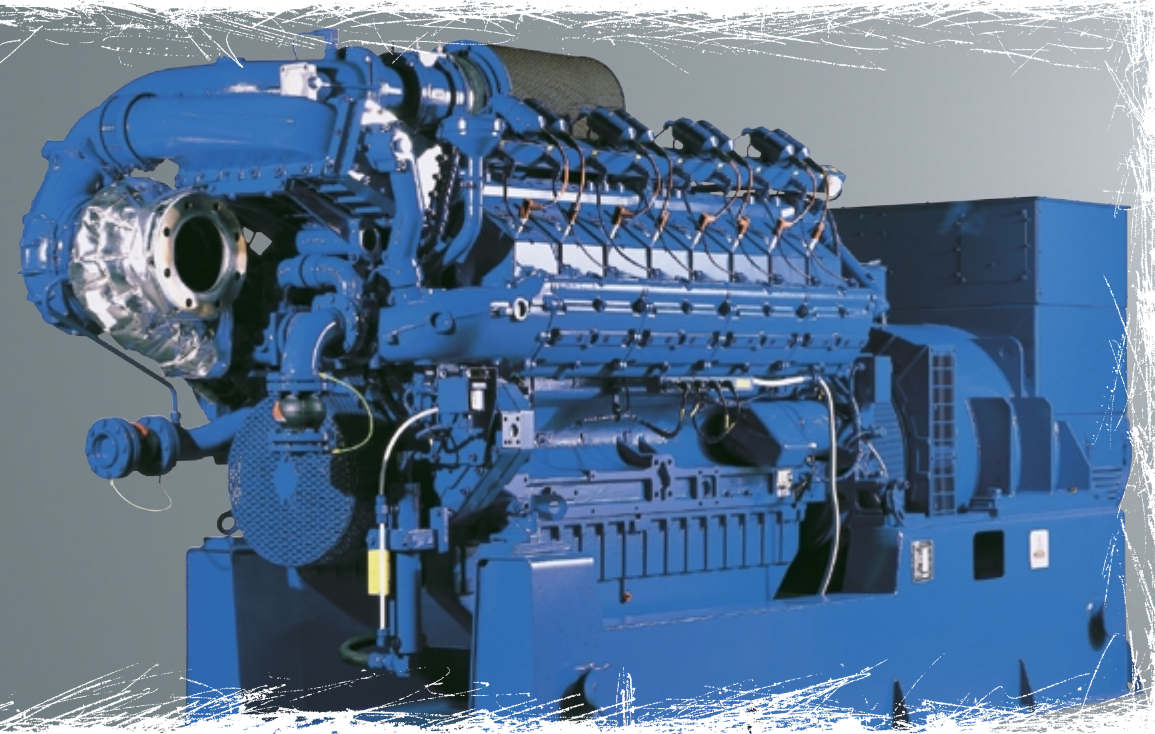


TBG 616. The gas engine.



323-700 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 igniter 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

$\text{NO}_x \leq 500 \text{ mg/m}_n^{3 \cdot 1)}$

Naturalgas applications

**Minimum methane number MN: 70
wet exhaust manifold with inliner**

Engine type		TBG 616 V8 K	TBG 616 V12 K	TBG 616 V16 K
Engine power ²⁾	kW	350	525	700
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	1873	2790	3656
Ventilation air flow ³⁾	approx. m ³ /h	8306	12333	15953

Generator

Efficiency ⁴⁾	%	96.5	96.6	96.9
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Energy balance

Electrical power ⁴⁾	kW	338	507	678
Jacket water heat	± 8 % kW	290	382	509
Intercooler LT heat ⁵⁾	± 8 % kW	21	29	41
Exhaust cooled to 120°C	± 8 % kW	152	259	348
Engine radiation heat	kW	20	30	40
Generator radiation heat	kW	12	18	22
Fuel consumption ⁶⁾	± 5 % kW	914	1346	1795
Electrical efficiency	%	37.0	37.7	37.8
Thermal efficiency	%	48.4	47.6	47.7
Total efficiency	%	85.4	85.3	85.5

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 volume	dm ³	3	3	3
Engine jacket water temperature ⁸⁾ – with glycol ⁸⁾	°C	78/90 (74/86)	78/90 (74/86)	78/90 (74/86)
Intercooler coolant temperature ⁸⁾	°C	40/–	40/–	40/–
Exhaust backpressure min./max.	mbar	20/50	20/50	20/50
Maximum pressure loss in front of air cleaner	mbar	5	5	5
Gas flow pressure, fixed between (tolerance +/- 10 %)	mbar	20...100	20...100	20...100
Starter battery 24 V, capacity required	Ah	143	143	286
Dry weight engine	kg	1810	2380	2880
Dry weight genset	kg	3800	5000	5650

