AVILOO
BATTERY DIAGNOSTICS

286 km** >100%*

BATTERYCERTIFICATE

Date: 23/05/2022
Executed by: Carla AB

100%*
286 km**

Vehicle information

Brand	BMW
Model	i3s - 120 Ah
Manufactured in	2019
VIN	WBY8P610XK7E05729

Analysis result

Actually available (100% - 0)	38.06 kWh
Available in new condition**	37.9 kWh
Remaining range**	285 km
New condition range**	285 km

Measured data:

	Start	End
State of charge display	100.00 %	5.00 %
Cell temperature min	19.00 °C	33.90 °C
Cell temperature max	19.00 °C	36.76 °C
Cell voltage min	4.19 V	3.45 V
Cell voltage max	4.19 V	3.46 V
Mileage	37,757 km	37,936 km

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TÜV AUSTRIA CERTIFIED

EXPLANATION BATTERY TEST

BASICS TRACTION BATTERY

The built-in traction battery of a full electrical vehicle or hybrid car is an energy storage that has a certain amount of energy in kilowatt-hours (kWh) available.

The gross energy content corresponds to the total installed energy, while the net energy denotes the actual usable portion that is available for driving. The actual released net energy is lower than the gross energy. For security reasons and to protect the battery against aging the battery has a buffer.

TEST RESULTS

The test result, health status of the battery, is given as a percentage.
The state of health (short: SoH) is calculated as follows:

$$\text{SoH-formula} = \frac{\text{actually available net energy during battery test}}{\text{available net energy in new condition}}$$

*100% SoH = At the AVILOO battery test on 23/05/2022, 38.06 kWh of usable energy were available for driving between 100 and 0 percent charge level display.
That is 100% of the energy that, according to the manufacturer, can be drawn in new condition. Tolerance SoH: +/-3%

TEST METHOD INFORMATION

The AVILOO battery test for electric vehicles is based on a combination of the following methods:
- Determination of the net energy that can be drawn from the electric vehicle (EV),
- Battery models for temperature compensation and internal resistance calculation.
- Calculation to derive the State of Health of the battery.

The analysis is performed within a discharge process from 98% to less than 10% State of Charge. Millions of battery relevant data points from the vehicle are transferred to the AVILOO platform in real time. After the end of the discharge drive, the transferred data is validated and the State of Health (SoH) of the battery is analyzed. The state of health (SOH) is calculated based on compensation models for a reference temperature of 25°C. That is why this value is always comparable and independent of the actual battery temperature during the test drive.

EXPLANATION OF TERMS

** Sources	Usable energy and range according to manufacturer information or AVILOO reference run. Range according to WLTP or, if not available, converted from NEDC values.
SoH (State of Health)	State of Health of the traction battery
SoC (State of Charge)	State of Charge of the traction battery
State of charge Display	Net charge level read from the battery control unit
Cell temperature min.	Temperature of the coldest battery cell
Cell temperature max.	Temperature of the warmest battery cell
Cell voltage min.	The Lowest cell voltage of all battery cells
Cell voltage max.	The greatest cell voltage of all battery cells

The start values describe the data that are read out from the battery control unit before the drive starts, The final values are those that are read out from the battery control unit at the end of the journey.

LIMITATION OF THE BATTERY TEST

The test result is an indicator for the actual State of Health (SoH) of the traction battery. The result only takes into account the condition of the battery at the time of the test. No prognosis for the future health of the battery can be derived from this. Due to the test method, no statements can be made about the mechanical condition damage, corrosion, leakage and other external influences or about electrical safety of the high voltage battery.

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