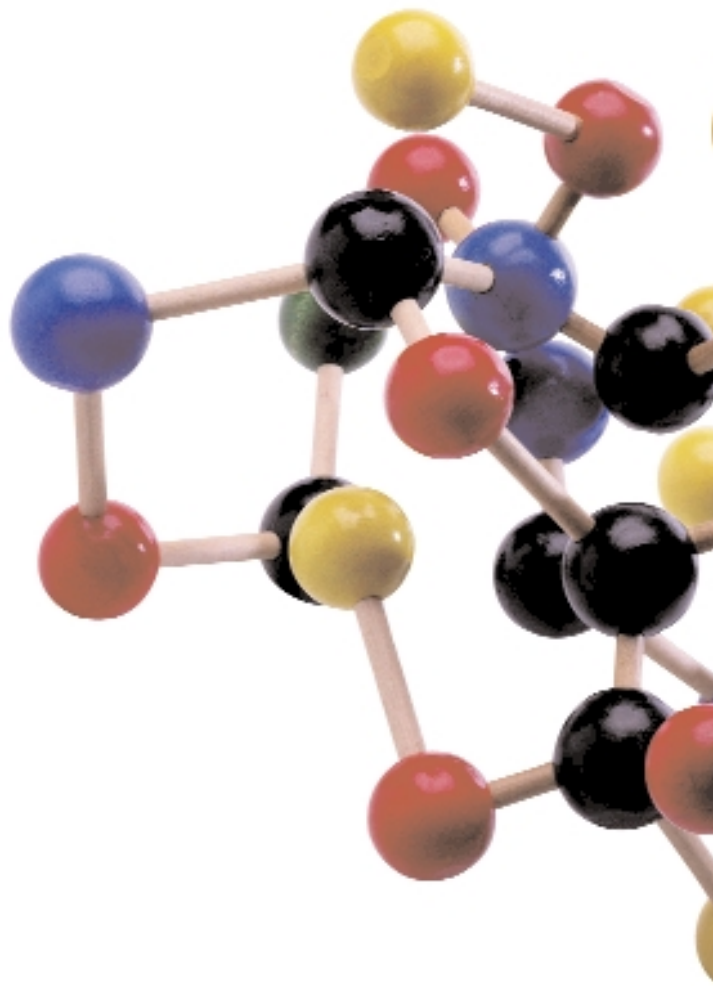
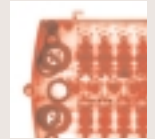
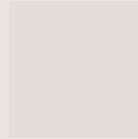
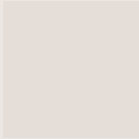
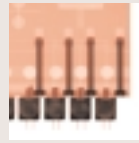
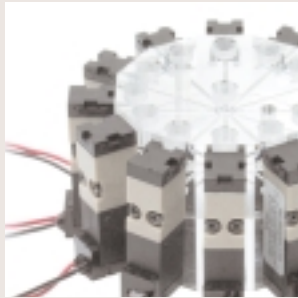
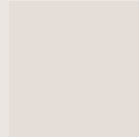
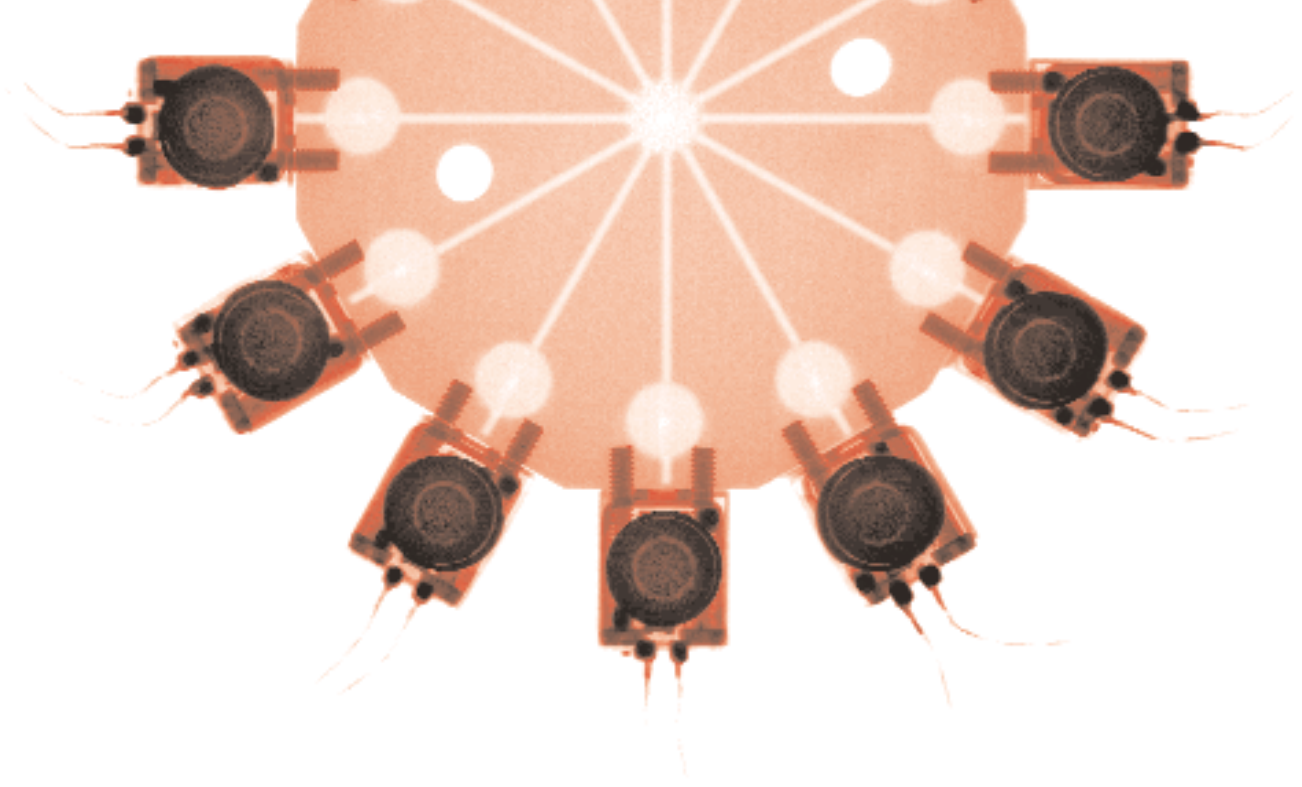


