<table>
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<tr>
<th>Series</th>
<th>Body material</th>
<th>Page no.</th>
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<tr>
<td>Watson Smith VP10 Series</td>
<td>Aluminium</td>
<td>204</td>
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<tr>
<td>Proportional pressure control valves</td>
<td>Zinc</td>
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</tr>
<tr>
<td>Watson Smith 140 Failsafe series</td>
<td>Aluminium</td>
<td>206</td>
</tr>
<tr>
<td>Current to pressure (I/P) electronic converter</td>
<td>Zinc</td>
<td></td>
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<tr>
<td>Watson Smith 421 Failsafe Series</td>
<td>Aluminium</td>
<td>208</td>
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<tr>
<td>Compact current to pressure (I/P) electronic converter</td>
<td>Zinc</td>
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</tr>
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<td>Watson Smith 422 Failfreeze Series</td>
<td>Aluminium</td>
<td>210</td>
</tr>
<tr>
<td>Current to pressure (I/P) electronic converter</td>
<td>Zinc</td>
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</tr>
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<td>Watson Smith 68 Series</td>
<td>Aluminium</td>
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</tr>
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<td>P/I Transmitters and converters</td>
<td>Zinc</td>
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</table>
Watson Smith VP10 Series
Proportional pressure control valves

Robust proportional I/P and E/P converters
Suitable for a wide range of applications
High accuracy
High flow versions available
IP 65 protection in normal operation

Technical data

Medium:
Compressed air filtered to 5 µm, oil-free, dry

Output signal:
0.2 to 1.0 bar, 0.2 to 2.0 bar, 0.2 to 4.0 bar (2 wire version), 0.2 to 6 bar, 0.2 to 8 bar (3 wire version)

Flow:
Up to 300 l/min

Air consumption:
<4 bar: 0.85 l/min typical at 50% signal
>4 bar: 1.75 l/min typical at 50% signal

Operating pressure:
At least 0.7 bar above maximum required output pressure range

Mounting:
Integral surface mounting bracket provided for preferred vertical mounting. 50 mm pipe mounting kit available

Ambient temperature:
-40°C to +85°C
Consult our Technical Service for use below +2°C

Response time:
<2 bar: less than 0.5 seconds
>2 bar: 2 seconds for 10 to 90% step change (dependent on input for 10 to 90% step change and outlet pressures)

Total error:
±0.5% of span (typical, independent error includes the combined effect of non-linearity, hysteresis, deadzone and repeatability)

Temperature effect:
Average 0.1% of span/°C for span and zero over operating range

Supply sensitivity:
< 0.075% span output change per % supply pressure change

Failure mode:
Signal falls to bleed pressure when electrical supply fails

Weight: 0.825 kg

Materials
Body: passivated zinc die-casting, epoxy painted
Diaphragms: nitrile
Internal: beryllium copper/brass
Flapper nozzle and supply valve: stainless steel/nylon

<table>
<thead>
<tr>
<th>Control signal</th>
<th>Output pressure (bar)</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 10 V</td>
<td>0.2 ... 1</td>
<td>VP101BJ100A00</td>
</tr>
<tr>
<td>4 ... 20 mA</td>
<td>0.2 ... 1</td>
<td>VP101BJ400A00</td>
</tr>
<tr>
<td>0 ... 10 V</td>
<td>0.2 ... 2</td>
<td>VP102BJ100A00</td>
</tr>
<tr>
<td>4 ... 20 mA</td>
<td>0.2 ... 2</td>
<td>VP102BJ400A00</td>
</tr>
<tr>
<td>0 ... 10 V</td>
<td>0.2 ... 4</td>
<td>VP104BJ100A00</td>
</tr>
<tr>
<td>4 ... 20 mA</td>
<td>0.2 ... 4</td>
<td>VP104BJ400A00</td>
</tr>
<tr>
<td>0 ... 10 V</td>
<td>0.2 ... 6</td>
<td>VP106BJ101A00</td>
</tr>
<tr>
<td>4 ... 20 mA</td>
<td>0.2 ... 6</td>
<td>VP106BJ401A00</td>
</tr>
<tr>
<td>0 ... 10 V</td>
<td>0.2 ... 8</td>
<td>VP108BJ101A00</td>
</tr>
<tr>
<td>4 ... 20 mA</td>
<td>0.2 ... 8</td>
<td>VP108BJ401A00</td>
</tr>
</tbody>
</table>

