

Automation solutions for wastewater treatment with Nereda® technology

FESTO



Reliable and fast

Highlights

- Pneumatic automation with fast opening and closing times (≤ 30 s, including with valve diameters up to DN800)
- Festo supports you right from the planning phase
- Sizing of the entire compressed air network to DIN EN ISO 11011
- Everything from a single source
- Available worldwide
- Added value and transparency through digitalisation

Nereda® technology is an innovative, sustainable and cost-effective biological wastewater treatment. The award-winning technology is up to four times smaller than conventional plants and uses the unique features of aerobic granular biomass with excellent settling properties. Festo provides support right from the plant planning phase, and uses pneumatic automation to ensure an exact process sequence.

Fast reaction times with pneumatics

Nereda technology combines all biological treatment processes in just one tank. This requires an exact process sequence. The sedimentation of the Nereda process is also approx. 30 times faster. The process steps, some of which are very short, require fast-closing process valves – something which is easily achieved with pneumatic automation from Festo.

Expertise and technology from a single source

Festo provides support with the design of the overall pneumatic system as well as with installation and commissioning. For an optimised compressed air

supply, Festo supplies turnkey solutions with control cabinets, compressors, tubing and accessories. Compressed air monitoring ensures efficient and stable processes – and a warranty for the overall system with maintenance agreement is also available.

Maximum energy efficiency to DIN EN ISO 11011

The compressed air system is perfectly sized for maximum energy efficiency and assessed by Festo to DIN EN ISO 11011. This is how you get reliable data for your energy and environmental management and further boost the optimisation potential of your plant.

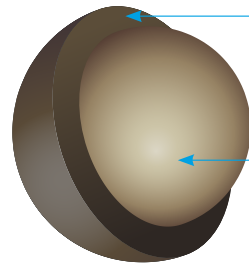


Nereda technology

The biology

Nereda technology is the new modern standard for sustainable and cost-effective biological treatment of urban and industrial wastewater. Unique to the Nereda process is that the bacteria used to purify the wastewater grow in fast-settling granules. All biological treatment processes take place simultaneously in these granules. The first indus-

trial plant commenced operation in 2005, followed by the first municipal plant in 2009. There are now more than 70 Nereda plants in operation or being planned (as of January 2020).



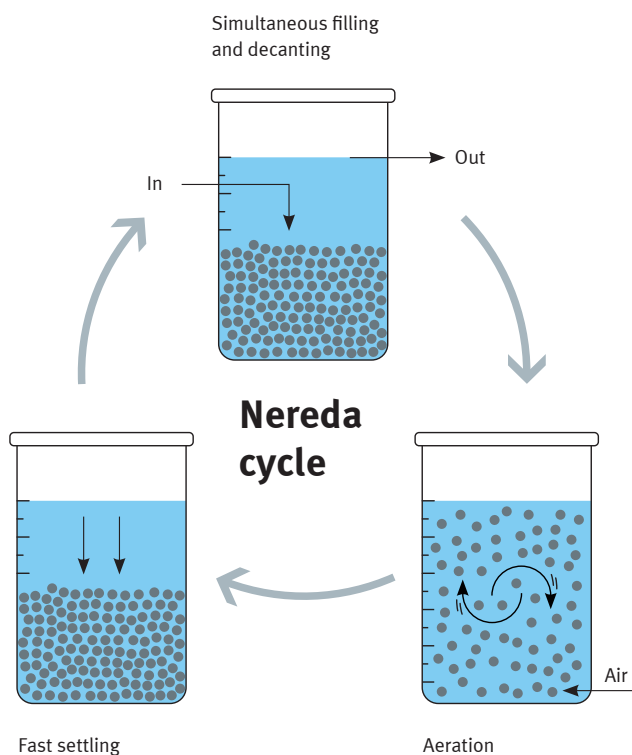
Aerobic zone:

- Oxidation of organic compounds
- Nitrification

Anoxic/anaerobic zone:

- Denitrification
- Phosphorus removal

The process



The Nereda technology is based on a simple 3 step cyclic operation and takes place in one or more Nereda reactors. The duration and the process parameters for the various stages of each cycle are automatically adjusted to guarantee optimum and efficient performance, even when the wastewater quantities, composition and temperature fluctuate.

- 1 Infeed of the untreated wastewater and simultaneous decanting (displacement) of the purified wastewater.
- 2 In the aeration phase, the simultaneous biological removal of organic, nitrogen and phosphorous compounds takes place.
- 3 Fast settling phase during which the biomass is separated from the wastewater and the Nereda plant is ready for a new cycle.

The benefits

Compared with a conventional plant...

- Nereda technology uses pure biomass and requires no plastic carriers or chemicals to form the granules
- The sedimentation process is approx. 30 times faster
- The investment and operation costs are much lower
- Nereda plants are up to 75% smaller with the same purification capacity
- Energy savings of up to 50% are possible
- The process is odour-free

