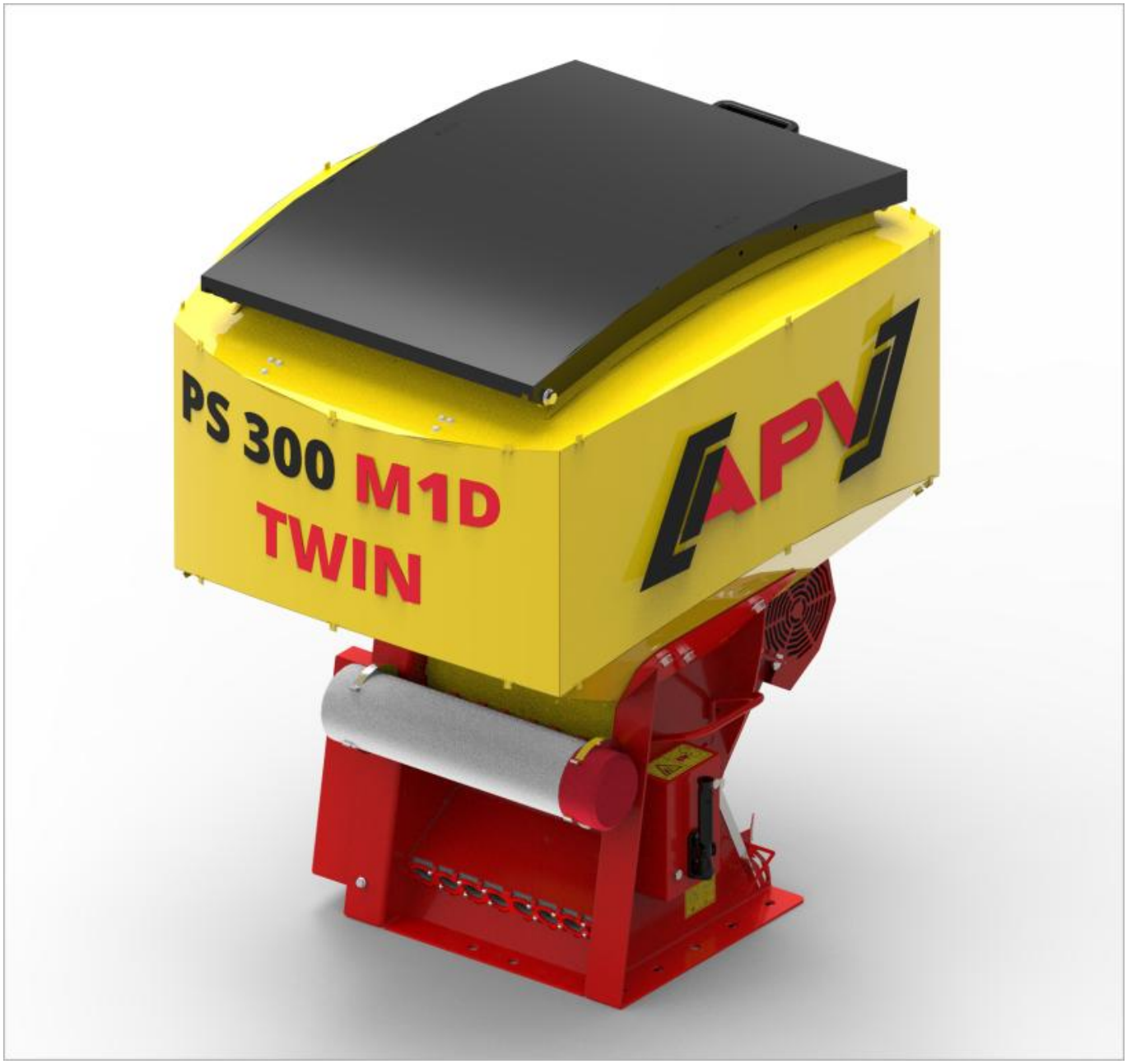
# PNEUMATIC SEED DRILL

## PS 300 M1 D TWIN, PS 500 M1 D TWIN, SMART TWIN 120-500

### OPERATOR MANUAL




**PLEASE READ CAREFULLY BEFORE COMMISSIONING!**

Original operating instructions

Version: 4.0 EN; item number: 00603-3-292

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# 1 GENERAL

This section contains information on your seed drill and about this operating manual.

## 1.1 ABOUT THIS OPERATING MANUAL

### 1.1.1 VALIDITY AND PURPOSE

This operating manual is valid for seeders manufactured by APV with the type designation PS 300 M1 D TWIN, PS 500 M1 D TWIN, SMART TWIN 120-500.

This operating manual provides anyone who will be handling the seed drill with the required information to be able to perform the following tasks properly and safely:

- Installation
- Initial operation
- Operation
- Maintenance
- Service
- Decommissioning, dismantling, recommissioning, storage and disposal

### 1.1.2 TARGET GROUP

This operating manual is aimed at all those who will be handling the seed drill:

- Transporter
- Assembly personnel
- Operating personnel
- Maintenance and repair personnel

### 1.1.3 PARTS OF THE DOCUMENT THAT MUST ABSOLUTELY BE READ

To prevent injuries and damage to the implement, it is absolutely necessary to have read and understood the ***Basic safety instructions*** section on page 11 before handling the implement.

### 1.1.4 COPYRIGHT

The copyright for this operating manual remains with the manufacturer:
APV - Technische Produkte GmbH
ZENTRALE
Dallein 62
3753 Hötzelsdorf
AUSTRIA

This operating manual contains regulations and technical drawings that may not, as a whole or in part, be reproduced, distributed or used in any unauthorised way for competitive purposes or passed on to others.

Passing on or reproduction of this operating manual, evaluation and communication of its contents are not authorised unless explicitly agreed. Contraventions shall result in an obligation to provide compensation for damages.

### 1.1.5 INFORMATION ON MANUFACTURER LIABILITY

The manufacturer is not liable for damage and malfunctions resulting from non-compliance with this operating manual.

## 1.2 IDENTIFICATION OF THE IMPLEMENT

### 1.2.1 CLEAR IDENTIFICATION

The seed drill can be clearly identified by the following information on the type plate:

- Designation
- Model
- Production number

### 1.2.2 POSITION OF THE TYPE PLATE

The type plate is located on the steel rack on the left side, near the handle over the motor cover.

### 1.2.3 FIGURE WITH THE TYPE PLATE

The image shows the layout of the type plate:

The data on the type plate have the following meaning:

| No. | Meaning |
|---|---|
| 1 | Designation |
| 2 | Model |
| 3 | Production number |
| 4 | Weight |
| 5 | Year of manufacture |

## 1.3 SERVICE

### Service

Please contact our service address in the following cases:

- If you still have questions regarding the handling of the seed drill despite the information provided in this operating manual
- For spare parts orders
- To order maintenance and servicing work

### Service address

APV - Technische Produkte GmbH
ZENTRALE

Dallein 62
3753 Hötzelsdorf
AUSTRIA

Telephone: +43 (0) 2913 8001
Fax: +43 (0) 2913 8002
Email: service@apv.at
Web: www.apv.at

# EC DECLARATION OF CONFORMITY

Manufacturer: **APV - Technische Produkte GmbH**
Dallein 62
AT - 3753 Hötzelsdorf

hereby declares that the mounted implement series described in the following complies with the applicable basic safety and health requirements of the above-mentioned Directives in terms of its concept and design as well as the versions put on the market.

This declaration loses its validity if there are any changes to the implement that are not approved by **APV - Technische Produkte GmbH**.

Name of the mounted implement series: **Pneumatic seed drill**
**PS 300 M1 D TWIN, PS 500 M1 D TWIN,**
**SMART TWIN 120-500**
**Hydraulic fan**
**HG 300 M1**

Year of manufacture: from **2016**

Serial number: From 04042-01000, 04043-01000, 04111-01000, 08001-01000

Relevant Directives: 2006/42/EC Machinery Directive
2014/30/EU EMC Directive
2014/35/EU Low Voltage Directive

For the planing, design, construction and marketing of the implement, the following harmonised European standards were applied:

| | |
|---|---|
| EN ISO 12100:2010 | Safety of machinery – General principles for design; risk assessment and risk reduction |
| EN 60204-1:2019 | Safety of machinery – Electrical equipment of machines – Part 1: General requirements |
| EN ISO 14120:2015 | Safety of machinery – Guards |
| EN ISO 13857:2019 | Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs |
| EN ISO 4254-1:2022 | Safety requirements for agricultural machinery – Part 1: General requirements |
| EN ISO 4254-9:2018 | Agricultural machinery - Safety - Part 9: Seed drills |

The special technical documents belonging to the implement in accordance with Appendix VII, Part A have been prepared.

Responsible for the technical documentation: APV - Technische Produkte GmbH

Dallein / Hötzelsdorf, 08/2025

APV - Technische Produkte GmbH
Dallein 62, 3753 Hötzelsdorf, Österreich
+43 2913 8001, office@apv.at, www.apv.at

Ing. Karl Heinz Steindl
Managing director

# 2 DESCRIPTION

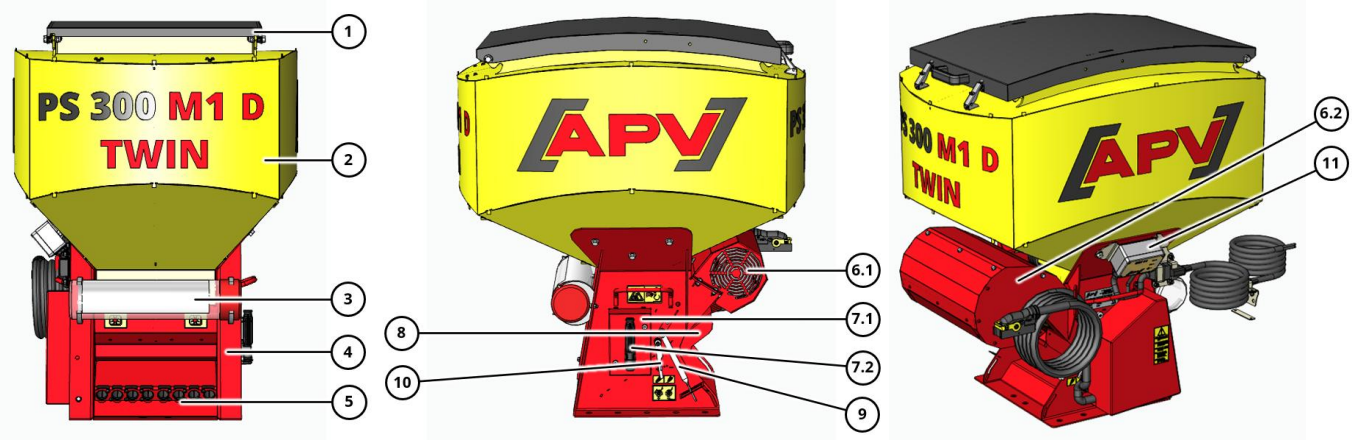
This section provides an overview of the technical characteristics of the seed drill.

## 2.1 LAYOUT AND FUNCTIONING OF THE SEED DRILL

### The seeder PS 300 M1 D TWIN, PS 500 M1 D TWIN, SMART TWIN 120-500

The seeder with the type designations PS 300 M1 D TWIN, PS 500 M1 D TWIN, SMART TWIN 120-500 is a pneumatic seed drill with electric seeding shaft drive. It is used to spread seed on grassland and cropland.

