

H³ Dynamics



HYDROGEN AIR MOBILITY
Power Solutions and Accessories

2022

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H³Dynamics

RANGE OF PRODUCTS

HYCOPTER



AEROSTAK
FUEL CELL SYSTEMS



H₂ REFILLING
STATION



H₂ PRESSURE
REGULATOR



H₂ CYLINDERS



H₂ BOOST
COMPRESSOR



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AEROSTAK FUEL CELL SYSTEMS

FULL LINE UP OF HIGH-PERFORMANCE PEM FUEL CELLS

The H3 Dynamics AEROSTAKs are family of advanced ultra-light hydrogen fuel cells, ranging from 250W to 1.5kW nominal rated power. All AEROSTAKs feature a special grade PEM fuel cell stack, full balance of plant, control electronics, LiPo-compatible hybrid electronics, lightweight casing and are plug and play. Pair the AEROSTAK with our hydrogen storage, pressure regulation, and refilling technology for a complete turnkey power solution.

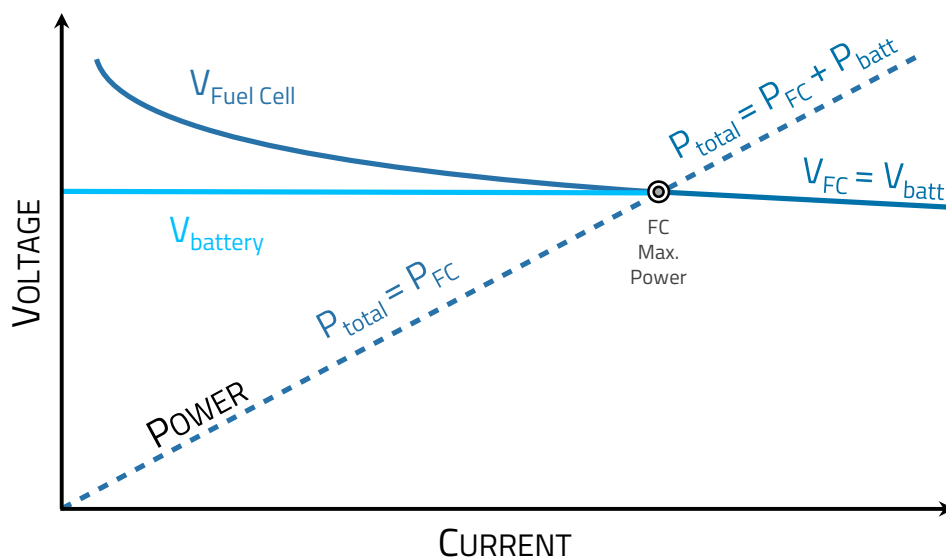
System operational data such as voltages, currents, power, and temperatures are provided through an RS232 data connection. Wireless data transmission is available as an option. The LiPo battery provides power for startup and additional electric power when the load required exceeds the capacity of the fuel cell stack. The electronics also provide up to 1.5 A to recharge the battery when excess power is available.

Standard system features:

- Remote ON/OFF button
- RS232 Data monitoring
- Maintenance cycle signal
- Waterproof hard case for transport
- H2 supply tube and quick-connect

Add-ons:

- DC/DC converter
- Wireless telemetry
- Custom firmware
- Higher power systems by stacking several systems



