



ENGINEERING  
TOMORROW

*Danfoss*

# Proven, Reliable Solutions for Sustainable Mining

Navigate the demands of mining with proven solutions from Danfoss. Our dedication to quality will reduce the threat of downtime. And we know mining companies are held to higher sustainability standards than ever. Reducing your environmental impact while keeping your mine running safely and efficiently is our commitment. With decades of experience, our solutions are optimized for your specific application.

## **Sensing Solutions**

Built on heavy-duty applications expertise, Danfoss sensors and transmitters provide precise temperature and pressure measurement for safe and reliable operation of the system, even in the harshest environments.

## **High Pressure Pumps**

Danfoss high pressure pumps offer the same amount of power in a smaller package, making the most efficient use of valuable space and energy.

## **Power Solutions**

Power Solutions as a pioneer of hydrostatic transmissions, Danfoss was the first to introduce load-sensing proportional valves — and the first to control them electronically. Danfoss is your partner for seamless integration of electronics and hydraulics. The fault monitoring capabilities on our products add yet another layer of safety and dependability that is key for mining customers.

## **Drives**

Drives offers a complete portfolio of VLT® and VACON® drives for mining needs. Danfoss drives are designed and built for maximum uptime and robust performance, which is critical in the mining and minerals industry, where repair and maintenance must be kept to a minimum.

To learn more, visit [www.danfoss.com](http://www.danfoss.com)

# Contents

---

Fluid Conveyance	03
Electric Motors and Converters	04
Steering	04
SONDEX® heat transfer solutions for mining	05
Monitoring, control and diagnostics	06
Industrial Solutions	06
Danfoss Sensing Solutions	07
Open Loop Pumps	08
Closed Loop Pumps	08
Hydraulic Valves	08
Hydraulic Pumps & Motors	09
Danfoss Drives	10
Applications	11

## Fluid Conveyance

### Aeroquip and Winner by Danfoss hydraulic hoses and fittings

With MSHA qualifications, our comprehensive selection of hydraulic hoses and fittings are designed to guarantee minimized downtime and maintenance expenses, optimized for tight spaces and ensure dependable performance and full compliance with stringent mining regulations.



### Connectors

Discover our versatile connectors for mining solutions including our tube fitting systems, a wide range of steel adapters, flat face couplings, and Flexmaster tube/pipe joints all offer exceptional performance, specifically engineered to meet rigorous application demands, all while minimizing energy loss.



### Boston branded mining hoses for specific mining areas

Empower your mining operations with our comprehensive range of industrial, low-pressure hoses. From air-operated power tools to rock dust suppression, slurry transfer to mine fire protection, our hoses cater to diverse mining needs with high performance and reliability.



### Danfoss hoses for auxiliary and support functions

Discover specialized hoses for mining operations specifically tailored for air conditioning systems, fuel lines, and engine compartments, offering efficient refrigerant flow and low permeation, enhanced durability, temperature tolerance, and resistance to abrasion.



## Electric Motors and Converters

### EC-C1200/C1700 – Electric Converter

These heavy-duty converters were specifically developed for electric or hybrid drive trains in mobile work machines. Available as two variants suitable for two different system voltage levels 500 VAC and 690VAC. Both converters can work as active front end, microgrid, motor control (inverter) and EC-C1200 also as a DC-to-DC converter when combined with EC-LTS1200-410.

#### VOLTAGE LEVELS

850VDC/500VAC (EC-C1200-450)

1200VDC/690VAC (EC-C1700B-420)



### EM-PMI375 – Electric Motor

Our electric SRPM motors offer high torque and efficiency at low speed with compact size as traction motors in heavy machinery. The motors are available in various speed and torque ratings: EM-PMI with power up to 1,000 kW and EM-PME outer rotor machines with power up to 50 kW.

#### POWER RANGE

1,000 kW (EM-PMI)

50 kW (EM-PME)



## Steering

### OSPE Electrohydraulic steering valve

Suitable for applications where conventional steering wheel is used. Provides a repeatable high performance and precision. Increased productivity with variable steering ratio. Improved operator comfort with joystick interface. Integrated safety and steering controller, SIL 2 certified.

#### FLOW CAPACITY

70 l/min, [18.4 US gal/min]

#### STEERING PRESSURE

210 Bar, [3046 psi]



### EHI Electrohydraulic steering valve

Suitable for steer-by-wire, autonomous and all-wheel steering applications. Provides a repeatable high performance and precision. Increased productivity with variable steering ratio. Improved operator comfort with joystick interface. Integrated safety and steering controller, SIL 2 certified.

