



Version: 2.0 EN / Item no.: 00601-3-394

Operating manual PS 1200 M1, PS 1600 M1, HG 450 M1

Please read carefully before initial operation!

ORIGINAL OPERATING MANUAL



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EC conformity

In compliance with Directive 2006/42 EC

The manufacturer APV - Technische Produkte GmbH.
Dallein 15, AT-3753 Hötzelendorf hereby declares that the product

Pneumatic seed drill
"PS 1200 M1" "PS 1600 M1"
"HG 450 M1"

Implement type designation / serial no. (see handover declaration and title page)

to which this declaration of conformity refers, complies with the relevant basic safety and health requirements of EC Directive 2006/42 EC as well as the requirements of other relevant EC Directives

2006/42/EC Machinery Directive
2004/108/EC EMC Directive

If applicable: Title / Number / Current version of the other EC Directives

For proper implementation of the safety and health requirements mentioned in the EC Directives, the following standards and / or technical specifications were taken into account:

EN 12100/1; EN 1200100/2
EN 14018 Agricultural and forestry machinery – Seeders – Safety
EN 349 Safety of machinery – Minimum gaps to avoid crushing of parts of the human body
EN 60204-1 Safety of machinery – Electrical equipment
EN 953 Safety of machinery – Guards
ISO 12100 Safety of machinery – General principles for design – Risk assessment and risk reduction
ISO 13857 Safety of machinery – Safety distances

If applicable: Title / Number / Current version

Your CE contact person at APV is Mr. Jürgen Schöls.
He can be reached at the telephone number +43(0) 2913-8001.

Dallein, 11/2017
City, Date



Signature

Ing. Jürgen Schöls
Management

1 Provisions

Dear customer!

We are pleased and congratulate you on your purchase and wish you lots of fun and success in working with this implement!

Please be sure to read all the instructions in this operating manual before operating the implement!

2 Warranty

Please check the implement for any transport damage immediately upon receipt. Later claims regarding transport damage can no longer be considered.

We provide a one-year factory warranty as of the date of delivery (your invoice or the delivery slip serve as a warranty certificate).

This warranty is applicable for cases of material or construction faults and does not include parts that are damaged by normal or excessive wear.

The warranty expires

- if damage is caused by external forces.
- in cases of operating errors.
- if the prescribed requirements are not met.
- if the implement is modified, expanded or equipped with third-party spare parts without our permission.
- if the implement is cleaned with water.
- if the spreader is used for snow and ice removal.

3 Accident prevention safety instructions

The general accident prevention regulations of the respective countries must be observed.

The implement may only be used by persons who are informed of the hazards.

Check the hazard area before starting up and operating the implement! (Children!) Ensure sufficient visibility!

The warning and information stickers applied to the implement provide important instructions for safe operation: observe them for the sake of your own safety!

Before starting work, you should get to know all of the equipment and operating elements as well as their functions.

4 Mounting the PS

4.1 Layout and mode of operation

The pneumatic seed drill is a spreader and seed drill with 1200/1600 litres capacity as a standard.

The seeding shaft is driven by a 12 V electric gear motor, which is regulated by the control box. The speed of the seeding shaft can be comfortably regulated from the driver's seat using the control box. Here, there is the option of using speed sensors (see operating manual for the control box) to regulate the speed of the seeding shaft according to the ground speed. Power can be supplied to the control box either through the 3-pin standard socket or optionally directly from the battery.

The blower fan is driven by a hydraulic motor, which is controlled via a valve. This can be used to adjust the speed of the blower fan impeller and therefore the working width and the required air volume for various seed types. The implement also has a pressure sensor in the air flow and a fill level sensor for monitoring.

Cover

The cover seal can be separately adjusted on each cover using adjustment screws. On the hinge, loosen the M10 lock nut and screw the M10x25 bolts down until the seal is resting against the hopper all around. On the side with the handle, also loosen the M8 lock nut and screw the hook further in. This adjustment is necessary if leaks are observed on the cover.

The cover can also be mounted turned by 180° without additional material. That means that the covers then fold open on the other side of the hopper.



Figure 1



Figure 2: lock nut near the handle

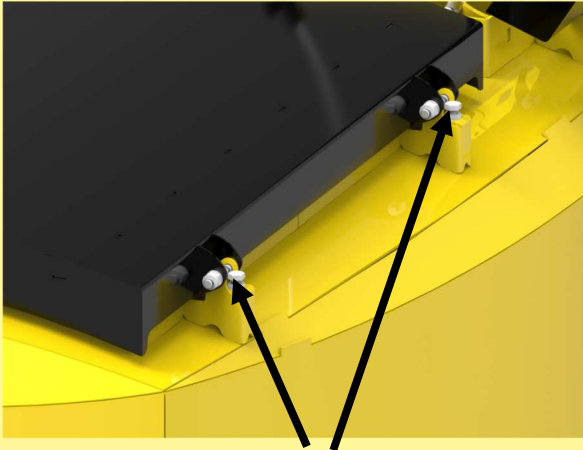


Figure 3: position of the lock nuts near the hinges

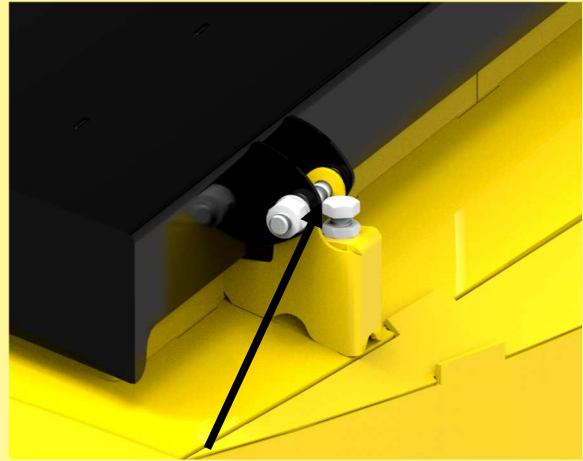


Figure 4: lock nut near the hinge

Ascent with MT2 steps

When folding the ladder down, the black hook (see Figure 5: hook) must be pushed to the rear and the steps can be folded. When folding up, the hook automatically snaps into place and the steps are fixed.

Ascent with MT2 ladder

To be able to pull out the ladder, you must remove the locking pin (see Figure 6: locking pin). Then you can pull out the ladder and fold it down.



Figure 5: hook

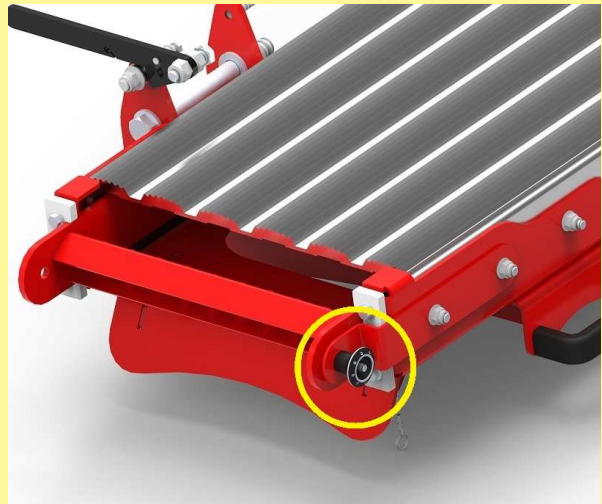


Figure 6: locking pin

4.2 Mounting on an implement

To mount the PS 1200/1600 M1 on an implement, you must ensure that the intended carrier or the design is capable of carrying **a load of at least two tons** without suffering damage! If this is not given, both devices can be damaged!

The 4 base plates must be firmly welded to the implement by a qualified specialist, or each bolted with 4x M20 bolts.

Hole pattern, see Point 8 Technical Specifications.

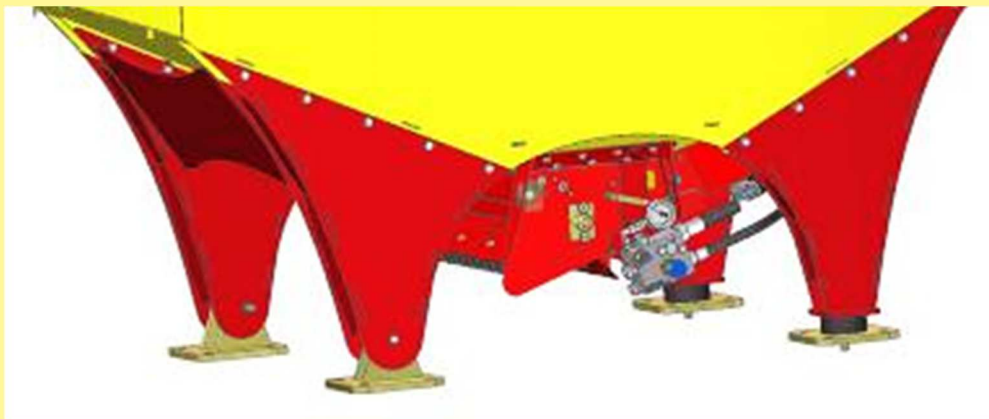


Figure 8

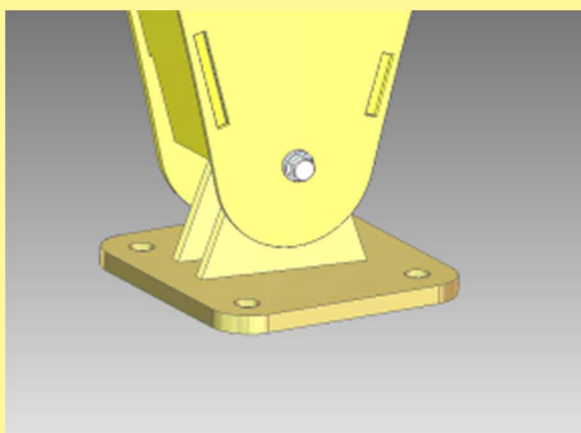


Figure 9: base plate at the front

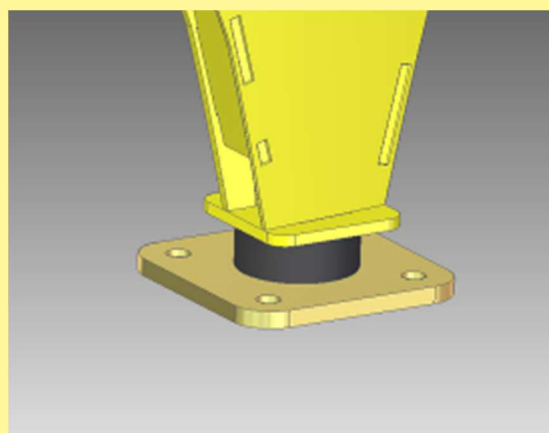


Figure 7: base plate at the rear

4.3 Installation of the baffle plates

The baffle plates can be mounted using the standard supplied hexagon shaft or directly (without the hexagon shaft) onto the soil tillage implement.

The following points must be noted when mounting onto the implement (cultivator, harrow, etc.):

- To install the baffle plates, you must bend the "tabs" on the sides towards the rear (approx. 80°, see Figure 12) using pliers and then bolt or weld them with the hexagon shaft onto the implement.
- To prevent the baffle plates from sliding to the sides on the hexagon shaft, fasten the baffle plates with the supplied plate nuts and bolts (see Figure 13).

- The baffle plates should be evenly distributed over the entire width of the implement (max. 75 cm)!
- The baffle plates should have approx. 40 cm clearance from the tilled soil!
- The seed hoses should flow into the dispersion plates vertically (90°). Therefore, the baffle plates should also be mounted vertically (90°) on the hexagon shaft (see Figure 11).



