Bifold FluidPower® Limited

Reliability and innovation in directional control valves

Slide Valve Solenoids

Model SV & SVI

Up to 1380 bar, 40 litres per minute

Superior performance throughout the full operational range

Features:

- Worldwide solenoid approvals ATEX, SAA, INMETRO, CSA & GOST
- 316L Stainless steel
- Contamination tolerant:- fluids > NAS 1638 Class 12
- Solenoid positionable through 360°
- NACE MR-01-75 options
- Arctic Service options to -50°C

CONTENTS

TECHNICAL SPECIFICATIONS

MATERIALS OF CONSTRUCTION

All valve bodies:-	stainless steel 316L.
Internal components:-	stainless steel 316L/316, CA104 Aluminium Bronze, Ceramic, stainless steel AISI 440C (according to valve type), PEEK (according to valve type).
Fasteners:-	A4 18/10 316 grade stainless steel.
Springs:-	stainless steel 302S26.
O-Rings:-	Nitrile (standard). Alternative elastomers available for extreme conditions.
Lip Seals:-	PTFE compounds.

MEDIA:

Mineral oils, water glycol mixtures, sea water (filtered), some chemicals, gases (subject to pressure limitations)(main stage)
Air, natural gas, bottled gases (low pressure pilot stages only)
Mineral Oils, water glycol mixtures (low pressure pilot stages, solenoid types 87C, 87D, 92 92A only).

WORKING PRESSURE:

Up to 1380 Bar (20,000PSI). Maximum working pressure varies according to valve model.
Refer to ordering code.

TEMPERATURE RANGE:

See solenoid and elastomer options. All high pressure, pilot stage solenoid valves, with the exception of type 97D, are limited to -36°C minimum operating temperature on account of restricted flow path and fluid viscsoity considerations:-

Examples	SV8001/NC/05/SA-24VDC/97CA9	Operating temperature -36°C to + 40°C
	SV8001/NC/05/SA-24VDC/97CA2	Operating temperature -36°C to + 90°C
	SV8001/NC/05/A-24VDC/97DA4	Operating temperature -50°C to + 55°C

SOUR GAS SERVICE (REFER TO ORDERING CODE).

All internal wetted and body metal materials conforming to NACE MR-01-75. Solenoid options 97D, 87C & 87D only.

LAST CHANCE FILTRATION:

A 40 micron, sintered stainless steel, filter disc is fitted as standard on all high pressure, pilot stage solenoid valve operators.

INSTALLATION:

Valves can be mounted in any attitude. Solenoids can be rotated relative to the pilot stage valve body to suit cable entry. Systems should be flushed clean to ISO 4406 Class 18/15 or better. Bifold Fluidpower slide valves afford excellent sealing characteristics and are capable of handling fluids with cleanliness levels > Class 21/18.

Weights detailed in this catalogue are approximate only.

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SELECTION CHART

Primary Operator

SV	upto 690 bar pilot stage solenoid valve	**SV/SV**	Bi-stable, high pressure pilot stage solenoid valve
SVI	upto 10 bar pilot stage solenoid valve	**SVI/SVI**	Bi-stable, low pressure pilot stage solenoid valve

Application & Configuration

80	Body ported	1/4 NPT (3/8 MP autoclave, pressure code 15)	
81	Subbase mounting	(10A, 12A & 18A configurations)	liquid service
51	Subbase mounting		
82	Body ported	1/4 NPT (3/8 MP autoclave, pressure code 15)	
53	Subbase mounting		liquid service - subsea
84	Body ported	1/4 NPT	
55	Subbase mounting		gaseous service

Configuration

00	3-way, 2-position	**01**	3-way, 2-position (reverse flow S to P)
02	2-way, 2-position		
10A	3-way, 2-position (81 body only, rated @ 40 lpm, 414 bar max)		
12A	2-way, 2-position (81 body only, rated @ 40 lpm, 414 bar max)		
18A	5-way, 2-position (81 body only, rated @ 40 lpm, 414 bar max)		
08	5-way, 2-postition (80 & 84 body only, 345 bar max. working pressure, 3/8 NPT ports		

NC	normally closed	2/2 & 3/2
NO	normally open	spring return valves

Working Pressure

02	138 bar		gaseous service
03	207 bar		
05	345 bar	**06**	414 bar (10A, 12A & 18A only)
07	520 bar	**10**	690 bar
15	1035 bar		liquid service
20	1380 bar (Type 5100 only) 180°C max fluid temp. ; 6 lpm nominal		

