

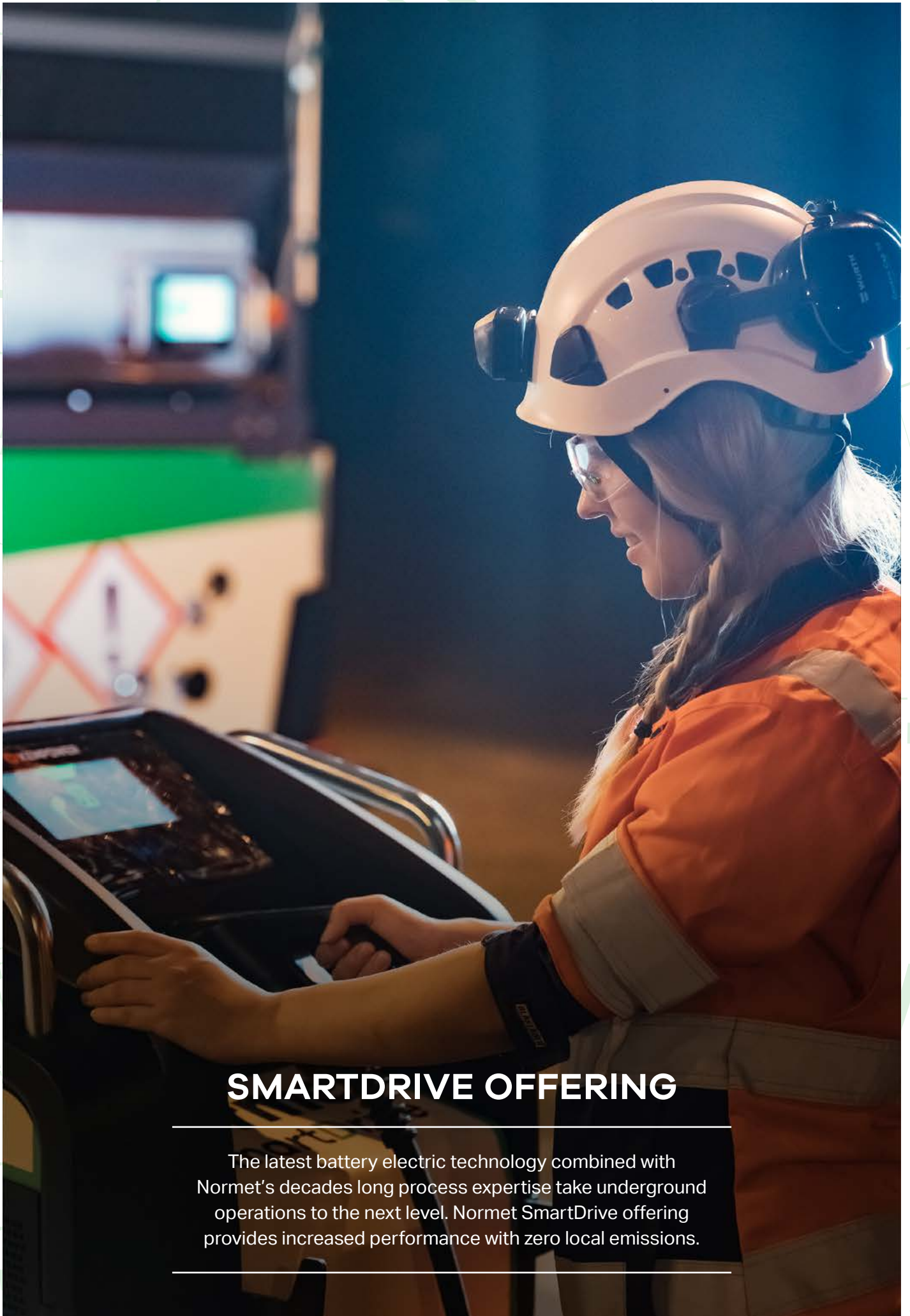


Normet SmartDrive technology and offering

DEFINING THE FUTURE
UNDERGROUND

normet
SmartDrive®

normet.com/smartdrive



SMARTDRIVE OFFERING

The latest battery electric technology combined with Normet's decades long process expertise take underground operations to the next level. Normet SmartDrive offering provides increased performance with zero local emissions.

