

olivertwinsafe

1" TO 16" DOUBLE BLOCK & BLEED PIPELINE VALVES SOLUTIONS TO A STANDARD ASME B16.10 LENGTH



reliability under pressure

- **Full Bore** therefore no system pressure drop problems, no hydrate formation problems, no flow cavitation problems.
- **Using proven trunnion ball technology** in a patented package - world wide patent no. 1322886 and patent no. 2271164.
- **Soft seat and metal seat** options for high temperature service, abrasive /erosive service or chemical plant applications.
- **All forged body construction or all cast body construction.**
- **Zero leak points** on standard length twinsafe.
- **Maintenance Free**



Patented Product



www.valves.co.uk

reliability
under
pressure



Firesafe

Firesafe in accordance to API 6A, API 607 Rev4, BS6755 Part 2 as Standard.

Design

Designed in accordance with the industry Standards i.e. B16.34, ASME VIII, B16.10, B16.5, API 6D.

Valve Marking

Marking of ball valves to MSS-SP-25 and EN19 standards.

NACE

As standard, the full range of Oliver Twinsafe Valves are compliant to NACE specification MR-01-75 (latest revision) 'Sulphide stress cracking resistant metallic materials for oilfield equipment'.

Tested as a complete unit in factory in accordance with ASME B16.34, API 6D

Each valve product is individually tested both hydrostatically and pneumatically as follows: Hydrostatic shell test to 1.5 x full rated pressure, and hydrostatic seat test to 1.1 full rated pressure, and a low pressure, pneumatic seat test to 80psig. Gas testing is also available.

Certification and Traceability

All valves exhibit unique identification coding and material test certificates to BS EN102043.1.B as well as lifetime factory history being available.

Development

Continual development maintains the highest levels of performance and integrity for our Double Block and Bleed Twinsafe valves. Oliver Twinsafe Valves maintains in-house performance and fire test facilities. We also incorporate the latest finite element analysis software in the design of valves.

Painting

Carbon steel valves can be supplied with a range of external coatings for environmental protection. Please consult factory.

Temperature

Standard temperature range is -20°C to 150°C in accordance with API6D and higher temperatures to 315°C with metal seated valves, lower temperature option to -50°C, -100°C and -196°C full cryogenic are also available.

Explosive Decompression

Explosive decompression occurs when gas at high pressure permeates into seal materials. When the gas pressure is reduced the absorbed gas expands, which can cause the seals to swell and blister. Oliver Twinsafe Valves only use seal material within their 'twinsafe valve' range that are resistant to explosive decompression.

Pressure Equipment Directive and Atex Directive

Manufactured in accordance with the Pressure Equipment Directive 97/23/EC, (SI 1999/2001) satisfy the essential safety requirements contained there in and CE marked.

Seat Options - Metal Seated - Soft Seated

Tungsten Carbide Chrome Carbide and stellite metal seats available as well as full range of soft seats.

Reduced bores available

Special combination valves are also available (ball globe and check etc.)

Pressure classes available from 150lb to 2500lb

Reduced lead times

Oliver Twinsafe valves have a part machine program for valves bodies up to 8" bore size where stocks are kept of standard length products 90% machined with flange detail and vent drain to be machined to customer specification, dramatically reducing lead time.

Maximum sizes and classes

8" and below 2500lb, 10" and 12" 1500lb, 14" and 16" 600lb.



Our ball valves are manufactured according to:

ASTM	MATERIALS
NACE MR-01-75	MATERIALS
API 6D	MANUFACTURE AND TESTING
ASME B16.34	BALL VALVE DESIGN
ASME B16.5	FLANGED ENDS
ASME B16.10	FACE TO FACE DIMENSIONS (DEPENDANT ON TYPE)
ASME B16.25	BUTT WELD ENDS
ASME B16.11	SOCKET WELD ENDS
ASME VIII	BALL VALVE DESIGN
BS 5351	BALL VALVE MANUFACTURE
BS 6755 PART 1	BALL VALVE TESTING
API 6FA, BS 6755 PART 2	FIRESAFE TESTING
API 607 REV 4	

Geared Handwheel Operation

Generally valves above 2" 1500 class reduction gearing to turn the ball valve through 90 degrees is available, with watertight casing to IP65 protection rating, as strengthened and helicoidal gearing, complete with mechanical position indication. De-clutchable manual override gear box and high ratio gear boxes for greater torque output are also available, please consult factory.

Valve Actuation/Limit Switches

On one or both of the valves, double acting and spring return, pneumatic or hydraulic actuators are available, limit switches and open and close indication can also be specified. Please consult factory.

Fugitive Emissions

Twinsafe Valves have been tested in accordance with Shell fugitive emission test 77/312.

Seat Injection/Spindle Injection

This is an option, please specify full details to factory.

Subsea Twinsafe valves

We supply Twinsafe Double Block and Bleed valves from 1" and 2" bore size for subsea applications.

BI - Directional

Twinsafe floating and trunnion ball valves are BI - Directional as standard.

Differential Pressure

Twinsafe floating and trunnion ball valves can be operated against full differential pressure.



Pig Manifold™ Range

Between a pig valve and a traditional pig launching and receiving station there is the Oliver Twinsafe valve option of a pig manifold, patent pending. Please consult factory for details.

Weld Inlay

A Range of weld inlay materials can be applied to valve bodies.

Cavity Relief

Any undesirable build up of pressure in the ball cavity is relieved automatically past the 'sprung' seat design on trunnion mount balls.

Emergency shut down valve applications

Please consult factory for details.

High Pressure 10K Twinsafe

1" and 2" flange size designs to 10,000 psi are available.

Single Isolates in exotic material

As well as block and bleed configurations and compact cartridge single isolate valves.

Compact Connections

Combine the enormous weight savings from the Twinsafe concept with an additional saving in weight which can be achieved by utilising hub connections or compact flanges.

Anti Static Design

Twinsafe floating and trunnion ball valves incorporate anti static design as standard.

