Description:

Engine type	**TG 110 G5V NX 88 (Dwg. No. 7000 850/xx)**	
Fuel	natural gas (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	stoichimetric	
Cooling	liquid	
Operation (looking at flywheel)	anticlockwise	
Displacement	11,946	[dm^3]
Bore	130	[mm]
Stroke	150	[mm]
Compression ratio	12:1	[-]
Firing order	1-5-3-6-2-4	[-]

Rated parameters at reference conditions:

Rated speed	1500	[rpm]
Rated power output (continuous)	110,4	[kW]
Peak torque	703	[Nm]

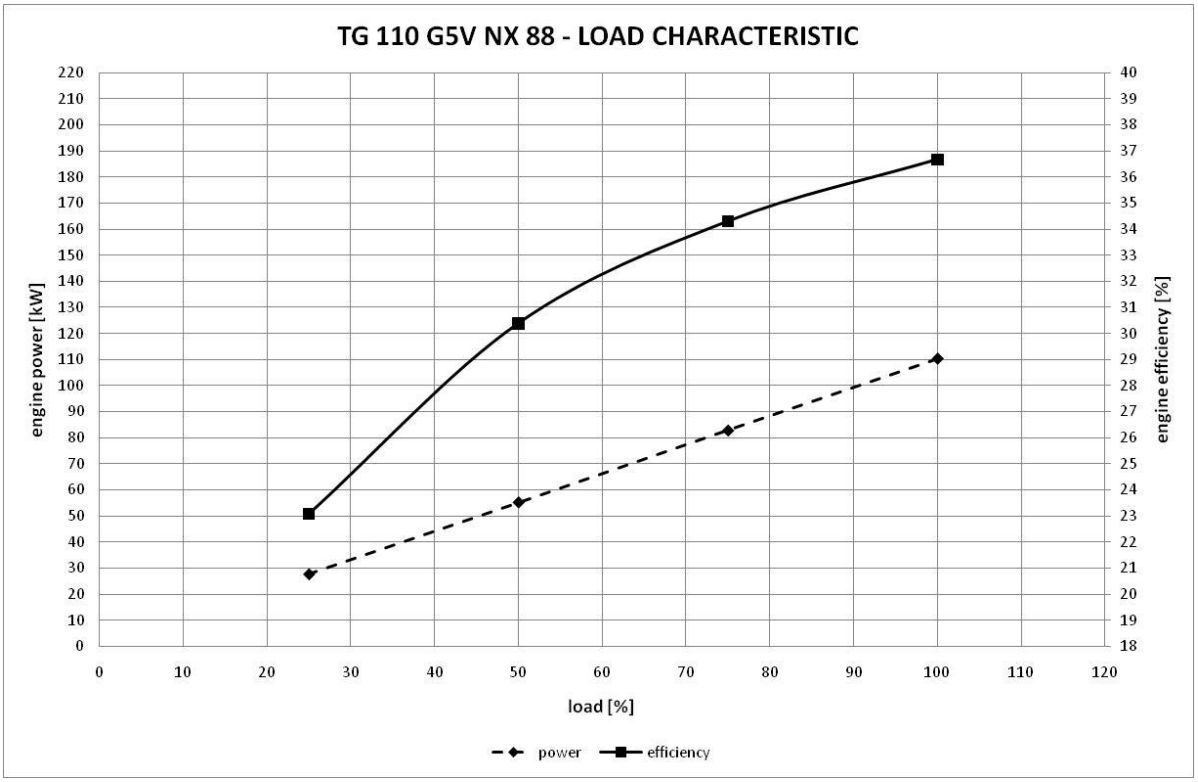
Engine heat output:

Coolant heat output	101,6	[kW]
Exhaust gas heat output (cooled to 120 °C)	64,9	[kW]
Radiation heat power	12,0	[kW]

Parameters under load:

Load	100	75	50	25	[%]
Fuel input power	301,1	241,4	181,7	119,6	[kW]
Efficiency	36,7	34,3	30,4	23,1	[%]
Fuel consumption	31,9	25,6	19,2	12,7	[$m^3.h^{-1}$]

Load Characteristics:



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

Engine parameters and settings:

Ignition advance	30	[°]
Coefficient of excess air λ	0,995	[-]
Exhaust gas temperature at the outlet from the engine	614	[°C]
Exhaust gas temperature at the catalyst	627	[°C]
Combustion air flow	392	[kg.h^{-1}]
Exhaust gas flow	427	[kg.h^{-1}]
Max. exhaust back pressure for rated parameters (at output of the engine)	3,5	[kPa]
Recommended exhaust gas temperature for warning signal	680	[°C]
Recommended exhaust gas temperature for stop signal	690	[°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	56	[dm^3]
Lubricating oil - oil sump - max. mark	51	[dm^3]
Lubricating oil - between max. and min.	10	[dm^3]
Oil consumption	0,3-0,5	[$g.kW^{-1}.h^{-1}$]
Min. operating oil pressure (rated speed)	360	[kPag]
ENGINE COOLING		
Volume of coolant in engine	22	[dm^3]
Coolant temperature at the outlet from the engine	85-95	[°C]
Max. coolant temperature short time (1 hour)	100	[°C]
Min. coolant temperature for 100 % load	60	[°C]
Maximum load for the coolant temperature below 60 °C	25	[%]
Minimum coolant temperature for start	10	[°C]
Recommended power cooler	200	[kW]
Required engine coolant flow	300-400	[$dm^3.min^{-1}$]
Maximum cooling circuit pressure	260	[kPaa]
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	80	[°C]
Allowed crankcase pressure range	-2/+1	[kPa]
OPERATING CLEARANCE		
Cold valve clearance - intake valve	0,30	[mm]
Cold valve clearance - exhaust valve	0,55	[mm]

Emissions:

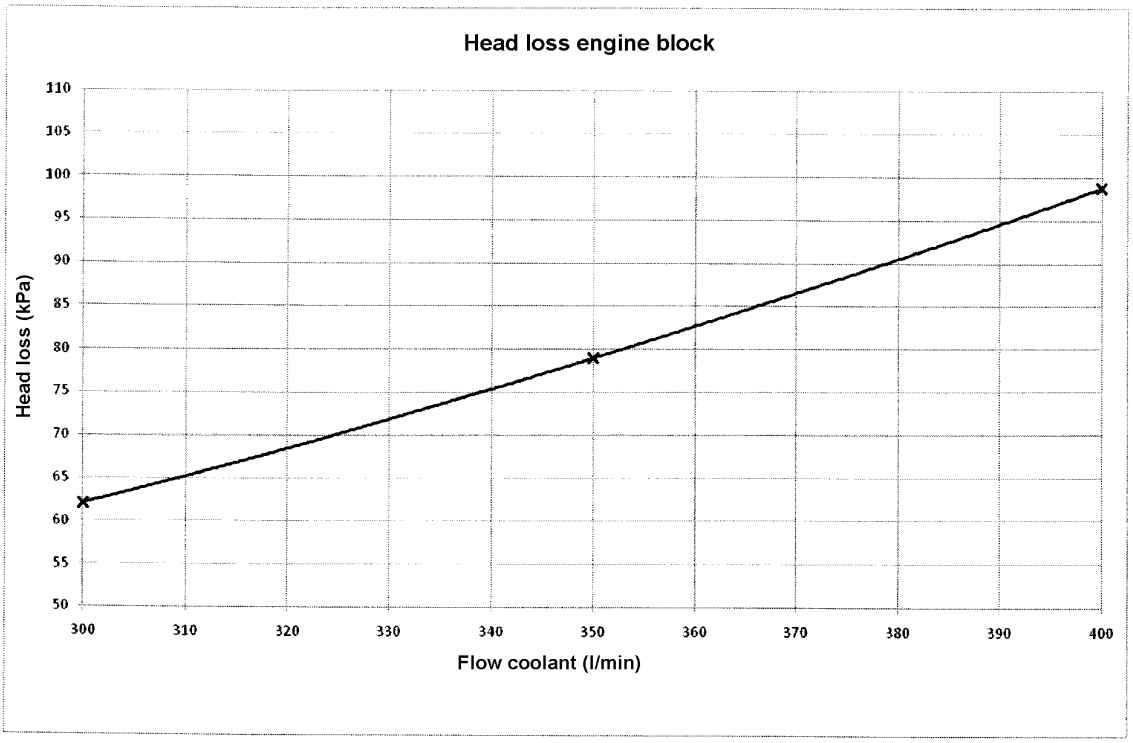
Nitrogen oxides - NO_x	< 50 *	[$mg.m_n^{-3}$]
Carbon monoxide - CO	< 50 *	[$mg.m_n^{-3}$]
Total hydrocarbons - HC	-	[$mg.m_n^{-3}$]
Particulate - PM^b	-	[$mg.m_n^{-3}$]
Formaldehyde - HCHO	-	[$mg.m_n^{-3}$]

* This value is obtained only by installing a specially sized catalytic converter on the exhaust gas line.

Engine noise:

Sound pressure level	91	[dB(A)]

Head loss engine block:



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	[$MJ.m^{-3}$]
CH_4 concentration (biogas engines)	-	[%]
CO_2 concentration (biogas engines)	-	[%]

Allowed fuel characteristic:

Minimum methane fuel number for standard engine adjustment	95	[-]

Minimum methane fuel number for replacement engine adjustment	80	[%]
Replacement engine adjustment - Ignition advance	18	[°BTDC]
Fuel efficiency (biogas engines)	-	[$MJ.m_n^{-3}$]

Engine power compensation for methane fuel numbers < 95 depending on intake air temperature:

Inlet air temperature	25	30	35	40	[°C]
Correction factor	1	0,85	0,70	0,77	[-]

Note: In addition to the above, add engine control for 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:

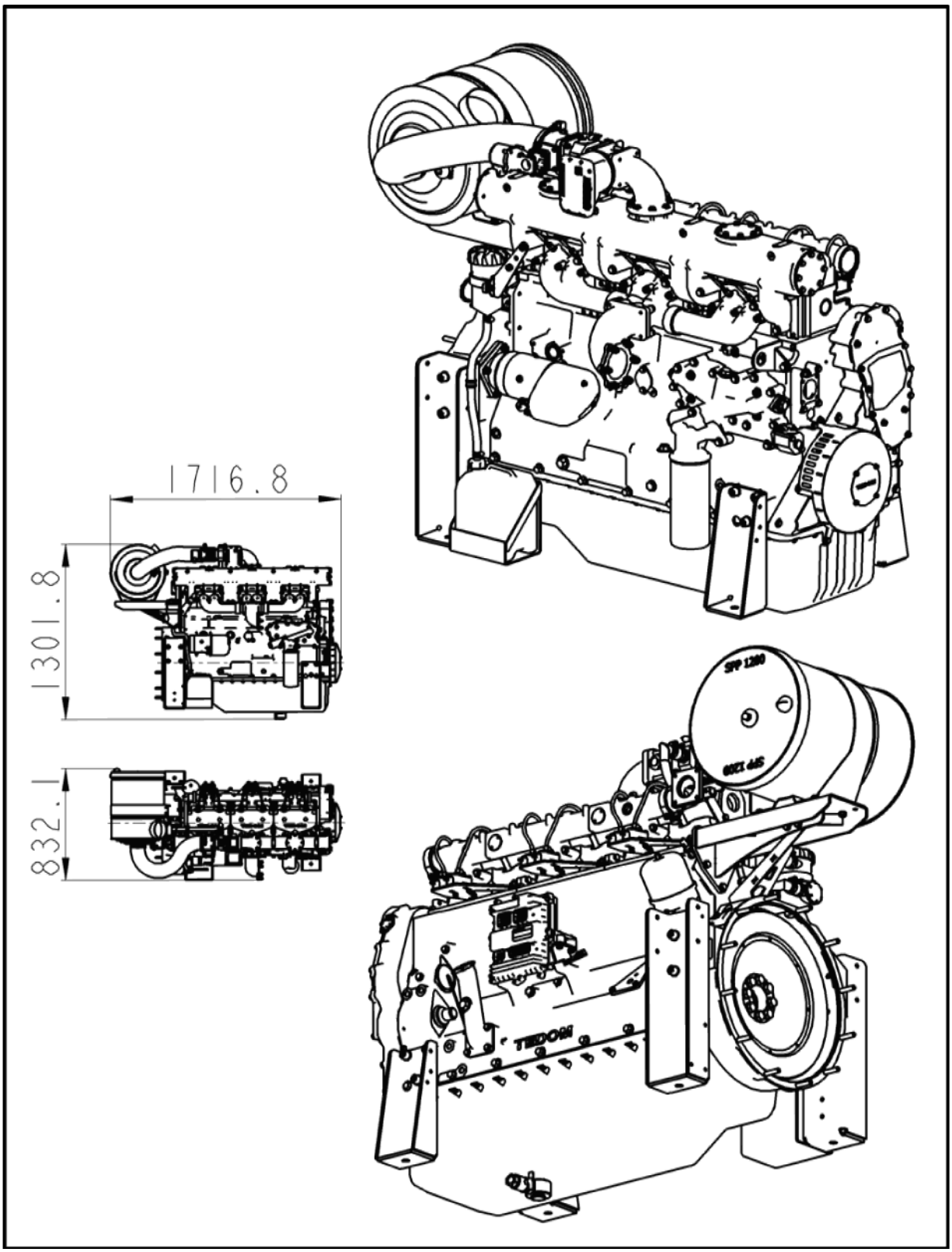
Engine power [%]	Runtime [min]
0 – 30	30*
31 - 50	120*
51 - 100	Continuous

* *After allowed running time under 51 % of nominal power must follow min. 2 hours recovery run above 70 % 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

Outline dimensions of the engine:



Total engine weight:

Total engine weight	920	[kg]

Fitting dimensions of the engine:

Flywheel housing	SAE 1 (alternator)
Engine block/ flywheel housing	SAE 1 (with rear brackets)
Engine block	4 x M16 (for front brackets)
Flywheel	SAE 11½ (or SAE 14)

Publication specification:

Date of specification:	Specification version:	Elaborated by:	Note:
15.8.2011	1st. edition	T. Hampl	
31.5.2012	REVISION A	T. Hampl	Efficiency (3 at 5)
1.11.2016	REVISION B	V. Gulova	Allowed crankcase pressure range
16.10.2018	REVISION C	T. Hampl	Correction for methane fuel numbers
28.3.2019	REVISION D	V. Gulova	Revision No. 520/19
29.4.2020	REVISION E	V. Gulova	Revision No. 534/20