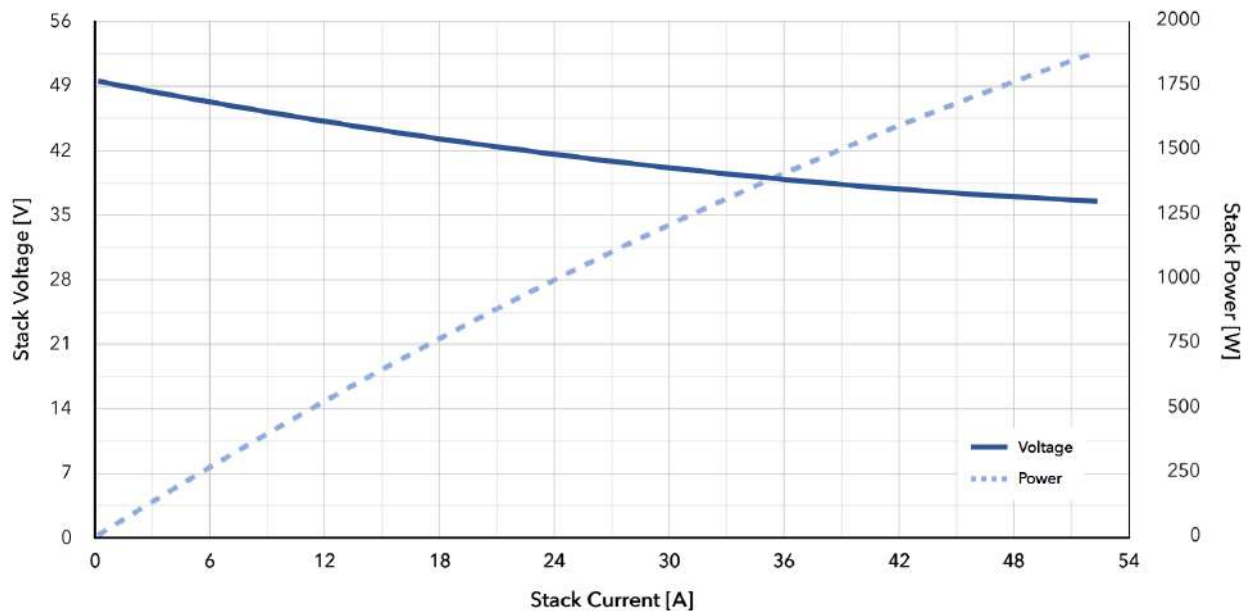


AEROSTAK 1500

ADVANCED LIGHTWEIGHT FUEL CELL SYSTEM

The AEROSTAK 1500 is suitable for larger payload multi rotor UAV's as well as for fixed wing, VTOL and other higher power mobile applications.

Stack Design	55 cells	Dimensions	339 x 143 x 172 mm
Rated Power (FC)	1500 W	Cooling	Air
Peak Power (FC + battery)	4000 W	Air Input Temperature	0 - 35°C
Voltage	32.0 - 51.3 V	Hydrogen Input Pressure	0.6 - 0.8 bar
Current	0 - 50 A	Hydrogen Purity Required	99,998%
Weight	3 000 g	Max. Consumption	< 16.8 L/min
Specific Power	500 W/kg	Start Up Time	< 20 s
Power Density	180 W/L	Suggested Hybrid LiPo	9S (>100C)



