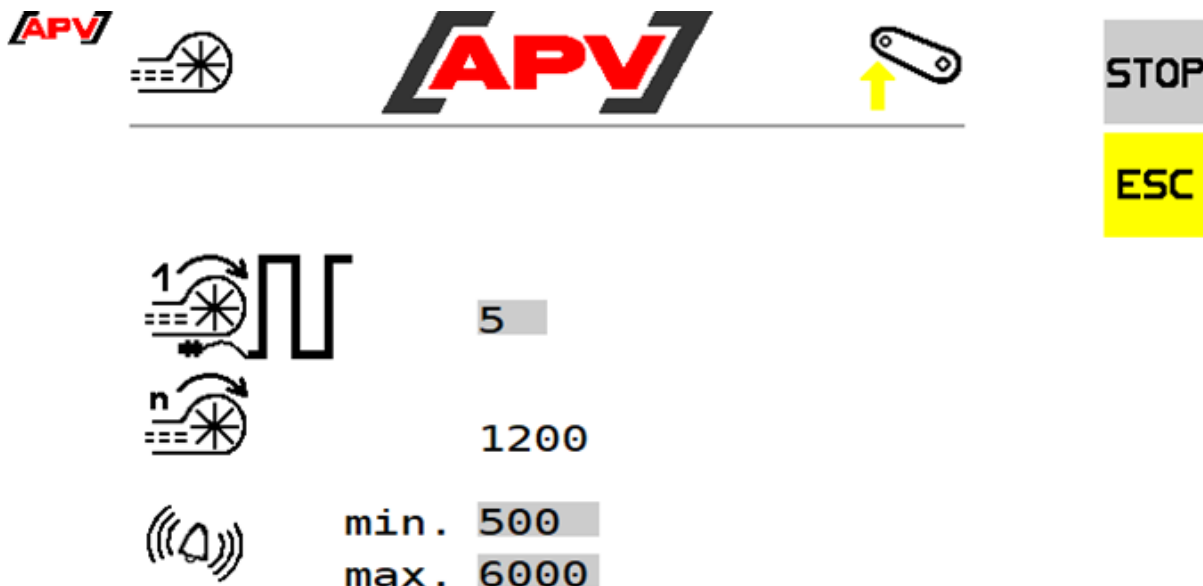


Figure 29

## Description of button functions

**ESC**

Use the ESC button to go back one menu level; in this case, to the Start menu.

## Description of display elements

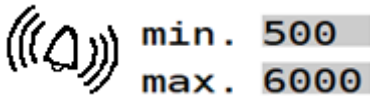


This is where the number of pulses sent by the fan speed sensor per revolution can be set. The number of pulses must be selected as specified in the conversion instructions for the sensor.

The default value is 5 pulses per revolution. More precise information in this regard is provided in the operating manual / conversion instructions of the respective seeder.



Display of the current fan speed.



This is where the speed and the alarm limits for the hydraulic fan can be set.

If you enter 0 revolutions per minute for "min." the error message "Fan speed too low" will be deactivated.

**NOTE:** The speed itself can only be adjusted through the oil quantity, directly on the tractor or on the hydraulic block of the seeder! Here, you must proceed as specified in the seeder operating manual.



## 6.4 INFO MENU

Use this menu to display 3 different trip counters and a total counter. The trip counters can be reset individually.

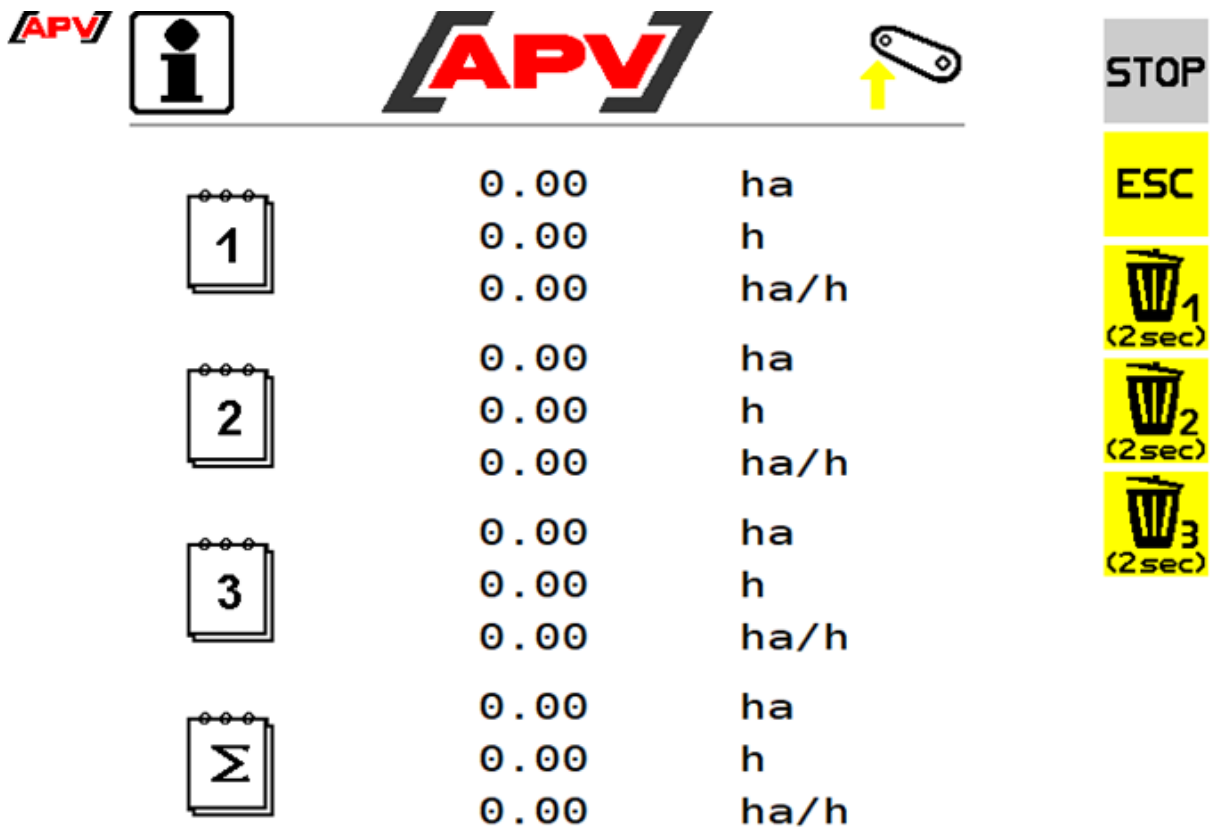


Figure 30

### Description of button functions



Use the ESC button to go back one menu level; in this case, to the Start menu.



Press and hold the Delete button for 2 seconds to reset the respective day counter to 0.

### Description of display elements



The trip counters show the worked area, the operating hours, and the area output since the last reset.



The total counter shows the total worked area, the total operating hours, and the average area output of the Control Box.



### TIP!

For example, the trip counters can be used for the respective field, day or the respective year.

## 6.5 DIAGNOSTIC MENU

Use this menu to display all of the important information for customer service. This includes the switching states of the sensors, the supply voltage and the current draw of the motors.

