



MARSHALSEA
HYDRAULICS LIMITED

Bifold FluidPower[®]
Limited

Corporate Brochure

Reliability & Innovation in Directional
Control Valves, Pumps and Intensifiers

Features:

- World-wide solenoid approvals - ATEX, CSA, SAA, INMETRO & GOST
- Providing one of the widest range of valves, manifolds pumps and intensifiers
- 316L stainless steel
- World-wide product and system support
- Extensive applications reference list
- State of the art testing facilities for qualification and performance optimisation of control valves and systems



**THORNE &
DERRICK**
INTERNATIONAL

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Introduction

Bifold Fluidpower was established over a century ago as a manufacturer of valves for hazardous environments and is currently a leading manufacturer of electro-hydraulic and pneumatic directional control valves for the oil and gas industry. With the takeover of Marshalsea Hydraulics, Bifold Fluidpower can now offer a large selection of pumps / pump sets and intensifiers along with other high pressure, stainless steel fluidpower equipment. The state of the art manufacturing facility is based in the UK with sales offices in Houston, Singapore and Taunton and representatives in every continent. Through a commitment to innovation and value engineering, Bifold Fluidpower and Marshalsea Hydraulics offers leading technical solutions for control system designs whilst providing excellent service and technical support to customers around the world.

Leading Performance

Major producers world-wide depend upon Bifold Fluidpower products to perform in the most extreme conditions, offshore and onshore. Depth of knowledge built up over a century enables us to identify the optimum solution for each application. Over 3000 designs include valves for pressures from 10 to 20,000 psi, ambient temperatures from -50°C to +180°C and contamination levels beyond NAS 1638 Class 12. Solenoids certified for flammable gas & dust atmospheres are available with power ratings from 0.9 to 20 watts.

Actuators & Chokes

You can rely on Bifold Fluidpower for the widest range of directional control valves for actuators and chokes. Our compact manifold systems provide high integrity coupled with low maintenance. They comply with major world-wide solenoid approvals including ATEX, SAA, INMETRO, CSA and GOST. You also have the reassurance and convenience of global technical and circuit design support.



Wellhead

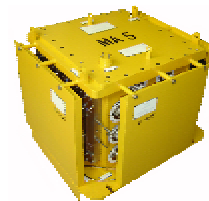
The Bifold Fluidpower range for wellhead control, incorporating electro-hydraulic low pressure logic, is the widest there is. With a choice of 8000 types across 15 categories, and high and low power options, you are sure to find a valve to fit your application and with the addition of Marshalsea's range it gives you an even greater choice including pumps, relief valves and intensifiers.



Subsea

Experience gained since 1987 of successfully applying valves directly immersed in sea water has been applied to develop the technically superior, market leading performance, FPS10 range of shearseal type directional valve. Fully seawater compatible, the standard products operate on fluids with contamination levels greater than NAS 1638 Class 12. True failsafe valves, they bring you the benefits of reduced manifold weight, size and costs, and put world beating performance at your command.

- Worlds first 180°C, 20,000 psi valve for HPHT well SSSV control
- Worlds first 130°C, 10,000 psi, 3000 metre subsea valve



Arctic Service

Since the middle 1990's, Bifold Fluidpower's directional control valves have demonstrated their ability to withstand the severity of environments in Northern Alaska, Canada, Siberia and the Caspian Region. We supply the largest range of pneumatic and hydraulic products for pressures from 2 to 690 bar, backed by the quality assurance of valve type approval testing in our in-house, state of the art climatic test chamber for temperatures down to -70°C. Rigorous test programmes simulate both prolonged low temperature exposure and rapid temperature changes, including complete actuator control system testing.



Marshalsea Hydraulics



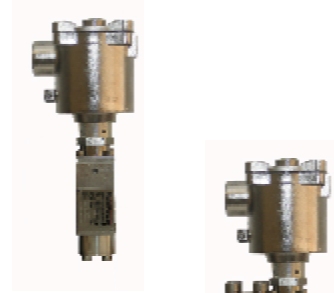
Marshalsea has an established reputation as a manufacturer and supplier to the international offshore oil and gas industry - which demands the very highest standards of engineering excellence and product. The companies success continues to be attributable to its firm commitment to product quality.

