



Special Products & Applications

PCU Portable Charging unit

Application Examples

- Automatic Cylinder Filling
- Automatic Gas Changeover Unit
- Automatic Pressure Control Panel
- Configurable Automated Filling Skid
- Proportional Small Volume Cylinder Filling Panel
- Manual Mixtures Filling Skid
- Fill, Vent, Vac and Analysis Manifold Assembly
- Pressure Control Solutions for PET Blow Moulding
- Proportional Regulator for Cylinder Filling and Gas Supply Applications
- SV60/OXB Stop Valve for Medical Oxygen

We design, machine, build and test all our products on one site in Uxbridge. If you don't see what you want in our standard ranges, contact us and we'll do our best to meet your needs.

Hale Hamilton (Valves) Ltd
Cowley Road, Uxbridge, UB8 2AF, UK
Tel: 01895 236 525
www.halehamilton.com



HALE HAMILTON®
Excellence in Pressure & Flow Control
A CIRCOR International, Inc. Company

Portable Charging Units

Description

By using a carbon fibre/epoxy resin composite gas cylinder and a light but strong aluminium case we have made a Portable Charging Unit the size and weight of a small suitcase.

The unit incorporates all the valves, regulators and gauges that are needed to supply gas under pressure safely and accurately. There is space to store up to 5metres of hose and other accessories.

Because of its potential for use on airfields, all small removable parts are retained by chains to prevent foreign object damage (FOD).

The inlet includes an easily removable filter.

Materials are flame retardant and are suitable for breathing Oxygen where necessary.

The units are certified to TPED (Transportable Pressure Equipment Directive).

Full military standard documentation can be provided.

The configurations shown here are examples – we will design a system to meet your specific requirements.



Example colours – other colours can be supplied

Standard Specification

- Cylinder charge pressure: 280bar
- Design pressure: 350bar
- Cylinder capacity: 6.8l (liquid), 1800l (gas at STP)
- Temperature range: -34 to +60°C

Standard Materials

Alternative materials can be supplied

- Case: polyester powder coated Aluminium
- Tubing: Copper with Brass fittings
- Elastomers: EPDM, Nylon back up rings
- Valve seats: PEEK
- Handwheels: Aluminium on regulators, plastic on stop valves

Options

Please contact us for details

- Various outlet pressure ranges can be supplied
- We can design or source charging fittings or tools and arrange stowage in the case
- Ports: alternative port configurations including quick connectors can be supplied
- Materials: suitable combinations of materials can be supplied for various applications
- The case can be lightweight for easy handling or heavy duty for better survival under field conditions

Ordering Information

Please supply the following information when ordering

- Outlet pressure ranges
- Number of outlet pressure ranges
- Lightweight or heavy duty case
- Wheels and handle
- Flow medium
- Port configuration
- Case colour and markings
- Operating and storage temperature ranges
- Certification and QA requirements

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When selecting a product, the total system design must be considered to ensure safe, trouble free performance. Component function, material compatibility, adequate ratings, proper installation, operation and maintenance are the responsibility of the system designer and user.

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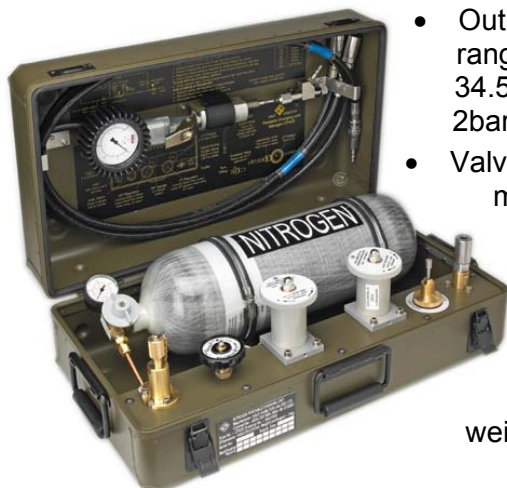
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Portable Charging Units

