

Operation and maintenance

## **MagixX-B**

Code No. 99-97-0356

Edition: 05/2012 GB

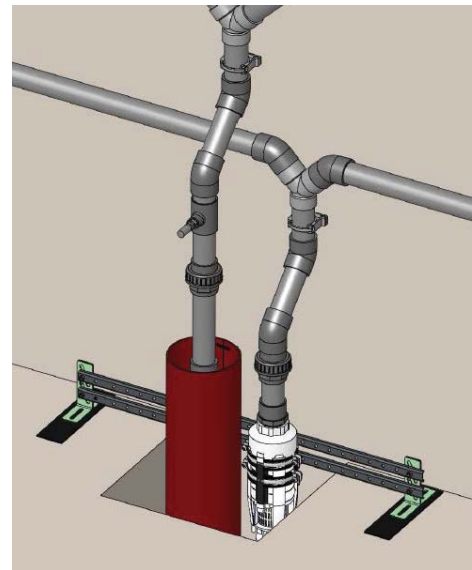




**PRODUCT INFORMATION**

# Cooling jacket for irrigation pumps in MagixX-B and MagixX-L exhaust air cleaners

The irrigation pumps of BD exhaust air cleaners for the poultry sector can be equipped with a cooling jacket. This improves motor cooling and thus prevents pump failure.



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<b>RELEASED BY</b>						
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Submersible pumps of type SP46-1B (BD code no. 60-50-0176 or predecessor 60-50-0093) are used for sprinkling the filter banks in MagixX-B and MagixX-L exhaust air cleaners. In many cases, these pumps are in continuous operation for many hours. As the motors of these pumps are located at the bottom of the pump sump, the accumulation of sediments in the pump sump or a bad circulation of water in the basin leads to insufficient cooling of the motor. This causes motor overheating, motor bearing destruction and thus pump failure.

To prevent this problem, it is possible to place a cooling jacket around the pump. The jacket consists of a tube sleeve guiding the water directly along the motor before being drawn into the pump impeller. The high flow speed in the cooling jacket improves motor cooling and carries away dirt particles so that deposits cannot build up.

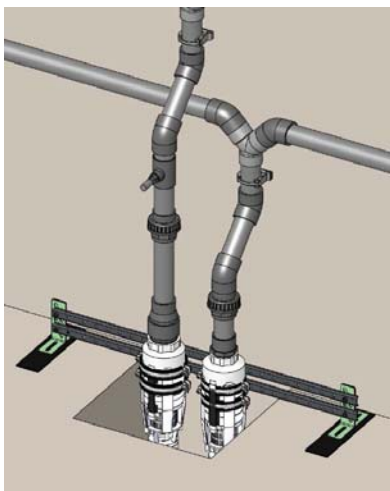


Figure 1: Pumps before installation of the cooling jacket



Figure 2: Cooling jacket

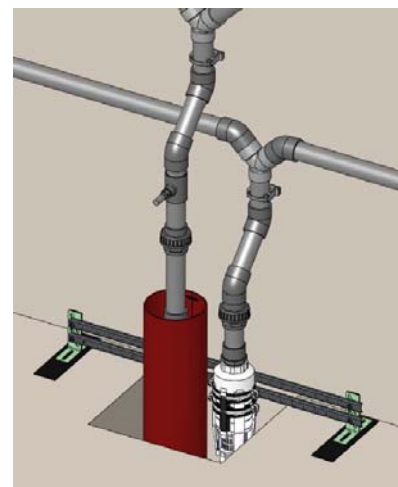


Figure 3: Pumps after installation of the cooling jacket

Space conditions in the individual exhaust air cleaners are so different that cooling jackets must be customized on site and thus adapted to the respective circumstances. This is possible, however, with very limited effort. As a general rule, retrofitting is no problem either.

In case of a new installation, the following material is required for the cooling jacket (for each cleaner module):

Code no.	Description	Quantity
99-50-4059	Drain pipe DN 200x1000	1 pc
10-88-3413	Strap (cable tie) 360 mm x 7.5mm black (UV-resistant)	1 pc

This material has been added to the parts lists.



For retrofitting, check the space conditions on site first. Modifications might require further small parts.

### Requirements for installation

Before the assembly, check whether there is enough room for the cooling jacket around the irrigation pump. The jacket has a diameter of approx. 200 mm and a wall thickness of 5 mm. The cooling jacket exactly fits over the outer edges of the two tube clamps fixing the pump (figure 4). Relocate the pump if necessary.

The C-profiles with the tube clamps fixed to them must be placed with their opening to the rear side so that the fastening thread of the clamps lie free (figure 5). Turn the profiles around if necessary.

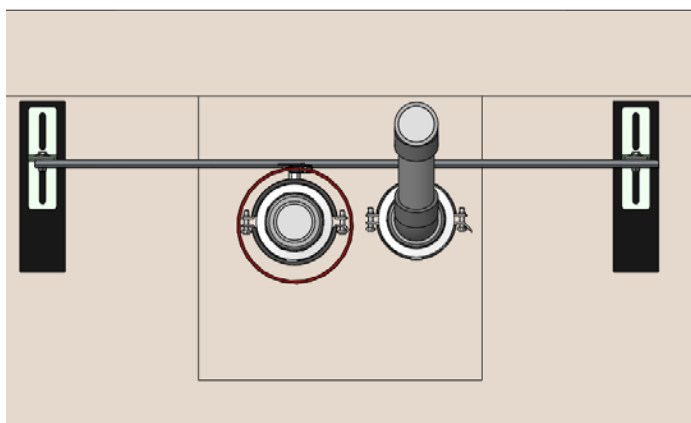


Figure 4: Pumps with cooling jacket, top view

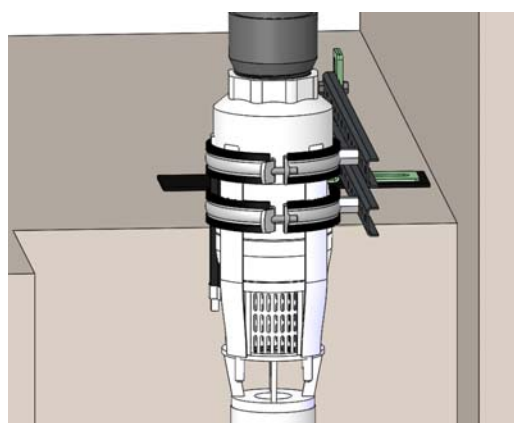


Figure 5: Pump support, C-profiles with their opening to the rear side

To attach the cooling jacket, cut off the pipe above the pump. The MagixX-B exhaust air cleaner already has a PVC screw fitting which can be used for attaching the jacket.



The SP 17-2 spraying pump will not be equipped with a cooling jacket.



## Creating the cooling jacket

Separate the plug-in sleeve from the drain pipe and cut the pipe to the required length. Measure the length on site: the lower end of the pipe must be located approx. 70 mm above the bottom of the pump sump, the upper end shall protrude a little above the regular water level in the basin (figure 6). As a general rule, the ready-made jacket is approx. 800 mm in length.

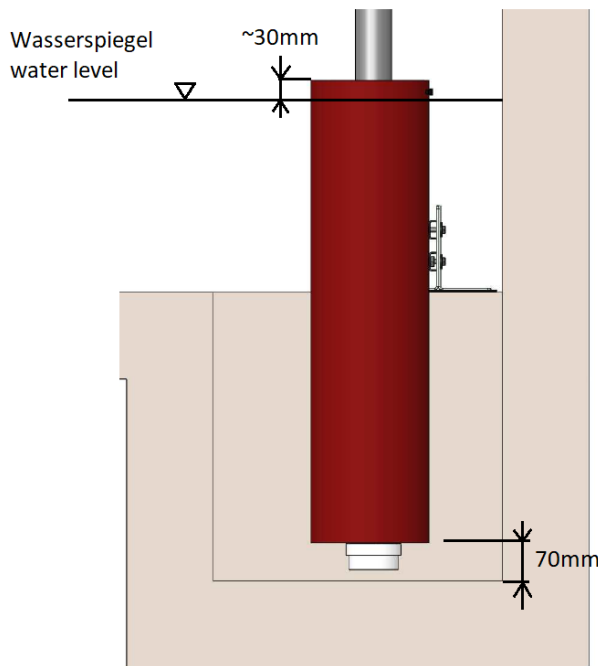


Figure 6: Installation dimensions

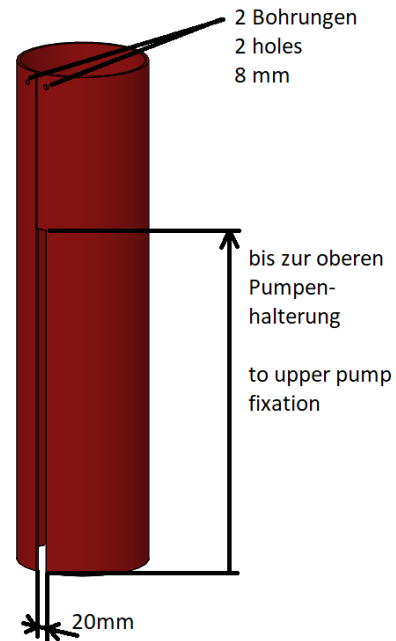


Figure 7: Opening and drill holes

- Cut the pipe open lengthwise.
- Widen the cut to 20 mm from the lower edge of the pipe to the upper pump fixing. Determine the exact dimensions on site (figure 7).
- Drill a hole of 8 mm at the upper end of the pipe to the left and right side of the cut in order to draw the cooling jacket tight after installation by means of a cable tie.

## Installation

Separate the 63 mm PVC pipe above the pump at the screw fitting and push it slightly aside. After that, put the cooling jacket over the pump. During this process, insert the pump cable into the cooling jacket through the entire opening. Put the 20 mm wide opening in the cooling jacket over the fastening thread of the two tube clamps so that it lies on the upper clamp. Draw the cooling jacket tight at the two 8 mm drill holes at the upper edge by means of a cable tie which ensures a sufficiently tight fit. Finally, reconnect the 63 mm pipe.

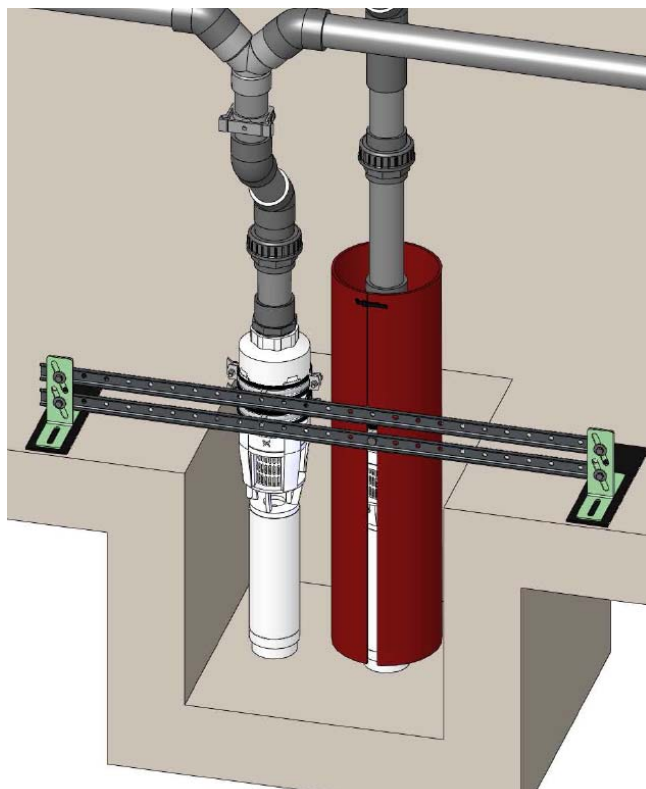


Figure 8: Installed cooling jacket, rear view

For checking and cleaning the pump, pull up the cooling jacket without any further dismantling as far as the pipe and the pump cable allow this.








**PRODUCT INFORMATION**

# Revision of the droplet separator for the exhaust air washers MagixX-B and MagixX-L

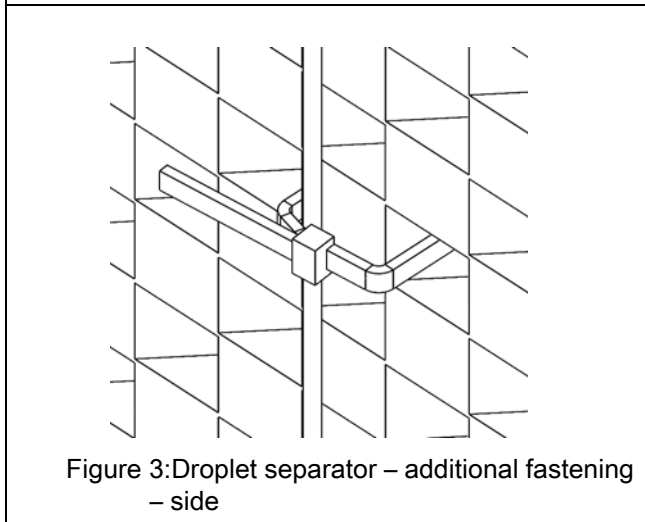
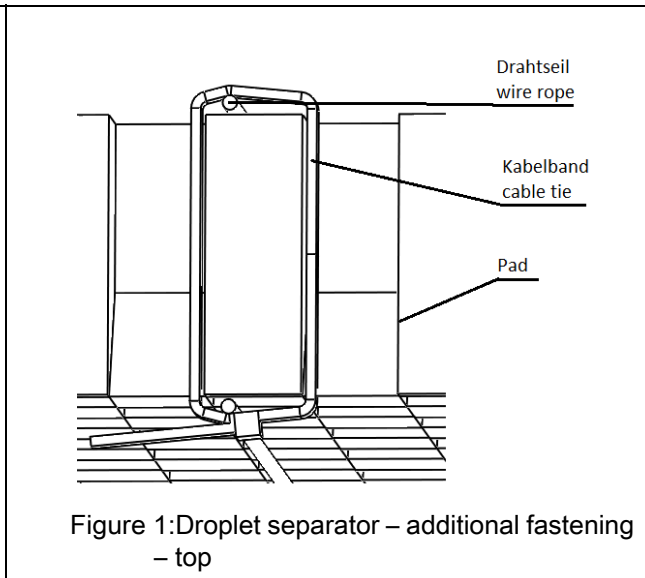
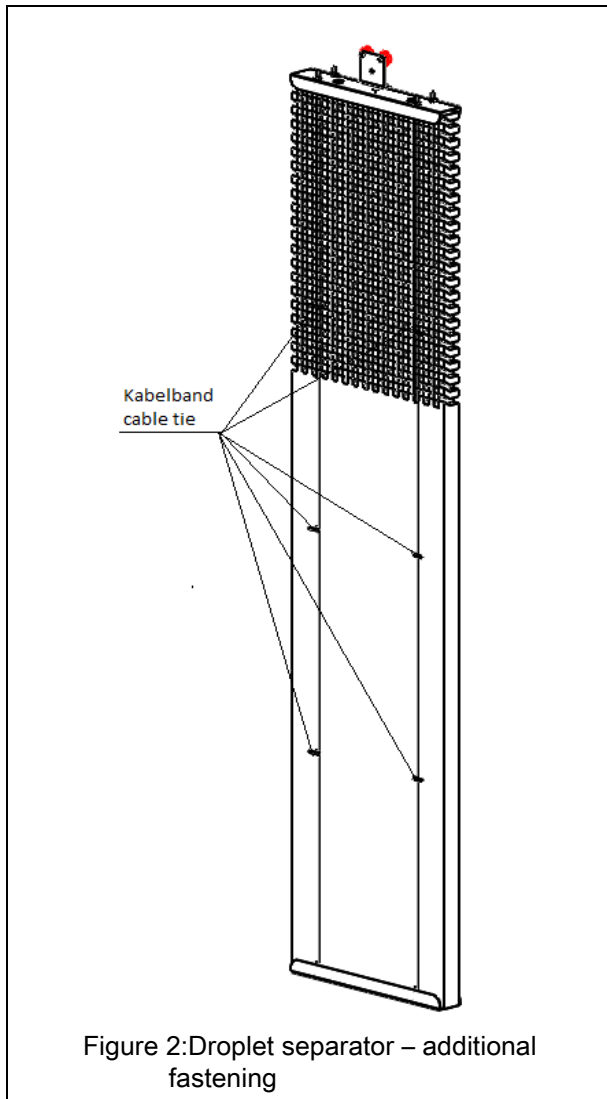
The packing of the droplet separator is additionally fastened to prevent damage in case of heavy soiling.

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A droplet separator has already been available for the exhaust air washers MagixX-B and MagixX-L for some time now, see also **PI no. 1606**. The droplet separator is mounted behind the filter wall and catches most of the splash water from the filter wall before it soils and damages the fans and exhaust air chimneys.

Previous experience from practical use has shown that the droplet separator works well. However, the packing tends to deform in case of heavy soiling and slip in its fastening since it cannot withstand the weight of the dirt.



The droplet separator is therefore stabilized by connecting the packing and suspension ropes with additional cable ties. Each suspension rope must be fastened to the packing on both sides by means of 3 cable ties (figure 2). Each cable tie must be guided through the honeycombs of the packing twice (figure 1 and figure 3). The cable ties must be distributed evenly over the height of the packing.

In the BOM

<b>60-50-2038</b>	Droplet separator 4.2 x 2.7 m cpl. for ceiling suspension
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the required cable ties have been added:

<b>10-88-3413</b>	Strap (cable tie) 360 mm x 7.5 mm black (UV-resistant)	42 pieces
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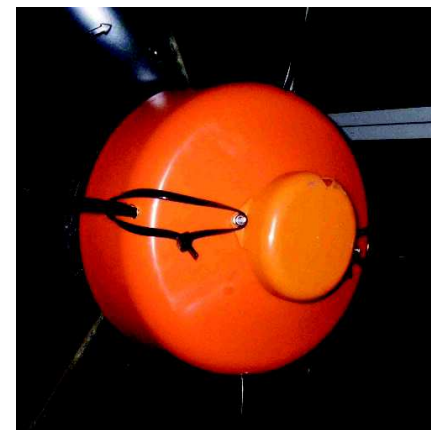


**PRODUCT INFORMATION**

# Guard cap for fan

for exhaust air washer MagixX-B and MagixX-L

A retrofit cap protects the fan motor against dirt, splash water and salt deposits and thus counteracts a frequent cause for failure.



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Normally, the fans in the exhaust air washers MagixX-B and MagixX-L are installed behind the washer modules in the exhaust air chimney. The fans are exposed to an extreme load through dirty, salty and acidic aerosol from the filter walls of the exhaust air washer. This often led to fan failures due to penetrated water, blocked motors, corroded blades and bearing damages.

Previous experience has shown that an additional droplet separator (see PI No. 1606) removes a great part of the aerosol from the air flow. Furthermore, the droplet separator reduces the soiling of the chimney as well as the corrosion of the fan blades considerably. A complete separation of the aerosol, however, is not achieved. Dirt and salt deposits at the motor as well as water in the terminal box still occur to a lesser extent and after a longer operating period.

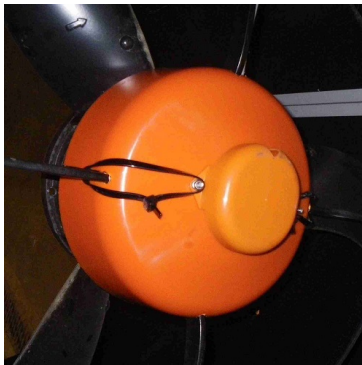


Figure 1: New cap, mounted



Figure 2: Fan with guard cap after 7 months of operation



Figure 3: The same fan with removed guard cap

For the additional protection for the fan motor, a guard cap is available as of now: This cap protects the motor and terminal boxes almost completely against the penetration of dirt and water from below:

60-50-2046	Guard cap cpl for electric fan exhaust air washer
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This article consists of:

60-50-2046	Guard cap cpl for electric fan exhaust air washer	
83-15-8485	Guard cap for fan exhaust air washer	1.0000 pc
99-50-3777	Strap 360 mm × 4.5 mm black (UV-stabilised)	2.0000 pc

The cap can be retrofitted without tools to the followings fans which were used in the MagixX-B and -L up to now.

60-50-0021	Fan FE091-6DT.6N.3 FU 27000m <sup>3</sup> 400V 1480W 3.8 A only frequency adjustable
60-50-0240	Fan FN091-6DT.6N.A5 3x400V 50Hz 4.0A for tube
60-50-0241	Fan FN091-6DT.6N.A5 3x400V 50Hz 4.0A 0.8 m cable for tube
60-50-0250	Fan FN091-6DT.6N.A5 3x400V 50Hz 4.0A 2.5 m cable for tube

The cap is put from below over the motor, terminal box and supporting brackets of the fan. One of the slots is wider in order to insert the connection cable of the fan. The supplied cable ties are put around both screws and the adjacent supporting brackets and tightened.

	There must be a distance of at least 10 cm between the four supporting brackets of the fans and the open damper of the exhaust air chimney so that the damper does not strike against the guard cap.
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For the removal of the cap, the cable ties can be detached without tools and usually do not have to be cut through.

Rain and cleaning water which penetrates from above can run off through the drain hole below in the cap.





No. 1672      January 20, 2016

## Revision of acid metering at MagixX exhaust air cleaning systems

The equipment for the metering of sulfuric acid in MagixX-B (Broiler), MagixX-L (Layer), and MagixX-P (Pig) exhaust air cleaning systems has completely been revised and standardized in order to increase the operational safety, to prevent operational disturbances, and to be prepared for future legal requirements.

### 1. Standardized measuring and metering system

Previously, three different measuring and metering systems have been used for all three exhaust air cleaning systems:

Code no.	Description
60-50-0094	pH-metering and dosing system cpl MagixX B
60-50-0199	pH-conductivity metering and dosing system (LDPHCD) cpl MagixX
60-50-0108	pH-metering and dosing system cpl MagixX P

These have now been by a standardized system:

Code no.	Description
60-50-2044	Measuring and metering system cpl MagixX universal



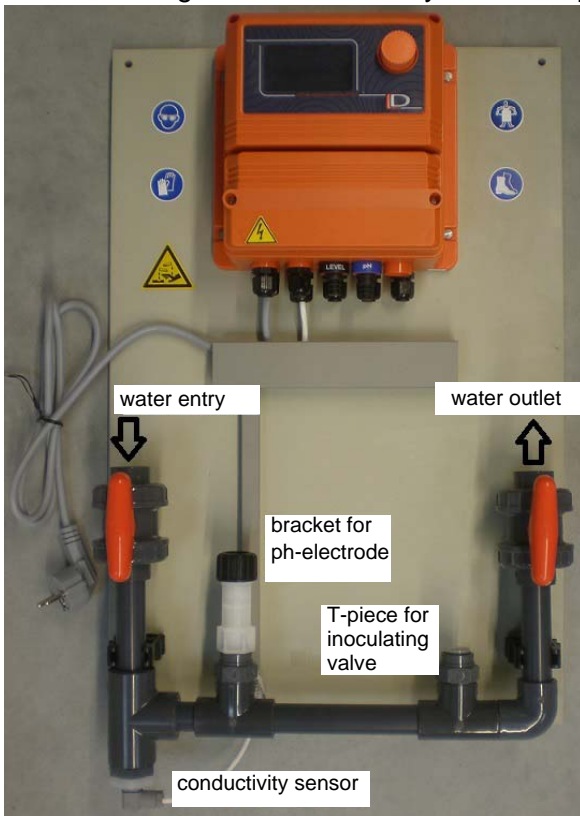
**Fig. 1:** Measuring and metering system cpl MagixX universal (code no. 60-50-2044)

The system consists of a 600 x 400 mm large base plate on which a measuring device of the type LDPHCD is mounted together with a short tubular string. Latter is prepared for the installation of the pH-electrode and the inoculating valve and comprises a conductivity sensor as well as two ball valves.

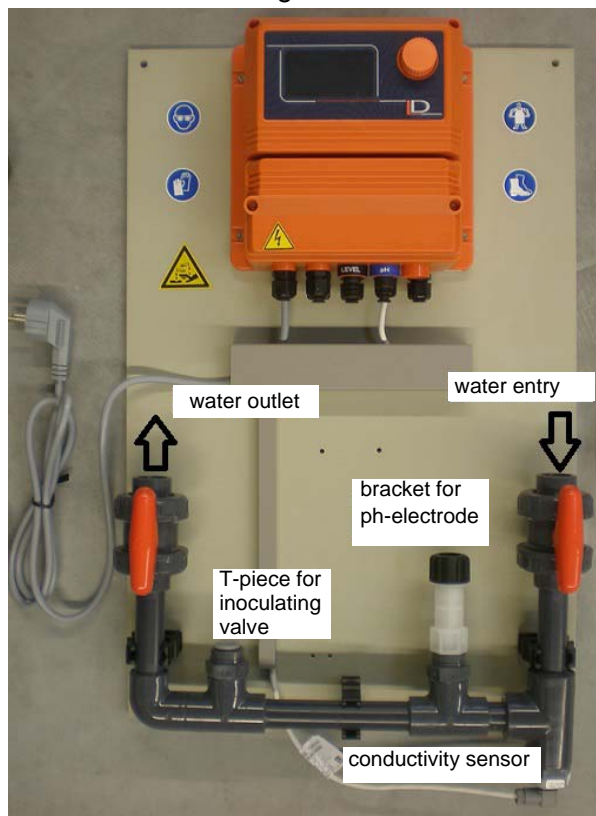
The inoculating valve, the pH-electrode, the acid pump with connection cable, and a multifunction valve are delivered unassembled and are included in the scope of delivery.

Suction lance, buffering solution, acid hoses, and protective tubes are to be added to the order.

If required, the flow direction of the system can be changed by detaching the tubular string from the base plate and installing it again the other way round. The water has to run through the system in the following order: conductivity sensor → pH-electrode → inoculating valve.



**Fig. 2:** Connection left



**Fig. 3:** Connection right

### Conversion of spare parts for older systems

The parts lists of the exhaust air cleaners will be changed after reduction of old stock.

The above mentioned previous systems will discontinue.

In case of defects on these older systems, the following components of the new "MagixX universal" system can be applied:

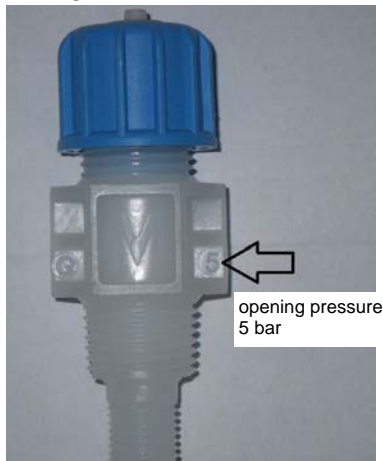
LDPH measuring device	➔ replacement by LDPHCD, observe different terminal allocation
Acid pump VIS 1004	➔ identical, maybe exchange of 230V-plug
pH-electrode + bracket	➔ identical
Conductivity sensor	➔ identical
Inoculating valve	➔ The new inoculating valve PTFE 0.3 bar (no. 60-50-0235) must only be installed together with a multifunction valve (no. 60-50-0236). If this is not possible, the previous 5-bar inoculating valve (no. 60-50-0141) without multifunction valve has to be used, which however offers a lower safety regarding failures (see 3.).

The two inoculating valves can be distinguished by means of a print on the casing:

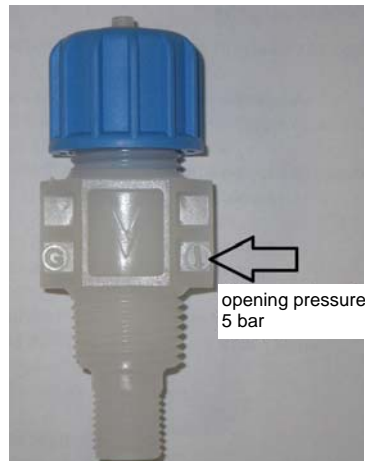
Inoculating valve 5 bar no. 60-50-0141:	print "5"
Inoculating valve 0.3 bar PTFE no. 60-50-0235:	print "arrow"



The colour of the cap nut indicates the material of the seat of the valve ball (blue = PTFE, black = Viton). Both are suitable for the use in exhaust air cleaning systems. In the course of the product change, blue valves will be delivered first, black ones after the reduction of the stock.



**Fig. 4:** Inoculating valve 5 bar (old)



**Fig. 5:** Inoculating valve 0.3 bar (new)

## 2. Regulations for the installation

For the prevention of operational failures, operating errors, and damages on the acid pipes, the installation of acid pipes and the assembly of the single components is described in detail.

### Generally:

- Only the PVDF-hose 6/4 mm no. 20-50-4676 must be used as acid hose.
- The acid hoses are to be protected against damages.
- Prevention of narrow bends.
- In case of kinks the entire hose must be exchanged.
- The hoses are to be laid preferably in a robust, acid-resistant protective tube.
- A contact between the acid hose with sharp-edged components or abrasive surfaces must absolutely be avoided.
- In wall ducts the use of a protective tube is obligatory.
- All ends of the protective tube must be produced free from burrs.
- In case of damages at the acid hoses, the leaking acid must be collected by the protective tube and drain without risks and visibly e. g. into the collecting basin of the acid tank, another suitable collecting vessel or into the water basin of the exhaust air cleaning system. Before the installation it has to be clarified where the acid is supposed to be collected in case of a defect. Therefore, the protective tube must be installed with a slope towards the corresponding direction and must be sealed tightly. If required, drainage pipes towards the collecting basin must be provided.
- Marking of the protective tubes: every 50 cm with the sticker 00-00-1409 "Pictograph: Risk of chemical burn W04 / 25 mm"
- Thorough production of hose connection, make sure that the connection of bulges is proper. See PI no. 1583.

## Details about the single components

### 2.1 LDPHCD measuring device with pH-electrode and conductivity sensor

- The base plate with measuring device and sensors is mounted at an easily accessible place and connected to the process water pipe. The sensors must permanently and sufficiently be surrounded by process water when the exhaust air system is operating. This can be checked by closing and reopening one of the ball valves at the measuring device. Flow noise must be audible which arises due to the stopping and releasing of the water flow.

### 2.2 Suction hose from acid tank (suction lance) to pump

- Length of suction hose: max. 5 m
- Installation of the hose: with downward slope towards acid tank respectively with upward slope towards the pump in order to allow for a trouble-free venting. Air bubbles must automatically rise to the pump.
- For a smooth re-plugging of the suction lance a sufficiently long piece of hose without protective tube has to be laid.

### 2.3 Acid pump

- The acid pump is no longer mounted on the base plate of the measuring device but is separately fixed to the wall near the acid tank. Thus, the laying of the suction hose can be carried out ideally without consideration of the installation position of the measuring device. The delivery comprises a 5 m long connection cable with BNC-plugs between measuring device and acid pump for the transmission of control signals.
- Installation height of the pump: at least at the level of the upper edge of the acid tank but maximally 1.5 m above the bottom of the acid tank (maximum suction height of the pump)
- Current supply of the pump: as before via a 230V outlet, which can be disconnected by the MagixX-controller in case of failures. For more protection against mix-ups a blue CEE-plug for 230V is now used as plug coupling so that the acid pump cannot be connected to a continuous current socket anymore. The appropriate CEE-wall socket has to be provided by the customer and be mounted during the connection of the MagixX-controller.