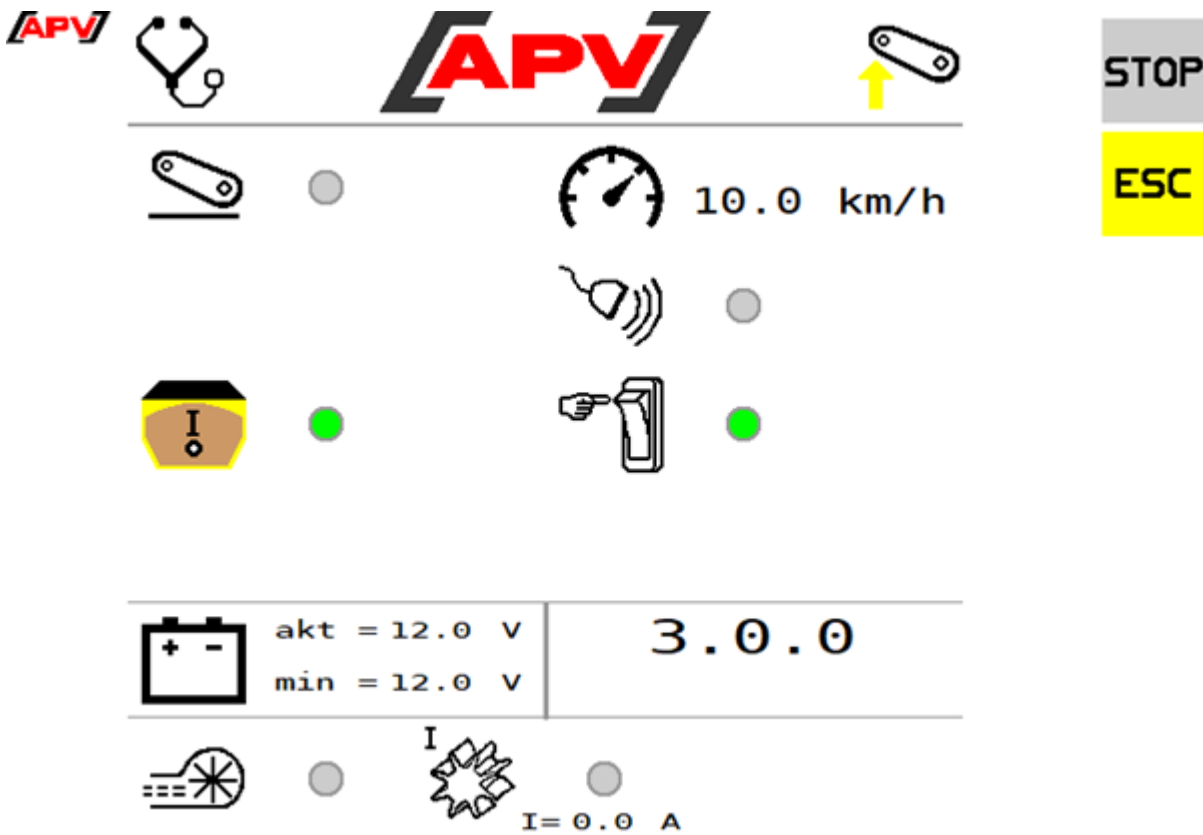


Figure 31

### Description of button functions



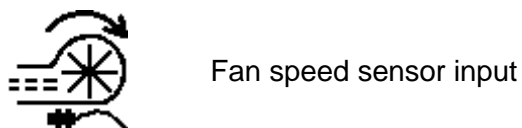
Use the ESC button to go back one menu level; in this case, to the Start menu.

### Description of display elements

Switching states of the individual sensors:



Linkage sensor input



Fan speed sensor input



Fill level sensor input



Calibration button input

Information concerning the speed sensors:



Current forward speed.  
If "N/A" is displayed the selected speed source is not available.



If a wheel sensor, radar sensor or GPS sensor input is used to determine the forward speed, this menu item will be shown in green.

Measured voltage and the currents:



akt = 12.0 V  
min = 12.0 V

This is where the supply voltage measured on the control box and the minimum supply voltage since start are displayed.



I = 0.0 A

This is where the current of the seeding shaft motor measured by the control box is displayed. For the PS TWIN implement type, two displays are shown here.

## 7 SPECIAL FEATURES PS TWIN

If a PS TWIN is configured, one seed type with two sections next to each other as well as two seed types with the same working width can be spread one after the other. This is set in the Basic settings menu with the display element "Number of seed types to spread" (see point 5.2).

### 7.1 SPREADING TWO SEED TYPES

If in the Basic settings menu, in the display element, "Number of seed types to spread", "2" is selected, then two seed types will be ready for configuration in the Work menu.

Ensure that the same working width is entered here for both seed types. If this is not the case, the message "Inconsistent working widths!" will be output.

If in spite of the message the settings are not changed, then the larger entered working width will be assumed automatically for both seed types and will be used to spread the seed. Greater differences can result in the situation that the metering unit will be operated outside of controlled operation!

#### 7.1.1 WORK MENU

The Work menu has already been described in point 6.2. This menu has been extended for the PS TWIN implement type. This point only provides descriptions of all changed or new buttons and their functions.

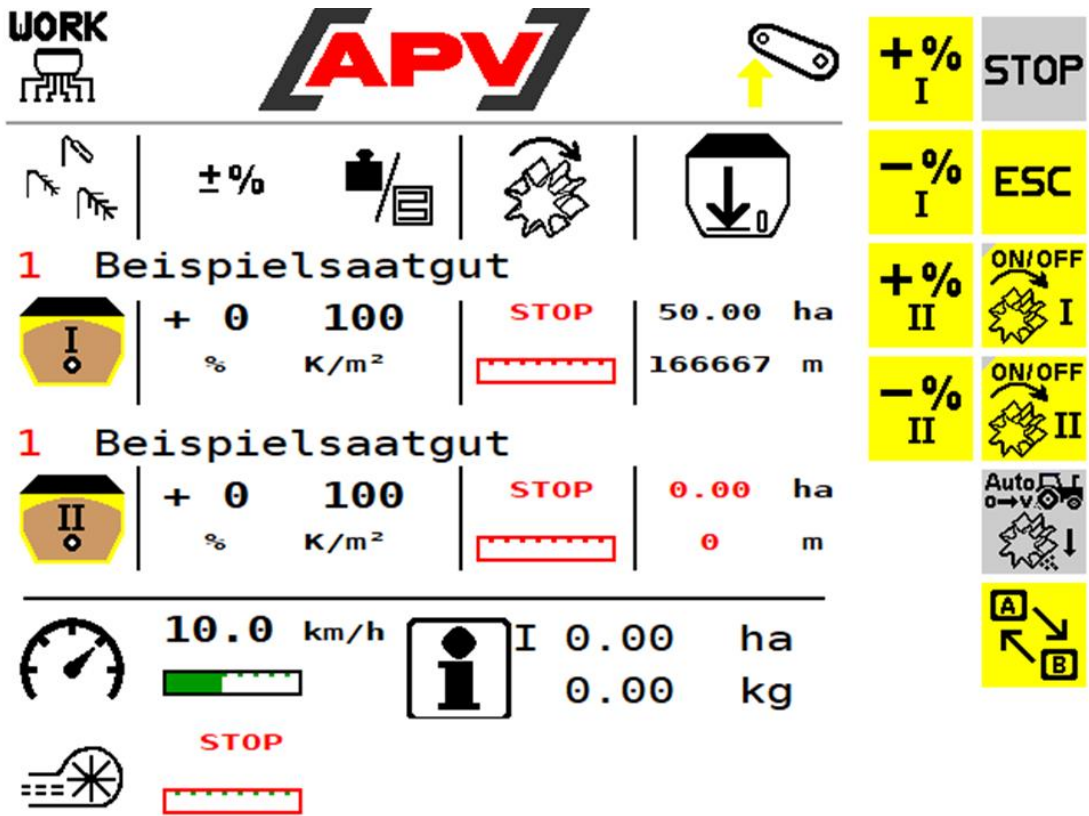
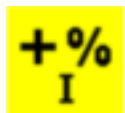
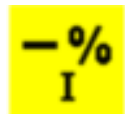
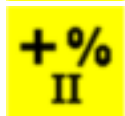


