Indirect Acting Solenoid Valves
Model FP15
(Up to 690 bar, 15 litres per minute)

Superior Performance Throughout the Full Operational Range

- Compact Design
- Solenoid Valve Certified as SIL 3 Capable
- Solenoid Free to Rotate Through 360°
- 316L Stainless Steel Solenoid Enclosure and Valve
- NACE MR-01-75 Internal Wetted and Body Materials (Option)
- Arctic Service Options to -36°C
- Seated Ball design offers extremely low leakage (Less Accumulation Required, Smaller Pump Size & Duty)
- Worldwide Solenoid Approvals Ex d, Ex ia, Ex emb and Explosion Proof
- Low Power
- Up to 690 bar Working Pressure

Innovative and Reliable Valve Solutions www.bifold.co.uk
Solenoid Valve Range

Features & Benefits

Worldwide Approvals

- ATEX
- IEC Ex
- Ex US
- EN
- CE
- cETL
- QUA

Solenoïd Valve Range

Solenoid Operator is Free to Rotate 360°

- Solenoid operator is free to rotate 360° allowing for an easy cable layout and ease of connection wiring. Solenoid operator internals rotate with the enclosure and prevent cables being pulled out of terminal block.


- Standard solenoid valve can be mounted in any orientation to simplify installation due to all the components having enhanced rotational capabilities.

Commissioning and Maintenance Benefits for the Standard Solenoid Valve

- Tropicalised solenoid operator design - 316L stainless steel enclosure; stainless steel or Remko B magnetic parts (dependant upon solenoid Ex type) Fully encapsulated coil.

- Spacious solenoid enclosure for ease of wiring.

- No time penalty for heat dissipation before removing solenoid enclosure cover.

- No special high temperature cable requirements.

Worldwide Approvals

- Solenoid Operator

- Equipment Design & Build

- Terminal Block

- Surge Suppression

- Internal Earth Connection

Spacious Enclosure for Ease of Wiring

- No time penalty for heat dissipation before removing solenoid enclosure cover.

No special high temperature cable requirements.

Accurate Information

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

When selecting a product the applicable operating system design must be considered as unsuitable use. The product spec, which contains product information and installation, operation and maintenance are the responsibilities of the system designer and user.

Quality Assurance

All Bifold products are manufactured to a most stringent QA programme to ensure that every product will give optimum performance and reliability. We are third party certified to BS 5750:2000, International accreditation, level of evidence is available on request as BS EN 10204 3.1

We reserve the right to make changes in specifications and design, without prior notice.
Features & Benefits

SIL 3 Capability, FMEA, Extensive Qualification Testing Coupled with 100% Computerised Diagnostic Test Procedures.

Safety and Environmental Benefits

- **SIL 3 capability:** The product has met manufacturer design process requirements of Safety Integrity Level (SIL) 3.

- Force balanced valve design with high safety factors to de-energise at all pressures in Normally Open and Normally Closed configurations.

- 100% computerised diagnostic testing to ensure each solenoid valve is proven along with confirmed safety factors.

- Bifold has state of the art testing and qualification equipment including endurance, environment, climatic, performance, function and leakage testing.

- The standard solenoid operator is a holding magnet type which ensures the valve will operate in damp conditions. The risk of corrosion to internal components is reduced, unlike other valve types that incorporate a solenoid core tube design with a 'wetted' armature that will only operate in dry air conditions!

- The standard solenoid valve has proven arctic service and low temperature performance.

- Products are manufactured, inspected, assembled and tested in our state of the art production facilities.

- Dry solenoid armature to prevent corrosion and affecting safe shut down.

- Simple maintenance - Removable transient suppression diode on Ex d DC solenoid valve assemblies and removable solenoid coil without removing valve from the tubing.

www.bifold.co.uk

BFD90 November *13

Accuracy of Information

While every care is taken that product information is correct, we reserve the right to make changes without notice. If in any doubt please contact us and we will be happy to confirm the details. For a complete listing of all products and specifications please refer to the latest product catalogue on website or contact a member of our sales team.

Quality Assurance

All Bifold products are manufactured to a most stringent QA programme to ensure that every product will give optimum performance and reliability. We are third party certified to BS EN 10204 3.1, 3.2 and 3.3. For a complete listing of all products and specifications please refer to the latest product catalogue on website or contact a member of our sales team.
### Solenoid Valve Range

#### Preferred Range

**INDIRECT ACTING SOLENOID VALVES - PREFERRED RANGE**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15/S1/04/32/S/74AT4-24D/36</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Auto Reset. ATEX II 2 GD c, Ex emb IIC T4 Gb IECEx Ex emb IEC T4 Gb 36Watt, Cv 0.32, 345 bar.</td>
</tr>
<tr>
<td>FP15/S1/04/32/S/77A-24D/30</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Auto Reset. ATEX II 2 GD, Ex d IIC T6 IECEx Ex d IIC T6 3.0 Watt, Cv 0.32, 345 bar.</td>
</tr>
<tr>
<td>FP15/S1/04/32/S/78A-155</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, Auto Reset. ATEX II 1 GD, Ex ia IIC T6 Ga IECEx Ex ia IIC T6 Ga 155 Ohms, Cv 0.32, 345 bar.</td>
</tr>
<tr>
<td>FP15/S1/04/32/S/77A-24D/ML/36</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Manual Reset. ATEX II 2 GD c, Ex emb IEC T4 Gb IECEx Ex emb IEC T4 Gb 3.6 Watt, Cv 0.32, 345 bar.</td>
</tr>
<tr>
<td>FP15/S1/04/32/S/77A-24D/ML/30</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Manual Reset. ATEX II 2 GD, Ex d IEC T6 IECEx Ex d IEC T6 3.0 Watt, Cv 0.32, 345 bar.</td>
</tr>
<tr>
<td>FP15/S1/04/32/S/78A-155/ML</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, Manual Reset. ATEX II 1 GD, Ex ia IEC T6 Ga IECEx Ex ia IEC T6 Ga 155 Ohms, Cv 0.32, 345 bar.</td>
</tr>
<tr>
<td>FP15/S2/04/32/S/74AT4-24D/36</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Auto Reset. ATEX II 2 GD c, Ex emb IEC T4 Gb IECEx Ex emb IEC T4 Gb 36Watt, Cv 0.32, 517 bar.</td>
</tr>
<tr>
<td>FP15/S2/04/32/S/77A-24D/30</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Auto Reset. ATEX II 2 GD, Ex d IEC T6 IECEx Ex d IEC T6 3.0 Watt, Cv 0.32, 517 bar.</td>
</tr>
<tr>
<td>FP15/S2/04/32/S/78A-155</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, Auto Reset. ATEX II 1 GD, Ex ia IEC T6 Ga IECEx Ex ia IEC T6 Ga 155 Ohms, Cv 0.32, 517 bar.</td>
</tr>
<tr>
<td>FP15/S2/04/32/S/74AT4-24D/ML/36</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Manual Reset. ATEX II 2 GD c, Ex emb IEC T4 Gb IECEx Ex emb IEC T4 Gb 3.6 Watt, Cv 0.32, 517 bar.</td>
</tr>
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<td>FP15/S2/04/32/S/77A-24D/ML/30</td>
<td>¼” NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Manual Reset. ATEX II 2 GD, Ex d IEC T6 IECEx Ex d IEC T6 3.0 Watt, Cv 0.32, 517 bar.</td>
</tr>
</tbody>
</table>

