CNG Valve Technology
High quality components and complete system solutions for the Compressed Natural Gas industry
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.
Expertise in CNG technologies

IMI Precision Engineering has over 150 years of combined experience in providing energy solutions

- Proven in safety
- Proven in reliability
- Proven in durability
- Proven in knowledge

Our market-leading product ranges - IMI Norgren, IMI Buschjost, IMI Herion and IMI Maxseal - offer an extensive range of high quality components and complete system solutions to meet the specific requirements of the Compressed Natural Gas industry.

- Helping to increase energy efficiency
- Simplified assembly by reduction of parts, intelligent manifold solutions
- Improving the safety of CNG delivery systems
- Reduction of fittings and therefore potential leakage points

Up to 350 bar
ANEI / NEMA protection classes
FM and CSA approval available
According to PED and ATEX
Cost effective
3 station valve manifold - priority panel control
CNG valve technology

IMI Buschjost and IMI Herion high pressure solenoid valves

IMI Precision Engineering has been supplying high pressure valves to customers manufacturing CNG compression and dispense systems since 1996. With pressures up to 350 bar, we understand the need for valves to be safe, have very high levels of pressure integrity and to be reliable - particularly with regard to the high number of switching cycles that a typical valve needs to perform.

Due to the requirement for zero internal and external leakage, we have to ensure the highest standards of production, coupled with premier quality materials in the design and manufacture of our valves.

CNG solenoid valve range

- Nominal diameter: DN 09 to DN 15mm
- Body Material: aluminium, brass or stainless steel, NPT, SAE on demand
- Port Sizes: G1/8 to G3/4
- Ambient temperature range: -40°C to +60°C
- Pressure range: 10 to 350 bar
- Function: NC or NO
- Sealing material: PEEK or POM
- PED: compliant
- Mounting position: horizontal or vertical
Solenoid coil technology

The interchangeable coil system on our CNG valves enables us to select from our extensive range of globally approved coils to match with the required approval and meet the demands of the most hostile of environments.

Solenoid coil options

- Electrical connections: Terminal box with M16, M20 or 1/2" NPT thread glands for cables Ø5 to 14mm Flying leads 0.45m, 3m or 10m long
- ATEX Category: II 2G, II 2D
- EX protection class: me, mb, emb, dmb, tb, tD
- Approvals: ATEX, FM, CSA, NEMA
- Ambient temperature range: -40 to +110°C
- Ingress protection range: IP65 to IP67
- Duty Cycle: 100%
CNG manifold solutions

With over 80 years’ experience manufacturing sophisticated solenoid valves, we are confident in the reliability and performance of our products, and we are now providing valued added solutions by incorporating our proven valve technology into customized valve manifolds.

Typical priority panel three bank system using; ball valves, rotary actuators and pilot solenoid valves

Typical systems used in priority panels and dispensers utilize the CNG to drive rotary actuators, which in turn open and close ball valves. Alternatively, a compressed air infrastructure is installed, and compressed air is used to drive the rotary actuator.

Problems associated with this system are:

> Gas or air is vented to atmosphere on every filling cycle
> Complex pipe work system with a large number of high pressure fittings
> Costly and time consuming to install and maintain
> High number of potential leak paths

Our solution

Each CNG line previously consisting of ball valve, rotary actuator and pilot solenoid is replaced by a solenoid valve manifold with integrated check valves and filters.

Benefits

> Great increase in the system reliability
> Reduction in installation cost
> Simplified servicing
> Zero wasted gas vented to atmosphere
> No requirement for a compressed air infrastructure
> High reduction in component count and fittings
> Reduction in potential leak paths
Three station valve manifold
Solenoid valve manifold with integrated check valves which can be used in priority panels and even in a bus or truck dispenser
> 1x G1 inlet
> 3x G3/4 outlet
> 3x G1/4 connection for the pressure regulators
> ND 15 mm