N.B. Codes 15 & 20:- maximum pilot stage pressure 690 bar

O-ring material

S	Nitrile (standard)	(-30°C to +130°C)	Refer to valve operating temperature range on page 2
V	Viton	(-20°C to +180°C)	
A	Silicone/Fluorosilicone	(-50°C to +40°C)	
SA	Low temperature Nitrile	(-46°C to +130°C)	

Voltage

XXX (refer to solenoid options on page 4)

Solenoid

XXX (refer to solenoid options on page 4)

Solenoid Approvals

A **G** **I** **S**	ATEX Ex II 2 GD (standard) GOST 1 Exd IIC T6 (T5,T4) INMETRO Br-Exd IIC T6 (T5) SAA Exd IIC T6 (T5,T4)	87C, 87D, 97C, 97D, 97F, 97G,
U	CSA Exd IIC (Canada) CSA AExd IIC (USA)	87C, 87D
A	ATEX Ex II 1 GD T75°C (T110°C)	98C
A **G**	ATEX Ex II 1 GD T65°C (standard) GOST 0 Exia IIC T6	981
A	ATEX Ex II 2 GDc T120°C	94C
A	ATEX Ex II 2 G	991

T-Rating & Gas Group

1 **2**	T4 IIA T4 IIB	87C, 87D, 97C, 97D, 97F, 97G,
3	T4 IIC	As above +98C
4 **5** **6** **7** **8**	T5 IIA T5 IIB T5 IIC T6 IIA T6 IIB	87C, 87D, 97C, 97D, 97F, 97G,
9	T6 IIC (standard)	As above +98C

Options

H2S	NACE MR-01-75
K6	BSPP ported
K85	1/2" NPT cable entry

SV solenoid operators options

ML	Manual reset
M	Manual override-spring return
MOR	Manual overide-rotary stayput
WS	Weather seal solenoid core tube (90J only)

Example

SV 80 01 / NC / 05 / S-24VDC /97C A 9 / ML

Standard Test Fluid: Marston Bentley HW540.

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SOLENOID OPTIONS

HIGH PRESSURE PILOT STAGE SOLENOID VALVES

Order Code	Apparatus Code	Power Consumption	Standard Voltage	Voltage Tolerance	Temperature Range* Media	Temperature Range* Ambient	Protection	Cable Connection	Materials of Construction
90J	General Purpose	3 Watts	12, 24, 48 & 110 VDC 110, 240 VAC 50 or 60 Hz	+/- 10 %	-20°C to +60°C		IP65 applies to connector	Hirschmann Connector	Glass filled nylon moulded coil
94C	EExemb II T3 T120°C	3.7 Watts			-20°C to +40°C		IP66	M20 x 1.5	316 stainless steel
97C (std)	EExd IIC T85 or T100 or T135	3 Watts			-20°C to +40°C (T6) (std)				
97F		1.5 Watts			-60°C to +40°C (T6) -20°C to +55°C (T5)				
97G		1.0 Watt			-60°C to +55°C (T5) -20°C to +90°C (T4)				
97D		5.7 Watts			-60°C to +90°C (T4)				
98C	EExia IIC T6 or T4	refer to solenoid drivers table on the next page			-20°C to +60°C (T6) (std) -60°C to +60°C (T6) -20°C to +95°C (T4) -60°C to +95°C (T4)				

UL / CSA approved solenoids available upon request. Consult Bifold Fluidpower for details

*Refer to operating temperature range on page 2

LOW PRESSURE PILOT STAGE SOLENOID VALVES

Order Code	Apparatus Code	Power Consumption	Standard Voltage	Voltage Tolerance	Temperature Range * Media	Temperature Range * Ambient	Protection	Cable Connection	Materials of Construction
981	EExia IIC T6	24VDC System, 12VDC @ solenoid 370 OHMS (Typical barrier MTL728)			-20°C to +40°C		IP66	M20 x 1.5	316 stainless steel
991	EExme II T3	5.7 Watts	12, 24, 110 VDC 110, 240 VAC 50 or 60 Hz	+10% / -15%	-20°C to +40°C				
87C	EExd IIC T85 or T100 or T135	3.5 Watts	24, 110 VDC 110, 240 VAC 50 or 60 Hz	+/- 10%	-20°C to +40°C (T6) (std) -60°C to +40°C (T6) -20°C to +55°C (T5)				
87D		5.7 Watts			-60°C to +55°C (T5) -20°C to +90°C (T4) -60°C to +90°C (T4)				
92	Class I Div1 Gp C&D Class I Div2 Gp A&B Class II Div1 Gp E,F,G	5.6 - 7.2 Watts		+/- 10%	-20°C to +60°C		NEMA 4, 4X	1/2" NPT	316 stainless steel
92A									Nickel plated steel enc.