#### FLOW CAPACITY

50 l/min, [13.2 US gal/min]

#### STEERING PRESSURE

250 Bar, [3626 psi]



### OSQ Flow amplifiers

Our flow amplifiers bring steering control to the biggest machines on the planet. Several hundred tons of solid machine is a tough steering challenge. We can help you overcome it with the largest steering flow amplifiers on the market. Ideal for vehicles that require a high steering flow.

#### FLOW CAPACITY

400 l/min, [105 US gal/min]

#### STEERING PRESSURE

240 Bar, [3481 psi]



## SONDEX® heat transfer solutions for mining

### Plate and Shell heat exchangers (SPS)

Danfoss plate and shell heat exchangers (SPS) are perfect choices for condensation and steam heating duties. A fully welded plate pack makes the heat exchangers well-suited for handling aggressive media as well as high pressure levels and temperatures. Less space demanding and much lighter in weight, they are good replacements for shell and tube heat exchanger.

#### PRODUCT RANGE

Design pressure: Up to 40 bar (580 psi)

Connections/standards: DN32 to DN300 (1 1/4" to 12") / ASME and CRN

Min/max working temperature : -10°C / 250°C (14°F / 482°F) for bolted types

Min/max working temperature : -10°C / 400°C (14°F / 752°F) for fully welded types

Material: Plates – SS 304, 316, Titanium (Other material on request)



### Free Flow heat exchangers

Free Flow plate heat exchangers are excellent choices for applications that use media with particle-rich contents, fouling tendency, or high viscosity. Each Free Flow heat exchanger is configured to suit your application and media type, with contact-free plate channels for an unimpeded flow and long intervals between cleaning.

#### PRODUCT RANGE

Design pressure: Up to 10 bar (150 psi)

Connections/standards: DN25 to DN500 (1" to 20") / ASME and CRN

Min/max working temperature : -20°C / 180°C (-4°F / 356°F) Depending on the gasket materials

Material: Plates – SS 304, 316, Titanium, Hastelloy, SMO 254 (other material on request)

Material: Gasket – NBR, EPDM, Viton



### Spiral heat exchangers

Danfoss spiral heat exchangers are the definitive solution for applications that require treatment of challenging fluids, such as sludges, slurries, waste water, liquids with high viscosity, and liquids that cause fouling or contain fibers and solids.

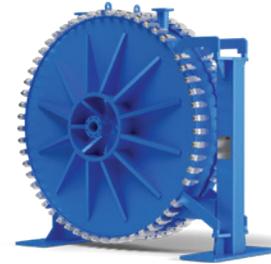
#### PRODUCT RANGE

Design pressure: Up to 16 bar (250 psi) Higher pressures available upon request

Connections/standards: DN32 to DN300 (1 1/4" to 12") / ASME and CRN

Min/max working temperature : -20°C / 200°C (-4°F / 392°F)

Material: Carbon steel, SS 304, SS 316



### Standard plate heat exchangers

Our standard gasketed plate heat exchangers are the ideal choice for a wide range of applications across numerous market segments. We have one of the largest plate portfolio in the world, and we conjure each heat exchanger to meet your requirements. Innovative technologies and smart design make our standard plate heat exchangers a stellar investment.

#### PRODUCT RANGE

Design pressure: Up to 35 bar (500 psi)

Connections/standards: DN25 to DN600 (1" to 24") / ASME and CRN

Min/max working temperature : -20°C / 180°C (-4°F / 356°F) Depending on the gasket materials

Material: Plates – SS 304, 316, Titanium, Hastelloy, SMO 254 (other material on request)

Material: Gasket – NBR, EPDM, Viton



## Monitoring, control and diagnostics

### Connect and control solutions

Ergonomic, modern and rugged electronic components provide superior control and operation of equipment in the harshest environments. The PLUS+1® platform offers easy-to-configure controllers, with user-friendly programmable displays, and Pedals, joysticks designed for precision performance, durability and functional safety.

