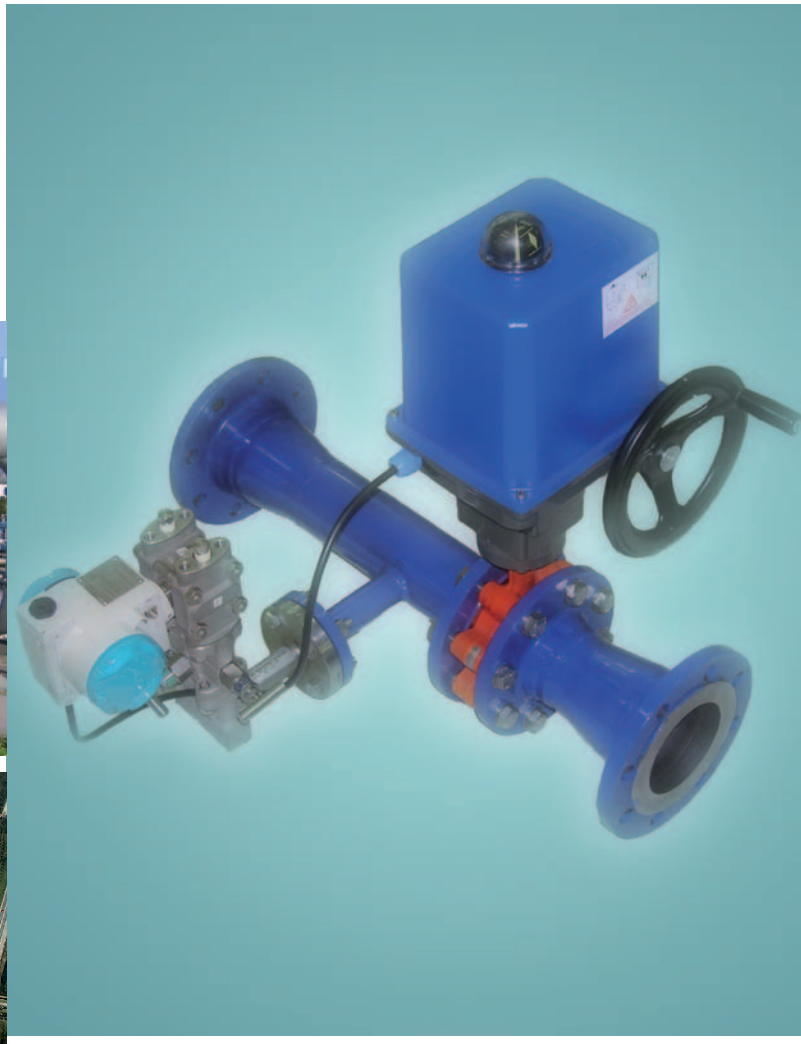
deltafit

Air-flow regulation for sewage treatment plants

- Precise
- Compact
- Maintenance-free

deltafit
made by systec



Clever messen!
systec CONTROLS

Measurement and regulation of air for aeration tanks

The precise regulation of the air quantities for the aeration tanks ensures not only the optimum sewage treatment process: The exact measurement and dosing of the energy-intensively compressed air saves cash and prevents the costly production of „surplus" compressed air which is not really required for the optimum operation of the aeration tanks.

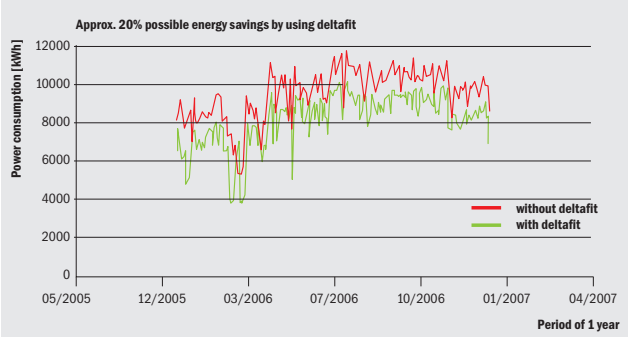
deltafit increases the efficiency of the installation through demand-driven air conduction. The compact measurement and control system saves energy costs and works maintenance-free over years, even under the harshest conditions. The optimally adjusted deltafit components are used in thousands and prove their high accuracy and availability in the entire process industry. After their installation and parameterisation, no expensive commissioning is required, according to the motto „Install - Switch on - Forget".

