

# WaterPro

## Water separator for fuel cells

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# MANN+HUMMEL WaterPro – Water separator for the protection of components in the fuel cell BOP

Decades of experience with water separation in air intake systems of ICE applications



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Watch the video of the water separator for fuel cell systems.



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MANN+HUMMEL memberships and partnerships in e-mobility and fuel cells:

Hydrogen Council

elektromobilität  
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Science for a  
moving society

European Clean  
Hydrogen Alliance



USHA  
UNITED STATES HYDROGEN ALLIANCE



Arbeitsgemeinschaft  
Brennstoffzellen  
(Fuel Cell Working Group)

EUROPEAN  
BATTERY  
ALLIANCE | EBA250

brennstoffzelle  
BW

Leadership in Filtration

MANN+  
HUMMEL

# MANN+HUMMEL WaterPro – Water separator for the protection of components in the fuel cell BOP

## Product features and concept advantages

- High water mass flow separation up to 40 g/s
- High separation efficiency for a wide airflow range
- Separates different liquid condition types:
  - Water droplets
  - Water wall film
  - Water accumulation and plug flow
- Designed to be freezing resistant
- Continuous water drainage
- Vertical and horizontal design
- Inclination capable up to  $\pm 20^\circ$
- Package optimized compact design

## Material and resistance

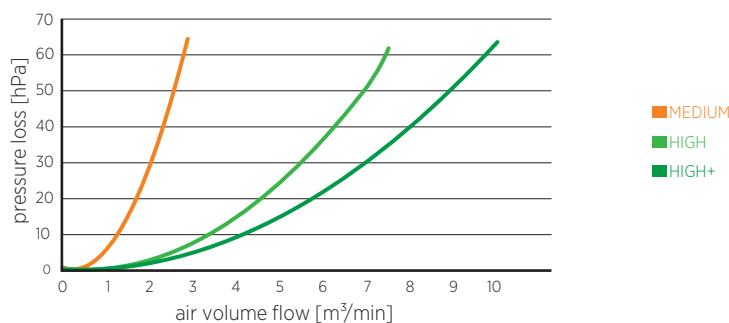
- Rapid part production technology:
  - PA and PP material
  - T = 85°C (long term, operating)
  - Burst pressure  $p > 8$  bara @ T = 20°C

\* @ Lab condition: T = 20°C | p = 1013 hPa |  $\varphi$  = 50% rel. air humidity  
 \*\* @ Lab condition: Inlet droplet size distribution 10 to 35 to 100  $\mu\text{m}$   
 Efficiency in nominal separator position: vertical/horizontal

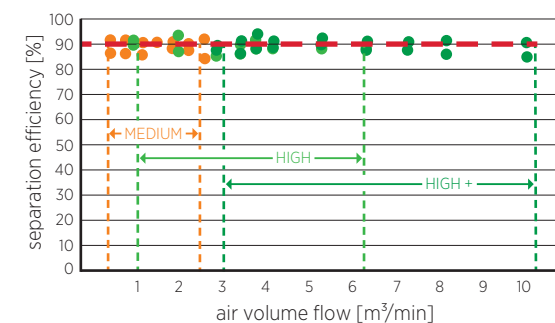
## Technical specification

Performance class	MEDIUM		HIGH		HIGH+	
Fuel cell stack power [kW]	~ 30 - 60		~ 80 - 130		~ 150 - 200	
Air volume flow * [m <sup>3</sup> /min]	1.0 - 2.6		2.0 - 6.5		3.5 - 10.0	
<b>Type vertical</b>						
Air volume flow * [m <sup>3</sup> /min]	2	2.6	5	6.2	7	9
Pressure loss [hPa]	≤ 30	≤ 50	≤ 30	≤ 50	≤ 30	≤ 50
Separation efficiency */** [%]	≥ 85		≥ 85		≥ 85	
<b>Type horizontal</b>						
Air volume flow * [m <sup>3</sup> /min]	2	2.6	5	6.8	7	9
Pressure drop [hPa]	≤ 30	≤ 50	≤ 30	≤ 50	≤ 30	≤ 50
Separation efficiency */** [%]	≥ 85		≥ 85		≥ 85	