In recent years, Marshalsea has built on the experience and skills of its workforce to extend its product range. In addition to its high quality pumps and valves, Marshalsea now provides a range of stainless steel intensifiers for subsea and topside applications - plus a new range of water pumps specifically designed for water jet cutting applications.



Product Series:-
Pressure:-
Size Range:-
Solenoid Power / type:-
Explosion Protection:-
Primary Applications:-

FP01
0 - 690 bar
1 litre per minute nominal
0.9 to 3.7W / direct acting
EExd, EExemb, EExia
SSSV, Process, ESD, Choke Valve and Ballast System actuator controls

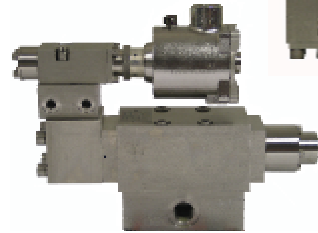


Product Series:-
Pressure:-
Size Range:-
Solenoid Power / type:-
Explosion Protection:-
Primary Applications:-

FP05
0 - 345 bar
5 litres per minute nominal
5.7W / direct acting
EExd,
Process, ESD and choke valve actuator control, Ballast

Product Series:-
Pressure:-
Size Range:-
Solenoid Power / type:-
Explosion Protection:-
Primary Applications:-

FP15
0 - 690 bar
15 litres per minute nominal
0.9 to 3.7W / indirect acting
EExd, EExemb, EExia
Wellhead, Process, ESD, Choke, Ballast, Turret and Mooring System actuator control



Product Series:-
Pressure:-

FP50, FP100 & FP200
0 - 345 bar (FP50)
0 - 250 bar (FP100 & FP200)
50, 100 & 200 litres per minute nominal
0.9 to 3.7W / indirect acting
EExd, EExemb, EExia
Process, ESD and HIPPS valve actuator control



Size Range:-
Solenoid Power / type:-
Explosion Protection:-
Primary Applications:-

Product Series:-
Pressure:-
Size Range:-
Solenoid Power / type:-
Explosion Protection:-
Primary Applications:-

SV/SVI Series
0 - 1380 bar
up to 40 litres per minute nominal
0.9 to 3.7W / indirect acting
EExd, EExemb, EExia
Special applications for high pressure, high temperature and contaminated control fluids



Solenoid Valves:-

Flameproof (EExd)

Product Series:-
Pressure:-
Size Range:-
Solenoid Power / type:-
Explosion Protection:-
Primary Applications:-

FP03P, FP06P, FP10P & FP12P
0 - 10 bar
1/4" to 1/2"
1.5 to 6.5 W / direct acting
EExd, EExia+ EExemb(FP03P only)
Wellhead, Process and ESD valve actuator control



Product Series:-
Pressure:-
Size Range:-
Solenoid Power / type:-
Explosion Protection:-
Primary Applications:-

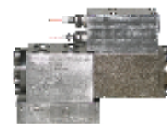
SVP8x08
0 - 250 bar
8 litres per minute nominal
5.7W / direct acting
EExd
Process, ESD and choke valve actuator control

Solenoid Valves:-

Subsea

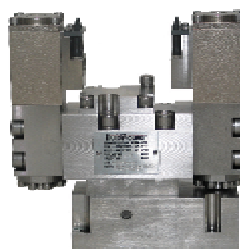
Product Series:-
Pressure:-
Size Range:-
Solenoid Power / type:-
Primary Applications:-
Depth of operation:-

FPS01 Subsea
0 - 690 bar
1 litre per minute nominal
15W / direct acting
Subsea
3000m



Product Series:-
Pressure:-
Size Range:-
Solenoid Power / type:-
Primary Applications:-
Depth of operation:-

