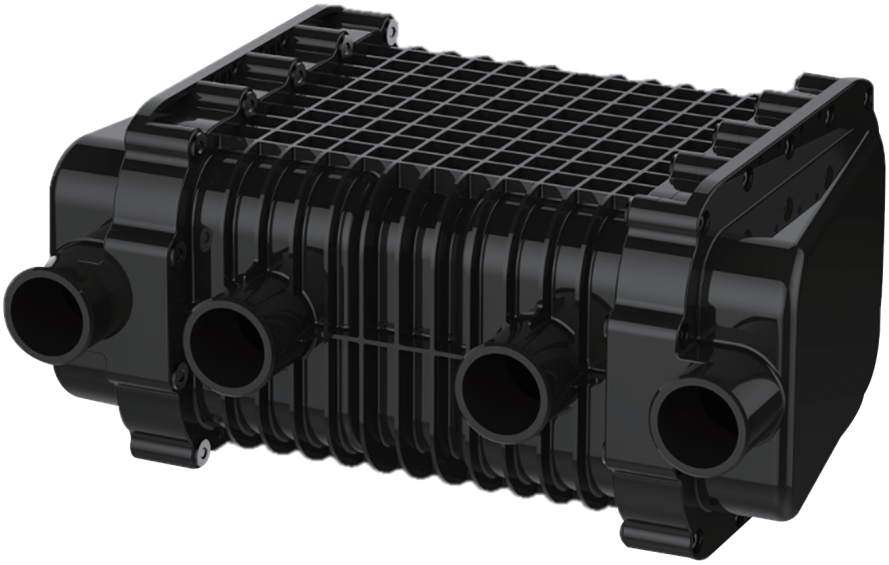
ECOMATE™

Fuel Cell Membrane Humidifier

Make Your Fuel Cell System more Stable and Efficient!



Novel Membrane

- Non Fluorinated Hollow Fiber
- Excellent Heat and Moisture Transfer
- High Pressure Operation
- Low & High Temperature Operation
- High Reliability & Long Life Time

Optimized Design

- Design Optimization by CAE
- World Patented Design
- Technical Support to Build Optimized Fuel Cell System

Low Cost & High Quality

- Mass Production Facility for Hollow Fiber Membrane
- Automated Serial Manufacturing Facility for Humidifier Assembly
- In-line Inspection for High Quality

Customizable & Scalable

- Customizable for System Requirement
- Scalable with Unit Humidifier Core

The individual specifications of our humidifier depend on operation conditions.
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KOLON

Revised. Feb-13-2019

General Specifications

Fuel Cell Power	0.5 ~ 150 kW
Rated Air Flow Rate	30 ~ 9,000 sLPM
Power Requirement	0 W
Type of Membrane	Hollow Fiber
Material of Membrane	Polysulfone's
Material of Housing	Glass fiber reinforced PA, PPA
Material of Potting	Heat resistant PU
Material of Sealing	Silicone
Flow Configuration	Counter & Co-current
Lifetime	> 7,000 hours
Operating fluid temperature range	-30 °C to 90 °C
Storage temperature range	-40 °C to 110 °C
Operating Pressure	Moderate to 300 kPa_a
Material Impurity (Cation)	Comply with automotive requirement

For further information, please contact :

