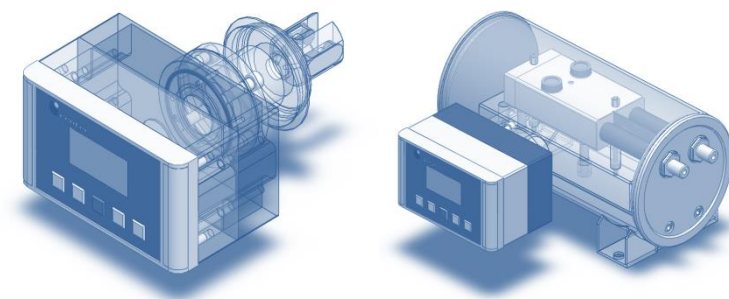


## The Centec Group

Centec is a privately owned group of companies. A core business for us is customized systems for the production and distribution of high purity water and water for injection (WFI) for pharmaceutical and biotechnological plants in accordance with GMP and FDA guidelines. We are an experienced partner for pure steam generation, CIP- and SIP-processes as well as for services related to product preparation. Centec technology includes a range of high precision process sensors for accurately measuring critical product properties such as the concentration of acidic and caustic solutions and O<sub>2</sub> content. The largest pharmaceutical groups in the world are among our key customers.



**Accuracy. Reliability. Centec.**

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**DGS**

## Membrane Deaeration

## Centec Pharma Systems



Automated  
process skids  
and high precision  
sensors from a  
single source.  
**Centec.**

# DGS

## The Principle

The Centec membrane deaeration system DGS is a modular skid for the removal of oxygen from water and low viscosity liquids. Using highly effective membrane contactors, extraordinarily low values of residual O<sub>2</sub> are achieved. The presence of even low oxygen levels can increase microbial activity and adversely affect quality and shelf life of pharmaceutical products. Each contactor contains thousands of microporous hydrophobic hollow fibre membranes. Their large internal surface maximizes the contact area between liquid and gas. While the strip gas (CO<sub>2</sub> or N<sub>2</sub>) is applied on the inside of the hollow fibres, the water flows in counter current on the outside. The high partial pressure difference of O<sub>2</sub> forces the oxygen out of the liquid to permeate through the membranes and away with the strip gas. This fundamental scientific principle is described by "Henry's Law". The DGS system consumes minimal energy and strip gas. Due to its modular design, DGS can easily be adapted to the required capacity (by parallel installation of membranes) and to the required residual oxygen content (by serial installation). O<sub>2</sub> content monitoring can be achieved with highly accurate Centec OXYTRANS optical sensing technology.

## Technical Data

Capacity	1 - 500 m <sup>3</sup> /h
Residual Oxygen	< 10 ppb
Pressure of Operation	0 - 6 bar
Temperature of Operation	2 - 45 °C
Temperature of CIP	max. 85 °C
Material	1.4404/1.4435/... AISI 316L/... electropolishing possible
Membrane	polypropylene (FDA approved)
PLC	SIMATIC S7
Options	in-line O <sub>2</sub> measurement chilling/chilling water recovery pre-filtration disinfection



The Centec production is certified according to ISO 9001.

- **Application Specific and Energy Efficient**  
extremely low residual oxygen content  
minimum consumption of energy and strip gas
- **Modular Design with Standard PLC**  
skid mounted for easy installation and start-up
- **In Compliance with USP, ASME, GMP, FDA, ISPE**
- **Completely Qualified (DQ, IQ, OQ)**
- **Low Operating and Maintenance Costs**

## Experience. Expertise. Centec.

Particle Pre-Filtration · Disinfection · Water Softening & Demineralization · Ultrafiltration · Reverse Osmosis  
Electro Deionization · WFI Distillation · Membrane Deaeration · Column Deaeration · Vacuum Deaeration  
Multi Component Mixing · Additive Dosing · Flash Pasteurization · Cleaning-in-Place · Pure Steam Generation

