BINDER GROUP

Intelligent aeration with AI







11/06/2026

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Outline of the presentation

- Introduction
- BINDERGroup worldwide
- Product & Solution Portfolio
- VACOMASS® series
- Global references

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Introduction

- Started as management buyout of Alfa Laval Flow Division in 1996.
- Headquartered in Ulm, Germany.
- Core business is gas flow metering, analysis and control.
- Products are used in over 50 countries worldwide for over 3 decades.
- Products are used worldwide in water, environment and energy facilities and industries.
- Application include air and sewage gas, biogas, landfill and industrial gas.



Robert Binder
President
BinderGroup

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BINDERGroup Worldwide



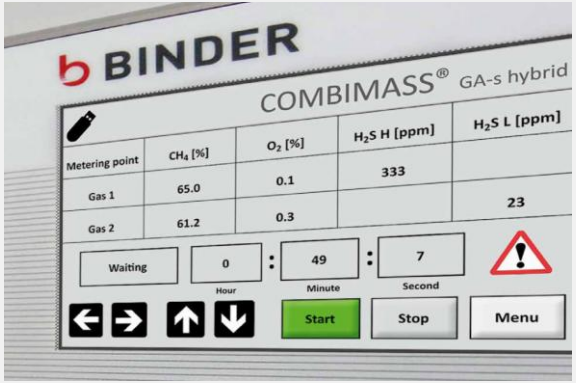
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Product & Solution Portfolio



VACOMASS®
Aeration management system for water, wastewater & sewage treatment plants.

COMBIMASS®
Gas analysis and gas flow measurement systems.



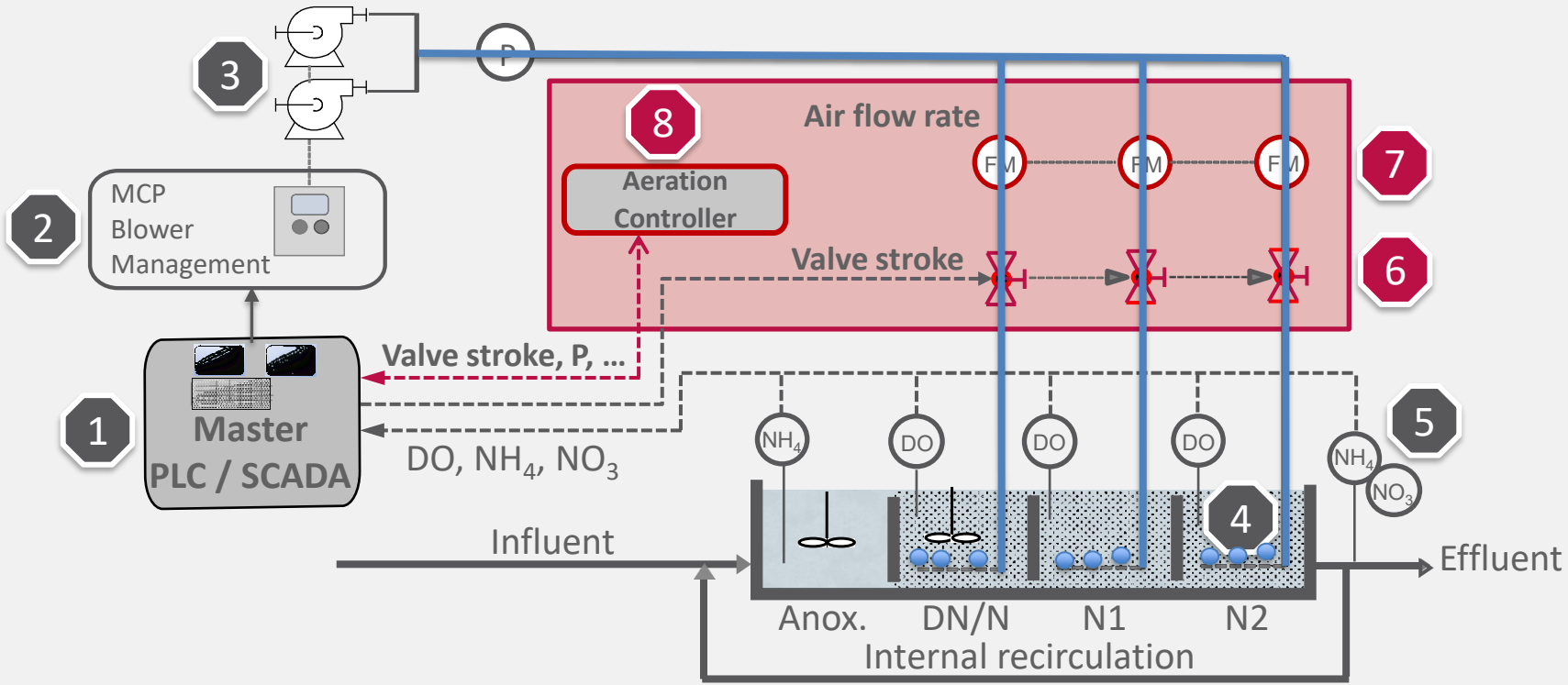
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VACOMASS®

