
INNOVATION IN THE PIPELINE
AXIAL
Isolation
VALVES
AB SERIES
GOODWIN®
INTERNATIONAL LTD
www.goodwinflowcontrol.com
LEARN MORE

TAKING FLOW control TO THE NEXT LEVEL

The product range offered by Goodwin has now been extended to include a selection of high performance Axial Isolation Valves.

Several years of Research, Design and Testing has been carried out to bring these products to market, with international patents pending for innovative design features.

Axial Isolation Valves are used in highly demanding applications where tight shut off, high reliability and fast opening / closing are desired. Goodwin Axial Isolation Valves represent a highly effective and cost efficient alternative to current designs available to the market.

Goodwin can supply a diverse range of forged or cast valve body materials, including a wide selection of Carbon Steel, Stainless Steel, Duplex Stainless Steel, Nickel Alloy and Titanium Alloy.

Specified throughout the hydrocarbon, energy, and process industries, Axial Isolation Valves are used in a diversity of liquid, gas and multi-phase fluid applications:

- Emergency Shut Down (ESD)
- Safety Shut Off
- Over Pressure Protection (HIPPS)

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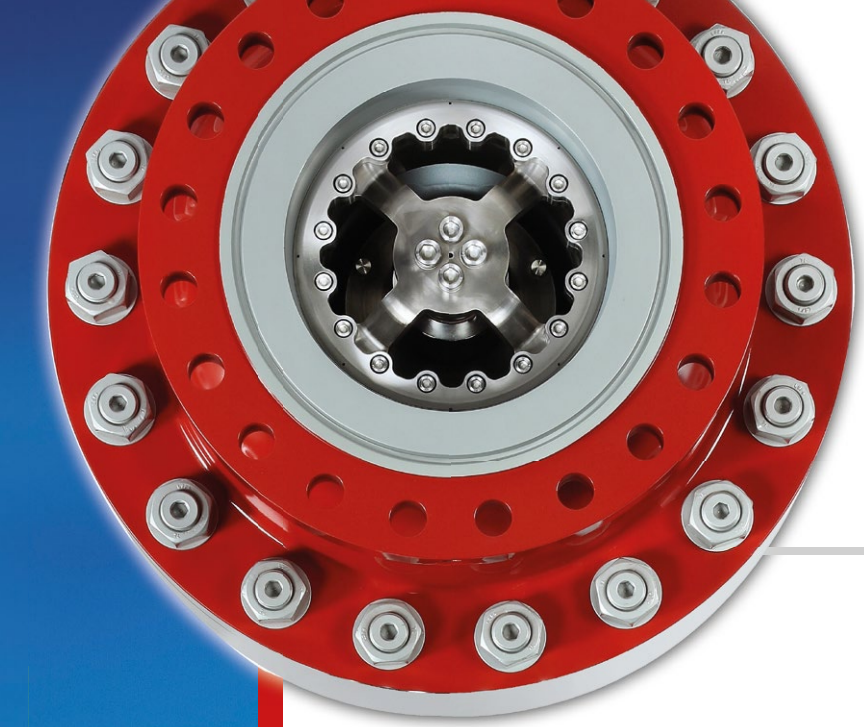
GOODWIN®
INTERNATIONAL LTD



INNOVATIVE DESIGN
PATENTED (PENDING) FEATURES
3 PIECE BODY
RACK-PINION-RACK GEAR TRAIN

DEMONSTRATING THE LEVELS OF TECHNICAL EXCELLENCE AND RELIABILITY OUR CUSTOMERS EXPECT

Goodwin International is a world leader in the design, manufacture and supply of valves for the hydrocarbon, energy and process industries worldwide.

Based in the United Kingdom, the company exports to over 80 countries and offers outstanding support to its customers, including many of the world's end users, oil majors and international engineering contractors.