INTRINSICALLY SAFE SOLENOID DRIVERS * (solenoid type 98C)

Interface Unit Manufacturer & Model Number	Apparatus Code	Solenoid Base model no.	Interface Unit Typical Input Characteristics Voltage (V)	Current (mA)	Power (W)	Typical Output Characteristics Measured At Solenoid Voltage (V)	Current (mA)	Power (W)
MTL 779+	EExia IIB	24VDC/98C & 24VDC/A98C	28	85.9	2.41	13.48	85.9	1.16
			24	73.7	1.77	11.57	73.7	0.85
			20	61.4	1.23	9.65	61.4	0.59
TURCK MK72-S13-Ex0	EExia IIC	24VDC/98C & 24VDC/A98C	30	88	2.63	11.81	74.3	0.86
			24	107	2.56			
			20	125	2.50			
PEPERL & FUCHS KFD2-SD-Exl.36	EExia IIB	24VDC/98C & 24VDC/A98C	30.0	85.5	2.57	11.81	76.0	0.90
			24.0	105.1	2.52			
			20.0	125.4	2.51			
ELCON HiD 2881-YA1	EExia IIB	24VDC/98C & 24VDC/A98C	28.0	98.6	2.76	11.71	77.5	0.91
			24.0	96	2.30	11.45	76.0	0.87
			21.0	83.4	1.75	10.00	66.3	0.66
STAHL 9351/10/14/10	EExia EExib IIB & IIC CONSULT MANUFACTURER	24VDC/98C & 24VDC/A98C	30.0	89.8	2.69	12.26	80.6	0.99
			24.0	115.6	2.77	12.18	80.0	0.97
			20.0	149.6	2.99	12.08	79.3	0.96

* The solenoid drivers detailed are suggested models only and do not constitute an approved I.S. system. Consult Bifold Fluidpower proir to using alternative drivers.

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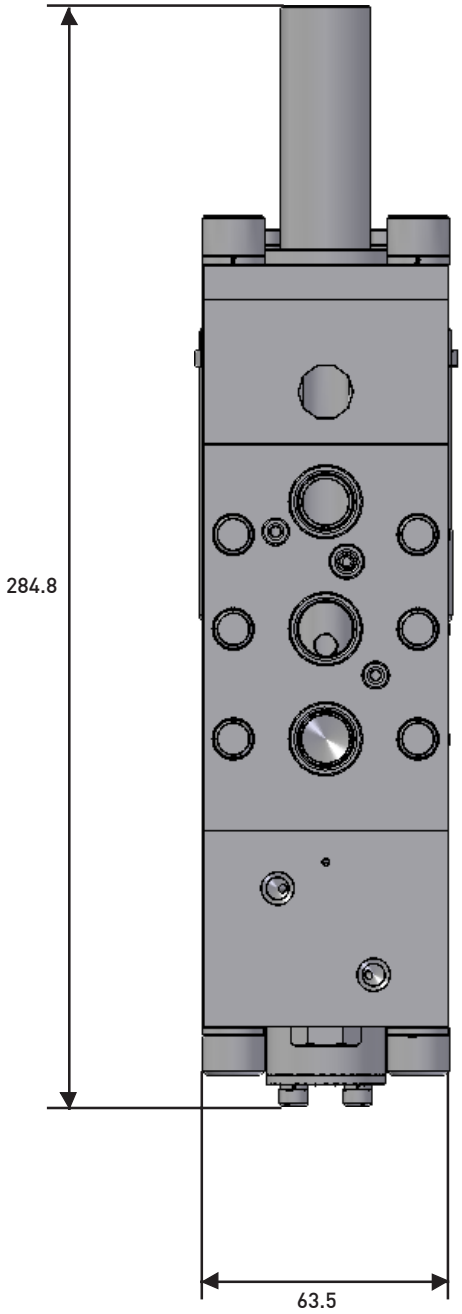
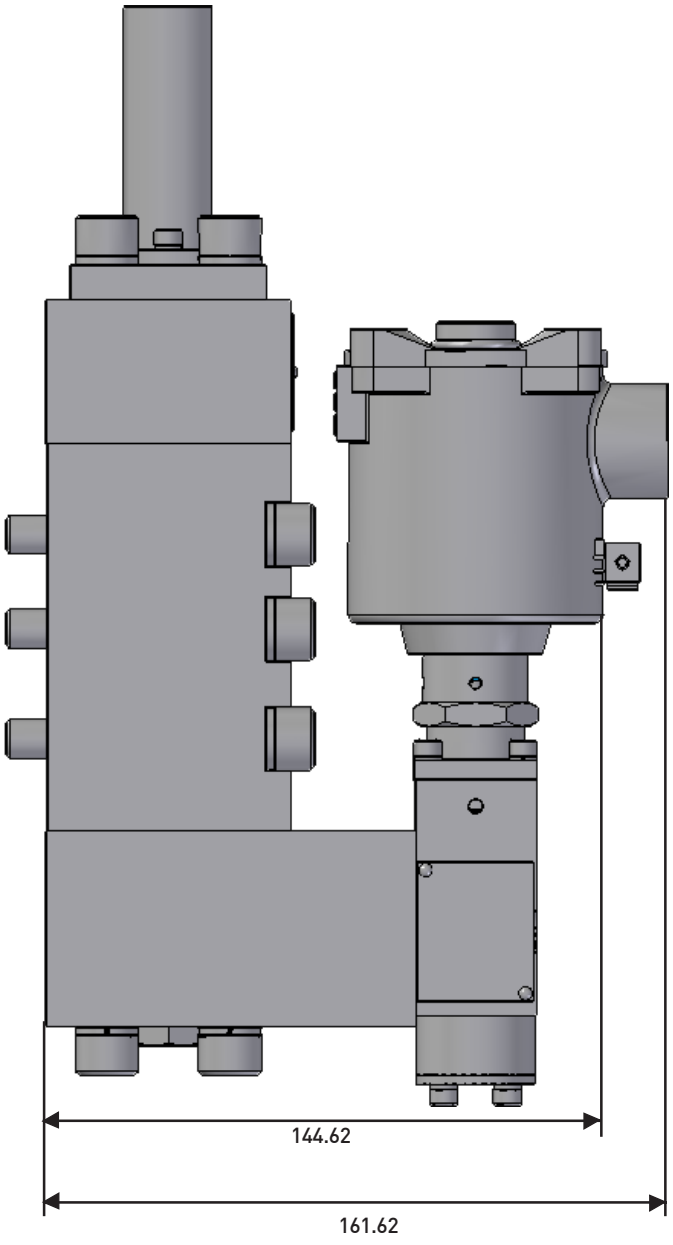
High Pressure Pilot Stage , 3/2, Solenoid Valves - Manifold Mount Versions