Figure 32

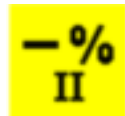
**Description of button functions**



Use the +% button to increase the spread rate of the respective seeding shaft in 5% increments to max. 95%, in operation.



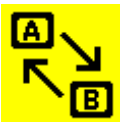
Use the % button to reduce the spread rate of the respective seeding shaft in 5% increments, to minimum 85%, in operation.



Use this button to switch the respective seeding shaft on or off. If an electric fan is installed it will start running automatically. Only thereafter will the respective seeding shaft start rotating.



If the respective seeding shaft is activated, the top left triangle on the button lights up green – at deactivation it is grayed-out.



Use this button to display the Info button, Fan button, and 100% button. Press the button again to return to the view shown in Figure 32.

100%

Use the 100% button to reset the spread rates of both seeding shafts to the value determined in the calibration test. (If both seed types have the same working width)

## 7.1.2 TASK CONTROLLER MENU

The Task Controller menu is described in point 6.3.6. This menu has been extended for the PS TWIN implement type. This point only provides descriptions of all changed buttons and their functions.

### 7.1.2.1 TASK CONTROLLER MENU FOR MOUNTED IMPLEMENTS

TC

APV

STOP

TC Mode AUTO

Connector Type Angebaut

Anhänge Position Hinten

AI 500 cm

AII 500 cm

SC Turn On Time 0.7 s

SC Turn Off Time 0.7 s

Figure 33

#### Description of display elements

AI 500 cm

AII 500 cm

This is where the horizontal distances (AI and AII) from the tractor reference point to the seeding rail are entered. For a rigidly mounted implement, the reference point is the center-point of the lower link hook.

### 7.1.2.2 TASK CONTROLLER MENU FOR TOWED IMPLEMENTS

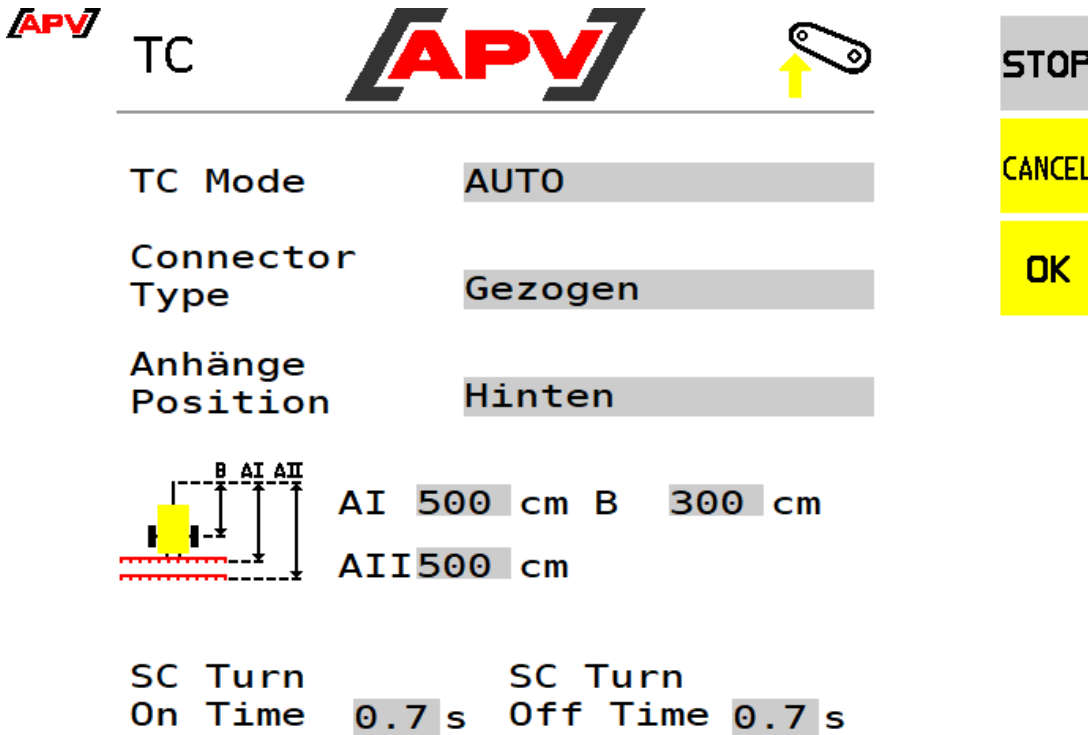
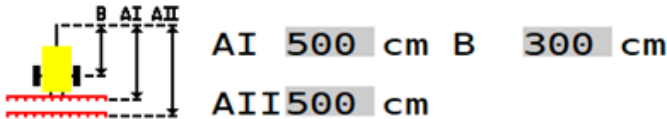


Figure 34

#### Description of display elements



This is where the horizontal distances (AI and AII) from the tractor reference point to the trailer axle and the horizontal distance (B) from the tractor reference point to the seed rail are entered. For a towing coupling attachment, the reference point for a towed implement is the center point of the towing coupling pin, for a ball-head attachment, it is the center point of the ball head or of the lower link.

## 7.2 SPREADING ONE SEED TYPE

If in the Basic settings menu, "1" is selected in the display element, "Number of seed types to spread", one seed type will be ready for configuration in the Work menu. Both seeding shafts will be displayed and they can be switched on and off separately.

Likewise, both sections can be switched on and off separately via the Task Controller. Information concerning the Task Controller menu is provided in point 6.3.6.

### 7.2.1 CALIBRATION MENU

For the calibration test, two working widths must be entered (each section individually). These working widths will be automatically added up for a total working width.



STOP

1. Beispielsaatgut

CANCEL

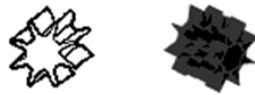
20.0 kg/ha



3.0 m 2.0 m

START  
(2sec)

10.0 km/h



30s

### 7.3 EMPTY HOPPER

The Empty hopper menu is described in point 6.3.7. This menu has been extended for the PS TWIN implement type. This point only provides descriptions of all changed buttons and their functions.



