

Proportional Technologies

140, 422, VP10/100X, VP50, VP50S, VP12, VP51, VP23 & VP60 Series



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Engineering GREAT solutions through people, products, innovation and service

IMI Precision Engineering is a world-leader in fluid and motion control. Building close, collaborative relationships with our customers, we gain a deep understanding of their engineering needs and then mobilise our resources and expertise to deliver distinctive products and solutions.

Wherever precision, speed and engineering reliability are essential, our global footprint, problem-solving capability and portfolio of high performance products enables us to deliver GREAT solutions which help customers tackle the world's most demanding engineering challenges.

> Reliability

We deliver and support our high quality products through our global service network.

> High performance products

Calling on a world-class portfolio of fluid and motion control products including IMI Norgren, IMI Buschjost, IMI FAS, IMI Herion and IMI Maxseal. We can supply these singly, or combined in powerful customised solutions to improve performance and productivity.

> Partnership & Problem Solving

We get closer to our customers to understand their exact challenges.

Proportional Expertise

Proportional control is essential when you need the flexibility to control the output pressure or flow in an application. This can be achieved with simple programming steps. IMI Precision Engineering offers unrivalled expertise to find the right solution for you. Choose from our extensive range of proportional valves - analogue and digital, open or closed loop, flow or pressure control.

Our pressure and flow control proportional valves incorporate advanced spool and balanced-poppet technologies. Unlike competitor products which rely upon miniature snap-action seats, our valves provide true stepless pressure or flow control. The result is smooth high speed response, low noise, and a long trouble free cycle life.

On-board digital electronics assure maximum flexibility and ease of tuning for specific application conditions. Self diagnostics, optional digital displays, and a variety of Fieldbus interfaces are all benefits of the microprocessor-based design.

Precise closed-loop performance is achieved via internal pressure feedback (pressure control valves).

- > Comprehensive range to meet all application requirements
- > Smooth stepless response for better resolution
- > Quiet and reliable due to pilot valve operation
- > Highly configurable for application specific requirements
- > Short set up time to increase productivity
- > Digital electronics offers multiple interface possibilities

*High Speed
Pressure
Control
(<80 ms)*



*Input Signal and
Output Pressure
Displayed*



Process Pressure Control

Type 140 Fail Safe

Proportional current to pressure closed loop converter, intrinsically safe with ATEX, FM and CSA approvals. Fail safe operation so that in the event of a control signal failure output pressure falls to zero. Ideally suited to process control applications in hazardous environments where certified products are required.

- > Supply pressure: up to 10 bar
- > Output pressure range: 0.2 to 2 bar
- > Supply port: G1/4 or 1/4 NPT
- > Input control signal: 4 to 20 mA
- > Flow rate: up to 300 NI/min
- > Air consumption: < 2.5 NI/min at 50% input control signal
- > Response time: < 1 second
- > Operating temperature range: -40 to +85°C
- > Linearity: average < 0.1% of span
- > Hysteresis: average < 0.1% of span
- > Power Consumption: < 0.13 Watts
- > Certification ATEX, FM, CSA
- > Marine Approvals: DNV-GL, BV

422IS Fail Freeze

Uniquely available as the only ATEX Intrinsically Safe fail freeze proportional valve in the world; ATEX IS means that this device can operate safely in hazardous environments and can even pilot flammable media such as natural gas or methane.

- > Supply Pressure: 4 bar max.
- > Output Pressure Range: 0.2 to 1 bar
- > Supply port: G1/4 or 1/4 NPT
- > Input Control Signal: 4 to 20mA
- > Flow Rate: up to 250 NI/min
- > Enclosure protection: IP65 with piped exhaust
- > Operating Temperature range: -10 to +70°C
- > Linearity: less than 0.5% of span
- > Hysteresis: less than 0.5% of span
- > Power Consumption: < 0.15 Watts
- > Certified: ATEX IS
- > Options: Captured Bleed, Conduit, etc.

Type 220 Modular I/P Pilot

The Type 220 is an extremely low power pilot technology designed for use within a wide array of custom pneumatic systems. The patented design and operation of this open loop pilot means that it can accurately control in excess of 1 bar pressure whilst using just 6 milliwatts of power. This extreme low power capability makes the technology easily certifiable and allows designers greater flexibility when developing their systems electrical parameters.

