Partner to the Mining Industry
For more than 50 years, Festo has been the brand name for automation technology and partner to numerous industry sectors. This forms the solid base on which our range of products for the process industry is built. Over 13,500 employees across the globe contribute to our substantial progress in factory and process automation, as well as in basic and advanced training in industry.

Whether you run a mining operation or manufacture machines and systems for mines anywhere in the world, Festo staff in 58 national companies at 250 locations in more than 176 countries can offer local support and expert, specialist advice. This guarantees optimum support during engineering, planning, operation and service.

Innovation is Festo’s top priority. That is why we invest 7.5% of our turnover in research and development. With a single goal in mind: ensuring your success.
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Maximum efficiency through automation
At a time when energy costs are rising and environmental awareness is heightened, the coal mining industry is under immense pressure. Coal processing plants must be extremely efficient in order to be able to compete with renewable energies. Maximum system availability is therefore an absolute must for mining and processing energy minerals. Unexpected downtime, which causes high costs and losses, must be kept to a minimum. This can be achieved with automation technology and components with diagnostic capabilities.

An example of this type of component is the valve terminal CPX/VTSA. Integrated diagnostic functionalities enable the user to retrieve valuable information about the status of the valves. In coal preparation plants (CPP), a valve terminal controls all the process valves and collects data from the field devices. It transmits this data to the controllers via fieldbus systems. Its modularity enables a variety of combinations that can be perfectly adapted to individual processes such as washing, crushing and screening.
Control cabinet with cooling functionalities
Reliable, even in extreme heat and harsh ambient conditions: this control cabinet with integrated valve terminal CPX/VTSA effortlessly controls numerous process valves in a coal preparation plant (CPP) in Australia. A special ventilation system for the control cabinet ensures that heat accumulation inside the control cabinet is prevented, even in the high temperatures experienced in Queensland, Australia.

Standards-based valve terminal VTSA – maximum pneumatic functionality up to ISO size 2 (52 mm)
Ideal for maximum pneumatic and electrical function integration. The possibility of mixing four valve sizes on one valve terminal without any adapter plates is totally unique. It is highly integratable and 100% compliant with ISO 15407-2 and ISO 5599-2. Suitable for universal use, including as flow rate-optimised VTSA-F for up to 3,000 l/min. Hot swapping of valves, pressure zones, diagnostics and use in safety zones is also possible.
Metallic minerals

Overcoming extremely difficult conditions with automation

Products used to extract metal ores and process them into metal concentrates are subject to extraordinarily difficult conditions. Particulate matter and aggressive acids form corrosive and highly abrasive slurry, which means products have to be extremely robust and reliable.

Festo’s products are therefore designed for resistance against aggressive media such as acids and alkalis. They are also protected against the ingress of moisture and particles such as dust, for example. The result is increased reliability in the field.

Protection to IP65 and IP66 is standard. Products developed specifically for mining comply with even higher protection classes.

Special materials, such as high alloy stainless steel or corrosion-proof coatings, permit use under almost all ambient conditions. The portfolio is completed by control cabinets and fittings made from stainless steel, tubing made from tetrafluoroethylene and special seal and scraper materials for the drives.
Proportional cylinder DFPI in flotation cells
To adjust the level of metal concentrate in a flotation cell the company Minera Milpo used the first series-produced DFPI in El Porvenir in the highlands of Peru. Today, the DFPI is found in many well-known mines around the world, for example in copper mines in Chile, silver mines in Peru and Mexico as well as gold mines in Argentina. The proportional drive DFPI is one of Festo’s key products for mining.

DFPI – linear drive with integrated positioner
This drive has extremely high IP protection thanks to its high level of integration. This makes the product virtually maintenance-free, even under the extremely difficult conditions associated with processing metallic minerals.
The worldwide distribution of these minerals calls for globally active companies and appropriate extraction structures. Festo’s worldwide presence, on-site support and service make it an ideal automation partner. And its high product and service quality as well as standardised routines that are easy to learn are a decisive advantage.

Processing industrial minerals very often produces corrosive salts that demand robust and reliable products. Special materials or coatings are essential when designing individual automation components, while extremely abrasive media also require special process valves.

