aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

BioEnergy Solutions

Parker Hiross

ENGINEERING YOUR SUCCESS.

Protect the Environment and your Investments...

Bioenergy is renewable energy stored in organic materials such as plant matter and animal waste, known as biomass. The wide variety of biomass fuel sources includes agricultural residue, pulp/paper mill residue, urban wood waste, forest residue, energy crops, landfills and animal waste. Anaerobic digestion is the process that occurs when bacteria decompose organic materials in the absence of oxygen to generate biogas.

Biogas is primarily composed of methane and carbon dioxide with smaller amounts of hydrogen sulphide and ammonia. Trace amounts of other gases like hydrogen, nitrogen or carbon monoxide are also present in the biogas. Usually the mixed gas is saturated with water vapour and may contain dust particles.

Biogas is available from:

- landfills
- wastewater treatment plants
- agriculture and livestock operation
- organic industrial waste
- separated municipal solid waste
- gasification of biomass residues

The characteristics of biogas are somewhere comparable to natural gas. The energy content is defined by the concentration of methane. For biogas as a fuel, most of the impurities have to be removed, as they may cause corrosion, deposits and damage to equipment. Substances which need to be removed include hydrogen sulphide, water, CO_2, halogen compounds (chlorides, fluorides), siloxanes, aromatic compounds.

Biogas is dried by cooling it to temperatures close to 1 °C using water-cooled heat exchangers working with water chillers.

Respecting the Environment:

Biogas is an attractive alternative to conventional fuels. Energy generated from biogas results in no net carbon emissions and helps to reduce the greenhouse effect and achieve the objectives of the Kyoto Protocol.

- Reduced methane emissions from atmospheric decomposition;
- Nitrogen is converted to ammonia that is more easily converted by plants to nitrites and nitrates, thereby eliminating nitrogen overloading in the soil;
- Biogas used for power production replaces the use of fossil fuels for the same purpose.

Improve your Factory performance:

- The European biogas sector is expanding as governments invest in renewable energy generation;
- Biogas utilisation is successful in wastewater treatment plants, industrial processing applications, landfills and in the agricultural sector. 10% of methane in the dry gas corresponds approximately to 1 kWh per m^3;
- Plants for biogas production are commercially available and systems have been installed throughout the EU and substantial revenues are invested annually to increase biogas capacities.

...with Parker Hiross solutions

Separators

Hypersep BioEnergy

Aftercoolers

Hypercool BioEnergy

Drains

Hyperdrain BioEnergy

Chillers

Hyperchill BioEnergy

Low pressure filter

Hyperfilter BioEnergy

Aftercoolers
Hypercool BioEnergy

- stainless steel ribbed tubes
- high efficiency heat exchanger
- low gas outlet temperature

Condensate drains
Hyperdrain BioEnergy

- large capacity drain
- no electrical wiring and no gas loss
- designed to work with dirty condensate and for low pressure operation
- Hiroshield treatment for optimal operation in any ambient

Separators
Hypersep BioEnergy

- high efficiency demister separator with very low pressure drops
- removable demister for very easy maintenance
- stainless steel separator with 99% efficiency for the whole range of flows
- patent pending

Low pressure filter
Hyperfilter BioEnergy

- Low pressure (< 0,5 bar(g))
- Pre- and after filter
- Stainless steel housing for single or multiple filter elements
- different filter ranges
- low differential pressure

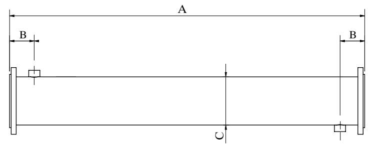
Water chillers
Hyperchill BioEnergy

- special protective treatment on condensers and copper piping for reliable operation even in aggressive ambients
- pump and tank installed inside the chiller for a compact and easy to install solution
- closed water temperature operation with high working limits and low running costs