### Pressure loss \*



### Separation efficiency \*/\*\*

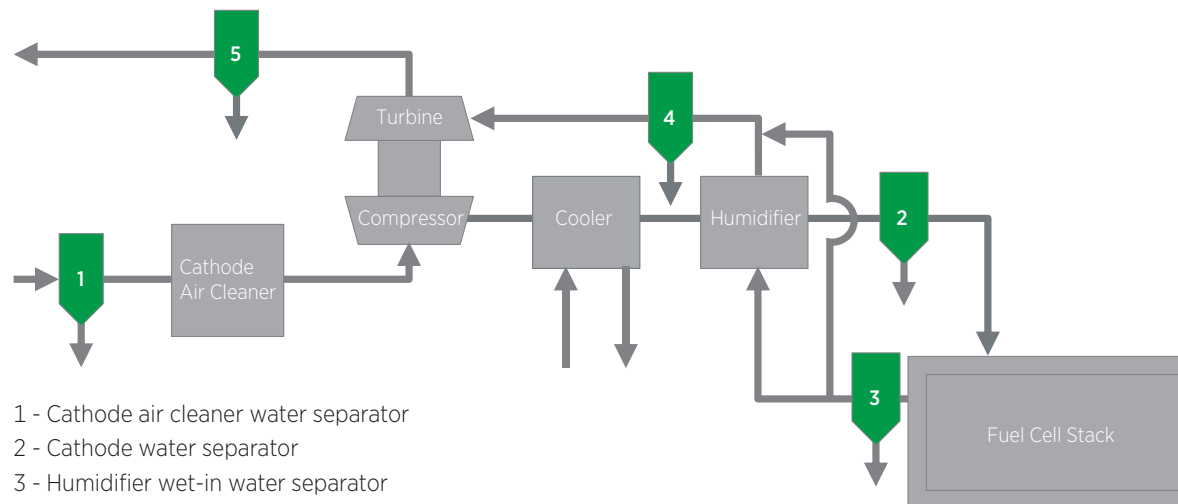


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## Technical specification

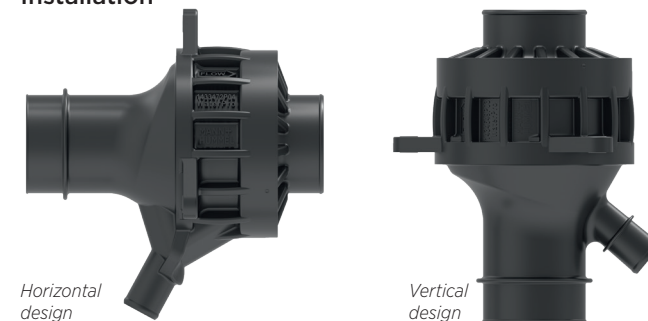
Performance class	MEDIUM	HIGH	HIGH+
Fuel cell stack power [kW]	~ 30 - 60	~ 80 - 130	~ 150 - 200
Air volume flow* [m <sup>3</sup> /min]	1.0 - 2.6	2.0 - 6.5	3.5 - 10.0
Dimensions (A/B/C/D/E) [mm]	200/99/44/35/25	200/129/66/54/25	260/154/76/64/25

## Potential positions in the cathode air path

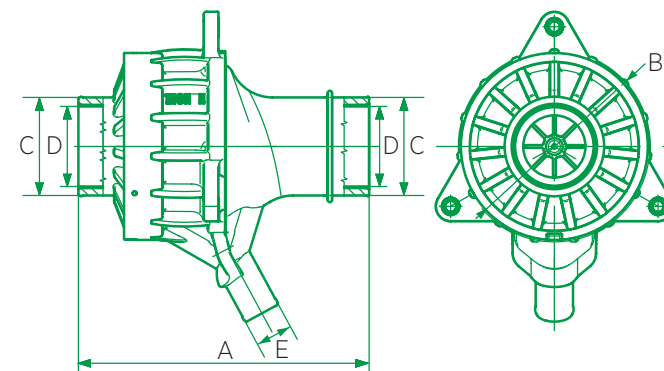


- 1 - Cathode air cleaner water separator
- 2 - Cathode water separator
- 3 - Humidifier wet-in water separator
- 4 - Turbine water separator
- 5 - Exhaust water separator incl. water management system

## Installation



## Dimensions



- A - Part length
- B - Part diameter
- C - Outer diameter interface inlet/outlet
- D - Inner diameter inlet/outlet
- E - Outer diameter interface drainage port



## MANN+HUMMEL Contact

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