MEDICAL SCIENCE ADVANTAGE



FLUID AND MOTION
CONTROL SOLUTIONS



www.norgren.com/medical

www.fasmedic.com

ENGINEERING **ADVANTAGE** FOR THE MEDICAL SCIENCE SECTOR

- » PRECISION GAS CONTROL
- » FLUID HANDLING EXPERTISE
- » RELIABLE, DURABLE, PROVEN SOLUTIONS

Norgren has a proven track record in creating lasting competitive advantage for customers in the medical science sector.

For over twenty-five years Norgren has supplied specialised pneumatic and electronic solutions to manufacturers of medical and analytical equipment.

Our capabilities were significantly extended when FAS joined the Norgren group in 2004, bringing a wealth of experience and proven expertise in miniature solenoid valve solutions for the medical sector. Combined with the successful technologies of KIP, Buschjost and Herion - all of which are integrated into the global Norgren group - this major development now enables our customers to fully exploit the capabilities of fluid and motion control technologies.

Our Global Medical Science Group provides all the advantages of dedicated and expert key account managers and design engineers who can anticipate and respond effectively to customers' needs.

Norgren's work with many of the leading global companies in the medical sector means that we talk our customers' language, and can bring specialised experience and expertise to bear on new challenges and applications.

Naturally we understand the specific legislation and material compatibility requirements of the medical sector. With clean room facilities at several manufacturing sites in Europe and USA, Norgren is well placed to meet the demanding requirements of the industry.

