DOOSAN
ELECTRIC

Wheeled excavator

# DX165W Electric

| | |
|---|---|
| Rated power | 104 kW |
| Operating weight | 18 t |
| Bucket capacity | 0,76 m3 |


engcon
MN

# Doosan DX165W Electric

## Meet the new generation excavator

Take your business to the next level with the Doosan DX165W Electric! The Doosan DX165W Electric excavator is very strong and also completely emission-free. What else do you want?

# Zero-emission and higher productivity

**Controls**
Control the excavator with high precision, high power and smooth operation for all your excavating and lifting jobs. Four modus for work and power, proportional control and a user friendly 7 inch TFT-LCD colordisplay. Two gears (High, Low + crawl) with cruise control and three locking modus of the front axle oscillation.

Additional 5,7 inch TFT-LCD color display for the electrical drive

**Maintenance free**
Because of the choice for high-end electrical parts, there is less need for maintenance compared to a diesel powered machine.

**Uptime**
Uptime of one working day using two power boxes. Based on results from field tests.

**Comfort**
One of the spaciest cabines in the market, with a low noise and vibration level. Standard air conditioning and climate control, fully adjustable heated chair with air suspension.

## Power

The electric Danfoss engine with SRPM technology, in combination with the high voltage system assures a constant output. Together with the high torque, high efficiency and maintenance free design, this machine can handle it all.

## Battery capacity

The available capacity of two Powerboxes combined is 280 kWh. Every Powerbox is made out of NMC modules and are equiped with a capacity meter which is directly visible on the Powerbox with LED lights and also on the additional 5,7 inch TFT-LCD color display.

## Charging time

The Doosan DX165W Electric is equipped with two CCS connectors, with the following charging options: 16A 400VAC, 32A 400VAC, 63A 400VAC.

The Powerboxes can be charged from 20% to 80% in just 4 hours with two CCS charging connectors.

## Certifications

Machine
UNECE R10

Cerfitfied components
2006/42/EG, 2014/35/EU, 2000/14/EG, EN 474.

Powerbox system
UNECE R100 certified REESS, UN38.3 en 2014/35/EU.

Charging
IEC 61851, IEC 62196 en ISO 15118.


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# Top performance and capacity

## The power to be more productive

The Danfoss electric engine with Synchronous Reluctance Assisted Permanent Magnet technology (SRPM) of the Doosan DX165W Electric delivers high constant power which is perfect for the requirements of a mobile excavator. A maintenance free package is offered with high torque and high efficiency. This results all together in a nominal power of 104kW.

**Danfoss SRPM electric motor**
**Nominal power 104 Kw**

# Powerbox

## Swappable Powerboxes

Thanks to the easy and fast swap ability and the fact that the machine can also be used with one individual Powerbox, it is possible to use the machine 24/7. Swapping the Powerboxes is just as fast as filling up a diesel machine. The Powerbox is a 140kWh high voltage system. By using a high voltage system there is less loss and a greater effiency of electric energy so the machine uptime is increased.

The Powerboxes in the Doosan Electric machines are one of the most important components of the machine. The choice for a swappable Powerbox system is made for a good reason. Continuesly uptime is gauranteed, you can use one Powerbox in the machine while the second Powerbox is being charged like your powertools.  Powerbox Charging can be done wherever, whenever, and how you want without moving the complete machine.