START YOUR ELECTRIFICATION JOURNEY TODAY!

Normet SmartDrive battery electric vehicle (BEV) architecture includes the latest Li-ion battery technology with a fast charging capability. High-torque electric motors provide instant torque and efficient operation without any local emissions. The fully reversible 4WD ensures safe and sure movement in difficult underground conditions.

Built-in energy recuperation technology maximizes the storing of regenerative braking energy during downhill driving and deaccel-

eration. In addition, efficient hydraulic dual-circuit oil immersed brakes provide additional braking power when it is needed.

From our long experience, we know our customers challenges and the importance of reliability. SmartDrive has industrial grade components and redundant design for maximum availability.

Normet SmartDrive is a smart and safe choice for challenging underground operations!

INNOVATING FOR PERFORMANCE

0 % local emissions

High productivity, up to 25 % faster cycles

Lower operational costs

Even 30 % less maintenance costs

75 % lower driving energy consumption

Up to 50 % energy recuperation in downhill driving

Long-life industrial grade Li-ion batteries with lifespan of 20 000 full charging cycles

No hot exhaust gases and very minor heating of surfaces

Significantly reduced service brake wear

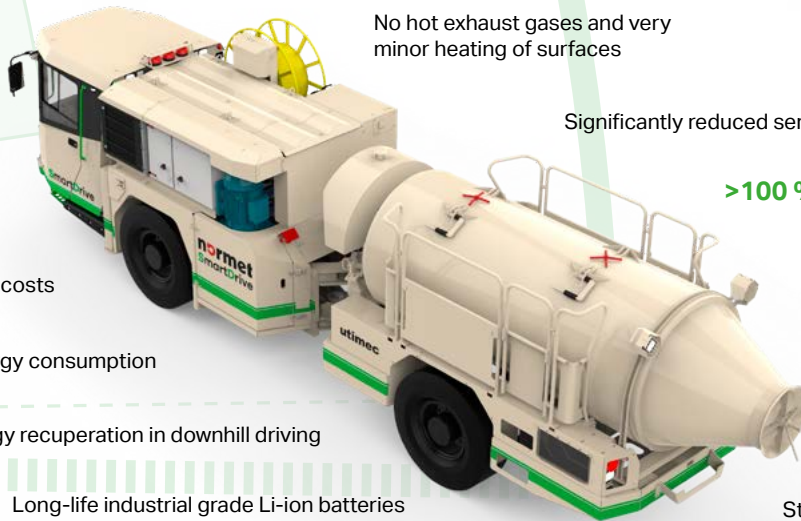
>100 % increased uphill tramping speed and fast acceleration

Easy and pleasant one pedal driving

Low noise levels

Fast charging capable

Standardized battery charging interfaces



Normet SmartDrive architecture suits ideally for underground logistics like concrete transportation. Scan the QR-code to see a video about the SmartDrive benefits and features which make driving more pleasant and safe.



INCREASED PERFORMANCE WITH ZERO LOCAL EMISSIONS

SMARTDRIVE ARCHITECTURE

Normet SmartDrive is a modular battery electric vehicle (BEV) architecture designed to optimize energy consumption and performance in underground mining and tunneling applications. Normet SmartDrive equipment enable higher productivity, lower operating costs and most importantly - zero local emissions.

Easiness of use and carefully engineered controls guarantee that the machine is safe and pleasant to operate. High power motors reduce tramping time to reach work sites and recover energy in downhill driving.

Normet provides both, complete turnkey solutions and flexibility to integrate SmartDrive equipment step-by-step into existing operational models.



Scan the QR-code to see a video explaining SmartDrive architecture in more detail.



Mining machines' redundant BEV architecture is optimized for underground mining use.



Tunneling machines' BEV architecture is optimized for tunnelling and shorter tramping distances.