Our Medical Science Group works hard to understand its medical customers and their end user business needs and processes. Our products can help OEMs meet their goals by:

- » OPTIMISING SPACE AVAILABLE
- » REDUCING DEAD VOLUME
- » IMPROVING PRESSURE AND FLOW CONTROL
- » REDUCING LEAKAGE

Our broad range of proven, high quality modular products, coupled with dedicated design and engineering resources, has enabled Norgren to become one of the leading suppliers of integrated modules and sub-systems to the industry.

Norgren's system solutions are fully tested to customers' specifications and can help reduce machine complexity, simplify supply chain management and gain a significant cost advantage.

TALKING OUR CUSTOMERS' LANGUAGE



» DAVID LEAKEY, SALES DIRECTOR
FRANK OELGARTH, TECHNICAL DIRECTOR FASMEDIC



»» MEDICAL CENTRES OF EXCELLENCE

Medical Science Technical Centres in the USA, Switzerland, Germany and the UK provide dedicated design engineering resources and clean room assembly facilities to meet the needs of medical equipment manufacturers worldwide.

Each site has its area of application focus and all work closely with customers to deliver innovative and specialised products and integrated solutions.

- »» DEDICATED MEDICAL ENGINEERING TEAMS
- »» 25 YEARS MEDICAL APPLICATIONS EXPERTISE
- »» MATERIALS AND LEGISLATION KNOWLEDGE (CE, FDA, UL)
- »» CLEAN ROOM ASSEMBLY FACILITIES & TEST FACILITIES
- »» ISO 9001 QUALITY APPROVED
- »» STATE-OF-THE ART 3D CAD AND COMPUTER FLUID DYNAMICS
- »» FINITE ELEMENT ANALYSIS



»» OUR DEDICATED ENGINEERS CREATE COMPETITIVE ADVANTAGE FOR CUSTOMERS IN THE MEDICAL SECTOR



- » 01 **GAS ALARM MANIFOLD FOR ANAESTHETIC WORKSTATION**
 Modular valves, cartridge regulators and fittings in a compact manifold. The system is assembled and fully tested in Norgren's clean room facilities
- 02 **HIGH PRESSURE CARTRIDGE REGULATOR**
 300 bar cartridge for adaptation into customer manifolds

»» PRECISION GAS CONTROL



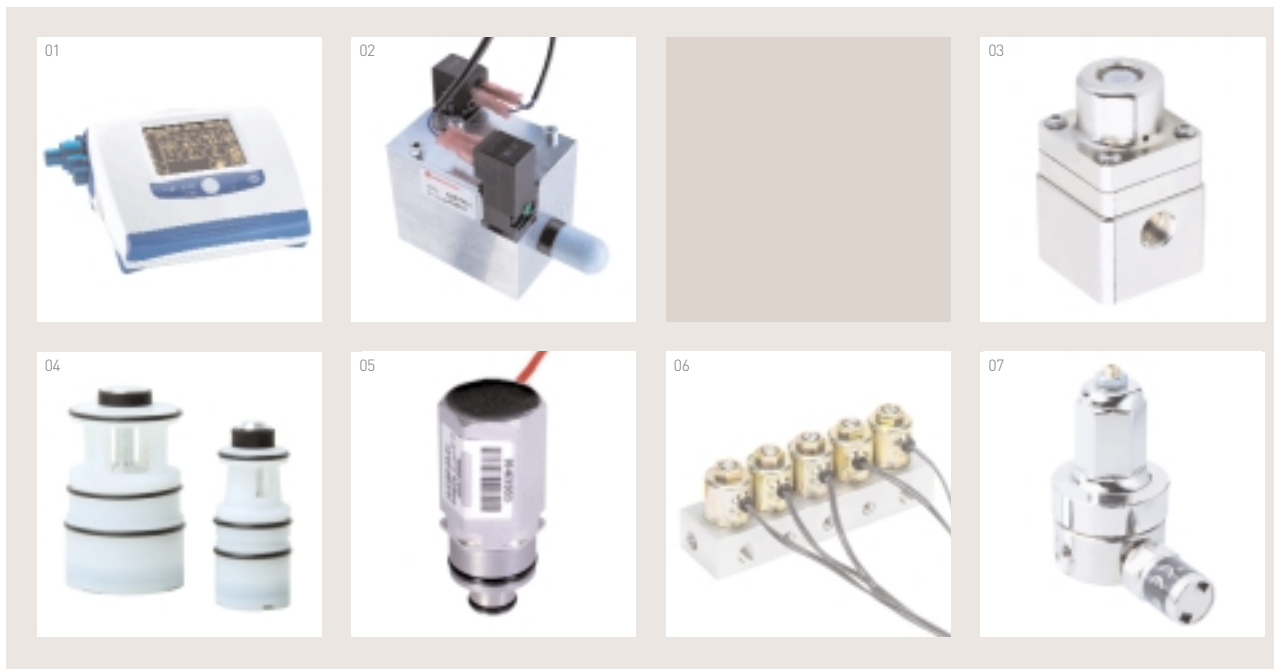
The reliability, accuracy and speed of response of valves and regulators play a vital part in the application of respiration equipment. Norgren's range of highly modular and compact products are suitable for air, oxygen and other medical gases. They are ideal for stand-alone applications or for space-saving system integrations. The performance / size ratio of our products allow customers to reduce the size of their machines and gain a competitive edge.

