

ACETIC ACID DOSING STATION

The main part of the energy costs in a waste water treatment plant is required to create the compressed air for the aeration system. Considering possible limescale deposits in diffusers with TPU-membrane, we recommend a periodical addition of acetic acid (30%) into the compressed air, as and when required. The vital necessity of such a treatment is in particular given in plants with high amount of chalky waste water.

In some cases, the limescale deposits can be removed, the pressure loss of the aeration system can be reduced and the reliability of the diffusers can be increased by cleaning the aeration system with acetic acid.

The success of this step is dependent on different issues and has to be tested individually on site. The acid resistance of the system has to be checked carefully!

Supratec is offering a mobile dosing station for the optimally dosed cleaning. Ready-to-use, the dosing station can temporarily be stored and easily installed to a dosing connection at the air piping, if required.

System pressure has to be recorded and controlled/compared at site under consideration of identical operation conditions (air amount, water level) to ensure a safe and long lasting operation of the aeration system.

1. PARTS

The mobile acetic acid dosing station is designed for the mobile use in any waste water treatment plants and consists of following main parts:

- flatcar with 4 wheels, fixing brake and acid proofed dike, usable for putting 2 x 60 l container at the maximum
- pump type AKL 603 NHH2000
 - o nominal capacity: about 8 l/h at an admissible counter pressure of max. 12bar
 - o suction height (max.): 1,5mWC
- Remark:
- The capacity is dependent on counter pressure. As a result of the counter pressure of about 1,4bar of the check valve supplied with the acetic acid doing station, a capacity of approx. 21l/h is achieved with a stroke of 100%.
- suction section:
 - o suction lance (length: 1 m) for withdrawal of acetic acid out of the container
 - o connection hose between suction lance and pump: length 1 m
- pressure section:
 - o hose (length: 10 m)
 - o check valve with male thread R $\frac{1}{2}$ "
 - o 1 x nozzle with male thread G $\frac{1}{4}$ " for installation into the dosing point at the air pipe(=supply limit Supratec, please compare drawing A8775-2).
- chemical gas absorber (only as an option within the scope of supply for the indoor-version).

Neither any container nor any acetic acid isn't within the scope of supply of Supratec.

DESIGN:

The acetic acid dosing station is usable for:

- temperature at the dosing point $\leq 120^{\circ}\text{C}$
- acetic acid $\leq 30\%$
- ambient temperature $> 5^{\circ}\text{C}$, since the acetic acid crystallizes with lower temperatures
- for exteriorly usage out of closed rooms only (outdoor-version)

As an option an indoor-version for an operating in closed rooms is available. A subsequent upgrade of an outdoor-version to an indoor-version is optional possible.



picture: acetic acid dosing station

2. INSTALLATION SITE:

Required electrical connection: 110-230 V, 50/60Hz

Required connection point: dosing point at the air pipe in front of the aeration system for mounting the nozzle G $\frac{1}{4}$ " please compare drawing A8775-2);

For using the mobile dosing station, one connection unit (please compare drawing A8775-2) is included in the scope of supply. Using several dosing points, further connection units can be ordered.

3. SAFETY INSTRUCTIONS:

The safety instructions in handling with acetic acid must be respected!

The piping should be made out of rust- and acid proofed material. If the aeration system is equipped with drainage or dewatering pipes, this system won't have to be opened during the cleaning procedure with acetic acid in order to avoid any leakage. The hazard warnings, operating and safety instructions in the manual of the dosing station have to be respected.

4. DOSING:

The kind of dosing is extremely dependent on individual situation on site, the size of diffusers, type and intensity of deposits. Using the recommended acetic acid (30%), the following approximately amount can be used at the beginning:

3 – 5 g acetic acid per day and diffuser.

Example: 400 diffusers, cleaning period every 4 weeks (=30 days) and an assuming amount of 4g per day and diffuser:

$$400 \text{ diffusers} \times 30 \text{ day} \times 4 \text{ g/diffuser/day} = 48000 \text{ g}$$

$$48000 \text{ g} / 1,07 \text{ g/cm}^3 = 44860 \text{ cm}^3 = 44,9 \text{ l}$$

This quantity can be added within a few hours. There should be some hours before starting the next cleaning procedure so that possible not evaporated residues can be dissolved.