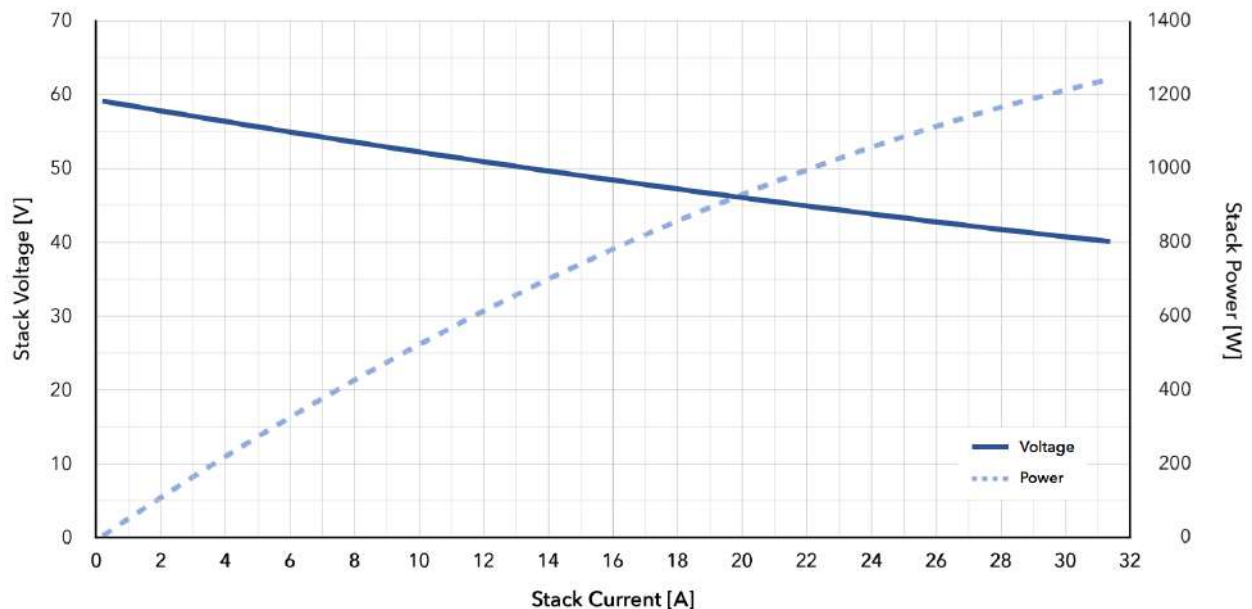


AEROSTAK 1000-HV

ADVANCED LIGHTWEIGHT FUEL CELL SYSTEM

The AEROSTAK 1000-HV has been designed to power large fixed wing drones and mid-sized multi rotor UAV's (<10 kg MTOW), as well as other portable applications.

Stack Design	65 cells	Dimensions	194 x 127 x 193 mm
Rated Power (FC)	1000 W	Cooling	Air
Peak Power (FC + battery)	3800 W	Air Input Temperature	0 - 35°C
Voltage	35.0 - 61.8 V	Hydrogen Input Pressure	0.6 - 0.8 bar
Current	0 - 30 A	Hydrogen Purity Required	99,998%
Weight	2 100 g	Max. Consumption	< 11.2 L/min
Specific Power	476 W/kg	Start Up Time	< 20 s
Power Density	210 W/L	Suggested Hybrid LiPo	10 S (>100C)



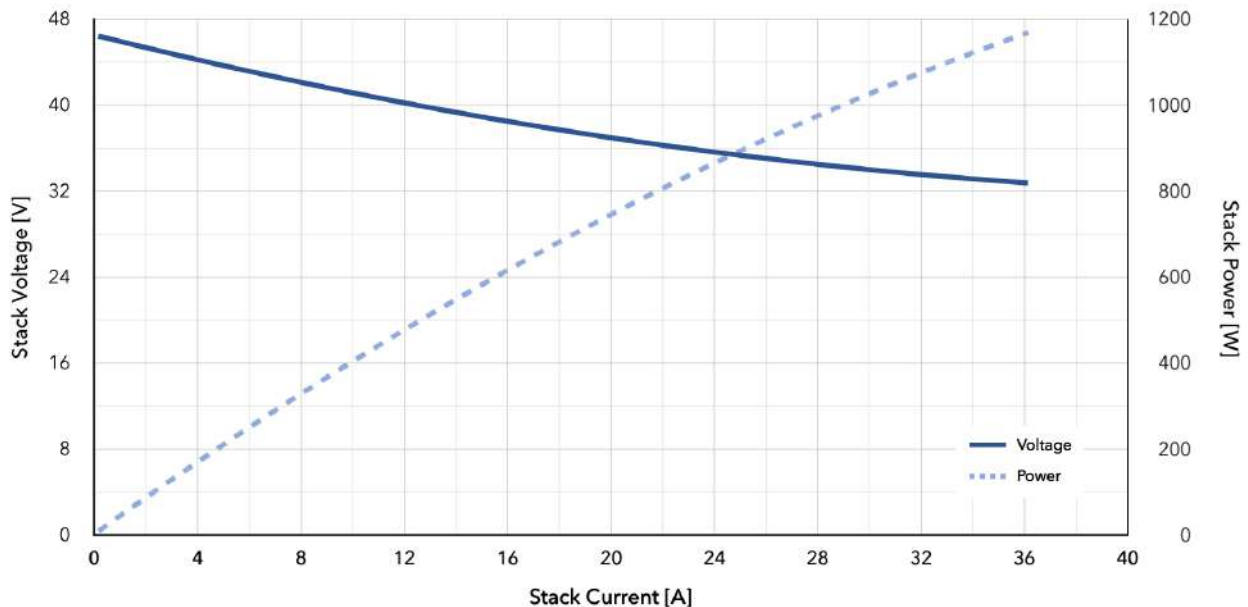


AEROSTAK 1000-LV

ADVANCED LIGHTWEIGHT FUEL CELL SYSTEM

The AEROSTAK 1000-LV has been designed to power large fixed wing drones and mid-sized multi rotor UAV's (<10 kg MTOW), as well as other portable applications.

