

# JFM

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# FLOWSERVE

*Argus, Worcester  
Valbart, Gestra  
Edward, McCanna  
Norbro Actuator  
Rotadisk Actuator*

## Process Valve & Automation Product Guide



*Experience In Motion*



## Flowserve Flow Control Serving the Process Industries

### Introduction

*Flowserve Flow Control is the foremost specialist valve and controls manufacturing organization in the world, supplying contractors, OEMs, distributors and end users with a product range of unparalleled breadth to meet the flow control needs of the process industries.*

*We have the systems, the products and the expertise to help your processes run more safely and efficiently. Our range of valves, actuators, positioners, controls and switches are designed to ensure extended service life, providing some of the lowest life cycle costs in the industry, whilst our comprehensive R&D, engineering and global support services provide every Flowserve customer with a one-stop solution, whatever the type of service or application.*

*Manufacturing sites and service facilities around the globe and partnerships with leading distributors mean that our customers can rely on on-the-spot availability, experienced technical support and unmatched service.*

### Heritage Manufacturers

#### Argus

Focusing on the manufacture of high specification valves from Ettlingen, Germany, Argus has developed a strong brand name and reputation for high quality and performance within the chemical, petrochemical and oil & gas industries.

#### Atomac

Specialising in the design and manufacture of lined equipment, Atomac has developed a broad portfolio of products from their headquarters in Ahaus, Germany. Now recognized as a quality leader in the supply of this specialized equipment they have a reputation for satisfying and solving customer applications.

#### Automax

From their manufacturing facilities in the United Kingdom, China and India, Automax offers a broad range of rack and pinion and Scotch yoke actuators. They also produce ancillary equipment such as switch boxes, mounting kits and gear overrides to satisfy all actuation requirements.

#### Deutsche Audco

AUDCO ball valves are ideally suited for service in oil and gas pipelines. They have been proven in various applications in metering and regulation stations, compressor stations as well as for refineries, product pipelines and storage facilities.

## **Valbart**

The company specializes in designing and manufacturing API 6A and API 6D Trunnion Mounted ball Valves. Valbart is also recognized for its production of Trunnion Mounted Control Ball Valves, Cryogenic Valves, Twin Ball Double Block & Bleed Valves and Rising Stem Friction Free Ball Valves.

## **Edward**

All procedures for quality assurance and lot-traceability have earned Flowserve Edward Valves the ASME N stamp and certification of our Raleigh, North Carolina, manufacturing facility for nuclear service valve production.

## **Gestra**

Designed to increase the efficiency of steam and condensate applications, these new Gestra products serve a wide range of industries and applications including the chemical and petrochemical industries, the pharmaceutical industry, and steam and hot water plants.

## **Durco**

With a history of manufacturing valves in a wide range of specialized alloys Durco of Cookeville TN, USA has focused on meeting the high demands of the Chemical and Petrochemical industry. Strong engineering, metallurgy and research have resulted in a broad range of plug and butterfly valves.

## **McCANNA / Marpac**

The manufacturing facility in Cookeville, TN, USA produces a selection of McCANNA top entry ball valves and Marpac threaded end ball valves for a wide variety of severe service applications within the chemical and petrochemical industries.

## **NAF**

In 1933, NAF in Sweden, produced the first known ball valve. Ever since that time it has developed a strong history of supplying high quality metal seated ball, V-port ball and triple offset butterfly valves. The company is now a leading supplier of automated rotary control and on-off valves for many demanding applications.

## **Noble Alloy**

Noble Alloy Valves offers ball valves and check valves that are available in a great variety of high alloys and materials from their facility in Cookeville TN, USA. These valves are designed to handle extreme corrosive applications, high pressures and severe temperature processes.

## **Norbro**

As the recognized brand leader in rack and pinion actuators Norbro has a reputation for high quality and reliability world wide. From their manufacturing facility in West Sussex, UK, Norbro supplies actuators for a diverse range of market requirements.




## **PMV**

Specializes in the design and manufacture of digital and analog positioners, switchboxes and accessories for mainly quarter turn valves. The digital products of Sweden based PMV are compatible with all main communication protocols for monitoring and controlling plant processes. Its ValveSight Diagnostics software enables increased plant efficiency.

## **Worcester Controls**





Worcester Controls have been manufacturing valves from their facilities in the United Kingdom and USA for over 50 years. As the brand leader in ball valves they have focused on producing quality products to comply with all international standards and to meet a variety of user requirements.

## 3-Piece Ball Valves




Brand	Worcest	Worcest	Worcest
Product			
Model	A44/A59, 44/59	A459/A599, 459/599	AW44/59
Design	Standard	Standard	Steam
Size Range	6 - 50 mm, ¼" - 2" Reduced Bore 15 - 40, ½" - 1½" Full Bore	65 - 150 mm, 2½" - 6" Reduced Bore 50 mm -100 mm, 2" - 4" Full Bore	6 - 50 mm, ¼" - 2" Reduced Bore 15 - 40 mm, ½" - 1½" Full Bore
Pressure Rating	69 bar, 1000psi 102 bar, 1480psi 207 bar, 3000 psi Pressure rating depends on seat selection	50 bar, 725 psi	17 bar, 250 psi saturated steam 90 bar, 1300 psi non steam
End Connections	Screwed Butt Weld Socket Weld Specials	Screwed Butt Weld Socket Weld	Screwed Butt Weld Socket Weld
Body Materials	Stainless Steel Carbon Steel Brass Exotics	Stainless Steel Carbon Steel (Note - Carbon steel valve suitable for use at -46 °C (-51 °F) as standard)	Stainless Steel Carbon Steel
Seat Materials	Virgin PTFE, Filled PTFE, TFM, Polyfill (US), Fluorofill (UK), High-Per Fill (PEEK), Metal, UHMWPE, Lubetal (Delrin AF)	Virgin PTFE, Filled PTFE, TFM, Polyfill (US), Fluorofill (UK), High-Per Fill (PEEK), Metal, UHMWPE, Lubetal (Delrin AF)	Fluorofill PEEK Metal
Applications and Options	Reduced and full bore valve which has been adopted as the industry standard. It can be used on an extensive variety of applications with many special build options available.	The A459/599 valve extends the size range of the A44/59 product up to 150 mm, 6".	Designed for on/off steam applications up to 17 bar on saturated steam. The valve is also ideal for thermal fluid applications up to 280 °C, 536 °F depending on seat material.
Further information	WCEBR0003 (for UK) WCABR1050 (for US)	WCEBR0003 (for UK) WCABR1050 (for US)	WCEBR0009



## 3-Piece Ball Valves




Worcester	Worcester	Worcester	Worcester
			
<b>C44/C59</b>	<b>E44/E59, 94</b>	<b>F44/F59, AF44/FZ44</b>	<b>WK44/WK70/WK74</b>
<b>Cryogenic</b>	<b>Enviro-Safe / Fugitive Emission</b>	<b>Firesafe</b>	<b>High Purity and Aseptic</b>
6 - 50 mm, ¼" - 2" C44 Reduced Bore 15 - 40 mm, ½" - 1½" C59 Full Bore	6 - 50 mm, ¼" - 2" Reduced Bore 15 - 40 mm, ½" - 1½" Full Bore	6 - 50 mm, ¼" - 2" Reduced Bore 15 - 40 mm, ½" - 1½" Full Bore	15 - 50 mm, ½" - 2" Reduced Bore (WK44) 15 - 50 mm, ½" - 2" Tube Bore (WK70/74)
69 bar, 1000 psi	69 bar, 1000 psi 102 bar, 1480 psi Pressure rating depends on seat selection	69 bar 1000 psi 102 bar, 1480 psi Pressure rating depends on seat selection	69 bar, 1000 psi psi rating depends on seat and pipe end design
Screwed Butt Weld Socket Weld	Screwed Butt Weld Socket Weld	Screwed Butt Weld Socket Weld	Butt weld Tri clamp RTJ ISS IDF
Stainless Steel Brass	Stainless Steel Carbon Steel	Stainless Steel Carbon Steel	Stainless Steel ASTM A351 CF3M (WK44/74) ASTM A182 F316L (WK70)
Fluorofill (UK) Polyfill (US)	Virgin PTFE, Filled PTFE, TFM, Polyfill (US), Fluorofill (UK), High-Per Fill (PEEK), Metal, UHMWPE, Lubetal (Delrin AF)	Virgin PTFE Filled PTFE Fluorofill (UK), Polyfill (US), Metal G	Virgin PTFE Filled PTFE TFM Polyfill (US), Fluorofill (UK)
Designed for use on cryogenic medias such as Oxygen, Nitrogen, Argon, Natural Gas and Carbon Dioxide. All valves are supplied cleaned for Oxygen service.	The Enviro-Safe valve features a unique dual stem sealing arrangement which ensures high integrity combined with long life. Ideally suited for toxic media such as phosgene, chlorine and high cycling applications. Fire safe EF44/59 available.	Suitable for flammable media in hydrocarbon and chemical lines. The F44 is anti-static and tested to global fire test standards.	Standard and tube bore clean valves for high purity and aseptic processes. Cast and forged designs. Optional electro-polishing and cavity filled seats and purge ports for SIP/CIP cleaning.
WCEBR0013 (for UK) WCABR1040 (for US)	WCEBR0011 (for UK) WCABR1023 (for US)	WCEBR0014 (for UK) WCABR1029 (for US)	WCEBR0026 (for UK) WCABR1035/1036/1037 (for US)