Nitrogen unit – Dual Range

Specification

NSN 3655-99-2125901

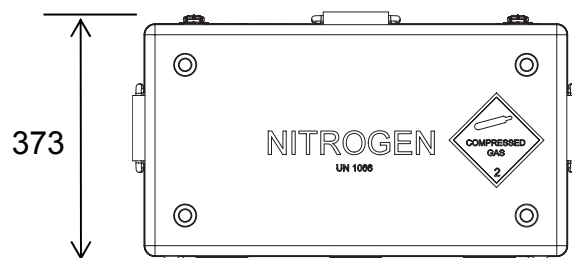
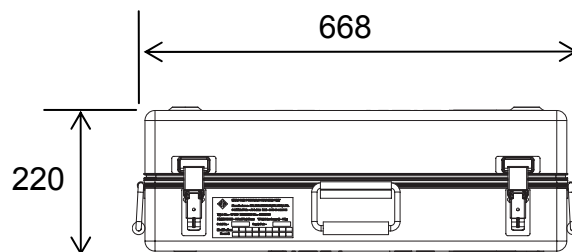


- Outlet pressure ranges: 0 to 34.5bar and 0 to 2bar
- Valve body material: Brass except regulator bodies which are Aluminium to reduce weight

- A 3m outlet hose, tyre inflator and special tyre adaptor are stowed in the case lid. These items have quick fit connectors for easy assembly.
- The tyre inflator is fitted with an automatic shut off device to prevent over inflation.
- Weight: 19kg (uncharged), 21.5kg (charged)

Typical Dimensions

in mm except where shown otherwise



- Additional handles are fitted to allow for two-man lifting.

Oxygen unit – Single Range

Specification

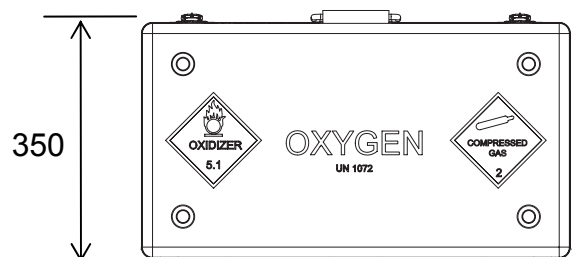
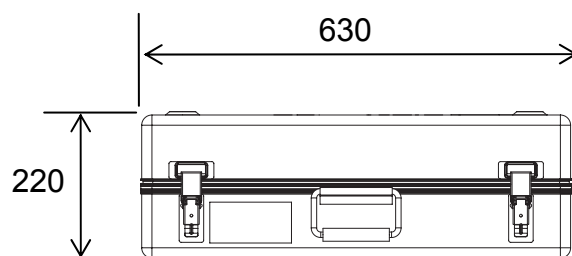
NSN 3655-99-6659781



- Outlet pressure range: 0 to 220bar
- Valve body material: Brass
- A 5m outlet hose is stowed in the case lid
- Weight: 16.5kg (uncharged), 19kg (charged)

Typical Dimensions

in mm except where shown otherwise



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Portable Charging Units

Nitrogen unit Dual Range – Heavy Duty

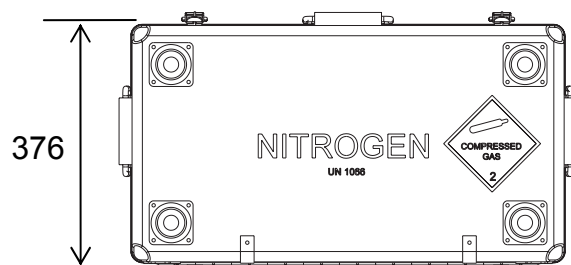
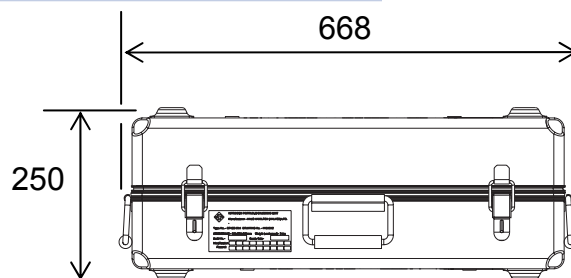
Specification



- Outlet pressure ranges: 0 to 207bar and 0 to 35bar
- Valve body material: Brass except regulator bodies which are Aluminium to reduce weight
- This unit uses a heavier gauge material for the case and includes protective steel feet
- A 3m outlet hose and high-pressure hand-held inflator are stowed in the case lid. These items have quick fit connectors for easy assembly.
- The inflator is fitted with two pressure gauges to give accurate readings over a wide range of pressures.
- Weight: 24kg (uncharged), 26.5kg (charged)
- Additional handles are fitted to allow for two-man lifting.