Saves costs and reduces CO_2-output

Even medium-sized sewage treatment plants must partially spend electricity costs of more than 500,000 euros a year. Thereby, just making available the air supply for the aeration tanks often causes more than 60% of the total energy costs, i.e. more than 300,000 euros in the example mentioned. Therefore, the precise dosing of the air quantity is a decisive argument for optimising the operating costs. Often, an energy cost reduction of 20% or more can only be obtained through deltafit.

Economic from installation to operation

deltafit saves energy costs over the whole investment period. deltafit is extremely cost-effective regarding the purchase. Pre-mounted and parameterised components ensure quick installation and simple commissioning. The intelligent drive provides not only the precise flap position; the integrated regulator and the transmitter power supply allow to do without an expensive, separate controller. The low pressure drop also saves energy costs. The high control quality and measuring accuracy of deltafit ensures optimum process operations, i.e. the optimisation of the decomposition performance and consequently the observation of the limit values during the process and, at the same time, prevents costly waste of compressed air. The maintenance efforts are practically non-existent, the components used have a long life.

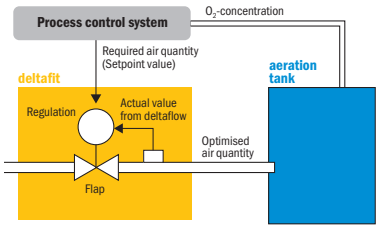


Typical power consumption of a medium-sized biological sewage treatment plant.

Optimisation of the oxygen concentration

Even very small changes of the sewage level in the aeration tank or of the aerator condition cause significant changes of the pressure conditions in the compressed-air pipings.

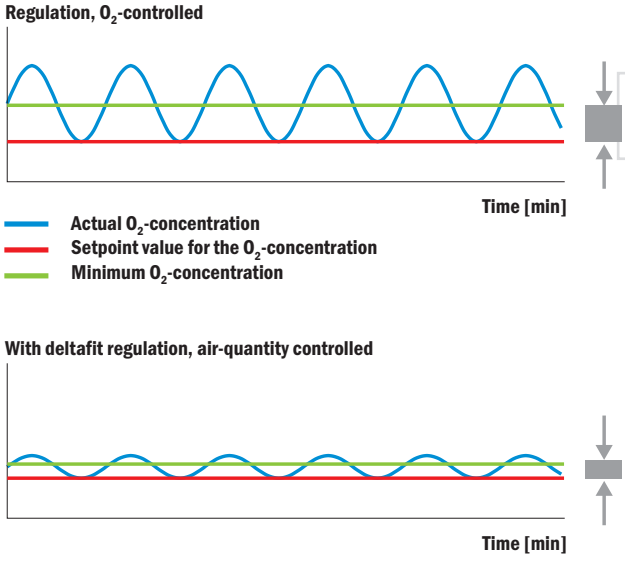
Regulation diagram



The air diffusion of the plant is thus permanently exposed to partially strong variations. Therefore, the regulation of the aeration according to the oxygen concentration is too slow for a consumption-optimised regulation. The O_2-concentration responds to the actually delivered air quantity only with a delay. Therefore, the O_2-concentration varies continuously around the setpoint value. This has negative effects on the power consumption and the cleaning process.