† Solenoid must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system.
# Solenoid Valve Range

## Preferred Range

### INDIRECT ACTING SOLENOID VALVES - PREFERRED RANGE

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15/S3/04/32/S/74AT4-24D/36</td>
<td>¼&quot; NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Auto Reset. ATEX II 2 GD c, Ex emb IIC T4 Gb. IECEx Ex emb IIC T4 Gb. 3.6 Watt, Cv 0.32, 690 bar.</td>
</tr>
<tr>
<td>FP15/S3/04/32/S/77A-24D/30</td>
<td>¼&quot; NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Auto Reset. ATEX II 2 GD, Ex d IIC T6. IECEx Ex d IIC T6. 3.0 Watt, Cv 0.32, 690 bar.</td>
</tr>
<tr>
<td>FP15/S3/04/32/S/78A-155</td>
<td>Solenoid must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system.</td>
</tr>
<tr>
<td>FP15/S3/04/32/S/74AT4-24D/ML/36</td>
<td>¼&quot; NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Manual Reset. ATEX II 2 GD c, Ex emb IIC T4 Gb. IECEx Ex emb IIC T4 Gb. 3.6 Watt, Cv 0.32, 690 bar.</td>
</tr>
<tr>
<td>FP15/S3/04/32/S/77A-24D/ML/30</td>
<td>¼&quot; NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Manual Reset. ATEX II 2 GD, Ex d IIC T6. IECEx Ex d IIC T6. 3.0 Watt, Cv 0.32, 690 bar.</td>
</tr>
</tbody>
</table>
Solenoide Valves

**INDIRECT ACTING SOLENOID VALVES**

<table>
<thead>
<tr>
<th>Product</th>
<th>Schematic Representation</th>
<th>Page Number</th>
<th>Product Code</th>
<th>Product Description</th>
</tr>
</thead>
</table>

For the complete S1 / S1, S2 / S2 & S3 / S3 range, please see the selection chart on Page 18.

For the complete DPSS1, DPSS2 & DPSS3 range, please see the selection chart on Page 19.

† Solenoids must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system.

* Manual Override Spring Return.

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**Quality Assurance**

All Bifold products are manufactured to a most stringent Quality Assurance QA programme to ensure that every product will give optimum performance and reliability. We are also a proudly accredited to BS EN-9001:2008, demonstrating that our products meet the most demanding international quality standards. ATEX products are available to order as BIFOLD, NBR 21108, or with added insulation for Zone 0 use. We reserve the right to make changes to the specifications and design, at any time without prior notice.
### Solenoid Valves

#### Other Products Within The FP15 Range

**INDIRECT ACTING SOLENOID VALVES**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15/S4/04/32/S/74AT4-24D/36</td>
<td>¼&quot; NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc, Auto Reset. ATEX IIG 2 GD c, Ex emb IIC T4 Gb. IECEx Ex emb ITC T4 Gb 36.6Watt, Cv 0.32, 690 bar.</td>
</tr>
<tr>
<td>FP15/S5/04/32/S/77A-24D/M</td>
<td>¼&quot; NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc. ATEX IIG 2 GD c, Ex emb IIC T4 Gb. IECEx Ex emb ITC T4 Gb 36.6Watt, Cv 0.32, 690 bar.</td>
</tr>
<tr>
<td>FP15/S5/06/32/S/78A-370</td>
<td>¼&quot; NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, Auto Reset. ATEX II IGD, Ex ia IIC T4 Gb. IECEx Ex ia IIC T4 Gb 370 Ohms, Cv 0.1, 690 bar.</td>
</tr>
<tr>
<td>FP15/S6/04/32/S/74AT4-24D/M</td>
<td>¼&quot; NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc. Auto Reset. ATEX IIG 2 GD c, Ex emb IIC T4 Gb. IECEx Ex emb ITC T4 Gb 36.6Watt, Cv 0.32, 690 bar.</td>
</tr>
<tr>
<td>FP15/S6/04/32/S/77A-24D/M</td>
<td>¼&quot; NPT Ports, 3 way 2 position, Indirect Acting, Normally Closed, 24Vdc. ATEX IIG 2 GD c, Ex emb IIC T4 Gb. IECEx Ex emb ITC T4 Gb 36.6Watt, Cv 0.32, 690 bar.</td>
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</tr>
</tbody>
</table>

**FP15 - S4 & S5**

For the complete S4 & S5 range, please see the selection chart on Page 20.

**FP15 - S6**

For the complete S6 range, please see the selection chart on Page 21.

† Solenoid must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system.

* Manual Override Spring Return.

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Accuracy of information is subject to change. Please refer to www.bifold.co.uk or contact a member of our sales team for the most up-to-date information.

