Technical Data Sheet

TCD 9.0 L4 EU Stage V / US EPA TIER 4

General

01	General technical data	Unit	PC 0	PC 1	PC 2	PC SP
01.01	Rated net power (according to ECE-R.24 / ISO 9249)	kW	300	285	255	225
01.02	Rated net power (according to ECE-R.120 / ISO 14396)	kW	304	289	259	229
01.03	Calculated fan power (because of various cooling systems)	kW		4		
01.04	Rated speed	rpm		2100		
01.05	Engine configuration	-		Inline-Engine		
01.06	Cycle	-		Four-Stroke		
01.07	Number of cylinders	-		4		
01.08	Firing order (according to DIN 73021)	-		1-3-4-2		
01.09	Displacement	liters		8,989		
01.10	Bore	mm		135		
01.11	Stroke	mm		157		
01.12	Compression ratio	ε		16,5		
01.13	Maximum net torque at full load (according to ECE-R.24 / ISO 9249)	Nm	1731	1731	1727	1527
01.14	Maximum net torque at full load (according to ECE-R.120 / ISO 14396)	Nm	1739	1739	1735	1535
01.15	Speed at maximum torque	rpm		1400		
01.16	Idle speed low (engine at testing stand without load)	rpm		800		
01.17	Idle speed high (engine at testing stand without load)	rpm		2200		
01.18	Sense of rotation of engine (viewed from flywheel)	-		Anticlockwise		
01.19	Maximum boost pressure at turbocharger outlet (absolut)	bar	3,11	3,05	3,03	2,89

02	Engine dimensions and weight	Unit	PC 0	PC 1	PC 2	PC SP
02.01	Length	mm		1057		
02.02	Width	mm		827		
02.03	Height	mm		1129		
02.04	Engine weight (without water, with oil) @ +/- 3.5%	kg		827		

03	Intake air system	Unit	PC 0	PC 1	PC 2	PC SP
03.01	Intake air flow	kg/h	1473	1451	1398	1378
03.02	Maximum pressure drop at inlet turbo charger with air filter (new)	mbar		50		
03.03	Maximum pressure drop at inlet turbo charger with air filter (used)	mbar		70		
03.04	Maximum air temperature at compressor inlet	°C		60		
03.05	Maximum temperature rise ambient air to engine inlet before turbocharger	°C		10		

04	After cooling specification (air to air)	Unit	PC 0	PC 1	PC 2	PC SP
04.01	Heat rejection of charge air cooler	kW	67	67	58	56
04.02	Charge air flow	kg/h	1473	1451	1398	1378
04.03	Maximum temperature of charge air after cooling system	°C		50		
04.04	Nominal temperature of charge air before cooling system	°C	190	185	175	170
04.05	Maximum temperature of charge air before cooling system	°C		230		
04.06	Maximum pressure drop at charge air cooler and piping	mbar		150		

05	Exhaust system (point of reference see 15)	Unit	PC 0	PC 1	PC 2	PC SP
05.01	Exhaust gas flow	kg/h	1536	1510	1452	1422
05.02	Exhaust temperature after turbo charger	°C	554	538	501	446
05.03	Maximum exhaust temperature before SCR	°C		540		
05.04	Maximum exhaust backpressure after turbine with after treatment system	mbar		320		

06	Coolant system (HT- high temp.)	Unit	PC 0	PC 1	PC 2	PC SP
06.01	Heat rejection to coolant (with 85°C engine inlet coolant temp.)	kW	133	128	118	108
06.02	Maximum operating engine out coolant temperature	°C		105		
06.03	Coolant capacity (only engine)	liters		14		
06.04	Engine coolant flow at maximum pressure loss	l/min		605		
06.05	Thermostat begin of opening	°C		82		
06.06	Thermostat end of opening	°C		92		
06.07	Maximum pressure drop in external coolant circuit at rated speed	mbar		450		
06.08	Minimum pressure at inlet of water pump	mbar		500		
06.09	Maximum pressure at inlet of water pump	mbar		1500		
06.10	Transmission ratio of coolant water pump	-		1 : 1.77		
06.11	Engine coolant flow rate to (urea tank heater)	l/min		5		