## 3-Piece Ball Valves

Brand	Worcest	Worcest	Worcest
Product			
Model	5HP44, H44	H71	13/14, D44
Design	High Pressure	High Pressure	3-Way Directional
Size Range	6 - 50 mm, ¼" - 2" Reduced Bore	15 - 50 mm, ½" - 2" Reduced Bore	6 - 50 mm, ¼" - 2" Reduced Bore 15 - 40 mm, ½" - 1 ½" Full Bore
Pressure Rating	345 bar, 5000 psi	400 bar, 6000 psi	69 bar, 1000 psi 102 bar, 1480 psi pressure rating depends on seat selection
End Connections	Screwed Butt Weld Socket Weld	Screwed Socket Weld BW6 SAE	Screwed Butt Weld Socket Weld
Body Materials	Stainless Steel Carbon Steel	Stainless Steel Carbon Steel	Stainless Steel Carbon Steel Brass
Seat Materials	Delrin AF High-Per Fill (PEEK)	High-Per Fill (PEEK)	Virgin PTFE Filled PTFE Polyfill (US), Fluorofill (UK) Lubetal (Delrin AF) UHMWPE
Applications and Options	The 5HP44 can be used for group II media liquids up to 345 bar.	High pressure liquids and gases, CO <sub>2</sub> / H <sub>2</sub> O injection, subsea hydraulics, production manifolds.	Can be used for diverting flow or by fitting upstream sealing seats, mixing of two discrete media can be achieved. Mid stroke isolation available with 180° 14 series. Bottom entry as standard with side entry available.
Further information	WCEBR0006 (for UK) WCABR1051 (for US)	WCABR1051	WCEBR0001 (for UK) WCENBR1017 (for US)





<b>3-Piece Ball Valves</b>			<b>One Piece Threaded Valves</b>
<b>Marpac</b>	<b>Marpac</b>	<b>NAF</b>	<b>Argus</b>
			
<b>E790</b>	<b>E325/E525</b>	<b>Triball</b>	<b>BK/MK8/10</b>
<b>Union End Ball Valve</b>	<b>3-Piece Tapped Body</b>	<b>Standard, Full Bore</b>	<b>Floating ball</b>
6 - 50 mm, ¼" - 2"	6 - 50 mm, ¼" - 2" Reduced Bore E325 6 - 40 mm, ¼" - 1½" Full Bore E525	10 - 100 mm Metric only	6 - 50 mm, ¼" - 2" Full Bore
CWP pressure rating 310 bar, 4500 psi	CWP 69 - 210 bar, 1000 - 3000 psi dependent on valve size and seat.	PN 10 - 40	500 bar (7350 psi) for 8-10 mm 400 bar (5880 psi) for 12 mm 315 bar (4630 psi) for 20-50 mm 100 bar (1470 psi) for 6-50 mm
Screwed Socket Weld Other connections available	Screwed Socket Weld Other connections available	Screwed Short weld ends (mm pipe) Long weld ends (ISO pipe) Long weld ends (mm pipe) Flanged Weld plate Combinations of above	Screwed (NPT)
Stainless Steel Carbon Steel	Stainless Steel Carbon Steel	Stainless steel	Carbon Steel (forged) Stainless Steel
Virgin PTFE Filled PTFE UHMWPE Kel-F	Virgin PTFE Filled PTFE Thermopac UHMWPE	R-PTFE Alloy 6	PTFE POM
Double union swing out design allows for easy removal of valve for repair.	Ball valve using a tapped center section. Oxygen, API 607, Vacuum, NACE, and Chlorine service options available.	Soft or metal seated general service stainless steel valve with many options for end connections. Special version for use as sample taking valve.	Oil & Gas Water, Hydraulic High pressure
MMENBR0001	MMENBR0001	NAF brochure Fk 25.622	

## Flanged Ball Valves


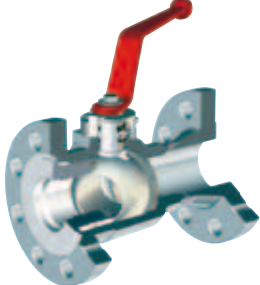

Brand	Worcest	Worcest	Worcest
Product			
Model	F519/F529	F51/F52, 51/52	E51/E52, 94
Design	ASME	ASME Reduced Bore	Enviro-Safe / Fugitive Emission
Size Range	15 - 40 mm, ½" - 1½" Full Bore	15 - 250 mm, ½" - 10" Reduced Bore	15 - 200 mm, ½" - 8" Reduced Bore
Pressure Rating	ASME Class 150 (519) ASME Class 300 (529)	ASME Class 150 (51) ASME Class 300 (52)	ASME Class 150 / 300 ASME Class 600 (25 - 80 mm, 1" - 3")
End Connections	ASME Class 150 ASME Class 300 DIN PN 16 DIN PN 40	ASME Class 150 ASME Class 300 DIN PN 16 DIN PN 40	ASME Class 150 ASME Class 300 ASME Class 600 (25 - 80 mm, 1" - 3") DIN PN 16 DIN PN 40
Body Materials	Stainless Steel Carbon Steel Exotic alloys	Stainless Steel Carbon Steel Exotic alloys	Stainless Steel Carbon Steel (Note - Carbon steel valve suitable for use at -46 °C (-51 °F) as standard)
Seat Materials	Virgin PTFE Filled PTFE Fluorofill PEEK	Virgin PTFE Filled PTFE, Polyfill (US), Fluorofill (UK) UHMWPE	Virgin PTFE Filled PTFE TFM Polyfill High-Per Fill (PEEK) Metal UHMWPE
Applications and Options	Flanged valve with third party approval to BS5351 with fire test certification to EN 10497. ISO 5211 mounting bonnet also available as cryogenic C519/529 TA-Luft.	Reduced Bore flanged valve with third party approval to BS5351 with fire test certification to EN 10497. Also available as cryogenic C51/52. Also available as cryogenic C51/52.	High-performance solution for fugitive emission toxic gases or high cycle applications. Live loaded, dual stem seal design with leak detection ports. Available with PTFE or graphite packing for fire safe applications.
Further information	WCEBR0004	WCEBR0004 (for UK) WCABR1013 (for US)	WCEBR0012 (for UK) WCABR1023 (for US)






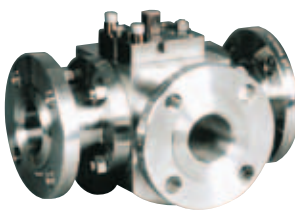
## Flanged Ball Valves

Worcestera	Worcestera	Worcestera	Worcestera
			
F53/F54	F55	F819/F829, 818/828	B18/19
DIN Reduced	ASME Reduced	Firesafe ASME Full Bore	Multi-Way
15 - 250 mm, ½" - 10" Reduced Bore	65 - 200 mm, 2½" - 8" Reduced Bore	50 - 200 mm, 2" - 8" Full Bore	15 - 150 mm, ½" - 6" B18 - Full Bore 20 - 200 mm, ¾" - 8" 18 - Reduced Bore
DIN PN 40	ASME Class 150	ASME Class 150 (819/818) ASME Class 300 (829/828)	ASME Class 300
DIN PN 10 DIN PN 16 DIN PN 25 DIN PN 40	ASME Class 150	ASME Class 150 ASME Class 300 DIN PN 16 DIN PN 40	ASME Class 150 ASME Class 300 DIN PN 16 DIN PN 40
Stainless Steel Carbon Steel	Stainless Steel Carbon Steel	Stainless Steel Carbon Steel	Stainless Steel Carbon Steel Exotics
Virgin PTFE Filled PTFE Fluorofill PEEK	Virgin PTFE Filled PTFE Fluorofill PEEK	Virgin PTFE Filled PTFE Polyfill (US), Fluorofill (UK)	Virgin PTFE Filled PTFE Fluorofill PEEK
Designed for use on the majority of hydrocarbon and chemical lines.	2-piece reduced bore flanged valve.	Full bore flanged valve with third party approval to BS5351 with fire test certification to EN 10497 ISO 5211 mounting bonnet. Available as cryogenic C819/829. EnviroSAFE version available to TA Luft.	Allows media diversion through a number of flow paths with up to 5 flange connections. Flange ratings and face to face lengths are optional with flexible installation through loose hub slip flanges. Available as 3-piece valve with screwed or welded connection.
WCEBR0005	WCEBR0004	WCEBR0015 (for UK) PB 800-2 (for US)	WCEBR0002 (for UK) WCABR1002 (for US)

## Flanged Ball Valves

Brand	Argus	Argus	Argus
Product			
Model	HK35	EK71	FK75M
Design	Trunnion Mounted	Floating Ball	Pad Mounted
Size Range	40 - 500 mm, 1½" - 20" Full & Reduced Bore	15 - 50 mm, ½" - 2" Full & Reduced Bore	80 - 200 mm, 3" - 8" Full & Reduced Bore
Pressure Rating	ASME Class 600 - 2500 PN 10 - 250	ASME Class 150 - 1500 PN 16 - 100	ASME Class 150 - 2500 PN 16 - 40
End Connections	Metric DIN PN Rating ASME class rating Welded ends	Metric DIN PN Rating ASME Class Rating	Metric DIN PN Rating ASME Class Rating
Body Materials	Stainless Steel (Forged & Cast) Carbon Steel (Forged & Cast) Duplex stainless steel Special materials : Alloy20, Hastelloy, Monel, Inconel	Carbon Steel (Forged)	Stainless Steel (Forged & Cast) Carbon Steel (Forged & Cast) Duplex stainless steel Special materials : Alloy20, Hastelloy, Monel, Inconel
Seat Materials	POM PEEK (Lyton) ARGULOY (metal coating) Carbide (Metal coating)	PTFE POM	PTFE POM ARGULOY (metal coating) Carbide (metal coating)
Applications and Options	Chemical and Petro-Chemical industry, Oil and Gas ISO 5211 topwork, Fire-safe, Anti-static design, Anti-blow out stem TA-Luft/EPA/ISO 15848. Designed for severe applications: High cycle, temperature & abrasion Oxygen, slurry & fly ash applications oil & gas platforms, FSPO ships.	Oil and gas.	Oil and Gas, Chemical and Petro-Chemical industry ISO 5211 topwork, Fire-safe, Anti-static, Anti-blow out stem TA-Luft/EPA/ISO 15848.
Further information	AREBR1108-02 English ARGBR1108-02 German	AREBR1110-02 English ARGBR1109-02 German	AREBR1112-02 English ARGBR1111-02 German