Figure 10



Figure 11

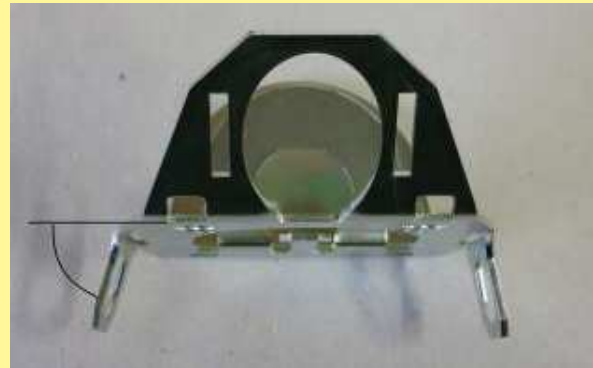


Figure 12

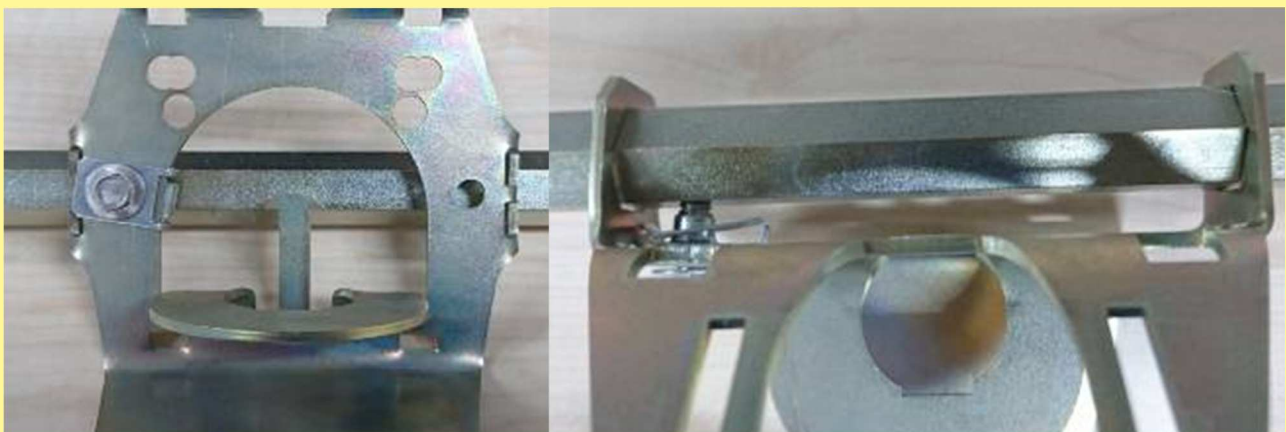


Figure 13

5 Hydraulic blower fan drive

5.1 Connecting the blower fan

For the PS1200/1600 M1, the hydraulic fan is driven directly by the tractor hydraulic system. Two hoses are intended for coupling to the tractor (see Figure 14):

- The return line (marked in yellow, BG4) must flow into the tractor oil tank unpressurised (without reduction)!
- The pressure line (marked in red, BG3) can be simply connected to the tractor control unit.
- When connecting the hydraulic hoses to the tractor hydraulic system, make sure that the hydraulic system on the tractor and implement side is unpressurised!



Figure 14



CAUTION!

Before you start up the fan, completely close the flow control valve! This prevents the fan from over-revving unintentionally!

The BG4 coupling plug for the tank line on hydraulic seeders is dismantled and included with the accessories. Please observe the operating manual for your tractor to make sure that you use the correct unpressurised connection.

The tank line is closed with a plastic cap so that no oil can leak during transport, it must be removed before initial operation and replaced by the proper BG4 coupling.

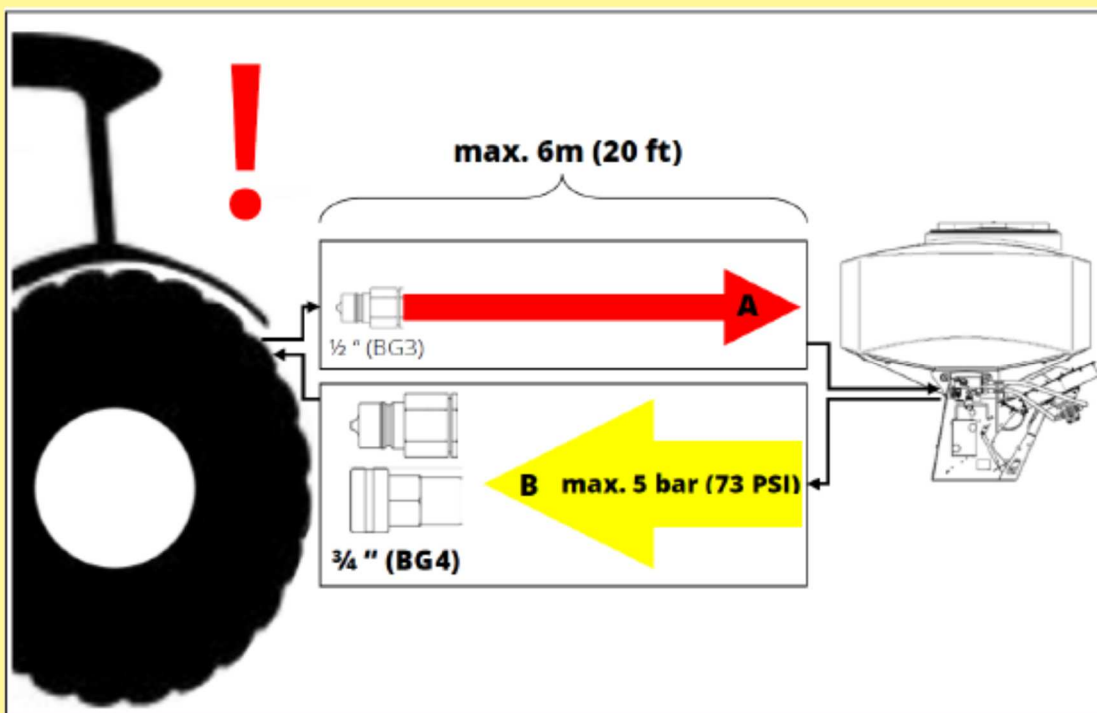


Figure 15

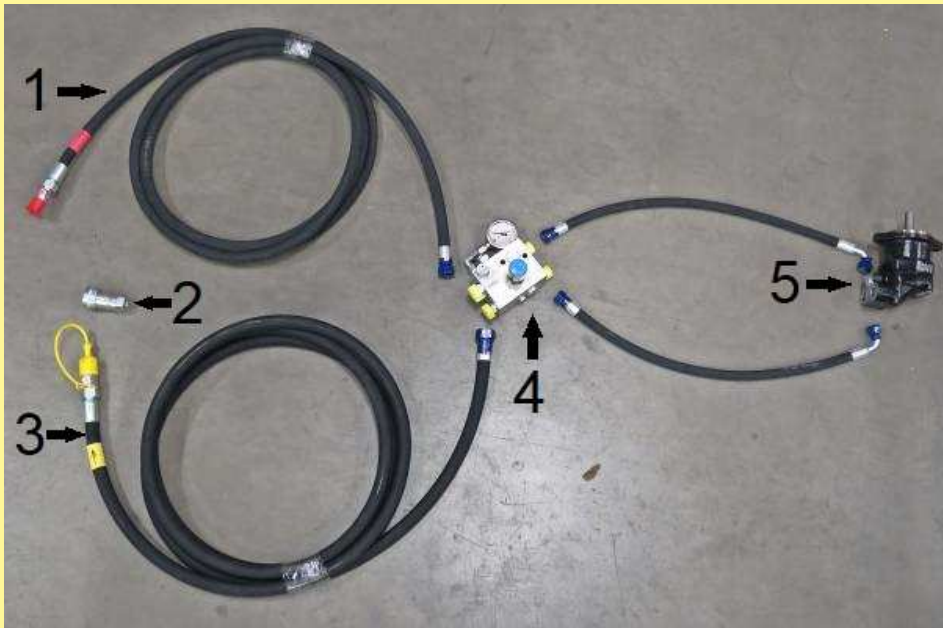


Figure 16

- 1 = Pressure line (marked in red, with direction arrow),
- 2 = Coupling sleeve BG 4 (alternative),
- 3 = Tank line with direction arrow (marked in yellow),
- 4 = Hydraulic block with control valve,
- 5 = Motor

5.2 Setting values (HG)

The 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!

A reference value can be found under 5.3.



CAUTION!

The air flow must not be too low under any circumstances, otherwise the seed can get stuck and clog the hoses! This results in a lot of work, since the hoses must then be disconnected and emptied manually. In addition, the seed might be ground in the metering unit!

An excessive air flow can also have negative impacts on the seed distribution. Guiding principle: As much air as required, but as little air as possible!



Figure 17

The air quantity is limited by the utilised spreading material, which must not be damaged when hitting the spreading plate and must also not bounce off too high in order to achieve the desired placement!

The fan speed increases proportionally with the oil flow.

5.3 Setting procedure (HG)

Version 1 (constant pump – non-adjustable oil quantity)

- Completely screw in the control valve (- minus)
- Start up the blower fan (tractor engine speed as in field operation)
- Adjust the fan speed using the control valve on the control block
- The control block protects the motor against overspeed



TIP!

The hydraulic pump on the tractor must supply sufficient oil so that the fan speed does not drop when the tractor motor speed drops or when other hydraulic functions are actuated.

Version 2 (Variable pump or oil quantity adjustable on the tractor)

- Completely turn out the control valve (+ plus)
- Close the flow control valve on the tractor (set the oil quantity to **ZERO**)
- Start up the fan and run up to the desired fan speed (slowly increase the oil quantity)



TIP!

The control block is designed for 80 l/min – The system can overheat if the tractor pump produces a larger quantity of oil as well as when the tractor is not equipped with oil cooling.



CAUTION!

The setting is only valid for the tractor used.

If a different tractor is connected, the fan must be readjusted!

Correct adjustment is essential to prevent possible seeding errors when the speed is too slow or damage to the fan when the speed is too fast!

Setting table for the control valve:
(valid for approx. 50°C oil temperature)

		Working width					
		3 m		6 m		12 m	
Seed	Rate	Press- ure	Speed	Press- ure	Speed	Press- ure	Speed
Fine seed	5 kg/ha	9 bar	750 rpm	15 bar	1000 rpm	15 bar	1000 rpm
Fine seed	30 kg/ha	20 bar	1250 rpm	22 bar	1500 rpm	24 bar	1600 rpm
Coarse seed	50 kg/ha	16 bar	1100 rpm	20 bar	1250 rpm	37 bar	2000 rpm
Coarse seed	200 kg/ha	22 bar	1500 rpm	50 bar	2500 rpm	64 bar	2900 rpm

These pressure specifications apply for the manometer attached on the control block.



TIP!

A measuring strip is applied on the hydraulic motor. If the temperature increases in a range of the scale (from 71 °C to 110 °C), the strip is coloured black.

Temperatures above 80 °C are not permitted!