BFD90 November ’13 © Bifold 2013
Overview

Materials of Construction

Solenoid enclosure and valve manufactured from 316L stainless steel as standard. Internal components are constructed from 316L stainless steel, AISI 440C, CA104 aluminium bronze and ceramic as standard. Alternative materials are available for NACE MR-01-75 compliance. Valve seals are supplied in Nitrile as standard. Alternative elastomers available for extreme conditions and to suite media. Springs are manufactured from 316S42 stainless steel as standard. Fasteners are metric A4 18 / 10 grade stainless steel; equivalent to 316L grade stainless steel.

Technical Data

Accuracy of information

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

When selecting a product, the applicable operating system design must be considered to ensure safe use. The products function, material compatibility, adequate ratings, correct installation, operation and maintenance are the responsibilities of the system designer and user.

Quality Assurance

All Bifold products are manufactured to a most stringent QA programme to ensure that every product will give optimum performance and reliability. All our products undergo extensive testing as per test procedures and in accordance with the relevant standards in place at the time of manufacture. All our products meet BS EN 10204 3.1 where available. We reserve the right to make changes without prior notice.

Product Options

Certification & Approval options available

ATEX 3 capability: The product has met manufacturer design process requirements of Safety Integrity Level (SIL) 3 in accordance with IEC 61508.

Solenoid valve assemblies can be mounted in any orientation. Solenoid enclosure can be rotated relative to the pilot stage valve body to suit cable entry.

Operating pressure up to 690 bar. Maximum working pressure according to valve model.

Operating media - Mineral oils, water glycol mixtures, sea water (filtered) and some chemicals (mainstage & high pressure pilot stages). Air, natural gas, bottled gases (low pressure pilot stages only).

For operating temperature range, please see solenoid valve type and seal options.

Higher voltage options available for line monitoring.


Arctic Service options to -36ºC.

Flow Performance

S to P & S OPERATORS S5

\( \Delta p (\text{bar}) \)

LITRES PER MINUTE

TEST FLUID MINERAL OIL @30°C

For types S4, S5 & S6, see the graph above.

Pilot Pressures

Minimum operating pressure 50 bar for types S1, S2, S3, S1 / S1, S2 / S2 & S3 / S3.

For types S4, S5 & S6, see the graph above.
**Certification Details**

**Certification & Approval Details**

**Type 74 Solenoid**

- **ATEX, Certificate Number Baseefo 09ATEX0040X.**
  - II 2GD c Ex emb IIC T4 Gb Tamb -25°C to +50°C.
  - II 2GD c Ex emb IIC T3 Gb Tamb -25°C to +55°C.

- **IECEx, Certificate Number IECEx Bas 09.0012X.**
  - Ex emb IIC T4 Gb Tamb -25°C to +50°C.
  - Ex emb IIC T3 Gb Tamb -25°C to +55°C.

**Type 77 Solenoid**

- **ATEX, Certificate Number Baseefo 10ATEX0026.**
  - II 2GD d IIC T6 (Tamb -60°C to +40°C).
  - II 2GD d IIC T5 (Tamb -60°C to +55°C).
  - II 2GD d IIC T4 (Tamb -60°C to +90°C).

- **IECEx, Certificate Number IECEx Bas 10.0008.**
  - Ex d IIC T6 (Tamb -60°C to +40°C).
  - Ex d IIC T5 (Tamb -60°C to +55°C).
  - Ex d IIC T4 (Tamb -60°C to +90°C).

- **INMETRO, Certificate Number CEPEL-EX-097/2003X.**
  - BR-Ex d IIC T6 -60°C to +40ºC ambient.
  - BR-Ex d IIC T5 -60°C to +55ºC ambient.
  - BR-Ex d IIC T4 -60°C to +90ºC ambient.

- **GOST, Certificate Number B00763, RTN.**
  - Ex d IIC T6 -60°C to +40ºC ambient.
  - Ex d IIC T5 -60°C to +55ºC ambient.
  - Ex d IIC T4 -60°C to +90ºC ambient.

**Type 78 Solenoid**

- **ATEX, Certificate Number Baseefo 02ATEX0124X.**
  - II 1GD Ex ia IIC T6 Ga (Tamb = -60°C to +60°C).
  - II 1GD Ex ia IIC T4 Ga (Tamb = -60°C to +95°C).

- **IECEx, Certificate Number IECEx Bas 09.0092X.**
  - Ex ia IIC T6 Ga (Tamb = -60°C to +60°C).
  - Ex ia IIC T4 Ga (Tamb = -60°C to +95°C).

- **INMETRO, Certificate Number CEPEL-EX-532/05.**
  - BR-Ex ia IIC T6 -60°C to +40ºC ambient.
  - BR-Ex ia IIC T5 -60°C to +95ºC ambient.

- **GOST, Certificate Number B00015, RTN.**
  - Permit Number PPC 00-28504.
  - Ex ia IIC T6 -60°C to +40ºC ambient.
  - Ex ia IIC T5 -60°C to +55ºC ambient.
  - Ex ia IIC T4 -60°C to +90ºC ambient.

- **GOST K, GGTN K Permit, Kazakhstan, BIF 7727 2.**
  - Ex ia IIC T6 -60°C to +40ºC ambient.
  - Ex ia IIC T5 -60°C to +55ºC ambient.
  - Ex ia IIC T4 -60°C to +90ºC ambient.

**Type 77 Solenoid**

- **CSA (US), Certificate Number 1398692.**
  - Class 1, Division 1, Groups B, C & D for both Canada & USA.
  - Ex d IIC for Canada, AEx d IIC for USA.
  - T85°C -60°C to +40°C ambient.
  - T100°C -60°C to +55°C ambient.
  - T135°C -60°C to +90°C ambient.

**Type 78 Solenoid**

- **INMETRO, Certificate Number CEPEL-EX-532/05.**
  - BR-Ex ia IIC T6 -60°C to +40ºC ambient.
  - BR-Ex ia IIC T4 -60°C to +95ºC ambient.

- **GOST, Certificate Number B00015, RTN.**
  - Permit Number PPC 00-28504.
  - Ex ia IIC T6 -60°C to +40ºC ambient.
  - Ex ia IIC T5 -60°C to +55ºC ambient.
  - Ex ia IIC T4 -60°C to +90ºC ambient.

