FlexBio

Anaerobic Wastewater technology

Efficient, environmentally friendly and cost-effective

Product catalogue

Commercial and industrial wastewater
Food and beverage production, slaughterhouses, manufacturing & agriculture

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Technology for people and the environment

THAT MAKES US INNOVATIVE

Anaerobic wastewater treatment in a compact containerised design is the first and only of its kind. It enables the effective and efficient purification of wastewater in just a few process steps. In addition, our systems ensure a permanently positive energy balance.

THAT MAKES US EFFICIENT

Less sewage sludge - more energy: With the anaerobic wastewater technology we use, the organic matter in the wastewater is converted exclusively by microorganisms. The result is a methane-rich gas (approx. 60 - 95% by volume).

THAT MAKES US FLEXIBLE

The unique containerised design of our anaerobic biological wastewater treatment plants makes it possible to transport our systems easily, install them quickly and simply (plug & play) and equip them with additional modules (modular principle). You do not have to invest in the final expansion stage today. You invest as required.

THAT MAKES US SUSTAINABLE

We generate energy from your wastewater. The CO2 savings associated with our wastewater treatment plants avoid negative environmental impacts. At the same time, little to no sewage sludge is produced. These aspects enable sustainable corporate development and create an additional source of income.

FlexBio
wastewater technology

ADVANTAGES OF A WASTEWATER TREATMENT PLANT FROM FLEXBIO

- Energy-efficient and cost-saving in all areas of application
- Simple operational management
- Reliable cleaning
- Generation of energy-rich gas from organic residues
- Sustainable and environmentally friendly energy source
- Permanent improvement of the CO2 balance
- Decomposition of organic residues, by over 90 % possible
- System performance remains the same even with changing organic and hydraulic loads
- Plant concept can be expanded to include an aerobic treatment stage and a membrane bioreactor. This means that even the strictest discharge limits are met

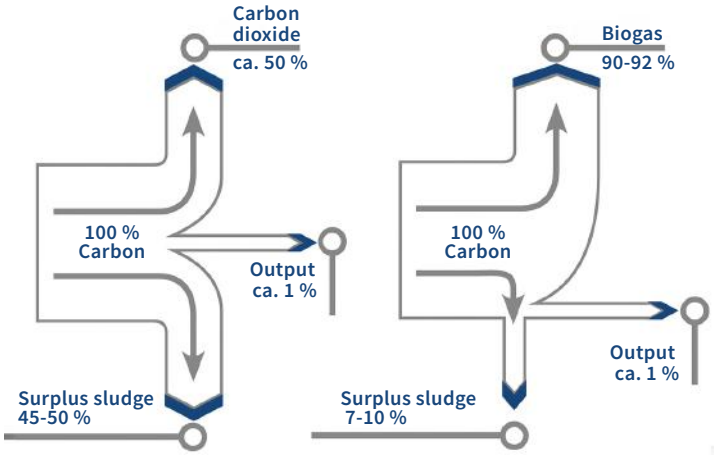
FLEXIBLE SOLUTIONS

- Flexible solutions in a compact and modular design
- Flexible and transportable container design
- Modules can be set up and operated in parallel
- Flexible sizes in standardised ISO containers
- Biogas produced can be flexibly utilised as energy
- Effective reduction of ammonium nitrogen, nitrate and phosphorus optionally possible

ANAEROBIC VS. AEROBIC TECHNOLOGY

CONVENTIONAL SEWAGE TREATMENT PLANT (aerobic degradation)

FLEXBIO COMPACT TREATMENT PLANT (anaerobic pre-treatment and aerobic post-treatment)



ENERGY CONSUMTION FOR THE REDUCTION OF 1 kg COD

Aerobic (activated sludge process)	0,7 - 1 kWh
Anaerobic (fermentation)	0,07 - 0,1 kWh

In addition, the anaerobic process produces approx. 0.35 m^3 of methane, which corresponds to 3.5 kWh of primary energy from 1 kg of COD. This results in a significant energy surplus in the anaerobic process!

COD = chemical-biological oxygen demand as a sum parameter for oxidisable organic compounds

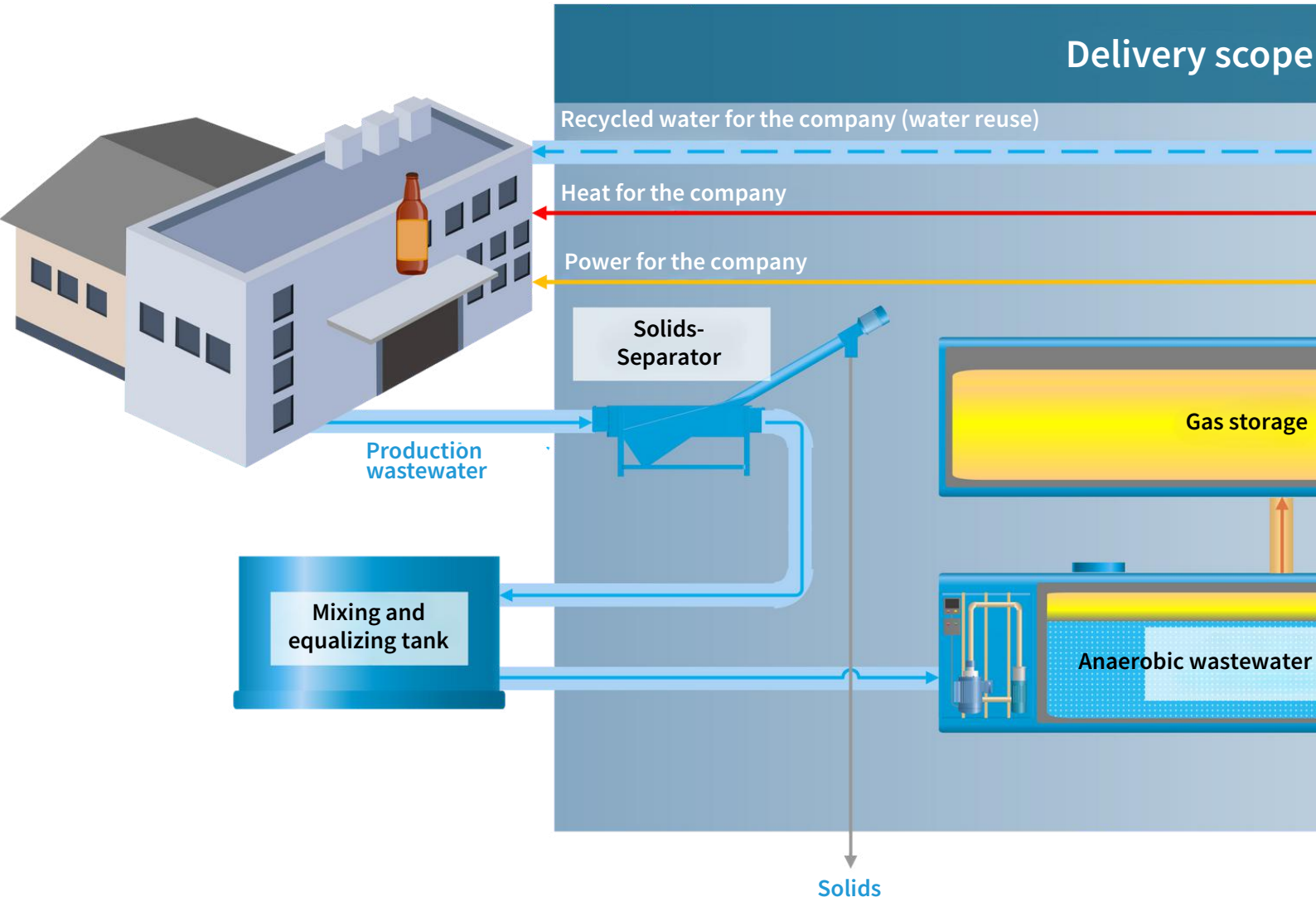
OUR SERVICES

- Determination of potential and requirements
- Process delivery
- 3D modelling
- Production and approval planning
- Plant construction as general contractor
- Standardised documentation
- Commissioning

