



Natural Gas Engine E 0836 E 302 Technical Data

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09 / 2010



Principle:	4-stroke Otto gas engine
No of cylinders :	6 in line
Engine cooling :	Without engine water pump, coolant to be circulated by external water pump with temperature control.
Lubrication :	Pressure lubrication by gear-driven pump, exchangeable lube-oil filter in full flow and lube oil cooler integrated in engine coolant circuit.
Spark plugs:	Special spark plug for industrial gas engines.
Starter motor:	Pre-engaged-drive starter 24 V - 4.0 kW Starter battery capacity: 88 Ah, 24 V

Since our products are in continuous development, we reserve the right to make technical modifications.



ENGINE DATA

$\lambda = 1.00$

	50 Hz		50 Hz	
	METRIC		ENGLISH	
Rated speed	rpm	1500	rpm	1500
ISO standard power (COP)	kW	75	bhp	101
Air ratio	λ	1,00	λ	1,00
Configuration	in-line engine		in-line engine	
No of cylinders		6		6
Bore	mm	108	in	4,25
Stroke	mm	125	in	4,92
Swept volume	L	6,87	cu in	419
Direction of rotation looking on flywheel	counter clockwise		counter clockwise	
Flywheel housing	SAE 2		SAE 2	
Ring gear with number of teeth	Z	129	Z	129
Compression ratio	ϵ	13:1	ϵ	13:1
Mean effective pressure	bar	8,73	psi	126,7
Mean piston speed	m/s	6,3	in/s	246,1
Lube oil consumption up to	kg/h	0,10	lb/hr	0,026
Lube oil filling quantity min./max.	l	24/34	U.S. gal	6.3/9.0
Coolant filling quantity	l	16	U.S. gal	4,23
max. operating pressure	bar	2	psi	29,0
min. engine coolant circulation quantity	l/min	170	U.S. gal/min	45,0
Coolant temperature min.	°C	80	°F	176
max. coolant temperature	°C	88	°F	190
Difference (inlet - outlet max.)	K	6	K	6
max. suction pressure	mbar	15	psi	0,22
max. exhaust back pressure	mbar	40	psi	0,58
Engine width	mm	740	in	29,13
Engine length	mm	1090	in	42,91
Engine height	mm	930	in	36,61
Engine weight, dry	kg	520	lb	1146

Lube oil to MAN works standard M 3271-2 and coolant to MAN works standard M 324 Type NF
Gas quality to MAN data sheet - minimum requirement for the gas quality for MAN gas engines
Air ratio measured by lambdameter ETAS LA 4_E



RATING DATA

$\lambda = 1.00$

		50 Hz		
		METRIC		
Load	%	100	75	50
Ignition timing	°BTDC	18	18	18
ISO standard rating	kW	75	56	38
Coolant heat	kW	63	52	43
Exhaust heat up to 120 °C	kW	46	33	23
Radiation heat max.	kW	15		
Energy input	kW	204	159	122

Stroke	MJ/kWh	9,8	10,2	11,7
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Efficiency

mechanical	%	36,7	35,3	30,8
thermal	%	53,3	53,1	53,8
total	%	90,1	88,4	84,6

Mass flows

Combustion air	kg/h	257	198	151
Fuel	kg/h	15	12	9
Exhaust gas mass flow rate, wet	kg/h	272	209	160

Temperatures

Exhaust gas temperature	°C	610	580	550
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Emissions at 100 % load (Correlation 5 % O₂)

NO _x	mg/Nm ³	< 7000
	ppm	< 3500
CO	mg/Nm ³	< 5000
	ppm	< 4000

Engine surface noise	dB (A)	98,8
Exhaust sound power level	dB (A)	153,6

Reference gas mixing unit: RMG 985a-100/90 and ignition system Woodward IC 100

The technical data are based on natural gas with a calorific value of 10 kWh/Nm³ and a methane no. > 80

The technical data indicated is based on standard conditions acc to DIN ISO 3046-1

Standard conditions:

Atmospheric pressure absolute:	100 kPa
Air temperature	25 °C
Relative air humidity	30 %

Rating adaptation at ambient conditions acc to DIN ISO 3046-1

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

The tolerance for the usable heat is 7 % at rated output

The coolant data are based on a 40 % portion of antifreeze



RATING DATA

$\lambda = 1.00$

		100	75	50
Load	%	100	75	50
Ignition timing	°BTDC	18	18	18
ISO standard rating	Btu/min	4265	3199	2133
Coolant heat	Btu/min	3583	2957	2445
Exhaust heat up to 248 °F	Btu/min	2610	1857	1284
Radiation heat max.	Btu/min	853		
Energy input	Btu/min	11611	9063	6931

Stroke	Btu/bhp-hr	557	580	665
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Efficiency

mechanical	%	36,7	35,3	30,8
thermal	%	53,3	53,1	53,8
total	%	90,1	88,4	84,6

Mass flows

Combustion air	lb/hr	566	436	333
Fuel	lb/hr	33	26	20
Exhaust gas mass flow rate, wet	lb/hr	600	462	353