Technical data Hypercool BioEnergy

Model	Gas flow		Refrigerant connections		Dimensions (mm)			Weight
	m³/min	m³/h	IN	OUT	A	B	C	kg
WFB120	2,0	120	DN125	1"	1800	100	133	71
WFB170	2,8	170	DN150	1"	1800	100	168	86
WFB220	3,7	220	DN150	1"	1800	100	168	92
WFB300	5,0	300	DN150	1" 1/4	1800	125	194	110
WFB500	8,3	500	DN200	1" 1/4	1800	125	245	150
WFB700	11,7	700	DN250	1" 1/4	1800	125	273	209
WFB1000	16,7	1000	DN300	1" 1/2	1800	125	324	259
WFB1300	21,7	1300	DN350	1" 1/2	1800	125	356	298
WFB1600	26,7	1600	DN350	2"	1800	125	375	333
WFB2000	33,3	2000	DN450	2" 1/2	1800	150	457	480
WFB2400	40,0	2400	DN500	DN100	1800	200	508	600
WFB2800	46,7	2800	DN600	DN100	1800	200	610	890

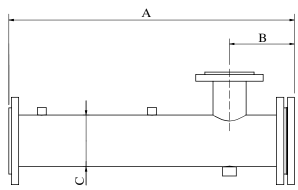
Performances refer to models operating with a clean, cool gas flow of 20 °C / 1 bar A. Nominal working conditions: 60 % CH_4, 35 % CO_2, 5 % other gases, working pressure 0,2 barg, water inlet gas content 48 g/Nm³, water inlet temperature 1 °C, gas outlet temperature 4 °C (± 1 °C).



Technical data Hypersep BioEnergy

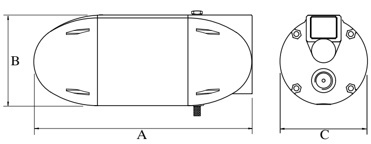
Model	Gas flow		Refrigerant connections		Dimensions (mm)			Weight
	m³/min	m³/h	IN	OUT	A	B	C	kg
SFB120	2,0	120	DN125	DN50	785	191	133	35
SFB220	3,7	220	DN150	DN100	932	212	168	42
SFB300	5,0	300	DN150	DN125	936	214	194	58
SFB500	8,3	500	DN200	DN150	1422	285	273	105
SFB700	11,7	700	DN250	DN200	1609	285	324	140
SFB1000	16,7	1000	DN300	DN200	1610	285	356	180
SFB1600	26,7	1600	DN350	DN250	1880	305	457	240
SFB2000	33,3	2000	DN450	DN300	2130	355	508	310
SFB2400	40,0	2400	DN500	DN350	2335	390	610	400
SFB2800	46,7	2800	DN600	DN400	2155	415	610	435

Performances refer to models operating a clean, cool gas flow of 20 °C / 1 bar A. Nominal working conditions: 60 % CH_4, 35 % CO_2, 5%other gases, working pressure 0,2 barg, gas inlet water content 48 g/Nm³, average pressure drop 1 kPa (± 0,3 kPa).



Technical data Hyperdrain BioEnergy

	Construction materials			Gas flow		Connec.		Pressure	Dimensions (mm)			Weight
Model	housing	float	lever	m³/min	m³/h	in	out	max	A	B	C	kg
HDF220BE	aluminium	plastic/st steel	plastic/st steel	108	6500	1"	½"	1	266	111	108	1,9



