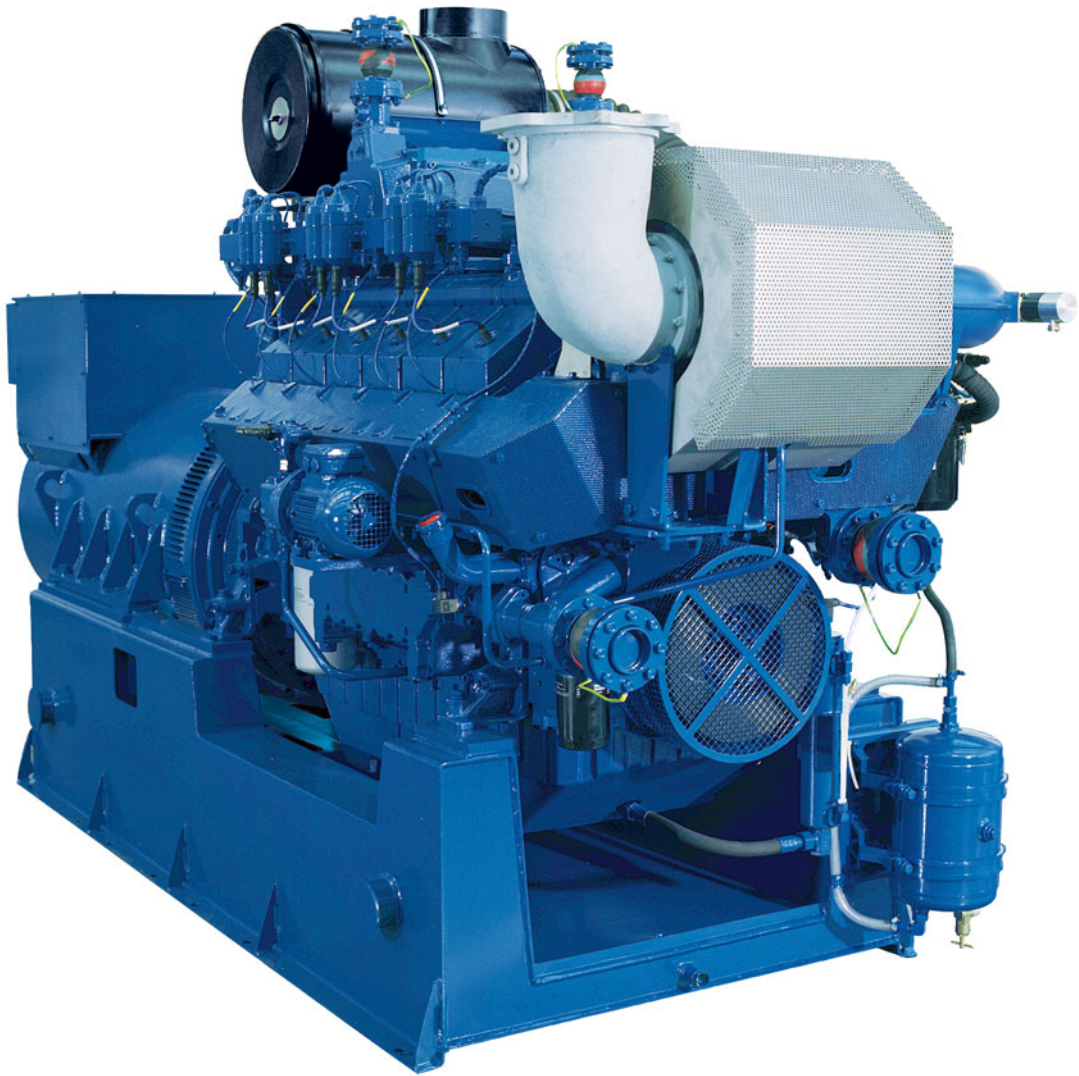


# *DEUTZ POWER SYSTEMS*



# TCG 2016

555–800 kW at 1500 min<sup>-1</sup> (50 Hz)

