PROCHEM

Your Source for Local Supply and Support

REFERENCE MANUAL

VALVES AND ACTUATORS

PIPING PRODUCTS

INSTRUMENTATION

VALVES AND ACTUATORS

MANUFACTURING

INDENT SERVICE

HYDRAULIC FITTINGS

PROCHEM
PIPELINE PRODUCTS

Valves and Actuators

Prochem offers excellence in all areas of Valve and Actuator supply through its partnership with world-class, innovative manufacturers whose high integrity and uncompromising quality enables our team to be truly customer service focused. Coupled with a range of engineered valve and actuator products, designed for Oil and Gas severe environments and the Mining sectors – Prochem has the right solution for your demanding application.

Prochem is proud to support industry with high quality products from:

- **Poyam Valves**
- **BSM Valves**
- **Actuator Technology Company (ATC)**
- **Pacson Valves**
- **Anderson Greenwood Primary Isolation Valves**
- **Habonim Industrial Valves and Actuators**

The World of Prochem

PIPING PRODUCTS

MANUFACTURING

INSTRUMENTATION

INDENT SERVICE

VALVES AND ACTUATORS

HYDRAULIC

Valves & Actuators

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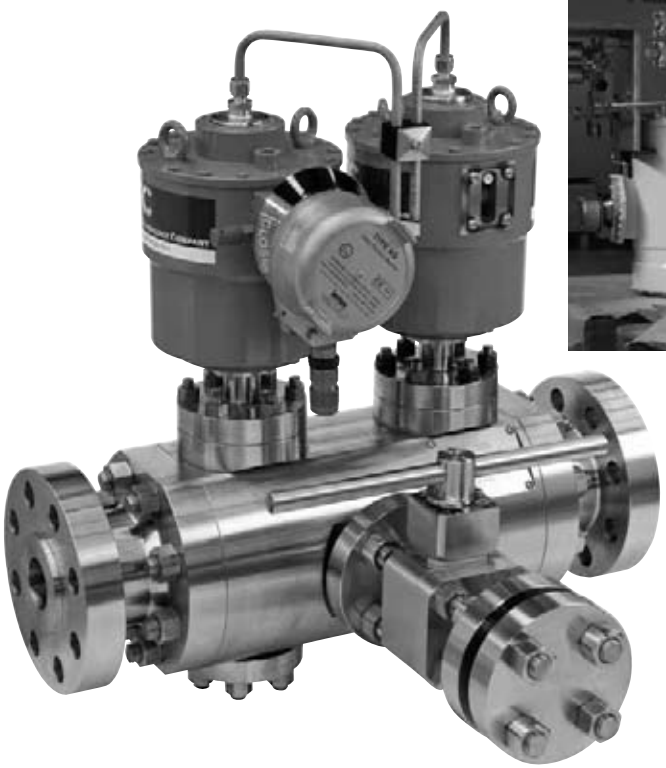
PROCHEM

Actuated Valve Packages

Specialising in Poyam, ATC, BSM, Pacson and Habonim – Prochem can deliver actuated valves in any combination to suit your valve, actuator and control system specification.

Prochem manages the process making certain a smooth and continual dialogue between the valve and actuator companies is maintained ensuring the project runs on time and to specification.



- Wellhead and upstream
- Topsides
- Manifolds and confined space applications
- ESD and HIPPS
- Subsea shallow and deep water
- Cryogenic and high temperature
- Fire safe
- Double block and bleed assemblies

AMPO Poyam Valves

“COMMITMENT MADE OF STEEL”

AMPO S. Coop., located in Idiazabal, Spain, and founded in 1964, has been involved in many large international projects, supplying not only the product but also expertise in project management, finance of high value projects and logistical expertise to ensure trouble-free and on-time delivery of quality products.

- Cryogenic Service
- High Pressure
- General Service
- Metal Seated
- Special Application

AMPO Engineering
"Our aim is engineering efficiency: Our engineers are ready to help customers meet the most demanding design challenges and applications"

AMPO Foundry
"Our foundry is fully in line with manufacturing processes, providing us with the best quality castings and service"

AMPO Poyam Valves
"AMPO is able to design and manufacture high-technology valves with best performance and low maintenance costs"

Why choose AMPO-POYAM Valves?

Best quality & optimum performance

- Quality assurance system: ISO 9001, API Spec Q1 & 6D, SIL 3
- Environment: ISO 14001
- In-house quality control: X-ray, Dye Penetrant, Magnetic Particles and PMI facilities
- Internal Weld Overlay Technologies: (Stellite® 6, Nickel, Inconel® 625, Incoloy® 825, Tungsten Carbide, Chromium Carbide)

Best Service

Always fulfilling delivery periods
Fast actions to customer requests

Customised valves under high specifications

Special materials: Incoloy®, Hastelloy®, Monel®, Duplex, Super Duplex

Fully In-house manufacturing process

Casting design - Pattern design - Pouring - Casting NDE - Machinery - Assembling - Testing - Painting - Packing

Maximum care of customers, suppliers and the environment

- Natural Gas Processing
- Oil and Petroleum Refining
- Petrochemical & Chemical
- Power Plants
- Mining

Monel, Hastelloy and Incoloy are registered trademarks.

Customised Solutions

AMPO Poyam Valves have all the facilities needed to manaufacture finished components, which are the basis for the high added value offered by AMPO to its customers. They can adapt to specific needs as required, having a wide experience of more than forty years offering solutions.

Actuation Choices

Electric Actuators
Gas over Oil Actuators
Hydraulic Actuators
Pneumatic Actuators

Additional Devices

Commercial and own design control panels
Limit switches
Position indicators
AMPO control software
Junction boxes
Power packs
Interlock systems
Position and pressure transmitter

Fire Protection Systems

Flexible fire protection
K-MASS: Ceramic coat process
Rigid fire protection

AUSTENITIC STAINLESS STEEL

ASTM	EN	UNS	OTHERS
A351 CF8	1.4308	J92600	AISI 304
A351 CF8M	1.4408	J92900	AISI 316
A351 CF8C	1.4552	J92910	AISI 347
A351 CF3	1.4306	J92500	AISI 304L
A351 CF3M	1.4404	J92800	AISI 316L
A351CF10MC	1.4581	J93000	AISI 316Nb
A351 CG8M	-	-	AISI 317

SUPER AUSTENITIC STAINLESS STEELS

ASTM	EN	UNS	OTHERS
A351 CN7M	1.4527	-	-
A351 CK3MCuN	1.4593	J93254	254 SMO
-	1.4469	S32654	654 SMO

AUSTENITIC - FERRITIC STAINLESS STEEL (DUPLEX)

ASTM	EN	UNS	OTHERS
A890Gr4A	1.4470	J92205	DUPLEX S31803
A890Gr5A	J93404	-	SUPERDUPLEX
A890Gr6A	1.4469	J93380	SUPERDUPLEX S32760
CD4MCu	1.4517	J93370	-

NICKEL-BASED ALLOYS

ASTM	EN	UNS	OTHERS
A494 CU5MCuC	-	-	INCOLOY 825
A494 M-35-1	-	N24135	MONEL 400
A494 M-30H	-	N24030	-
A494 CW-6MC	-	N26625	INCONEL 625
A494 CW-12MW	-	N30002	HASTELLOY C276

CARBON STEELS

ASTM	EN	UNS	OTHERS
A216 WCA	-	J02502	-
A216 WCB	-	J03002	-
A216 WCC	-	J02503	-

MARTENSITIC STAINLESS STEELS

ASTM	EN	UNS	OTHERS
A217 CA-15	1.4008	J91150	AISI 410
A352 CA-6NM	-	J91540	-
A747 CB7Cu-1	-	J92180	17-4PH

MEDIUM AND LOW ALLOY STEELS

ASTM	EN	UNS	OTHERS
WC6	1.7357	-	-
WC9	1.7365	-	-
A217C5	1.7365	-	-
A217C12	-	-	-

HEAT-RESISTANT STEELS

ASTM	EN	UNS	OTHERS
A297 HH	-	-	25/12
A297 HK	-	-	25/20
A297 HP	-	-	25/35
A297 HU	-	-	18/38

LOW TEMPERATURE CARBON STEELS

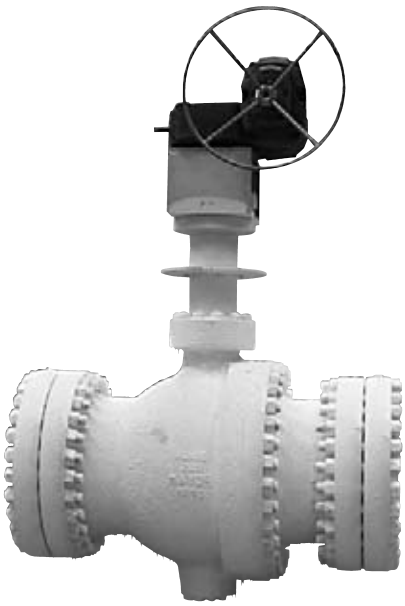
ASTM	EN	UNS	OTHERS
A352 LCA	-	J02504	-
A352 LCB	-	J03003	-
A352 LCC	-	J02505	-