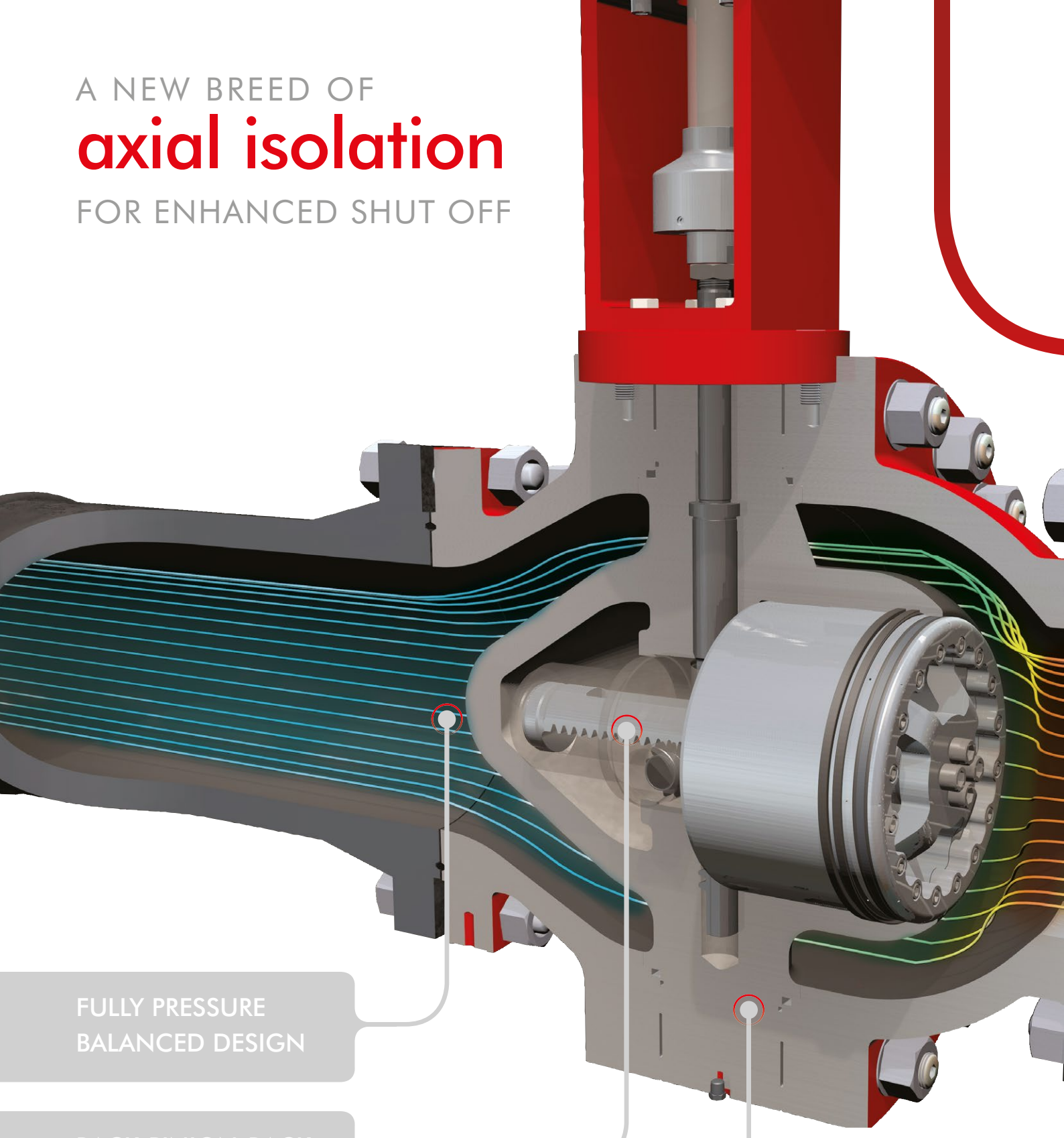
With 40 years of valve manufacture and international sales, Goodwin has built an enviable reputation for providing quality products at internationally competitive prices.

With valve sales in excess of 800 million USD in the past 10 years, Goodwin International is globally approved. Its high quality products are supported by an organisation that has extensive experience, knowledge and skill sets to meet today's stringent end-user specifications and their quality management system expectations.

A NEW BREED OF

axial isolation

FOR ENHANCED SHUT OFF



FULLY PRESSURE BALANCED DESIGN

RACK-PINION-RACK GEAR TRAIN

3 PIECE SPLIT BODY DESIGN

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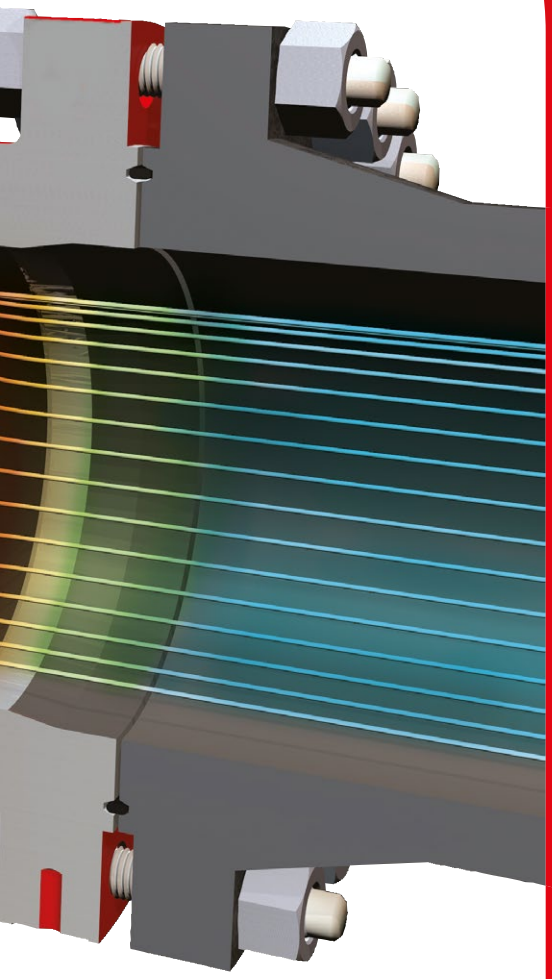
Goodwin Axial Isolation Valves come equipped with innovative features that set Goodwin apart from its competition. Providing durability and reliability of performance, with the exceptional service that Goodwin is renowned for.

OPERATIONAL BENEFITS

- FAST OPENING/CLOSING
- TIGHT SHUT-OFF
- HIGH CAPACITY
- HIGH TURNDOWN
- RELIABILITY
- FLEXIBILITY



FULLY TESTED
LOW EMISSION

FAST OPENING/CLOSING

With operating response times of less than 2 seconds achievable, especially closure times, the Goodwin Axial Isolation Valve is particular well suited to overpressure protections systems applications (HIPPS).