The check of the cleaning result is tested by pressure measurement at the compressed air piping in front of the treated aeration system before and after the cleaning procedure.

If an increased pressure loss is noted again after a while, the acid addition will have to be repeated, the used amount of acetic acid and the cleaning period could be adapted, if necessary.

5. TIPS FOR TREATMENT:

The blowers should be operated in manual mode and the max. allowed air volume flow should be set up. In any case, the blower mustn't be operated in the automatic adjusting mode, since it will not be possible to note a consistent pressure.

Having connected the dosing station to the dosing point and having opened the bale valve, the dosing pump can be switched on (it must be ensured that suction lance can suck in the acetic acid). In case that liquid isn't transported by the pump despite of lifting noises (no

liquid movement in the transparent suction-/pressure-horse): switch of the pump / put suction lance into a bucket with clear water and position the bucket above the dosing pump / switch on the dosing pump until the suction-horse is filled with liquid / switch of the pump / put the suction lance back into the acetic acid and switch on the pump.

The acetic acid has to be added slowly (about 8-9 l/h or less) via a dosing point at the compressed air pipe in front of the diffusers.

To check the result of the chemical cleaning, the pressure in the system should be controlled and recorded in suitable intervals (approx. every 10-30 minutes) dependent on planned total dosing time.

Generally, a reduction of system pressure can already be recognized even before the total planned amount of acetic acid is added. In case that a considerable pressure reduction is already realized and there is no further reduction within one hour, the dosing process could be stopped, even before the planned total amount of acetic acid has been added.

Dependent on deposits, there can be a further reduction of pressure loss, even within the next 10-12 operation hours after the dosing process.

After having switched of the dosing pump, the ball valve of dosing point should be kept open for at least another 10 minutes, so that the compressed air can suck and remove any possible acid liquid remaining in the dosing point. After having closed the ball valve of the dosing point, the mobile dosing station can be disconnected from the dosing point.

6. STORAGE:

The mobile acetic acid dosing station should be stored in a clean, frost proof and secure way. The dosing station can be cleaned just by using water. Temporarily storing, the acid container has to be hermetically, safely closed. Before putting into operation, the proper functioning has to be checked, especially after a longer stand still period.

7. OUTPUT AKL 603 NHH2000

percental output with :1 counter- pressure [bar]	30%	50%	100%
1,4	6l/h	10l/h	21l/h

The output is adjusted by using the manual controller of the dosing pump

Further details in the manual of the diffusers has to be considered.

Attachments:

- drawing no A8775 (mobile acetic acid dosing station)
- drawing no A8775-2 (connection overview)

Konisch dichtende Verschraubung am Anschluss Rückschlagventil, Außengewinde R $\frac{1}{2}$ " (=Liefergrenze SUPRATEC)

conically sealing screwing joint for connection of the check valve, male thread R $\frac{1}{2}$ " (= supply limit of SUPRATEC)

Stromkabel mit Schutzkontaktstecker 100-240 VAC / 50-60 Hz (Kabellänge 1,4m)

Schuko plug 100-240VAC / 50-90 Hz Cable length 1,4m

Schlauchhalter für 10m Druckschlauch

Hose holder for pressure hose 10m

ca. 10m Druckschlauch PE (D6/4)

approx. 10m pressure hose PE (d6/4)

optionales Chemiekaliendampfschloss für Innenraumausführung

optional chemical gas absorber for indoor-version

Pumpentyp: AKL 603 NHH2000

Pumpe type: AKL 603 NHH2000

ca. 1m Saugschlauch PTFE (D6/4)

approx. 1m suction hose PTFE (d6/4)

Anschluß Trockenlaufschutz (ca. 23m)

