

USER MANUAL

Acid applicators VP30, VP200 and VP1000



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Eu Declaration of conformity

Happowa Oy
Kankaantie 563, 62150 Ylihärmä

We declare under our sole responsibility that the acid applicators **VP30**, **VP200** and **VP1000** starting from production number 00100 are in conformity with the relevant Union legislation Machinery Directive 2006/42/EC.

These products are also in conformity with the relevant safety requirements of the following directives:

Directive 89/392/EEC

Directive 91/368/EEC

Directive 93/44/EEC

Directive 93/68/EEC

The following standards have also been considered in designing the products, as applicable:

EN 292-1

EN 292-2

EN 294

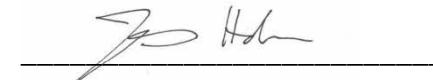
EN 349

EN 811

EN 1152

SFS 5091

In Ylihärmä 4.1.2019



Johannes Holkkola, managing director

1. Safety

Easy acid applicator is primarily intended for pumping and dosing fluid agricultural preservatives in silage production. The pump feeds the preservative to the nozzles through the hoses and the preservative is mixed to the fodder by the nozzles.

The acid applicator can also be used as a transfer pump, in which case the pump feeds the preservative straight to another container through the hose.

1.1 General safety instructions

- In addition to the instructions given in the manual, you must obey all the general safety rules concerning mechanical working.
- Before using the applicator, make sure that the device has been connected correctly and that covers are at place.
- Before using the applicator, make sure that all the hoses, couplings and nozzles connected to the system are suited for the preservatives used.
- All operating personnel must be familiar with the operating functions and the manual of this machine.
- Keep children and unauthorised people away while using, assembling or maintaining the machine.
- Always stop the tractor prior to maintenance or repairs. Apply the parking brake, remove the ignition key and disconnect the dosing machine before leaving the cab.
- Keep the rear window of the tractor closed while using the acid applicator.

- Always keep enough clean rinse water on hand.
- Pump a large amount of clean water through the system before maintenance. Always handle acids with caution. Always use acceptable personal protective equipment.
- Inspect the condition of the hoses and the couplings regularly. Replace any damaged parts with new ones immediately. Notice that even a small detrition or corrosion may cause danger.

1.2 Handling of acids

- Familiarise yourself with the safety and handling instructions of the preservative manufacturers.
- Always handle the acid applicator with caution and use appropriate personal protective equipment.
- Only use the acid applicator outdoors or in spaces with adequate ventilation.
- An acid applicator that has not been cleaned can only be placed on a surface that is acid resistant.

1.3 Personal protection

- Use an appropriate respirator if ventilation is inadequate.
- Use tight-fitting safety goggles to protect your eyes and keep clean water in a bottle for rinsing out eyes.
- Use protective clothing or an apron of a sufficient size and boots to protect from any splashing.
- Use neoprene or PVC gloves to protect hands.

1.4 First aid instructions

- Inhalation of acid fumes: move to fresh air, keep warm and calm. Consult a doctor if necessary.
- Acid splashing on skin: rinse splashes from the skin immediately using plenty of water and take off stained clothes.
- Acid exposure to eyes: rinse eyes immediately with plenty of water, also under the eyelids. Consult a doctor.
- If acid gets into mouth: rinse your mouth immediately with plenty of water. A few glasses of water may be drunk. Consult a doctor if necessary.

1.5 Restrictions on use

- The operator of the acid applicator must not be under the influence of narcotics, alcohol or powerful medications.
- In case of illness or disablement, the operation of the machine must be authorized by the attending physician.
- The acid applicator must not be used dry.
- Pumping inflammable liquids, liquids for human consumption, or additives is forbidden.
- Do not pump acid that has been diluted with water unless specifically permitted by the manufacturer.

2. Technical specifications

You can find the identity information of the machine in the warning sticker shown in the picture below. With this information it is easier to maintain the product and order spare parts.



	VP30	VP200	VP1000
Operating voltage	12 V	12 V	12 V
Max. required current	10 A	10 A	10 A
Max. pressure	0,5 bar	0,5 bar	0,5 bar
Pumping capacity	6 l/min	6 l/min	6 l/min
Container size	30 l	200 l	1000 l

3. Assembly

Mount the container containing the preservative to a container holder or make sure that it is firmly mounted elsewhere. Lower the pump slowly into the container and tighten the cap. Connect the hose to the pump's hose connector and tighten with a clamp.