### Seed drill layout




| No. | Designation | Function |
|---|---|---|
| 1 | Seed hopper lid | • Covering the seed hopper.<br>• Protecting the seed from moisture and foreign objects. |
| 2 | Seed hopper | • Carrying the seed.<br>• Conveying the seed to the agitator and seeding shaft. |
| 3 | Operating manual tube | • Storing the operating manual |
| 4 | Steel rack | • Hanging and connecting components of the seed drill. |
| 5 | Hose clamping plate | • Clamping the seed tube hoses onto the steel rack. |
| 6.1 | Electric fan | • Producing compressed air for conveying the seed. |
| 6.2 | Electric fan PLUS | • Producing compressed air for conveying the seed. |
| 7.1 | Bearing cover | • Covering the access to the agitator and seeding shaft. |
| 7.2 | Hexagon wrench | • Tool for use on the implement |
| 8 | Calibration slide | • The seed flows from the seeding shaft through the calibration slide into the calibration bag. |
| 9 | Brush adjustment lever | • Pressing the brush more or less onto the seeding shaft. |
| 10 | Air regulation lever (on both sides) | • Increasing or reducing the opening of the air control flaps. |
| 11 | Motor module | • Direct supply for the electric fan PLUS |

### Mode of operation of the seed drill

For the spreading of seeds, the following process takes place:

| Phase | Description |
|---|---|
| 1 | The operator sets the implement up for operation and fills the seed hopper with seed. |
| 2 | The operator activates the seed drill using the controls.<br>Result:<br>• The seeding shaft rotates.<br>• The agitator rotates.<br>• The fan produces compressed air. |
| 3 | The seed flows from the seed hopper through the seeding shaft and is transported with compressed air through the hoses to the dispersion plates. |
| 4 | The seed is spread. |

## 2.2 LAYOUT AND FUNCTION OF THE HYDRAULIC FAN (HG 300 M1)

### Task

The hydraulic fan serves to produce compressed air for conveying the seed.

### Layout of the fan

| No. | Designation | Function |
|---|---|---|
| 1 | Speed sensor | • Monitoring of the fan speed |
| 2 | Hydraulic block | • Setting/limiting the oil quantity to the hydraulic motor. |
| 3 | Hydraulic motor | • Driving the fan. |
| 4 | Temperature measuring strips | • Displaying the temperature of the hydraulic motor. |

### Mode of operation of the sensors

The fan sensor monitors the air pressure on the pressure side of the fan.

The pressure switch monitors the pressure in the tank line of the hydraulic motor.

As soon as one of the sensors reports an error, the message "Fan error" appears on the control box.

### Functioning of the temperature measuring strip

The segments of the temperature measuring strip turn black when the respective temperature range has been reached or exceeded.

Temperatures above 80°C cause destruction of the gaskets in the hydraulic motor.

## 2.3 LAYOUT AND FUNCTION OF THE FILL LEVEL SENSOR

### Task

The fill level sensor monitors the seed level in the seed hopper for each seeding shaft.

### Layout of the sensor

| No. | Designation | Function |
|---|---|---|
| 1 | Fill level sensor | • Reporting to the control box when the minimum fill level has been reached. |
| 2 | Mounting plate | • Fastening point for the fill level sensor<br>• Defines the minimum seed level. |

### Functioning of the sensor

As soon as the sensor detects seed, a signal is sent to the control box. If the signal is not sent, the minimum fill level has been reached.

## 2.4 SCOPE OF DELIVERY

The scope of delivery includes all assembly groups and components that are delivered as a standard by APV - Technische Produkte GmbH.

| Pos. | quantity | Designation |
|---|---|---|
| 1 | 1 | Basic implement |
| 1.1 | 1 | Steel rack |
| 1.2 | 1 | Seed hopper |
| 1.3 | 1 | Extra seeding shaft (standard accessory) |
| 2 | 1 | Counter plate |
| 3 | 8 | Dispersion plate along with fastening material |
| 4 | 4 | Hexagonal bar |
| 5 | 1 | Hose roll (25 m) |
| 6 | 2 | Calibration bag |
| 7 | 1 | Calibration scale |
| 8 | 1 | Hexagon wrench (fastened on the steel rack) |

## 2.5 TECHNICAL DATA

### Mechanical data

| Implement version | Size | Value |
|---|---|---|
| PS 300 M1 D TWIN | Max. hopper content | 150 l / 150 l |
| | Weight | 100 kg |
| | Dimensions (H × W × D in cm) | 110 x 77 x 100 |
| PS 500 M1 D TWIN | Max. hopper content | 250 l / 250 l; 350 l / 150 l |
| | Weight | 120 kg |
| | Dimensions (H × W × D in cm) | 125 x 80 x 120 |

| Implement version | Size | Value |
|---|---|---|
| SMART TWIN 120 | Max. hopper content | 120 l |
| | Weight | 55 kg |
| | Dimensions (H × W × D in cm) | 90 x 60 x 80 |
| SMART TWIN 200 | Max. hopper content | 200 l |
| | Weight | 65 kg |
| | Dimensions (H × W × D in cm) | 100 x 70 x 90 |
| SMART TWIN 300 | Max. hopper content | 300 l |
| | Weight | 70 kg |
| | Dimensions (H × W × D in cm) | 110 x 80 x 100 |
| SMART TWIN 500 | Max. hopper content | 500 l |
| | Weight | 100 kg |
| | Dimensions (H × W × D in cm) | 125 x 80 x 120 |

| | | |
|---|---|---|
| Hydraulic Fan (HG) | Weight | 23 kg |
| | Dimensions (H × W × D in cm) | 27 × 46 × 40 |

| | | |
|---|---|---|
| Hydraulic lines | Length of the pressure line | 6 m |
| | Length of the motor line | < 1 m |
| | Length of the tank line | 6 m |

### Electrical data

Values for supply from the electric fan:

| Size | Value | |
|---|---|---|
| | Electric fan | Electric fan PLUS |
| Supply voltage | 12 V | 12 V |
| Supply current | 25 A | 40 A |

The battery cable of the motor module equipped with a 40 A fuse.
The motor module is internally protected with a 40 A safety fuse. In case of replacement, an equivalent fuse must be used; under no circumstances may it have a higher tripping current.

### Hydraulic data

Values for supply from the hydraulic fan:

| Size | Value |
|---|---|
| Maximum pressure | 180 bar |
| Maximum oil quantity | 38 l/min |

### Spreading widths

Recommended spreading width: 1 - 6 m
Maximum spreading widths:

| Drive type | Maximum spreading width |
|---|---|
| Electric fan | 6 m |
| Electric fan PLUS | 12 m (with 16 outlets) |
| Hydraulic fan | 12 m (with 16 outlets) |
| PTO shaft fan | 12 m (with 16 outlets) |

### Mount categories

CAT I – III (only with three-point mounting bracket)

# 3 SAFETY

This section contains all requirements and measures that ensure safe operation of the seed drill.

## 3.1 SAFETY INSTRUCTIONS IN THIS DOCUMENT

### What are safety instructions?

Safety instructions are information that serve to prevent personal injuries. Safety instructions contain the following information:

- Type of danger
- Possible consequences in case of non-compliance with the instructions
- Measures to prevent personal injury

## 3.2 BASIC SAFETY REGULATIONS

### Target group for these regulations

These regulations are aimed at all those who will be handling the seed drill.

### Purpose of these regulations

These regulations aim to ensure that all persons who will be handling the seed drill are thoroughly informed about the dangers and safety measures and observe the safety instructions in the operating manual and on the seed drill. If you do not follow these regulations, you are at risk of injury and material damage.

### Handling the operating manual

Observe the following regulations:

- Read the Safety section and the section relating to your work completely. You must understand these contents.
- Always keep the operating manual close to the seed drill for reference purposes. There is a container for this installed on the seed drill.
- When passing on the seed drill, be sure to pass on the operating manual.

### Handling the seed drill

Observe the following regulations:

- Only persons who fulfil the requirements defined in this operating manual may handle the seed drill.
- Only use the seed drill for the intended purpose.
- Never use the seed drill for other purposes that may seem similar.
- Observe all of the safety measures that are indicated in this operating manual and on the seed drill.
- Do not make any modifications to the seed drill, e.g. by removing parts or mounting unauthorised parts.
- When replacing defective parts, only use original spare parts or standard parts approved by the manufacturer.

### Operator obligations toward the personnel

As the operator, you have to ensure the following:

- The personnel fulfils the requirements corresponding to his work.
- The personnel has read and understood this operating manual before handling the seed drill.
- The regulations applicable in your country for safety at work are being observed.

### Procedure in case of accident

The seed drill is designed and built so that the personnel can work without risk. Despite all precautions, however, unforeseeable accidents can still occur under unfavourable circumstances.

Always observe your company's guidelines regarding accidents.

### More information on the subject of


- ***Intended use of the seed drill*** on page 12
- ***Personnel requirements*** on page 12
- ***Dangers and safety measures*** on page 14

## 3.3 INTENDED USE

The pneumatic seeders, types PS 300 M1 D TWIN, PS 500 M1 D TWIN, SMART TWIN 120-500 are used to spread seed with different properties and grain sizes on open fields.

The implements are designed solely for normal use in agricultural operations. Only cereal varieties that are intended by the manufacturer and listed in the operating manual may be used. Different seeding shafts are designed for the different cereal varieties, which must be used and replaced if necessary. The seeder can also be used to spread fertiliser with a seeding shaft designed for this purpose (intended use).

Any other use is considered to be non-intended. The manufacturer is not liable for any resulting damage, the operator alone bears the associated risk.

Intended use also includes compliance with the conditions for operation, maintenance, and repairs prescribed by the manufacturer.

The applicable accident prevention regulations as well as the other general safety-related and occupational health regulations must also be observed.

The manufacturer is not liable for any damage resulting from unauthorised modifications and the use of components and auxiliary parts.

## 3.4 PERSONNEL REQUIREMENTS

The implement may only be used, maintained and repaired by persons who have relevant experience and were instructed on the risks. The safety instructions must also be handed over to other users.

### Qualification

Persons who will be handling the seed drill must fulfil the following requirements:

| Personnel | Activities | Required qualification |
|---|---|---|
| Forwarder | • Transport of the seed drill from one business to another | • Experience with transport of machinery<br>• Qualification of a transport specialist for machinery |
| Transporter | • Transport of the implement within the farm | • Forklift driver<br>• Experience with handling the suitable lifting gear |
| Installer | • Installation and commissioning of the seed drill | • Trained mechanic |
| Setter | • Setting up the seed drill | • Experience in the agricultural field<br>• Experience with handling the seed drill |
| Operator | • Operating the seed drill on the farm<br>• Cleaning the seed drill | • Trained assistant |
| Maintenance personnel | • Performing maintenance work<br>• Performing repair work | • Trained mechanic |
| Disposer | • Disposal of the seed drill | • Disposal specialist |

## 3.5 PERSONAL PROTECTIVE EQUIPMENT

The personnel must be equipped with the following personal protective equipment and wear it if necessary:

- Hearing protection
- Mask
- Safety shoes with non-slip soles

## 3.6 SAFETY DEVICES

### Meaning of the safety devices

The seed drill has safety devices that protect the user from danger. All safety devices must be equipped and functional when operating the seed drill.