Stack Design	50 cells	Dimensions	279 x 127 x 143 mm
Rated Power (FC)	1000 W	Cooling	Air
Peak Power (FC + battery)	3250 W	Air Input Temperature	0 - 35°C
Voltage	28.0 - 47.5 V	Hydrogen Input Pressure	0.6 - 0.8 bar
Current	0 - 35 A	Hydrogen Purity Required	99,998%
Weight	2 150 g	Max. Consumption	< 11.2 L/min
Specific Power	465 W/kg	Start Up Time	< 20 s
Power Density	197 W/L	Suggested Hybrid LiPo	8 S (>100C)



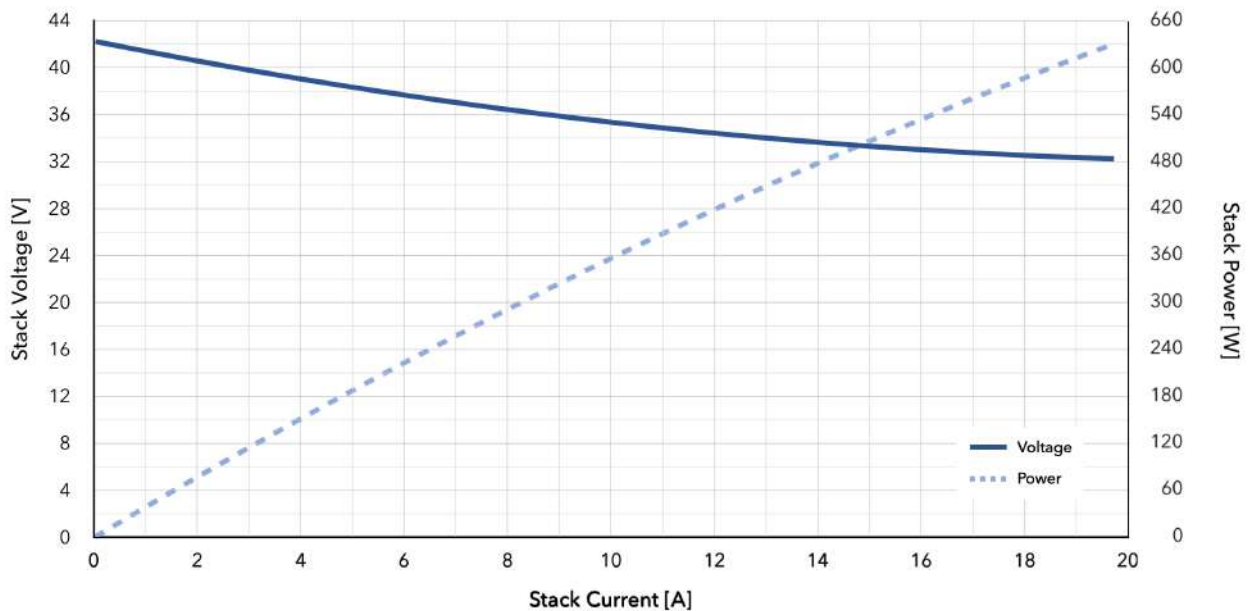


AEROSTAK 500

ADVANCED LIGHTWEIGHT FUEL CELL SYSTEM

The AEROSTAK 500 has the perfect power and form factor for fixed wing and VTOL drones.

Stack Design	45 cells	Dimensions	214 x 123 x 130 mm
Rated Power (FC)	500 W	Cooling	Air
Peak Power (FC + battery)	2750 W	Air Input Temperature	0 - 35°C
Voltage	28.0 - 42.8 V	Hydrogen Input Pressure	0.6 - 0.8 bar
Current	0 - 20 A	Hydrogen Purity Required	99,998%
Weight	1 580 g	Max. Consumption	< 5.6 L/min
Specific Power	316 W/kg	Start Up Time	< 20 s
Power Density	146 W/L	Suggested Hybrid LiPo	8 S (>100C)