Engine type		TBG 616 V8 K	TBG 616 V12 K	TBG 616 V16 K
Bore/stroke	mm	132/160	132/160	132/160
Displacement	dm ³	17.5	26.3	35.0
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⁾	g/kWh	0.3	0.3	0.3

► Technical data

NO_x ≤ 500 mg/m_n³

Sewage gas application (65 % CH₄/35 % CO₂)

Landfill gas application (50 % CH₄/27 % CO₂, rest N₂)

Minimum heating value (LHV) = 5.0 kWh/m_n³

wet exhaust manifold without Inliner

Engine type		TBG 616 V8 K	TBG 616 V12 K	TBG 616 V16 K
Engine power ²⁾	kW	323	485	647
Mean effective pressure	bar	14.8	14.8	14.8
Exhaust temperature	approx. °C	370	412	409
Exhaust mass flow wet	approx. kg/h	1805	2687	3528
Combustion air mass flow ²⁾	approx. kg/h	1648	2456	3219
Ventilation air flow ³⁾	approx. m ³ /h	7981	11761	15367
Generator				
Efficiency ⁴⁾	%	96.4	96.6	96.8
Energy balance				
Electrical power ⁴⁾	kW	311	469	626
Jacket water heat	± 8 % kW	318	412	562
Intercooler LT heat ⁵⁾	± 8 % kW	21	27	36
Exhaust cooled to 120 °C	± 8 % kW	133	234	303
Engine radiation heat	kW	20	30	40
Generator radiation heat	kW	12	16	21
Fuel consumption ⁶⁾	± 5 % kW	878	1282	1711
Electrical efficiency	%	35.5	36.5	36.6
Thermal efficiency	%	51.4	50.4	50.6
Total efficiency	%	86.9	86.9	87.2
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 volume	dm ³	3	3	3
Engine jacket water temperature ⁸⁾	°C	78/90	78/90	78/90
– with glycol ⁸⁾	°C	(78/90)	(78/90)	(78/90)
Intercooler coolant temperature ⁸⁾	°C	40/–	40/–	40/–
Exhaust backpressure min./max.	mbar	20/50	20/50	20/50
Maximum pressure loss in front of air cleaner	mbar	5	5	5
Gas flow pressure, fixed between (tolerance +/- 10 %)	mbar	20...100	20...100	20...100
Starter battery 24 V, capacity required	Ah	143	143	286
Dry weight engine	kg	1810	2380	2880
Dry weight genset	kg	3800	5000	5650

1) Exhaust emissions with oxidizing catalyst:
NO_x < 0.50 g NO₂/m_n³ dry exhaust gas at 5 % O₂
CO < 0.65 g CO/m_n³ dry exhaust gas at 5 % O₂
NMHC < 0.15 g NMHC/m_n³ dry exhaust gas at real O₂
(NMHC = Non-Methan-Hydro Carbons).

2) Engine power ratings and combustion air volume flows acc. to ISO 3046/1.

3) Intake air volume 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 (= flow rate for 1 bar pressure loss).

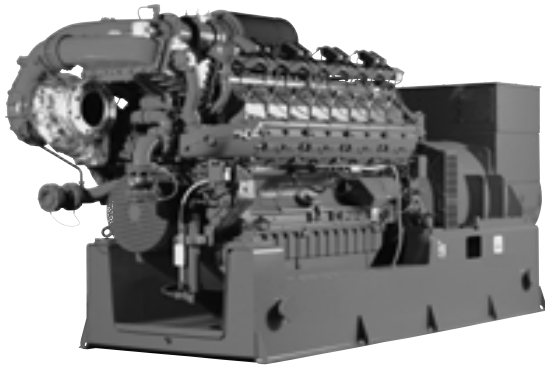
8) Inlet/outlet.

9) Including pipes and heat exchangers.

10) At full load (± 20 %).

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



Genset		Length	Width	Height
TBG 616 V8 K	mm	3100	1300	2100
TBG 616 V12 K	mm	4000	1400	2100
TBG 616 V16 K	mm	4400	1400	2200

► Noise emissions*

Noise frequency band	Hz	63	125	250	500	1000	2000	4000	8000	
Engine type TBG 616 V8 K										
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 K										
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 K										
Exhaust noise	125 dB (A)	dB (lin)	108	119	123	120	119	118	115	107
Air-borne noise	99 dB (A)	dB (lin)	85	93	92	94	93	91	89	92

Exhaust noise at 1 m, $\leq 45^\circ$, ± 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.

For further details please contact DEUTZ ENERGY GmbH in Mannheim.



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