Description:

Engine type	**MG 185 G5V NX 88 (Dwg. No. MN 7000 008/00)**	
Fuel	natural gas (according to TEDOM: 61-0-0282.1 regulation)	
Engine design	stationary	
Engine working cycle	four-stroke, spark ignited	
Design	Fork (90°), vertical	
Number of cylinders	8	
Valve train	OHV	
Number of valves per cylinder	4	
Turbocharging	No	
Intercooler	No	
Mixture	stoichiometric	
Cooling	liquid	
Operation (looking at flywheel)	anticlockwise	
Displacement	17,19	[dm^3]
Bore	132	[mm]
Stroke	157	[mm]
Compression ratio	12:1	[-]
Firing order	1-5-7-2-6-3-4-8	[-]

Rated parameters at reference conditions:

Rated speed	1500	[rpm]
Rated power output	183,3	[kW]
Peak torque	1167	[Nm]

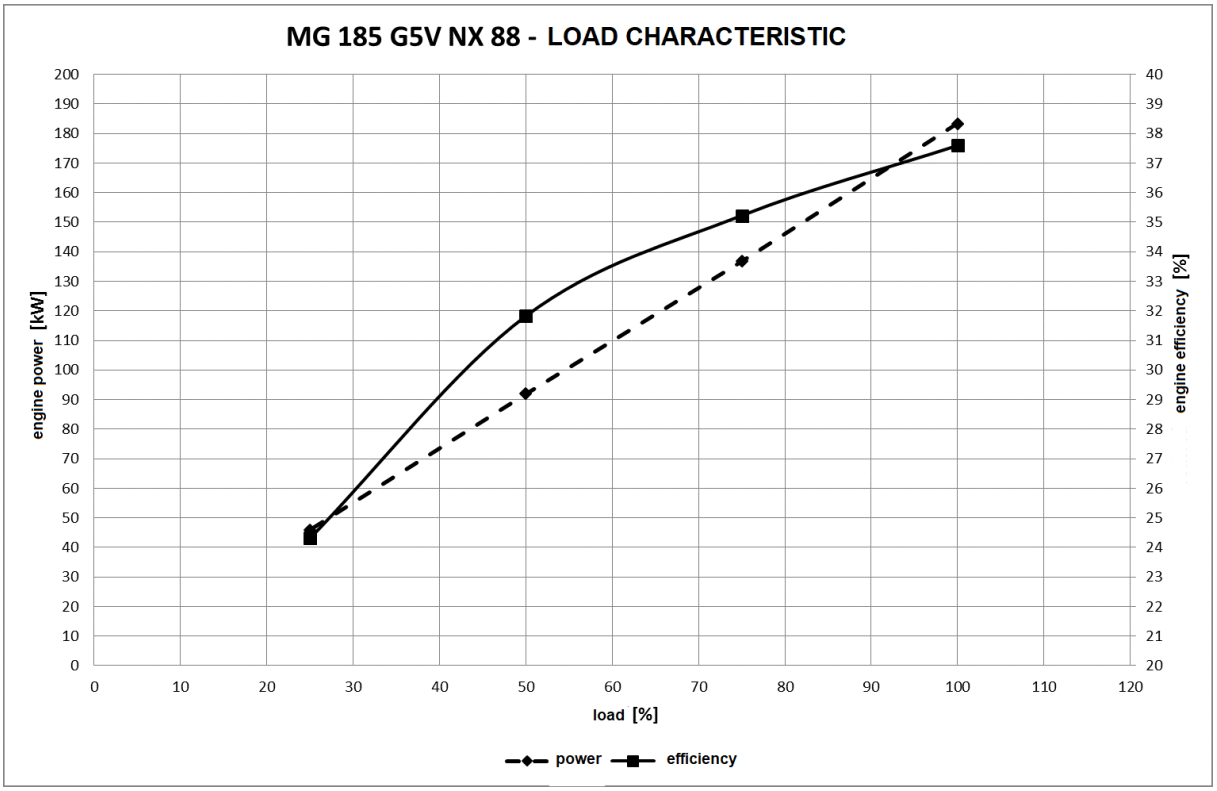
Engine heat output:

Coolant heat output	183,2	[kW]
Exhaust gas heat output (cooled to 120 °C)	88,0	[kW]
Radiation heat power	15	[kW]

Parameters under load:

Load	100	75	50	25	[%]
Fuel input power	487,6	390,3	288,0	188,5	[kW]
Total engine efficiency	37,6	35,2	31,8	24,3	[%]
Fuel consumption	51,6	41,3	30,5	20,0	[$m^3.h^{-1}$]

Load Characteristics:



Tolerance values given in the specification is subject to internal regulation TEDOM: 61-0-0284.