## Flanged Ball Valves




Argus	Argus	Noble Alloy	Noble Alloy
			
FK76M	FK79	NAV	Multiport
Trunnion Mounted	Floating Ball	High Specification	Diverter Valve
80 - 900 mm, 3" - 36" Full & Reduced Bore	15 - 100 mm, 1/2" - 4" Full & Reduced Bore	6 - 25 mm, 1/4" - 1" 3 piece 15 - 50 mm, 1/2" - 4" flanged cast 6 - 450 mm, 1/4" - 18" flanged forged	15 - 200 mm, 1/2" - 8" Full Bore
ASME Class 150 - 2500 PN 16 - 160	ASME Class 150 - 2500 PN 16 - 250	Up to PN 250 ASME Class 1500 depending on size and valve type	ASME Class 150 - 1500 PN 16 - 250
Metric DIN PN Rating ASME Class Rating	Metric DIN PN Rating ASME Class Rating Welded ends	Flanged Screwed Welded	RF flanged Screwed Socket weld
Welded ends Stainless Steel (Forged & Cast) Carbon Steel (Forged & Cast) Duplex stainless steel Special materials : Alloy20, Hastelloy, Monel, Inconel	Stainless Steel (Forged & Cast) Carbon Steel (Forged & Cast) Duplex stainless steel Special materials : Alloy20, Hastelloy, Monel, Inconel	Stainless Steel Hastelloy, Inconel Titanium, Zirconium Alloy 20, Duplex Ultimet & others	
PTFE POM PEEK (Lyton) ARGULOY (metal coating) Carbide (Metal coating)	PTFE POM PEEK (Lyton) ARGULOY (metal coating) Carbide (Metal coating)	PTFE Metal	Polymer Metal
Chemical and Petro-Chemical industry, Oil and Gas ISO 5211 topwork, Fire-safe, Anti-static design, Anti-blow out stem TA-Luft/EPA/ISO 15848. Designed for severe applications: High cycle, temperature & abrasion, Oxygen, slurry & fly ash applications, Polymer industry, Catalysts.	Chemical and Petro-Chemical industry, Oil and Gas ISO 5211 topwork, Fire-safe, Anti-static design, Anti-blow out stem TA-Luft/EPA/ISO 15848. Designed for severe applications: High cycle, temperature & abrasion, Oxygen, slurry & fly ash applications, Polymer industry, Catalysts.	Forged and precision cast ball valves in a wide range of materials for tough service and high pressure applications.	High temperature, highly corrosive applications requiring exotic alloys.
AREBR1114-02 English ARGBR1113-02 German	AREBR1116-02 English ARBRR1115-02 German	NAENTB0001	NAENTB0001

## ***Flanged Ball Valves***




Brand	NAF	NAF	NAF
Product			
Model	Duball	Duball DL	ProCap
Design	<b>Full Bore Floating Ball Valve</b>	<b>Full Bore Floating Ball Valve, Standard and Fire Safe</b>	<b>Segmented Ball Capping Valve</b>
Size Range	25 - 400 mm, 1" - 16"	25 - 400 mm, 1" - 16"	500 and 600 mm, 20" and 24"
Pressure Rating	ASME Class 150 / 300 PN 10 - 40	ASME Class 150 / 300 PN 10 - 40	ASME Class 150 PN 16
End Connections	Flanged	Flanged	Flanged outlet (customized if required)
Body Materials	Stainless steel Special alloys Titanium	Carbon steel Stainless steel Special alloys Titanium	Stainless steel Special alloys
Seat Materials	Alloy 6 Metal encapsulated R-PTFE	Alloy 6 Metal encapsulated R-PTFE	Alloy 21
Applications and Options	Suitable for on/off and control applications within pulp and paper, chemical and petrochemical, oil and gas, power plants, metal and mining. Z-trim for cavitation control and noise reduction.	Suitable for on/off and control applications within pulp and paper, chemical and petrochemical, oil and gas, power plants, metal and mining. Z-trim for cavitation control and noise reduction. Fire safe certified versions acc. to API 607 6th edition and ISO 10497:2010.	Capping valve, mainly used for automated filling of wood chips to the batch digester in pulp industries. Optionally with water flushing units, safety locking device, control box.
Further information	NAF brochure Fk 4161	NFENTB4167	NAF brochure Fk 4155






## Trunnion mounted ball valves

Valbart	Valbart	Valbart	Valbart
			
<b>VB2/VB3</b>	<b>VT1</b>	<b>VW1</b>	<b>RSBV</b>
<b>Side Entry</b>	<b>Top Entry</b>	<b>Welded Body</b>	<b>Rising Stem</b>
1" ~ 64"(API 6D) 1" ~ 18"(API 6A)	2" ~ 56"(API 6D) 1" ~ 18"(API 6A)	2" ~ 64"	1" ~ 24"
Standard, Low temp -46°C Cryogenic -47°C to -196°C Sub sea & Underground High temp 280°C ~ 450°C	Standard, Low temp -46°C Cryogenic -47°C to -196°C Sub sea & Underground High temp 280°C ~ 450°C	Standard Low temp -46°C Sub sea Underground	- 196 °C to 600 °C
ASME 150 ~ 2500(API 6D) API 2000 ~ 15000(API 6A)	ASME 150 ~ 2500(API 6D) API 2000 ~ 10000(API 6A)	ASME 150 ~ 1500	ANSI 150 ~ 2500 DIN PN 10 ~ 320
Flanged RF or RTJ to ASME B16.5(to 24"), B16.47A for 26" Butt-weld to ASME B16.25 Hub ends for customer specification	Flanged RF or RTJ to ASME B16.5(to 24"), B16.47A for 26" Butt-weld to ASME B16.25 Hub ends for customer specification	Flanged RF or RTJ to ASME B16.5(to 24"), B16.47A for 26" Butt-weld to ASME B16.25 Hub ends for customer specification	Flanged RF/RJ Butt weld Socket weld Hub end Screwed
Carbon Steel, Low alloy steel Stainless Steel, Nickel Alloys etc.	Carbon Steel, Low alloy steel Stainless Steel, Nickel Alloys etc.	Carbon Steel, Low alloy steel Stainless Steel, Nickel Alloys etc.	Carbon Steel, Stainless Steel, Duplex, Nickel Alloys and etc.
Nylon, Peek, PTFE, FKM, etc. Metal-seated	Nylon, Peek, PTFE, FKM, etc. Metal-seated	Nylon, Peek, PTFE, FKM, etc. Metal-seated	Graphite, PTFE Combination composition
Independent ball and stem Anti Blowout Anti static design Floating self-relieving seat rings Emergency sealant injection Low emission valves	Independent ball and stem Anti Blowout Anti static design Floating self-relieving seat rings Emergency sealant injection Low emission valves	Independent ball and stem Anti Blowout Anti static design Floating self-relieving seat rings Emergency sealant injection Low emission valves	Helix Coil Stem Backseat Top entry Heavy wall thickness Critical / lethal services Blowout proof stem
ASME B 16.5 MSS SP-44, B 16.47A	ASME B 16.5 MSS SP-44, B 16.47A	ASME B 16.5 MSS SP-44, B 16.47A	ANSI Class V or VI

## Flow Control Solutions - Gate, Globe & Check

Brand	Edward	Edward	Edward
Product			
Model	EVAWP3 Series	Y Pattern & Angle	EVAWP3 Series
Design	Equiwedge Gate	Globe	Piston & Stop Check
Size Range	2½ - 32" 2½ - 24" 16 - 24"	½ - 2" ½ - 4" ½ - 2½"	½ - 2" ½ - 4" ½ - 2½"
Pressure Rating	ASME 600 & 900 ASME 1500 & 2500 ASME 3600	PN40 CL 150 to 1500	ASME 600 ASME 800 Series 1500 5000 & 10000 PSI CWP
End Connections	Buttwelding or Flanged Buttwelding	Flanged Threaded, Socket Buttwelding	Flanged Threaded, Socket Buttwelding
Body Materials	ASTM A-105 / A216 WCB A-182 F316, 347	ASTM A-105 / A216 WCB A-182 F316, 347	ASTM A-105 / A216 WCB A-182 F316, 347
Seat Materias	Stellite 21	Stellite 21	Stellite 21
Applications and Options	Safety-Related MOV Class 600 - 2500 steam and water Other gasses and liquids Main steam isolation	90° Bonnet / Class 300 - 2500 steam and water Other gasses and liquids Usable for throttling Inclined Bonnet / Class 600 - 4500 through size 4 Class 300 - 2500 through size 24	Class 300 - 4500 service H-Temperature steam and water refiningm petrochemical, chemical, etc. Calss 600 - 1500 service Water, steam, refining, petro-chemical etc.
Futher information	Lowest pressure drop Lowest torque	High pressure drop High torque	Very low pressure drop Forged steel valves



## Steam Boiler Equipment with Bus Technology

GESTRA	GESTRA	GESTRA
		
BK Series	Type MPA	ZK Series
Steam Trap	Blowdown	Control
DN 15 - 25, 40, 50	DN 20 - 50	DN 15 - 400
PN 40, 63, 100, 630 CL 300 - 2500	PN40 CL 150 to 1500	$\Delta P$ max. 40 - 560 bar
Flanged EN PN 40 Flanged ASME 150, 300 Screwed sockets Socket-weld Butt-weld	Flange DIN Flange ANSI CL 150, 300, 600, 900, 1500 Socket-weld	Flange DIN Flange ANSI CL 150, 300, 600, 900, 1500 Socket-weld
ASTM A105 SA350 LF2 ASTM A182-F1,12,22,91	ASTM A105 ASTM A182-F12	A182 F12, F22, F91 A 217 WC6 A105
Soft Metal	Soft Metal	Soft Metal
For open-loop controlled heating processes. Draining of Saturated steam line Superheated steam line Steam tracer	Manual intermittent blowdown of steam boilers and pressurized hot-water boilers. Automatic, programme- controlled intermittent blowdown of steam boiler and waste-heat boiler	Control of liquids, gases and steam. Ultra-compact pneumatic design thanks to directly attached positioner
EN 10204-2.1, 2.2, 3.1 & 3.2	EN 1092-1 ASME B16.34	EN 12266-1 leakage rate A