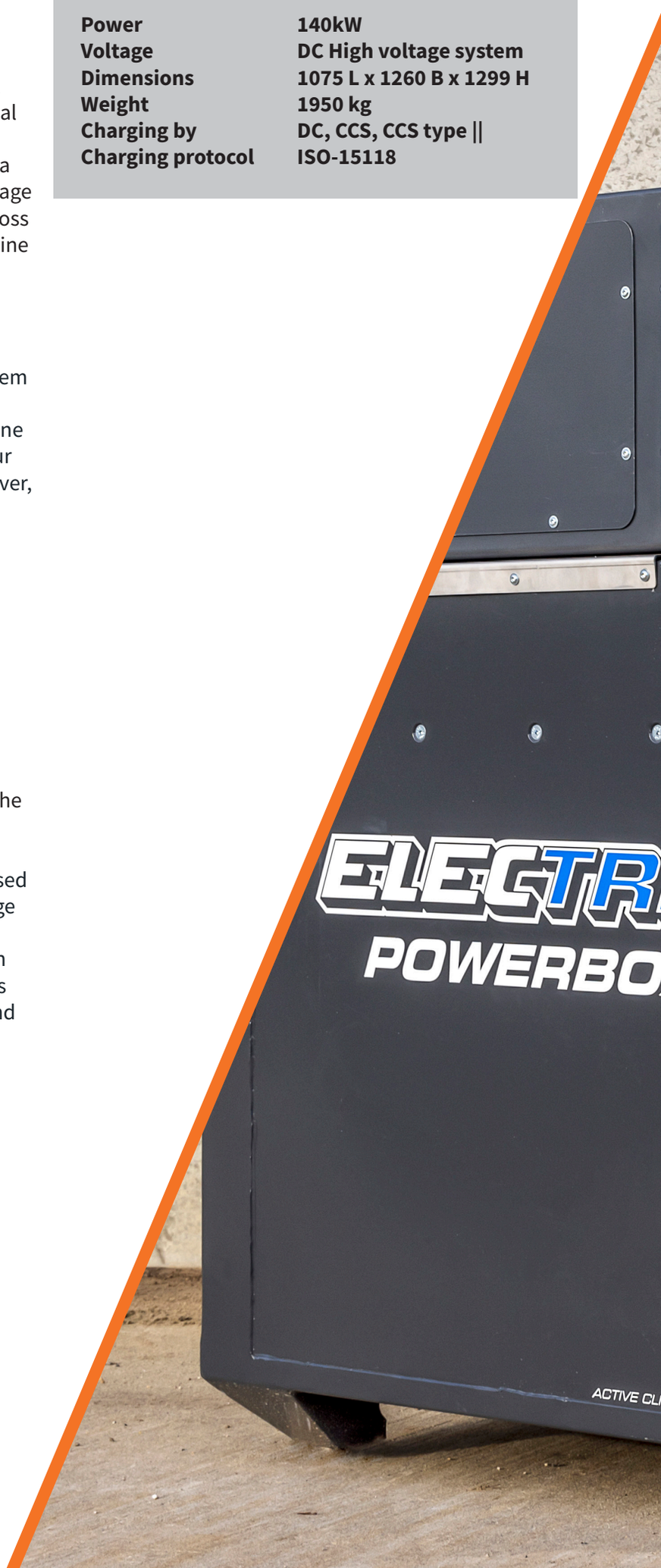
## Powerboxes

Our Powerboxes are made of lithium ion batteries which are recyclable. For each Powerbox you get an EoL (End of Life) certificate issued. In the current application, the Powerboxes have a feature that regulate the temperature called the Active Climate Control System, the Powerbox has an expected life cycle of 10 years. Than the Powerbox still has a capacity of 80% compared to a new one. This gives the oppurtunity to give the Powerbox a second life.

The second life of the Powerbox (batteries) can be used for example ass residential or corporate enery storage systems in combination with solar panels of wind turbines. The Powerbox can fullfill this function of an energy storage system for another 10 years. After this period the Powerboxes are at the end of their life (End of Life) and then they will be 100% recycled.

### Specifications Powerbox

| | |
|---|---|
| **Power** | **140kW** |
| **Voltage** | **DC High voltage system** |
| **Dimensions** | **1075 L x 1260 B x 1299 H** |
| **Weight** | **1950 kg** |
| **Charging by** | **DC, CCS, CCS type \|\|** |
| **Charging protocol** | **ISO-15118** |




ecotap
E32843
POWER SUPP
STOP CHARGING
SERVICE KEY
RIC
OX
E CLIMATE CONTROL SYSTEM

# Charging

## Charging

Not only following the correct procedure of working with the Doosan Electric excavator is important, it is also very important to arrange the correct charging procedure. The Powerboxes of the Doosan DX165W Electric can be charged in multiple ways.