**Fig. 6:** Acid pump VIS 1004



**Fig. 7:** CEE-plug blue for acid pump

## 2.4 Multifunction valve



*Fig. 8: Multifunction valve*

The multifunction valve is fixed directly above or beside the acid pump at the wall and connected to the pressure port of the pump.

- Observe the flow direction of the valve (arrows above and below the venting connection at the front of the valve)!
- Adjustment at the knob "A" on the right (pressure holding function): slightly higher than the water pressure at the inoculating valve. For MagixX-B and -L: setting 1.5 bar.
- Adjustment at the knob "S" on the left (safety valve): slightly lower than the maximum pressure of the acid pump. For VIS 1004 pump: adjustment 8 bar.
- Pull out the knobs for adjustment, set the value and push again until they lock.

## 2.5 Venting hose of multifunction valve

- The venting hose at the front of the multifunction valve is led back either to the acid tank or into an acid-proof collection vessel, not into the exhaust air cleaning system! The venting hose can also be installed together with the suction hose.
- Acid leaks from the venting hose when the pressure in the acid line is too high (clogged pipe) or when the knob "S" is set to 0 (e.g. for manual venting of the pump). In normal operation acid does not leak.

## 2.6 Pressure pipe from multifunction valve to inoculating valve

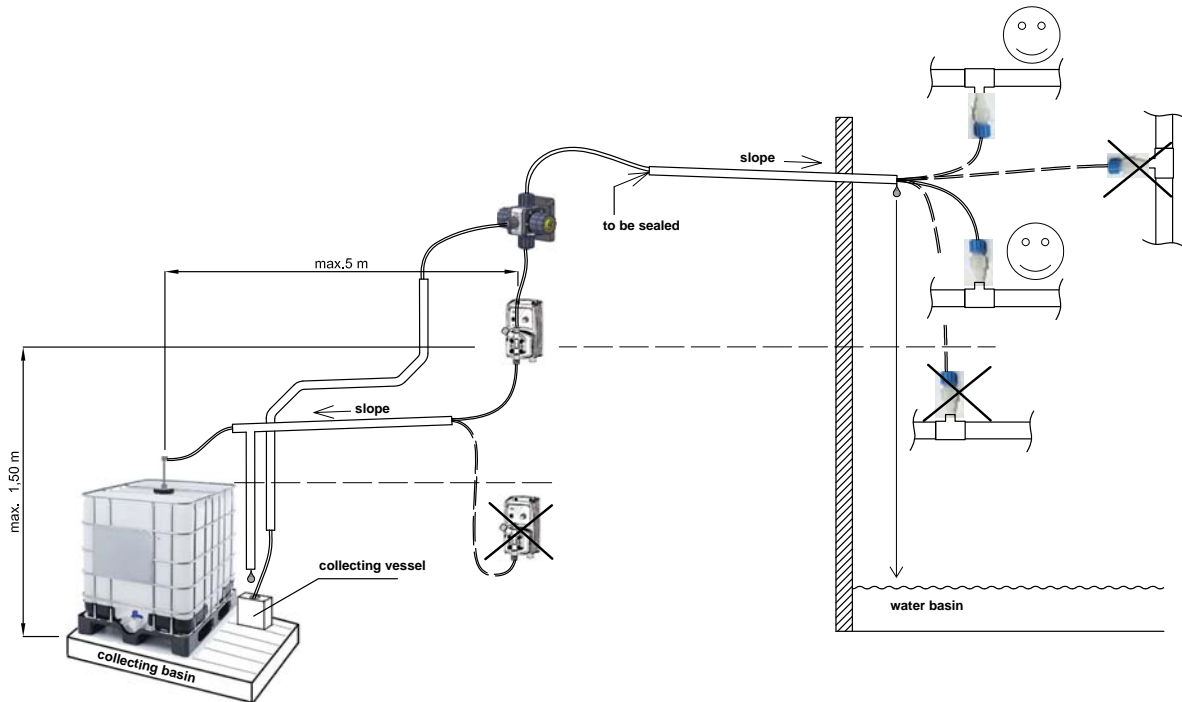
- Length of pressure pipe: not longer than 5 m. For a larger distance the technical department has to be consulted.
- Due to pressure shocks during the pumping the acid hose could hit other objects and get damaged. The hose must be checked in regard to possible hits on other objects and be sufficiently fixed.
- At the entry of the hose into the protective tube the hose can be fixed e.g. with silicone in order to prevent fraying.

## 2.7 Inoculating valve

- The delivered "inoculating valve ½ - 4x6 - 0.3 bar PTFE for exhaust air cleaner" has an opening pressure of only 0.3 bar, see fig. 5. It must only be used in connection with the delivered multifunction valve.
- Installation height: above the acid pump
- Installation position: vertically downwards or vertically upwards but not horizontally (higher wear of the valve ball)
- Installation point: depending on the layout of the system either in a process water line (MagixX-B and -L) or into the prepared T-piece at the measuring device next to the pH-

electrode (MagixX-P). The height of acid tank and pump has to be observed! Process water must permanently flow through the line in which the inoculating valve is installed.

The following sketch shows a summary of the most important instructions. But also other designs are possible.



**Fig. 9:** Example for the installation of the acid lines on exhaust air cleaners

### 3. Advantages arising from the revision of the acid metering

1. By correct placing of the acid pump an easy venting of the suction line is possible, also in case of larger distance between acid tank and inoculation position.
2. The LDPHCD measuring device can be placed at an easily accessible position without consideration of the acid tank and the acid lines.
3. At very low water pressure in the system, an defective inoculating valve, or an acid tank at high level (at wrong installation) the multifunction valve prevents uncontrolled leakage of acid through the inoculating valve.
4. In case of a clogged pressure line or a blocked inoculating valve the multifunction valve prevents a damage of the pressure line caused by excessive pressure, e.g. a slipping of the connections.
5. The multifunction valve relieves the inoculating valve and allows for the use of a new inoculating valve with higher chemical resistance (valve ball now from PTFE instead of the previously used ceramic ball, opening pressure only 0.3 bar instead of 5 bar).
6. The LDPHCD measuring device is much easier to operate than the previously used LDPH.
7. With the additional measuring of the conductivity the pollution of the process water can be monitored. This is increasingly demanded by authorities.
8. The risk of acid accidents is considerably reduced.

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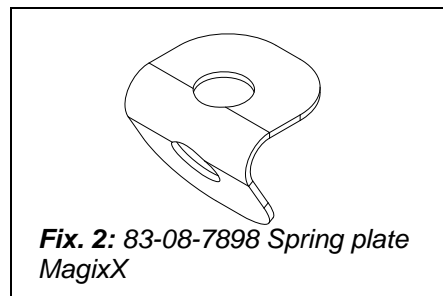
## Revision of MagixX-B assembly

The MagixX-B exhaust air washer was revised in some points in order to simplify the assembly and to eliminate weak points.

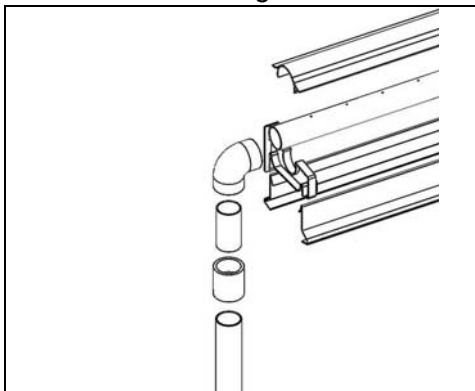
1. For the assembly of a filter wall with a length of 4.20 m it has been common practice until today, to deliver three drip troughs (code no. 83-07-1746) each with a length of 2995 mm. One of these troughs had to be cut to size at the construction site in order to produce two troughs of each 4.20m length. In future, only two troughs (code no. 83-07-1746) each of 2995 mm length and two short troughs (code no. 83-13-8982) each with a length of 1200 mm (see fig. 1) which can be mounted without the need to be cut to size.



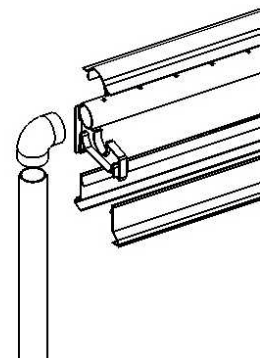
2. The spring plates MagixX (code no. 83-08-7898) which keep the threaded rods inside the drip trough are normally not required for the assembly and no replacement is needed.



3. The previous white spray pipe in the Top Profile was changed from the size 60.3 x 2.5 mm (nominal width 2") to a gray PVC pipe 63 x 3.00 mm and standardized with the other pipes in the exhaust air washer. Thus, also the transition piece from the 63-mm-pipe to the 2"-pipe are no longer required. The previously used pipe brackets are also suitable for the new thicker spray pipe and remain unchanged.

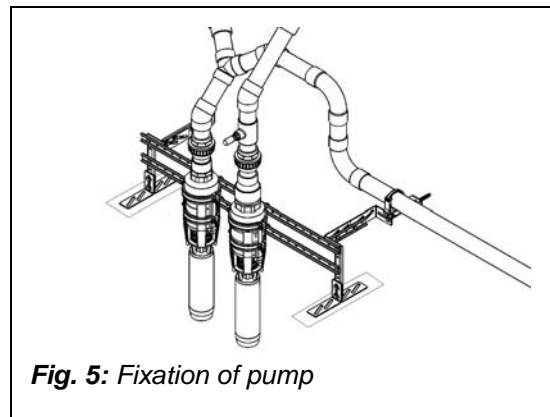


**Fig. 3:** old: connection for spray pipe 2"



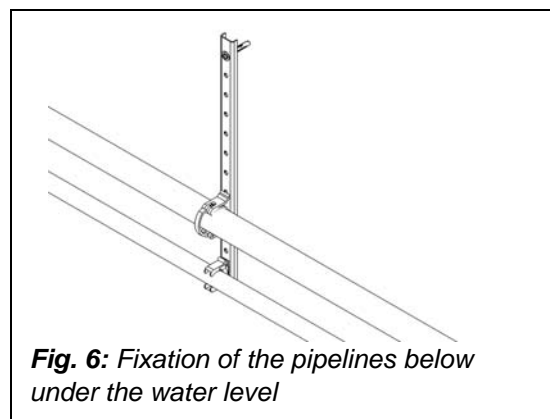
**Fig. 4:** new: connection for spray pipe 63 x 3 mm

4. For the fixation of the sprinkling pump additional ground mounting brackets and braces were included in the parts list. The bracket of the pumps is no longer fixed to the floor of the water basin by means of screws and dowels but placed on anti-slip mats and fixed to the wall above water level. Thus, the coating of the basin must no longer be drilled at underwater areas.



**Fig. 5:** Fixation of pump

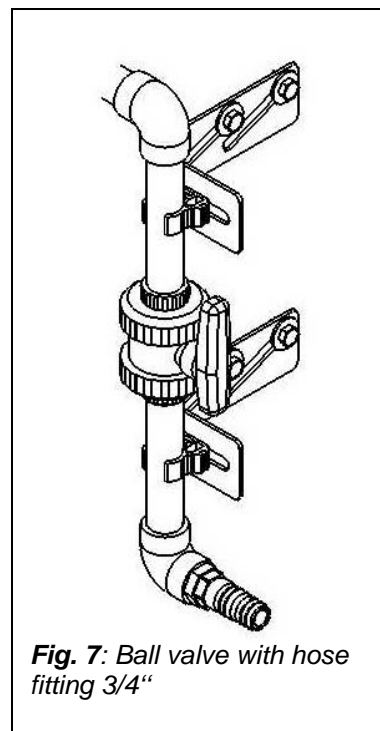
5. For the same reason also the brackets for several pipelines in the basin were changed. By means of a pipe clamp, pipelines under the water line (such as e.g. discharge pipe, fresh water pipelines) are now fixed to a piece of brace which is screwed to the wall above the water level.



**Fig. 6:** Fixation of the pipelines below under the water level

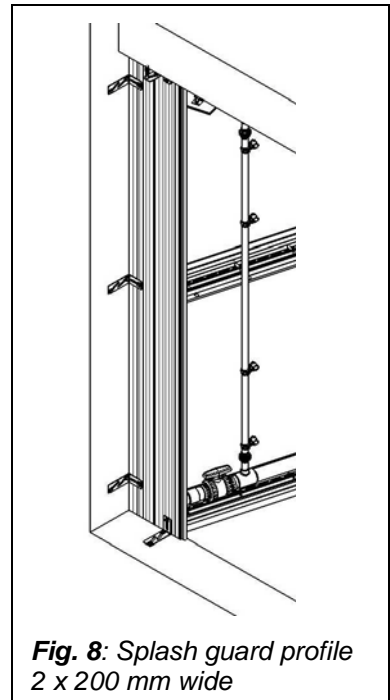
6. The tubing 6/4 mm made of PTFE (code no. 20-50-4651) was substituted by tubing PVDF 6/4 mm (code. no. 20-50-4676). This tubing can be processed more easily, especially the handling of the tubing connections at the acid pump and the inoculating valve considerably simplified and thus more reliable (also see product information no. 1583).

7. The two ball valves with tubing connection for the filling of the backwash pump and for water supply at the basin were replaced by plastic ball valves. The galvanized bracket elbow (99-40-3172) at risk of corrosion by means of which the ball valves are fixed at the wall were substituted by pipe clamps made of plastic. Both fittings end with connection threads 1/2" IG with a screwed-in hose fitting for 3/4"-hose. However, as an option, also a different connection can be mounted to the thread.



**Fig. 7:** Ball valve with hose fitting 3/4"

8. The 200 mm wide splash guard profile (code no. 60-50-2018) has turned out to be thin for the previous washers and was supplemented with additional pen profiles and fixation material. It is now possible to build 2 x 200 = 400 mm wide splash guard wall.



**Fig. 8:** Splash guard profile  
2 x 200 mm wide

9. In the course of the revision, the parts lists were newly compiled and provide a clear overview now. Several sheet-metal parts of the exhaust air washer have previously been summarized in assembly groups which made the material order, the stock-keeping and subsequent changes more difficult. This compilation was cancelled and the sheet metal parts were adopted in the parts lists as single parts.

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No. 1606      May 8, 2015

## Droplet separator for MagixX-B and MagixX-L

When using MagixX-B and MagixX-L exhaust air washers, the exhaust air chimneys and fans are installed behind the filter walls. This positioning allows for a uniform incoming flow towards the filter walls and the compliance with a certain exhaust air velocity at the chimney outlet. As the exhaust air is vertically forwarded into the atmosphere via the chimneys, an optimum rarefaction with the surrounding air is guaranteed. This has a positive effect on the result of the approval-related dispersion calculation.

The disadvantage of this design is that the airflow entrains polluted process water from the filter walls. Fans and chimneys are exposed to a heavy impact of humidity, salt, and dirt particles. This leads to a severe pollution of the chimneys and also to damages on the fans (see fig. 1 & fig. 2).

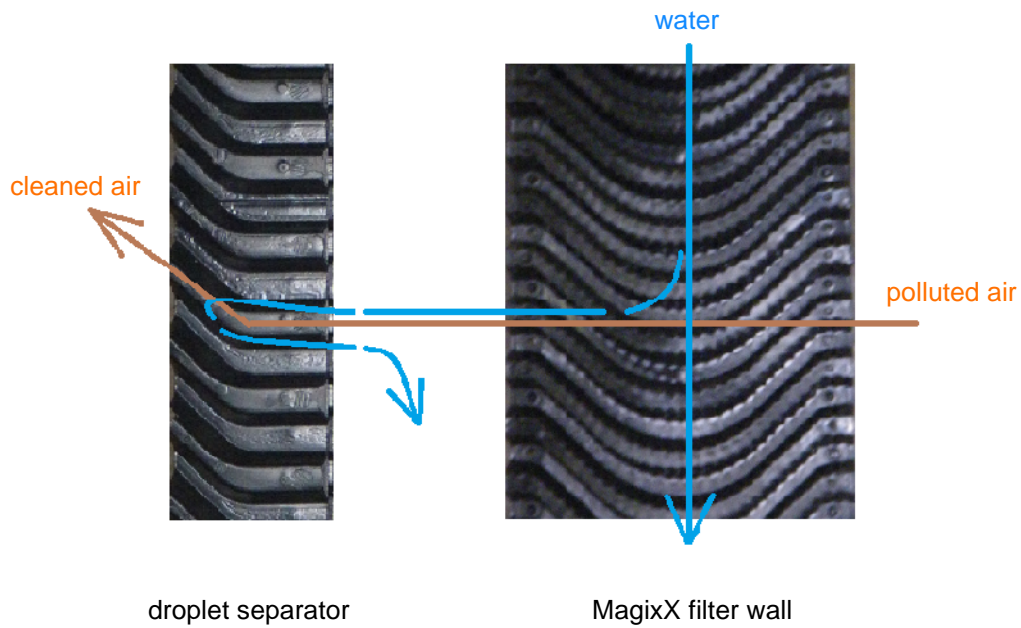


*Fig. 1 & 2: Exhaust air fans of a MagixX-L after longer operation*

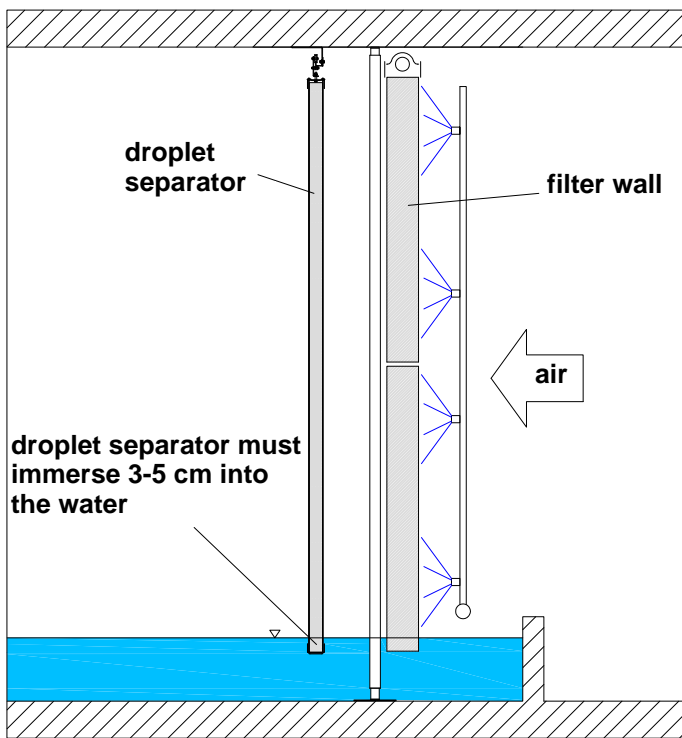
**Thus, a droplet separator is available for MagixX-B and MagixX-L exhaust air washers as of now.**

### Design and function

One droplet separator for a filter wall consists of seven special filling material pads with a height of 2.70 m and a width of 60 cm. Behind the filter wall, these filling material pads are fixed to a shared rail (which is mounted to the ceiling), pushed together to a continuous wall and connected to each other. The finished droplet separator is 4.20 m wide and 2.70 m high and, thus, has the same size as the filter wall. The droplet separator deflects the airflow upwards so that it collects most of the entrained process water and returns it into the water basin (see fig. 3).



**Fig. 3:** Operating principal of the droplet separator



**Fig. 4:** Cross section of filter wall and droplet separator

Each filter wall is equipped with its own droplet separator.

## Coding

The droplet separator is coded on a modular basis as well as the component parts of the MagixX-B and MagixX-L exhaust air washers:

Code no.	Description	Qty.
60-50-2037	Droplet separator per module MagixX-B	1
<i>consists of:</i>		
60-50-2038	Droplet separator 4.2 x 2.7m cpl for ceiling suspension	2

**The droplet separator is included in the parts lists of the MagixX-L exhaust air washer by default. For the exhaust air washer MagixX-B it can be installed as an option and it can also be retrofitted.**

Why is the droplet separator included by default only in the parts lists of MagixX-L but not in the parts lists of MagixX-B?

Usually, MagixX-B is thoroughly cleaned after every batch, normally every 5-6 weeks. On this occasion the fans get cleaned as well as the chimneys and the process water gets changed. Thus, the pollution of the chimneys and fans caused by dirt and salt is comparatively low. However, a batch in the field of layer husbandry lasts approximately one year. This is why the interval between the cleaning procedures is much longer for MagixX-L. In order to keep the intervals between the essential cleaning procedures as large as possible, the droplet separator is required.

## Component parts

Each droplet separator consists of:

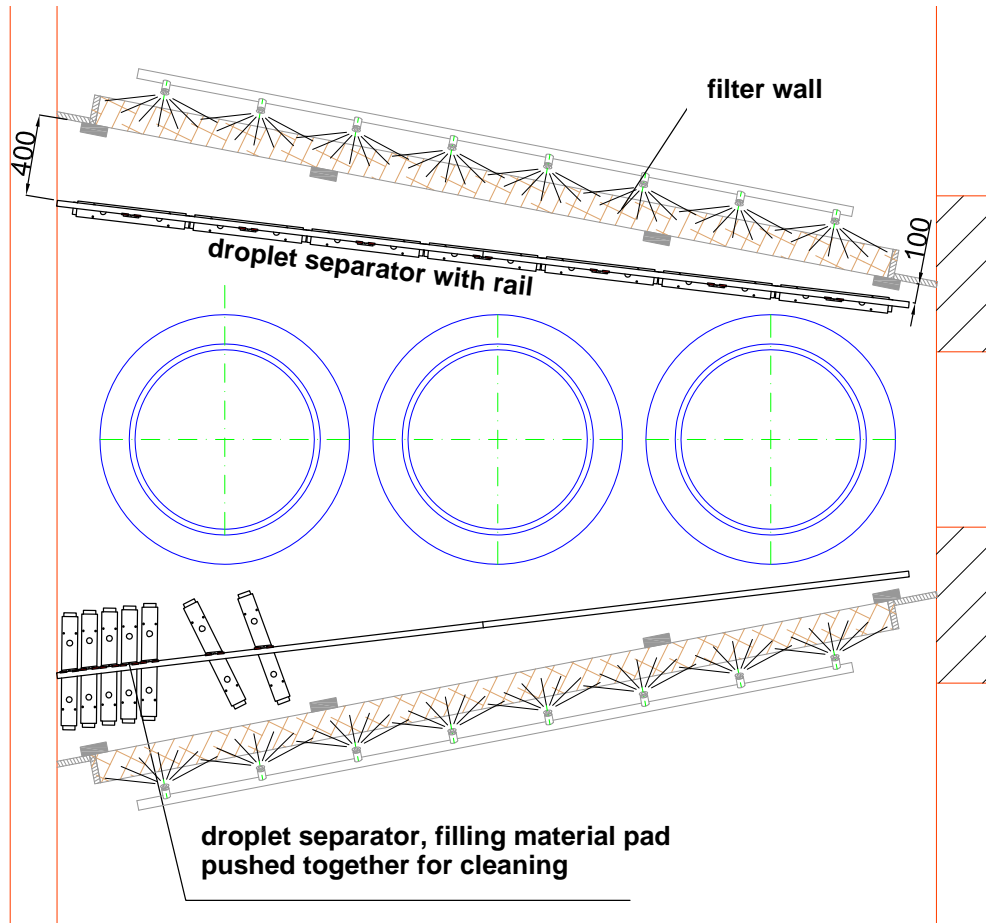
<i>60-50-2038 - Droplet separator 4.2 x 2.7m cpl for ceiling suspension</i>		
<b>Code no.</b>	<b>Description</b>	<b>Qty.</b>
60-50-2043	Rod 5x2100 SST	2 pcs.
83-01-9598	Pulley 1 1/2" 38,1mm plastic	14 pcs.
38-30-4606	Spacer roller 6.3x15x10 PS white	14 pcs.
99-20-1102	Hexagon nut M 6 SST DIN934	36 pcs.
99-10-4153	Hexagon head screw M 6x 30 SST DIN 931	21 pcs.
99-20-1616	Washer A 8,4x40x1,5 SST	20 pcs.
99-20-1418	Hexagon head screw M 8x 40 DIN 933 SST	7 pcs.
99-50-0505	Cable clamp 3mm 1/8" SST	28 pcs.
60-40-3105	Wire rope 3mm spec.steel 1.4301	84 m
60-50-2039	Pad PP63 600x2700mm TA63 F3	7 pcs.
83-14-0737	Angle 95x25x90 SST f/rolling sled droplet separator	7 pcs.
83-14-0736	Angle 32.5x15x60 SST f/roller rail droplet separator	3 pcs.
83-14-0738	U-profile 80x40x590 SST f/droplet separator	14 pcs.
83-14-0739	Roller rail 30x30x2200 SST f/droplet separator	2 pcs.
99-20-1176	Hexagon nut M 8 SST DIN934	24 pcs.
99-20-1400	Hexagon head screw M 8x 16 DIN 933 SST	10 pcs.
99-20-1408	Hexagon head wood screw 8x 80 DIN 571 SST	6 pcs.
99-98-3784	Dowel universal UX 10x60 wo/collar	6 pcs.
83-04-4700	Angle for floor mounting SST housing 35N	6 pcs.

## Installation of a droplet separator

The rail is put together of two sections with a length of 2.20 m each and is fixed to the ceiling with six SST angles (*code no. 83-04-4700*). The small angles (*code no. 83-14-0736*) serve as connection of the two rails and as limit stop. The rail must be installed as close as possible to the filter wall. It still has to be possible to turn and move the filling material pads. The dimensions in fig. 8 serve as orientation and have to be adapted at site.

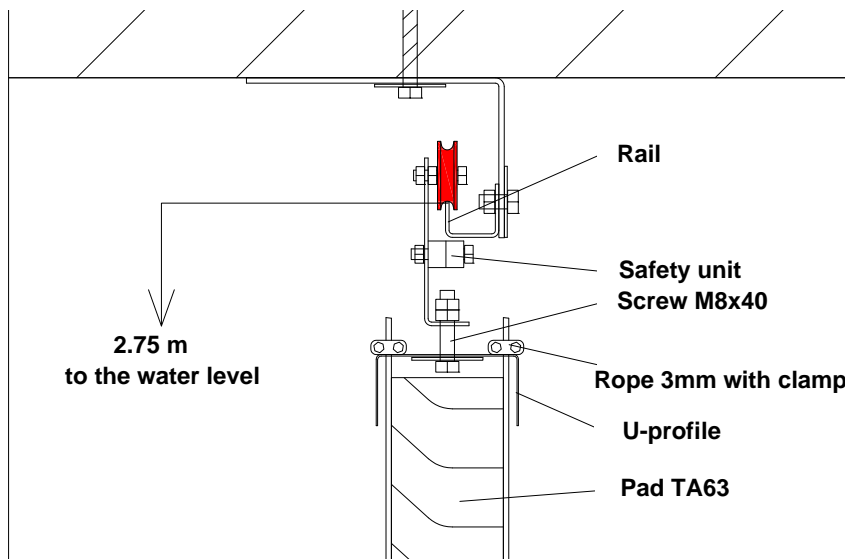


**Fig. 5-7: Rail**



**Fig. 8: Installation dimensions for rail**

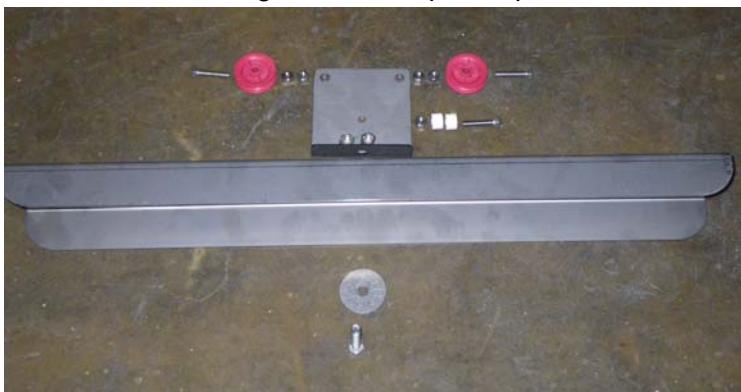
For a proper operation the lower edge of the filling material pads must immerse a little into the water in the basin. Therefore, the upper edge of the rail must be at a height of approx. 2.75 m above the water level (fig. 9). The angles for the ceiling fixation can be adjusted suitably. In case that the angles are not long enough, the M 8 x 40 hexagon screws for the suspension of the pads at the roller slides can be exchanged with longer screws.



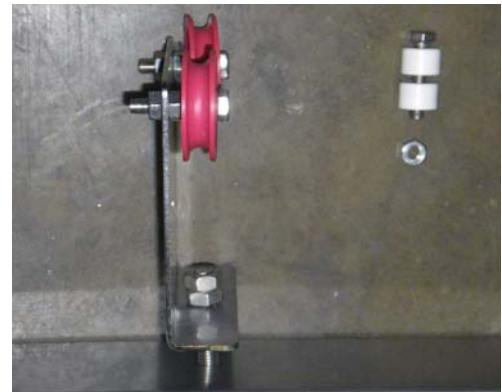
**Fig. 9:** Cross section of rail and roller slide

Two red 38.1 mm pulleys with M 6 x 30 screws and two M 6 hexagon nuts each are mounted to every roller slide as shown in fig. 11. The pulleys must be freely rotating. Tighten the two nuts at each screw.

Each roller slide is fixed to a U-shaped profile by means of an M8 screw and a 8.4 x 40 K-washer so that it can rotate. Screw two M 8 nuts onto the bolt and counter them. The adjustment of the two nuts defines the height of the droplet separator. It must be the same at all roller slides.

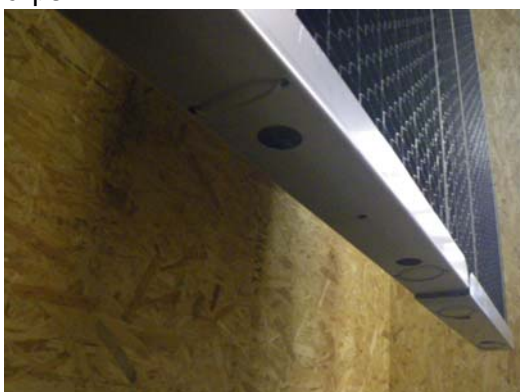


**Fig. 10:** Roller slide & upper U-shaped profile, unmounted



**Fig. 11:** Roller slide, mounted

The filling material pads are put into the upper U-shaped profile and furnished with a second U-shaped profile as lower edge. The installation direction of the filling material pads must be observed (see fig. 3)! Two 3 mm wire ropes are guided around the filling material pads and through the little bore holes in the U-shaped profiles, until the ends of the ropes are visible at the upper U-shaped profile (fig. 12 & 13). The ropes are tightened by hand and fixed by means of rope clips.



**Fig. 12:** Lower U-shaped profile



**Fig. 13:** Upper U-shaped profile with suspension ropes

The completely assembled filling material pads are suspended with the rollers into the running rails.

Tighten two white plastic bushes with an M 6 x 30 screws in the free bore holes below the running rail. These bushes serve as lift stop and as protection against derailing of the roller slide (fig. 14).

After all seven filling material pads are hooked in, they are aligned and pushed together to a continuous wall. Observe the air direction and the alignment of the filling material walls (fig. 2)! Two 5 x 2100 mm rods are inserted in the lower U-shaped metal sheets of all filling material pads in order to fix the pads (fig. 15).

