Industrial Automation

IMI Norgren

Secondary Suspension Control

Breakthrough engineering for a better world

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Breakthrough engineering for a better world

We create solutions for our customers which enable smarter, safer, more productive and sustainable factories, production lines and warehouse operations. Our pneumatic and electric motion systems help machine builders and end users around the world automate and optimise manufacturing and warehousing processes.

We have partnered with customers in industrial automation for over a century, applying our experience and innovation to create lasting value for their businesses. Our solutions support critical industries such as automotive, food and beverage, pharmaceuticals and even the space industry. We support the automation of precision manufacturing, product assembly, testing and packaging.

We use the latest digital technologies in our automation products and constantly innovate in close partnership with our customers. By applying our deep expertise, we can solve their toughest automation challenges, today and tomorrow. Through increased productivity, efficiency and safety, our customers can serve their own customers better, creating sustainable competitive advantage and delivering growth.

Our world-class product portfolio includes IMI Norgren, IMI Bimba, IMI Bahr and IMI Buschjost.

Breakthrough engineering you can count on.

NOTE: *Due to our policy of continuous development, we reserve the right to change specifications without prior notice.*

Delivering Expertise, Solutions and Value to the Rail Sector

For over 45 years, we have delivered robust, reliable and bespoke solutions to the rail sector.

Our products continue to give millions of miles of reliable service across the world's most challenging environments, from the cold of China and Eastern Europe to Australian outback heat.

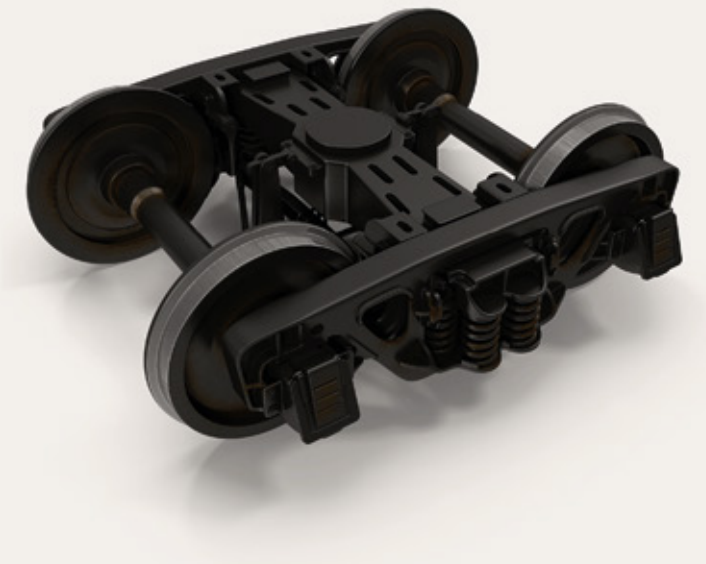
With a true understanding of the daily issues faced by rail operators and original equipment manufacturers, we design for the precise needs of the rail industry, including:

- Temperatures ranging from -40°C (-40°F) to +85°C (+176°F)
- Voltage tolerances of +/- 30%
- EN 61373 category 1 class A and B vibration resistance
- EN 61373 category 2 vibration resistance
- EN 45545-2 Fire and Smoke
- EN ISO 9227 - Corrosion tests in artificial atmospheres — Salt spray tests

We talk extensively to maintenance professionals and work closely with rail engineers to ask the questions they ask. That means we can offer customised, practical solutions to the metro, intercity, high-speed, freight and permanent-way rail industries, covering:

- Air preparation equipment
- Brake sub-systems and components
- Coupling control systems
- Door and step systems
- Pantograph control systems
- Water control systems
- Freight control and actuation
- Suspension control
- HVAC systems
- Sanding systems

By listening and responding to your specific challenges, we help you make significant improvements and savings in terms of cost of ownership, energy efficiency, reduced weight, reduced maintenance and more.



