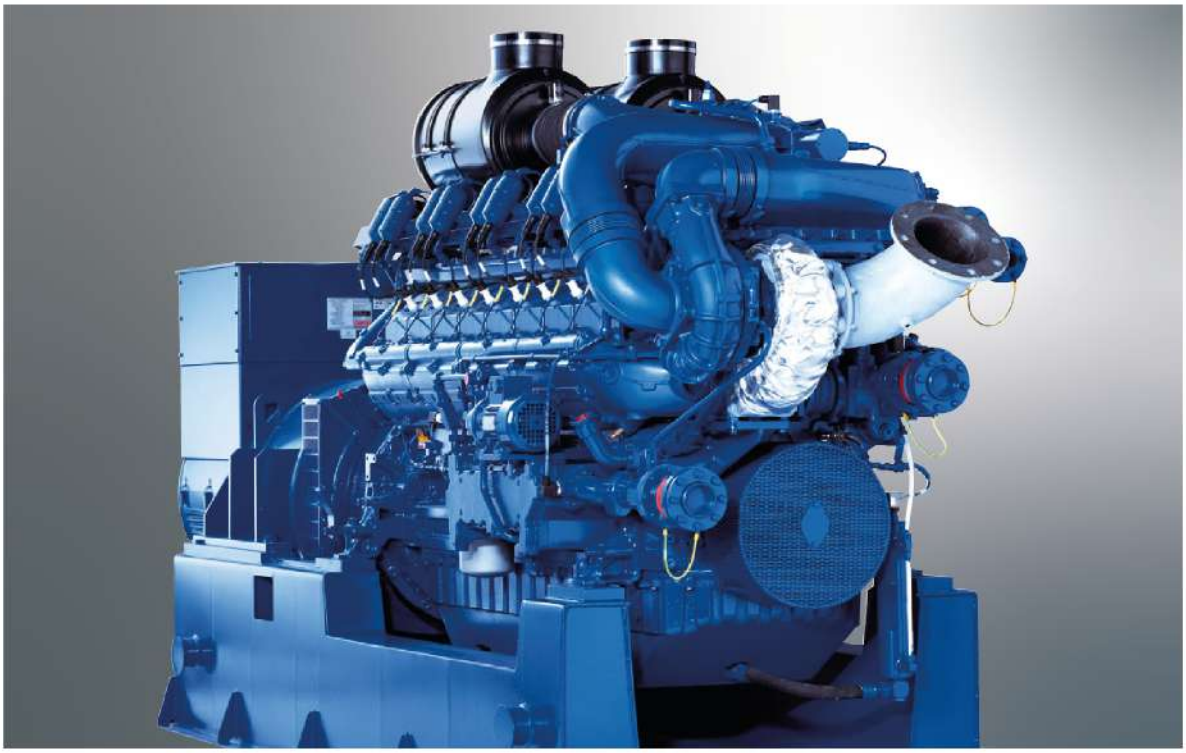
TBG 616 The gas engine.

290-580 kW at 1500 min^{-1} (50 Hz)



These are the characteristics of the TBG 616 :

State-of-the art 8, 12 and 16 cylinder V-engines.
Air-fuel turbocharging and two-stage intercooling.
Single cylinder heads with four-valve technology.
Centrally arranged industrial spark plug with intensive plug seat cooling.
Microprocessor-controlled high-voltage ignition system.
One ignition coil per cylinder.
Electronic control and monitoring of genset operation through TEM.
Exhaust emissions controlled according to combustion chamber temperature.

Your benefits:

- Package of favourable investment and low operating costs.
- Low energy consumption thanks to maximum primary energy utilization.
- Long service intervals and ease of service guarantee additional cost savings.
- Efficient energy conversion with outstanding efficiencies.
- Intercooling permits maximum power even when using gases with low methane numbers.
- Reliable control and monitoring with high safety standards ensure optimum combustion and maximum engine protection.
- All governing, service, control and monitoring functions are easy and comfortable to operate.