TOP ENTRY BALL VALVES

Ball Valves	Characteristics
Standards:	API, BS, MSS, ANSI, ASME, ASTM, DIN
Classes:	150lbs to 2500lbs
Sizes:	15 (1/2") to 1200 (48")
Construction:	Extended bonnet. Bolted bonnet. Floating and trunnion-mounted ball. Full and reduced bore. Flanged, buttweld ends and both. Manual and motor-operated. Fire safe. Soft and metal seats.
Temperature:	-196 (Cryogenic) to 580°C

SPLIT BODY & END ENTRY BALL VALVES

Ball Valves	Characteristics
Standards:	API, BS, MSS, ANSI, ASME, ASTM, DIN
Classes:	150lbs to 2500lbs
Sizes:	15 (1/2") to 1200 (48")
Construction:	Extended bonnet. Bolted bonnet. Floating and trunnion-mounted ball. Full and reduced bore. Flanged ends. Manual and motor-operated. Fire safe. Soft and metal seats.
Temperature:	-196 (Cryogenic) to 580°C



GATE, GLOBE & CHECK VALVES

Gate, Globe & Check Valves	Characteristics
Standards:	API, BS, MSS, ANSI, ASME, ASTM, DIN
Classes:	150lbs to 2500lbs
Sizes:	15 (1/2") to 1800 (72")
Construction:	Extended bonnet. Bolted bonnet. Flanged and buttweld ends. Manual and motor-operated. Throttling Service Globe valves. Soft and metal seats.
Temperature:	-196 (Cryogenic) to 580°C
Type:	Gate: Standrad Design (API600). Light Pattern Design (ASME B16.34). Globe: Straight Pattern, Y Pattern and Stop Check. Check Valves: Swing Check, Lift Check.

PRESSURE SEAL GATE, GLOBE & CHECK VALVES (High Pressure)

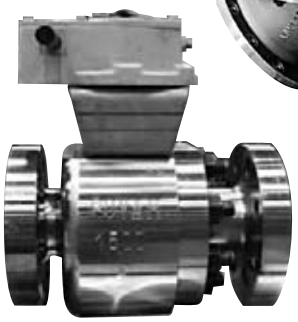
Pressure Seal Valves	Characteristics
Standards:	API, BS, MSS, ANSI, ASME, ASTM
Classes:	600lbs to 2500lbs
Sizes:	50 (2") to 1400 (56")
Construction:	Pressure Seal bonnet. Extended bonnet (gas column). Flanged and buttweld ends. Manual and motor-operated. Metal seats.
Temperature:	-196 (Cryogenic) to 580°C
Type:	Gate: Flexible wedge, parallel slide. Globe: Straight Pattern, Y Pattern, Stop Check. Check Valves: Swing Check, Lift Check, Tilting Disc.

SLURRY ANGLE VALVES

Slurry Angle Valves	Characteristics
Standards:	MSS, ANSI, ASME, ASTM
Classes:	150lbs up to 1500lbs
Sizes:	50 (2") to 750 (30")
Construction:	Angle 90°, Angle 45°. Bayonet. Straight-through. Three way. Lift Check. Lever, gear and motor-operated. Regrinding operation. Metal seats.

SEVERE SERVICE BALL VALVES

Severe Service Ball Valves	Characteristics
Standards:	API, MSS, ANSI, ASME
Classes:	150lbs up to 2500lbs
Sizes:	15 (1/2") to 500 (20")
Construction:	Bolted bonnet. Floating mounted ball. Full and reduced bore. Flanged ends, BW, SW. Manual and motor-operated.
Temperature:	Up to 870°C



LIFT PLUG & SWITCH VALVES

Plug Valves	Characteristics
Standards:	API, MSS, ANSI, ASME
Classes:	150lbs up to 2500lbs
Sizes:	50 (2") to 900 (36")
Construction:	Bolted bonnet. Flanged ends. Manual and motor-operated. Metal seats. Lift plug. Port sizes: 100% and 70%. Accessories: Purge, drain and flushing connections.

BSM Valving Solutions

Industry leading manufacturer of ultra fast-track, high quality valving solutions.

Emergency Delivery Specialists

Specialists in the Oil & Gas Industry

BSM Valves is one of the world's most important fast-track valve producers. At their state-of-the-art production facilities in Breda, The Netherlands, BSM manufacture hard to obtain valves in a wide range of exotic materials. BSM's valves are made to order and to tight specifications, and the company is specialised in working from custom-made designs, producing high-quality valves, quickly and efficiently.

BSM's dedicated and experienced team works hard to provide customers with specialty valves to suit even the most extreme conditions. They pride themselves in their ability to offer tailor-made valves with short lead times. To make this happen, they maintain fast and effective communication with customers, use the latest in design and manufacturing technologies and dedicate themselves to innovation and product development.

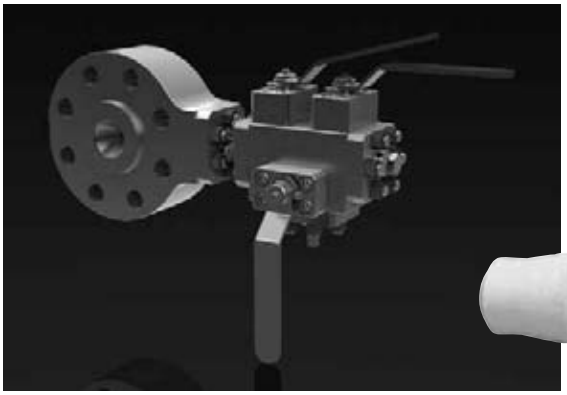
BSM®

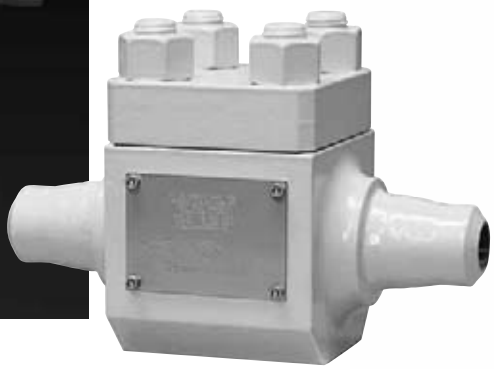
High Quality Products

BSM's specialty valves are all manufactured from forged bar or forgings in their state-of-the-art production facilities. With the newest equipment, they can guarantee the highest quality and the shortest of lead times.

BSM's range includes:

- Ball
- Gate
- Check
- Globe
- DBB
- Cryogenic
- Subsea
- Needle
- Metal Seated
- Through Conduit
- Special Designs





SPECIAL VALVES

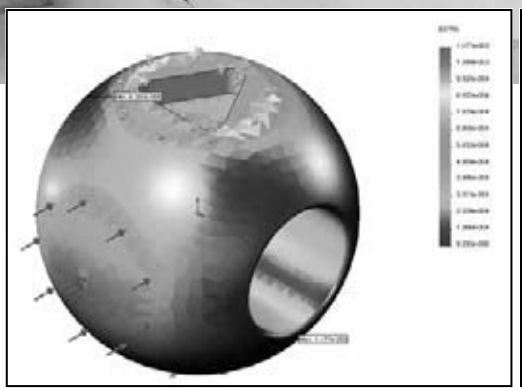
Sizes 15 (1/2") – 500 (20")
ANSI Class (lbs) 150 – 4500
API Rating (psi) 3000 – 10000
DIN Rating (PN) 10 – 400

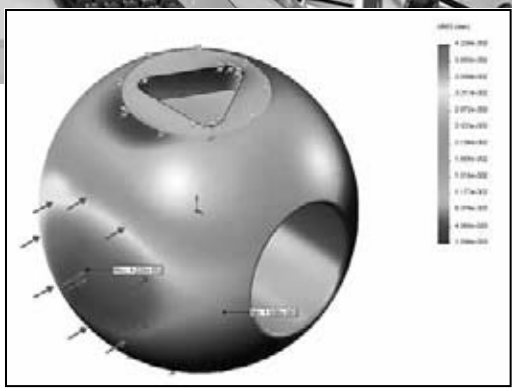
Temperature range:
-196 to 550°C

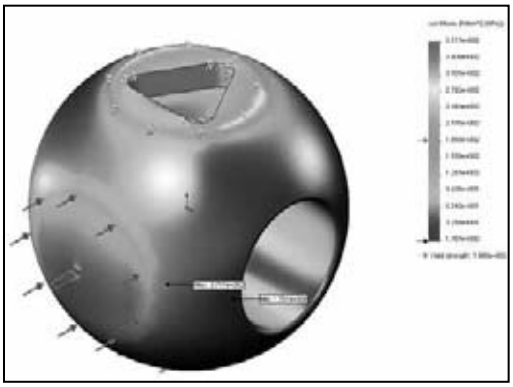
Construction
No limitations

Standards
No limitations

All valves comply with European Legislation PED 97/23/EC
NOTE: Larger sizes available on request







Static strain, displacement and stress shown using Finite Element Analysis (FEA)

Engineering at its Best

BSM Valves' manufacturing facilities in Breda include a well-equipped, state-of-the-art engineering department. All technical staff and engineers are highly qualified and fully up to date on the latest in design and production technologies. With the best equipment at their fingertips, they are able to handle even the toughest specifications.

Research and development is an important part of the company strategy and BSM pride themselves in their ability to provide you with modern and effective design solutions. Depending on your needs, BSM's engineers will work with you to design the right valves for your specific situation.

