Contents

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	12V1600G10F				
Rated power [kW]	524				
Rated speed [rpm]	1500				
Application Group	3B, 3E, 3F				
Legislative body	NOx emission optimized				
Test cycle	10% Schritte				
Data Set No.	XZ57554150310/R141				
Data Set Basis	NOx emission optimized				
Fuel sulphur content [ppm]	5				

Content **Page**

PDF	Name	Project no. **AVK Enquiry - 18/03/2022**	Size **A4**
Configurator	Adali, Deniz (TATV)	Order no. **AVK Enquiry - 18/03/2022**	
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Approver2	Kneifel, Alexander (TSLE)		
Approver3			
Approver4			
User	EMEA\williamsshan		

Engine model **12V1600G10F**

Title **Emission data sheet**

Description of Revision	Frequency
Data generated by EDS Creator version 1.0 and uniplot. Ref.-dataset: BR1600.12V1600G_16701007072.9_TKTP_D.1.nc - Staub_nKohlenstoffbilanz.nc2 for 1410 in EDS platfrom.	

Configuration-ID	Documentation
1410	

Emissionstage **NOx emission optimized**

Emissionstage basis **NOx emission optimized**

General Disclaimers (valid for Measured and NTE values)

Please note that these data are physical and/or technical values only referring to and representing a normative defined operating condition. Any change in operating time and conditions will have impact on physical values and engine behavior, which must be considered and assessed within the complete propulsion system especially in regard to emission compliance and product safety.

Measurements listed in this EDS are representative of the listed engine rating at the time of testing. These measurements and results can change according to instrumentation, boundary condition, and engine to engine variability. In addition - changes to the engine family hard or software may occur which could result in changes to some of the listed values.

Emissions data measurement procedures are conducted according to applicable rules and standards as per “Emission Stage/Optimization”. Potential deviations from these procedures are documented internally.

The listed emission values relate to the corresponding certification data. Seller doesn´t take any responsibility or liability neither out or in connection with the contract nor on any other basis
- beyond these specified operating conditions of the engine
- and for any installation/modification of the entire propulsion system by the customer itself or any third party
and the customer will indemnify MTU on first demand for any third party claim out or in connection with this.

Seller reserves the right to amend specifications and information without notice and without obligation or liability. No liability for any errors, facts or opinions is accepted. Customers must satisfy themselves as to the suitability of this product for their application. No responsibility for any loss as a result of any person placing reliance on any material contained in this data sheet will be accepted.

Seller reserves all rights in the information contained in this data sheet. It shall not be reproduced, made available to a third party or otherwise used in any way whatsoever.

When applicable, emission values are measured after combined exhaust streams.

Measured Emissions data is based on single operating points and thus cannot be used to compare to regulations which use values based on a weighted cycle.

Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures, and instrumentation. Over time deterioration may occur which may have an impact on emission levels.

The SO2 emission rates comprehend exclusively the SO2 content as found in the fuel source, oil consumption effects are not included. Variation of sulfur content in the fuel changes only the stated SO2 emissions, cross sensitivity to other emissions (e.g. particulates) is not possible.

All values based on metric units, inaccuracies for non metric values can occur, values are not binding.

Specific to gas engines: The listed emission values are based on gas composition at the time of certification measurement. Gas composition is as displayed in the EDS-document. Carbon dioxide and methane concentrations have direct influence on the corresponding displayed carbon dioxide and methane emissions.

EAT Specific Disclaimers (valid for EDS values)

NH3 emissions levels measured with AVL SESAM i60/ 4 FT Multi Component Exhaust Measurement System (FTIR) including EPA 40 CFR 1065 legislation compliant automated checks for linearity.
Generators or engines with exhaust after-treatment systems require a stabilization period of approximately 1 hour to ensure stable temperatures across SCR prior to performing an emissions test. Performing emissions measurements before a stable temperature has been achieved can result in inconsistent emission values. NOx Values only applicable if temperatures across SCR reached for DEF Dosing.

NTE Disclaimers (valid for NTE calculated values)

Calculated not to exceed values (NTE) are not proven by tests and therefore the accuracy is not guaranteed.

All emission data shown in chapters Emission Data Sheet, Not to Exceed Values, and Type Approval were gathered from a corresponding certification engine under test conditions shown above and complying to corresponding TEN data.

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Configuration-ID	Documentation
1410	

Emissionstage
NOx emission optimized

Emissionstage basis
NOx emission optimized

Engine data

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Application	X				
Engine model	12V1600G10F				
Application Group	3B, 3E, 3F				
Legislative body	NOx emission optimized				
Test cycle	10% Schritte				
Fuel sulphur content [ppm]	5				
mg/mN^3 values base on residual oxygen value of [%]	5				