#### CAUTION!

Before emptying, the calibration lid must be removed and the calibration bag must be attached (see the PS TWIN operating manual).



STOP

ESC



Figure 35

## Description of button functions



If one of these buttons is pressed and held for 2 seconds, the emptying procedure is started for the respective seeding shaft and it rotates at 100%.

## 8 SPECIAL FEATURES OF THE LF600

The LF600 has a flow sensor, consequently calibration by means of a calibration test is not necessary. In the Seed detail page, the pump capacity utilization is displayed next to the set spread rate. The calculated minimum speed and maximum speed at the current settings are also displayed.

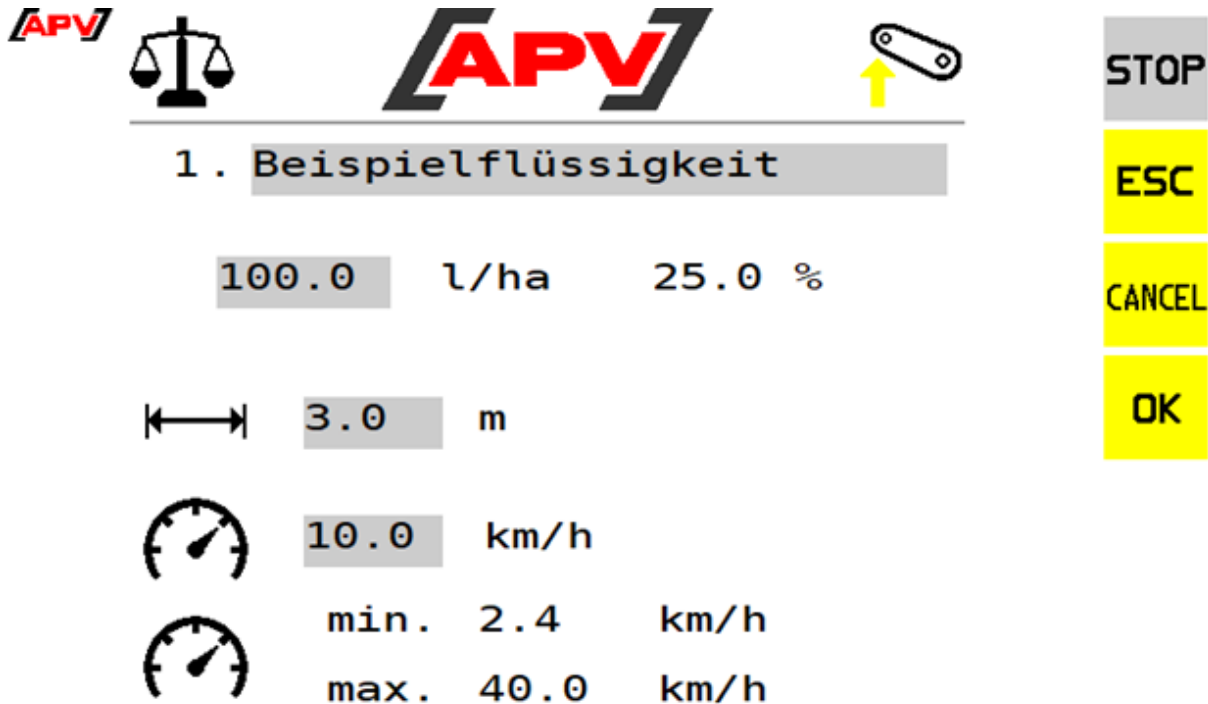


Figure 36

## 9 CONTROLLER MESSAGES

### 9.1 SUPPRESSING / ACKNOWLEDGING MESSAGES

An acknowledgement button appears simultaneously with a message, which can be used to suppress messages for a specific period of time:



Press the OK button to acknowledge/delete messages as soon as the error has been rectified.



Press the Snooze button to suppress messages. However, they will still be displayed in the status bar.

The Snooze button is not available for all messages, since a STOP of all actuators is performed if there are critical errors.



## 9.2 WARNINGS

Display	Cause	Solution
Battery voltage too low!	The supply voltage is below 10 V.	<ul style="list-style-type: none"> <li>• Minimize consumers (e.g. work floodlights).</li> <li>• Check battery.</li> <li>• Check cabling.</li> <li>• Check plug connectors.</li> <li>• Check alternator.</li> </ul>
Battery voltage too high!	The supply voltage is too high.	<ul style="list-style-type: none"> <li>• Check alternator.</li> </ul>
Hopper I/II almost empty!	Is displayed as soon as the fill level sensor is not covered with seed longer than the time set in point 6.3.2.	<ul style="list-style-type: none"> <li>• Refill seed</li> <li>• Adjust the sensor (position further downward).</li> <li>• Increase the delay time for the message.</li> </ul>
Metering drive out of control range!	The prescribed/required seeding shaft speed cannot be maintained.	<ul style="list-style-type: none"> <li>• Use larger/coarser seed wheels to reduce the speed.</li> <li>• Use smaller/finer seed wheels to increase the speed.</li> </ul>
Tractor speed too high!	The forward speed is too high and the seeding shaft can no longer readjust.	<ul style="list-style-type: none"> <li>• Reduce the forward speed.</li> <li>• Use larger/coarser seed wheels.</li> <li>• Use more seed wheels on each outlet.</li> <li>• Reduce spread rate.</li> </ul>
Tractor speed too low!	The forward speed is too low and the seeding shaft can no longer readjust.	<ul style="list-style-type: none"> <li>• Increase forward speed.</li> <li>• Use finer seed wheels.</li> <li>• Use fewer seed wheels on each outlet.</li> <li>• Increase the spread rate.</li> </ul>
Fan speed too high!	The speed of the hydraulic fan is higher than the high limit set in point 6.3.8.	<ul style="list-style-type: none"> <li>• Reduce the speed of the hydraulic fan.</li> <li>• Pulses per revolution parameter is set incorrectly, see point 6.3.8.</li> </ul>
ISOBUS working position signal not available!	The tractor does not make a valid working position signal available on the ISOBUS.	<ul style="list-style-type: none"> <li>• Check whether the signal is deactivated in the tractor settings.</li> <li>• Consult with the tractor manufacturer's customer service organization.</li> </ul>

### 9.3 WARNINGS – TC "AUTO" MODE

Warnings when the implement is in Task Controller AUTO mode:

Display	Cause	Solution
TC units inconsistent!	The units for the default values from the Task Controller do not match the expected units.	<ul style="list-style-type: none"> <li>TC units must be checked.</li> </ul>
TC default no longer available!	The TC default is no longer available on the tractor side.	<ul style="list-style-type: none"> <li>Check Task Controller.</li> </ul>
TC default is used!	The TC default is used, this serves only as information.	