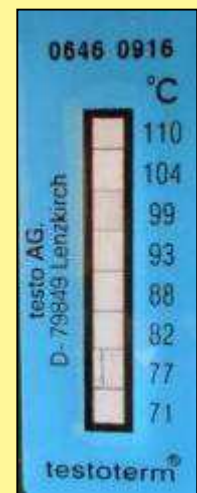
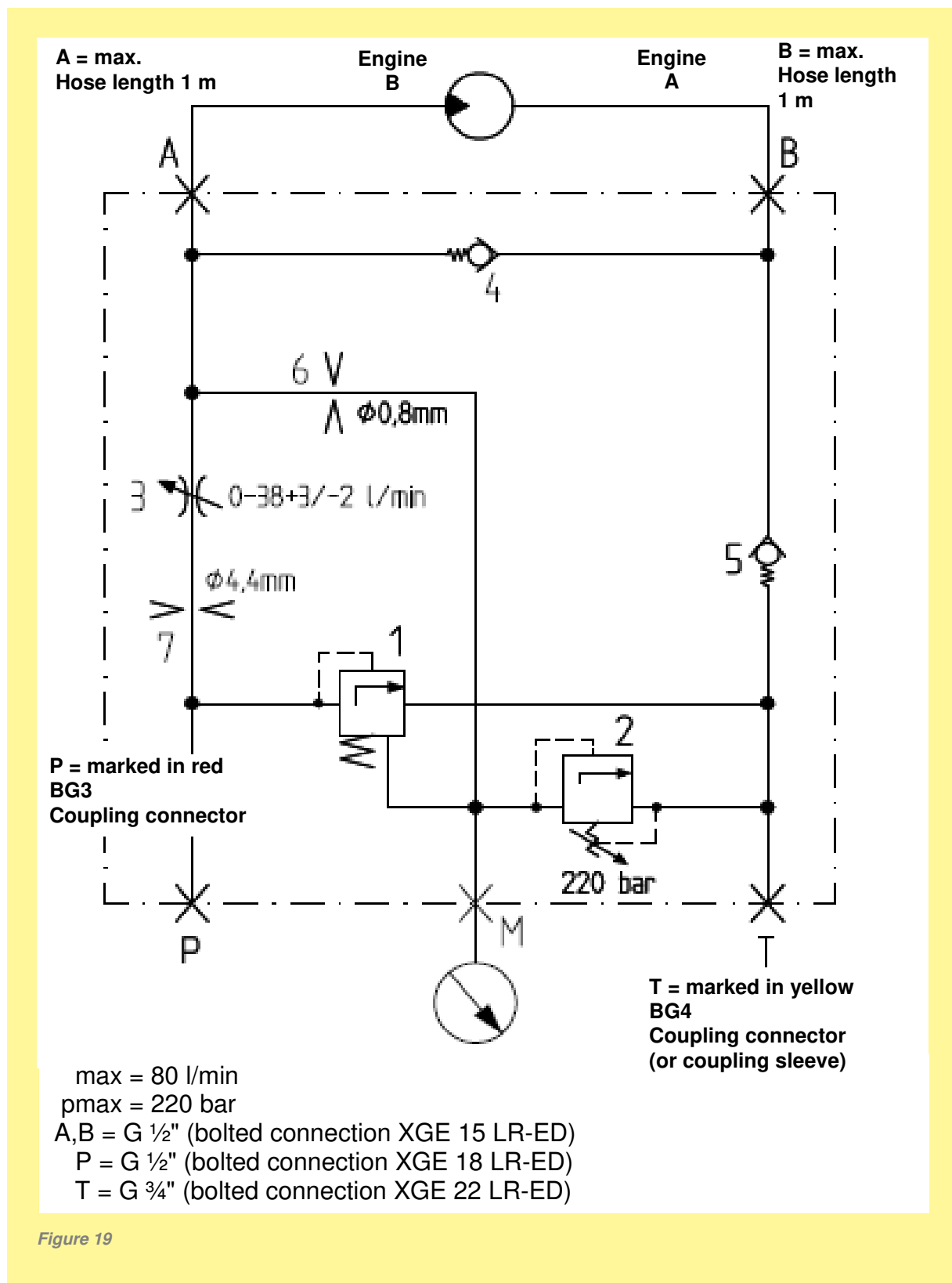


Figure 18

5.4 Scheme (HG)



CAUTION!

When changing the motor, it must be ensured that connection A from the control block is connected to connection B of the motor and connection A from the motor to connection B on the block.

5.5 Function of the blower fan pressure sensor and the hydraulic pressures switch

The blower fan pressure sensor (Figure 20) prevents the seeding shaft from being switched on as long as a hydraulic fan is not yet switched on, and thus prevents clogging of the seed drill through undesired or premature switch-on.

The hydraulic switch (Figure 21) signals on the control box if there is too much pressure (10 bar) in the tank line of the hydraulic motor. This can destroy the seal.

As soon as one of the two sensors reports an error, the message "Blower fan error" appears on the screen of the control box (1.2 / 5.2 / 6.2).

If the fan is not running yet, start it up and then the error message should disappear and you can start the seeding shaft.

If the fan is already running, there is probably too much pressure in the tank line of the motor. The causes on the tractor could be a clogged oil filter or a tank line to the coupling that is too small.

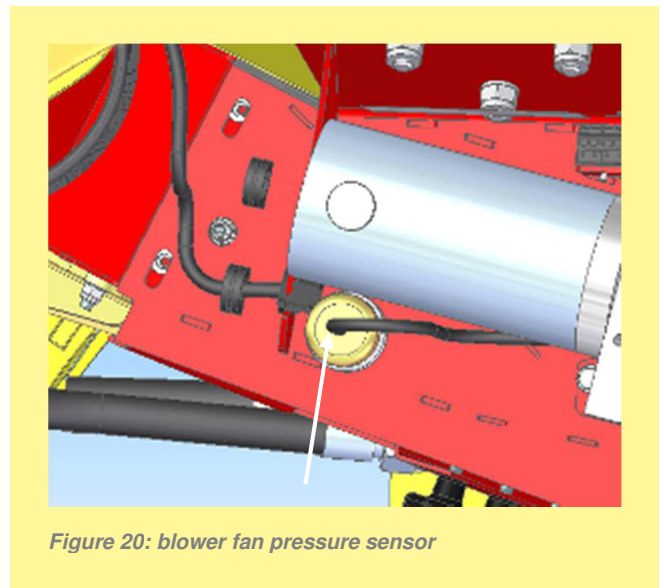


Figure 20: blower fan pressure sensor

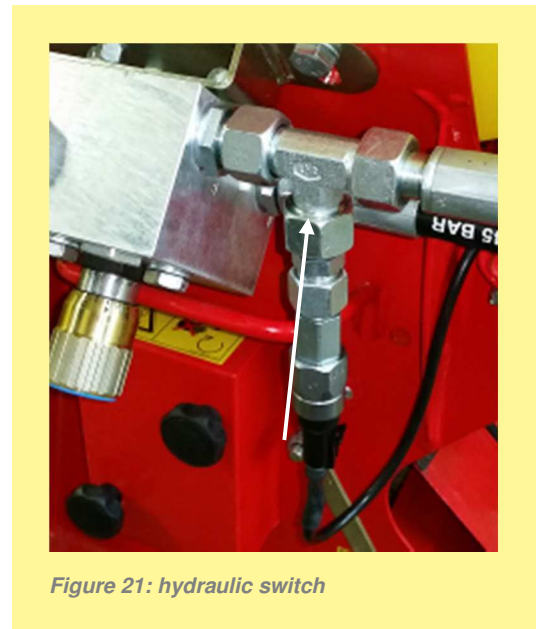


Figure 21: hydraulic switch



CAUTION!

It is imperative to reduce the pressure, otherwise the motor can be destroyed!

5.6 Hydraulic system (HG)



CAUTION!

The hydraulic system is under high pressure!

If the connections are interchanged, there will be an inverse function (e.g. lifting/lowering) and/or certain destruction of the hydraulic motor! – Danger of accident!

- When connecting hydraulic motors, the specified connection of the hydraulic hoses must be observed!
- When connecting the hydraulic hoses to the tractor hydraulic system, make sure that the hydraulic system on the tractor and implement side is unpressurised!
For hydraulic function connections between the tractor and the implement, coupling sleeves and connectors should be marked to rule out operating errors!
- Inspect the hydraulic hose lines at regular intervals and replace in case of damage or wear!
The replacement lines must comply with the technical requirements of the implement manufacturer!
- Due to the risk of injury, use suitable tools when searching for leaks!
- Liquids escaping under high pressure (hydraulic oil) can penetrate skin and cause serious injuries! Consult a doctor immediately in case of injury! (Risk of infection!)



PLEASE NOTE!

Before working on the hydraulic system, park the implement, depressurize the system and switch off the motor!

5.7 Changing the seals on the hydraulic motor

To change the seals on your motor, open the service flap shown in Figure 20. It is fastened with 6x M6 nuts. After removing the service flap, you can remove the impeller. More detailed assembly instructions are included with the new seal.



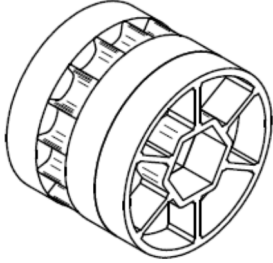
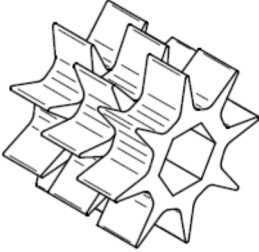
Figure 22

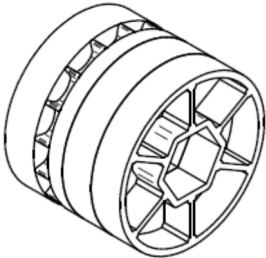
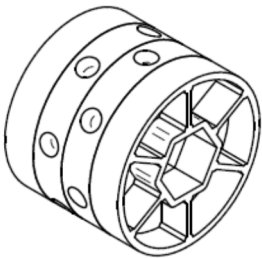
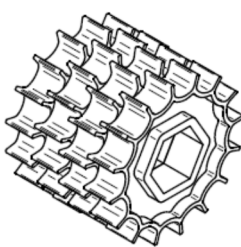
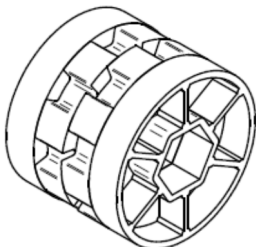
6 Settings

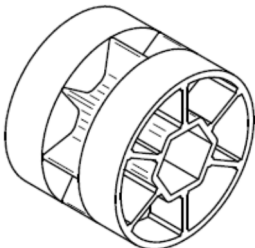
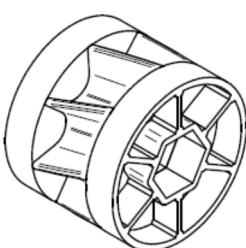
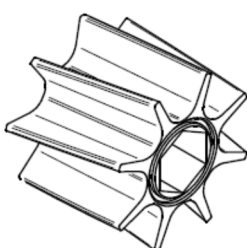
6.1 Proper selection of the seeding shaft

Before filling the hopper with seed, it is important to select the proper seeding shaft (coarse, fine or blind).

The selection is based on the properties of the seed and the rate to be spread.

Seeding shaft types: Standard equipment	
	
fb-f-fb-fb	GGG
Mustard Phacelia	Cereals Grass

Seeding shaft types: Available as an option			
			
fb-fb-ef-eb-fb	fb-efv-efv-fb	fff	fb-fv-fv-fb
Poppy	Oil rape seed	Buckwheat Mustard, cress	Clover Cress

Seeding shaft types: Available as an option			
			
GB-G-GB	Fb-Flex20-fb	Flex40	
Buckwheat Fodder radish	Seed mixtures Peas, beans, lupines, vetch		

In the standard scope of delivery for the PS 1200/1600 M1, 2 completely mounted seeding shafts are included:

- 1 seeding shaft with coarse-toothed seed wheels (G-G-G) (Figure 23)
- 1 seeding shaft with one fine seed wheel per outlet (fb-f-fb-fb) (Figure 24)

Scope of use for the coarse-toothed seeding shaft (Figure 23):

Generally for high rates or large grain sizes.
E.g.: grass mixtures, rye, barley, wheat, oats, etc.



Figure 23

Scope of use for the fine-toothed seeding shaft (Figure 24):

Generally for low rates or small grain sizes.
Small seeds such as clover, phacelia, slug pellets, etc.