AREAS OF EXPERTISE:

- » CRITICAL CARE AND EMERGENCY VENTILATION
- » ANAESTHESIA WORKSTATIONS
- » OXYGEN CONCENTRATORS
- » SLEEP THERAPY
- » HOSPITAL GAS MANAGEMENT SYSTEMS
- » DENTAL
- » MINIMAL INVASIVE SURGERY



»» HANS-JOACHIM JABERG
KEY ACCOUNT MANAGER



» 01 **ELISÉE 350 - CRITICAL CARE VENTILATOR**

The portable device is equipped with valve solutions from FAS, including a proportional flow valve which provides accurate supply of oxygen under critical care and resuscitation conditions.

Reprinted with permission of SAIME, Savigny le Temple, France

02 **HIGH FLOW VALVE UNIT**

Control block for high flow or quick exhaust applications such as O₂ concentrators. 15mm solenoid valves control large orifice poppet cartridge valves.

03 **MINIATURE PRECISION REGULATOR**

Highly accurate pressure regulator in a small space envelope. Available as stand-alone or cartridge unit, for maximum 300 l/min flow.

04 **CARTRIDGE VALVES**

Low leakage poppet valves for integration into customer specific applications. Maximum 1200 l/min flow.

05 **FAS PROPORTIONAL FLOW VALVE**

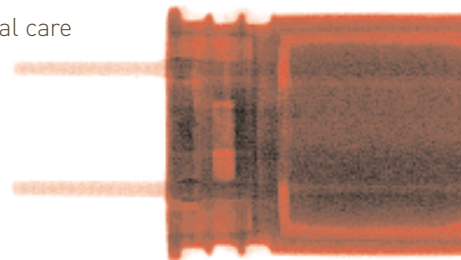
Small footprint with a low power consumption, 0 up to 200 l/min. Friction-free design assures excellent control for closed loop systems as well as fast response and low leakage.