Electrical information

Electromagnetic compatibility: This is a passive electromagnetic instrument and is unaffected by interfering high frequency signals

Electrical signal:
Two wire version 4 to 20 mA or 0 to 10 V
Three wire version requires 12 to 24 V d.c. supply

Connections:
30 mm square connector DIN 43650 provided, mountable in four directions (alternative connections available)
Watson Smith VP10 Series
Proportional pressure control valves

Characteristic curves

Forward flow characteristics
(Supply pressure 7 bar)

Relief flow characteristics
(Supply pressure 7 bar)

Span/zero adjustments

20% of output range

Flow (l/min)
Outlet pressure (bar)
Outlet pressure (bar)
Input signal
Watson Smith 140 Failsafe series
Current to pressure (I/P) electronic converter
½ NPT or M20x1,5

**Technical data**

**Medium:**
Compressed air, min. filtered to 50 µm, oil-free, dry
Internal in-built air filter

**Output signal:**
0.2 to 1 bar

**Flow:**
>300 Nl/min

**Air consumption:**
< 2.5 Nl/min at 50% signal

**Instrument accuracy:**
Mean <0,1%

**Mounting:**
Integral bracket allows for surface or 50 mm pipe mounting in any orientation

**Ambient temperature:**
-40°C to +85°C
Consult our Technical Service for use below +2°C

**Linearity:**
Mean <0,05% of span

**Hysteresis:**
Mean <0,05% of span

**Temperature effect:**
Typically less than 0,035% span/°C between -40°C
to +85°C

**Supply sensitivity:**
Less than 0.1% of span over full supply pressure range

**Calibration:**
Independent control of 0% and 100% set points.
Adjustable by potentiometers up to 20% of output range. Unit is factory calibrated to within 1% of span.

**Fail-safe:**
Signal falls to below 15mbar in < 2sec, when input signal fails.

**Tight shut-off control:**
Potentiometer sets input signal failure at 3,5 mA

**Electromagnetic compatibility:**
Compliant with EC requirements EN 50081-2:1994 (Emissions) and EN50082-2:1995 (Immunity)

**Weight:**
2,07 kg

**Materials**
Body: aluminium and zinc diecasting
Diaphragms: nitrile
Black epoxy powder coating standard
Watson Smith 140 Failsafe series
Current to pressure (I/P) electronic converter
½ NPT or M20x1,5

Characteristic curves

Flow capacity at 12 mA
1,3, 2 and 4 bar supply pressure
Watson Smith 421 Failsafe Series
Compact current to pressure (I/P) electronic converter
¼ NPT

Advanced electronic control
High density rail mounting
Failsafe operation (output pressure fails to minimum on power failure)
Vibration immune

Technical data
Medium:
Compressed air, filtered to 5 µm, oil-free, dry
Output signal:
0, 2 to 1 bar; minimum outlet pressure less than 15 mbar
Flow:
Up to 150 Nl/min
Air consumption:
0,2 l/min typical low pressure
Operating pressure:
1, 5 to 3,5 bar or at least 0,7 bar above maximum output pressure
Mounting:
Optional. A rail clip is provided with each instrument for TS32 EN50035)/TS35 (EN50022) rail.
Ambient temperature:
-10°C to +60°C
Consult our Technical Service for use below +2°C
Response time:
5 seconds (10 to 90% or 90 to 10% of output pressure into a 5 litre load)
Total error:
±0,5% of span (typical, independent error includes the combined effect of non-linearity, hysteresis, deadzone and repeatability
Temperature effect:
Typically less than 1% span for span and zero between 0°C and 50°C
Supply sensitivity:
Maximum of ±2% of outlet pressure at extremes of supply range
Degree of protection:
IP40
Vibration immunity:
The unit possesses a high degree of immunity
Electromagnetic compatibility:
Compliant and CE marked in accordance with the EC E.M.C. directive. Tested to standards: BS EN50082-2: 1995, BS EN50081-2: 1994
Weight: 0,6 kg