FlexBio –
Everything from a single source

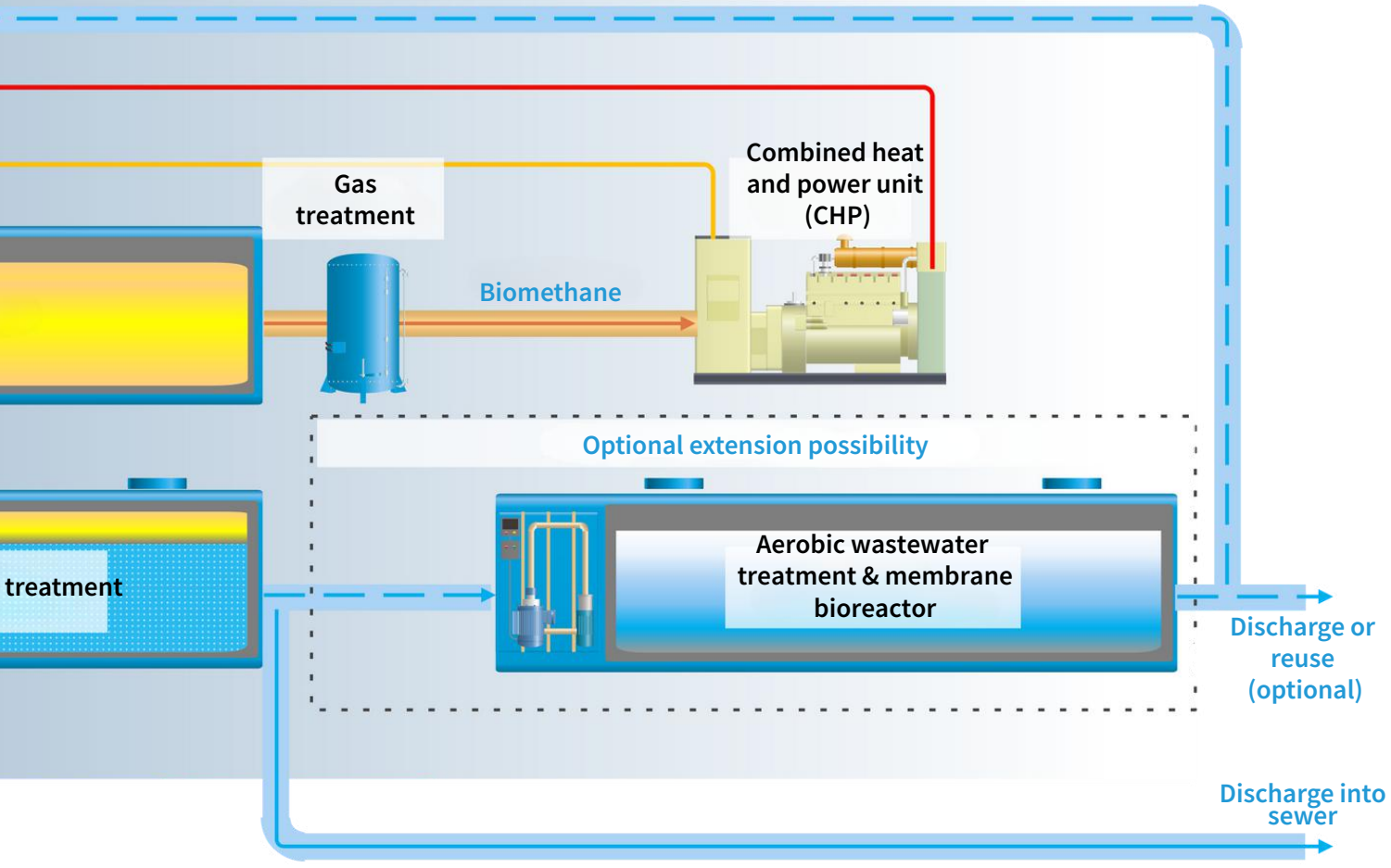
FlexBio
scope of delivery

Complete project planning and realisation



- everything from a single source!

of FlexBio Technologie GmbH



FlexBio - scope of delivery
Complete biogas plant for your business

LOW PRESSURE GAS STORAGE

- Modular container design
- Variable storage volume
- Pre-pressure 1-5 mbar

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ANAEROBIC FIXED BED REACTOR

- Modular container design
- Complete treatment plant
- Gas production

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GAS TREATMENT

- Gas drying
- Desulphurisation
- Gas compression

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GAS UTILISATION

- Gas boiler plant
- Gas CHP
- Gas torch

FROM PAGE 24

FlexBio
Anaerobic fixed bed reactor

Complete anaerobic treatment plant type AF

HIGH-PERFORMANCE BIOGAS PLANT

- Fermentation of liquid substrates
- Treatment of municipal and industrial wastewater
- Fermentation of liquid manure
- Waste fermentation