For manifold interface details
consult Bifold Fluidpower

Example Code:- SV8110A/NC/06/S-24VDC/97CA4

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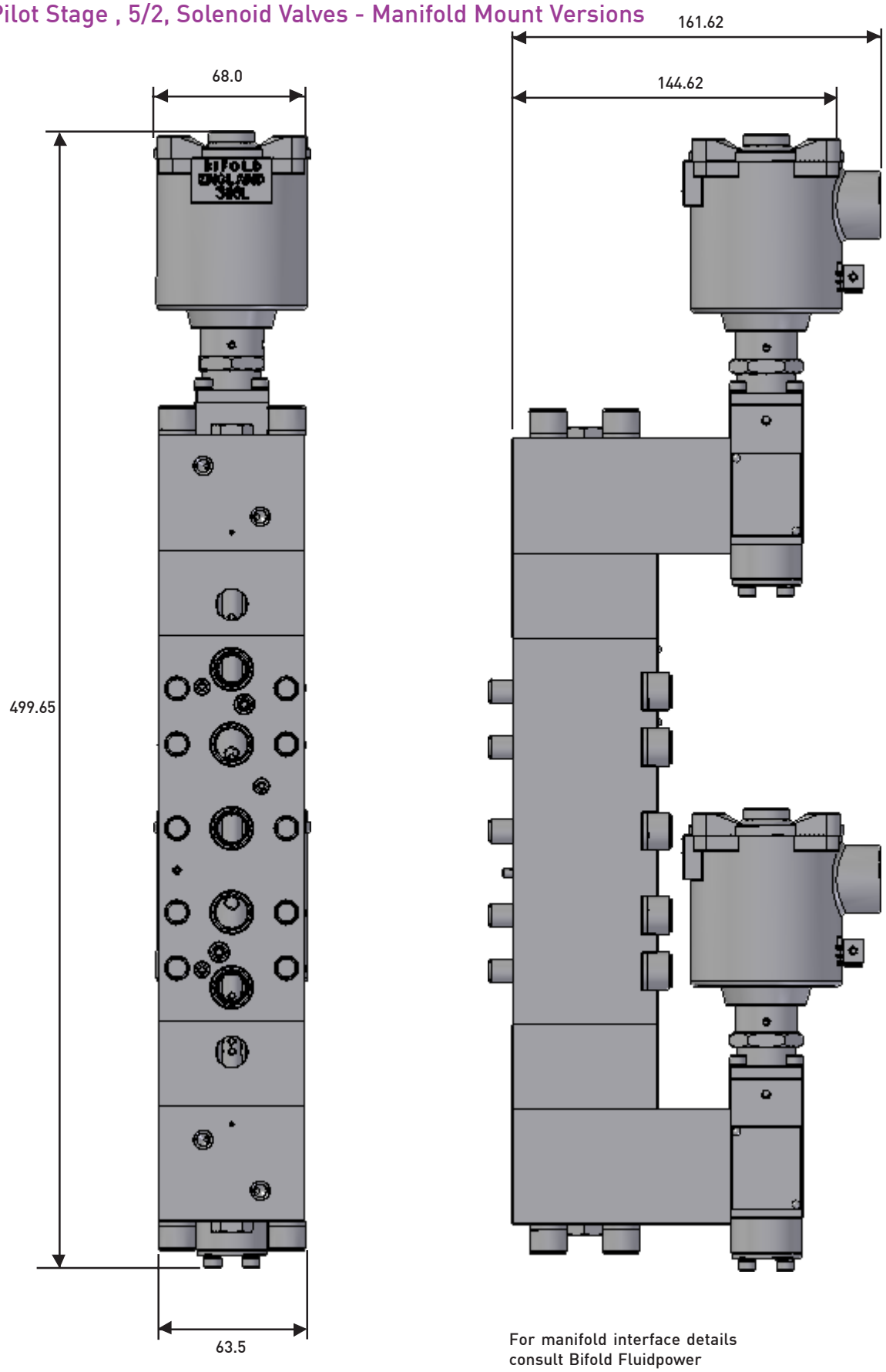
High Pressure Pilot Stage , 5/2, Solenoid Valves - Manifold Mount Versions