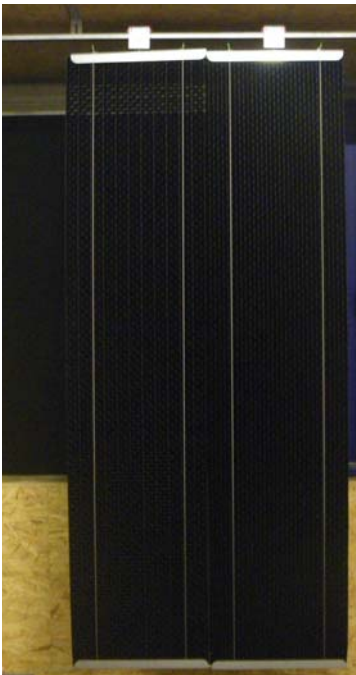
The wires can be removed for cleaning purposes of the exhaust air washer and the filling material pads can separately be twisted and pushed aside (fig. 17).



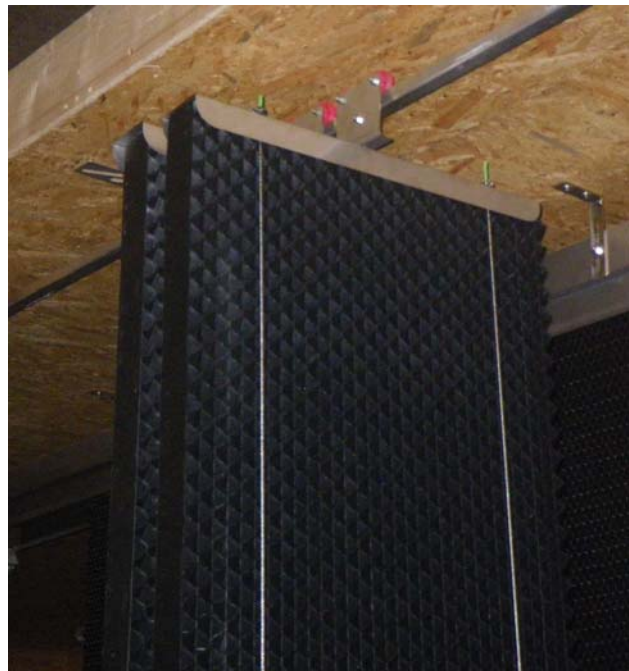
**Fig. 14:** Lift stop



**Fig. 15:** Inserted rod



**Fig. 16:** Connected filling material pads



**Fig. 17:** Filling material pads twisted for cleaning

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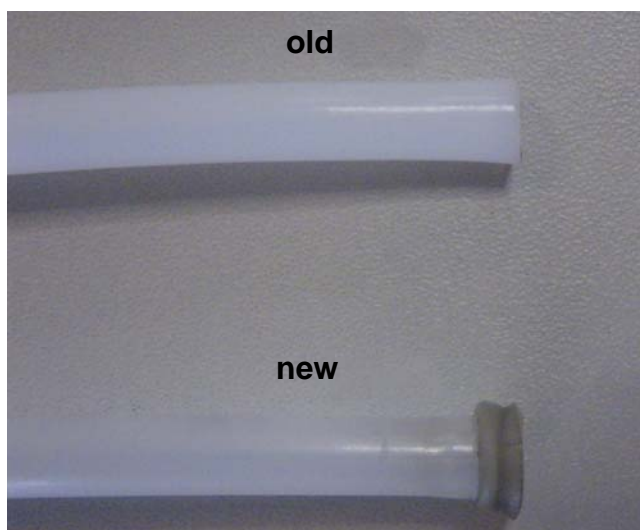
No. 1583      January 20, 2015

## Acid dosing hose exhaust air cleaning

### Replacement of hose PTFE 6/4 by hose PVDF 6/4

The new hose PVDF 6/4 (*code no. 20-50-4676*) has the same characteristics regarding the acid resistance in the field of exhaust air cleaning (96% sulfuric acid) as the so far used hose PTFE 6/4. However, the new hose has a higher stiffness and thus, cannot be pulled off the dosing unit that easily.

Furthermore, the risk of defective mounting is lower since - because of the different material composition - the new material can be formed more easily and the resulting bulge (see fig. 1) is more significant.



**Fig. 1:** Hose after first-time mounting

The way of mounting remains unchanged. The hose is still slightly warmed, pushed onto the cone ring and fixed to the dosing pump or the suction bar by means of the squeezing ring and screw connection.

The modifications affect the following assembly groups:

Code no.	Description
60-50-1020	pH value control MagixX-P with connection material
60-50-2031	pH metering unit f/MagixX B
60-50-6111	pH/conductivity measurement for water treatment small/large HelixX

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No. 1577      December 12, 2014

## MagixX - Changeover from LDPH to LDPHCD

Currently, each of our MagixX-systems has a different dosing system. Here, the systems differ in the measured parameters like pH value or conductivity. A consequence of increasing requirements to the process control on the part of authorities is a larger extent of measurements so that a conductivity measurement may be retrofitted in existing houses as the case may be. In the course of product harmonization we have developed a multi-purpose conversion kit (code no.: 60-50-0197). Many future change requests have already been taken into account (e. g. redundant pH-measuring, no acid dosing in the measuring line...) and can be directly realized without any further assembly work in this conversion kit.

### Parts list

**60-50-0197** Conversion kit cpl LDPH to LDPHCD MagixX

Code no.	Description	Pcs.
83-13-5812	Conversion kit piping LDPH to LDPHCD MagixX	1
60-50-0196	pH-conductivity control and metering device MagixX	1
30-00-3846	Sealing strip 0,1mm/12m for thread HDF	1
99-50-3760	Glue Tangit 0.125kg tube	1
30-62-3611	Cleaner Tangit 125ml	1
60-50-0185	Conductivity sensor 0-200mS/cm	1

### Assembly instruction

First of all, the LDPH controller has to be exchanged. The connected cables are marked according to their purpose and wired to the new LDPHCD controller (fig. 2).

Terminals at LDPH:

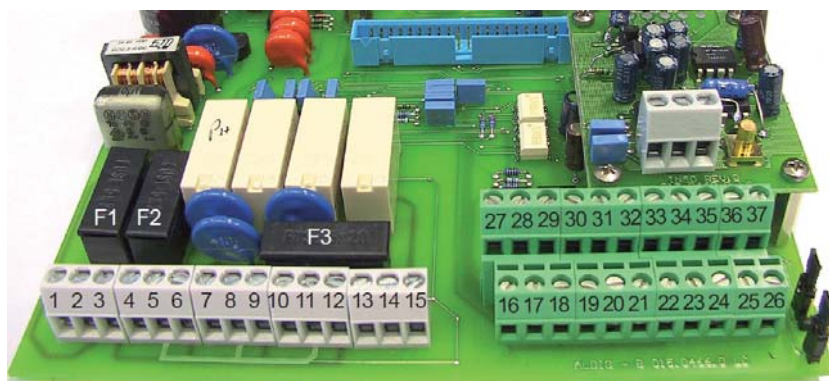
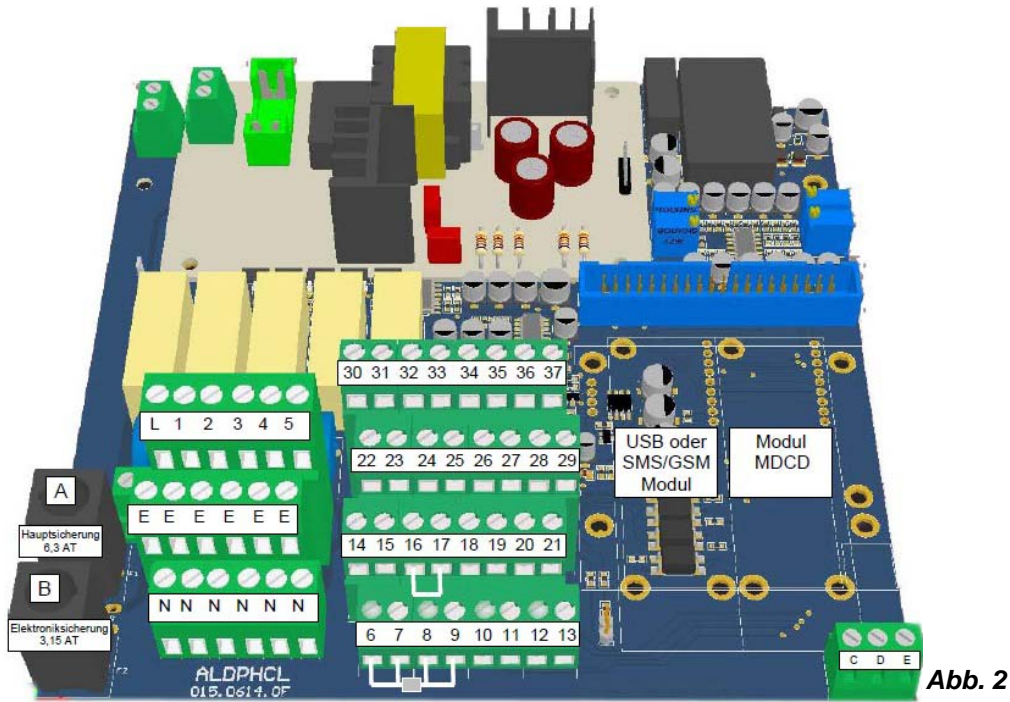


Fig. 1

Terminal 27(-), 28(+):      *Pulse for dosing pump*

Terminal 31(-), 32(+):      *Analogue output for pH*

Connecting terminals at LDPHCD:



- Terminal 26(-), 27(+): Pulse for dosing pump*
- Terminal 30(+), 31(-): Analogue output for pH*
- Terminal 31(-), 32(+): Analogue output for mS (conductivity)*

Module MDCD:

The module is positioned on the right-hand side of the board. It has three terminals only and conduces to the conductivity measuring.

- Terminal 1: blue wire of conductivity sensor
- Terminal 2: black wire of conductivity sensor
- Terminal 3: red wire of conductivity sensor

table 1: Terminal connections LDPH - LDPHCD


LDPH	LDPHCD
Terminal 27	Terminal 26
Terminal 28	Terminal 27
Terminal 31	Terminal 31
Terminal 32	Terminal 30

Additionally, the conductivity sensor has to be connected. It has 7 wires and the following colours are important:

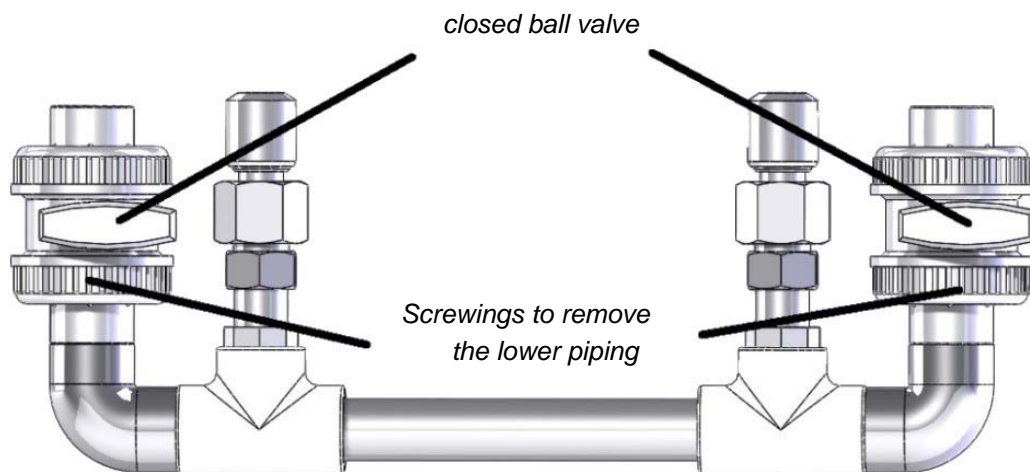
- blue: Terminal 1 of module "MDCD"
- black: Terminal 2 of module "MDCD"
- red: Terminal 3 of module "MDCD"

The remaining wires are safely insulated, e.g. with luster terminals or the like.

## Exchange piping component

	<p><b>Before the exchange all necessary steps of health and safety matters must be adhered to! Focus: works with sulfuric acid</b></p> <p><b>Components which had contact to sulfuric acid must be cleaned before the start of work!</b></p>
-----------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

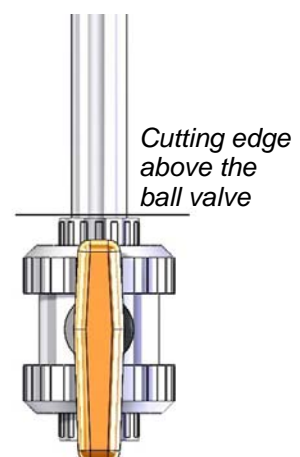
When exchanging the piping of the measuring unit the ball valves on the screwed panel are to be closed. Now the screwing below the ball valves and be loosened and the piping can be removed. The fittings of the pH measuring cell as well as, if applicable, the inoculating valve (only MagixX-P) are set aside as they are reused for the new piping.



**Fig. 3**

The next step is to collect the water of the pipe above the ball valve in a suitable box. For this purpose all irrigation pumps must be switched off. Hold a bucket below the still installed ball valve before latter is opened thoroughly.

Now the pipe is cut directly above both ball valves, the cutting edge is bevelled by means of emery paper and finally cleaned by means of Tangit cleaner. Now the new piping component (code no.: 83-13-5812) is applied. Also the connections of both ball valves are cleaned with Tangit cleaner and thoroughly glued on the remaining pipe ends by means of Tangit glue. The excessive glue must immediately be removed with a cloth.



**Fig. 4**

To prevent a repeated dismantling, the conductivity sensor and the pH measuring cell are calibrated according to the operating instructions already before the installation.

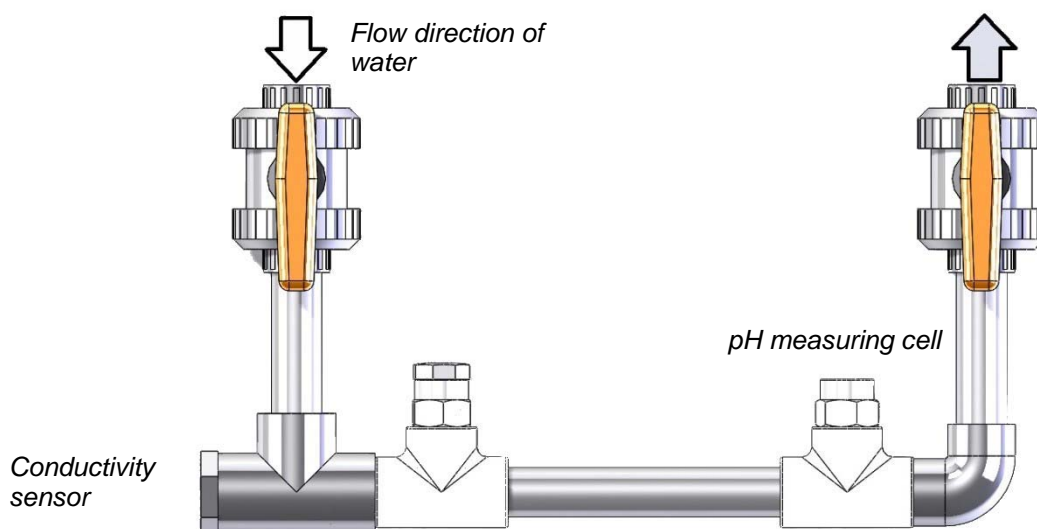
After the calibration, the thread of the pH-fitting and the conductivity sensor (and if used the thread of the inoculating valve) are furnished with sealing tape. The sealing tape must be applied against the rotating direction of the thread. Insert the sensors according to fig. 6. For the installation of the pH measuring cell and the inoculation valve (MagixX-P) remove the blind plug.

The pH measuring cell has to be positioned **in front** of the inoculation valve in flow direction!

At MagixX-P the pH- and the conductivity sensor are positioned directly next to each other.

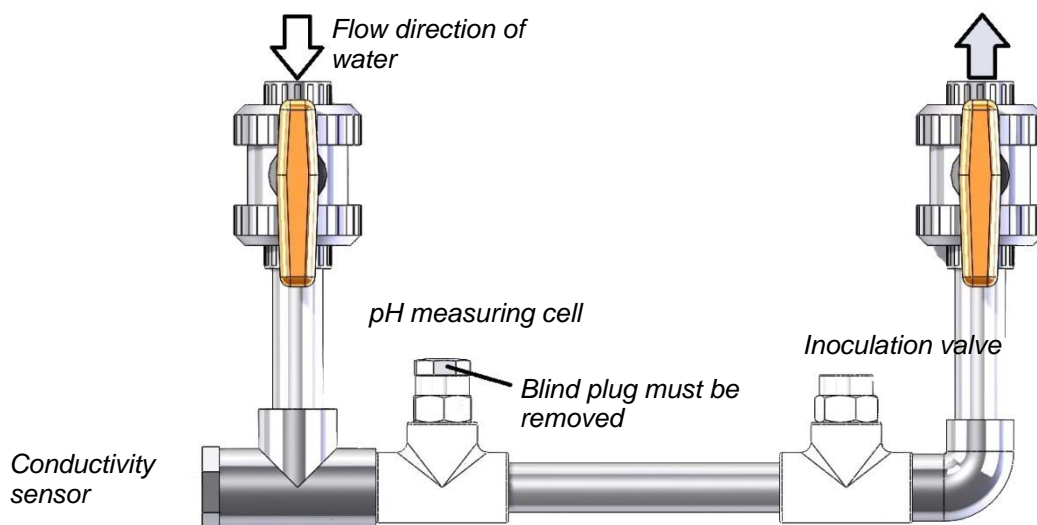
In order to allow for an easier assembly of the conductivity sensor the cable, which is secured with a screw, is removed before the installation of the sensor and reconnected afterwards. A twisting of the cable is thus prevented.

Installation without inoculation valve in measuring section:



**Fig. 5**

Installation without inoculation valve in measuring section:



**Fig. 6**

In case of opposite flow direction the entire piping component must be mirrored.

**Following steps must be considered when installing the piping component:**

- All irrigation pumps must be switched off and ball valves at the panel must be closed.
- At the connection in MagixX-P both measuring cells must be positioned directly next to each other (fig. 6 installation with inoculation valve in measuring section).
- The measuring cells of the piping component must be positioned **in front** of the inoculation valve in flow direction.

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No. 1549      September 10, 2014

## Miscellaneous changes at the exhaust air washer MagixX-B

Water supply, sprinkler- and sprayer pumps, sprayer frame,  
post for filter walls, supply of the acid and pH-value  
measurement

Due to practical experiences and stricter legal regulations various technical changes were made at the exhaust air washer MagixX-B which are valid as of now.

### 1. Fresh water supply into the basin

The previous constant water level regulator is replaced by a significantly smaller regulator:

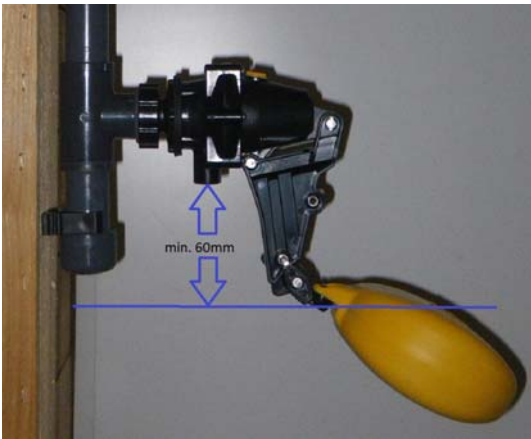
Code-no. OLD	Code-no. NEW	Description
60-50-0036	60-50-0210	Constant water level regulator small for MagixX B

The new constant water level regulator is firmly installed at the centre of the washer tank, at the wall facing the bird area, and it is connected to a steep PVC-pipe. The previous flexible tube is no longer required. The outlet has to be placed at least 6 cm above the water level. The exact height of the water level is no longer determined by moving the entire pipe but rather by the new extendible floater arm (see fig. 1).

With this constant water level regulator the water flows freely into the basin from a height of at least 6 cm (see fig.2). The previous pipe lines that were connected to the float valve to distribute the water are deleted without replacement. Due to this free outlet, dirty water can definitely not flow back into the drinking line and the current regulations regarding this subject are met.



**Fig. 1:** Constant water level regulator small for Magixx B (Code-no. 60-50-0210)



**Fig. 2:** Distance to the water level at least 60 mm

## 2. Omission of the nonreturn valve at the pumps for sprinkling and spraying of the filter walls

The nonreturn valve is left out at the currently used pumps since it is not required for the operation of the washer and it represents another source of interference. The pumps were newly coded:

Code-no. OLD	Code-no. NEW	Description
60-50-0064	60-50-0177	Underwater pump SP 17-2 spraying 20m <sup>3</sup> /h wo/check valve
60-50-0093	60-50-0176	Underwater pump SP 46-1 B irrigation 40m <sup>3</sup> /h wo/check valve

The pumps without a nonreturn valve can also be used for repairs at old washers. The dimensions and technical data remain unchanged.

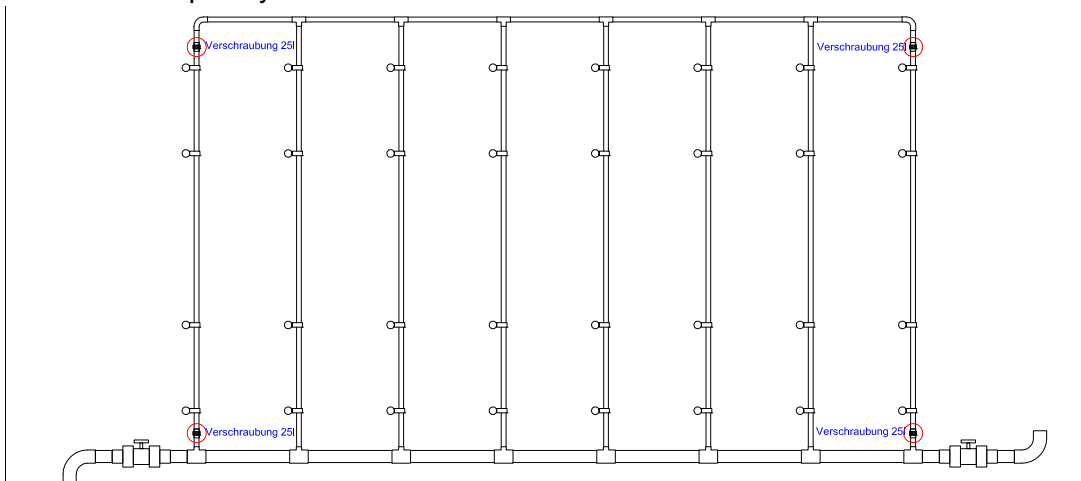
The pumps with nonreturn valve were shut down.

## 3. Changed connection for pressure sensor of the sprinkler pump

To connect the pressure sensor a 90° T-piece of 63 x 25 x 63 mm is used. This T-piece replaces the previous 45° T-piece (63 x 63 x 63 mm) with additional reduction.

## 4. Bolting for nozzle holders

8 PVC-boltings each 25 mm are delivered per module for the sprinkler frames. These boltings are each installed at the top and at the bottom of the fi last nozzle holder of the frame in order to turn the nozzle holder if necessary and to change the sprinkler direction during the installation of the pumps. This way the direct spraying of separating walls and other component parts can be prevented or subsequently corrected.



**Fig. 3:** Sprinkler frame with additional boltings



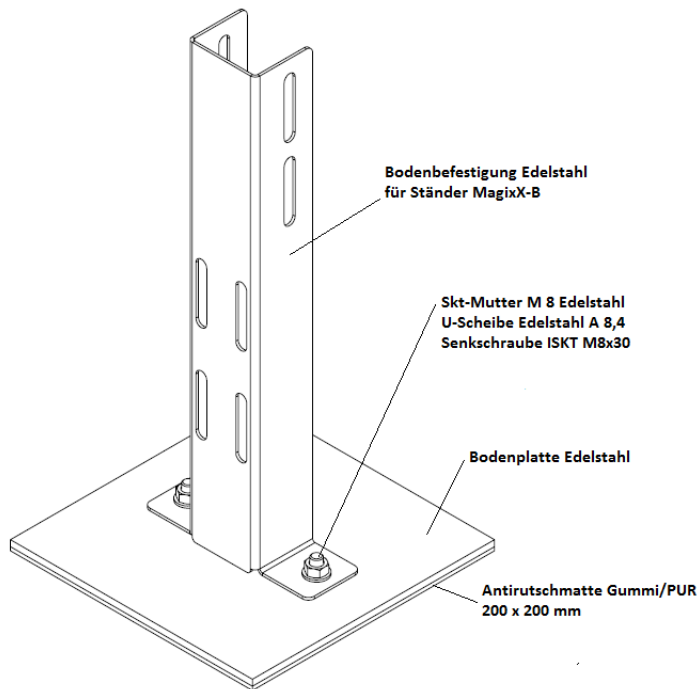
## 5. Base plates for posts

For every post of the filter wall a base plate with accessories (anti-slip mat and screws) is delivered which is screwed below the floor fixation with hexagon socket screws. The base plate is placed on the floor of the basin with the underlaid anti-slip mat and not screwed to the floor. This way a damage of the floor coating is prevented.

During the installation of the posts a stable ceiling fixation is to be provided!

The base plate with screws and rubber mat is coded as follows:

Code-no.	Description
83-13-5380	Bottom plate f/post filter wall MagixX-B cpl



**Fig. 4:** Bottom plate f/post filter wall MagixX-B cpl (here displayed with installed floor fixation)

## 6. Changed inlet of the acid sulfur into the washer basin

The connection of the pH measuring and dosing system as well as the pipes to jet the acid and to turnover the washer water were entirely revised:

- Washers with 1 to 4 modules have a smaller, energy saving circulation pump: Centrifugal pump 0.37KW 230V 50Hz COM350/03 K/A (Code-no. 60-50-0198). Washers with 5 and 6 modules still have the current centrifugal pump 0.75 kW COM 350/07 included.
- The filling of the pump during the installation is carried out with a water hose and a special filling connection. The previous fixed pipe connection to the drinking line is no longer used since the required separation to the drinking water network was not given.
- On the pressure side of the pump, pipes with a larger diameter are used. The laying of the pipes was partly changed in order to ensure a better distribution of the water in the basin.
- The pH measuring and dosing system is bypassed to the pipe.
- Thus, the previous thin PVC-pipes of the modules for the pH measuring and dosing system are no longer necessary.
- The drillings for the outlet of the water below the filter walls are enlarged to 10 mm.

So the connection diagram changed significantly (see fig. 5).

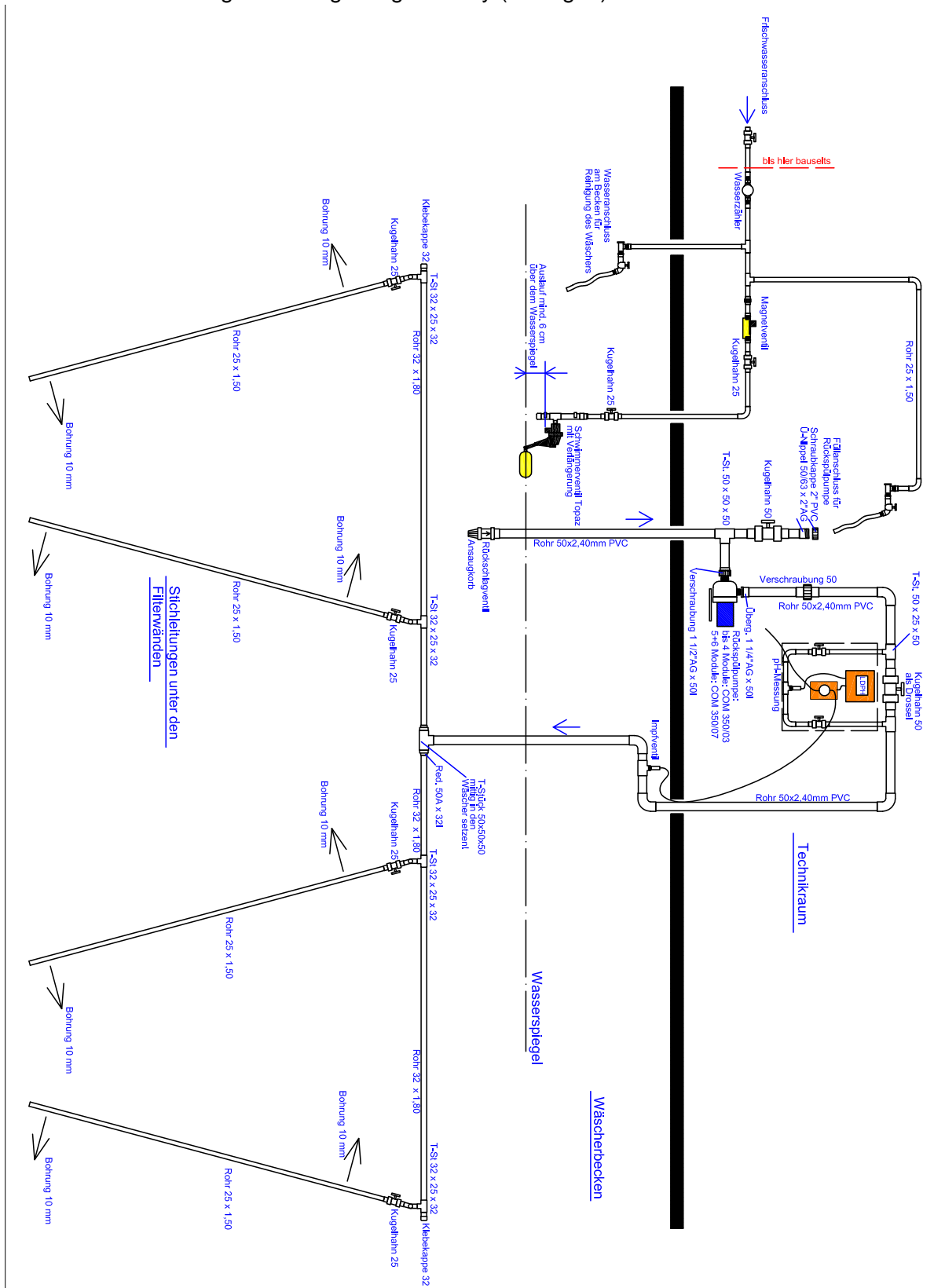


Fig. 5: Connection diagram pH-measurement and acid-jetting

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Exhaust Air Treatment

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- Product Operator-  
Exhaust Air Treatment

# Product information

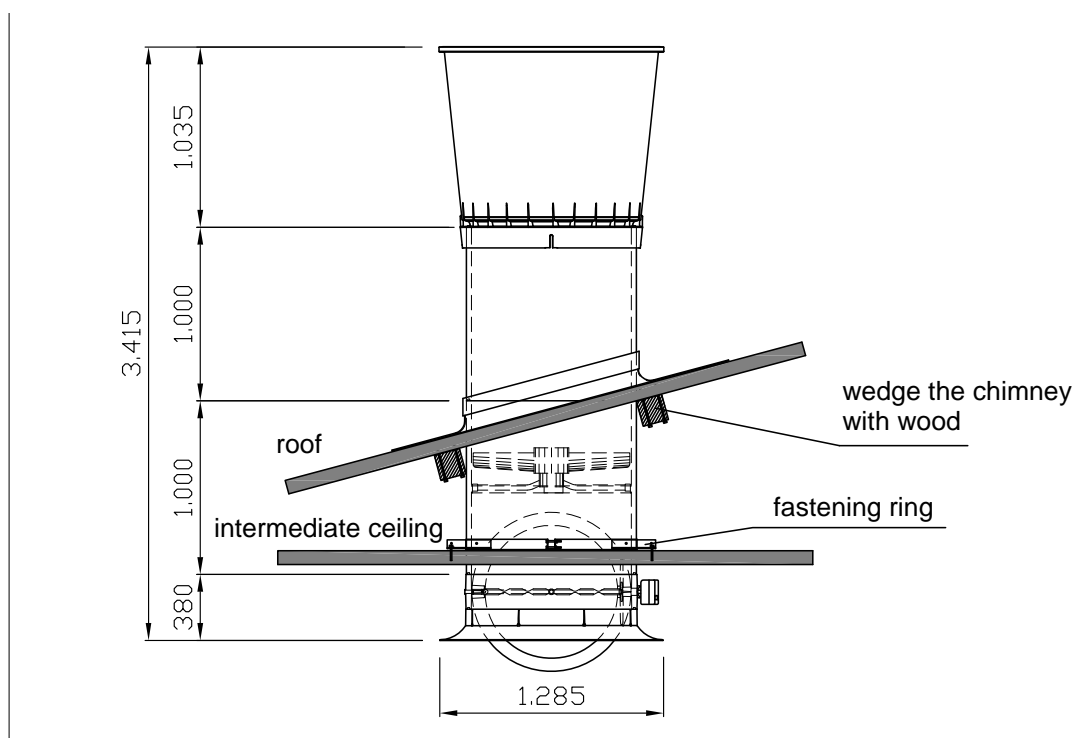


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No. 1516 June 16, 2014

## CL 920 exhaust air chimney cplt. for MagixX exhaust air washer



As of now, the CL 920 exhaust air chimney is available as complete parts list for the installation behind exhaust air cleaners of the type MagixX:

Code no.	Description
60-50-2041	Exhaust air chimney CL920-30-AF-3400 brown MagixX cplt
60-50-2042	Exhaust air chimney CL920-30-AF-3400 grey MagixX cplt

These parts lists can be used for all Magixx-B and Magixx-L where the chimneys are installed behind the last filter level and the air is sucked through the exhaust air washer.