Secondary Suspension system

Suspension Control

Rail suspension systems are a notoriously harsh environment. Our innovative valve technology, with exceptional reliability and safety credentials, is resilient to extreme temperatures and designed for long life and ease of interchange.

We can offer a wide range of products for secondary air suspensions systems, with all products being fully rail certified. These systems use air bellows between the bogie and car body to control the height ride of the train giving passengers a more comfortable journey. Using air suspension also gives the ability to provide an accurate load/weight signal which can be used to optimise the acceleration and braking of a multiple train set.

Suspension Control Products

Double check valve (Compensation)

Ball Valves

Proportional technology

Average load valve

Mechanical levelling valve

Pressure sensor

Secondary Suspension Control

Mechanical Levelling Valve
VRSS1000 Series

The Mechanical Levelling Valve is used to inflate and deflate the suspension bellows depending on the car body movement, which keeps the car level under changing load conditions (passengers moving, track conditions). The car body is linked directly to the levelling valve lever and depending on the lever angle the output flow changes which increases or decreases to amount of air in the bellows.

Features

- Robust design
- Aluminium anodised body
- Excellent repeatability over life
- Life cycles > 2 million
- Working Temperature -40 to +80ºC
- Operating Pressure 0 to 8.5 bar
- Shock & Vibration IEC/EN 61373: 1999, Category 2
- Salt Spray testing 1000h, ISO 9227
- Fire & Smoke Compliant to EN45545
- IP54 Rated
- Complies to EN14817 (Railway applications, suspension components, Air spring control components)

Double Check Valve
VRSS2000 Series

The double check valve is used to compensate (also known as a compensation valve) an excessive pressure difference (quick and significant load changes, bellow puncture etc.) between two suspension bellows on one bogie and therefore levels the car body again to avoid risky tilting during higher speed (derailment). The double check valve provides air from one bellow to the other once the pressure difference (set pressure) between both bellows is exceeded.

Features

- Robust design
- Aluminium anodised body
- Working Temperature -40 to +65ºC
- Operating Pressure 0 to 10 bar
- Flow rate > 300 L/min @ 4bar
- Shock & Vibration IEC/EN 61373: 1999, Category 2
- Salt Spray testing 1000h, ISO 9227
- Fire & Smoke Compliant to EN45545
- IP54 Rated
- Additional ports for test points and pressure sensor
- Complies to EN14817 (Railway applications, suspension components, Air spring control components)

Average Load Valve
VRSS3000 Series

The braking force of a train is related to the load of the train. This valve takes the average air pressure in the bellows and sends it back to the brake control system. This will convert this pressure signal to determine the applied braking force required for the train.

Features

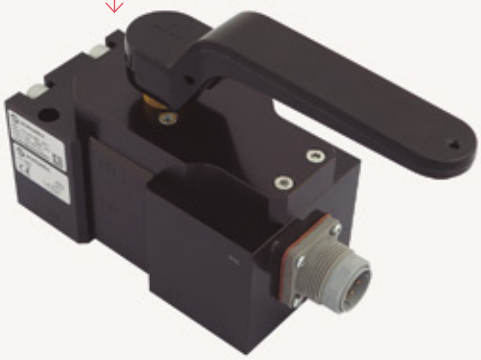
- Robust design
- 1/4 G, Rc, NPT & interface
- IP54 Rated
- Working Temperature -25 to +60ºC
- Operating Pressure 1 to 10 bar
- Shock & vibration IEC/EN 61373: 1999 Category 2
- Accuracy ± 0.15 bar at ambient
- Salt spray testing 1000h, ISO 9227
- Complies to EN14817 (Railway applications, suspension components, Air spring control components)

Also available on request Over Height valve which is mounted to the bogie or car body of the train. In the event of the air suspension bellows becoming over inflated, a mechanical chain connected from the valve will actuate the dump function of the bellows. Once the bellows have deflated (gap between car body and bogie back to acceptable height) the valve will reset to a closed position. This process will automatically repeat for any further over inflation of the air bellows.