The company's highly experienced team of engineers and technical staff are all experts in their field; in design, materials selection, welding and testing and of course interpreting and implementing our customers' specifications. Whether it is a new application, new combination of valve types or unusual materials, BSM's experienced engineers are always on the look out for a new challenge.

PROCHEM SOLUTIONS: ***Super-fast Delivery***

Prochem facilitated a lightning fast delivery from BSM Valves, when one of our North West Shelf clients had an emergency requirement for special, large diameter check valves. Whilst the standard industry delivery is over 30 weeks, BSM offered delivery in just two weeks, and that is exactly what they delivered.

BSM®

In-house Valve Testing

An in-house testing department at BSM Valves ensures they meet the high standards. Every valve manufactured or supplied undergoes extensive testing before being dispatched for delivery.

BSM's testing capabilities include:

- Low pressure and High pressure seat tests
- Shell (body)
- Fugitive Emission (FE)
- Cryogenic
- Ultrasonic wall thickness measurement
- Positive Material Identification (PMI)
- Liquid Dye Penetrant (LPD)
- Magnetic Particle Examination (MPE)
- High Pressure Gas Tests

BSM can also carry out non-destructive testing, including Eddy current, ultrasonic, x-ray and destructive tests like (hot)-tensile testing, impact, corrosion, micrographic, spectrometric and fire testing.

A Wide Selection of Materials

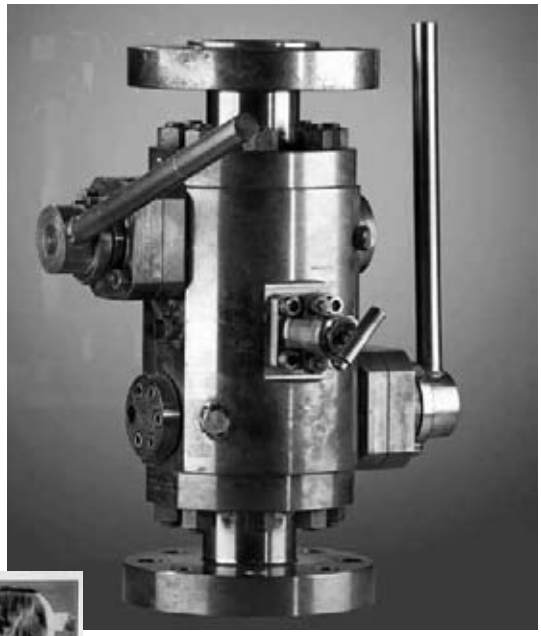
With a large stock of exotic materials and long-standing relationships with reliable suppliers, BSM can manufacture a broad selection of valves in almost any material. The company always strives to provide our customers with whatever material they require.

BSM Valves specialise in exotic materials. Their considerable stock consists of forged bar materials and forgings in a variety of materials as well as single valve pieces and semi-finished products.

Materials include:

Stainless steels
Duplex / Super Duplex
Titanium
Nickel
Monel®
Incoloy®
Zinconium
Alloy and Carbon steels
6Mo
Cunifer
Feralium
Inconel®
Hastelloy®

Monel, Hastelloy, Inconel and Incoloy are registered trademarks.



Fire Tested 3" 900lb Full Bore Double Block and Bleed Ball Valve Trunnion Mount F51 Duplex. This valve currently in service in the Australian Oil and Gas industry.

Certification and Quality Assurance

The BSM quality system complies with ISO 9001:2000 and the Pressure Equipment Directive (PED) modules H. Lloyd's Register Quality Assurance has accredited BSM, whilst a number of their valves have type approval for fire safe operation. They also carry out regular fugitive emissions, cryogenic and temperature testing.

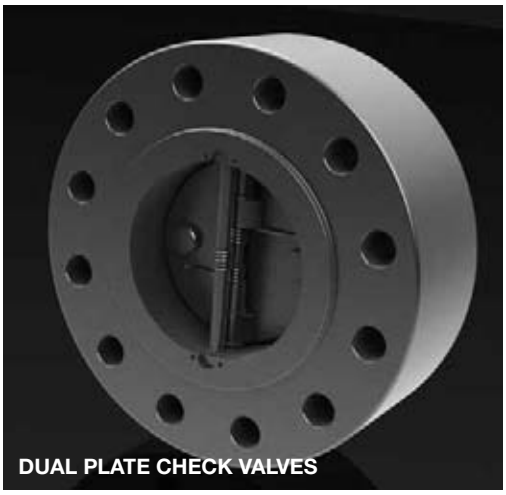
BSM Valves ensure that all of their production processes maintain international safety and quality standards, whilst their products are tested rigorously and certified for quality assurance. You can be guaranteed of excellent quality from BSM Valves.

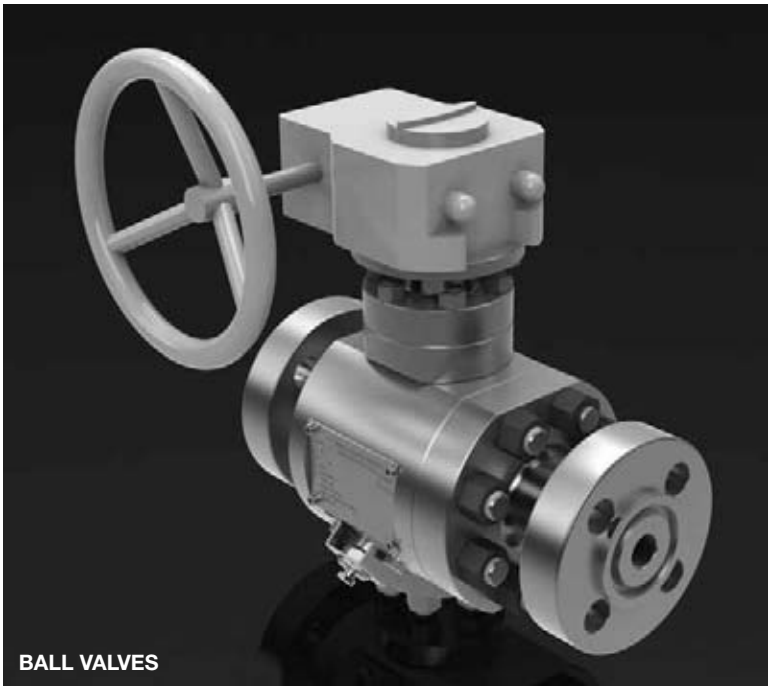
The company's complete production process from start to finish: design, manufacture and testing, is carried out with the highest quality and safety in mind.

BSM Valves
Product Selection Overview

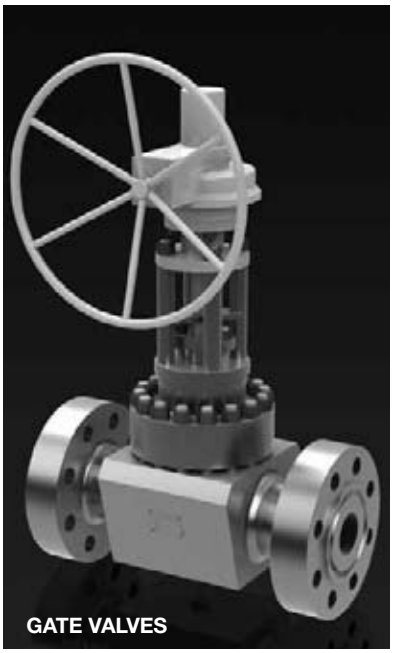
All valves comply with European Legislation PED 97/23/EC

NOTE: Larger sizes available on request


DUAL PLATE CHECK VALVES


BALL VALVES


GLOBE VALVES


GATE VALVES

DUAL PLATE CHECK VALVES

Sizes 15 (1/2") – 300 (12")
ANSI Class (lbs) 150 – 4500
DIN rating (PN) 10 – 400
API 6A. 5000/10000 psi

Construction
Dual plate, single piece body
retainerless type, retainer type, spring loaded
Wafer type, solid lug, flanged, hub ends, BW ends
integral seats, renewable seats, screwed-in,
Stellited disc
Stellited seat and disc

Standards
BS 1868 ASME B16.34, ASME B16.5, BS 5352,
ISO 14313, ISO 17292, API 6A , API 594, MSS SP-44,
API 598

BALL VALVES

Sizes 15 (1/2") - 450 (18")
ANSI Class (lbs) 150 - 4500
API Rating (psi) 3000 - 10000
DIN Rating (PN) 10 - 400
Temperature range: -196 to 500°C

Construction
Soft and metal seated
Floating/trunnion mounted ball
One piece, three piece, split body
Top entry
Side entry
Wafer type

Standards
BS 5351, ISO 14313, ISO 17292, API 6A,
API 6D ASME B16.34

GLOBE VALVES

Sizes 15 (1/2") – 300 (12")
ANSI Class (lbs) 150 – 4500
API Rating (psi) 3000 – 10000
DIN Rating (PN) 10 – 400
Temperature range: -196 to 850°C

Construction
Bolted bonnet, OS&Y, back-seated
Screwed-in seal-welded bonnet, OS&Y, back-seated
Pressure seal bonnet, OS&Y, back-seated

Standards
BS 1873 API 602, ISO 14313, ISO 17292,
BS 5352 ASME B16.34, API 6A, API 6D