The parts lists contain all required components for the application in the exhaust air washer and they are also attuned to common situations of installation. Normally, it is no longer necessary to order additional components like fans, winch motors or fastenings or to remove parts from the parts list.

The parts lists consist of the following components:

60-50-2041 - Exhaust air chimney CL920-30-AF-3400 brown MagixX cpl			
Pos.	Code no.	Description	Qty.
1	60-49-3803	Exhaust air pipe AF-30 D920-1000 brown	2
2	60-45-4339	Suction funnel with swivel shutter CL920 brown assembled	1
3	60-48-4419	Providing ring PS D920/30	1
4	60-47-3979	Segment ring inner plastic D920	1
5	60-48-4259	Fastening ring D920/30 SST	1
6	60-43-4101	Diffuser CL-920 cpl brown	1
7	60-47-3446	Covering universal with glue D820-D920 for all types of roofs + pipes black	1
8	60-47-3689	Sealing tape f/covering D920 black	1
9	60-50-0021	Fan FE091-6DT.6N.3 FU 27000m <sup>3</sup> 400V 1480W 3,8A only frequenc	1
10	60-47-4209	Retaining ring SST for fan ZA-D920/30 VO2	1
11	60-43-2071	Winch motor 24V CL-74C drive pulse 0-10V	1
12	60-47-3429	Glue f/exhaust air pipe 310ml brown	5
13	60-47-3999	Mounting-set for exhaust air chimney	1

The differences to the normal parts lists for CL 920 exhaust air chimneys (*code no. 60-39-0130 to 60-39-0160*) are:

- the fan is included (see pos. 9)
- the winch motor is included (see pos. 11)
- pipe length of 2 m instead of 1.5 m
- universal covering instead of a fixed roof panel
- a simple fastening ring - for the fastening of the chimney at the intermediate ceiling - is included (see pos. 5)
- the rope fastening (*code no. 60-49-3759*) is omitted
- the chimney always consists of an one-piece AF-pipe

As before, three chimneys have to be applied per MagixX module when making a quotation and when ordering the material. The technical data of the chimneys do not change.

Still, one frequency converter per house has to be used for the speed control adjustment of the regulated MagixX module regardless of the amount of MagixX modules:

Code no.	Description
60-50-0153	Frequency convert. FXDM 14AM 208-480V 50/60Hz 3PH IP54 w/ housing & sin.filt.

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# 1 Basic instructions



Please take care of this manual and always keep it in the same place close to the installation for quick reference. All persons working with the system, assembling, cleaning and servicing have to be familiar with the contents of these instructions.

Please observe the contained safety instructions!

If this manual gets damaged or lost, request a new copy from **Big Dutchman**.

## 1.1 Basics

The **Big Dutchman** system corresponds to the state of the art in accordance with the principles of European directives and fulfils the requirements of recognized safety engineering rules. It is safe to operate. However, danger to the life and limb of the user or third parties or impairments to the system or other property can occur, if it is used in the incorrect manner.

### **The system may only be mounted, attended, repaired and used:**

- for due use
- in an excellent state from the safety and technical point of view
- by persons who are familiar with the safety regulations

In the event of special problems which are not described in detail in this manual, we recommend to contact us for your own safety.

## 1.2 Designated use

The single-stage **Big Dutchman** exhaust air cleaning system "MagixX-B" is intended exclusively for reducing ammoniac and dust emissions in the exhaust air from poultry-keeping systems.

The **Big Dutchman** system may only be used according to its designated use.

Every other use is considered as non-designated use. The manufacturer does not accept liability for damages resulting from other uses, the user alone has to bear the risk. The designated use also includes the exact following of the operation, maintenance and repair conditions as prescribed by the manufacturer.

## 1.3 Avoidance of foreseeable misuse

The following uses of the **Big Dutchman** exhaust air cleaning system "MagixX-B" are not permitted and qualify as misuse:

- The use of liquids and substances inside the exhaust air cleaning system other than those described in this book.
- Operation of the system following structural / design modifications, which have not been agreed with **Big Dutchman** and the local authorities responsible for approvals.




A non-designated use will lead to a liability exclusion by **Big Dutchman**.

**Only the user of the system takes the risk resulting from a misuse!**

## 1.4 Explaining the symbols




### 1.4.1 Safety symbols in this manual

Upon reading this **manual** you will come across the following symbols


	<p><b>WARNING</b></p> <p>This symbol indicates risks possibly leading to personal injury resulting in death or to severe injuries.</p>
	<p><b>CAUTION</b></p> <p>This symbol indicates risks or insecure procedures possibly leading to injuries or material damage.</p>
	<p><b>NOTE</b></p> <p>This symbol indicates notes leading to an effective, economic and environmentally-conscious handling of the installation.</p>

### 1.4.2 Safety symbols in the manual and on the installation

These safety symbols illustrate remaining dangers when handling the system. They are supplements to the above-mentioned symbols:

	Warning against the cold
	Warning against dangerous electric tension
	Warning against slippery surface



### 1.4.3 Safety symbols and notes on your installation

	<b>If a safety symbol or instruction is fixed to a part to be replaced, ensure that it will be fixed to the new part as well.</b>
------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------

Implicitly observe the instructions attached to the installation, such as the arrow on the motor indicating the direction of rotation.

The signs and safety instructions always have to be visible and must not be damaged. If they are soiled by dust, manure, feed remains, oil or grease, clean them by means of a water-detergent mixture.

## 1.5 Ordering spare parts

	<b>Operational safety is the prime necessity !</b> For you own safety only use original <b>Big Dutchman</b> spare parts. For foreign products that have not been released or recommended we cannot judge whether there is a safety risk in connection with <b>Big Dutchman</b> systems.
	You can find the exact description of the parts for ordering spare parts by means of the pos. no. in the spare parts list.

Indicate the following for ordering spare parts:

- Code No. and description of the spare part or
- Invoice No. of original invoice
- Current supply, e.g. 220/380V 50-60Hz

## 1.6 Obligations

Closely adhere to the instructions in this manual.

A basic condition for safe operation and trouble-free handling of this system is the knowledge of the basic safety instructions and regulations.

These mounting and operating instructions, particularly the safety instructions, have to be observed by everyone working with this system. Moreover, the regulations and instructions for the prevention of accidents valid at the respective place of use have to be observed.

The manufacturer is not responsible for any damages to the machine resulting from changes done by the user.

## 1.7 Warranty and liability

Warranty and liability claims regarding personal and material damage are excluded if they result from one or several of the following causes:

- non-designated use of the installation
- inappropriate mounting and operating of the system
- operating the system with defective safety equipment or not duly fixed or not functioning safety and protective devices,
- non-observance of the instructions in this manual regarding transport, stock keeping, mounting, maintenance, operating and upgrading of the system
- unauthorised modifications on the system
- inappropriate repairs
- in the event of disasters caused by foreign matters or force majeure.

## 1.8 Disorders due to power failure

We recommend the installation of warning systems for a better monitoring of your production units and the installation of an emergency power-generating set for adequate supply with power in case of power failure. By this, you protect the animals and thus your own economical health. For further information please contact your property insurance.

## 1.9 First aid

For the case of an accident, unless specified otherwise, a first-aid kit must always be available at the place of work. Material taken out and used is to be replaced immediately.

**If you need help, describe the accident as follows:**

- where it happened
- what happened
- the number of persons injured
- what type of injury
- who is reporting the accident (your data)!



**Important:**

In addition to the first aid kit, an eye wash solution must also be available in those areas where work with acid takes place. **The eye wash solution is included in the scope of deliverables.**

## 1.10 Pollution abatement regulations

All works on and with the installation have to be carried out in compliance with the legal requirements concerning waste prevention and proper recycling / disposal of waste.

Special care has to be taken when carrying out installation, repair and maintenance works, as water pollutants like lubricating grease and oils, as well as solvent-containing cleaning solutions are not to pollute the soil or get into the canalisation! These materials have to be kept, transported, collected and disposed of in appropriate containers!

## 1.11 Waste disposal

After finishing the assembly or repair of this installation, dispose of the packing material and remains which do not need to be further used according to the legal provisions for recycling. The same applies to the component parts after putting the installation out of service.

## 1.12 Notes for use

We reserve the right to modify the construction and technical data for reasons of further development.

Therefore, no claims can be derived from the information, pictures, drawings and descriptions. Subject to correction !

Get the information on mounting, adjusting, operating and maintaining before taking the system into operation.

Apart from the safety-relevant instructions in this manual and the safety precautions valid in the country of use, also consider the generally acknowledged technical regulations (safe and appropriate working according to UVV, VBG, VDE etc.).

## 1.13 Copyright

This manual is subject to copyright. The information and drawings included in this manual shall not be copied without the manufacturer's consent, nor shall they be used for anything other than the designated use. Neither shall they be given to third parties.

If you find mistakes or unclear information in this manual, please do not hesitate to let us know.

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## 2 Safety instructions

These mounting and operating instructions, particularly the safety regulations, have to be observed by all persons working on this system. Moreover the regulations for accident prevention valid for this place have to be observed!

### 2.1 General safety instructions




All established safety precautions and other generally accepted safety regulations and medical references have to be observed. Please check safety and function control devices to ensure safe and accurate operation:



- before putting into operation
- at adequate time intervals
- after modifications and repairs.

Check the proper functioning of the system after any kind of repair works. You may only take the device into operation, when all protective systems have been put into place again. Follow the directions of the electric and water supply company.

### 2.2 Safety instructions when operating electrical appliances

You have to ensure that the system with the electrical appliances is operated and maintained according to the electro-technical regulations.

	<p>Installation and work on electric components/structural groups may only be carried out by qualified personnel according to electro-technical regulations (e.g. EN 60204, DIN VDE 0100/0113/0160).</p>
	<p>Dangerous electric tensions are bare in case of open control equipment. Be aware of the danger and keep workers of other professions away from the danger zone !</p>
	<p>Do not install control devices directly in the house, but in the service room to prevent corrosion caused by ammonia gas.</p>

	<b>Warning</b>
	<b>Never repair or bypass the fuses!</b>
	Damaged fuses have to be replaced with new fuses!

Immediately switch off the installation in the event of malfunctions of the power supply units. Use a bipolar voltage probe to make sure that the electrical equipment is not alive.

Check the electrical wiring and cables for recognisable damage before putting the device into operation. Replace damaged wiring and cables before taking the device into operation.

Only use the fuses indicated in the circuit diagram. Immediately replace damaged fuses. Never repair or bypass the fuses!

Never cover the electrical motor. This can cause high temperatures resulting in fire and a break-down of the equipment.


The control box as well as the terminal and connector boxes of the installation must always be kept shut.

Let damaged or broken plugs be replaced by an electrician.

Do not pull the plug from the socket at the flexible cable.

For the respective connections please see the enclosed connecting plan of the system parts delivered.

## 2.3 Safety instructions when handling sulphuric acid

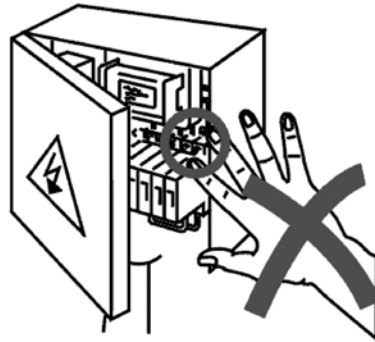
	<b>Warning!</b>
	When handling the dosing equipment and the sulphuric acid please observe the safety datasheet "Sulphuric acid 96%" (refer to chapter 12 "EU safety datasheet - sulphuric acid 96 %").



## 2.4 System safety instructions

### 2.4.1 Individual components

#### 2.4.1.1 Electrical components



#### High electric tension!

If touching live parts, severe injuries due to electric shocks are possible!

During repair or maintenance work, live elements can be bare!



Never touch bare electrical components. Staff members must not use machines with bare electrical components.

#### 2.4.1.2 Ventilation system

- Rotating fans can lead to severe injuries.
- Fans can start due to their automatic control units.





Never reach through the protective grills or blade flaps into a fan, even if it is not in operation!



Before carrying out repair or maintenance work, disconnect power supply and indicate this by a sign fixed to the main switch!

## 2.5 Safety contrivances

	It is strictly forbidden to remove or put out of operation any safety contrivances. This leads to risk of injury and danger of life! Should the safety devices be damaged, the system has to be put out of operation immediately. The main switch has to be locked in zero position.
	

## 2.6 Dangers resulting from non-compliance with the safety instructions

Non-observance of these instructions can cause severe danger for life and health of people or can lead to material or environmental damages and to the forfeiture of any claim for damages. To be precise, the non-observance of these instructions can lead to:

- Failure of vital functions of the installation
- Failure of prescribed maintenance methods
- Dangers for people owing to electrical and mechanical influences.
- Hazards to personnel due to chemical effects.

### 3 Functional description

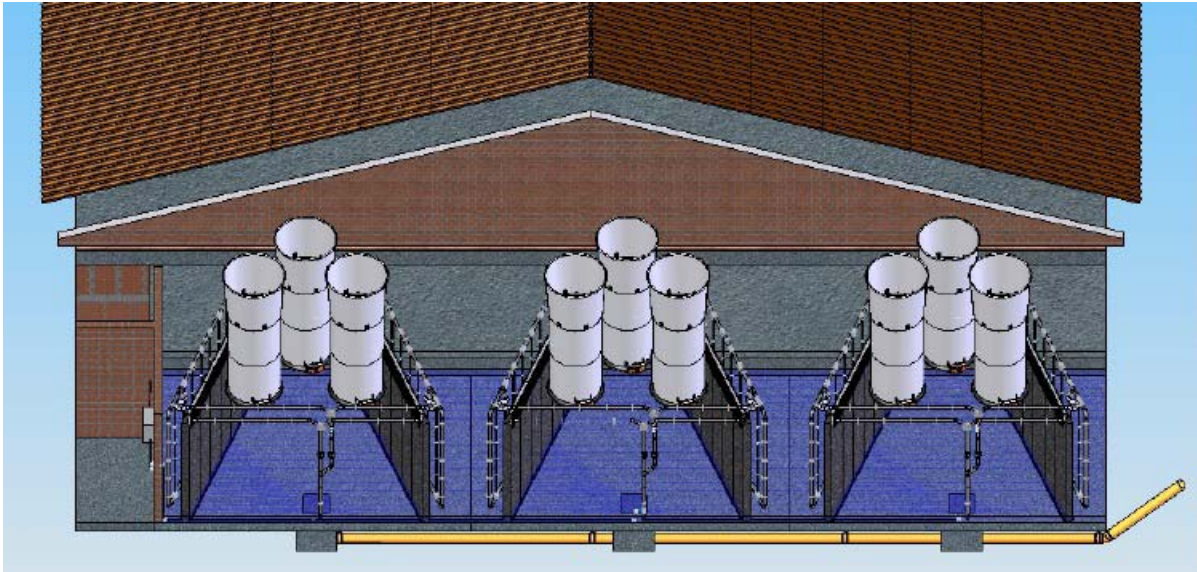


Figure 3-1: Back view of MagixX-B exhaust air cleaner

The MagixX-B is a single-stage chemical washer for precipitating dust and ammonia from exhaust air generated by poultry keeping. The exhaust air cleaning system is modular in design. Each module consists of two wet filter walls (4.2m x 2.7m) and is designed for a volumetric air flow of 65,000m<sup>3</sup>/h. In accordance with increasing ventilation requirements, for example in the course of chicken production, the modules are connected one after another in series. The modular design means that operating costs can be lowered. The modules themselves and the required housing are designed with simplicity in mind so that the installation and assembly expenses are kept down.

A base of around 5.0m wide x 4.5m front-to-back dimension is required for each module with an installation height of 3.1m. The entire base is assembled on site in the form of a process water basin with a wall height of 40cm. The filling height of the process water is 30cm. The modules are installed adjacently and the width of the process water basin is adjusted accordingly. An additional 1 m must be allowed for the width of the two outer modules. It should thereby be noted that the water reservoir basin must be made of an acid-resistant material (use of concrete of exposure class XA3 including acid-resistant sealant of the concrete, for example with epoxy resin).

With the MagixX-B, 6 modules with a total volumetric flow of 390,000m<sup>3</sup>/h can be operated.

Table 3-1: Required building dimensions and performance specifications of the modules

Number of modules	Building dimensions	Number of fans (FE 091 SD 6N)	electrical pump output* (kW)	Capacity
1	7m x 4.5m	3	1,1 (+1,1)	65,000m <sup>3</sup> /h
2	12m x 4.5m	6	2,2 (+2,2)	130,000m <sup>3</sup> /h
3	17m x 4.5m	9	3,3 (+3,3)	195,000m <sup>3</sup> /h
4	22m x 4.5m	12	4,4 (+4,4)	260,000m <sup>3</sup> /h
5	27m x 4.5m	15	5,5 (+5,5)	325,000m <sup>3</sup> /h
6	32m x 4.5m	18	6,6 (+6,6)	390,000m <sup>3</sup> /h

\* the figures in brackets relate to the energy requirement for clock-controlled spraying (1 minute of spraying every 5 minutes)

Via the filling body PP 150 (code no.: 60-50-0066) and the geometrical arrangement of the walls, a very high precipitation rate for ammonia and suspended dust is achieved (table 3-2). In the case of very high dust loads, the StuffNix dry dust filter can be connected upstream.

Table 3-2: Precipitation rates

Precipitation rates	
Ammonia	>70%
Total dust	>70%
PM <sub>10</sub> dust	>70%

### 3.1 MagixX module

A MagixX module for 65,000m<sup>3</sup>/h is automatically activated by the controller as soon as the fan in the corresponding module is started by the climate computer. The supply pump is activated by the controller when the necessary conditions and setpoint values have been reached, for example sufficient filling level in the water reservoir.

The process water from the central washing water reservoir is sprinkled onto the 15cm filter bank with an immersion pump. 96% sulphuric acid is metered into the process water to reduce the pH and thus ensure efficient ammonia precipitation (pH < 3.3). The wet filter wall is additionally sprinkled by a nozzle array at a time interval set ex works in order to scrub out the dust load. A second immersion pump is employed for sprinkling, which is likewise positioned in the central wash water basin. The nozzle array is divided into individual nozzle lines each with four vertically arranged nozzles, which are mounted at a distance of 15cm in front of the first wet filter wall. The nozzles operate with a water pressure of 0.8bar. They are activated every 5 minutes for 1 minute. Blockage free operation is assured by the high pressure, the large nozzle opening and the clocked cycles.

In order to achieve the most even distribution of acid in the water reservoir, the wash water mixed with acid is returned to the basin via a stub pipe. The stub pipe is supplied via a sprinkling pump bypass. The return flow of the stub pipe is directed through the basin so that the process water reservoir is in permanent motion and no anaerobic zones are produced.

### 3.2 Volumetric air flow

The process for capturing the volumetric flow via the differential pressure is based in the Magix-B on the ventilation characteristic of the installed fan module and on the negative pressure in the washer module. The fan assembly consists of the fan itself, an admission nozzle, 2 m pipe, diffuser and the choke valve. The air throughput of the entire fan assembly is saved in the MagixX-B and is continuously calculated. This function is used to document the purified discharge volumetric flow.

### 3.3 Further installations

In addition to the assemblies included in the **Big Dutchman** scope of delivery, a sulphuric acid reservoir must be provided by the operator to ensure efficient operation of the MagixX system.

### 3.4 Sulphuric acid store



**Warning!**

When handling the dosing equipment and the sulphuric acid, please observe the safety data sheet „Sulphuric acid 96%“ (see Appendix)

The annual sulphuric acid demand is dependent on the number of birds served and how they are kept. A guideline value for the anticipated consumption quantities in chicken production (intensive fattening) is provided in table 3-3 . In order to keep the replacement intervals to a minimum, containers holding volumes of 1000 litres should be provided.

The location of the sulphuric acid reservoir should be selected such that deliveries and collections as well as the replacement of the containers can be performed easily and safely. So that any leaking sulphuric acid cannot cause environmental pollution, a collection drain or collection pan is to be installed in accordance with local regulations.

The supply line to the water treatment plant can take the form of a PTFE hose laid in a protective pipe running to the pH dosing device. In order to guarantee constant dosing of sulphuric acid, provide for two storage tanks when planning the storage capacity.

Table 3-3: Predicted sulphuric acid requirement per bird slot

Method of keeping	Emission factor TA air [kg NH <sub>3</sub> / bird slot / year]	Sulphuric acid demand [kg H <sub>2</sub> SO <sub>4</sub> / TP / year]
Broilers	0.0486	0.1

## 4 Controller

The complete process sequences of the MagixX are centrally controlled by the controller. Furthermore, the controller is also used to record process data that documents the operation of the exhaust air cleaning system according to the official duty of proof.

### 4.1 Summary

The software is designed to control and monitor up to six modules in a MagixX system. However it is also possible to select fewer modules per configuration.

The entire software is based on the AMACS concept. In contrast to the previous control systems, this system is designed as a standalone system. This means that no separate farm controller is required, for example, for logging data or user management.

### 4.2 Operation

Operation is also based on the AMACS concept and is effected via a touchscreen. In places, where a keyboard input is required, a suitable keyboard appears on the screen (depending on the purpose, either numeric or alphanumeric).

### 4.3 Rights administration

The system supports user rights. Several users can be created, all with individual rights. The details are explained in chapter 4.7. If a user logs in without a user name and password, then he is automatically logged in as a guest user. Such a user has minimum rights and may not make changes of any kind to the system.

## 4.4 System start

After the system start, the AMACS logo on the screen flashes. If the screen is touched, the blank homepage appears (figure 4-1).



Figure 4-1: Overview House view

To get from here to the main MagixX-B controller, all you need to do is touch the screen in the middle.

The menu is accessed via the **Big Dutchman** button  on the bottom left edge of the screen.

Touching the button once causes the horizontal and vertical menus to appear (figure 4-2). If the button is touched again or after a few seconds have lapsed, the menu automatically disappears again.





Figure 4-2: House view with menu bar

A click on the exhaust air washer icon  in the bottom menu bar also fades in the main screen.

The main screen of the MagixX controller is shown in figure 4-3 .

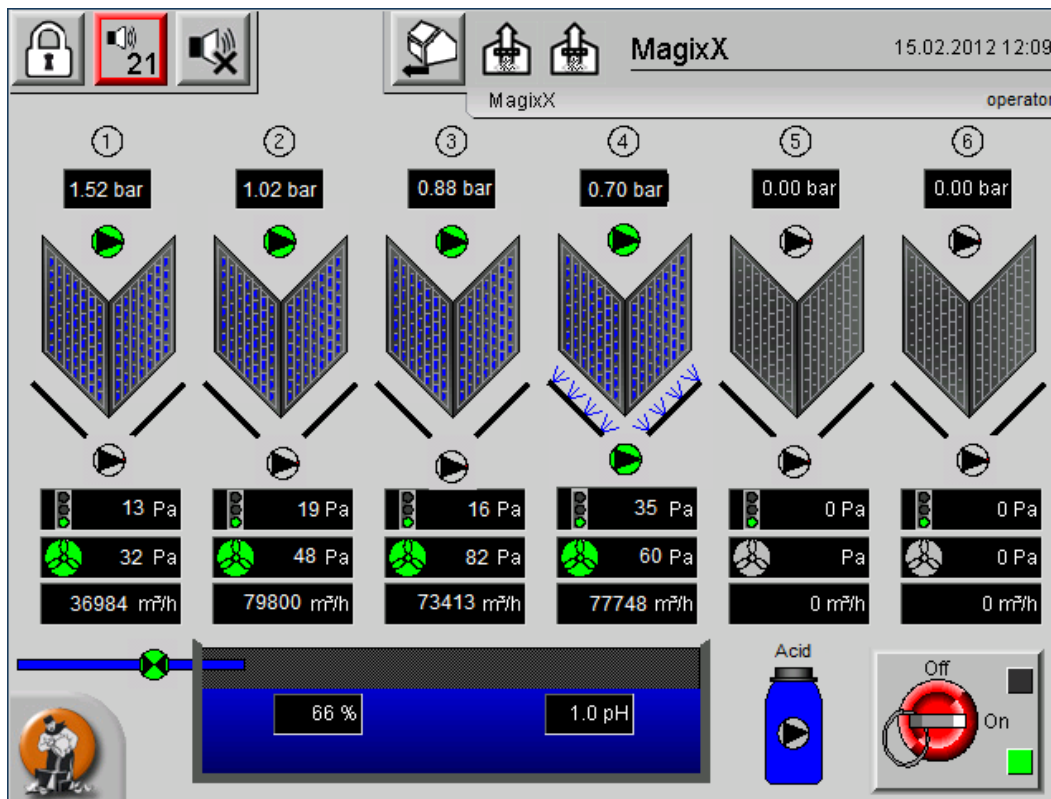


Figure 4-3: Main screen

### 4.5 Controls for the AMACS system

The controls for the AMACS system are arrayed above the screen.



Figure 4-4: The top edge

On the right is the actual time and next to it today’s date. Under it appears the name of the currently logged in user (in this case: “operator”). In the middle appears the name “MagixX”; this is the name that is entered during generation in the Config Generator. The house icon with the arrow next to it returns the user to the house view (figure 4-1).

The icons in the top left margin have the following meanings:



Logs off the current user and logs in another user chapter 4.5.1



Display of the currently active alarms (in this case: 21 Alarms); see chapter 4.5.2



Silence the acoustic alarm. The alarm is switched off until a new alarm is generated.

### 4.5.1 Change of user

If the lock symbol at the top right is touched, the currently logged in user is logged out and the login screen is displayed (figure 4-5).

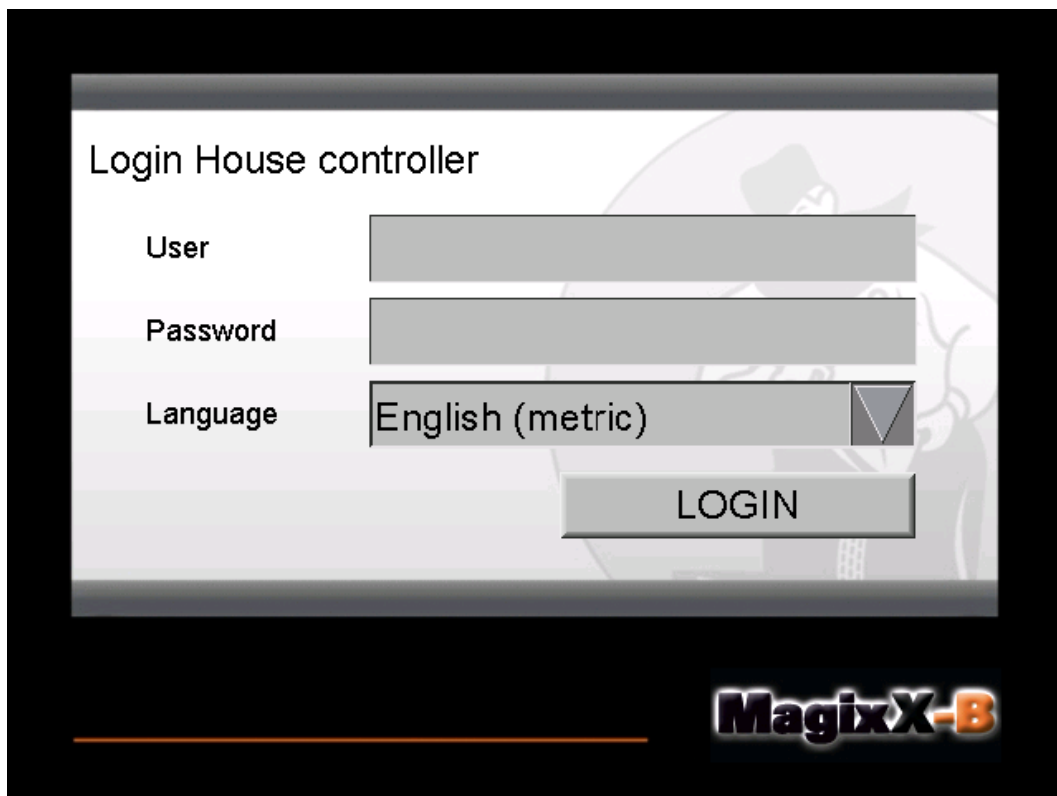


Figure 4-5: The login screen

At the bottom of the screen the required language can be set. The determines the language of the displayed text, the format of the date displayed at the top of the main screen and the assignment of the keyboard keys.

If one of the input fields is touched, a virtual keyboard appears. In figure 4-6 the English version of the keyboard is shown; another keyboard language can however be selected with the blue button at the bottom.