Typical Dimensions

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Portable Charging Units

Wheeled Option



For ease of transport we can now supply the PCU fitted with wheels and an extendable handle. These can be fitted to any configuration of PCU and a retrofit kit is available. Both the wheels and the handle are selected from proven applications and are both rugged and practical.

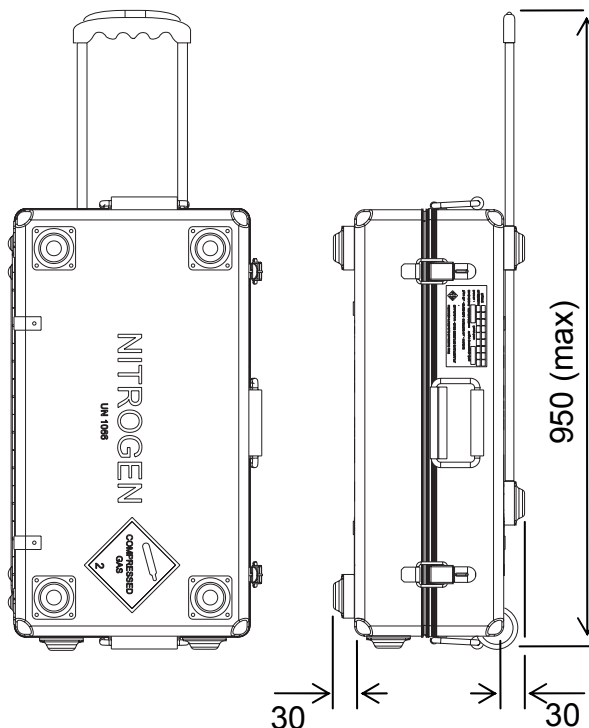
The handle has two extension positions and when retracted it does not increase the length of the case. The handle extends to about 950mm from the floor with an intermediate stop at 850mm. The handle is positively locked in all positions and the lock is released by a convenient press button in the handle.

Extended feet are added to protect the case and the handle mechanism. Additional feet are also fitted on the top of the case, so that the lid lies flat when open. These feet add to the height by about 30mm on each face. The wheels are recessed into the case.

- Additional weight: approximately 1kg

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PCU Accessories High Pressure Inflator

Description

A high-pressure hand-held inflator fitted with two pressure gauges to give accurate readings over a wide range of pressures. Controls for filling and venting are conveniently placed for easy operation. The vents are silenced. Quick connectors are fitted for easy assembly. We can supply mating connectors and hose assemblies as required. Other connectors can be supplied.

Specification

- Working Pressure: up to 207 bar (3000 psi)
- Temperature range: -20 to +70°C
- Connections: male quick fit
- Weight: approx. 2.85 kg

Standard Materials

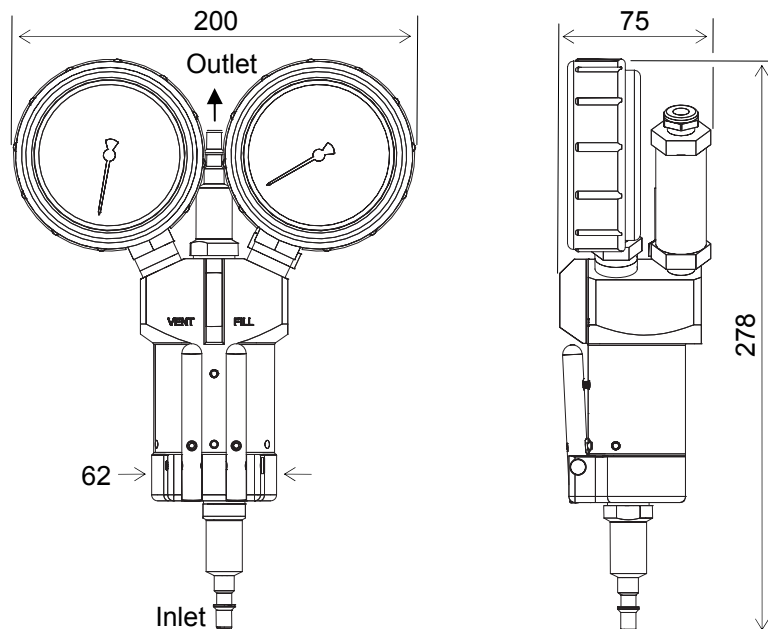
Alternative materials can be supplied

- Body: High strength Aluminium alloy
- Body seals: Nitrile
- Valve seats: PEEK



Typical Dimensions

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PCU Accessories Tyre Adaptor

Description

A high-pressure adaptor for inflating tyres and other devices with a Schrader type fitting.