# Technical data 50 Hz – Natural gas applications

NO<sub>x</sub> ≤ 500 mg/m<sub>n</sub><sup>3</sup> <sup>1)</sup>

Minimum methane number MN 80  
dry exhaust manifolds

Engine type		TCG 2016 V12	TCG 2016 V16
Engine power <sup>2)</sup>	kW	600	800
Speed	min <sup>-1</sup>	1500	1500
Mean effective pressure	bar	18.3	18.3
Exhaust temperature	approx. °C	468	471
Exhaust mass flow wet	approx. kg/h	3239	4294
Combustion air mass flow <sup>2)</sup>	approx. kg/h	3134	4155
Combustion air temperature minimum/design	°C	20/25	20/25
Ventilation air flow <sup>3)</sup>	approx. kg/h	13164	17528
Engine parameters			
Bore/stroke	mm	132/160	132/160
Displacement	dm <sup>3</sup>	26.3	35.0
Compression ratio		12.0 : 1	12.0 : 1
Mean piston speed	m/s	8.0	8.0
Lube oil content <sup>4)</sup>	dm <sup>3</sup>	100	135
Typical mean lube oil consumption <sup>5)</sup>	g/kWh	0.15	0.15
Generator			
Efficiency <sup>6)</sup>	%	96.7	96.8
Energy balance			
Electrical power <sup>6)</sup>	kW	580	774
Jacket water heat	± 8 % kW	209	287
Intercooler LT heat <sup>7)</sup>	± 8 % kW	118	141
Exhaust cooled to 120 °C	± 8 % kW	349	466
Engine radiation heat	kW	22	30
Generator radiation heat	kW	20	26
Fuel consumption <sup>8)</sup>	+ 5 % kWh	1422	1882
Electrical efficiency	%	40.8	41.1
Thermal efficiency	%	39.2	40.0
Total efficiency	%	80.0	81.2
System parameters			
Engine jacket water flow rate min./max.	m <sup>3</sup> /h	28/44	38/58
Engine K <sub>VS</sub> -value <sup>9)</sup>	m <sup>3</sup> /h	40.0	42.0
Intercooler coolant flow rate	m <sup>3</sup> /h	20	20
Intercooler K <sub>VS</sub> -value <sup>9)</sup>	m <sup>3</sup> /h	60.0	60.0
Engine jacket water volume	dm <sup>3</sup>	40	53
Intercooler coolant volume	dm <sup>3</sup>	10	10
Engine jacket water temperature max. <sup>10)</sup>	°C	84/90	84/90
– with glycol <sup>10)</sup>	°C	(84/90)	(84/90)
Intercooler coolant temperature <sup>10)</sup>	°C	40/–	40/–
Exhaust backpressure min./max.	mbar	30/50	30/50
Maximum pressure loss in front of air cleaner	mbar	5	5
Gas flow pressure, fixed between (pressure variation +/– 10%)	mbar	20...100	20...100
Starter battery 24 V, capacity required	Ah	143	286