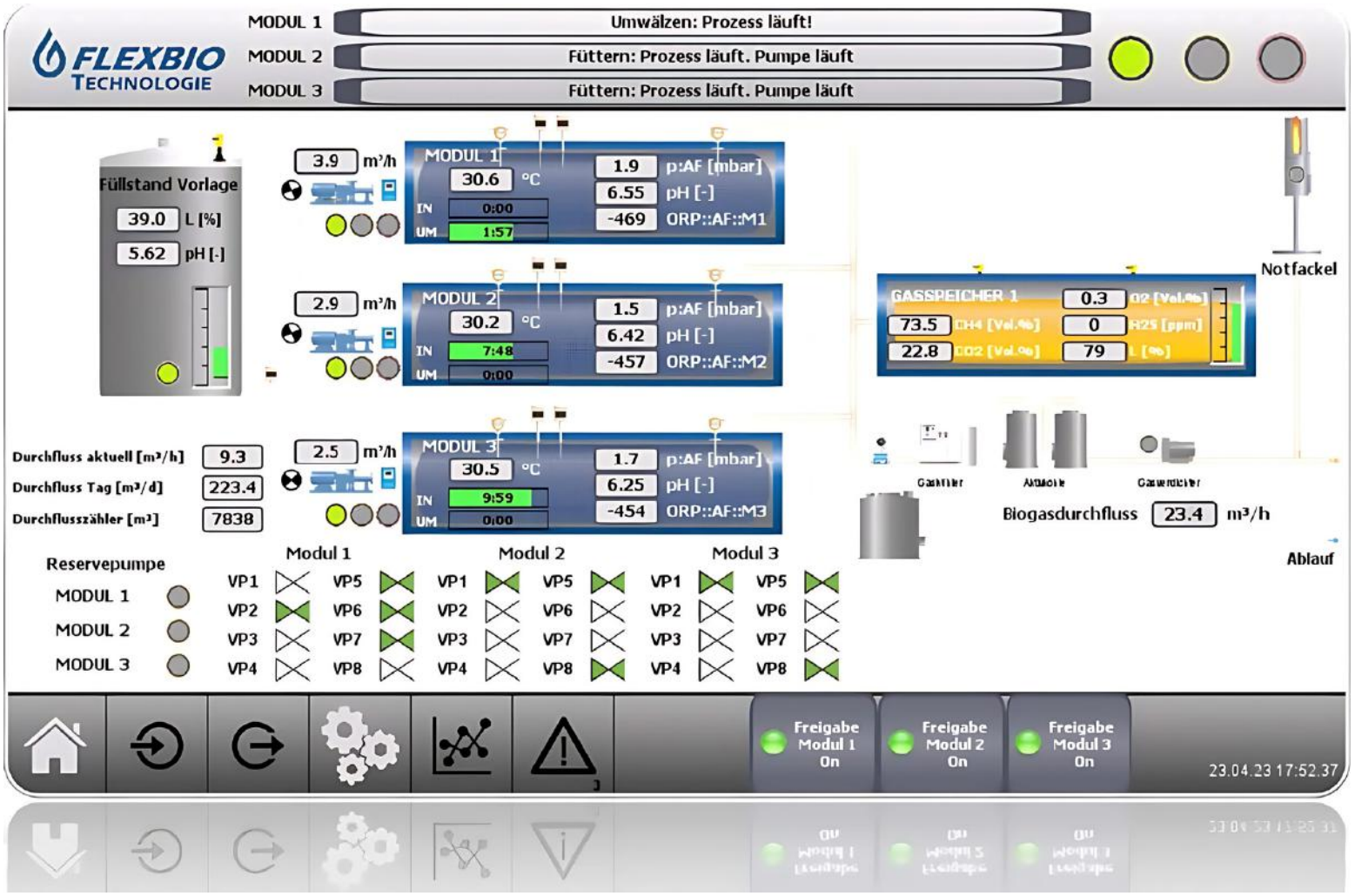
SYSTEM ADVANTAGES

- Compact system in containerised design (easy transportation)
- Ready for operation, "turnkey" on delivery (plug & play principle)
- Modular principle: modular and expandable according to needs and requirements
- Individual modules can be operated both in combination and as stand-alone units
- Complete system including control and safety technology
- Newest and most efficient technology
- Low maintenance

GENERAL INFORMATION

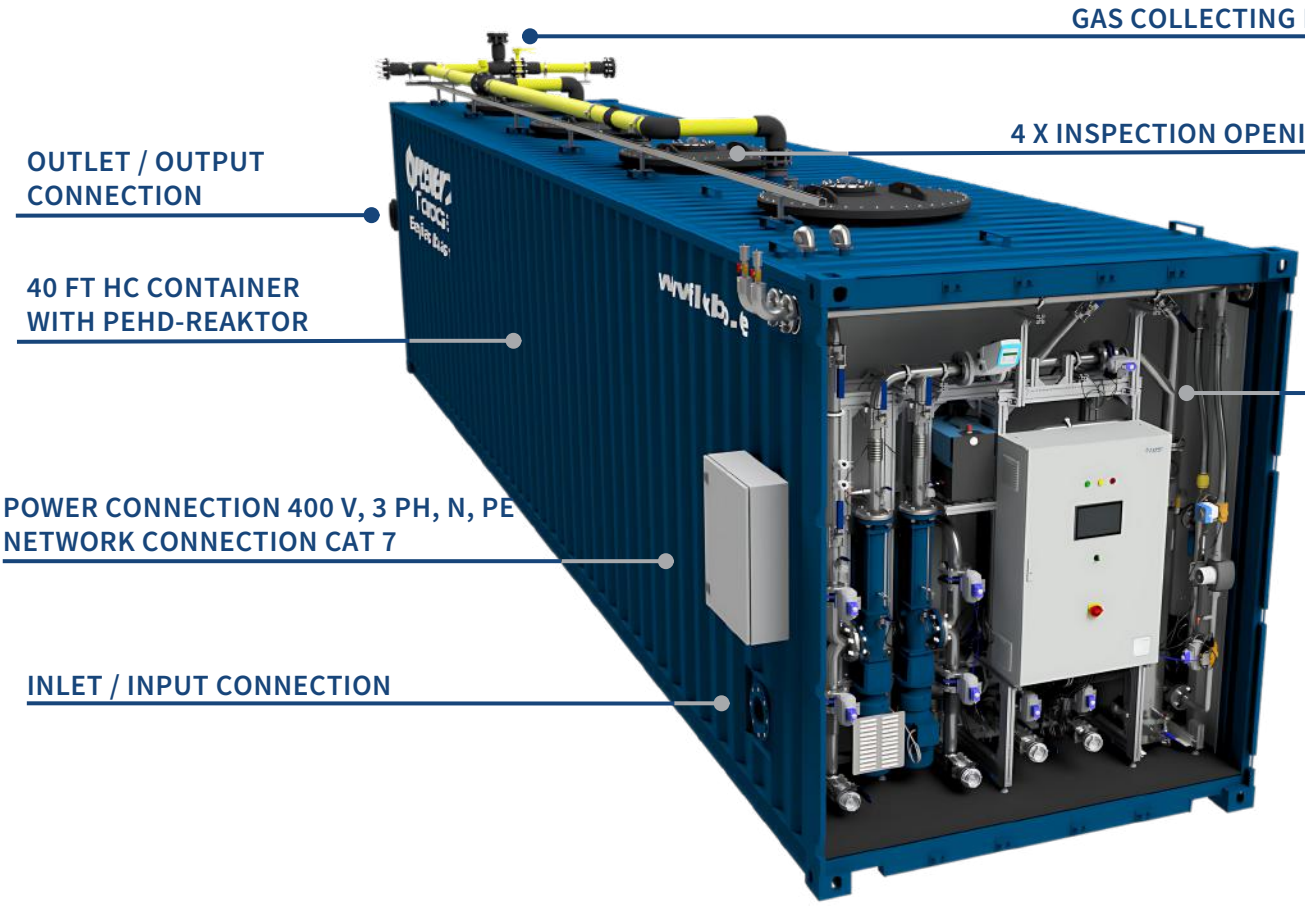
Biological wastewater pre-treatment using an anaerobic fixed bed is equipped with packed bed, upflow throughflow with external circulation and heat recovery. The entire system is supplied turnkey with complete machine technology - pumps, tube heat exchanger for heat recovery, tube bundle heat exchanger for substrate heating, control cabinet with control panel via HMI incl. electrotechnical equipment and PLC in an ISO container. The process monitoring and safety technology is based on proven parameters (overfill protection, gas pressure monitoring and protection, pH, redox, conductivity, temperature, pressure, fill levels, flow rate). The design enables a space-saving installation according to the plug & play principle, so that the containerised solutions from FlexBio can be integrated in most companies. The system can be modularly expanded as required. This means that the system capacity can grow in line with increasing wastewater volumes. In addition to the basic module, further system modules can be combined into a system network and controlled centrally.

MODERN CONTROL SYSTEM AND SOFTWARE



FlexBio
Anaerobic fixed bed reactor

Complete anaerobic treatment plant type AF



CONNECTIONS (OPTIONALLY LEFT OR RIGHT)

MODERN CONTROL SYSTEM

- Automation and monitoring of all processes
- Clear menu navigation
- Visualisation of all processes
- Data recording; alarm manager; User administration
- Various soft ware data interfaces optionally configurable
- Interfaces via hardware signals - digital / analogue
- Communication interface / remote access via VPN router, mobile (optional) or LAN
- The module controller is designed for the optional connection of additional system components and expansion modules

TYPE
Type of construction
Module
Throughput max.
Organic load (COD) in continuous operation
Gas production max.
Heat absorption (at 25° inlet temperature)
Nominal electrical power consumption
Average electrical power consumption
Nominal current
Gas connection
Inlet connection
Outlet connection
Heating connection (flow and return)
Power supply
Network connection
Operating temperature min./max.
pH feed min./max.
Inlet temperature min./max.
Transport dimensions
Transport weight
Gross weight (ready for use)