SMARTDRIVE MODELS AVAILABLE:

- Charmec MC 605 VE SD
- Charmec MC 605 V SD
- Charmec MF 605 V Long End SD
- Spraymec MF 050 SD
- Spraymec 8100 SD*
- Utimec MF 500 Transmixer SD
- Utimec MF 205 PER SD
- Multimec MF 100 SD
- Utilift MF 540 SD

* Optimized for tunnelling



Utimec MF 205 PER SD

Utimec MF 500 Transmixer SD

Multimec MF 100 SD

Utilift MF 540 SD

Spraymec 8100 VC SD

SMARTDRIVES AROUND THE WORLD



Charmec MC 605 VE SD in Australia

Our SmartDrive explosives charger has been in use in several mine sites in Australia with outstanding results. From the first trial in Carrapateena, we got great customer feedback from our trusted partner and customer Enaex:

"SmartDrive technology is the next generation for underground vehicles. Coupled with emulsion charging systems, the benefits are not just based on operational costs, but the safety and health of operators. The two biggest impacts on personnel in the charging environment is fume and heat generation and the SmartDrive eliminates both these hazards. Enaex are proud to have been part of an Australian-first and a move towards increased safety and productivity for our industry and its people."

Says Murray Gordon, Regional Operations Manager Underground, Enaex Australia.



Scan the QR code to watch a video telling more about the Charmec MC 605 VE SD operating in mine sites in Australia.



Utimec MF 500 Transmixer SD in Chile



Multimec MF 100 SD in Canada



Spraymec 8100 VC SD in Norway



Spraymec MF 050 SD

Charmec MF 605 V Long End SD

Charmec MC 605 V SD

Charmec MC 605 VE SD

SmartDrive CC160

SmartDrive CT40

SMARTDRIVE EQUIPMENT OFFERING

UNDERGROUND LOGISTICS AND TRANSPORTATION

Normet underground logistics offering includes a large range of equipment to meet the needs of the mining and tunneling industries. All our equipment improve safety and productivity in different underground tasks. Normet SmartDrive electric power transmission allows unforeseen speed and productivity for underground logistics vehicles.

Multimec MF 100 SD

Multimec MF 100 SD offers an innovative and reliable cassette system with a powerful carrier to serve in a wide variety of different mining and tunneling tasks. With Multimec it is possible to carry out almost all service tasks underground, like personnel and material transportation, machine fueling and maintenance jobs, concrete transportation, just to mention few. Multimec MF 100 SD is real beast of burden which allows an extremely high carrier utilization rate with low operational costs.



Utimec MF 205 PER SD

Utimec MF 205 PER SD with 20+2 persons transport capacity is designed for people transportation in underground mines and tunnels. Utimec personnel carriers are designed utilizing Normet's decades long expertise in underground transportation, which makes Normet equipment the safest and most adequate solutions in the market. These built-for-purpose machines have high transport capacity comparing to their overall dimensions, and they include several safety features as standard. Optional full chassis suspension offers outstanding comfortability for passengers.





Utimec MF 500 Transmixer SD

Utimec MF 500 Transmixer SD provides the highest productivity in its size class. Utimec MF 500 Transmixer SD has a large concrete transport capacity and extremely high output power to ensure high tramming speed also when it is fully loaded. New ergonomic cabin provides comfortable and safe operational environment for the driver and co-driver. Normet concrete transport equipment have a full range of optional accessories to support concrete transport and spraying process and to increase machine value.

LIFTING AND INSTALLATIONS

Normet underground lifting and installation offering includes a large range of equipment to meet the needs of the mining and tunneling industries. All Normet person lifters have been designed to improve safety in underground person lifting and installation processes, having design and construction comply to latest safety standards and optional FOPS II safety roofs for every person lifter in our offering. SmartDrive BEV technology, together with optional remote drive system (RDS), enables better safety, ergonomics and productivity.

Utilift MF 540 SD

Utilift MF 540 SD is a scissor lifter based on Normet SmartDrive technology. Utilift series offer reliable performance for lifting and installation needs of underground mining. 4,5 ton maximum lifting capacity enables to installation of even the heaviest ventilation fans used in mining. Optional remote drive systems (RDS) increases productivity of underground installation processes enabling carrier driving from platform. Normet SmartDrive BEV technology, in addition to zero emissions, provides high tramming speed and fast transits from site to site in underground installation works.