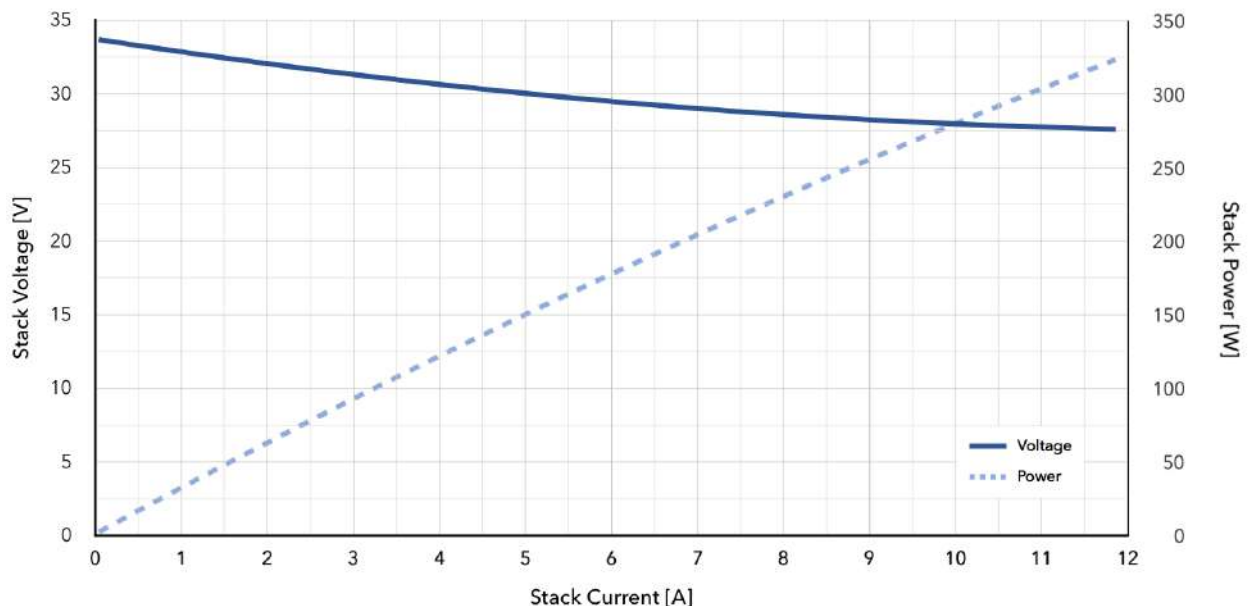


AEROSTAK 250

ADVANCED LIGHTWEIGHT FUEL CELL SYSTEM

The AEROSTAK 250 is ideal for powering smaller fixed wing drones, scaled demonstrators, research, and other low-powered hydrogen applications.

Stack Design	37 cells	Dimensions	122 x 123 x 112 mm
Rated Power (FC)	250 W	Cooling	Air
Peak Power (FC + battery)	800W – up to 2210W	Air Input Temperature	0 - 35°C
Voltage	24.5 - 35.2 V	Hydrogen Input Pressure	0.6 - 0.8 bar
Current	0 - 13 A	Hydrogen Purity Required	99,998%
Weight	720 g	Max. Consumption	< 2.8 L/min
Specific Power	347 W/kg	Start Up Time	< 20 s
Power Density	149 W/L	Suggested Hybrid LiPo	7 S (>100C)





COMPATIBLE WITH
AEROSTAK PEM FUEL CELLS SYSTEMS
H₂ PRESSURE REGULATOR

SERIES A 350 BAR CYLINDERS

WITH PRESSURE REGULATOR

The Series A cylinders are designed and manufactured following the best practices in the industry, in order to guarantee safety and security. The Series A have a working pressure up to 350 bar and a M18x1.5 thread compatible with our ultra-light pressure regulator.

	Weight ¹	Water Capacity	Hydrogen Mass	Dimensions	Specific Energy	Energy Density	Electrical Energy ²
A5	1.65 kg	5 L	120 g	∅ : 152 mm L : 395 mm	8 725 kJ/kg	2 879 kJ/L	2 000 Wh
A9	2.65 kg	9 L	216 g	∅ : 173 mm L : 528 mm	9 779 kJ/kg	2 879 kJ/L	3 600 Wh
A12	3.30 kg	12 L	288 g	∅ : 196 mm L : 532 mm	10 471 kJ/kg	2 879 kJ/L	4 800 Wh
A20	7.05 kg	20 L	480 g	∅ : 230 mm L : 655 mm	8 169 kJ/kg	2 879 kJ/L	8 000 Wh

¹Excluding Pressure Regulator

²Estimated at 50 % efficiency



EN 12245 CERTIFICATION

COMPATIBLE WITH
AEROSTAK PEM FUEL CELLS SYSTEMS
H₂ PRESSURE REGULATOR

SERIES F 300 BAR CYLINDERS

WITH PRESSURE REGULATOR

The Series F cylinders are designed and manufactured in conformity with EN 12245. The Series F have a working pressure up to 300 bar and a M18x1.5 thread compatible with our ultra-light pressure regulator.