Temperatures

Exhaust gas temperature	°F	1130	1076	1022
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Emissions at 100 % load (Correlation 15 % O₂)

NO _x	g/bhp-hr	< 17,4
	ppm	< 1278
CO	g/bhp-hr	< 12,5
	ppm	< 1500

Engine surface noise	dB (A)	98,8
Exhaust sound power level	dB (A)	153,6

Reference gas mixing unit: RMG 985a-100/90 and ignition system Woodward IC 100

The technical data are based on natural gas with a calorific value of 970 Btu/cu ft and a methane no. > 80

The technical data indicated is based on standard conditions acc to DIN ISO 3046-1

Standard conditions:

Atmospheric pressure:	14,5 psi or 328 ft above sea level
Air temperature	77 °F
Relative air humidity	30 %

Rating adaptation at ambient conditions acc to DIN ISO 3046-1

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

The tolerance for the usable heat is 7 % at rated output

The coolant data are based on a 40 % portion of antifreeze



ENGINE DATA

$\lambda = 1.00$

	60 Hz		60 Hz	
	METRIC		ENGLISH	
Rated speed	rpm	1800	rpm	1800
ISO standard power (COP)	kW	85	bhp	114
Air ratio	λ	1,00	λ	1,00
Configuration	in-line engine		in-line engine	
No of cylinders		6		6
Bore	mm	108	in	4,25
Stroke	mm	125	in	4,92
Swept volume	L	6,87	cu in	419
Direction of rotation looking on flywheel	counter clockwise		counter clockwise	
Flywheel housing	SAE 2		SAE 2	
Ring gear with number of teeth	Z	129	Z	129
Compression ratio	ϵ	13:1	ϵ	13:1
Mean effective pressure	bar	8,25	psi	119,6
Mean piston speed	m/s	7,5	in/s	295,3
Lube oil consumption uo to	kg/h	0,10	lb/hr	0,026
Lube oil filling quantity min./max.	l	24/34	U.S. gal	6.3/9.0
Coolant filling quantity	l	16	U.S. gal	4,23
max. operating pressure	bar	2	psi	29,0
min. engine coolant circulation quantity	l/min	189	U.S. gal/min	50,0
Coolant temperature min.	°C	80	°F	176
max. coolant temperature	°C	88	°F	190
Difference (inlet - outlet max.)	K	6	K	6
max. suction pressure	mbar	15	psi	0,22
max. exhaust back pressure	mbar	40	psi	0,58
Engine width	mm	740	in	29,13
Engine length	mm	1090	in	42,91
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RATING DATA

$\lambda = 1.00$

		60 Hz		
		METRIC		
Load	%	100	75	50
Ignition timing	°BTDC	19	19	19
ISO standard rating	kW	85	64	43
Coolant heat	kW	70	59	48
Exhaust heat up to 120 °C	kW	55	41	29
Radiation heat max.	kW	16		
Energy input	kW	234	188	143
Stroke	MJ/kWh	9,9	10,6	12,0
Efficiency				
mechanical	%	36,4	34,0	30,0
thermal	%	53,6	53,2	53,7
total	%	90,0	87,2	83,7
Mass flows				
Combustion air	kg/h	291	234	178
Fuel	kg/h	17	14	10
Exhaust gas mass flow rate, wet	kg/h	308	248	188
Temperatures				
Exhaust gas temperature	°C	650	620	590
Emissions at 100 % load (Correlation 5 % O₂)				
NO _x	mg/Nm ³	< 7000		
	ppm	< 3500		
CO	mg/Nm ³	< 5000		
	ppm	< 4000		
Engine surface noise	dB (A)	100,9		
Exhaust sound pressure level	dB (A)	146,8		

Reference gas mixing unit: RMG 985a-100/90 and ignition system Woodward IC 100

The technical data are based on natural gas with a calorific value of 10 kWh/Nm³ and a methane no. > 80

The technical data indicated is based on standard conditions acc to DIN ISO 3046-1

Standard conditions:

Atmospheric pressure absolute: 100 kPa
Air temperature 25 °C
Relative air humidity 30 %

Rating adaptation at ambient conditions acc to DIN ISO 3046-1

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

The tolerance for the usable heat is 7 % at rated output

The coolant data are based on a 40 % portion of antifreeze



RATING DATA

$\lambda = 1.00$

		100	75	50
Load	%	100	75	50
Ignition timing	°BTDC	19	19	19
ISO standard rating	Btu/min	4834	3640	2445
Coolant heat	Btu/min	3981	3355	2730
Exhaust heat up to 248 °F	Btu/min	3146	2347	1650
Radiation heat max.	Btu/min	910		
Energy input	Btu/min	13293	10717	8151

Stroke

	Btu/bhp-hr	6997	7492	8481

Efficiency

	%	36,4	34,0	30,0
mechanical	%	36,4	34,0	30,0
thermal	%	53,6	53,2	53,7
total	%	90,0	87,2	83,7