Technical data 50 Hz $NO_X <= 500\ mg/m^3_n$ [1]

Naturalgas applications — **Minimum methane number MN: 80, wet exhaust manifold with inliner**

Engine type		TBG616 V8	TBG616 V12	TBG616 V16
Engine power [2]	kW	290	475	580
Speed	min^{-1}	1500	1500	1500
Mean effective pressure	bar	16.0	16.0	16.0
Exhaust temperature	approx.°C	375	411	417
Exhaust mass flow wet	approx. kg/ h	1940	2888	3788
Combustion air mass flow [2]	approx. kg/h	1872	2789	3655
Combustion air temperature minimum/design	°C	20/25	20/25	20/25
Ventilation air flow [3]	approx. kg/h	9753	14252	18461
Generator				
Efficiency [4]	%	96.4	96.6	96.9
Energy balance				
Electrical power [4]	kW	280	450	560
Jacket water heat	± 8 % kW	290	382	509
Intercooler LT heat [5]	± 8 % kW	21	29	41
Exhaust cooled to 120°	± 8 % kW	152	260	248
Exhaust cooled to 150°	± 8 % kW	134	233	313
Engine radiation heat	kW	20	30	40
Generator radiation heat	kW	13	18	22
Fuel consumption [6]	+ 5 % kW	700	1100	1380
Specific fuel consumption [6]	+ 5 % kWh/kWh	2.41	2.31	2.37
Electrical efficiency	%	41	41	42.2
Thermal efficiency	%	46.2	46.7	46.7
Total efficiency	%	87.2	87.7	87.9
System parameters				
Engine jacket water flow rate min./max.	m^3/h	16/30	22/36	30/45
Engine K_{VS}-value [7]	m^3/h	30.8	37.1	40.2
Intercooler coolant flow rate	m^3/h	8	10	10
Intercooler K_{VS}-value [7]	m^3/h	18.8	18.8	18.8
Engine jacket water volume	dm^3	28	40	53
Intercooler coolant volum	dm^3	3	3	3
Engine jacket water temperature max. [8]	°C	78/90	78/90	78/90
– with glycol [8]	°C	(74/86)	(74/86)	(74/86)
Intercooler coolant temperature [8]	°C	40/-	40/-	40/-
Exhaust backpressure min./max.	mbar	30/50	30/50	30/50
Maximum pressure loss infront of air cleaner	mbar	5	5	5
Gas flow pressure, fixed between	mbar	20...100	20...100	20.100
Starter battery 24 V, capacity require	Ah	143	143	286
Dry weight engine	kg	1810	2380	2880
Dry weight genset	kg	3750	4890	5510

Engine type		TBG 616 V8	TBG 616 V12	TBG 616 V16
Bore/ stroke	mm	132/160	132/160	132/160
Displacement	dm^3	17.5	26.3	35.00
Compression ratio		12:1	12:1	12:1
Mean piston speed	m/s	8.0	8.0	8.0
Lube oil content [9]	dm^3	70	100	135
Lube oil consumption mineral oil [10]	+ 20 % g/kWh	0.3	0.3	0.3

Technical data 50 Hz NO_X <= 500 mg/m ^3_n

Sewage gas application (65 % CH_4 / 35 % CO_2)
Landfill gas application (50 % CH_4 / 27 % CO_2, rest N_2)

Minimum heating value (LHV) = 5.0 kWh/m ^3_n
wet exhaust manifold without inliner