LVP50 Series

19S Series

VRSS3000 Series



Proportional Technology
LVP50 Series

New developments for electronic levelling control and variable height control for automated platform leveling, with precise accuracy and repeatability.

Features
- Closed-loop air piloted proportional pressure control
- G1/4 Ported
- IP65 Rated
- Working Temperature -40 to +80ºC
- Operating Pressure 0 to 10 bar
- Shock & vibration IEC/EN 61373: 1999 Category 1, Class A & B
- Salt spray testing 1000h, ISO 9227
- Excellent performance characteristics
- Fast response time

Pressure Sensor
19S Series

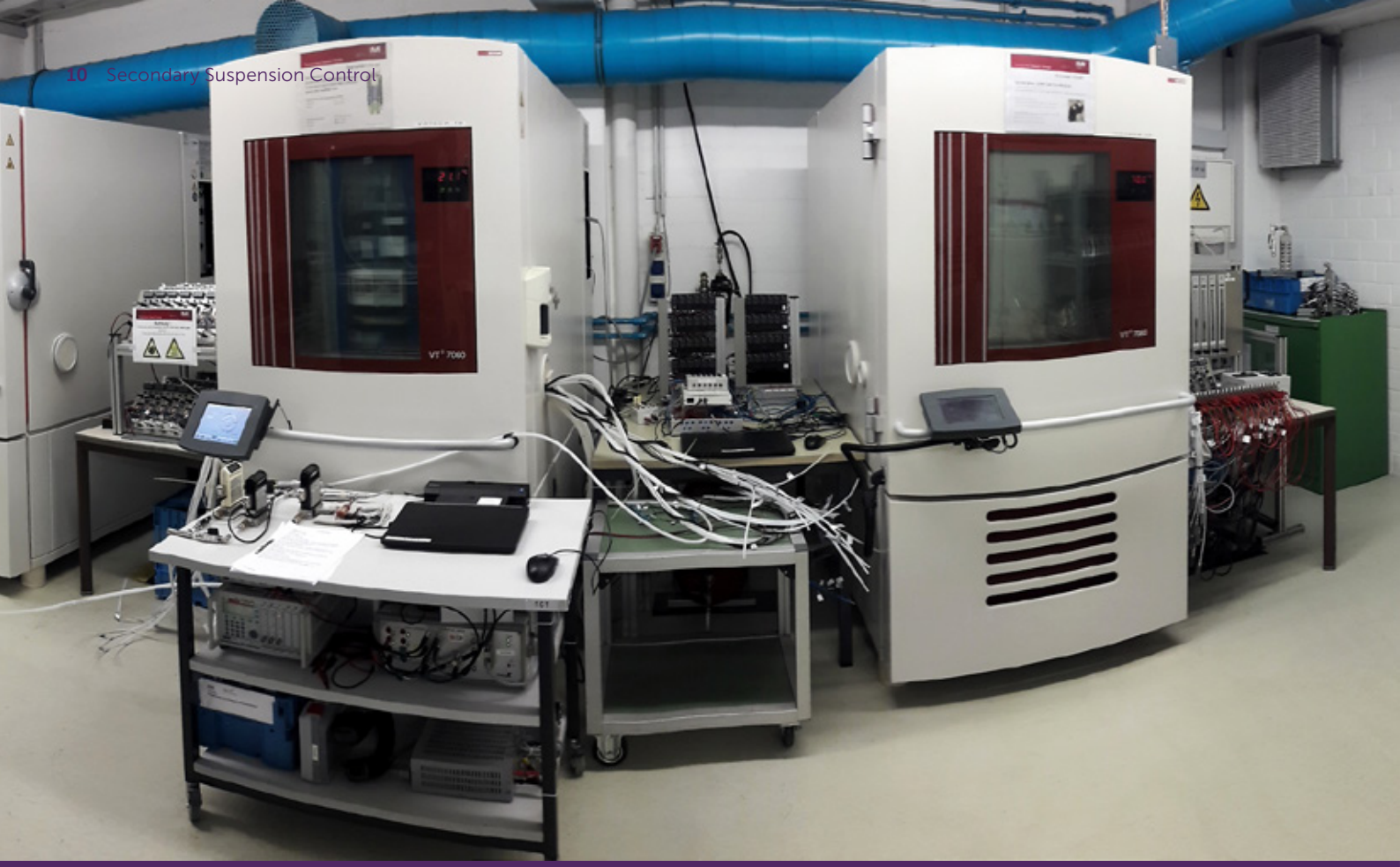
Pressure sensors can be fitted to the double check valve to monitor the pressure and feed back information to the train management system to help monitor the performance of the suspension system.