Technical data Hyperchill BioEnergy

Modell ICE		007	010	015	022	029	039	046	057	076	090	116	150	183	230
Cooling Capacity[1]	kW	7,0	9,5	14,3	21,8	28,1	38,2	45,2	56,4	76,0	90,2	115,5	149,2	182,3	228
Compr. abs. power[1]	kW	2,0	2,3	3,4	5,2	5,7	7,7	10,1	12,3	15,4	20,3	24,9	30,8	40,1	51,4
Cooling Capacity[2]	kW	3,9	4,9	7,4	12,3	16,7	21,8	26,1	32,4	43,2	51,7	66,1	85,3	104,2	130,2
Compr. abs. power[2]	kW	1,7	1,8	2,9	5,5	6,0	8,2	10,3	13,2	16,4	20,8	26,4	32,5	41,4	55,1
Power supply	V/ph/Hz	400/3/50 no neutral													
Protection class		44		54											
Refrigerant		R407C													
Compressors															
Type		ermetic pistons			ermetic compliant scroll										
Compressor/circuits		1/1								2/2			4/2		
Max. abs. power-1 compr.	kW	1,8	3	5,8	6,9	7,8	11,1	13,7	16,8	11,1	13,7	16,8	11,1	13,7	16,8
Axial fans															
Quantity	N°	1					2		3				2		3
Max. abs. power-1 fan	kW	0,14	0,14	0,61	0 61	0,78	0,61	0,61	0,61	0,78	0,78	0,78	2	2	2
Total air flow	m^3/h	4400	4100	7100	6800	9200	12400	12000	17400	25500	25000	26400	47000	46000	66000
Pump P15															
Type		periferal		centrifugal											
Max . abs. power	kW	0,48	0,48	0,3	0,45	0,75	0,75	0,75	0,75	1,1	1,1	1,1	1,5	1,5	2,2
Water flow (nom/max)[1]	m^3/h	1,3/2,4	1,5/2,4	2,3/4,2	3,5/7,2	4,5/18	6,3/18	7,6/18	9,3/18	12/25	15/825	19/44	25/44	30/44	39/48
Head pressure (nom/min)[1]	m H_2O	23/6	20/6	18/10	18/7	17/10	16/10	16/10	15/10	15/8	15/8	13/6	12/6	10/6	14/8
Water flow (nom/max)[2]	m^3/h	0,9/2,4	1,0/2,4	1,6/4,2	2,4/7,2	3,2/18	4,5/18	5,5/18	6,7/18	9,0/25	11,0/25	13/44	18/44	22/44	28/48
Head pressure (nom/min)[2]	m H_2O	30/6	27/6	18/10	20/7	17/10	17/10	17/10	16/10	16/8	16/8	13/6	11/6	12/6	20/8
Dimensions & Weight															
Depth (A)	mm	980	980	1090	1090	1650	1650	1650	2200	2200	2200	2200	3000	3000	3260
Width (B)	mm	534	534	744	744	744	744	744	744	898	898	898	1287	1287	1287
Height (C)	mm	1228	1228	1358	1358	1358	1358	1358	1358	1984	1984	1984	2298	2298	2298
Connection in/out	in	1”	1”	1 ¼”	1 ¼”	1 ½”	1 ½”	1 ½”	1 ½”	2”	2”	2”	2 ½”	2 ½”	2 ½”
Tank Capacity	l	45	45	120	120	180	180	250	300	500	500	500	1000	1000	1000
Weight (axial)	kg	170	180	250	270	380	410	430	520	800	900	1000	1500	1800	2100
Noise level															
Noise level[3]	dB(A)	53	53	50	50	53	52	52	56	58	58	58	62	62	64

1) data refers to water inlet/outlet temperature = 20/15 °C, glycol 0 %, ambient temperature 25 °C.
2) data refers to water inlet/outlet temperature = 5/1 °C, glycol 10 %, ambient temperature 35 °C.
3) weights are inclusive of pallet and refrigerant charge.
4) in free field conditions at a distance of 10m from the unit, measured on condenser side, 1m from ground.
All models supplied with R407C and with power supply 400V / 3ph / 50Hz.

Correction factors

A) Ambient temp. (air-cooled models) correction factor (f1)	°C	5	10	15	20	25	30	35	40	45
		1,05	1,05	1,05	1,05	1	0,95	0,89	0,83	0,77

B) Water outlet temperature correction factor (f2)	°C	5	10	15	20	25
		0,72	0,86	1	1	1

C) Glycol correction factor (f3)	%	0	10	20	30	40	50
		1	0,99	0,98	0,97	0,96	0,94

To obtain the required cooling capacity multiply the value at nominal conditions by the above correction factors (i.e. cooling capacity = Pxf1xf2xf3xf4, where P is the cooling capacity at conditions (1)). The above correction factors are approximative: for a precise selection always refer to the software selection program.