A quick connector is fitted for easy assembly. We can supply mating connectors and hose assemblies as required. Other connectors can be supplied.

Specification

- Working Pressure: up to 35 bar (500 psi)
- Temperature range: -20 to +70°C
- Connections: male quick fit
- Weight: approx. 0.25 kg

Standard Materials

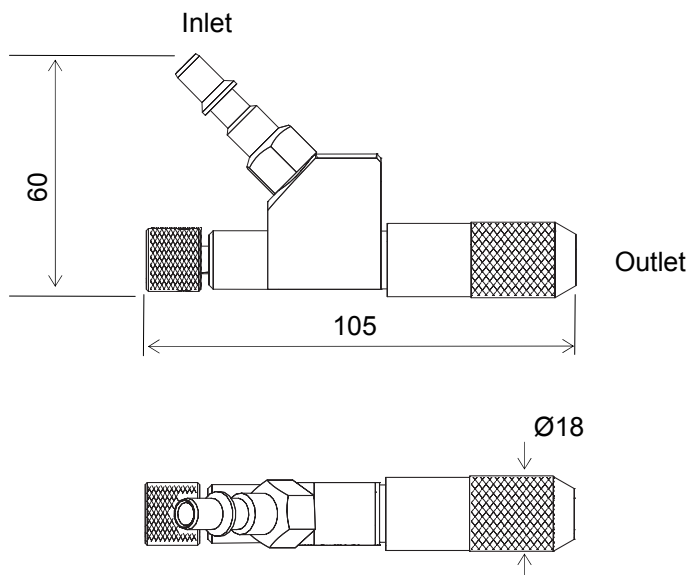
Alternative materials can be supplied

- Body: 316 Stainless Steel
- Seals: Nitrile and Nylon



Typical Dimensions

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Applications

AUTOCHARGE - Automatic Cylinder Filling (ACF)

For naval fire-fighting / damage control Breathing Air (BA) and Diving Air (DA) cylinder charging



Imagine taking uncertainty out of an unfamiliar task, the end result of which may save lives.

Filling breathing air cylinders is a time consuming, manual process, not without risk and often with a variable outcome in terms of the mass of gas filled

..... Until now!

Automation - addresses issues such as:

- reducing the risk inherent with manual control of high pressure air systems
- cutting out the drudgery of a repetitive task
- lean manning

Proportional control - enables:

- repeatable & consistent mass of gas filled
- reduced filling times (2-5 minutes)
- safe control of high pressure air

Sensor technology - allows:

- fill pressures to be pre-selected for different applications
- multiple applications to be filled from the same panel
- cylinder filling from any residual pressure up to 380bar (5,510 psi)

Push button operation - means:

- simplified start, stop and vent down procedures
- reduced training requirement
- ease of operation

Robust design - to withstand:

- shock
- vibration
- corrosive marine environment

Track record - proven technology:

- in industrial applications
- with 57 years experience in BA systems
- as specified by BAE SYSTEMS Naval Ships for Type 45

For further details contact sales on
indsales@halehamilton.com

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Applications

Automatic Pressure Control Panel



The problem:

Our customer required a gas supply panel capable of supplying Oxygen at a stable supply pressure (within 2%). The panel was to be supplied by a supply source where the pressure fluctuates between 50 and 300 barg. The process flow rate fluctuated between 20 – 800 kg/hr and anywhere in between.

Conventional pressure regulators cannot hold stable outlet pressures within the limits required on this project therefore a different solution was required. Other problems were caused with existing equipment unintentionally by the operators who at times weren't trained in the proper use of the equipment. With mechanical regulators in place and their outlet pressure set, if the inlet pressure were increased to quickly, the relief downstream of the regulator would blow off.