Figure 24

Scope of use for the Flex20 and the Flex40 seed wheels (Figure 25):

Since these seed wheels are flexible, damage to the seed wheels can be avoided.
For extra-large seeds such as peas, vetch, etc., see also under Point 6.7.

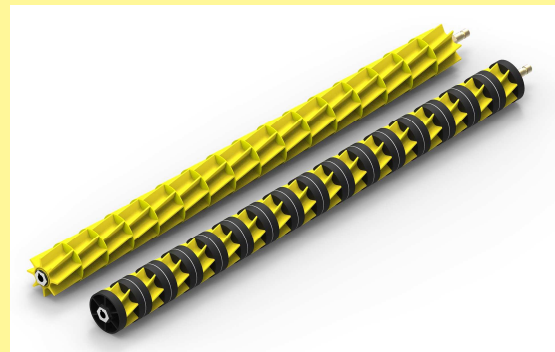


Figure 25



CAUTION!

For wheat or seed types with grains of similar size or larger, the hoses can be shifted at high spread rates. This can lead to consequential damages such as more rapid wear of the seeding shaft!

To prevent such damage to the implement, we recommend increasing the air quantity to the maximum level!



TIP!

Seeding shaft according to the customer's specifications:
The spread rate can be reduced significantly by using blind seed wheels!



CAUTION!

It is important to select the combination of seed wheels such that the seeding shaft settings on the control box are ideally between 20 % and 80 %.

This ensures good regulation and homogeneous delivery of the seed even with ground speed related spreading at very low or high speeds!

6.2 Dismounting (changing) the seeding shaft

When changing the seeding shaft, observe the following:

- First completely empty the hopper.
- Refer to the seeding table and select the desired seeding shaft with the corresponding spread rate.

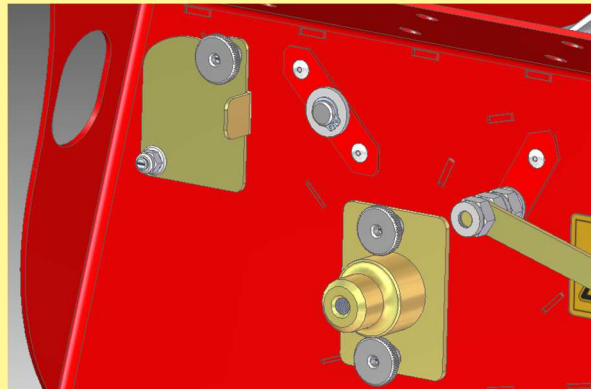


Figure 26

- Unscrew the locking nuts from the side cover plate for the seeding shaft.

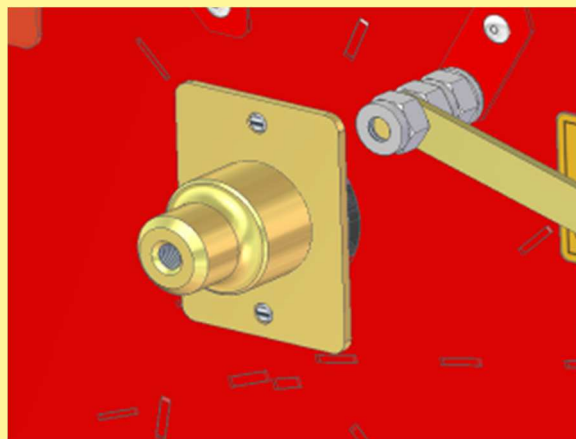


Figure 27

- Rotate the cover plate by 180 ° and screw it onto the seeding shaft. Remove the entire seeding shaft along with the side cover plate.

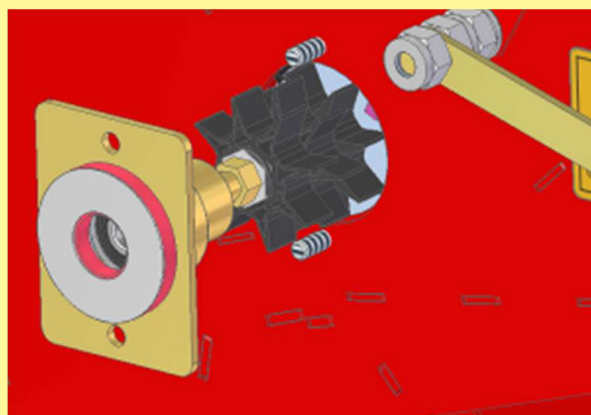


Figure 28

- The second seeding shaft is stowed in the seeding shaft holder.

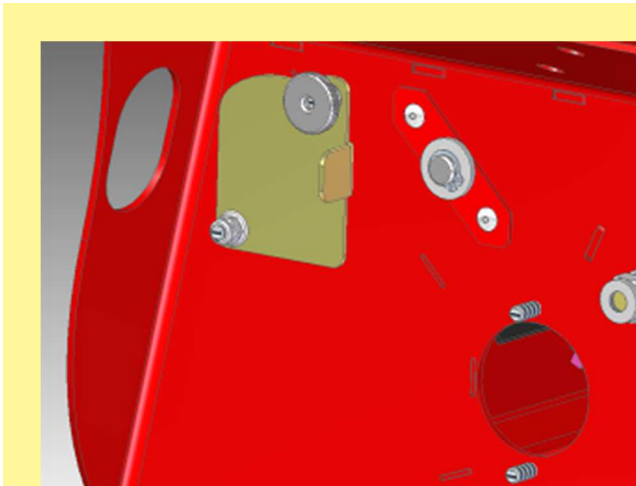


Figure 29

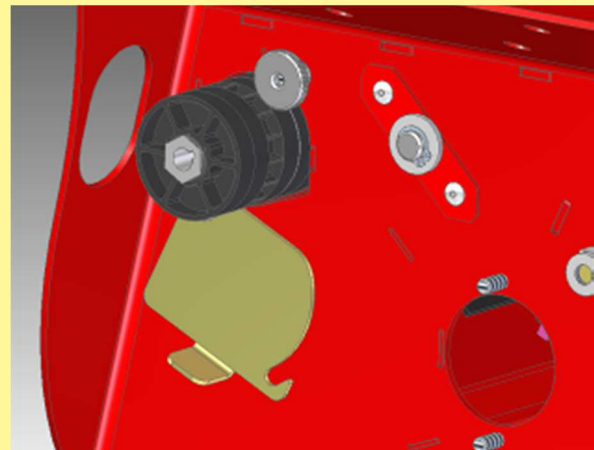


Figure 30

- Here, you must loosen the knurled nuts, then you can swivel the cover away and remove the second seeding shaft (Figure 29). Turn the spare roll by 180° and stow it in the meter roll holder (Figure 30).

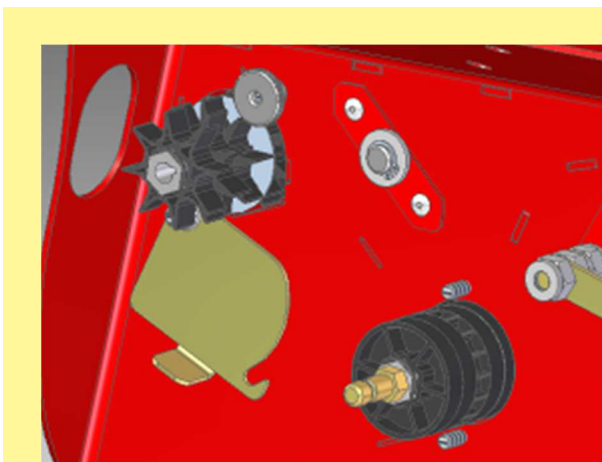


Figure 31

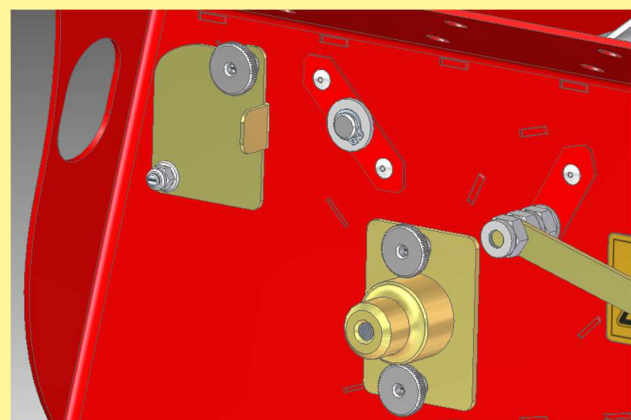


Figure 32

- Now the new seeding shaft can be installed in the implement (Figure 31).
- Install the disassembled parts again in the reverse sequence (Figure 32).

6.3 Bottom flap (brush adjustment)

A brush is installed over the seeding shaft. This brush can be adjusted on a scale from +4 to -5 using a lever on the frame.

When the brush is pressed more on the seeding shaft using the lever (scale value -1 to -5), the spread rate is slightly reduced.

When the brush is lifted (scale value +1 to +4), the spread rate is slightly increased.

The basic setting of the bottom flap is 0. The calibration tests for the seeding tables were performed with this setting.

As a matter of principle, the brush is used to adjust the implement for the seed to be spread.

For fine seed types that flow well, the brush usually has to be set more inwards, i.e. at a negative value, and for larger seeds, it must be set more outwards, i.e. at a positive value on the scale.

The brush can also be used for finer adjustments to the seed spread rate!

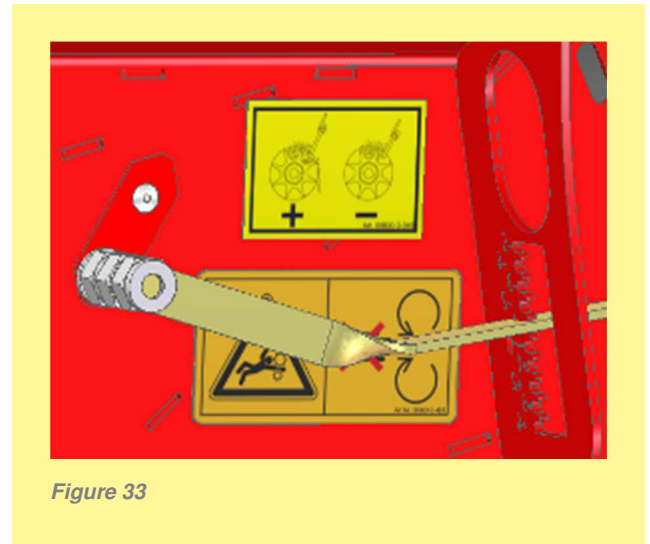


Figure 33

6.4 Agitator

Use of the agitator is only required for seed types that tend towards bridging or for very light seed (e.g. for grasses).

When the agitator is not required, you only have to remove the chain that is spanned on the drive wheels between the agitator and the meter roll.