Six station manifold
Solenoid valve manifold with integrated check valves which can be used in a two sided small vehicle dispenser
> Option: 3 x 40µm integrated filter
> 3x G3/8 or G1/2 inlet
> 2x G3/8 or G1/2 outlet
> ND 8mm

Eleven station manifold
Solenoid valve manifold with integrated check valves and filters to control a three bank priority panel and two hose vehicle or bus dispenser
> Option with two additional check valves to enable direct filling from the compressor to the dispenser

Manifold solution A

Manifold solution B

Manifold solution A + B

3 x 1/4 ports for pressure transmitters

Integrated check valves

Small vehicle - ND 8mm

ND 8mm

Bus or truck - ND 15 mm
Pressure control solutions

Proven solutions for high pressure gas control on the outlet from the compressor and in downstream pressure reduction applications such as in the dispenser.

Spring loaded regulators

Pressure regulators (reducers or controllers) control the outlet pressure over a range of varying inlet pressures and flows. Regulators are sometimes called "Forward Regulators" to prevent confusion with back pressure maintaining valves.

- Manual adjustment via knob
- Port sizes: 1/4" to 1"
- Pressure range: 100 to 420 bar
- Flow rate: up to 1000 Nm³/h
- Temperature range: -20°C to +80°C
- Body materials: aluminium bronze, brass or stainless steel

Dome loaded regulators

Functioning in the same way as the spring loaded pressure regulator, but rather than using a manually adjusted spring, 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°C to +80°C
- Body materials: aluminium bronze, brass or stainless steel
Back pressure maintaining valves - spring or dome loaded

Back pressure maintaining valves regulate the inlet pressure to keep this pressure at a constant level. This means the valve will open to reduce excessive pressure in the line, or close when the pressure drops below the set point.

- Ideally suited for maintaining the output pressure from the compressor or drier
- Port sizes: 1/4” 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

Proportional pressure control valves

Functioning in the same way as the spring and dome loaded regulators, except the output pressure is controlled by an electrical signal. They can be used to control the pilot pressure onto a dome loaded pressure regulator and therefore automate a pressure control process.

- 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

Pressure relief valves

The valve opens to the atmosphere if the inlet pressure rises above the pre-set point. Excess pressure is therefore relieved from the system in a safe and controlled manner.

- Port sizes: 1/4” to 1” 1/2
- Pressure range: up to 450 bar
- Pre-set pressure range: up to 450 bar
- Tamper proof seal
- Body materials: aluminium bronze, brass or stainless steel
Ancillary products

**Non return valves**
Used to prevent the back flow of media.

- Port sizes: 1/4" to 1"
- Pressure range: up to 420 bar
- Temperature range: -35 to +120°C
- Materials: brass or stainless steel

**Stop valves**
Shut off the flow of gas enabling maintenance and service access to the CNG system.

- Balanced needle valve construction enabling constant low torque adjustment
- High pressure tight integrity
- Port sizes: 1/4" to 1"
- Pressure range: up to 420 bar
- Temperature range: -20 to +80°C
- Body materials: stainless steel, aluminium bronze or brass
**Tube fittings**

Connect components and pipe work in the CNG system.

- 3 piece flat face sealing construction enabling system components to be removed without disturbing the pipe work installation
- Connection sizes: 1/8” up to 3”
- Tube sizes: Ø 4 to 80mm
- Pressure range: up to 420 bar
- Temperature range: -20 to +80°C
- One end available for but or socket welding
- Materials: brass, aluminium bronze or stainless steel

**Inline filters**

Particle contamination at high pressures will reduce the service life of CNG control equipment, in-line filters provide protection against particle ingress.

- Port sizes: 3/8” to 3”
- Pressure range: up to 750 bar
- Temperature range: -40 to +150°C
- Filter element: 5, 15 or 25 micron stainless steel mesh or sintered bronze
- Body materials: brass, aluminium bronze or stainless steel
IMI Precision Engineering operates four global centres of technical excellence and a sales and service network in 75 countries, as well as manufacturing capability in the USA, Germany, China, UK, Switzerland, Czech Republic, Mexico and Brazil.

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