06 **KIP SOLENOID VALVES AND MANIFOLD SOLUTIONS**

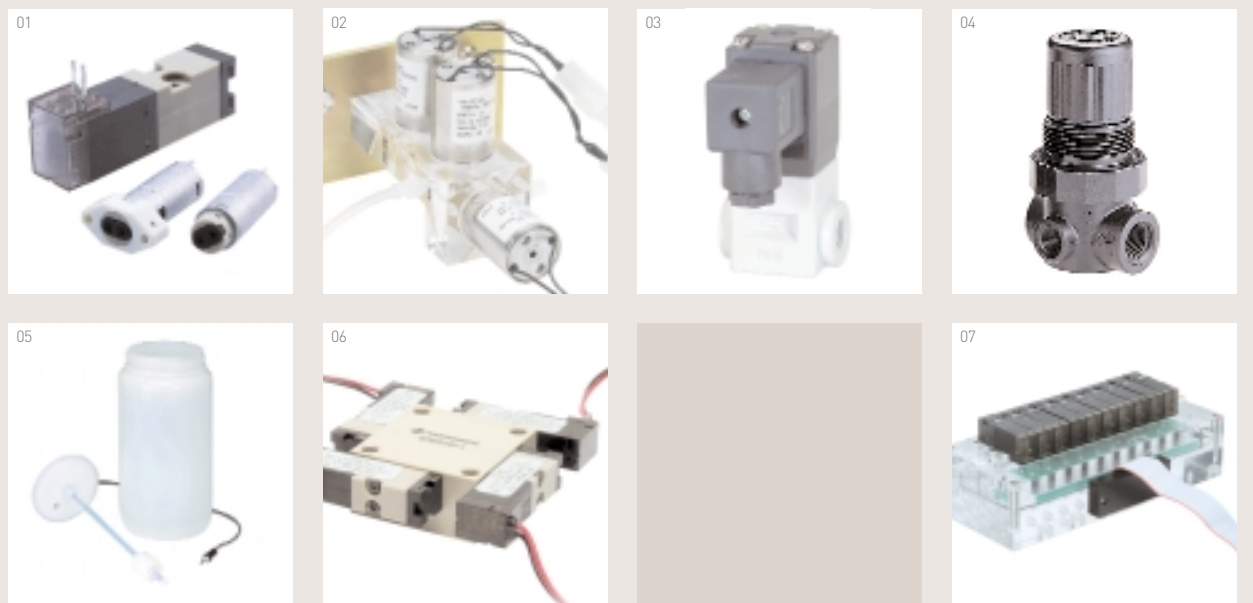
Quiet, durable, reliable and well proven in respiration applications including home care.

07 **HIGH PRESSURE REGULATOR**

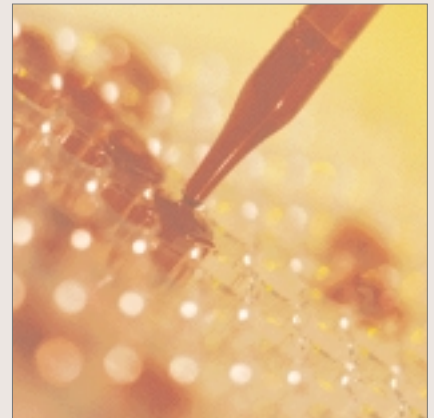
Accurate control of 300 bar medical gases. Ideal for high flow applications. Pressure relief valve is CE approved.



>> FLUID HANDLING EXPERTISE



- >> 01 **FAS MINIATURE ISOLATION VALVES**
8mm and 10mm footprint isolation valves in flange and cartridge form. 2/2 and 3/2 functions. 8 mm valves have zero dead volume.
- 02 **ISOLATION VALVES SOLUTION**
Acrylic manifold with KIP isolation valves for controlling de-ionised water on flush process in in-vitro diagnostic applications.
- 03 **HIGH FLOW ISOLATION VALVE**
Teflon bellows diaphragm isolation valve for high flow and high temperature applications.
- 04 **PRESSURE REGULATOR**
Pressure regulator for water and aggressive fluids. FDA and NSF approved materials for drinking water.
- 05 **LIQUID LEVEL CONTROL SOLUTION**
Complete flask solution from Norgren with low level fluid control. Enables customer to know exactly when to change the bottle and minimises waste.
- 06 **MIXING MANIFOLD**
4 station valve mixing manifold for chromatography applications. Highly repeatable solenoid isolation valves for accurate mixing of reagents.
- 07 **ACRYLIC MANIFOLD WITH FIELDBUS**
Diffusion bonded acrylic manifold removes the need for tubing and fittings, and significantly reduces space and dead volume. By integrating a printed circuit board into the manifold, the problems of damaged valve pins and chemical spillage are eliminated, as well as reducing assembly time. Fieldbus control, for example Devicenet or Ethernet is possible.