#### REMOTE CONTROLS IK2/IK3/IK4

Up to 4 joysticks or 8 paddles  
4.3" display (IK3/IK4 models)

#### DISPLAYS

Screen sizes: 4.3", 7", 10", 12"

#### CONTROLLERS MC/SC

Number of pins: 12-50  
Number of outputs: 2-14  
Number of inputs: 4-24



## Open Loop Pumps

The APP high-pressure pumps set new standards for small- and medium-sized RO applications ranging up to 92 m<sup>3</sup>/h (405 gpm). The most compact and energy efficient pumps on the market. With low maintenance needs and low total cost of ownership, the Danfoss APP high-pressure pumps are a market leader.

#### PRODUCT RANGE: Axial Piston Pumps (APP)

Max pressure: Pressure up to 124 bar, 1800 psi  
Max flow: 92 m<sup>3</sup>/hr  
Min flow: 0.6 m<sup>3</sup>/hr



## Closed Loop Pumps

Most of the Danfoss range of PAH and PAHT high-pressure pumps are suitable for closed loop hydraulic systems. PAH operate on tap water of up to a 100 cm<sup>3</sup>/rev, while PAHT can withstand ultra-pure water with a maximum displacement of 90 cm<sup>3</sup>/rev within a closed system. Both types can produce the same flow at a given speed, regardless of the discharge pressure.

#### PRODUCT RANGE: PAH+PAHT

Max pressure: Pressure up to 160 bar, 2320 psi  
Max displacement: 100 cm<sup>3</sup>/rev  
Min displacement: 2 cm<sup>3</sup>/rev



## Danfoss Sensing Solutions

### DST P650 Smart heavy-duty pressure transmitter

The mobile hydraulic industry is paving the way to reduce emissions and fuel consumption. That calls for optimized performance, safety, and precision of machines. Our new DST P650 pressure transmitter is engineered for the future, putting diagnostics, customization, and control in your hands.

#### PRESSURE RANGES

0.00 bar – 600.0 bar / 0.00 PSI – 8700.00 PSI



### MBT 5250 Temperature transmitter for general industry

The MBT 5250 is designed for temperatures up to 200 °C and comes with interchangeable measuring inserts equipped with EN 175301-803-A, Pg 9 as standard. The temperature sensor is based on a standardized Pt 100 or Pt 1000 element, which gives a reliable and accurate measurement.

#### TEMPERATURE RANGE

-50° – 200° C / -122° – 1112° F



### MBT 2310 bearing temperature sensor

The MBT 2310 bearing sensor is specifically designed for measuring the temperature in the bearings in mobile hydraulic machines, purpose-built for the ultimate accuracy, reliability, and longevity. Even in the roughest environments.

#### TEMPERATURE RANGE

-25°C-125°C NTC; -25°C-200°C PTC



### Position sensors for mobile hydraulic solutions

Danfoss is taking functional safety to the next level with a full program of state-of-the-art DST X510 and X520 rotary position sensors, DST X710, X720 and X730 inclination sensors, and DST X800 wire position sensors.

All variants come as both single and redundant sensor types, making the complete portfolio suitable for safety-critical applications.

#### POWER RANGE

Ranges vary by sensor type



## Industrial Solutions

### Cylinders

The Vickers by Danfoss range of hydraulic cylinders is tailored for superior performance in mining applications. Our mill-type cylinders have a robust feature set, including integral bearings, rod protection bellows, and application-based sealing systems. Our welded cylinders are constructed with high-grade steel and a sealing system designed to endure the challenges of highwall mining.

#### PRODUCT RANGE

Size range: Bore 40mm - 1.5m, Stroke up to 20m (sizes vary by model type)

Rod coating options: Hydroclad® Laser Cladding, ceramic coating, HVOF coating, Galvanic coatings

Cylinder types: XL series, Mill-type, Welded, Tie-Rod, Threaded, Electro-hydraulic, Light-duty pneumatic



### Airflex® Clutches and Brakes

If it rotates, think Airflex®! Known for their safe and superior performance, long life and ease of maintenance, Airflex industrial clutches and brakes are specifically engineered to manage the movement in your mining operation.

#### PRODUCT RANGE

Clutches: VC Clutch, HEVC Clutch

Brakes: FHB Floating Housing Brake, DBA Brake, Failsafe Caliper Brake

Torque Limiter: Airflex VC-style TLC



## Hydraulic Valves

### Industrial Valves

We offer valves to control machine functions; Cut, groove, bore, clamp, inject, press, form, lift, dig, or haul - day in and day out, in the world's most demanding environments. This is the work of Vickers by Danfoss range of hydraulic valves, engineered for reliable and continuous performance in both industrial and mobile applications.