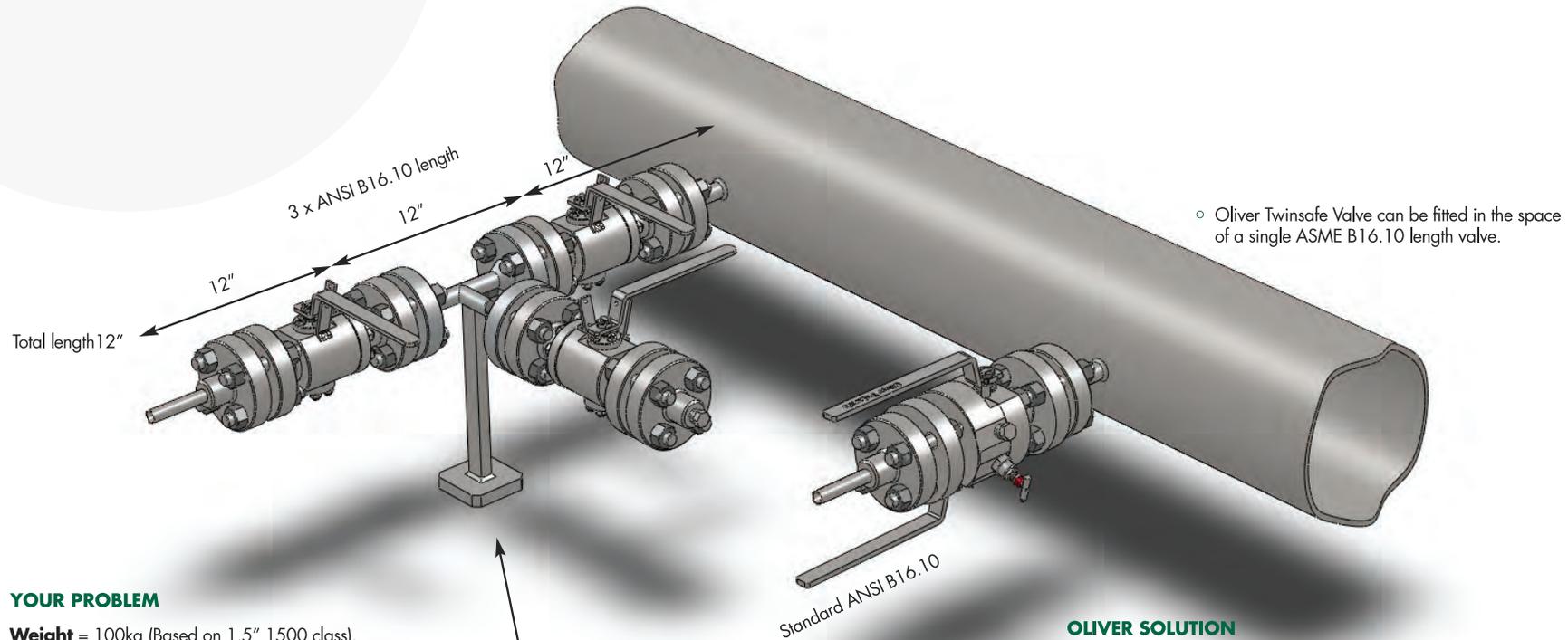




- A two piece construction, flanged standard length Twinsafe has 2 ball valves in an ASME B16.10 standard length from 1", 1 1/2" and 2" bore sizes.
- FSL (flanged standard length) in classes 600, 900, 1500 and 2500lb, or FNSL (flange non-standard length) in 150 and 300lb.
- Benefits associated with the Oliver Valves DBB are exactly the same in Twinsafe, however health & safety, weight, cost saving is maximised a 100% more.
- **Space saving**, cost saving – the ability to replace one single isolate valve for retro-fit work with two or to reduce skid package footprint and still maintain full bore double block & bleeding is significant.
- **Weight saving, cost saving** – the single isolate valve using central spool piece to vent which is called for in many piping specifications good rule of thumb is half the weight is saved. This is a significant cost saving on carbon steel bodies, but is multiplied six-fold when exotic body materials are called for.
- **Reduced leak paths safety** – against a traditional hook-up to two single 3-piece isolated ball valves with traditional trunnion design and spool piece gives **a potential of 8 additional leak points!** Legislation is moving more to these leak points having to be individually tested to ensure the soundness of joint.
- **Cost saving – less items purchased.** In today's world total cost of project is reviewed by contractors and their users. Compared to a traditional hook-up, savings on completion times when you review the costs of man hour assembly, gaskets, bolts, pipes, valves and fabrication, plus specialist testing of MPI, radiography and coded welding, plus expediting department to call in all these parts.
- **Larger process return on full bore** – most products we compete against are reduced bore and also not a uniformly reduced bore, unless you have a ball valve, but bore shape can change or as with the butterfly valve restricts the centre of flow cavity. It also leads to some major problems, flow cavitation problems, hydrate formation problems and system pressure drop problems. The actual flow through the valve can also be immensely important.
- We have range of different material combinations with a range of seat materials from various soft seating materials to metal seated chrome carbide and tungsten carbide seats. Actuation can be pneumatic, electric, on both valves or one valve.
- Forged and cast bodies are available.



SMALL BORE (FSL) TWINSAFE VALVE SOLUTION WORLD WIDE PATENT (FLANGE STANDARD LENGTH)



YOUR PROBLEM

Weight = 100kg (Based on 1.5" 1500 class).

- 3 Ball valves
- 24 Bolts.
- 6 Gaskets.
- Additional pipework.
- Expedire of parts.
- Additional leak points = 9.
- Safety issues + more increasingly.
- All leak points require inspection prior to commissioning.

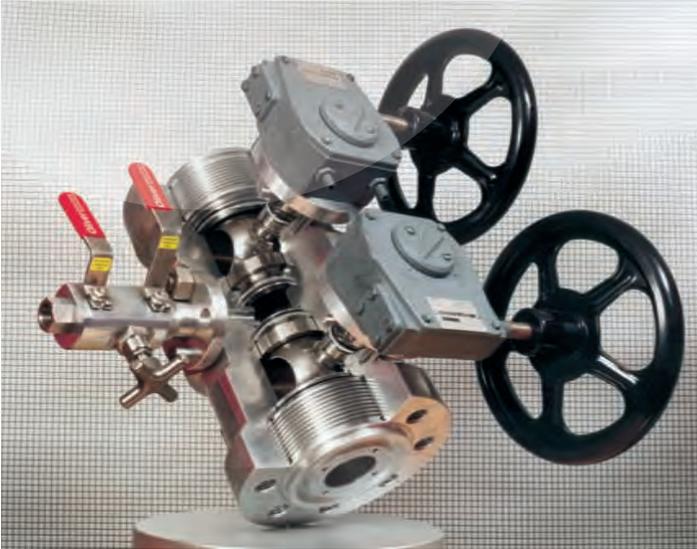
Pipe support required due to high bending, movement / additional weight.

OLIVER SOLUTION

Weight = 32kg.

- 1 valve.
- 8 Bolts.
- 2 Gaskets.
- Additional pipework.
- No pipe support required.
- Low bending movement.
- No bore reduction.
- Factory tested - one component.





- CSL for the 1- piece body (cartridge standard length) Twinsafe has 2- ball valves in an ASME B16.10 standard lengths to 8" full bore. We can continue CSL to 12" with reduced bore and we have a design up to 16" cartridge non - standard length CNSL (cartridge non-standard length).
- Full range of FNSL (flanged non-standard length) 3-piece construction incorporating a standard flange or hub connections to 16".
- Full FSL (flanged standard length) or FNSL (flange non-standard length) 2-piece construction utilising floating ball valves, 2" bore sizes.
- Benefits associated with the Oliver Valves DBB are exactly the same in Twinsafe, however health & safety, weight, cost saving is maximised a 100% more.

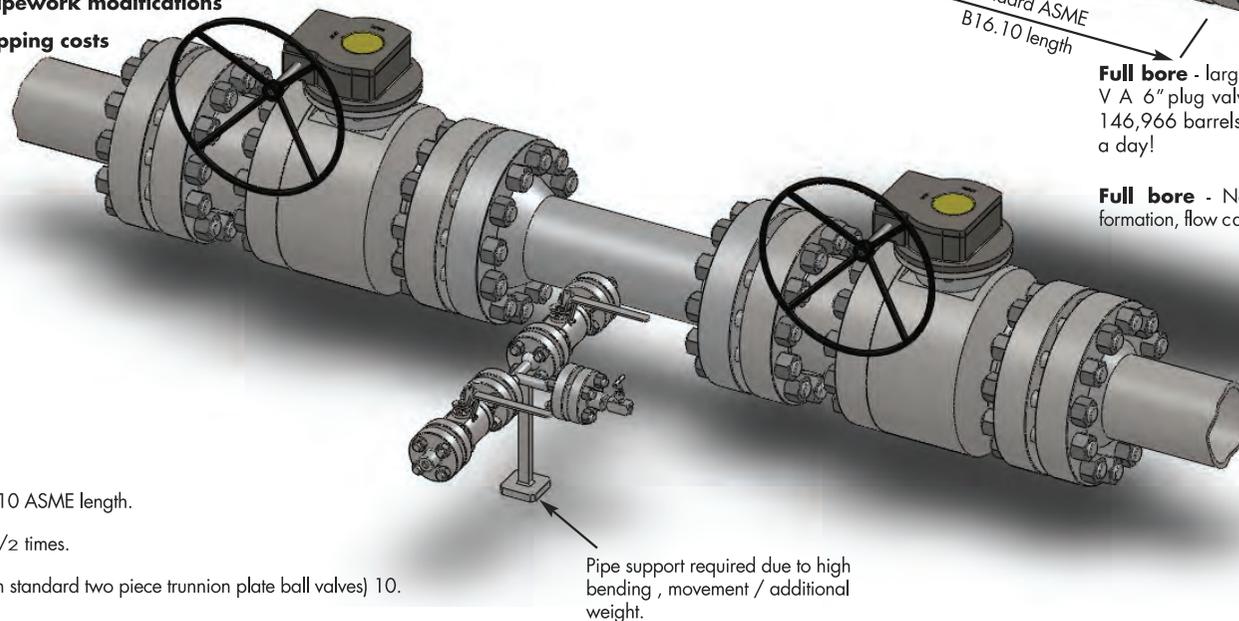
- **Space saving, cost saving** – the ability to replace one single isolate valve for retro-fit work with two or to reduce skid package footprint and still maintain full bore double block & bleeding is significant.
- **Weight saving, cost saving** – the single isolate valve using central spool piece to vent which is called for in many piping specifications. A good rule of thumb is half the weight is saved. This is a significant cost saving on carbon steel bodies, but is multiplied six-fold when exotic body materials are called for.
- **Reduced leak paths safety** – against a traditional hook-up to two single 3-piece isolated ball valves with traditional trunnion design and spool piece gives **a potential of 8 additional leak points!** Legislation is moving more to these leak points having to be individually tested to ensure the soundness of joint.
- **Cost saving – less items purchased.** In today's world total cost of project is reviewed by contractors and their users. Compared to a traditional hook-up, estimate on, say, 6" 1500lb double block & bleed installation a **total saving of over £5,000** on each installation is achieved, plus savings on completion times when you review the costs of man hour assembly, gaskets, bolts, pipes, valves and fabrication, plus specialist testing of MPI, radiography and coded welding, plus expediting department to call in all these parts.
- **Larger process return on full bore** – most products we compete against are reduced bore and also not a uniformly reduced bore, unless you have a ball valve, but bore shape can change or as with the butterfly valve restricts the centre of flow cavity. It also leads to some major problems where you cannot pig the line due to the valving, flow cavitation problems, hydrate formation problems and system pressure drop problems. However, as many of the 4", 6" and 8" Twinsafes these are flowline applications, the actual flow through the valve is immensely important. If you take the 6" double block & bleed plug valve with a CV of 1180 against a 6" double block & bleed twinsafe ball valve with a CV of 5074 these figures actually equate to 44,532 barrels per day from the plug valves and 191,489 barrels per day through our Twinsafe valves. At \$90 a barrel this is **\$13,226,940 a day more through our valve than the plug valve!** Therefore maximise through paths equals maximum profit.
- We have range of different material combinations with a range of seat materials from various soft seating materials to metal seated chrome carbide and tungsten carbide seats. Actuation can be pneumatic, electric, on both valves or one valve.
- We also have many different services. We have great successes in cryogenic, low temperature, LNG, polymer, high temperature, semi-solid and severe service.
- Major benefit to Oliver Twinsafe Valves is our sister company, Oliver Valves, who can supply an exhaustive range of vent valve configurations in various needle valves from 5.4mm to 20mm bore, bolted bonnet, double block & bleed, monoflange and Twinsafe vent valves up to 2" bore – literally anything is possible.
- Cast & forged bodies available and inlaying either 100% or seat cavities are available.