<b>One-Piece Butt Weld Valves</b>		<b>Top Entry Valves</b>	
<b>Deutsche Audco</b>	<b>Worcester</b>	<b>McCANNA</b>	<b>McCANNA</b>
			
<b>HPZ &amp; HPT (on request)</b>	<b>911</b>	<b>McCannaSeal</b>	<b>CryoSeal</b>
<b>Floating Ball (HPZ) or Trunnion Mounted (HPT)</b>	<b>Top Entry Cartridge Valve</b>	<b>Top Entry</b>	<b>Cryogenic</b>
100 - 1000 mm, 4" - 40" (HPZ) 100 - 600 mm, 4" - 24" (HPT) Full Bore	15 - 50 mm, ½" - 2"	15 - 500 mm, ½" - 20" Reduced Bore 25 - 450 mm, 1" - 18" Full Bore	15 - 200 mm, ½" - 8" Reduced Bore 15 - 150 mm, ½" - 6" Full Bore
ASME Class 150 - 900 PN 16 -160	50 bar, 725 psi	ASME Class 150 - 1500 PN 16 - 250	98 bar, 1440 psi ASME Class 150 - 600
Metric DIN PN Rating ASME class rating	Screwed Butt Weld Socket Weld	Screwed (NPT) Welded End Flanged	Butt Weld Flanged
Welded ends Carbon Steel	Stainless Steel Others on request	Stainless Steel Carbon Steel Titanium Hastelloy Other Exotics	Stainless Steel
Metal to metal (HPZ) Primary metal / secondary soft (HPT)	Virgin PTFE Filled PTFE Flourofill Lubetal (Delrin AF) PEEK	Virgin & Filled PTFE Carbon graphite PEEK Metal Ceramics UHMWPE	Kel-F
Oil & Gas Pipeline valve Fully Welded design, floating or trunnion mounted ball Secondary sealing systems on ball and stem, drain & vent connections, above and underground installation. Single or double Piston (HPT).	In-line maintenance is possible due to cartridge design whereby all components can be removed from the body as a single assembly.	Top entry Wedge-Seated ball valves. Forged and precision cast in a wide range of materials for corrosive, high temperature and pressure and severe service applications.	Liquefaction, LNG Carriers, Regasification Terminals and general cryogenic service to -196 °C (-320 °F).
	WCEBR0017	MMENBR0001	MMENBR1027






## Butterfly Valves

Brand	Durco	Durco	NAF
Product			
Model	<b>BX2001</b>	<b>BTV 2000 &amp; BTV-LP (Long Pattern)</b>	<b>Torex</b>
Design	<b>High Performance</b>	<b>Lined Butterfly</b>	<b>Triple Offset High Performance</b>
Size Range	50 - 900 mm, 2" - 36"	50 - 600 mm, 2" - 24"	80 - 700 mm, 3" - 28"
Pressure Rating	ASME Class 150 / 300 PN 10 - 40	10 bar 150 psi	ASME Class 150 / 300 PN 10 - 40
End Connections	Wafer Lug	Wafer Lug ASME & DIN	Wafer Lug
Body Materials	Stainless Steel Carbon Steel Alloys	Lined Ductile Iron Lined Stainless Steel	Stainless steel Carbon steel
Seat Materials	Inconel, UHMWPE PFA/Viton	PTFE PTFE-Conductive UHMWPE Durlon™	Inconel R-PTFE
Applications and Options	A double offset high performance butterfly valve designed for a wide range of applications within the petrochemical industry.	Specifically designed for the chemical industries. Provides triple stem sealing, Viton energised seats and also a wide variety of alloy discs. BTV-LP recommended in combination with heavy duty lined piping.	Suitable for on/off and control applications within pulp and paper, chemical and petrochemical, oil and gas, power plants, metal and mining . Fugitive Emission Solution according to EN ISO15848-1. Special version TX for full API609 compliance.
Further information	DVENTB0039	DVENBR0020	NAF brochure Fk 41.42



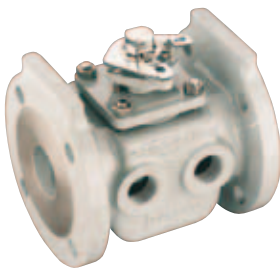

## Non-Lubricated Plug Valves

Durco	Durco	Durco	Durco
			
G4	G4E	G4Z	G4Z-HF
Sleeved Plug	Europa Plug	Fire Sealed	Alkylation
15 - 450 mm, ½" - 18" Reduced Bore	15 - 150 mm, ½" - 6" Reduced Bore	15 - 450 mm, ½" - 18" Reduced Bore	15 - 450 mm, ½" - 18" Reduced Bore
ASME Class 150 / 300 PN 16 - 40	PN 10 - 40	ASME Class 150 / 300 PN 16 - 40	ASME Class 150 / 300 PN 16 - 40
ASME Class 150 (G411) ASME Class 300 (G431) Screwed Butt Weld Socket Weld	PN 10 - 40	ASME Class 150 (G411) ASME Class 300 (G431) Screwed Butt Weld Socket Weld	ASME Class 150 ASME Class 300 Screwed Butt Weld Socket Weld
Ductile Cast Iron Stainless Steel Carbon Steel Durcomet, Durimet Inconel, Monel, Alloys	Ductile Cast Iron Stainless Steel Carbon Steel Durcomet, Durimet Inconel, Monel, Alloys	Ductile Cast Iron Stainless Steel Carbon Steel Durcomet, Durimet Inconel, Monel, Alloys	Monel
PTFE Durlon II UHMWPE TFEG TMHT (high temperature)	PTFE Durlon II UHMWPE TFEG TMHT (high temperature)	PTFE Durlon II UHMWPE TFEG TMHT (high temperature)	PTFE Durlon II UHMWPE TFEG TMHT (high temperature)
The G4 Sleeveplug valve is a non-lubricated plug valve manufactured in a wide range of materials to meet the demands of the chemical industry.	The G4E Sleeveplug valve is a non-lubricated plug valve manufactured to DIN face to face dimensions to suit the European market.	The G4Z has been fire tested in accordance with API 607 and is provided with graphoil stem seals to reduce atmospheric leakage should fire destroy the PTFE sleeve.	The G4Z-HF is specifically designed and refinery proven for use on HF Alkylation with bonnet and flanges painted with HF detection paint.
DVENBR0024	DVRUIM0011	DVENBR0024	DVENBR0024

## Non-Lubricated Plug Valves




Brand	Durco	Durco	Durco
Product			
Model	G4B	TSG4	Full Port G4
Design	Marathon	Severe Service	Full Port Plug
Size Range	15 - 450 mm, ½" - 18" Reduced Bore	15 - 300 mm, ½" - 12" Reduced Bore	25 - 200 mm, 1" - 8" Full Bore
Pressure Rating	ASME Class 150 / 300 PN 16 - 40	ASME Class 150 / 300 PN 16 - 40	ASME Class 150 / 300 PN 16 - 40
End Connections	ASME Class 150 / 300 ASME Class 300 Screwed Butt Weld Socket Weld	ASME Class 150 / 300 ASME Class 300	ASME Class 150 ASME Class 300
Body Materials	Ductile Cast Iron Stainless Steel Carbon Steel Durcomet, Durimet Inconel, Monel, Alloys	Ductile Cast Iron Stainless Steel Carbon Steel Durcomet, Durimet Inconel, Monel, Alloys	Stainless Steel Carbon Steel Alloys
Seat Materials	PTFE Durlon II UHMWPE TFEG TMHT (high temperature)	PTFE Durlon II UHMWPE TFEG TMHT (high temperature)	PTFE Durlon II
Applications and Options	The G4B Marathon valve is designed for high cycling on-off applications or modulating service.	The TSG4 is a triple sealed valve designed for lethal, toxic and sub-zero fluid services. Stem sealing exceeds the Clean Air Act fugitive emissions regulations.	The Full port plug valve allows minimal restriction while maintaining tight sealing capability.
Further information	DVENBR0024	DVENBR0024	DVENBR0024

## Non-Lubricated Plug Valves

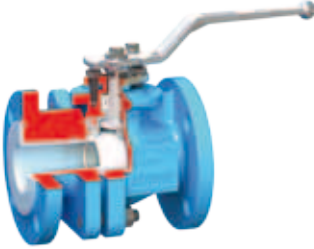



Durco	Durco	Durco	Durco
			
Mach 1	MG4	FJG4	PlugSeal
Seated Plug	3-Way	Fully Jacketed	High Pressure Plug
25 - 200 mm, ½" - 8" Reduced Bore	25 - 250 mm, 1" - 10" Reduced Bore	25 - 200 mm, 1" - 8" Reduced Bore	25 - 100 mm, 1" - 4" Reduced Bore
ASME Class 150 / 300 PN 16 - 40 68 bar (1000 psi) <b>Note:</b> Class 600 derated	ASME Class 150 / 300 PN 16 - 40	ASME Class 150 / 300 PN 16 - 40	ASME Class 600 PN 100
ASME Class 150 ASME Class 300	ASME Class 150 ASME Class 300 Screwed Butt Weld Socket Weld		Butt Weld
Ductile Cast Iron Stainless Steel Carbon Steel Durcomet, Durimet Inconel, Monel, Alloys	Ductile Cast Iron Stainless Steel Carbon Steel Alloys	Stainless Steel Carbon Steel Alloys	Stainless Steel Carbon Steel Alloys
PFA Encapsulated 316 (Hastelloy and other alloys available)	PTFE Durlon II UHMWPE TFEG TMHT (high temperature)	PTFE Durlon II UHMWPE TFEG TMHT (high temperature)	PFA
The Mach 1 is a non lubricated plug valve with a replaceable seat providing lower operating torques and higher temperature capability allowing for in-line maintenance.	The MG4 3-way valve is available in a wide variety of plug configurations to suit almost any piping arrangement.	The FJG4 valves are ideal for helping to keep process fluids at a consistent temperature.	The PlugSeal is designed for high pressure applications where tight shutoff is needed.
DVENTB0030	DVENBR0024	DVENBR0024	DVENVBR0391