For manifold interface details
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Example Code:- SV/SV8118A/NC/06/S-24VDC/97CA4

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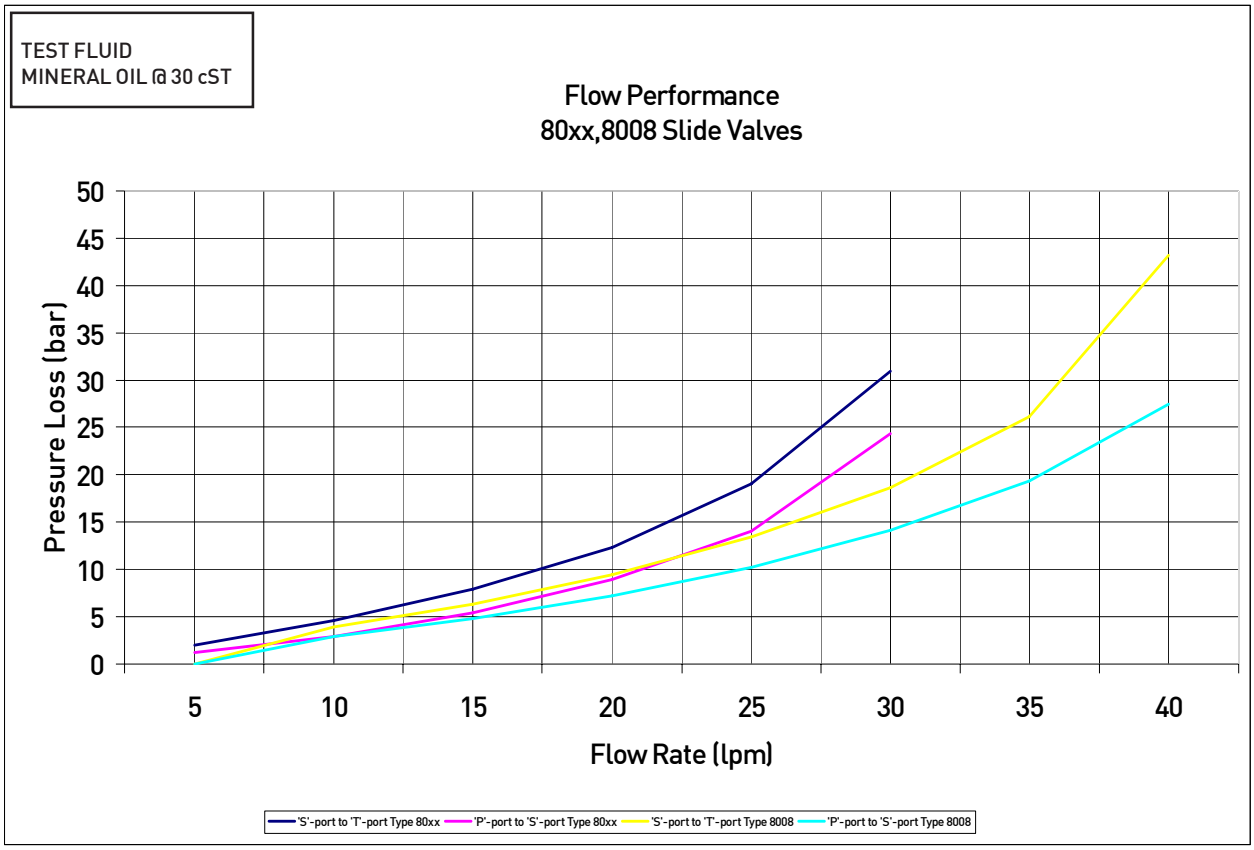

