

G9512

Natural gas engine Technical data



Layout

For stroke V- engine

Cylinder

V12 cylinder

Charge air

Turbocharger with water-cooled bearing housing

Intercooler:

*Two stage intercooler made of stainless steel
Cooling water flow to be provided by external water pump
to achieve 45°C charge air temperature*

Engine cooling

*Cooling water circulation powered through an external
water pump*

Grease

*Forced feed lubrication with optimized oil cooler for
maximum oil lifetime*

Spark plug

Special spark plug for industrial gas engines

Starter

7,8 kW – 24V

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General technical data		
Layout		V
Number of cylinders		12
Bore	mm	130
Stroke	mm	157
Cylinder capacity	l	25
Direction of rotation (facing the flywheel)		Left
Ignition sequence		1-12-2-11-3-10-6-7-5-8-4-9
Flywheel housing		SAE 1
Flywheel (number of teeth)	Z	137
Compression ratio	ϵ	13.3:1
Width (engine)	mm	1200
Length (engine)	mm	1550
Height (engine)	mm	1550
Weight (engine)	kg	2150
Mass moment of inertia	kgm ²	3.86
Piston velocity mean value	m/s	7.85
Minimum pressure before gas mixer	mbar	-20
Ignition pressure before turbo	mbar	-100
Max. exhaust gas back pressure	mbar	50
Motor oil capacity min / max	l	72/90
Cooling water capacity	l	65
Max. system pressure of cooling water min/max	bar	1 / 2.5
Cooling water recirculated quantity / min.	l/min	594
Cooling water-outlet temperature / min	°C	80
Cooling water-outlet temperature / max	°C	88
Temperature difference over engine (in-out max.)	K	5
Intake temperature max.	°C	35

Intercooler data		TA-air		½ TA-air	
		HT	LT	HT	LT
Input temperature of cooling water mixture	°C	80	35	80	35
Flow rate	m ³ /h	10.0	6.5	10.0	6.5
Recirculated quantity intercooler / min	m ³ /h	9.0	4.5	9.0	4.5
Recirculated quantity intercooler / max	m ³ /h	22.0	11.0	22.0	11.0
Drop in pressure	bar	0.286	0.076	0.286	0.076

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Performance data 50 Hz

Power rate		TA-air			½ TA-air		
		100%	80 %	60 %	100%	80 %	60 %
Air ratio ca. (depending on gas quality and controls)	λ	1.74	1.7	1.66	1.76	1.73	1.71
Mix-temperature max.	°C	45	45	45	45	45	45
Ignition timing before top dead center	grad	23	23	23	23	23	23
Rated speed	min-1	1500	1500	1500	1500	1500	1500
Max. rated power *)	kW	516	412	309	516	412	309
Max. torque	Nm	3289	2631	1973	3289	2631	1973
Brake mean effective pressure	bar	16.5	13.2	9.9	16.5	13.2	9.9
Consumption of lubricating oil	kg/h	0.10	0.08	0.06	0.10	0.08	0.06
Consumption of lubricating oil	g/kWh	0.3	0.2	0.2	0.3	0.2	0.2
Mechanical performance *)	kW	516	412	309	516	412	309
Colling water heat quantity (engine)	kW	185	170	145	178	166	151
Heat quantity of cooling water (intercooler HT-stage)	kW	62	46	23	76	49	24
Heat quantity of cooling water (intercooler LT-stage)	kW	41	23	10	45	27	16
Exhaust gas heat capacity 120 °C	kW	300	254	205	312	264	212
Combustible energy	kW	1237	1029	778	1283	1045	805

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Power rate	TA-Luft			½ TA-Luft		
	100 %	80 %	60 %	100 %	80 %	60 %

Mass flows							
Air Mass flow	kg/h	2654	2145	1616	2857	2242	1704
Gas consumption	kg/h	93	76	59	94	76	59
Exhaust Mass flow	kg/h	2747	2221	1674	2950	2318	1763

Temperatures							
Exhaust gas temperature after turbine	°C	475	491	505	485	491	505

		TA-Luft		½ TA-Luft	
Emission values					
NOX	mg/Nm ³	< 500	by 5 % residual oxygen	< 250	by 5 % residual oxygen
CO	mg/Nm ³	< 750	by 5 % residual oxygen	< 800	by 5 % residual oxygen
HC	g/Nm ³	< 2	by 5 % residual oxygen	< 2	by 5 % residual oxygen

Formaldehyde	to be calculated
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*) Rated power

**) DIN ISO 3046-1: The tolerance for specific fuel consumption is + 5 % at rated power
The tolerance for usable heat is 7 % at rated power

The technical data are based on standard conditions according to DIN ISO 3046-1

Standard conditions:

Air pressure absolute: 1013 m Bar

Air temperature: 25 °C

Relative humidity: 30 %

Performance data for natural gas with a calorific value of : 10,19 N/m³ methane number (MZ) > 80 for 80 % Methane (CH4)

Air ratio calculated with Lambdameter.

Power adjustment in accordance with environmental conditions DIN ISO 3046-1

The tolerance for specific fuel consumption is + 5 % at rated power

The tolerance for usable heat is 7% at rated power

The cooling water data are based on a share of 50 % antifreeze