### 9.4 ERRORS

Display	Cause	Solution
Operating voltage not OK!	<ul style="list-style-type: none"> <li>The supply voltage is below 8 V.</li> <li>Excessive voltage fluctuations.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize consumers (e.g. switch off the work floodlights).</li> <li>Check battery.</li> <li>Check cabling.</li> <li>Check plug connectors.</li> <li>Check alternator.</li> </ul>
Motor overloaded (seeding shaft I)! Motor overloaded (seeding shaft II)!	<ul style="list-style-type: none"> <li>A seed shaft is not able to rotate.</li> <li>The motor has been overloaded in the limit range for too long!</li> </ul>	<ul style="list-style-type: none"> <li>Switch off the control box!</li> <li>Remove any foreign objects or similar items from the seeding shaft or the agitator.</li> <li>Close the agitator (for well-flowing seed).</li> <li>Remove 1 to 3 spacing disks from the seeding shaft.</li> <li>Check the set motor type.</li> <li>In Idle, check the motor for proper function.</li> <li>See the operating manual for the seeder</li> </ul>
Error (fan)!	Only with electric fan: Is displayed when the implement cable is not connected or if the cabling is faulty.	<ul style="list-style-type: none"> <li>Check cabling.</li> <li>Check the plug connector on the motor module.</li> <li>Read the error message on the motor module (motor overloaded or motor not connected) and rectify the error as specified in the seeder operating manual.</li> </ul>

Display	Cause	Solution
Fan speed too low!	Only for hydraulic fan / external fan: <ul style="list-style-type: none"> <li>Seeding shaft I AND/OR II active.</li> <li>The fan speed is below the minimum speed.</li> </ul>	<ul style="list-style-type: none"> <li>Switch on the hydraulic fan.</li> <li>Increase the fan speed.</li> <li>Pulses per revolution parameter is set incorrectly, see point 6.3.8.2.</li> <li>The fan speed limit has been incorrectly set, see point 6.3.8.2.</li> </ul>
Motor not connected (seeding shaft I)! Motor not connected (seeding shaft II)!	Is displayed when the implement cable is not connected or if the cabling is faulty.	<ul style="list-style-type: none"> <li>Ensure that the implement cable is connected.</li> <li>Check cabling.</li> <li>Check plug connectors.</li> </ul>
No motor speed (seeding shaft)!	Current draw for the motor, but no feedback that it is rotating.	<ul style="list-style-type: none"> <li>Check terminal connections on the seeder (particularly the encoder ENC)</li> <li>Contact Customer Service.</li> </ul>

## 9.5 ERROR – TC MODE "ON"

If TC mode is switched on, the following messages are output as errors. As a result, all actuators will be switched off at these warnings.

Display	Cause	Solution
TC units inconsistent! Boom I TC units inconsistent! Boom II	The units for the default values from the Task Controller do not match the expected units.	<ul style="list-style-type: none"> <li>TC units must be checked.</li> </ul>
TC default no longer available I TC default no longer available II	The Task Controller must be used (TC mode: ON), but it is no longer available on the tractor side.	<ul style="list-style-type: none"> <li>Check Task Controller.</li> </ul>

## 10 PROBLEM SOLVING

Problem	Cause	Solution
The seeding shaft rotates when the implement is lifted!	<ul style="list-style-type: none"> <li>Wrong linkage signal.</li> <li>Linkage signal is not available on the ISOBUS.</li> </ul>	<ul style="list-style-type: none"> <li>Invert the linkage signal on the controller, see point 6.3.4.</li> <li>Reposition the linkage sensor.</li> </ul>
The seeding shaft does not rotate when the implement is in working position!	<ul style="list-style-type: none"> <li>Seeding shaft is not switched on.</li> <li>Forward speed is 0.</li> <li>No linkage signal.</li> </ul>	<ul style="list-style-type: none"> <li>Switch on the seeding shaft, the seeding shaft must be switched on manually one time at the beginning.</li> <li>Check the settings for the speed sensor – see point 6.3.4.</li> <li>Check speed sensor.</li> <li>Check linkage sensor.</li> </ul>

Problem	Cause	Solution
Fill level sensor installed, but does not signal!	<ul style="list-style-type: none"> <li>No signal from the fill level sensor.</li> <li>The fill level sensor is deactivated, see point 6.3.2.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust the sensitivity of the fill level sensor (via the screw on the rear side).</li> <li>Reposition fill level sensor.</li> <li>Check plug connectors and cable.</li> </ul>
Fill level sensor signals constantly!	<ul style="list-style-type: none"> <li>Wrong sensor settings.</li> <li>Wrong sensor position.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust the sensitivity of the fill level sensor (via the screw on the rear side).</li> <li>Reposition fill level sensor.</li> <li>Deactivate fill level sensor, see point 6.3.2.</li> </ul>
No speed signal!	<ul style="list-style-type: none"> <li>Speed signal is not available on the ISOBUS.</li> <li>Wrong speed signal selected.</li> </ul>	<ul style="list-style-type: none"> <li>Check the settings for the speed sensor – see point 6.3.4.</li> </ul>
No linkage signal!	<ul style="list-style-type: none"> <li>Linkage sensor is not detected.</li> <li>No linkage signal output on ISOBUS.</li> </ul>	<ul style="list-style-type: none"> <li>Check signal source.</li> <li>If external linkage sensors are present, check them.</li> <li>Magnet sensor: The sensor and magnet must be precisely opposite to each other in working position or in lifted position.</li> </ul>
Forward speed of 0.0 km/h is displayed or it keeps reverting to 0.0 km/h!	<ul style="list-style-type: none"> <li>Wrong speed signal detected or selected.</li> </ul>	<ul style="list-style-type: none"> <li>Check speed sensor settings (point 6.3.4).</li> </ul>
Spread rate in kg/ha or seeds/m <sup>2</sup> is not displayed!	<ul style="list-style-type: none"> <li>A valid calibration test was not performed.</li> <li>Values retroactively changed in the Calibration test menu.</li> </ul>	<ul style="list-style-type: none"> <li>Perform calibration test.</li> <li>Reload the seed type from the library.</li> </ul>
Spread rate too high or too low!	<ul style="list-style-type: none"> <li>Wrong speed.</li> <li>Linkage sensor switches in operation.</li> <li>Seed property has changed.</li> </ul>	<ul style="list-style-type: none"> <li>Check the hectare counter on the controller!</li> <li>Check speed!</li> <li>Calibrate the speed sensor (not required for GPS sensor).</li> <li>Check linkage sensor.</li> <li>Perform calibration test.</li> <li>Reduce the fan speed for the hydraulic fan.</li> </ul>

## 11 SOFTWARE UPDATE

For a software update, contact Service at APV; contact data is provided in point 2.

## 12 ACCESSORIES

### 12.1 EXTENSION CABLE

This cable serves as an extension cable between the APV implement and the "ISOBUS connection cable" (see point 4.3 – included in the scope of delivery of an ISOBUS-PS).

The extension cable is available in two lengths: 2 m and 5 m.

Order numbers: 00410-2-221 (2 m), 00410-2-220 (5 m)



Figure 37: Symbolic image



#### NOTE!

**If several extension cables are used together, the electrical power of the fan can be reduced!**

### 12.2 SPLITTER CABLE APV EXTERNAL

Use this cable to operate an APV implement and an external implement via the ISOBUS.