## Charging in the machine

In the machine the Powerboxes can be charged using AC. The 2 x AC onboard chargers combined charge the batteries with the maximum of 44kW. The machine can also be charged using a charging station. The Powerboxes in the machine are ‘serial’ charged meaning that first 1 Powerbox is charged and then the second one.

## Charging the Powerbox

The Powerboxes themselves can be charged by DC fast charging. Charging can be done with maximum of 140 kW through a CCS type || DC charging port. It is not possible to connect 2 Powerboxes. They have to be charged one by one. Below we will discuss the different charging options.

## AC Single

With this charger the Powerboxes can only be charged through the machine. The cable of the charger must have a plug with CCS 7 pins. This cable is the same which is used with charging of electric cars. The charging of the Powerboxes is regulated by the machine itself. The machine will first charge one battery until it’s full, then it will charge the second battery. The charger needs 1 x 32A and 380V VAC. The minimum charging time of one Powerbox is 5 hours to charge to 80% SoC (state of charge)*. And is adjustable from 0 to 32A charge speed.

*for a 100% full batterie a charging time of 6 hours (32A) per Powerbox is needed.


## AC Duo

With this charger the Powerboxes can only be charged through the machine. The cable of the charger mus have a plug with a CCS 7 pins. This cable is the same which is used with the charging of electric cars.
The charging of the Powerboxes is regulated by the machine itself. The machine will first charge one battery until it's full, then it will charge the second battery. The charger needs an imput power of 1 x 63A and 380V AC . The charging time of one Powerbox is 2,5 hours to charge 80% SoC (state of charge)*.
*for a 100% full batterie a charging time of 3,5 hours (63A) per Powerbox is needed.

## DC30

With this fast charger a Powerbox can be charged directly on the Powerbox CCS type || plug. The DC30 charger needs 380V AC with 50A input power. And it is the cheapest in its class. A real entry level model. The charging time of one Powerbox is 4 hours to charge 80% SoC (state of charge)*.
*for a 100% full batterie a charging time of 5 hours (50A) per Powerbox is needed.

## DC40

With this mobile DX fast charger a Powerbox can be charged directly on the Powerbox CCS type || plug. The mobile charger DC40 needs 380VAC with 32A of 63A input power. The charging time of one Powerbox is 5 hours (32A) or 2,5 hours (63A) to charge 80% SoC (state of charge)*.
*for a 100% full batterie a charging time of 6 hours (32A) or 3,5 hours (63A) per Powerbox is needed.

## DC60

With this fast charger it is possible to either charge one Powerbox or two at the same time directly on the Powerbox CCS type || plug. The DC60 charger needs 380VAC with 90A input power. This has to be set beforehand. The charging time of one Powerbox is 2 hours to charge to 80% SoC (state of charge)*. This charger has a display where information of the charging process is visible.
*for a 100% full batterie a charging time of 2,5 hours (90A) per Powerbox is needed.

## DC120

With this fast charger it is possible to fast charge two Powerboxes at the same time. The DC120 charger needs 380VAC with 180A input power. The charging time of one Powerbox is 1 hour to charge to 80% SoC (state of charge)*.
*for a 100% full batterie a charging time of 1,5 hours (180A) per Powerbox is needed.




# Certifications

### Safety first: Everything you need to know about safety standards and certifications

Strict laws and regulations are in place when in comes to a safe workplace with an electyric machine that runs on a high voltage system. Safety first for the operator, bystanders and mechanical engineers. Because this is a new technology within the Off Road Industry, we closely work together with the automotive industriy regarding the international functional safety standards. We are member of National Standars Committee and give input to the European technical Standards Committee CEN/TC 151 and Technical Standard Committees ISO/TC 127 and ISO/TC 195 and sub committees. We also implement extra safety measurements when it comes to working with machines with High Voltage Systems.

### Safety standards

To meet the type-approval of an electric vehicle, certain safety standards have to be met, UNECE R10, 2006/42/EG, UNECE R100 verhicle, IP65 and NEN ISO 5006-norm are examples of specific safety standards. What do these certifications mean?