LARGE BORE (CSL) TWINSAFE VALVE SOLUTION WORLD WIDE PATENT (CARTRIDGE STANDARD LENGTH)

OLIVER SOLUTION

- **Space saving - cost saving** - Retrofit in same ASME B16.10 standard length one valve with two, reduced footprint.
- **Weight saving - cost saving** - Two pipeline valves plus spool piece with additional vent valves over half the weight saved!
- **Reduced leak path - safety** - Against example shown 10 additional leak paths, and with worldwide legislation insisting on expensive "sniffing" of each joint.
- **Cost saving less items purchased** - Two pipeline valves + vent valves + pipework + gaskets + bolts + radiography + MPI + man hours to order, expedite install + test - on 6" 1500lb installation over £5,000 saving against one factory pressure tested item.
- **No expensive pipework modifications**
- **Reduction in shipping costs**



Full bore - larger process return on 6" Twinsafe V A 6" plug valve at \$90 a barrel equates to 146,966 barrels or \$13,226,940 extra process a day!

Full bore - No system pressure drop hydrate formation, flow cavitation or pig restriction problems.

① **Vent valve** - can be any Double Block and Bleed, mono flange Twinsafe or integral needle valve from Oliver Valves

YOUR PROBLEM

- **Length** = 3 x B16.10 ASME length.
- **Weight** = Over 2¹/₂ times.
- **Leak points** = (On standard two piece trunnion plate ball valves) 10.



reliability
under
pressure



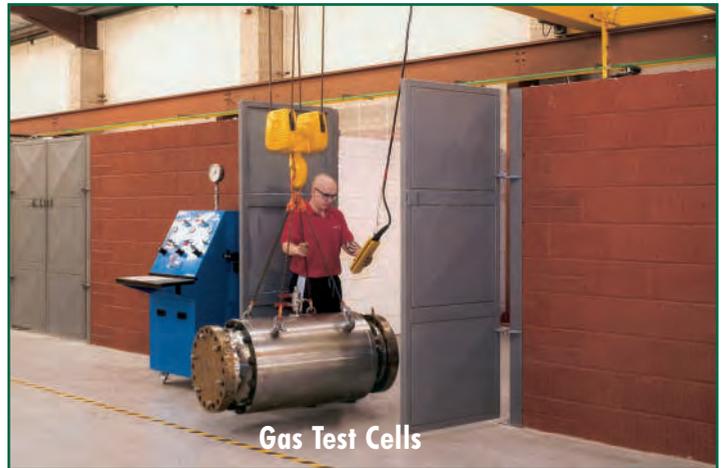
Shop Floor



Engineering Office



Test Cells



Gas Test Cells



Production

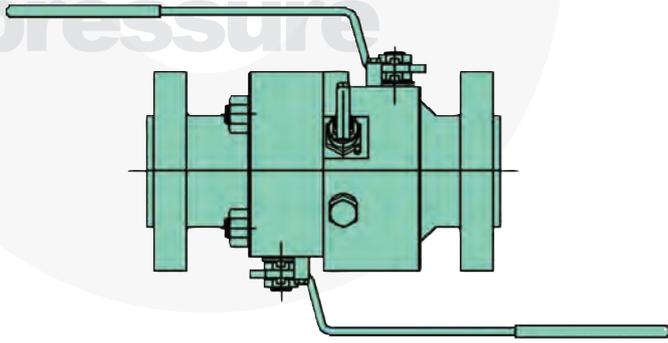


Production



FLANGED STYLE, TWO PIECE CONSTRUCTION (FSL) (FNLSL)

reliability
under
pressure



- World Wide Patent No. 2271164.
- Size 1" through 2" (FSL) NB.
- To ASME B16.10 Length (FSL) in classes 600, 900, 1500 & 2500lb.
Non Standard Length (FNLSL) in 150 & 300lb.
- Floating Ball construction.
- Needle valve vent.
- Lever operated.
- Available Forged or Cast body.



1" & 2" Forged
Body Twinsafe



2" Cast Body Twinsafe

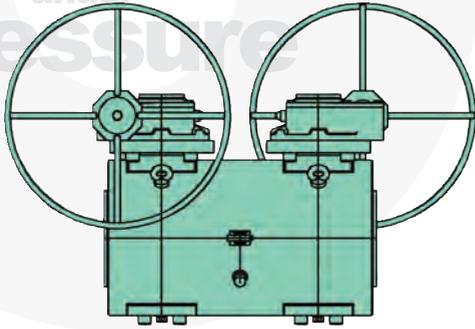


Twinsafe 'Space Saving'



CARTRIDGE STYLE, SINGLE PIECE CONSTRUCTION (CSL) (CNSL)

reliability
under
pressure



- World Wide Patent No. 1322886, one piece design.
- Available in ASME B16.10 Standard Length (CSL) up to 8" Full Bore.
- Available in ASME B16.10 Standard Length (CSL) up to 12" Reduced Bore.
- Available in Non Standard Length (CNSL) to Customer Specifications.
- Studded flanged detail to ASME B16.5.
- Needle valve vent or Double Block and Bleed vent option available.
- Trunnion construction patent application number PCT/GB2004/000856.
- Available Forged or Cast body.



**3" Full Bore 900 LB
Standard ASME B16.10 Length Twinsafe valve**

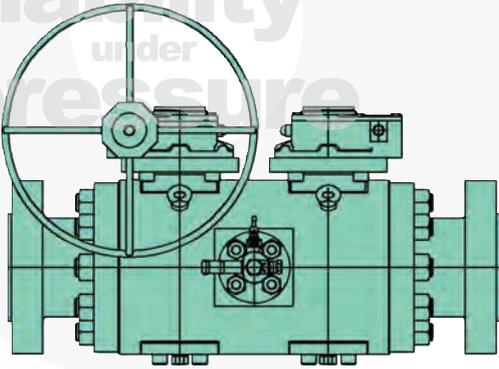


**8" Full bore 1500 LB
Standard ASME B16.10 Length Twinsafe valve**

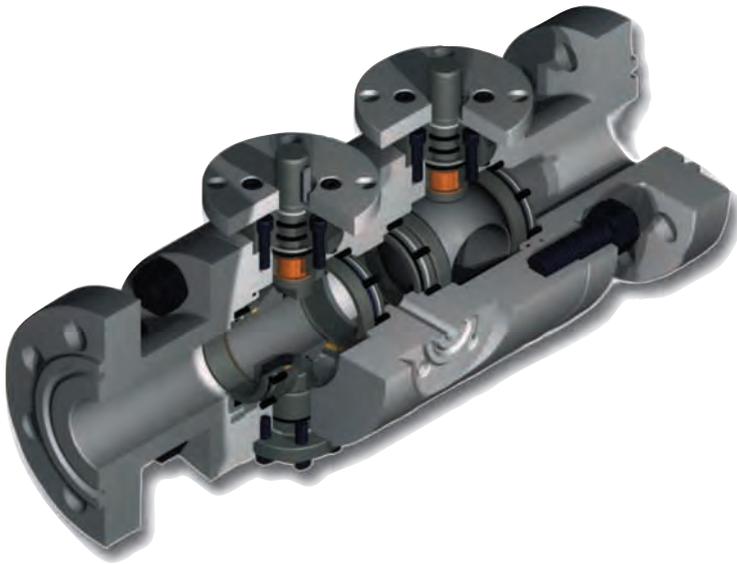


FLANGED STYLE, THREE PIECE CONSTRUCTION (FNSL)

reliability
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pressure



- Non Standard Length (FNSL) face to face dimensions.
- Flanged connections to ASME B16.5.
- Needle valve vent or Double Block and Bleed vent option available.
- Trunnion & Floating Ball Construction.
- Available Forged or Cast body.