### Location of the guards

The picture shows the location of the safety devices:

### Function of the safety devices

The safety devices have the following function:

| No. | Designation | Function |
|---|---|---|
| 1 | Bearing cover | Protection against reaching into the running agitator. |

### 3.6.1 SAFETY STICKERS

#### Purpose

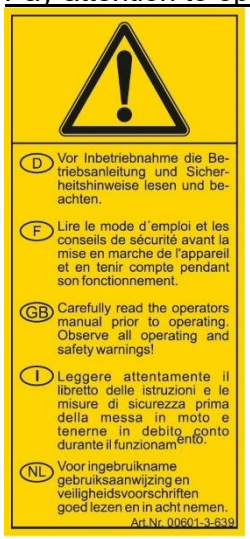
Safety stickers on the seed drill warn of danger points. The safety stickers must always be present and legible.

#### Overview

The table shows all country-specific safety stickers that are installed on the seed drill and their meaning.

## Meaning of the ISO stickers

Pay attention to operating manual




Incorrect use or operation of the implement can lead to death or serious injury.

Before commissioning:

- Read and comply with the operating manual.
- Follow instructions.

Rotating parts

Rotating parts can cause death or serious injury.

- Maintain a safe distance from rotating parts.

Rotating parts can cause death or serious injury.

- Never put the implement in operation without closed, i.e., attached protective devices.
- In operation, keep the protective devices closed and never remove them.

Hot surfaces

Hot surfaces can cause minor or moderate injuries.

- Maintain a safe distance from hot surfaces.

Using hearing protection

Failure to wear hearing protection when operating the implement can result in death or serious injuries.

- Put on hearing protection before operating the implement.
- Wear hearing protection while operating the implement.

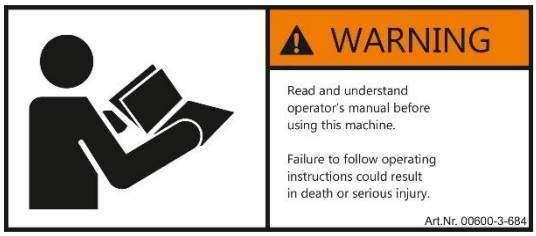
**Meaning of the ANSI stickers**

Pay attention to operating manual

Incorrect use or operation of the implement can lead to death or serious injury.

Before commissioning:

- Read and comply with the operating manual.
- Follow instructions.




Moving parts

Moving parts can cause death or serious injury.

- Pay attention to the danger areas.
- Never put the implement in operation without closed, i.e., attached protective devices.

Rotating parts

Rotating parts can cause death or serious injury.

- Pay attention to the danger areas.
- Never put the implement in operation without closed, i.e., attached protective devices.

Rotating parts can cause death or serious injury.

- Do not reach into rotating parts.
- For setup, cleaning and care as well as for maintenance and servicing work, switch off the implement and disconnect the power supply.

Thrown parts

Thrown parts can hit people. This can result in death or serious injury.

During operation:

- Pay attention to the danger areas.
- Watch out for other people in the vicinity of the implement.

Escaping hydraulic fluid

High-pressure fluids can escape from defective lines and cause death or severe injuries.

- Nobody may be standing in the danger area when starting up the implement.
- Use personal protective equipment.
- Inspect the implement according to the maintenance schedule.

Hot surfaces

Hot surfaces can cause minor or moderate injuries.

- Do not touch hot surfaces.

Using hearing protection

Failure to wear hearing protection when operating the implement can result in death or serious injuries.

- Put on hearing protection before operating the implement.
- Wear hearing protection while operating the implement.

## 3.7 DANGERS AND SAFETY MEASURES

### Overview

The seed drill is designed such that the user is protected from all avoidable dangers that are practical in design terms. Due to the purpose of the seed drill, however, there are residual dangers that require precautionary measures to be avoided.

In the following, you will be informed about the types of these residual dangers and their effects.

### Transport

| Danger | Where and in which situations does the danger occur? | Countermeasure |
|---|---|---|
| Risk of crushing due to the weight of the implement | When lifting and lowering the implement | The implement may only be transported by personnel trained for this task. |

### Installation

| Danger | Where and in which situations does the danger occur? | Countermeasure |
|---|---|---|
| Risk of crushing due to the weight of the implement | When lifting and lowering the implement | The implement may only be transported with a forklift or lift truck by personnel trained for this task. |
| Risk of slipping, stumbling and falling | When mounting the implement on a soil tillage implement or on the tractor | Work must be performed on sturdy steps with non-slip safety shoes. |

### Configuration

| Danger | Where and in which situations does the danger occur? | Countermeasure |
|---|---|---|
| Risk of injury due to moving parts | When setting the spread rate, which must be done with the seeding shaft cover removed | The spread rate may only be adjusted exactly according to the operating manual by trained personnel. |
| Risk of injury due to moving parts when the implement is accidentally switched on | When the agitator is activated, which must be done with the seeding shaft cover removed | Make sure that the implement is disconnected from the power supply to prevent sudden start-up of the implement. |

| Danger | Where and in which situations does the danger occur? | Countermeasure |
|---|---|---|
| Danger due to defective implement parts | When operating the implement | Before operating the implement, always check for fractures, cracks, chafe marks, leaks, loose bolts, vibrations, sounds and function. |

**operation**

| Danger | Where and in which situations does the danger occur? | Countermeasure |
|---|---|---|
| Risk of injury due to rotating parts | When handling the implement during operation | Make sure that the covers for the agitator are closed during operation. |
| Risk of injury due to seed being thrown out | While spreading seed. | Always ensure that there is nobody standing in the spreading range of the implement. |
| Risk of slipping, stumbling and falling | When handling the implement during operation | Only enter the implement area using sturdy steps with non-slip safety shoes. |
| Hearing damage due to implement noise | When operating the implement | Use hearing protection. |
| Risk of poisoning due to toxic seed types | While spreading seed. | Wear a mask when handling toxic seed types. |

**Cleaning**

| Danger | Where and in which situations does the danger occur? | Countermeasure |
|---|---|---|
| Risk of poisoning with toxic seed types | When cleaning the implement with compressed air | Wear a mask when handling toxic seed types. |

**Maintenance and repairs**

| Danger | Where and in which situations does the danger occur? | Countermeasure |
|---|---|---|
| Incorrectly or inadequately performed maintenance work with limited visibility | Under poor light conditions | If necessary, maintenance must be performed with additional lighting. |

# 4 TRANSPORT, INSTALLATION AND COMMISSIONING

In this section, you will learn which work steps must be performed for the installation and commissioning of the seed drill, and what must be done and observed.

## 4.1 ATTACHING THE SEED DRILL TO A SOIL TILLAGE IMPLEMENT

### Purpose

For operation on the field, the seed drill can be attached to a soil tillage implement, such as a cultivator or a harrow. The attachment must be installed individually.

### Requirements

The following requirement must be fulfilled for this work step:

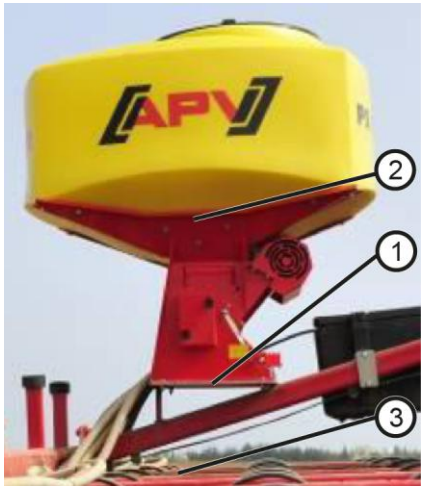
- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** on page 37 for more information.

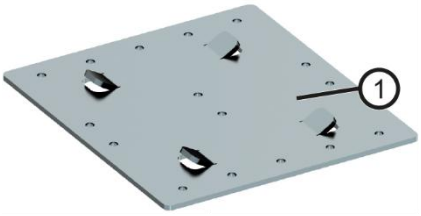
### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Counter plate
- Bolts with Ø > 10 mm, strength class 8.8 or higher
- Self-locking fastenings (nuts)
- Lifting gear that is suitable for the mass of the respective implement version, see ***Technical Data*** on page 9 for more information.

### Overview




| No. | Designation |
|---|---|
| 1 | Counter plate |
| 2 | Seed drill |
| 3 | Soil tillage implement |

### Procedure

To attach the seed drill on a soil tillage implement:

| Step | Description |
|---|---|
| 1 | Fasten the counter plate (1) on the soil tillage implement (3).<br>The counter plate must be parallel to the ground. |
| 2 | Use the lifting gear to place the seeder (2) on the counter plate (1). |
| 3 | Fasten the seeder (2) with bolts and nuts on the counter plate (3). |

## 4.2 ATTACHING THE SEED DRILL TO A TRACTOR

### Purpose

For operation on the field, the seed drill can be attached directly to a tractor.

### Requirements

The following requirement must be fulfilled for this work step:

- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** on page 37 for more information.

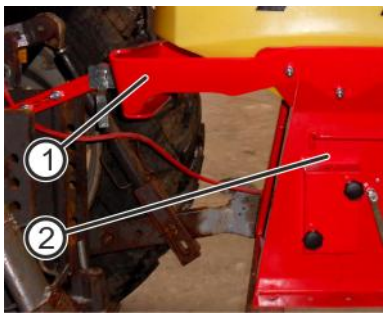
### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Suitable component for attachment (e.g. top link mounting kit, pallet fork or three-point loader)
- Bolts M 12, strength class 8.8 or higher
- Self-locking fastenings (nuts)

- Lifting gear that is suitable for the mass of the respective implement version, see ***Technical Data*** on page 9 for more information

### Overview




| No. | Designation |
|---|---|
| 1 | Top link mounting kit |
| 2 | Seed drill |

### Procedure

To attach the seed drill to a tractor using the top link mounting kit:

| Step | Description |
|---|---|
| 1 | Fasten the top link mounting kit (1) with bolts and nuts onto the seed drill (2). |
| 2 | Fasten the top link (1) with the bolts onto the tractor. |
| 3 | Using lifting gear, move the seed drill (2) close to the tractor and mount the top link in the top link bracket. Using the counter plate, clamp the seeder onto the tractor linkage drawbar. |

## 4.3 INSTALLING THE DISPERSION PLATES ON THE SOIL TILLAGE IMPLEMENT

### Purpose

The dispersion plates serve to fix the hoses, through which the spreading material flows, at the right spot and spread the seed.

### Requirements

The following requirement must be fulfilled for this work step:

- None

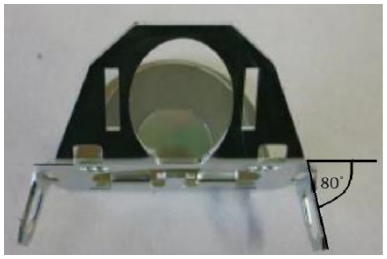
### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Dispersion plates
- hexagonal bar
- Bolts
- Washers
- Pliers
- Hexagon wrench

### Procedure for mounting with hexagonal bar

This is how to install the dispersion plates on the soil tillage implement.

| Step | Description | Explanation/illustration |
|---|---|---|
| 1 | Using the pliers, bend the tabs on the sides of the dispersion plates down by 80°. | Result:   |
| 2 | Distribute the dispersion plates evenly across the entire working width of the soil tillage implement. Maximum spacing of the dispersion plates: 75 cm | |
| 3 | Push the hexagonal bar through the two hexagonal holes in the tabs on the sides of the dispersion plate intended for this purpose. | |
| 4 | Using the supplied bolts and washers, fasten the dispersion plates onto the hexagonal bar. | Result: |
| 5 | Fasten the hexagonal bar equipped with the dispersion plates onto the soil tillage implement at a distance of 40 cm from the ground. | |
| 6 | Connect the hoses to the dispersion plates, see ***Connecting the hoses*** on page 21 for more information. | |

## 4.4 CONNECTING THE HOSES

### Purpose

The hoses convey the seed from the seed drill onto the field. Before initial operation, the hoses have to be cut to the required length and installed on the dispersion plates and the seed drill.

