QSense
Battery Cell, QEBC



QSense® Battery Cell (QEBC) allows for simultaneous QCM-D and electrochemistry measurements on the same surface, built for in-operando battery studies. The cell can be assembled and filled in a glove-box, so your measurements start in an inert, oxygen-free atmosphere. Its liquid and gas-sealing construction removes the need to run the experiment inside the glove-box.

The electrode configuration is flexible. You can choose between different metals for the counter and reference electrodes, and easily coat them with battery-relevant materials such as Li or Na foils. A pseudo-reference configuration with a variety of material options, together with 2-electrode capability, makes the cell well suited to non-aqueous measurements in typical battery electrolytes. All wetted materials are chosen to withstand organic solvents and aggressive battery electrolytes, so the cell is designed for harsh chemistries. Potentiostat data from a BioLogic is shown live in the QSense Edge software, and other potentiostats can be used with a common start trigger.*

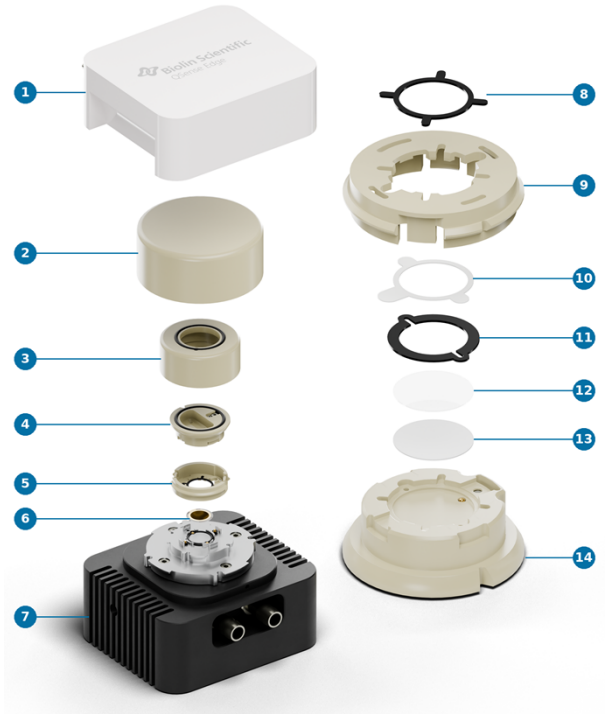
General Specifications:	
Compatibility	QSense Edge
Type of measurements	Stagnant (non-flow) liquid measurements; 3-electrode or 2-electrode configuration
Sample volume	~100 µl
Temperature control	Without water circulator: ambient ±5 °C With water circulator: 5–70 °C
Maximum EIS frequency	200 kHz
Electrolyte compatibility	Aqueous and non-aqueous electrolytes
Gas tightness	Liquid and gas sealing; can be assembled in a glove-box
Materials exposed to liquid	PEEK (sample/electrode holder), FFKM (gaskets) Counter and pseudo reference electrodes: aluminum, platinum, stainless steel or copper QSense sensor surface (selectable from the QSense sensor range)
Dimensions and weight	Height: 81 mm; Width: 100 mm; Depth: 93 mm; Weight: 1,3 kg

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Other	
Delivered with: QEINST Battery cell and Flex holder installation kit and QCS 212 Accessory kit for QSense battery cell.	
* Notes on potentiostat: 1. BioLogic SP-200 and SP-300: data is read into the QSense Edge software (live view and synchronized export). 2. Other potentiostats: a trigger function gives a common start. Their data is not read into the QSense software.	
Electrodes:	
Working electrode	The QCM-D sensor itself
Counter electrode (= current collector)	Stainless steel, aluminum, copper or platinum Diameter 14 mm, thickness 0,2 mm Coated with battery-relevant materials, e.g. Li/Na foils (thickness of the coating needs to be ~0.2 mm)
Pseudo reference electrode	Stainless steel, aluminum, copper or platinum Thickness 0,2 mm
Distance from RE to WE	0,26 mm
Distance from CE to WE	0,77 mm
Potentiostat connection	3 × 2 mm banana connectors marked WE/CE/RE
Sensor (WE)	
Fundamental frequency	~5 MHz
Sensor diameter	14 mm
Electrode area exposed to electrolyte	1.13 cm^2 (Ø 12 mm)
Thickness (sensor + Au)	340 µm
Roughness of optically polished electrode surface	< 3 nm (RMS)

Exploded view



1 Gas sealing lid
2 Sealing lid (PEEK)
3 Clamping lid (PEEK)
4 Electrode holder, top (PEEK)
5 Electrode holder, bottom (PEEK)
6 QCM-D Sensor, WE
7 Temperature-controlled base with water circulation connectors
8 Gasket (FFKM)
9 Electrode holder, bottom (PEEK)
10 Pseudo reference electrode
11 Gasket / insulating spacer (FFKM)
12 Counter electrode material e.g. lithium (added by the user)
13 Counter electrode (current collector)
14 Electrode holder, top (PEEK)