Description:

Engine type	**MP 50 G5V NX 88**	
Fuel	propane (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	2	
Turbocharging	no	
Intercooler	no	
Mixture	stoichiometric	
Cooling	liquid	
Operation (looking at flywheel)	anticlockwise	
Displacement	4,58	[dm^3]
Bore	108	[mm]
Stroke	125	[mm]
Compression ratio	9,5:1	[-]
Firing order	1-3-4-2	[-]

Rated parameters at reference conditions:

Rated speed	1500	[rpm]
Rated power output (continuous)	52,4	[kW]
Peak torque	334	[Nm]

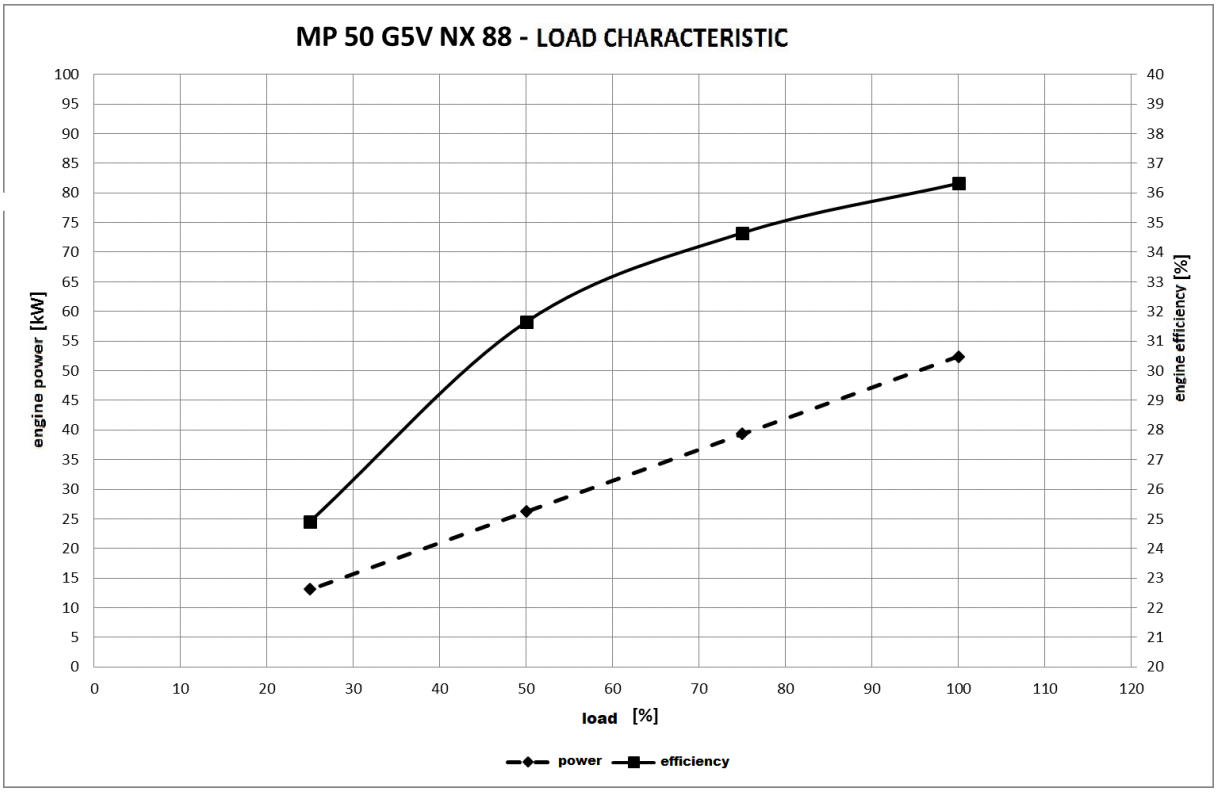
Engine heat output:

Coolant heat output	47,6	[kW]
Exhaust gas heat output (cooled to 120 °C)	26,2	[kW]
Radiation heat power	13,0	[kW]

Parameters under load:

Load	100	75	50	25	[%]
Fuel input power	144,3	113,4	82,8	52,6	[kW]
Efficiency	36,3	34,6	31,7	24,9	[%]
Fuel consumption	5,6	4,4	3,2	2,0	[$m^3.h^{-1}$]