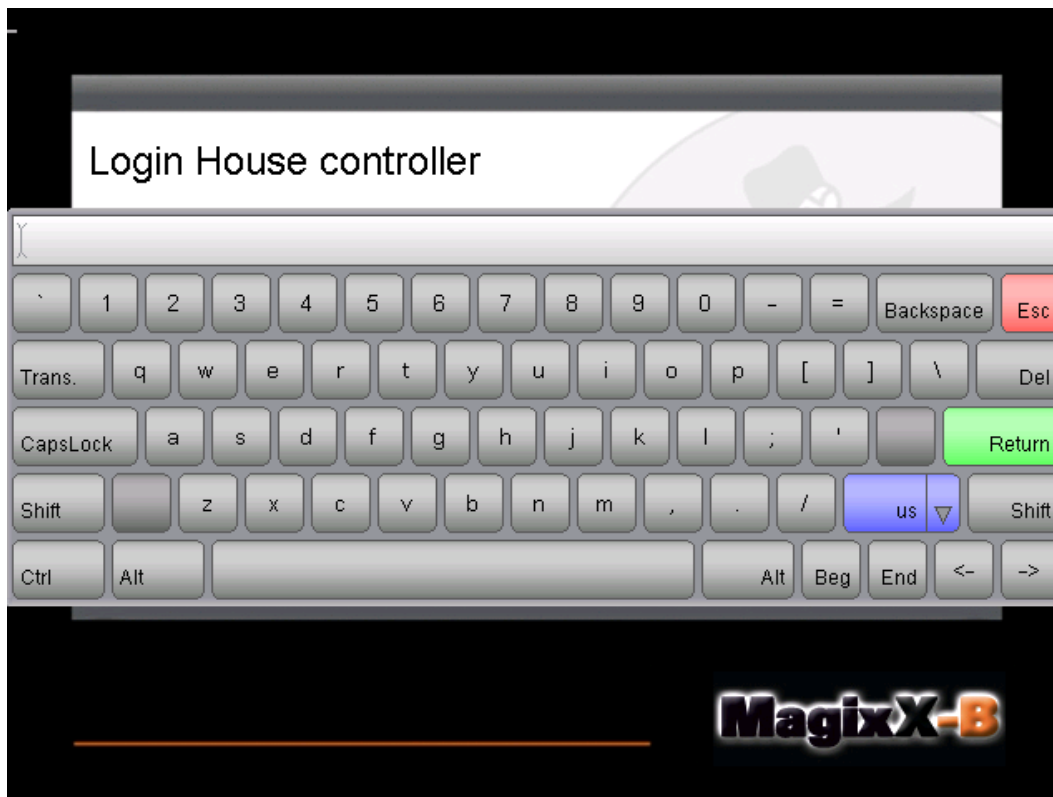



Figure 4-6: Login screen with virtual keyboard

The user name and password can now be entered via this keyboard. The password is not displayed, the characters being masked by “\*”s.

If the login button is touched without entering a user name and password, the user is logged in as a guest user.

## 4.5.2 Active alarms

Via the button  the list of active alarms is displayed. If no alarm has been activated, the button is not edged in red and instead of a digit, "--" will appear.

			Time	Group	Message	
			2012/02/15 12:12:45*	SYSTEM - MESSAGES	Plc01 CAN_1 : CAN-Module 10 not r	
			2012/02/15 12:12:45*	SYSTEM - MESSAGES	Plc01 CAN_1 : CAN-Module 20 not r	
			2012/02/15 12:12:45*	SYSTEM - MESSAGES	Plc01 CAN_1 : CAN-Module 30 not r	
			2012/02/15 12:12:45*	SYSTEM - MESSAGES	Plc01 CAN_1 : CAN-Module 40 not r	
			2012/02/15 12:12:45*	SYSTEM - MESSAGES	Plc01 : No connection to UPS	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Fault Fuses	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_1 Irrigatio	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_2 Irrigatio	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_2 Nozzle j	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_3 Irrigatio	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_3 Nozzle j	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_4 Irrigatio	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_4 Nozzle j	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_5 Irrigatio	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_5 Nozzle j	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_6 Irrigatio	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_6 Nozzle j	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Acid Dosage Pump	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX AcidRadialPump F	
			2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX : Water Level Leve	

Figure 4-7: List of active alarms

The bell icon on the right switches an acoustic alarm off. The button underneath resets all visible alarms (i.e. all alarms displayed on this screen). The next button resets all alarms (useful for longer lists). The alarms can also be reset individually by clicking the respective line.

Then a window will appear as in shown in figure 4-8 .

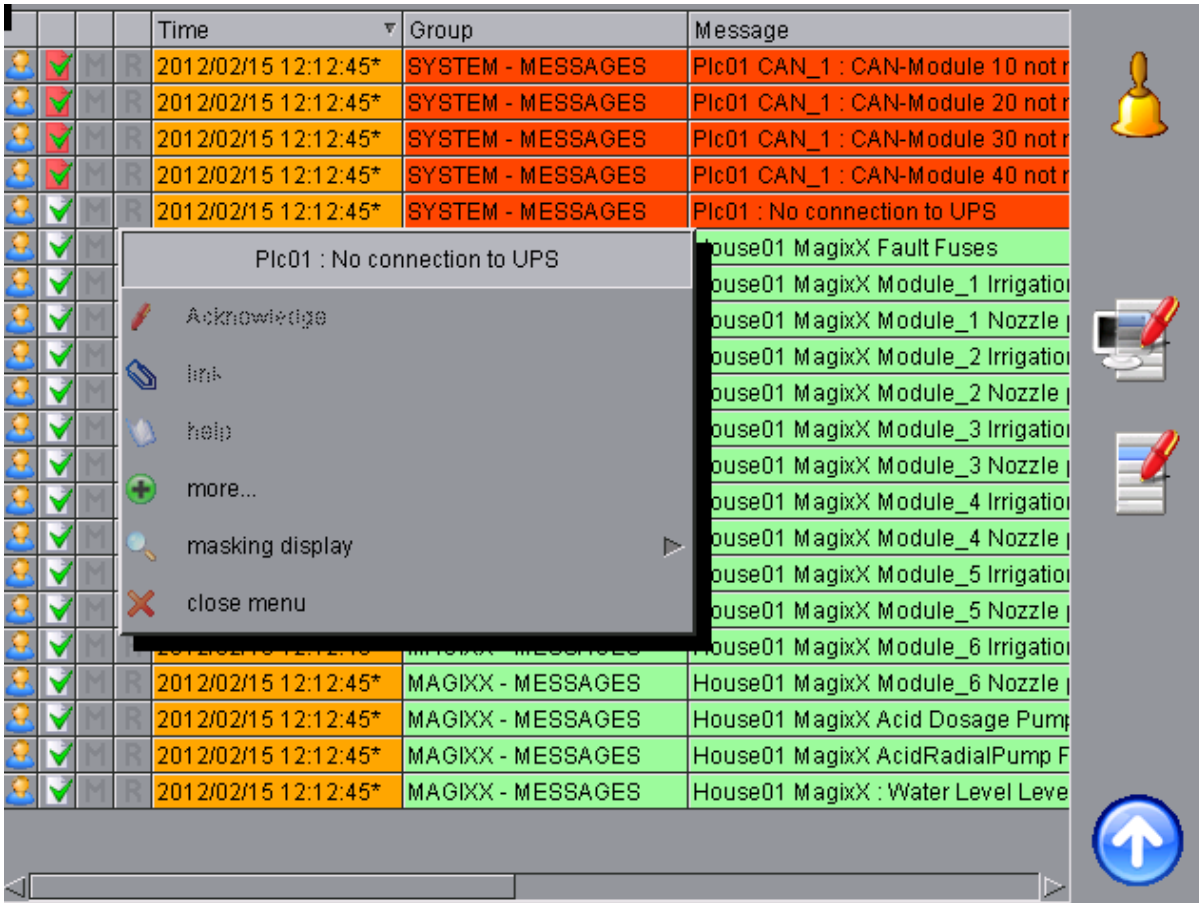


Figure 4-8: Alarm list: Resetting an individual alarm

The arrow at the bottom makes the window disappear again.

The alarm list is divided into several columns. In the left column, a blue man icon appears if the current user may reset the alarm (for user rights: see chapter 4.7). If the user is not entitled to do this, the icon is grey.

In the second column it can be seen whether the alarm has to be reset (figure 4-8, top alarm; field is red) or not (middle and bottom alarms, fields are white). Furthermore it is indicated, whether an alarm has already been reset (figure 4-9: in this case all three alarms have been reset).

		2012/02/15 12:12:45*	SYSTEM - MESSAGES	Plc01 CAN_1 : CAN-Module 40 not r
		2012/02/15 12:12:45*	SYSTEM - MESSAGES	Plc01 : No connection to UPS
		2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Fault Fuses

Figure 4-9: List of active alarms (2)

















				2012/02/15 12:12:45*	SYSTEM - MESSAGES	Plc01 CAN_1 : CAN-Module 40 not r
				2012/02/15 12:12:45*	SYSTEM - MESSAGES	Plc01 : No connection to UPS
				2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Fault Fuses
				2012/02/15 12:12:45*	MAGIXX - MESSAGES	House01 MagixX Module_1 Irrigation

Figure 4-10: List of active alarms (3)

The column "M" means "Multi". If a resettable alarm has been issued, not been reset, and then resent, a blue arrow appears in the "M" column (figure 4-10). This shows that the alarm has been issued several times.

The column "R" stands for "Repeat". There is the option of configuring the alarms so that they are not triggered immediately on occurrence of the respective alarm condition but are issued after a delay. If the alarm is generated again within this delay time, i.e. the condition is fulfilled again, then a blue arrow is displayed in the "R" column. However, this case is not parameterized for in the MagixX-B messages.

The time of arrival of the alarm is displayed in the time column. The field in this case is orange. This means that the alarm is still pending. If the field is blue, the displayed time is the time of message return. This means that the alarm itself is no longer pending; as, however, it is resettable, the go message is still pending.

The column "Group" indicates the group to which this alarm is assigned. This determines who may clear the alarm.

The alarm text appears in the "Message" column. Either the receive text when the alarm is still pending, or the return message when the alarm has already been returned but has not yet been reset.

When an returned alarm is reset, it disappears from the list.

If a still pending, alarm that has to be reset is reset, its return message is not displayed as it has already been reset. This alarm disappears out of the list as soon as it is returned again.

A non-resettable alarm also disappears from the list as soon as it ceases to be pending.

The colour of the fields "Group" and "Message" reflect the urgency (priority) of the alarms. The fields of "important" alarms that concern the entire system are red.

### 4.6 The main screen

The main screen in figure 4-11 clearly presents the statuses of the individual actuators, the values of the sensors and all information required for operation.

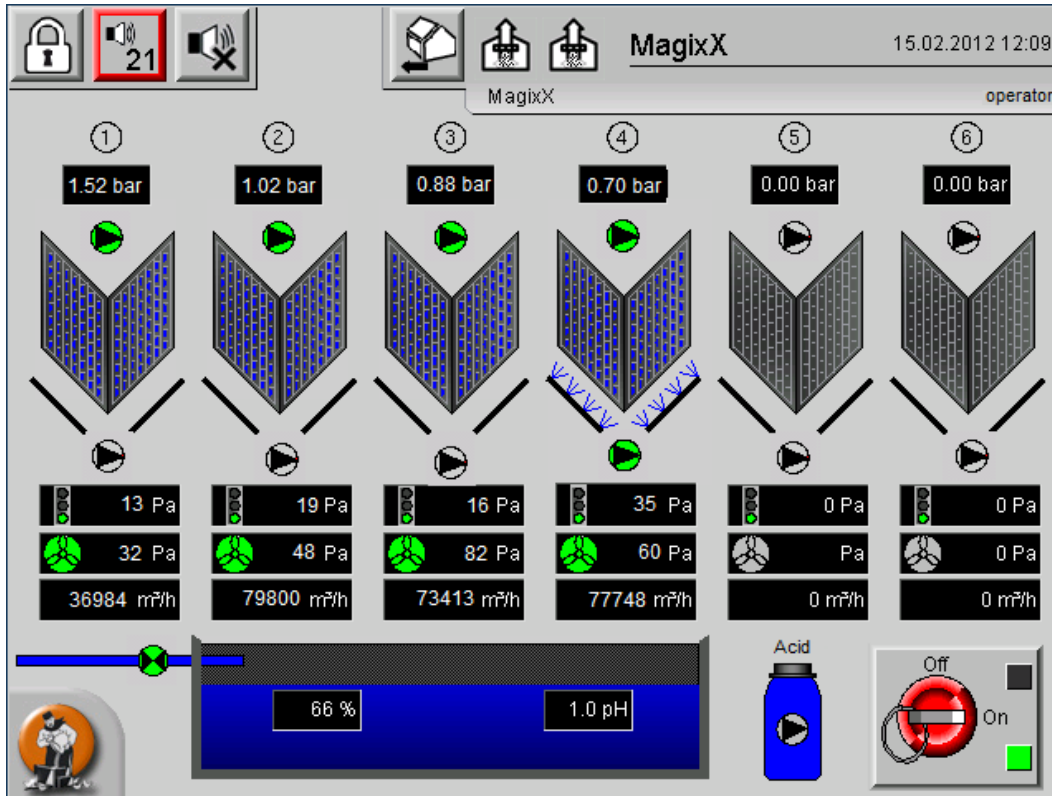


Figure 4-11: The main screen

This is the display for a system with 6 air extraction modules. If there are fewer modules in a given system, only the corresponding number can be seen after setup.



All the fields for sensor values described below are normally black. Alarms can be parameterized for each display.

The alarms are triggered as soon as the respective value rises above an upper limit or falls below a lower limit. Furthermore, a delay time is separately definable for each alarm, for which the value must be above or below the respective limit before an alarm is triggered. As soon as an alarm is triggered, the display field turns red and flashes (with the exception of displays for contamination pressure, differential pressure of the fan and the air flow rate display).

The alarms can be separately switched on or off. If they are switched off, then infringement of limit values has no effect and is not displayed.

All the modules share a common structure:

- The module number appears above the module.
- The pump pressure of the sprinkling pump is displayed below.
- And under this is the symbol for the sprinkling pump (for details of the display see below).
- Finally the filter wall can be seen. Inside the wall it can be seen whether the sprinkling pump is currently switched on. In this case blue water drops are shown (figure 4-12).

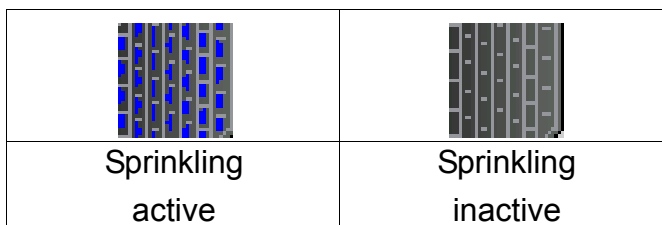


Figure 4-12: Sprinkling

- The spraying status is indicated below the filter wall (figure 4-13).

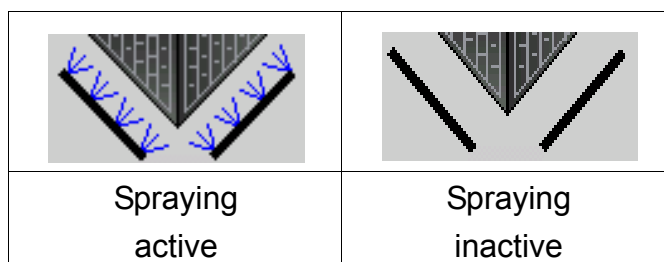


Figure 4-13: Spraying

- In the middle of the nozzle array there is the spraying pump.
- Under this the contamination pressure display is to be found. Next to the display a traffic light signal is shown, providing information about the differential pressure in accordance with the air flow rate displayed below.
- The next display shows the fan pressure. A fan icon appears next to the numerical value. Its colour indicates whether the fan for this module is currently switched on or off (figure 4-14).

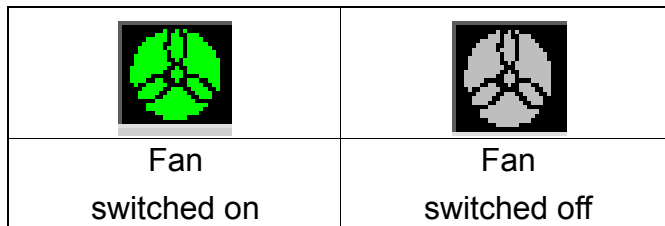


Figure 4-14: Fan

- Under this the calculated air flow-rate for each module is displayed in m<sup>3</sup>/h. As with every sensor, boundary values can be parameterized in this case, too; as soon as the value exceeds or falls below these limits, the display background turns red.

At the bottom of the screen, the water infeed can be seen. On the left the water reservoir appears containing a water level and pH value display. The height of the blue column changes according to the filling level of the water reservoir.

On the left of the water reservoir there is the solenoid valve that controls the fresh water infeed.

The acid tank is coloured blue. As soon as an empty message is generated by the tank, the colour changes to red.

On the bottom right of the screen, the master switch can be seen (figure 4-15).

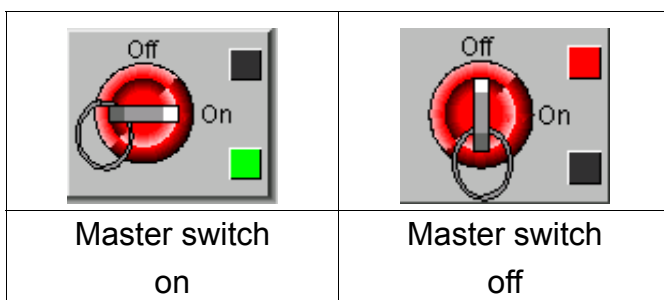


Figure 4-15: Master switch

Via this master switch, all IO outputs of the controller can be switched off. As soon as the switch is turned to “Off”, all outputs are switched off. It is thereby irrelevant, whether an actuator is in automatic mode or is manually actuated.

The only exception to this are the fan actuators; these cannot be changed manually nor via the master switch.

To forestall inadvertent operation, the master switch must be actuated for at least 3 seconds before its status changes.

#### 4.6.1 Actuator display

All actuators which are controlled by the controller, can be switched via the control panel to manual operation. To this end the respective actuator must be clicked, but more about this later.

Two pumps per module can be seen. These are displayed as in figure 4-16 :





			
Pump on; automaticmode (green)	Pump off; automaticmode (grey)	Pump on; manual operation (green with yellow border)	Pump off; manual operation (grey with yellow border)

Figure 4-16: Automatic and manual operation of pumps

There is no feedback, therefore it is assumed that the pumps will run when triggered. The same applies for the acid pump.

There is also no feedback for the fresh water value; it does not have motor overload protection. Therefore the last case is not applicable.

## 4.6.2 Manual operation of actuators

If actuators are to be manually operated, the required actuator must be clicked. A menu appears as in figure 4-17 .

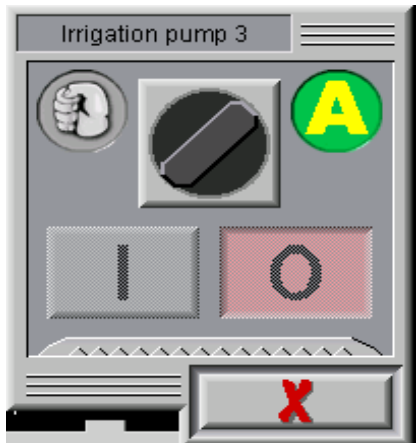


Figure 4-17: Changeover menu Auto/Man, guest user

The actuator name appears in the header. Below it can be seen whether the actuator is in automatic mode (selector switch pointing right) or in manual mode (selector switch pointing left). In addition, the current operating status of the actuator can be seen (activated or not activated).

The menu can be moved around the screen by clicking the header and moving a finger to the desired position on the screen. In the same way, several menus from various actuators can be displayed simultaneously by clicking other actuator icons.

If a user is not in possession of rights to make changes via the controller, the controls are greyed out as shown here. If a button is clicked, an message to this effect appears and it is possible to directly login with the appropriate rights (figure 4-18).



Figure 4-18: User rights insufficient

When the right button is clicked, the popup disappears. No further operations can be performed on it. When the left button is clicked, the login screen appears. If a user name to which the required right has been assigned and the correct password are entered, the previous screen reappears. The actuator can now be directly controlled.

If a login with the appropriate user rights has been performed, the menu appears as in figure 4-19 . In this case automatic mode is active and the value is activated.

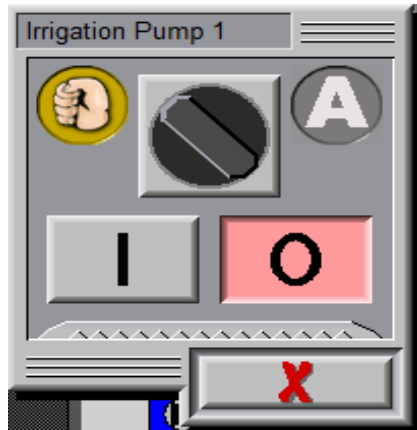


Figure 4-19: Changeover menu Auto/Man

To switch to manual operation, the selector switch must be clicked. The switch turns left, the bottom two fields are active and the icon for the respective actuator changes: an orange outer ring appears (figure 4-20).

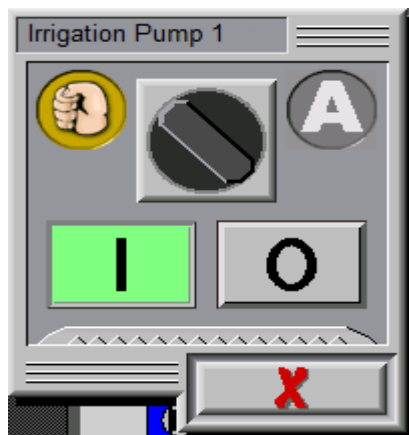


Figure 4-20: Changeover menu Auto/Man, manual operation

If the "0" button is clicked, the actuator is switched off (figure 4-21).

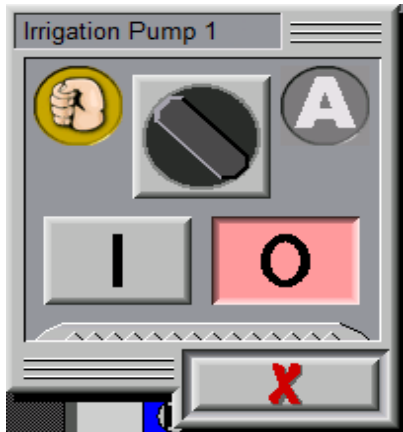


Figure 4-21: Manual operation, actuator not activated

If the selector switch is turned back to automatic mode again, the actuator is immediately controlled as specified by the logic circuit.

### 4.6.3 Sprinkling and spraying pumps

Basically the pumps are operated in exactly the same way as the valves.

#### Operating hours display

The operating time is determined by adding up the times in which the pump was activated. For display the running time, there is a zigzag line at the bottom of the man/auto menu. If this is clicked, the controls of the man/auto menu are partly overlaid (figure 4-22).

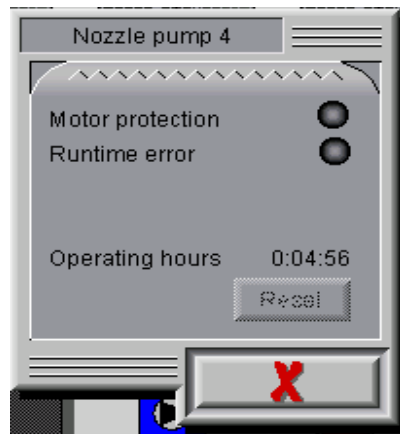


Figure 4-22: Operating hours display

With the "Reset" button, the display can be reset to "0:00:00". At the top it is also displayed whether there is a fault in the motor overload protection or a runtime fault. In both cases, the corresponding lamp icon on the right goes red.

Clicking the display button hides the information page again.

#### 4.6.4 Important instructions for manual operation

The master switch at the bottom right of the main screen has absolute priority. If the main switch is turned to "Off", no actuator can be activated, even in manual mode.

Only an operator with corresponding rights can switch an actuator to manual mode, and likewise: If an actuator is in manual mode, only a user with the appropriate rights can switch it back to automatic mode. Under some circumstances this can have far-reaching consequences, as the currently logged in user is automatically logged off after a certain time period for security reasons (see chapter 4.7). If a service technician switches an actuator to manual mode and then logs off, then the operator will not be able to reset the actuator back to automatic mode.

Manual operation requires detailed knowledge of the system. If an actuator has been switched to manual mode and is activated, it will be triggered regardless of other ambient conditions exist (only exception: the master switch is set to "Off"). For pumps, for example, this means that they would start, even if the filling level in the water reservoir is not sufficiently high. The pump may run dry and could thus be destroyed. In automatic mode, this is prevented by a limit due to low water level.

Manual operation has no effect of any kind on the control algorithms. Thus manual activation of a spraying pump does not require that the fan in the respective module is switched on.

If an actuator is switched to manual mode, this is recorded in the logging table. The user name, date and time, the actuator name and the selected control value are saved in this table. Switching back to automatic mode is also entered in the logging table.



The fans in the modules cannot be switched to manual operation via the MagixX control system as they are not activated via the controller. The controller only enables the number of modules which have been predetermined by the Climate computer. Furthermore it selects the modules which are to be enabled (see chapter 4.14 "Rotation of modules", page 52).



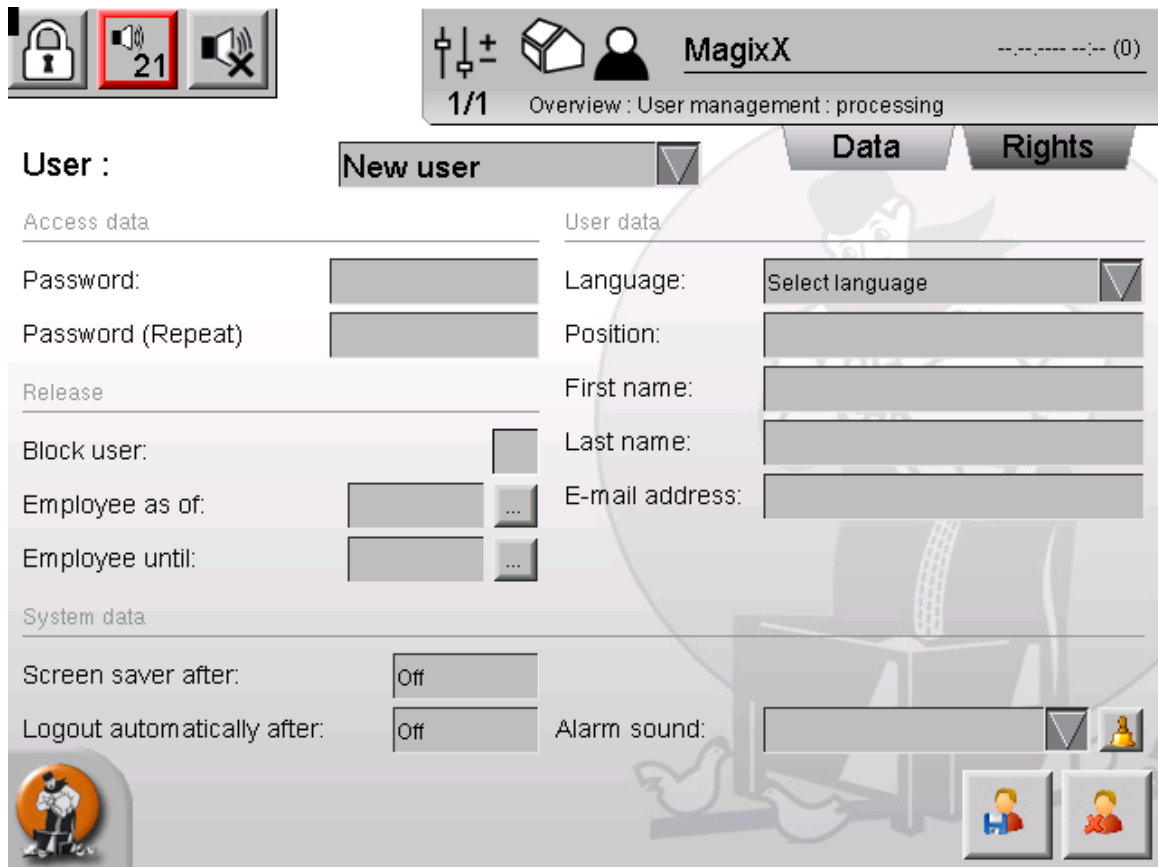
## 4.7 User and right administration

It is necessary to first switch to the house view to administer user rights.

This is done either with the button  in the top menu bar or via the button  in the bottom menu bar.

Clicking the menu button  on the house view page makes the button for user management  appear.


Clicking the menu button user management opens the user management menu (figure 4-23).



The screenshot shows the MagixX user management interface. The top menu bar includes a house icon and a user icon. The main area is divided into sections: Access data (Password, Password Repeat), Release (Block user, Employee as of, Employee until), System data (Screen saver after, Logout automatically after, Alarm sound), and User data (Language, Position, First name, Last name, E-mail address). The 'New user' button is highlighted.

Figure 4-23: User management

Before settings in this menu can be made, two conditions must be fulfilled:

1. The presently logged in user must have rights to edit other users.
2. The setup button  in the bottom left menu bar must be clicked.

If both conditions are fulfilled, the users can be selected via the selection list whose details are to be edited. New users can also be created.

The procedure for creating a new user will now be demonstrated. The user details of existing users can also be edited.

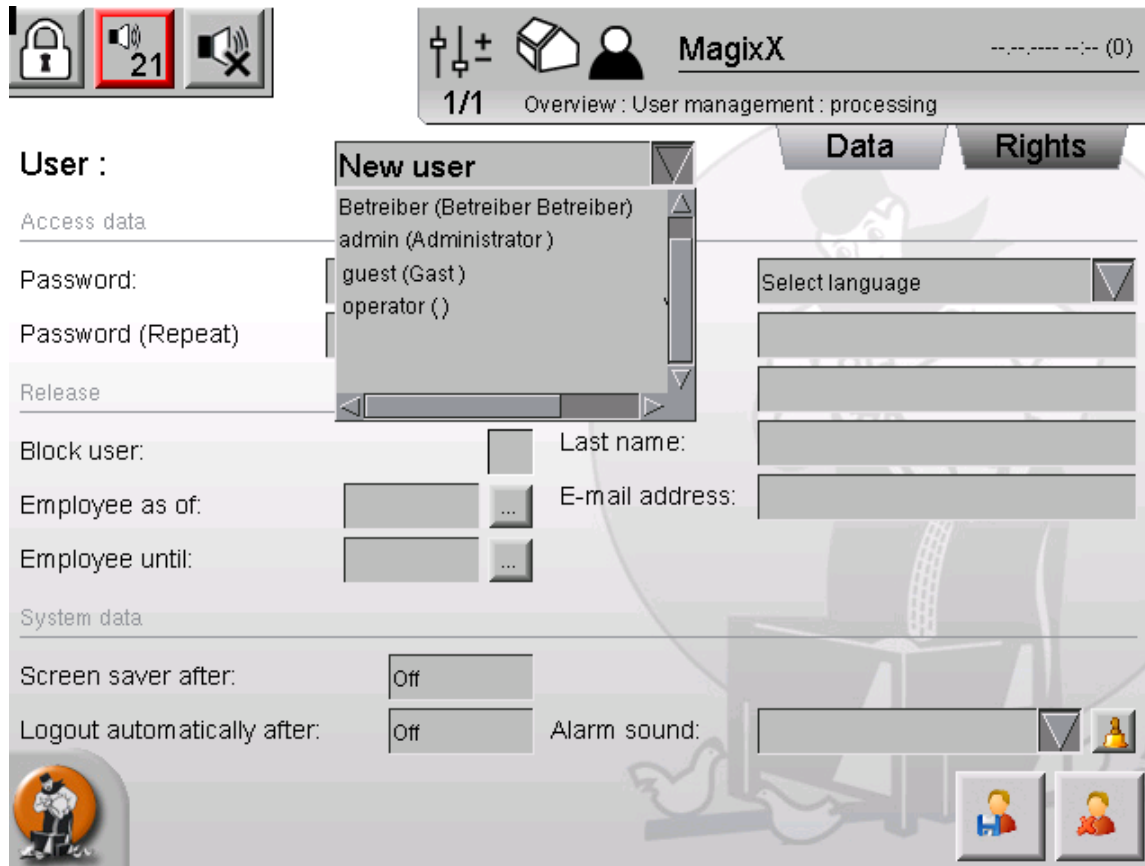


Figure 4-24: Creating a new user

First “New User” is selected, then the name is entered into the field. This is the name that must be entered for subsequent logins of this user. In this example the user “Operator” is created.

