ROTARY HOE
RH 600 M1

OPERATING MANUAL

PLEASE READ CAREFULLY BEFORE INITIAL OPERATION!

Translation of the original operating manual

Version: 2.4 EN US; Item number: 00602-3-329

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1 EC DECLARATION OF CONFORMITY

in accordance with Machinery Directive 2006/42/EC

APV-Technische Produkte GmbH
Dallein 15
3753 Hötzelsdorf, Austria

hereby declares that the mounted implement described below complies with the relevant essential health and safety requirements of the directives cited above by virtue of its design and construction and in the configuration we have placed on the market.
If the mounted implement is modified without prior consultation with **APV-Technische Produkte** this declaration shall lose its validity.

Designation of the mounted implement:
ROTARY HOE RH 600 M1

Serial numbers: from 07013-01000

Year of manufacture: from **2021**

Relevant EC directives:
Directive on machinery – Machinery Directive 2006/42/EC

In the planning, design, construction, and placement on the market of the mounted implement Rotary Hoe RH 600 M1, in addition to the directives, the following harmonized European norms have also been applied, in particular:

EN ISO 12100:2010 Safety of machinery – General principles for design – Risk assessment and risk reduction
EN ISO 13857:2020 – Safety distances to prevent hazard zones being reached by upper and lower limbs
EN ISO 13849-1:2015 – Safety of machinery – Safety-related parts of control systems

Responsible for the technical documentation: Planning and Design department, Dallein 15

Ing. Jürgen Schöls
Managing Director
(Authorized person in the EU)

Dallein/Hötzelsdorf, on 11/2022

2 UK CONFORMITY ASSESSED

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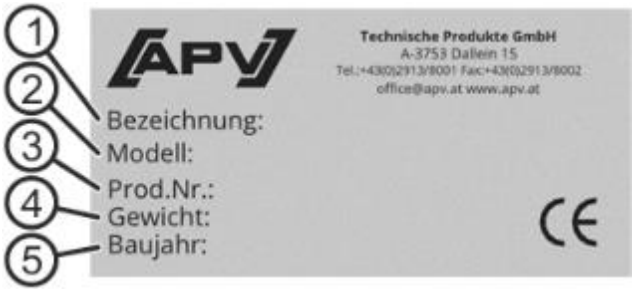
3 IDENTIFICATION OF THE IMPLEMENT

The Rotary Hoe can be clearly identified through the following information on the type plate:

- Designation
- Model
- Production number

Position of the type plate
The type plate is located on the main frame on the mounting frame bracket.

The illustration below (Figure 1) shows the structure of the type plate.



The information on the type plate has the following meaning:

1: Designation
2: Model
3: Production number/serial number
4: Weight
5: Year of manufacture

Figure 1

NOTE!
Always specify your implement's production number/serial number for inquiries or warranty claims.

4 SERVICE

Contact us at our Service address in the following cases:

- If in spite of the information in this operating manual you have questions concerning the handling of the Rotary Hoe
- To order spare parts
- To commission service and maintenance tasks

Service address:

APV - Technische Produkte GmbH
ZENTRALE
Dallein 15
3753 Hötzelsdorf
AUSTRIA

Telephone: +43 2913 8001-5500
Fax: +43 2913 8002
Email: service@apv.at
Web: www.apv.at

5 GUARANTEE

When taking delivery of the device, check it immediately for any transport damage. Subsequent complaints arising from transport damage can no longer be acknowledged.
Based on a warranty activation (see point 5.1), we provide a six-month factory warranty, starting from the date of first use (your invoice is the warranty certificate).
This guarantee shall apply in the event of material or design errors and does not extend to parts that become damaged through normal or excessive wear.

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

- If damage occurs due to external force.
- In the event of an operating error.

- If the kW/HP limit is significantly exceeded.
- If the implement is altered, extended or fitted with third-party spare parts without our authorization.

5.1 WARRANTY ACTIVATION

Every APV implement must be registered immediately after delivery. The registration activates the claim for warranty performances and thus APV can guarantee the best service.
To activate the warranty for your implement, simply scan the QR code with your smartphone – you will then be taken directly to the Service area of our website.

Of course, you can also activate the warranty through our website www.apv.at in the Service area.

6 SAFETY INSTRUCTIONS

This chapter contains general rules of behavior for proper use of the implement and safety instructions that you must strictly comply with for your own safety.

The list is quite extensive, and some information does not just pertain to the provided implement. However, the summary of the information will often remind you of safety rules that are unconsciously disregarded when using the machines and implements in day-to-day work.

6.1 INTENDED USE

The implement has been built exclusively for customary use in agricultural tasks (intended use).

Any use that beyond this is non-intended use. The manufacturer shall not be liable for damage that is incurred through non-intended use; the user alone bears the associated risk.

Intended use also includes compliance with the operation, service and maintenance conditions that are prescribed by the manufacturer.

The implement must only be used, maintained, and repaired by people who are familiar with with the implement and have been instructed with regard to the hazards. Ensure that all safety instructions are passed on to other users as well.

The relevant, country-specific accident prevention regulations and other generally recognized safety, occupational health and safety, and road traffic regulations must be complied with.
Unauthorized changes to the implement exclude any and all liability on the part of the manufacturer for the resulting damage. This causes the Declaration of Conformity to lose its validity.

The Rotary Hoe is intended for outdoor operation in dry weather, within a temperature range from +5 °C to 40 °C. Water ingress must be prevented. Do not use the Rotary Hoe in rainy conditions!

6.2 GENERAL SAFETY INFORMATION AND ACCIDENT PREVENTION REGULATIONS

- The operator must have read and understood this operating manual before handling the implement.
- The owner must train and instruct their personnel. Personnel must have read and understood this operating manual before handling the implement.
- Always keep the operating manual in the vicinity of the implement for reference purposes.
- When passing on the implement, ensure that you also pass on the operating manual.
- Do not use the implement if you are tired or under the influence of drugs, alcohol or medications.

- Each time before start-up check the implement and the tractor for road safety and operational safety (e.g. defective parts, connections, fixations, hoses, guards, etc.)!
- Before each use, the folding device and its securing devices (securing chain) must be checked for proper function and effect.
- Inspections must be performed before, during, and after use; care and maintenance of the implement must be performed on a regular basis.
- Comply with the generally valid safety regulations and accident prevention regulations of the respective country!
- This implement must only be used by persons who are informed of the danger zones and who are familiar with the regulations for transport on public roads.
- The warning and information signs affixed on the implement provide important instructions for safe operation. Do not remove the warning and information signs under any circumstances. Comply with the warning and information signs for your own safety!
- Comply with the applicable country-specific road traffic regulations when using public roads!
- Before beginning work, familiarize yourself with all the devices, activating elements, and their functions. It is too late to do so during work implementation!
- The user should wear close-fitting clothing! Avoid wearing loose clothing!
- Keep the implements clean to prevent a fire hazard!
- Check your immediate surroundings (check for children!) before start-up! Ensure sufficient visibility!
- Carrying passengers while working and transporting them on the implement are prohibited!
- Climbing onto the implement is only allowed if a platform kit is installed.
- When using the platform kit, ensure that the implement is at a standstill, that it is also unfolded, and lowered onto the ground.
- Transporting work materials on the implement is prohibited!
- Properly hitch the implement and fasten only to the prescribed fixtures!
- Special care is required when coupling implements onto the tractor or uncoupling them from the tractor!
- When mounting the implement, the operator must particularly proceed in compliance with the tractor requirements as stipulated in the operating manual, and the operator must ensure that the connections are properly established as specified in the operating manual.
- Bring the support devices into their respective positions when mounting and dismounting the implement (stability)!
- Always install the weights properly at their designated fastening points!
- Pay attention to the permissible axle load, total weight, and transport dimensions!
- Check and install transport equipment, such as lighting, warning devices, and any protective devices!
- Release parts for fast couplers must be freely suspended, and they must not release on their own in the low position!
- Never leave the driver's platform while implement and tractor are in motion!
- Handling, steering, and braking capability are also affected by mounted or attached implements and ballast weights. Consequently, ensure that there is adequate steering and braking capability!
- Take into account the wide load and/or the implement's oscillating mass when turning! Attention tractor curve!
- Only operate the device when all protective devices are installed and in the protective position!
- Do not position yourself in the work area!
- Do not position yourself in the implements turning and swivel range!
- Hydraulic folding frames must only be activated if no one is in the swivel range.
- There are crushing and shearing points on power-operated parts (e.g. hydraulically-operated parts)!
- Always ensure that you have a secure, safe stance when using implements with manual folding!
- For high-speed implements with ground-drive tools – the oscillating mass that continues running poses a hazard after lifting-out! Only approach implement after it has come to a complete standstill!
- Before exiting the tractor, park the implement on the ground, turn off the engine and remove the ignition key!
- Do not allow anyone to enter the area between the tractor and implement without securing the vehicle from rolling off via the parking brake and/or the wheel chocks!