### Requirements

The following requirement must be fulfilled for this work step:

- None

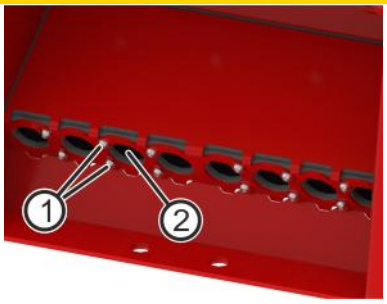
### Required components, tools and materials

For this work step, the following components, tools and materials are required:

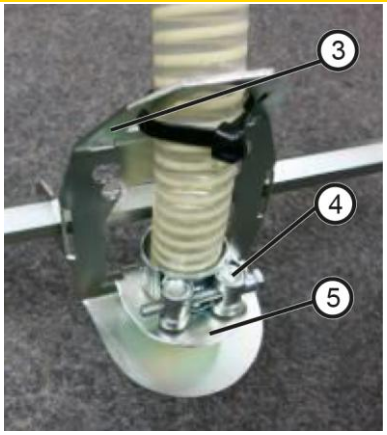
- Hose roll
- Cutting tool
- Torx screw driver TX 30
- Silicone spray

### Procedure

This is how you connect the hoses to the seed drill:

| Step | Description | Illustration |
|---|---|---|
| 1 | Using the cutting tool, cut off pieces from the hose roll in the required length for each transition piece. | |
| 2 | Slightly loosen the clamping screws (1) on the clamping plate using a Torx screw driver. |  |
| 3 | Insert the ends of the hoses into the transition pieces (2) up to the stop.<br>NOTE: If it is too difficult to insert the hoses, use silicone spray on the outside of the hose. | |
| 4 | Tighten the clamping screws (1). | |

This is how to connect the hoses to the soil tillage implement and dispersion plates:

| Step | Description | Illustration |
|---|---|---|
| 1 | Push the end of the hose through the opening in the large tab (3) on the dispersion plate. |  |
| 2 | Fix the end of the hose with the fastening clip (4). | |
| 3 | Install the fastening clip (4) on the dispersion plate (5).<br>In doing so, install the fastening clip so that<br>• the holding finger is positioned between the hose and the fastening clip.<br>• it is fixed by the hooks on the holding finger. | |

## 4.5 CONNECTING THE HYDRAULIC FAN (HF)

### Purpose

The hydraulic fan is used for operation with working widths up to 12 m or for higher spread rates of e.g. wheat.

### Requirements

The following requirement must be fulfilled for this work step:

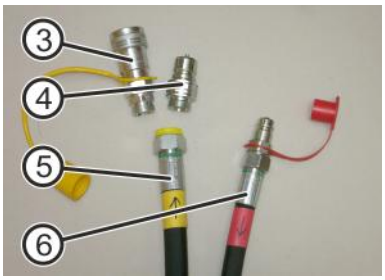
- The hydraulic system is depressurized both on the tractor and implement side.

### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Coupling plug or coupling sleeve (for initial operation)

### Overview




| No. | Designation |
|---|---|
| 1 | Hydraulic block |
| 2 | Current control valve |
| 3 | Coupling sleeve (alternative) |
| 4 | Coupling plug |
| 5 | Return line |
| 6 | Pressure line |

### Procedure

This is how to connect the hydraulic fan:

| Step | Description |
|---|---|
| 1 | Completely close the current control valve (2) on the hydraulic block (1). |
| 2 | Connect the return line (5) (marked in yellow, BG4) without reduction to the return flow connection of the tractor hydraulic system.<br>For initial operation: Remove the plastic plug on the return line and connect the coupling plug (4) or the coupling sleeve (3) with the return line. |
| 3 | Connect the pressure line (6) (marked in red, BG3) with a pressure connection of the tractor hydraulic system. |

# 5 OPERATION

In this section, you will learn how to properly configure the seed drill and the seed flow rate, and how to adjust it during operation.

## 5.1 SETTING THE HYDRAULIC FAN (HF)

### Purpose

The hydraulic fan produces an air current that carries the seed through the hoses to the dispersion plates.

The required air pressure and air quantity depend strongly on the seed (type and weight), the spread rate, working width and speed. For this reason, it is not possible to give precise specifications for the correct fan settings, it must be determined in field trials! Reference values for the fan setting can be found in the setting table for the current control valve.

### Requirements

The following requirement must be fulfilled for this work step:

- The hydraulic fan is connected, see also ***Connecting the hydraulic fan (HF)*** on page 22.

### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

### Overview

| No. | Designation |
|---|---|
| 1 | Hydraulic block |
| 2 | Current control valve |

### Procedure

This is how to set the hydraulic fan:

**Version 1** (Constant pressure pump – non-adjustable oil quantity on the tractor)

| Step | Description |
|---|---|
| 1 | Completely close the current control valve (2) on the hydraulic block (1). |
| 2 | Start up the blower fan (tractor engine speed as in field operation). |
| 3 | Adjust the fan speed using the current control valve (2) on the control block. |

**Version 2** (Variable pump - oil quantity adjustable on the tractor):

| Step | Description |
|---|---|
| 1 | Completely open the current control valve (2) on the hydraulic block (1). |
| 2 | Completely close the current control valve on the tractor (set the oil quantity to zero). |
| 3 | Start up the fan and run up to the desired fan speed (slowly increase the oil quantity). |

### Setting table for the current control valve

(valid for approx. 50°C oil temperature)

| **Working width 3 m** | | | |
|---|---|---|---|
| **Seed** | **quantity** | **Printing** | **speed** |
| Fine seed | 5 kg/ha | 5 bar | 1400 rpm |
| Fine seed | 30 kg/ha | 15 bar | 2900 rpm |
| Coarse seed | 50 kg/ha | 18 bar | 3000 rpm |
| Coarse seed | 100 kg/ha | 19 bar | 3100 rpm |
| **Working width 6 m** | | | |
| Fine seed | 5 kg/ha | 8 bar | 1550 rpm |
| Fine seed | 30 kg/ha | 20 bar | 3300 rpm |
| Coarse seed | 50 kg/ha | 21 bar | 3400 rpm |
| Coarse seed | 100 kg/ha | 22 bar | 3500 rpm |
| **Working width 12 m** | | | |
| Fine seed | 5 kg/ha | 10 bar | 1650 rpm |
| Fine seed | 30 kg/ha | 35 bar | 4000 rpm |
| Coarse seed | 50 kg/ha | 39 bar | 4200 rpm |
| Coarse seed | 100 kg/ha | 41 bar | 4300 rpm |

## 5.2 SETTING AND ADJUSTING THE SPREAD RATE

### Purpose

The setting for the spread rate, which is spread by the seed drill during the seeding process, has a significant effect on the seeding results.

### Requirements

The following requirement must be fulfilled for this work step:

- None

### Procedure

This is how to set and adjust the spread rate:

| Step | Description |
|---|---|
| 1 | Perform a calibration test to determine the current spread rate, see ***Performing a calibration test*** on page 25 for more information. |
| 2 | If necessary, take measures to adjust the spread rate.<br>Suitable measures are:<br>• Selection of the seeding shaft, see ***Selecting the right seeding shaft*** on page 27 for more information.<br>• Selection of the brush pressure, see ***Setting the brush pressure*** on page 30 for more information.<br>• Adjustment of the working width, see ***Installing dispersion plates on the soil tillage implement*** on page 20 for more information.<br>• Adjusting the tractor speed. |

### Calculating the spread rate

The spread rate can be calculated using the following formula:

$$StM = \frac{m_{gew} \times v_{Traktor} \times b_{Arbeit}}{600}$$

SpR: Spread rate in kg/min
r(req): Required spread rate in kg/ha
v(tractor): Speed of the tractor in km/h
w(working): Working width in m

## 5.3 REGULATING THE SEED FLOW RATE (CALIBRATION TEST)

### Purpose

During the calibration test, the seed quantity for a specific area is defined.

### Requirements

The following requirement must be fulfilled for this work step:

- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** on page 37 for more information.

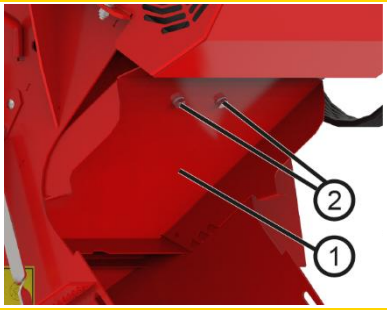
### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Calibration bag
- Hexagon wrench

### Procedure

This is how to perform a calibration test:

| Step | Description | Explanation |
|---|---|---|
| 1 | Unscrew the hexagonal bolt (2) on the calibration slide (1). |  |
| 2 | Take the calibration slide out of the anchoring and turn it by 180°. | |
| 3 | Re-attach the rotated calibration slide on the seeder. | Result:<br> |
| 4 | Hook the calibration bags onto the calibration slide. | |
| 5 | Select the suitable brush pressure, see ***Setting the brush pressure*** on page 30. | |
| 6 | Switch on the control box. | |
| 7 | Start the calibration program of the seed drill, refer to the control box operating manual for more information. | |

## 5.4 PREPARING THE SEEDING SHAFT

### Purpose

Preparation of the seeding shaft serves to prepare for changing the seeding shaft.

### Requirements

The following requirements must be fulfilled for this work step:

- The right seeding shaft is selected, see ***Selecting the right seeding shaft*** on page 27 for more information.

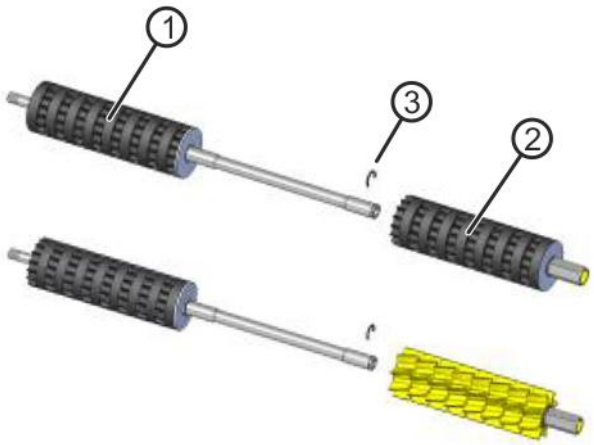
### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

### Overview

Divided seeding shaft:




| No. | Designation |
|---|---|
| 1 | Inner seeding shaft |
| 2 | Outer seeding shaft |
| 3 | Locking ring |

### Procedure

This is how to prepare the seeding shaft:

| Step | Description |
|---|---|
| 1 | Pull the locking ring (3) off of the inner seeding shaft (1). |
| 2 | Pull the outer seeding shaft (2) off of the inner seeding shaft (1). |
| 3 | Put the new outer seeding shaft (2) onto the inner seeding shaft (1). |
| 4 | Put the locking ring (3) back onto the inner seeding shaft (1). |

## 5.5 SELECTING THE RIGHT SEEDING SHAFT

### Purpose

By selecting the right seeding shaft, which is suitable for the seed type, the seeding results are significantly improved.

