INTEGRATED SOLUTIONS
FOR LIFE SCIENCES

Pneumatics
It’s that easy
A partner you can rely on

AVENTICS delivers exceptional value in Life Sciences applications by drawing upon our core technological competencies, global presence and deep industry knowledge.

Why AVENTICS?

- AVENTICS is a partner you can rely on for all of the above: with experience in pneumatics for oxygen concentrators going back more than 30 years, we offer both high-volume, standardized components and customized solutions that suit customers’ specific needs.
- Experienced in low pressure and vacuum systems with electrical integration
- Worldwide market leader in fluid control products for oxygen therapy devices
- Sub-assembly production for maximum value and easy, error free customer installation
- Expertise in ergonomic weight compensation with best in class proportional pressure regulation and low-friction actuators (sensitive and strong)
- Strong investments in R&D for Life Sciences and continuous product platform development
- Revision control and traceability of sub-components for serial device OEMs is a long standing competence

Assembly of oxygen service products in state of the art facilities

Technology roadmap in partnership with OEMs of surgical and acute care devices

Highly optimized sub-assemblies pre tested with parameters relevant to customer application
Experience you can count on

Since we entered the field many years ago, Life Sciences has advanced enormously. But our mission has never changed. In fact, the essence of AVENTICS is more than a century old, back to our invention of the pneumatic valve. As a manufacturer and partner, we’re a known quantity that you can rely on – now, and in the future.

Quality carries on: Pneumatics – It’s that easy

We are specialists in the design, application, and manufacturing of components and sub-assemblies well suited for medical devices and analytical and diagnostic equipment.

Paul Gant – Director, Global Life Sciences
Your vision, our solutions

Focus on “your” core engineering competence

Reduce the size of your device

Reduce the weight and volume of your device

Sensitive therapy for patient

Consolidate vendor supply chain

Receive support from supplier relevant to project phase (eg: 3D models)

Streamline direct material flow with relevant documentation and in Kanban packaging

Know how your product is performing in the real world in real-time

Deliver more oxygen to the patient in a smaller package

Reduce device assembly time
Our value proposition

We are keenly focused on understanding your needs and developing solutions that exactly fulfil them. We channel our wide ranging areas of expertise – from components integration and systems experience to in-house research and development – into solutions that work for you.

With a strong technology platform, our dedicated international sales and support organization for Life Sciences are ready to discuss your specific requirements and identify the optimal solution for your success. From off the shelf products to highly function integrated closed loop controlled pneumatic assemblies.

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<td>Pre tested sub-assembly with function integration</td>
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<td>Kit of direct materials packaged and documented for your production material flow</td>
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Core valve platform for Life Sciences

We have a large palette of pneumatic valves, actuators and other components for various applications within Life Sciences. Each is targeted to a specific need, but some things they all have in common: reliability, quality and precision.

**MSV8** – high efficiency micro solenoid valve (8 mm Ø)
- Cartridge and flange mount
- Suitable for vacuum and pressurized oxygen, reactive gas and liquid service
- Corrosion resistant stainless steel
- Multiple electric interface and orifice diameter options

**MSV12** – high flow micro solenoid valve (12 mm Ø)
- Compact design
- High flow – up to 225 l/min@1.4bar
- Energy saving solenoid for portable devices
- 0.32 W holding power
- Economic screw-in cartridge mount – no fasteners required

**DO** – directly operated poppet valves
- Flange mount
- 10, 15, 22, 30 & 35 mm body width
- Configurable orifice/pressure ranges
- Multiple voltage and electrical interface options
- Volume booster for 16 mm body

**Valves with integrated diaphragm technology**
- For high flow and dependable switching at very low pressure (0.5bar)
- Robust polymer housing
- Light weight with energy saving coils
- 3/2 NO or 2 x 3/2 NO/NO function
- Multiple voltage/electric interface options
- Custom Poka Yoke designs
ED02 – proportional pressure regulator

- Silent operating due to variable force (non PWM) solenoids
- Excellent sensitivity due to extremely low hysteresis with full flow exhaust
- In line or compact manifold mount
- Multiple closed-loop control functions possible (weight compensation, force, air flow, vacuum level, positioning, actuator speed)

Integrated fluid blocks

- Highly optimized sub-assembly
- Electrical connectivity (including ethernet IoT)
- All fluid logic control functions integrated
- Multiple polymer and metal material options
- Reduce footprint, prevent end of line failures and speed up production rate
- Integrated viewing chamber

Internet of Things

- Predictive maintenance through integrated diagnostics
- Energy efficiency through effective use of compressed air
- Operating comfort thanks to simple plug-and-run application

AV – advanced valve system

- Integrated ethernet interface
- Condition monitoring function (IoT)
- Directional valve functions with plug-in accessories
- Multiple electrical I/O function blocks including closed loop electro-pneumatic positioning
Air supply management

The ever-increasing complexity and sensitivity of pneumatically controlled work processes continually redefine the requirements for compressed air preparation. AVENTICS confronts this challenge with comprehensive air supply management to cover any need.