SMARTDRIVE EQUIPMENT OFFERING

CONCRETE SPRAYING

Many years of experience and process knowledge allows Normet to offer unique solutions in mechanized underground concrete spraying applications, admixture technologies, and after sales services. Today Normet provides a complete range of machines for the concrete spraying process in mining and tunnelling with a high mechanization and automation level. SmartDrive BEV technology, combined with low-pulsation concrete delivery and the latest concrete admixtures, enable customers to achieve the highest quality standards for concrete spraying. Batteries can be charged during spraying, when connected to electric supply, in order to increase productivity.

Spraymec MF 050 VC SD

Spraymec MF 050 VC SD is a robust and highly mobile concrete sprayer for mining, developed with decades of concrete spraying experience in the mining environment. The integrated control

system continuously monitors and adjusts the unique concrete spraying pump technology and unmatched dosing system for set accelerator for minimal pulsation.

Equipped with a proven and highly agile spray manipulator and a low-pulsation concrete spraying pump, it delivers unsurpassed efficiency and application quality.



Spraymec 8100 VC SD

Spraymec 8100 VC SD is a robust mobile concrete sprayer for tunnel construction projects with medium to large tunnel profiles. The sprayer's SmartDrive architecture is optimized for tunnelling. A tried and tested spray manipulator with spray lance is easy to operate and has an impressive working range.

The optional SmartSpray system assists the operator in spray application by simplifying nozzle guidance, which reduces rebound, increases efficiency, and ultimately leads to better application quality.

The reliable and high-volume on-board compressor delivers the air volumes for a high-quality sprayed concrete application. The conveying and nozzle system with big diameter steel pipes and hoses minimizes the risk of blockages.



EXPLOSIVES CHARGING

Normet is well known of its underground charging equipment and has the widest offering of mechanized underground explosive chargers in the market. Charging equipment have been designed with safety and mechanization in mind, to fulfill even the most demanding customer needs all over the world. Normet SmartDrive BEV technology suits particularly well to emulsion charging enabling zero local emissions and providing comfortable, quiet and ergonomic work process with a possibility for independent battery electric explosive charging, even without plugging in to electric supply.

Charmec MC 605 V(E) SD

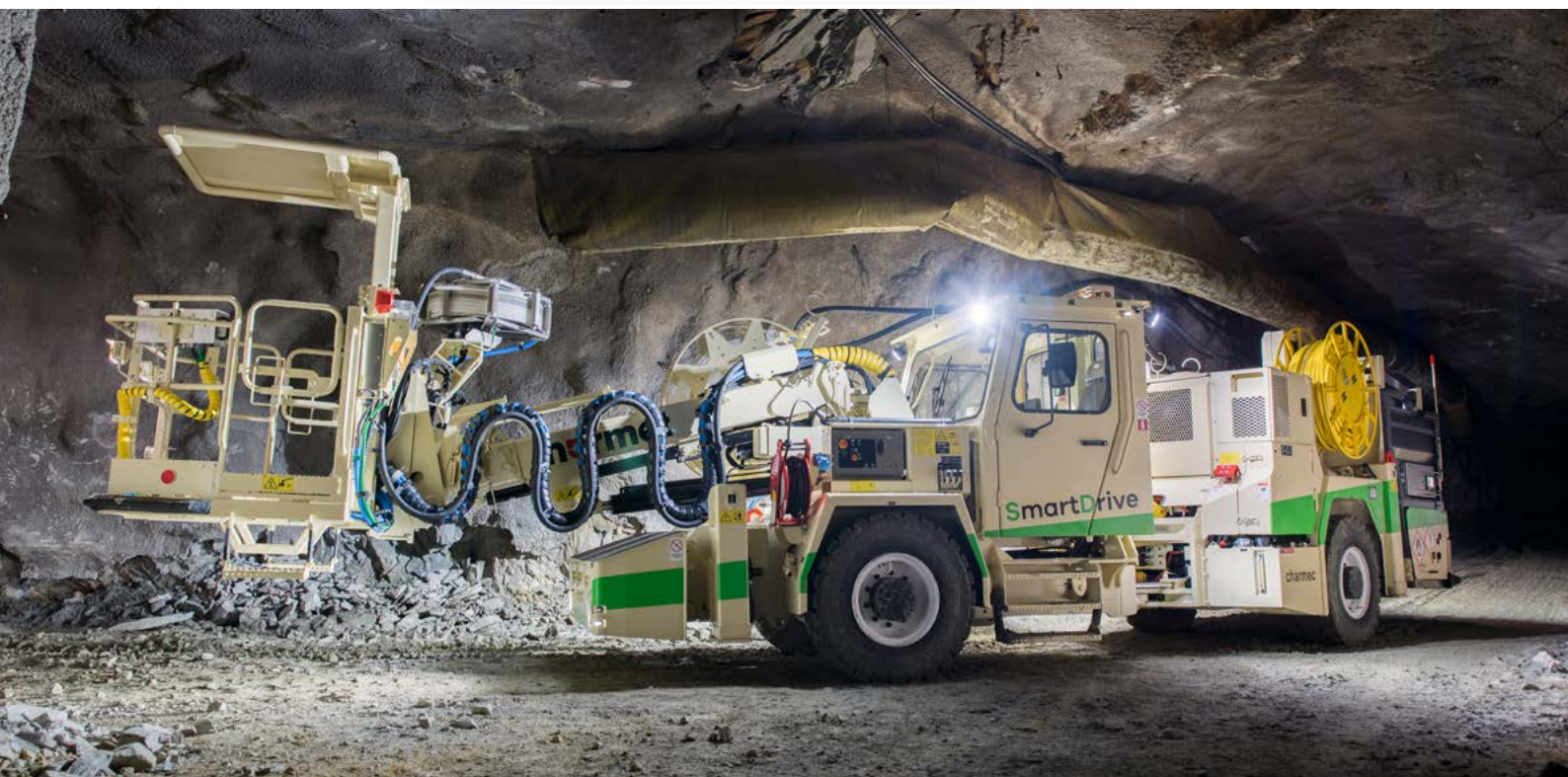
Charmec MC 605 V(E) SD presents the new era of explosives charging in underground mines. Normet SmartDrive battery electric vehicle architecture integrated into the state-of-the-art emulsion charging technology offers the highest value to customer in terms of safety, ergonomics and productivity, with zero local emissions.