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	0,990	[-]
Exhaust gas temperature at the outlet from the engine (at the outlet of the cylinder heads)	602	[°C]
Exhaust gas temperature behind the catalyst	562	[°C]
Combustion air flow	170	[$kg.h^{-1}$]
Exhaust gas flow	181	[$kg.h^{-1}$]
Max. exhaust back pressure for rated parameters (behind the flue gas exchanger)	4	[kPa]
Max. exhaust back pressure for nominal parameters (at the inlet to the mixer)	1	[kPa]
Recommended exhaust gas temperature for warning signal - behind the catalyst	580	[°C]
Recommended exhaust gas temperature for stop signal - behind the catalyst	600	[°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 - total	9/13	[dm^3]
Lubricating oil - oil sump - max. mark	4	[dm^3]
Oil consumption	0,075	[$g.kW^{-1}.h^{-1}$]
Min. operating oil pressure – engine rated speed	600	[kPag]
ENGINE COOLING		
Volume of coolant in engine	12	[dm^3]
Max. coolant temperature at the outlet from the engine	88	[°C]
Min. coolant temperature at the outlet from the engine	80	[°C]
Maximum possible coolant temperature difference between engine inlet and outlet	6	[°C]
Minimum coolant temperature for start	25	[°C]
Minimum required coolant flow	100	[$dm^3.min^{-1}$]
Maximum cooling circuit pressure	200	[kPa]
OPERATING LIMITATIONS		
Min. intake air temperature for start	-10	[°C]
Intake air (mixture) temperature input into the engine for the nominal parameters	25	[°C]
Maximum temperature of the engine compartment during operation	50	[°C]
Maximum permissible suction vacuum (at the inlet to the mixer)	3,0	[kPa]
Maximum allowable exhaust back pressure (at engine outlet)	4	[kPa]
OPERATING CLEARANCE		
Cold valve clearance - intake valve	0,5	[mm]
Cold valve clearance - exhaust valve	0,5	[mm]
Air gap spark plugs	0,6	[mm]

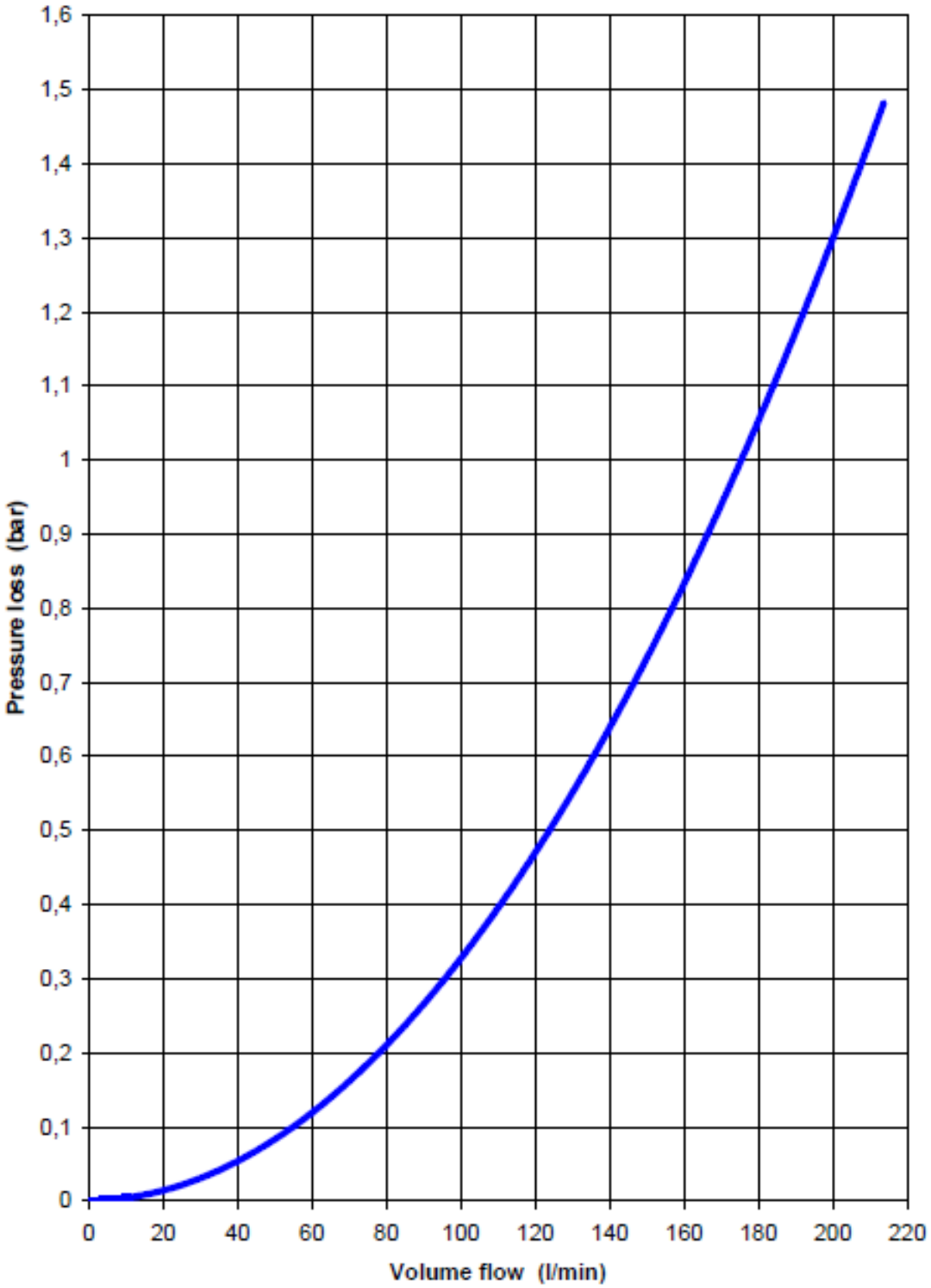
Emission production behind a three-way catalytic converter:

Nitrogen oxides - NO_x	< 90	[$mg.m_n^{-3}$]
Carbon monoxide - CO	< 150	[$mg.m_n^{-3}$]
Total hydrocarbons - THC	< 110	[$mg.m_n^{-3}$]
Particulate - PM^b	< 10	[$mg.m_n^{-3}$]
Formaldehyde - HCHO	< 20	[$mg.m_n^{-3}$]

Engine noise:

Exhaust sound pressure level	139,0	[dB(A)]
Noise around the engine	98,3	[dB(A)]

Pressure loss of the engine block:



Reference ambient conditions:

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

Fuel parameters:

Fuel pressure - reference	101,325	[kPa]
Fuel temperature - reference	0	[°C]
Fuel relative humidity	0	[%]
LHV	93,1	[$MJ.m^{-3}$]
C_3H_8 concentration	100	[%]
C_4H_{10} concentration	0	[%]

Allowed fuel characteristic:

Fuel efficiency (biogas engines)	-	[$MJ.m_n^{-3}$]
Minimum C_3H_8 concentration	75	[%]
Maximum C_4H_{10} concentration	25	[%]
Minimum methane number fuel	30	[-]

Engine power correction for methane fuel numbers < 30 depending on intake air temperature:

Air temperature	25	30	35	40	[°C]
Corection factor	1	0,85	0,70	0,77	[-]

Note.: In addition to the above, supplement the engine control with detonation detection!!!

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	[-]

Correction of power depending on the temperature of inlet air:

Inlet air temperature	0	5	10	15	20	25	30	35	40	45	50	[°C]
Correction factor	1,10	1,08	1,06	1,04	1,02	1,00	0,98	0,96	0,94	0,92	0,90	[-]

Time limits for low load operation:

The minimum power for continuous operation is 50 % of the rated value.

Engine power [%]	Conditions / restrictions
50 ÷ 100	without restriction / year
30 ÷ 50	- max. 500 h / year, max. 5 hours onwards - interval oil changes must be determined ot the basis of an oil analysis (according to operating instructions / TUC 13.036)
0 ÷ 30	5 minutes *

* *After allowed running time under <50 % of nominal power must follow min. 1 hour recovery run 100 % of nominal engine power.*

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

Total engine weight:

Total engine weight	430	[kg]

Engine dimensions:

Width	740	[mm]
Length	825	[mm]
Height	940	[mm]

Fitting dimensions of the engine:

Rear cover	SAE 2

Recommended accessories to achieve the nominal parameters:

Zero gas pressure regulator Krom-Schröder GIK 40R02-5
LPG fuel mixer CHP version
Air filter MANN-HUMMEL 4540092920
CHP flue gas exchanger with integrated three-way catalytic converter
Ignition Motortech MIC4
Motortech ignition coils
Spark plugs DENSO GK3-3 (original part MAN)
Ignition cables TESLA K412C

Publication specification:

Date of specification:	Specification version:	Elaborated by:	Note:
02.08.2021	1st. edition	T. Hampl	ETA 3/5
06.03.2023	REVISION A	V. Gulová	Adjustment according to protocol 2018/23 (fuel parameters)
27.02.2024	REVISION B	T. Hampl	Correction of NO_x and CO limits