Description:

Engine type	**SB 275 G5V TW 86 (č.v. SC 7000 XXX)**	
Fuel	Biogas (according to TEDOM: 61-0-0282.1 regulation)	
Engine design	stationary	
Engine working cycle	four-stroke, spark ignited	
Design	in-line, vertical	
Number of cylinder	6	
Valve train	OHV	
Number of valves per cylinder	4	
Turbocharging	yes	
Intercooler	yes	
Mixture	lean	
Cooling	liquid	
Operation (looking at flywheel)	anticlockwise	
Displacement	12,74	[dm^3]
Bore	130	[mm]
Stroke	160	[mm]
Compression ratio	14,0:1	[-]
Firing order	1-5-3-6-2-4	[-]

Rated parameters at reference conditions:

Rated speed	1500	[min^{-1}]
Rated power output (continuous)	276,4	[kW]
Rated power output according ISO 3046-1	X	[kW]
Peak torque	1759	[Nm]

Engine heat output:

Load	100	80	60	40	[%]
Coolant heat output	106,0	96,0	82,0	66,3	[kW]
Exhaust gas heat output (cooled to 150 °C)	140,7	119,1	94,8	68,2	[kW]
Intercooler heat output	49,4	30,5	15,6	5,2	[kW]
Radiation heat	20	19,5	19,0	18,5	[kW]

(1)… expected distribution of intercooler heat output: HT 30,1kW, LT 19,3kW

Parameters under load:

Load	100	80	60	40	[%]
Fuel input power	644,6	528,1	409,9	292,7	[kW]
Fuel consumption	129,3	106,0	82,3	58,7	[$m^3.h^{-1}$]
Engine efficiency measured	42,9	41,9	40,4	37,8	[%]
Engine efficiency according to (2)	45,0	44,0	42,5	39,7	[%]

(2)…Efficiency computed according to regulation 61-0-0284 with full use of tolerance according to ISO 3046-1

Tolerances of values in the specification are specified in regulation 61-0-0284

Engine parameters and settings:

Zatížení	100	80	60	40	[%]
Coefficient of excess air λ	1,583	1,557	1,539	1,495	[-]
Exhaust gas temperature at the outlet from the cylinder heads	601	596	586	578	[°C]
Exhaust gas temperature at the outlet from the turbocharger	488	504	517	529	[°C]
Combustion air flow	1215	979	751	521	[kg.h^{-1}]
Exhaust gas flow	1389	1122	862	600	[kg.h^{-1}]
Mixture temperature at the outlet from the turbocharger	152,4	127,9	100,8	73,3	[°C]
Maximum temperature of the mixture after the intercooler for nominal parameters	45				[°C]

Ignition advance:

Load	100	80	60	40	[%]
Cylinder no.1[(3)]	22	23	25,5	27,5	[°BTDC]
Cylinder no.2[(3)]	22	23	25,5	27,5	[°BTDC]
Cylinder no.3[(3)]	22	23	25,5	27,5	[°BTDC]
Cylinder no.4[(3)]	22	23	25,5	27,5	[°BTDC]
Cylinder no.5[(3)]	22	23	25,5	27,5	[°BTDC]
Cylinder no.6[(3)]	22	23	25,5	27,5	[°BTDC]

(3)... Cylinders marked from engine pulley

Technical and build-up parameters:

REGIME OF THE ENGINE REVOLUTION		
Overrun speed max. - gas cut-off	2100	[min^{-1}]
Overrun speed max. - ignition deactivation	2100	[min^{-1}]
ENGINE LUBRICATION		
Lubricating oil - total	30 – 36	[dm^3]
Lubricating oil - between max. and min.	6	[dm^3]
Oil consumption	< 0,2	[$g.kW^{-1}.h^{-1}$]
Operating lubrication pressure – rated speed	3-6	[bar]
Min. operating oil pressure - rated speed	0,7	[bar]
ENGINE COOLING		
Volume of coolant in engine and intercooler	17 +10	[dm^3]
Coolant temperature at the outlet from the engine	89	[°C]
Max. coolant temperature short time (1 hour)	90	[°C]
Min. coolant temperature for 100 % load	70	[°C]
Maximum load for the coolant temperature below 70 °C	25	[%]
Minimum coolant temperature for start	10	[°C]
Recommended radiator (jacket water cooler) capacity	200	[kW]
Required engine coolant flow	350-400	[$dm^3.min^{-1}$]
Maximum cooling circuit pressure	250	[kPa]
OPERATING LIMITATIONS		
Min. intake air temperature for start	10	[°C]
Intake air (mixture) temperature input before turbocharger for the nominal parameters	25	[°C]
Maximum temperature of the engine compartment during operation	50	[°C]
Allowed crankcase pressure range	-2/+1	[kPa]
Maximum exhaust back pressure for rated parameters (at the output of the engine)	4,1	[kPa]
Maximum permissible exhaust back pressure (at the output of the engine)	5,0	[kPa]
Maximum suction vacuum for nominal parameters (at the entrance to the mixer)	X	[kPa]
Maximum permissible suction vacuum (at the entrance to the mixer)	X	[kPa]
Recommended exhaust gas temperature upstream turbo for warning signal	621	[°C]
Recommended exhaust gas temperature upstream turbo for stop signal	641	[°C]
OPERATING CLEARANCE		
Cold valve clearance - exhaust valve	0,7	[mm]
Cold valve clearance - intake valve	0,45	[mm]