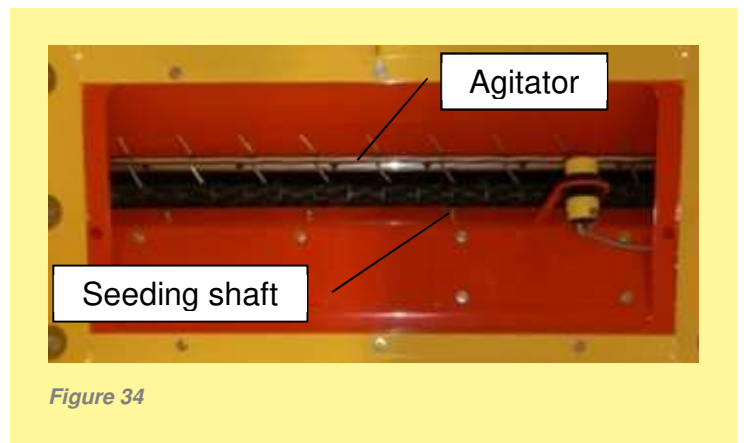


Figure 34



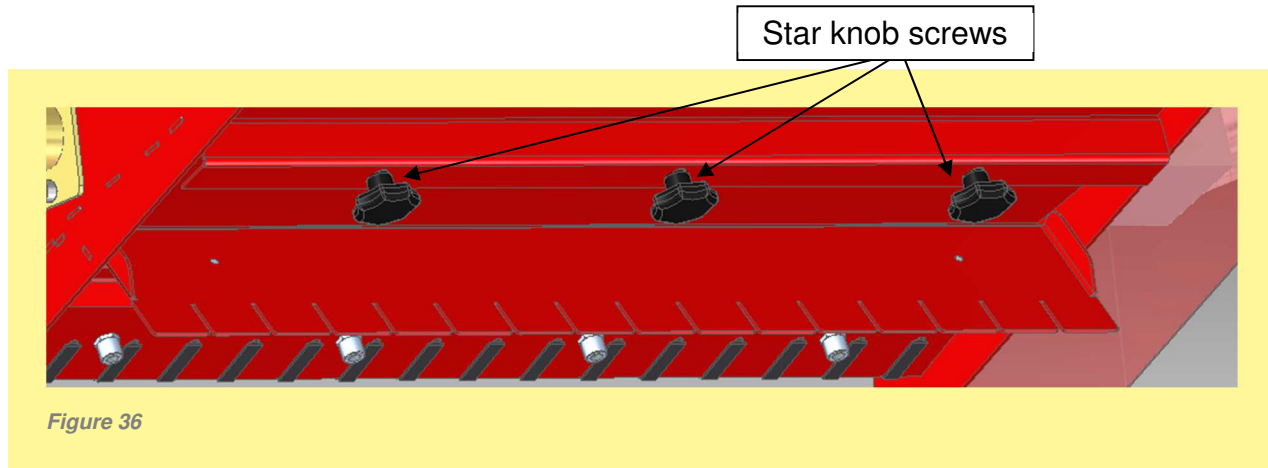
Figure 35

6.5 Swell air plate

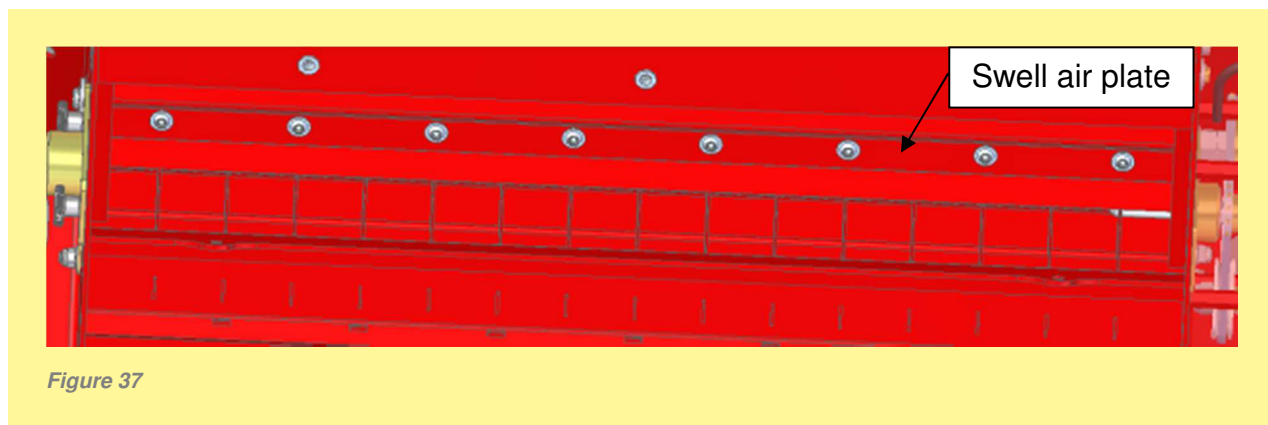
For larger seed types, the swell air plate must be removed to prevent damage to the seed, the seeding shaft and the steel frame.

To do so, proceed as follows:

- Remove the calibration cover using the three star knob screws.



- Unscrew the 8 bolts for the swell air plate and remove the plate.



- Mount the seeding shaft cover with the three star knob screws. When mounting the seeding shaft cover, ensure that the cover latches into the groove so that no air escapes here.



PLEASE NOTE!

For large seed types such as vetch, peas, horse gram or similar large seeds, the swell air plate must be removed to avoid damage to the seed wheels.



TIP!

We also recommend the use of Flex seed wheels, since these are flexible and do not break (see under 7.1).

6.6 Fill level sensor

The fill level sensor reacts when it is no longer covered with seed. Its height can be adjusted depending on the desired quantity in the hopper when the sensor is triggered.

The intensity of the sensor can also be adjusted for the respective seed type. It is adjusted using the small slotted screw at the rear of the sensor.

When the sensor is switched, it lights up and the hopper is full. You can cover the sensor at the front with your hand and it should then light up.

This makes it easy to check whether the sensor works and if the intensity is correct.

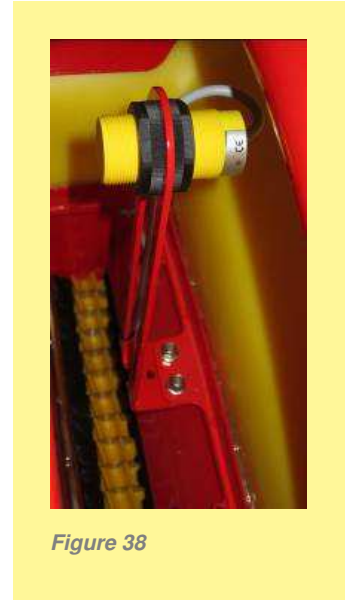


Figure 38

6.7 Working widths, spread rates, seeding tables

The PS 1200/1600 M1 can be used for working widths up to max. 12 m.



CAUTION!

It must be ensured that the tractor is capable of providing enough hydraulic power for the blower fan. Otherwise, the hoses can be displaced towards the baffle plates and cause damage to the implement!

The spread rate depends on the speed of the seeding shaft and the forward speed when operating with sensors. To determine the desired spread rate, you should perform a calibration test before beginning work.

The seeding tables show the spread rate for the respective seed types in kilograms per minute (= spread rate of the calibration test).



CAUTION!

The seeding tables are based on 16 outlets with the same equipment! If you are using e.g. only 12 outlets instead of the 16 outlets, the calibrated quantity is reduced accordingly.



CAUTION!


These tables can be used as reference values. However, they cannot be used in the same way everywhere as many factors play a role and strong changes can occur (e.g. thousand grain weight, seed moisture content, changes in flow behaviour, and much more).


The spread rate is calculated with the following formula:


$$\frac{\text{desired spread rate [kg/ha]} \times \text{forward speed [km/h]} \times \text{working width [m]}}{600} = \text{weight [kg/min]}$$

Example:
$$\frac{5 \text{ [kg/ha]} \times 12 \text{ [km/h]} \times 12 \text{ [m]}}{600} = 1,2 \text{ [kg/min]}$$

Seeding tables

Gras Grass Herbe Lolium perenne	
	
Rate	kg/min
Seeding shaft	GGG
2	0.78
5	1.57
10	2.89
15	4.22
20	5.54
25	6.86
30	8.12
35	9.37
40	10.63
45	11.88
50	13.14
55	14.27
60	15.40
65	16.53
70	17.67
75	18.80
80	20.54
85	22.27
90	24.01
95	24.22
100	29.20

Wheat Wheat Blé Triticum			
			
Rate	kg/min	kg/min	kg/min
Seeding shaft	GGG	fb-Flex20-fb	Flex40
2	1.19	0.48	0.54
5	1.90	1.08	1.95
10	3.08	2.09	4.32
15	4.26	3.09	6.68
20	5.45	4.10	9.04
25	6.63	5.11	11.40
30	7.74	6.11	13.76
35	8.86	7.12	16.13
40	9.97	8.13	18.49
45	11.09	9.13	20.85
50	12.20	10.14	23.21
55	13.28	11.15	25.58
60	14.37	12.15	27.94
65	15.45	13.16	30.30
70	16.53	14.16	32.66
75	17.61	15.17	35.02
80	18.71	16.18	37.39
85	19.80	17.18	39.75
90	20.89	18.19	42.11
95	25.83	19.20	44.47
100	30.75	20.20	46.83

Radish Radish Radis Raphanus raphanistrum	
	
Rate	kg/min
Seeding shaft	GGG
2	1.89
5	3.20
10	5.36
15	7.53
20	9.70
25	11.87
30	14.24
35	16.61
40	18.98
45	21.34
50	23.71
55	25.62
60	27.53
65	29.44
70	31.36
75	33.27
80	45.68
85	58.10
90	70.52
95	74.65
100	86.59

**Vetch
Vetch
Vesce**



Vicia

Rate	kg/min
Seeding shaft	fb-f-fb-fb
2	0.11
5	0.31
10	0.63
15	0.95
20	1.27
25	1.59
30	1.87
35	2.14
40	2.41
45	2.68
50	2.96
55	3.20
60	3.44
65	3.68
70	3.92
75	4.16
80	4.43
85	4.70
90	4.96
95	5.03
100	5.19

**Buckwheat
Buckwheat
Blé Noir**



Fagopyrum

Rate	kg/min	kg/min	kg/min
Seeding shaft	GGG	fb-Flex20-fb	Flex40
2	1.05	0.03	0.86
5	2.33	0.05	1.26
10	4.46	0.47	2.92
15	6.59	1.16	4.57
20	8.72	1.85	6.22
25	10.85	2.54	7.88
30	13.01	3.23	9.53
35	15.18	3.92	11.18
40	17.34	4.61	12.84
45	19.50	5.30	14.49
50	21.66	5.99	16.14
55	23.69	6.68	17.80
60	25.73	7.37	19.45
65	27.76	8.06	21.10
70	29.79	8.75	22.76
75	31.83	9.44	24.41
80	33.82	10.14	26.06
85	35.82	10.83	27.72
90	37.81	11.52	29.37
95	40.09	12.21	31.02
100	48.73	12.90	32.68

**Blue lupine
Blue Lupine
Lupin Bleu**



Lupinus
angustifolius

Rate	kg/min
Seeding shaft	GGG
2	1.24
5	2.81
10	5.41
15	8.02
20	10.62
25	13.23
30	15.12
35	17.01
40	18.90
45	20.79
50	22.68
55	25.30
60	27.93
65	30.56
70	33.18
75	35.81
80	37.79
85	39.77
90	41.75
95	44.41
100	47.01

**Perennial rye
Green Rye
Seigle Vert**



Secale
cereale

Rate	kg/min
Seeding shaft	GGG
2	0.65
5	1.33
10	2.46
15	3.59
20	4.72
25	5.84
30	9.28
35	12.71
40	16.14
45	19.57
50	23.00
55	25.01
60	27.03
65	29.04
70	31.05
75	33.07
80	35.15
85	37.24
90	39.32
95	40.85
100	43.32

Spelt
Spelt
Épeautre



Triticum
aestivum

Rate	kg/min
Seeding shaft	GGG
2	0.15
5	0.29
10	0.54
15	0.79
20	1.03
25	1.28
30	1.41
35	1.54
40	1.67
45	1.81
50	1.94
55	2.05
60	2.16
65	2.27
70	2.38
75	2.49
80	2.57
85	2.64
90	2.72
95	3.05
100	3.66

Mustard
Mustard
Moutarde



Sinapis Alba

Rate	kg/min
Seeding shaft	fb-f-fb-fb
2	0.22
5	0.45
10	0.82
15	1.20
20	1.57
25	1.95
30	2.32
35	2.70
40	3.07
45	3.45
50	3.82
55	4.17
60	4.52
65	4.88
70	5.23
75	5.58
80	5.91
85	6.24
90	6.57
95	6.94
100	8.43