**12" Full bore 600 LB
Non Standard Length Twinsafe valve**



**3" Full Bore 1500 LB
Non Standard Length Twinsafe valve**



SAMPLE OLIVER TWINSAFE® VALVE PROJECT REFERENCE LIST

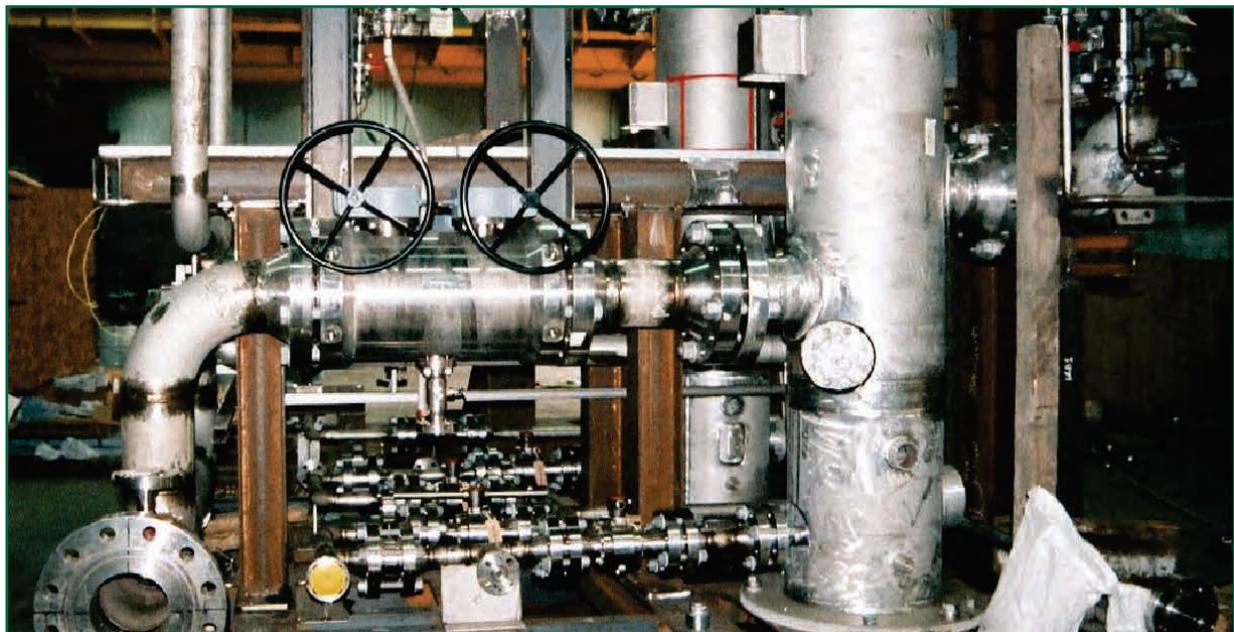
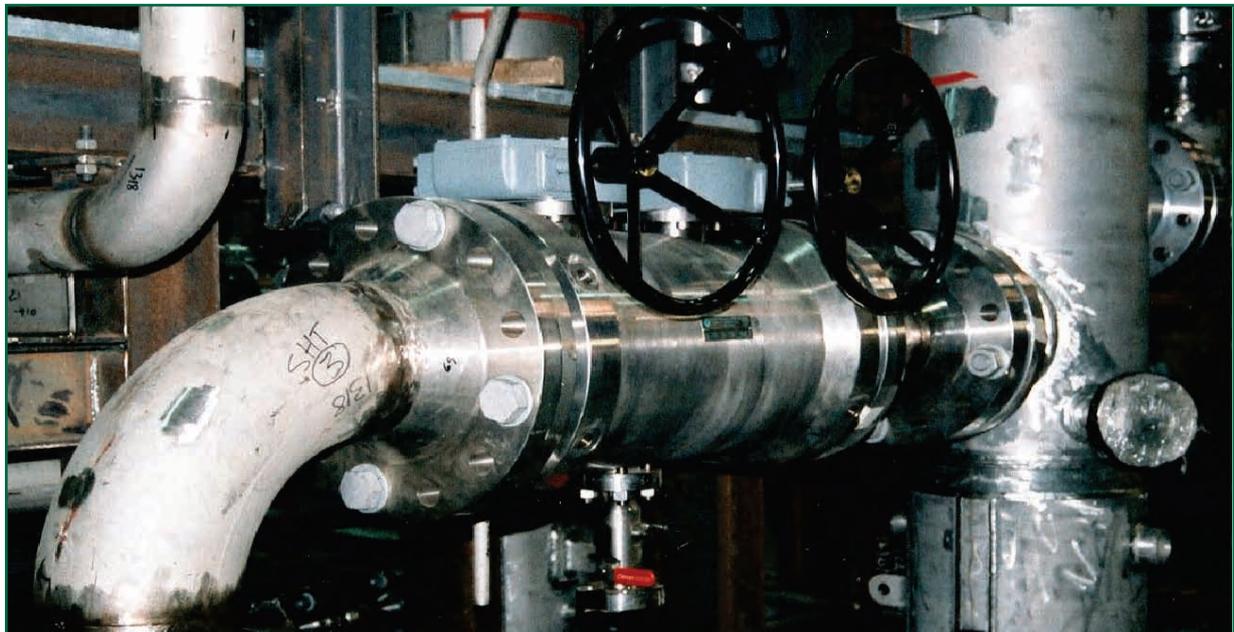
End User	Country	Project s	Valve Size s	Since
Agip	Italy	Sabratha	2 & 3	2003
AIOC	Azarbajian	Offshore	4	2006
Amec	UK	Griffin	3 4 & 8	2006
Apache	UK	Forties	1 1.5 4 & 6	2004
BHP	Australia	Wollybutt	1 2 3 6 & 8	1997
BHP	UK	Liverpool Bay/Morecambe Bay	1 & 6	2007
BNFL	UK	Sellafield	1 2	2004
BP	UK	Amirtnst/Andrew/Dimlington/Harding/Magnus/Bruce/Dumbarton Sakhalian / Mungo	1 2 1½ 3 4 6 8 & 10	1996
BP	USA	Thunder Horse	2 3	2002
BP	Indonesia	West Java	2 3	2005
BP	Norway	Valhall	2 4 8 & 10	2008
British Gas	UK	Amada/SNS	1 2 3 6 & 8	2004
British Gas	Trinidad	Beachfield	2 3 & 4	2005
Centrica	UK	Storage	2 3 & 4	2005
Chevron	UK	Alba/Captain	1 & 2	1996
CNOOC	China	Indonesia Pipeline	2	2005
CNR	UK	Ninian	2 4 & 6	2003
Conoco	UK	Bridge linked Platform/Buzzard/Theddlethorpe/CMS III/Viking/Loggs/Magnolia/Banff Annabel/Ninian/North/Saturn/Kelvin	1 2 3 4 & 6	2001
Conoco	USA	Magnolia	2	2003
Egyptian Oil	Egypt	ENNPI	2	1998
ENEPMI	Malasia	Gutong-E	2	2004
Esso	Norway	Ringhorne/Balder	2 3 & 4	2001
Exxon Mobil	UK	Mobile Bay/EAP EPC2/NSOA/Beryl	2 3 4 6 & 8	1996
Larson & Turbo	India	Al Shaheen	2 3 4 10 & 14	2008
Kvaerner	Norway	Kristin	1	2004
Krohne	Malasia	PC4 Field	2 & 10	2008
Maersk	UK	Leadon/Dunbarton	3 4 & 6	2001
Moss Gas	S.Africa	Moss Gas Redevelopment	1	1998
Occidental	Qatar	PS1 Upgrade/ED El Sharghi/5302/Sandflush/PS2 Upgrade/PS3 Upgrade	2 3 4 & 6	2000
Paladon	UK	Kittawake	4 6 & 8	2005
PDO	Oman	Oman LNG	1 & 1.5	1997
Petro Canada	Canada	De Ruyter	1 & 2	2005
Petro Vietnam	Vietnam	Bunga Orchid	8	2007
Petronas	Singapore	Angsi	1 & 2	2005
Premier Oil	Burma	Yetagun	3	2003
QGPC	Qatar	Dukham/NGL4	2 & 4	1996
Ras Gas	Qatar	Offshore Expansion Project	1½ 2 10 & 11	1997
Rolls Royce	UK	Croydon Power Station	3 4 & 6	2006
Samsung	Angola	Takula	1 2 3 4 & 6	2007
Sabic	Qatar	Ras Laffan	1 & 2	1997
Saipem/ENI	France	East Area EPC2 Nigeria	4 6 & 8	2006
Sasol	S.Africa	Lumex/Secunda	1 1.5 & 2	2006
Shell	Gabon	Gabon Offshore	1½ 2 3 & 4	2004
Shell	Venezuela	Maracaibo	1 2	1996
Shell	UK	Camelot/Arthur/Dumferline/St. Fergus/Brent/Hutton/Shearwater/Trent & Tyne Beryl/Lab/Starling/Alpha/Cormorant/NW Hutton/Balton/NGL	1 1½ 2 3 6 & 12	2000
Shell	Nigeria	Bonga	2	2004
Shell	Malaysia	Shallai Clastics	3 4	2003
Shell	USA	Perdido/Offshore	2 3	2002
Single Buoy Morings	Brazil	Marlim Sul FPSO	1.75 & 2	2003
Single Buoy Morings	Angola	Caminda	2	2003
Single Buoy Morings	USA	Thunder Hawk	1 2 3 4 6 8 10 & 12	2006
Talisman	UK	Ninian/Muchasion/Claymore/Tweedsmuir/Galley/Duart Over Tartan/Galley Re Development	1 2 3 4 6 8 10 & 12	2004
Talisman	Malaysia	Bunga Orkid B,C & D	3 4 6 8 & 12	2006
Total Fina ELF	France	Yandana/Elgin/Franklin	1 & 2	2002
Venture	UK	Annabel	1	2004
Woodside	Australia	Otway Offshore	2 , 6 & 8	2003



reliability
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pressure

REPLACE ONE VALVE WITH TWO, WITH NO MODIFICATION TO PIPEWORK.

Standard ASME B16.10 Length full bore Twinsafe valves replace single Isolate valves in retrofit work and provides engineers the opportunity to move from single isolate to Double Block and Bleed without design change of pipework.



Skid package footprint reduced therefore skid cost reduced by keeping the valve envelope to standard ASME B16.10 length.



TWINSAFE vs TWO STANDARD ISOLATION BALL VALVE HOOK UP = A REDUCTION OF ALMOST HALF OF THE WEIGHT.