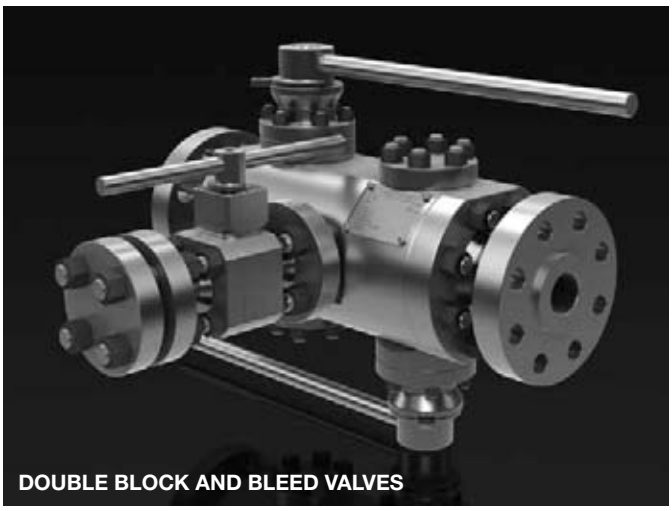
GATE VALVES

Sizes 15 (1/2") – 250 (10")
ANSI Class (lbs) 150 – 4500
API Rating (psi) 3000 – 10000
DIN Rating (PN) 10 – 400
Temperature range: -196 to 850°C

Construction
Bolted bonnet, OS&Y, back-seated
Screwed-in seal-welded bonnet, OS&Y, back-seated
Pressure seal bonnet, OS&Y, back-seated
Welded bonnet OS&Y, back-seated
Bellow sealed
Through conduit, double expanding

Standards
BS 1414 API 602, BS 5352, ASME B16.34, API 6A,
ISO 14313, ISO 17292, API 6D, API 600

Deviations
Solid flex wedge and solid wedge

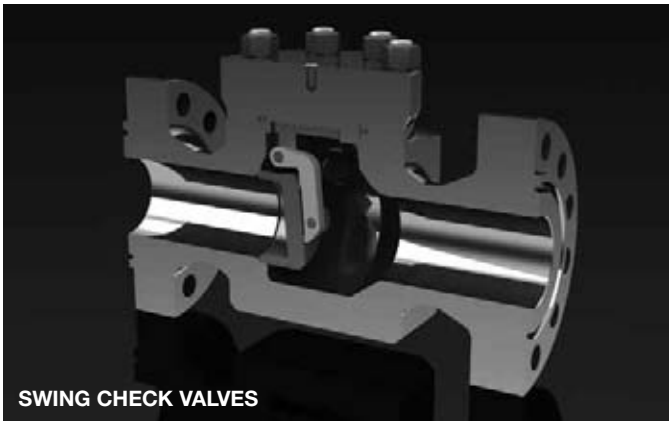

DOUBLE BLOCK AND BLEED VALVES

DOUBLE BLOCK AND BLEED VALVES

Sizes 15 (1/2") – 450 (18")
ANSI Class (lbs) 150 – 4500
API Rating (psi) 3000 – 10000
DIN Rating (PN) 10 – 400
Temperature range: -196 to 500°C

Construction
Three piece body
Cartridge body
Injection/sample quill
Integral check valve

Standards
BS 5351
API 6A
API 6D ASME B16.34
API 17D DIN 3840

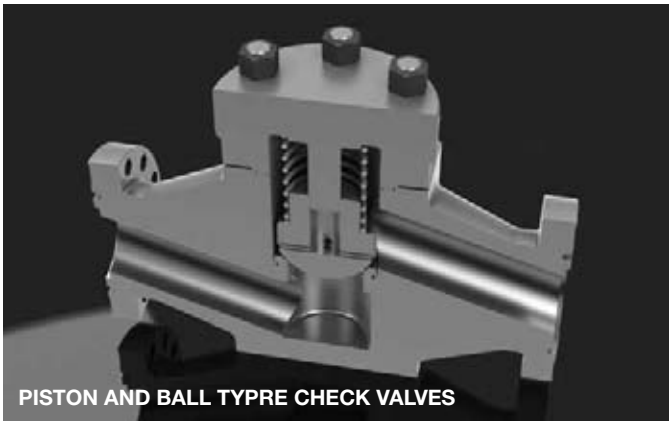

SWING CHECK VALVES

SWING CHECK VALVES

Sizes 15 (1/2") – 250 (10")
ANSI Class (lbs) 150 – 4500
DIN rating (PN) 10 – 400
API 6A. 5000/10000 psi

Construction
Swing check valve, bolted cover, internal hinge construction
Outside hinge construction
Pressed-in seat, screwed seat,
Sealweld seat.
Stellited seat and disc
Leakrate A according to EN 12266
Part 1/2 2003 (BS 6755)

Standards
BS 1868 ASME B16.34, BS 5352,
ISO 14313, ISO 17292, API 6A

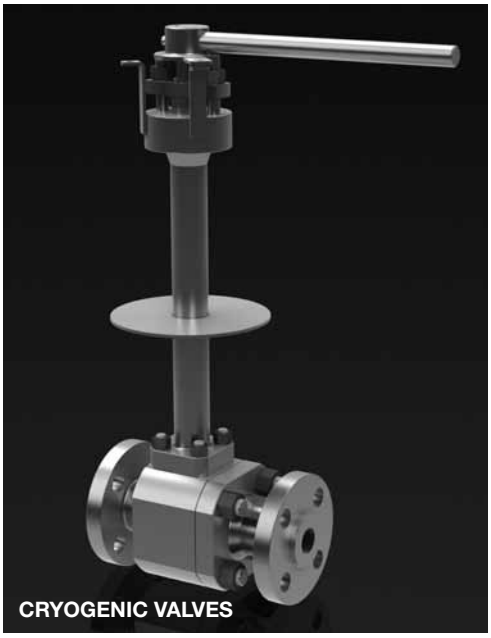

PISTON AND BALL TYPRE CHECK VALVES

PISTON AND BALL TYPE CHECK VALVES

Sizes 15 (1/2") – 300 (12")
ANSI Class (lbs) 150 – 4500
DIN rating (PN) 10 – 400
API 6A. 5000/10000 psi

Construction
Piston type, bolted cover, loose disc and spring loaded
Ball type, bolted cover and spring loaded
Non-slam type
Renewable, screwed-in, integral seats
Stellited disc
Stellited seat and disc
Leakrate A according to EN 12266 Part 1/2 2003 (BS 6755)

Standards
BS 1868 ASME B16.34, ISO 14313,
ISO 17292, BS 5352, API 6A


CRYOGENIC VALVES

CRYOGENIC VALVES

Sizes up to 200 (8")
ANSI Class up to 2500
Operable/non-operable
Temperature down to -196°C

Construction
Ball, globe, gate, swing and piston check, double block and bleed (DBB)

Standards
ISO 17292, BS 1873, ISO 15761

All valves comply with European Legislation PED 97/23/EC
NOTE: Larger sizes available on request

ATC COMPACT Actuator Solutions and SYSTEMS

With ultra compactness, superior reliability and unique design flexibility, the ATC actuator is in a class of its own.

The Actuator Technology Company (ATC), based in The Netherlands, has been founded to accommodate the specific market need for a compact spring return actuator to operate quarter turn and linear operated valves. Applications that particularly benefit from this compact design are those where installation space is limited, like on topsides, high-pressure manifolds, internal /external turret areas and (vertical mounted) riser valves. A compact actuator design could also benefit the handling, mounting and alignment in case large valve sizes/high pressure ratings apply. Due to the enhanced actuator design, ATC actuators are also installed in shallow to ultra deepwater, and available complete with ROV interfacing and receptacles to ISO 13628-8 2002.

The ATC actuators are SIL 3 compliant to IEC 61508 and are manufactured in compliance with the ISO 9001 2000 quality procedures at ATC's new advanced assembling facilities, comprising a total area of 5000 m2. The company's impressive track record with the major end users and contractors confirms the high-end quality of the ATC organization and its revolutionary actuator design.

ATC
ACTUATOR TECHNOLOGY COMPANY

The ATC actuator design is based on:
- **Compactness**
- **Reliability**

Compactness

The ATC compact actuator is considerably smaller than a traditional scotch yoke actuator and this results in space savings up to 500%. This design flexibility, combined with the innovative integration of all actuator parts, results in the most compact actuator available in the market. In virtually all applications, irrespective of hydraulic or pneumatic operation, the ATC actuator diameter is smaller than the face-to-face dimension of the valve.

Reliability

The ATC actuator offers the highest level of reliability available on the market. The simplicity of the ATC actuator design involves a minimal number of parts, and therefore the ATC spring return actuator is the ideal solution to enhance safety and reliability. In the standard configuration, the ATC actuators are fully pressure balanced, airtight and watertight, self-lubricating and maintenance free.
A complete FMECA has been carried out, including verification of the complete installed base. As a result, TUV Rheinland has certified the ATC actuators to SIL 3, following the IEC 61508, based on a 1oo1 architecture applied.