Engine parameters and settings:

Ignition advance	18	[°]
Coefficient of excess air λ	1	[-]
Exhaust gas temperature (cylinder head outlet)	615	[°C]
Exhaust gas temperature at outlet of water-cooled exh. manifold	583	[°C]
Combustion air flow	598	[kg.h^{-1}]
Exhaust gas flow	633	[kg.h^{-1}]
Maximum exhaust back pressure for nominal parameters	4	[kPa]
Maximum suction vacuum for nominal parameters (at miser inlet)	1	[kPa]
Recommended exhaust gas temperature for warning signal – before cat (behind the catalyst = actual temperature during adjustment + 15°C)	600	[°C]
Recommended exhaust gas temperature for stop signal – before cat (behind the catalyst = actual temperature during adjustment + 30°C)	615	[°C]

Technical and build-up parameters:

REGIME OF THE ENGINE REVOLUTION		
Overrun speed max. - gas cut-off	2100	[rpm]
Overrun speed max. - ignition deactivation	2100	[rpm]
ENGINE LUBRICATION		
Lubricating oil volume - total	42/95	[dm^3]
Lubricating oil volume - between max. and min.	53	[dm^3]
Oil consumption – maximum permissible	0,14	[$kg.h^{-1}$]
Lubrication pressure – nominal speed	3-6	[bar]
Minimum operating lubrication pressure – rated engine speed (overpressure)	400*	[bar]
ENGINE BLOCK COOLING		
Coolant volume	68	[dm^3]
Maximum coolant temperature at engine outlet	88	[°C]
Minimum coolant temperature at engine outlet	80	[°C]
Maximum possible temperature difference of the coolant between the inlet and outlet of the engine	6	[°C]
Minimum coolant temperature for start	25	[°C]
Minimum required coolant flow rate	515	[$dm^3.min^{-1}$]
Maximum pressure in the cooling circuit	300	[kPaa]
Coolant concentration min/max	40/50	[%]
OPERATING LIMITATIONS		
Minimum intake air temperature for start	-10	[°C]
Intake air (mixture) temperature for the nominal parameters	25	[°C]
Maximum temperature of the engine compartment during operation	50	[°C]
Maximum allowable under-pressure (at the entrance to the mixer)	3	[kPa]
Maximum exhaust backpressure for nominal parameters (on engine output)	5	[kPa]
OPERATING CLEARANCE		
Cold valve clearance - intake valve	0,5	[mm]
Cold valve clearance - exhaust valve	0,6	[mm]
Electrode distance of spark plugs	0,3	[mm]

*… preliminary recommended value (2,5 bar stated in the manufacturer´s documentation)

Emissions production at engine output:

Nitrogen oxides - NO_x	< 5315	[$mg.m_n^{-3}$]
Carbon monoxide – CO	< 5410	[$mg.m_n^{-3}$]
Total hydrocarbons – THC	< 411	[$mg.m_n^{-3}$]
Methane – CH_4	< 378	[$mg.m_n^{-3}$]
Formaldehyde – HCHO	< 15	[$mg.m_n^{-3}$]

Emissions production behind three-way catalyst*:

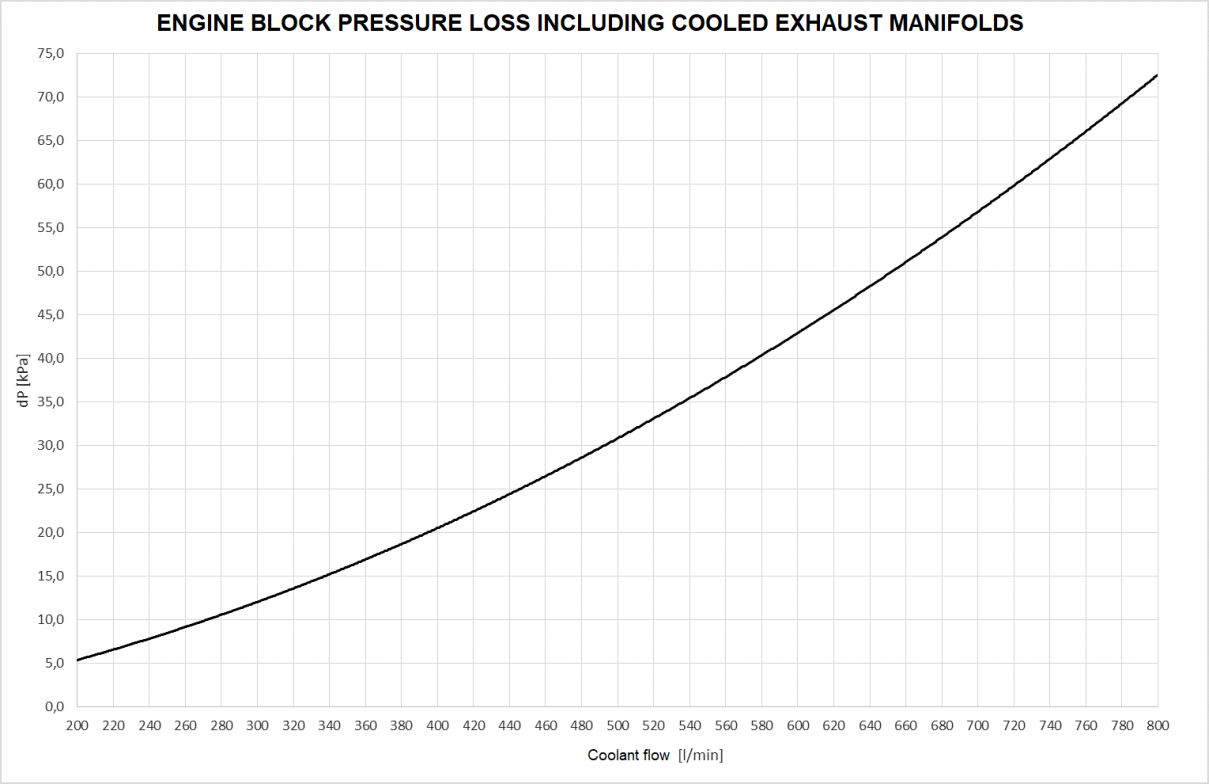
Nitrogen oxides - NO_x	<50	[$mg.m_n^{-3}$]
Carbon monoxide – CO	<50	[$mg.m_n^{-3}$]
Total hydrocarbons – THC	<300	[$mg.m_n^{-3}$]
Methane – CH_4	<200	[$mg.m_n^{-3}$]
Formaldehyde – HCHO	<20	[$mg.m_n^{-3}$]

* Values for new catalyc converter. Applies to three way catalyst ECOCAT 2.0 type: 810056

Engine noise:

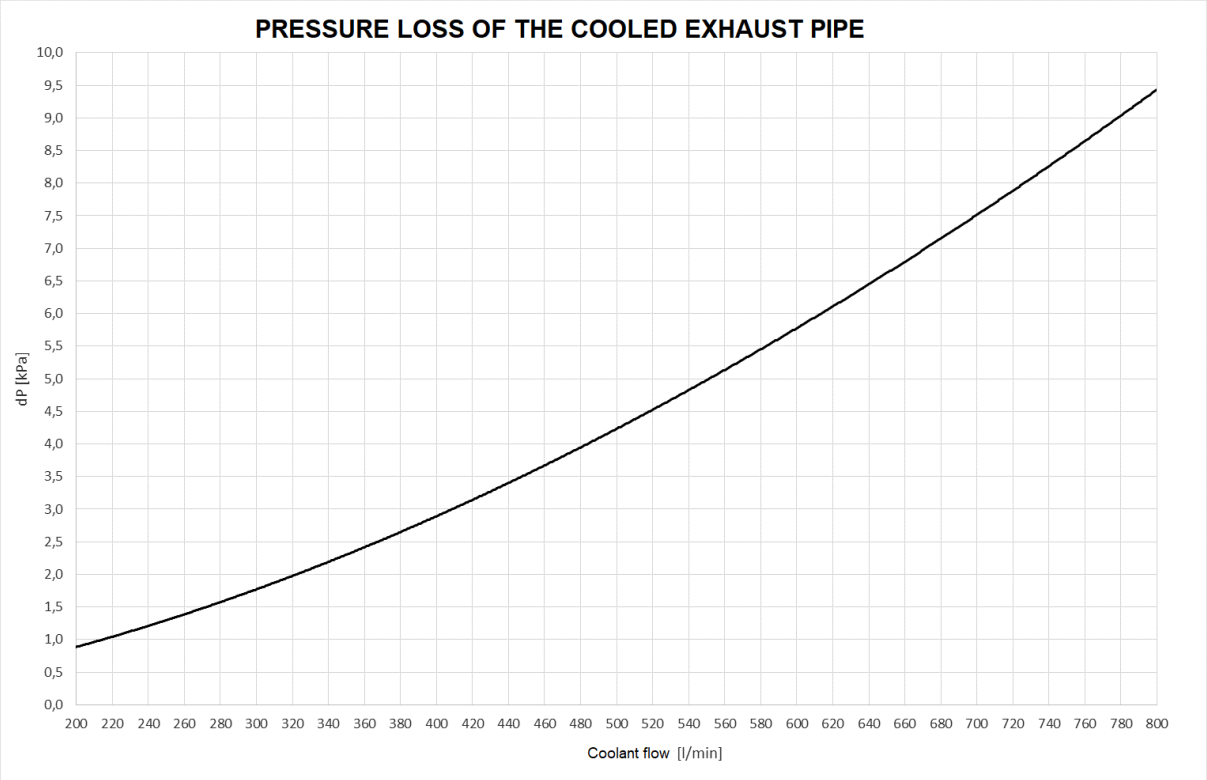
Engine sound pressure level	110	[dB(A)]
Exhaust sound pressure level	92	[dB(A)]

Engine block pressure loss including cooled exhaust manifolds:



For the first unit, verify the actual coolant flow through the engine

Pressure loss of the cooled exhaust pipe:



Reference ambient conditions:

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

Fuel characteristic:

Fuel pressure - reference	101,325	[kPa]
Fuel temperature - reference	15	[°C]
Fuel relative humidity	0	[%]
LHV	34,0	[$MJ.m^{-3}$]
CH_4 concentration (biogas engines)	-	[%]
CO_2 concentration (biogas engines)	-	[%]

Allowed fuel characteristic:

Minimum methane number fuel for standard engine adjustment	80	[-]

Engine power correction for methane fuel numbers < 80 depending on the temperature of the intake of air:

Inlet air temperature	25	30	35	40	[°C]
Correction factor	1	0,91	0,83	0,74	[-]

Correction of power depending on the altitude:

Altitude	500	750	1000	1250	1500	[m a.s.l.]
Correction factor	1	0,96	0,93	0,89	0,85	[-]

Natural correction of power depending of inlet air:

Inlet air temperature	25	30	35	40	45	[°C]
Power correction factor	1,00	1,00	1,00	0,97	0,94	[-]
Efficiency Correction factor	1,00	1,00	1,00	0,99	0,98	[-]

Time limits for low load operation:

Engine power [%]	Runtime [min]
50 ÷ 100	no restrictions
30 ÷ 50	- max. 500 h / year; max. 5 h continuous - the oil change interval must be determined based on the oil analysis (according to operating instructions / TUC 13.036)
0 ÷ 30	5 minutes *