Materials
Pressure converter:
Anodised natural aluminium

<table>
<thead>
<tr>
<th>Output pressure (bar)</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 ... 1</td>
<td>53AB2100</td>
</tr>
</tbody>
</table>

Electrical information

<table>
<thead>
<tr>
<th>Electrical signal</th>
<th>4 to 20 mA (two wire); load presents 10 volts (±0.5 V) constant voltage drop to the current source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure mode</td>
<td>Signal falls to below 15 mbar when input signal fails</td>
</tr>
<tr>
<td>Connections</td>
<td>Two part quick release terminal block with capacity up to 2.5 mm² cable</td>
</tr>
</tbody>
</table>
Watson Smith 421 Failsafe Series
Compact current to pressure (I/P) electronic converter
¼ NPT

Bracket mounted

Characteristic curves

Span/Zero adjustments

<table>
<thead>
<tr>
<th>Max.</th>
<th>20% of output range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td></td>
</tr>
</tbody>
</table>

Input signal

Bracket mounted

1. Mounting bracket
2. Mounting rail
3. 1/8” NPT pneumatic fittings
4. Pressure inlet port
5. Pressure outlet port
**Technical data**

**Medium:**
Compressed air, filtered to 5 µm, oil-free, dry

**Output signal:**
0.2 to 1 bar low pressure unit; 0.2 to 8 bar high pressure unit; minimum outlet pressure less than 140 mbar

**Flow:**
Up to 300 Nl/min

**Air consumption:**
0.2 l/min typical low pressure; 0.4 l/min typical high pressure

**Operating pressure:**
At least 0.7 bar above maximum output pressure

**Mounting:**
Operation in any attitude is possible without recalibration; integral surface mounting bracket provided for vertical mounting

**Ambient temperature:**
-20°C to +70°C
Consult our Technical Service for use below +2°C

**Response time:**
6 seconds (low pressure unit)
12 seconds (high pressure unit) (from 10 to 90% of output pressure into a 5 litre load)

**Total error:**
Max. error ±0.5% of span (low pressure), 0.5% (high pressure) (typical, independent error includes combined effect of non-linearity, hysteresis, deadzone and repeatability)

**Temperature effect:**
Typically better than 1% span between -10°C and 60°C

**Supply sensitivity:**
Negligible effect

**Degree of protection:**
IP65

**Vibration immunity:**
The unit possesses a high degree of immunity

**Electromagnetic compatibility:**
Compliant and CE marked in accordance with the EC E.M.C. directive. Tested to standards: BS EN50082-2: 1995 & BS EN50081-2: 1994

**Weight:**
0.8 kg

**Materials**

**Body:** zinc diecasting passivated and epoxy painted
**Cover:** Verton glass/nylon
**Diaphragms:** nitrile

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**Electrical information**

**Electrical signal:**
4 to 20 mA (two wire); load presents 6 V (±0.5 V) constant voltage drop to the current source

**Failure mode:**
Signal held at previous value when input signal falls below 2 mA ±0.5 mA; drift rate 0.02% in 30 seconds (mid-range)

**Connections:**
30 mm square connector DIN 43650 provided, mountable in four directions

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**Model Output pressure (bar)**

<table>
<thead>
<tr>
<th>Output pressure (bar)</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 ... 1</td>
<td>53AC2100</td>
</tr>
<tr>
<td>0.2 ... 8</td>
<td>53AC2400</td>
</tr>
</tbody>
</table>

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**Electrical connections:**

- Pneumatic connections: NPT female
- Electrical connections: 30 mm square connector DIN 43650 provided

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**Advanced electronic control**

*Failfreeze operation (output pressure retained on power failure)*

*Vibration Immune*

*IP65 environment protection*

*ATEX approved*

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**Watson Smith 422 Failfreeze Series**

Current to pressure (I/P) electronic converter

½ NPT

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**I/P & P/I Converters**

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**Input to Pressure (I/P) & Pressure to Current (P/I) Converters**

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**Design and Testing**

- Compliant and CE marked in accordance with the EC E.M.C. directive.