**STANDARD ISOLATION VALVE
6" X 4" REDUCED BORE**



= 217kg X 2 = 434kg

**OLIVER TWINSAFE VALVE
6" X 4" REDUCED BORE**

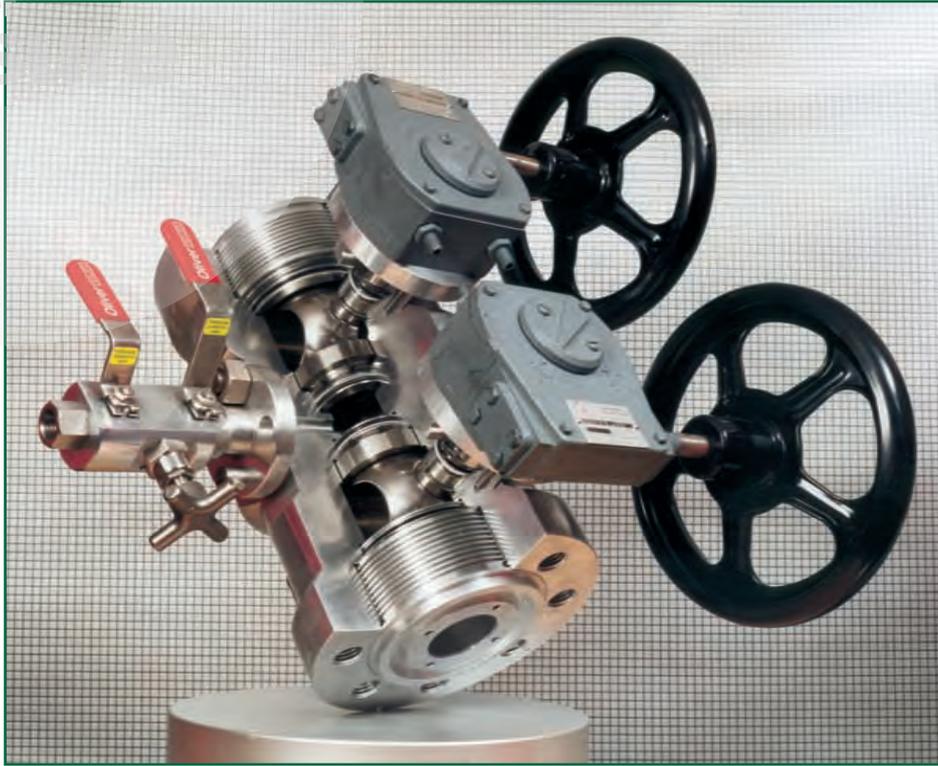


= 284kg

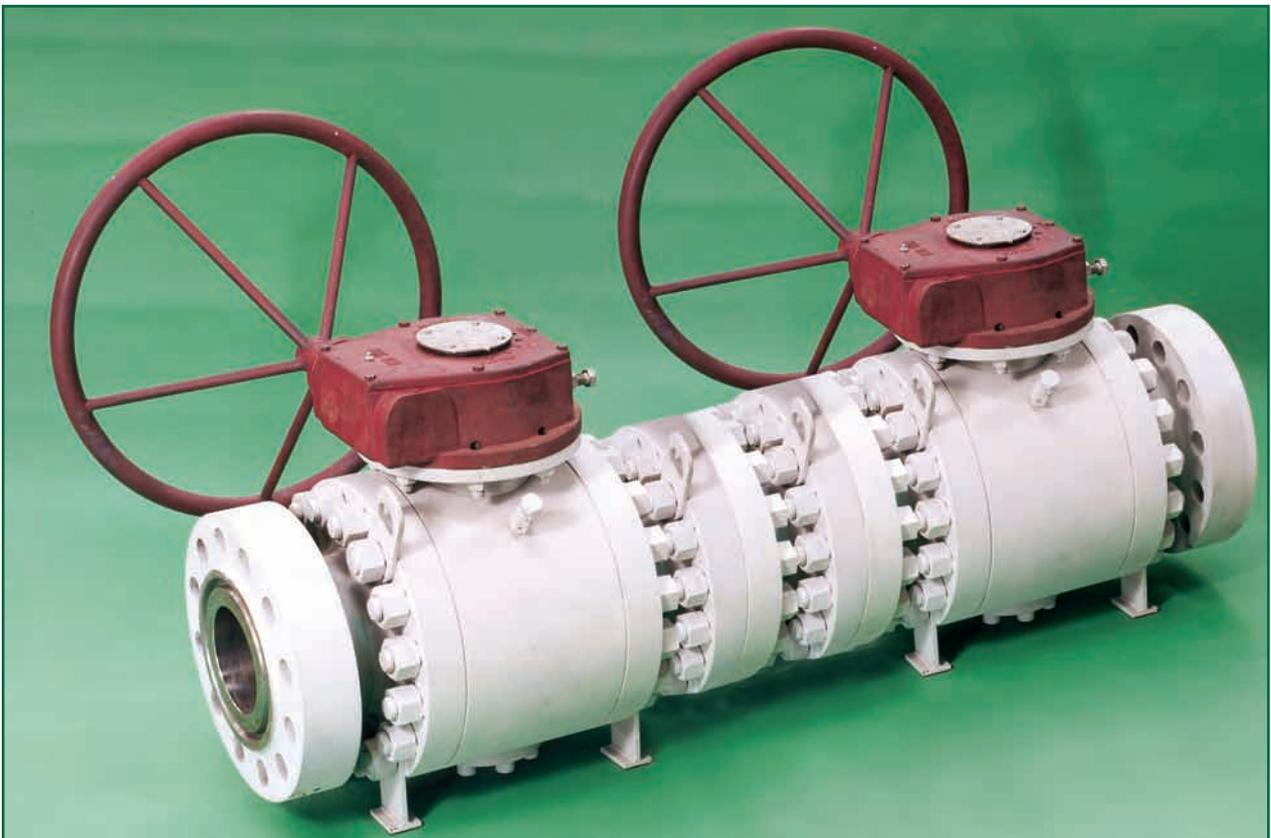
Almost half the weight is taken out of a double block and bleed hookup when compared to two single isolates (more if spool piece is included) multiply this by multiple assemblies of Twinsafe on the top works of an offshore platform as shown, the weight savings and cost savings are dramatic, more so if valves are in exotic material.



TWINSAFE vs TWO ISOLATION BALL VALVE HOOK UP = A REDUCTION OF EIGHT POTENTIAL LEAK PATHS.



Looking at a traditional hook up, two traditional single 3 piece isolate ball valves and spool piece means a potential of, 8 additional leak points (2 from trunnion, 4 from 3 piece design, 2 from spool joints.) Compared to one piece Twinsafe with slipper plate trunnion design.



HUGE HIDDEN COST SAVINGS OF ONE FACTORY TESTED UNIT vs TRADITIONAL INSTALLATION.



A Single Isolate 6" Full Bore 1500 LB Ball Valve to ASME B16.10 Length Versus An Oliver Twinsafe 6" Full Bore 1500 LB Double Block and Bleed Valve to ASME B16.10 Length.

6" 300/600lb Example

6" 1500lb Example

THE PAST

Existing Hook Up - Two Isolation valves, plus Vent Valve and Associated Materials, Fabrication, Installation and Testing

Materials					
Pipe (A333 Gr 6) Sch XXS	6"	6	£67.24	£403.44	
Flange RFWN-600# Sch XXS	6"	2	£143.75	£287.50	
Flange RFWN-600# Sch XXS	3/4"	1	£13.13	£13.13	
O' Lets Sch 160	3/4"	1	£22.50	£22.50	
Spiral Wound Gasket - 600#	6"	4	£11.83	£47.32	
Spiral Wound Gasket - 600#	3/4"	1	£2.04	£2.04	
Bolts per set 6" - 600#		4	£99.60	£398.40	
Bolts per set 1" - 600#		1	£11.30	£11.30	
Fabricators Handling Charge @ 10%				£118.56	
Valves 300/600#	6"	2	£3,300.00	£6,600.00	
Valves 300/600#	3/4"	1	£400.00	£400.00	£8,304.19

Fabrication					
Butt Weld Sch XXS	6"	2	£294.32	£588.64	
Butt Weld Sch XXS	3/4"	1	£61.23	£61.23	
O'let	3/4"	1	£61.23	£61.23	
Radiography	6"	2	£30.63	£61.26	
Radiography	3/4"	1	£19.03	£19.03	
MPI	6"	2	£3.19	£6.38	
MPI	3/4"	2	£1.65	£3.30	
Hydrotest		1	£100.00	£100.00	
Paint		1	£100.00	£100.00	£1,001.07

Installation					
Erect Valve 600#	6"	2	11.08	22.16	
Erect Valve 600#	3/4"	1	3.57	3.57	
Erect Valves Pipework Sch XXS	6"	1	6.51	6.51	
Bolt up Flg'd Joint 600#	6"	2	5.33	10.66	
Bolt up Flg'd Joint 600#	3/4"	1	1.87	1.87	

Non Prod and Sup'v @ 70%				31.34	
Total Man Hours				76.11x	
Man Hour Rate			£33.00		£2,511.63

TOTAL COST £11,816.89

Existing Hook Up - Two Isolation valves, plus Vent Valve and Associated Materials, Fabrication, Installation and Testing

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Flange RFWN-1500# Sch XXS	3/4"	1	£13.13	£13.13	
O' Lets Sch 160	3/4"	1	£22.50	£22.50	
Spiral Wound Gasket - 1500#	6"	4	£11.83	£47.32	
Spiral Wound Gasket - 1500#	3/4"	1	£2.04	£2.04	
Bolts per set 6" - 1500#		4	£99.60	£398.40	
Bolts per set 1" - 1500#		1	£11.30	£11.30	
Fabricators Handling Charge @ 10%				£118.56	
Valves 1500#	6"	2	£5,000.00	£10,000.00	
Valves 1500#	3/4"	1	£500.00	£500.00	£11,804.19