- Aeration management system for treatment plants.
- Designed for optimised treatment in compliance to discharge norms.
- Efficient, precise and flexible aeration control.
- Stability in treatment operation.
- Modular design.
- Low life cycle cost.
- Preventive maintenance free.
- Retrofitting, modernization and new plants.



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Efficient, controllable and reliable air distribution provides the link between blowers and diffusers.

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VACOMASS®



VACOMASS® flow meter

VACOMASS® control valve





VACOMASS® flexcontrol

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VACOMASS® control valve



VACOMASS®
jet control valve



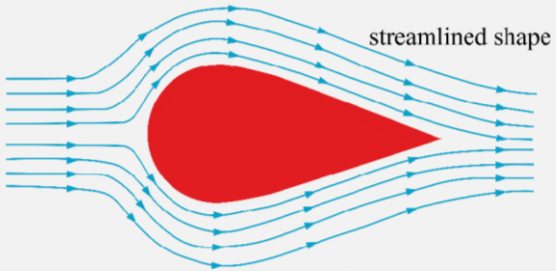
VACOMASS®
elliptic diaphragm control valve(EDCV)



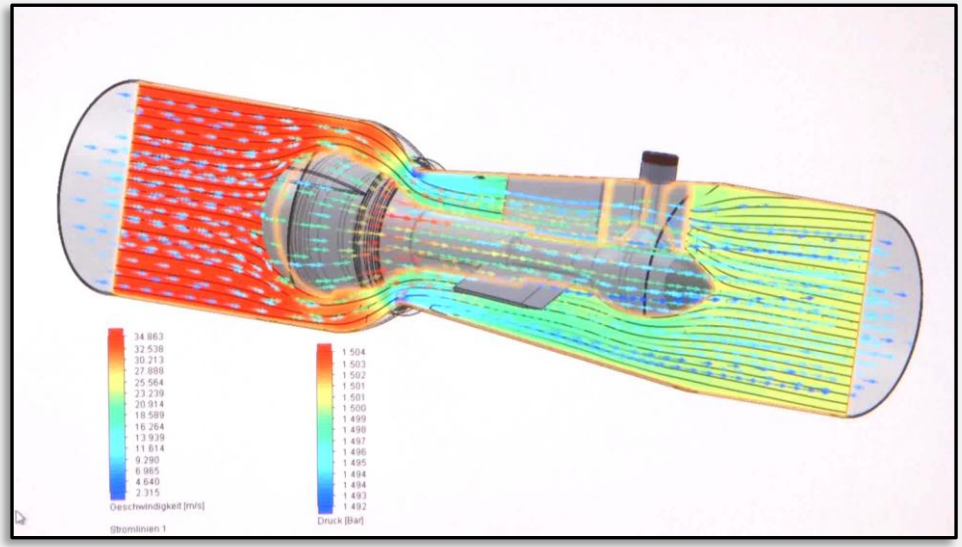
VACOMASS®
square diaphragm control valve(SDCV)