Engine raw emissions*

Cycle point	[-]	n1	n2	n3	n4	n5	n6	n7	n8	n9	n10	n11
Power	kW	576	524	471	420	367	314	262	210	157	105	52
Power relative	[-]	1.1	1	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
Engine speed	1/min	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Engine speed relative	[-]	1	1	1	1	1	1	1	1	1	1	1
Filter smoke number	[-]	0.266	0.291	0.376	0.524	0.501	0.489	0.557	0.847	0.795	0.885	0.443
Exhaust temperature after ETC	grdC	511	497.6	487.4	478.4	471.2	460.2	442.8	408.7	363.9	296.4	214.8
Exhaust back pressure after ETC (static)	mbar	97	85	71	57	46	37	29	23	17	13	10
Exhaust mass flow wet	kg/h	3289	3.0569E3	2.8286E3	2.5758E3	2.3228E3	2.1039E3	1.8535E3	1.5915E3	1377	1.2269E3	1.1013E3
NOX-Emissions specific	g/kWh	4.45	4.37	4.18	4.13	4.14	4.05	3.92	4.17	4.48	4.81	6.42

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Emissionstage
NOx emission optimized

Sheet
3
of
6

Configuration-ID	Documentation
1410	

Emissionstage basis
NOx emission optimized

SO2-Emissions specific	g/kWh	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003
CO-Emissions specific	g/kWh	0.45	0.52	0.67	0.78	0.72	0.73	0.82	1.05	1.3	2.15	3.35
HC1-Emissions specific	g/kWh	0.1	0.1	0.11	0.13	0.15	0.17	0.2	0.26	0.32	0.62	1.4
CO2-Emissions specific	g/kWh	670.5	667.6	667	666.8	674.4	685.6	694.2	694.1	709.5	757.3	927.9
PM-Emissions specific (Meas.)	g/kWh	0.035	0.037	0.048	0.061	0.057	0.06	0.071	0.124	0.154	0.213	0.209
NOX-Emissions (based on 5% O2)	mg/m3N	2006	2022	1981	2007	2060	2053	2046	2341	2791	3478	5426
CO2-Emissions (based on 5% O2)	mg/m3N	2.2431E5	2.2375E5	2.2279E5	2.2289E5	2.2427E5	2.2373E5	2.2322E5	2.229E5	2.2257E5	2.2026E5	2.1635E5
CO-Emissions (based on 5% O2)	mg/m3N	152.3	173.1	222.6	259.2	238.9	237.2	262.4	336.7	409	624.2	781.8
HC1-Emissions (based on 5% O2)	mg/m3N	33.3	32.5	35.8	42.4	48.3	55	63.2	81.9	99.8	179.4	327.3
SO2-Emissions (based on 5% O2)	mg/m3N	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
PM-Emissions (based on 5% O2)	mg/m3N	11.7	12.5	16.2	20.3	18.9	19.7	22.9	39.7	48.2	61.9	48.8

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Emissionstage
NOx emission optimized

Sheet
4
of
6

Configuration-ID	Documentation
1410	

Emissionstage basis
NOx emission optimized

Engine data

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Application	X				
Engine model	12V1600G10F				
Application Group	3B, 3E, 3F				
Legislative body	NOx emission optimized				
Test cycle	10% Schritte				
Fuel sulphur content [ppm]	5				
mg/mN^3 values base on residual oxygen value of [%]	5				

Not to exceed emission values*

Cycle point	[-]	n1	n2	n3	n4	n5	n6	n7	n8	n9	n10	n11
Power	kW	576	524	471	420	367	314	262	210	157	105	52
Power relative	[-]	1.1	1	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
Engine speed	1/min	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Engine speed relative	[-]	1	1	1	1	1	1	1	1	1	1	1
NOX+HC1 mass flow	kg/h	3.43	3.06	2.65	2.34	2.07	1.75	1.43	1.38	1.24	1.03	0.8
NOX-Emissions specific	g/kWh	5.79	5.68	5.43	5.36	5.39	5.26	5.09	6.09	7.26	8.51	12.21
CO-Emissions specific	g/kWh	0.77	0.88	1.13	1.32	1.25	1.32	1.55	2.03	2.58	4.44	7.37
HC1-Emissions specific	g/kWh	0.17	0.17	0.18	0.22	0.25	0.31	0.37	0.5	0.63	1.28	3.09
NOX+HC1-Emissions specific	g/kWh	5.96	5.85	5.62	5.58	5.64	5.57	5.47	6.58	7.89	9.79	15.3
PM-Emissions specific (Meas.)	g/kWh	0.056	0.059	0.078	0.097	0.095	0.111	0.143	0.252	0.32	0.462	0.482

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Emissionstage
NOx emission optimized

Sheet
5
of
6

Configuration-ID	Documentation
1410	

Emissionstage basis
NOx emission optimized

NOX-Emissions (based on 5% O2)	mg/m3N	2608	2628	2575	2609	2678	2669	2660	3418	4521	6156	10309
NOX+HC1-Emissions (based on 5% O2)	mg/m3N	2664	2684	2636	2681	2762	2769	2780	3577	4719	6528	11029
CO-Emissions (based on 5% O2)	mg/m3N	258.9	294.3	378.4	440.7	415.7	431.8	498.6	653.3	809.8	1.2922E3	1.7199E3
HC1-Emissions (based on 5% O2)	mg/m3N	56.7	55.3	60.8	72.2	84	100.1	120.1	159	197.6	371.3	720
PM-Emissions (based on 5% O2)	mg/m3N	18.7	19.9	25.9	32.6	31.7	36.3	45.8	81.1	100.3	134.3	112.3

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Emissionstage
NOx emission optimized

Sheet
6
of
6

Configuration-ID	Documentation
1410	

Emissionstage basis
NOx emission optimized