4. Accessories

4.1 Junior controller

If you use the electronic Junior controller for adjusting the flow, mount the controller securely into the cabin so that it is not exposed to unnecessary vibration. Connect the pump with the controller using the Junior connecting cable. Make sure that the cable is not exposed to crushing forces. Connect the controller's power cable to the tractor's tripolar power outlet.

Make sure that the power switch of the controller is in OFF position as you connect the cables of the pump with the power cable. Make sure that the pump rotates in the right direction (the right rotation direction is shown with an arrow in the yellow warning sticker, see p. 7).

Please note that for monitoring the flow, you need a flow meter that is sold separately.

 **INCORRECT WIRING MAY DAMAGE THE CONTROLLER!**

 **DO NOT USE THE PUMP DRY**

4.2 Flow meter

When a glass tube flow meter is used for monitoring the flow, attach the flow meter to the harvesting machine at a convenient height with at least two M8 screws so that the flow meter can be easily seen from the cabin. For the flow meter to function correctly, it must be installed in an upright position. Do not install the flow meter into a place where it is exposed to strong vibration!

Connect the hose coming from the pump with the flow meter's hose connector and tighten the connection with a clamp. Connect the hose going to the nozzles with the hose connector and tighten with a clamp.

4.3 Anti-drip valve

The purpose of the anti-drip valve is to prevent the hoses from emptying and the preservative from dripping and to keep the hoses from emptying after the pump is stopped. The anti-drip valve is installed in between the flow meter and the nozzles so that the distance from the nozzles is as short as possible. Install the anti-drip valve according to the direction of flow shown by the arrow.

4.4 Nozzles

Nozzles are selected based on the need. In a baler, the best choice for applying additive with a VP applicator is our pick-up spray bar with spoon nozzles. With a trailed forage harvester, we recommend round jet nozzles which can also be used in acid preservation of grain.

5. Taking into use

5.1 Testing

Prior to acid pumping the system must be tested by pumping clean water through the pump. The testing is easier to do after the pump has been mounted to the harvesting machine as the conditions are then similar to the actual use.

The following should be observed during the pumping test:

- The operating of the pump and the right rotating direction
- The operating of the flow meter: the float moves up or down as the adjusting screw is turned.
- The evenness of the distribution of the flow from the nozzles
- The durability of the equipment and all the joints

A test run is also recommended prior to the beginning of the harvest season.

6. Calibration test

The flow rate given by the flow meter is approximate. If you need to know the accurate pumping rate, you must carry out a calibration test. In the calibration test, the liquid pumped by the system in a certain time is collected and measured, and the amount is compared to the pumping time in order to calculate the actual flow rate.

Please note that the following factors affect the flow rate:

- Lifting height
- The flow meter, nozzles, anti-drip valve and hoses in use
- The power source used (tractor)
- The viscosity (fluidity) of the liquid

The calibration test should be conducted next to the harvesting machine. The test can be conducted with water for safety reasons, but of course the best result is obtained with the preservative in use. Always follow the safety instructions given by the manufacturer of the preservative and use appropriate protective gear.

Remove the nozzles from the harvesting machine and keep them at the same distance from ground as they are when mounted. Fill the container with liquid and place a container under the nozzles for collecting and measuring the liquid pumped through the system. Use the pump before the actual test in order to fill the hoses with liquid.

Switch on the pump and clock with a stopwatch. Use the pump for at least 60 seconds. Measure the amount of liquid pumped calculate the flow rate (litres per minute) by dividing the amount of liquid (litres) with the pumping time (seconds) and multiplying that with 60.

$$\frac{\text{Amount of liquid (litres)}}{\text{The pumping time (seconds)}} \times 60 = \text{Flow rate l/min}$$

When necessary, adjust the system by using the Junior controller or the adjusting screw of the flow meter. Repeat the calibration test if needed.