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VACOMASS® jet control valve



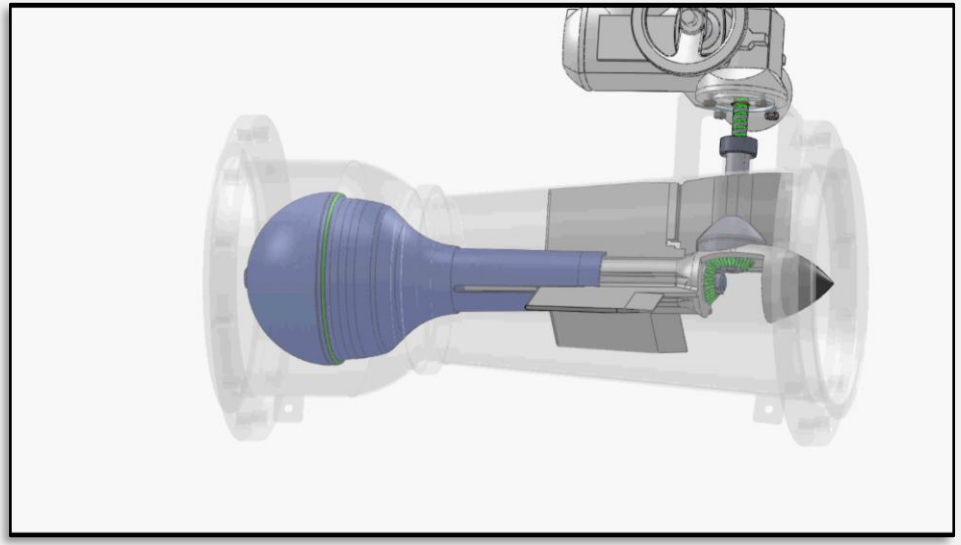
- Aerodynamically optimised air control valve
- Very low pressure loss (2-5 mbar/ cmWC)
- Robust construction
- Integrated flow conditioner
- Very short installation length
- Gas tight shut-off
- Patented design



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VACOMASS® jet control valve

- Materials: 316L/316 Ti stainless steel, Viton, Teflon/Carbon, PEEK
- Gas temperatures from -40°C to +150°C
- Maintenance free design (20+ years)
- Sizes: DN250 to DN500
- Linear control characteristic
- Control range: 5 to 100%
- Flanges: DIN, EN, ISO, ANSI



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VACOMASS® EDCV

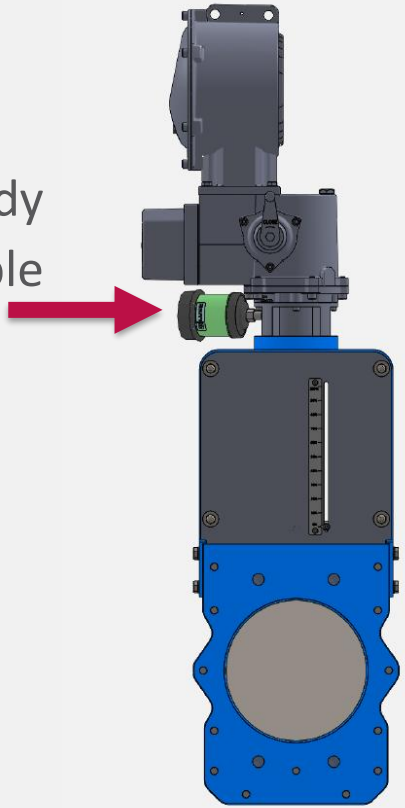
- Optimized diaphragm control valve with an extremely high air flow rate.
- Typical design control range is 10 to 70% stroke.
- Air flow rate triples when valve is opened from 70 to 100% at same pressure drop.
- Pressure drop in control mode is 10-15 mbar.
- A stable and linear working characteristic for reliable flow control.
- Gas-tight shut-off allows the use in ON/OFF zones or intermittently aerated tanks.



