IMI
Precision Engineering

Engineering GREAT Solutions

Mining

Mining Solutions for process plants, equipment and vehicles

IMI NORGREN
IMI BUSCHJOST
IMI FAS
IMI HERION
IMI MAXSEAL

Contents

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 singlely, 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.

Experience and Expertise in Mining

Whether it's shaft sinking stage jacks, air breathing units, quarrying equipment, loading station conveyors, or beneficiation processes, IMI Precision Engineering has the control cabinets, valves, and air preparation products to keep your people, plant and processes running strong and safe.

Typical solutions include:

Beneficiation Plant

Quarrying

Loading Station

Shaft Sinking

Blasthole Drilling

Mobile Mining

STOP PROBLEMS,
NOT PRODUCTION

Beneficiation Plant Solutions

Nothing slows you down like a production stoppage, whether it's caused by a valve or actuator failure, an equipment malfunction or water in your air lines. IMI Precision Engineering's reliable Filters, Regulators, Lubricators (FRLs), dust filter valves and actuators stop equipment failures before they happen so you can keep going strong.

- **FRLs** protect pneumatic equipment from damage and wear while offering users easy installation.
- **Dust filter valves** open in milliseconds to deliver a high volume air pulse that cleans filter elements effectively. They close just as fast, saving air and energy.
- **Process diaphragm valves** handle high flow rates for air or other fluids.
- **Customized control cabinets** integrate cylinders and valves in a stainless steel cabinet to meet critical safety requirements.
- **Inline lockout valves** provide safety during equipment maintenance.
- **Air bellows** dampen vibration to extend equipment life.
- **Custom heavy-duty actuators** keep processes running smoothly and safely

PM/31000 Series
Air Bellows

IMI Buschjost
82960/82970 Series
Series Dust Filter Valves

Case Study

High performance pinch valve for abrasive, corrosive slurries relies on fast-acting control

Customer: **Flowrox Group**
Location: **Global**
Key Benefits: **Fast acting, long wearing**

Requirement

Pinch valves control the volume of fluids flowing through pipes for batching processes in mining operations. They are also used to isolate slurry or dirty water from the process. Flowrox Group, headquartered in Finland, is the leading supplier of high performance pinch valves and other equipment for mineral processing. Flowrox pinch valves are ideal for shut-off or control applications that involve abrasive or corrosive slurries, powders or granular substances. Their customer wanted fast-acting control that could actuate the pinch valves in just a few seconds. Flowrox turned to Norgren, now IMI Precision Engineering, for a control valve that could meet this requirement by moving a large amount of compressed air in a short time.

Solution

With a flow coefficient of 5.0 and compact size, the IMI Norgren Nugget 500 valve allows Flowrox to meet their customer's requirement. In addition to increasing controllability, the fast-acting valve allows operators to close down the process quickly in an emergency. The Nugget 500 has nitrile O-rings and seals so it can operate reliably across a broad temperature range. Its durable finish provides excellent corrosion and chip-resistant protection so it stands up to the harsh operating conditions typical of processing plants at mine sites. The Flowrox pinch valve is ideal for this mining application because of its excellent wear and corrosion resistance and ability to operate without jamming or clogging for extended service intervals.

WE HELP YOU DIG DEEPER

Quarrying Solutions

When you're trying to dig deep, the last thing you need is dirty air in your equipment or water in your air lines due to faulty valves. The integrated and customizable design of IMI Precision Engineering's actuators, valve islands and rotary hand valves will help you avoid production stoppages so you can dig deeper.

- **Custom heavy-duty cylinders** with a variety of bore and rod sizes, adjustable cushioning and mounting options are easy to install without major design changes.
- **Expandable, integrated valve manifolds** with dual spool technology for long life and high flow are smaller and more cost effective than individual valves.
- **Rotary hand valves** are easy to grasp and rotate.
- **FRLs** protect pneumatic equipment from damage and wear while offering users easy installation.
- **Air bellows** dampen vibration to extend equipment life.