A password is then assigned. The password must be confirmed by entering it again in the field directly below. In the right column the language is selected. The selected language is activated as soon as the user logs in. It is still possible however to change the language in the login dialogue.

The other details in the right-hand column (Position, First name, Last name and E-Mail address) are only provided for information purposes. The first and last names are saved in the login database, if the user is assigned the right to switch actuators to manual mode.

Under the menu item "Release" a user can be blocked. This user will then not be able to log in any more. Via "Employee as of" and "Employee until" a period can be defined in which a user may log in.

At the bottom, the waiting time before the screen saver is activated (input as number in minutes), as long as a user is logged in. Below this is specified the period after which a user is automatically logged off, if no more inputs are made (input as number in minutes). In both cases deletion of the field results in the respective function being switched off. To the right of this a certain tone can be selected which is generated when an alarm is triggered (figure 4-25).

The screenshot shows the MagixX user management interface. At the top, there is a navigation bar with icons for a lock, a speaker with the number 21, and a hand with a cross. The main header displays 'MagixX' and 'Overview : User management : processing'. Below the header, the user 'operator' is selected. The interface is divided into sections: 'Access data' (Password, Password Repeat), 'Release' (Block user, Employee as of, Employee until), and 'System data' (Screen saver after, Logout automatically after, Alarm sound). The 'Data' and 'Rights' tabs are visible at the top right. At the bottom, there are icons for saving changes and deleting the user.

Figure 4-25: Creating the user "operator"

Save changes to this page with the button



. With the button



the presently selected user is deleted.

In order to assign rights, the tab “Rights” at the top right must be clicked (figure 4-26).

The screenshot shows the MagixX user management interface. At the top, there is a navigation bar with 'Data' and 'Rights' tabs. Below the tabs, the user 'operator' is selected. A table lists various rights for 'System' and 'MagixX'. The 'MagixX' column has a dropdown menu open, showing options: 'OK' (green), 'Range released' (grey), 'View only' (grey), '1' (yellow), 'Operation' (yellow), '2' (orange), and 'Operation and Parametrisation' (orange).

Rights	System	MagixX
MAGIXX		
MAGIXX -> MESSAGES		
MAGIXX -> OPERATOR		
MAGIXX -> SERVICE		
MAGIXX -> MANUAL CONTROL		
SYSTEM		
SYSTEM -> USER MANAGEMENT		
SYSTEM -> LOGGING		
SYSTEM -> BACKUP		
SYSTEM -> SET UP		
SYSTEM -> DATABASE		
SYSTEM -> ADMINISTRATION		
SYSTEM -> PRINTING		
SYSTEM -> MESSAGES		

Figure 4-26: User management: Rights

In this case the required rights are set by clicking the required fields. If a field is clicked, the contents are changed.

The individual rights, from top to bottom, have the following meanings:

- **MAGIXX:** This right is absolutely essential. Without this right, the user may not switch over from the homepage to the main MagixX screen. This right must be selected first before the following rights can be edited. Possible values: "OK" (green) or grey for "Not OK".
- **MAGIXX -> MESSAGES:** This right determines whether a user may or may not acknowledge MagixX messages.
- **MAGIXX -> OPERATOR:** The user needs this right to access the first setup screen. This screen lists the settings that the user can edit (see chapter 4.8).
- **MAGIXX -> SERVICE:** This right is required to access of all other setup screens of the MagixX system.
- **MAGIXX -> MANUAL CONTROL:** This right is required to switch actuators to manual mode or to switch them back to automatic mode.

The rights in the section "System" have been adopted from the AMACS standard.

The above rights have the settings "View only" (grey), "Operation" (yellow) or "Operation and parameterisation" (orange). The settings "View only" and "Operation" are not supported in the MagixX system. If a user is assigned such a right, he must be assigned the setting "Operation and parameterisation".

figure 4-27 shows the recommended setting for the guest user.

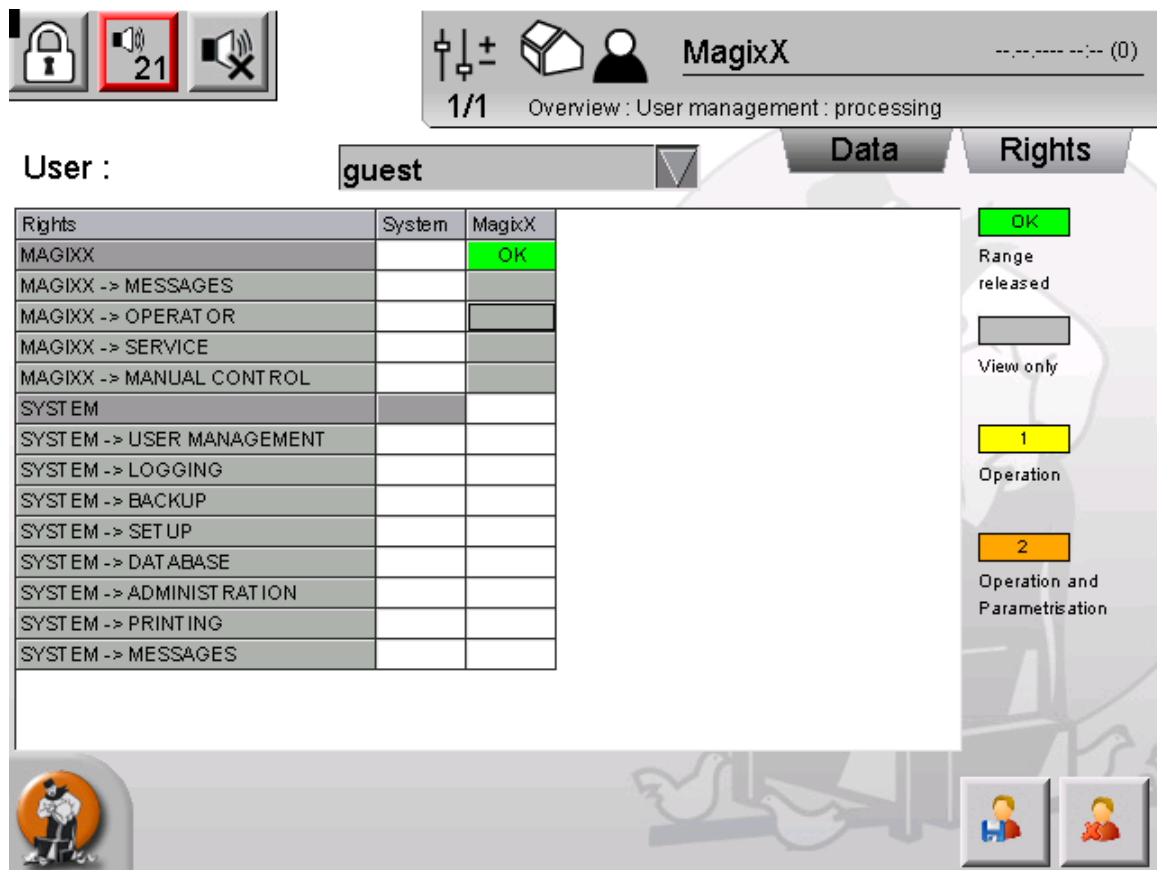



Figure 4-27: Recommend rights for guest users

## 4.8 Setup

If the main MagixX screen is active (figure 4-11, page 24), the button  accesses setup.

This causes the header to change as shown in figure 4-28 .

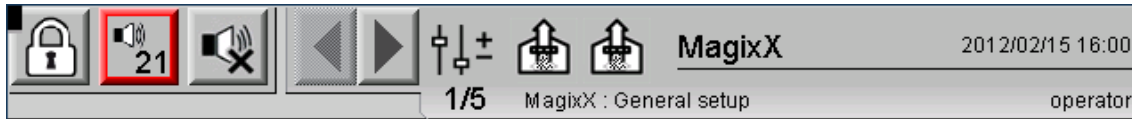


Figure 4-28: Setup header

Navigation arrows to scroll through the set up have been added. Next to this is stated how many setup pages there are in total and which of them is being presently displayed. The area is "MagixX: General Settings".

To quit the setup once more, the setup button must be touched again.

### 4.8.1 General settings

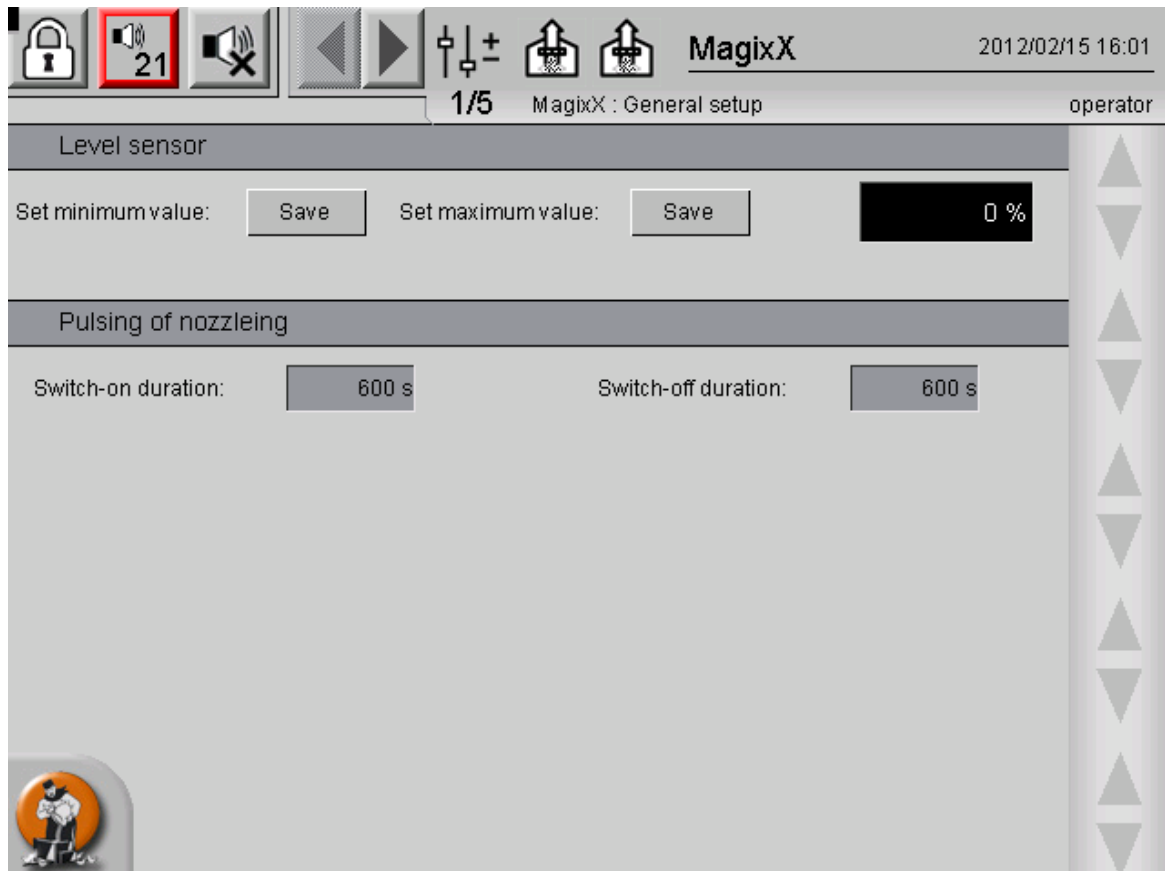


Figure 4-29: Setup: General

The various sections of the setup screen are labelled with corresponding headings and are separated from each other with vertical bars.

Clicking the input fields opens a virtual keyboard with which the required inputs to the touch screen can be made. If a field only requires numerical inputs, only a numerical keyboard will be shown.

#### Calibrating the filling level sensor


The operator has the right to calibrate the filling level sensor. To this end, the save button after “Set minimum value” must be touched when the tank is empty and when the tank is full the save button after “Set maximum value” must be touched (or the level sensor must be move to the position that correspond to “Empty” and “Full”). In the adjacent field, the present filling height is determined from the saved values for the minimum and maximum positions.

#### Cycle times for spraying

In the area below, settings for the pulse-pause ratio for spraying can be made. Both times are defined in seconds.

The next setup screen (system settings) and all the following screens can only be accessed by service technicians with the "MAGIXX -> SERVICE" right.

### 4.9 Operation diary

An electronic logbook is provided make it possible to follow which changes have been made. In order to access this operation diary, the main MagixX screen must be displayed and then the menu button  must be touched.

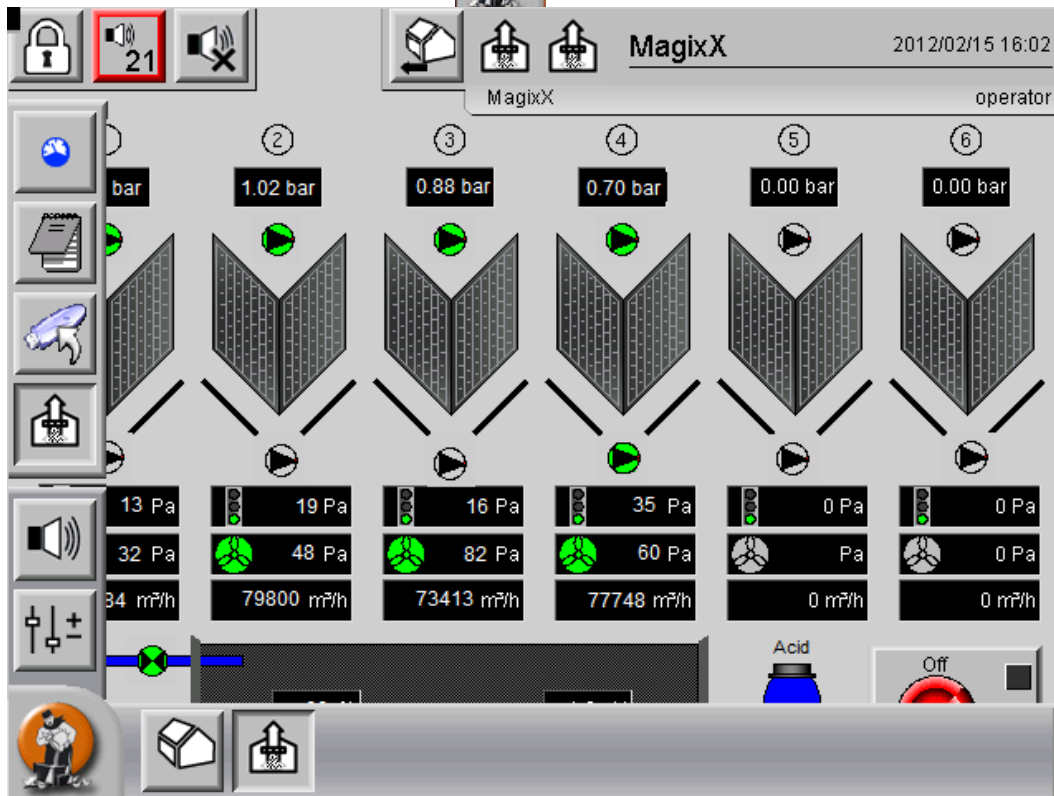


Figure 4-30: Main screen with folded out menu bar

The operating manual (figure 4-31) can then be accessed  above the button.



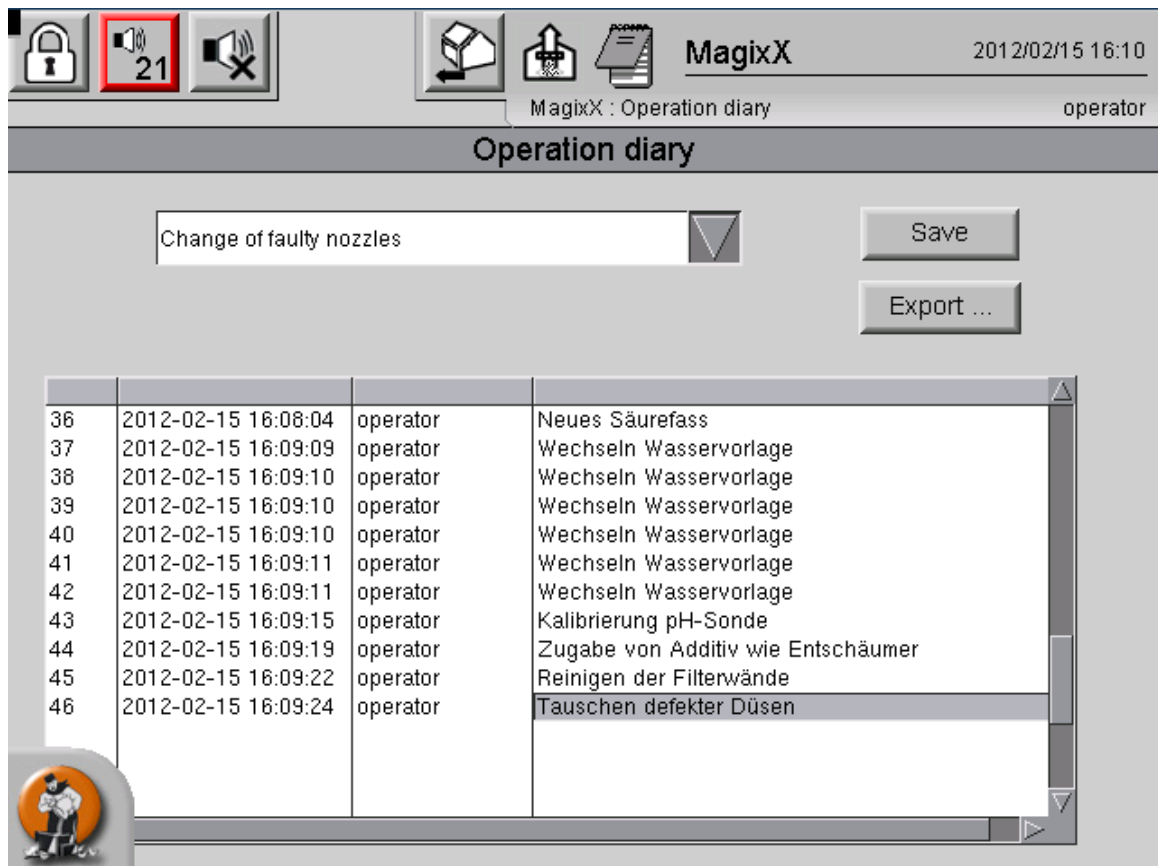


Figure 4-31: Operation diary

A ready prepared text from the opened menu can be selected to entries in the operation diary (figure 4-32).

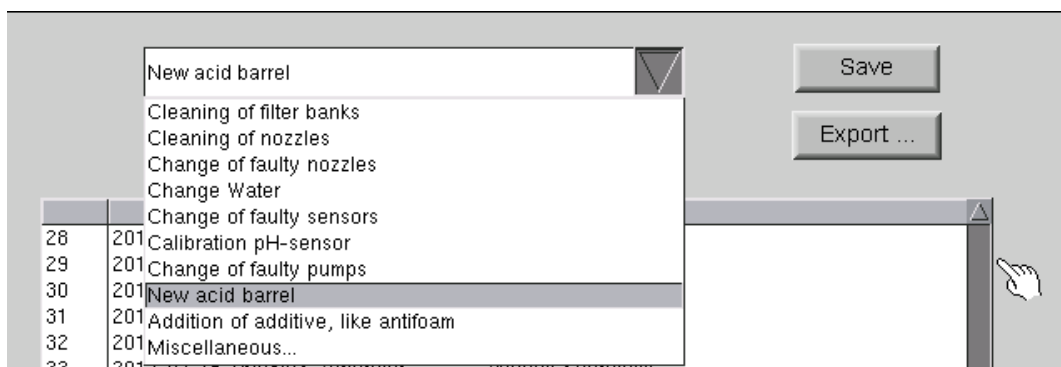


Figure 4-32: Ready to use text blocks for the operation diary

However, it is also possible to enter freely composed text. To this end, the lowest item "Miscellaneous..." in the selection menu. Under the selection menu a text input box then opens in which the desired text can be entered.

To save a text in the operation diary, the “Save” button must be pressed. This is only possible if a selection has been made from the opened menu. If the “Miscellaneous...” is selected, a text must be entered in the input box underneath (see figure 4-33, page 42).

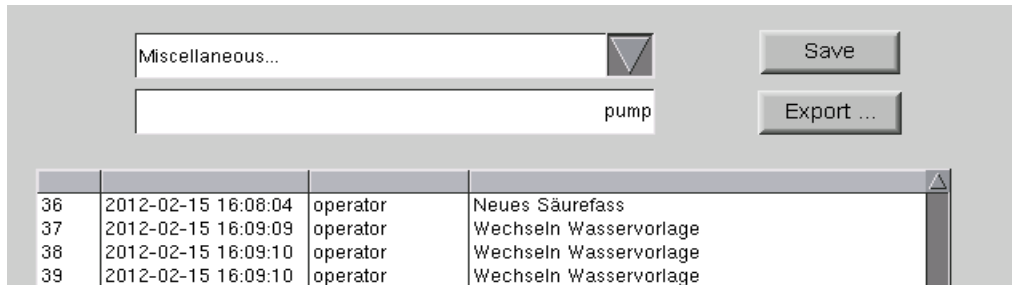


Figure 4-33: Input box

The text is then saved with the user name, date and time and added to the bottom of the table.

The operating logbook can be exported to a USB stick by tipping the “Export” button.

For this purpose, a USB stick must be inserted in the USB port of the controller. After a few seconds, the controller beeps, thus indicating that the USB stick has been identified.

The export button can then be actuated. Thereupon a window opens in which the directory on the USB stick in which the export file is to be saved must be entered (figure 4-34).

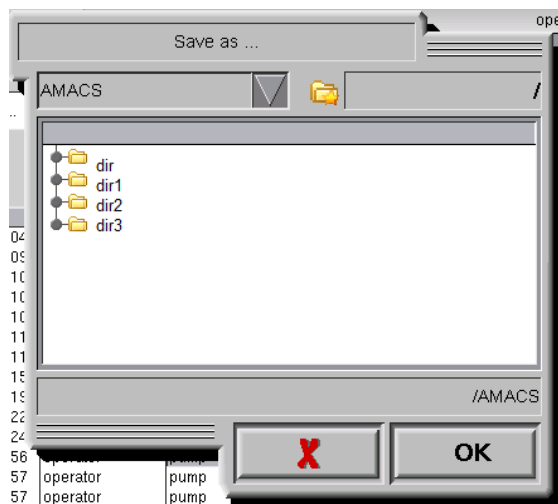


Figure 4-34: Exporting the operation diary

The file name is composed of the current data with time, the term "OperationDiary" as well the name of the poultry house.

Example: "2011-06-08-1539\_OperationDiary\_ MagixX.pdf"

The file is saved in PDF format.

The progress of the export is indicated by a progress bar (see figure 4-35).

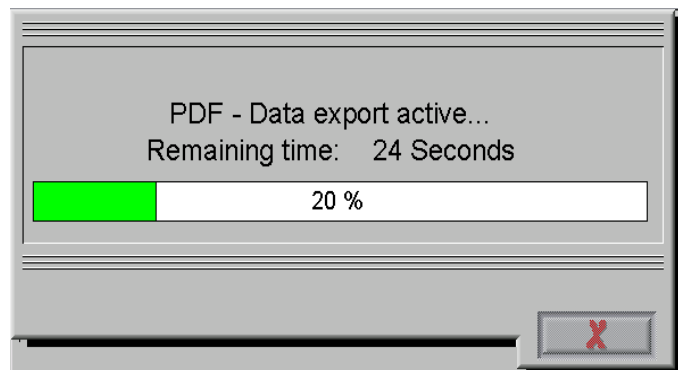



Figure 4-35: Operation diary: Progress display for data export

When the data export is completed, the progress display must be closed with the red "X" button. Only then the USB stick can be unplugged. If the stick is removed earlier, this could result in a loss of data.

#### 4.10 Data recording, data export

The relevant process data is saved in a database as daily mean or daily total values. These values for each day are saved at 00:02 hrs of the respective next day.

To view the window for data export to a USB stick, the MagixX main screen must be displayed. Then the menu button must be touched. In this menu, the data export button must  then be actuated (see figure 4-30).

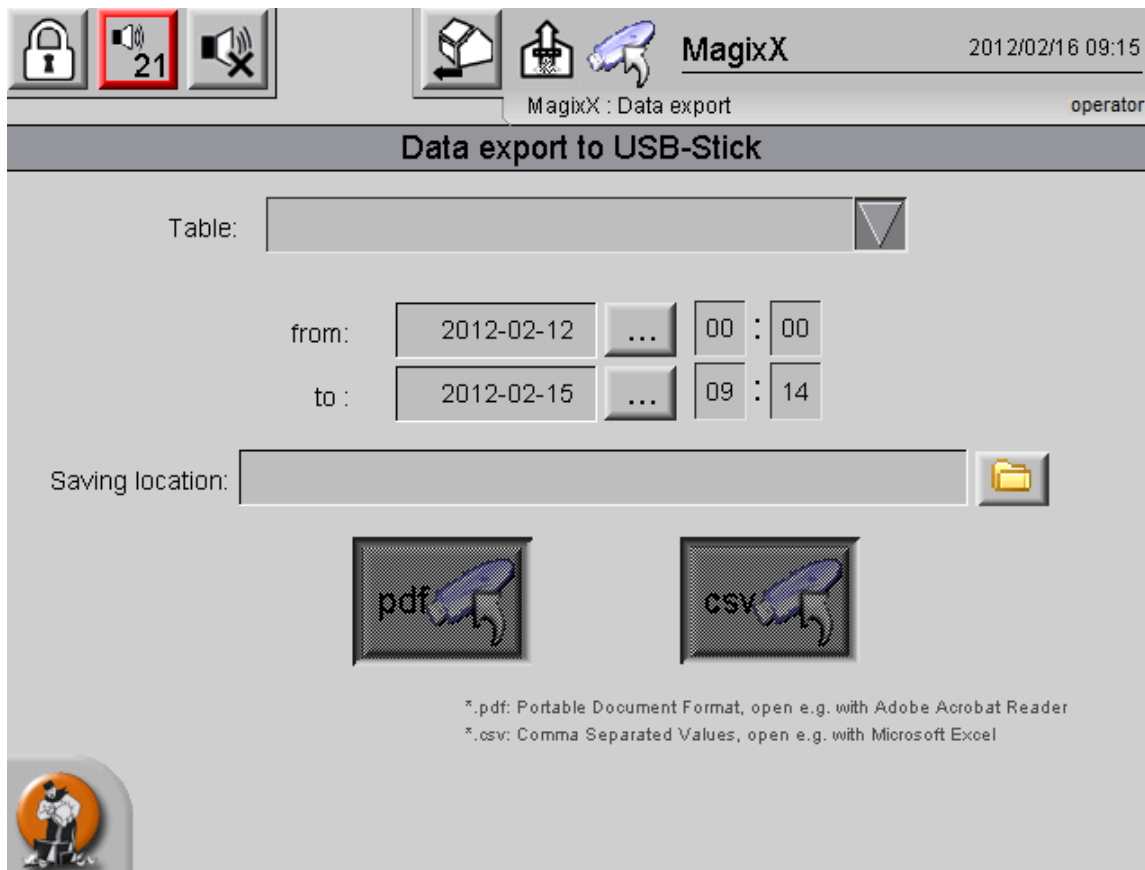


Figure 4-36: Data export (Service)

For data export, the data type, i.e. which table, is to be exported must be selected. For this purpose a drop-down menu is provided (figure 4-37).

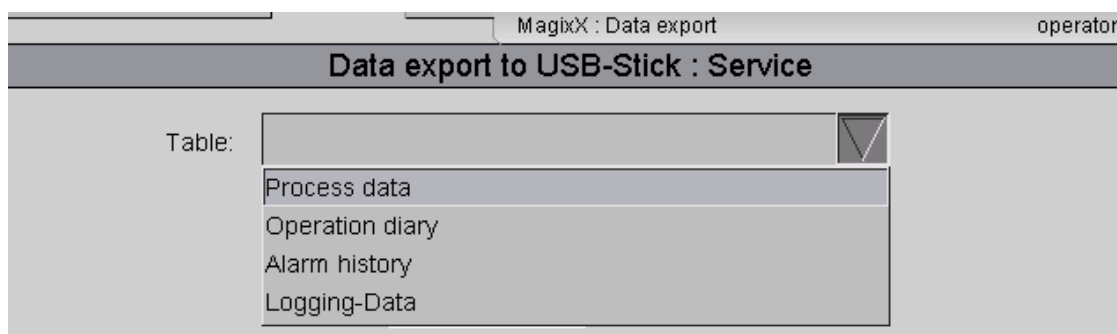


Figure 4-37: selection of the files to be exported (Service)

Three menu items are available for selection: “Process data”, “Operation diary” and “Alarm history”. In the table “Process data”, the daily average or daily total values are displayed. The alarm history contains a list of all alarms that have been issued by this system. It is also noted if an alarm has been cleared as well as when and by whom the alarm was cleared.

After the table has been selected, a time period for which the export data is to be generated (figure 4-38).