General

07	**Lubricating oil system**					
07.01	Oil temperature maximum	°C		130		
07.02	Oil pressure at idle when engine is warm	mbar		1700		
08	**Fuel system**	**Unit**	**PC 0**	**PC 1**	**PC 2**	**PC SP**
08.01	Fuel flow at rated speed	l/h	77	73	66	59
08.02	Maximum fuel flow at engine outlet (return line)	l/h				
08.03	Minimum absolute fuel pressure at engine inlet (close to the feed pump)	mbar		500		
08.04	Maximum absolute fuel pressure at engine inlet (close to the feed pump)	mbar		1300		
08.05	Minimum relative fuel backpressure at engine outlet (close to the engine)	mbar				
08.06	Maximum relative fuel backpressure at engine outlet (close to the engine)	mbar		200		
08.07	Maximum operating fuel temperature at engine inlet	°C		60		
08.08	Maximum operating fuel temperature at engine outlet	°C		100		
09	**Environmental operating condition**	**Unit**	**PC 0**	**PC 1**	**PC 2**	**PC SP**
09.01	Minimum guaranteed temperature for cold start	°C		-10		
09.02	Maximum parasitic load during cranking at -20°C	Nm		500		
09.03	Maximum ambient temperature	°C		50		
10	**Engine performance derating**	**Unit**	**PC 0**	**PC 1**	**PC 2**	**PC SP**
10.01	Maximum altitude without derating at nominal engine speed	m ASL		2000		
10.02	Maximum coolant temperature without derating	°C		105		
10.03	Maximum fuel temperature without derating	°C		70		
10.04	Maximum intake manifold air temperature without derating	°C		75		
10.05	Maximum SCR inlet temperature without derating	°C		540		
11	**Equipment**					
11.01	Starter (base)	V / kW		24 / 5,5		
11.01	Starter (option)	V / kW		24 / 6,5		
11.02	Alternator (system / nominal voltage)(base)			24 / 28 / 140		
11.02	Alternator (system / nominal voltage) (option)	V / V / A		24 / 28 / 180		
11.03	Transmission ratio:	i		01:03,8		
11.04	Number of pole pairs			6		
11.05	Frequency	Hz		802		
11.06	Flywheel housing (base)			SAE 1		
11.07	Flywheel housing (option)			SAE 2		
12	**Optional**					
12.01	Engine brake			optional		
12.02	Air compressor			optional		
12.03	Climate compressor			optional		
12.04	Hydraulic pump			optional		
12.05	Engine pre-heating			optional		
13	**Power Take Off (PTO)**					
	PTO K					
13.01	Transmission ratio:	i		1 : 1,135		
13.02	Torque maximum continuous	Nm		665		
	PTO C					
13.03	Transmission ratio:	i		1 : 1,68		
13.04	Torque maximum continuous	Nm		100		
	PTO A					
13.05	Transmission ratio:	i		1 : 1,312		
13.06	Torque maximum continuous	Nm		230		
13.07	**Maximum power take-off from all PTOs togehter are nominal 270 kW at 2100 rpm.**					