6. Trouble shooting

Error	Possible cause	Solution
The output is weak.	The pump rotates in the wrong direction.	Change places of the wire cables.
	The counter pressure is too high.	Check the hoses, nozzles, flow meter and the anti-drip valve.
	The pump is out of power.	Check the wiring and the voltage of the tractor's socket.
	The bearings of the pump are worn out.	Change the bearings and the axle.
The pump vibrates or makes extra noise.	The bearings of the motor are worn out.	Change the motor.
	Axle is damaged.	Replace the damaged parts.
The spray from the nozzles is uneven / abrupt.	Error in the anti-drip valve.	Check the condition and functioning of the anti-drip valve.

Error	Possible cause	Solution
The pump does not rotate.	The fuse has blown.	Change the fuse.
	The contacts of the power cable are loose or damaged (oxidated).	Clean the contacts or replace them if necessary.
	Motor is damaged.	Change the motor.
	The housing of the pump is melted due to dry-use (strictly forbidden!).	Replace the melted parts.
The pump makes the fuse blow.	The impeller has melted.	Change the damaged parts.
	The bearings of the motor are stuck.	Change the motor.
	Short circuit in the power cables.	Repair or change the power cable and the contacts.

7. Maintenance and storing

The acid applicator must always be cleaned after use by pumping clean water through the whole system. External cleaning is also necessary. During cleaning, the electronic components must be protected from water. After cleaning, the pump and the electric couplings must be carefully dried.

⚠ Do not use a pressure washer for cleaning the pump!

⚠ Use the appropriate personal protective equipment!

After use the acid applicator must be stored in a dry place, protected from sunlight. If the acid applicator is stored in a cold place, pump antifreeze through the system before storing to prevent freezing.

8. Terms of guarantee

- The warranty period for the machines manufactured by Happowa Oy is 12 months.
- The warranty period begins on the date the authorized dealer has delivered the new equipment.
- Warranty covers manufacturing and material defects.
- Damaged parts that have been made a complaint about during the warranty period will be replaced or repaired free of charge if they are returned to the manufacturer, the shipping paid by the customer.
- The parts that have not been manufactured by Happowa Oy, such as the circuit cards and electric motors, are covered by the warranty of the supplier in question.
- Warranty does not cover the operating and travelling expenses.
- Warranty is only valid if the fault has been reported to our dealer within 14 days from the delivery date.

Warranty does not cover:

- Damages caused by normal wear or incorrect maintenance.
- Damages caused by incorrect use.
- Repairs or changes made without the consent of the manufacturer and the damages caused by them.
- Secondary damages and the financial losses caused by them.
- Damages caused by incorrect wiring.

Subject to change without notice.

9. Responsibilities


Manufacturer is not responsible if the acid applicator is used contrary to safety regulations or this operating manual. Since the use of the acid applicator may cause situations for which there are no instructions or regulations, the operators are recommended to follow general machine safety instructions and directives.

Note that the incorrect use of acid may cause harm to people, animals, bodies of water and soil. Follow the instructions provided by the manufacturer of the preservative and other experts regarding the handling and use of preservatives.

Manufacturer is not responsible for the incorrect use of preservatives or secondary damages caused by it. Manufacturer is not responsible for damages caused by the use of components manufactured by others. Manufacturer is not responsible for damages to other machines or equipment caused by the use of preservatives.

The owner of the machine is responsible for its use, care and maintenance.

The owner of the machine is responsible for making sure that all people using the machine are sufficiently informed of its handling and use.