To do this, the ISOBUS socket is mounted on the APV implement. The two AMP plug connectors are connected between the APV implement and the "ISOBUS connection cable" (see point 4.3 – included in the scope of delivery of an ISOBUS-PS).



Figure 38



#### NOTE!

**The short connection must be connected directly on the APV implement. Do not connect an extension cable in between!**

Cable length: 0.75 m

Order number: 04000-2-930

### 12.3 SPLITTER CABLE APV-APV

Use this cable to operate two APV implements via the ISOBUS.

The cable is connected between an APV implement and the "ISOBUS cable connection" (see point 4.3 – included in the ISOBUS-PS scope of delivery). Then the longer cable end is connected to the second APV implement.



Figure 39



#### NOTE!

**Do not connect an extension cable in between!**

Availability on request and only from software version 3.2.0!

Cable length: 2 m

Order number: 04000-2-931

## 12.4 CALIBRATION BUTTON

The Calibration button is integrated directly in the wiring harness of the pneumatic seeder and is installed on the implement with the integrated magnets. As a result, the calibration test and emptying of the hopper can be performed directly on the implement.

Order number: 00410-2-185



Figure 40

## 12.5 SENSOR FOR THE LINKAGE CHASSIS

Via this sensor, the seeding shaft of the PS can start and stop rotating automatically when lifting and lowering the implement.

Connection: 12-pin plug connector on the PS side (under the cover)

Order number: 00410-2-173



Figure 41

## 12.6 SENSOR FOR TOP LINK LINKAGE

Via this sensor, the seeding shaft of the PS can start and stop rotating automatically when lifting and lowering the implement.

Connection: 12-pin plug connector on the PS side (under the cover)

Order number: 00410-2-169



Figure 42

## 12.7 SENSOR FOR LINKAGE PULL SWITCH

Via this sensor, the seeding shaft of the PS can start and stop rotating automatically when lifting and lowering the implement.

Connection: 12-pin plug connector on the PS side (under the cover)

Order number: 00410-2-174



Figure 43

## 12.8 SENSOR FOR LINKAGE HYDRAULIC SYSTEM

The sensor can be installed in an existing hydraulic system on an implement (e.g. chassis cylinder). Function: Activation by a change in pressure in the hydraulic system. The rotation of the seeding shaft is then automatically started or stopped.

Order number: 00410-2-176



Figure 44

## 12.9 FILL LEVEL SENSOR FOR PS

The fill level sensor triggers an alarm on the ISOBUS terminal if there is not enough seed in the hopper.

Order number: 04000-2-269



Figure 45

## 13 CONNECTION DIAGRAMS

### 13.1 PS 120 TO PS 500

Electric fan:

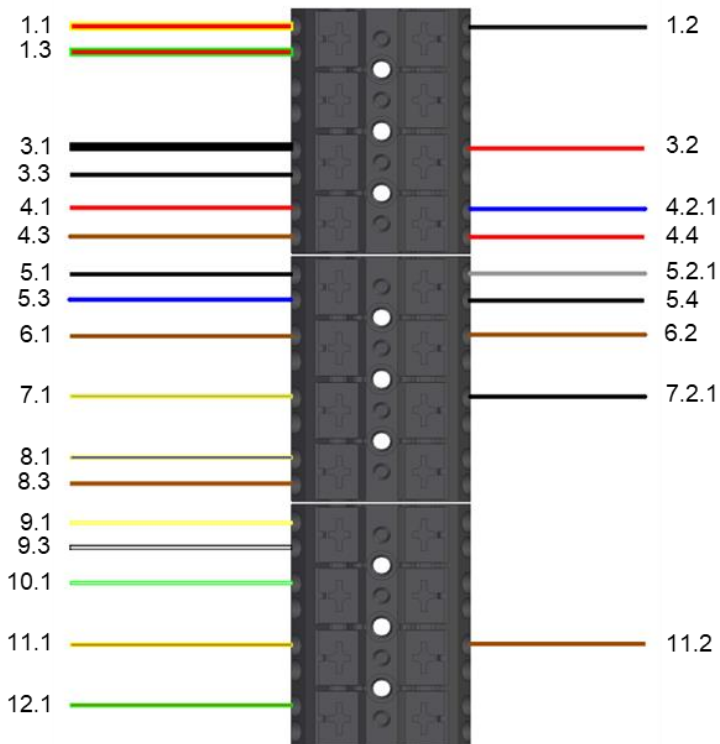


Figure 46

## Hydraulic fan:

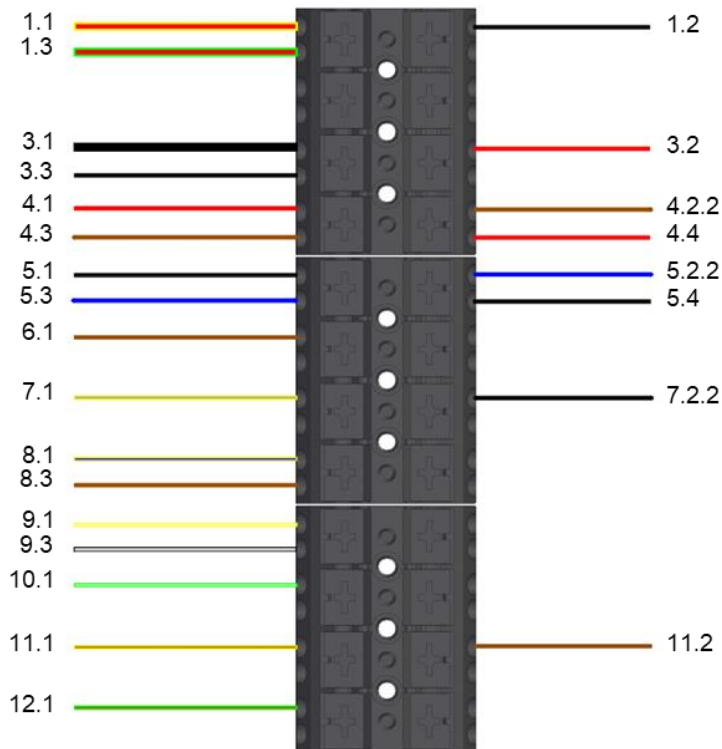


Figure 47

Number	Description	Color	Cross-section (mm <sup>2</sup> )	Function
1.1	Implement cable	Red-yellow	2.5	PWM seeding shaft
1.2	Seeding shaft motor	Black	1.5	
1.3	Implement cable	Red-green	2.5	
3.1	Implement cable	Black	2.5	Ground
3.2	Seeding shaft motor	Red	1.5	
3.3	Calibration button	Black	0.75	
4.1	Implement cable	Red	0.75	+12 V sensor supply
4.2.1	Motor module	Blue	0.5	
4.2.2	Fan speed sensor	Brown	0.34	
4.3	Fill level sensor	Brown	0.34	
4.4	Encoder	Red	0.34	
5.1	Implement cable	Black	0.75	Sensor ground
5.2.1	Motor module	Gray	0.5	
5.2.2	Fan speed sensor	Blue	0.34	
5.3	Fill level sensor	Blue	0.34	
5.4	Encoder	Black	0.34	
6.1	Implement cable	Brown	0.75	PWM electric fan
6.2	Motor module	Brown	0.5	
7.1	Implement cable	Gray-yellow	0.75	Fan status input