PM/31000 Series Air Bellows

VHLA Series Rotary Hand Valves

Case Study

Precise flow control helps compressor regulation system save fuel on drill rigs

Customer: **Atlas Copco**
Location: **Global**
Key Benefits: **Intelligent air flow control**

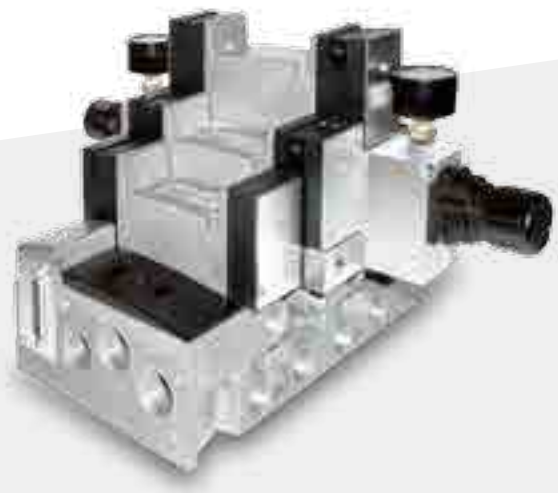
Requirement

Atlas Copco drill rigs use compressed air to transport rock debris and clean blast holes during drilling. The compressor regulation system uses valves to control the pressure and flow of air coming out of the compressor. To get adequate pressure without wasting compressed air Atlas Copco needed control valves that could be adjusted to meet specific demands. The analog valves originally used could not be adjusted using software algorithms. Electrical valves in a new control system were adjustable, but not robust enough to meet Atlas Copco's high standards for performance and longevity.

Solution

Drawing on decades of expertise in air preparation and flow control, IMI Precision Engineering supplied an IMI Norgren proportional valve that was "much better suited for the application in terms of robustness, both when it comes to external properties such as vibration and temperatures, but also regarding the internal fluid properties such as moisture resistance," according to Erik Alden, Atlas Copco Group Manager for Drill Rig Systems. The valve is part of a system that makes the rigs more fuel efficient.

VS18, VS26, VS45 Series
Valve Manifolds



Excelon 74 Series
FRL's

YOU CONVEY IT,
WE CONTROL IT!

Loading Station

Keep your conveyors running safely and your ore flowing efficiently with IMI Precision Engineering's large bore actuators, control cabinets, poppet valves and FRLs. Clean air and rugged cylinders mean no breakdowns to slow you down.

- **Control cabinets** integrate cylinders and valves, custom configured for specific application requirements, in a stainless steel cabinet to meet critical safety requirements.
- **Custom heavy-duty actuators** and **poppet valves** keep automatic loading stations in motion.
- **Air filters/regulators/lubricators** (FRLs) keep the compressed air that powers these components clean and dry while lubricating equipment downstream.
- **Press safety valves** provide redundancy to increase safety.
- **Inline lockout valves** provide safety during equipment maintenance.

Prospector Series
Poppet Valves

RM/900 Series
Actuators

Case Study

Control cabinets key to success of history-making Namibian gold mine

Customer: **B2Gold Corp., Lycopodium**
Location: **Namibia**
Key Benefits: **Centralized operation**

Requirement

In order to open the Otjikoto Gold Mine in Namibia, B2Gold Corp needed a world-class control system. IMI Precision Engineering had supplied a similar and highly successful package for B2Gold's EPCM, Lycopodium, on a previous project, and knew they could provide a custom solution that was more cost-effective and more efficient than their competitors for the Otjikoto Mine as well. Improving on the design of the original spec and lowering the cost, IMI Precision Engineering submitted a separate control panel and air component supply-only bid that was accepted by Lycopodium.

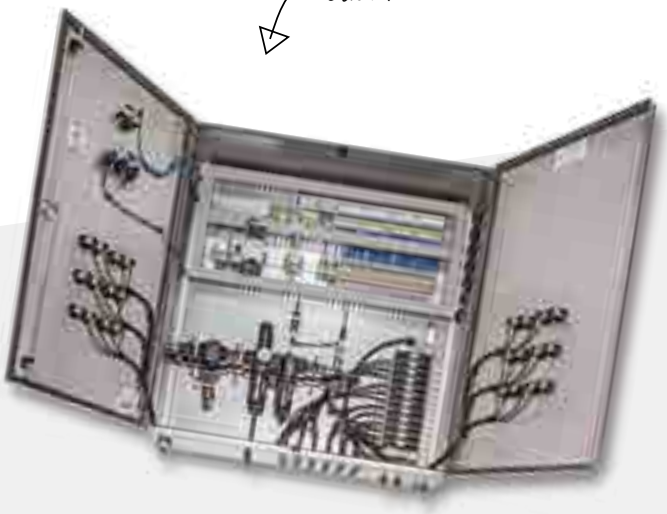
Solution

The set of approximately 40 pneumatic control panels provided by IMI Precision Engineering provide centralized operation for launder gates, diverter gates and a series of localized control valves across Otjikoto's beneficiation plant. These control the flow of slurry and other solutions used to separate the mine's gold from crushed ore. The centralized control panel packages are integrated into the plant's master digital control system meaning maintenance and issue resolution can take place centrally, saving the mine time and therefore money. Other design innovations include a simple, roomy and well-labeled layout, low-voltage components that can be changed by hand or with a screwdriver, and a "plug-and-play" design with stainless steel, weather-proof components.