- Secure the folded-in frame and lift-out units in transport position!
- Swing in and lock the packer catch arms before road transport!
- Lock the track marker in transport position!
- The Rotary Hoe may only be used on agricultural land. It must not be used on normal road surfaces, on asphalt or concrete. In particular, the Rotary Hoe must not be used in the building industry on construction sites, for winter service, for road construction, or for underground mining.
- When driving on roads, which is only permitted with folded-in side wings and the Rotary Hoe lifted, the tractor hydraulic system prevents lowering of the Rotary Hoe as well as lowering of the folded up components (additionally secured with a chain), and does this even if the tractor hydraulic system fails.
- The specifications in the operating manual regarding mounting as well as the calculation of the weight ratios and the axle loads of the tractor must be complied with.
- There must be no other persons in the hazard area of the Rotary Hoe. The driver must perform a visual inspection!
- Always keep hands, clothing etc., away from rotating parts!
- According to the operating instructions, the tractor vehicle speed must be maintained between 2 and 25 km/h when performing work operations.
- Do not transport people on the Rotary Hoe during intended use on agricultural land or when driving on roads.
- A clear view of the mounted Rotary Hoe and the hazardous movement area is required to monitor the procedure.
- Do not work under the implement – especially when it is lifted.
- Safety goggles and hearing protection must be used.
- Ensure that the hydraulic couplings are not soiled.
- When driving under low obstructions or through narrow obstructions (e.g. power lines, underpasses, etc.), pay attention to the height and width of the implement to avoid collisions.
- If implement parts are lost or broken, they must be immediately replaced with original parts by trained specialist personnel.
- Accessories must be properly mounted in compliance with standards by qualified specialists from an appropriately authorized company.
- When implement parts are moving (e.g. during the folding or pre-loading procedure) ensure that no one is standing in the danger zone of the implement – there is a risk of crushing.
- During mounting, the operator must particularly ensure compliance with tractor requirements regarding power, axle loads, and weight distribution as stipulated in the operating manual, and the operator must ensure that the connections are properly established as specified in the operating manual.
- The operator must regularly check the implement (before each use) for breakage, cracks, abrasion points, leaks, loose bolts and threaded connections, vibrations, abnormal noises, and proper function.
- The implement must not be used during storms and rain, it must be parked under a roofed shelter.
- The operator must ensure that no one is standing near the Rotary Hoe when it or its components are moved via the tractor hydraulic system. The driver/operator must perform a visual inspection!
- Secure the implement to prevent it from rolling off!

6.3 ATTACHED IMPLEMENTS

- Before mounting and dismounting implements on the three-point linkage, bring the operating devices into the proper position that prevents unintentional lifting or lowering!
- For three-point mounting, the attachment categories for the tractor and implement must match or be agreed!
- There is a risk of injury due to crush and shear points in the three-point linkage area!
- Do not step between the tractor and implement when activating the external control operating unit for the three-point attachment!
- Always ensure that the tractor three-point linkage is adequately arrested on the side when the implement is in transport position!
- For road travel with lifted implement, the operating lever must be locked to prevent lowering!

- When mounting the implement, the operator must ensure that there is a metallic connection (ensured by the lower link) established with the tractor.
- The operator must ensure that the implement cannot lower when driving on roads (shut-off valve on the tractor's hydraulic system or similar safeguard).
- When driving on roads, which is only permitted with the implement lifted and with folded side frames, the control block on the hydraulic cylinder prevents lowering of the implement and lowering of the folded-up side frames (additionally secured with a chain). The hooked-in chain also prevents accidental lowering of the side frame in road transport in the event that the tractor hydraulic system fails.
- Mounting of any accessories on the implement must be executed in accordance with standards. The maximum permitted mounted weight / total weight of the implement must not be exceeded.
- Only APV machines and accessories may be mounted on the implement.

6.4 HYDRAULIC SYSTEM

- The hydraulic system is under high pressure!
- Ensure that the hydraulic hoses are connected as prescribed when connecting hydraulic cylinders and hydraulic motors!
- When connecting the hydraulic hoses to the tractor hydraulic system, ensure that the hydraulics on both tractor and implement are depressurized!
- For hydraulic function connections between tractor and implement, coupling sleeves and coupling connectors must be marked so that the possibility of operating error can be excluded! Swapping the connections reverses the function (e.g. lifting/lowering) – risk of accident!
- Regularly inspect hydraulic hose lines and replace them if they are damaged or ageing! The replacement hoses must meet the technical requirements specified by the implement manufacturer!
- Due to the danger of injury, use the appropriate aids when looking for leaks!
- Liquids that escape under high pressure (hydraulic oil) can penetrate the skin and cause severe injuries! If there are injuries, seek medical attention immediately! (Danger of infection!)
- Before tasks on the hydraulic system, set down the implement, depressurize the system, and turn off the engine!
- Only detach the securing chains after they have been slackened! (The cylinder must be filled with oil).
- The operator must carefully and cleanly establish the connections to the tractor hydraulic system when installing the implement.

6.5 MAINTENANCE

- Always perform repair, maintenance, and cleaning tasks, and eliminate malfunctions when the drive is switched off, the engine is at a standstill, and the implement has been uncoupled from the towing vehicle! Remove the ignition key! Check to ensure de-energized status!
- The maintenance tasks themselves must only be performed by trained specialists and must never be performed alone. The utmost caution is required when replacing defective components or tools.
- The mounted implement must always be disconnected from the towing vehicle for service or maintenance tasks. If repairs or maintenance tasks are required on the implement that can only be performed in conjunction with the towing vehicle, these tasks must be identified by a clearly visible information sign "Caution: Maintenance Work".
- Regularly check nuts and bolts for firm seat and retighten if necessary!
- When performing maintenance tasks on the raised implement, always prevent it from lowering by means of appropriate support elements!
- Use suitable tools and gloves that are cut-resistant when replacing work tools with sharp edges!
- Components that cannot be removed with tools, such as a screwdriver or wrench, may only be replaced by qualified specialists from an appropriately authorised company or by APV Customer Service.
- Properly dispose of oil, grease, and filters in accordance with local regulations!
- Always disconnect the power supply before working on the electrical system!