Fabrication					
Butt Weld Sch XXS	6"	2	£294.32	£588.64	
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O'let	3/4"	1	£61.23	£61.23	
Radiography	6"	2	£30.63	£61.26	
Radiography	3/4"	1	£19.03	£19.03	
MPI	6"	2	£3.19	£6.38	
MPI	3/4"	2	£1.65	£3.30	
Hydrotest		1	£100.00	£100.00	
Paint		1	£100.00	£100.00	£1,001.07

Installation					
Erect Valve 1500#	6"	2	11.08	22.16	
Erect Valve 1500#	3/4"	1	3.57	3.57	
Erect Valves Pipework Sch XXS	6"	1	6.51	6.51	
Bolt up Flg'd Joint 1500#	6"	2	5.33	10.66	
Bolt up Flg'd Joint 1500#	3/4"	1	1.87	1.87	

Non Prod and Sup'v @ 70%				31.34	
Total Man Hours				76.11x	
Man Hour Rate			£33.00		£2,511.63

TOTAL COST £15,316.89

THE FUTURE

Proposed Oliver Twinsafe Valve

Materials					
Valve 600# Twinsafe DBB	6"	1	£5,012.00		
Spiral Wound Gasket - 600#	6"	2	£11.83	£23.66	
Bolts per set 6" - 600#		2	£99.60	£199.20	£5,234.86

Fabrication					
Not Applicable					£0

Installation					
Erect Valve 600#	6"	1	20.00	20.00	
Bolt up Flg'd Joint 600#	6"	2	5.33	10.66	

Non Prod and Sup'v @ 70%				21.46	
Total Man Hours				52.12 x	
Man Hour Rate			£33.00		£1,719.96

TOTAL COST £6,954.82

Proposed Oliver Twinsafe Valve

Materials					
Valve 1500# Twinsafe DBB	6"	1	£8,200.00		
Spiral Wound Gasket - 1500#	6"	2	£11.83	£23.66	
Bolts per set 6" - 1500#		2	£99.60	£199.20	£8,422.86

Fabrication					
Not Applicable					£0

Installation					
Erect Valve 1500#	6"	1	20.00	20.00	
Bolt up Flg'd Joint 1500#	6"	2	5.33	10.66	

Non Prod and Sup'v @ 70%				21.46	
Total Man Hours				52.12 x	
Man Hour Rate			£33.00		£1,719.96

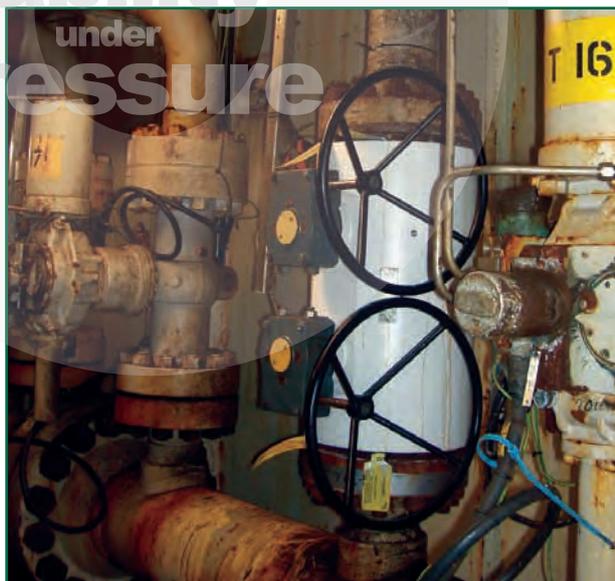
TOTAL COST £10,142.82

Total saving £4,862.07 each installation, plus saving on completion time. Leak points on joints, weight of each unit, space of each unit, safety of pressure testing of the whole unit at the factory, one item to tag as opposed to many, no specialist coded welding or MPI/Radiography inspection personnel on site.

Total saving £5,174.07 each installation, plus saving on completion time. Leak points on joints, weight of each unit, space of each unit, safety of pressure testing of the whole unit at the factory, one item to tag as opposed to many, no specialist coded welding or MPI/Radiography inspection personnel on site.



ON FLOWLINES ADDITIONAL \$10,000,000 OF PROCESS THROUGH VALVE A DAY.



Full Bore therefore;

- No system pressure drop problems
- No Hydrate formation problems
- No flow cavitation problems
- No pig restriction problems

A major priority is to MINIMISE PRESSURE DROPS, which will occur in flow lines. By minimising the pressure drops you can maximise the product, which in turn increases PROFIT.

The easiest way to maximise the reductions in diameter of the flow line is to introduce a full bore valve, which will have the largest flow coefficient (Cv) for a given nominal bore.

Flow coefficient, or, Cv by definition is the volume of water in gallons per minute at 60°F that will flow through a given element with a pressure drop of 1 psi. Below are some examples of calculations on different pipeline valves.

Oliver Twinsafe Valve 6" Double Block and Bleed Full Bore Ball Valve

Valve Cv = 5074

Typical Single Block 6" Plug Valve

Valve Cv = 1180

To calculate the flow that could be achieved from each of these valves with a 1 psi pressure drop, we would use the formula below.

$$Q = C_v \sqrt{\frac{\Delta P}{(s.g.)}}$$

Q = Flow, gallons per minute
 Cv = Flow coefficient
 ΔP = Pressure Drop, psi
 s.g. = Specific gravity

The process media will be taken as API 40° Crude with specific gravity of 0.825.

Oliver Twinsafe Valve 6" Double Block and Bleed Full Bore Ball Valve

Flow = 5586 Gallons/Minute

This actually equates to 191,489 barrels per day

Typical Single Block 6" Plug Valve

Flow = 1299 Gallons/Minute

This actually equates to 44,532 barrels per day

Taking the difference between these two figures of 146,966 barrels per day and multiplying this by cost of a barrel of crude oil \$90 it can be seen that an extra \$13,226,940 a day can be produced which is why it makes sense to install an Oliver Twinsafe Full Bore Double Block and Bleed valve.

**Minimising Leak Paths = Maximum Safety.
 Maximising Through Paths = Maximum Profits.**



reliability
under
pressure

- Standard: -20°C continuous**
- 46°C blowdown**
- Option: -50°C continuous**
- Option: -100°C continuous**
- Option: -196°C continuous**

Twinsafe valves as standard have a lower temperature range of -20°C continuous working temperature which is also suitable for -46°C (-50°F) blowdown service (ie for a limited time).

A full range of low temperature extended bonnets are available from -50°C (LT50), -100°C (LT100) and full cryogenic valves for LNG service down to -196°C (LT196).



HIGH TEMPERATURE SERVICE - SEMI SOLID SERVICE - SEVERE SERVICE

- Standard: 150°C continuous**
- Option: 180°C continuous**
- Option: 315°C continuous**

Twinsafe valves as standard have an upper temperature range of 150°C, this can be extended to 180°C (HT180) on standard design with addition of higher temperature seals. We also have option of expanding upper limit to 315°C (HT315).

Twinsafe Valves have supplied valves into dirty and severe service and semi solid service using a combination of: Tungsten carbide metal seats (MS-TC), as well as our spring protection system (SPC), ball cavity filler (CF) and hybrid trunnion ball valve design (HTB).



reliability
under
pressure



Type: LGDBB - Twinsafe level gauge Double Block and Bleed valve.

Used in level Gauge applications where a diaphragm seal pressure transmitter is being used.

The problem is media in tank can solidify, small particles build up on sensing faces leading to false readings.

Pressure Transmitter is isolated and will need to be removed for cleaning.

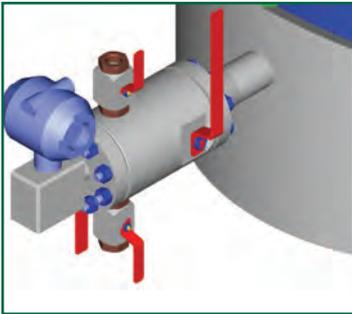
A Twinsafe designed specifically for Diaphragm seal pressure transmitter applications.

Can clean, drain away contaminates and recalibrate transmitter without removal.

Consists of 5 valves in 1 compact unit.

OPERATION

- 1, Close the two main isolation valves.
- 2, Open needle valve vent, venting cavity between balls to ensure a true double barrier.
- 3, Open small flushing drain valve (located on the bottom) to drain media trapped between second isolate & diaphragm seal.
- 4, Add cleaning solution under pressure through the purge valve (located at top) due to internal drillings, the cleaning solution hits the diaphragm seal from four angled ports cleaning the entire face.
- 5, After flushing with cleaning fluid, reverse above procedure.



VENT VALVE OPTIONS



Monoflange vent (5.4, 8mm bore)



Twinsafe vent (1", 2" bore)



DBB vent (10, 14, 20mm bore)



Needle valve Threaded bonnet vent (5.4, 11, 20mm bore)



Needle valve Bolted bonnet vent (5.4, 11mm bore)



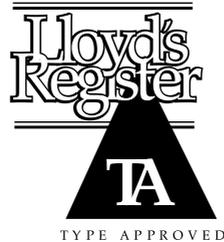
reliability
pressure

Oliver Twinsafe valves can provide 'Firesafe' valves. We maintain an in house fire test facility, which enables us to provide an independent certified fire test for our customers if required.