COMPACT MACHINE ROOM

REDUNDANT PUMPING STATION

AF-50.HC.B	AF-100.HC.B	AF-100.HC.E	AF-180.HC.B	AF-180.HC.E
20ft ISO container HC	40ft ISO-Container HC		Spezialcontainer	
Basis/Master	Basis/Master	Extension/slave	Basis/Master	Extension/slave
4 m^3/h	8 m^3/h		14 m^3/h	
300 kg COD/d	500 kg COD/d		850 kg COD/d	
4.0 m^3 CH4/h	6.7 m^3 CH4/h		11.3 m^3 CH4/h	
30 kW	60 kW		100 kW	
4.2 kW	4.6 kW		6.5 kW	
2.0 kW	3.5 kW		4.9 kW	
23 A	25 A		32 A	
Flange DN100 PN16			Flange DN100 PN16	
Flange DN150 PN16			Flange DN150 PN16	
Flange DN200 PN16			Flange DN300 PN16	
Flange DN50 PN16			Flange DN65 PN16	
400 V/3Ph/PE/50 Hz				
CAT 7				
30 - 38 °C				
6,3 - 8,0				
15 °C - 40 °C				
L 6.5 / W 2.5 / H 3.2 m	L 12.5 / W 2.5 / H 3.2 m		L 15.5 / W 3.0 / H 3.5	
9,150 kg	14,950 kg		25,250 kg	
36,750 kg	67,350 kg		121,230 kg	

FlexBio
Gas storage

Compact and modular low-pressure gas storage type GS

GENERAL INFORMATION

Function	Low-pressure gas storage
Modular design	Basic module or extension model
Type of construction	Membrane bag in ISO container High Cube
Standard colour (outside)	RAL 5010 blue or according to your choice
Support air blowers (base model only)	
Min. / Max. Gas operating pressure	-1 / -5 mbar (relative pressure)
Materials	PVC / PU-coated polyester fabric on both sides
Level measurement	2 x laser sensors and / or draw-wire sensor
Gas connection	Flange DN100
Condensate discharge	Flange DN100

TYPE	GS-050.HC.B	GS-050.HC.E	GS-100.HC.B	GS-100.HC.E
Modules	Basis/Master	Extension/slave	Basis/Master	Extension/slave
Type of construction	20ft ISO-Container HC		40ft ISO-Container HC	
Gas storage volume	max. 35 m^3		max. 70 m^3	
Gas extraction	max. 200 m^3/h			
Operating pressure	1 - 5 mbar			
Support air blowers	Fan II 3G c IIB T3 X 04 ATEX; volume flow 85 - 590 m^3/h; 0.18 kW, 400 V, rated current 0.53 A			
Level measurement	Two measuring points: Laser distance or draw-wire sensor; ATEX, intrinsically safe, zones (0), 1, 2			
Transport dimensions	L 6.0 / W 2.5 / H 3.2 m		L 12.0 / W 2.5 / H 3.2 m	
Transport weight	2,700 kg		4,450 kg	

DESCRIPTION

For gas storage, a gas membrane in a customised container shape with a maximum volume of 70 m^3 is installed in an ISO container. An overpressure of maximum 5 mbar (set pressure 2 to 2.5 mbar) is generated on the gas membrane by an externally mounted radial blower (support air blower) and a downstream overpressure flap. This pressure is transferred to the gas chamber via the gas membrane film and thus simultaneously produces the biogas system pressure. The gas produced by the anaerobic process is temporarily stored in the low-pressure gas storage tank (gas membrane storage tank). The pressure protection of the low-pressure storage is realised by means of a correspondingly dimensioned biogas overpressure and underpressure protection. This ensures that the biogas overpressure does not exceed 5 mbar and the biogas underpressure does not exceed 1 mbar.

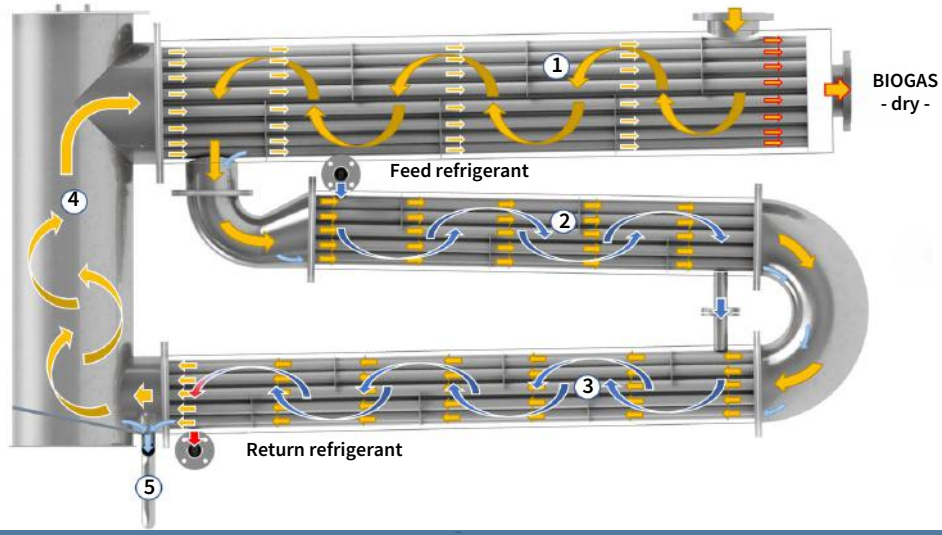
GAS STORAGE MEMBRANE WITH ALL-ROUND SUSPENSION

Gas drying of the GKT type

GENERAL INFORMATION

Function	Gas cooling for dehumidification biogas
Features	Compact design on frame, modular construction; high availability, operational reliability, low maintenance; retrofitting of additional modules / options possible.
Cooler design	Shell and tube heat exchanger; max. operating pressure: 0.5 bar on the tube side, 3 bar on the shell side; low specific pressure loss on the gas side.
Chiller	Air-cooled condenser for outdoor installation and year-round operation; industrially manufactured series unit in compact design.
Cold brine cycle	Stainless steel pipework incl. flanges, screws, gaskets, required manual and safety fittings.
Condensate separation	Moulded piece made of stainless steel; demister (fine droplet separator) made of stainless steel; condensate drain via on-site condensate shaft .
Factory assembly	All components piped and wired ready for operation; interfaces routed to the outside; filled with glycol; commissioning prepared at the factory.
Installation conditions	Outside (-15 °C to + 35 °C); Outside Ex zones.
Nominal operation	Cooling water 12 °C to 7 °C at 35 °C outside temperature.
Cold insulation with trace heating (optional)	Vapour diff usion-tight insulation for gas drying, condensate drain and cold brine circuit, sheathing with aluminium sheet, trace heating.
Condensate separator with level monitoring, condensate drain via a valve (optional)	Stainless steel fitting; gas pressure at gas inlet -10 to +20 mbar (g); monitoring of the liquid stop by rod probe with two switching contacts (ATEX); condensate drain via solenoid or compressed air valve (ATEX).
Technical documentation	Operating instructions, P&I flow diagram, unit list, spare parts lists and individual component documentation, acceptance/test certificates. FlexBio products comply with the EC Declaration of Incorporation in accordance with the EC Machinery Directive 2006/42/EC.