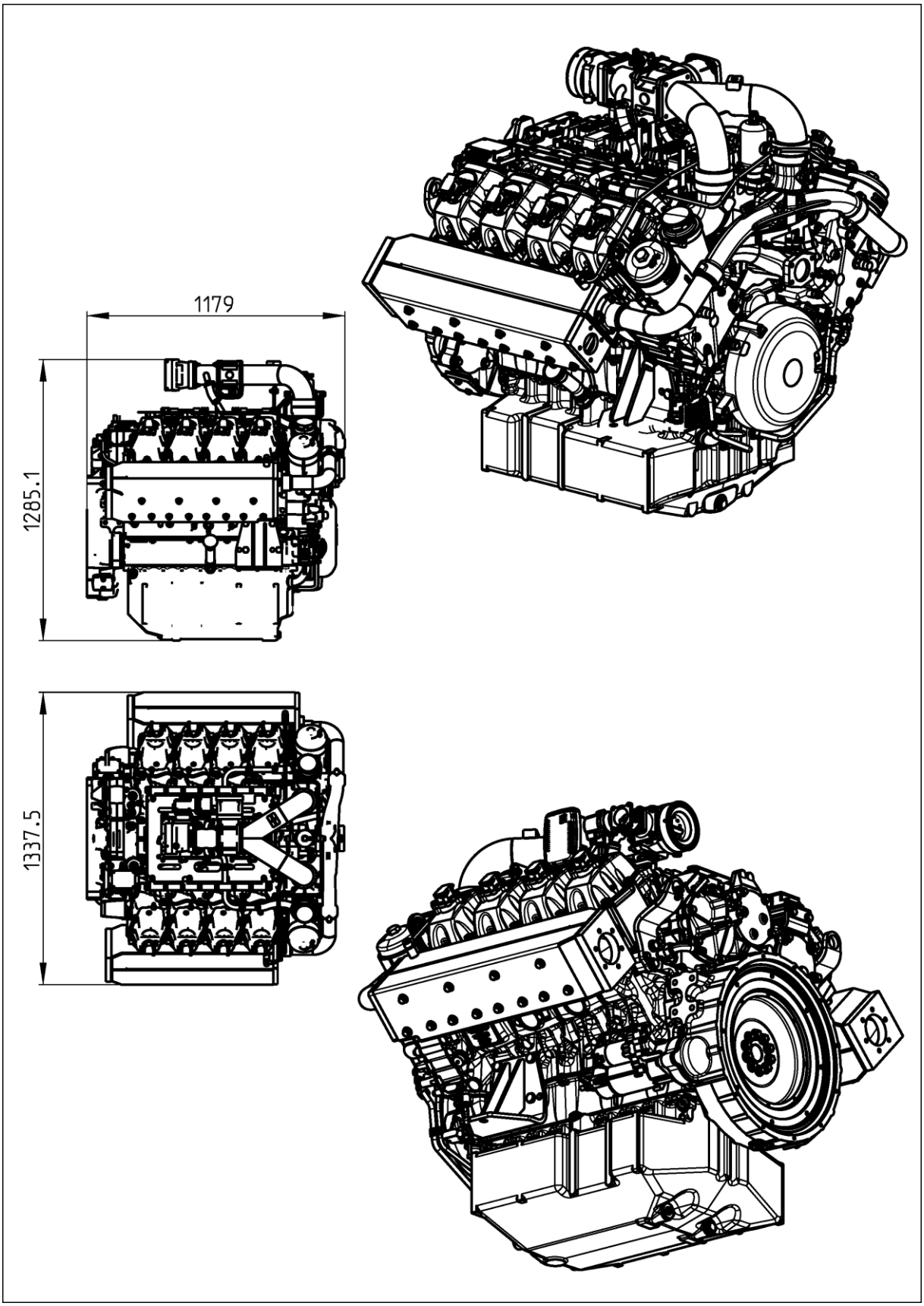
Notes:

* **After each part load operation < 50 % the engine have to be run at least 1 hour at full load (100 %).**

Other operating restrictions:

- Up to 4 Start per day are possible
- Minimum runtime 1 hour per Start
- Due to wear 1 start is equal 0,5 operating hours

Outline dimensions of the engine:



Total engine weight:

Total engine weight	1437	[kg]

Rozměry motoru:

Width	1338	[mm]
Length	1179	[mm]
Height	1285	[mm]

Fitting dimensions of the engine:

Flywheel flange	SAE 1

Recommended accessories to achieve nominal parameters:

Zero gas pressure regulator Krom Schröder GIK 40R02-5
Heinzmann GM-140 fuel mixer (diffuser 76 mm, holes 6,4 mm)
Mixer
Air filter SANDRIK SPP 1200L
Three-way catalyst ECOCAT 2.0 TYPE: 810506
Engine management BOSCH
Spark plugs with M18 thread – BOSCH MR3DII360 (original MAN part)

Publication specification:

Date of specification:	Specification version:	Elaborated by:	Note:
01.03.2019	1st edition	T. Hampl	ETA 3/5, power reserve 5 %
26.09.20190	REVISION A	V. Gulová	Operating restrictions on reduced engine power
21.10.2019	REVISION B	V. Gulová	Operating restrictions on reduced engine power – clarification; Change of engine name TG 185 … to MG 185