Robust automation – worldwide

Unlike metals and coal, industrial minerals are found almost everywhere. That is why so many countries around the globe process at least one industrial mineral, be it salt, potassium, lithium, phosphor or diamonds.
Quarter-turn actuators for processing lithium and magnesium

Sociedad Chilena de Litio uses quarter-turn actuators from Festo for processing lithium and magnesium in its plant in Antofagasta, Chile. Special coatings for the actuators and special materials for the process valves ensure system reliability and continuous production. Special process valves, actuated with pneumatic actuators, are the right choice in most cases for the highly abrasive media inherent in extracting and processing industrial minerals.

Quarter-turn actuator DFPB – sturdy and flexible

The sturdy quarter-turn actuator DFPB with standardised interfaces can be flexibly mounted on a wide range of process valves. The direct connection of sensor boxes type SRBP makes for a user-friendly and extremely sturdy unit that can easily withstand even dirty environments.
Construction minerals

Managing changing situations with modular automation
The building industry is very closely linked to the global economy. A strong economy means a lot of construction activity, which in turn creates a demand for cement, sand and other construction materials. During periods of slow growth, production is cut back and as a result demand for materials also drops.

These fluctuations in demand together with rising energy costs and worldwide competition are the three reasons why it is so crucial to be able to adapt systems for extracting and refining construction minerals to the market situation.

Modular products that can be extended, adapted and optimised as needed are the ideal solution. Valve terminals from Festo are the right product for this market because both their electric and pneumatic parts are modular.

Products from Festo defy dust and heat
The atmosphere at many extraction sites is saturated with extremely fine dust that impairs the quality of the pilot air for the drives and solenoid valves and could therefore damage these components. This is not a problem for our wide range of compressed air preparation devices; with these devices, the pilot air is always clean and dry.

Festo also provides products and solutions for applications involving high ambient temperatures as, for example, in the vicinity of rotary kilns used to manufacture cement. Examples of these include quarter-turn actuators and cylinders with special sealing materials designed for ambient temperatures of up to 140 °C.
Perfect tension at the V-belt
The fluidic muscle ensures the ideal V-belt tension in cement and concrete factories. Thanks to its closed system and self-cleaning function it is perfect for extremely dusty atmospheres, sometimes even with self-hardening slurry. Its pressure is proportional to the stroke and is thus the best solution for this requirement.

Fluidic muscle MAS – sturdy, powerful and stick-slip free
Whether with screwed or press-fitted connection, the sturdy structure and hermetically sealed design make the fluidic muscle ideal for applications in dusty and dirty environments. It has up to 10 times the initial force of a conventional cylinder and stick-slip-free movements, even at extremely slow speeds. Diameters 10, 20 and 40 mm; nominal length 30 ... 9,000 mm; force 480 ... 6,000 N.
Reducing the total cost of ownership (TCO) through targeted use of Festo services

This efficiency is achieved by reducing your total cost of ownership (TCO).

Festo’s product and service philosophy is based on continuously analysing the value creation chain of a wide range of customers. Festo uses every possible tool to design services specifically for each link in the chain. It is this win/win cooperation that results in a reduction of your Total Cost of Ownership.

**One-stop shopping: from components to complex systems**
Everything from a single source. Innovative technology, such as control and fieldbus systems, pneumatic or electric drives, standard or customised products, ready-to-install or pre-assembled solutions, and modular designs offer maximum flexibility. Combined with market leading services, such as our comprehensive project support, this ensures you will achieve maximum productivity – quickly and reliably.

Reducing the total cost of ownership (TCO) through targeted use of Festo services

- E.g. Energy Saving Service: savings of up to 35%
- E.g. ready-to-install pneumatics: savings of up to 50%

![Costs graph showing potential savings in various project phases](image)
Perfect engineering: the basis for highly efficient systems

Production and processing systems in mining plants are among the biggest in the industry and never stop. They consist of several connected, continuous processes. The huge size of the plants demands that they be broken down into subprocesses or product groups during planning. As a result, planning and engineering offices always work in close cooperation.

Products and services from Festo lighten their workload. They simplify the selection of the components, guarantee their compatibility and speed up the documentation of the plants. If necessary, our engineers will work together with the planners to work out the ideal automation concept.