Emissions:

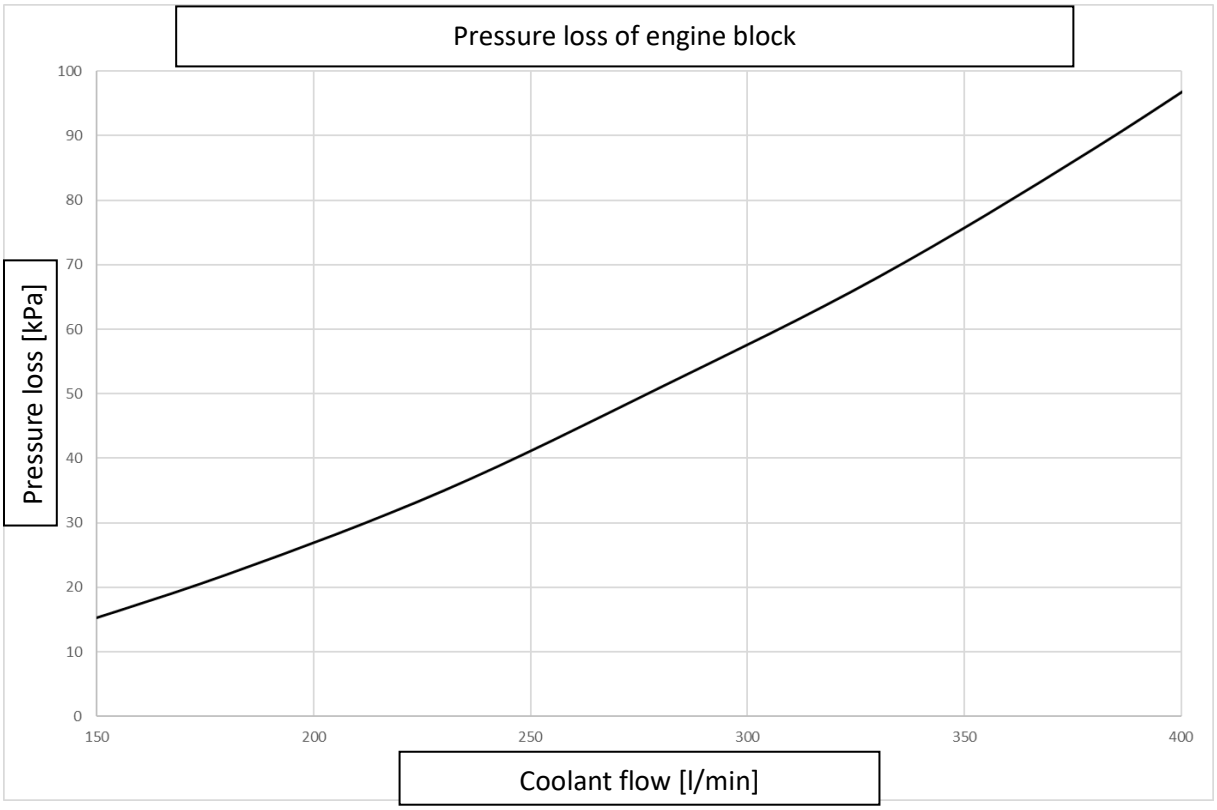
Nitrogen oxides - NO_x	< 500	[$mg.m_n^{-3}$]
Carbon monoxide - CO	< 500	[$mg.m_n^{-3}$]
Total hydrocarbons - HC	< 1300	[$mg.m_n^{-3}$]
Methan - CH4	< 1100	[$mg.m_n^{-3}$]
Formaldehyde - HCHO	<50	[$mg.m_n^{-3}$]

Engine noise [4]:

Sound power pressure of the engine	105	[dB(A)]
Sound power pressure of the exhaust line noise	115	[dB(A)]

[4]... estimated values

Engine block pressure loss:



Reference ambient conditions for engine performance data:

Barometric pressure	100	[kPa]
Ambient temperature	25	[°C]
Relative air humidity	30	[%]

Fuel reference conditions:

Fuel pressure - reference	101,325	[kPa]
Fuel temperature - reference	0	[°C]
Fuel relative humidity	0	[%]
LHV	17,941	[$MJ.m^{-3}$]
Concentration CH_4 (biogas engines)	50	[%]
Concentration CO_2 (biogas engines)	50	[%]