# Technical data 50 Hz – Sewage, bio and landfill gas applications

**NO<sub>x</sub> ≤ 500 mg/m<sub>n</sub><sup>3</sup>**

**Sewage gas (65 % CH<sub>4</sub> / 35 % CO<sub>2</sub>)**

**Bio gas (60 % CH<sub>4</sub> / 32 % CO<sub>2</sub>, rest N<sub>2</sub>)**

**Landfill gas (50 % CH<sub>4</sub> / 27 % CO<sub>2</sub>, rest N<sub>2</sub>)**

**Minimum heating value (LHV) = 5.0 kWh/m<sub>n</sub><sup>3</sup>  
dry exhaust manifolds**

Engine type		TCG 2016 V12	TCG 2016 V16
Engine power <sup>2)</sup>	kW	555	740
Speed	min <sup>-1</sup>	1500	1500
Mean effective pressure	bar	16.9	16.9
Exhaust temperature	approx. °C	497	500
Exhaust mass flow wet	approx. kg/h	2958	3912
Combustion air mass flow <sup>2)</sup>	approx. kg/h	2641	3491
Combustion air temperature minimum/design	°C	20/25	20/25
Ventilation air flow <sup>3)</sup>	approx. kg/h	11954	16148
<b>Generator</b>			
Efficiency <sup>6)</sup>	%	96.7	96.8
<b>Energy balance</b>			
Electrical power <sup>6)</sup>	kW	537	716
Jacket water heat	± 8 % kW	211	279
Intercooler LT heat <sup>7)</sup>	± 8 % kW	93	120
Exhaust cooled to 150 °C	± 8 % kW	321	429
Engine radiation heat	kW	21	29
Generator radiation heat	kW	18	24
Fuel consumption <sup>8)</sup>	+ 5 % kW	1341	1777
Electrical efficiency	%	39.7	39.8
Thermal efficiency	%	41.5	41.6
Total efficiency	%	79.7	80.2
<b>System parameters</b>			
Engine jacket water flow rate min./max.	m <sup>3</sup> /h	28/44	38/58
Engine K <sub>VS</sub> -value <sup>9)</sup>	m <sup>3</sup> /h	40.0	42.0
Intercooler coolant flow rate	m <sup>3</sup> /h	20	20
Intercooler K <sub>VS</sub> -value <sup>9)</sup>	m <sup>3</sup> /h	60.0	60.0
Engine jacket water volume	dm <sup>3</sup>	40	53
Intercooler coolant volume	dm <sup>3</sup>	10	10
Engine jacket water temperature max. <sup>10)</sup>	°C	84/90	84/90
– with glycol <sup>10)</sup>	°C	(84/90)	(84/90)
Intercooler coolant temperature <sup>10)</sup>	°C	50/–	50/–
Exhaust backpressure min./max.	mbar	30/50	30/50
Maximum pressure loss in front of air cleaner	mbar	5	5
Gas flow pressure, fixed between pressure variation +/- 10 %)	mbar	20...100	20...100
Starter battery 24 V, capacity required	Ah	143	286

1) Exhaust emissions with oxidizing catalyst:  
NO<sub>x</sub> < 0.50 g NO<sub>2</sub>/m<sub>n</sub><sup>3</sup> dry exhaust gas at 5 % O<sub>2</sub>

CO < 0.30 g CO/m<sub>n</sub><sup>3</sup> dry exhaust gas at 5 % O<sub>2</sub>  
Formaldehyde < 0.06 g/m<sub>n</sub><sup>3</sup> dry exhaust gas at 5 % O<sub>2</sub>

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) Including pipes and heat exchangers

5) At full load

6) At 50 Hz, U=0.4 kV, power factor = 1

7) At 40 °C water inlet (50 °C for biogas)

8) With a tolerance of +5 %

9) The K<sub>VS</sub>-value is the parameter for the pressure loss in the cooling system (= flowrate for 1 bar pressure loss)

10) Inlet /outlet

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

Genset		TCG 2016 V12	TCG 2016 V16
Length	mm	3700	4000
Width	mm	1450	1450
Height	mm	2200	2200
Dry weight genset	kg	5700	6570

## Noise emissions\* 50Hz

Noise frequency band	Hz	63	125	250	500	1000	2000	4000	8000
<b>Engine type TCG 2016 V12</b>									
Exhaust noise 121.4 dB(A)	dB(lin)	105.5	116.5	121.5	116.2	115.5	115.5	110.0	104.0
Air-borne noise 98.7 dB(A)	dB(lin)	86.0	88.5	90.0	92.5	92.0	91.5	88.0	94.5

## Engine type TCG 2016 V16

Exhaust noise 122.4 dB(A)	dB(lin)	107.0	116.5	123.0	117.5	116.0	116.5	111.0	104.0
Air-borne noise 101.4 dB(A)	dB(lin)	91.0	100.0	97.0	97.5	96.5	94.5	91.0	88.0

Exhaust noise in 1 m,  $\angle 45^\circ$ ,  $\pm 2,5$  dB(A)

Air-borne noise at 1 m from the side,  $\pm 1$  dB(A)

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

## Characteristics:

State-of-the-art 12 and 16 cylinder V-engines | Turbocharging and 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 favorable 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 performance.
- 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.