TYPE	GKT-WT100	GKT-WT200
Gas flow max.	50 m^3/h	100 m^3/h
Gas inlet temperature	30 °C	30 °C
Gas outlet temperature	10 °C	10 °C
Pressure loss Δp approx.	3 mbar	5 mbar
Quantity of condensate approx.	2.5 l/h	5 l/h
Nominal cooling capacity	1.5 kW	4.7 kW
Nominal electrical power consumption	0.9 kW	3.0 kW
Average electrical power consumption (at 15° C outside)	0.5 kW	2.1 kW
Nominal current	4.1 A	14 A
Starting current	15.8 A	55 A
Power supply	230 V/1Ph/PE/50 Hz	230 V/1Ph/PE/50 Hz
Gas connection	Flange DN100	Flange DN100
Transport dimensions	2,200 x 900 x 1,200 mm	2,500 x 1,100 x 1,500 mm



LEGEND

1. Heat exchanger-1 Gas preheating
2. Heat exchanger-2 Gas cooler
3. Heat exchanger-3 Gas cooler
4. Calming tank with demister (fine droplet separator)
5. Condensate separator with siphon

- Raw biogas - wet -
- Biogas - dry -
- Biogas - dry - preheated -
- Flow refrigerant
- Return refrigerant

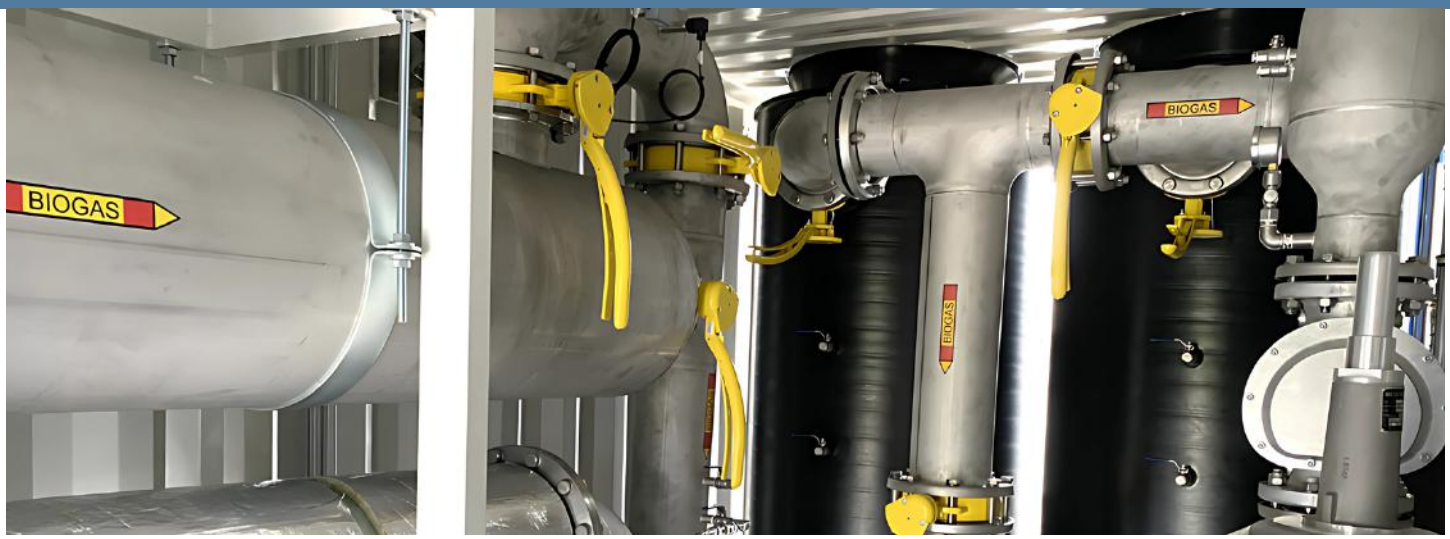
DIAGRAM: GKT-WT600 - HEAT EXCHANGER WITH HEAT RECOVERY

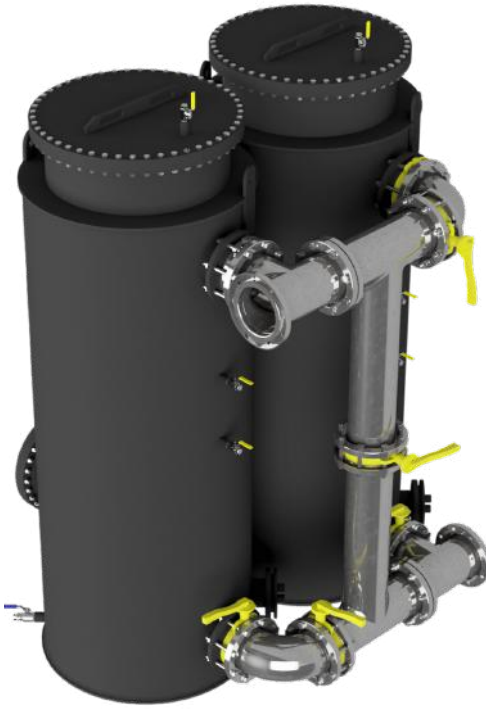
GKT-WT300	GKT-WT400	GKT-WT500	GKT-WT600
250 m^3/h	380 m^3/h	500 m^3/h	600 m^3/h
30 °C	35 °C	35 °C	35 °C
10 °C	5 °C	5 °C	5 °C
10 mbar	6 mbar	10 mbar	12 mbar
13 l/h	19 l/h	24 l/h	32 l/h
18.5 kW	25.5 kW	38.7 kW	44 kW
7.0 kW	8.5 kW	12.9 kW	14 kW
3.8 kW	4.9 kW	6.7 kW	8 kW
19.5 A	23 A	33 A	38 A
76 A	115 A	160 A	165 A
400 V/3Ph/PE/50 Hz	400 V/3Ph/PE/50 Hz	400 V/3Ph/PE/50 Hz	400 V/3Ph/PE/50 Hz
Flange DN200	Flange DN200	Flange DN200	Flange DN200
2,500 x 1,200 x 1,700 mm	3,100 x 1,400 x 1,800 mm	4,000 x 2,000 x 2,000 mm	4,500 x 2,000 x 2,000 mm

Gas purification using activated carbon type AK-H2S

GENERAL INFORMATION

Function	Filter system for the fine desulphurisation of biogas.
Features	Safe and simple purification of the biogas. The filter system removes sulphur from several thousand to 0 ppm. The filter system can be operated alternately, in parallel or in series. Integrated gas heating increases the cleaning performance and service life of the activated carbon. Robust technology, high availability and operational reliability, low maintenance requirements.
Type of construction	The activated carbon filter consists of two thermally insulated HDPE filter containers. A filter unit consists of a base chamber with the gas inlet, in which gas heating is integrated, activated carbon bedding and an upper cover with the gas outlet. The filter unit can be operated alternately, in parallel or in series.
Gas heating	In order to achieve the absorption capacity of the activated carbon, the gas is heated in the inlet. By correctly positioning the filter and heating the gas, the relative gas humidity is ideally set at around 40 % to 60 %. The thermal insulation and gas heating prevent the formation of condensate and extend the service life and absorption capacity of the activated carbon by keeping the filter dry.
Oxygen supply	An oxygen content in the gas of less than 0.3 % should be avoided; the ideal range is 0.5 %, as desulphurisation comes to a standstill if the oxygen content is too low.
Technical documentation	Operating instructions, spare parts list of components, acceptance/test certificates. FlexBio products comply with the EC Declaration of Incorporation.





DESCRIPTION

For many years, fine desulphurisation with activated carbon has been a proven process for removing hydrogen sulphide (H2S) from biogas. The hydrogen sulphide is completely retained by the activated carbon, while the rest of the biogas, mainly methane and carbon dioxide, passes through the activated carbon. The service life of the activated carbon essentially depends on the hydrogen sulphide content in the biogas and the biogas volume flow. The exhausted (loaded) activated carbon is rich in elemental sulphur. The activated carbon can absorb up to 50 % of its own weight in sulphur.