The ATC actuator offers:

- The most compact actuator available.
- Spring return and double acting.
- Quarter turn and linear.
- Simple highly efficient operating mechanism.
- Output torques up to 1,000,000 Nm / 8,850,750 in-lbs.
- Output thrust up to 1100 KN / 250 Klbf.
- Standard hydraulic supply pressures up to 345 barg / 5000 psig.
- Pneumatic supply range from LP instrument air to HP line gas.
- HIPPS and ESD design and reliability.
- SIL 3 certified and Type A (field proven) to IEC 61508.
- Considerable displacement savings up to 50%.
- Subsea, splash zones and harsh topside environments.
- Cryogenic, standard offshore and high temperature applications.
- High integrity environmental sealing.
- Lifetime lubrication.
- Maintenance free.

PROCHEM SOLUTIONS: ***Offshore Demands No Problem***

Australia's largest oil and gas owner operator required ultra compact hydraulic quarter turn actuators with the highest level of reliability. Needed to operate 900 (36") NB 1500# metal seated ESDVs with high levels of torque, the application was offshore in a below platform deck environment.

ATC worked tirelessly to engineer a compact solution with output torques exceeding 550,000 Nm, and these ATC actuators are in service offshore in the North West Shelf of WA.

SPRING RETURN HYDRAULIC ACTUATORS

The standard ATC spring return actuator is the most compact actuator available in the market.

SPRING RETURN PNEUMATIC ACTUATORS

Due to the innovative design, the ATC pneumatic spring return actuator is available in dimensions which are close to the hydraulic version and therefore uniquely compact.

LINEAR TOPSIDES AND SUBSEA ACTUATORS

The ATC linear actuator offers significant advantages over available types on the market.

ACTUATORS FOR SAFETY RELATED SYSTEMS

The ATC spring return actuator offers an enhanced reliability. The actuator is certified by TUV Rheinland to meet SIL 3, following the IEC 61508 and based on a 1oo1 architecture applied.

COMPACT DOUBLE BLOCK & BLEED (DBB) VALVE ACTUATORS

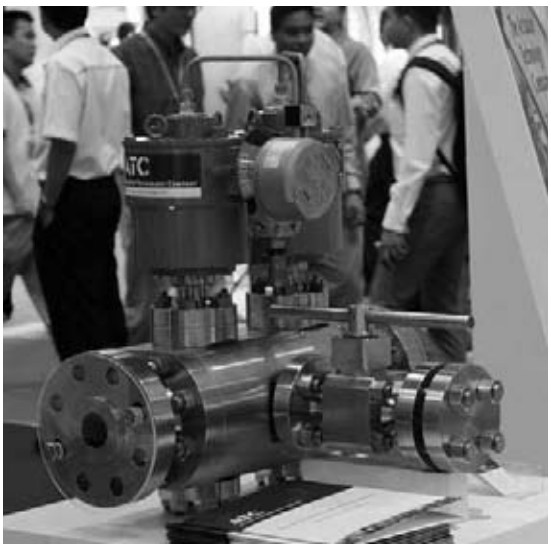
The ultra compact ATC actuator allows for “redundant actuation” within one valve body (DBB) rather than using two individually installed valves. This optimisation results in a considerable reduction in pipe length, flanges, adapter sets and has the most impact in cases where exotic pipe materials are applied.

ATC DOUBLE ACTING ACTUATORS

The ATC double acting actuator is based on the same unique design approach and flexibility as applies to the spring return range.

ATC SUBSEA ACTUATORS

ATC has a complete line of sub-sea actuators available, suitable for shallow water applications and installation in ultra deep waters, including ROV interfacing and receptacles.



The above photos concern installations of actuators on the North West Shelf of Australia.

PROCHEM SOLUTIONS:
Compact Design and High Reliability

Prochem and ATC developed an excellent relationship with a senior engineer whilst working together on another actuator requirement for a WA oil and gas client. When the engineer subsequently left Perth to work for another oil and gas major in South East Asia, he soon discovered the need for compact, high reliability hydraulic quarter turn actuators. In fact, over 30 pieces were required in less than 10 weeks.

Not only could ATC meet the most stringent of reliability requirements (SIL 3), a compact design for an offshore requirement, but they could offer an ultra fast expedited delivery, and the actuators have since installed and running flawlessly ever since.

Project delivery of ATC pneumatic spring return compact actuators.

ATC
ACTUATOR TECHNOLOGY COMPANY

Pacson Valves

World leading onshore and offshore valve applications.

A key supplier of high integrity valves to the world oil & gas market, Pacson Valves is a leading developer for severe service and highly critical applications. A privately owned Scottish company, with its 4,650 m^2 headquarters in a modern manufacturing facility based in Dundee, Scotland, the company has a global presence with sales offices in every major oil and gas producing country in the world. Pacson Valves pride themselves on the quality of products and services with a total in-house capability for the design and manufacture of surface valves, subsea valves and pressure control products up to 400 mm (16") NB, or up to 172 MPa (25,000 psi) working pressure.

Meeting the needs of the Oil, Gas, Petrochemical and Process Industries worldwide.

Whether you require a 8 (1/4") NB isolation valve or a 250 (10") NB 100 MPa (15,000 psi) rated isolation valve, Pacson Valves have a total solution from design and manufacture, through to testing.

Ball Valves: single isolation valves, double block and bleed valves.

Gate Valves: hydraulically actuated valves, and manual valve products.

Needle Valves: ROV operated 3/4 turn and manual multi-turn valves.

Check Valves: swing valves, and inline piston valves.

Committed to Continual Improvement – the Key to Quality Performance.

Quality Assurance

Pacson recognises the importance of quality to their customers and to the company's continued success. The independent Quality Assurance and Quality Control departments monitor product and process compliance.

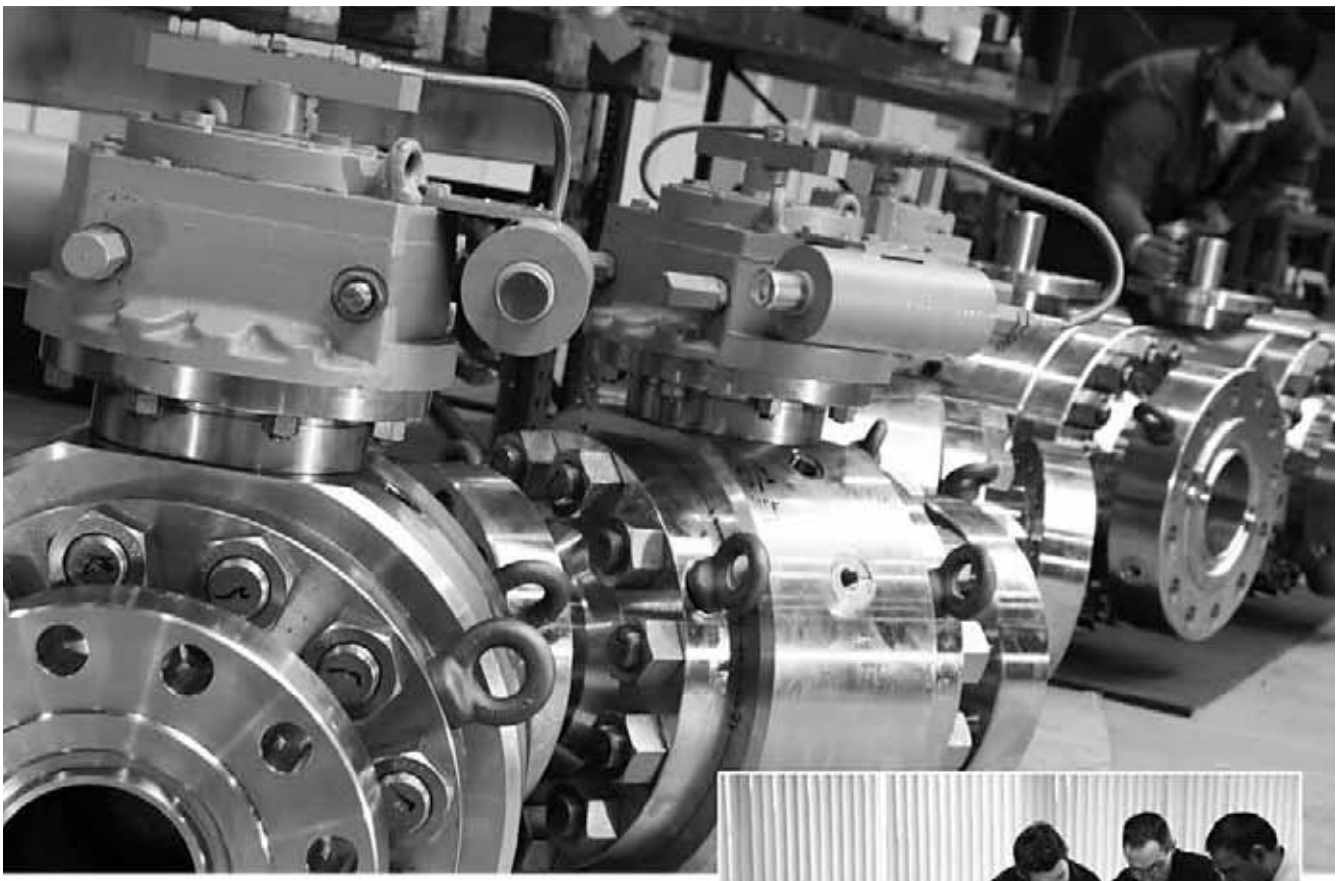
Expectations of quality are set to meet and exceed all specified requirements and relevant standards. These include, as a minimum, the requirements of EN ISO9001:2000 and the European Council Directive 97/23/EC Module H of the Pressure Equipment Directive, as per the Pressure Equipment Regulations S1 1999. No 2001.

