



Nedstack

PEM FUEL CELLS

To be sure.

SPECIFICATIONS

Electrical - Beginning of Life

Power _{maximum}	: 5 kWe @ 230 A
Power at lower current	: see Table 1

Mechanical

Weight	: 28 kg (approx)
Size	: 353(l)x194(w)x288(h) mm
Cell count	: 40

Hydrogen

Humidification	: $\geq 40\%$ RH at 65 °C at inlet
Purity (dry)	: Grade ≥ 2.5 (max: CO 0.2ppm, CO ₂ 0.5vol%, total sulphur 4ppb, formaldehyde 0.01ppm, formic acid 0.2ppm, ammonia 0.1ppm, total halogenated compounds 0.05ppm, particles 1µg/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 ₂ , minimum flow = 24 Nl/min
Max H ₂ consumption	: 64 Nl/min at full power

Air

Filtered	
Humidification	: $\geq 40\%$ RH at 65 °C
Purity	: instrument air quality (max: CO 25ppm, Sulphur 0.01ppm, nitrogen dioxide 0.3ppm, ammonia 1ppm, particles 1µg/Nl)
Pressure level	: Ambient (no backpressure allowed)
Pressure drop	: < 0.12 bar at max power
Stoichiometry	: ≥ 2.0
Max air required	: 305 Nl/min at full power

MEA

Pressure difference	<0.3 bar
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Emissions

Noise	: 0
Water	: 3.1 kg/hour (approx.)
H ₂	: 25 ml/min (max)

PRODUCT DATA SHEET – NEDSTACK FCS 5-HP



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Cooling

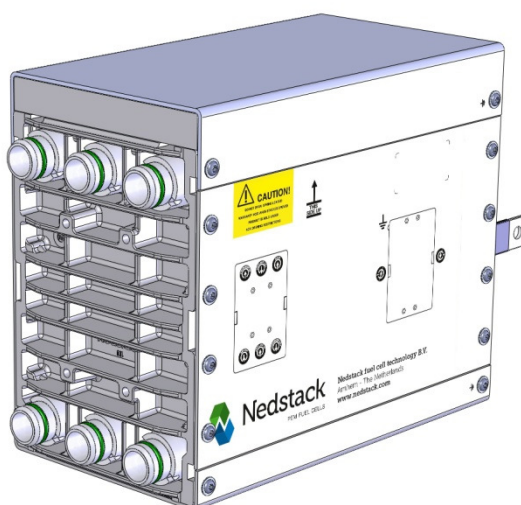
Nominal temperature	:	65 °C
Temperature _{max}	:	≤ 70 °C
Capacity	:	< 8.3 kW _{th} at full power
Medium	:	de-mineralized water or BASF glysantine FC G20
Purity	:	conductivity < 10 µS.cm ⁻¹
Pressure difference	:	< 0.15 bar (DI water) or < 0.45 bar for glysantine
Operating window	:	ΔT < 5K

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>	:	3/4 inch HAM-let/Swagelok compatible or Nedstack quick coupling (female)
Hydrogen	<i>standard</i>	:	Nedstack quick coupling (male)
	<i>optional</i>	:	3/4 inch HAM-let/Swagelok compatible or Nedstack quick coupling (female)
Air	<i>standard</i>	:	Nedstack quick coupling (male)
	<i>optional</i>	:	32 mm OD, hose clamp connection or Nedstack quick coupling (female)
Current		:	End contact with 8 mm hole
Cell voltage connector		:	1 DD50 female connector

Stack Connection lay-out:



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Electrical specifications

Minimum Beginning of Life stack performance data under standard conditions*

Current (A)	0	10	40	80	120	150	180	200	230
Stack V (V)	38.7	34.3	31.6	29.3	27.5	26.2	24.8	23.8	22.1
Stack P (kW)	0	0.34	1.26	2.34	3.30	3.93	4.46	4.75	5.09
Cell V (mV)	967	857	789	732	687	655	620	594	553

*standard conditions:

Stack temperature = 62 °C,

Hydrogen: stoichiometry = 1.25; minimum hydrogen flow = 24 NI/min; RH = 80%.

Air: stoichiometry = 2.0; minimum air flow = 56 NI/min; RH = 80%

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