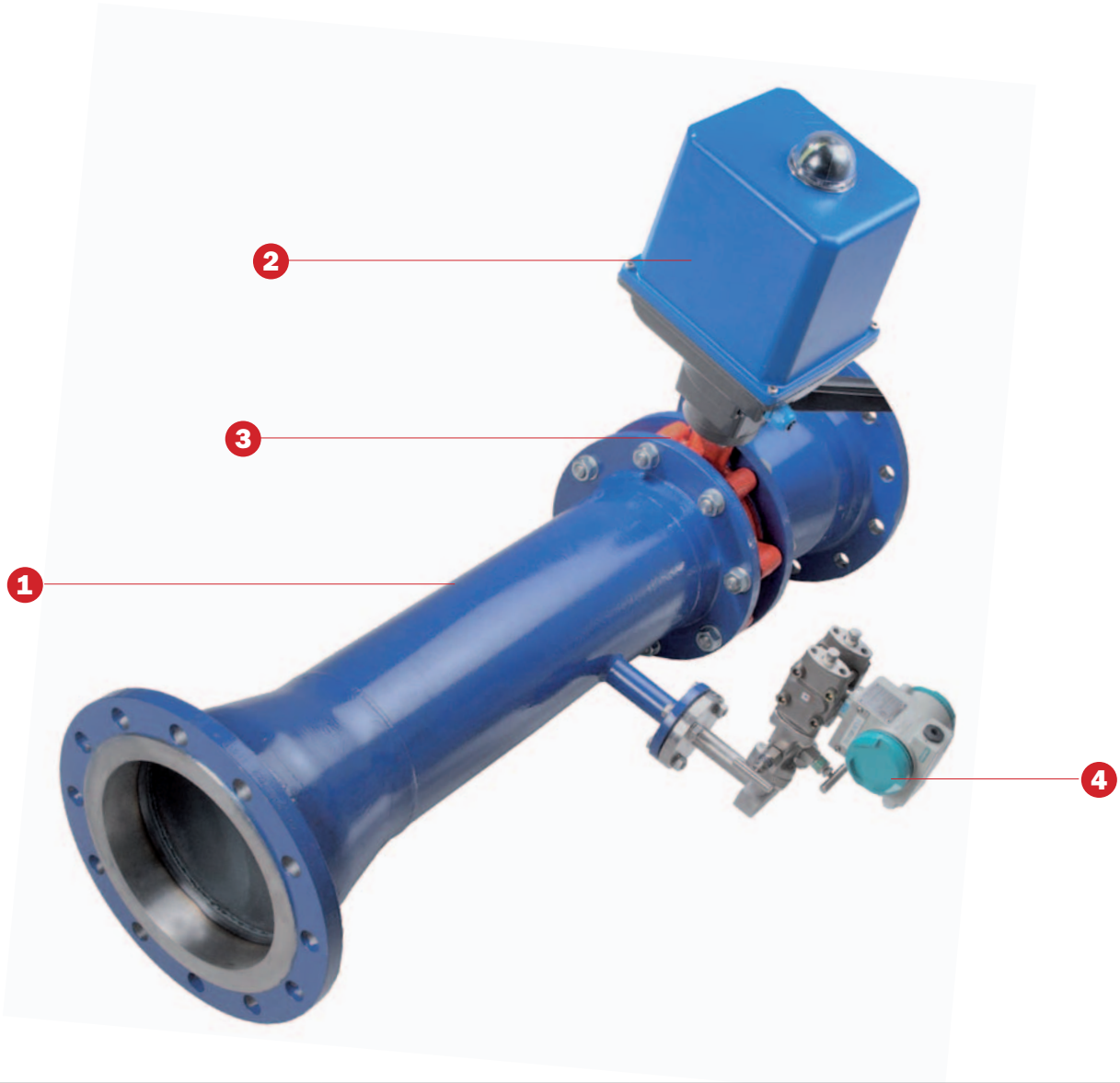
deltafit, however, continuously monitors the delivery of air and thus responds immediately to the smallest hydraulic changes. Thereby, deltafit ensures a constant oxygen concentration and consequently an optimised process.

Variation of the oxygen concentration



deltafit

Construction and components



	Components	Function	Benefits
1	Measuring path		• Compact construction • Built-in rectifier function, no inlet section required
2	Regulation drive	Here, the air-quantity setpoint from the process control system is connected, and the flap position is regulated accordingly	• Drive with integrated regulation • No additional wiring • Connect only setpoint and supply • High control quality • Easy parameterisation via Windows software • Various disturbance functions
3	Flap	Regulates the flow	• No dirt deposits • Robust • Cost-effective • Sensitive control characteristic
4	deltaflow + differential pressure transmitter	Measurement of actual flow value	• Insensitive to dirt and condensates • Highly accurate *) • Integrates across the whole pipe section • No drift of measured value • Maintenance-free

*) As an option, pressure and temperature can also be compensated.