The Fire Test Rig consists of 16 Gas burns, which encapsulate the whole valve in a temperature-controlled flame as required by the usual fire test specifications.

Fire tests can be carried out and certified to all the main fire test specifications such as API 6FA & API 607 Rev 4. Additional fire tests according to unique customer specifications can also be carried out upon request.

All fire-tested valves come complete with a fire test certificate, which has been certified by an independent body such as Lloyds or DNV etc.



PRESSURE TESTING - GAS TESTING



All Twinsafe Valves are tested in accordance with our own in house high performance test specifications, which operate above and beyond the tests required in ASME B16.34, API 598 and API 6D, thus ensuring the customer receives the highest standard of products.

Oliver Twinsafe Valves has invested in the state of the art test stations to allow larger valves to be tested easily, accurately and quickly.

Gas test facility available.



reliability
pressure

The Oliver Group Management operates a high-level quality control program to ensure all Oliver products are manufactured to the highest standards using the latest technology.

The Oliver Quality Assurance Program encompasses our entire operation, from order entry to final inspection.

Oliver Twinsafe Valves operate an ISO 9001-2000 quality assurance system that is fully accredited by Lloyds of London.



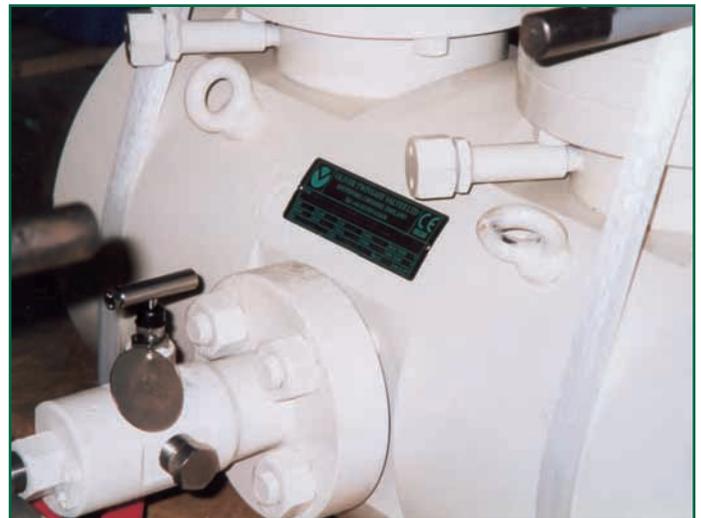
CE MARKED VALVES

Oliver Twinsafe Valves is a world leading manufacturer of high performance Double Block and Bleed twinsafe units with an unrivalled reputation for innovation, product development, quality and service.

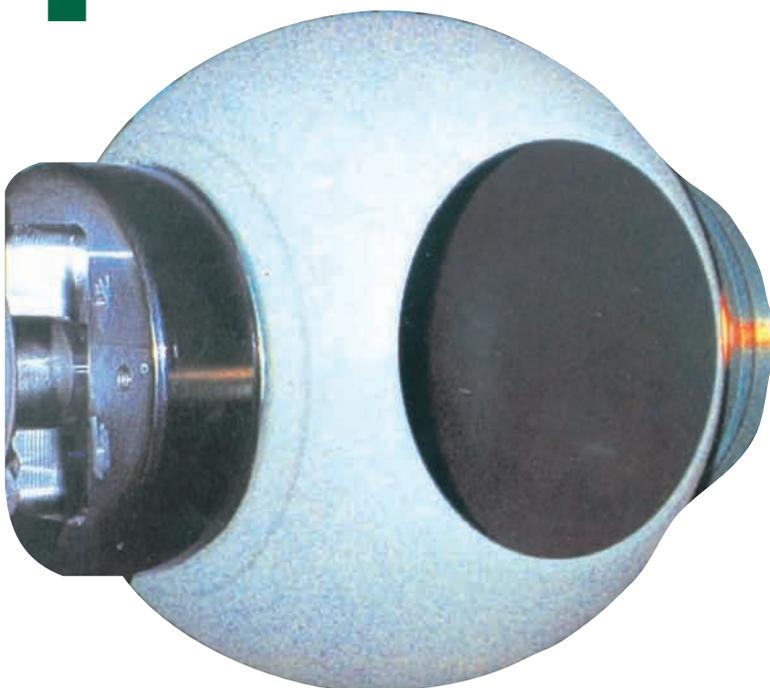
With a rapidly expanding manufacturing facility and a comprehensive network of marketing and distribution outlets across the globe, the company is able to offer outstanding support to our customers worldwide.



All Oliver Twinsafe Valves above 1" nominal pipe size are CE marked in accordance with the (SI 1999/2001) European Pressure Equipment Directive 97/23/EC and satisfy the essential safety requirements contained there in.



METAL SEATED BALLS



Oliver Twinsafe Valves is able to supply a complete range of metal-seated valves for abrasive service and high temperature applications.

Tungsten Carbide for abrasive service applications such as slurry and sand contaminated media.

Chrome Carbide for high temperature applications.

Stellite for high temperature applications.

All metal-seated Twinsafe valves are tested in accordance to API 598 for 2" and smaller and API 6D for the larger bore valves.

Oliver Twinsafe Valves is able to combine a metal-seated ball with a soft-seated ball (for positive shut off) into a single unit.

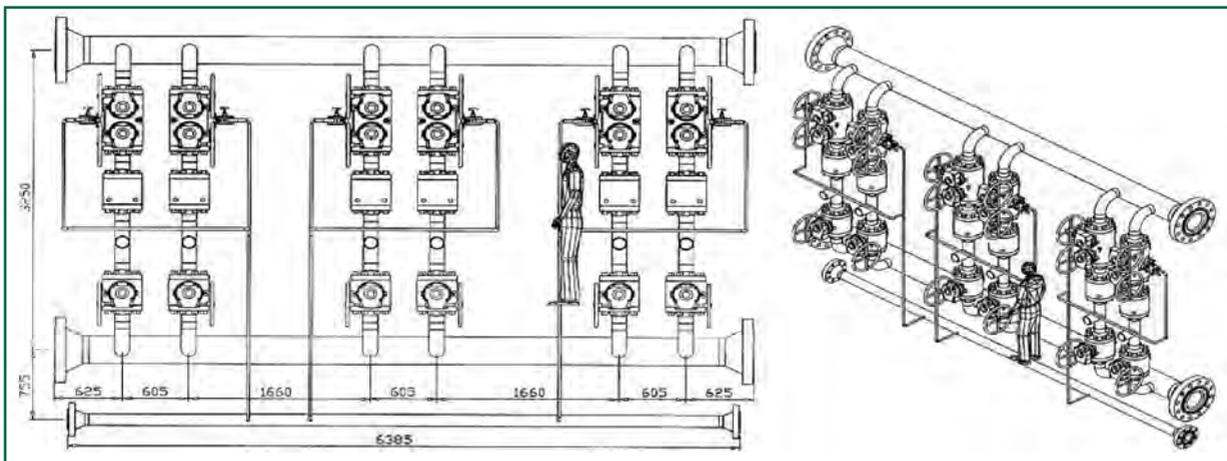
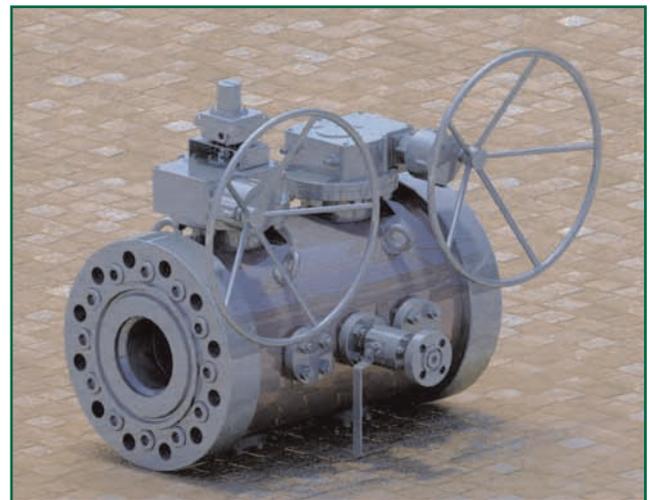
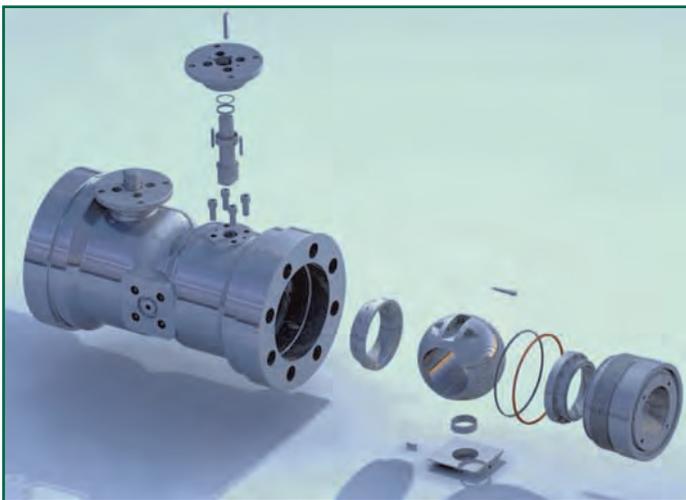
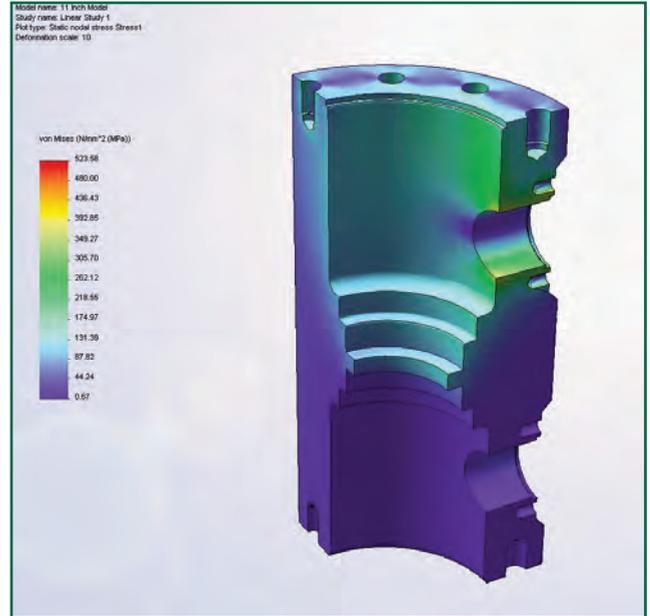
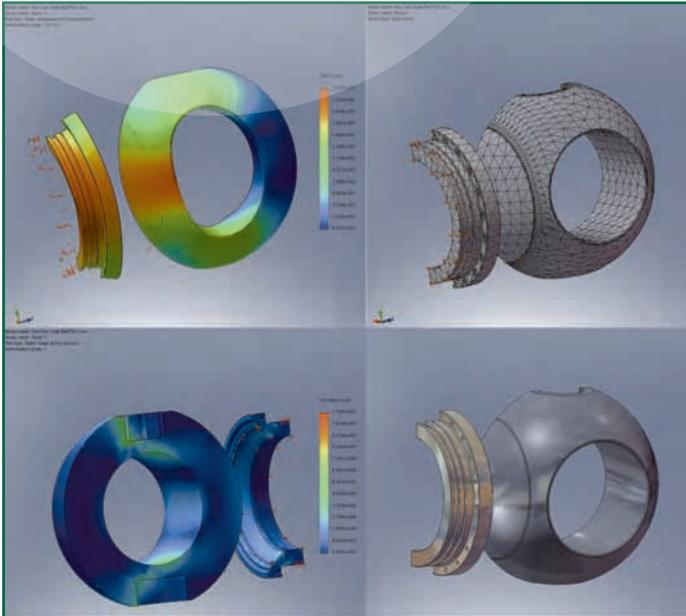