**Label Rationalisation**

The temperature details on our solenoid valve labels have, to date, been laid out with a single ambient range and ‘T’ rating, as follows: -

- **77A3 - T4 (-60°C ≤ Tamb ≤ +90°C)**
- **77A6 - T5 (-60°C ≤ Tamb ≤ +55°C)**
- **77A9 - T6 (-60°C ≤ Tamb ≤ +40°C)**

These are in the process of being replaced with a single label which covers all potential temperature parameters. Therefore the label will for example, read as follows: -

\[
\begin{align*}
77A & \{ \\
T4 & (-60°C ≤ Tamb ≤ +90°C) \\
T5 & (-60°C ≤ Tamb ≤ +55°C) \\
T6 & (-60°C ≤ Tamb ≤ +40°C)
\end{align*}
\]

For solenoid type 74, the maximum permissible ambient temperature is subject to the coil Wattage. Please see page 10.

Please note that operation ambient is dependent upon seal types.
Solenoid Valve Product Options

Port Connections

Port Connections (FP15)

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Pressure</th>
<th>Service</th>
<th>Vent</th>
<th>Pilot Supply</th>
<th>Pilot Vent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normally Closed</td>
<td>P</td>
<td>S</td>
<td>T</td>
<td>PL</td>
<td>TL</td>
</tr>
</tbody>
</table>

For port connections, please refer to selection chart ordering example on pages 17, 18, 19, 20 & 21.

Product Weights

Approximate Standard Product Weights

<table>
<thead>
<tr>
<th>Product</th>
<th>Approximate Weight (Excluding Sub-base) (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1, S2 &amp; S3</td>
<td>4</td>
</tr>
<tr>
<td>S1 / S2 &amp; S2 / S3 / S3</td>
<td>8.5</td>
</tr>
<tr>
<td>DPS1, DPS2 &amp; DPS3</td>
<td>9</td>
</tr>
<tr>
<td>S4 &amp; S5</td>
<td>5.2</td>
</tr>
<tr>
<td>S6</td>
<td>7</td>
</tr>
</tbody>
</table>

Seal Repair Kit

Seal Repair Kit Selection Chart - Ordering Example (FP15)

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Product Code</th>
<th>S1</th>
<th>S2</th>
<th>S1 / S1</th>
<th>S2 / S2</th>
<th>S3 / S3</th>
<th>Maximum Valve Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15-SX-32-S-RK</td>
<td>Ordering Example</td>
<td>690 bar</td>
<td>690 bar</td>
<td>690 bar</td>
<td>690 bar</td>
<td>690 bar</td>
<td></td>
</tr>
</tbody>
</table>

When ordering the seal repair kits, please ensure that the serial number of the valve to be overhauled is submitted with the enquiry / order.

Solenoid Coil Spare

Solenoid Coil Spare Selection Chart - Ordering Example Type 74 & 77

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Type 74</th>
<th>Type 77</th>
</tr>
</thead>
<tbody>
<tr>
<td>109</td>
<td>Voltage (V)</td>
<td>74 (Ex emb) 24 &amp; 48 Vdc</td>
</tr>
<tr>
<td></td>
<td>Voltage (V)</td>
<td>77 (Ex d) 12, 24, 48 &amp; 110 Vdc</td>
</tr>
<tr>
<td></td>
<td>Voltage (V)</td>
<td>77 (Ex d) 110 &amp; 240 Vac</td>
</tr>
<tr>
<td>109-24DC-30</td>
<td>Power (W)</td>
<td>74 (Ex emb) 1.8 &amp; 3.6 Watts</td>
</tr>
<tr>
<td></td>
<td>Power (W)</td>
<td>77 (Ex d) 1.5 &amp; 3.0 Watts</td>
</tr>
</tbody>
</table>

For detailed information, please contact Bifold sales department.

Solenoid Coil Spare

Solenoid Coil Spare Selection Chart Ordering Example Type 78

<table>
<thead>
<tr>
<th>Model Code</th>
<th>109</th>
<th>109-12 - 155</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nominal Voltage (V)</td>
<td>78 (Ex ia) 12V</td>
</tr>
<tr>
<td></td>
<td>Resistance (Ω)</td>
<td>78 (Ex ia) 155 Ohms - 370 Ohms - (S4, S5 &amp; S6 only)</td>
</tr>
</tbody>
</table>

† Solenoid must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system.

Accuracy of Information

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

When selecting a product, the applicable operating system design must be considered to ensure safe use. The products function, material compatibility, adequate ratings, correct installation, operation and maintenance are the responsibilities of the system designer and user.

Quality Assured

All Bifold products are manufactured to a high standard of quality and durability. We reserve the right to make changes to product specifications and design without prior notice. Bifold reserves the right to make changes to the specifications and design on our website without prior notice.
## Ex emb Options

### Options Table 1  74 (Ex emb)

#### HIGH PRESSURE SOLENOID OPTIONS TABLE 1  74 (Ex emb)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Solenoid Order Code</th>
<th>Typical Apparatus Code</th>
<th>Standard Voltage</th>
<th>Power Consumption (W)</th>
<th>CV Rate</th>
<th>Temperature Range (°C)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (S1)</td>
<td>74</td>
<td>Ex emb II C T3 / T4</td>
<td>24 Vdc</td>
<td>1.8</td>
<td>0.32</td>
<td>-20°C to +50°C</td>
<td>IP66</td>
<td>M20 x 1.5 (¼” NPT Option)</td>
<td>ATEX / IECEx</td>
</tr>
<tr>
<td>FP15 (S2)</td>
<td></td>
<td></td>
<td>48 Vdc</td>
<td>3.6</td>
<td></td>
<td>-25°C to +55°C (T3) (Up to 3.0 W)</td>
<td>IP67</td>
<td>NEMA 4X</td>
<td></td>
</tr>
<tr>
<td>FP15 (S3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-25°C to +50°C (T4) (Up to 4.0 W)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### HIGH PRESSURE TWO STAGE DUAL PULSE SOLENOID OPTIONS TABLE 1  74 (Ex emb)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Solenoid Order Code</th>
<th>Typical Apparatus Code</th>
<th>Standard Voltage</th>
<th>Power Consumption (W)</th>
<th>CV Rate</th>
<th>Temperature Range (°C)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (S1 / S1)</td>
<td>74</td>
<td>Ex emb II C T3 / T4</td>
<td>24 Vdc</td>
<td>1.8</td>
<td>0.32</td>
<td>-20°C to +50°C</td>
<td>IP66</td>
<td>M20 x 1.5 (¼” NPT Option)</td>
<td>ATEX / IECEx</td>
</tr>
<tr>
<td>FP15 (S2 / S2)</td>
<td></td>
<td></td>
<td>48 Vdc</td>
<td>3.6</td>
<td></td>
<td>-25°C to +55°C (T3) (Up to 3.0 W)</td>
<td>IP67</td>
<td>NEMA 4X</td>
<td></td>
</tr>
<tr>
<td>FP15 (S3 / S3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-25°C to +50°C (T4) (Up to 4.0 W)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For detailed information on certification, please see page 9.