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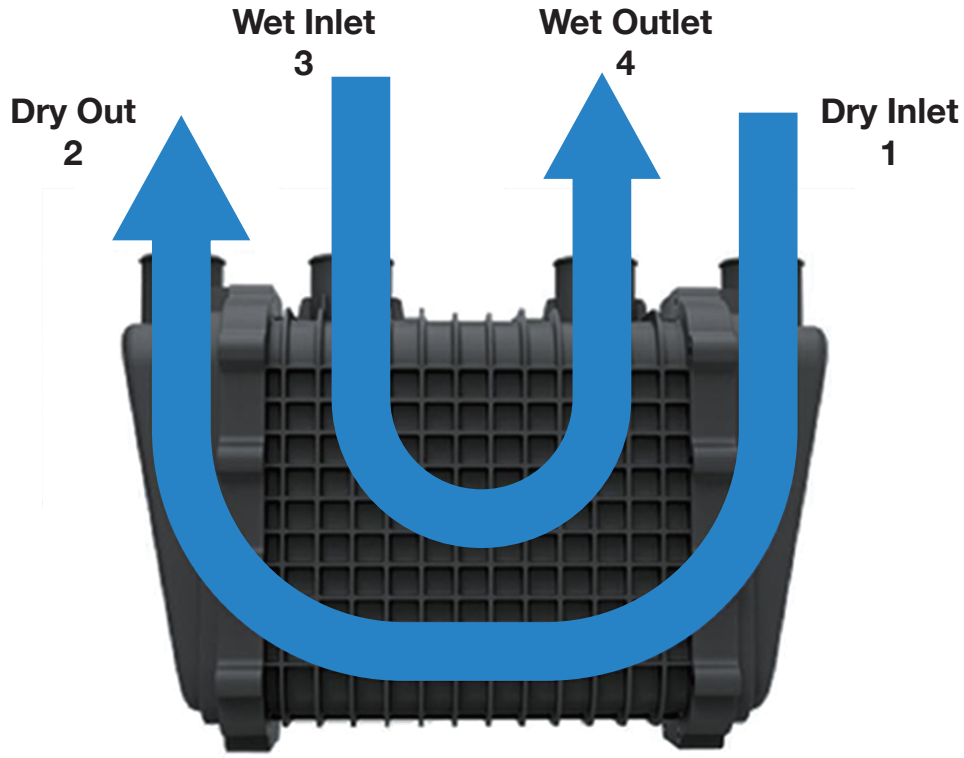
Performance Test Protocol



Performance Test Conditions for Each Product

Products	Air Flow Range (sLPM)	Dry Inlet		Dry Outlet	Wet Inlet			Reference Air Flow Rate (sLPM)
		Temp.	RH	Pressure	Temp.	RH	Pressure	
		(°C)	(%)	(kPa_a)	(°C)	(%)	(kPa_a)	
H7G	~50	55	<5	110	70	95	108	50
H02N	50~200	55	<5	110	70	95	108	100
H10N	200~600	80	<5	180	80	95	160	600
H20NP	600~2,000	80	<5	180	80	95	160	1,600
H20N	600~2,500	80	<5	180	80	95	160	2,000
H50N	2,000~5,000	80	<5	180	80	95	160	3,000
H100N	5,000~9,000	80	<5	180	80	95	160	5,000

※ Customers can get Kolon's free technical service about feasibility testing at real system operation conditions before selecting optimum humidifier products.
※ To provide more improved performance, the design of the product such as membrane can be modified.

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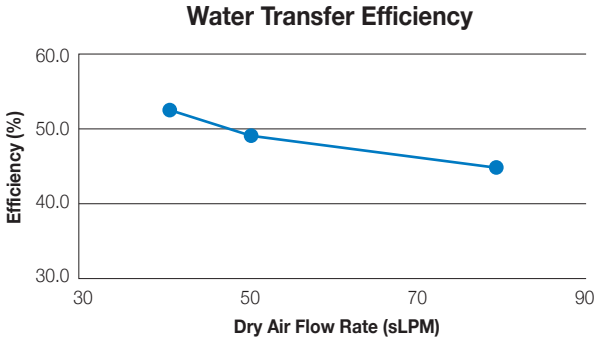
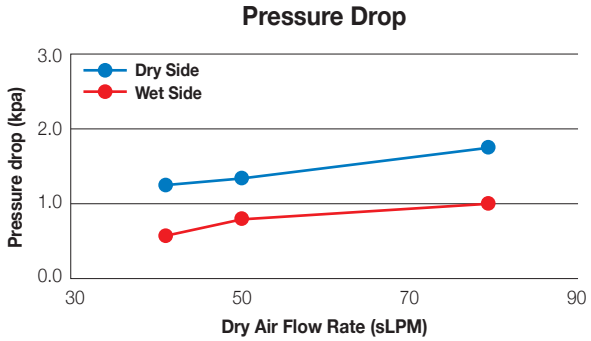
ECOMATE™ H7G