Regulating precisely means measuring accurately: deltaflow

The deltaflow measuring principle

Regulating precisely starts with the accurate mass flow measurement (actual value). The accurate and drift-free flow measurement is also a difficult measuring task in the practical operation of sewage treatment plants.

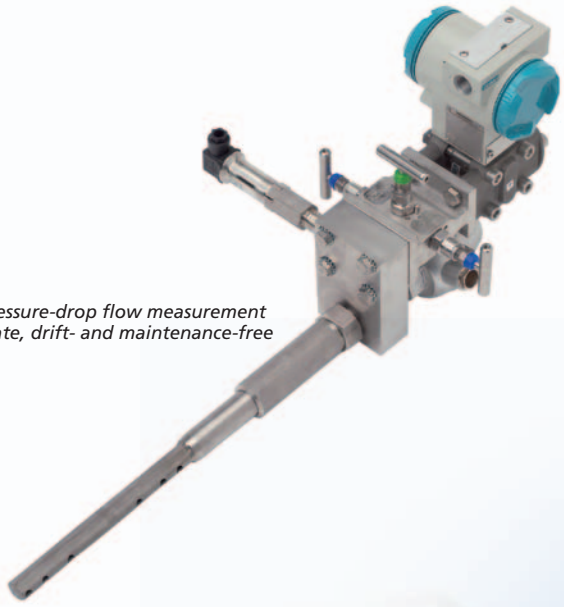
- Optimum inlet conditions are not always possible.
- The quality of the compressed air can be subject to humidity and contamination level and cause deposits in the flow sensors.

deltafit copes with all these problems: This air-flow measuring and control system uses the proven deltaflow pitot tube. Its high accuracy was tested several times, even with reduced inlet sections, by the Physikalisch-Technische Bundesanstalt (PTB) in Braunschweig, Germany. The results are convincing: Even under restricted inlet conditions, the accuracy was always better than 0.6%.

Particles, condensates, lubricating residues are no problem for deltafit. Thereby, deltafit uses a long-term accurate and absolutely robust measuring method which minimises the maintenance and ensures the high control quality, even after many years. [The technical documents for deltaflow are available at http://www.systec-controls. de/files/deltaflow_prospekt.pdf.]

The use of deltafit is advantageous to the following applications:

- Municipal sewage treatment plants
- Industrial purification plants
- Large sewage treatment plants
- Small wastewater treatment plants
- Combustion air regulation e.g. steam boilers in waste incineration plants



Low pressure-drop flow measurement - accurate, drift- and maintenance-free

Proven a thousand times and simply reliable

Even under unfavourable installation conditions, the deltaflow pitot tube integrated in the deltafit system can also accurately measure disturbed flow profiles thanks to the unique, patented probe profile.
The measuring path is designed in a way that disturbances of the flow profile in the inlet are effectively reduced. This gives the devices a high accuracy, even under unfavourable inlet conditions. deltafit works without expensive and susceptible slide valves. The flap used in place of slide valves works reliably, even with contaminated air, loaded with particles and condensate. „Flooding or drowning" is not possible. The intelligent control drive of the flap takes over the power supply of the connected differential pressure transmitter. Therefore, no separate controller, which would need additional wiring, is required. Under normal operating conditions, the drive works free of maintenance. The reduction gears are lubricated for a lifetime and require no relubrication.

The deltaflow pitot tube has proved its reliability for years in thousands of applications, even under the harshest conditions. With almost a thousand applications only in Germany, it is one of the best-proven methods for measuring gas flow. Approved as a flow measurement device for aggressive, contaminated and condensing gases, deltaflow is ideally suited for the conditions in sewage treatment plants.

Comfortable software possibilities for the regulation drive

systec Controls designs deltafit according to the individual process data and carries out the adjustments of the drive and the differential pressure transmitter. On the site, only the power supply and the setpoint need to be connected - finished.

If later changes need to be carried out on the drive, a comfortable Windows software is available for this purpose. The software also enables a complete commissioning of the drive and is available free of charge.