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VACOMASS® EDCV

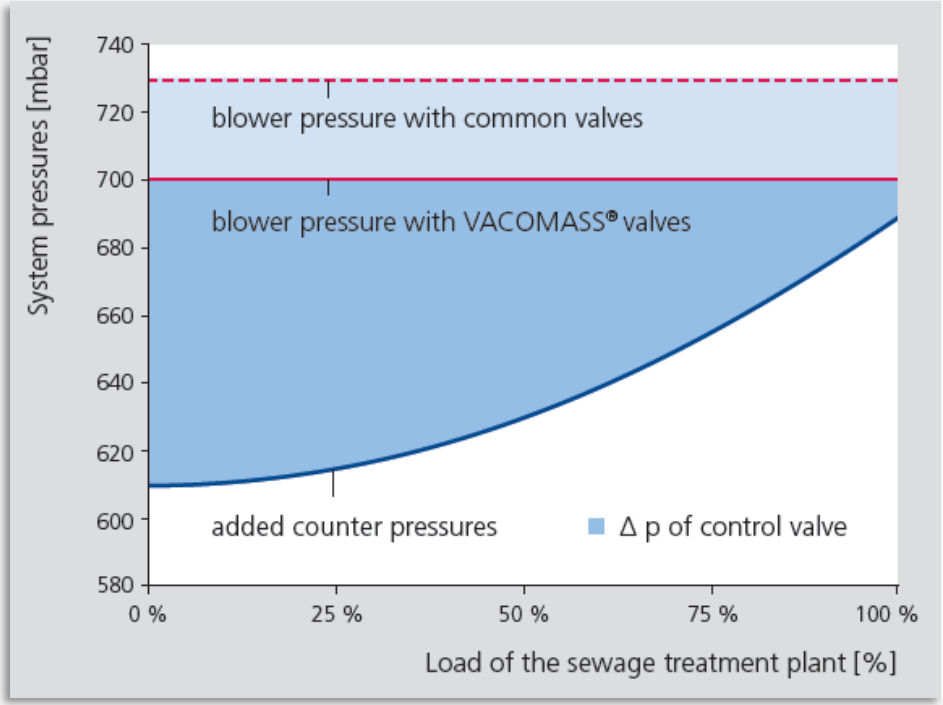
- Standard sizes: DN50 – DN400.
- Standard-Materials: Housing S235JR (galvanized body plus one layer epoxy and one layer PU coating = triple corrosion and UV-protection).
- All other parts 304 / 316 stainless steel.
- Optional Housing material: 304 SS or 316 SS.
- PTFE/ Carbon/ HNBR seals as a standard up to 120°C.
- Viton gaskets for the HT-version up to 150°C.



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Potential savings by the valve

- Conventional control valves run typically with 40-70 mbar pressure drop.
- The EDCV can control with 12-15 mbar.
- The jet control valve runs with 2-5 mbar head loss.
- Example: 50 mbar reduction at 600 mbar = 8.33% direct savings, can rise up to 15%.



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VACOMASS® flexcontrol (AI based intelligent aeration)

- Developed by BINDER Group to achieve precise and flexible aeration control for various operating conditions in wastewater treatment plants.
- flexcontrol collects data from various sensors and utilizes user defined control logic & AI to achieve efficient aeration.
- It is a modular designed, PLC-based support tool performing as a SLAVE for the plant SCADA.
- Objective is to provide a demand driven control of air supply and its distribution.



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VACOMASS® flexcontrol

- Modular HMI system, PLC with 7” graphic display
  - 760x760 for up to 8 control loops
  - 800x1,000 for up to 12 control loops
- Real-time monitoring of process data
- Aeration controller: calculates based on actual flow and stroke the new required air flow rate and related stroke
- All common types for data transmission



CE & UL versions are available

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Process related functions

- Aeration controller
- Sliding header pressure control (econtrol)
- Ammonia based DO control (DO-SET NH4-N)
- Load distribution monitoring (DO-SET KASK)
- Flexible aerated zones (Vaer-SET)
- Load depending intermittent aeration (biocontrol)
- Control of internal recirculation (IntRezi-SET)
- Load depending dosage of chemicals (CDos-SET)

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Further functions in VACOMASS® flexcontrol

Diffuser maintenance functions (5-15% Energy savings)

- DIFF-CHCK - long-term monitoring of pressure drop of diffuser
- DIFF-FLEX - flexing with a high air flow rate
- PRESS-REL - pressure release
- DIFF-CLEAN - chemical cleaning of diffuser

Monitoring of signal quality

- SENS-CHCK – for availability, plausibility, frozen or inconsitent data

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Result from various projects