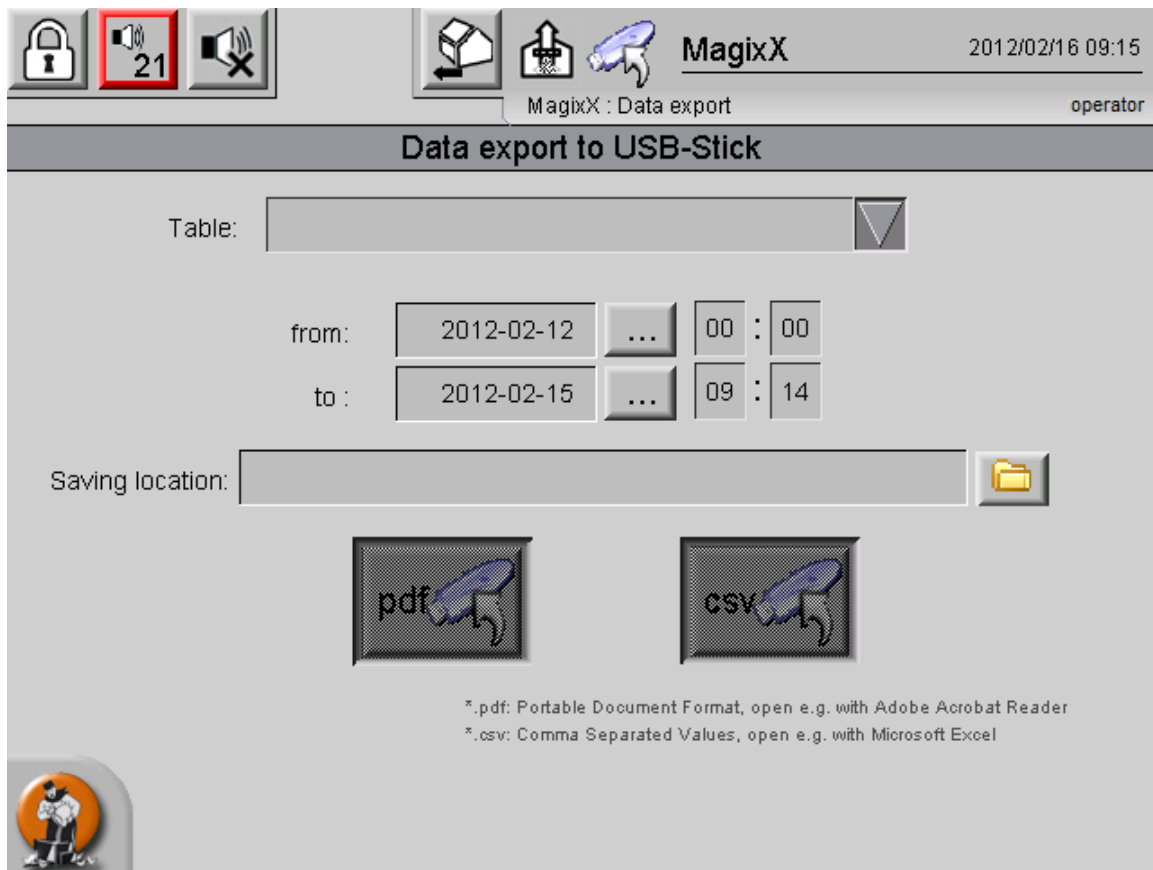


Figure 4-38: Data export: Selection of time period

Clicking the button for one of the three items opens a calendar in which the required date can be selected.

Before the button for selecting the saving location is clicked, a USB stick must first be inserted in the USB port of the controller. After a few seconds, the controller beeps, thus indicating that the USB stick has been identified.

Only then should the saving location selection button be actuated.

Thereupon a window opens in which the directory on the USB stick in which the export file is to be saved must be entered (figure 4-39).

If the USB stick has not been identified yet, no directories appear in the window. In this case, the window must be closed again and then reopened. If no directories exist on the USB stick, then logically no directories will appear in the list.

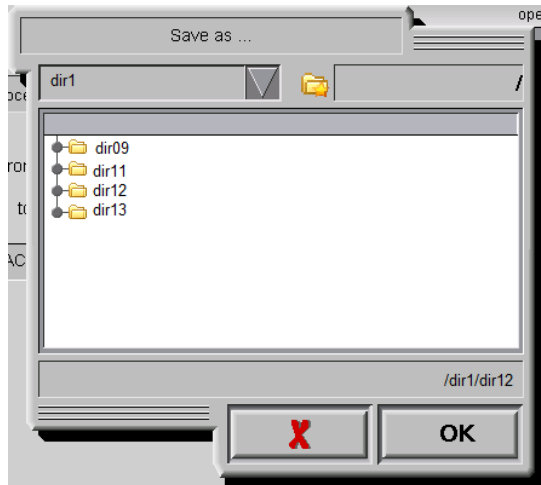


Figure 4-39: Selection of directory

Not until all the settings have been made (data type, time period and storage location) are the two buttons for starting the data export activated.

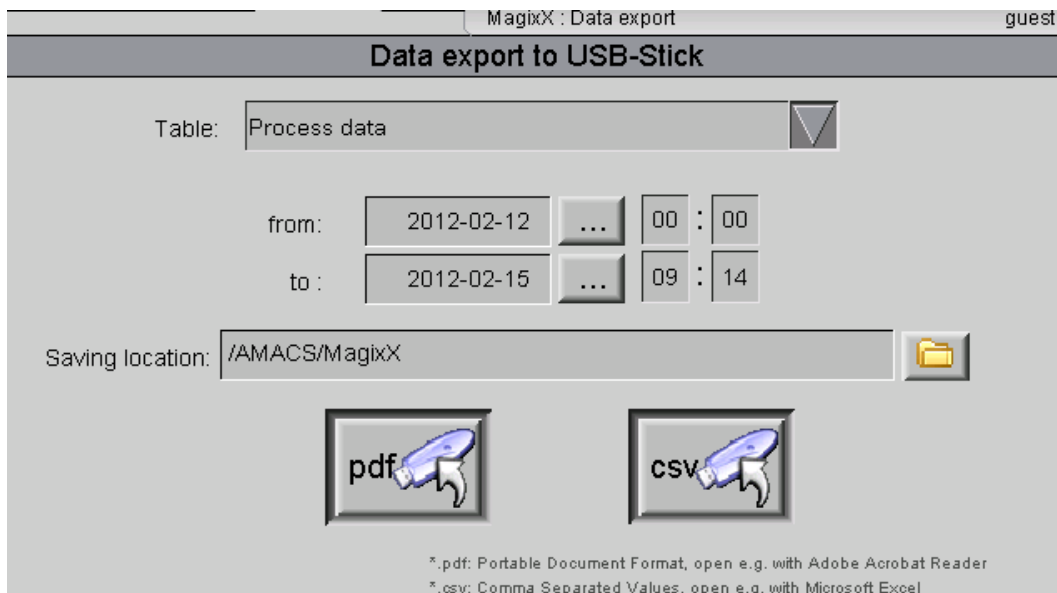


Figure 4-40: Starting the data export

Depending on which button is actuated, either a PDF or a CSV file will be generated. The names of the files thus produced are structured according to the following model:  
 <date>-<time>\_<data type>\_<henhouse name>.csv or .pdf

Examples:

Process data:	2011-06-09-1539_ProcessData_MagixX.csv
Operation diary:	2011-06-09-1539_OperationDiary_MagixX.csv
Alarm history:	2011-06-09-1539_AlarmList_MagixX.csv

After the export button is touched, the progress of the export is indicated by a progress bar.

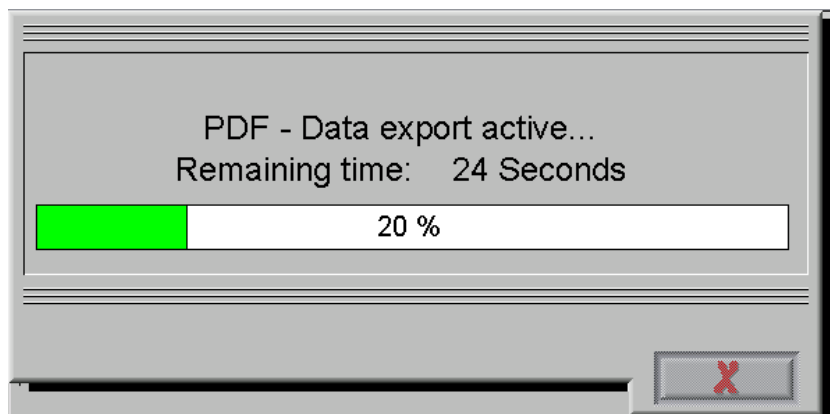


Figure 4-41: Progress display for data export

When the data export is completed, the progress display must be closed with the red "X" button. Only then the USB stick can be unplugged. If the stick is removed earlier, this could result in a loss of data.

Depending on the type of the data exported and the defined export period, the export of PDF files may take longer. Durations of several minutes, depending on the volume of data up to even 30 minutes are possible.

Thus, for example, the export of process data for a period of 18 months in PDF format will take 31 minutes. During time, the controller continues to remain operable. If the progress bar next to the window is clicked then this will disappear.

It is also possible to operate the menu button on the bottom left. As long as a given data export is still active, no further data export can be started. The corresponding buttons are disabled.

Furthermore, on screens from which data can be exported (i.e. the operation diary and data export screens) a text appears stating how long the ongoing data export will continue (figure 4-42).

If the time has lapsed, the text with the residual runtime disappears and the export buttons are enabled again.

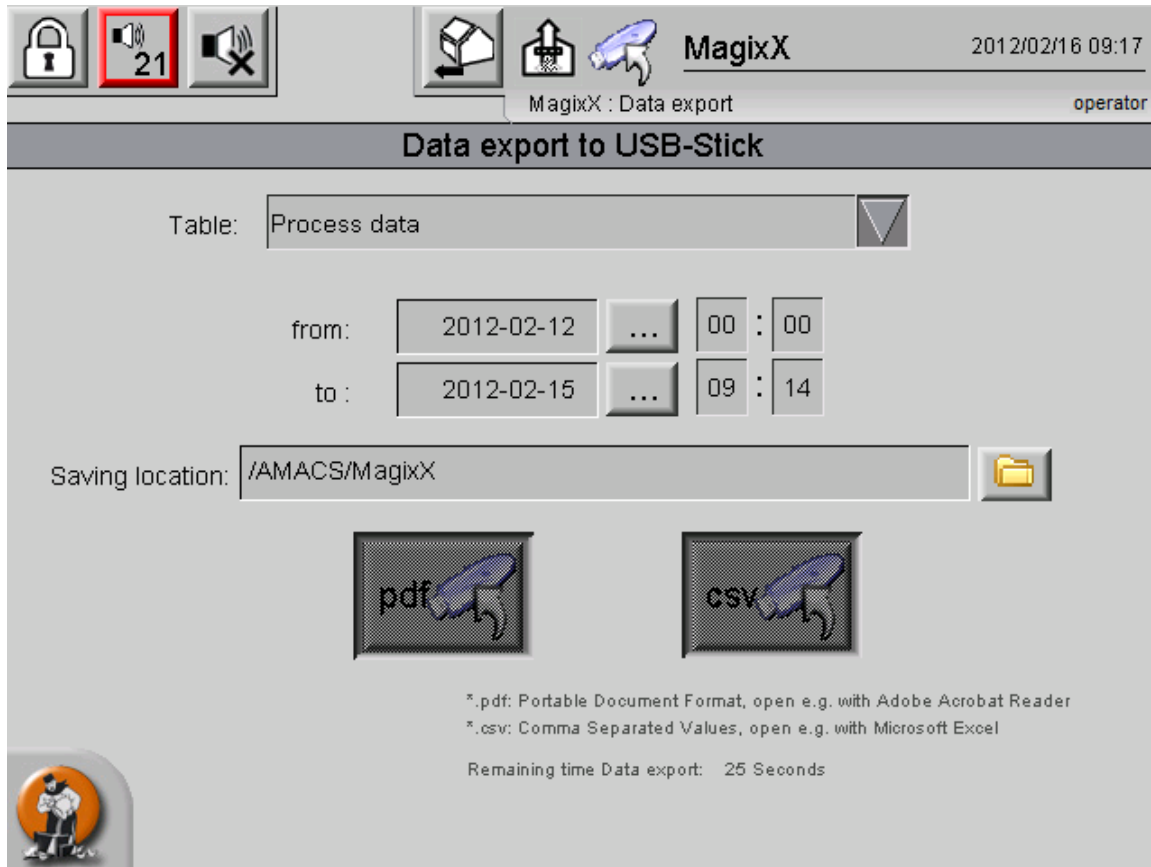



Figure 4-42: Active data export without progress bar

If the progress bar has been faded out in this way during the ongoing data export, the USB stick cannot be removed until the text indicating the residual runtime disappears, i.e. until no data export is active any more. Removing the USB stick prematurely could cause a data loss.



## 4.11 Consumption counter display

Via the button  the display with the two consumption counters is accessed.

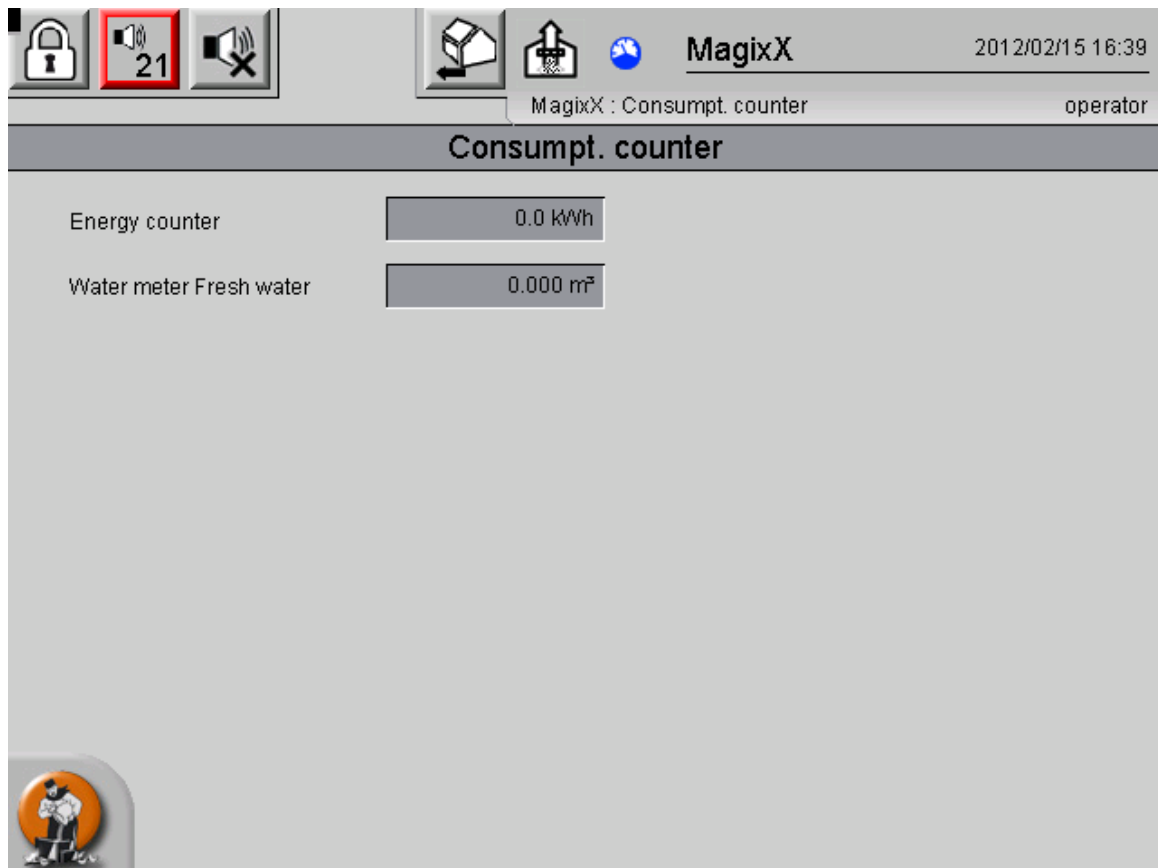




Figure 4-43: Consumption counter display

The number of displayed decimal places and the reset are defined on the corresponding setup screens.

## 4.12 Alarm history list

Not only can the alarm history list be exported, it can also be viewed at the controller. To do this, the user must switch to the house overview screen.

This is done either with the button  in the top menu bar or via the button  in the bottom menu bar.

If the menu button  in the house view screen is actuated, the button  for the alarm history display appears in the left menu bar (figure 4-44).

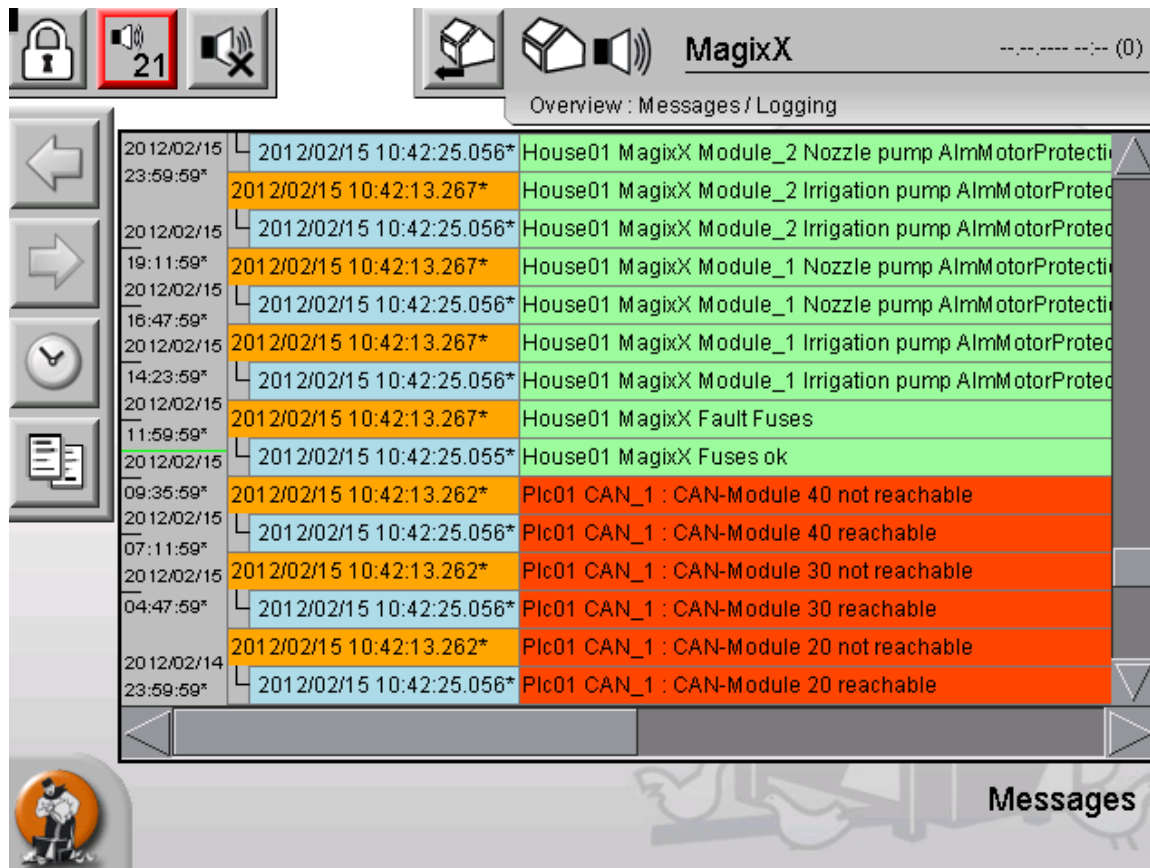



Figure 4-44: Alarm history list display

In the default setting, one calendar day is displayed in this list. On the left side there is a time line, the area shown on the right is highlight in green in the timeline. The area can be moved along the time line by clicking it. It is also possible to move the area via the scrolling bar on the right edge.

Other days can be selected via the arrow buttons on the left edge, with which the user can scroll one day forwards or backwards. Clicking the clock icon fades in a calendar, in which the time period to be displayed can be set.

If an range of more or less than 24 hours is set, then the arrows will subsequently scroll forwards or backwards in correspondingly smaller or larger time units.

## 4.13 CAN overview

The overview of CAN modules is opened via the button . This is where information about the connected CAN modules can be viewed (figure 4-45).

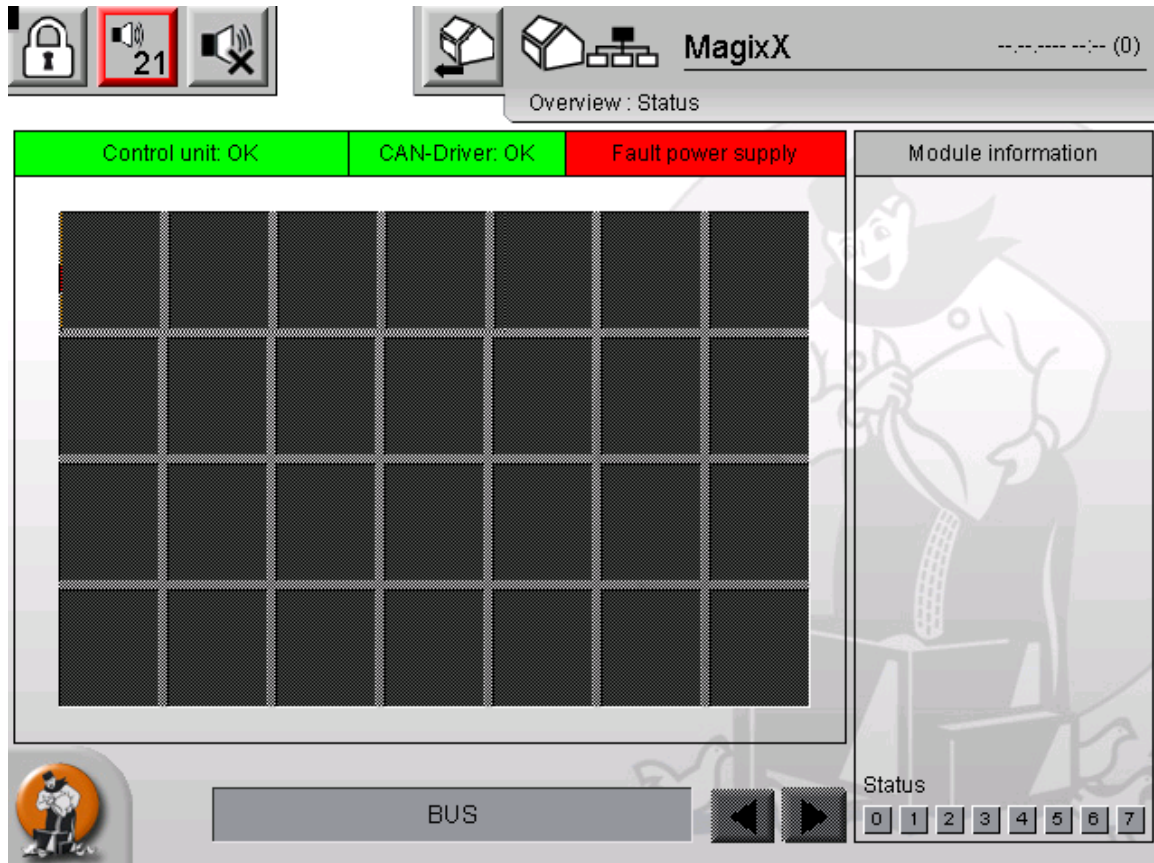


Figure 4-45: CAN overview

For each connected CAN module details such as the node ID and software version are available when the module is clicked. Moreover, it can also be seen whether a module has a fault. In this a hardware or software reset can be triggered.

Furthermore, the status of the USP controller (Uninterruptible Power Supply) and the PLC can be viewed as well as the status of the CAN driver.

## 4.14 Rotation of modules

Besides data capture, one of the main tasks of the controller is managing the rotation of the modules. The purpose of rotation is to evenly distribute the contamination of the aspirated air among all available modules. This helps to prevent blockage of the filter walls.

The controller receives the number of modules that are to be digitally activated (i.e. with immediate 100% power) and the control value for a infinitely adjustable module as parameters from the climate computer. This entire air volume is distributed by the rotation.

The controller does not itself determine how many modules should be activated or how quickly the infinitely adjustable module or the flaps should be ramped up. This parameters are exclusively generated by the climate computer. If the controller breaks down for any reason, this is identified by the absence of an activity sign. This activity sign is set at present so that a pause of 300 seconds is followed by a high signal lasting 10 seconds. This signal is evaluated by a time relay. If this fails to appear, an external circuit ensures that the number of modules defined by the climate computer continues to be activated.

The rotation is not affected by the position of the master switch. Thus it takes place, even if the switch is set to "Off".

Rotation occurs in configurable time intervals. When the system is started up, the first modules are activated: Module 1 is gradually energized and as many of the following modules 2 to 6 are 100% energized as predefined by the climate computer.

**Example:** 6 available modules. According to the climate computer, one infinitely adjusted module and two other modules, each with 100% output are required. Rotation occurs after 24 hours. This results in a sequence as presented in table 4-1 .

Table 4-1: Rotation with three modules at 24 hours

	System start	After 24 hours	After 48 hours	After 72 hours	After 96 hours	After 120 hours
Module 1	Continuously variable	Off	Off	Off	100%	100%
Module 2	100%	Continuously variable	Off	Off	Off	100%
Module 3	100%	100%	Continuously variable	Off	Off	Off
Module 4	Off	100%	100%	Continuously variable	Off	Off
Module 5	Off	Off	100%	100%	Continuously variable	Off
Module 6	Off	Off	Off	100%	100%	Continuously variable

As soon as rotation occurs, the configurable interval of max. 10 seconds is taken into account. Thus the previous module is switched off, then there is an interval of up to 10 seconds before the next module is activated. This only affects modules in there are actually changes in the activation type due to the rotation (i.e. from "Off" to "Infinitely variable" or "100%"). The modules that were and will be operated before and after rotation at 100% output, continue running. Likewise, the new infinitely adjusted module is immediately gradually energized, if it was previously energized at 100%.

If there are changes in the required air flow occur during the runtime, these changes are executed "at the end". If another module is required within the first 24 hours, module 4 is connected. If another module is required, for example, after 50 hours, module 6 is connected. A new module is connected without parameterized delay, i.e. directly after request by the climate computer.

If a lower air flow rate is required, this change is also performed "at the end". If module less is required within the first 24 hours, module 3 is disconnected. If on the other and, one module less is first required after 50 hours, module 5 is disconnected.

At the next rotation time, the applicable number of modules is then rotated.

**Example:** The system runs with the configuration described above. After 23 hours another module is required, thus module 4 is connected. One hour later, i.e. 24 hours after the system start, the first rotation occurs. The system then runs as shown in table 4-2 .

Table 4-2: Connection of a module after 23 hours

	System start	After 23 hours	After 24 hours	After 48 hours	After 72 hours	After 96 hours	After 120 hours
Module 1	Continuously variable	Continuously variable	Off	Off	100%	100%	100%
Module 2	100%	100%	Continuously variable	Off	Off	100%	100%
Module 3	100%	100%	100%	Continuously variable	Off	Off	100%
Module 4	Off	100%	100%	100%	Continuously variable	Off	Off
Module 5	Off	Off	100%	100%	100%	Continuously variable	Off
Module 6	Off	Off	Off	100%	100%	100%	Continuously variable

**Example:** After 23 hours one module less is required: Module 3 is switched off. However, module 3 is switched on again an hour after the first rotation (table 4-3).

Table 4-3: Disconnection of a module after 23 hours

	System start	After 23 hours	After 24 hours	After 48 hours	After 72 hours	After 96 hours	After 120 hours
Module 1	Continuously variable	Continuously variable	Off	Off	Off	Off	100%
Module 2	100%	100%	Continuously variable	Off	Off	Off	Off
Module 3	100%	Off	100%	Continuously variable	Off	Off	Off
Module 4	Off	Off	Off	100%	Continuously variable	Off	Off
Module 5	Off	Off	Off	Off	100%	Continuously variable	Off
Module 6	Off	Off	Off	Off	Off	100%	Continuously variable

**Example:** Fault of a module after 23 hours. The module concerned is removed from the rotation. It is bypassed and not activated. As soon as a fault message is identified in an active module, the affected module is switched off and the next free module is switched on. This change also occurs again “at the end” (table 4-4).

Table 4-4: Fault after 23 hours

	System start	After 23 hours	After 24 hours	After 48 hours	After 72 hours	After 96 hours	After 120 hours
Module 1	Continuously variable	Continuously variable	Off	Off	100%	100%	Continuously variable
Module 2	100%	Fault	Fault	Fault	Fault	Fault	Fault
Module 3	100%	100%	Continuously variable	Off	Off	100%	100%
Module 4	Off	100%	100%	Continuously variable	Off	Off	100%
Module 5	Off	Off	100%	100%	Continuously variable	Off	Off
Module 6	Off	Off	Off	100%	100%	Continuously variable	Off

A special case is when a fault message is issued for the infinitely adjusted module. Then at the end of the next rotation not only is a new module at 100% connected, but the module after the faulty, previously infinitely adjusted module is switched from "100%" to "Infinitely variable" so that the total air flow rate remains constant. When the changeover occurs, the configurable interval of max. 10 seconds is taken into account.

If a fault is no longer reported from a faulty module, it will be included in the next rotation. The previously faulty module then participates in the normal rotation, but does not change the order within the rotation. Thus if only two modules should be activated, and at that moment these are modules 5 and 6, the clearing of the fault from module 4 will not result in module 4 being reactivated until after rotation 4 (first rotation: modules 6 and 1, then 1 and 2, then 2 and 3, then 3 and 4).

Shut-down and bypassing a module in response to fault message only occurs if there are still free modules available in the scrubber. The total required number of active modules has absolute precedence over fault messages. This can mean that fans in modules are running in which one or both pumps are not working.

This case may also occur if the water level in the water reservoir is not high enough and the pumps therefore cannot be switched on. In this case, the fans will be run dry in order to ensure circulation of air in the house.

In setup, there is a button with which rotation can be manually initiated. Actuation of this button has just the same effect as if the parametrized time since the last rotation had expired, i.e. as if a “normal” rotation had taken place.

#### 4.15 Activation of the fans

There are two digital outputs per module for controlling the fans. These determine whether a module is off or activated in a infinitely adjusted or on/off (100%) manner (table 4-5).

Table 4-5: Fan control of a module

Activation output 1	Activation output 2	Meaning
0	0	Module fan is off
0	1	Module fan is infinitely adjusted (i.e. via the frequency inverter)
1	0	Module fan is unadjusted (100%)
1	1	This status is invalid and is prevented by the system

The control value of the adjusted fan is transmitted to the freq. inverter via an external circuit; the controller is not responsible for this. The unregulated activation of the fans is also performed externally; the controller only specifies, which module is to be activated. This is based on the input message from the climate computer.



## 5 Commissioning

In order to put the MagixX into operation it is necessary to connect the switch cabinet to the power supply and switch the emergency stop switch to the "ON" position. Once the switch cabinet is supplied with electricity the computer will start up automatically.

### 5.1 Switching on the exhaust air scrubber

When the controller starts up the user automatically arrives in the main view of the MagixX controller. This presents an overview of the current status of the operational exhaust air cleaning system.



It is necessary to switch all switches on the controller front to automatic mode.

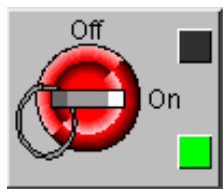


Figure 5-1: Master switch on

The exhaust air cleaning system is switched on with the main switch. To this end this it (see figure 5-1) be held down for at least 3 seconds on the controller screen. First the basin is automatically filled. The sprinkling pumps switch on automatically as soon as the maximum fill level is reached.

### 5.2 Switching off the exhaust air cleaner



Figure 5-2: Master switch off

The exhaust air cleaning system is switched off at the master switch. This (see figure 5-2) must be held down for this purpose for at least 3 seconds on the controller.

## 6 Maintenance and cleaning

General cleaning and service tasks must be carried out by the operator on a regular basis. In addition to the maintenance contract, the following tasks must be performed:

### Daily function check

- Supply pump in the water reservoir
- Visual check of the nozzles
- pH value of the process water
- Fill level in the sulphuric acid container
- Pressure increase through the filling unit

### Regular cleaning tasks

- Cleaning the filling unit:

Clean the filling unit thoroughly after each fattening cycle or when the red traffic light is displayed on the controller. Perform the cleaning with a high pressure cleaner with mains or spring water. If chemicals or cleaning additives are used, the possibility of reactions between these and the process water and possible health hazards must be excluded. Furthermore, the compatibility with the construction materials should be examined.

A high-pressure cleaner with a minimum output of 26 l/min and 180 bar should be used for cleaning in conjunction with a flat fan nozzle. When doing so a sufficient spray distance should be maintained so that the filling unit is not damaged (at least 10 cm).