- Disconnect the cables on the generator and battery when performing electrical welding tasks on the tractor and attached implements! The repair points must be cleaned (risk of ignition if there is fouling)!
- Spare parts must at least meet the technical requirements specified by the implement manufacturer! Original parts meet these requirements!
- Only universal joint shafts prescribed by the manufacturer can be used!
- The guard tube and guard funnel for the universal joint shafts as well as the PTO shaft guard – also on the implement side – must be installed and they must be in proper condition!
- For universal joint shafts, pay attention to the prescribed tube covers in transport position and working position!
- The universal joint shaft must only be mounted and dismounted when the PTO shaft and the motor are switched off and the ignition key is removed!
- Always ensure that the universal joint shaft is properly mounted and secured!
- Prevent the universal joint shaft guard from rotating simultaneously with the shaft by hooking in the chain!
- Before switching on the PTO shaft, ensure that the selected PTO shaft speed of the tractor matches the permissible speed of the implement!
- When using the ground speed PTO, ensure that the rpm is forward speed-dependent and that the direction of rotation is inverted when driving in reverse!
- Before switching on the PTO shaft, ensure that no one is standing in the danger zone of the implement!
- Never switch on the PTO shaft when the motor is switched off!
- When working on the PTO shaft, ensure that no one is standing in the area of the rotating PTO shaft or universal joint shaft!
- Always switch off the PTO shaft if excessive angular deflection occurs and it is not required!
- Caution is required after switching off the PTO shaft: Danger due to the centrifugal mass that is still rotating!
- Do not get too close to the implement during this time. Work can only be performed after it comes to a complete standstill!
- Cleaning, lubricating or adjusting the implement or universal joint shaft driven by the PTO shaft must only be performed when the PTO shaft and motor are switched off and the ignition key is removed!
- Place the uncoupled universal joint shaft on the prescribed holder!
- After dismounting the universal joint shaft, fit the protective cover onto the PTO stub!
- If damaged, it must be replaced immediately before working with the implement!
- If necessary, use additional lighting (e.g. hand lamp) for repair or maintenance tasks.
- The implements should be regularly lubricated and cleaned (outdoors) using water or compressed air. While doing this, personal protective equipment must be worn if necessary.
- Maintenance and cleaning tasks must be carried out with the implement lowered, engine switched off, and secured to prevent it from being switched on again.
- We recommend a cleaning in accordance with the maintenance instructions. In this regard you must proceed as specified in the maintenance manual and protective equipment must be used. The Rotary Hoe must be cleaned with water (no high-pressure cleaner) or compressed air.

6.6 TIRES

- For tasks on tires, ensure that the implement has been safely parked and secured against rolling off (wheel chocks).
- Installing wheels and tires requires adequate knowledge and the prescribed installation tools!
- Repair tasks on the tires must only be performed by specialists and with the appropriate assembly tool!
- Regularly check the tire pressure! Pay attention to the prescribed air pressure!

6.7 ATTACHED SEEDERS

- When using a seeder, all the instructions provided by the implement manufacturer must be complied with.

- The seeder can be reached easily via a ladder and a platform. The ladder and platform must be clean and dry for use.
- While driving, it is strictly prohibited to stand on the platform or on its access ladder.
- When not in use, the ladder must be swung upward and secured.
- A ladder must be made in conformance with standards. This ladder is available from APV.

6.7.1 FILLING THE SEEDER

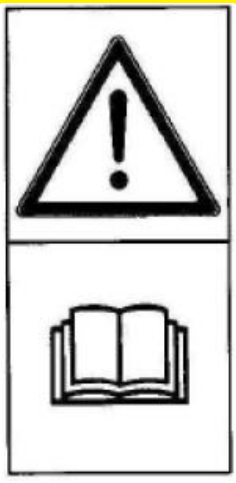
- The seeder is filled using a supply vehicle.
- The platform kit must not be used to fill the seeder or used as a storage area for objects or seed.
- When filling the seeder, never stand under a suspended load!
- When driving up to the implement with seed, ensure that no one is standing on or around the implement.
- During the loading procedure, avoid any contact with the treated seed; wear gloves, a dust mask, and safety goggles.

CAUTION!
Printing errors excepted, all information without guarantee.

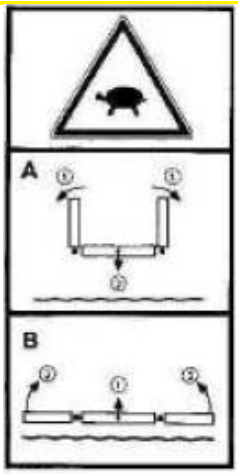
7 INFORMATION SIGNS / HAZARD LABELS

Pay attention to these stickers on the implement; they warn of particular hazards!

7.1 INFORMATION SIGNS

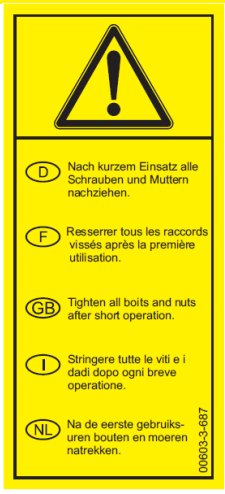


Read and comply with the operating manual before start-up!

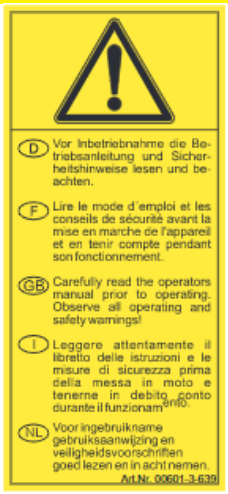


Only lift the implement off of the ground slowly!

Loading hook.
Fasten the cable or chains here when loading the implement!



Retighten all bolts and nuts after brief use.



Carefully read the operators manual prior to operating. Observe all operating and safety warnings!

Do not position yourself in the danger zone (swivel area)!

7.2 HAZARD LABELS

Caution, crushing area! Never reach into the crush hazard zone as long as parts are moving in this zone!

8 OPERATING MANUAL

8.1 STRUCTURE AND MODE OF OPERATION

Thanks to its robust and compact design, the Rotary Hoe RH 600 is ideal for controlling undesired mulch plants (weeds) in various crops.
The rotating hoe rings bury or uproot the mulch plants, promote tillering of the crop, and bring oxygen into the soil. The slanted position of the rings increases efficiency and makes the implement even more aggressive. The rotating rings prevent the implement from clogging and makes it possible to comb out the weeds.
The Rotary Hoe is insensitive to organic residues; this makes it highly suitable for mulch seeding.

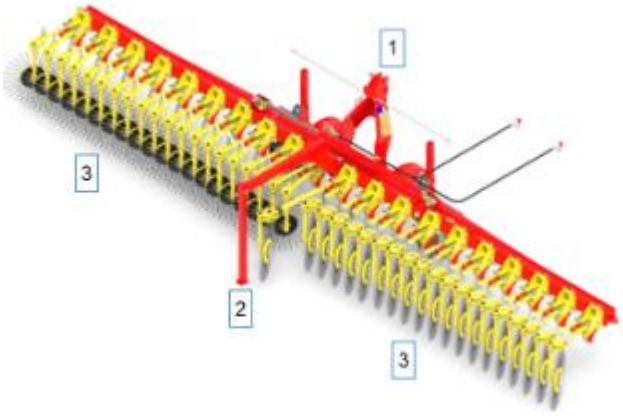


Figure 2

1: Cat II three-point linkage
2: Parking supports
3: Star rings

The work is performed by spring steel pins, 6 mm thick, which are cast in a slanted polyurethane disc. These star rings 50 cm in diameter are individually suspended and they can individually adapt to ground unevenness. The downward pre-load force occurs via the net weight of the ring, added to the pre-load force of the springs. Thanks to the toolless quick-release fastener on each arm, it is possible to adjust the pitch from 0 – 30° in 5° increments.
Because the working rings are arranged back-to-front, starting from the middle, lateral pulling forces do not occur. To ensure full area tillage, the middle ring is slightly set back, this prevents the two rings in the middle from interlocking, which would damage the crops.