FPS10 Subsea
0 - 690 bar
10 litre per minute nominal
15W / indirect acting
Subsea
3000m



* pending spring 2005; consult Bifold Fluidpower



Stainless Steel Actuator and Choke Control / Wellhead Control

Product Series:-
Pressure:-
Size Range:-

AXIS Manifold system
0 - 12 bar
1/4" to 1"
Contact Bifold Fluidpower for full range

Product Series:-
Pressure:-
Size Range:-
Primary Applications:-

Junior - SJE06 Series
0 - 10 bar
1/4"
Wellhead and process valve control system logic valves

Product Series:-
Pressure:-
Size Range:-
Primary Applications:-

Junior - SJJE06 Series
0 - 10 bar
1/4"
Wellhead and process valve control system logic valves

Product Series:-
Pressure:-
Size Range:-
Primary Applications:-

Domino - S Series
0 - 10 bar
1/4" to 1/2"
Wellhead and process valve control system logic valves

Product Series:-
Pressure:-
Size Range:-
Primary Applications:-

Diaphragm SD Series & Poppet SPR Series
0 - 10 bar
1/4" to 1"
High flow actuator control valves

Product Series:-
Pressure:-
Size Range:-

SH Series Air Preparation
0 - 40 bar
1/4" to 1"

Product Series:-
Pressure:-
Size Range:-

Flow Control; Needle & Cylinder Plug
0 - 690 bar
1/4" to 1"

Product Series:-
Pressure:-
Size Range:-
Primary Applications:-

FP15
0 - 1035 bar
15 litres per minute nominal
Wellhead, Process, ESD, Choke, Ballast, Turret and Mooring System actuator control

Product Series:-
Pressure:-

FP50, FP100 & FP200
0 - 345 bar (FP50)
0 - 250 bar (FP100 & FP200)
50, 100 & 200 litres per minute nominal
Process, ESD and HIPPS valve actuator control

Size Range:-
Primary Applications:-

Product Series:-
Pressure:-
Size Range:-
Primary Applications:-

Slide Valve Series
0 - 1380 bar
up to 40 litres per minute nominal
Special applications for high pressure, high temperature and contaminated control fluids

Product Series:-
Pressure:-
Size Range:-
Primary Applications:-

PSV5E - flowline pilot range
0 - 690 bar sensing; 0 - 16 bar control
5 litres per minute nominal
Process valve actuator control systems, Wellhead control system logic valves

Product Series:-
Pressure:-
Size Range:-

Check Valves (Hydraulic & Pneumatic)
0 - 690 bar / 0 - 12 bar
up to 190 litres per minute nominal / 1/4" to 1"

Product Series:-
Pressure:-
Size Range:-

Frangible Bulb, Eutectic plug/Fusible link (Hydraulic & Pneumatic)
0 - 690 bar / 0 - 12 bar
up to 200 litres per minute nominal / 1/4" to 1"

Product Series:-
Pressure:-
Size Range:-

Quick Exhaust Valves (Hydraulic / Pneumatic)
0 - 345 bar / 0 - 12 bar
up to 200 litres per minute nominal / 1/4" to 1"

Product Series:-
Pressure:-
Size Range:-

Hydraulic In Line and Bowl Filters
0 - 520 bar
3, 10 & 25 micron filter rating, 1/4" to 1/2"

Other Units

Other units included in the Bifold Fluidpower Range include; **Auto shut off regulator by-pass valves, bug vents, relief valves, port flow regulators, hydraulic valve manifold assemblies** -
Contact Bifold Fluidpower for details or reference our web site





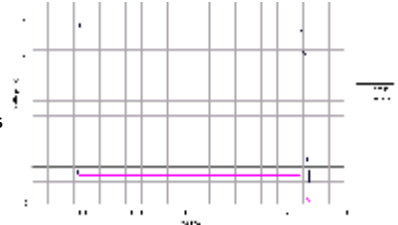
Approval Testing

In obtaining a wide range of approvals Bifold Fluidpower has subjected valves to onerous tests accredited by external bodies.