### UNECE R10 (EMC)

Automotive ‘EMC’ stands for Electro Magnetic Compatibility, R10 is a component and ‘automotive’ stands for verhicle industry. The EMC R10 automotive certification includes multiple type approval tests. Among these tests is lowering the harmful electric magnetic radiation sources within the boundaries of the law. This means that a machine will be tested on all European car-electrionic regulations like emissions an RF-immunity.

### UNECE R100 Vehicle/REESS

Only in the Netherlands there is an obligation to meet the R100 vehicle standard for vehicle safety. This aims to avoid contact with high voltage components in a machine.

Due to our choice of battery supplier and commissioning approval, our batteries meet the even stricter legislation of the R100 REESS (Rechargeable Energy Storage Systems). Which is not mandatory, but a lot safer!

### IP

An Ingress protection (IP)-classification is a method where the protection class of the material of the housings (or the object) is listed. An IP value gives the level of waterproofness or dustproof. This is important to protect all the mechanis/electric components within.

### ISO 5006-norm

This international norm specifies a testing method for determining the visibility of the machine operator. By using cameras and mirrors, the operator has a good overview of the surrounding.

# Technical specifications

## Electric engine

Danfoss SPRM Permanent magnet Motor with high constant power.

| | |
|---|---|
| Nominal power | 104 kW |

## Chassis

The excavators are exceptionally strong build with materials of high quality and a long life. All the weldings are designed for minimal material stress. Heavy-duty front axle with automatic or manual control oscillation locking (on/off/auto).

## Weight

| | |
|---|---|
| Superstructure without front part and batteries | 6030 kg |
| Superstructure without front part with batteries | 9930 kg |
| Chassis | 5510 kg |
| Front part | 2860 kg |
| Boom | |

## Swivel mechanism

For the swivel mechanism, a hydraulic axial piston motor is used that drives a two-stage planetary transmission in oil bath for the highest torque.

- Swivel bearing: sliding-type ball bearing, in single row, with induction-hardened internal gear
- Internal gear and pinion immersed in lubricant
- Due to the higher swivel torque, the swing time is shorter
- The swivel brake for parking is activated by a spring and hydraulically released

| | |
|---|---|
| Maximum swivel speed | 13,5 tpm |
| Maximum swivel torque | 3565 kgf·m |

## Drive

The wheels are driven by an axial piston engine via a two-speed powershift transmission. In addition to the two-speed powershift transmission, there's an economy mode and a creep speed switch. A button can be used to switch from high to low working mode. Two travel speeds offer the choice of more torque or higher speed.

| | |
|---|---|
| Driving speed (creep - low - high) | 3,5 / 10 / 30 km/u |
| Maximum traction | 10 t |
| Minimal turning radius | 6,4 m |
| Climbing ability | 62% (32°) |

## Hydraulic system

The electronic power optimization system (e-EPOS) is the brain of the excavator. It minimizes energy consumption and optimizes the efficiency of the hydraulic system for all working conditions. In order to harmonise the electric motor and hydraulics, the e-EPOS is connected to the electric motor's electronic control unit via a data connection. The hydraulic system allows independent or combined operation. Two travel speeds offer either more torque or a higher speed. Cross-sensing and energy-saving pump system. Automatic system for lower speed. Four operating modes and four power modes. Control of the flow rate and pressure of the auxiliary hydraulics from the control panel. Computer-aided pump flow control.

## Maximum system pressure

| | |
|---|---|
| Working | 350 gf/cm$^2$ |
| Swivel | 275 gf/cm$^2$ |
| Driving | 370 gf/cm$^2$ |
| Extra power | 370 kgf/cm$^2$ |

## Hydraulic cylinders

Piston rods and cylinders made of high strength steel. All cylinders are equipped with a shock absorbing mechanism to ensure shock-free operation and a longer piston life.

| Cylinders | Number | Bore x postion diameter x stroke (mm) |
|---|---|---|
| Boom lower | 1 | 140 x 85 x 720 |
| Boom upper | 1 | 110 x 75 x 1035 |
| Arm | 1 | 115 x 80 1068 |
| Bucket | 1 | 100 x 70 900 |
| Dozer blade | 2 | 100 x 60 204 |
| Stabilizer | 2 | 110 x 70 x 438 |

Specifications and design are subject to change without notice. Images of the products may differ from standard version.

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