TIGHT SHUT-OFF

With pressure energised seals encapsulating the piston body and pressure energised seating seals in the piston head, tight shut-off to FCI 70-2 Class VI, i.e. bubble tight, is achieved. The seals are out of the line of flow when in the fully open or fully closed positions, ensuring the valve can be operated thousands of times whilst maintaining high integrity sealing.

BI-DIRECTIONAL FLOW AND SEALING

The Axial Isolation Valve can be flowed in either direction and, because of the pressure energised seals, bubble tight shut-off is achieved both ways.

HIGH CAPACITY

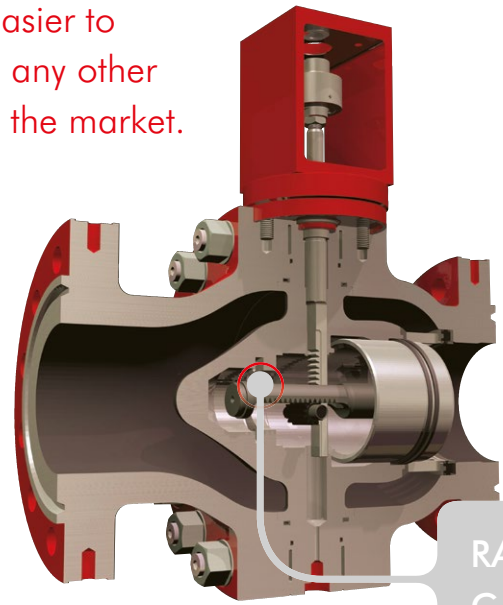
With an annular flow area and an unrestricted, symmetrical, streamlined flow path though the valve, Goodwin Axial Control Valves have a higher inherent flow capacity compared to conventional globe control valves and existing axial control valve designs.

UNPRECEDENTED

innovation

IN FLOW CONTROL

The Goodwin range of Axial Isolation Valves are equipped with innovative features that make the product more efficient, reliable and easier to maintain than any other axial valve on the market.



RACK-PINION-RACK GEAR TRAIN

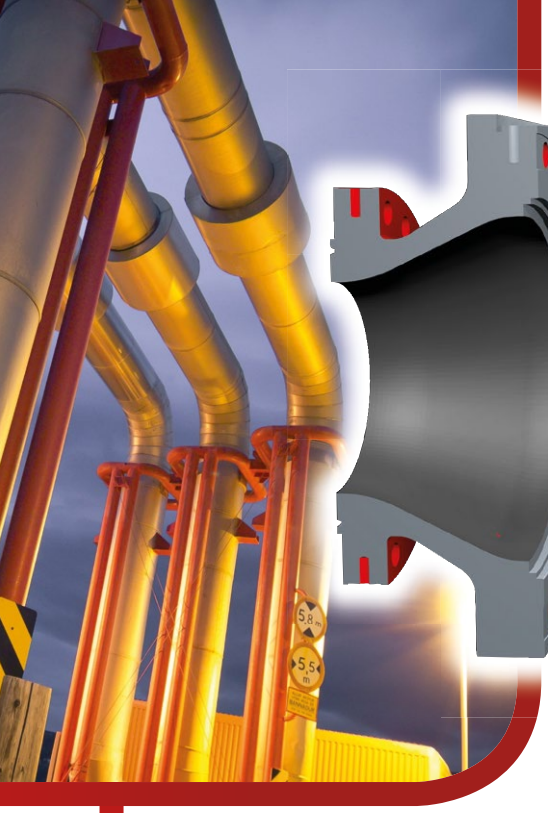
The novel concept of rack-pinion-rack gear mechanism is employed in the Goodwin Axial Isolation Valve to transpose the linear motion of actuation through 90° into axial motion of the piston providing:

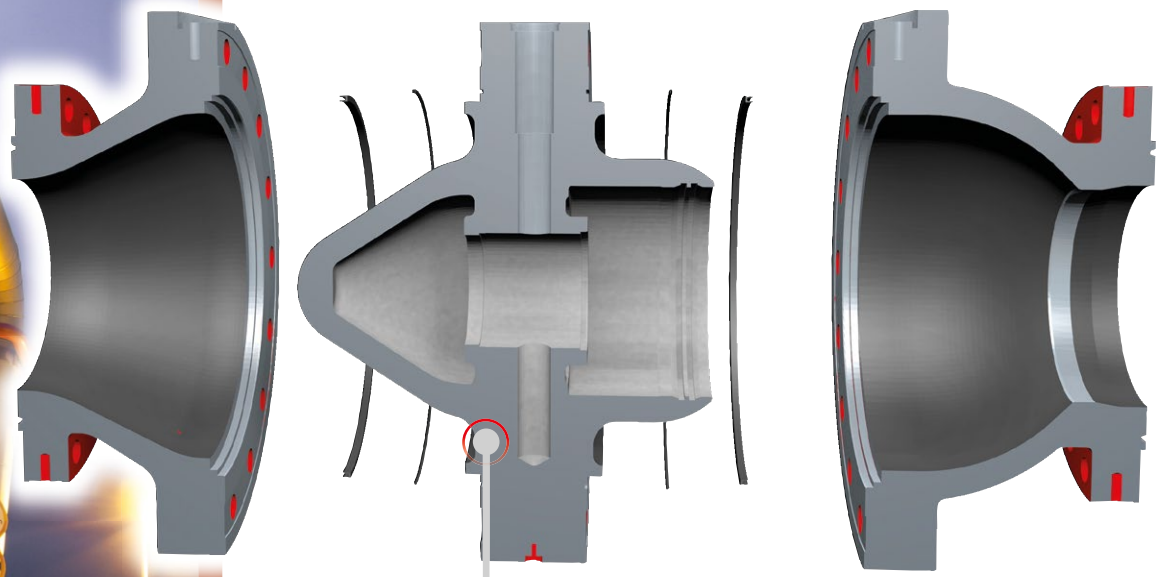
- High durability, rapid and precise movement
- Closure in less than 2 seconds
- Stability of operation for high turndown ratio, i.e. high rangeability
- Zero risk of gear teeth seizure with minimal or no lubrication
- Low friction and high efficiency compared to sliding gear mechanisms
- Low backlash maintained over lifetime of the product