#### PRODUCT RANGE:

Max pressure: Up to 350 bar/5000 psi

Size: NG4-32 (D02-10)

Flow capacity: up to 1100 LPM/290 GPM



### Spool Valve Solutions (SVS)

Experience flexibility, efficiency, and global reach with our Spool Valve Solutions. Our comprehensive portfolio offers best-in-class control, ensuring high productivity, safety, and minimal emissions for mining operations. Our modular approach allows for easy adaptation to future control needs, offering countless configuration possibilities. This flexibility ensures integrated solutions perfectly suited to your vehicle. PVE can be controlled by Danfoss joysticks directly, via controller or from a PLC.

#### PRODUCT RANGE:

PVG 32/128/256

#### ENCLOSURE RATING:

Up to 440bar

#### FLOW RANGE:

1-500 L/min per section



# Hydraulic Pumps & Motors

## Gear Pumps & Motors

Danfoss Gear pumps and motors are the ideal choice for a wide range of applications - from small to medium and large off-highway vehicles up to the most demanding mobile applications. Available in 4 families: Lumi for standard aluminum applications, GearMe for high performance aluminum products with a wide range of features available, Rugid for high power density requirements with cast iron option for heavy duty operations, shhark® for low noise applications.



**PRODUCT RANGE:**

Max pressure: Pressure up to 276 bar, 4000 psi

Max displacement: 200 cm<sup>3</sup>/rev

Min displacement: 0.25 cm<sup>3</sup>/rev

## Orbital Motors

Offering a wide range of the most durable, reliable, and robust motors on the market, our Orbital motors are packed with power and deliver consistent performance designed for mining applications.



**PRODUCT RANGE:**

Max pressure: Pressure up to 350 bar, 5,080 psi

Max displacement: 940 cm<sup>3</sup>/rev

Min displacement: 160 cm<sup>3</sup>/rev

## Piston Pumps & Motors

Danfoss piston pumps and motors enjoy a sterling reputation around the world – whether it's our robust, tried-and-true legacy lines with decades of proven performance, or cutting-edge technologies such as our legendary H1 family - industrial machine designers know that Danfoss is dedicated to abundant options and maximum efficiency.



**PRODUCT RANGE:**

Max pressure: Pressure up to 450 bar, 6500 psi

Max displacement: 280 cc

Min displacement: 20 cc

## Danfoss Drives



**VLT® AutomationDrive FC 302**  
Designed to provide variable speed control of all asynchronous motors and permanent magnet motors.

POWER RANGE	LOW HARMONIC DRIVE	ENCLOSURE RATINGS
3 x 200-240 V...0.33 Hp - 200 Hp	3 x 380-480 V...250 Hp - 1000 Hp	IP20, 21, Nema 1, Nema 12, Nema 3R, IP55, Nema 4X, IP66
3 x 380-500 V...0.50 Hp - 1200 Hp	<b>12-PULSE DRIVE</b>	
3 x 525-600 V...1 Hp - 120 Hp	3 x 380-500 V...450 Hp - 1350 Hp	
3 x 525-690 V...1.5 Hp - 1550 Hp	3 x 525-690 V...450 Hp - 1350 Hp	



**VACON® NXP System Drive**  
A comprehensive configured common DC bus drive lineup for heavy-industry needs where round-the-clock activity is required, leaving little time for maintenance.

CURRENT RATINGS	ENCLOSURE RATINGS
3 x 380-500 V...630-5000 A	Nema 12, Nema 3R
3 x 525-690 V...630-5000 A	



**VACON® NXP Air Cooled**  
Designed for a broad range of demanding applications, focusing on higher power sizes and system drives.

POWER RANGE
3 x 208-240 V...0.55-90 kW
3 x 380-500 V...1.5-1200 kW with DriveSynch 1.5-4000 kW
3 x 525-690 V...2.0-2000 kW with DriveSynch 2.0-4500 kW



**iC7-Automation**  
Whatever the environment, the iC7-Automation delivers the reliability and performance you need. With connectivity, security and intelligence, this drive lets you take advantage of the latest in Industrial IoT.

POWER RANGE	ENCLOSURE RATINGS
3 x 380-500 V AC ... 0.37 - 710 kW	IP21, Nema 12, Nema 3R



**VACON® NXC**  
An enclosed drive designed for demanding applications that includes options for Active Front Ends and low harmonic solutions.