- > Supply Pressure: 10 bar max.
- > Output Pressure Range: 0 to 1 bar
- > Input Control Signal: 0 to 1.7 mA
- > Response: < 650 ms
- > Operating Temperature range: -40 to +85°C
- > Temperature sensitivity: < 0.2% span/°C
- > Linearity: less than 2.0% of span
- > Hysteresis: less than 0.35% of span
- > Air Consumption: 1.5 NI/min
- > Power Consumption: < 6 milliwatt
- > Base design: System Specific
- > Electrical Connections: System Specific



Proportional Pressure Control

VP12



VP12

Miniature Proportional current to pressure and voltage to pressure converters. Using proven low Power Pilot Technology. Suited to applications where size matters.

- > Supply pressure: 10 bar
- > Output pressure range: 0.2 to 8.0 bar
- > Supply port: G1/8 or 1/8 NPT or Manifold mount
- > Input control signal: 4 to 20 mA, 0 to 10V
- > Flow rate up to: 200 NI/min
- > Air consumption: < 3.0 NI/min
- > Enclosure protection: IP20
- > Response time: < 0.5 second
- > Operating temperature range: 0 to +60°C
- > Linearity: < 1.5% of Span
- > Hysteresis: < 1.0% of Span
- > Power Consumption: < 1.0 Watts

VP10 / 100X



VP10 / 100X

Low Power Proportional current to pressure and voltage to pressure converters. Reliable, rugged, open loop control. ATEX certified units are available as intrinsically safe. Suited to both Industrial and Process control applications.

- > Supply pressure: 13 bar
- > Output pressure range: 0.2 to 8.0 bar
- > Supply port: G1/4 or 1/4 NPT
- > Input control signal: 4 to 20 mA, 0 to 10 V
- > Flow rate up to 300 NI/min
- > Air consumption: < 9.0 NI/min
- > Enclosure protection: IP65
- > Response time: < 0.5 second
- > Operating temperature range: -40 to +85°C
- > Linearity: < 0.5% of Span
- > Hysteresis: < 0.5% of Span
- > Power Consumption: < 1.0 Watts

Proportional Pressure Control

VP50

Three way, closed loop proportional valve using air piloted glandless spool technology. Ideally suited to general purpose industrial pressure control applications requiring high flow and fast response time.

- > Output pressure range: 0 to 2, 0 to 6, 0 to 10 bar
- > Linearity: < 1% of span
- > Response time: < 80 ms
(10 to 90% of output pressure, 0.1 litre load)
- > Power Consumption: < 1.0 Watts
- > Supply pressure: up to 14 bar
(min. 2 bar above output pressure)
- > Supply port: G1/4 or 1/4 NPT or Manifold mount
- > Input control signal: 4 to 20 mA or 0 to 10 V
- > Flow rate up to: 1.400 NI/min
- > Air consumption: < 5 NI/min
- > Enclosure protection: IP65
- > Operating temperature range: 0 to 50°C
- > Hysteresis: < 1% of span
- > ISO 2 manifold option available
- > Vacuum control option available

VP50



High Performance Valves Outshines Competition Case Study

One of the world's leading food processing and packaging solutions company required a high performance valve to control the actuators on their dancing roller tensioning system. The system ensures the packaging material enters the process in the correct position at high run rates. The solution had to provide:

- > High speed response < 100 ms
- > Accurate to < 1.0%
- > High Flow

IMI Precision Engineering offered the standard 6 Bar VP50 into the application and successfully outperformed the previously preferred supplier. The food processing and packaging solutions company were impressed by the combination of fast response, high accuracy and low over/under shoot as well as the high flow rate of the valve.



VP50S

Combination of proven glandless spool valve and air pilot technology with a digital display. Ideally suited to industrial process control applications for ease of installation and life servicing.