Other Wattages available upon request.

# Permissible media operating temperatures are dependent upon the selected O-Ring material. Please refer to the product selection charts on pages 17 to 18.
### HIGH PRESSURE, DUAL REDUNDANT SOLENOID OPTIONS TABLE 1 74 (Ex emb)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Solenoid Order Code</th>
<th>Typical Apparatus Code</th>
<th>Standard Voltage</th>
<th>Power Consumption (W)</th>
<th>CV Rate</th>
<th>Temperature Range (°C)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (DPSS1)</td>
<td>74</td>
<td>Ex emb II C T3 / T4</td>
<td>24Vdc</td>
<td>1.8</td>
<td>0.32</td>
<td>-20°C to +55°C (T3)</td>
<td>IP66</td>
<td>M20 x 1.5</td>
<td>ATEX</td>
</tr>
<tr>
<td>FP15 (DPSS2)</td>
<td></td>
<td></td>
<td>48Vdc</td>
<td>3.6</td>
<td></td>
<td>-25°C to +55°C (T3)</td>
<td>IP67</td>
<td></td>
<td>IECEx</td>
</tr>
<tr>
<td>FP15 (DPSS3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-25°C to +50°C (T4)</td>
<td>NEMA 4X</td>
<td></td>
<td></td>
</tr>
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</table>

#### LOW PRESSURE SOLENOID OPTIONS TABLE 1 74 (Ex emb)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Order Code</th>
<th>Typical Apparatus Code</th>
<th>Standard Voltage</th>
<th>Power Consumption (W)</th>
<th>CV Rate</th>
<th>Temperature Range (°C)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (S4)</td>
<td>74</td>
<td>Ex emb II C T3 / T4</td>
<td>24Vdc</td>
<td>1.8</td>
<td>0.32</td>
<td>-20°C to +40°C</td>
<td>IP66</td>
<td>M20 x 1.5</td>
<td>ATEX</td>
</tr>
<tr>
<td>FP15 (SS)</td>
<td>74</td>
<td></td>
<td>48Vdc</td>
<td>3.6</td>
<td></td>
<td>-25°C to +55°C</td>
<td>IP67</td>
<td></td>
<td>IECEx</td>
</tr>
<tr>
<td>FP15 (S6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-25°C to +50°C</td>
<td>NEMA 4X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For detailed information on certification, please see page 9.
Other Wattages available upon request.

# Permissible media operating temperatures are dependent upon the selected O-Ring material. Please refer to the product selection charts on pages 19 to 21.
## HIGH PRESSURE SOLENOID OPTIONS TABLE 2  77 (Ex d)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Solenoid Order Code</th>
<th>Typical Apparatus Code</th>
<th>Standard Voltage</th>
<th>Power Consumption (W)</th>
<th>CV Rate</th>
<th>Temperature Range (ºC)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (S1)</td>
<td>77</td>
<td>Ex d IIC T6, T5 or T4</td>
<td>12Vdc</td>
<td>1.5</td>
<td>0.32</td>
<td>-20ºC to +90ºC (T4)</td>
<td>IP66 IP67</td>
<td>M20 x 1.5</td>
<td>ATEX IECEx INMETRO GOST GOST K GGTN CSA (C, US)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24Vdc</td>
<td></td>
<td></td>
<td>-60ºC to +90ºC (T4)</td>
<td>(¼” NPT Option)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>48Vdc</td>
<td></td>
<td></td>
<td>-60ºC to +90ºC (T4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>110 Vdc</td>
<td></td>
<td></td>
<td>-60ºC to +90ºC (T4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>110 Vac 240 Vac</td>
<td></td>
<td></td>
<td>-60ºC to +90ºC (T4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>50 or 60 Hz</td>
<td></td>
<td></td>
<td>-60ºC to +90ºC (T4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FP15 (S2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>FP15 (S3)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For detailed information on certification, please see page 9.

Other Wattages available upon request.

# Permissible media operating temperatures are dependent upon the selected O-Ring material. Please refer to the product selection charts on pages 17 to 18.
### High Pressure, Dual Redundant Solenoid Options Table 2  77 (Ex d)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Solenoid Order Code</th>
<th>Typical Apparatus Code</th>
<th>Standard Voltage</th>
<th>Power Consumption (W)</th>
<th>CV Rate</th>
<th>Temperature Range (°C)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (DPSS1)</td>
<td>77</td>
<td>Ex d IIC T6, T5 or T4</td>
<td>12 Vdc 24 Vdc 48 Vdc 110 Vdc 110 Vac 240 Vac 50 or 60 Hz</td>
<td>1.5</td>
<td>0.32</td>
<td>-20°C to +90°C (T4) -60°C to +90°C (T4)</td>
<td>IP66 IP67 NEMA 4X</td>
<td>M20 x 1.5 (1/2&quot; NPT Option)</td>
<td>ATEX IECEx INMETRO GOST GOST K GGTN CSA (C, US)</td>
</tr>
<tr>
<td>FP15 (DPSS2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FP15 (DPSS3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Low Pressure Options Table 2  77 (Ex d)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Solenoid Order Code</th>
<th>Typical Apparatus Code</th>
<th>Standard Voltage</th>
<th>Power Consumption (W)</th>
<th>CV Rate</th>
<th>Temperature Range (°C)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (S4)</td>
<td>77</td>
<td>Ex d IIC T6, T5 or T4</td>
<td>12 Vdc 24 Vdc 48 Vdc 110 Vdc 110 Vac 240 Vac 50 or 60 Hz</td>
<td>1.5</td>
<td>0.32 (S4 &amp; S6)</td>
<td>-20°C to +90°C (T4) -60°C to +90°C (T4)</td>
<td>IP66 IP67 NEMA 4X</td>
<td>M20 x 1.5 (1/2&quot; NPT Option)</td>
<td>ATEX IECEx INMETRO GOST GOST K GGTN CSA (C, US)</td>
</tr>
<tr>
<td>FP15 (S5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FP15 (S6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For detailed information on certification, please see page 9.