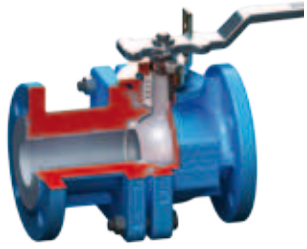
## Lined Valves and Accessories

Brand	Durco	Atomac	Atomac
Product			
Model	T4E - Line	AKH2.2	AKH2(A)
Design	<b>Lined Plug</b>	<b>Full Bore Ball</b>	<b>Full Bore Ball</b>
Size Range	15 - 350 mm, ½" - 14" Reduced Bore	15 - 100 mm, ½" - 4" AKH2.2 Full Bore DIN - ASME Long Pattern	15 - 350 mm, ½" - 14" AKH2 Full Bore Long Pattern 25-150 mm, 1" - 6" AKH2A Full Bore Short Pattern
Pressure Rating	ASME Class 150 / 300 PN 16	ASME Class 150 PN 16	ASME Class 150 PN 16
End Connections	T4E1 ASME Class 150 T4E2 DIN PN 16 T4E3 ASME Class 300	ASME Class 150 DIN PN 16	ASME Class 150 DIN PN 16
Body Materials	Lined Ductile Iron Lined Stainless Steel Lined Carbon Steel	Lined Ductile Iron Lined Stainless Steel	Lined Ductile Iron Lined Stainless Steel Lined Carbon Steel
Seat Materials	PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request
Applications and Options	The T4E-Line is a PFA* lined plug valve for the chemical and pharmaceutical industries. *PFA material FDA approved	The AKH2.2 is a full port long pattern length fully lined valve for corrosion resistance. It incorporates a metal-to-metal maintenance-free body joint.	The AKH2 is a full port ASME or DIN long pattern length fully lined valve for corrosion resistance. The AKH2A is the full port ASME short pattern length version.
Further information	DVENBR0066	ATETB001	ATETB001




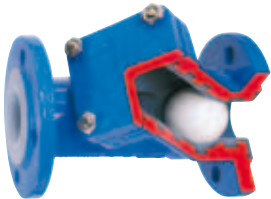
## Lined Valves and Accessories

Atomac	Atomac	Atomac	Atomac
			
<b>AKH3</b>	<b>AMP3</b>	<b>AKH5</b>	<b>AKH6</b>
<b>Reduced Bore</b>	<b>3-Way</b>	<b>Ceramic Ball</b>	<b>Tank Drain</b>
15 - 350 mm, ½" - 14" Reduced Bore Short Pattern	25-100 mm, ½" - 4" Full Bore DIN - ASME	25-150 mm, ½" - 6" Full Bore Long Pattern	25-200 mm, 1" - 8" Reducing Flange
ASME Class 150 PN 16	ASME Class 150 PN 16	ASME Class 150 PN 16	ASME Class 150 PN 16
ASME Class 150 J1S 10K	ASME Class 150 DIN PN 16	ASME Class 150 DIN PN 10 DIN PN 16	ASME Class 150 (200mm PN10) DIN PN 16
Lined Ductile Iron Lined Stainless Steel	Lined Ductile Iron	Ceramic Lined Ductile Iron	Lined Ductile Iron
PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request	Zirconium Ceramic	PFA PFA-C (conductive) Others on request
The AKH3 is a reduced bore fully lined valve to ASME length allowing for interchangeability with existing valves. Available with JIS flange connections.	Compact design 3-way valve offering 90° and 180° operation with L or T port balls to provide a variety of flow configurations.	The AKH5 has a full ceramic liner and is designed for abrasive slurries, high temperature corrosives and applications with high temperature fluctuations. Available to DIN and ASME lengths.	Designed with a larger inlet port the valve is primarily used for tank drainage. Provided with long service liners with inert non-stick properties make it ideal for viscous or high purity services.
ATETB001	ATETB001	ATETB001	ATETB001




## Lined Valves and Accessories

Brand	Atomac	Atomac	Atomac
<b>Product</b>			
<b>Model</b>	AKH2 300 lbs	Atostar	AKH8(A)
<b>Design</b>	Full Bore 300 lbs	Stainless	Monoblock
<b>Size Range</b>	25-150 mm, 1" - 6"	25 - 150 mm, 1" - 6" Full Bore DIN - ASME Long and Short Pattern	25 - 150 mm, 1" - 6" Full Bore
<b>Pressure Rating</b>	ASME Class 300 PN 40	ASME Class 150 PN 16	ASME Class 150 PN 16
<b>End Connections</b>	ASME Class 300	ASME Class 150 DIN PN 16 JIS 10K	ASME Class 150 DIN PN 16
<b>Body Materials</b>	Lined Carbon Steel	Lined Stainless Steel	Lined Ductile Cast Iron Lined Stainless Steel
<b>Seat Materials</b>	PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request
<b>Applications and Options</b>	The AKH2 is a full bore Class 300 long pattern fully PFA lined ball valve. Suitable for use as control or on/off valve under severe service conditions.	The Atostar lined stainless steel armoured valve is recommended for food and beverage, pharmaceutical, conductor and offshore industry.	The Atomac Monoblock ball valve has one-piece stem/ball design which makes it suitable for automated applications or high cycling applications.
<b>Further information</b>	ATETB001	ATETB001	ATETB001

## Lined Valves and Accessories

Atomac	Atomac	Atomac	Atomac
			
AtoPro™	ARK2	ARV2	ARL
Ball Valve Sampling System	Swing Check	Ball Check	Angle Check
25 - 80 mm, 1" - 3"	50 - 400 mm, 2" - 16"	15 - 300 mm, ½" - 12" Full Flow	25 - 80 mm, 1" - 3" Full port
ASME Class 150 PN 16	ASME Class 150 PN 16	ASME Class 150 PN 16	ASME Class 150 PN 16
DIN PN 16	ASME Class 150 Wafer DIN PN 16	ASME Class 150 DIN PN 16	ASME Class 150 DIN PN 16
Lined Ductile Iron Lined Stainless Steel Stainless Steel	PFA-Lined Ductile Iron	PFA-lined ductile iron	PFA-lined ductile iron
PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request
The AtoPro is a new design high integrity lined ball valve sampling system. For manual / automated / safety systems. Sample capacities 15, 45 and 90 cm <sup>3</sup> .	The ARK2 swing check valve is used for corrosive applications. It can be used in vertical or horizontal installations.	The ARV2 check valve can be used in horizontal or vertical position.	The ARL check valve allows fully unobstructed flow. Where there is turbulence the ARL is the best choice to avoid liner damage.
ATETB001	ATETB0001	ATETB001	ATETB001




## Lined Valves and Accessories

Brand	Atomac	Atomac	Atomac
Product			
Model	AKR2	ASG	ASF
Design	Piston Check Valve	Sight Glass	Strainer
Size Range	25 - 150 mm, 1" - 6"	2 - way 25 - 250 mm (1" - 10") 3 - way 25 - 100 mm (1" - 4") 4 - way 25 - 50 mm (1" - 2") Full port	25 - 200 mm, 1" - 8"
Pressure Rating	ASME Class 150 PN 16	ASME Class 150 PN 16	ASME Class 150 PN 16
End Connections	ASME Class 150 DIN PN 16	ASME Class 150 DIN PN 16	ASME Class 150 DIN PN 16
Body Materials	PFA-lined ductile iron	PFA-lined ductile iron	PFA-lined ductile iron
Seat Materials	PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request	PFA PFA-C (conductive) Others on request
Applications and Options	The AKR2 is a spring supported piston check valve designed to stop mass flow with low pressure differentials.	The ASG offers clear visual inspection from either side.	The ASF offers strainer cartridges having many different mesh openings to allow removal of particles of various sizes.
Further information	ATETB001	ATETB001	ATETB001




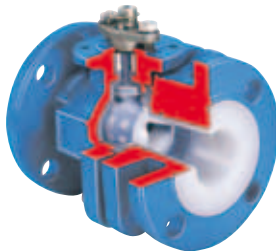


<b>Check Valves</b>			<b>Gate Valves</b>
NAF	Noble Alloy	Noble Alloy	NAF
			
NAF Check	Condor	Swing Check	Series 48
Tilting Disc Check Valve	Piston Check Valve	Swing Check Valve	Wedge Gate Valve
40 - 1000 mm, 1½" - 40"	15 - 250 mm, ½" - 10" forged	15 - 250 mm, ½" - 10" forged, 300 mm, 12" cast	80 - 500 mm Metric only
ASME Class 150 / 300 PN 10 - 40	ASME Class 150 - 1500 PN 10 - 250	ASME Class 150 - 1500 PN 10 - 250	PN 16
Wafer	RF wafer	RF flanged Screwed end Socket weld	Flanged
Carbon steel Alloy steel Stainless steel Special alloys	Stainless steel, Alloy 20, Hastelloy C, Inconel, Titanium, Zirconium, Duplex SS, Ultimet and others	Stainless steel, Alloy 20, Hastelloy C, Inconel, Titanium, Zirconium, Duplex SS, Ultimet and others	Stainless steel
Stainless steel Hardened stainless steel	Polymer Metal	Polymer Metal	Stainless steel
Suitable for applications within pulp and paper, chemical and petrochemical, oil and gas, power plants, metal and mining.	High temperature, highly corrosive applications requiring exotic alloys.	High temperature, highly corrosive applications requiring exotic alloys.	General service Short face-to-face
NAF brochure Fk 30.70 Fk 30.71	NAENTB0001	NAENTB0008	NAF brochure Fk 21.63