Norgren can call on the combined expertise of FAS, KIP, Buschjost and Herion for fluid control applications. Our isolation valves are designed for the most aggressive of fluids and to minimise internal dead volume to reduce the risk of contamination carry over and the costs of wasted fluid. Pressure regulators, level switches, fittings, sensors and fieldbus expertise complete a broad product range. We recognise the need for space reduction, accuracy and speed as well as modular solutions. By integrating our miniature components into special manifolds, Norgren can help reduce significantly the overall envelope size, the tubing required and the dead volume.

AREAS OF EXPERTISE:

- » HAEMATOLOGY
- » CLINICAL CHEMISTRY
- » IMMUNOASSAY
- » CYTOLOGY
- » CHROMATOGRAPHY
- » DIALYSIS
- » DENTAL



» JUAN OLIVER & GERHARD DÖRING
KEY ACCOUNT MANAGERS



» RELIABLE, DURABLE,
PROVEN SOLUTIONS

Our expertise in both gas and fluid control, in automation and in proportional technology makes Norgren a natural partner for a broad range of medical applications.

Much of Norgren's expertise lies in our applications experience, helping our customers choose the right technologies, modifying standard products to meet customer needs, and in systems integration.

AREAS OF EXPERTISE:

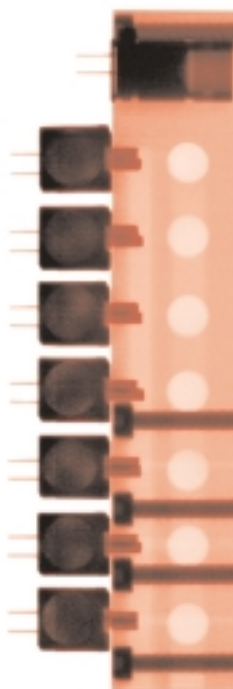
- » AUTOCLAVES AND STERILIZERS
- » BIO-REACTORS
- » DENTAL
- » DECUBITUS TREATMENT
- » DNA ANALYSIS
- » IN-VITRO DIAGNOSTICS
- » LAB AUTOMATION
- » RESPIRATION



» SUSAN CARPENTER
KEY ACCOUNT MANAGER



- » 01 **VP10**
 Highly accurate proportional pressure control valve. Well established in cytometry applications to precisely control cell flow.
- 02 **GRIPPERS**
 Two and three finger grippers for small handling applications.
- 03 **MULTI POSITION AIRLESS CYLINDER**
 Fully programmable electric actuator for precise movement control at high speeds.
- 04 **VE10**
 Compact valve island with Multipole or Fieldbus connections. Space saving solution for piloting process valves on autoclaves or gas management systems in bioreactors.
- 05 **ANGLE SEAT VALVES**
 For hot water and steam. Suitable for 200°C. Stainless steel or gun metal bodies.
- 06 **FAS MINIATURE SOLENOID VALVES**
 For medical gases and aggressive fluids. Available in 8mm, 10mm, 15mm and 22mm sizes to meet all flow requirements.



mb air systems ltd was born following the management buyout of the business and assets of Motherwell Bridge Air Systems Limited in 2002, which was originally established in 1973, from the Motherwell Bridge Group.

Our operations, with over 30 years of expertise and service to a wide range of clients, specialise in the fields of Compressed Air, Material Handling, Power Tools, Pneumatics and Product Finishing Systems.

Our Service and Technical teams, through a structured network of branches in the United Kingdom, will provide clients with customised Maintenance Solutions to meet your exact requirements. This will also include Condition Monitoring and Energy Efficiency Programmes designed to achieve optimum equipment and systems operation.

The Company, in partnership with our principals, Ingersoll-Rand, domnick hunter, IMI Norgren, ITW Finishing and Dresser Roots are committed to bringing added value to your business. This will be achieved through the provision of innovative solutions and the highest standard of service and customer care.



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