Other Wattages available upon request.

# Permissible media operating temperatures are dependent upon the selected O-Ring material. Please refer to the product selection charts on pages 19 to 21.
### Ex ia Options

Options Table 3  78 (Ex ia)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Solenoid Order Code</th>
<th>Typical Apparatus Code</th>
<th>CV Rate</th>
<th>Temperature Range (°C)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (S1)</td>
<td>78 †</td>
<td>Ex ia IIC T6 or T4</td>
<td>0.32</td>
<td>Media #</td>
<td>IP66</td>
<td>M20 x 1.5 (¼&quot; NPT Option)</td>
<td>Ex ATEX  IECEx INMETRO GOST GOST K GGTN</td>
</tr>
<tr>
<td>FP15 (S2)</td>
<td>78 †</td>
<td>Ex ia IIC T6 or T4</td>
<td>0.32</td>
<td>Media #</td>
<td>IP66</td>
<td>M20 x 1.5 (¼&quot; NPT Option)</td>
<td>Ex ATEX  IECEx INMETRO GOST GOST K GGTN</td>
</tr>
<tr>
<td>FP15 (S3)</td>
<td>78 †</td>
<td>Ex ia IIC T6 or T4</td>
<td>0.32</td>
<td>Media #</td>
<td>IP66</td>
<td>M20 x 1.5 (¼&quot; NPT Option)</td>
<td>Ex ATEX  IECEx INMETRO GOST GOST K GGTN</td>
</tr>
</tbody>
</table>

For detailed information on certification, please see page 9.
† Solenoid must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system.

# Permissible media operating temperatures are dependent upon the selected O-Ring material. Please refer to the product selection charts on pages 17 to 18.

### Safety Parameters: Type 78 (S1, S2, S3, S1 / S1, S2 / S2 & S3 / S3)

- \( U_i = 31\, V \), \( I_i = 210\, mA \), \( P_i = 1.5\, W \), \( C_i = 0\, \mu F \), \( L_i = 0\, mH \)
- Coil Resistance : 155 Ohm ± 5%
- Minimum Current @ solenoid coil = 80 mA

### Safety Parameters: Type 78 (S4, S5 & S6)

- \( U_i = 31\, V \), \( I_i = 210\, mA \), \( P_i = 1.5\, W \), \( C_i = 0\, \mu F \), \( L_i = 0\, mH \)
- Coil Resistance : 370 Ohm ± 5%
- Minimum Current @ solenoid coil = 32 mA
### Ex ia Options

**Options Table 3 78 (Ex ia)**

#### HIGH PRESSURE, DUAL REDUNDANT SOLENOID OPTIONS TABLE 3 78 (Ex ia)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Solenoid Order Code</th>
<th>Typical Apparatus Code</th>
<th>CV Rate</th>
<th>Temperature Range (°C)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (DPSS1)</td>
<td>78 †</td>
<td>Ex ia IIC T6 or T4</td>
<td>0.32</td>
<td>Media #</td>
<td></td>
<td></td>
<td>ATEX IECEx INMETRO GOST GOST K GGTN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-20°C to +95°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-60°C to +95°C</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td>Ambient</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-60°C to +60°C (T6)</td>
<td>IP66</td>
<td>M20 x 1.5</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-60°C to +95°C (T4)</td>
<td>NEMA 4X</td>
<td></td>
<td></td>
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<tr>
<td>FP15 (DPSS2)</td>
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</tr>
<tr>
<td>FP15 (DPSS3)</td>
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</tbody>
</table>

#### LOW PRESSURE SOLENOID OPTIONS TABLE 3 78 (Ex ia)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Solenoid Order Code</th>
<th>Typical Apparatus Code</th>
<th>CV Rate</th>
<th>Temperature Range (°C)</th>
<th>Ingress Protection</th>
<th>Cable Entry Connection</th>
<th>Certification Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP15 (S4)</td>
<td>78 †</td>
<td>Ex ia IIC T6 or T4</td>
<td>0.32</td>
<td>Media #</td>
<td></td>
<td></td>
<td>ATEX IECEx INMETRO GOST GOST K GGTN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-20°C to +95°C</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-60°C to +95°C</td>
<td></td>
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<td>Ambient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-60°C to +60°C (T6)</td>
<td>IP66</td>
<td>M20 x 1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-60°C to +95°C (T4)</td>
<td>NEMA 4X</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>FP15 (S5)</td>
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<td></td>
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<tr>
<td>FP15 (S6)</td>
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</tr>
</tbody>
</table>

For detailed information on certification, please see page 9.

† Solenoid must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system.

# Permissible media operating temperatures are dependent upon the selected O-Ring material. Please refer to the product selection charts on pages 19 to 21.