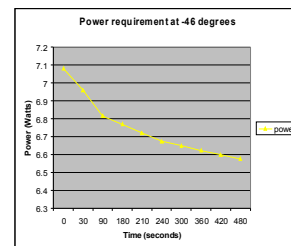
- Endurance testing to 600,000 cycles at the extremes of the operating temperature envelope.
- Environmental testing from -50°C to +180°C
- Full function testing, leak rate monitoring, proof testing 1.5 to 5 times operating pressure (dependent on approval body)
- Maximum and minimum pull-in voltage testing
- Response time testing
- Dielectric strength and insulation strength testing

State of the art testing and qualification facilities

- State of the art climatic test facilities (-70°C to +180°C).
- Single valve or complete control system testing capability including the process valve actuator - avoid discovering a problem in the field
- Full data logging and analysis of temperature, pressure, and response time.



Temp. (°C)	Time (min)	Current (mA)	Power (W)	Pressure (bar)	Leak Rate (ml/min)	Response Time (ms)
-50	10	100	10	10	0.1	100
0	10	100	10	10	0.1	100
50	10	100	10	10	0.1	100
100	10	100	10	10	0.1	100
150	10	100	10	10	0.1	100
180	10	100	10	10	0.1	100



Solenoid Approvals

Bifold Fluidpower present valves certified by a wide range of international approved bodies

- ATEX (European hazardous area approval)
- CSA, (Canadian and United States of America hazardous area approval).
- INMETRO (Brazilian hazardous area approval).
- SAA (Australian hazardous area approval).
- GOST (Russian hazardous area approval), GGTN (export licence to Russia), Expert Analysis report supporting the GGTN permit.



Valve Performance Testing

Bifold Fluidpower offer full qualification testing facilities; independent inspectorate and/or customer witness testing is free of charge when significant valve package orders are placed. Bifold Fluidpower has invested in state of the art climatic testing facilities. Valves are tested to the extremes of the environment required. Testing from simple valve operation to the assessment of:- i) variations in actuator opening times, and ii) pressure surges due to fluid thermal expansion as a result of a rapid temperature rise.

Leading Innovation

We combine the creative application of valve technology, innovative use of raw materials and the first hand knowledge of offshore and onshore hydraulic and pneumatic control systems to keep our customers ahead of the field. A significant part of our workforce is dedicated to developing valves that are smaller, more robust, for lower power solenoids, working at more extreme temperatures, enhancing both output and safety.

World-wide Support and Service

With over 95% of production for export, Bifold Fluidpower provides product and technical support for over 5000 valve products world-wide from the offices in the UK, Houston and Singapore. Bifold Fluidpower has invested in state of the art machining centres ensuring accuracy of close tolerances, all thread milled ports and a rapid turnaround capability.

The end user can be sure that Bifold Fluidpower has the product portfolio and the technical and production capability to provide the right solution for your pneumatic and hydraulic system requirements.

Project Reference List

Bifold Fluidpower has supplied pneumatic and hydraulic control valves to the vast majority of worldwide projects on all continents. Some recent major projects include; Dalia, Sakhalin, Bayu Undan, P50 Albacora Leste, South Pars and North East Al Dhabiya/Rumaitha (NEB). A full Installation Reference list is available via the web or by contacting Bifold Fluidpower



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Quality Assurance

All Bifold Fluidpower products are manufactured to a most stringent QA programme. Every care is taken at all stages of manufacture to ensure that every product will give optimum performance and reliability. We are recognised to EN ISO 9001:2000. Functional test certificate, letter of conformity and copies of original mill certificates, providing total traceability are available on request, to BSEN 10204 3.1.B where available. The manufacturer reserves the right to make changes to the specifications and design etc., without prior notice

Accuracy of information

We take care to ensure that product information in this catalogue is reasonably accurate and up-to-date. However, our products and services are continually updated so to ensure accurate and up-to-date information please refer to the issue list on the web site or contact a member of our sales team.