Alfalfa
Alfalfa
Alfalfa



Medicago
Sativa

Rate	kg/min
Seeding shaft	fb-f-fb-fb
2	0.40
5	0.67
10	1.12
15	1.57
20	2.02
25	2.47
30	2.88
35	3.29
40	3.71
45	4.12
50	4.53
55	4.94
60	5.34
65	5.75
70	6.15
75	6.56
80	6.98
85	7.41
90	7.84
95	8.24
100	9.45

**Red
clover
Red
Clover
Trèfle
Rouge**



Trifolium

Rate	kg/min
Seeding shaft	fb-f-fb-fb
2	0.33
5	0.58
10	0.98
15	1.39
20	1.79
25	2.20
30	2.61
35	3.02
40	3.43
45	3.84
50	4.25
55	4.67
60	5.09
65	5.51
70	5.92
75	6.34
80	6.73
85	7.11
90	7.49
95	7.90
100	9.72

Phacelia
Phacelia
Phacélie



Phacelia
tanacetifolia

Rate	kg/min
Seeding shaft	fb-f-fb-fb
2	0.20
5	0.44
10	0.85
15	1.26
20	1.67
25	2.08
30	2.45
35	2.82
40	3.19
45	3.57
50	3.94
55	4.28
60	4.62
65	4.97
70	5.31
75	5.65
80	5.97
85	6.29
90	6.62
95	6.88
100	7.54

Oil rape
seed
Rape
Colza



Brassica
Napus

Rate	kg/min	kg/min
Seeding shaft	fb-fb-f-fb	fb-efv-efv-fb
2	0.19	0.02
5	0.43	0.07
10	0.83	0.17
15	1.23	0.26
20	1.63	0.36
25	2.03	0.45
30	2.36	0.54
35	2.68	0.64
40	3.01	0.73
45	3.34	0.83
50	3.67	0.92
55	3.98	1.01
60	4.30	1.11
65	4.61	1.20
70	4.93	1.30
75	5.24	1.39
80	5.51	1.49
85	5.78	1.58
90	6.05	1.67
95	6.28	1.77
100	6.92	1.86

Pea
Pea
Pois



Pisum sativum

Rate	kg/min	kg/min
Seeding shaft	fb-Flex20-fb	Flex 40
2	0.27	2.19
5	0.47	3.31
10	0.48	5.19
15	1.17	7.06
20	1.86	8.94
25	2.55	10.81
30	3.24	12.69
35	3.93	14.56
40	4.62	16.44
45	5.31	18.31
50	6.00	20.19
55	6.69	22.07
60	7.38	23.94
65	8.07	25.82
70	8.76	27.69
75	9.45	29.57
80	10.14	31.44
85	10.83	33.32
90	11.52	35.19
95	12.21	37.07
100	12.90	38.95

**Pferde-
Bean
Field beans
Féveroles**

Macrotyloma
uniflorum



**Feuerbohne
bzw.
Käferbohne
Scarlet
runner bean
Haricot
rouge**

Phaseolus
coccineus



DC 37 bulk

NACKAS bulk

DC25 bulk

Rate	kg/min	kg/min
Seeding shaft	fb-Flex20-fb	Flex 40
2	0.81	2.16
5	1.27	3.30
10	2.03	5.20
15	2.79	7.11
20	3.55	9.01
25	4.31	10.91
30	5.07	12.82
35	5.82	14.72
40	6.58	16.62
45	7.34	18.52
50	8.10	20.43
55	8.86	22.33
60	9.62	24.23
65	10.38	26.14
70	11.14	28.04
75	11.90	29.94
80	12.66	31.84
85	13.42	33.75
90	14.18	35.65
95	14.94	37.55
100	15.70	39.46

Rate	kg/min
Seeding shaft	GGG
2	0.43
5	0.86
10	1.59
15	2.31
20	3.03
25	3.75
30	4.55
35	5.35
40	6.15
45	6.95
50	7.75
55	8.52
60	9.29
65	10.07
70	10.84
75	11.62
80	12.39
85	13.17
90	13.94
95	14.72
100	15.49

Rate	kg/min
Seeding shaft	GGG
2	2.65
5	4.88
10	8.62
15	12.35
20	16.08
25	19.81
30	23.06
35	26.31
40	29.56
45	32.81
50	36.06
55	38.88
60	41.71
65	44.53
70	47.36
75	50.18
80	53.01
85	55.83
90	58.65
95	61.48
100	64.30

Rate	kg/min
Seeding shaft	GGG
2	2.71
5	5.06
10	8.99
15	12.92
20	16.85
25	20.77
30	24.19
35	27.61
40	31.03
45	34.45
50	37.87
55	49.28
60	60.70
65	72.11
70	83.53
75	94.94
80	106.36
85	117.77
90	129.18
95	140.60
100	152.01

Rate	kg/min
Seeding shaft	GGG
2	0.90
5	1.81
10	3.82
15	5.18
20	6.90
25	8.56
30	10.08
35	11.56
40	13.11
45	14.64
50	16.15
55	17.63
60	18.85
65	20.99
70	22.08
75	23.16
80	23.91
85	24.66
90	25.41
95	26.15
100	26.90

6.8 Calibration test / Regulation of the seed rate

To determine the desired spread rate, you must perform a calibration test.

Proceed as follows to perform the calibration test:

1. Remove the seeding shaft cover with the 3 star knob nuts, which is located underneath the fan over the partition plates (Figure 39).
2. Unscrew the two star knob nuts from the calibration plate and then rotate it by 180° so that the slots in the partition plates latch in. Then attach again with the 2 nuts (Figure 40).
3. Please use the supplied container to collect the seed during the calibration test. The calibration trough is supplied with the "stand-alone" version. For the version with implement carrier (MT2), the calibration trough is already installed as shown in Figure 41.
4. Please proceed as described in the operating manual for your control box.
5. You can also make slight adjustments to the spread rate using the bottom flap (brush adjustment, see Point 6.3). **(Please note:** after adjusting the bottom flap, it is absolutely necessary to repeat the calibration test!)
6. After beginning operation, you should verify the spreading on the field. In particular, check the forward speed, the spread rate and distribution of the baffle plates.
7. We recommend repeating the calibration test after seeding on 1 ha.

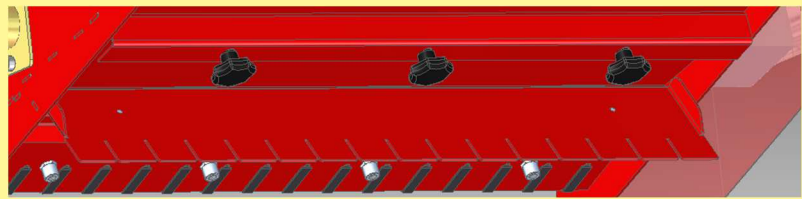


Figure 39

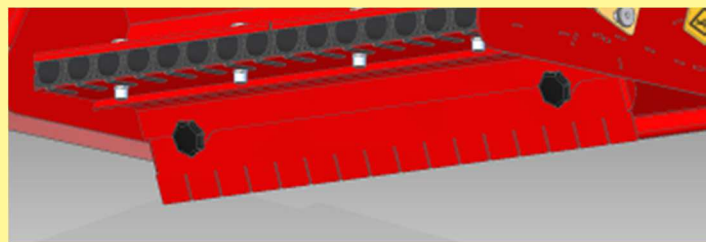


Figure 40



Figure 41: calibration trough on MT2

6.9 Operation on the field

When you start seeding, proceed as follows:

- Start your towing vehicle.
- Switch on the control box using the "On/Off" button.
- Switch on the blower fan and allow to run up to speed; the red LED control lamp will light up.
- Press the seeding shaft On/Off button. When the green LED control lamp is lit for the "Seeding shaft" button, the gear motor that turns the seeding shaft and conveys the seed is switched on.



TIP!

These points are not applicable if you have a speed sensor.

- While you are turning at the headlands, you only have to press the "Seeding shaft" button so that the green LED is turned off. This stops the seeding shaft and only the fan is still running.
- When finishing the work, press the "ON/OFF button" on the control box to switch the fan and the seeding shaft off.

The following points must be observed for field operation:

- The fan should always be switched on during field operation.
- Verify the required spread rate.
- Check the width distribution (distance) of the baffle plates.
- Check the height of the baffle plates: Distance from the ground approx. 40 cm.
- Angle of the baffle plates: attachment plate for the baffle plates should be mounted at approx. 90° (perpendicular) to the ground.
- The spreading hoses should be routed slightly slanted down or horizontally on the implement.
- The hopper cover must be tightly sealed.

6.10 Emptying the hopper

To empty the hopper, push the emptying opening to the right and fix it there. Hold a bucket, a sack or a different container under it.

To ensure complete emptying, you must also remove the seeding shaft cover, which is located underneath the fan, as well as the calibration slide.

Then actuate the menu point "Emptying" on the control box. With this menu point, the seeding shaft starts rotating automatically. Now let the seeding shaft rotate until the hopper is completely empty, and the seed wheels no longer deliver seed.

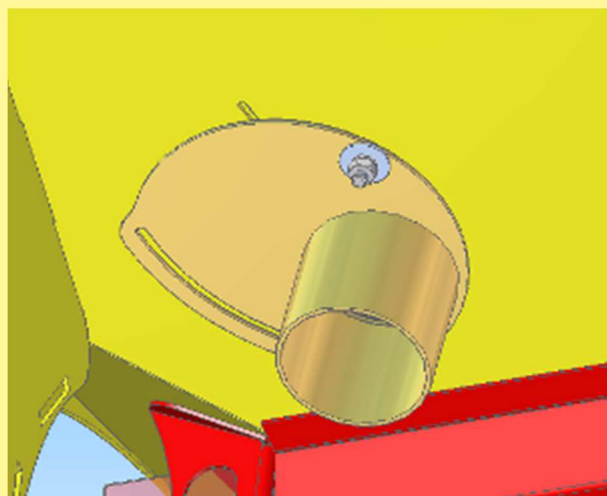


Figure 42

7 Maintenance and care

7.1 General

To maintain the implement in good condition even after a long service life, the following instructions must be observed:

- In the supplement "For your safety..." you will find some basic safety regulations for maintenance work.
- Original parts and accessories are designed especially for the machines or implements.
- Please note that spare parts and accessories not supplied by us have also not been tested and approved by us.
- The installation or use of such products can therefore possibly negatively change or impede the constructional properties of your implement. The manufacturer rules out any liability for damages resulting from the use of non-original parts and accessories.
- The manufacturer is not liable for any unauthorised modifications and the use of components and auxiliary parts.
- All bolted connections should be re-tightened at the latest after 3 operating hours and again after 20 hours, and then checked regularly. (Loose bolts can cause significant consequential damage, which is not covered by the warranty.)
- The paint can be damaged by cleaning with excessive pressure.
- During the winter, the implement should be protected against rust with an environmentally-friendly product.
- Park the implement protected from weather conditions.
- Do not clean the implement with water. It is recommended to clean the implement with compressed air.



CAUTION!

Ensure that no water enters the hopper or the implement. The inside of the implement can only be cleaned with compressed air! Please cover the suction channel with the supplied covering plate!

7.2 Location of the rating plate

The rating plate is located on the motor cover on the right side of the implement when looking from the front!

In cases of inquiries or warranty claims, please always tell us the production number of your machine.