LOADING CAPACITIES - UP TO 0.5 kg SULPHUR PER 1 kg ACTIVE COAL

TYPE	AK-H2S.200	AK-H2S.300	AK-H2S.400	AK-H2S.500
Type of construction	Two thermally insulated HDPE filter containers with activated carbon filling			
Materials	HDPE / stainless steel			
Total volume	2 x 0.65 m^3	2 x 1 m^3	2 x 2.1 m^3	2 x 3.2 m^3
Gas flow max.	250 m^3/h	400 m^3/h	600 m^3/h	800 m^3/h
Operating pressure	-10 bis +20 mbar		-10 bis +40 mbar	
Activated carbon quantity	0.8 m^3 / 400 kg	1.3 m^3 / 650 kg	2.4 m^3 / 1,200 kg	3.4 m^3 / 1,700 kg
Gas connection	DN 100	DN 150	DN 200	DN 250
Transport dimensions	2,000 x 1,400 x 1,600	2,800 x 1,500 x 1,800	2 pcs. 2,900 x 1,500 x 1,500	2 pcs. 3,100 x 1,800 x 1,800
Transport weight (empty)	350 kg	600 kg	900 kg	1,200 kg

FlexBio
Gas treatment

Gas purification by means of biological-chemical desulphurisation of the BioH2S type

GENERAL INFORMATION

Function	Filter system for biological-chemical desulphurisation of biogas.
Features	Targeted, complete removal of H2S (up to 100,000 ppm) to zero level; reliable desulphurisation of process-related H2S peaks; no handling of chemicals; no handling of substances hazardous to water.
Type of construction	The filter system consists of a thermally insulated HDPE filter tank. The untreated, warm and wet gas flows through the system container, which is filled with oxigranulate (pellets). The hydrogen sulphide is specifically and completely removed from the raw gas and converted into elemental sulphur. The fresh water and process waste water connections can be operated manually, pneumatically or electrically via ball valves. The system can optionally be equipped with gas measurement technology, the corresponding sampling nozzles, fresh air dosing and raw gas conditioning.
Factory assembly	All components are piped ready for operation and filled with oxigranulate on delivery.
Installation conditions	Outside (-15 °C to + 40 °C); installation of an explosive zone not required in normal operation.
Technical documentation	Operating instructions, spare parts list of components, acceptance/test certificates. FlexBio products comply with the EC Declaration of Incorporation.

PELLET CONSUMPTION: 3.7 kg/1000 Nm³ RAW GAS AT H2S CONCENTRATION OF 1,500 ppm

DESCRIPTION

The FLEXBIO-BioH2S plants are a biological-chemical fine desulphurisation system for undried biogas. This is a cost-eff ective method that has been tried and tested for many years to reduce high to very high loads of hydrogen sulphide. The biological eff iciency of these plants is optimally adapted to the microbiological conditions (H2S concentration, humidity, temperature). The biogas is fed into the desulphurisation plant in its raw state (wet, warm), i.e. it does not have to be dried at high cost. Furthermore, the optimised bulk structure of the filter material makes the additional installation of compressors superfluous.

OXI-PELLETS

TYPE	BioH2S.200	BioH2S.400	BioH2S.600
Type of construction	Heat-insulated HDPE filter container with oxigranulate filling		
Materials	HDPE / Stainless steel		
Total volume	6 m³	11 m³	16 m³
Gas flow max.	200 m³/h	400 m³/h	600 m³/h
Oxipellets filling quantity	2.5 m³ / 1,250 kg	5 m³ / 2,500 kg	7.5 m³ / 3,250 kg
Operating pressure	-10 bis +40 mbar		
Power connection	0,75 kW, 400V		1,1 kW, 400V
Gas connection	DN 100	DN 150	DN 200
Fresh water (2 bar)	DN 25 / Consumption max. 3 m³/a	DN 25 / Consumption max. 6 m³/a	DN 25 / Consumption max. 9 m³/a
Process heat (50°C - 80°C)	DN 32 max. 5 kW	DN 32 max. 10 kW	DN 32 max. 15 kW
Transport dimensions	2,800 x 1,800 x 3,500	3,000 x 2,250 x 3,500	3,200 x 2,500 x 3,500
Transport weight (empty))	2,270 kg	3,130 kg	4,050 kg

The concentration of H2S is given in ppm (parts per million; corresponds to ml/m³). The factor 1.4 can be used for conversion to mg/m³, e.g. 1,000 ppm H2S corresponds to 1,400 mg/m³ H2S or 1,326 mg/m³ sulphur (S).

Gas compressor station type SKV

GENERAL INFORMATION

Function	Special side channel blower for the intake and compression of biogas or natural gas.
Features	Compact design with weather protection and formwork protection(optional) for outdoor installation, modular design; high availability, operational reliability, low maintenance requirements; additional modules / options can be retrofitted.
ATEX	The devices comply internally and externally with ATEX Directive Group II Category 2G or optionally 3G. The temperature class is T3 (200 °C). They can be used in Ex zone 1 (2G) or 2 (3G).
Gas recirculation / Circulation controller	The optional safety gas recirculation (circulation control / bypass) with integrated pressure safety valve short-circuits the inlet and outlet of the compressor in the event of a blockage on the pressure side. The appliance is dimensioned in such a way that suff icient cooling is guaranteed even in this operating state.
Safety	If the gas overheats (e.g. due to circulation control), the appliance is switched off in an emergency. Optionally, pressure monitoring (instead of the serial pressure display) and emergency shutdown can be realised.
Pressure control	The circulation control can be used for constant pressure control. Possible setting values for the pressure safety valve are between 30 - 300 mbar for the start of valve opening.
Factory assembly	All components piped and wired ready for operation; connections routed to the outside; commissioning prepared at the factory.
Installation conditions	Outdoor (-15 °C to + 35 °C)
Technical documentation	Operating instructions, P&I flow diagram, spare parts lists and individual component documentation, acceptance/test certificates.

ATEX SIDE CHANNEL BLOWER IN COMPACT DESIGN FOR OUTDOOR INSTALLATION

TYPE	SKV03	SKV04
Nominal gas flow	50 m^3/h	100 m^3/h
Nominal pressure		
Nominal power consumption	0.55 kW	0.75 kW
Nominal current	1.6 A	2.0 A
Starting current	4.0 A	6.0 A
Power supply		
Gas connection	Flange DN40	
Dimensions (LxWxH mm)	1,250 x 500 x 650	

SKV08: CONSTRUCTION IN A CONTAINER

SKV05	SKV06	SKV07	SKV08
180 m³/h	250 m³/h	350 m³/h	450 m³/h
50 mbar			
1.1 kW	2.2 kW		3 kW
2.6 A	5.0 A		6.6 A
6.0 A	10.0 A		16 A
400 V/3Ph/PE/50 Hz			
Flange DN50		Flange DN80	
1,350 x 600 x 750		1,500 x 800 x 900	

FlexBio
Gas utilisation

Combined heat and power plant - CHP container in plug & play design

GENERAL INFORMATION

Our combined heat and power units (CHP units) work in accordance to the principle of cogeneration, applied in extremely low-noise housings, on a very small footprint. The basic modules are based on optimised industrial gas engines and a water-cooled generator with integrated lubrication of the bearings. All the heat is recovered via a heat exchanger, an exhaust gas exchanger and a condensing heat exchanger and is made available for the heat requirement up to a maximum flow temperature of 95 °C. The electricity generated by the generator can be used directly for heating. The electricity generated by the generator can be fed directly into the building's domestic grid for self-consumption and/or as surplus electricity into the grid operator's public grid.

USE WHERE THE ENERGY IS NEEDED DIRECTLY

CHP units are increasingly being used for decentralised energy supply. Renewable and fossil fuels can be converted into electricity and heat with a high degree of efficiency. The systems become really interesting when the line length remains short. This is where CHP containers are used most frequently.