Varied safety adjustments

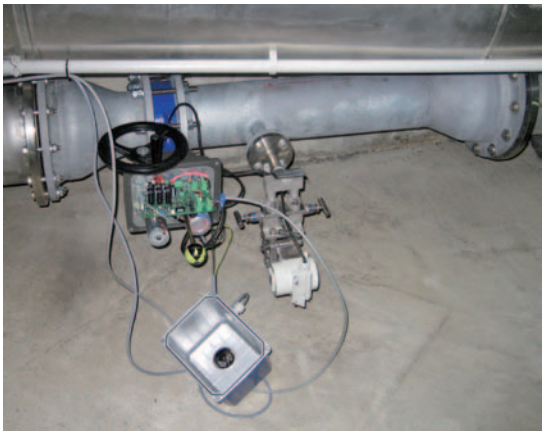
The deltafit regulation drive is characterised by a variety of safety functions. The user can fix how the drive should behave e.g. in case of a power or setpoint loss or a disturbance.

Moreover, the software offers the access to the diagnostic menu. Here, important drive parameters such as the motor run time or the housing temperature are available. So the information on the actual operating state of the drive is available at any time. As an option, the drive can be controlled via Profibus. All adjustments can then be easily carried out from the process control centre.

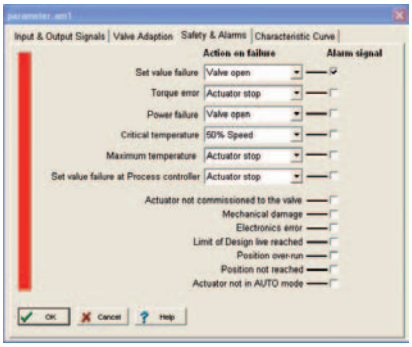
Inlet conditions Improve IT

With the new ImproveIT database, it is possible to use the deltaflow without any inlet sections.

Even with strongly varying process data regarding temperature and pressure, the usual accuracy of 0.6% is obtained through the compensation of these influencing variables.



Minimum installation effort



Comfortable and simple parameterisation software

Optimised air entry - Optimised operating costs and pollution control

What you need to know for your enquiry/order:

Piping
- Material
- Internal diameter
- Wall thickness
- Insulation
- Pressure
- Temperature

Flowmetering „by systec“

deltawave - Ultrasonic multimeter for flow and flow profile

The deltawave ultrasonic device is far more than a flowmeter for filled and (!) partially filled pipelines as well as open or closed channels: It also determines very precisely the flow conditions in partially filled pipelines or during open-channel measurements.
In an open flume, deltawave combines the „normal“ level measurement with the highly accurate multi-path transit time measurement and a revolutionary ultrasonic evaluation method. The deltawave electronics can be operated with up to 16 transducer pairs, - i.e. work with 16 measuring paths which, even under difficult conditions, reliably and accurately sense the real circumstances.

flowcom made by systec

Whoever measures professionally, needs to evaluate professionally. The flowcom is the ideal supplement to the deltaflow or any other flowmetering system. It compensates for the pressure- and temperature-related error of flowmeters and calculates mass or volume flows of gas. In steam, it can additionally calculate the quantities of energy. It is qualification-tested by the TÜV.

portaflow X clamp-on flowmeters for mobile measurements in sewage treatment systems and waterworks

The portable clamp-on flowmeter portaflowX and his permanently installed brother TimeDelta measure the flow of liquids in pipelines using the highly accurate transit time method. Very easy use, highest accuracy and extremely competitive prices characterise this series of instruments. Using the new ABM method, pipe diameters from 13 to 6000mm can be measured at temperatures between -40 and +200°C and a turbidity of up to 10,000 mg/l.

The headquarters of the company systec Controls are located in Puchheim near Munich. Here, we develop and manufacture our products according to DIN EN ISO 9000:2000. However, innovation and product quality alone are not sufficient for us. We have also had our systems examined by independent institutes - with a clear and verifiable success.

Besides, we are also at your service after the installation of your plant. You can reach our hotline **24 hours a day and 7 days a week**.
systec Controls - the specialist for flowmeters.

Handed over by:

Clever messen!
systec CONTROLS

Mess- und Regeltechnik GmbH
Lindberghstraße 4
D - 82178 Puchheim
Tel.: 0 89 / 8 09 06 - 0
Fax: 0 89 / 8 09 06 - 2 00
info@systec-controls.de