Number	Description	Color	Cross-section (mm <sup>2</sup> )	Function
7.2.1	Motor module	Black	0.5	
7.2.2	Fan speed sensor	Black	0.34	
8.1	Implement cable	Blue-yellow	0.75	Calibration button input
8.3	Calibration button	Brown	0.75	
9.1	Implement cable	White-yellow	0.75	Fill level sensor input
9.3	Fill level sensor I	White	0.34	
10.1	Implement cable	White-green	0.75	Spare
11.1	Implement cable	Brown-yellow	0.75	Seeding shaft speed input
11.2	Encoder	Brown	0.34	
12.1	Implement cable	Brown-green	0.75	Spare

Stripping length: 10 mm

### 13.2 PS 300 TWIN

Electric fan:

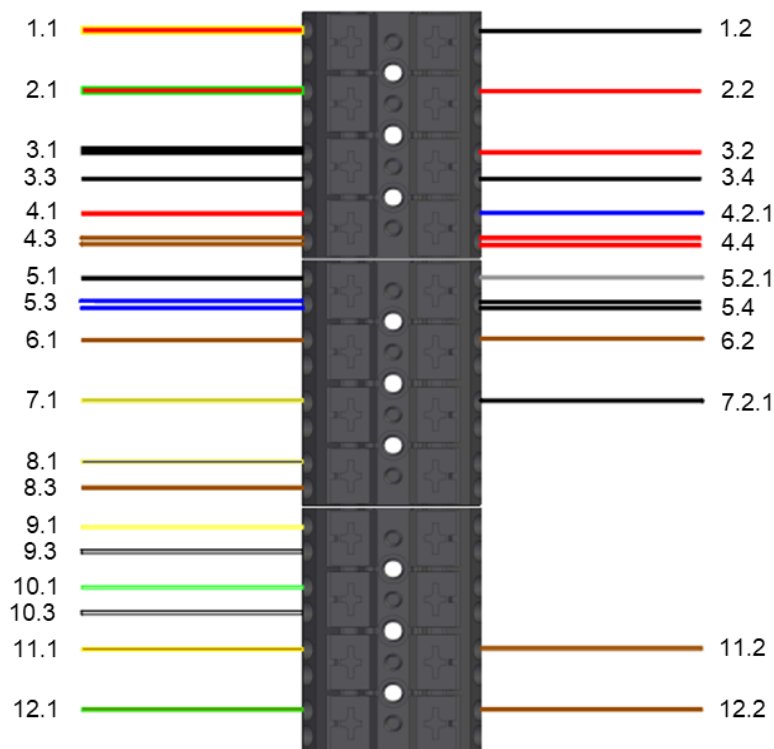


Figure 48

## Hydraulic fan:

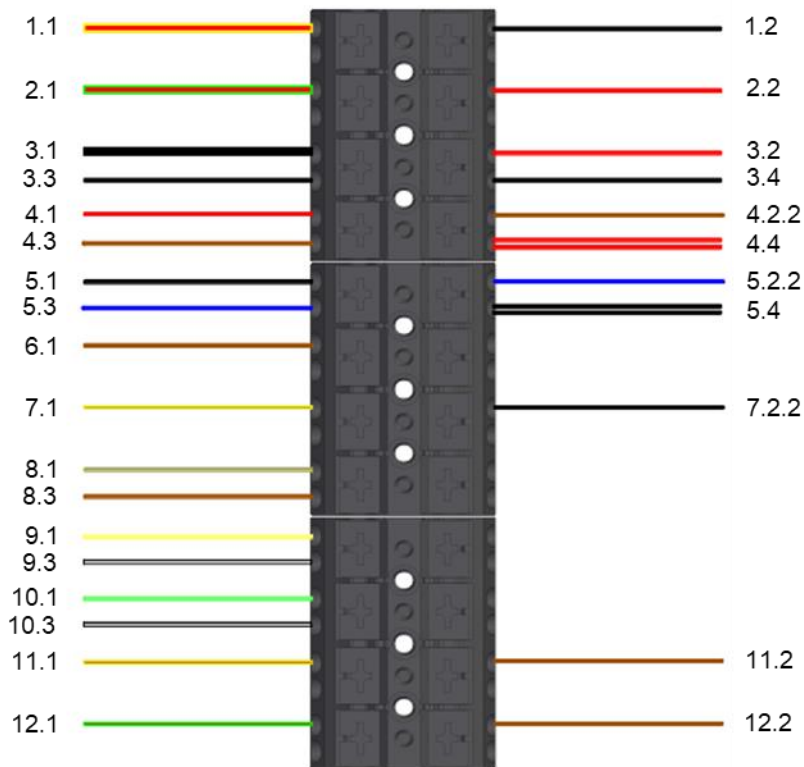


Figure 49

Number	Description	Color	Cross-section (mm <sup>2</sup> )	Function
1.1	Implement cable	Red-yellow	2.5	PWM seeding shaft I
1.2	Seeding shaft motor I	Black	1.5	
2.1	Implement cable	Red-green	2.5	PWM seeding shaft II
2.2	Seeding shaft motor II	Red	1.5	
3.1	Implement cable	Black	2.5	Ground
3.2	Seeding shaft motor I	Red	1.5	
3.3	Calibration button	Black	0.75	
3.4	Seeding shaft motor II	Black	1.5	
4.1	Implement cable	Red	0.75	+12 V sensor supply
4.2.1	Motor module	Blue	0.5	
4.2.2	Fan speed sensor	Brown	0.34	
4.3	Fill level sensor I & fill level sensor II	Brown	0.34	
4.4	Encoder I & encoder II	Red	0.34	
5.1	Implement cable	Black	0.75	Sensor ground
5.2.1	Motor module	Gray	0.5	
5.2.2	Fan speed sensor	Blue		

Number	Description	Color	Cross-section (mm <sup>2</sup> )	Function
5.3	Fill level sensor I & fill level sensor II	Blue	0.34	
5.4	Encoder I & encoder II	Black	0.34	
6.1	Implement cable	Brown	0.75	PWM electric fan
6.2	Motor module	Brown	0.5	
7.1	Implement cable	Gray-yellow	0.75	Fan status input
7.2.1	Motor module	Black	0.5	
7.2.2	Fan speed sensor	Black	0.34	
8.1	Implement cable	Blue-yellow	0.75	Calibration button input
8.3	Calibration button	Brown	0.75	
9.1	Implement cable	White-yellow	0.75	Fill level sensor I input
9.3	Fill level sensor I	White	0.34	
10.1	Implement cable	White-green	0.75	Fill level sensor II input
10.3	Fill level sensor II	White	0.34	
11.1	Implement cable	Brown-yellow	0.75	Seeding shaft speed I input
11.2	Encoder I	Brown	0.34	
12.1	Implement cable	Brown-green	0.75	Seeding shaft II speed input
12.2	Encoder II	Brown	0.34	