Features
- 0 – 50 bar (Port size: G1/4)
- Robust sensor for pneumatic/ hydraulic/fluid applications
- Small, space saving stainless steel construction
- Excellent long-term stability
- Wide temperature range
- Cold Test (DIN EN 60068-2-1:2008-01)
- Dry heat (DIN EN 60068-2-2:2008-05)
- Test on voltage peaks of the electrostatic discharge and the sensitivity of transient bursts (EN 50121-3-2:2007-07)
- Shock & Vibration IEC/EN 61373: 1999, Category 2
- Salt Spray testing 1000h (ISO 9227:2012-04)
- Life time test (2 million switching cycles)

Ball Valves
T10 & VT Series

Ball valves perform a vital function, enabling the compressed air supply to be isolated. This might be during the normal operation of a vehicle or perhaps to allow maintenance of pneumatic suspension equipment to take place.

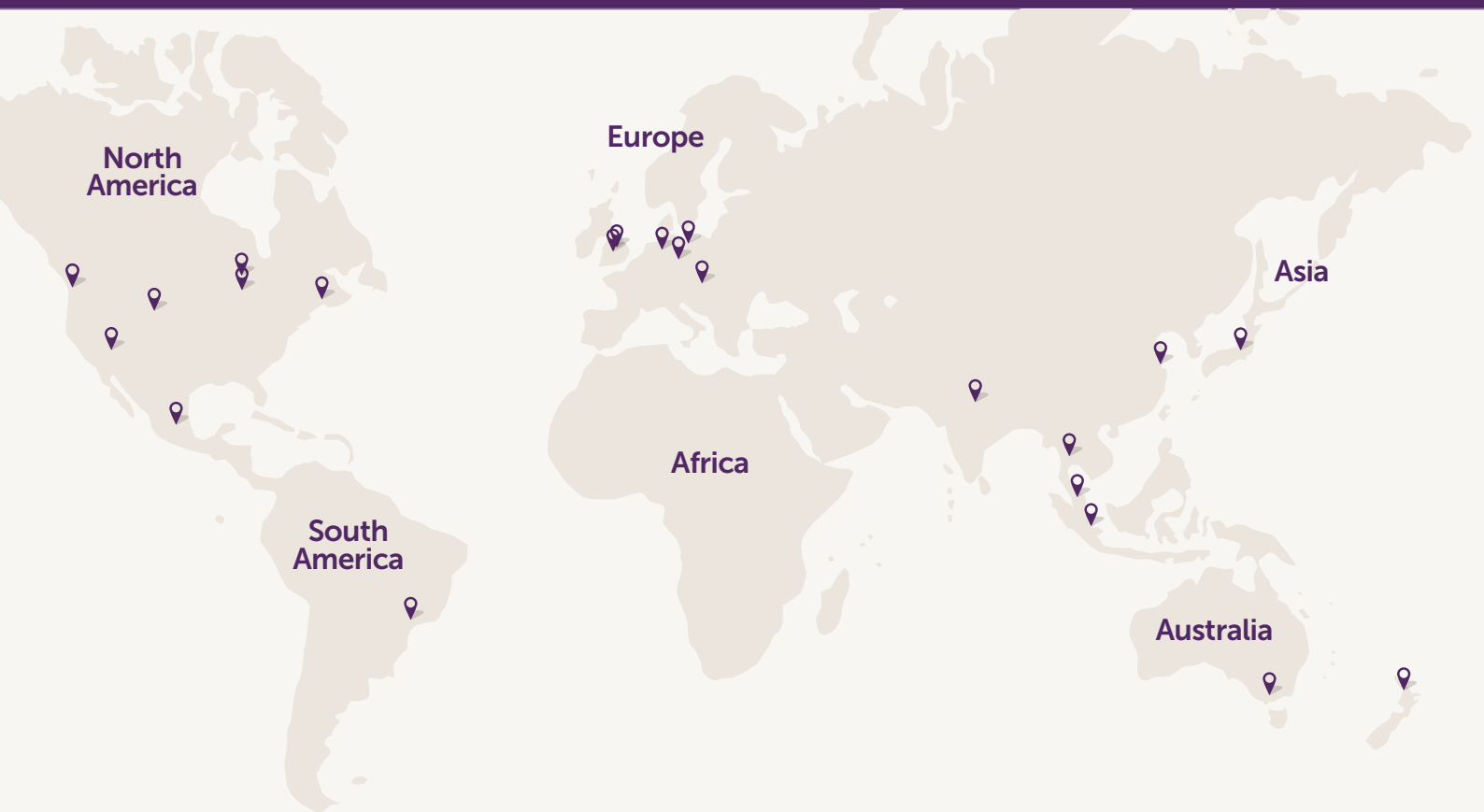
Features
- Designed specifically for the Rail Sector
- Leak tight design over wide temperature range
- 3/2 Function, Flange and In-Line versions
- Choice of operating handles
- Choice of position monitoring options
- Robust design
- Easy to maintain
- DN15 – DN32 (G1/2" - G1 1/4") (1/2" NPT - 1 1/4" NPT)
- Shock & Vibration IEC/EN 61373: 1999, Category 2
- Salt Spray testing 1000h (ISO 9227:2012-04)
- Fire & Smoke Compliant to EN45545 & NF F16-101



