SILOXA frame-mounted gas supply system with gas drying and gas compression module and controller, GKV model, set up for outdoor installation

Attributes

– Compact frame-mounted design; modular structure
– High availability, operational reliability, low maintenance
– Possibility of upgrading with further modules/options
– Defined interfaces to fermenters and gas utilisation system

Frame

– Made of square tubes, galvanised
– Dimensions according to structural requirements

Gas cooler

– Tube bundle heat exchanger
– Max. permissible operating pressure: tube side approx. 0.5 bar, shellside approx. 6 bar, pressure loss on gas side approx. 15 mbar

Water cooler

– With air-cooled condensers for outdoor installation and all-year operation
– Compact, commercially produced standard unit

Liquid coolant circuit

– Pipework material: steel incl. flange, screws and gaskets
– Required manual and safety valves andlocal-readout thermometer and manometer

Condensate trap

– Moulded piece, material No. 1.4571, for flange-mounting on gas cooler DN 150-400
– Demister, material No. 1.4571
– Condensate outlet via liquid shut-off valve
– Monitoring of liquid shut-off valve via rod probe with 2 switching contacts

Cold insulation

– Vapour-diffusion-proof insulation for gas drying system, condensate trap, condensate outlet and liquid coolant circuit. Aluminium-sheet sheathing

Compressor

– 1 centrifugal fan (multistage)
– Pressure increase 160 mbar
– V-belt drive with aluminium drive guard
– Permanently technically leakproof, ATEX approved for Zone 2
– 1 pressure monitor on the suction side of the compressor and 1 on the pressure side
– 1 temperature monitor
– To limit the discharge pressure and ensure a minimum flow rate (surge limit):
  • Pressure regulator including bypass up to 600 Nm^3/h
  • Frequency converter from 750 Nm^3/h

Control cabinet

– With microprocessor for controlling the gascompressor and the monitoring devices

Factory assembly

– All components supplied ready for use, with pipework and cabling
– External interfaces

Technical documentation

– Operating instructions, installation drawing/ shop drawing
– Piping and instrumentation diagram, circuit diagram, list of assemblies
– Spare parts lists and individual documentation for the installed components
– Inspection/testing reports and certificates ▶

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Available options

Version for indoor installation

– The system components that perform the cooling and supply the cooling agent have no aluminium sheathing

Autonomous heating water supply

– Hot water supply for gas heating, if no external heating water is available from the CHP

Biogas analysis

– Analysis of the biogas for CH_4, H_2S, $O_2$and CO_2
– Automatic measurement at programmable time intervals; separate measurements for the individual gas components and manual start of measurement also possible at any time
– Measuring gas conditioning with deflagration flame arrester acc. to EN 12874, protective filters

Frequency converter

– Regulates the final compression pressure by changing the engine speed
– From 750 Nm^3/h in the standard installation
– Up to 600 Nm^3/h pressure regulator incl. bypass in the standard version

Gas heating

– Tube bundle heat exchanger
– Heating water provided by customer/optionally autonomous

Assembly and commissioning

– Mounting of the supply unit on base constructed by the customer
– Commissioning

Pipe with butterfly valve (manually operated) extending to 10 cm above ground level

– DN 100-200

Oxygen monitoring

– 1 central evaluation device for 2 channels O_2; output 4 to 20 mA
– Measuring gas transportation, conditioning and analysis are redundant
– Sensor and evaluation unit meet the requirements of directive 94/9/EC on equipment and protective systems intended for use in potentially explosive atmospheres and carry an EC type examination certificate

TÜV certification of the pipework

– Inspection of the pipework included in the supply package by a certified TÜV engineer
– In line with RL 97/23/EC by TÜV-Nord

Compression by 200 or 280 mbar

– 1 centrifugal fan (multistage)
– Pressure increase 200/280 mbar
– V-belt drive with aluminium drive guard, permanently technically leakproof, ATEX approved for Zone 2
– 1 pressure monitor on the suction side of the compressor and 1 on the pressure side
– 1 temperature monitor on the pressure side of the compressor

Weld neck flange instead of loose flange

– Required for TÜV certification acc. to VP 265

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Technical specifications:

Technical data	GKV 180	GKV 260	GKV 320
Gas medium	Biogas	Biogas	Biogas
Gas flow rate	180 Nm^3/h	260 Nm^3/h	320 Nm^3/h
Gas inlet temperature	max. 40 °C	max. 40 °C	max. 40 °C
Gas outlet temperature	3 °C to 4 °C	3 °C to 4 °C	3 ° C to 4 °C
Saturation temperature	max. 40 °C	max. 40 °C	max. 40 °C
Gas pressure at gas inlet	max. 10 mbar/gauge	max. 10 mbar/gauge	max. 10 mbar/gauge
Quantity of condensate	approx. 10 l/h	approx. 14 l/h	approx. 17 l/h
Technical data for cooling device			
Electricity supply	400 V / 3Ph+PE / 50 Hz	400 V / 3Ph+PE / 50 Hz	400 V / 3Ph+PE / 50 Hz
Coolant compressor	1 scroll compressor	1 scroll compressor	1 scroll compressor
Number of cooling circuits	1	1	1
Condensers	1 air-cooled	1 air-cooled	2 air-cooled
Rated cooling capacity *1	14.5 kW	18.7 kW	22.5 kW
Rated input power *1	6.5 kW	10.1 kW	10.5 kW
Mean elec. power consumption with design parameters and 15 °C ambient temperature *2	2.7 kW	3.8 kW	4.3 kW
Rated current	13.0 A	19.0 A	19.4 A
Starting current	73.0 A	76.0 A	101.0 A
Gas compressor			
Gas pressure at gas outlet	max. 160 mbar	max. 160 mbar	max. 160 mbar
Gas inlet temperature	3 °C to 4 °C	3 ° C to 4 °C	3 °C to 4 °C
Gas outlet temperature	approx. 35 °C	approx. 35 °C	approx. 35 °C
Motor output	4.0 kW	5.5 kW	7.5 kW
Gas composition			
Methane CH_4	approx. 60 % v/v	approx. 60 % v/v	approx. 60 % v/v
Carbon dioxide CO_2	approx. 40 % v/v	approx. 40 % v/v	approx. 40 % v/v
Hydrocarbons > C_5	< 100 mg/m^3	< 100 mg/m^3	< 100 mg/m^3
Physical properties			
Gas density	approx. 1.2 kg/Nm^3	approx. 1.2 kg/Nm^3	approx. 1.2 kg/Nm^3
Specific heat capacity C_P	approx. 1.6 $kJ/Nm^3 K$	approx. 1.6 $kJ/Nm^3 K$	approx. 1.6 $kJ/Nm^3 K$
Installation conditions			
Installation site	Outside	Outside	Outside
Permissible temperature	-15 to + 35 °C	-15 to + 35 °C	-15 to + 35 °C
Danger area	Outside of Ex Zones	Outside of Ex Zones	Outside of Ex Zones
Electrical connection	400 V / 3Ph+N+PE / 50 Hz	400 V / 3Ph+N+PE / 50 Hz	400 V / 3Ph+N+PE / 50 Hz
Connected load	12.5 kW	17.6 kW	20.0 kW

*1 Rating according to Eurovent: Coolant 12 °C to 7 °C at 35 °C ambient temperature. The annual mean temperature at our latitudes is 11 °C.
*2 This value is to be used for calculating the energy requirement of the gas cooler.

SILOXA frame-mounted gas supply system with gas drying and gas compression module and controller, GKV model, set up for outdoor installation

Technical specifications:

Technical data	GKV 420	GKV 500	GKV 600
Gas medium	Biogas	Biogas	Biogas
Gas flow rate	420 Nm^3/h	500 Nm^3/h	600 Nm^3/h
Gas inlet temperature	max. 40 °C	max. 40 °C	max. 40 °C
Gas outlet temperature	3 °C to 4°C	3 °C to 4 °C	3 °C to 4 °C
Saturation temperature	max. 40 °C	max. 40 °C	max. 40 °C
Gas pressure at gas inlet	max. 10 mbar/gauge	max. 10 mbar/gauge	max. 10 mbar/gauge
Quantity of condensate	approx. 23 l/h	approx. 27 l/h	approx. 32 l/h
Technical data for cooling device			
Electricity supply	400 V / 3Ph+PE / 50 Hz	400 V / 3Ph+PE / 50 Hz	400 V / 3Ph+PE / 50 Hz
Coolant compressor	1 scroll compressor	1 scroll compressor	1 scroll compressor
Number of cooling circuits	1	1	1
Condensers	2 air-cooled	2 air-cooled	2 air-cooled
Rated cooling capacity *1	29.7 kW	38.7 kW	44.2 kW
Rated input power *1	13.3 kW	17.8 kW	19.7 kW
Mean elec. power consumption with design parameters and 15 °C ambient temperature *2	5.3 kW	6.7 kW	7.9 kW
Rated current	24.2 A	32.7 A	38.1 A
Starting current	132.0 A	161.0 A	163.0 A
Gas compressor			
Gas pressure at gas outlet	max. 160 mbar	max. 160 mbar	max. 160 mbar
Gas inlet temperature	3 °C to 4 °C	3 °C to 4 °C	3 °C to 4 °C
Gas outlet temperature	approx. 35 °C	approx. 35 °C	approx. 35 °C
Motor output	7.5 kW	11.0 kW	15.0 kW
Gas composition			
Methane CH_4	approx. 60 % v/v	approx. 60 % v/v	approx. 60 % v/v
Carbon dioxide CO_2	approx. 40 % v/v	approx. 40 % v/v	approx. 40 % v/v
Hydrocarbons > C_5	< 100 mg/m^3	< 100 mg/m^3	< 100 mg/m^3
Physical properties			
Gas density	approx. 1.2 kg/Nm^3	approx. 1.2 kg/Nm^3	approx. 1.2 kg/Nm^3
Specific heat capacity C_P	approx. 1.6 $kJ/Nm^3 K$	approx. 1.6 $kJ/Nm^3 K$	approx. 1.6 $kJ/Nm^3 K$
Installation conditions			
Installation site	Outside	Outside	Outside
Permissible temperature	-15 to + 35 °C	-15 to + 35 °C	-15 to + 35 °C
Danger area	Outside of Ex Zones	Outside of Ex Zones	Outside of Ex Zones
Electrical connection	400 V / 3Ph+N+PE / 50 Hz	400 V / 3Ph+N+PE / 50 Hz	400 V / 3Ph+N+PE / 50 Hz
Connected load	22.8 kW	30.8 kW	36.7 kW

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SILOXA frame-mounted gas supply system with gas drying and gas compression module and controller, GKV model, set up for outdoor installation

Technical specifications:

Technical data	GKV 750	GKV 850	GKV 1000
Gas medium	Biogas	Biogas	Biogas
Gas flow rate	750 Nm^3/h	850 Nm^3/h	1000 Nm^3/h
Gas inlet temperature	max. 40 °C	max. 40 °C	max. 40 °C
Gas outlet temperature	3 °C to 4 °C	3 °C to 4 °C	3 °C to 4 °C
Saturation temperature	max. 40 °C	max. 40 °C	max. 40 °C
Gas pressure at gas inlet	max. 10 mbar/gauge	max. 10 mbar/gauge	max. 10 mbar/gauge
Quantity of condensate	approx. 40 l/h	approx. 45 l/h	approx. 53 l/h
Technical data for cooling device			
Electricity supply	400 V / 3Ph+PE / 50 Hz	400 V / 3Ph+PE / 50 Hz	400 V / 3Ph+PE / 50 Hz
Coolant compressor	2 scroll compressors	2 scroll compressors	2 scroll compressors
Number of cooling circuits	1	1	1
Condensers	2 air-cooled	2 air-cooled	2 air-cooled
Rated cooling capacity *1	52.0 kW	59.9 kW	66.6 kW
Rated input power *1	24.1 kW	27.0 kW	30.5 kW
Mean elec. power consumption with design parameters and 15 °C ambient temperature *2	10.3 kW	15.9 kW	15.4 kW
Rated current	41.0 A	45.8 A	51.0 A
Starting current	149.0 A	154.0 A	159.0 A
Gas compressor			
Gas pressure at gas outlet	max. 160 mbar	max. 160 mbar	max. 160 mbar
Gas inlet temperature	3 °C to 4 °C	3 °C to 4 °C	3 °C to 4 °C
Gas outlet temperature	approx. 35 °C	approx. 35 °C	approx. 35 °C
Motor output	15.0 kW	15.0 kW	15.0 kW
Gas composition			
Methane CH_4	approx. 60 % v/v	approx. 60 % v/v	approx. 60 % v/v
Carbon dioxide CO_2	approx. 40 % v/v	approx. 40 % v/v	approx. 40 % v/v
Hydrocarbons > C_5	< 100 mg/m^3	< 100 mg/m^3	< 100 mg/m^3
Physical properties			
Gas density	approx. 1.2 kg/Nm^3	approx. 1.2 kg/Nm^3	approx. 1.2 kg/Nm^3
Specific heat capacity C_P	approx. 1.6 $kJ/Nm^3 K$	approx. 1.6 $kJ/Nm^3 K$	approx. 1.6 $kJ/Nm^3 K$
Installation conditions			
Installation site	Outside	Outside	Outside
Permissible temperature	-15 to + 35 °C	-15 to + 35 °C	-15 to + 35 °C
Danger area	Outside of Ex Zones	Outside of Ex Zones	Outside of Ex Zones
Electrical connection	400 V / 3Ph+N+PE / 50 Hz	400 V / 3Ph+N+PE / 50 Hz	400 V / 3Ph+N+PE / 50 Hz
Connected load	41.1 kW	44.0 kW	47.5 kW