Charmec MC is globally well-known charger and its charging technology is proven in the hardest conditions. Charmec MC 605 V(E) SD has a full range of optional accessories to support and improve modern underground development and production charging operations and to increase value for the customer. Charmec MC 605 V(E) SD is available with Normet's own emulsion charging module ECM or as a carrier for 3rd party emulsion kit.



Charmec MF 605 V Long End SD

Charmec MF 605 V Long End SD provides place for an external emulsion unit in size capable for both, underground development charging and production charging. Normet battery electric vehicle technology offers zero local emissions and high tramming speed also when fully loaded. New improved cabin provides comfortable and safe operational environment for the driver and the passenger.



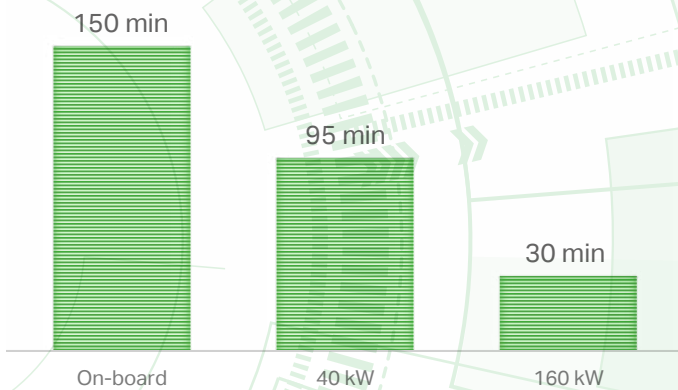
POWER WHEN AND WHERE YOU NEED IT

FAST CHARGING

For demanding operations where tramping distances are long, Normet provides fast charging solutions; optional fast chargers can charge batteries quickly during operation or a break, when there is never need for costly battery swapping.

With strategically placed fast chargers, battery charging can become a part of normal operations. Normet provides easy-to-use fast chargers for on-site installation. Normet's fast chargers are based on the CCS standard and specifically designed for challenging environments and can be used to charge any compatible CCS capable vehicle. There is no need for tedious and dangerous fuel delivery and storing anymore. Normet's CCS compatible battery charger offering includes three chargers which are described in more detail below. Normet SmartDrive batteries can also be charged at any time from typical underground AC-sockets.