8.2 ATTACHMENT ON THE TRACTOR

The implement must be mounted on the tractor's 3-point linkage.
The lifting struts must be adjusted at the same height on the left and right.
Hook in the top link in such a manner, that the top link is also inclined toward the tractor in work operation. (Comply with the information provided by the manufacturer of the tractor.)
Adjust the side linkage so that the implement can oscillate freely in the field but becomes fixed in place in lifted-out status.
Additional wheel weights can be advantageous for difficult operating conditions. See the operating manual provided by the manufacturer of the tractor.
To ensure steering and braking capability, the tractor must be adequately equipped with ballast weight on the front. At least 20% of the unladen vehicle weight is required on the front axle.

8.3 SAFE PARKING

To ensure safe parking of the implement, lower the parking support and the two feeler wheels on the center frame, as shown in Figure 3.

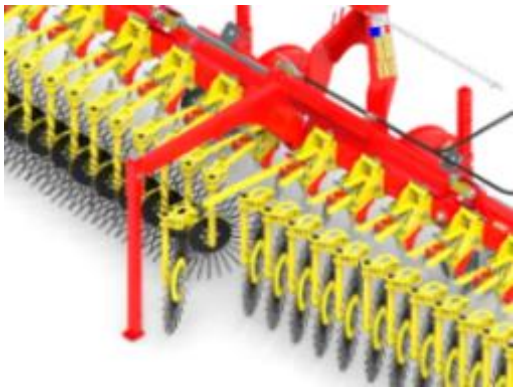


Figure 3

8.4 TEST FOLDING

Connect the hydraulic lines to the towing vehicle, and ensure that the connections are clean to prevent contamination in the oil.
Actuate the control unit to fill the cylinder with oil. The cylinder is filled as soon as the securing chains are offloaded. Unhook the securing chains and hook them in on the other end of the chain. Ensure that no one is in the danger zone and only fold the implement when it is lifted off of the ground.
The implement must also be lifted off of the ground when it is folded into transport position. Do not forget to hook-in the securing chains and close the stop tap.
When uncoupling the implement, you must offload the hydraulic hose through the float position before pulling it out.

CAUTION!
Before unfolding the machine, always ensure that the securing chain is unhooked. If the implement is unfolded with the securing chain hooked in, the machine can be irreversibly damaged or the securing chain and its direct components can at least be initially damaged, which can result in failure when the chain is later loaded to capacity. Consequently, the securing chain must always be replaced after a faulty / incorrect folding procedure!

CAUTION!
Before folding the implement, the four arms left and right of the pivot point must be in working position. Risk of collision with the arms when they are folded up!

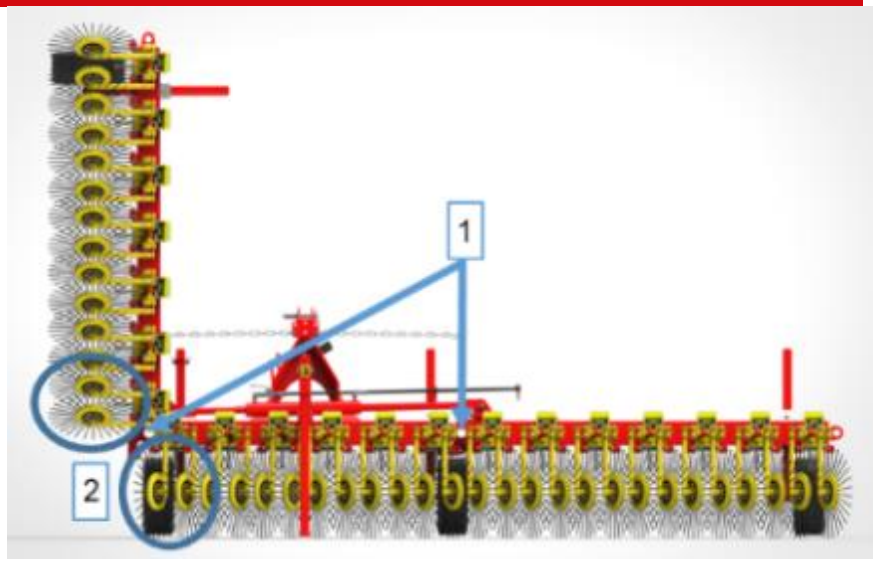


Figure 4

1: Pivot point of the folding
2: These 2 + 2 arms must ALWAYS be in working position before they are folded up!

8.5 WORKING POSITION

Adjustment of the working depth, i.e. the regulating effect, occurs via the support wheels, the pre-load of the spring, the adjustment of the pressure angle of the star rings, and the forward speed. The contact pressure must not be increased via the top link! In this regard, it must be stated that the frame of the implement must be adjusted horizontally.

Figure 5

8.5.1 ADJUSTMENT OF THE PRE-LOAD FORCE PER ARM

The pre-load force is increased / reduced by releasing the quick-release fastener and adjusting the spring pre-load through the hole pattern.

In order to actuate the quick-release fastener for adjustment of the pre-load force, the clamping mechanism must be released. This is done by pressing the spring-loaded bolt, which clamps the quick-release fastener onto the hollow profile.
This releases the quick-release fastener and it can also be turned downward and out of the way if there is a lack of space.

Thanks to the handle, the pre-load plate of the spring can be adjusted up or down in the 2nd step. When the pre-load plate is pulled out, the pre-load force on each ring increases. When the pre-load plate is pushed in, the pre-load force is reduced.

In the last step, the quick-release fastener must be pulled forward again and the clamping mechanism must be released.

Figure 6

1: Pre-load plate with handle
2: Quick-release fastener

8.5.2 ADJUSTING THE PITCH

Press the quick-release fastener lever forward (in the direction of travel) to unlock the ring fastening. Turn the arm holder to adjust the pitch of the ring. The angle is adjusted by 5 degrees with each locking notch. The ring is again fixed in place by releasing the lever.

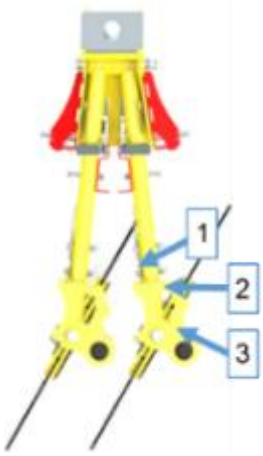


Figure 7: Pitch for both rings 30°

Fig. 8: Pitch 30° and 0°

1: Fastening lever
2: Locking notch
3: Ring holder

8.6 QUICK-LIFT (FACTORY-MOUNTED)

Use the quick-lift to adapt the implement to the crop without tools; here only the folded-up arm must be fixed in place with the pin in the top hole. If the quick-lift is not active, the pin can be stored in the parking position in the last hole. Likewise, the downward swing range for the arm can be limited by inserting the pin in the second hole from the bottom.
The ground clearance is 290 mm when the arm is lifted. By folding up the arm, a width of approx. 150 mm will not be worked.