TECHNICAL DATA

Fuel Cell Power (Rated Air Flow)	~0.7 kW (~50 sLPM)
Total Weight @ dry	0.4 kg
Volume (Middle Part)	0.6 L (Φ55 x 180 mm)
Materials of Potting	Heat Resistant PU
Materials of Housing	PA6+GF
Material Impurity	Comply with the automotive requirement
Connecting Method	QF P14
Internal Air Leakage @ 80 kPa_g	< 0.15 L/min
External Air Leakage @ 100 kPa_g	Δ < 1 kPa for 2 min
Operating Temperature	-30 ~ 90 °C
Maximum Operating Pressure	300 kPa_a

PERFORMANCE





Gas to Gas	Dry Inlet Flow rate (sLPM)	Water Transfer Efficiency (%)	Approach Dew Temperature (°C)	Pressure Drop (Dry side, kPa)	Pressure Drop (Wet side, kPa)
	50	49.1	13.7	1.3	0.8

※ Water Transfer Efficiency(%) = m_{H2O_vap}(dry out)/m_{H2O_vap}(wet in)

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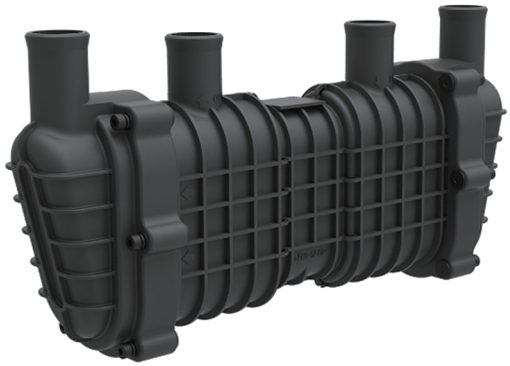
ECOMATE™ H02N (Under Development to replace H02G)

TECHNICAL DATA

Fuel Cell Power (Rated Air Flow)	1~3 kW (50~200 sLPM)
Total Weight @ dry	0.8 kg
Volume (Middle Part)	1.8L (122 x 66 x 230 mm)
Materials of Potting	Heat Resistant PU
Materials of Housing	PPA+GF
Material Impurity	Comply with the automotive requirement
Connecting Method	Hose Clamping (Φ : 1.0 in)
Internal Air Leakage @ 80 kPa_g	< 0.3 L/min
External Air Leakage @ 100 kPa_g	Δ < 1 kPa for 2 min
Operating Temperature	-30 ~ 90 °C
Maximum Operating Pressure	300 kPa_a



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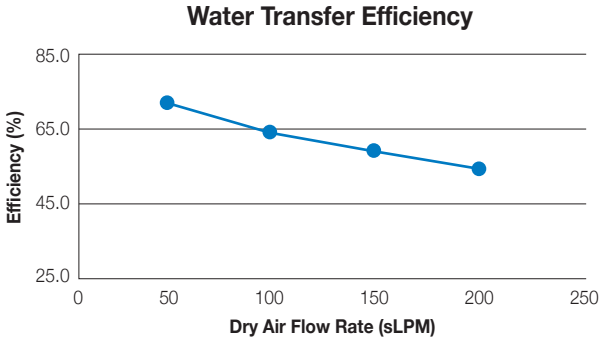

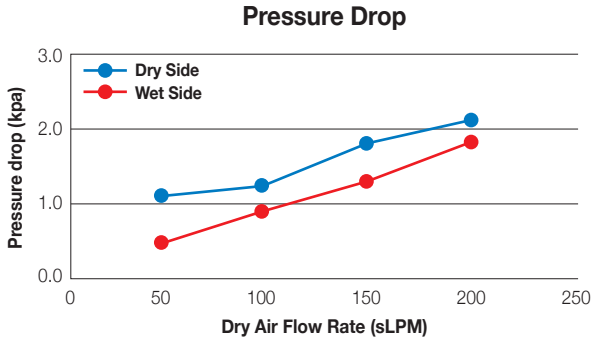

Gas to Gas	Dry Inlet Flow rate (sLPM)	Water Transfer Efficiency (%)	Approach Dew Temperature (°C)	Pressure Drop (Dry side, kPa)	Pressure Drop (Wet side, kPa)
	100	64.5	9.0	1.2	0.9

※ Water Transfer Efficiency(%) = m_{H2O_vap}(dry out)/m_{H2O_vap}(wet in)