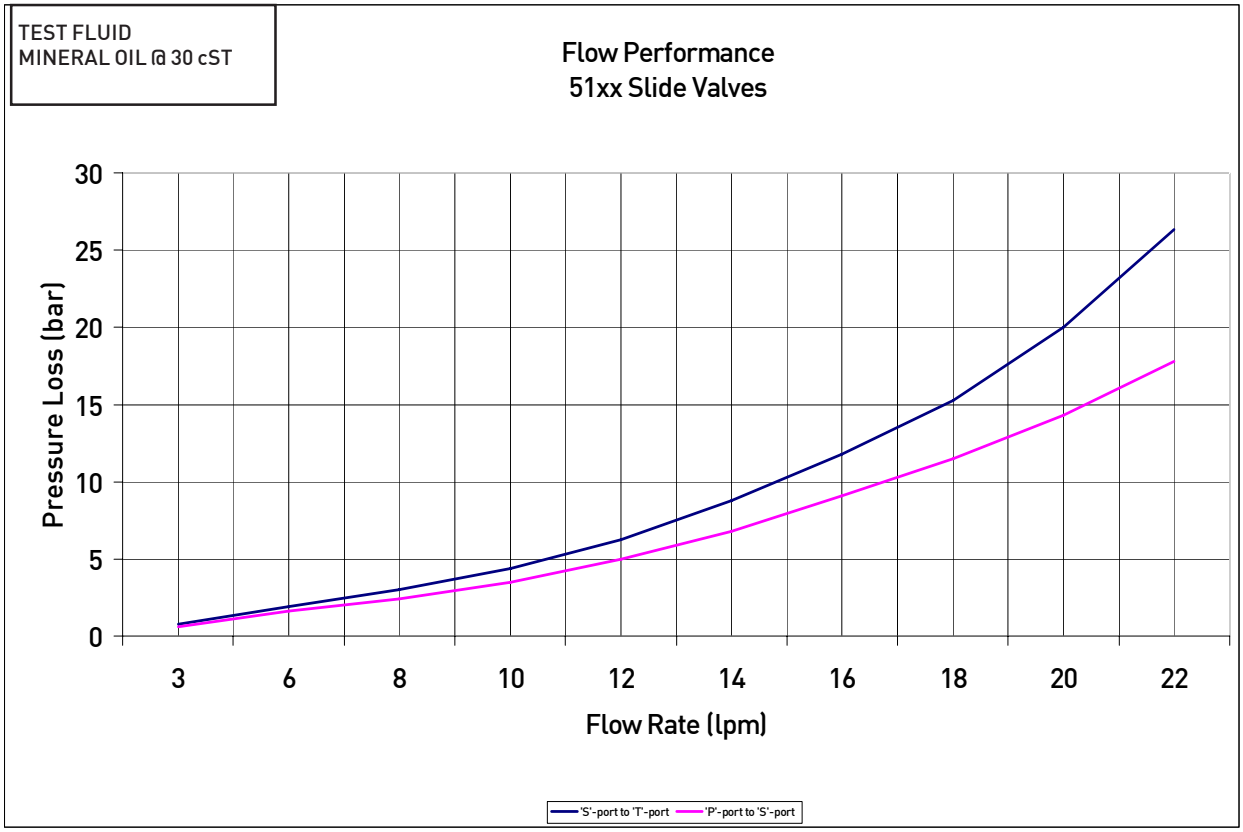

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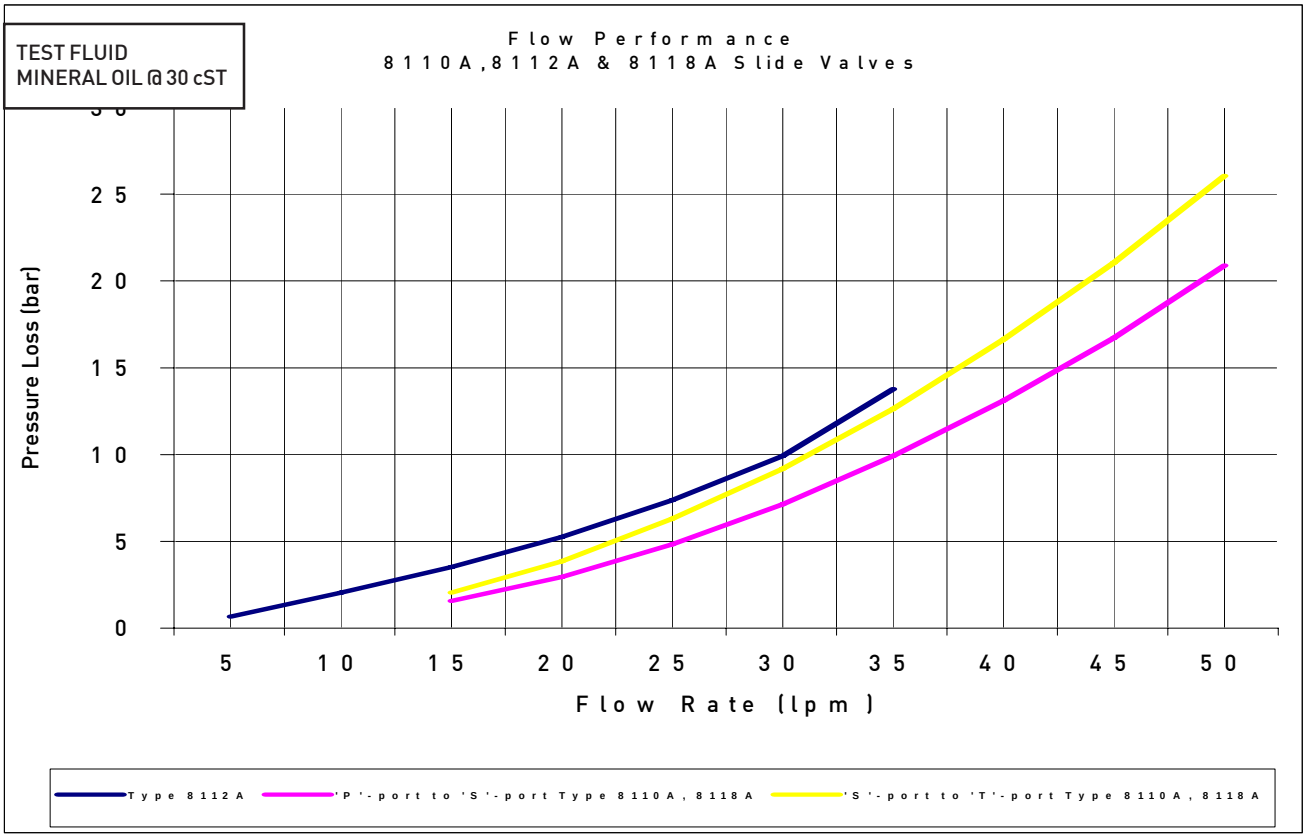


OPERATING LIMITATIONS

APPLICABLE TO ALL 5000 AND 8000 SERIES 2-WAY, 3-WAY AND 5-WAY SLIDE VALVES

WARNING

Slide type valves incorporating single acting seals will if subjected to reverse pressurisation/flow partially or fully collapse these seals.

Seal failure will occur if the following operating conditions are introduced into the hydraulic system.