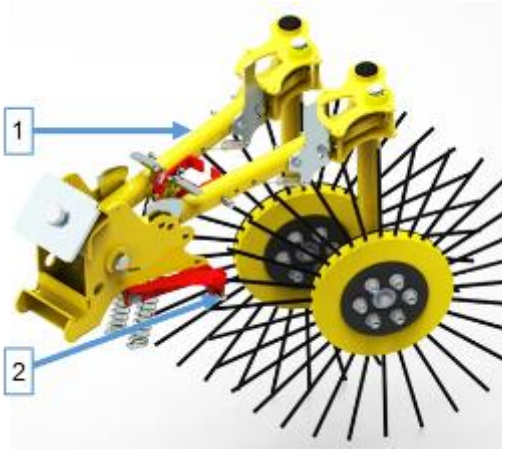


Figure 9

1: Arm
2: Pin for quick-lift

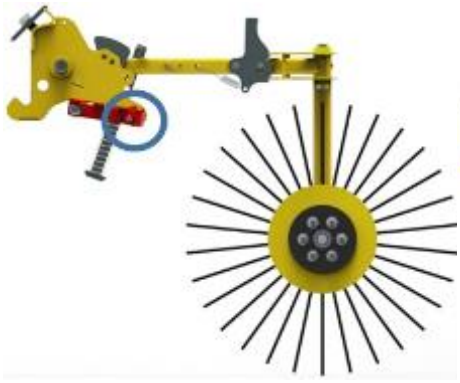


Fig. 10: Pin in parking position

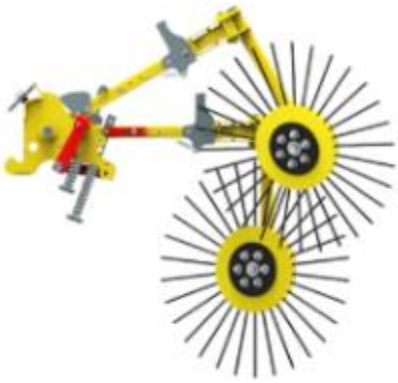


Fig. 11: Quick-lift – lifted-out position

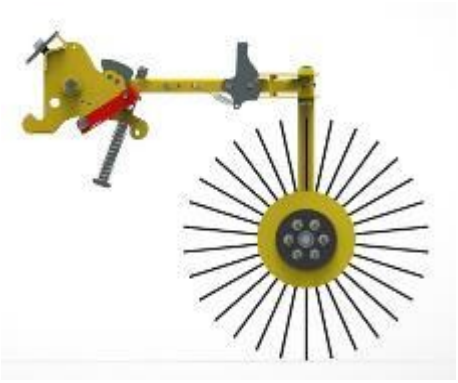


Fig. 12: Negative range limitation

The mounted plate (see Figure 13) prevents misuse. Thus the quick-lift cannot be used as a lifting accessory for the work elements.

CAUTION!
Before folding the implement, the four arms left and right of the pivot point must be in working position. Risk of collision with the arms when they are folded up!

CAUTION!
The quick-lift MUST NOT be used as a lifting accessory!

Figure 13: Installed plates to prevent misuse

9 MAINTENANCE AND CARE

9.1 GENERAL MAINTENANCE INSTRUCTIONS

To maintain the implement in good condition even after a long service life, comply with the following instructions:

- In Point 6, you will find some basic safety regulations for maintenance tasks.
- Original parts and accessories are specifically designed for the machines, i.e. implements.
- We expressly state that parts and accessories that are not delivered by APV are also neither tested nor approved by APV. Consequently, installing and/or using such products can negatively alter or affect the prescribed design characteristics of your implement. The manufacturer cannot be held liable for damage that occurs due to use of non-original parts and accessories.
- Unauthorized modifications, as well as use of components and add-on parts on the implement that are not purchased from APV, exclude any and all liability on the part of the manufacturer and render the CE Declaration of Conformity null and void.
- **Check the hydraulic hoses for wear, damage, and ageing before every start-up. Damaged or faulty parts must be replaced immediately.**
- When replacing the hydraulic hose lines, original spare parts must be used that meet the technical requirements specified by the implement manufacturer.
- Caution! Liquids escaping under high pressure can penetrate the skin. Consequently, seek medical attention immediately if there is an accident!
- Lubricate all lubrication points after cleaning, and uniformly distribute the lubricant in the bearing points (e.g. perform a brief test run).
- For implements with fast coupler, the guide slots must also be lubricated.
- Do not use a high-pressure cleaner to clean bearing parts and hydraulic parts.
- Cleaning with excessive pressure can damage the paint.
- Use environmentally-friendly agents to protect the implement from rust during the winter.
- Park the implement in a place where it is protected from the weather.
- Park the implement in a manner that prevents an unnecessary load on the tine wheels.
- **Hydraulic hose lines must be replaced at the latest 6 years after their manufacturing date. The manufacturing date of the hydraulic hose lines is specified on the press fittings.**
- Park hydraulically folded, and also mechanically folded implements in a folded state only.
- The hydraulic system must be inspected at least once a year by a qualified specialist.

9.2 INSTRUCTIONS FOR REGULAR MAINTENANCE

- Retighten all bolted connections no later than after 3 operating hours, then repeat the process after approx. 20 operating hours, and perform regular inspections afterwards. (Loose bolts can cause significant secondary damage that is not covered by the guarantee.)
- After the first 10 operating hours and every 50 operating hours thereafter, check the hydraulic units (hoses and couplings) as well as pipeline for leaks and retighten the threaded connections, if necessary.
- All implement parts must be regularly checked for operational capability (appearance and handling).
- Occasionally check the tire pressure (approx. 2.1 bar).
- The platform kit and its access ladder must be visually inspected on a regular basis.
- The rubber for fixation of the access ladder of the platform kit must be checked regularly for wear and replaced if necessary.
- Regularly lubricate the lubricating nipples on the fold points (with multipurpose grease approx. every 10 operating hours).

CAUTION!
The bearings on the arms are maintenance-free bearings; do not lubricate these bearings.

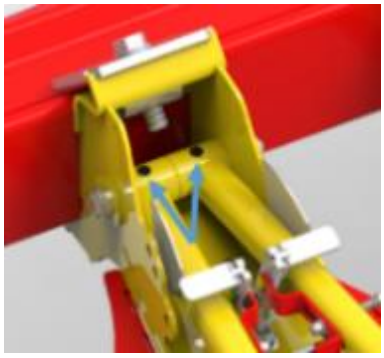


Figure 14

9.3 REPLACING STAR RINGS / BEARINGS

Replace worn or broken star rings:

- Unscrew the hex bolt.
- Take off the ring, including the bearing and the black fastening discs.
- Now take the new star ring.
- Assembly occurs in the reverse order.

Figure 15

Replace bearing:

- Unscrew the 6 hex nuts.
- Take off the black fastening discs and press out the bearing.
- Now take the new bearing.
- Assembly occurs in the reverse order.

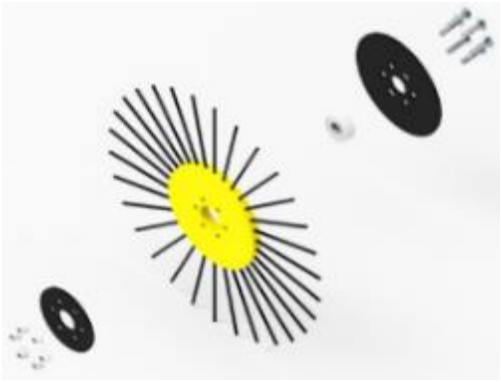


Figure 16

9.4 REPAIR AND CORRECTIVE MAINTENANCE

Contact the manufacturer if the implement fails or is damaged. The contact data is provided in chapter 4.