The Need:

A pressure control system able to control to supply pressure regardless of changes in inlet pressure and flow rate.

Our solution:

The RH series proportional regulator was built into the panel and held under closed loop control. A programmable controller was fitted to the panel and connected to a downstream pressure transmitter. The signal from the transmitter acts as a demand signal. The controller adjusts the dome pressure in the regulator to provide the correct outlet pressure and has other programmed routines to ensure the panel works as it should. This solution has been fitted at site for one year and has seen trouble free operations since then.

Benefits / Specification:

- Stable outlet pressure regardless of inlet pressure or flow demand.
- Fool proof programmed features such as:-
 - set ramp rates preventing overshoot
 - no set point until the inlet pressure has been switched on, again to prevent overshoot.
- Ease of maintenance – valves fitted with zero clearance couplings
- Max inlet pressure: 300 barg
- Outlet Pressure: 38 barg (regulator capable of upto 400 bar in / 380 barg out)
- Flow: 20-800 kg/hr

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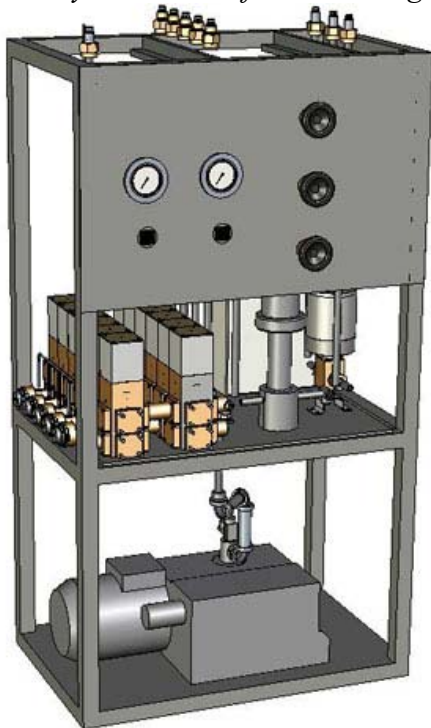
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Applications

Configurable Automated Filling Skid

The Hale Hamilton Automatic Mixtures Filling Skid enables the user enhance productivity and mixture accuracy. It also has features designed to ensure product integrity.



Features:

- *Expandable skid configuration*
 - 1-9 Component lines
 - 1-6 ramps (supply lines)
- *Block and Bleed valve arrangements & check valves on component lines prevent cross contamination.*
- *Ramps available as manual or automatic.*
- *Proportional control device for minor component fills and purge*
 - Accuracy @ 5 barg = 10%
 - Accuracy @ 200 barg = 0.5%
- *Vacuum pump flow rate – 100nm³/hr*
- *Vacuum relief valve protects pump.*
- *Pressure indication via gauges and transmitters as required.*

Components:

- *Fill, main vent and vacuum valves: ASV150*
- *Bleed Valves: ASV142*
- *Check Valves (component lines): NRS38/OXB*
- *Control Valve: HH or customer specification*
- *Pump: HH or customer specification*

Benefits:

- *Skid can be supplied in an expandable form (more gas components, more ramps)*
- *Accurate control of minor components.*
- *Fully compliant for use on medical / breathable gas (no fluorinated polymers).*
- *Back contamination of gas components prevented*
- *Skid design permits a highly competitive product offering.*

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Applications

Proportional Small Volume Cylinder Filling Panel



The problem:

Our customer fills breathing air cylinders for use in fire fighting. The existing method of filling was to use a stop valve to blast air into the cylinders as fast as possible. This process created excess heat during the filling process and resulted in a settled pressure far below the required 276 barg.

The Need:

A filling system capable of controlling the fill in such a way as to increase the mass of gas delivered during each fill thus increasing the duration each fire fighter could remain at the scene of the fire. Note the maximum supply pressure was 276 barg so over filling the cylinders was not an option.

Our solution:

The CP422 cylinder filling panel is designed to fill a small group of breathing air cylinders to 276 barg in such a way as to minimise adiabatic compression and maximise the mass of gas in the cylinders. The system is operated via a simple 2 button system (start / off) and has a series of status lights to tell the operator which stage in the filling process the programme has reached.