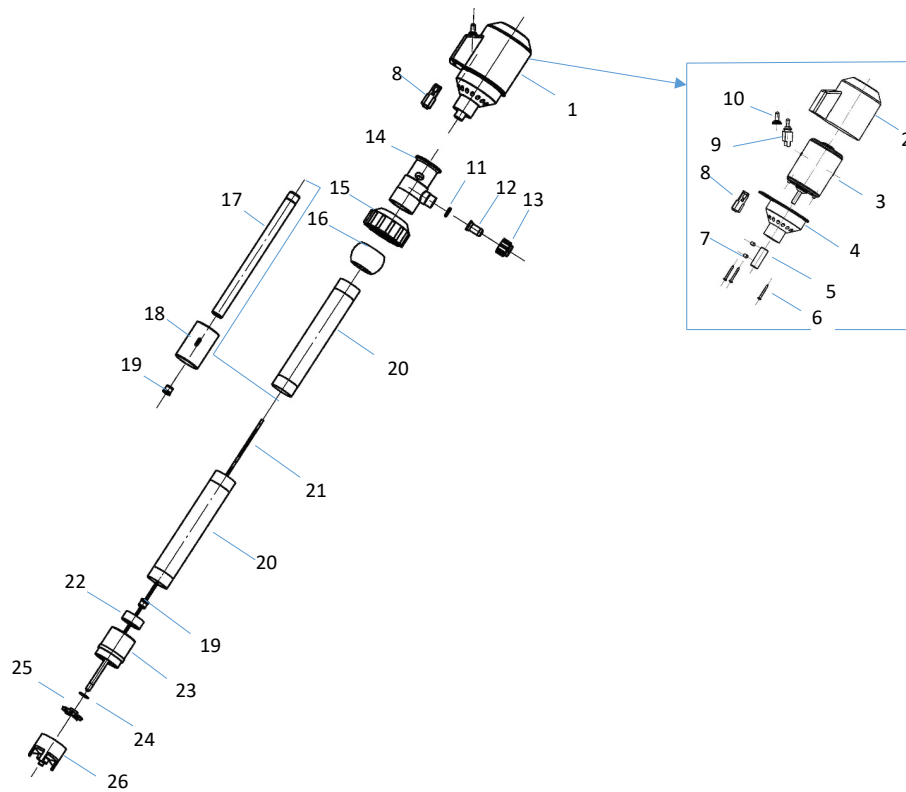
 Since the manufacturer cannot supervise the use of the products we can only guarantee their quality. We cannot take responsibility for the performance of the products.

10. Disposal

The product should be recycled or disposed of according to the current legislation. The product is made of material which does not decompose naturally and which releases poisonous gases and substances when burned.

Spare parts

VP30



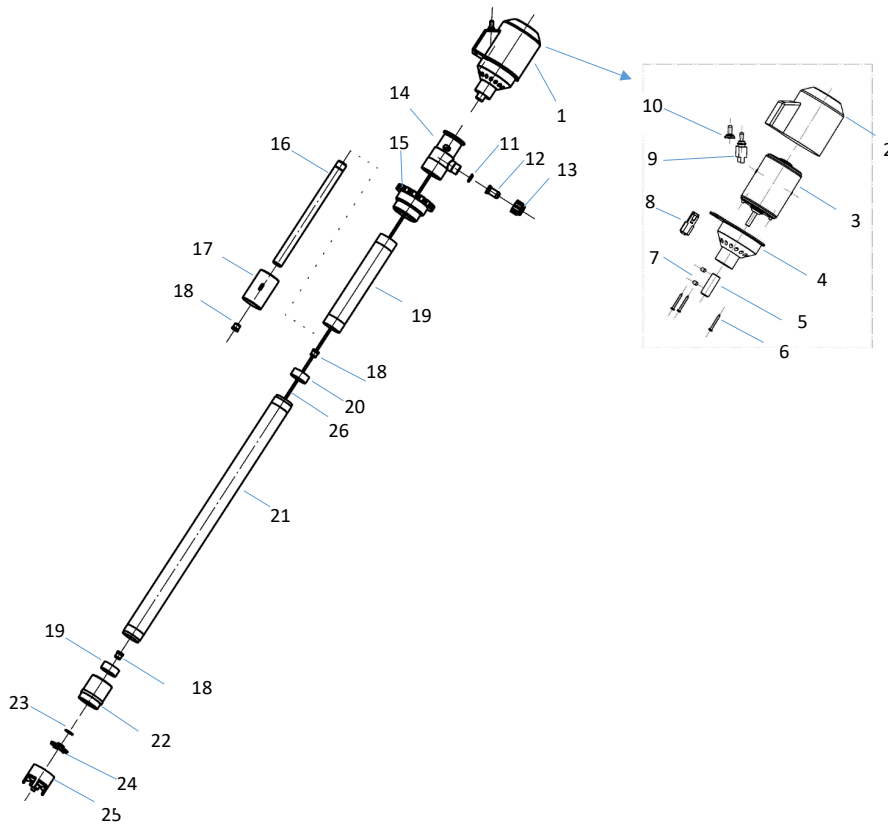
Osa Nr.	Tunnus Code	Suomi	English	Svenska	Kpl. Pc. St.
1	103125	Pumppumoottori, täydellinen	Pump motor, complete	Pumpmotor, komplett	1
2	921126V	Hattu	Cap	Hat	1
3	490170	Moottori	Motor	Motor	1
4	490182	Moottoripesä	Motor housing	Motorhus	1
5	945174	Holkki	Bushing	Bussning	1
6	D7981C 3,5*32	Ruuvi	Screw	Skruv	3
7	D916 M6*6 A4	Ruuvi	Screw	Skruv	2
8	500435	Liitin	Coupler	Koppling	1
9	500220	Vipukytin	Switch	Strömbrytare	1