Figure 43

8 Technical Specifications

Technical specifications for stand-alone version

Designation:	PS 1200/1600 M1
Hopper content:	1200/1600 litres
Dimensions (H x D x W):	1650/1800 x 1100 x 2250 mm
Weight:	470/500 kg
Max. spreading width:	12 m
Power supply:	12 V, 25 A

Hydraulic supply with HG

Max. pressure:	150 bar
Max. oil quantity:	38 l/min
Weight:	40 kg
Length of the hydraulic hoses:	Tank line 6 m Supply line for the motor 6 m Pressure line 0.75 m Return line 0.75 m
Dimensions (L x W x H):	760 x 660 x 270 mm

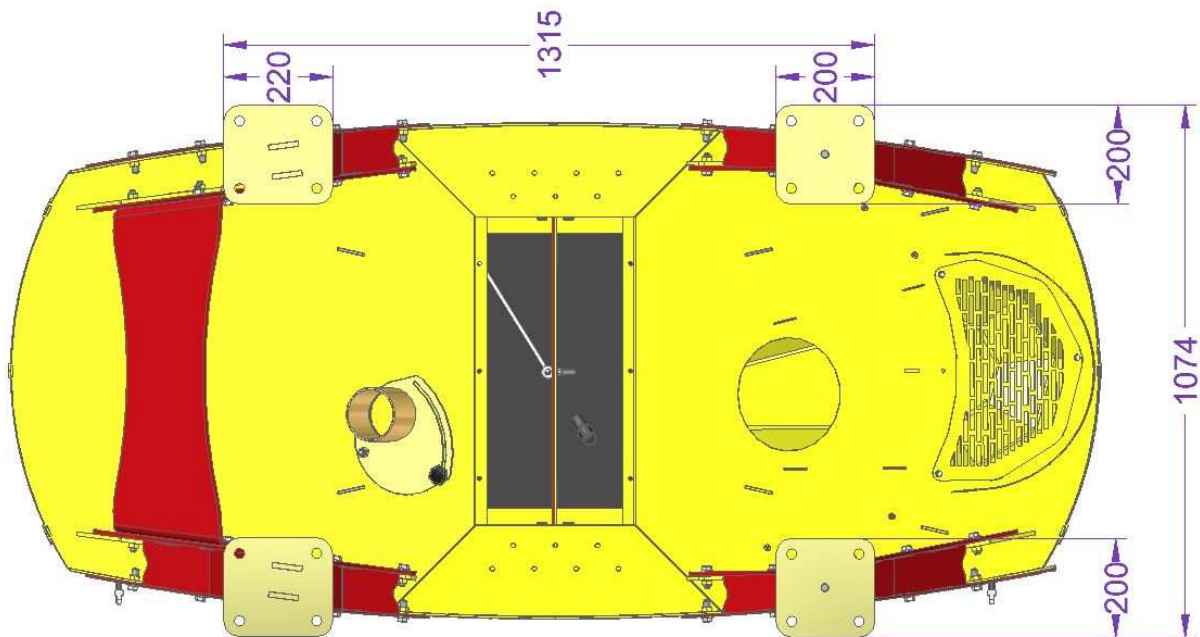


Figure 44: dimensions

Units in mm

Dimensions of the base plates:

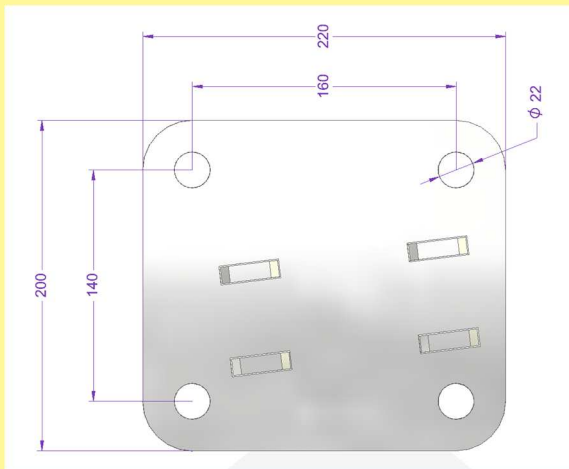


Figure 45

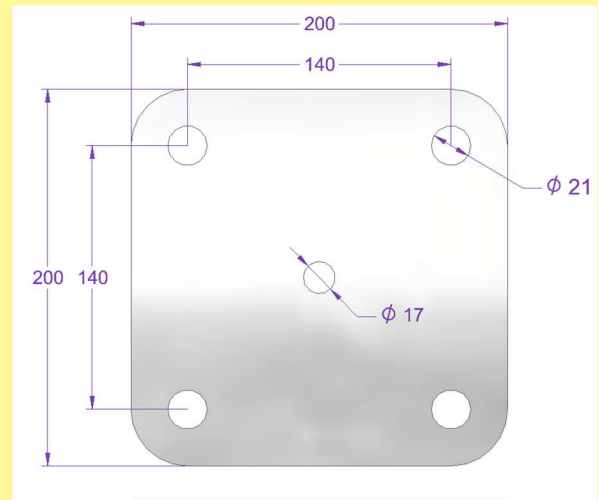
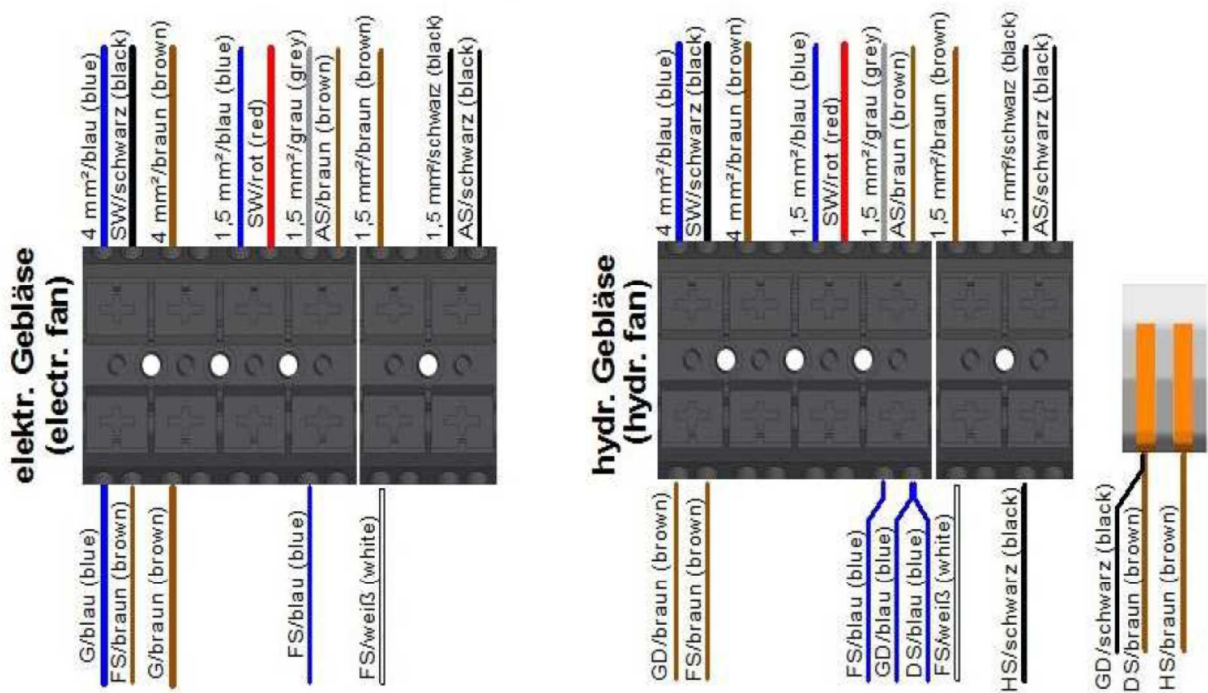


Figure 46

Technical specifications MT2

Designation:	PS 1200/1600 M1 MT2
Hopper content:	1200/1600 litres
Dimensions (H x D x W):	2050/2250 x 1500 x 2200 mm
Weight:	750/780 kg
Max. spreading width:	12 m
Power supply:	12 V, 25 A

9 Connection diagram PS MX3 #04



Plug pin	Implement cable	Blower fan (F)	Meter roll motor (MR)	Fill level sensor (FLS)	Calibration button (CB)	Pressure switch (PS)	Blower fan speed sensor (BFS) (fan speed sensor)	Hydraulic switch (HS)
1	4 mm ² / blue	4 mm ² / blue	1.5 mm ² / black	0.75 mm ² / brown				
2	4 mm ² / brown	4 mm ² / brown						
3	1.5 mm ² / blue		1.5 mm ² / red					
4	1.5 mm ² / grey			0.75 mm ² / blue	0.75 mm ² / brown	1.5 mm ² / blue	0.75 mm ² / blue	
5	1.5 mm ² / brown			0.75 mm ² / white				
6	1.5 mm ² / black				0.75 mm ² / black			0.75 mm ² / black
						1.5 mm ² / brown	0.75 mm ² / black	1.5 mm ² / brown

Stripping length 10 mm!

Figure 47

10 Accessories

The following parts are available as accessories:

- **Cable extension 5 m (6-pin)**

This is a cable extension (5 m) for the implement cable (6-pin plug). It is required when the soil tillage implement is longer than the 6 m cable installed ex-factory, or to allow practical routing of the cable.

Scope of delivery: 1 cable extension

Order number: Item no.: 00410-2-015



Figure 48

- **Cable extension 2 m (6-pin)**

If the standard installed 6 m implement cable is too short due to the length of the soil tillage implement and/or the implement structure, or if the cable cannot be routed practically, this cable extension can be ordered as accessories.

Scope of delivery: 1 cable extension

Order number: Item no.: 00410-2-133



Figure 49

- **Tractor cable set**

For the power supply to the control box without a standard 3-pin standard socket on the tractor, a retrofit kit is available as an accessory. The cable is 8 m long. It is screwed directly on the terminals of the battery on the battery side, and at the other end, a 3-pin standard socket is installed.

Scope of delivery: 1 cable set

Order number: Item no.: 00410-2-022



Figure 50

- **Fan speed sensor**

Only possible with control box 6.2. This sensor shows the actual speed of the hydraulically driven fan.
Can be installed for HG 450 as of serial number 08002-01300.

Scope of delivery: 1 sensor

Order number: Item no.: 00410-2-139

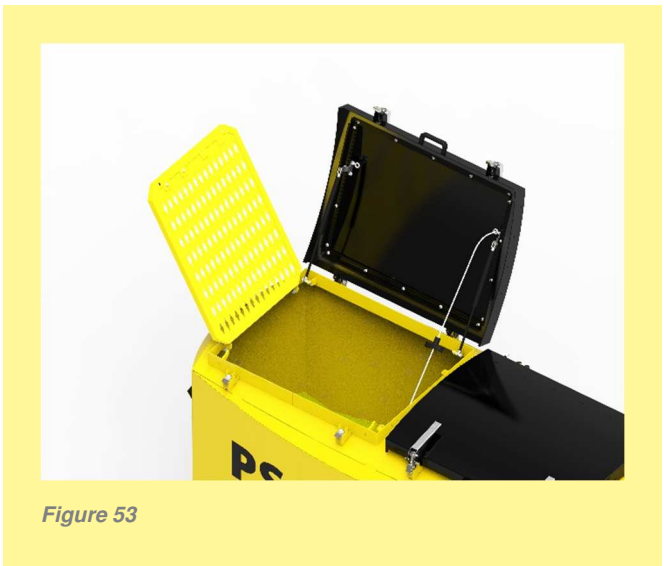


- **Foreign body sieve (sieve for protection of impurities)**

It is possible to install a foreign body sieve under each cover (see Figure 52). These sieves are pivoted and each foreign body sieve can be individually unfolded (see Figure 53).

Scope of delivery: 1 foreign body sieve

Order number: Item no.: 04049-2-090



11 My idea

The **PS 1200/1600 M1** was extensively developed and tested. It took a long time from the initial idea to serial production. It required lots of commitment from individual employees and the entire development team.