It is almost impossible for a galling or gear train seizure failure mode to occur with the rack-pinion-rack design. A rolling gear mechanism has high efficiency and, therefore, low frictional losses, reducing the actuation forces necessary to operate the valve. The lower the forces to position the valve the less the strain and wear on the actuator promoting operational longevity. The failure mode with the rack-pinion-rack mechanism is graceful where an increase in backlash would become evident over several million cycles. The degradation is easily measured without having to dismantle the valve.

LOW MAINTENANCE

SEIZURE FREE DESIGN

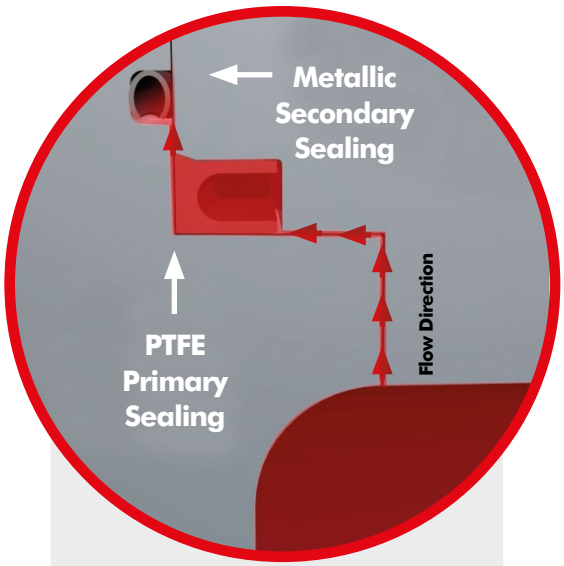




3 PIECE SPLIT BODY DESIGN

The Goodwin Axial Isolation Valve incorporates a novel 3 piece split body design which is widely accepted across the energy industries for other valve types providing:

- Inherent manufacturing advantages leading to reduced lead times
- Flexible design allowing the use of forgings or castings
- Inlet /outlet pipeline size transitioning feasibility within the valve for compressible fluid applications
- High capacity with larger trim sizes
- 100% Non Destructive Examination (NDE) accessibility for the pressure boundary components
- Full verification of casting quality feasibility
- Advanced sealing and precise component manufacture ensuring compliance with all international standards for fugitive emissions
- Dual redundancy sealing with primary and secondary sealing



Precision engineered bolted body joint combined with advanced primary and secondary sealing system complies easily with stringent fugitive emissions standards.