XSz Series
Press Safety Valves

CR04/C002 Series
Inline Lockout Valves

Custom Control
Cabinets



DON'T MOVE!

Shaft Sinking

Imagine building a skyscraper in the jungle – constructing a shaft-sinking stage in a remote location can be just as challenging. The actuators for stage jacks that hold the stage firmly against the shaft have to extend and retract reliably, even under extreme conditions to keep your operation strong and safe.

- **Custom steel actuators** in a variety of bore and rod sizes hold firm, retract reliably and are compatible with various designs.
- **Control cabinets** integrate cylinders and valves, custom configured for specific application requirements, in a stainless steel cabinet to meet critical safety requirements.
- **Press safety valves** provide redundancy to increase safety.
- **FRLs** protect pneumatic equipment from damage and wear while offering users easy installation.

XSz Series
Press Safety Valves

17 Series
FRL's

Case Study

Robust stage jacks support shaft sinking operations

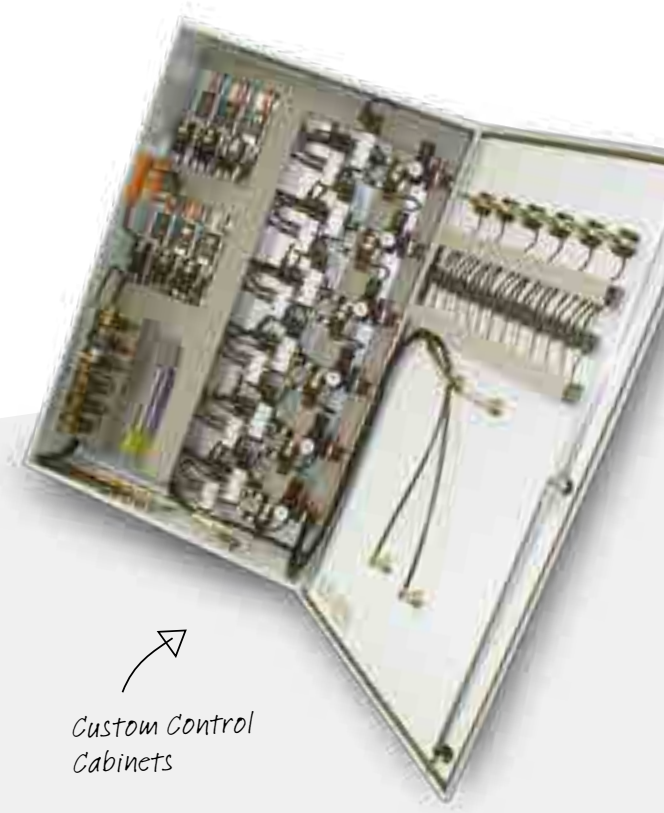
Customer: **Mine shaft development company**
Location: **South Africa**
Key Benefits: **Safe and dependable stage operation**

Requirement

A large mine shaft development company required a system to stabilize the work platform used for drilling blast holes. These stage jacks, six each on the top and bottom decks of the shaft sinking stage, have to hold the platform in place during drilling, then retract reliably so the platform can be hoisted out of the shaft during blasting. Then the platform is lowered again and the stage jacks extended to keep it stable during mucking and rock removal. With the safety of the operation depending on the reliable extension and retraction of these stage jacks, the shaft development company needed actuators that were robust, durable and dependable.

Solution

The heart of the stage jack system for this OEM is the IMI Norgren RM/900 12-inch bore actuator. This industry workhorse was selected for shaft sinking because of its robust construction and proven reliability under challenging conditions. A local distributor installed the RM/900 actuators with a special rounded piston rod nose to interface solidly with the shaft wall when the stage jack is extended. A ratchet system then locks the jack in position so it cannot be accidentally retracted. When the drilling or removal operation is complete, the actuators retract the stage jacks so the platform can be removed efficiently.