More information about Nereda technology: www.nereda.net

Festo is a preferred supplier within the Nereda community

Control cabinet solutions

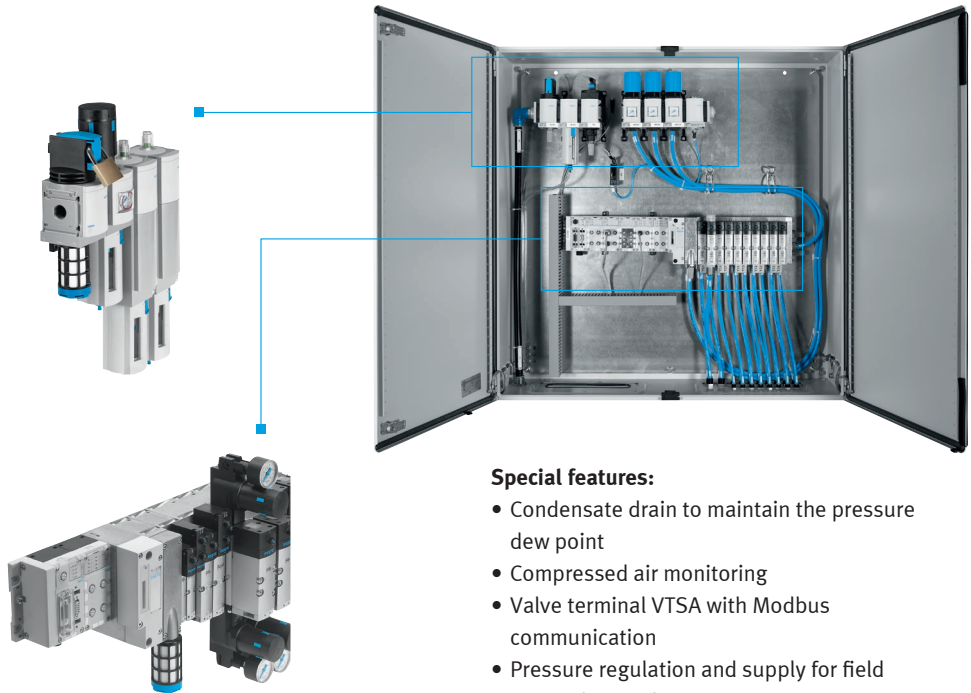
For protecting the decentralised automation components from external influences.

MS series

Modular compressed air preparation with numerous configuration options such as pressure regulation and tamper protection.

CPX/VTSA

Valve terminal VTSA for high flow rates for controlling large-volume actuators combined with the electrical terminal CPX for maximum function integration, such as pressure monitoring as well as digital/analogue inputs and outputs.

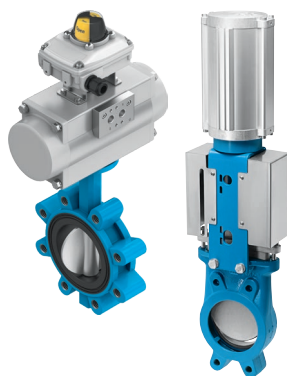


Special features:

- Condensate drain to maintain the pressure dew point
- Compressed air monitoring
- Valve terminal VTSA with Modbus communication
- Pressure regulation and supply for field measuring equipment
- LED lighting, heating, and humidity control

Process valve units

Pre-assembled process valve units ensure that the components optimally match one another, make installation easier and give you planning certainty, even in the case of customer-specific solutions.



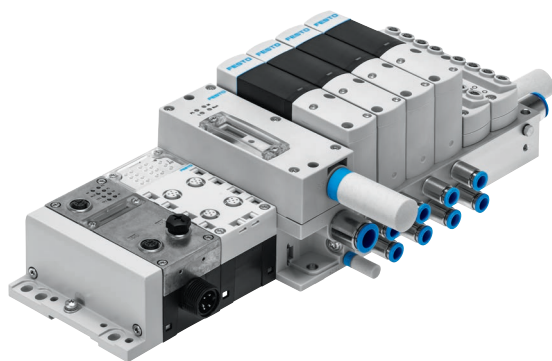
Compressed air network

A perfectly sized compressed air network is crucial for energy-efficient plants. At Festo, you get everything from a single source, from the compressor and air preparation (e.g. dryer) right up to an extensive selection of tubing and connectors – combined of course with advice from our experts.



Added value and transparency through digitalisation

Digital pneumatics with the Festo Motion Terminal



The Festo Motion Terminal VTEM is the world's first valve to be controlled using apps. Our Motion Apps allow you to integrate many functions with just one standardised hardware device; functions can simply be switched at the touch of a

button. Thanks to integrated sensors the Motion Terminal is also capable of self-learning and autonomous adaptation. This increases process reliability and productivity and reduces complexity in the plant.



Apps (a selection of the 10 apps currently available)

Saving compressed air: ECO drive

The actuator is operated with the minimum pressure needed for the load. This saves significant amounts of compressed air, particularly with large actuators.



Detecting malfunctions: Leakage diagnostics

Using diagnostic cycles and defined threshold values, malfunctions can be detected and pinpointed to a specific actuator.



Specifying opening/closing times: Presetting of travel time

The duration of the working stroke is not defined by adjusting flow control valves, but simply by entering a time in seconds.

Compressed air supply taken to a new level with the energy efficiency modules MSE6



The energy efficiency modules MSE6 combine pressure regulator, on/off valve, sensors and fieldbus communication in one unit. They monitor the compressed air consumption, automatically shut off the compressed air after production has stopped for a certain amount of time, and prevent the system pressure from falling below a specific stand-by pressure level. Thanks to this patented technology from Festo, you can save several metric tons of CO₂ and hundreds of euros in operating costs per year.

With Industry 4.0, the actual data is always in view – worldwide

With the modules from the MSE6, series condition monitoring takes place via fieldbuses or PROFINET, and measured values are provided via the PLC or cloud. For every plant supplied with compressed air via an MSE6, you

can view the pressure, flow rate, consumption and changes in pressure at any time. This allows you to identify possible leaks, carry out preventive maintenance and reduce downtimes.