Global support

We help you achieve your goals by working with you as a partner, not just a supplier. Our dedicated rail team is connected worldwide to ensure close, continuous support no matter what the size and extent of your organisation. We have the reach and capability to work alongside you on complex, global projects or to simply offer local spare part supply.

●● Across manufacturing, sales, innovation centres and offices ●●



Global testing and validation

We help you achieve your goals by working with you as a partner, not just a supplier. Our dedicated rail team is connected worldwide to ensure close, continuous support no matter what the size and extent of your organisation. We have the reach and capability to work alongside you on complex, global projects or to simply offer local spare part supply.

We work closely with our customers to achieve tailored solutions. During development and testing, the focus is placed on designing products that can withstand anticipated loads and consistently perform their tasks. It is this thorough and detailed testing and validation in accordance with the relevant standards that reduces early failure of components. In addition, a comprehensive valuation under realistic conditions helps avoid high consequential costs caused by failures of components in the end application.

Complete product testing and valuation is done in our state of the art testing centres.

The laboratories have an extensive range of test equipment, operated by a neutral expert team working independently of the development departments. Their experience and expertise enables quick implementation of tests, the design of test programs tailored to the needs of real applications and operating conditions in the various sectors, and a guarantee of the neutrality and accuracy of test results.

We have extensive experience in the field of environmental simulation, with a focus on climate, temperature, thermal shock, corrosion, vibration and mechanical shock.

Prototyping and material laboratories are additional, important resources that contribute to our targeted and rapid product development.

Specific tests we undertake for the rail sector include:

- EN 45545
- EN 50155
- EN 50121-3-2
- DIN 5510-2
- EN 61373
- NFPA 130
- EN 60068
- ISO 9227

Our Industrial Automation sector operates four global centres of technical excellence and a sales and service network in 50 countries, as well as manufacturing capability in Europe, Americas and Asia Pacific.

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