10 INFORMATION ON NATURE CONSERVATION AND ENVIRONMENTAL PROTECTION

Reduction of noise exposure in use
Any loose parts (such as chains) should be fastened to avoid unnecessary noise.

Energy-efficient use
The tine wheels of the implement should not penetrate into the field deeper than necessary. This ensures that the load on the towing vehicle is no more than is strictly necessary and fuel can be saved.

Recyclable raw materials and disposal
Many parts of the implement are made of steel or spring steel (such as the center frame, side frame, etc.) and can be removed and recycled by a waste disposal company.

11 TECHNICAL DATA

type designation	**RH 600 M1**
Mode of operation	1 row of star rings
Working width [m]	6
Transport width [m]	2.85
Dimensions (L x W x H) folded [m]	1.65 x 2.85 x 2.75
Working speed [km/h]	2 – 25 (depending on crop)
Working depth [mm]	0 – 30
Star rings [units]	40
Line spacing of the star rings [mm]	150
Angle of inclination [°]	0 – 30 (adjustable in 5° increments)
Feeler wheels (standard equipment) [units]	4
Attachment/suspension (three-point, etc.):	Cat II
Hydraulics	Double-acting control unit
Net weight [kg]	750
Work tools	Star rings with wire nail inserts Ø 6 mm Star ring Ø 500 mm
Ground adaptation	Individual suspended star rings Ground adaptation occurs via a compression spring
Minimum tractor performance	48 kW / 65 HP
Can be equipped with:	PS 120 M1, PS 200 M, PS 300 M1 with electric / hydraulic fan

11.1 COMBINATION POSSIBILITIES RH 600 M1 WITH PS

PS	PS 120 E	PS 120 H	PS 200 E	PS 200 H	PS 300 E	PS 300 H	
PS dimensions LxWxH [cm]	80x60x90	105x60x90	90x70x100	110x70x100	100x80x110	150x80x110	
PS weight [kg]	45	68	60	83	70	93	
PS and RH	**RH 600 M1 PS 120 E**	**RH 600 M1 PS 120 H**	**RH 600 M1 PS 200 E**	**RH 600 M1 PS 200 H**	**RH 600 M1 PS 300 E**	**RH 600 M1 PS 300 H**	**Part for mounting**
Transport dimensions for RH and PS combined LxWxH [m]	1.65x2.85x2.75	1.65x2.85x2.75	1.65x2.85x2.75	1.65x2.85x2.75	1.65x2.85x2.75	1.65x2.85x2.75	Mounting kit for PS 120-300
Weight of RH and PS combined [kg]	795	818	810	833	820	843	

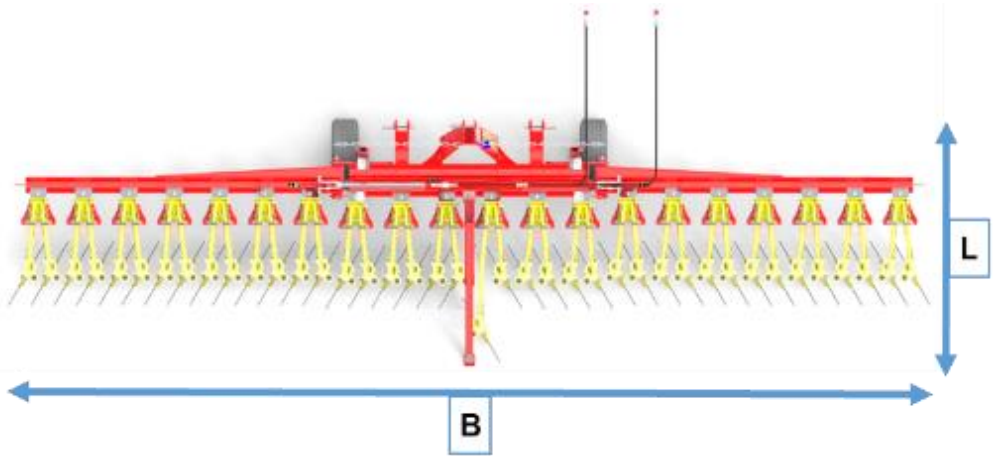
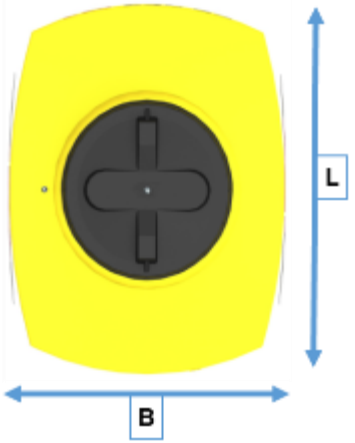


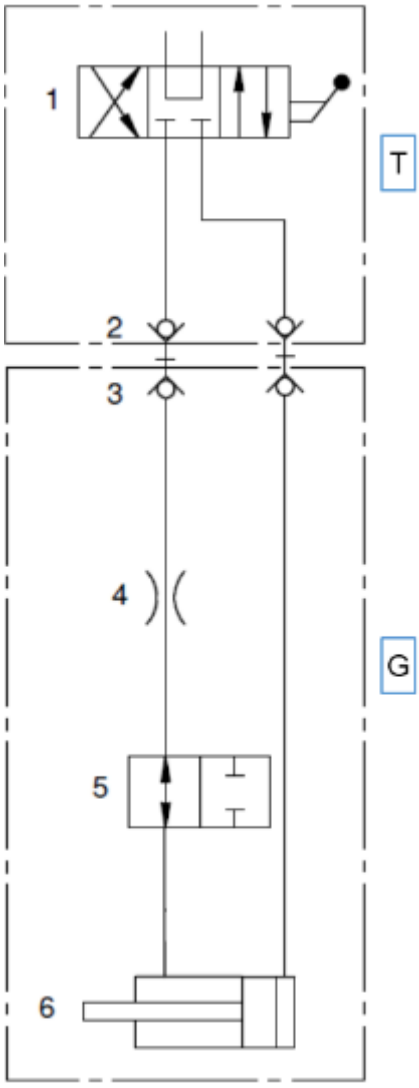
Fig. 17: RH from above



W: Width
L: Length

Fig. 18: PS from above

12 HYDRAULIC SYSTEM DIAGRAM



T: Tractor-side
G: Implement-side
1: Control unit
2: Coupling sleeve BG2
3: Coupling connector BG2
4: Throttle plate
5: Stop tap
6: Cylinder for folding

Figure 19

13 ROAD TRANSPORT

13.1 TRANSPORT ON PUBLIC ROADS (GENERAL INSTRUCTIONS)

- Comply with the relevant road traffic regulations in your country.
- Do not exceed the axle load and the total weight of the tractor unit.
- The mounted implement must be labeled with country-specific warning signs or foils with white-red slanted bars (in accordance with DIN, ÖNORM or the respective country-specific STANDARDS).
- Any part posing a traffic hazard or dangerous parts (tine wheels) must be covered and additionally identified with warning signs or stickers.
- Warning signs or foils should be no higher than 150 cm above the road surface in driving operation.
- Do not allow the implement to cover the tractor unit's lighting equipment; if it does the lighting equipment must be installed on the implement.
- Do not allow the implement to impair or reduce the tractor's steerability!
- Hitched equipments may only be towed on public roads with an operating permit.
- Fold in the hydraulic equipment to transport position.