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Technical specifications:

Technical data	GKV 1200	GKV 1500	GKV 2100
Gas medium	Biogas	Biogas	Biogas
Gas flow rate	1200 Nm^3/h	1500 Nm^3/h	2100 Nm^3/h
Gas inlet temperature	max. 40 °C	max. 40 °C	max. 40 °C
Gas outlet temperature	3 °C to 4 °C	3 °C to 4 °C	3 °C to 4 °C
Saturation temperature	max. 40 °C	max. 40 °C	max. 40 °C
Gas pressure at gas inlet	max. 10 mbar/gauge	max. 10 mbar/gauge	max. 10 mbar/gauge
Quantity of condensate	approx. 64 l/h	approx. 80 l/h	ca. 111 l/h
Technical data for cooling device			
Electricity supply	400 V / 3Ph+PE / 50 Hz	400 V / 3Ph+PE / 50 Hz	400 V / 3Ph+PE / 50 Hz
Coolant compressor	2 scroll compressors	4 scroll compressors	4 scroll compressors
Number of cooling circuits	1	2	2
Condensers	2 air-cooled	2 air-cooled	2 air-cooled
Rated cooling capacity *1	82.7 kW	114.8 kW	143.3 kW
Rated input power *1	38.0 kW	55.0 kW	66.0 kW
Mean elec. power consumption with design parameters and 15 °C ambient temperature *2	15.5 kW	20.4 kW	26.9 kW
Rated current	66.0 A	96.0 A	117.0 A
Starting current	206.0 A	216.0 A	256.0 A
Gas compressor			
Gas pressure at gas outlet	max. 160 mbar	max. 160 mbar	max. 160 mbar
Gas inlet temperature	3 °C to 4 °C	3 °C to 4 °C	3 °C to 4 °C
Gas outlet temperature	approx. 35 °C	approx. 35 °C	approx. 35 °C
Motor output	18.5 kW	18.5 kW	30.0 kW
Gas composition			
Methane CH_4	approx. 60 % v/v	approx. 60 % v/v	approx. 60 % v/v
Carbon dioxide CO_2	approx. 40 % v/v	approx. 40 % v/v	approx. 40 % v/v
Hydrocarbons > C_5	< 100 mg/m^3	< 100 mg/m^3	< 100 mg/m^3
Physical properties			
Gas density	approx. 1.2 kg/Nm^3	approx. 1.2 kg/Nm^3	approx. 1.2 kg/Nm^3
Specific heat capacity C_P	approx. 1.6 $kJ/Nm^3 K$	approx. 1.6 $kJ/Nm^3 K$	approx. 1.6 $kJ/Nm^3 K$
Installation conditions			
Installation site	Outside	Outside	Outside
Permissible temperature	-15 to + 35 °C	-15 to + 35 °C	-15 to + 35 °C
Danger area	Outside of Ex Zones	Outside of Ex Zones	Outside of Ex Zones
Electrical connection	400 V / 3Ph+N+PE / 50 Hz	400 V / 3Ph+N+PE / 50 Hz	400 V / 3Ph+N+PE / 50 Hz
Connected load	58.5 kW	75.5 kW	98.0 kW

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Issued: 06/2014, subject to technical modifications.

SILOXA
Take out what doesn't belong.