	Weight ¹	Water Capacity	Hydrogen Mass	Dimensions	Specific Energy	Energy Density	Electrical Energy ²
F2	1.46 kg	2 L	42 g	∅ : 114 mm L : 371 mm	3 173 kJ/kg	2 538 kJ/L	705 Wh
F3	1.75 kg	3 L	63 g	∅ : 120 mm L : 445 mm	4 008 kJ/kg	2 538 kJ/L	1 055 Wh
F6	2.89 kg	6 L	127 g	∅ : 161 mm L : 481 mm	4 479 kJ/kg	2 538 kJ/L	2 115 Wh
F6.8	3.09 kg	6.8 L	144 g	∅ : 161 mm L : 520 mm	4 665 kJ/kg	2 538 kJ/L	2 400 Wh
F7.2	3.29 kg	7.2 L	152 g	∅ : 166 mm L : 550 mm	4 809 kJ/kg	2 538 kJ/L	2 540 Wh
F9	4.06 kg	9 L	190 g	∅ : 186 mm L : 545 mm	4 759 kJ/kg	2 538 kJ/L	3 175 Wh

¹Excluding Pressure Regulator, in Light Version

²Estimated at 50 % efficiency



FOR UNMANNED AERIAL VEHICLE

COMPATIBLE WITH
A SERIES & F SERIES CYLINDERS
AEROSTAK PEM FUEL CELLS SYSTEMS

ULTRALIGHT H₂ GAS PRESSURE REGULATOR

The pressure regulator provides safety and performance in an ultralight package of only 200 grams (250g with accessories). The single-stage regulator reduces pressure up to 350 bar storage to less than 1 bar with accurate reliable control.

Gas	Hydrogen
Material	Aluminium
Weight	200 g (250 g with accessories)
Type	Single Stage
Max Input Pressure	350 bar
Adjustable Output Pressure ¹	0-1 bar
Cylinder Thread	M18 x 1.5
Outlet Port	1/8" NPT
Fill Port	1/8" NPT
Length	107 mm
Max Flow	< 45 slpm at 0.5 bar

¹Higher output pressures available



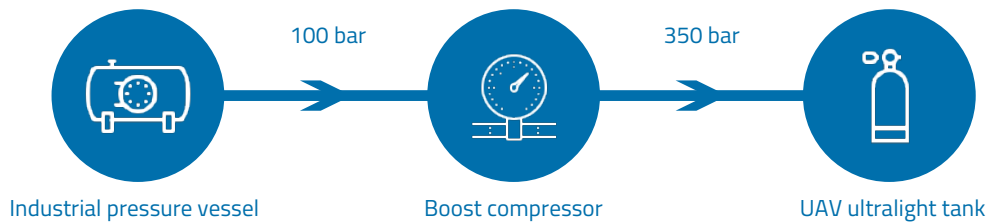
FOR UNMANNED AERIAL VEHICLE

COMPATIBLE WITH
A SERIES & F SERIES CYLINDERS
H₂ PRESSURE REGULATOR

ELECTRIC BOOST COMPRESSOR

FILLS UP TO 300 OR 350 BAR

The H3 Dynamics electric gas booster pump system increases a low-pressure hydrogen supply to allow filling of high pressure (300-350 bar) composite cylinders. The pump is self-contained with gauges, valves, an hour meter and a power switch. The pump includes a high and low pressure safety switch as well as a high pressure safety relief valve.



Dimensions	L: 940 mm H: 292 mm D: 559 mm
Weight	65.9 kg
Voltage ¹	120 or 240 VAC single phase
Motor Frequency	60/50 Hz
Operational Speed ²	70 cycles/min
Cooling	Air cooled
Noise	< 63 dB
Maximum Inlet Pressure	372 bar
Minimum Inlet Pressure	34 bar
Maximum Outlet Pressure	386 bar
Maximum Flow Rate ³	617 slpm

¹ Other voltages available as well as 3 phases

² Variable Speed Option

³ Dependent on input pressure

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