- Ensure that the stop tap (if present) is closed and that the securing chains are hooked in.
- Also ensure that securing cotter pins have not been lost due to work implementation.
- Only dissipate the pressure of the hydraulic hose at home, via the float position on the tractor control unit.
- The holder for the warning signs (supplemental equipment) is mounted on the carrier of the support foot.
- When driving on roads after field operation, the implement should be cleaned of field residues (soil, grass, etc.).

13.2 CALCULATION OF THE WEIGHT RATIOS OF AXLE LOADS ON THE TRACTOR UNIT AND BALLAST WEIGHTS

If you want to drive with an implement that is attached to the 3-point linkage, you must ensure that you do not exceed the tractor's permissible axle loads and tire load capacities with the mounted implement.

The front axle of the tractor must be loaded with at least 20% of the net weight of the tractor.
All of these values can be determined with this calculation:

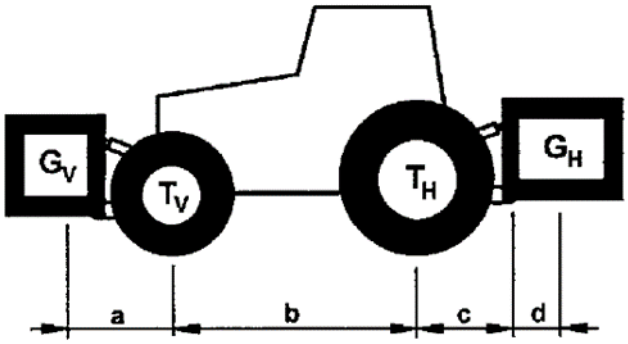


Figure 20

Information:

T_L	Unladen weight of the tractor
T_V	Front axle weight of the unladen tractor
T_H	Rear axle load of the unladen tractor
G_H	Total weight of the rear-mounted implement
G_V	Total weight of the front-mounted implement
a	Distance from the front-mounted implement's center of gravity to mid front axle
b	Wheelbase of the tractor
c	Distance from the middle of the rear axle to the center of the lower link ball
d	Distance from the center of the lower link ball to the center of gravity of the rear-mounted implement (d = 97 cm)

WEIGHT CALCULATIONS

1. Calculating the minimum front ballasting on rear-mounted implements G_V min:

$$G_{V\ \min} = \frac{G_H \bullet (c+d) - T_V \bullet b + 0{,}2 \bullet T_L \bullet b}{a+b}$$

Enter this result in the table under point 13.3.

2. Calculating the minimum rear ballasting on front-mounted implements GH min:

$$G_{H\ \min} = \frac{G_V \bullet a - T_H \bullet b + 0{,}45 \bullet T_L \bullet b}{b+c+d}$$

Enter this result in the table under Point 13.3 as well.

3. **Calculating the actual front axle load $T_{v\ tat}$:**
If the required minimum front ballasting (GV min) is not achieved with the front-mounted implement (GV), then the weight of the front-mounted implement must be increased to the weight of the front minimum ballasting!

$$T_{V\ tat} = \frac{G_V \bullet (a+b) + T_V \bullet b - G_H \bullet (c+d)}{b}$$

In the table under point 13.3, now enter the calculated, actual front axle load and the permissible front axle load that is specified in the tractor's operating manual.

4. **Calculating the actual total weight G_{tat}:**
If the required minimum rear ballasting (GH min) is not achieved with the rear-mounted implement (GH), then the weight of the rear-mounted implement must be increased to the weight of the rear minimum ballasting!

$$G_{tat} = G_V + T_L + G_H$$

In the table under 13.3, now enter the calculated total weight and the permissible total weight that is specified in the tractor's operating manual.

5. **Calculating the actual rear axle load $T_{H\ tat}$:**

$$T_{H\ tat} = G_{tat} - T_{V\ tat}$$

In the table on page 13.3, enter the calculated, actual rear axle load and the permissible rear axle load that is specified in the tractor's operating manual.

6. **Tire load:**
Enter double the value (two tires) of the permissible tire load (for example, see the tire manufacturer's documents) in the table under point 13.3.

13.3 TABLE OF WEIGHT RATIOS

	Actual value according to calculation		Permissible value according to operating manual		Doubled permissible tire load (2 tires)
Front/rear minimum ballasting	kg				
Total weight	kg	≤	kg	≤	kg
Front axle load	kg	≤	kg	≤	kg
Rear axle load	kg	≤	kg	≤	kg

CAUTION!
The minimum ballasting must be installed on the tractor in the form of a mounted implement or ballast weight!
The calculated values must not exceed the permissible values!

14 LIGHTING CIRCUIT DIAGRAM

Legend:

R	Right
1	Connector, 12 V, 7-pin
2	Right tail light
2.1	Turn signal
2.2	Tail light
2.3	Brake light
L	Left
3	Left tail light
3.1	Brake light
3.2	Tail light
3.3	Turn signal

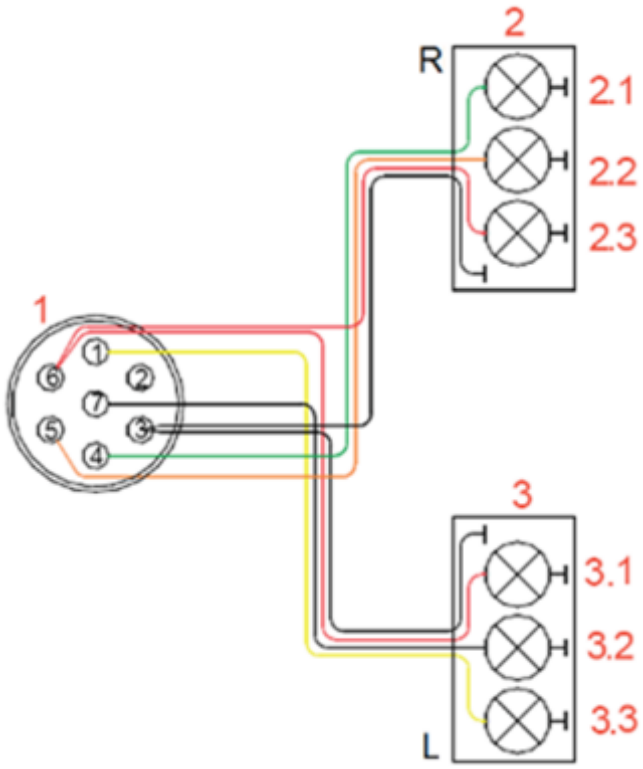


Figure 21: Circuit diagram

Connector and cable pin assignment:

No.	Name	Color	Function
1	L	Yellow	Left turn signal
2	54 g	---	---
3	31	White	Ground
4	R	Green	Right turn signal
5	58R	Brown	Right tail light
6	54	Red	Brake light
7	58L	Black	Left tail light

15 DECOMMISSIONING, STORAGE, AND DISPOSAL

15.1 DECOMMISSIONING THE IMPLEMENT

To ensure that the implement retains its full functionality, even during a longer period of non-operation, it is important to take precautions for storage: Comply with the information in point 15.3 in this regard.

15.2 STORING THE IMPLEMENT

- The implement must be stored in a dry and weather-protected location, so that it does not lose its functionality, even during a longer storage period.
- The implement must be parked as specified in 8.3.
- Prevent the implement from rolling off unintentionally.
- Do not place or store anything on the implement.
- The implement must always be parked and stored in a secure area. An unauthorized operation has to be prevented.