ADVANTAGES OF CONTAINER CONSTRUCTION

- Simple, uncomplicated installation and commissioning on site Retrofitting a small power plant without the need for additional buildings
- Short construction time, cost savings due to less on-site assembly
- Best system quality due to the high proportion of pre-assembly
- Good protection of the system against weather, dust and mechanical damage
- Quickly available energy

TYPE	BHKW-EG20	BHKW-BG20	BHKW-EG50	BHKW-BG50
Fuel	Biomethane	Biogas	Biomethane	Biogas
Hydrogen admixture (H2 ready)	up to 30 %			
Electrical power	5 - 20 kW		10 - 50 kW	
Thermal output	18 - 44.6 kW	17.4 - 43 kW	55 - 101 kW	53.1 - 97.4 kW
Total efficiency	102.2 %	105 %	102 %	103.40 %
Electrical efficiency	31.7%	33.3 %	34.8 %	35.1 %
Thermal efficiency	70.6 %	71.7 %	67.2 %	68.3 %
Feed temperature	max. 95 °C			
Return temperature	max. 75 °C			
Sound pressure level CHP (1m distance)	< 49 dB(A)		< 50 dB(A)	
Heating connections	DN 32 1“ (female thread)			
Exhaust gas connection	DN 20 3/4" (male thread)	DN 25 1“ (male thread)		DN 32 1 1/2" (male thread)
Flue gas connection	DN 80, PPS Typ B, max. 120°C			
Installation dimensions (LxWxH mm)	1,416 x 860 x 1,367		1,646 x 860 x 1,510	

CHP CONTAINER: 75 kW ELECTRICAL

WELL-KNOWN MANUFACTURERS

smartblock
POWERED BY KW ENERGIE

A-TRON

WOLF
[POWER SYSTEMS]

2G

AREAS OF APPLICATION

- Utilisation of biogas / sewage gas in anaerobic wastewater treatment
- Utilisation of biogas from waste fermentation
- Utilisation of biogas from slurry biogas plants in agriculture

BHKW-EG75	BHKW-BG75	BHKW-EG100	BHKW-BG100
Biomethane	Biogas	Biomethane	Biogas
up to 40 %			
37.5 - 75 kW	36 - 72 kW	45 - 90 kW	42 - 88 kW
92.8 - 139.8 kW	113.5 - 174.7 kW	113.5 - 174.7 kW	105 - 170.5 kW
102.5 %	102.4 %	106.1 %	103.9 %
35.8 %	34.6 %	36.1 %	35.1 %
66.7 %	67.8 %	70 %	68.8 %
max. 90 °C			
max. 70 °C			
56.8 dB(A)		57 dB(A)	
DN 32 1 1/2" (female thread)			
DN 25 1" (male thread)		DN 32 1 1/2" (male thread)	
DN 120, nozzle, max. 130°C			
2,640 x 960 x 1,710		2,870 x 960 x 1,730	

OTHER CHP SIZES ON REQUEST

- Biogas: 7.5 to 2,000 kWel
- Hydrogen: 75 to 750 kWel
- Biomethane: 7.5 to 3,360 kWel
- As well as different ratios of biogas-H2-biomethane / natural gas

FlexBio
Gas utilisation

Biogas/biomethane boiler - plug & play design

GENERAL INFORMATION

Gas boilers for biogas or biomethane generate heat by burning gas. Biomethane boilers are basically natural gas boilers, as biomethane is of natural gas quality. When biogas is used, it has a lower methane content and a higher CO2 content than natural gas. Biogas boilers are therefore adapted to this different gas composition. Some of the heat is required by the biogas plant itself, e.g. for the fermenters, while the rest can be used to supply heat to processes and buildings via a heating network, for example.

PERFORMANCE AREAS

- Thermal output: 15 to 1,200 kW

AREAS OF APPLICATION

- Utilisation of biogas / sewage gas in anaerobic wastewater treatment
- Utilisation of biogas from waste fermentation
- Utilisation of biogas from slurry biogas plants in agriculture

BIOGAS BOILERS: 300 TO 1,200 kWth

CONTROL OF THE BIOGAS BOILER SYSTEM

BIOGAS BOILERS: 15 TO 30 kWth

FlexBio
Gas utilisation

Biogas torch - Safe gas disposal

GENERAL INFORMATION

The FLEXBIO-GF biogas torch provides the operator with an automatically operating, safe and low-emission gas torch. Thanks to its robust and functional design, the FLEXBIO biogas torch guarantees over all a long service life, low maintenance and constant availability. The gas torch works fully automatically, i.e. aft er receiving the start or stop signal, the control system automatically opens the corresponding fittings and simultaneously initiates the ignition process. The flame is continuously monitored by a UV sensor. FLEXBIO biogas torches are made entirely of stainless steel and equipped with high-quality components / fittings. The robust design guarantees a long service life with low maintenance requirements.

FEATURES

- Fully automatic gas torch for the combustion of biogas and other combustible gases in accordance with with national and international regulations (such as EN 746-2).
- Automatic solenoid/motor valve EC type-tested
- Flame arrester with ATEX certificate
- Condensate drain with ball valve
- Made entirely of stainless steel
- Optional pressure control
- Optional electric valve heater
- Concealed flame (optional)
- Various accessories optionally available

IN MANY COUNTRIES, IT IS MANDATORY TO HAVE AN ADDITIONAL PERMANENTLY INSTAL- LED GAS CONSUMER THAT CAN BURN ALL THE GAS PRODUCED IN THE EVENT OF AN IN- CIDENT SO THAT NO UNBURNT METHANE IS RELEASED INTO THE ENVIRONMENT.

TYPE	GF-15	GF-40	GF-50	GF-80
Thermal output	33 - 100 kW	65 - 250 kW	130 - 500 kW	300 - 900 kW
Gas flow	5 - 15 Nm^3/h	10 - 40 Nm^3/h	20 - 80 Nm^3/h	50 - 120 Nm^3/h
Methane content	30 - 70 %			
Gas pre-print	30 -80 mbar		10 - 60 mbar	
Gas connection	DN 32 1" female thread)		DN 50 / PN 10	DN 100 /PN 10

FURTHER SIZES AVAILABLE ON REQUEST

BIOGAS-TORCH: GF-15

FlexBio
Flexible financing

SPECIFIC COSTS FOR WASTEWATER TREATMENT WITH FLEXBIO SYSTEMS

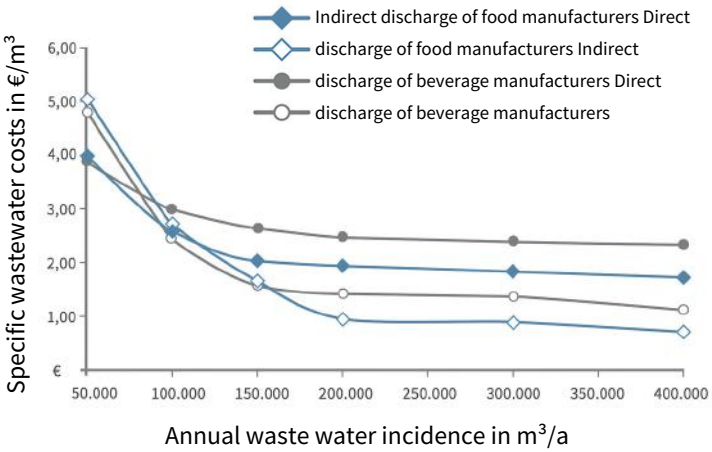
Operator model or own operation?

When making a major investment in an industrial wastewater treatment plant, the operator is always faced with the question of financing. Numerous factors play a role in the decision. With the purchase or lease, you operate the plant by yourself, being responsible for the performance of the operational wastewater treatment. It is important to know that in addition to the investment, it is necessary to maintain specialised personnel or operating staff and operating equipment. Although the specific treatment costs are higher with contracting than with in-house operation, you still benefit from the many advantages of the operator model. You only buy the power generated and the benefits of our plant. You pay a fixed amount for treated wastewater, have full cost control and can therefore concentrate on your core business. The diagram opposite provides an overview of specific treatment costs.

Investment in wastewater treatment or discharge to a municipal sewage treatment plant?