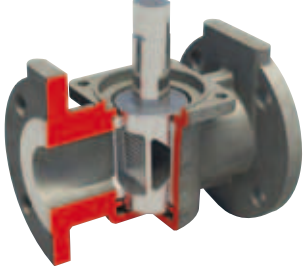
## Rotary Control

Brand	NAF	NAF	NAF
Product			
Model	Setball	Z Trim	Trunnball DL
Design	<b>V-Port, Segmented Ball Valve</b>	<b>Anti-Cavitation Trim</b>	<b>Full Bore Trunnion Mounted Ball Valve</b>
Size Range	25 - 500 mm, 1" - 20"	50 - 500 mm, 2" - 20"	150 - 800 mm, 6" - 32"
Pressure Rating	ASME Class 150 / 300 PN 10 - 40	ASME Class 150 / 300 PN 10 - 40	ASME Class 150 / 300 PN 10 - 40
End Connections	Wafer Flanged	As per the individual product family	Flanged
Body Materials	Carbon steel Stainless steel Special alloys Titanium	As per the individual product family	Stainless steel Special alloys Titanium
Seat Materials	Alloy 6 R-PTFE/SS	As per the individual product family	Alloy 6
Applications and Options	Suitable for control applications within pulp and paper, chemical and petrochemical, oil and gas, power plants, metal and mining. Z-trim for cavitation control and noise reduction. Fugitive Emission Solution according to EN ISO15848-1.	A cost effective solution for eliminating common cavitation and noise problems in many control applications. Retrofits into existing Setball, Duball and Trunnball valves.	Suitable for on/off and control applications within pulp and paper, chemical and petrochemical, oil and gas, power plants, metal and mining. Z-trim for cavitation control and noise reduction.
Further information	NAF brochure Fk 41.51	NAF brochures Fk 41.53 Fk 41.65	NFENTB4168




# Rotary Control

NAF	Worcester	Worcester	Atomac
			
Ceramic	V44/V459, CPT44	V51/V52, CPT51/52	Atomac V-Port
<b>Ceramic lined, Reduced Ball Valve</b>	<b>Modulating Control</b>	<b>Modulating Control</b>	<b>Lined Control</b>
25 - 150 mm, 1" - 6"	15 - 50 mm, ½" - 2" Reduced Bore	15 - 100 mm, ½" - 4"	25 - 200 mm, 1" - 8" Reduced Bore
ASME Class 150 / 300 PN 10 - 40	102 bar, 1480 psi	ASME Class 150 / 300 ASME Class 600 (25 - 80 mm, 1" - 3")	ASME Class 150 / 300 PN 16 - 40
Flanged	Screwed Butt Weld Socket Weld	ASME Class 150 ASME Class 300 ASME Class 600 (25 - 80 mm, 1" - 3") DIN PN 16 DIN PN 40	ASME Class 150 ASME Class 300 DIN PN 16 DIN PN 40
Stainless steel Special alloys	Stainless Steel Carbon Steel Special alloys	Stainless Steel Carbon Steel Special alloys	Lined Ductile Cast Iron Lined Stainless Steel
Aluminum oxide Zirconium oxide	Stainless Hastelloy C Monel Stellite 6	Stainless Hastelloy C Monel Stellite 6	PFA PFA-C (conductive) Others on request
All ceramic lined ball valve suitable for control and on-off service of slurries and other erosive media.	Precision rotary control for steam, cryogenic, thermal fluids, toxic fluids and high-cycle, tight shutoff, low maintenance applications.	Precision rotary control for steam, cryogenic, thermal fluids, toxic fluids and high-cycle, tight shutoff, low maintenance applications.	The Atomac V-port ball valve, either reduced port or full port, provides control on a wide range of corrosive applications. Also available in AKH5 ceramic lined valves.
NAF brochure Fk 41.64	WCEBR0025 (for UK) WCENBR1001 (for US)	WCEBR0025 (for UK) WCENBR1001 (for US)	ATETB001

## Rotary Control

Brand	Durco	Durco	Durco
Product			
Model	T4E V-Port	G4 V-Port	Sound Trim
Design	Lined Control	Control	Noise Control
Size Range	25 - 100 mm, 1" - 4" Reduced Bore	25 - 150 mm, 1" - 6" Reduced Bore	25 - 150 mm, 1" - 6" Reduced Bore
Pressure Rating	ASME Class 150 / 300 PN 16 - 40	ASME Class 150 / 300 PN 16 - 40	ASME Class 150 / 300 PN 16 - 40
End Connections	ASME Class 150 ASME Class 300 DIN PN 16 DIN PN 40	ASME Class 150 ASME Class 300 PN 16 PN 40 Screwed Socket Weld Butt Weld	ASME Class 150 ASME Class 300 PN 16 PN 40 Screwed Socket Weld Butt Weld
Body Materials	Lined Ductile Iron Lined Stainless Steel Lined Carbon Steel	Ductile Cast Iron Stainless Steel Carbon Steel Alloys	Ductile Cast Iron Stainless Steel Carbon Steel Alloys
Seat Materials	PFA PFA-C (conductive) Others on request	PTFE Durlon II UHMWPE TFEG TMHT (high temperature)	PTFE Durlon II UHMWPE TFEG TMHT (high temperature)
Applications and Options	The Durco T4E V-port plug valve provides control on a wide range of corrosive applications.	The Durco V-port plug can be fitted into most versions of G4 or Mach 1 plug valves to provide control on a wide range of applications.	The Durco SoundTrim valve offers a 2-step pressure drop to suit applications with high differential pressure.
Further information	DVENBR0066	DVENBR0024	DVENFL0070

## Actuators - Electric



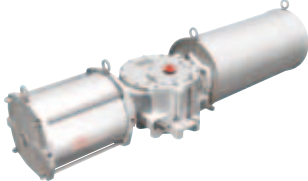

Brand	Worcester / Norbro	Limitorque	Worcester / Norbro
Product			
Model	75 Series	Worcester Controls / Automax CEA Series	72 Series
Design	Electric	Electric	Electro-Hydraulic
Torque Range	13 to 276 Nm 10 to 204 ft-lb.	17-2034 Nm 12-1500 ft-lb.	90 to 147 Nm 66 to 108 ft-lb.
Supply Pressure / Voltage	12 VDC, 24 VDC 120 VAC, 240 VAC	12/24 VDC, 120/240 VAC (single phase, 3-phase)	24 VDC 120 VAC, 240 VAC
Temperature Range	-40 °C (with heater) to +65 °C -40 °F (with heater) to +140 °F	-40 °C to +85 °C -40 °F to +185 °F Low temp option: -48 °C (-55 °F)	-32 °C to +65 °C -26 °F to +149 °F
Travel Stops	No	Yes	Optional
Ratings and Certifications	CSA: TYPE 4, 4X Watertight CSA: Hazardous Locations TYPE 7, Class 1, Div. 1, 2, Group C, D; TYPE 9, Class II, Div. 1, 2 Group E, F, G	IP66/68, NEMA 4, 4X, 6, 7, 9 ATEX II 2G, Ex d IIB +H2 T4 ATEX II 2D, Ex tD A21 FM/CSA Class1, div.1, 2, Gps B, C & D; Class 2, div.1, 2, Gps E, F, G	Factory Mutual approval for Liquid and Gas Safety Shut-off Service Approval Pending: Type 4, 4X, 7, 9, 12 Class 1, Div. 1 & 2, Group B, C and D; Class II, Div. 1 & 2, Group E, F and G; Class III, Div. 1 & 2
Design Options	Positioner, PID Control 180° Centre off, Heater Mechanical brake	Positoner / Controller; network interfaces: FF, ProfiBus PA, HART, Modbus, DeviceNet, ASi; Bluetooth	Fail open / fail closed Position feedback Step control
Applications and Options	Rugged design single phase electric actuator designed for on / off applications but adaptable to meet the increasing demand for analog and digital control. Available in AC and DC versions.	Rotary control for On / Off, multi-turn and modulating applications for multiple valve designs including Ball, Plug, Butterfly, Choke and Dampers.	An electro-hydraulic actuator based upon the Norbro 40R providing a true spring return electric actuator for fail safe systems.
Further information	WCABR1014	WCENBR2080 AXENBR2080	WCABR1025

## *Actuators - Pneumatic*




Brand	Norbro / Worcester	Norbro / Worcester	Norbro / Worcester
Product			
Model	40R/39	33R Series	P61 Series
Design	Rack & Pinion	180° Rack & Pinion	3 Stage Dosing
Torque Range	11 to 4617 Nm at 5.5 bar 8 to 3405 ft-lb. at 80 psi	96 to 2309 Nm at 5.5 bar 71 to 1703 ft-lb. at 80 psi	11 to 263 Nm (End of Spring) 8 to 194 ft-lb.
Supply Pressure / Voltage	Up to 8.3 bar, 120 psi	Up to 8.3 bar, 120 psi	Up to 8.3 bar, 120 psi
Temperature Range	-40 °C to +150 °C -40 °F to +302 °F	-40 °C to +150 °C -40 °F to +302 °F	-20 °C to +100 °C -4 °F to +212 °F
Travel Stops	Optional	Optional	Two stage travel stop control
Design Options	Fast acting NorGuard severe service actuator	90° stop position 120° rotation	Standard
Applications and Options	High performance quality actuator combining reliability, long life and ease of maintenance with operational safety.	180° actuator using standard Norbro 40R series design concept provides spring return capability on diverter valves.	Designed to provide rapid, repeatable and highly accurate filling control for all weigh / measuring processes.
Further information	NBEBR0003 (for Norbro 40) WCABR1003 (for Worcester 39)	NBEBR0002	NBEBR0004