Normet offers a service concept to ensure that you can maximize the value of your investment. Our service concept includes: charging infrastructure design consultancy, installation services, start-up training, spare parts and maintenance services.



Approximate charging times from 0 % to 80 % SoC (State-of-Charge) for 90 kWh batteries



SmartDrive CT40 fast charging trolley

Normet CT40 is a state-of-the-art Finnish DC-charging trolley, which is tailor made for harsh underground conditions. The trolley does not require permanent installation and it is an ideal mobile charger for workshops and service depots. It is equipped with fast charging plug (Type 2), offering output power of 40 kW.

SMARTDRIVE BATTERY CHARGERS AVAILABLE:

- SmartDrive CT40
- SmartDrive CC160
- SmartDrive CC160 MV



SmartDrive CC160 and CC160 MV fast charging cabinets

Normet CC160 charger cabinet with 160 kW output power provides power where you need it the most. Cabinet provides fast charging and their robust and durable design is tailor made for harsh conditions.

In addition to regular CC160, Normet offers also a multi-voltage version, CC160 MV, which is equipped with step-down transformer to suite typical grid voltages in underground work sites. Because of the transformer, CC160 MV cabinet is bigger than CC160.

LIFE CYCLE SERVICES

Normet offers an extensive range of services to maximise the productivity and safety of your operations. We have the knowhow to keep your equipment running at its best throughout its working life and we can provide everything from individual parts to personnel training and full service agreements for your entire fleet. With our global service network, we can support you at Normet facilities around the world, as well as on-site, at your location.

TRAINING

Normet provides training for the entire Normet product range including mining and tunnelling process and applications. We encourage to continuously improve your knowledge base on the operations of the Normet's offering, and to assist you to get the best out of Normet products, solutions and services. Training services can be tailored to your individual needs and range from the Normet Driving License through to a single process audit.

FIELD SERVICES

At Normet we understand how important it is to keep your equipment running and performing to its optimum level. To support our customers' needs, Normet has built a global support network with over 600 service professionals. These professionals provide on-site support throughout the entire life cycle of your equipment, ensuring all environmental, health and safety standards are maintained.

SERVICE AGREEMENTS

Service agreements from Normet Services are tailored for your needs to ensure that your fleet is reliable and productive. We work with you to design and agree the package of services that will support your equipment and operations the best. From process performance agreements to parts, and maintenance and rebuilds, service agreements from Normet Services guarantee that you always have the service you need.

GENUINE PARTS

Genuine parts from ensure that you always have the highest quality parts available to keep your equipment up and running. Depending on your needs, we can offer everything from individual parts to complete parts contracts, and our professionals around the world have the experience to ensure that you have the parts you need when you need them.

We ensure high availability of genuine, high quality Normet parts, including all process-critical parts, as well as wearing parts, consumables, and parts for periodical maintenance.



GLOBAL PRESENCE LOCAL SUPPORT

NORMET AMERICAS
SALT LAKE CITY (USA)

NORMET FINLAND
IISALMI (FINLAND)

NORMET RUSSIA
ST. PETERSBURG (RUSSIA)

NORMET CHINA
SHANGHAI (CHINA)

NORMET INDIA
NOIDA (INDIA)

NORMET CHILE
SANTIAGO (CHILE)

NORMET SOUTH AFRICA
JOHANNESBURG (SOUTH AFRICA)

NORMET ASIA-PACIFIC
ADELAIDE (AUSTRALIA)

NORTH AMERICA

Canada
Mexico
USA

SOUTH AMERICA

Brazil
Chile
Colombia
Peru

EUROPE

Finland
France
Norway
Russia
Sweden
Switzerland
United Kingdom

AFRICA

Ghana
South Africa
Zambia

ASIA

China
Hong Kong
India
Indonesia
Kazakhstan
Mongolia
Qatar

Russia
Singapore
Taiwan
United Arab Emirates
Uzbekistan

AUSTRALASIA

Australia

**WE ARE LOOKING FORWARD
TO TELL YOU MORE**

For more information, please contact your local Normet representative, visit normet.com for contact details.



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