Valves designed to comply with: API 6A, API 6D, API 17D, ASME B16.34, ASME B16.5, B16.10 and B16.25, ASME II, V, VIII, X, NACE MR0175

ISO STANDARDS

ISO 5208 Industrial Valves Pressure testing
ISO10497 Fire Testing
ISO10423 Wellhead & Christmas Tree Equipment
ISO10433 Underwater Safety Valves
ISO 13628-8 Remotely Operated vehicle (ROV) Interfaces
ISO 14723 Subsea Pipeline Transportation Systems
ISO 9001:2000 Quality Systems
ISO 4406 Hydraulic Fluid Cleanliness

PACSON valves



Engineering and Design

Pacson Valve's engineering and design capability has been developed through significant investment in manpower, training, hardware and software. The company can provide extensive technical support to customers, whilst ensuring that products and systems are at the cutting edge of product design.
All designs are validated by extensive performance testing programs, covering extremes of temperature, pressure, endurance and process fluids, giving total confidence in Pacson Valves' products.

- 3D solid modeling
- Finite element software
- CAD 2D drafting
- Unique parametric design methods
- Fluid Dynamics

Manufacture and Finishing

The in-house machining facility has the capability to process a wide range of valve and equipment components in standard or exotic materials. Pacson's expertise in machining has been built up over many years within the oil & gas industries. The CNC machine operate with the latest tooling technology, and this allows Pacson Valves to stay at the forefront of machining techniques, resulting in the highest quality components and the most cost effective machining techniques.

Materials of Construction

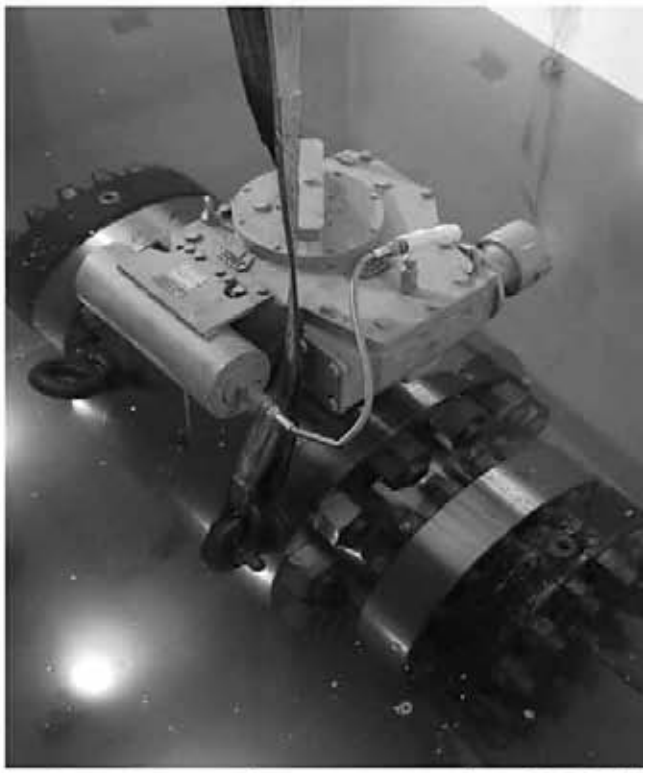
Carbon Steel, Stainless Steel, Duplex and Super Duplex Stainless Steels, Inconel, Hasteloy and Titanium.

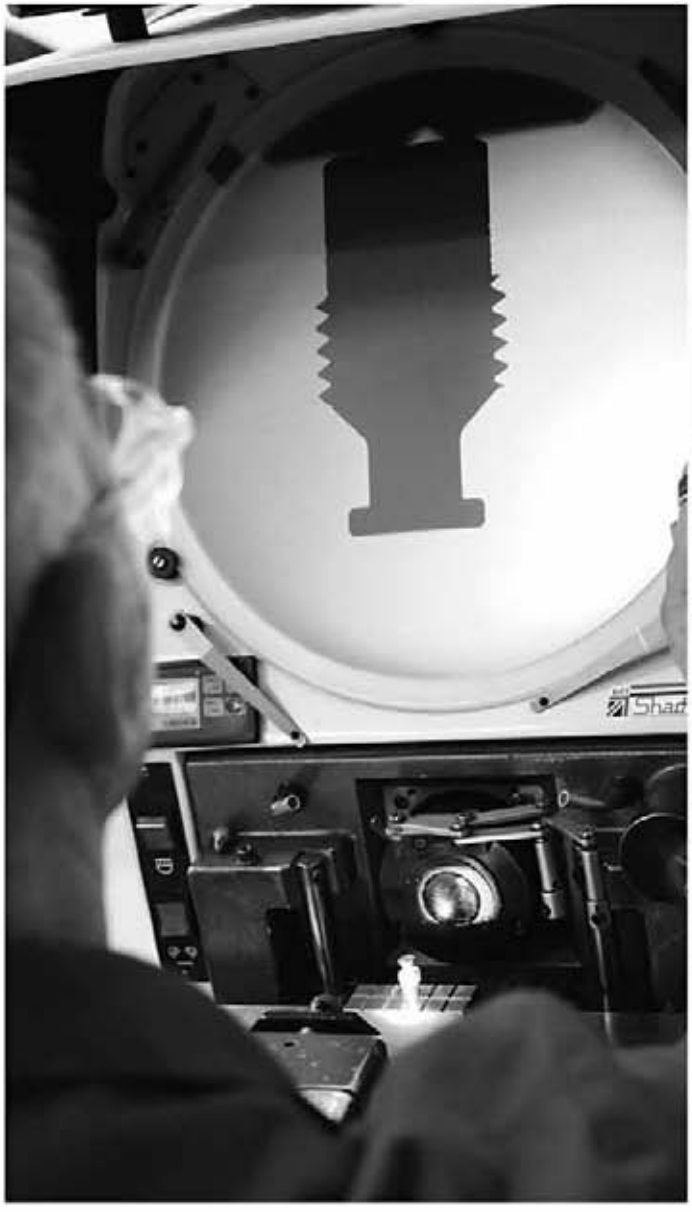
Testing Facilities

Wide Ranging and Dedicated Assembly and Testing Facilities.

Safety is always Pacson's first concern, and all pressure testing is carried out in safety cells. These are compliant with all current safety legislation and with the latest recommendations set out in the H.S.E. guidance note GS4, Safety in Pressure Testing. Each test cell is equipped with computerised data logging equipment for the continuous monitoring and performance analysis of the product being tested. Pacson Valves' test facilities also have the capability to operate multiple pressure-channel recording, including temperature, for total valve signature mapping.

Performance and qualification testing, API 6A PR2, environmental and hyperbaric testing can all be carried out on site with specialised testing equipment. Testing can be carried out up to pressures of 345 MPa (50,000 psi) and temperature ranges from -70 to 180°C.





PACSON valves

BALL VALVES: Single Isolation

Product Features:

Onshore and offshore (subsea) options available
Top entry and side entry options
Bolted bonnet
Body cavity self relieving seats (Double piston effect seats optional)
Double barrier PTFE stem seals
Spring energized seats
Soft and metal seated options
Metal to metal static body seals
Floating and trunnion

BALL VALVES: Single Isolation

Design Benefits:

Full bore
Fail safe design
Anti blow out stem
Bi directional sealing
Compact design
Low operating torque
Double block and bleed (Single ball)
No lubrication and no maintenance required
High strength robust design
All end connection options available

BALL VALVES: Double Block and Bleed

Design Benefits:

3 independent valves in one body
Compact design
Lightweight
Improved pipeline security
Reduced costs
All end connection options available

NEEDLE VALVES: Single Isolation

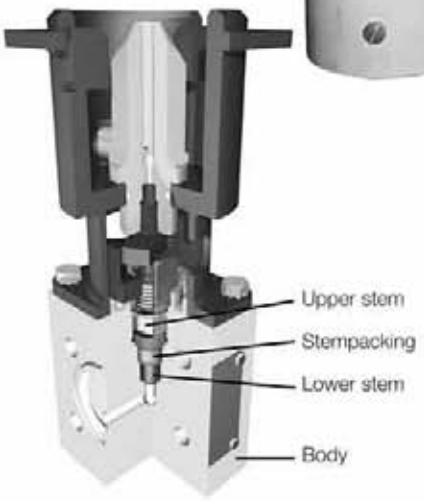
Product Features:

Onshore and offshore (subsea) options available
Non rotating stem
Bolted bonnet
Multi turn and 3/4 turn options
Double barrier PTFE stem seals and metal to metal
Clear position indication
Design Benefits
Full bore flow path
Fail safe design
Patented design
Compact design
Low operating torque
No lubrication and no maintenance required
High strength robust design
All end connection options available

NEEDLE VALVES: Double Block & Bleed

Product Features:

3 independent valves in one body
Compact design
Lightweight
Improved pipeline security
Reduced costs
All end connection options available
Pacson Unique Patented Design No - 2,304,175



PACSON valves

SLAB GATE: Manual actuated

Product Features:

Onshore and offshore (subsea) options available
Top entry and side entry options
Bolted bonnet
Through conduit
Double barrier PTFE stem seals
Spring energised seats
Metal to metal static body seals

SLAB GATE: Hydraulic actuated

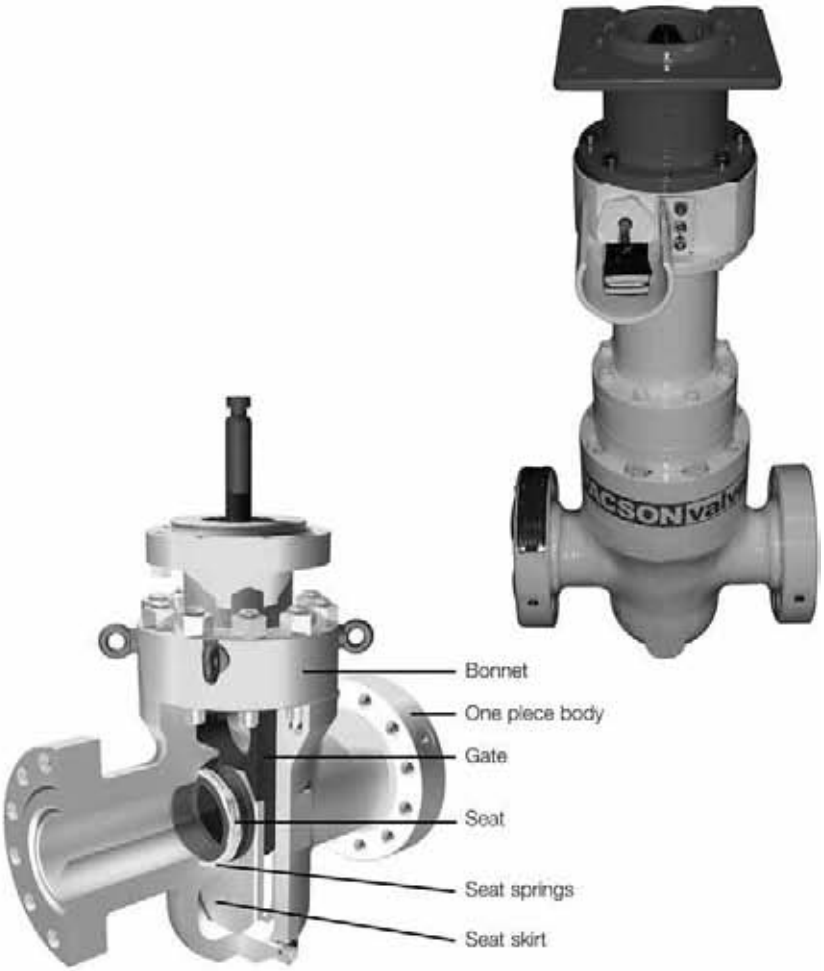
Product Features:

Onshore and offshore (subsea) options available
Top entry and side entry options
Bolted bonnet
Solid Slab
Double barrier PTFE stem seals
Spring energised seats
FSC/FSO/FAI Linear actuators
Metal to metal static body seals
Fully compensated
Direct mechanical position indication

SLAB GATE: Manual actuated

Design Benefits:

Full bore
Fail safe design
Bi directional sealing
Compact design
Low operating torque
No lubrication and no maintenance required
High strength robust design
All end connection options available
Double block and bleed (Single gate)



CHECK VALVES: Swing

Product Features:

Onshore and offshore (subsea) options available
Bolted bonnet
Soft and metal seated options
Metal to metal static body seals
Non slam
Lockable open

Design Benefits:

Full bore
Compact design
No lubrication and no maintenance required
High strength robust design
All end connection options available
Piggable

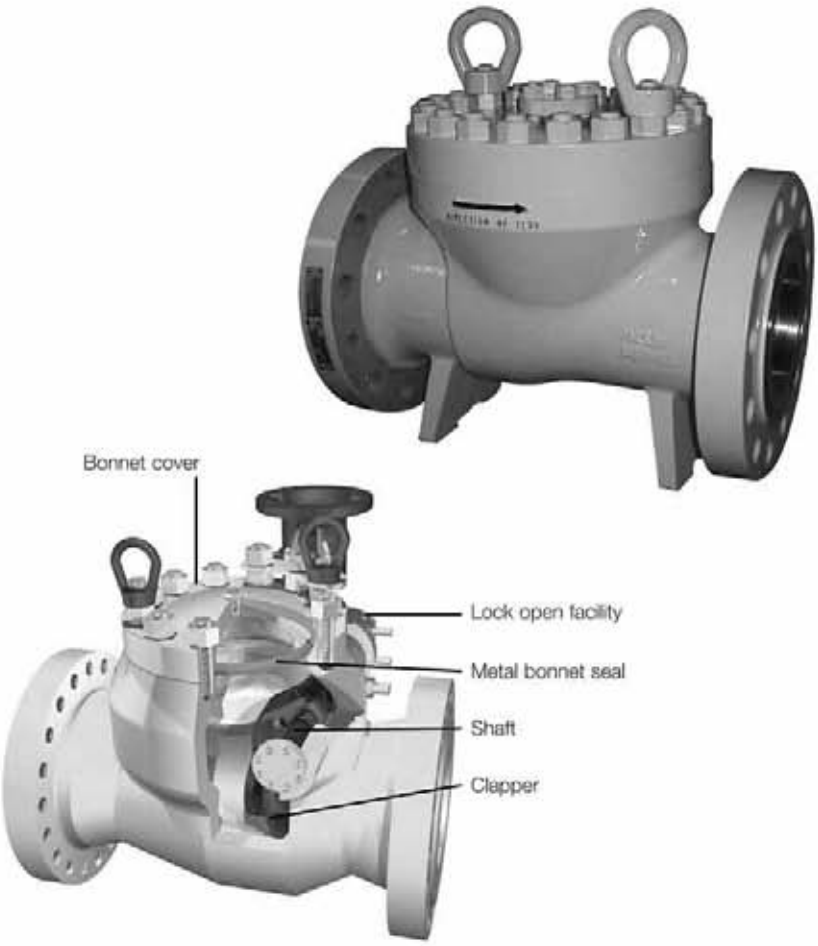
CHECK VALVES: Inline piston

Product Features:

Onshore & offshore (subsea) options available
Soft and metal seated options
Metal to metal static body seals
Non slam
Lockable open

Design Benefits:

Full bore flow path
Compact design
No lubrication and no maintenance required
High strength robust design
All end connection options available
Piggable



Anderson Greenwood

PRIMARY ISOLATION VALVES

Anderson Greenwood Instrumentation Products provide the ultimate solutions for a compact range of forged body Primary Isolation Valves, featuring a choice of end connections, body styles and valve technology.

ANDERSON GREENWOOD
INSTRUMENTATION PRODUCTS

KEYBLOK LARGE BORE

The Keyblok Large Bore is an innovative range of two piece Primary Isolation double block and bleed valves. With sizes up to 80 mm (3") and pressures up to Class 1500 the design offers double the safety of a single isolate valve but does this within the same face to face dimension. The large bore design is ideal for dirty service where blockage is of concern and for vessel measurement/diaphragm seal/flow type applications.

KEYBLOK

The range of primary isolation double block and bleed valves meets both instrument and piping engineers' specifications, offering significant savings on space, weight, installation and cost. Suitable for line isolation, sample connectors and chemical injection service, Keyblok manifolds use ball valves, outside screw and yoke (OS&Y) bonnets and threaded bonnet instrument valves, and are available with a full range of threaded and flanged connections up to API 10K. Bore size range is 10 mm to 19 mm.

MONOFLANGE

The Monoflange manifolds can be mounted directly onto vertical or horizontal flanged connections, allowing a gauge to be kept in an upright position. Suitable for both primary isolation (double block and bleed) and instrument (block and bleed, block) duties, the Monoflange provides isolation, venting and instrument mounting in a single compact unit. The designs incorporate safety features that limit vibration and reduce the overall height of a gauge installation. Bore size is 5 mm.

ROOT VALVE

Root Valves are an integrally forged one-piece double block and bleed assembly for primary isolation of pressure take-offs where the valve is either screwed or welded directly into the vessel or process pipe without the need for a flanged connection. Instruments may be directly mounted to the valve outlet or alternatively remotely mounted with gauge lines/impulse pipe work. Bore size range is 5 mm to 10 mm.