Mass flows

	lb/hr	641	516	392
Combustion air	lb/hr	641	516	392
Fuel	lb/hr	38	30	23
Exhaust gas mass flow rate, wet	lb/hr	679	546	415

Temperatures

	°F	1202	1148	1094
Exhaust gas temperature	°F	1202	1148	1094

Emissions at 100 % load (Correlation 15 % O₂)

NO _x	g/bhp-hr	< 17,4
	ppm	< 1278
CO	g/bhp-hr	< 12,5
	ppm	< 1500

Engine surface noise	dB (A)	100,9
Exhaust sound pressure level	dB (A)	146,8

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Rating adaptation at ambient conditions acc to DIN ISO 3046-1

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

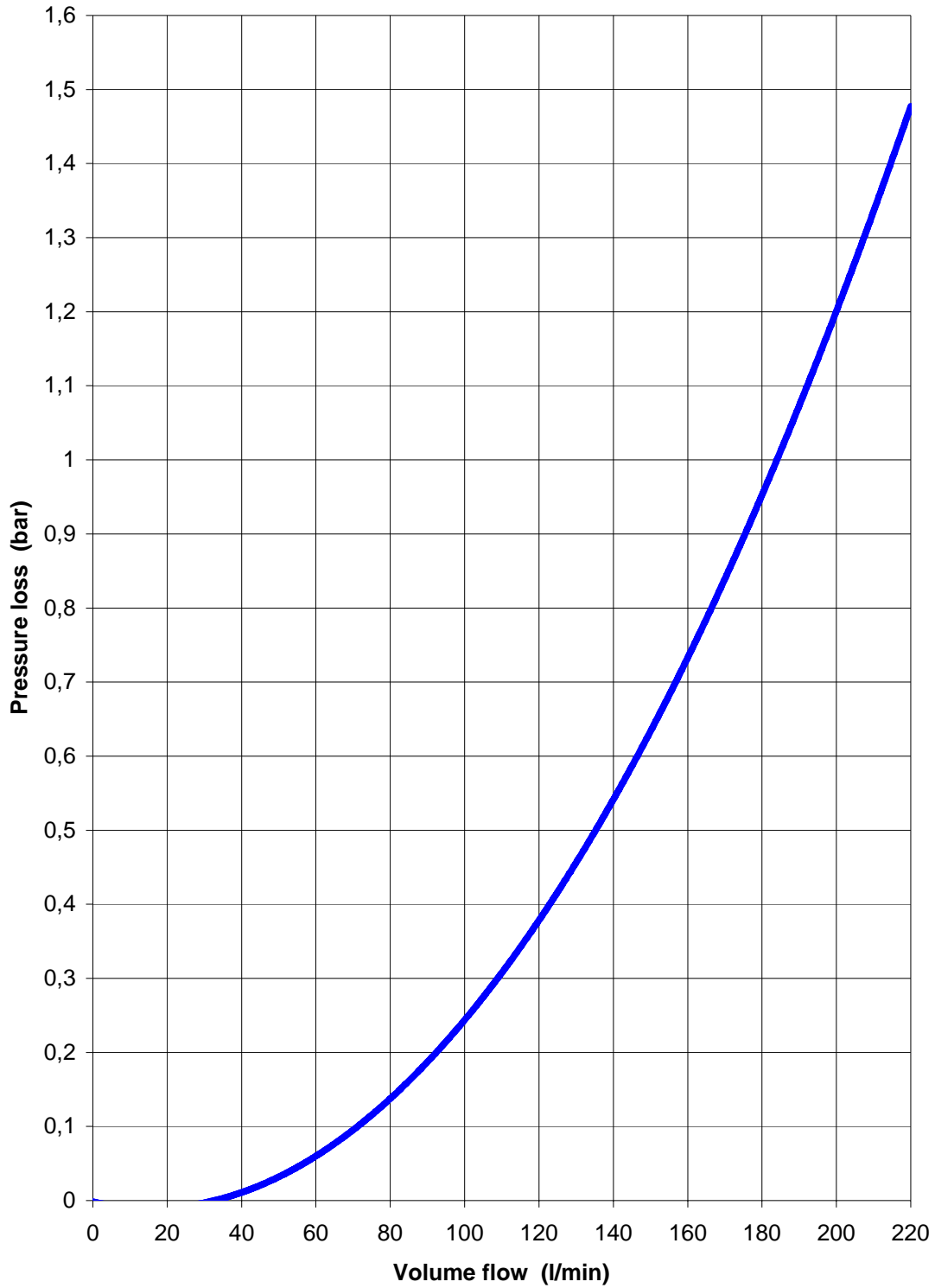
The tolerance for the usable heat is 7 % at rated output

The coolant data are based on a 40 % portion of antifreeze



Resistance Curve of Engine

METRIC





Resistance Curve of Engine

ENGLISH

