

# NEDSTACK FCS 13-XXL PEM FUEL CELL STACK




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## SPECIFICATIONS

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### Electrical - Beginning of Life

Rated power : 13.6 kWe @ 230 A  
Power at lower current : see graph

### Mechanical

Weight : 41 kg (approx)  
Size : 604(l)x196(w)x288(h) mm  
Cell count : 96

### Hydrogen

Humidification :  $\geq 50\%$  RH at 62 °C at inlet (75% recommended)  
Purity (dry) : Grade  $\geq 2.5$  (max: CO 0.2ppm, CO<sub>2</sub> 0.5vol%, total sulphur 4ppb, formaldehyde 0.01ppm, formic acid 0.2ppm, ammonia 0.1ppm, total halogenated compounds 0.05ppm, particles 1 $\mu$ g/Nl. Hydrogen specification adapted from ISO 14687-2:2008)  
Pressure drop : < 0.05 bar at full power  
Pressure level : 0.15 - 0.3 barg  
Stoichiometry : 1.25 - 1.50 for H<sub>2</sub>, minimum flow = 72 Nl/min  
Max H<sub>2</sub> consumption : 154 Nl/min at full power

### Air

Filtered  
Humidification : 75% RH at 62 °C  
Purity : instrument air quality (max: CO 25ppm, Sulphur 0.01ppm, nitrogen dioxide 0.3ppm, ammonia 0.1ppm, particles 1 $\mu$ g/Nl)  
Pressure level : Ambient (no backpressure allowed)  
Pressure drop : < 0.12 bar at max power  
Stoichiometry :  $\geq 2.0$ , minimum flow = 134 Nl/min  
Max air required : 732 Nl/min at full power

### MEA

Pressure difference : <0.3 bar

### Emissions

Noise : 0  
Water production : 0.5 l/kWh<sub>e</sub>(approx.)  
H<sub>2</sub> respiration : 60 ml/min (max)

## PRODUCT DATA SHEET – NEDSTACK FCS 13-XXL



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PEM FUEL CELLS

### Cooling

Nominal temperature	: 65 °C
Temperature <sub>max</sub>	: ≤ 70 °C
Capacity	: < 20 kW <sub>th</sub> at full power
Medium	: de-mineralized water or BASF glycantine FC G20
Purity	: conductivity < 10 μS.cm <sup>-1</sup>
Pressure difference	: < 0.15 bar (DI water) or < 0.45 bar for glycantine
Operating window	: ΔT < 5K

Note that proper material selection in the tempering device is important to avoid release of ions into the coolant

### Connectors

Coolant	<i>standard</i>	: Nedstack quick coupling (male)
	<i>optional</i>	: quick coupling (female)
Hydrogen	<i>standard</i>	: Nedstack quick coupling (male)
	<i>optional</i>	: quick coupling (female)
Air	<i>standard</i>	: Nedstack quick coupling (male)
	<i>optional</i>	: quick coupling (female)
Current		: End contact with 10.5 mm hole (2x)
Cell voltage connector		: M12 connector (2x)

### Appearance Impression



### Nedstack fuel cell technology B.V.

Westervoortsedijk 73  
6827 AV ARNHEM

P.O. Box 5167  
6802 ED ARNHEM  
The Netherlands

Phone +31 (0)26 319 7600  
Fax +31 (0)26 319 7601  
E-mail info@nedstack.com

Trade Register Arnhem  
nr. 09102161

www.nedstack.com

**PRODUCT DATA SHEET – NEDSTACK FCS 13-XXL**



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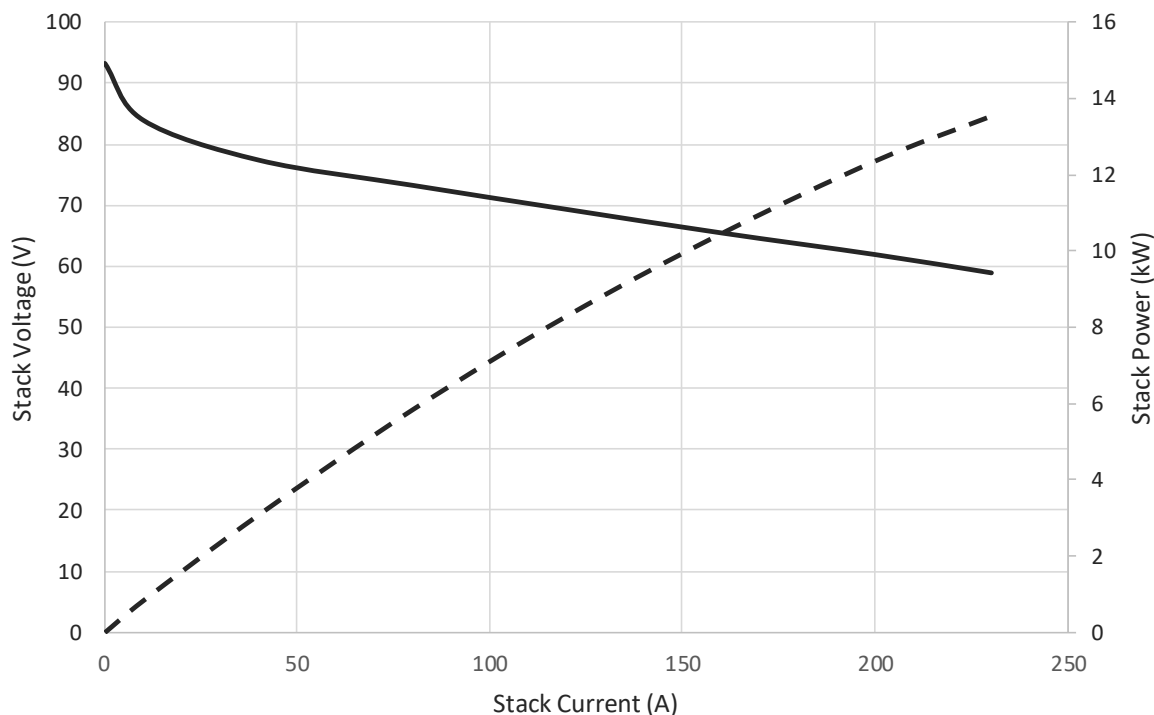
**Electrical specifications**

Beginning of Life stack performance data under standard conditions:

Stack temperature = 62 °C,

Hydrogen: stoichiometry = 1.25; minimum hydrogen flow = 72 NI/min; RH = 75%.

Air: stoichiometry = 2.0; minimum air flow = 134 NI/min; RH = 75%



Current (A)	0	40	80	120	160	200	230
Stack Voltage (V)	93.2	77.4	73.2	69.3	65.5	61.9	58.9
Stack Power (kW)	0.0	3.1	5.9	8.3	10.5	12.4	13.6

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P.O. Box 5167  
6802 ED ARNHEM  
The Netherlands

Phone +31 (0)26 319 7600  
Fax +31 (0)26 319 7601  
E-mail info@nedstack.com

Trade Register Arnhem  
nr. 09102161

www.nedstack.com