## Actuators - Pneumatic





Automax	Automax	Automax	NAF
			
SuperNova	SXL Series	RG	Turnex
Rack & Pinion	Stainless Steel	Heavy Duty Scotch Yoke	Linkage
17 to 3441 Nm at 5.5 bar 12 to 2538 ft-lb. at 80 psi	17 to 526 Nm at 5.5 bar 12 to 388 ft-lb. at 80 psi	Up to 248,000 Nm 183,000 ft-lb.	60 Nm to 20,000 Nm at 5 bar
Up to 10 bar, 150 psi	Up to 8.3 bar, 120 psi	2.8 bar to 10 bar (40 psi to 150 psi) depending on configuration	Up to 8 bars, 115 psi
-50 °C to +150 °C -58 °F to +302 °F	-50 °C to +150 °C -58 °F to +302 °F	-40 °C to +148 °C -40 °F to +300 °F -48 °C to +148 °C -55 °F to +300 °F	-30 to +80 °C -22 to +176 °F
Standard	Standard	Standard	Standard, both ends
140° / 180° option		Manual Overrides; Sandwich gear, Jackscrew, Hydraulic pump. Other options; ESD, Quick closing	Fast acting M-lock safety locking device
Aluminum rack and pinion actuator with integral limit stops as standard allowing for open and closed position adjustment.	The SXL uses a 316 stainless steel body and can be supplied with either Aluminum or stainless steel pistons. Optional polished finish is also available for sanitary applications.	Modular design supporting both DA and SR (failsafe) quarter-turn automation for ball, plug and butterfly valves and rotary dampers in chemical, refining oil and gas and general industries. Design qualified to EN15714-3 (cycle performance) and IEC61508 - SIL3 suitable.	Light weight aluminum actuator with linkage mechanism specially built for rotary control and on-off severe service.
AXENBR0005	AXENBR0005	AXENBR0005	NAF brochure Fk 74.59

## Switch Boxes - Standard



Brand	Automax / PMV / Worcester		
Product			
Model	WS/WM	PS/PM	XCL / XML
Key features	Modular compact design Corrosion resistant option	Modular design Corrosion resistant	Modular design Explosion proof
Indicator	Dome or Flat	Dome or Flat	Dome or Flat
Enclosure material	Aluminum or PC	Fiberglass reinforced Nylon	Aluminum
Connections	Prewired terminals 2 x ½" NPT or 2 x M20	Prewired terminals 3 x ¾" or ½" NPT or 3 x M20 or M25	Prewired terminals 2 x ¾" NPT or 2 x M25
Switch options	Multiple options 2 x switches	Multiple options Up to 4 x switches	Multiple options Up to 4 x switches
Dimensions	120 x 80 x 59 mm Flat 120 x 80 x 106 mm Dome	146 x 140 x 103 mm Flat 146 x 140 x 154 mm Dome	157 x 135 x 87 mm Flat 157 x 135 x 148 mm Dome
Special options	Viton O-rings (low temp) AS-i DeviceNet	Viton O-rings (low temp) AS-i DeviceNet	Viton O-rings (low temp) One or two solenoids AS-i DeviceNet 4 - 20 mA transmitter
Ratings and certification	Aluminum enclosure ATEX II 1G Ex ia IIC T4-T6 ATEX II 1G Ex ia IIB T4-T6 ATEX II 1D Ex ta IIIC T80 °C T50085 °C Da cCSAus: Class I, II, III Div. 1&2 Grps. A-D & F-G <hr/> PC version for general purpose only No Ex certifications	ATEX II 1G Ex ia IIC T4-T6 ATEX II 1G Ex ia IIB T4-T6 ATEX II 2G Ex e mb IIC T5-T6 IECEX Ex ia IIC T4-T6 cFMus: Class I, II, III Div. 1&2 Grps. A -G cCSAus: Class I, II, III Div. 1&2 Grps. A-G	ATEX II 2 G Ex d IIB T5 ATEX II 2 D Ex tD A21 IP 65 IECEX Ex d IIB T5 IECEX Ex tD A21 IP 65 InMetro BR Ex d IIB T5 Kosha Ex d IIB T5 cCSAus EX: Class I, II & III, Div. 1&2, Grps.C, D, E,F&G Class I, Div. 2, Grps. A,B,C&D. cCSAus IS: Class I, II, III Div. 1, Grps. A, B, C, D, E,F & G
Further information	AXENBR0135 (for Automax) PMENBR0019 (for PMV) WCENBR0135 (for Worcester)	AXENBR0134 (for Automax) PMENBR0018 (for PMV) WCENBR0134 (for Worcester)	AXENBR0006 (for Automax) WCENBR1057 (for Worcester)

# Switch Boxes - Explosion Proof



Automax / PMV / Worcester

			
DS/DM	RS / RM	Aviator II	BUSwitch
Modular design Explosion proof ATEX IIC Corrosion resistant option	Modular design Integrated spool valve Corrosion resistant	Modular design Explosion proof Integrated spool valve	Modular design Explosion proof Integrated spool valve
Skirt indicator	Dome or Flat	Dome	Dome
Aluminum or Stainless Steel	Fiberglass reinforced Nylon	Aluminum	Aluminum
Prewired terminals 3 x ¾" NPT or 3 x M25	Prewired terminals 3 x ¾" or ½" NPT or 3 x M20 or M25	Prewired terminals 3 x ¾" NPT or 3 x M20	Prewired terminals 3 x ¾" NPT or 3 x M20
Multiple options Up to 4 x switches	Multiple options Up to 4 x switches	Multiple options Up to 4 x switches	Multiple options Up to 2 x switches
150 x 137 x 100 mm	Flat: 146 x 140(+solenoid) x 103 mm Dome: 146 x 140(+solenoid) x 154 mm	Dome: 157 x 135(+solenoid) x 148 mm	Dome: 157 x 135(+solenoid) x 148 mm
Viton O-rings (low temp) AS-i DeviceNet	4-20mA Transmitter Viton O-rings (low temp) AS-i DeviceNet Foundation Fieldbus High Cv spool valve Stainless steel spool valve	High Cv spool valve Stainless steel spool valve	AS-i Foundation Fieldbus Device Net Profibus - DP High Cv spool valve Stainless steel spool valve
ATEX II 2GD Ex d IIC T4 Gb ATEX IIIC T113 °C Db	Contact Flowserve PMV Sweden	ATEX II 2G Ex d IIB T3/T4 CSA Class I, Div.1, Gr. C, D Class II, Div.1 &2, Gr. E, F, G Class III TYPE 4X Class I, Div.2, Gr. A, B, C, D Class I, Zone 1, Gr. IIB Ex d IIB T3/T4 IP65 AEx d IIB T3/T4 IP65 IECEx Ex d IIB T3/T4 InMetro BR Ex d IIB T3/T4 FM Class I, II, III, Div. 1, Gr. A, B, C, D, E, F, G	ATEX II 2G Ex d IIB T3/T4 CSA Class I, Div.1, Gr. C, D Class II, Div.1 &2, Gr. E, F, G Class III TYPE 4X Class I, Div.2, Gr. A, B, C, D Class I, Zone 1, Gr. IIB Ex d IIB T3/T4 IP65 AEx d IIB T3/T4 IP65 IECEx Ex d IIB T3/T4 InMetro BR Ex d IIB T3/T4 FM Class I, II, III, Div. 1, Gr. A, B, C, D, E, F, G
AXENBR0136 (for Automax) PMENBR0020 (for PMV) WCENBR0136 (for Worcester)	AXENBR0134 (for Automax) PMENBR0018 (for PMV) WCENBR0134 (for Worcester)	AXENBR0006 (for Automax) WCENBR1057 (for Worcester)	AXENBR0006 (for Automax) WCENBR1057 (for Worcester)



## Positioners - Digital

Brand	PMV	PMV
<b>Product</b>		
Model	D20	D3
<b>Key features</b>	Friction clutch Explosion proof, Intrinsically safe and non incendive	Multitude of options Friction clutch Low air consumption Explosion proof and Intrinsically safe
<b>Communication</b>	HART, Profibus PA, Foundation Fieldbus	HART, Profibus PA and DP, Foundation Fieldbus
<b>Output</b>	Single acting Double acting - High flow	Single acting Double acting
<b>Enclosure material</b>	Aluminum, Stainless steel	Aluminum, Stainless steel
<b>Diagnostic</b>	Standard Local alarm monitoring	Standard Local alarm monitoring ValveSight FDT/DTM diagnostics AMS SnapOn application
<b>User interface</b>	Status LED's LCD + Menu interface	LCD + Menu interface
<b>Motion</b>	Linear Rotary	Linear Rotary
<b>Mounting option</b>	IEC 534-6 (NAMUR) VDI/VDE 3845 VDI/VDE 3847 Direct mounted	IEC 534-6 (NAMUR) VDI/VDE 3845 VDI/VDE 3847 Direct mounted
<b>Ratings and certification</b>	IECEX Ex d IIB + H2 ATEX II 2G EEx d IIB + H2 ATEX II 2D T85°C Ta: 80°C D20E: CSA/FM Cl 1 Div 1 Gr B, C, D; Cl II Div 1 Gr E, F, G; Cl III Div 1 ATEX II 1G EEx ia IIC FM Ex II 1G ia Cl 1, Zone 0&1 Gr. IIC Non incendive Cl 1 Div 2 Gr A-D and Cl 1 Zo 2 Gr IIC	IECEX Ex d IIB + H2 ATEX II 2G EEx d IIB + H2 ATEX II 2D T85°C Ta: 80°C D3E: CSA/FM Cl 1 Div 1 Gr B, C, D; Cl II Div 1 Gr E, F, G; Cl III Div 1 ATEX II 1G EEx ia IIC
<b>Further information</b>	PMENBR0015	PMENBR0001