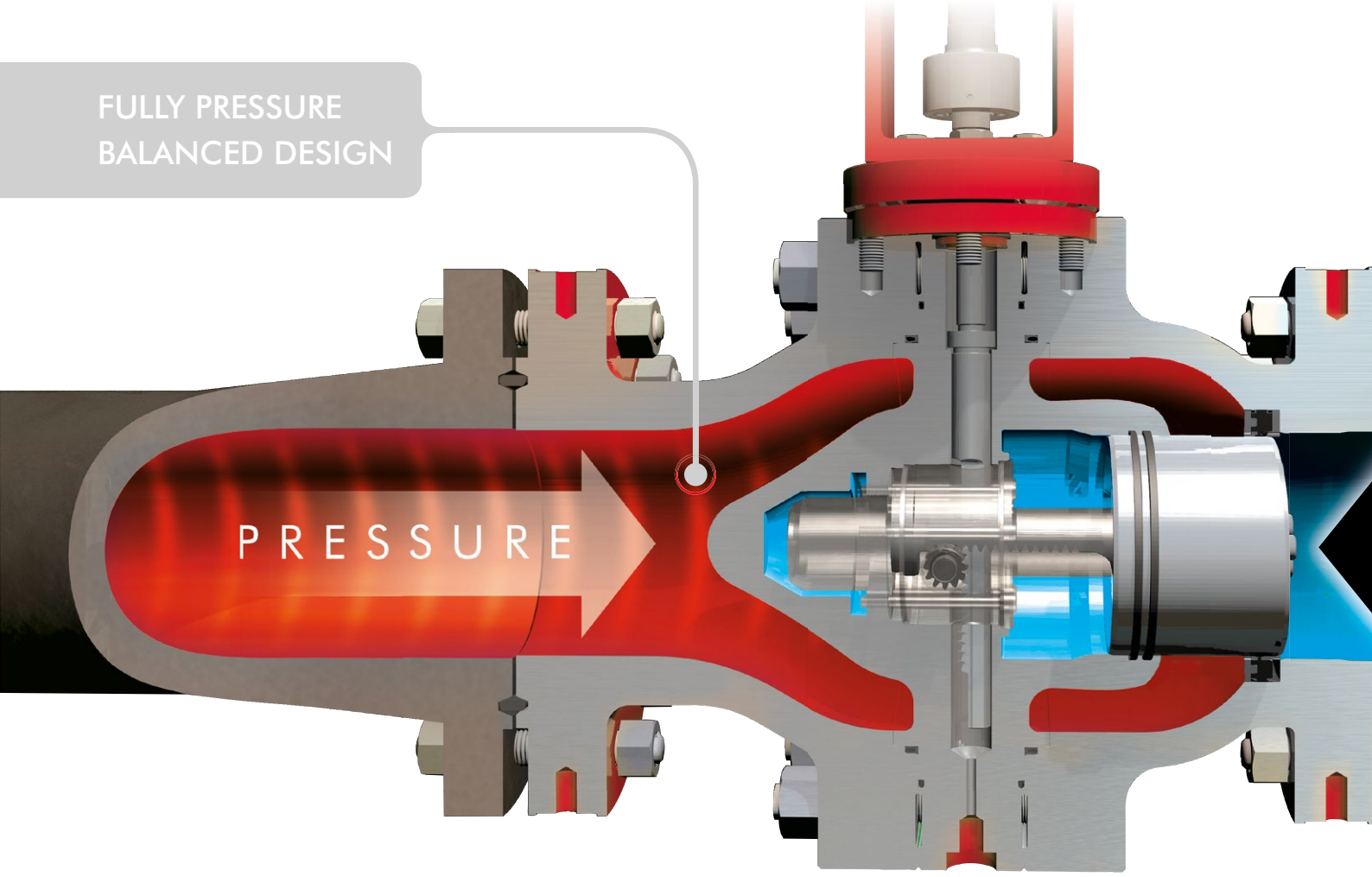
COST & TIME
EFFECTIVE SOLUTIONS

THE ONLY CHOICE

complete isolation

VALVE SYSTEM

FULLY PRESSURE BALANCED DESIGN



The Goodwin Axial Isolation Valve is a fully pressure balanced design, avoiding imbalance in the forces acting on the piston or the stem:

- Pressure balancing is equally effective in both forward and reverse pressure conditions
- Stable operation permits high rangeability / high turndown ratio
- The valve can be opened against full differential pressure
- Breakout forces are minimal as only the seal and mechanical frictional forces are to be overcome
- No need for a bypass or pilot valve to equalise line pressure to open the valve
- Valve closure time in less than 2 seconds can be achieved

Being fully pressure balanced, together with the low frictional forces of the rack-pinion-rack mechanism, enables the use of compact and cost effective actuation compared to other valve types.

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FORWARD & REVERSE

PRESSURE BALANCED

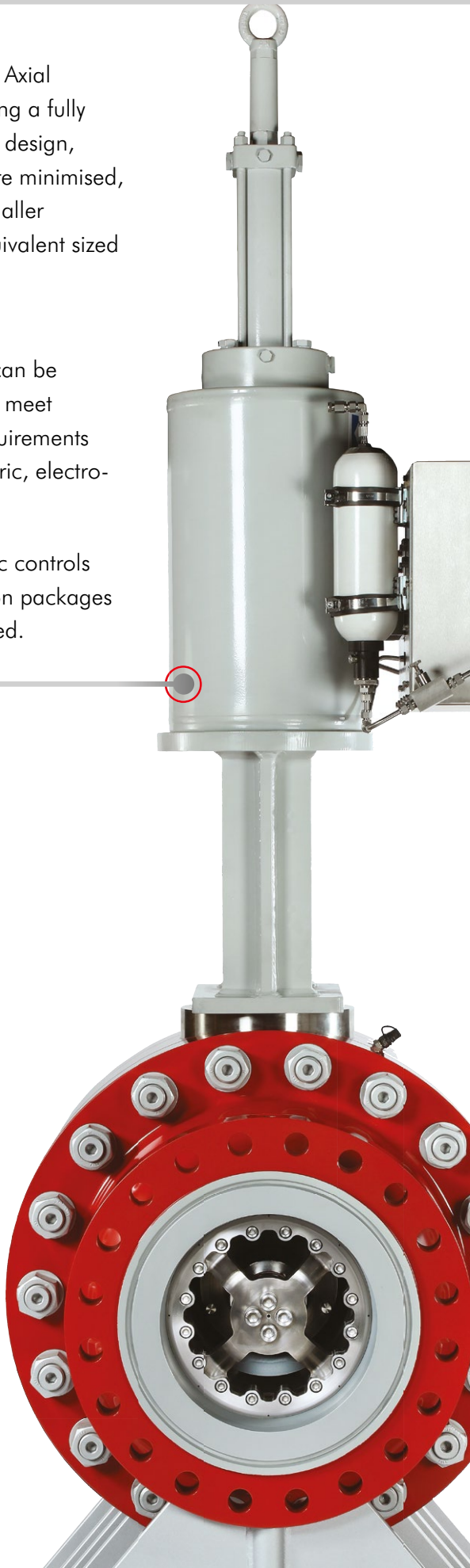
ACTUATION

With the Goodwin Axial Isolation Valve being a fully pressure balanced design, actuation forces are minimised, requiring much smaller actuators than equivalent sized globe valves.

All types of linear motion actuators can be accommodated to meet control system requirements – pneumatic, electric, electro-hydraulic.

Application specific controls and instrumentation packages can be incorporated.