DON'T LET A LITTLE HEAT SLOW YOU DOWN

Blasthole Drilling

The key to productive blasthole drilling is to keep equipment going. But there are lots of things to slow you down, from frozen water in compressed air lines to drills that overheat and jam. IMI Norgren valves keep equipment clear of muck and debris that cause overheating, and dryers and FRLs keep air clean and dry.

- **Angle seat valves** meet requirements for temperature stability and corrosion resistance and are approved for use in the ex-zone.
- **Dust filter valves** open in milliseconds to deliver a high volume air pulse that cleans filter elements effectively. They close just as fast, saving air and energy.
- **AMT dryers** based on our unique adsorbent media tube technology last longer and remove water from compressed air faster.
- **Electronic drain valves** with dual timers allow full adjustment of both the drain interval and the valve actuation duration.
- A wide range of **FRLs** effectively remove damaging contaminants from compressed air and lubricate downstream equipment.

82960/82970 Series Dust Filter Valves

82400/82410 Series Process Valves

17-020-300 Series Electronic Drain Valves

Case Study

Dust filter valves make drill rigs safer, more efficient

Customer: **Sandvik Mining**

Location: **Finland**

Key Benefits: **Reliable Operation, Reduced Energy Consumption**

Requirement

Surface top hammer drill rigs can only operate reliably if the dust they generate is removed from the path of the drill to prevent the drill string from jamming. However, the dust cannot simply be exhausted, as respirable particles present a significant health and safety hazard. Sandvik Mining, a global equipment and tool supplier, solves the loose dust problem by integrating compressors and patented jet pulse dust collectors directly on their surface top hammer drill rigs. Dust-laden air flows into sock-shaped filter bags, where the dust collects, or "cakes," on the outside. Timed blasts of compressed air shake the cake into the collector so it can be discarded safely. Frequent jet pulse cleaning of the filter bag requires fast acting, long lasting valves to control the air pulse

Solution

IMI Buschjost valves help Sandvik keep their dust collectors operating at peak efficiency by:

- Opening in milliseconds so air pressure builds quickly to deliver an intense burst that cleans the filter bag most effectively
- Reducing energy consumption
- Being explosion-proof up to hazardous area 1/21
- Operated by a unique one-piece diaphragm rather than a spring
- Performing consistently across a temperature range from -40°F to 284°F (-40°C to 140°C)

The Sandvik dust collection system can be used anywhere in the world to protect workers from dust regardless of temperature. Using the same valves across the complete range of blast hole drill rigs simplifies ordering specifications.

A SPARK OF SAFETY

Loading and Haulage

The underground environment can be a dangerous one, but it doesn't have to be. With IMI Norgren's pneumatic start/emergency stop systems you don't have to rely on electrical systems that need to be protected with expensive and complex equipment in explosive environments.

- **Manual/mechanical valves** allow safety interlocks to disengage the drive and engage the brakes when the operator leaves his seat. Various options (push button, rotary switch and lever) are available to pilot operate hydraulic systems replacing the need for electrically controlled solenoid operated hydraulic valves
- **Custom pneumatic actuators** with a variety of materials, bore and rod sizes, adjustable cushioning and mounting options are easy to install without major design changes.
- **Pressure switches** control flow to protect systems from overload.
- **Solenoid Valves** control water spraying for dust suppression.
- **Fittings** Brass push-in fittings.

Pneufit Series Fittings

18D Series and IMI Herion 38D Series Pressure Switches

STOP AND GO

Personnel Vehicles

Moving people underground can be complex, but it doesn't have to be. With IMI Norgren's pneumatic start/emergency stop systems you don't have to rely on electrical systems that need to be protected with expensive and complex equipment in explosive environments.

- **Manual/mechanical valves** allow safety interlocks to disengage the drive and engage the brakes when the operator leaves his seat. allow safety interlocks to disengage the drive and engage the brakes when the operator leaves his seat. Various options (push button, rotary switch and lever) are available to pilot operate hydraulic systems replacing the need for electrically controlled solenoid operated hydraulic valves
- **Custom pneumatic actuators** with a variety of bore and rod sizes, adjustable cushioning and mounting options are easy to install without major design changes.
- **Solenoid Valves** control water spraying for dust suppression.
- **Fittings** Brass push-in fittings.

1C03S Series Solenoid Valves

Roundline Plus Series Actuators

Super X Series and Nugget 200 Series Manual Mechanical Valves