CR1-OX compact pressure regulator
- Media: oxygen, compressed air, inert and medical gases
- High repeatability (± 0.2% F5)
- Compact 30 x 30 mm footprint
- Special pressure range options

Electronic pressure and flow sensors

Electronic pressure and flow sensors

Pneumatic connection technologies
- Plastic, nickel plated brass, and stainless steel variants

Vacuum generators
- Single-stage ejectors (EBS)
- Compact ejectors (ECD)
- Multi-stage ejectors (EMS)

Pressure gauges

PE5
- Miniature P/E sensors

Plastic tubing

TU series

Media: oxygen, compressed air, inert and medical gases
High repeatability (± 0.2% F5)
Compact 30 x 30 mm footprint
Special pressure range options

Complete range of modular air preparation functions in multiple sizes (multiple pressure ranges, particulate, coalescing, and active, carbon filters, maintenance-free diaphragm principle air dryers, lockable pressure adjustment, manual and solenoid supply/exhaust valves, electronic pressure and flow monitoring)

Pressure regulators from M5 to G2 port-size
Sanitary design and corrosion resistant versions
Pneumatic cylinders

Clean with ease, balance variable weights, locate and hold any desired position. The power, endurance and sensitivity of AVENTICS pneumatic cylinders are the optimal choice for advanced applications in Life Sciences.

**Mini and round cylinders**

Ø 8 – 100 mm
Options for sanitary design and pre-adjusted air cushions

**Short-stroke and compact cylinders**

Ø 12 – 100 mm
Concentrated power in a minimum of space

**Profile and tie rod cylinders**

Ø 32 – 320 mm
Standardized to international norms and with an outstanding profile

**Rodless cylinders**

Ø 16 – 80 mm
Precision and speed for long strokes

**Mini-slides and rotary actuators**

Ø 6 – 100 mm
Components for moving and positioning

**Miniature cartridge cylinders**

Ø 6 – 16 mm

**Full range of detachable accessories**

Rod locks and guide-units

Cylinder and piston rod mountings

**Sensors and accessories**

Many additional cylinder variants available
Oxygen concentrators

When a patient’s lungs are unable to absorb enough oxygen, they need permanent artificial respiration. Just a few years ago, this diagnosis meant a lifetime spent in a hospital bed. Today, patients can take part in life thanks to stationary and portable oxygen devices.

These devices feature customer-specific pneumatic valves from AVENTICS. We work closely with customers to design valves that suit their plans – after all, producers of complex oxygen concentrators shouldn’t need to design their devices around the valves. Our experience in oxygen concentrators, both stationary and portable, stretches back over 30 years. As with all our components produced for life science applications, cleanliness during production is of the highest importance.
Custom valve ensemble

- Maximize air flow at very low pressure with integrated diaphragm technology – ideal for feed/waste functions
- Excellent repeatability at low pressures due to uniform switching times
- Low pressure volume amplification with optimized surface area

AVENTICS is focused on the complete spectrum of pneumatics for oxygen concentrators.
Wide ranging applications

Through intensive investment in R&D and our teams of experts dedicated to Life Sciences, we have successfully applied our knowledge and expertise to the sector for over 30 years. Leave the production of complex, high-quality components to us and you can concentrate on what you know and love best: building robust appliances of unmatched quality. Here’s an overview of where our components are often used:

**Pneumatic shockwave therapy**
Best in class projectile force adjustment is achieved using the ED02 series proportional pressure regulators from AVENTICS. The use of variable force solenoids ensures silent operation and extremely precise control even in dynamic flow conditions over a long life. All in a compact 76 x 60 x 30 mm package.

**Ventilators and anesthesia equipment**
To control the appropriate medical gas (be it oxygen, nitrous oxide, and/or air), AVENTICS designs fluidic blocks containing solenoid valves and pressure regulators with integrated miniature electronic pressure sensors. Assembly of the OEM’s device is accelerated and end-of-line failures are prevented by pre-connecting all electrical elements to a multi-pin connector.
Surgical equipment
Surgical equipment and other acute care devices require fluidic control elements to be on stand by for their real life operational environment. From surviving cold storage to withstanding vibration in rescue helicopters, AVENTICS works closely with the device manufacturer to ensure the product is able for the defined task. From oxygen and helium gas to liquid media, our MSV series stainless steel solenoid valves and miniature sensors are adaptable, robust and ready for duty.

Compression therapy
Directional control and monitoring of extremely low pressure air and vacuum is in our milieu. Direct acting solenoid valves with orifice diameter up to 5 mm ensure the patient receives the desired support and relief at the therapist's defined rate.

Blood pressure monitors
Precise control of air pressure within the compressor is important for an accurate blood pressure reading, and this is why AVENTICS valves are a must for anyone producing blood pressure monitors. Solenoid valves control the direction of flow and the pressure release, so the patient’s blood pressure can be measured constantly or intermittently.

Although it is possible to use our valves for home use units, they are ideal for use in surgical monitors.
Wound therapy
AVENTICS produces the components necessary for directing and regulating the low pressures and vacuum waves used in negative pressure wound healing.

Medical diagnostic equipment
Medical diagnostic equipment often requires air and gases to be controlled at low pressure, and this is where AVENTICS components come in. Our valves are ideally suited for directing reagents and other liquids through the system, using gas as the motive force. Our valves are reliable and durable – even where contact is made between components and reagents or other liquids.
**Bed/medical mattresses**
Not only a patient’s comfort but also their safety relies on precise control of air pressure in medical mattresses. The quiet energy-saving solenoid valves and pressure sensors that AVENTICS provides make this possible.

**Dialysis**
AVENTICS understands the necessity for tight leakage tolerances over a long working life in fluidic control elements designed for use in peritoneal and hemodialysis devices. Compact sub-assemblies are pre-tested to a protocol relevant to the serial OEM’s actual application requirements. Revision control and traceability of sub-components are a long-standing competence.

Also available are products for patient simulators and training equipment.

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**Engineering Tools**

Our online portal is available around the clock, with comprehensive information about our product portfolio and refined tools for engineers that you can use free of charge.

- Online catalog
- Calculation programs
- Cross reference tool
- CAD
- Circuit diagram software
- CylinderFinder
- Configurators
- eShop
- Extranet

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