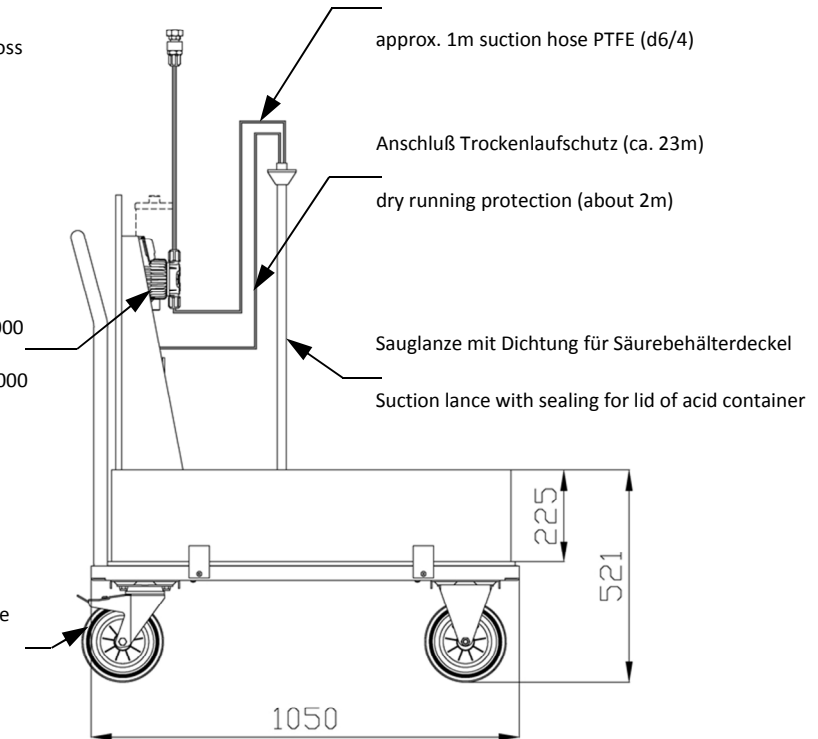
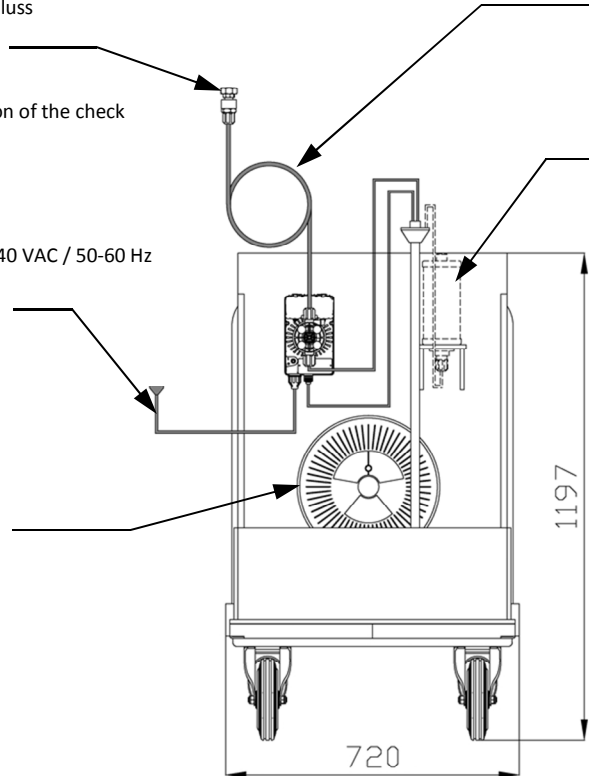
dry running protection (about 2m)

Sauglanze mit Dichtung für Säurebehälterdeckel

Suction lance with sealing for lid of acid container

Lenkrolle mit Feststellbremse

Swivel castor with brake



Hinweis:

Die Dosierlanze muss bauseits im Deckel des Säurebehälters montiert werden. Für den Fahrbetrieb sollten bauseitig Halterungen für die Liefergebände gegen Kipp/Rutschen vorgesehen werden.

Note:

The suction lance must be installed in the lid of the acid container on site. During moving the dosing unit, you should use fixations to provide the tilt / slide of the acid container.



Für Essigsäure-Dosierung wird eine Hohlkegeldüse G $\frac{1}{4}$ " mitgeliefert

A Hollow-cone nozzle G $\frac{1}{4}$ " is included within the scope of supply for dosing of acetic acid

Essigsäuresäuredosierstation acetic acid dosing station

Siehe auch Zeichnung A8775-1 für Beschreibung der Liefergrenze und der benötigten Dosierstelle(n).

For clarification of limit of supply and required dosing spot, please see drawing A8775-2.