Osa Nr.	Tunnus Code	Suomi	English	Svenska	Kpl. Pc. St.
10	500222	Suojus vipukytkimeen	Switch cover	Skydd till strömbrytare	1
11	971750	O-rengas 13*3	O-ring 13*3	O-ring 13*3	1
12	323016	Letkulähtö 12 mm	Hose coupling 12 mm	Slangkoppling 12 mm	1
13	49360	Supistajan mutteri	Reducer's nut	Förminsknings mutter	1
14	921462	Yhdyskappale	Output housing	Utgångshus	1
15	9413184	Korkki	Cork	Kork	1
16	946044	Pullon suukappale	Cork holder	Korkhållare	1
17	946040	Sisäputki	Inner pipe	Inre rör	1
18	932339	Välikappale	Pipe connector	Rörförbindning	1
19	944982	Laakeriholkki	Bearing support	Lagerbussning	2
20	948156	Runkoputki, lyhyt	Pipe, short	Rör, kort	2
21	947828	Akseli	Axle	Axel	1
22	947194	Välilaakeri	Bearing	Lager	1
23	921131	Johtosiivikko	Impeller holder	Impellerhållare	1
24	948106	Teflon prikka	Washer	Bricka	1
25	922984	Siipipyörä	Impeller	Impeller	1
26	910540	Pumppupesä	Pump housing	Pumphus	1

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2021

VP1000



Osa Nr.	Tunnus Code	Suomi	English	Svenska	Kpl. Pc. St.
10	500222	Suojus vipukytkimeen	Switch cover	Skydd till strömbrytare	1
11	971750	O-rengas 13*3	O-ring 13*3	O-ring 13*3	1
12	323016	Letkulähtö 12 mm	Hose coupling 12 mm	Slangkoppling 12 mm	1
13	49360	Supistajan mutteri	Reducer's nut	Förminsknings mutter	1
14	921462	Yhdyskappale	Output housing	Utgångshus	1
15	933324	Tynnyrisovite	Barrel adapter	Fatadapter	1
16	946040	Sisäputki	Inner pipe	Inre rör	1
17	932339	Välikappale	Pipe connector	Rörförbindning	1
18	944982	Laakeriholkki	Bearing support	Lagerbussning	3
19	948156	Runkoputki, lyhyt	Pipe, short	Rör, kort	1
20	947194	Välilaakeri	Bearing	Lager	2
21	947167	Runkoputki, pitkä	Pipe, long	Rör, lång	1
22	921131	Johtosiivikko	Impeller holder	Impellerhållare	1
23	948106	Teflon prikka	Washer	Bricka	1
24	922984	Siipipyörä	Impeller	Impeller	1
25	910540	Pumppupesä	Pump housing	Pumphus	1
26	9481860	Akseli VP1000	Axle	Axel	1

Osa Nr.	Tunnus Code	Suomi	English	Svenska	Kpl. Pc. St.
1	103125	Pumppumoottori, täydellinen	Pump motor, complete	Pump motor, komplett	1
2	921126V	Hattu	Cap	Hat	1
3	490170	Moottori	Motor	Motor	1
4	490182	Moottoripesä	Motor housing	Motorhus	1
5	945174	Holkki	Bushing	Bussning	1
6	D7981C 3,5*32	Ruuvi	Screw	Skruv	3
7	D916 M6*6 A4	Ruuvi	Screw	Skruv	2
8	500435	Liitin	Coupler	Koppling	1
9	500220	Vipukytkin	Switch	Strömbrytare	1



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