Benefits:

- *Accurate control over the entire pressure range 1-276 barg.*
- *Optimised flow rates providing improved speed of fill and hence efficiency.*
- *Guaranteed maximum mass in each cylinder.*
- *Repeatable process with closed loop control incorporating error feedback.*
- *Safer and simpler operation.*
- *Modular design permits ease of maintenance – service exchange recommended.*
- *Compact design limits the installation space required.*

Specification:

- *Maximum inlet pressure: 276 barg*
- *Fill pressure: 276 barg*
- *Fill duration: 5 minutes*
- *Accuracy: better than 0.5% based on final fill pressure*
- *Repeatability: better than 0.2% based on final fill pressure.*

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Manual Mixtures Filling Skid – O₂/Ar/CO₂/N₂



The problem:

Our customer, a major gas company, fills cylinders with gas mixtures for the food market and needed to build a filling panel compatible with the duty, made from proven reliable components and in accordance with the relevant legislation without incurring significant project management costs or high equipment costs.

The Need:

The customer required a mixtures filling skid, compatible with oxygen, fit for prolonged use and supplied complete with a full sets of drawings, operating and maintenance instructions and assessed to ensure compliance with the pressure equipment directive, PED.

Our solution:

Hale Hamilton designed and built the unit complete using it's range of medical oxygen valves and zero clearance couplings. The panel was fabricated in accordance with the piping code ASME B31.3 and assessed in accordance with the requirements of the PED. All pipe work is monel 400. The unit was leak tested and all valves functionally tested prior to being released to our customer. All drawings were released to our customer for approval within 2 weeks of the order being placed and the panel was delivered complete in 8 weeks. All materials were supplied by Hale Hamilton – no free issuing of parts by the customer was necessary.

Benefits:

- *Designed, built, tested and assessed to PED.*
- *Built with proven and adiabatically shock tested products.*
- *Fully medically oxygen compliant ensuring product integrity is maintained.*
- *Good ergonomic design making it easy for the operator to use.*
- *Block and bleed valve arrangements on each component line prevent back contamination.*
- *Check valves on each component line provide extra protection.*

Specification:

Design pressure – 420 barg

- *4 Component lines and Fill, vent and vac lines*
- *Process lines 12.5mm N.B, Vent Lines 6.35mm, Vacuum Flange KF40*
- *Monel 400 piping, Brass bodied valves, mild steel power coated frame.*

Fill, Vent, Vac and Analysis Manifold Assembly



The problem:

Our customer fills medical gases one cylinder at a time. The process has fill, vent, vac and analysis routines and requires some peripheral equipment be fitted to the system. Existing solutions were based around pack filling systems where the equipment is much larger and more expensive than this system required.

The Need:

An easy to maintain, low capital cost, 411 barg rated, adiabatically shock tested assembly was required. There was also a clear need to minimise the amount of pipe connections and potential leak paths as far possible.

Our solution:

The ASV145 actuated stop valve and 28/41 regulator were development as base mounted components which could be bolted direct to the manifold block. The relief valve and pressure transmitter on the system were also fitted directly to the manifold. The valves and regulators were built with non fluorinated polymers to ensure compatibility with medical oxygen. All components were then adiabatically shock tested to 400 barg to ensure safe operation in the application.

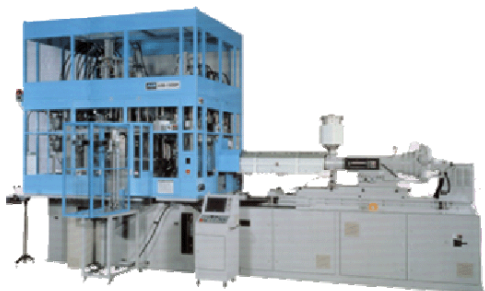
Benefits:

- *Ease of maintenance – valves can be changed out in 1 minute.*
- (HH operate a service exchange scheme with a very short turnaround on repairs)*
- *Compatibility with medical oxygen helps to ensure product integrity*
- *Compact design which saves space and reduces potential leak paths to a minimum*
- *Good leak tight performance.*

Specification:

- *Maximum operating pressure: 411 barg*
- *Analysis regulator outlet pressure: 5 barg (adjustable to 58 barg if required)*
- *Leak rate across valve seats: 1x10⁻³mbar.l.s⁻¹ N₂*
- *Pilot pressure for stop valves: 6-8 barg.*
- *Nominal bore of stop valves: 6mm*

Pressure Control Solutions for PET Blow Moulding



The problem:

Our customer who is a high volume manufacturer of PET Blow moulding machines, experienced major problems sourcing control products that would give accurate repeatable control with high levels of reliability

The Need:

To accurately control main inlet gas pressure to 35bar. Next control of the 5bar Primary stage which completes 97% of the PET blowing process. The Secondary stage controlled at 5-15bar, forms the final detail and chills the component. The production output and duty cycle of the machine is high, therefore the customer required a solution which would give accurate repeatable control coupled with high reliability.