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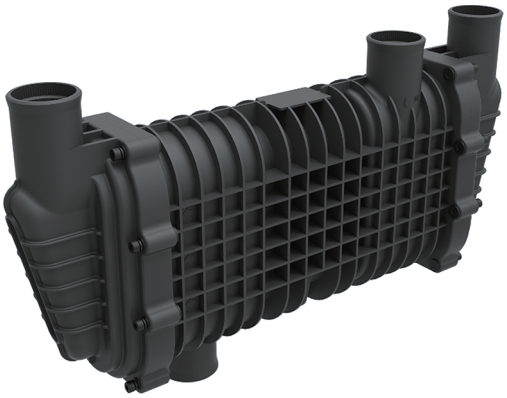
ECOMATE™ H10N (Under Development)

TECHNICAL DATA

Fuel Cell Power (Rated Air Flow)	3~10 kW (200~600 sLPM)
Total Weight @ dry	1.5 kg
Volume (Middle Part)	3.8L (165 x 80 x 286 mm)
Materials of Potting	Heat Resistant PU
Materials of Housing	PPA+GF
Material Impurity	Comply with the automotive requirement
Connecting Method	Hose Clamping (Φ : 1.5 in)
Internal Air Leakage @ 80 kPa_g	< 1.8 L/min
External Air Leakage @ 100 kPa_g	< 1 kPa for 2 min
Operating Temperature	-30 ~ 90 °C
Maximum Operating Pressure	300 kPa_a



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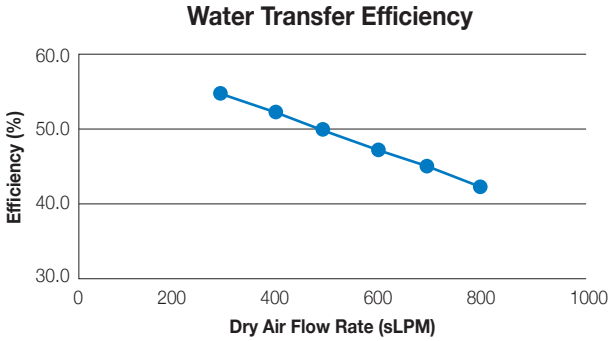

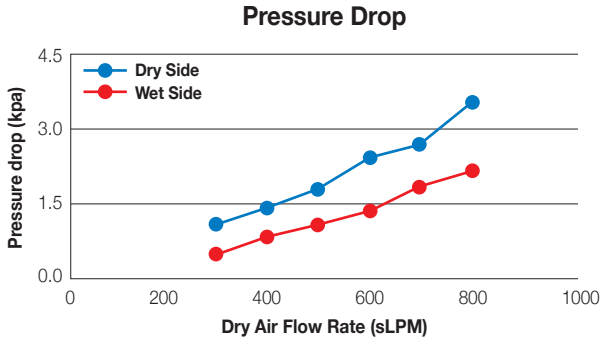

Gas to Gas	Dry Inlet Flow rate (sLPM)	Water Transfer Efficiency (%)	Approach Dew Temperature (°C)	Pressure Drop (Dry side, kPa)	Pressure Drop (Wet side, kPa)
	600	47.0	13.8	2.3	1.3

※ Water Transfer Efficiency(%) = m_{H2O_vap}(dry out)/m_{H2O_vap}(wet in)

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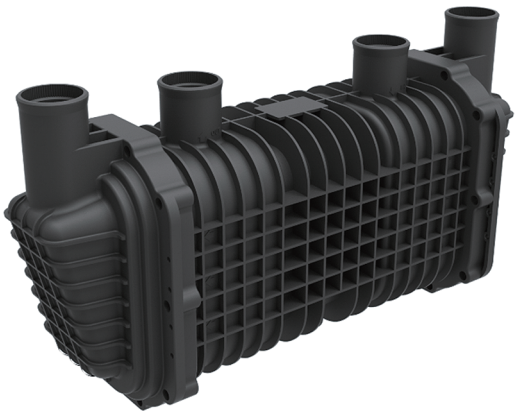
ECOMATE™ H20NP (Under Development)