Indirect discharge (to the central sewage treatment plant) becomes excessively expensive if the discharging company reaches a certain size. In addition to the fixed wastewater charges, indirect discharge is oft en subject to surcharges depending on the level of organic residues (heavy pollution surcharge). In some cases, expansion of the business is jeopardised by the limited capacity of the municipal sewage treatment plant. We off er a compact and profitable solution even for small businesses!

FlexBio treatment: The calculation is based on 10 years of depreciation, income from gas utilisation and all relevant costs.



ADVANTAGES OF AN OPERATIONAL FLEXBIO TREATMENT PLANT

- More favourable solutions than indirect discharge
- Already suitable for smaller businesses
- Independence from the capacities of the central sewage treatment plant
- Permanent and calculable cost control
- Expandable due tot he modular design of the FlexBio System.

Flexible financing

We off er leasing as a financing alternative for our modular treatment systems. This allows you to react quickly and flexibly. We tailor our contract off ers specifically to your needs, e.g. by adjusting the instalment payments and off ering flexible service models. No type of financing is as flexible as a leasing arrangement. The payment corresponds to the economic benefit of your property. Everything can be optimally covered by a leasing alternative. The lessee is the economic owner of the property from the start of the contract and automatically becomes the owner under civil law when the last instalment is paid. We will be happy to put together a suitable leasing off er for your planned wastewater treatment. We can organise this through our selected partners and thus off er you individual solutions for your company - tailored to your needs, flexible and customer-oriented.

LEASING ADVANTAGES

- Conservation of liquidity and equity
- Tax advantage through fully deductible instalments
- Planning security thanks to fi xed leasing instalments
- Manufacturer-independent fi nancing
- Customised contract design
- Exemption from insurance
- Rapid processing, quick decision

FlexBio Sustainability

BREWERY (09/2022)

- Treatment capacity: 100.000 m^3
- Energy generation: 40 kW electricity & 45 kW heating energy

RESOURCE CONSERVATION THROUGH WASTEWATER REUSE

With the help of the treatment process, the water can be discharged into a municipal drainage system or purified in a further stage to the required direct discharge quality. This purified wastewater can also be used for agricultural irrigation or internal reuse, as it fulfils the minimum requirements for water reuse aft er treatment with the FlexBio process. This is an important sustainability factor and leads to a reduction in water scarcity.

TAKING RESPONSIBILITY

Nowadays, it is becoming increasingly important for companies to act in an ecologically sustainable manner. Society expects a sustainable use of resources, the avoidance of CO2 emissions and a general sense of responsibility towards our environment. Sustainable corporate development is the solution to satisfying these needs. This can also be used to build or renew the company's image and as a competitive advantage.

WITH THE HELP OF THE FLEXBIO PROCESS YOU CAN DEVELOP YOUR COMPANY SUSTAINABLE FURTHER DEVELOPMENT.

SUSTAINABILITY WITH THE FLEXBIO PROCESS

The use of the FlexBio wastewater treatment plant makes it possible to reduce CO2 emissions, because it helps to significantly reduce operational energy costs. Utilising the energy potential of wastewater also helps to avoid emissions that are harmful to the climate and the environment.

Our plants also maximise the use of the wastewater produced by recovering energy, nutrients and organic substances and producing clean, reusable water. In this way, we take responsibility for saving resources in every aspect. Thanks to our technology, our customers can reduce their consumption of primary resources.

FlexBio

BEVERAGE PRODUCER (05/2023)

- Treatment capacity: 105,000 m^3/a
- Energy generation: 50 kW electricity & 60 kW heating energy


FLEXBIO
TECHNOLOGIE
Energie aus Abwasser
Geringe Betriebskosten
Abwasserreinigung
Energieautarkie
Positive CO2-Bilanz
Plug and Play Prinzip
Containerlösungen
Modulare Bauweise
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Tel.: 05561/980 901
www.flexbio.de
FLEXBIO
TECHNOLOGIE
Energie aus Abwasser

FlexBio
Services and benefits

Services and benefits

FlexBio Technologie GmbH provides a comprehensive service in the field of wastewater technology. Our service is customised to individual customer requirements and ranges from general advice to a complete operator model, while you can concentrate on your core business.

- Inventory
- Support in the preparation and development of a drainage concept
- Economic eff iciency calculations
- Professional planning of your construction project
- Technical drainage calculations and drawings
- Support with the preparation of approval documents
- On-site installation
- Handover of the system only aft er stable operation has been achieved and limit values are complied with.
- Remote monitoring
- Maintenance and emergency service
- Laboratory analyses

PLEASE FEEL FREE TO CONTACT US:

We bring a personalised and eff ective approach to every project we work on. Your contact for all questions relating to wastewater treatment plants and biogas technology.

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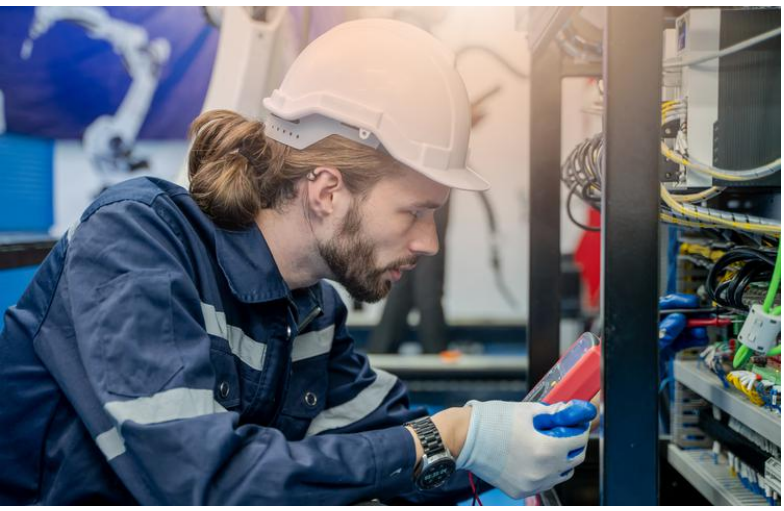

Identification of potentials

In many cases, the configuration of the wastewater technology for future treatment plants can be guaranteed by standardised preliminary investigations. This saves you money both on the investment side and during subsequent operation, and you can be directly convinced of our service before placing the order. Preliminary tests can be carried out in the laboratory, in the technical centre or directly on site in your company's operating environment.

Cleaning paramenter

- Reduction of organic loads (COD/BOD5 degradation)
- Elimination of nitrogen compounds (Nges, NH4+, NO3--N, No2--N)
- Phosphate removal

FlexBio
Application examples

BREWERY (07/2023)

- Treatment capacity: 60,000 m^3/a
- Energy generation: 40 kW heating energy

BEVERAGE PRODUCER (11/2022)

- Treatment capacity: 30,000 m^3/a
- Energy generation: 15 kW electricity & 20 kW heating

FOOD/DELICATESSEN MANUFACTURER (08/2020)

- Treatment capacity: 65,000 m^3/a
- Energy generation: 360 kW heating energy

MILK PROCESSING (03/2024)

- Treatment capacity: 45,000 m^3/a
- Energy generation: 18 kW electricity & 20 kW heating

Everything from a single source!
We deliver system solutions!

FOOD/DELICATESSEN MANUFACTURER (08/2021)

- Treatment capacity: 48,000 m^3/a
- Energy generation: 60 kW heating energy

Mitglied der DWA
Klare Konzepte. Saubere Umwelt.

German Water Partnership

TÜVNORD
TÜV NORD Systems GmbH & Co. KG
Fachbetrieb nach AwSV
tuev-nord.de

TÜV NORD
Fachbetrieb nach WHG
von der TÜV NORD Systems GmbH & Co. KG betreut

Environmental and Quality Standards Certification
ESC
DIN EN ISO 9001 : 2015

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