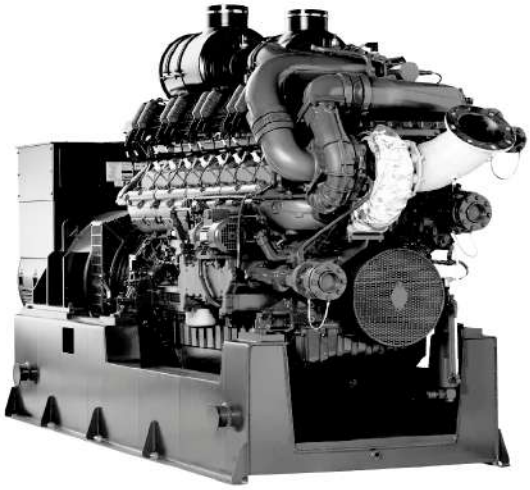
Engine type		TBG616 V8	TBG616 V12	TBG616 V16
Engine power[2]	kW	280	450	560
Speed	min^{-1}	1500	1500	1500
Mean effective pressure	bar	14.8	14.8	14.8
Exhaust temperature	approx. °C	380	403	400
Exhaust mass flow wet	approx. kg/h	1802	2655	3485
Combustion air mass flow[2]	approx. kg/h	1595	2353	3081
Combustion air temperature minimum/design	°C	20/25	20/25	20/25
Ventilation air flow[3]	approx. kg/h	9237	13338	17648
Generator				
Efficiency[4]	%	96.4	96.6	96.8
Energy balance				
Electrical power[4]	kW	270	440	540
Jacket water heat	± 8 % kW	307	412	564
Intercooler LT heat[5]	± 8 % kW	21	29	36
Exhaust cooled to 120°	± 8 % kW	152	260	248
Exhaust cooled to 150°	± 8 % kW	134	233	313
Engine radiation heat	kW	20	30	40
Generator radiation heat	kW	13	18	22
Fuel consumption[6]	+ 5 % kW	650	1100	1310
Specific fuel consumption[6]	+ 5 % kWh/kWh	2.32	2.44	2.33
Electrical efficiency	%	41	41	42.2
Thermal efficiency	%	46.2	46.7	46.7
Total efficiency	%	87.2	87.7	87.9
System parameters				
Engine jacket water flow rate min./max.	m^3/h	16/30	22/36	30/45
Engine K_{VS}-value[7]	m^3/h	30.8	37.1	40.2
Intercooler coolant flow rate	m^3/h	8	10	10
Intercooler K_{VS}-value[7]	m^3/h	18.8	18.8	18.8
Engine jacket water volume	dm^3	28	40	53
Intercooler coolant volum	dm^3	3	3	3
Engine jacket water temperature max.[8]	°C	78/90	78/90	78/90
– with glycol[8]	°C	(74/86)	(74/86)	(74/86)
Intercooler coolant temperature[8]	°C	40/-	40/-	40/-
Exhaust backpressure min./max.	mbar	30/50	30/50	30/50
Maximum pressure loss infront of air cleaner	mbar	5	5	5
Gas flow pressure, fixed between	mbar	20...100	20...100	20.100
Starter battery 24 V, capacity require	Ah	143	143	286
Dry weight engine	kg	1810	2380	2880
Dry weight genset	kg	3750	4890	5510

1) Exhaust emissions with oxidizing catalyst:
NO_X < 0.50 g NO_2/m^3_n dry exhaust gas at 5 % O
CO < 0.3 g CO/m^3_n dry exhaust gas at 5 % O
Formaldehyde < 0.06 g $/m^3_n$ dry exhaust gas at 5 % O
2) Engine power ratings and combustion air volume flows acc. to ISO 3046/1.
3) Intake air flow at delta T = 15 K including combustion air.
4) At 50 Hz, U = 0.4 kV, power factor = 1.
5) At 40 °C water inlet.
6) With a tolerance of + 5 %.
7) The K_{VS}-value is the parameter for the pressure loss in the cooling system (= flowrate for 1 bar pressure loss).
8) Inlet/outlet.
9) Including pipes and heat exchangers.
10) At full load.

Data for special gas and dual gas operation on request.
The values given in this data sheet are for information purposes only and not binding.
The information given in the offer is decisive.

Dimensions 50 Hz

Minimum methane number MN: 80



Noise emissions* 50 Hz

Noise frequency band		Hz	63	125	250	500	1000	2000	4000	8000
Engine type TBG 616 V8										
Exhaust noise	120 dB(A)	dB (lin)	108	125	123	116	114	112	107	103
Air-borne noise	97 dB(A)	dB (lin)	85	85	91	93	87	88	92	91
Engine type TBG 616 V12										
Exhaust noise	122 dB(A)	dB (lin)	105	126	118	120	115	113	112	105
Air-borne noise	98 dB(A)	dB (lin)	82	87	91	93	93	90	88	93
Engine type TBG 616 V16										
Exhaust noise	125 dB(A)	dB (lin)	108	119	123	120	119	118	115	10
Air-borne noise	99 dB(A)	dB (lin)	85	93	92	94	93	91	89	92

Exhaust noise at 1 m, ∢45 °, ± 2.5 dB (A)
Air-borne noise at 1 m from the side, ±1 dB (A)

*** Values apply to natural gas applications, measured as noise pressure level.**

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