FINITE ELEMENT ANALYSIS AND 3D MODELING CAPABILITY

Oliver Twinsafe Valves have invested heavily in the research and development of new products for the Oil and Gas Industry. To aid this research and development process, we maintain an in house Finite Element Analysis (FEA) software package.

FEA consists of a computer model of a material or design that is loaded and analysed for specific results. It is used in new product design, and existing product refinement.

This FEA package is coupled with several 3D modelling software seats, so you can be sure that from the initial concepts of a design through to production, the integrity of the valve is guaranteed.



Oliver Twinsafe Valves Ltd also have a range of Double Block and Bleed valves designed in accordance with API6A. (Specification for wellhead and christmas tree equipment).

API Specification 6A specifies requirements and gives recommendations for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, shipment and purchasing, of wellhead and christmas tree equipment for use in the petroleum and natural gas industries.

The design constraints imposed by this specification allows us to design and offer a much lighter and lower cost Double Block and Bleed valve compared to the design constraints imposed by ASME B16.34.

An excellent example of this is a 2 tonne weight saving between a 11" API 5K (1500kg) Double Block and Bleed valve and a 10-25001b ASME B16.34 (3500kg) Double Block and Bleed valve.

Oliver Twinsafe Valves, API6A Double and Block and Bleed valves can be offered in pressure classes of 2K, 3K and 5K and in nominal bore sizes up to 11".

COMBINATION VALVES



Oliver Twinsafe Valves also offers a range of ball - Globe valve and ball - check valves combination.



PAINTING IN HOUSE

Oliver Twinsafe Valves has the inhouse ability to blast and paint valves to our standard three part epoxy paint specifications or customers special paint specifications.



FLEXIBILITY

Oliver Twinsafe Valves Ltd's comprehensive range of piping valves is designed to exceed the demands of today's international clients. The expertise of our design department together with our modern manufacturing philosophy ensures that we can offer the utmost flexibility to accommodate a customer's specific requirements whilst maintaining short lead times.

RELIABILITY

Oliver Twinsafe products are proven in many installations worldwide, often under the most arduous operating conditions. A policy of continuous product development and improvement helps us to maintain our enviable reputation for reliability.

A process of 'continuous inspection' during assembly and test helps to ensure product integrity.

T 4 DBB / D / C / 4-900RF / 4-900RF / 75-900RF / CSL / CT / FB / FS / GO / NA / TN

TWINSAFE

BORE SIZE

1 = 1"	4 = 4"	10 = 10"
2 = 2"	6 = 6"	12 = 12"
3 = 3"	8 = 8"	

STYLE

DBB	= Twinsafe Double Block & Bleed Valve
DB	= Twinsafe Double Block
BB	= Single Block & Bleed
BK	= Block Valve
LGBK	= Twinsafe Level Gauge Block Valve
LGDB	= Twinsafe Level Gauge Double Block Valve
LGDBB	= Twinsafe Level Gauge Double Block & Bleed Valve

CONFIGURATION

A	= Double Ball Block
D	= 2 Ball Isolates, Needle Vent
F	= 2 Ball Isolates, Ball Vent
G	= Ball, Globe Isolate, Needle Vent
BN	= Ball, Needle Vent
BB	= Ball, Ball Vent

MATERIAL SELECTION

C	= ASTM A350 LF2 Carbon Steel Forged Bar	} Forged
S	= ASTM A182 F316 Stainless Steel Forged Bar	
D	= ASTM A182 F51 Duplex Forged Bar	
SD	= ASTM A182 F55 Super Duplex Forged Bar	
825	= Incoloy 825 Forged Bar	
625	= Inconel 625 Forged Bar	} Cast
LCC	= ASTM A352 LCC Cast Carbon Steel with Low Carbon	
CFB	= ASTM A351 CF8M, Cast 316 Stainless steel	
4A	= ASTM A995 4A Cast Duplex	
6A	= ASTM A995 6A Cast Super Duplex	
4MC	= ASTM A494 CW-6MC Cast Inconel 625	

Other materials available upon request

INLET CONNECTION

FLANGE SIZE	FOLLOWED BY CLASS	FOLLOWED BY FLANGE TYPE
1 = 1" 6 = 6"	150 = 150lb	RTJ = Ring Type Joint
2 = 2" 8 = 8"	300 = 300lb	RF = Spiral Finish Raised Face
3 = 3" 10 = 10"	600 = 600lb	
4 = 4" 12 = 12"	900 = 900lb	
	1500 = 1500lb	
	2500 = 2500lb	

OUTLET CONNECTION

FLANGE SIZE	FOLLOWED BY CLASS	FOLLOWED BY FLANGE TYPE
1 = 1" 6 = 6"	150 = 150lb	RTJ = Ring Type Joint
2 = 2" 8 = 8"	300 = 300lb	RF = Spiral Finish Raised Face
3 = 3" 10 = 10"	600 = 600lb	
4 = 4" 12 = 12"	900 = 900lb	
	1500 = 1500lb	
	2500 = 2500lb	

VENT CONNECTION

INTEGRAL VENT VALVE	WHERE A SEPARATE VENT VALVE IS SUPPLIED
Heavy Duty Head Unit 25F = 1/4" NPT 50F = 1/2" NPT 75F = 3/4" NPT	*Vent Valves - specify which "Oliver Valve" either single isolate, mono valve or double block and bleed valve/DBB mono required Examples: MONO / BK / BV / LP2 / Y / 75-800RF-50F DBB / D / S / X / 10-1500RTJ / 50F / MONO / BK / 50-600RF / SSV11 / 50F / 50F

OPTIONS (ALPHABETICALLY)

ACT = Actuated	FS = Firesafe	LT196 = -196°C cryogenic service
ATV = Anti-tamper vent valve	FSL = Flange Standard Length	MS-TC = Metal Seated Tungsten Carbide
BF = Blind Flange on Vent	GO = Gear Operated	MS-CC = Metal Seated Chrome Carbide
CF = Cavity Filler	HL = Handle Locking Lever and Gear Box Options	MS-S = Metal seated stellite
CNSL = Cartridge Non-Standard Length	HT180 = High temperature 180°C	NA = NACE Specification
CSL = Cartridge Standard Length	HT315 = High temperature 315°C	OSY = Outside Screw and Yoke design
CT = Carbon Steel Trim	HTB = Hybrid Trunnion ball valve	PK = PEEK Seats
DT = Duplex Trim	IL316 = 316 Weld inlay	RB = Reduced Bore
EXT = With GO and LO Options Handle Extensions	IL625 = 625 Weld inlay	SPS = Spring protection system
FB = Full Bore	LO = Lever Operated	SSI = Seat and stem injection
FL = Floating Ball Design	LT50 = -50°C low temperature service	ST = Stainless Steel Trim
FNSL = Flange Non-Standard Length	LT100 = -100°C low temperature service	TN = Trunnion Ball Design



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