- > Backlit LCD display showing live input signal and output pressure
- > Output pressure range: 0 to 2, 0 to 6, 0 to 10 bar
- > Linearity: < 1% of span
- > Response time: < 80 ms
(10 to 90% of output pressure, 0.1 litre load)
- > Power Consumption: < 1.0 Watts
- > Supply pressure: up to 14 bar
(min. 2 bar above output pressure)
- > Supply port: G1/4 or 1/4 NPT or Manifold mount
- > Input control signal: 4 to 20 mA or 0 to 10 V
- > Flow rate up to: 1.400 NI/min
- > Air consumption: < 5 NI/min
- > Enclosure protection: IP65
- > Operating temperature range: 0 to 50°C
- > Hysteresis: < 1% of span
- > Supplied with M12x1 5-pin connector as standard

High Speed Filling Control Case Study

Filling and dosing applications are found in a vast array of industries, from food and beverage to painting and mixing. In these systems, which can run at 15,000 pieces per hour, a small error in control can result non-conformance. One such application required a high performance valve to pilot the juice filling valve on the their filling machines.

- > Highly accurate pressure control
- > Response to signal changes < 100 ms
- > High Flow, greater than 1.000 NI/min

IMI Precision Engineering offered the VP50S into the application and was successful over both the incumbent valve and several other devices due to its high speed precision performance and its easy to read display.



Proportional Pressure Control

VP51

Digital closed loop proportional valve enhancing proven spool and pilot technologies. Digital interface allows end user modification to all parameters including, language, pressure range and response. Ideally suited to general purpose industrial pressure control applications requiring precise customising to ensure optimum system output and quality.

- > Output pressure range: 0 to 6, 0 to 10 bar
- > Supply port: G1/4 or 1/4 NPT or Manifold mount
- > Flow rate up to: 1400 NI/min
- > Air consumption: < 5 NI/min
- > Response time: < 80 ms
(10 to 90% of output pressure, 0.1 litre load)
- > Operating temperature range: 0 to 50°C
- > Backlit LCD display showing live input signal and output pressure
- > Language options
- > Selectable pressure units
- > Supplied with M12x1 5-pin connector as standard
- > Password Protection
- > Selectable Reverse Acting

VP51



Exceptional welding system control Case Study

A leading welding systems manufacturer required an adaptable high performance valve to pilot the actuators controlling the welding tip system onboard robotic welders for the Automotive Industry. The solution had to provide:

- > High Resolution
- > Fast response < 120 ms
- > Configurable

IMI Precision Engineering Engineers offered a standard VP51 into the system where it successfully performed to and beyond the customer's initial specification. The exceptional response control of the VP51, less than 80 ms, combined with the high resolution meant that the overall system could move to a work piece much quicker and position the tip precisely producing more accurate and repeatable welds.



VP23

Three way closed loop proportional pressure control valve with microprocessor controlled seat valve. Available in two body sizes ND8 and ND16. Optional Software VP-Tool allows Enduser modification of parameters like pressure range, set point, controller properties. Optional Fieldbus control capability: Two color LED-display.

- > Supply pressure: up to 17 bar
- > Output pressure range: 0 to 2, 0 to 10, 0 to 16 bar
- > Supply port: G1/4 to G3/4
- > Input control signal: 4 to 20 mA; 0 to 10 V or Fieldbus
- > Output signal: 4 to 20 mA and 0 to 10 V
- > Flow rate up to: 16.000 NI/min
- > Air consumption: < 4 NI/min
- > Response time: 100 ms
- > Operating temperature range: -5 to +50°C
- > Linearity: < $\pm 1\%$ of span
- > Hysteresis: < $\pm 0.5\%$ of span
- > Repeatability: < $\pm 0.5\%$ of span

VP40

Three way, open loop proportional pressure control valve with directly actuated poppet seat driven by an external power amplifier/drive electronics. Extremely robust, ideally suited to mobile/on vehicle applications. Option for power amplifier/drive electronics to be integrated in the solenoid plug.