#### Safety Parameters: Type 78 (S1, S2, S3, S1 / S1, S2 / S2 & S3 / S3)

- \( U_i = 31 \text{V}, I_i = 210 \text{mA}, P_i = 1.5 \text{W}, C_i = 0 \mu \text{F}, L_i = 0 \text{mH} \)
- Coil Resistance: 155 Ohm ± 5%
- Minimum Current @ solenoid coil = 80 mA

#### Safety Parameters: Type 78 (S4, S5 & S6)

- \( U_i = 31 \text{V}, I_i = 210 \text{mA}, P_i = 1.5 \text{W}, C_i = 0 \mu \text{F}, L_i = 0 \text{mH} \)
- Coil Resistance: 370 Ohm ± 5%
- Minimum Current @ solenoid coil = 32 mA

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**Accuracy of Information**

The tables and images provided are intended to give an overview of the features and specifications of the products. The tables are based on the most recent information available at the time of publication. The accuracy of the information is subject to change, and the manufacturer reserves the right to make amendments or corrections. The product specifications and design may vary, subject to change without notice.
## Dimensional Drawing

![Diagram](image)

### FP15 Selection Chart - Ordering Example

<table>
<thead>
<tr>
<th>FP15</th>
<th>Model Code</th>
<th>Sub-base Mounting</th>
<th>High Pressure, Pilot Stage Solenoid Valves</th>
<th>Connections</th>
<th>Valve Configuration</th>
<th>O-ring Material</th>
<th>Option</th>
<th>Solenoid Approval</th>
<th>Ex emb 'T' Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>345 bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>517 bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>690 bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SOLENOID HOUSING MAY BE

Rotated Th' 360°

- Normally Open (NC Normally Closed as Standard)
- For maximum operating temperatures see 'T' Rating Limitations for Ex emb.
- See 'T' Rating Limitations for Ex emb. on pages 11, 13 & 15.

### Accuracy of Information

While every effort is made to produce information in this catalogue in a clear and accurate manner, the information is in accordance with the best knowledge and belief of the company at the time of printing. All dimensions, weights and other information in the catalogue are given as guidance to help in selecting the correct product. No information given in the catalogue should be taken as definitive. No guarantee is given as to the performance of any product and no warranty is given for the performance of any product. Consequently, while every attempt is made to ensure that the information given is correct, the company accepts no liability for errors or inaccuracies.

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All Bifold products are manufactured to a most stringent Quality Assurance programme to ensure that every product will give optimum performance and reliability. We are a member of the Bifold Group of companies.

### For the shaded block sections, please refer to the same shaded sections on pages 11, 13 & 15.

† Solenoid must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system.

The solenoid valve installation operating and maintenance instruction references are OP0001 & OP0165.
**FP15 - S1 / S1, S2 / S2 & S3 / S3 Selection Chart**

**FP15**

<table>
<thead>
<tr>
<th>FP15</th>
<th>Model Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td></td>
<td>Sub-base Mounting</td>
</tr>
<tr>
<td>04</td>
<td></td>
<td>Pulse operated, hydrually latched, spring bias to close on loss of pressure</td>
</tr>
<tr>
<td>06</td>
<td></td>
<td>Maximum Valve Pressure</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>Connections</td>
</tr>
<tr>
<td>32</td>
<td></td>
<td>Valve Configuration</td>
</tr>
</tbody>
</table>

**FP15 Selection Chart - Ordering Example**

For the shaded block sections, please refer to the same shaded sections on pages 11, 13 & 15.

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Quality Assurance

All Bifold products are manufactured to a high standard in order to achieve the best possible performance and reliability. The end product contains over 1000 different items, and it is Bifold’s responsibility to ensure that only the highest quality can be achieved. Bifold will not be responsible for any errors or omissions in the data. It is the responsibility of the end-user to ensure that the Bifold products are appropriate for the application and any information provided by Bifold is used in conjunction with the Bifold Quality Assurance Policy and the Bifold Quality Manual.

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### FP15 Selection Chart - Ordering Example

#### FP15 (DPSS1, 2 & 3)

**Dimensional Drawing**

---

**FP15/DPSS1/ 04 /32 / 74 A    T4- ML / K85 / H2S/K6 / EP / S  / 24D / 36 /**  

---

**FP15 Selection Chart - Ordering Example**

| Model Code | Code | High Pressure, Pilot Stage, Dual Redundant Solenoid Valves | Maximum Valve Pressure | Connections | Valve Configuration | O-ring Material | Solenoid Approval | Ex emb 'T' Option | Voltage | Resistance (Ω) | Resistance † | Options | Power (W) | Power | Option | Option | Option | Option |  
|------------|------|----------------------------------------------------------|------------------------|-------------|---------------------|-----------------|------------------|------------------|---------|-----------------|-------------|---------|-----------|-------|---------|---------|---------|---------|---------|  
| DPSS1      | 345  | 38MP ¾" MP Body Ported (Non Standard)                   |                        |             |                     |                 |                  |                  |         |                  |             |         |           |       |         |         |         |         |         |  
| DPSS2      | 517  |                                                         |                        |             |                     |                 |                  |                  |         |                  |             |         |           |       |         |         |         |         |         |  
| DPSS3      | 690  |                                                         |                        |             |                     |                 |                  |                  |         |                  |             |         |           |       |         |         |         |         |         |  

---

**Sub-base Mounting**

<table>
<thead>
<tr>
<th>Code</th>
<th>04</th>
<th>06</th>
<th>2</th>
<th>32</th>
<th>3</th>
<th>2 way, 2 - position</th>
<th>3 way, 2 - position</th>
<th>Nitrile (standard)</th>
<th>Nitrile (Low Temperature)</th>
<th>Viton</th>
<th>(-30°C to +130°C)</th>
<th>(-30°C to +180°C)</th>
<th>74 (Ex emb)</th>
<th>77 (Ex d)</th>
<th>78 (Ex ia)</th>
<th>74(Ex emb)</th>
<th>77(Ex d)</th>
<th>78(Ex ia)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Page 12 - Table 1</td>
<td>Page 14 - Table 2</td>
<td>Page 16 - Table 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Option**

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
</tr>
<tr>
<td>ML</td>
</tr>
<tr>
<td>MOR</td>
</tr>
</tbody>
</table>

---

**Valve Configuration**

- **S**: Sub-base Options
- **V**: Voltage, refer to Solenoid options tables.
- **SA**: Refer to Solenoid options tables.