POWER RANGE - 6- AND 12-PULSE SUPPLY	ENCLOSURE RATINGS
3 x 380-500 V...132-1200 kW	Nema 12, Nema 3R
3 x 525-690 V...110-2000 kW	
POWER RANGE - AFE SUPPLY	LOW HARMONIC, ACTIVE FILTER SUPPLY
3 x 380-500 V...132-1500 kW	400 V...132-560 kW
3 x 525-690 V...110-2000 kW	500 V*...132-560 kW
	690 V...110-800 kW

\*requires 690 V active filter



**VACON® 1000**  
This air-cooled medium-voltage drive is ideal for general-purpose industrial MV applications, especially for variable torque loads such as pumps and fans in the low and mid-power range.

POWER RANGE	ENCLOSURE RATINGS
2400-3000 VAC: 150-3530 kVA	Nema 12, Nema 3R
3300-4160 VAC: 210-4900 kVA	
6000-6900 VAC: 375-8130 kVA	
10000-11000 VAC: 625-12960 kVA	



**VLT® AQUA Drive FC 202**  
With no need for additional components, the VLT® AQUA Drive provides flexible installation with cable lengths up to 150m screened and 300m unscreened to reduce installation costs.

POWER RANGE	ENCLOSURE RATINGS
1 x 200-240 V... 1.5 - 30 HP	IP20, 21, Nema 1, Nema 12, Nema 3R, IP55, Nema 4X, IP66
1 x 380-480 V... 10 - 50 HP	
3 x 200-240 V... 0.33 - 60 HP	
3 x 380-480 V... 0.5 - 1350 HP	
3 x 525-600 V... 1 - 125 HP	
3 x 525-690 V... 15 - 1900 HP	



**VACON® 100 X**  
A drive for indoor and outdoor applications that withstands high pressure and vibrations levels, water, heat, and dirt.

POWER RANGE	ENCLOSURE RATINGS
208-240 V...1.1-15 kW	IP66, Nema 4X
380-500 V...1.1-37 kW	

## Applications

Danfoss has deep application expertise and supports many mining applications, including the following:

- Air Separator
- Apron Feeder
- Automation
- Ball Mills
- Belt Tensioners on Conveyors
- Blast Hole Drill Rigs
- Borehole Pumps
- Boring machines
- Cable Reel Trucks
- Centrifugation and classification
- Continuous Miner
- Conveyors
- Crushing
- Desalination Systems
- Dewatering Skids
- Digital twins
- Draglines
- Filtration
- Flotation and attrition
- Flotation Systems
- Grinders
- High wall mining systems
- Hoist and Winch
- Hydrometallurgy
- In-pit crush and convey
- Jumbo Drill
- Loading and hauling
- Lube Trucks
- Magnetic separation
- Material handling
- Milling and grinding
- Mine shaft systems
- Mining Dump Trucks
- Mining Shovels
- Mobile Pump Stations
- Precious metals recovery
- Process control and optimisation
- Pumping
- Pyromet
- Rock Crushers
- Rock Drills
- Rope shovels
- Rotary Drill Rigs
- Sampling, preparation and analysis
- Screening
- Shovel Lifting Systems
- Side Dump Loader
- Slurry handling
- Stacker/Reclaimer
- Stockpile Feeder
- Tailings management
- Thickening and clarifying
- Trenching Machines
- Tunnel boring machines
- Ventilation Fans
- Vertical drillers
- Vertical Roller Mill
- Wear solutions
- Wheel loaders

# Let us prove it to **you**.

Danfoss understands your complex challenges. That's why we are Engineering Tomorrow while delivering the right products, technologies and partnerships you need today to help you navigate more efficiently, safely and sustainably in the harshest environments.

To learn more, visit [energy.danfoss.com](https://energy.danfoss.com) or <https://bit.ly/DanfossMiningandMinerals>.

 Web: [www.danfoss.us](https://www.danfoss.us)

 LinkedIn: [Danfoss\\_North America](#)

 Email: [Solutions@Danfoss.com](mailto:Solutions@Danfoss.com)

---

Danfoss shall not be responsible for any errors in catalogs, brochures, or other printed material. Danfoss reserves the right to alter its products at any time without notice, provided that alterations to products already on order shall not require material changes in specifications previously agreed upon by Danfoss and the Purchaser. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.