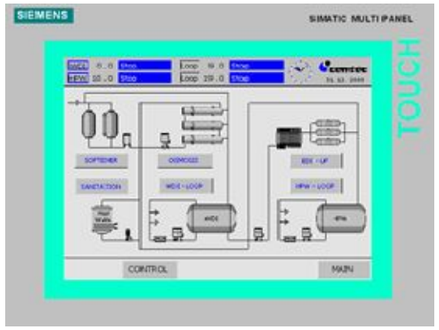
Vortex Injector

The Vortex Injector is a special venturi for homogeneous mixing of gases and liquids, e.g. O_2, CO_2 or N_2 in liquids.
Through an annular ring of small holes, very fine bubbles of gas are injected and distributed into a vortex as the liquid passes across the sharp edge of the venturi.
Where space is restricted, Centec Vortex Injectors provide particularly significant advantages.
The highly efficient performance reduces running costs and minimises the consumption of gases.

Automation

Our systems are designed at Centec with the cooperation of our mechanical, electrical and control disciplines, to design and implement a complete system as outlined in our clients' URSs and Validation Plans.
This includes control software design and qualification inline with the principles of GAMP5® guidelines.
As part of the software development, HMI process graphics are used to display key functions, operational data, prompts, alarms and customer specific functions.



Pure Water Loops & Draw-off points

Our production plant services include pharmaceutical grade pipe systems, components, wiring & networks and bespoke high purity draw-off points with management control systems.
Clear installation plans and isometric pipe diagrams are created and used by our experienced technicians and coded orbital welders.

Validation

Starting with a Validation Plan, URS, Functional & Design Spec., a qualification plan (QP) is produced in conjunction with the client, outlining equipment specifications, design details, etc. These lead to the Qualification procedure, for Design (DQ), Installation (IQ) and Function (OQ). In cooperation with our on-site personnel, user Performance qualification (PQ) normally follows when required or requested by the customer.

® ISPE owns the GAMP trademark

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Unsere weltweiten Partner für Vertrieb und Service sind auf unserer Homepage
Our worldwide partners for sales and service, you can see on our homepage
www.centec.de

Pharmaceutical Industy

Your Issues are important to us!

The Centec Group operates worldwide for the design, manufacture & supply of both specialist analysis instrumentation and process systems - *A unique synergy for superb automation.*

In the pharmaceutical industry, we are an established and dependable partner for numerous companies. They appreciate the functionality of our sensor technology and our competence in the design and execution of automated process skids.

Analytical measurement engineering combines the highest demands for accuracy, with flexible communication options for intelligent process control. We deliver exceptional production consistancy and numerous possibilities for real-time data communication, datalogging and efficient operational control.

Our plants are usually skid-assembled at Centec, installed by the customers' technicians and commissioned by our expert team.

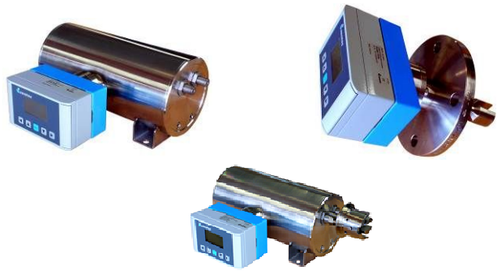
In addition to normal pharmaceutical regulations & guidelines such as FDA, GMP, GAMP®, USP, we also work to customer-specific requests: Special construction, documentation, service & maintenance if required - *A comprehensive portfolio from Centec*.

Process Analytical Technology (PAT)
- Liquid Density & Concentration Analysis
- Dissolved Oxygen measurement
- Process Sensor & Automation Systems

Process Skid Design & Construction
- Water Purification
- Water Deaeration
- Pure Steam Generators
- Multi-stage columns
- CIP and SIP units

'PAT' Process Analytical Technology for Liquids

Density & Concentration Measurement - Rhotec / Sonatec / Combitec



Centec fluid density and ultrasound velocity sensors give continuous and accurate data about liquids, for process automation and quality control.

Two and three component liquids can be monitored; from simple dilution to reaction control.

Online density instruments use the principle of modified vibration. Inline sound velocity sensors are based on a process time measurement.

Dissolved Oxygen Measurement - Oxytrans TR and M

Highly accurate dissolved oxygen measurement can be carried out both inline (TR) and offline with a portable instrument (M). Both sensors work on the same principle of quenched optical luminescence.

The optical window has a very long life, even at higher temperatures. It can be easily exchanged on site and complex recalibration is not needed; we simply provide calibration data values for keying into the instrument or via a USB link.

Product contact materials conform to US FDA CFR

Water Purification - Iontec / Revotec / Mixed bed / EDI / UF

For the reduction of hardness in raw water (softening) and to separate specific ions, ion exchangers work in cathodic / anodic or mixed beds.

Depending on the existing plant specifications, investment budget, running cost targets and the quality of raw water, the electrical conductivity can further be reduced for improved water quality by using membrane filtration technology and/or electro-deionization cells. For further refinement, ultrafiltration and reverse osmosis can be installed. All parts of the water treatment systems are designed for use with an integrated CIP unit.

Centec are certified to EU Directive 93/42/EEC to manufacture Class IIb Medical Devices, 'Water Treatment Systems for Dialysis'

Water Deaeration - DGS / DeGas / VeGas

Dissolved oxygen in water is a known problem. Centec provide a variety of technologies for removing oxygen and other gases from liquids. The choice of system will depend on the operating location and the process conditions. Cost effective solutions are normally available for a very wide range of capacities and operational requirements. We can also reduce dissolved CO_2 and N_2.

Pure Steam Generator - RDE

Many processes and components in the pharmaceutical manufacturing industry require pure steam sterilization. Centec provides this equipment as well as other evaporation and distillation technology, including falling film evaporators and appropriately sized multistage pressure columns.

A high security, double tubesheet heat exchanger is part of the evaporator system. Two pipes connect it to the evaporation chamber. The shell of the heat exchanger is heated by regulated steam. The operation of a valve on the lower connecting pipe between the heat exchanger and the evaporator controls the level and blow down frequency of any water droplets.

Stationary and mobile cleaning and sterilsation units - CIP & SIP

Centec CIP and SIP units are flexible systems for fully automatic cleaning and sterilisation of production machines.

Careful selection of application specific chemical dosing, heating and cooling equipment guarantees a constantly high level of cleaning performance. During CIP any product residue and surface film is removed to achieve biologically and visually clean surfaces. Centec CIP systems are optimized for efficient use of water, cleaning media, energy and time, while ensuring that cleanliness is maintained as the highest priority.

The cleaning media will be lost in single use systems or can be stored for re-use in multi-tank equipment.

The Centec manufacturing plant is certified to ISO 9001 : 2008

Centec CIP equipment:

To clean buffer preparation processes, fermenters or complete production plants

Mobile or fixed single tank units, or more sophisticated multi-tank multi-channel systems

For recirculation cleaning applications or for single use duties.