TECHNICAL DATA

Fuel Cell Power (Rated Air Flow)	10~30 kW (600~2,000 sLPM)
Total Weight @ dry	2.4 kg
Volume (Middle Part)	7L (180 x 135 x 286 mm)
Materials of Potting	Heat Resistant PU
Materials of Housing	PPA+GF
Material Impurity	Comply with the automotive requirement
Connecting Method	Hose Clamping (Φ : 1.5 in)
Internal Air Leakage @ 80 kPa_g	< 6 L/min
External Air Leakage @ 100 kPa_g	< 1 kPa for 2 min
Operating Temperature	-30 ~ 90 °C
Maximum Operating Pressure	300 kPa_a



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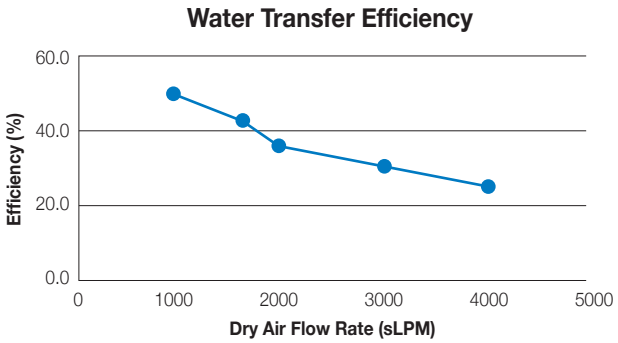

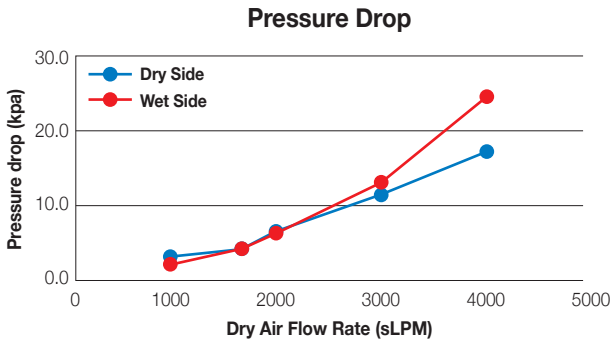

Gas to Gas	Dry Inlet Flow rate (sLPM)	Water Transfer Efficiency (%)	Approach Dew Temperature (°C)	Pressure Drop (Dry side, kPa)	Pressure Drop (Wet side, kPa)
	1,600	42.4	14.7	4.5	4.5

※ Water Transfer Efficiency(%) = m_{H2O_vap}(dry out)/m_{H2O_vap}(wet in)

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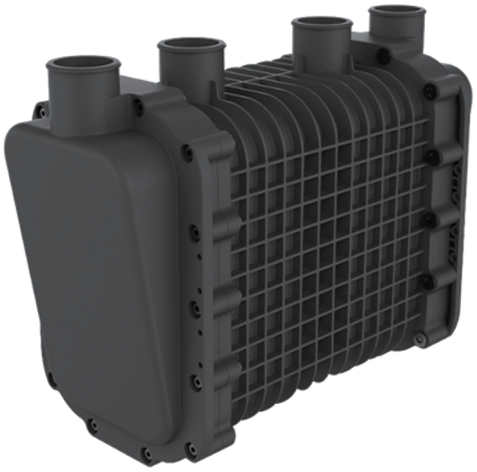
ECOMATE™ H20N

TECHNICAL DATA

Fuel Cell Power (Rated Air Flow)	10~45 kW (600~2,500 sLPM)
Total Weight @ dry	3.2 kg
Volume (Middle Part)	7L (135 x 222 x 230 mm)
Materials of Potting	Heat Resistant PU
Materials of Housing	PA6+GF
Material Impurity	Comply with the automotive requirement
Connecting Method	Hose Clamping (Φ : 1.5 in)
Internal Air Leakage @ 80 kPa_g	< 6 L/min
External Air Leakage @ 100 kPa_g	< 1 kPa for 2 min
Operating Temperature	-30 ~ 90 °C
Maximum Operating Pressure	300 kPa_a