### Requirements

The following requirement must be fulfilled for this work step:

- None

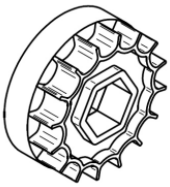
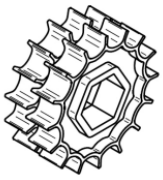
### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

### Table of available seeding shafts

From the following tables, select the seeding shaft that is suitable for your purposes:

| Standard equipment | | Available as an option |
|---|---|---|
|  | |  |
| fb-f | Flex20 | f-f |
| • White mustard<br>• Clover<br>• Phacelia<br>• Micro granules | • Cereals<br>• Fertiliser<br>• Buckwheat | • Grass<br>• Cereals<br>• Cress |

## 5.6 CHANGING THE SEEDING SHAFT

### Purpose

By installing the right seeding shaft, the seeding results are significantly improved.

### Requirements

The following requirements must be fulfilled for this work step:

- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** on page 37 for more information.
- The seed hopper is empty, see ***Emptying the seed hopper*** on page 38 for more information.
- The right seeding shaft is selected and ready, see ***Selecting the right seeding shaft*** on page 27 for more information.

### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Hexagon wrench

### Overview

Access to the agitator and the required tool:

| No. | Designation |
|---|---|
| 1 | Bearing cover |
| 2 | Hexagon wrench holder |
| 3 | Lid nuts |
| 4 | Bearing flange |
| 5 | Knurled nuts |

## Procedure

This is how to change the seeding shaft:

| Step | Description | Explanation |
|---|---|---|
| 1 | Take the hexagon wrench from the holder (2). | |
| 2 | Loosen the lid nuts (3) on the bearing cover (1). | |
| 3 | Remove the bearing cover (1). | |
| 4 | Loosen the knurled nuts (5). | |
| 5 | Remove the bearing flange (4). | Result:<br> |
| 6 | Screw the bearing flange turned by 180° onto the seeding shaft and pull out the seeding shaft.<br>NOTE: Residual seed can fall out in the process. | |
| 7 | Insert the new seeding shaft. | |
| 8 | Turn the seeding shaft until the fitted key of the gear motor engages in the groove of the seeding shaft. | |
| 9 | Slide the bearing flange onto the seeding shaft. | |
| 10 | Tighten the knurled nuts on the bearing flange by hand. | |
| 11 | Fit the bearing cover on the two threaded rods and tighten the lid nuts with the hexagon wrench. | |
| 12 | Check the seeding shaft for ease of motion, see ***Checking the ease of motion of the shaft*** on page 30 for more information. | |

## 5.7 CHECKING THE EASE OF MOTION OF THE SEEDING SHAFT

### Purpose

Each time the seeding shaft is installed or replaced, it must be checked for ease of motion. This check is performed by a hearing test.

### Requirements

The following requirement must be fulfilled for this work step:

- The seed hopper is empty, see ***Emptying the seed hopper*** on page 38 for more information.

### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

### Procedure

This is how to check the ease of motion of the seeding shaft:

| Step | Description |
|---|---|
| 1 | Switch on the seed drill. |
| 2 | Perform the hearing test. |
| 3 | If the sound of the running seeding shaft is noticeably loud or irregular, contact the maintenance and repair service, see ***Contact service*** on page 5 for more information. |

## 5.8 SETTING THE BRUSH PRESSURE

### Purpose

The brush pressure on the seeding shaft is regulated using the brush adjustment lever.

### Requirements

The following requirement must be fulfilled for this work step:

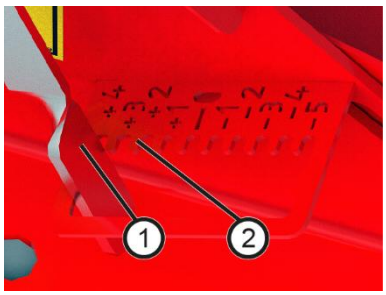
- None

### Required components, tools and materials

For this work step, you need the following components, tools and materials:

- None

### Overview




| No. | Designation |
|---|---|
| 1 | Brush adjustment lever |
| 2 | Setting scale |

### Procedure

This is how to set the brush pressure:

| Step | Description |
|---|---|
| 1 | Pull the brush adjustment lever (1) out of the setting scale. |
| 2 | Move the brush lever to the desired position and engage it in the appropriate notch of the setting scale.<br>The following orientation rules apply here:<br>• For fine seed, increase the brush pressure up to -5.<br>• For coarse seed, reduce the brush pressure up to +4. |

## 5.9 SETTING THE AIR CONTROL FLAPS

### Purpose

The air control flaps regulate the air supply to the seeding shaft.

### Requirements

The following requirement must be fulfilled for this work step:

- None

### Required components, tools and materials

For this work step, you need the following components, tools and materials:

- None

### Overview

| No. | Designation |
|---|---|
| 1 | Air regulation lever |
| 2 | Setting scale |

### Procedure

This is how to set the air control flaps:

| Step | Description |
|---|---|
| 1 | Pull the air regulation lever (1) out of the setting scale. |
| 2 | Move the air regulation lever to the desired position and engage it in the appropriate notch of the setting scale.<br>The following orientation rules apply here:<br>• Increase the air current in the + direction.<br>The normal setting is completely open.<br>• Reduce the air current in the - direction.<br>For coarse seed types, to have a greater distance from the seeding shaft and therefore avoid damage to the seeding shaft; if short, descending hoses are used on one side and more air is required on the other side.<br>• If less air is required for both seeding shafts, reduce the fan speed on the control box. |

## 5.10 SETTING THE FILL LEVEL SENSOR

### Purpose

The setting of the fill level sensor determines the minimum fill level and adjusts the sensor for the seed type.

### Requirements

The following requirement must be fulfilled for this work step:

- The seed hopper is empty, see ***Emptying the seed hopper*** on page 38 for more information.

### Procedure

This is how to set the minimum fill level:

| Step | Description |
|---|---|
| 1 | Loosen the nuts on the sensor. |
| 2 | Move the sensor on the assembly plate to the desired height and tighten the nuts. |

### Setting the intensity

The intensity of the sensor can be adjusted using the potentiometer (small slotted screw) on the rear side of the sensor to adapt it to the respective seed type. To check the sensor and the setting, cover the front side of the sensor with your hand. The sensor is functional and correctly set when the LED on the rear side of the sensor then lights up.

## 5.11 FILLING THE SPREADING MATERIAL TANK

### Purpose

The seed hopper stores the seed to be spread.

### Requirements

The following requirement must be fulfilled for this work step:

- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** on page 37 for more information.

### Required components, tools and materials

For this work step, the following components, tools and materials are required:

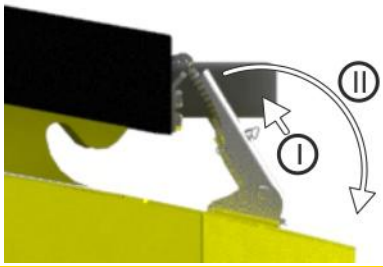
- Seed

### Overview

| No. | Designation |
|---|---|
| 1 | Seed hopper lid |
| 2 | Seed hopper |
| 3 | Flap fastener with lock |

### Procedure

This is how to fill the seed hopper:

| Step | Description | Explanation |
|---|---|---|
| 1 | Unlock the lock (I) and open (II) the flap fasteners (3). |  |
| 2 | Open the cover (1).<br>CAUTION: Starting at a certain opening angle, the cover opens automatically by means of a gas pressure spring. | |
| 3 | Fill the seed into the corresponding part of the seed hopper. | |
| 4 | Close the cover (1). | |
| 5 | Push the the flap fasteners (3) closed until the lock engages. | |

## 5.12 CHANGING THE HOPPER PARTITION WALL ON THE PS 500 M1 D TWIN

### Purpose

Changing the hopper division between 250 l / 250 l and 350 l / 150 l.

### Requirements

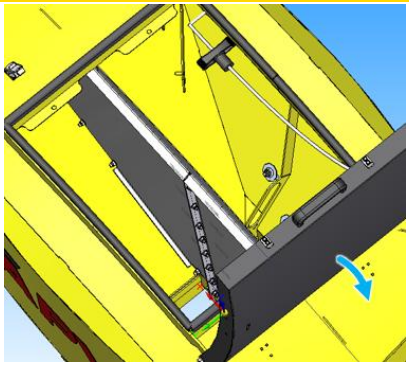
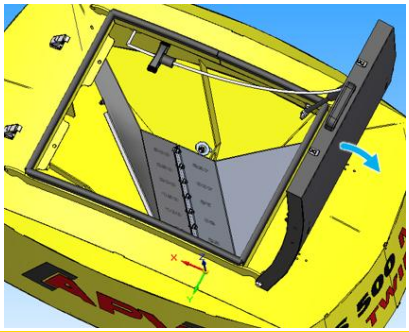
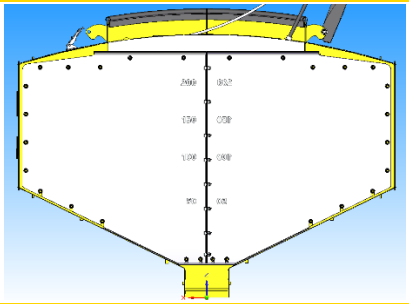
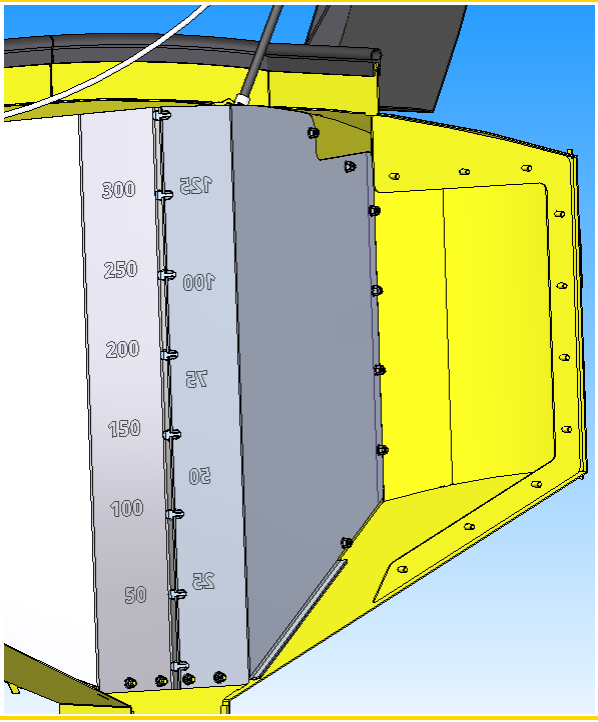
The following requirement must be fulfilled for this work step:

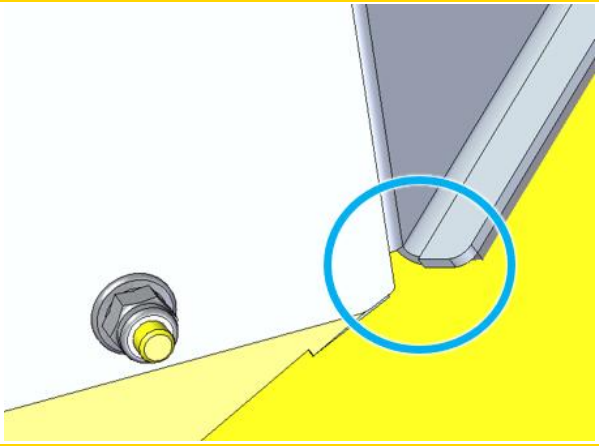
- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** on page 37 for more information.
- The seed hopper is empty, see ***Emptying the seed hopper*** on page 38 for more information.

### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Hexagon wrench
- Silicone for sealing

| Step | Description | Explanation |
|---|---|---|
| 1 | Unlock the lid fasteners and open the lid. |   |
| 2 | Remove all of the bolts and take the partition wall out of the hopper through the lid opening. |  |
| 3 | Insert the other partition wall through the lid opening and fasten it with the bolts. |   |

| Step | Description | Explanation |
|---|---|---|
| 4 | Seal the open areas with silicone. |  |

## 5.13 DEACTIVATING THE AGITATOR

### Purpose

With light and fine seed, the agitator prevents bridging and therefore ensures continuous seed flow in the seed drill.

### Requirements

The following requirements must be fulfilled for this work step:

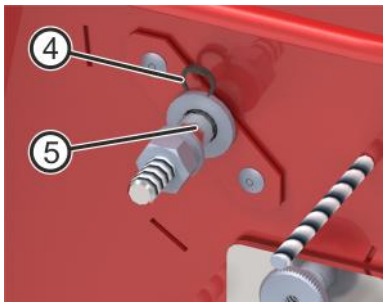
- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** on page 37 for more information.

### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Hexagon wrench
- Locking ring

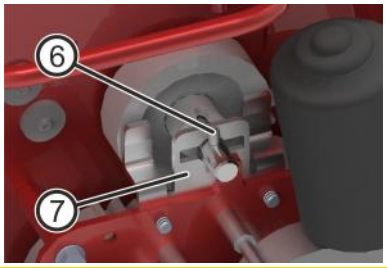
### Overview




| No. | Designation |
|---|---|
| 1 | Bearing cover |
| 2 | Hexagon wrench holder |
| 3 | Lid nuts |
| 4 | Locking ring |
| 5 | Agitator shaft |

**Procedure**

This is how to deactivate the agitator:

| Step | Description | Explanation |
|---|---|---|
| 1 | Open the bearing cover (1).<br>To do so, loosen the cover nuts (3) with the hexagon wrench. | |
| 2 | Pull the locking ring (4) off of the agitator shaft (5) and put it aside. | |
| 3 | Push in the agitator shaft. | |
| 4 | With a rotating movement, push the female pin (6) through the guide duct (7) on the motor side and turn clockwise up to the stop. | Result:<br>  |
| 5 | Close the bearing cover (1). | |

## 5.14 DISPLAY ON THE MOTOR MODULE

**Purpose**

The status of the fan is displayed on the motor module.

**Requirements**

The following requirements must be fulfilled for this work step:
None

**Required components, tools and materials**

For this work step, the following components, tools and materials are required:
Use of the electric fan PLUS with 5.2 Control Box or ISOBUS

**Overview**

| No. | Designation | Meaning |
|---|---|---|
| 1 | *Fan overload* control lamp | The LED lights up red if on of the motors is strained at its limits for too long. |
| 2 | *Fan not connected* control lamp | The LED lights up red if the cabling is faulty.<br>If only one fan is running, both connection lines must be connected to this fan. |
| 3 | Fan status lamp | The LED lights up green when the voltage supply is established. |

**Procedure**

To use the motor module:

| Step | Description |
|---|---|
| 1 | The Control Box outputs the *Error (fan)!* error message. |
| 2 | Check the display on the motor module. |
| 3 | Eliminate the respective fault according to Point 6. |

# 6 FAULT INDICATIONS

In this section, you will find information for eliminating faults that may occur during operation.

**Fault overview**

| Problem | Cause | Remedy |
|---|---|---|
| The seeding shaft does not rotate when the drive shaft of the gear motor is rotating | • The fitted key fell out of the drive shaft | • Stick on a new fitted key |
| The seed hoses get clogged | • Fan speed is too low | • Check the fan speed and increase if necessary |
| Control Box outputs error message *Error (fan)!*, control lamp *E01* (*Fan overload*) lights up red on the motor module. | • One or both of the motors ran in the limit range for too long. | • Check or install the calibration lid.<br>• Check whether all of the seeding hoses are installed.<br>• Remove any foreign objects or similar from the fan.<br>• Check the fan for smooth running. |
| Control Box outputs error message *Error (fan)!*, control lamp *E02* (*Fan not connected*) lights up red on the motor module. | • Faulty cabling. | • Check the cabling.<br>• If only one fan is running, both connection lines must be connected to this fan. |

You can find more information on other faults in the operating manuals for the respective control boxes.
If the problem could not be fixed, please contact the manufacturer. You can find information for this under ***Contact Service*** on page 5.

# 7 CLEANING, MAINTENANCE, AND REPAIRS

In this section, you will learn how to clean and maintain the seed drill, and what to do in case of damage or failure of the implement.

## 7.1 DISCONNECTING THE SEED DRILL FROM THE POWER SUPPLY

**Purpose**
Setup and maintenance work often require that the seed drill is disconnected from the power supply.

**Requirements**
The following requirements must be fulfilled for this work step:

- None

### Required components, tools and materials

For this work step, the following components, tools and materials are required:

None

### Overview

| No. | Designation |
|---|---|
| 1 | Implement cable |
| 2 | Main plug of the implement cable |

### Procedure

This is how to disconnect the seed drill from the power supply:

| Step | Description |
|---|---|
| 1 | Pull out the power supply plug from the control box<br>or<br>Pull out the implement cable plug from the control box<br>or<br>Switch off the control box |

## 7.2 EMPTYING THE SEED HOPPER

### Purpose

Before cleaning or decommissioning, the seed remaining in the seeder must be removed from the seed hopper.

### Requirements

The following requirement must be fulfilled for this work step:

- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** on page 37 for more information.

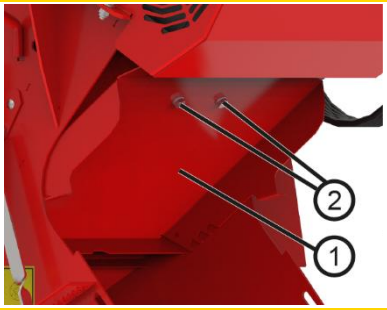
### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

### Procedure

This is how to empty the seed hopper:

| Step | Description | Explanation |
|---|---|---|
| 1 | Loosen the hexagonal bolt (2) on the calibration slide (1).<br>NOTE: The bolts are connected to the calibration slide with the circlips. |  |
| 2 | Take the calibration slide out of the anchoring and turn it by 180°. | |
| 3 | Reattach the rotated calibration slide back onto the seeder. | |
| 4 | Start the emptying program of the control box, refer to the control box operating manual for more information. | |

## 7.3 CLEANING THE SEED DRILL

### Purpose

The seed drill must be cleaned inside and out on a regular basis to ensure long-term proper functioning. If not cleaned properly, germs can form inside the seed drill due to seed residues.

### Requirements

The following requirements must be fulfilled for this work step:

- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** on page 37 for more information.

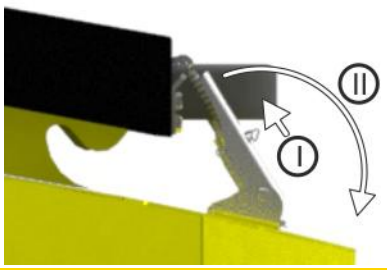
### Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Air compressor
- Moist cloth

### Procedure

To clean the seed drill:

| Step | Description | Explanation |
|---|---|---|
| 1 | Empty the seed hopper, see ***Emptying the seed hopper*** on page 38 for more information. | |
| 2 | Unlock the lock (I) and open (II) the flap fasteners (3). |  |

| Step | Description | Explanation |
|---|---|---|
| 3 | Open the cover (1).<br>CAUTION: Starting at a certain opening angle, the cover opens automatically by means of a gas pressure spring. | |
| 4 | Clean the inside of the seed drill and the seed paths with compressed air. | |
| 5 | Clean the outside of the seed drill with a moist cloth. | |

## 7.4 CHECKING THE HYDRAULIC HOSES

Have the hydraulic hoses checked annually by a qualified technician. The inspection intervals to be observed may be regulated by regional laws and regulations.

According to DIN 20066, all hydraulic hoses must be replaced after 6 years at the latest.

## 7.5 REPAIRS AND SERVICE

In case of failure or damage to the seed drill, please contact the manufacturer. You can find information for this under ***Contact Service*** on page 5.

# 8 DECOMMISSIONING, STORAGE AND DISPOSAL

In this section, you will learn how to decommission the seed drill, store it for longer periods of time, and dispose of it.

## 8.1 DECOMMISSIONING THE SEED DRILL

### Purpose

To ensure that the seed drill remains fully functional even if it is out of operation for longer periods of time, it is important to take precautions for storage.

### Procedure

This is how to prepare the seed drill for storage:

| Step | Description |
|---|---|
| 1 | Completely remove all seed from the seed drill. |
| 2 | Clean the seed drill inside and out, see ***Cleaning the seed drill*** on page 39 for more information. |
| 3 | Set the brush adjustment lever to Position "+4". |
| 4 | Store the seed drill in a dry place to prevent the formation of germs inside the implement. |

### Storage of the seed drill

The seed drill must be stored in a dry place protected from weather conditions to ensure that it remains functional even if it is stored for a longer period of time.

### Disposal

Disposal of the seed drill must be performed according to the local disposal regulations for machines.

# 9 ACCESSORIES

In this section, you will find a selection of possible accessories for your implement.

## 9.1 HG 300 M1

The HG 300 M1 is a hydraulically driven radial fan for working widths up to 12 m or for higher spread rates for e.g. wheat.
It is very resistant to dust and foreign objects, since these do not easily accumulate.
For mounting on the PS 120/200/300 M1 and PS 500 M2, a complete mounting kit including a transition piece and brace is available.

**Items included:**

1 HG 300 M1
1 Support
1 Flow regulator incl. hydraulic hoses

**Order number:**

Item no.: 08001-2-044

## 9.2 TOP LINK MOUNTING KIT FOR PS 120-500

With the top link mounting kit (three-point mounting bracket), you can attach the PS 120/200/300 M1, PS 500 M2 to a CAT 1 – CAT 3 three-point hitch.