General

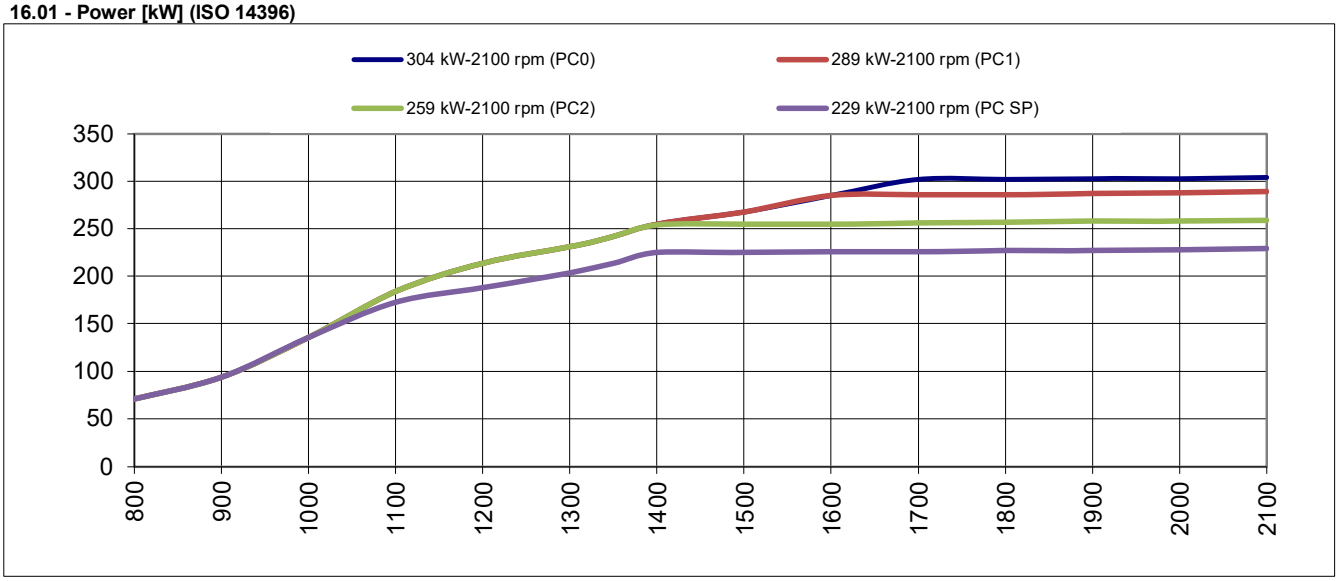
14	Component temperatures	Unit	PC 0	PC 1	PC 2	PC SP
14.01	Surface - Torsional vibration damper	°C		100		
14.02	Ambient - Torsional vibration damper	°C		90		
14.03	Ambient - Turbocharger bypass valve (wastegate) membrane canister	°C		180		
14.04	Ambient - Starter	°C		100		
14.05	Ambient - Alternator	°C		100		
14.06	Ambient - Engine control unit	°C		125		
14.07	Ambient - Wiring harness	°C		125		
14.08	Ambient - Pressure and temperature sensors	°C		125		
14.09	Ambient - High pressure sensor in fuel rail	°C		140		
14.10	Ambient - Volume control valve at high pressure pump	°C		125		
14.11	Ambient - EATS reduction agent pump	°C		85		
14.12	Surface - EATS air pump	°C		180		
14.13	Ambient - EATS air pump	°C		85		
14.14	Ambient - Humidity sensor	°C		125		
14.15	Ambient - reduction agent suction module	°C		85		
14.16	Ambient - Exhaust temperature sensor (connector)	°C		110		
14.17	Ambient - Speed sensor	°C		125		
14.18	Surface - Injector EATS	°C		550		
14.19	Ambient - Injector EATS	°C		150		
14.20	Ambient - NOx sensor 1 / 2	°C		200		
14.21	Ambient - NOx ECU 1 / 2	°C		105		
14.22	Ambient - Ambient reduction agent tank	°C		50		
14.23	Ambient - NH3 sensor (connector)	°C		200		
14.24	Ambient - NH3 ECU	°C		105		
14.25	EATS - Engine coolant valve	°C		105		
14.26	Ambient - Oil level sensor	°C		125		
14.27	Ambient - Air pressure switch	°C		120		
14.28	Ambient - ΔP Sensor	°C		135		
14.29	Ambient - Waste Gate Valve (electro pneumatic)	°C		125		

15	Remarks	Unit	PC 0	PC 1	PC 2	PC SP
15.01	Altitude	m ASL		800		
15.02	Ambient temperature	°C		25		
15.03	Relative humidty	%		50		
15.04	Charge air coolant temperature	°C		50		
15.05	delta pressure between blowby filter outlet to compressor inlet(from the customer	mbar		20		
15.06	Crankcase pressure	mbar		-10 bis +20		