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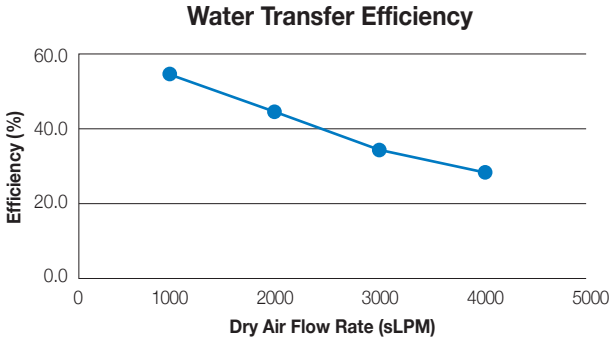

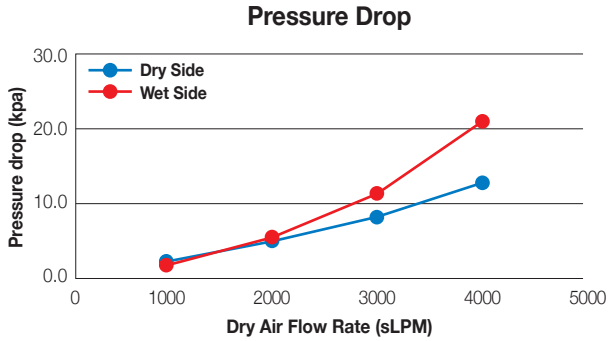

Gas to Gas	Dry Inlet Flow rate (sLPM)	Water Transfer Efficiency (%)	Approach Dew Temperature (°C)	Pressure Drop (Dry side, kPa)	Pressure Drop (Wet side, kPa)
	2,000	44.9	13.6	4.7	5.4

※ Water Transfer Efficiency(%) = m_{H2O_vap}(dry out)/m_{H2O_vap}(wet in)

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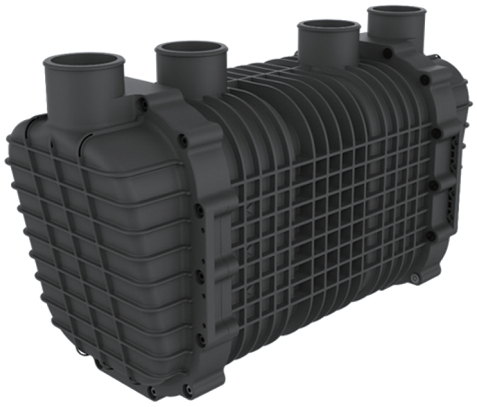
ECOMATE™ H50N

TECHNICAL DATA

Fuel Cell Power (Rated Air Flow)	45~90 kW (2,000~5,000 sLPM)
Total Weight @ dry	4.8 kg
Volume (Middle Part)	11L (178 x 223 x 280 mm)
Materials of Potting	Heat Resistant PU
Materials of Housing	PA6+GF
Material Impurity	Comply with the automotive requirement
Connecting Method	Hose Clamping (Φ : 2.0 in)
Internal Air Leakage @ 80 kPa_g	< 9 L/min
External Air Leakage @ 100 kPa_g	< 1 kPa for 2 min
Operating Temperature	-30 ~ 90 °C
Maximum Operating Pressure	300 kPa_a



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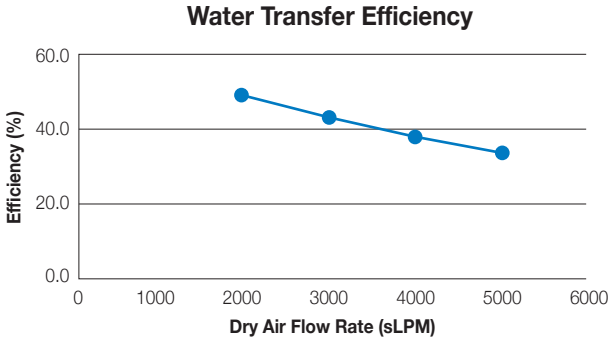