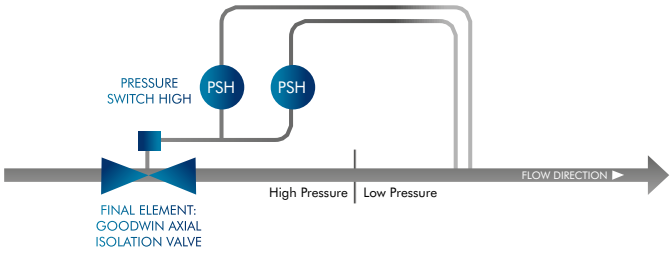
Actuator image is representative only. All actuator manufacturers and types are available.



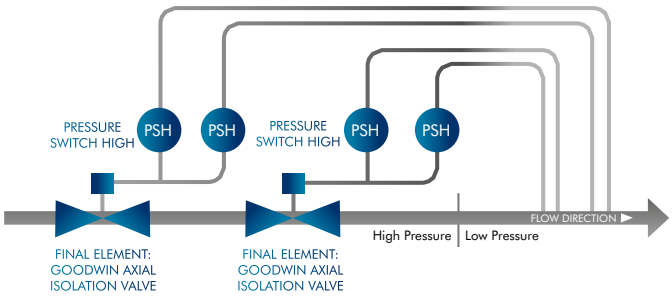
the ultimate barrier

Over pressure protection (HIPPS) Valve system

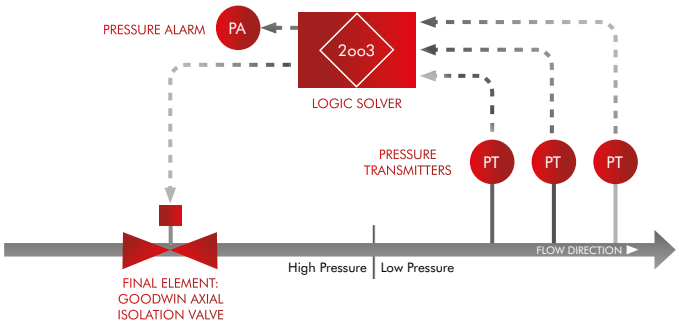
Mechanical HIPPS System (SIL2:1oo1)



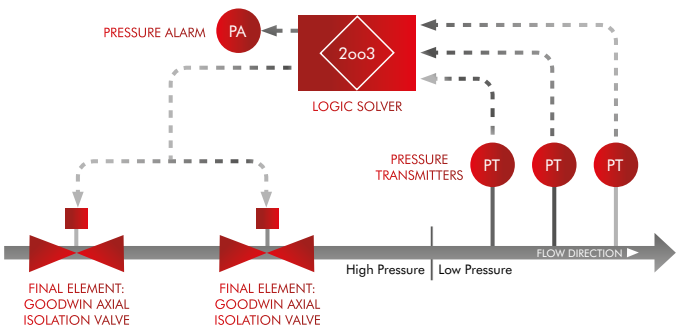
Mechanical HIPPS System (SIL3:1oo2)



Electronic HIPPS System (SIL2:1oo1)



Electronic HIPPS System (SIL3:1oo2)



HIPPS is the acronym for High Integrity Pressure Protection System and is a type of safety instrumented system (SIS) design to prevent over-pressurisation of a pipeline or plant. It is a barrier between high pressure and low pressure systems. In the event of possible pressurisation of the low pressure system, the HIPPS will shut-off the source of the high pressure.

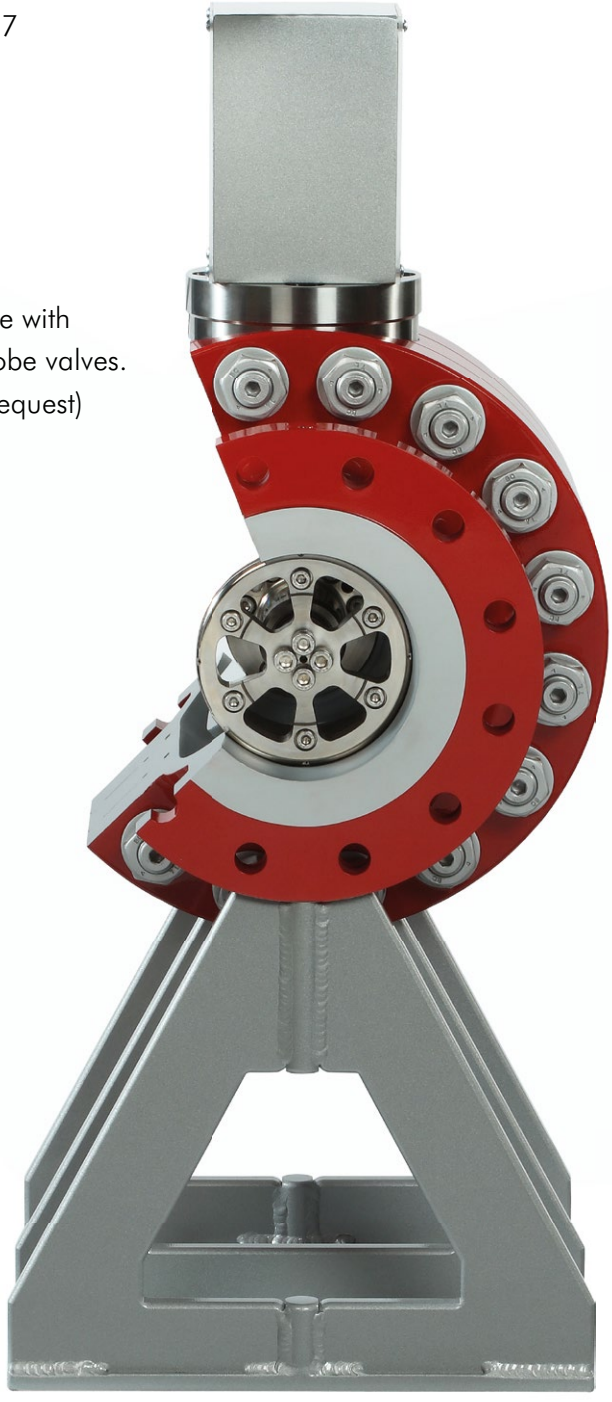
Designed, in accordance with IEC 61508, a High Integrity Pressure Protection System is a complete functional loop comprising three main elements:

- Initiators that detect high pressure. These can be either mechanical or electrical.
- A logic solver in the case of electronic HIPPS which processes the input from the initiators to an output to the final element.
- The final element consisting of valve and actuator to isolate the pipeline and return the system to a safe state. The valve is inherently fail safe with closure effected by venting its pneumatic or hydraulic actuator.

With its fast speed of operation, closure times of less than 2 seconds are achievable, making Axial Isolation Valves the ideal “final element” valve for HIPPS applications.

current scope of Isolation valve manufacture

- 2”-48” Valve Size range
- ASME 150-2500lb, API 3000 – 15,000 pressure class range
- Carbon, Low Temperature Carbon, Stainless, Duplex, Super Duplex Steels, Low-High Alloy, Nickel Alloy and Titanium Alloy.
- Axial Valve fire tested design to API 6FA & ISO 10497 verified by Lloyds register
- Hydro tested to API 598, FCI 70-2, ASME B16.37
- Tight shut off to FCI 70-2 Class VI
- Isolation Valve in compliance with IEC 60534
- Wall thickness in accordance with ASME B16.34
- Face-to-Face dimensions generally in accordance with ASME B16.10, interchangeable with ball and globe valves. (Customer specific face-to-face available upon request)

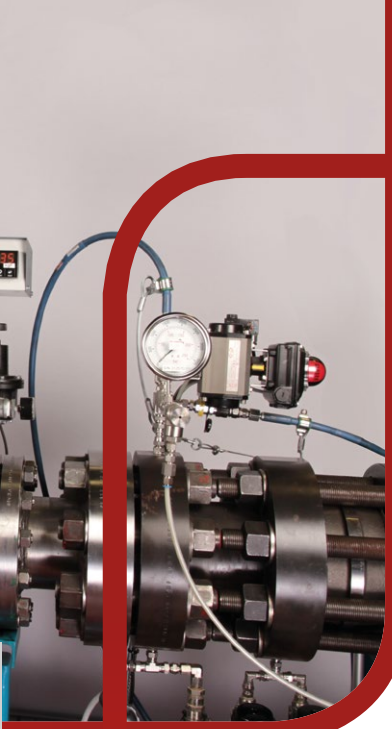


research & development

Extensive research and testing has been conducted by Goodwin to validate the reliability and performance of the new generation of Axial Isolation and Axial Control Valves.

Goodwin International has an excellent reputation as a recognised supplier to global industry.

- Isolation Valve sealing and mechanical performance are tested using a purpose built Hydraulic Flow Laboratory.
- Finite Element Analysis (FEA) used to verify the mechanical integrity of the design.
- Computational Fluid Dynamics (CFD) to simulate and determine flow capacity through the Axial Isolation Valve.
- Fire Testing conducted in compliance with API 6FA & ISO 10497.
- Fugitive Emissions testing conducted in compliance with International standards.
- Extensive mechanical and microstructural analysis is conducted when selecting materials to ensure compatibility and eliminate fretting and galling.
- Application specific seal performance testing.



quality

Goodwin International has an excellent reputation as an established and recognised supplier to global industry.

Quality is the bedrock of the company's ethos. Goodwin International is a highly approved manufacturer with end-user clients worldwide in a diversity of industries. Particularly so the hydrocarbon, energy and process industries. Together with today's priority considerations and objectives of Health, Safety and Environment, Goodwin provides products to all its customers backed by an integrated Quality, Health, Safety, Environment (QHSE) management system driven on the basis of continuous improvement.

- All valves are designed, manufactured, assembled and tested at its BSI EN ISO 9001 manufacturing facilities.
- Valves are certifiable in compliance with PED 2014/68/EU when required
- Extensive testing and laboratory facilities within its ultra-modern 38,000m^2 manufacturing plant to meet all customer valve testing requirements. Typically:

  Hydrostatic Pressure Testing (25000 psig/1725 barg)

  High Pressure Gas Testing (20000/1380 barg)

  Low Temperature (-46°C) and Cryogenic Testing (-196°C) Pressure Testing
- Fire tested to API 6FA & ISO 10497

"A Goodwin Axial Isolation Valve was supplied to Technical Valve Services Ltd to assess the valve's fire safe performance. With Lloyds Register in attendance to witness and certify, a fire test was conducted in accordance with API 6FA. Engulfing the pressurised test valve in a 761°C flame environment for 30 minutes, the valve was subsequently verified for external and through seat leakage as per the standard. The valve was tested in both the preferred flow direction and the reverse direction. The same valve passed both fire tests with ease without any need to adjust or replace any of the valve components or soft seals between tests".