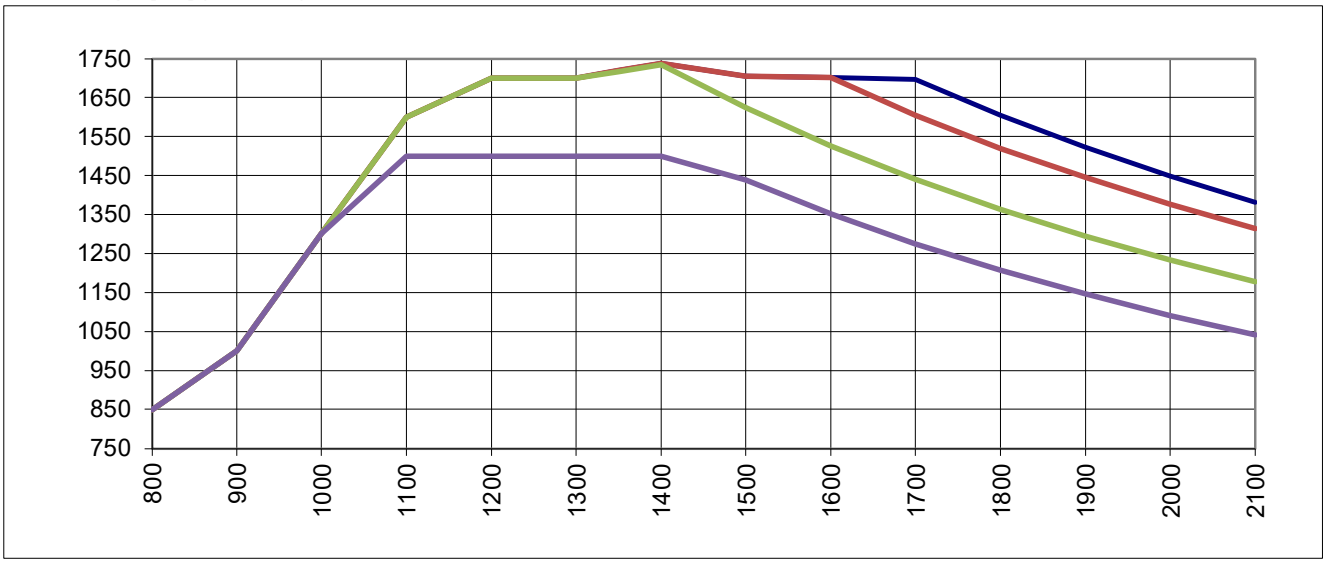
Tolerances on the power and torque declaration are according to standard ISO 9249, ISO 14396, ISO 3046-1, ECE-R.120 and ECE-R.24.
Tolerance on heat rejection power levels, exhaust gas flow, intake air flow and coolant flow is within ± 5% .
All pressures are given in relative value except the one specified in absolute.
If spark arrestor is installed, engine performance and fuel consumption may deteriorate and power reduction may occur earlier.

General

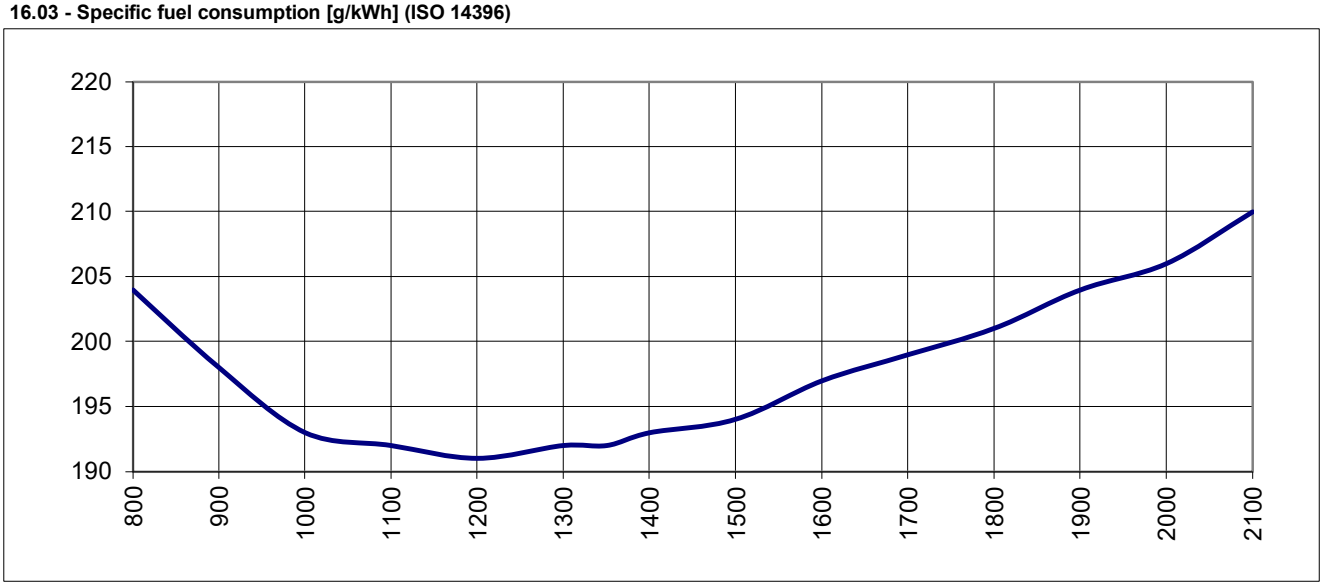
16.01 - Power [kW] (ISO 14396)