We collaborated with test centres and specialists from the field.

Nonetheless, the most valuable experience is gained in practice. Our motto:

"Inspired by Farmers & realized by Professionals."

For this reason, YOU are also the most important person for the development of agricultural machinery for practical use.

Without taking consideration of your opinions, experiences, enthusiasm, desires, and also your troubles, further development and constant improvement of our implements would not be possible.

We are now giving you the opportunity to effectively contribute to the development and improvement of our machines.

Tell us about the positive and negative experiences you have had with the machine.

Share your suggestions for improvement and your wishes!

Take pictures or draw a sketch, we are open and grateful for any information, no matter in what form.

Send this information to meineidee@apv.at or fax it to +43 (0)2913/8002 or send us a letter to our address. Key word: My idea.

The information will be forwarded directly to our construction department and will be discussed and considered. Please do not forget to tell us the serial number of your machine.

Please understand that we cannot take suggestions for improvement by phone, since it requires too much organisation. However, if you still wish for personal contact, you can share your experiences with our sales representatives at fairs and field days. Of course, we are there for you at all times if you have an urgent problem. Please just call us or direct your inquiry to the nearest distribution partner.

Good ideas are important to us – and will therefore also be rewarded. If one of your ideas is implemented, you will receive an acknowledgement as a token of our appreciation.

I thank you in advance for your constructive suggestions and remain

Sincerely yours,



Ing. Gregor Witzmann, MSc
Development / Engineering

12 Safety instructions



For your safety...

This supplement to the operating manual contains general rules of conduct for the intended use of the implement and safety-related information that should always be observed for your personal safety.

The list is very extensive, and some of the information does not apply exclusively to the delivered implement. However, the summary of the information often reminds you of unconsciously neglected safety regulations for the everyday operation of machines and implements.

12.1 Intended use

The implement is designed solely for normal use in agricultural operations (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 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.

The applicable accident prevention regulations as well as the other generally safety-related, occupational health and road traffic 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.

12.2 General safety-related instructions and accident prevention regulations

- Before operating the implement and the tractor, always check for traffic and operational safety (like fractures, cracks, chafe marks, leaks, loose bolts and connections, vibrations and unusual sounds).
- Observe the generally applicable safety and accident prevention regulations!
- Use additional lighting (e.g., flashlight) for repair or maintenance work!
- The warning and information signs applied to the implement provide important instructions for safe operation, observe them for the sake of your own safety!
- Observe the respective regulations when using public roads!
- Before starting work, get to know all of the equipment and operating elements as well as their functions. It is too late to do so during operation!
- The spread rate may only be adjusted exactly according to the operating manual and by trained personnel!
- The user should wear close-fitting clothing. Avoid wearing loose clothes!
- Please always wear safety shoes with non-slip soles!
- To reduce the risk of fire, keep the machines clean. It is also recommended to carry a fire extinguisher on the tractor.
- The implement should be cleaned regularly with compressed air!
- Check the surrounding area before starting up and operating the implement! (Children!) Ensure sufficient visibility!
- It is not allowed to carry passengers on the implement during operation and transport!
- The implement must be coupled according to the instructions and only onto the specified devices!
- Special care must be taken when coupling and uncoupling implement to and from the tractor! Use only self-locking attachments (nuts) as well as high-tensile bolts.
- Check the stability of the tractor and the implement when mounting, operating, and performing maintenance/filling. Depending on the soil tillage implement, on which the seeder is mounted, use a step according to EN 14018 and according to the operating manual.
- When mounting the implement, the hydraulic connections to the tractor hydraulic system must be connected carefully according to the operating manual.
- Always attach ballast weights at the intended attachment points according to the specifications!
- Observe the permissible axle load, total weight and transport dimensions!
- Transport equipment, e.g. lighting, warning signs and any protective equipment, must be checked and mounted!
- Triggers for fast couplers must be hanging loosely and must not trigger themselves when lowered.
- Never leave the driver's platform while driving!
- The driving behaviour, steering and braking capacity are also affected by mounted or towed implements and ballast weights. For this reason, always ensure sufficient steering and braking capacity!
- When driving in curves, take account of the wide radius and/or the centrifugal mass of the implement!
- The implement may only be operated when all of the protective devices are installed and in safety position!
- It is forbidden to stand in the working area of the implement!
- Do not stand near rotating and swivelling parts of the implement!
- Hydraulic folding frames may only be actuated when nobody is standing in the swivelling range.
- There are pinch and shear points on externally powered (e.g. hydraulic) parts!

- On implements with manual folding, always ensure that the implement is stable!
- For implements that are driven rapidly with soil-driven tools: Danger after lifting due to the still rotating centrifugal mass! Only approach the implement when it has come to a standstill!
- Before exiting the tractor, lower the implement onto the ground, switch off the motor and remove the ignition key!
- Standing between the tractor and the implement is forbidden unless the vehicle is secured against rolling away using the parking brake and/or with wheel chocks!
- Folded frames and lifting devices must be locked in transport position!
- Packer catch arms must be swivelled in and locked before road transport!
- Lock the track markers in transport position!
- When filling the hopper with slug pellets or similar toxic agents, only fill as much as is needed in the near future. Protective clothing, safety gloves, and face and eye protection must be worn during the filling procedure.
- Observe the warning information provided by the manufacturer on the packaging. The seed grains used in your spreader can be toxic!
- Always keep hands, clothing etc. away from rotating parts!
- Keep your distance when the implement is switched on!
- Never look into the spreading cone!
- Product remains should be returned to the original packaging. Residues must not be released into the environment.
- Authorised crop protection products are not known to have negative effects on the materials of the implement.
- Maintenance, repair, and cleaning work as well as the elimination of malfunctions should always be performed when the drive is switched off and the motor is at a standstill!
- When mounting the spreading device, the operator must connect it to the tractor or vehicle with a metal connection and if necessary, a grounding cable.
- Never look into the radar sensor!
- The operating manual calls for the use of CE-marked exchangeable universal joint shafts as well as their covers!
- Some parts have stickers warning about high temperatures. When working on these parts when they are hot, safety gloves must be worn. Dust deposits on the hydraulic motor must be prevented. Clean.
- The implement has the following maximum noise emission values:
 - Emission sound pressure level $L_{PA} =$ max. 103 dB
 - Sound power level $L_{WA} =$ max. 109 dB
 Based on EN ISO 3746:2005
 The measurement uncertainty is approx. +/- 2 dB
- Hearing protection must be worn when using the implement.
- If possible, the selected fan speed should not be too high.

12.3 Mounted implements

- Before mounting and dismounting implements on the three-point linkage, move the operating devices into the position that excludes unintentional lifting or lowering!
- For three-point mounting, the mounting categories of the tractor and the implement must match or be adapted!
- There is a risk of injury due to crushing and shearing points in the area of the three-point linkage!
- Do not stand between the tractor and the implement when actuating the external controls for the three-point mounting!

- When the implement is in transport position, always ensure that the tractor three-point linkage is sufficiently locked to the sides!
- When driving on roads with the implement lifted, the operating lever must be locked against lowering!

12.4 Maintenance

- Maintenance, repair, and cleaning work as well as the elimination of malfunctions should always be performed when the drive is switched off and the motor is at a standstill! – Remove the ignition key! – Switch off the implement!
- Check the nuts and bolts regularly for tight fit and retighten if necessary!
- When performing maintenance on the lifted implement, always ensure safety through suitable support elements!
- When changing work tools with sharp edges, always use suitable tools and gloves!
- Properly dispose of oils, grease and filters!
- Always cut the power supply when working on the electrical system!
- When performing electrical welding work on the tractor and mounted implement, disconnect the cable on the generator and the battery!
- Spare parts must at least comply with the technical requirements specified by the implement manufacturer! This is ensured with original parts!
- Do not clean the implement with water. It is recommended to clean the implement with compressed air.



CAUTION!

Misprints, errors and omissions excepted.

13 Safety signs

Observe this sticker on the implement! It informs you of special dangers!

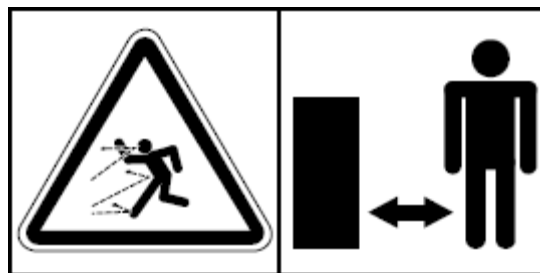


Read and observe the operating manual before operating the implement!



Operating errors can lead to serious injuries!

Read and observe the operating manual before operating the implement!



Danger due to thrown parts; observe the safety distance!

Do not stand on the implement while driving!



Always switch off the engine and remove the key before maintenance work!



Only operate the implement when the cover is installed!

Never reach into the crushing danger zone as long as the parts could still move!



Do not stand between the machines when connecting and actuating the hydraulic system!



Do not climb onto rotating parts, use the intended access ladders!



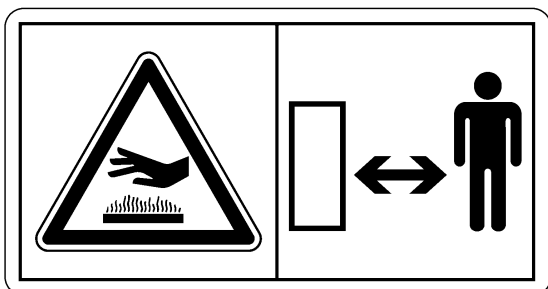
Be careful with escaping high-pressure liquids! Observe the instructions in the operating manual!



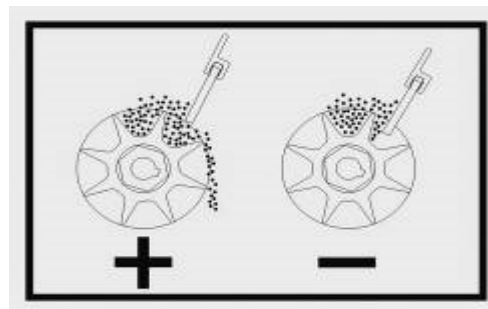
Be careful with escaping high-pressure liquids! Observe the instructions in the operating manual!



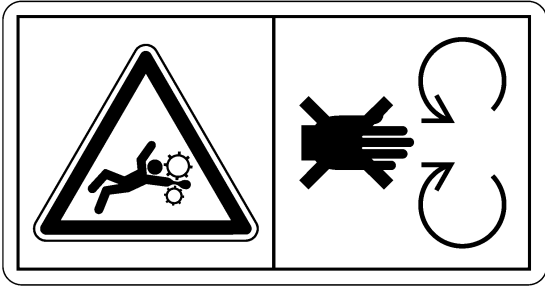
Danger due to thrown parts; observe the safety distance!



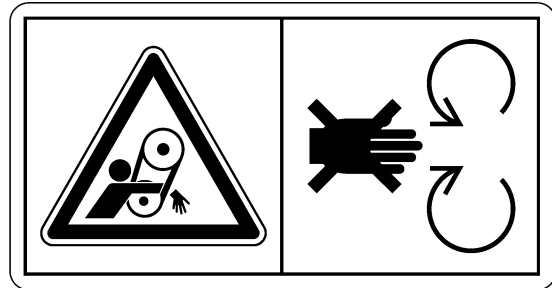
Maintain a safe distance from hot surfaces!



Brush adjustment (function/mode of operation)!



Maintain a safe distance from rotating implement parts!



Never open or remove safety guards when the engine is running!



Use hearing protection!



Use hearing protection!



Hot surface!
Do not touch!



Risk of injury due to moving parts.
Switch off the implement and disconnect the power supply when handling!



Risk of injury due to rotating parts. Only work with mounted covers!

Qualität für Profis

- seit 1997 -



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