**Items included:**

1 Three-point mounting bracket

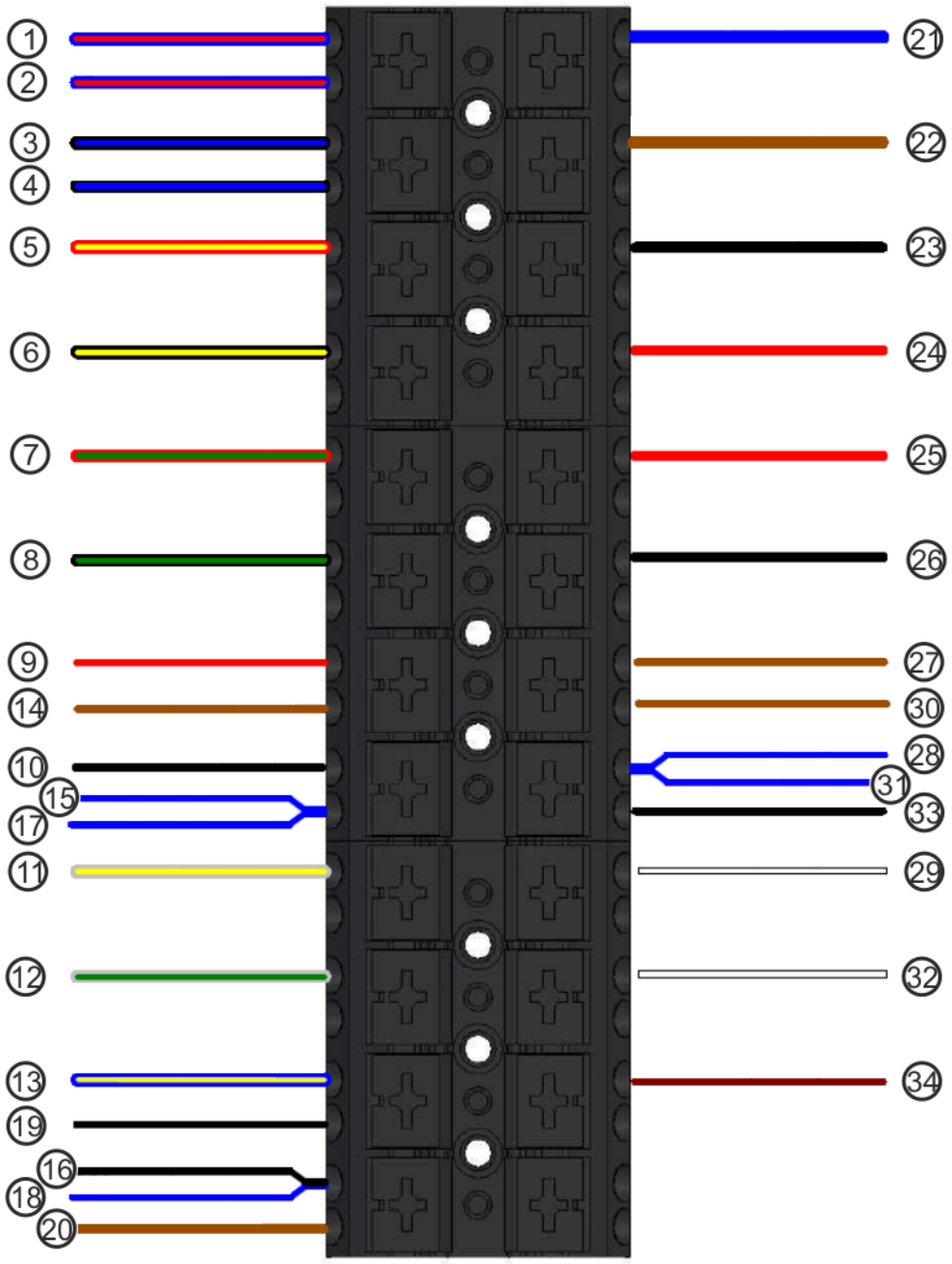
**Order number:**

Item no.: 04000-2-114

# 10 APPENDIX

## 10.1 CONNECTION DIAGRAM

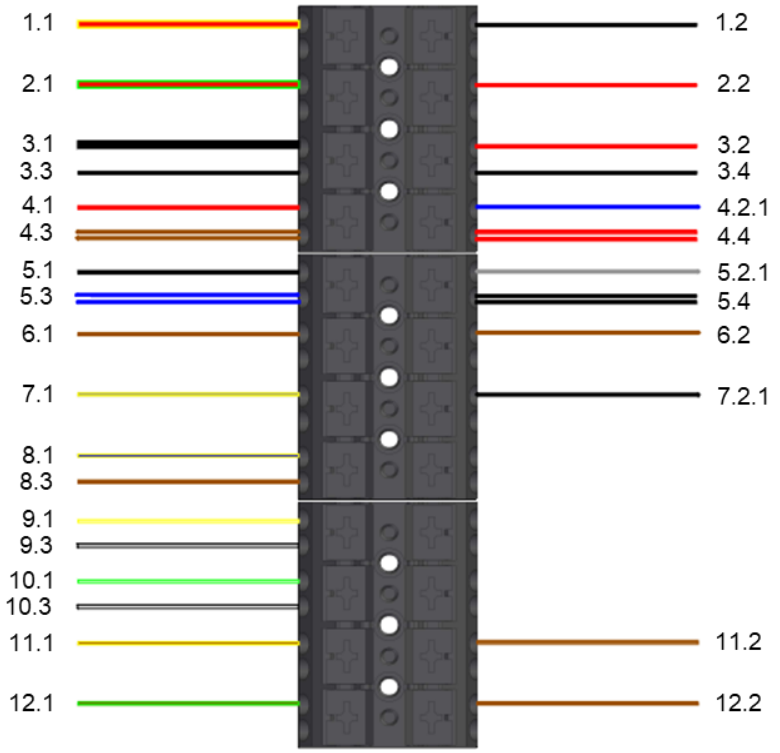
### 10.1.1 CONTROL BOX 5.7



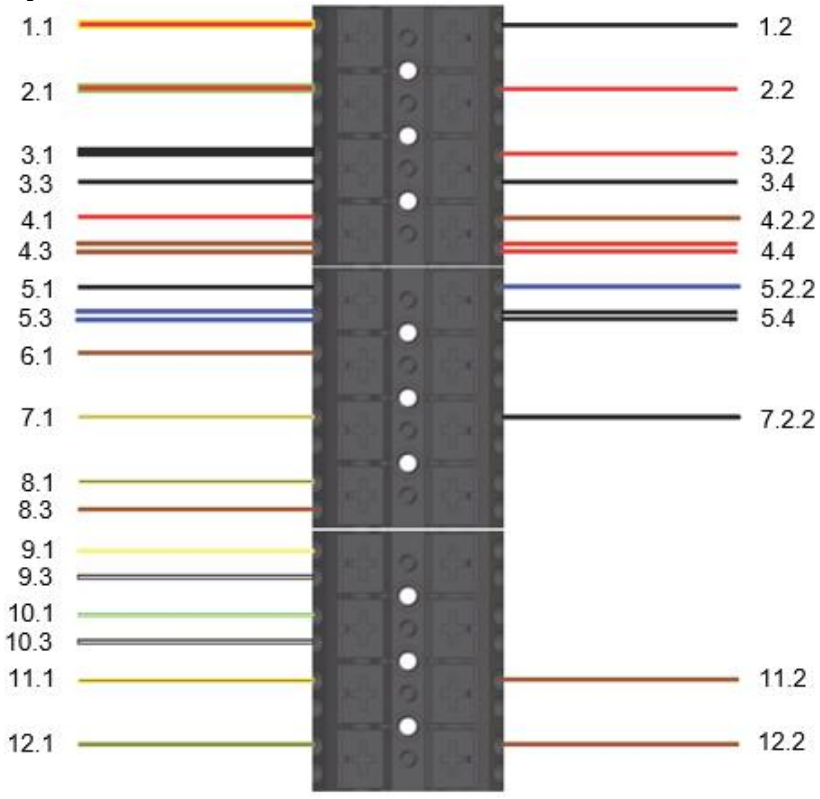
| No. | Description | Colour | Cross-section (mm²) |
|---|---|---|---|
| 1 | Implement cable (pin 59) | Red-blue | 2.5 |
| 2 | Implement cable (pin 59) | Red-blue | 2.5 |
| 3 | Implement cable (pin 62) | Black-blue | 2.5 |
| 4 | Implement cable (pin 62) | Black-blue | 2.5 |
| 5 | Implement cable (pin 57) | Red-yellow | 2.5 |
| 6 | Implement cable (pin 60) | Black-yellow | 2.5 |
| 7 | Implement cable (pin 58) | Red-green | 2.5 |
| 8 | Implement cable (pin 61) | Black-green | 2.5 |
| 9 | Implement cable (pin 41) | red | 1.0 |
| 10 | Implement cable (pin 49) | black | 1.0 |
| 11 | Implement cable (pin 1) | white-yellow | 0.5 |
| 12 | Implement cable (pin 2) | white-green | 0.5 |
| 13 | Implement cable (pin 5) | blue-yellow | 0.5 |
| 14 | Fan speed sensor (optional HF) | brown | 0.75 |
| 15 | Fan speed sensor (optional HF) | blue | 0.75 |
| 16 | Fan speed sensor (optional HF) | black | 0.75 |
| 17 | Pressure switch (only HF) | blue | 1.5 |
| 18 | Pressure switch (only HF) | brown | 1.5 |
| 19 | Hydraulic switch (only HF) | black | 1.5 |
| 20 | Hydraulic switch (only HF) | brown | 1.5 |
| 21 | Fan (not with HF) | blue | 4.0 |
| 22 | Fan (not with HF) | brown | 4.0 |
| 23 | Seeding shaft motor I | black | 1.5 |
| 24 | Seeding shaft motor I | red | 1.5 |
| 25 | Seeding shaft motor II | red | 1.5 |
| 26 | Seeding shaft motor II | black | 1.5 |
| 27 | Fill level sensor I | brown | 0.75 |
| 28 | Fill level sensor I | blue | 0.75 |
| 29 | Fill level sensor I | white | 0.75 |
| 30 | Fill level sensor II | brown | 0.75 |
| 31 | Fill level sensor II | blue | 0.75 |
| 32 | Fill level sensor II | white | 0.75 |
| 33 | Calibration button (optional) | black | 0.75 |
| 34 | Calibration button (optional) | brown | 0.75 |

## 10.1.2 ISOBUS

**Electric fan:**



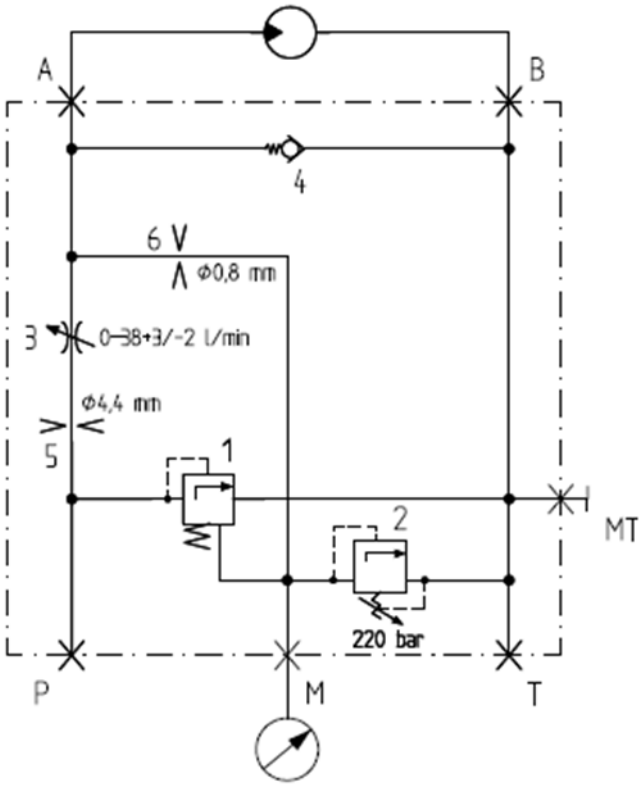

**Hydraulic fan:**



| Number | Description | Colour | Cross-section ($mm^2$) | Function |
|---|---|---|---|---|
| 1.1 | Implement cable | Red-yellow | 2.5 | Seeding shaft I PWM |
| 1.2 | Seeding shaft motor I | Black | 1.5 | |
| 2.1 | Implement cable | Red-green | 2.5 | Seeding shaft II PWM |
| 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 | Grey | 0.5 | |
| 5.2.2 | Fan speed sensor | Blue | 0.34 | |
| 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 elec. fan |
| 6.2 | Motor module | Brown | 0.5 | |
| 7.1 | Implement cable | Grey-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 speed II input |
| 12.2 | Encoder II | Brown | 0.34 | |

**Stripping length: 10 mm**

## 10.2 HYDRAULIC DIAGRAM




| Pos. | Description |
|---|---|
| A | G ½" (bolted connection XGE 15 LR-ED)<br>Max. hose length 1 m<br>Motor-side connection B |
| B | G ½" (bolted connection XGE 15 LR-ED)<br>Max. hose length 1 m<br>Motor-side connection A |
| P | G ½" (bolted connection XGE 18 LR-ED)<br>Max. hose length 6 m<br>Coupling plug BG3<br>Marked in red<br>Max. flow rate 80 l/min<br>Max. pressure 220 bar |
| T | G ¾" (bolted connection XGE 22 LR-ED)<br>Max. hose length 6 m<br>Coupling plug (or coupling sleeve) BG4<br>Marked in yellow |