– Test Directors TVS

"The Goodwin Isolation valve performed well in the fire test against standard API 6FA:2011; no leakage occurred during testing in the operational direction. While it is not required by the standard, the valve was also tested against the operational direction. The easy operation of the valve after testing showed a good fire test design".

– 3rd Party Inspector Lloyds Register

company overview

Goodwin International is globally recognised and approved for its design, manufacture and supply of valves to the world's hydrocarbon, energy and process industries.

Located in the heart of England in Stoke-on-Trent, Goodwin International is an engineering company of diverse skills, capabilities and products, and is a wholly owned subsidiary and member of the Goodwin PLC group of companies. The Group's core activities lie in engineering, refractories and investment powders and is trans-global in its activities.

The history and pedigree of Goodwin dates back to 1883. The initial company established in that year was an iron founders and engineers, R Goodwin and Sons (Engineers) Ltd. The foundry exists to this day operating under the name of Goodwin Steel Castings, and is one of the foremost nickel alloy foundries in Europe. It too is located in Stoke-on-Trent.

Publicly listed on the London Stock Exchange, Goodwin PLC is family managed. Currently the group is headed by the fifth generation of the Goodwin family with members of the sixth generation now in management positions within its operating companies.

With over 1.5 million valves in service from 40 years of supply to the global hydrocarbon, energy and process industries, Goodwin International Ltd provides a comprehensive level of customer service supported by a comprehensive representative network and its own overseas offices in Brazil, Dubai, South Korea, China and Japan.

Goodwin International

Goodwin Steel Castings

Company Commitment...

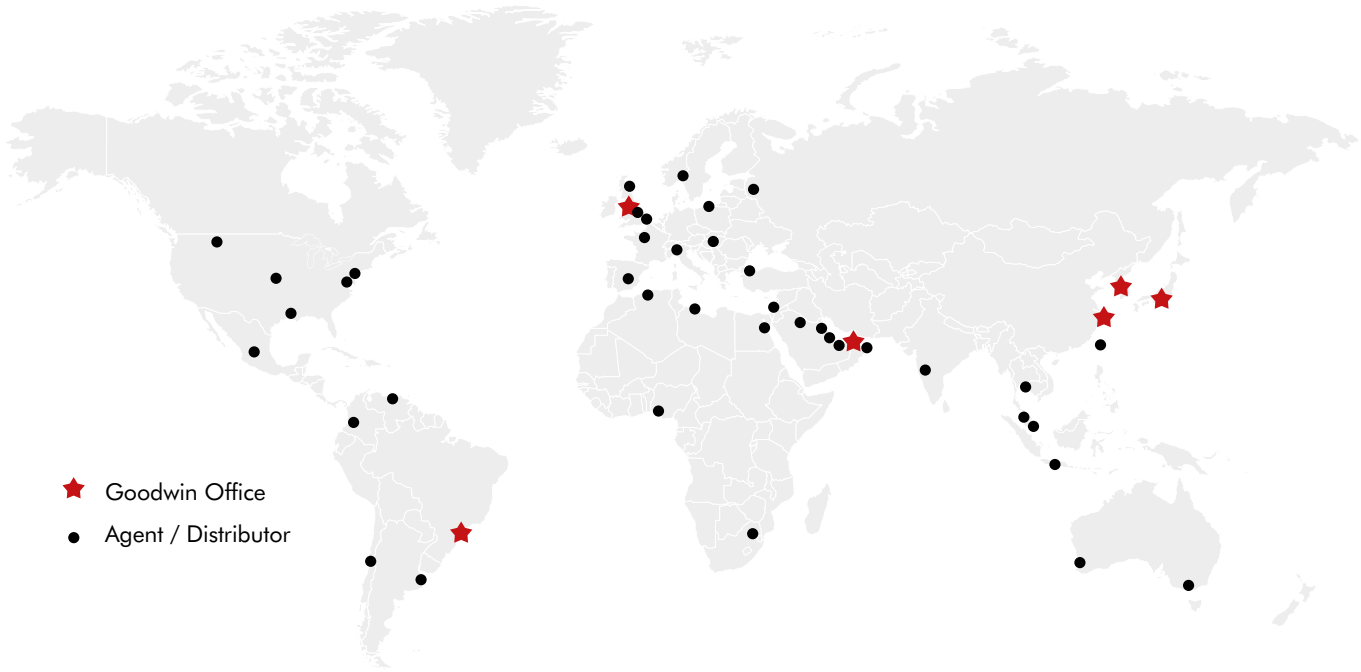
To maintain an underlying commitment to engineering by investing in the design, manufacture and sale of technically advanced products.

The company's philosophy is to supply well designed products fit for purpose that are internationally competitive, whilst being superior to our competitors' be it by product performance or efficiency always ensuring the highest level of quality in everything we do.

Through investment in its people and markets the company aims to maintain its market position, to become a world leader in its technologies and provide exemplary customer service.

Matthew Goodwin
Managing Director

global offices & agents



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AXIAL ISOLATION VALVE

AXIAL HIPPS VALVE

AXIAL CONTROL VALVE

AXIAL CHOKE VALVE

DUAL PLATE CHECK VALVE

AXIAL NON-SLAM CHECK VALVE

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