Our solution:

The GLD 15 Mk1 (28 series) spring loaded regulator is a product that provides accurate, repeatable control with guaranteed performance and reliability. The RL3M dome-loaded regulator provides accuracy and sensitive control coupled with high levels of reliability. These product solutions met the customers' key performance criteria exactly.

Benefits:

- Accurate pressure control of critical process stages.
- Use of products that have long established track record for performance and reliability.
- Consistent production rates with negligible machine downtime.
- Ease of maintenance
- RL and 28 series range of products offer a wide range of pressure, flow and body material

Specification:

- Maximum inlet pressure range: Up to 465 barg (28 series), up to 69barg (RL3M) regulators
- Outlet pressures: 1.5 – 58barg (28 series), 0.07 – 65barg (RL3M).

Proportional Regulator for Cylinder Filling and Gas Supply Applications



The problem:

Often in gas systems, it is desirable to be able to control a wide range of pressures accurately and to have a control valve operate with a high degree of repeatability and reliability. Most control valves on the market only operate accurately over a narrow band of pressure. A major gas customer had such a need for a gas filling system and could find nothing on the market to meet its requirements.

The Need:

A control valve / regulator was required to reduce a primary pressure of 380 barg to 5barg for purge fills and 137 barg, 230 barg and 300 barg for cylinder fills on medical grade oxygen, entonox and medical air. Used on single cylinder and pack filling systems, both fill accuracy and fill speed were important performance criteria as was the component's performance under adiabatic shock in oxygen.

Our solution:

A proportional regulator held under closed loop control was used to manage the fill process. A controller built by Hale Hamilton reads the feedback for the scales or pressure transmitter (this varies by system) and adjusts the dome pressure to ensure the correct delivery pressure. The result is a regulator with very accurate control across almost its entire range of pressure and high reliability (better than 200,000 cycles). The performance is far better than most control valves on the market.

Benefits / Specification:

- Very high turndown ratios of up to 300:1
- Maximum inlet pressure: 411 barg
- Controllable outlet range 5 – 380 barg
- Pilot pressure: 0-7 barg
- High flows (Max flow rate of 3600 nm³/hr of oxygen).
- High reliability > 200,000 cycles.
- CTE approval to 400 barg in oxygen

SV60/OXB Stop Valve for Medical Oxygen



The problem:

The customer (a major gas company) has a large number of valves installed in its system which contained polymers not compatible with medical oxygen. Moreover, the existing valves had not been adiabatically shock tested, a fact which gave rise to doubt about its integrity for safe use in a system filling medical grade oxygen.

The Need:

The customer required a valve adiabatically shock tested in oxygen in accordance with EN ISO 7291 that contained non fluorinated polymers to ensure the potential for realisation of toxic gas into the filling system was minimised as far as possible.

Our solution:

The SV60 series of stop valves have been used by most of the major gas companies over 25 years and have been proven reliable by the thousands in the field. Hale Hamilton reengineered its standard valve to include only those polymers favoured for medical oxygen duty.

A number variants have now been produced and are supplied with adiabatic shock test approvals to EN ISO 7291 with interface connections to make the valve retrofittable with the existing competitor's valve such that our customer incurs little installation cost.

HH now offers this product with 1" BSPP Flat face, 1" BSPP cone, ½" NPT(F), ¾" NPT(F), ½" BSPP(F) connections and many more.

Benefits:

- *Adiabatically shock tested.*
- *Approved by most major gas companies*
- *Fully medically oxygen compliant.*
- *Available in retrofittable form with most competitor products.*

Specification:

- *Maximum inlet pressure – 320 bar*
- *Nominal Bore 12.5mm*
- *Cv: 3.5*