15.3 DISPOSAL

The implement must be disposed of in accordance with local waste disposal regulations for machines.

16 CROP CULTIVATION TIPS WHEN USING THE ROTARY HOE

Thanks to its robust and compact design, the Rotary Hoe 600 is ideally suited for weed control. Furthermore, the Rotary Hoe can also be used for soil aeration and regulation of the water balance. Nurse crops as well as greening or catch crops can also be prepared with the Rotary Hoe.

Thanks to its successful use for cereals, maize, beets, squash, oil rape seed, vegetables, peas, soy, and field beans, the APV Rotary Hoe makes a significant contribution to soil cultivation. Its application area extends from crop rotation to fertilization, and from soil tillage to mechanical weed control. Its design objective is to keep the beneficial weed infestation small enough that the weeds cannot cause any qualitative or quantitative damage to your crops.

Select the tillage time so that the Rotary Hoe is used after mid-day, this ensures that the weed sprouts are dried out and killed in the sun. Ensure that the soil is not too moist. The optimal thickness and depth setting, as well as forward speed and adjustment of the star rings must be executed with your understanding of the correlations between the soil and weather conditions.

The faster the forward speed when hoeing, the greater the impact and success of the control measure. The aggressiveness of the working pass increases significantly with the working speed.
The aggressiveness increases when more pressure is applied to the arms.

16.1 HITTING THE RIGHT GROWTH PHASE

- Measures that are performed before the crop emerges are particularly effective. For this reason, weed control must be coordinated as precisely as possible with the soil tillage and seeding dates.
- "Blind hoeing" (before cereals emerge) often achieves very good results. This can be performed until the cereal starts tillering.
- Especially in the germination stage or small leaf stage of the weeds, the greatest control success is achieved (up to 80%) by burying or exposing the emerging weeds.
- The optimal hoeing date (emergence of weed sprouts through the seedbed) can be determined by laying a window pane on the ground. The Rotary Hoe should be used when the first seed leaves appear.
- For rye, winter barley, and early-seeded wheat in cereal-rich crop rotations, autumn germinating silky bent grass and black grass often cause the most problems. For rye and winter barley, hoeing success depends on timely pre-winter hoeing. For wheat a somewhat later seeding extends the hoeing period and reduces beneficial weed pressure.
- If the beneficial weed is already beyond the seed leaf stage and has reached the rosette stage, control becomes more difficult: In this case, hoeing must be more aggressive (more working pressure) since the beneficial weed is difficult to pull out and is also more likely to withstand burying.
- Hoeing in the late morning on sunny and windy days is particularly effective. Exposed beneficial weed seedlings dry until afternoon.

16.2 APPLICATIONS

16.2.1 WINTER CEREALS

Uses in the fall:

1) Use for soil aeration: destruction of the already-germinating weeds,
2) Use for early seeding: light use at the 2-leaf to 3-leaf stage (very effective against silky bent grass)

Uses in the spring:

1) Use with light to medium setting as early as possible
   Objective: strengthening the stock, stimulation of tillering, soil loosening, and aeration
2) Use at 30 – 40 cm growth height

16.2.2 SUMMER CEREALS

1) Use with medium setting at the 3-leaf stage
2) Use with a relatively strong setting before crop closure, since the weed pressure is stronger in the spring.

Maize

1) Use for blind hoeing: however, this is only possible at a greater seeding depth (4 - 5 cm).
2) Use at a growth height of approx. 7 – 15 cm: at this growth height, the Rotary Hoe can be used full-surface between the rows. At this growth stage, you should hoe the field on warm days, when the maize plants become more flexible due to the heat from the sun and therefore do not break.

Beets

1) Use at a growth height of 3 – 4 cm (light to medium aggressiveness)

Vegetables

1) Use for cuttings and seeds: At a growth height of 4 to 5 cm (light aggressiveness), cuttings – approx. 14 days after planting (light aggressiveness)
2) Use depending on beneficial weed pressure and soil conditions

Peas

1) Use: blind hoeing
2) Use: 8-leaf stage

Soy

1) Use: blind hoeing (light aggressiveness)
2) Use: at the 3-leaf to 4-leaf stage (medium aggressiveness)
3) Use: depending on beneficial weed infestation (strong aggressiveness)

Field beans

1) Use: blind hoeing
2) Use: at the 8-leaf stage of the beans (medium aggressiveness)
3) Use: at 15 – 20 cm growth height
   Objective: soil loosening before the plants close over the rows, optimal soil aeration until harvest

Squash

1) Use: cuttings and seeds at a growth height of 4 to 5 cm (light aggressiveness); cuttings – approx. 14 days after planting (light aggressiveness)
2) Use: depending on beneficial weed pressure and soil conditions

17 ACCESSORIES

17.1 MOUNTING KIT FOR PS 120 – 300 ON RS 600

To attach the pneumatic seeders PS120 to 300 on the RH 600 M1.

Order number:
07009-2-050

Figure 22

17.2 ACCESSORIES KIT FOR DISPERSION PLATE INSTALLATION RS600

For fastening the dispersion plates of the PS120/200/300 on the RH 600 M1.

Order number:
07009-2-022

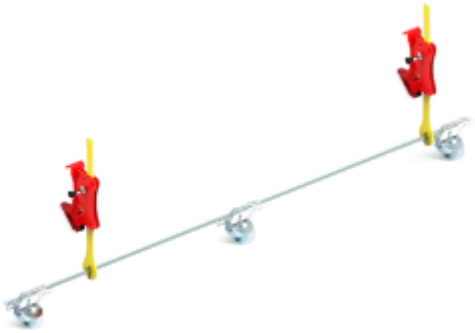


Figure 23

17.3 PLATFORM KIT

A suitable platform kit is available as an accessory for easier maintenance of the pneumatic seeder PS 120 to 300. Please note that it must be mounted in compliance with the standards.

Order number:
07000-2-019

Figure 24

17.4 LIGHTING WITH WARNING SIGNS (BOTH SIDES)

Is required when the RH is transported on public roads.

Order number:
07009-2-073

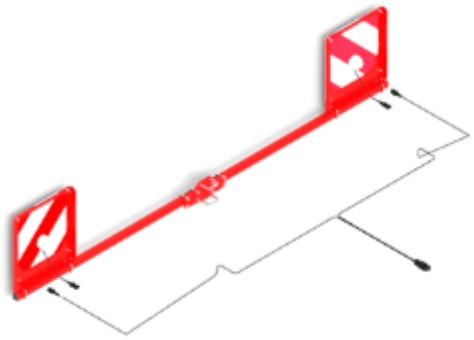


Figure 25

17.5 OPERATING HOURS COUNTER

A vibration sensor records the implement's vibrations and starts the operating hours counter.

Order number:
00602-3-659

Figure 26

17.6 ACCESSORIES KIT LINKAGE SENSOR TOP LINK MX

Order number:
00410-2-074

Figure 27

17.7 SENSOR SET – WHEEL SENSOR + LINKAGE SENSOR FOR TOP LINK

Order number:
00202-2-553

Figure 28

18 SPARE PARTS

You have the option of ordering your desired spare parts directly through our online spare parts catalog. To do so, scan the QR code with your smartphone – you will be taken directly to our online spare parts catalogue. Please have your product number / serial number on hand.

You can also access our online spare parts catalog on our website www.apv.at in the Service area.

If you have any questions regarding spare parts or your order, our Customer Service (see point 4 for contact data) is also happy to assist you.

19 INDEX

NOTES

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