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**Weight:**

0.8 kg

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**Materials**

- **Body:** zinc diecasting passivated and epoxy painted
- **Cover:** Verton glass/nylon
- **Diaphragms:** nitrile
Watson Smith 422 Failfreeze Series
Current to pressure (I/P) electronic converter
½ NPT

Characteristic curves

Flow capacity at 12 mA
1.3, 2 and 4 bar supply pressure

Outlet pressure (bar)
Flow capacity (l/min)

Span/Zero adjustments

Outlet pressure (bar)
Min. Input signal Max.

20% of output range
Watson Smith 68 Series
P/I Transmitters and converters
¾ NPT

**Technical data**

Medium:
Dry, non corrosive air or gas. The units are not suitable for continuous liquid exposure

Over pressure:
At least 100% with negligible calibration error, except for 10 bar models which are 13.5 bar maximum

Operating pressure:
0 to 10 bar

Mounting:
DIN rail clips fit TS32 and TS35 rail or direct pipe mounting

Ambient temperature:
-10°C to +60°C
Consult our Technical Service for use below +2°C

Response time:
<10 ms for 95% step output

Range and zero controls:
±10% FS (minimum adjustment)

Total error:
±0.2% FS max.

Linearity:
Typically ±0.15%, ±0.3% max.

Hysteresis:
Typically ±0.15%, ±0.3% max.

Temperature effect:
Zero <±0.025% FS/°C
Span <±0.025% FS/°C
Stability <±0.025 over 6 months

Supply sensitivity:
±0.05% FS/V max.

Degree of protection:
IP54 (IP65 option available)

Electromagnetic compatibility:
Compliant and CE marked in accordance with the EC E.M.C. directive. Tested to standards:
BS EN50082-2: 1995, BS EN50081-2: 1994

Weight: 0.2 kg

**Materials**

Casing: extruded aluminum
End plates: zinc diecast
Diaphragms: nitrile
Transducer: composite construction, mainly nickel, aluminum
Kovar, silicon rubber/gel
PCB: epoxy glass fibre

**Electrical information**

Supply voltage 9 to 30 V continuous
Output 4 to 20mA
Voltage drop 9 V min. (across unit)
Load resistance 750 ohms max. (24 V supply)
Connections Standard - Klippon terminal block to accept cables upto 2,5 mm²
Weatherproof - 16 mm square connector to DIN43650 to accept cable up to 6 mm diameter with conductors of 0.75 mm²

**Output pressure (bar)**

<table>
<thead>
<tr>
<th>Output pressure (bar)</th>
<th>Model Standard</th>
<th>Weatherproof</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 ... 1</td>
<td>53682100</td>
<td>53682110</td>
</tr>
<tr>
<td>0 ... 4</td>
<td>53683300</td>
<td>53683310</td>
</tr>
<tr>
<td>0 ... 6</td>
<td>53683700</td>
<td>53683710</td>
</tr>
<tr>
<td>0 ... 7</td>
<td>53683600</td>
<td>53683610</td>
</tr>
<tr>
<td>0 ... 10</td>
<td>53683500</td>
<td>53683510</td>
</tr>
</tbody>
</table>

**Alternative models**

Pressure ranges between 0 to 5 bar and 10 bar
Voltage ranges other than 0 to 10 V
Watson Smith 68 Series
P/I Transmitters and converters
¼ NPT

1. Klippon terminal (standard models)
2. Weatherproof DIN connector
3. Range set
4. Zero set
5. 2x Ø 3.2 Fixing holes at 40 CTRS on surface mounting plate (optional)
6. DIN rail mounting clip