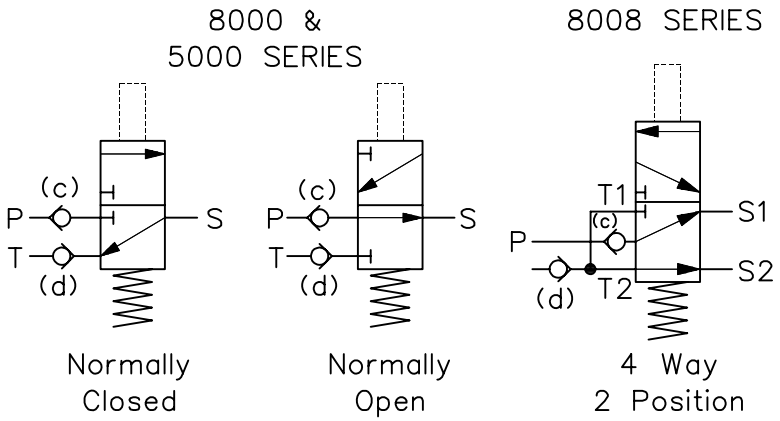
a) A higher pressure is applied to the tank/return port than at the service port
b) A higher pressure is applied to service port than at the pressure port.
c) Depressurisation of the hydraulic supply pressure with the valve in a pressure to service flow mode. (If this is a system design requirement we recommend the 5101 or 8001 valve types are used).
d) Back pressure at the tank port exceeding the maximum recommended 200 psi (14 bar) above the service line pressure.

