

KiloPotentiostat

KiloPTC-05100EW-ZL1500

High-power H2FC potentiostat
with zero-voltage load booster

Version 1.1
2019-01-30
Preliminary



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Quick summary

❖ Potentiostat/Galvanostat	±5 V, ±100 A
❖ Current ranges	1 mA .. 100 A
❖ Impedance spectroscopy	1 mHz .. 100 kHz (1 MHz)
❖ Load booster	0..+5 V, 0..-1 500 A
❖ Cooling	Water

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is a new range of high-power fuel-cell potentiostats/galvanostats equipped with a high-current booster that helps to increase the current in the load mode. This system is primarily designed for use with high-power hydrogen fuel cells and short stacks capable of supplying hundreds of amperes or even more than one kiloampere.

Such high currents are possible with hydrogen fuel cells in only one quadrant, whereas the currents required in 4-quadrant measurements are much lower. This is why the system consists of 100 A complete potentiostat with impedance spectroscopy and zero-voltage load booster available from 200A up to 2kA.

Electrochemical Impedance Spectroscopy (EIS) measurement is possible with a full DC current of booster while the AC component is generated by the potentiostat. The maximum amplitude of the AC component depends on the frequency and impedance of the fuel cell.

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Block diagram

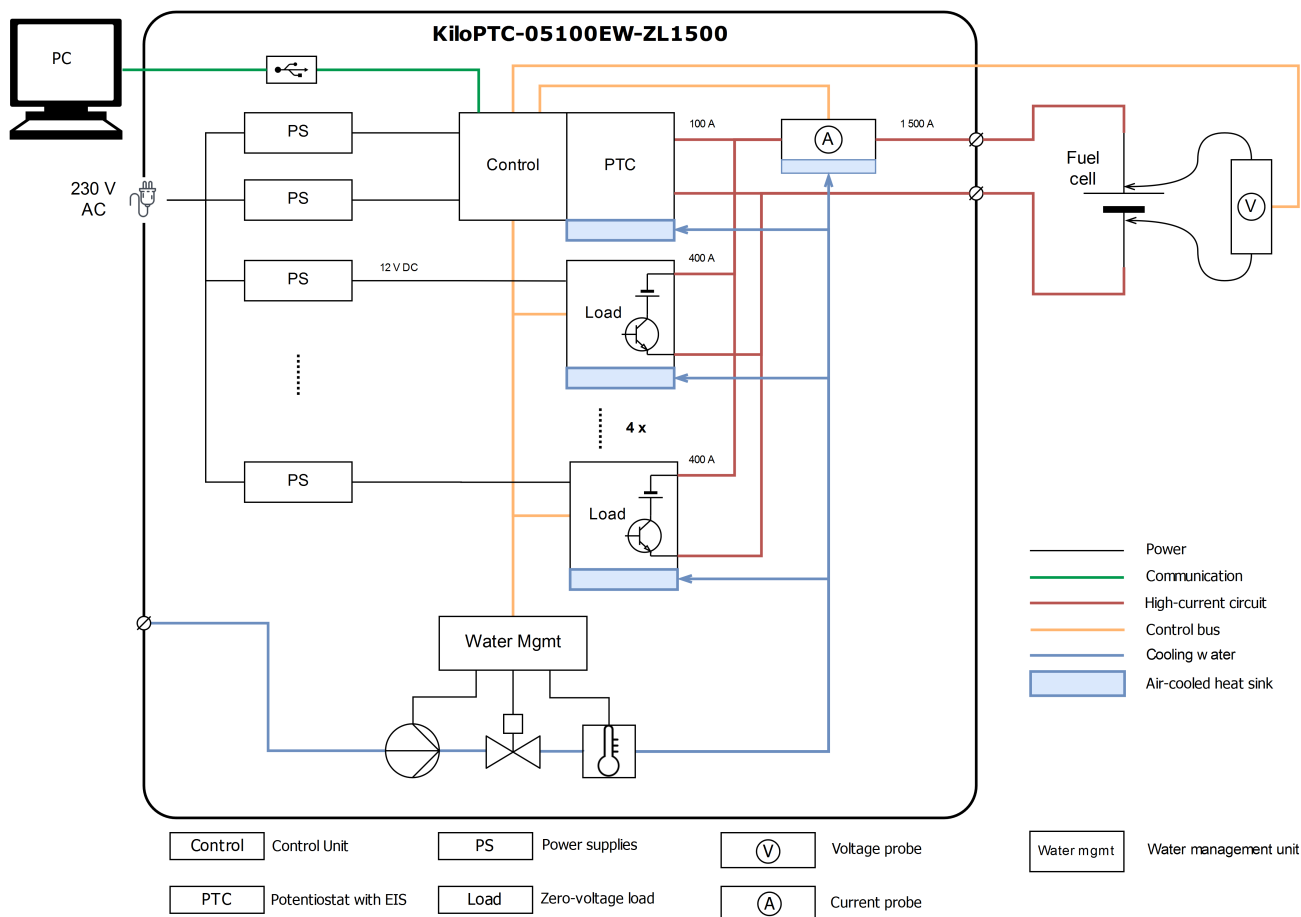


Image 1: Block diagram of KiloPTC-05100EW-ZL1500 model

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Technical Parameters

Power supply	230V AC / 50..60 Hz
Dimensions	19" rack cabinet, 11U height, 900mm depth
Cooling	Water
Protection rating	IP20
Electrometer Input voltage range	-10 V ... +10 V
Compliance / Output voltage	-5 V ... +5 V
Compliance / Output current	-100 A ... +100 A for output potential ± 1 V -50 A ... +50 A for output potential ± 5 V
Current ranges	6 current ranges (1 mA .. 100 A)
Zero-voltage load booster	Sink up to 1 500 A from voltage 0..+5 V
Sampling	24-bit ADCs, 3 ksps internal, 50 sps filtered sampling 14-bit ADCs, up to 20 Msps for EIS measurements
Measurement resolution	0.001 % of selected range for ≤ 3 ksps sampling
Accuracy	Voltage ≤ 0.1 % of range + 0.1 % of reading Current ≤ 0.1 % of range + 0.5 % of reading optional Hall-sensor < 0.1 % for < 1 kA
Acquisition methods	constant V, I, open circuit, manual control chronoamperometry, chronopotentiometry linear sweeps, I/V characteristics cyclic voltammetry pulse voltammetry - differential, square, normal impedance spectroscopy programmable sequences of all available methods
EIS frequency	1 mHz .. 100 kHz (1 MHz for <1 A)
EIS amplitude	1 .. 1000 mV, up to 100 A for < 1 kHz
Connection	USB 2.0