16.02 - Torque [Nm] (ISO 14396)

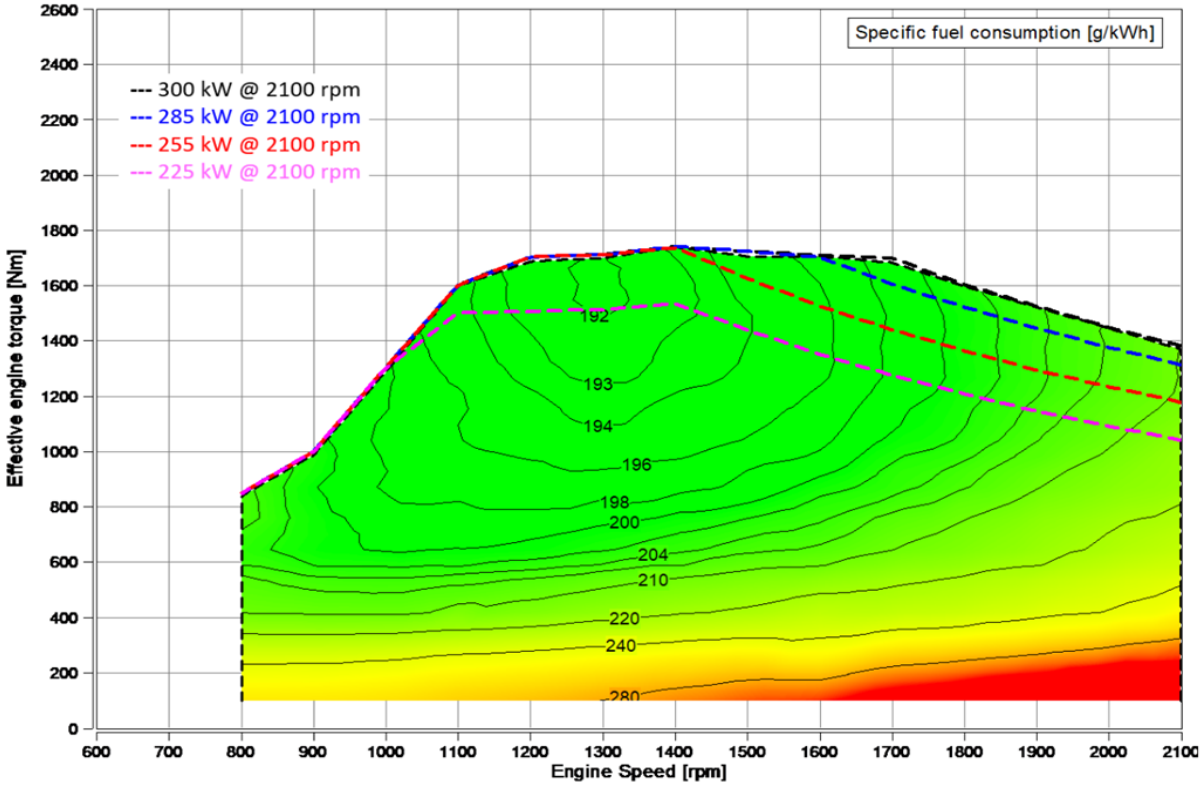


16.03 - Specific fuel consumption [g/kWh] (ISO 14396)



General

16.04 - Specific fuel consumption [g/kwh] (ISO 14396)



16.05 - Urea flow [kg/h] (ISO 14396)