If conditions (c) and (d) can arise during normal operation we recommend the following action is taken.

To eliminate condition (c) install a check valve directly at pressure 'P' inlet port.

To eliminate condition (d) install a check valve directly at the tank 'T' port.

P = PRESSURE
S = SERVICE
T = TANK/RETURN



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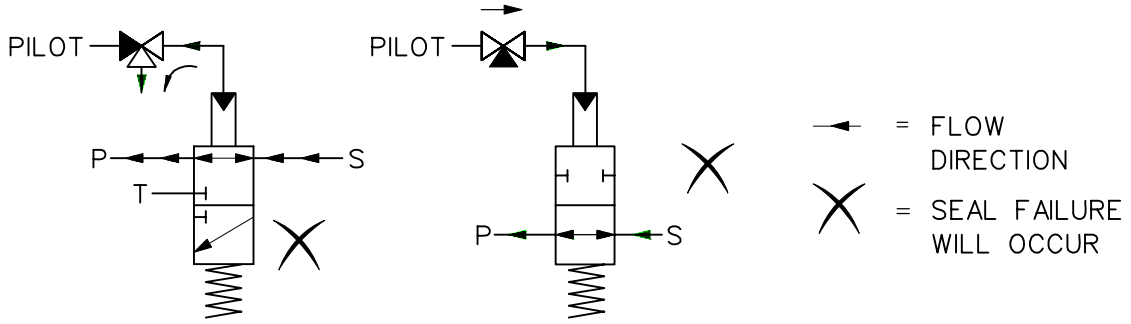
e) Valve types 5101, 5102, 8001 and 8002 are fitted with a bi-directional seal which is capable of tolerating flow from the pressure (P) port to the service (S) port and vice versa. The reverse flow capability of these valves is only permitted while the valve is in a static mode i.e. the valve must not change position whilst in a reverse flow mode as the seal will be damaged. **Note:** Condition (d) will remain applicable to these valve types.

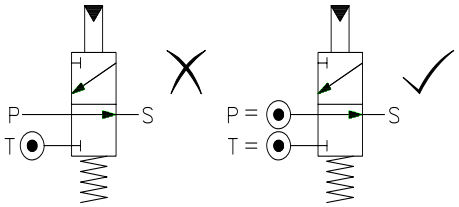


TESTING

For the purpose of proof testing an entire hydraulic system, including return/tank lines at the maximum test pressure, the tank port lines can be pressurised providing an equivalent pressure is always maintained at the valve pressure port with the valve in a pressure to service mode.

Always dissipate a test pressure down stream of the tank port.

Under no circumstances should the tank port be plugged.



To depressurise a control circuit with the direction for flow maintained P to S (Normally Open Valve or Normally Closed Valve pilot operated to open), pressure must always be dissipated down stream of the service port. (Excluding valves with reverse flow capability, refer to warning paragraph (e)).

Other Slide Valve Types Effected

(i) 3-way and 4-way for gas service
Types: 5500, 8400 and 8408

(ii) 2-way, 2 position valves for gas service
Types: 5502 and 8402

(iii) 2-way, 2 position valves for hydraulic service
Types 8102 and 8112

The above valve types are fitted with a bi-directional seal which is capable of tolerating flow from the pressure (P) port to the service port (S) and vice versa. The reverse flow capability of these valves is only permitted while the valve is in a static mode i.e. the valve must not change position whilst in a reverse flow mode as the seal will be damaged. (Refer to warning paragraph (e))

NOTE

To eliminate the modes of failure as described (excludes reverse flow type, refer to warning), we offer a stackable valve system, incorporating 5100 series, subbase manifolds, thermal relief and check valves.

We also manufacture a range of block before bleed and balanced poppet valves which are not susceptible to the seal damage through reverse flow mode applications. For further details on these and our stackable valve system please contact 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.