### Cleaning procedure:

1. Switch the exhaust air scrubber off at the control cabinet (see chapter 5.2).
2. Then open the ball valves in the riser pipes and sprinkling line to drain off the standing water in the pipes. Manually open the non-return valves by pressing the plastic body upwards. At the same time check the valve for contamination and deposits.
3. Then discharge the process water from the basin. Simultaneously turn the cleaning nozzles 180° to the front so that the nozzle discs can be cleaned. Dispose of the process water as per regulations.
4. Unscrew blocked nozzles and remove foreign objects from the nozzles. Also check the mounting clips on the nozzle fitting for possible blockages and also clean the mounting clips.

5. Clean every filling unit separately. Start at the top left and move slowly to the right with the flat fan nozzle of the high-pressure cleaner. Proceed in this way systematically from top to bottom. The nozzle must be held at an angle pointing downward during cleaning.
6. Clean the other side according to the same procedure.
7. If, once the rear of the first filter wall has been cleaned, dirt appears again on the front, then this must be rinsed off with plenty of water.
8. After cleaning the filling unit, wash out the basin with the high-pressure cleaner. Remove sludge, dirt etc.

### Recommissioning the scrubber after cleaning

1. Turn the cleaning nozzles back again by 180°.
  2. Close all previously opened ball valves.
  3. Reset the switch for the fresh water valve to automatic.
  4. Now reset all manual switches to automatic.
- The system commences operation once the basin is filled with sufficient water.



Log the completed cleaning and restart in the electronic operation diary (required documentation).

### Unscheduled cleaning without water change

The automated spraying of the 1st wet filter wall in clocked cycles ensures that no blocking of the filter occurs due to high dust loads. However, if the pressure losses between the cleaning intervals unexpectedly become too great, cleaning outside the planned cycle is essential.



The pump sump with the supply pumps must always remain filled with water after a water change so that dirt particles do not cake in the pump.  
The filling units should remain damp until cleaning so that soiling does not become caked.

### Process water change

The change of process water in the water reservoir must always occur after completion of the broiler production cycle.

Then clean the concrete basin of the water reservoir with a high-pressure cleaner. After bedding is spread in the house, the water reservoir basin must remain free of foreign objects (straw, plastic parts).

## 6.1 Calibration of the pH electrode

The pH-electrode must be calibrated at regular intervals (every 4 weeks). This maintenance process is very important in order to guarantee a reliable electrode function.

- Take the pH-electrode out of the packing when setting the system into operation and connect the blue BNC-plug of the pH-electrode to the blue BNC-connector of the LDPH with the designation "pH".
- Remove the protection cap from the pH-electrode.



- Plug the connector in the socket.  
The display of the LDPH" appears.



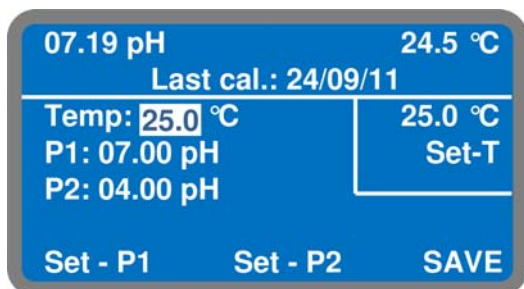
- Press the key "▶" 2 times until „**PROBE**“ flashes inversely and confirm with < **ENTER** >.



- Set the four-digit password 2 by means of the arrow keys.  
In the delivery status, the password is "0 0 0 0".
- The values can be set with the keys "▲" and "▼".
- Confirm the entry with



- Press < **ENTER** > once again to open the submenu „Calibrate“.

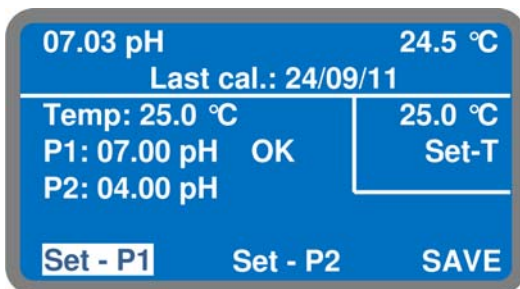


In the upper third of the display, following values are indicated:

- The current measured pH-value is displayed on the left.
- The current measured temperature appears on the right (if a temperature sensor is connected).
- In the second line, the date of the last calibration is displayed.

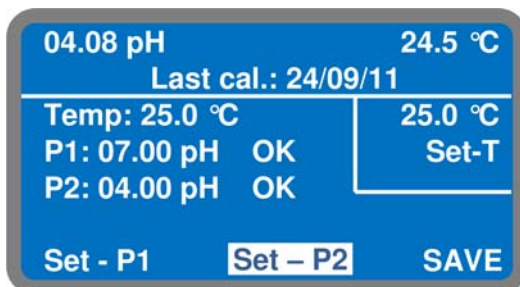
In the middle third of the display, the input value for the calibration temperature is displayed inversely.

- Press the key "►" until the field "**Set -P1**" is displayed inversely.



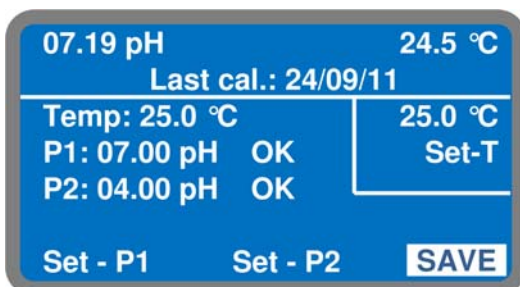
### Calibration of the zero point of the electrode „P1“:

- Immerse the pH-electrode in the bottle with the buffer solution "pH 7". The current value measured by the pH-electrode is displayed top left.
- Slightly swirl the pH-electrode in the bottle and wait until the value on the display is stabilized..
- Press < **ENTER** > in order to confirm the calibration. Now "**OK**" appears now behind P1.
- Press the key "▶" to open the menu point "**Set-P2**".



### Calibration of the electrode rate of rise „P2“:

- Wipe the pH-electrode with a clean paper towel and immerse it in the bottle with the buffer solution "pH 4". The current value measured by the pH-electrode is displayed top left.
- Slightly swirl the pH-electrode in the bottle and wait until the display value is stabilized.
- Press < **ENTER** > in order to confirm the calibration. Now "**OK**" appears behind P2.



- Press the key "▶" to open the menu point "**SAVE**" and confirm with < **ENTER** > to carry out the calibration.



With "SAVE?" you will again be prompted to save the new calibration.

- Press < **ENTER** > to save the new calibration values.
- Or press < **ESC** > to retain the old values.
- Install the pH electrode in the inline electrode holder (see general diagram on page 63).

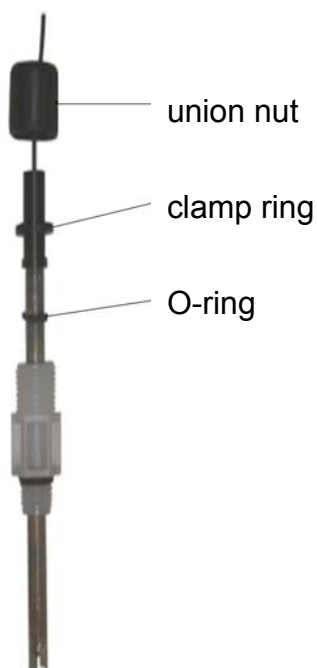


Figure 6-1: Installation of the pH electrode

## 7 Waste water disposal

The purging of the water reservoir basin is to be carried out manually by the operator. The wash water must always be completely replaced after each production cycle. The exhaust air cleaner then to be cleaned with fresh water.

### 7.1 Waste water volumes

The annual quantity of slurry produced is dependent on the number of installed modules. Per wash water change, with a filling level of 0.3m per module, the slurry quantities stated in table 7-1 are generated.

Table 7-1: Process water volumes is relation to the number of installed modules.

Number of modules	Basin dimensions [m]	m <sup>3</sup> per process water change
1	7 x 4.5 x 0.3	9,5
2	12 x 4.5 x 0.3	16,2
3	17 x 4.5 x 0.3	22,9
4	22 x 4.5 x 0.25	29,7
5	27 x 4.5 x 0.25	36,4
6	32 x 4.5 x 0.25	43,2

### 7.2 Storage

The process water may not be stored in the same container with the slurry. Microbial decomposition processes can convert the ammonium sulphate contained in the process water (sulphate inhalation) and release toxic hydrogen sulphide which is toxic for humans.

If the slurry is temporarily stored, the slurry tank or other storage option for the slurry be rated according to the specifications in table 7-1 . The slurry tank must be made corrosion-resistant by the use of acid-resistant concrete (exposure class XA3) and a suitable sealant (epoxy resin).



The mixing of process water with slurry can cause the release of toxic hydrogen sulphide.



The formation of toxic hydrogen sulphide during blending is prevented by the following measures.

- Neutralization of the process water before blending (see chapter 7.3).
- Agitation in the fluid mixing tank to ensure complete mixing during blending.
- Sufficient fresh air feed/air exchange rates in the fluid mixing tank.

### 7.3 Reuse for agricultural purposes

The elutriated process water can certainly be used for agricultural purposes. With direct application, the low pH value of 3.0 should be taken into account, which depending on the soil type and plant community can damage the soil structure and inflict acidic burns on the plant population.

For this reason, neutralization of the process water before application is recommended. This can be achieved by chemical neutralization or dilution. Chemical neutralization to a pH value 5 can be achieved by adding sodium hydrogen carbonate to the wash water.

- 500g sodium hydrogen carbonate ( $\text{NaHCO}_3$ ) per  $\text{m}^3$  process water

To adjust the pH of the process water to a neutral value by dilution, the following ratios are required:

- Fresh water/process water: 2,5:1
- Slurry/process water: 1:10

It should not be attempted to adjust the pH value above 5 by neutralization as above a pH value of  $> 6$  the dissociation balance  $\text{NH}_3/\text{NH}_4$  (ammonium/ammonia) to  $\text{NH}_3$  changes and  $\text{NH}_3$  (ammoniac) can be released.


The ammoniac ( $\text{NH}_3$ ) trapped in the process water is present as ammonium ( $\text{NH}_4$ ) in the wash water. The concentration can increase to up to 10g  $\text{NH}_4\text{-N/l}$  depending on the runtime and ammonia load. Other nitrogenous components ( $\text{NO}_2\text{-N}$  and  $\text{NO}_3\text{-N}$ ) do not have a significant effect due to the low pH value. It is recommended to have a nitrogen analysis of the process water performed at regular intervals. The nitrogen quantities bound in the process water should be taken into account in the calculations of required fertilizer quantities.

If it is not possible to reuse the process water for agricultural purposes, it must be properly disposed of.

## 8 Replacement parts list

### 8.1 Sensors

All sensors for process monitoring are adjusted in the controller in the factory and are available for use immediately after installation with the exception of the pH control unit.

	<p><b>Important:</b></p> <p>Only sensors exclusively approved by <b>Big Dutchman</b> may be used. The connection of other sensors that are not approved can result in the computer being damaged.</p>
-----------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### 8.2 Other components

Code no.	Description	Graphics
60-50-0066	filling unit	
60-50-0065	immersion pump sprinkling	
60-50-0064	immersion pump spraying	
60-50-0050	water level sensor	
60-50-0094	pH transmitter	
60-50-0096	pH electrode	
60-50-0063	pump pressure sensor	
61-00-0020	air pressure sensor	

## 9 Technical data


MagixX B	Unit
<b>Number of washing stages:</b>	1 stage
wet filter wall	15 cm
- pH value of the acid stage	3,0-3,3
<b>Precipitation capacities:</b>	
- ammonia	>70 %
- suspended dust	>70 %
- PM <sub>10</sub>	>70 %
<b>Filter loads:</b>	
Filter surface load*	2800m <sup>3</sup> /m <sup>2</sup> h
Filter volume load	20000m <sup>3</sup> /m <sup>3</sup> h
<b>Water and power consumption:</b>	
Power consumption:	0.05kWh/day and bird**
Water consumption	0.6-4.0l/bird**
Pressure increase:	<100 Pa
Sulphuric acid consumption:	0.1kg H <sub>2</sub> SO <sub>4</sub> /bird per year**
Slurry:	0.55l/bird**
N-concentration wash water:	<5g/l
Building requirement:	1.1-1.4m <sup>3</sup> per 1000m <sup>3</sup>

\* Ratio of max. air flow rate and inflow area


\*\* Consumption values are based on keeping of broilers in short batch

## 10 What to do if ..... First aid with fault analysis


### 10.1 No actuator is activated

No actuator is activated		The IO outputs of the controller are switched off.
--------------------------	-----------------------------------------------------------------------------------	----------------------------------------------------


Possible causes:


	The master switch is set to "Off"	
<input checked="" type="checkbox"/>	Set the master switch to "On".	


### 10.2 A pump is not running

A pump is not running		Not all conditions are fulfilled for the pump to run.
-----------------------	-----------------------------------------------------------------------------------	-------------------------------------------------------

Possible causes:

	The filling level of the water reservoir is lower than the parameterized dry running limit	
<input checked="" type="checkbox"/>	Check the filling level in the water reservoir.	

	The current module is not activated by the climate computer or by the rotation.	
<input checked="" type="checkbox"/>	Check the control by climate computer and rotation.	

	The spraying pump has been switched off according to the clocked cycle.	
<input checked="" type="checkbox"/>	Check the parameterized times via the setup.	


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### 10.3 Fresh water inlet valve does not open


<b>Fresh water inlet value does not open</b>		Not all conditions are fulfilled so that the fresh water inlet valve can open.
----------------------------------------------	-----------------------------------------------------------------------------------	--------------------------------------------------------------------------------

**Possible causes:**


	The current filling level is higher than the closing boundary.	
<input checked="" type="checkbox"/>		Check the filling level.

	If the closing boundary was exceeded, the filling level has not yet fallen below the closing boundary again.	
<input checked="" type="checkbox"/>		Check the filling level.

### 10.4 Display of sensor is incorrect

<b>Display of sensor is incorrect</b>		The sensor is not correctly parameterized.
---------------------------------------	-------------------------------------------------------------------------------------	--------------------------------------------

**Possible causes:**

	The sensor is not correctly parameterized. (IO type, signal range)	
<input checked="" type="checkbox"/>		Check and adjust the sensor parameterization (see the chapter "Controller").


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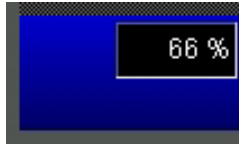
Fax: +49 (0)4447-801-237

Email: [big@bigdutchman.de](mailto:big@bigdutchman.de)


## 10.5 Water level error


Water level error		The water level in the reservoir basin is not at the normal level.
-------------------	-----------------------------------------------------------------------------------	--------------------------------------------------------------------


Symbol:



### Possible causes:


	The water supply has been interrupted ( <b>min. alarm</b> ).	
<input checked="" type="checkbox"/>	Check your central water supply	
<input checked="" type="checkbox"/>	Check the float on the level sensor.	
<input checked="" type="checkbox"/>	Check the water outlet and the respective water basin for leaks.	
<input checked="" type="checkbox"/>	Check the solenoid valve in the central water supply with the manual switching function. <ul style="list-style-type: none"> <li>• If the solenoid valve should open then there is a problem inside the exhaust air scrubber controller.</li> <li>• If the solenoid valve does not open then the solenoid valve is defective.</li> </ul>	


	The float valve in the water supply does not close correctly ( <b>max. alarm</b> ).	
<input checked="" type="checkbox"/>	Check the function of the float valve through manual actuation. If the float valve does not close correctly, attempt to clean the float valve.	

	The float valve in the basin is not functioning correctly ( <b>min. or max. alarm</b> )	
<input checked="" type="checkbox"/>	Check the function of the float valve through manual actuation. If the float valve does not close correctly, try cleaning the float valve.	
<input checked="" type="checkbox"/>	Check the switching function by manually actuating the level sensor (min. 5 sec). If the alarm message, which is signalled via a red bar in the basin, does not disappear then the level sensor is defective.	

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 Email: big@bigdutchman.de

### 10.6 Alarm pH value


<b>Alarm pH value</b>		<b>The pH value displayed does not lie within the prescribed pH value level.</b>
-----------------------	-----------------------------------------------------------------------------------	----------------------------------------------------------------------------------


	<p><b>Warning!</b></p> <p>When handling the dosing equipment and the sulphuric acid, please observe the safety datasheet "Sulphuric acid 96%" (see Appendix)</p>
-----------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------

Symbol:



**Possible causes:**

	<b>The acid dosing has been interrupted (max. alarm)</b>	
<input checked="" type="checkbox"/>		Check the acid supply.
<input checked="" type="checkbox"/>		Check the function of the acid dosing pump.
<input checked="" type="checkbox"/>		Check the suction line from the acid barrel to the dosing pump for trapped air. Deaerate the dosing pump again, if this is necessary. Follow the instructions in the dosing pump manufacturer's manual.


	<b>The pH value electrode is not functioning correctly (min. or max. alarm)</b>	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Check the function of the acid dosing pump. Use the 100% button to operate the pump for a short time at 100% dosing capacity.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Check the calibration of the pH value sensor with the aid of the litmus paper supplied. This will provide you with an initial indication of the accuracy of the value displayed in the pH value controller. If, despite carrying out the service and maintenance work stipulated in the maintenance contract, a renewed calibration of the pH value sensor should be necessary, then proceed as described in the operating instructions. If renewed calibration is no longer possible then replace the pH value sensor.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Follow the instructions in manufacturer's manual for the pH control unit.

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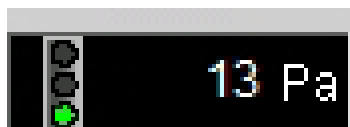
	<p><b>Warning!</b></p> <p>When handling the dosing equipment and the sulphuric acid, please observe the safety datasheet "Sulphuric acid 96%" (see Appendix)</p>
-------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------





## 10.7 Alarm differential pressure

<b>Alarm differential pressure</b>		<b>The displayed differential pressure between the individual cleaning stages does not lie within the prescribed differential pressure levels.</b>
------------------------------------	-----------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------

Symbol:



### Possible causes:

	The zero point adjustment of the pressure sensors used is incorrect ( <b>min. alarm</b> ).	
<input checked="" type="checkbox"/>		Check the zero point adjustment of the pressure sensors used. You can do this by briefly manually switching the ventilation in the sty to 0%. In this case all pressure sensors should display a value of 0 Pa. If the displayed values do not drop to 0 Pa then the respective sensor must be replaced.
	The pressure increase over the wet filter walls is too high ( <b>max. alarm</b> ).	
<input checked="" type="checkbox"/>		Check the condition of the dry and wet filter walls. If renewed cleaning should be necessary despite observing the cleaning intervals stipulated in the operating and maintenance manual, clean the wet filter walls immediately.
<input checked="" type="checkbox"/>		Check the max. display of the pressure sensors. You can do this by briefly manually switching the ventilation in the henhouse to 100 %. The absolute values depend on the degree of contamination of the filter walls and cannot therefore be precisely given.












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# 11 Copy templates for operating instructions

Company: _____ <b>DIRECTIVE</b>	
Working area: <u>Exhaust air cleaner</u>	According to § 14 GEFSTOFFV 
Responsible: _____ Signature	Place of work: Exhaust air cleaner pig house Kind of activity: Replacement of the sulphuric acid store
<b>Name of the substance</b>	
Concentrated sulphuric acid (96%) _____	
<b>Risks for Persons and Environment</b>	
	<ul style="list-style-type: none"> <li>- Causes severe chemical burns and badly healing wounds</li> <li>- Released vapours and aerosols may have health effects on the mucous membranes and eyes</li> <li>- Great development of heat when mixing it with water</li> <li>- Concentrated sulphuric acid may destroy organic substances under carbonization</li> </ul>
<b>Safety measures and codes of behaviour</b>	
      	<ul style="list-style-type: none"> <li>- Wear close-fitting protective glasses/face protection, acid-proof gloves, e.g. from butyl rubber - butyl: 0.5 mm, rubber boots and plastic apron when working with concentrated sulphuric acid</li> <li>- For dilution, give acid slowly into the water while stirring continuously. Never inversely!</li> <li>- Do not smoke, eat or drink at the work place and do not store any food here</li> </ul>
<b>Behaviour in case of danger</b>	
	<ul style="list-style-type: none"> <li>- Neutralize leaked acid by means of lime or soda and wash it away with plenty of water</li> <li>- If greater vapour quantities or fog occur, leave the danger area immediately</li> <li>- Wear respirator mask with filter P2 (white)</li> </ul>
Emergency call: _____	
<b>First aid</b>	
	<ul style="list-style-type: none"> <li>- Remove wetted clothing immediately</li> <li>- After skin contact, rinse out with plenty of water for at least 15 minutes</li> <li>- After eye contact rinse out with eye shower or plenty of water for at least 15 minutes with the eye lid held wide open</li> <li>- Inform first aider and call a physician immediately</li> </ul>
Emergency call: _____ First aider: _____	
<b>Appropriate disposal</b>	
<ul style="list-style-type: none"> <li>- Dilute sulphuric acid carefully with plenty of water and neutralize it in the compensation basin</li> <li>- Collect remaining quantities and dispose of according to the specifications</li> </ul>	

## 12 EU safety datasheet - sulphuric acid 96 %

Safety data sheet in accordance with regulation (EC) No 1907/2006		BÜFA Chemikalien GmbH & Co. KG	
Trade name: Sulfuric acid ca. 96%	Date revised: 13.04.10		
# 1000908/1000908	Version: 2 / DE	Master No. M-006	Date of printing: 05.05.10
<b>01. <u>Identification of the substance/preparation and of the company/undertaking</u></b>			
<b>Trade name</b>			
Sulfuric acid ca. 96%			
<b>Use of the substance/preparation</b>			
Base chemical with not specially defined use			
<b>Company/undertaking identification</b>			
<b>Address</b>			
BÜFA Chemikalien GmbH & Co.KG			
An der Autobahn 14			
27798 Hude / Altmoorhausen			
Telephone no.	+49 4484 9456 852		
Fax no.	+49 4484 9456 863		
Information provided by / telephone	Department product safety		
Emergency telephone	Giftzentrale Göttingen: +49 551 19 240		
E-mail address of person responsible for this SDS	produktsicherheit-c@buefa.de		
<b>02. <u>Hazards identification</u></b>			
<b>Classification</b>			
Classification	C, R35		
<b>Hazard symbols</b>			
C	Corrosive		
<b>R phrases</b>			
35	Causes severe burns.		
<b>03. <u>Composition / information on ingredients ***</u></b>			
<b>Hazardous ingredients ***</b>			
<b>Sulphuric acid ...%</b>			
CAS no.	7664-93-9		
EINECS no.	231-639-5		
Concentration	>=	50	%
Classification	C, R35		
Complete text of R-phrases in Chapter 16			
<b>04. <u>First aid measures</u></b>			
<b>General information</b>			
Remove affected person from danger area, lay him down. Remove contaminated, soaked clothing immediately and dispose of safely. Irregular breathing/no breathing: artificial respiration. If the patient is likely to become unconscious, place and transport in stable sideways position.			
<b>After inhalation</b>			
Remove the casualty into fresh air and keep him calm. Keep warm, calm and covered up. If the patient is likely to become unconscious, place and transport in stable sideways position. Summon a doctor immediately.			

Safety data sheet in accordance with regulation (EC) No 1907/2006		BÜFA Chemikalien GmbH & Co. KG	<b>BUFA</b>
Trade name: Sulphuric acid ca. 96%		Date revised: 13.04.10	
# 1000908/1000908	Version: 2 / DE	Master No. M-006	Date of printing: 05.05.10

**After skin contact**  
Wash immediately with plenty of water for several minutes. Summon a doctor immediately.

**After eye contact**  
Separate eyelids, wash the eyes thoroughly with water (15 min.). Summon a doctor immediately.

**After ingestion**  
Rinse out mouth and give plenty of water to drink. Do not induce vomiting. Summon a doctor immediately.

**05. Fire-fighting measures**

**Suitable extinguishing media**  
Carbon dioxide, Dry powder, Water spray jet, Alcohol-resistant foam

**Non Suitable extinguishing media**  
Full water jet

**Special exposure hazards arising from the substance or preparation itself, its combustion products or from resulting gases**  
In case of combustion evolution of dangerous gases possible.

**Special protective equipment for fire-fighting**  
Use self-contained breathing apparatus. Acid-resistant protective clothing

**Other information**  
Collect contaminated fire-fighting water separately, must not be discharged into the drains.

**06. Accidental release measures**

**Personal precautions**  
Use personal protective clothing. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use breathing apparatus if exposed to vapours/dust/aerosol.

**Environmental precautions**  
Do not allow to enter drains or waterways. Do not discharge into the subsoil/soil. In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

**Methods for cleaning up**  
Pick up with absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr). When picked up, treat material as prescribed under heading "Disposal".

**07. Handling and storage**

**Handling**

**Advice on safe handling**  
Keep container tightly closed. Open and handle container with care. Avoid formation of aerosols. When diluting, always stir product into water.

**Advice on protection against fire and explosion**  
No special measures necessary. The product is not combustible.

**Storage**

**Requirements for storage rooms and vessels**  
Provide acid-resistant floor. Keep only in the original container.


**Hints on storage assembly**  
Do not store together with: Alkalies, Metals, Reducing agents

**Further information on storage conditions**  
Keep container tightly closed and dry in a cool, well-ventilated place.

**VCI storage category**

Safety data sheet in accordance with regulation (EC) No 1907/2006		BÜFA Chemikalien GmbH & Co. KG	<b>BUFA</b>
Trade name: Sulphuric acid ca. 96%		Date revised: 13.04.10	
# 1000908/1000908	Version: 2 / DE	Master No. M-006	Date of printing: 05.05.10
VCI storage category	8B	Non-combustible corrosive substances	
<b>08. <u>Expose controls/personal protection</u> ***</b>			
<b>Exposure limit values ***</b>			
<b>Sulphuric acid ...%</b>			
Type	MAK		
Value	0,1	mg/m <sup>3</sup>	
Ceiling limit value	1		
Pregnancy group	Y		
Remarks	35, TRGS 901-104, DFG		
<b>General protective and hygiene measures</b>			
Remove soiled or soaked clothing immediately. Avoid contact with eyes and skin. Keep separated from food-stuffs and feed-stocks. At work do not eat, drink, smoke or take drugs. Wash hands before breaks and after work. Do not inhale gases/vapours/aerosols.			
<b>Respiratory protection</b>			
Short term: filter apparatus, combination filter B-P3; Self-contained breathing apparatus.			
<b>Hand protection</b>			
impermeable gloves			
Appropriate Material	viton		
Material thickness	>=	0,7	mm
Penetrating time	>=	480	min
<b>Eye protection</b>			
Tightly fitting safety glasses			
<b>Skin protection</b>			
Acid-resistant protective clothing			
<b>09. <u>Physical and chemical properties</u></b>			
<b>General information</b>			
Form	liquid		
Colour	colourless		
Odour	odourless		
<b>Boiling point</b>			
Value	appr.	310	°C
<b>Melting point</b>			
Value	appr.	-10	°C
<b>Vapour pressure</b>			
Value	<	0,0001	hPa
temperature		20	°C
<b>Density</b>			
Value		1,835	g/cm <sup>3</sup>
temperature		20	°C
<b>Viscosity</b>			
<b>dynamic</b>			
Value		21,6	mPa.s
temperature		20	°C
<b>Solubility in water</b>			
Remarks	Completely miscible		
<b>pH</b>			
Value	<	1	
temperature		20	°C

Safety data sheet in accordance with regulation (EC) No 1907/2006		BÜFA Chemikalien GmbH & Co. KG	<b>BUFA</b>
Trade name: Sulphuric acid ca. 96%			Date revised: 13.04.10
# 1000908/1000908	Version: 2 / DE	Master No. M-006	Date of printing: 05.05.10
<b>10. <u>Stability and reactivity</u></b>			
<b>Conditions to avoid</b>			
No decomposition if used as prescribed.			
<b>Materials to avoid</b>			
Reactions with metals, with evolution of hydrogen. Reacts strongly with water. Addition of water leads to increase in temperature. Reactions with alkalies.			
<b>Hazardous decomposition products</b>			
sulphurous oxides (SO <sub>x</sub> )			
<b>Other information</b>			
When diluting, add acids to water, never the other way around.			
<b>11. <u>Toxicological information</u></b>			
<b>Acute toxicity / further data</b>			
<b>Acute oral toxicity</b>			
Species	rat		
LD50	2140		mg/kg
<b>Irritant/corrosive effects</b>			
<b>Irritant effect on skin</b>			
valuation	strongly corrosive		
Remarks	Irritating effects on the skin and mucous membrane.		
<b>Irritant effect on eyes</b>			
valuation	strongly corrosive		
<b>Sensitization</b>			
valuation	non-sensitizing		
<b>Effects after repeated or prolonged exposition (subacute, subchronic, cronic)</b>			
<b>Other information</b>			
Phrase nicht verfügbar.			
<b>12. <u>Ecological information</u></b>			
<b>General information / ecology</b>			
Do not discharge into the drains/surface waters/groundwater. Do not allow to enter soil, waterways or waste water canal. Toxic to aquatic organisms. Phrase nicht verfügbar. Do not release into waterways untreated.			
<b>13. <u>Disposal considerations</u></b>			
<b>Disposal recommendations for the product</b>			
Allocation of a waste code number, according to the European Waste Catalogue (EWC), should be carried out in agreement with the regional waste disposal company.			
<b>Disposal recommendations for packaging</b>			
Packaging that cannot be cleaned should be disposed off in agreement with the regional waste disposal company.			
<b>14. <u>Transport information</u></b>			
<b>Land transport ADR/RID</b>			
UN number	1830		
Class	8		
Packing group	II		

Safety data sheet in accordance with regulation (EC) No 1907/2006		BÜFA Chemikalien GmbH & Co. KG	
Trade name: Sulfuric acid ca. 96%		Date revised: 13.04.10	
# 1000908/1000908	Version: 2 / DE	Master No. M-006	Date of printing: 05.05.10
Label	8		
Technical name	SULPHURIC ACID		
Tunnel limitation code	E		
<b>Marine transport IMDG/GGVSee</b>			
UN number	1830		
Class	8		
Packing group	II		
Technical name	SULPHURIC ACID		
EmS	F-A, S-B		
<b>15. Regulatory information ***</b>			
<b>Labelling in accordance with EC directives ***</b>			
The product is classified and labelled in accordance with EC directives/the relevant national laws.			
<b>Registration no.</b>			
EC No.:	231-639-5		
<b>Hazard symbols</b>			
C	Corrosive		
<b>Hazardous component(s) to be indicated on label</b>			
contains ***	Sulphuric acid ...%		
<b>R phrases</b>			
35	Causes severe burns.		
<b>S phrases ***</b>			
26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.		
36/37/39	Wear suitable protective clothing, gloves and eye/face protection.		
45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).		
60	This material and its container must be disposed of as hazardous waste.		
<b>National regulations</b>			
<b>Water Hazard Class (Ger.)</b>			
Water Hazard Class (Ger.)	WGK 1		
Classification according to VwVwS			
<b>16. Other information</b>			
<b>R-phrases of the ingredients listed in chapter 3</b>			
35	Causes severe burns.		
<b>Department issuing safety data sheet</b>			
Department product safety			
This information is based on our present state of knowledge. However, it should not constitute a guarantee for any specific product properties and shall not establish a legally valid relationship.			