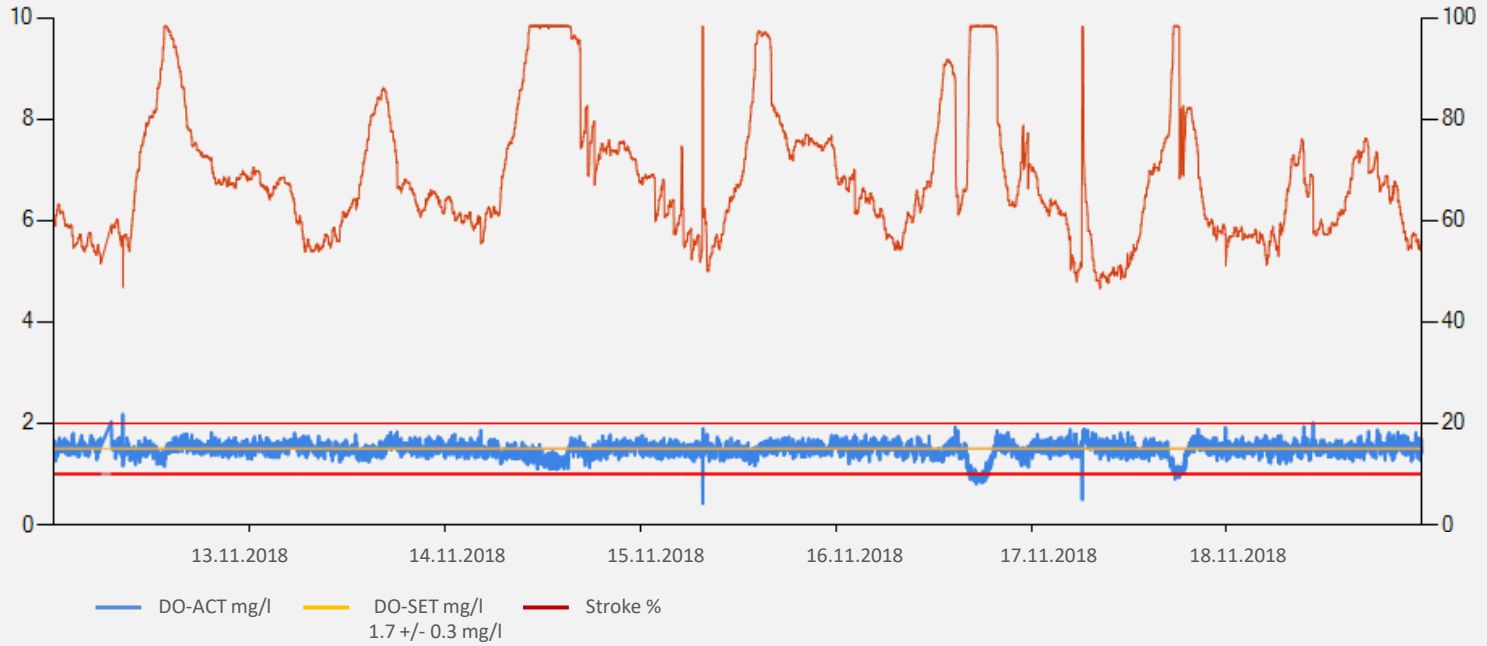
- Energy savings proven in field
  - Pressure drop of the valve: **5 – 15%**
  - Sliding header pressure: **8 – 10%**
  - Precise aeration control: **10 – 30%**
  - Ammonia-based DO-SET: **8 – 15%**
  - Diffuser maintenance: **5 – 15%**
- Reduction of total-N in the effluent
  - Precise aeration control: **10 – 25%**
  - Ammonia-based DO-SET: **5 – 15%**
- Reduction of chemical consumption
  - Improved denitrification: **15 – 25%**
  - Reduced C-dosing: **15 – 25%**





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WWTP Songshen Phase I (CN)



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Long term improvement

Results: Reduction of total nitrogen in the effluent with 19% less energy consumption plus 22% savings in chemicals.

	Long term improvement
C-Dosing reduction	22.4 %
Outlet COD reduction	24.3 %
Outlet NH_4 reduction	30.4 %
Outlet NO_3 reduction	52.9 %
Energy savings	19.0 %

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VACOMASS®

- A fully integrated intelligent aeration control system.
- User friendly operation with better treatment performance.
- Lower area requirement. Reduced equalization tank capacity.
- Flexible and scenario based design & treatment.
- Compact installation.
- Lower energy & chemical consumption.
- Lower power and chemical cost & bid loading.
- A complete solution from a single source.



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WWTP Shanghai Bailonggang (1,200,000 m³/d)





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WWTP Munich (440,000 m³/d)



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WWTP Rothenburg (1,000 m³/ d)



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Amsterdam (NL)


Auckland (NZ)


Singapore (SGP)


Milano (IT)


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Thank you very much
for your attention!

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