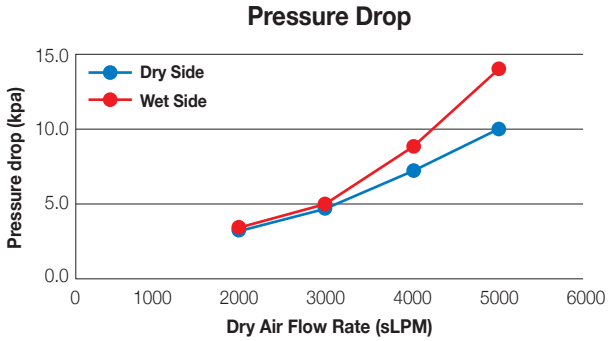

Gas to Gas	Dry Inlet Flow rate (sLPM)	Water Transfer Efficiency (%)	Approach Dew Temperature (°C)	Pressure Drop (Dry side, kPa)	Pressure Drop (Wet side, kPa)
	3,000	42.9	15.3	4.7	5.0

※ Water Transfer Efficiency(%) = m_{H2O_vap}(dry out)/m_{H2O_vap}(wet in)

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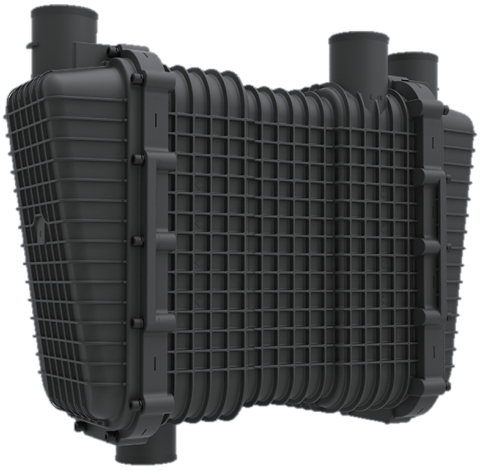
Revised. Feb-13-2019

ECOMATE™ H100N (Under Development)

TECHNICAL DATA

Fuel Cell Power (Rated Air Flow)	90~150 kW (5,000~9,000 sLPM)
Total Weight @ dry	6.2 kg
Volume (Middle Part)	16L (180 x 315 x 286 mm)
Materials of Potting	Heat Resistant PU
Materials of Housing	PPA+GF
Material Impurity	Comply with the automotive requirement
Connecting Method	Hose Clamping (Φ : 2.0 in)
Internal Air Leakage @ 80 kPa_g	< 15 L/min
External Air Leakage @ 100 kPa_g	< 1 kPa for 2 min
Operating Temperature	-30 ~ 90 °C
Maximum Operating Pressure	300 kPa_a



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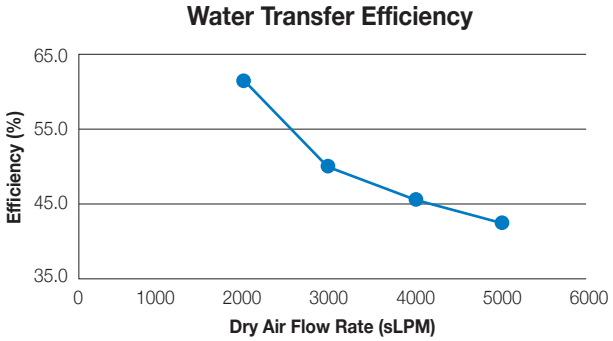

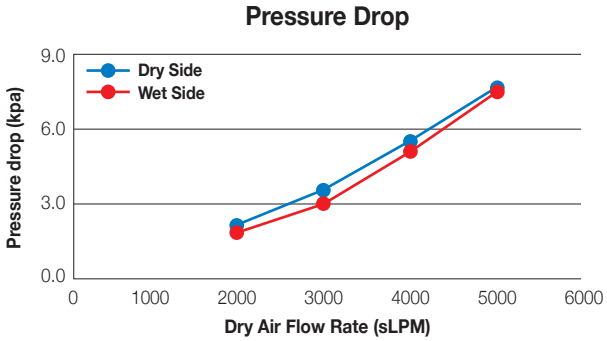

Gas to Gas	Dry Inlet Flow rate (sLPM)	Water Transfer Efficiency (%)	Approach Dew Temperature (°C)	Pressure Drop (Dry side, kPa)	Pressure Drop (Wet side, kPa)
	5,000	42.1	15.6	7.7	7.5

※ Water Transfer Efficiency(%) = m_{H2O_vap}(dry out)/m_{H2O_vap}(wet in)

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