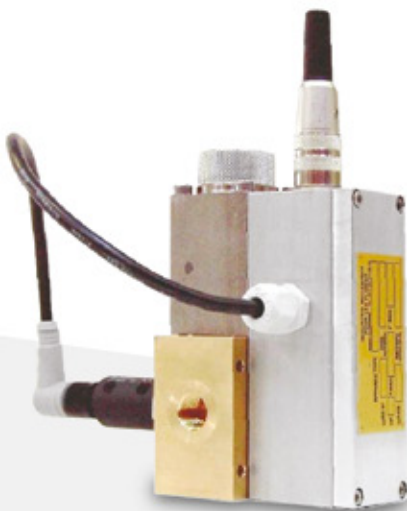
- > Supply pressure: up to 20 bar
- > Output pressure range: 0 to 2, 0 to 7, 0 to 11, 0 to 20 bar
- > Supply port: G1/8 to G3/8 or 1/8 to 3/8 NPT
- > Input control signal
- > Flow rate up to: 1.600 NI/min
- > Air consumption: < 7 NI/min
- > Enclosure protection: IP65
- > Response time: 200 ms
- > Operating temperature range: -10 to +40°C
- > Hysteresis: < 3% of span
- > Repeatability: < 1% of span

Proportional High Pressure Control

Proportional Pressure Control Valves

Three way, closed loop proportional valves with integrated 25 micron filters, typically used to control the pilot pressure on high pressure dome loaded regulators. Ideally suited to control the pressure on PET blowing systems and gas pressure control on laser cutting machine tools. Proven technology, compatible with most common industrial gases.

- > Port sizes: 1/4" or flange mounted directly on dome loaded regulator
- > Pressure range: Up to 420 bar
- > Temperature range: -20 to +80°C
- > Control signal: 4-20 mA or 0-10V
- > Internal closed loop control
- > Body Materials: Brass or Aluminium bronze



Proportional pressure control valve

Dome Loaded Regulators

Dome loaded regulators control the outlet pressure over a range of varying inlet pressures and flows. Force is applied to the control element (diaphragm or piston) by pressure inside the dome of the regulator. The pilot pressure can be applied from a proportional valve, or a small low flow spring loaded regulator.

- > Particularly suited to high flow applications
- > Can be remotely electrically adjusted by using a proportional valve
- > Port sizes: 3/8" to 3"
- > Pressure range: 100 to 420 bar
- > Flow rate: up to 10.000 Nm³/h
- > Temperature range: -20 to +80°C
- > Body materials: Aluminium bronze, Brass or Stainless Steel

temp. range;
-40 to +150°C

port sizes:
1" to 4"

output pressure;
0.5 to 300 bar

Dome loaded regulator



Proportional Flow Control

VP60

5/3 open loop proportional flow control valve. Direct operated spool with microprocessor driven position control. Closed loop on request. Excellent regulation of the centre position (very small overlap). Optional Software VP-Tool allows Enduser modification of Parameters like center position, valve function, set point.

- > Supply pressure: -1 to 16 bar
- > Supply port: G1/4; 1/4 NPT; ISO1
- > Input control signal: 4 to 20 mA, 0 to 10 V, -5 to +5 V
- > Flow rate up to: max. 5.000 l/min
- > Air consumption centre position: Typical 8 NI/min
- > Response time: 5 ms
- > Operating temperature range:
Ambient: 0 to +60°C, Medium: +5 to +60°C
- > Shock resistance: DIN EN 60068-2-67, 30 g/18 shocks
- > Several valve functions (5/3; 3/2; 2/2)
- > Service life: > 250 million full stroke



VP60

82880

Motorized 2/2 open or closed loop proportional valve controlling the flow of media via rotating ceramic discs, suitable for use with fluids or gases down to vacuum pressure. The motor can be either DC synchronous or stepper designs, driving the disc through a low-backlash gear.

A new stepper motor 9668 that fits with the 82880 IMI Buschjost range and which is used in the majority of cases, was entirely redeveloped and comes with a wealth of new features.

- > Motor is factory-calibrated to improve the control characteristics
- > It detects "stiction" and adjusts torque automatically up to the 2.5 fold
- > Position feedback can be set to 0-20 mA or 4-20 mA
- > Supply voltage is 24 Volts



82880

IMI Precision Engineering operates four global centres of technical excellence and a sales and service network in 50 countries, as well as manufacturing capability in the USA, Germany, China, UK, Switzerland, Czech Republic, Mexico and Brazil.

For information on all IMI Precision Engineering companies visit **www.imi-precision.com**

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DERRICK
INTERNATIONAL

Thorne & Derrick
+44 (0) 191 410 4292
www.heatingandprocess.com