**Stripping length: 10 mm**

### 13.3 PS 800 TO PS 1600

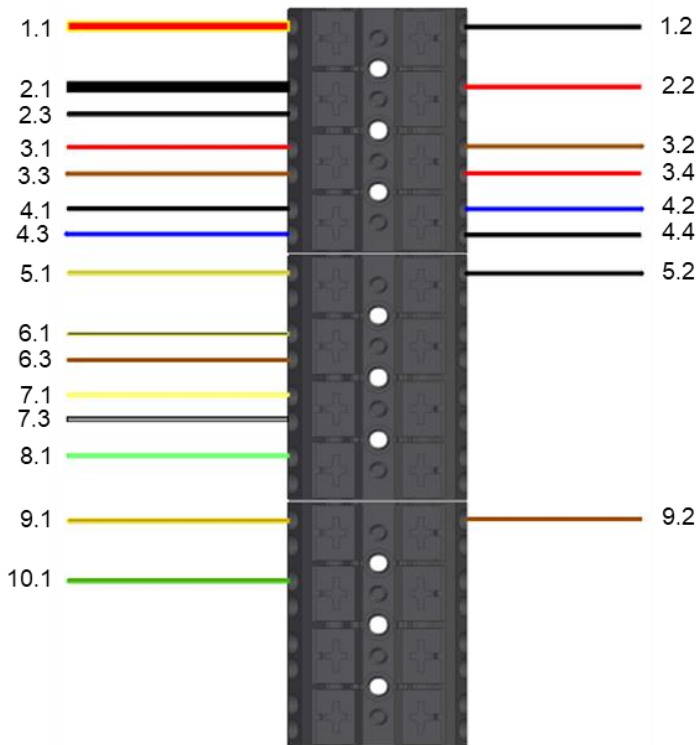


Figure 50

Number	Description	Color	Cross-section (mm <sup>2</sup> )	Function
1.1	Implement cable	Red-yellow	4	PWM seeding shaft
1.2	Seeding shaft motor	Black	2.5	
2.1	Implement cable	Black	4	Ground
2.2	Seeding shaft motor	Red	2.5	
2.3	Calibration button	Black	0.75	
3.1	Implement cable	Red	0.75	+12 V sensor supply
3.2	Fan speed sensor	Brown	0.34	
3.3	Fill level sensor	Brown	0.34	
3.4	Encoder	Red	0.34	
4.1	Implement cable	Black	0.75	Sensor ground
4.2	Fan speed sensor	Blue	0.34	
4.3	Fill level sensor	Blue	0.34	
4.4	Encoder	Black	0.34	
5.1	Implement cable	Gray-yellow	0.75	Fan status input
5.2	Fan speed sensor	Black	0.34	
6.1	Implement cable	Blue-yellow	0.75	Calibration button input
6.3	Calibration button	Brown	0.75	
7.1	Implement cable	White-yellow	0.75	Fill level sensor input

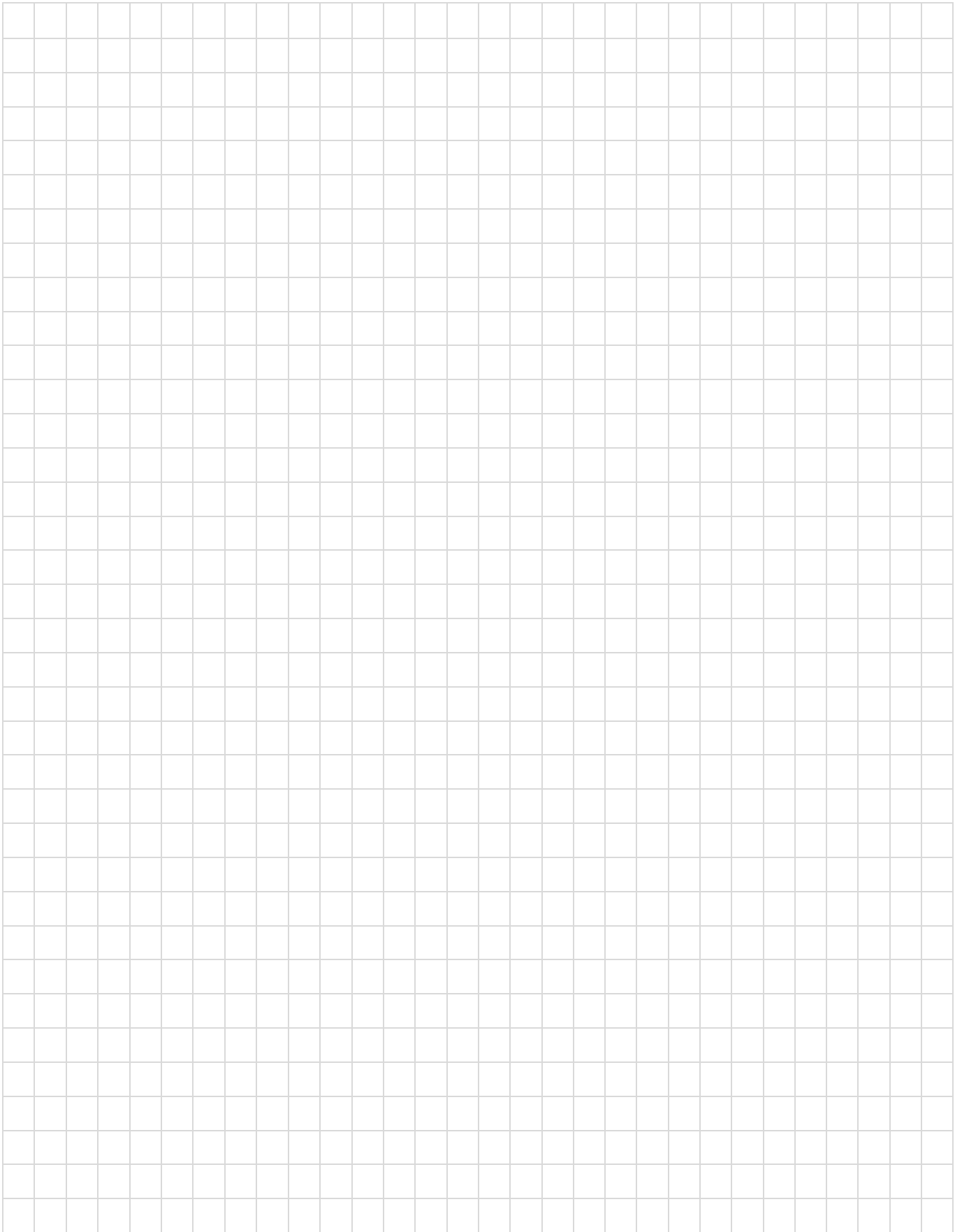
Number	Description	Color	Cross-section (mm <sup>2</sup> )	Function
7.3	Fill level sensor	White	0.34	
8.1	Implement cable	White-green	0.75	Spare
9.1	Implement cable	Brown-yellow	0.75	Seeding shaft speed input
9.2	Encoder	Brown	0.34	
10.1	Implement cable	Brown-green	0.75	Spare

**Stripping length: 10 mm**





**NOTES**





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