---

**Connections**

- **W**: NPT Body Ported
- **W**: 'NPT Body Ported (Non Standard)

---

**O-ring Material**

- **S**: Nitrile (Low Temperature)
- **V**: Viton
- **SA**: Nitrile (standard)

---

**Solenoid Approval**

- **AG**: ATEX/IECEx Dual Certified/Labelled
- **GI**: GOST
- **IU**: INMETRO
- **CSA (US)**: ATEX Dual Certified/Labelled

---

**Ex emb 'T' Option**

- **T4**: Class ≤ 4.0 W. (50°C maximum ambient temperature)

---

**Resistance (Ω)**

- **XX**: Resistance (Ω) - 155 Ohms

---

**Resistors**

- **S**: 99 99 99

---

**Power (W)**

- **XX**: Power (W)

---

**Sub-Base Options**

- **M**: "NPT cable entry
- **K**: "NPT Body Ported
- **H**: "NPT Body Ported (Non Standard)

---

**Quality Assurance**

All Bifold products are manufactured to a stringent QA programme and meet the requirements of ISO 9001:2008. This document has been reviewed to ensure that the information is accurate and up to date. We reserve the right to make changes where necessary. Accuracy of information is subject to change without notice. For more information, please refer to the product catalogue issue list on our web site or contact a member of our sales team.

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**For the shaded block sections, please refer to the same shaded sections on pages 12, 14 & 16.**

† Solenoid must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system.

The solenoid valve installation operating and maintenance instruction references are OP0001 & OP0165.

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

When selecting a product, the applicable operating system design must be considered to ensure safe use. The products function, material compatibility, adequate ratings, correct installation, operation and maintenance are the responsibilities of the system designer and user.

Quality Assurance
All Bifold products are manufactured to a most stringent QA programme to ensure that every product will give optimum performance and reliability. We are third-party certified to BS EN ISO 9001. Invoiced to order, batch certification for sub-base, sub-base options or components is available on request to Bifold National Sales.

For the shaded block sections, please refer to the same shaded sections on pages 12, 14 & 16.

† Solenoid must be used in conjunction with a correctly matched Intrinsically Safe (IS) solenoid driver. The valve installer is responsible for a correct and safe IS system. The solenoid valve installation and maintenance instruction references are OP0001 & OP0165.
### FP15 (S6) Selection Chart - Ordering Example

**FP15**

<table>
<thead>
<tr>
<th>Sub-base Mounting</th>
<th>Model Code</th>
<th>Maximum Valve Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 1/4&quot; NPT Body Ported</td>
<td>S6 690 bar</td>
<td>38MP 7/8&quot; MP Body Ported (Non Standard)</td>
</tr>
<tr>
<td>06 3/8&quot; NPT Body Ported</td>
<td>7 bar (Max Pilot)</td>
<td></td>
</tr>
<tr>
<td>3 way, 2 - position</td>
<td>3 way, 2 - position</td>
<td></td>
</tr>
</tbody>
</table>

**Connections**

- 74 (Ex emb) Page 12 - Table 1
- 77 (Ex d) Page 14 - Table 2
- 78 (Ex ia) Page 16 - Table 3

**Solenoid Approval**

| ATEX/IECEx Dual Certified/Labelled |
| GOST                             |
| INMETRO                          |
| CSA (US) ATEX Dual Certified/Labelled |

**Valve Configuration**

- Nitrile (standard) (-30°C to +130°C)
- Viton (-20°C to +180°C)
- Nitrile (Low Temperature) (-40°C to +180°C)

**O-ring Material**

- Nitrile (standard) (-30°C to +130°C)
- Viton (-20°C to +180°C)
- Nitrile (Low Temperature) (-40°C to +180°C)

**Resistance (Ω)**

- 74 (Ex emb) Page 12 - Table 1
- 77 (Ex d) Page 14 - Table 2
- 78 (Ex ia) Page 16 - Table 3

**Voltage**

- 74 (Ex emb) Page 12 - Table 1
- 77 (Ex d) Page 14 - Table 2
- 78 (Ex ia) Page 16 - Table 3

**Power**

- 74 (Ex emb) - 1.8 & 3.6 Watts Page 12 - Table 1
- 77 (Ex d) - 1.5 & 3.0 Watts Page 14 - Table 2

**Sub-Base Options**

- M306 1/4" NPT
- M1236 1/2" BSP
- M1211 1/2" BSP
- M329 1/4" NPT
- M1216 1/2" BSP
- M1211 1/2" BSP

**Sub-Base Options**

- Type 74
- Type 77
- Type 78

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Accessory Information

Options

Product Options

The range of products displayed in this brochure, are designed to accommodate all the options shown below. If the style or arrangement required for your application is not shown, please contact our office with full description and specification details.

Manual Override Type M

The solenoid valve switches on and off with the electrical supply. The manual override button can be pressed to operate the valve when the solenoid is in the electrically de-energised position. The manual override is non-detented, i.e. does not latch in position. When the button is released, the valve spring returns.

Manual Rotary Override Type MOR

The solenoid valve switches on and off with the electrical supply. The manual override button is rotated through ¾ turn to operate the valve when the solenoid is in the electrically de-energised position. The manual override is detented, i.e. remains in position until rotated back to its original position when the valve spring returns.

Manual Reset Type ML

Apply the electrical signal and press the reset button. The valve moves to the energised position and will not de-energise until the electrical supply is removed. The manual reset is non-detented, spring return, i.e. does not latch in position. The valve cannot be moved to the energised position by pressing the button if there is no electrical supply to the solenoid.

Accuracy of information

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When selecting a product, the applicable operating system design must be considered to ensure safe use. The products function, material compatibility, adequate ratings, correct installation, operation and maintenance are the responsibilities of the system designer and user.

Quality Assurance

All Bifold products are manufactured to a most stringent QA programme to ensure that every product will give optimum performance and reliability. We are ISO 9001:2008 certified and operate to BS EN 10204 3.1 where available. We reserve the right to make changes in the specifications and design of our products, without prior notice.
**Interface Detail**

**(For Customer Designed Sub-Base)**

![Diagram of Interface Detail](image)

**Surface Finish Requirements**

Valve Manifold Mounting - Surface Finish Requirements:
(applicable to full extent of valve/manifold interface)

- **Rz 3.2 μm (max)**

**Typical Assemblies**

**Typical Valve Assembly Showing an FP15 Solenoid Valve**

![Schematic of Typical Valve Assembly Showing an FP15 Solenoid Valve](image)

**Typical Valve assembly showing FP15 Solenoid Valves**

![Schematic of Typical Valve Assembly Showing an FP15 Solenoid Valve](image)

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Pneumatic and Instrumentation Valves
Hydraulic Valves
Subsea Valves
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