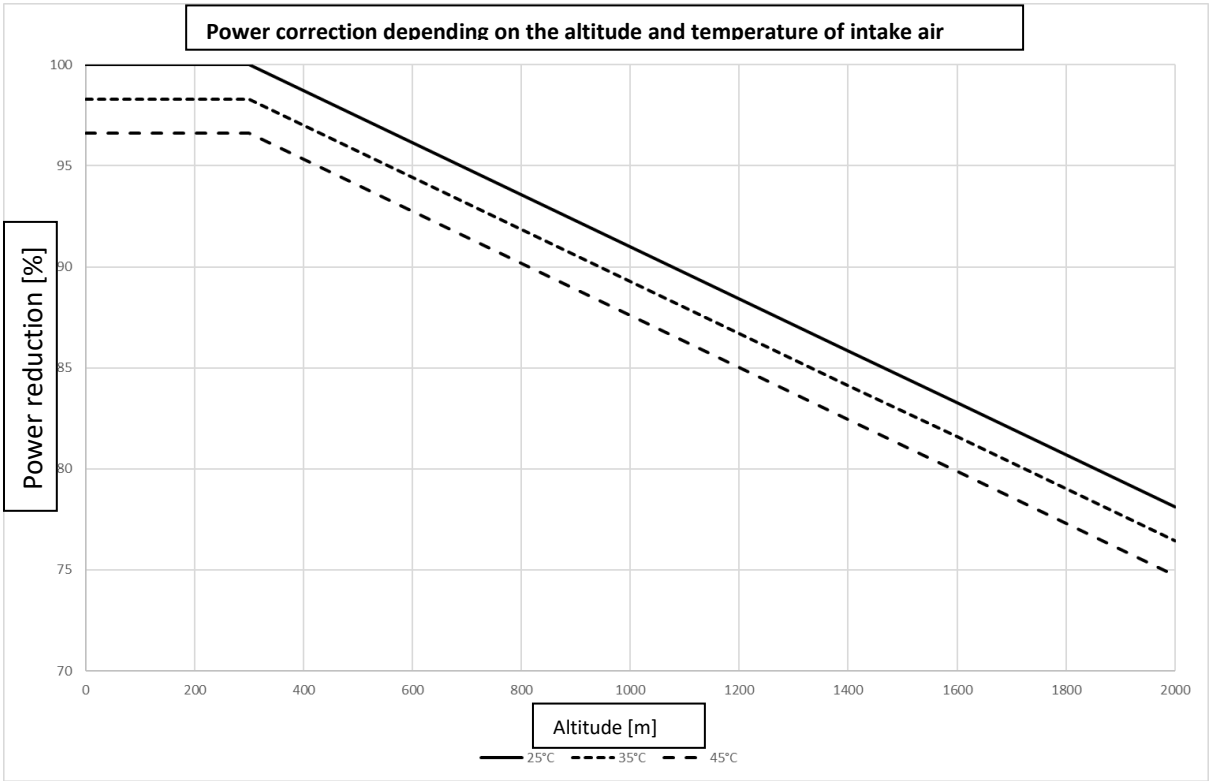
Allowed fuel parameters:

Minimum fuel methane number for a standard engine tune [(5)]	> 129	[-]
Minimum fuel methane number for a standard engine tune [(6)]	> 123	[-]
The maximum rate of change of the methane number of the fuel MN	10/30	[-/s]

(5)... Minimum methane number for fuels with a methane content between 48 and 55% vol. (without detonation detection)

(6)... Minimum methane number for fuels with methane content between 55 and 65% vol. (necessary detonation detection!)

Power correction depending on the altitude and temperature of intake air:



Time limits for low load operation:

The minimum power for continuous operation is 60 % of the rated value.

Engine power [%]	Runtime [min]
60 ÷ 100	continuous [8,9]
30 ÷ 60	max. 500 h / year; max. 5 h continuous [7,8,9]
0 ÷ 30	5 min [8,9]

[7]... After each part load operation <60 % the engine have to be run at least 1 hour at full load (100 %).

[8]... the oil change interval must be determined by sampling according to the SCHNELL prescription: 5424_220627_Technische__Anweisung_Schmierstoffe_019_de

[9]... use prescribed Schnell oils (Longlife GE, Protect oil SAE 40, Tectrol methaflexx ZS PLUS)

Other operating restrictions:

Maximum number of starts per day	4	[-/den]
Minimum running time after start	1	[hod]
In terms of wear, one start is equal	0,5	[mth]

Engine dimensions:

Vary based on configuraion

Total engine weight:

Total engine weight	1200	[kg]

Fitting dimensions of the engine:

Flywheel housing	SAE 1
Engine block/ flywheel housing	SAE 14

Scope of supply:

Motortech MIC-5 SE ignition	1-064-369
Ignition coils Motortech 06.50.104	1-030-214
Spark plugs Schnell M14x1	1-064-239
Schnell V20 prechambers	1-070-712
Woodward F-series 68mm electronic throttle	1-066-165
Mixer Honeywell HON 983 200/100 + Zeppelin	1-060-063 + 1-025-454
Woodward 8404-2022 Electronic Fuel Damper	1-067-964
Holset HE500FG Wastegate Turbo (A/R 22 Turbine)	1-067-770

Publication specification:

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