## 10.3 TORQUES

The following torques must be observed without lubrication:

| | Dimensions | Preload force $F_u$ (N) | | | Tightening torque $M_A$ (Nm) | | |
|---|---|---|---|---|---|---|---|
| Coefficient of friction $\mu_{tot}$ = 0.20 | - | 8.8 | 10.9 | 12.9 | 8.8 | 10.9 | 12.9 |
| | M 4 | 3450 | 5050 | 5900 | 3.6 | 5.3 | 6.1 |
| | M 5 | 5650 | 8250 | 9650 | 7.1 | 10.0 | 12.0 |
| | M 6 | 7950 | 11700 | 13600 | 12.0 | 18.0 | 21.0 |
| | M 8 | 14600 | 21400 | 25100 | 30.0 | 44.0 | 52.0 |
| | M 10 | 23200 | 34100 | 39900 | 60.0 | 87.0 | 100.0 |
| | M 12 | 33900 | 49800 | 58000 | 105.0 | 151.0 | 177.0 |
| | M 14 | 46500 | 68500 | 80000 | 165.0 | 240.0 | 285.0 |
| | M 16 | 640000 | 94000 | 110000 | 260.0 | 380.0 | 445.0 |
| | M 18 | 80500 | 114000 | 134000 | 635.0 | 520.0 | 610.0 |
| | M 20 | 103000 | 147000 | 172000 | 520.0 | 740.0 | 870.0 |
| | M 22 | 129000 | 184000 | 216000 | 710.0 | 1000.0 | 1200.0 |
| | M 24 | 149000 | 212000 | 248000 | 890.0 | 1250.0 | 1500.0 |
| | M 27 | 196000 | 279000 | 327000 | 1350.0 | 1900.0 | 2200.0 |
| | M 30 | 238000 | 339000 | 397000 | 1800.0 | 2550.0 | 3000.0 |

## 10.4 SEEDING TABLES

| | Grass<br>Grass<br>Herbe<br><br>Lolium perenne | | Wheat<br>Wheat<br>Blé<br><br>Triticum | | Barley<br>Barley<br>Orge<br><br>Hordeum | | Blue lupine<br>Blue Lupine<br>Lupin Bleu<br><br>Lupinus angutifolius |
|---|---|---|---|---|---|---|---|
| **Rate** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** |
| **Seeding shaft** | **f-f** | **Flex20** | **f-f** | **Flex20** | **f-f** | **Flex20** | **Flex20** |
| **2** | 0.03 | 0.14 | 0.07 | 0.34 | 0.09 | 0.27 | 0.21 |
| **5** | 0.11 | 0.31 | 0.08 | 0.58 | 0.24 | 0.44 | 0.56 |
| **10** | 0.25 | 0.59 | 0.10 | 0.99 | 0.49 | 0.71 | 1.13 |
| **20** | 0.52 | 1.15 | 0.14 | 1.79 | 0.98 | 1.26 | 2.28 |
| **30** | 0.69 | 1.71 | 0.79 | 2.59 | 1.48 | 1.81 | 3.44 |
| **40** | 0.78 | 2.28 | 2.06 | 3.39 | 1.97 | 2.36 | 4.60 |
| **50** | 0.86 | 2.84 | 3.32 | 4.19 | 2.47 | 2.91 | 5.76 |
| **60** | 0.97 | 3.40 | 3.64 | 4.99 | 2.56 | 3.80 | 6.72 |
| **70** | 1.07 | 3.96 | 3.97 | 5.80 | 2.66 | 4.69 | 7.69 |
| **80** | 1.17 | 4.53 | 4.29 | 6.60 | 2.76 | 5.58 | 8.65 |
| **90** | 1.27 | 5.09 | 4.62 | 7.40 | 2.86 | 6.48 | 9.62 |
| **95** | 1.34 | 5.37 | 4.93 | 7.80 | 2.90 | 6.92 | 10.86 |
| **100** | 1.41 | 5.65 | 5.24 | 8.20 | 2.95 | 7.37 | 12.10 |

| | Oats<br>Oats<br>Avoine<br><br>Avena | | Mustard<br>Mustard<br>Moutarde<br><br>Sinapis Alba | | Lucerne<br>Alfalfa<br>Lucerne<br><br>Medicago Sativa | | Rapeseed<br>Rape<br>Colza<br><br>Brassica Napus |
|---|---|---|---|---|---|---|---|
| **Rate** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** |
| **Seeding shaft** | **fb-f** | **Flex20** | **fb-f** | **f-f** | **fb-f** | **f-f** | **fb-f** |
| **2** | 0.01 | 0.08 | 0.04 | 0.17 | 0.10 | 0.15 | 0.12 |
| **5** | 0.02 | 0.23 | 0.15 | 0.38 | 0.21 | 0.35 | 0.22 |
| **10** | 0.04 | 0.49 | 0.33 | 0.73 | 0.40 | 0.69 | 0.38 |
| **20** | 0.07 | 1.01 | 0.68 | 1.43 | 0.79 | 1.37 | 0.72 |
| **30** | 0.12 | 1.52 | 1.00 | 2.12 | 1.15 | 2.03 | 1.04 |
| **40** | 0.17 | 2.01 | 1.29 | 2.78 | 1.49 | 2.68 | 1.32 |
| **50** | 0.22 | 2.50 | 1.58 | 3.45 | 1.82 | 3.34 | 1.62 |
| **60** | 0.24 | 2.93 | 1.72 | 3.81 | 1.90 | 3.70 | 1.76 |
| **70** | 0.26 | 3.36 | 1.86 | 4.17 | 1.97 | 4.07 | 1.90 |
| **80** | 0.27 | 3.79 | 2.00 | 4.53 | 2.04 | 4.44 | 2.02 |
| **90** | 0.27 | 4.23 | 2.14 | 4.89 | 2.12 | 4.81 | 2.16 |
| **95** | 0.28 | 4.37 | 2.31 | 5.18 | 2.24 | 5.17 | 2.30 |
| **100** | 0.31 | 5.12 | 2.48 | 5.46 | 2.36 | 5.53 | 2.44 |

| | Radish<br>Radish<br>Radis<br><br>Raphanus raphanistrum | | Vetch<br>Vetch<br>Vesce<br><br>Vicia | | Buckwheat<br>Buckwheat<br>Blé Noir<br><br>Fagopyrum | | Perennial rye<br>Green Rye<br>Seigle Vert<br><br>Secale cereale |
|---|---|---|---|---|---|---|---|
| **Quantity** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** |
| **Seeding shaft** | **f-f** | **Flex20** | **fb-f** | **f-f** | **f-f** | **Flex20** | **Flex20** |
| **2** | 0.12 | 0.33 | 0.76 | 1.69 | 0.05 | 0.27 | 0.23 |
| **5** | 0.31 | 0.59 | 1.42 | 1.95 | 0.20 | 0.50 | 0.50 |
| **10** | 0.64 | 1.03 | 2.51 | 2.38 | 0.45 | 0.87 | 0.94 |
| **20** | 1.28 | 1.90 | 4.71 | 3.24 | 0.96 | 1.62 | 1.81 |
| **30** | 1.80 | | | 4.00 | 1.43 | 2.34 | 2.67 |
| **40** | 2.49 | | | | 1.87 | 3.04 | 3.49 |
| **50** | | | | | 2.31 | 3.73 | 4.32 |
| **60** | | | | | 2.53 | | 5.14 |
| **70** | | | | | 2.75 | | 5.95 |
| **80** | | | | | 2.97 | | 6.72 |
| **90** | | | | | 3.19 | | 7.46 |
| **95** | | | | | | | 7.57 |
| **100** | | | | | | | 9.05 |

| | Red clover<br>Red Clover<br>Trèfle Rouge<br><br>Trifolium | | Phacelia<br>Phacelia<br>Phavélie<br><br>Phacelia tanacetigolia | | Pea<br>Pea<br>Pois<br><br>Pisum sativum | Horse gram<br>Field beans<br>Féveroles<br><br>Macrotyloma uniflorum | Chia WHITE |
|---|---|---|---|---|---|---|---|
| **quantity** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** |
| **Seeding shaft** | **fb-f** | **f-f** | **fb-f** | **f-f** | **Flex20** | **Flex20** | **fb-f** |
| **2** | 0.04 | 0.28 | 0.14 | 0.17 | 0.46 | 0.46 | 0.05 |
| **5** | 0.15 | 0.69 | 0.31 | 0.39 | 0.68 | 0.66 | 0.12 |
| **10** | 0.33 | 1.36 | 0.61 | 0.75 | 1.02 | 1.00 | 0.24 |
| **20** | 0.70 | 2.71 | 1.19 | 1.47 | 1.72 | 1.68 | 0.47 |
| **30** | 1.06 | 3.50 | 1.52 | | 2.42 | 2.36 | |
| **40** | 1.41 | 3.73 | 1.59 | | 3.12 | 3.04 | |
| **50** | 1.76 | 3.96 | 1.66 | | 3.84 | 3.71 | |
| **60** | 1.87 | 4.18 | 1.85 | | 4.54 | 4.39 | |
| **70** | 1.98 | 4.41 | 2.04 | | 5.24 | 5.07 | |
| **80** | 2.09 | 4.64 | 2.23 | | 5.94 | 5.75 | |
| **90** | 2.20 | 4.87 | 2.42 | | 6.64 | 6.43 | |
| **95** | 2.33 | 5.17 | 2.52 | | 7.00 | 6.77 | |
| **100** | 2.46 | 5.47 | 2.62 | | 7.34 | 7.11 | |

| | Florex | DC 37 bulk | PHYSIOSTART | | Force | | |
|---|---|---|---|---|---|---|---|
| **Quantity** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | **kg/min** | | |
| **Seeding shaft** | **fb-f** | **Flex20** | **fb-f** | **Flex20** | **fb-f** | | |
| **2** | 0.00 | 0.62 | 0.21 | 0.61 | 0.12 | | |
| **5** | 0.08 | 0.93 | 0.30 | 0.93 | 0.19 | | |
| **10** | 0.21 | 1.43 | 0.46 | 1.45 | 0.30 | | |
| **20** | 0.46 | 2.45 | 0.78 | 2.51 | 0.54 | | |
| **30** | 0.72 | 3.46 | 1.10 | 3.56 | 0.77 | | |
| **40** | 0.98 | 4.48 | 1.41 | 4.61 | 1.00 | | |
| **50** | 1.23 | 5.49 | 1.73 | 5.66 | 1.23 | | |
| **60** | 1.49 | 6.51 | 20.5 | 6.72 | 1.46 | | |
| **70** | 1.75 | 7.52 | 2.36 | 7.77 | 1.69 | | |
| **80** | 2.00 | 8.46 | 2.65 | 8.83 | 1.93 | | |
| **90** | 2.26 | 8.93 | 2.79 | 9.60 | 2.16 | | |
| **95** | 2.39 | 9.16 | 2.87 | 9.98 | 2.27 | | |
| **100** | 2.52 | 9.39 | 2.99 | 10.52 | 2.35 | | |

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## NOTES

**APV – Technische Produkte GmbH**
Zentrale: Dallein 62
AT - 3753 Hötzelsdorf

Tel.: +43 2913 8001
office@apv.at
www.apv.at