## Positioners - Digital

Brand	Automax	Worcester
Product		
Model	<b>APEX 9000</b>	<b>Pulsair III</b>
Key features	Friction clutch Explosion proof, Intrinsically safe and non incendive	Multitude of options Friction clutch Low air consumption Explosion proof and Intrinsically safe
Communication	HART, Profibus PA, Foundation Fieldbus	HART, Profibus PA and DP, Foundation Fieldbus
Output	Single acting Double acting - High flow	Single acting Double acting
Enclosure material	Aluminum, Stainless steel	Aluminum, Stainless steel
Diagnostic	Standard Local alarm monitoring	Standard Local alarm monitoring ValveSight FDT/DTM diagnostics AMS SnapOn application
User interface	Status LED's LCD + Menu interface	LCD + Menu interface
Motion	Linear Rotary	Linear Rotary
Mounting option	IEC 534-6 (NAMUR) VDI/VDE 3845 VDI/VDE 3847 Direct mounted	IEC 534-6 (NAMUR) VDI/VDE 3845 VDI/VDE 3847 Direct mounted
Ratings and certification	IECEX Ex d IIB + H2 ATEX II 2G EEx d IIB + H2 ATEX II 2D T85°C Ta: 80°C D20E: CSA/FM CI 1 Div 1 Gr B, C, D; CI II Div 1 Gr E, F, G; CI III Div 1 ATEX II 1G EEx ia IIC FM Ex II 1G ia CI 1, Zone 0&1 Gr. IIC Non incendive CI 1 Div 2 Gr A-D and CI 1 Zo 2 Gr IIC	IECEX Ex d IIB + H2 ATEX II 2G EEx d IIB + H2 ATEX II 2D T85°C Ta: 80°C D3E: CSA/FM CI 1 Div 1 Gr B, C, D; CI II Div 1 Gr E, F, G; CI III Div 1 ATEX II 1G EEx ia IIC
Further information	AXENBR0001	WCABR1019

## Positioners - Analog

Brand	PMV	Automax / Worcester
Product		
Model	P5/EP5	APEX 7000
Key features	Modular, sturdy, simple reliable design Single or Double acting Simple calibration, external zero adjustment High gain pilot valve	Modular, sturdy, simple reliable design Single or Double acting Simple calibration, external zero adjustment Independent zero and span settings High gain pilot valve
Input signal	4 - 20 mA 3 -15 psi / 0.2 - 1 bar 6 - 30 psi / 0.4 - 2 bar Split range	4 - 20 mA 3 -15 psi / 0.2 - 1 bar Split range
Output signal	0 - 100% of air supply	0 - 100% of air supply
Air supply	Up to 10 bar /1 M Pa / 150 Psi	Up to 10 bar /1 M Pa / 150 Psi
Air consumption	5.4 nl/min (at 0.2 M Pa supply pressure) 35.7 nl/min (at 1.0 M Pa supply pressure)	5.4 nl/min (at 0.2 M Pa supply pressure) 35.7 nl/min (at 1.0 M Pa supply pressure)
Temperature range	-20 °C to +85 °C -40 °C to +85 °C	-20 °C to +85 °C -40 °C to +85 °C
Mounting option	Namur standard	Namur standard
Design options	Explosion Proof or Intrinsically Safe I/P Feedback Unit Fail Freeze Cam alternatives Dome indicators	Explosion Proof or Intrinsically Safe I/P Feedback Unit Fail Freeze Cam alternatives Dome indicators
Ratings and certification	ATEX II 2 GD EEx d IIB + H2 T6 FM/CSA ClassI Div1 Gr. B, C, D; ClassII Div1 Gr. E, F, G; ClassIII IEC EEx d IIB+H2 T6 IP 66 / NEMA 4X	ATEX II 2 GD EEx d IIB + H2 T6 FM/CSA ClassI Div1 Gr. B, C, D IEC EEx d IIB+H2 T6 IP 66 / NEMA 4X
Further information	PMENBR0008 PMENBR0006	AXENPS0125 (for Automax) WCENPS0125 (for Worcester)



# Software



## Performance Valve Sizing and Selection

The Performance! Sizing Program helps you identify the control valve package best suited to each set of service conditions. It provides a fast, user friendly and flexible means for:

- Sizing, selecting and generating valve and actuator specifications
- Data entry and verification
- Importing and exporting all spec sheet fields

To learn more, go to [www.flowserve.com](http://www.flowserve.com) and in the search box in the upper right corner, type performance! - with exclamation mark at the end.



## AutoSize Actuator Sizing and Selection

The AutoSize actuator sizing program offers a user friendly Windows interface and features intelligent product selection screens suitable for global applications. Engineering calculations include:

- Actuator torque sizing
- Actuator torque curves
- Speed of operation ( $C_v$ , SCFM)
- Hot line distances
- Fail safe accumulator tank sizing

AutoSize is available from your local sales representative.



## ADS Automated Drawing System

The Automax Automated Drawing System will allow you to electronically submit assembly drawing requests to our server. Your submittal will create a customized drawing and return it to you via e-mail in a matter of minutes.

To operate the system and submit drawing requests, simply access the website below and select the items that you require in the finished drawing. The finished drawing is returned as a .PDF Adobe Acrobat file.

ADS website: <http://ads.flowserve.com>



## ValveSight™ FDT/DTM Technology

ValveSight™ DTM software utilizes FDT/DTM technology and HART protocol to allow you to monitor any D3, Pulsair III, D20 and APEX 9000 positioner on your network.

### Features

- Open the Dashboard window to gain real-time feedback on the status of your valve.
- ValveSight™ DTM Annunciator panels show the current status of all alarms.
- ValveSight™ DTM Health pages show detailed alarm status, list implications.
- ValveSight™ DTM On-Line Diagnostics pages allow you to monitor and log the positioner sensors.
- ValveSight™ DTM Off-Line Diagnostics pages allow you to run Ramp, Step, HDRL and Partial Stroke Tests.
- Store configuration and calibration histories.

Get more information: Product catalog, VSENBR0000 / Installation instructions, SFLGEN0001



## Automated Solutions

Flowserve has extensive experience in supplying automated packages to meet exacting customer requirements, whether for on/off or modulating service. Our range of valves, actuators, switch boxes and positioners in addition to solenoids, filter regulators and dump valves allows Flowserve to provide a total solution to any flow control requirement. Automax, Norbro and Worcester pneumatic and electric actuators are specifically designed to be mounted not just on our own quarter turn products but also on other manufacturers' valves if required. The final control element can be supplied from PMV's range of positioners and switch boxes to provide customers with complete automated solutions from a single source.

Flowserve's range of electric and pneumatic instrumentation includes:

- Digital network communication
- Superior diagnostics
- Intelligent valve controllers
- Comprehensive user-friendly software  
(see page 37 for further details)



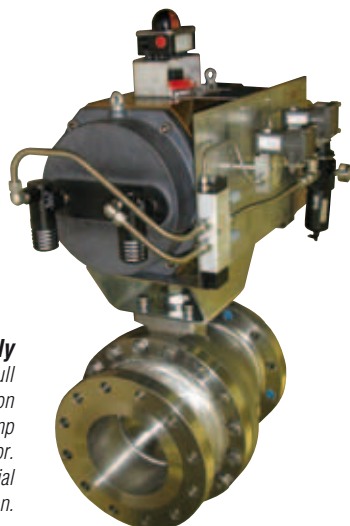
### Control Service

A petrochemical customer uses the Worcester characterized port ball valve with Worcester series 39 rack and pinion actuator and Pulsair positioner



### Acid Service

A chemical customer uses the Durco BTV lined butterfly valve mounted with Automax SuperNova rack and pinion pneumatic actuator, manual override and analog positioner



### Fast Acting Valve Assembly

A customer in the power industry uses full bore Class 300 valve with rack and pinion actuator incorporating pneumatic dump valves, solenoid valves and filter regulator. Supplied with logic control for sequential pilot valve operation.



### High Consistency Pulp Service

A pulp and paper customer uses an integrated rotary control valve package consisting of NAF-Setball segmented ball valve (v-port), NAF-Turmex linkage-type pneumatic actuator and a Flowserve digital positioner.





## Customized Valves

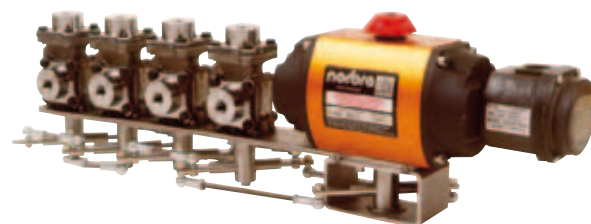
Flowserve have more than fifty years experience in the conception, design and manufacture of highly engineered, customized and unique valves and actuators. This includes manifolds, special seat designs and the use of high metal alloy materials. Many have been used in critical services such as nuclear power (whether in generation, reprocessing or decommissioning), defence, ESD, toxic chemicals or high purity pharmaceutical / biotech.

With this level of technical expertise and application knowledge, Flowserve engineers will collaborate with their customers to design and manufacture individual application solutions tailored to their specific requirements.



### Jacketed Valve

Ball valve fitted with thermal fluid / steam heating jackets with customized connections and drain points. Can be supplied as shown with high integrity stem build and purge ports. Welded jackets are fully tested and certified.



### Manifold Assembly

For synchronized operation of a number of valves. Linked assembly allows for multiple valve operation with a single actuator. Pneumatic actuator also fitted with unique end-mounted switch box.



### Non-Return Ball Valve System

Ball / seat package contained within a solid nickel aluminum bronze body incorporating a non-return valve. Compact design with easy access points for service and repair.





# **JFM**

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