The services for faster and simpler engineering range from:
• 2D drawings and 3D models comprising more than 20,000 components in 80 CAD formats, directly transferable free of charge
• FluidDRAW® for generating pneumatic circuit diagrams on a PC without CAD
• ProPneu for simulating, selecting and configuring pneumatic drive systems
• Tubing selection program for maximum process reliability and productivity
Procurement services: always tailored to your supply chain

In the mining industry, purchasing is usually done centrally at a company’s headquarters. Delivery, on the other hand, is directly to the mines, often in very remote locations. Knowing that the right product will be delivered in the right quantity to the right place is therefore an important criterion when selecting suppliers in the mining industry. This is because the only way to reduce expensive downtimes and therefore increase productivity is with quick delivery directly to the mines. Festo’s services for procurement and logistics are perfectly tailored to this situation:

- Festo online shop
- E-procurement
- 24-hour delivery service
- Express service
- Customised build-up of stock
- On-site delivery on request
- Special manufacturing service (SMS)
- Customised packaging systems, contracts and part numbers

On-site services for mines – Festo has the right equipment.
Service packages for getting started – installation and commissioning

The installation and commissioning of plants signals the end of years of cost-intensive studies and complicated engineering. Festo reduces these expensive and unproductive lead times. After all, the faster your plant is installed and commissioned, the faster extraction can begin and the quicker you can get a return on investment (ROI).

- Festo easy assembly service: from delivery of individual components to pre-assembly service and turnkey pneumatics
- Local support during commissioning
- Programming

- Setup of the components and subsystems
- Integration technology
- Special designs: close-to-standard or individual
- Specific training for specialists
After sales: designing more effective processes for the long-term

Everything from a single source and perfectly harmonised products and services from Festo. Take, for example, the compact flow sensors that support the Energy Saving Services and immediately indicate leaks or failures. This combination of product and service helps to reduce energy consumption.

Another way of identifying and implementing savings potential quickly and cost-effectively is with compressed air consumption analyses. There is no easier way of achieving immediate and lasting cost reductions.

Our portfolio of services for the mining industry includes:

- Maintenance contracts for maximum availability of pneumatic installations
- Energy Saving Services
- Compressed air consumption analysis
- Compressed air quality analysis
- On-site consultation by Festo technical consultants
- Spare parts and repair service
- Help and hotline
- Diagnostics-capable components to support maintenance and repairs
- Total productive maintenance support

Reducing energy consumption and extending the service life of the products thanks to compressed air quality and consumption analysis
Didactic: world market leader in basic and advanced technical training

Successful training through practical experience of process automation is possible with industry-oriented model systems. “Learning by doing” and “process orientation” are the best ways of teaching the different critical topics of process engineering. Simulating a process engineering system on a PC provides an opportunity to use a simulation as an actual training system. The process control system is based on the successful concept of replication and simulation:

- Modular station structure
- With industrial components and standards
- Open interfaces

- Individually configurable and extendable
- For all types and levels of qualification
- Stimulating project and team work

This system offers an effective learning environment for:

- Electronic engineers, process control engineers, mechatronics engineers, microtechnologists
- Procedural technicians for plastic and rubber technology, glass technology and coating technology
- Experts in food technology, confectionery and fruit juice technology
- Chemical laboratory assistants, chemical engineers, pharmaceutical engineers
- Experts in water supply, sewage technology, pipe, canal and industrial services
- Biological laboratory technicians, biotechnicians
Automation concepts in the mining industry
With more than 30,000 catalogue products the right automation concept can always be found for every application within the mining industry. An extremely wide range of standard solutions and many customised solutions covering every level of automation ensure smooth system operation in the mining industry.

Levels and depth of diagnostics in the automation pyramid

6 Remote maintenance, remote diagnostics
5 Control system and visualisation
Compressed I/O and diagnostic information from several thousand I/Os
2 Module level
Digital: 4, 8, 16 channels
Analogue: 2, 4 channels
1 Sensor/actuator level
1 sensor = 1 channel,
1 valve/actuator = 1 channel
4.1 Visualisation
by means of programming
3 Field device level
64 to 512 I/Os per device
3.1 Handheld terminal
Diagnostics in plain text,
without any programming
4 PLC level
Communication, status and diagnostic information from several thousand I/Os
3.2 CPX maintenance tool
Local diagnostics and parameterisation via Ethernet
2 Module level
Digital: 4, 8, 16 channels
Analogue: 2, 4 channels
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Products for the mining industry

In this section Festo’s product portfolio for the mining industry is described in more detail. It covers the entire control sequence and virtually every process and requirement, whether for sturdy, resilient, stable, reliable, explosion and overload proof or corrosion-resistant products.