PRIMARY ISOLATION VALVE Applications

All Anderson Greenwood Instrumentation Products Primary Isolation Valves are designed to comply with the following code requirements:

- ANSI/ASME B16.34 Material wall thickness
- ANSI/ASME B16.5 Flange dimensions
- ANSI/ASME 8 Design procedures and materials
- ANSI/ASME B1.20.1 National pipe threads
- API 607/BS6755 Fire tested

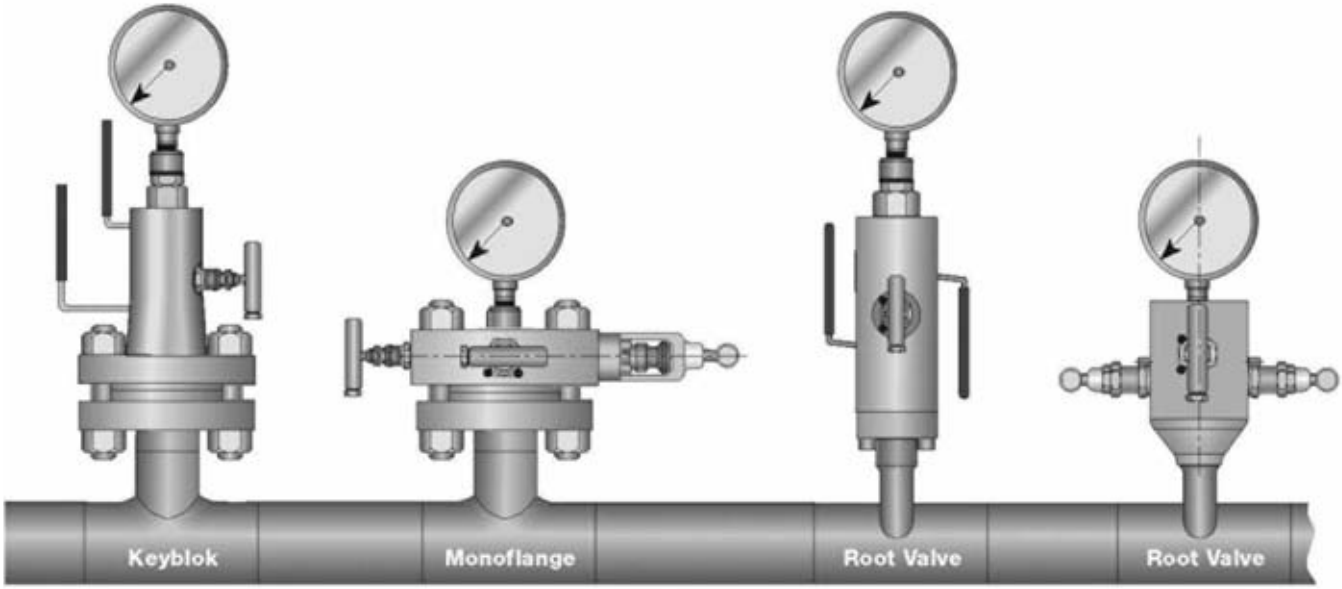
Applications

- Double block and bleed instrument isolation
- Gauge isolation
- Instrument drain
- Chemical injection connection
- Sample connections
- Chemical seat instrument isolation
- Piping/instrument interface
- Direct mounting of instruments
- Remote mounting of instruments

Advantages

Advantages gained by installing Anderson Greenwood Instrumentation Products Keyblok and Monoflange Primary Isolation Valves, based on a typical ANSI 25 mm (1”), Class 1500 one-piece integrally forged valve:

- Reduced weight – 7.0kg (15.4lb)
- Reduced height – 250.0 mm (10 inches)
- Reduced leakage points
- Reduced effect of system vibration
- Supporting brackets are not required
- Reduced bending moment acting on the vessel branch fitting weld
- Reduced installation cost
- Reduced gaskets and bolting



KEYBLOK

- Ball and Globe Style Needle Valves
- Flanged and Threaded Connections
- Integrally Forged Body

MONOFLANGE

- Globe Style Needle Valves
- Flanged and Threaded Connections
- Slimline Integrally Forged Body

ROOT VALVE

- Ball or Globe Style Needle Valves
- Welded or Threaded Connections
- Integrally Forged Body

Habonim

INDUSTRIAL VALVES AND ACTUATORS

HermetiX™

Habonim's new series of ZERO-Stem-Leak valves, is based on the HermetiX™ technology. HermetiX™ is a patented stem seal designed to reduce stem leaks to a minimum and to provide maintenance-free service.

3 Piece Valves

47 X

Size Range:
8 (1/4") to 200 (8")
Pressure Range:
Vacuum 10^{-6} Tor to
210 bar (3000 psi)
Temperature Range:
-40 to 350°C (-40 to 660°F)
Materials: Carbon Steel, Stainless Steel, Monel®, Hasteloy®C276, Hasteloy® C22, Alloy-20, Duplex, SMO 254

Flanged Valves

31/32 X

Size Range:
15 (1/2") to 200 (8")
Flange Connection:
31 Series - ANSI Class 150
32 Series - ANSI Class 300
Service: Steam, Chemicals, LP-Gas, Thermal Fluid, Chlorine, Ammonia, Sour Gas
Materials: Carbon Steel, Stainless Steel, Duplex, Hastelloy® C22, Alloy-20, Monel®

73/74 X

Size Range:
15 (1/2") to 150 (6")
Flange Connection:
73P Series – ANSI Class 150
74P Series – ANSI Class 300
Service: Steam, Chemicals, LP-Gas, Thermal Fluid, Chlorine, Ammonia, Sour Gas
Materials: Carbon Steel, Stainless Steel, Duplex, Hastelloy® C22, Alloy-20, Monel®, Inconel®.

77/78 X

Size Range:
15 (1/2") to 150 (6")
Flange Connection:
77 Series - DIN PN16 F4, F5
78 Series - DIN PN40 F4, F5
Service: Steam, Thermal Fluid, LP-Gas, Dry Chlorine, Oxygen, Ammonia, Vacuum, Sour Gas and others
Materials: Stainless Steel, Carbon Steel, Alloy-20 (others on request)

High Pressure Valves

H27

Size Range: 8 (1/4") to 200 (8")
Class Range: 8 (1/4") to 65 (2-1/2") up to Class 2500, (413 bar / 6000 psi)
80 (3") to 200 (8") up to Class 1500, (255 bar / 3700 psi)
End Connections: Screwed, Socketweld, Buttweld, Flanged (ANSI, ISO, SAE, DIN)
Materials: Stainless Steel, Carbon Steel and others

H24

Size Range: 8 (1/2") to 40 (1-1/2")
Pressure Rating: 413 bar (6000 psi)
Temperature Range: -28 to 260°C (-18 to 500°F)
Body Material: Stainless Steel 316/316L

Cryogenic Valves

Size Range: 8 (1/4") to 150 (6")
Pressure Rating: Vacuum 10^{-6} Torr to 64 bar (928 psi)
Temperature Range: -269 to 200°C (-452 to 392°F)
Materials: Austenitic stainless steel 316/316L
Available in 3 piece Valves and Flanged Valves

Metal Seat Valves

Size Range: 8 (1/4") to 200 (8")
Avalable in: H27Z, 47Z, 73Z, 74Z, 77Z, 78Z
Pressure Range: Vacuum 10^{-2} Torr to 600 bar (8700 psi)
Temperature Range: -40 to 650°C

A variety of ball valves suitable for the toughest applications

3,4,5-Way Valves

Size Range: 15 (1/2") to 100 (4")
Service operation: Diversion, Mixing, Blending
Temperature Range: -30 to 300°C
Materials: Stainless Steel, Carbon Steel

Accessories

FUGITIVE EMISSION

Eliminating product emissions is one of the most serious challenges for the process industry and consequently can be the most costly to control. As part of its Health & Safety initiative campaign Habonim has introduced additional security to the valve stem design for critical applications.

SPRING RETURN

Allows quick opening and automatic closing.

LOCKING DEVICE

Double Ideal for applications where it is critical to keep the valve position without the risk of accidental operation.

Special Tailor-made Valves

SKID MOUNTED VALVE SYSTEMS

Multi-Valve-Ensemble (MVE), weighs 30% less and eliminates up to 90% of the piping required on conventional skids.

MODULAR MANIFOLD

An array of multiple valves to enable precision distribution of process fluid or gas to multiple points.

ZERO-POCKET POCKET

Designed to eliminate bacterial contamination caused by “Dead Leg” or improper circulation in the pipeline.

EASY VALVE RETROFITTING

The Semi-Manifold Junction Block was designed for easy installation and retrofitting of valves using a wide variety of end connections including purging.

Double Block and Bleed

The Habonim Dual-Safe valve series presents an optimal design solution and guarantees isolation on critical applications and service when an Emergency Shut-Down (ESD) valve is a necessity.

Actuators

COMPACT – 4 PISTON ACTUATOR

The unique 4-Piston design offers these (major) advantages: space saving, fast acting, superior corrosion resistance, balanced forces, less air consumption.

BREATHER BLOCK

Namur Breather Block prevents suction of external air into the actuators spring chambers.

Impact – Pneumatic Actuator

SPRING ASIST

A pneumatic device whose purpose is to increase spring closing torque on spring return actuators by 50% or more.

Control Valves

ProfiX™

Habonim has extended its range to meet industrial demands for flow control systems that are accurate, flexible, cost efficient and maintenance friendly.

Ball valves provide excellent performance, even in the harshest environments, and offer a compact lightweight design solution; characterized by step-less control of pressure and flow for fast response times, wide rangeability and bubble-tight shutoff for increased valve longevity even in the most demanding conditions. Critical features include high pressure drop capacity with straight-through flow, high Cv, and large exhaust capacity with added design features for ease of maintenance and zero backlash.

ProfiX™ SOFTWARE

Habonim Valve Sizer, a unique software tool which simplifies the task of selecting the perfect ProfiX control valve package for any service conditions

PROCHEM
PIPELINE PRODUCTS

FOR FURTHER DETAILS PLEASE CONTACT YOUR LOCAL PROCHEM OFFICE

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Telephone 61-7-3265 2711
Facsimile 61-7-3265 7430
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Australia 7009
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