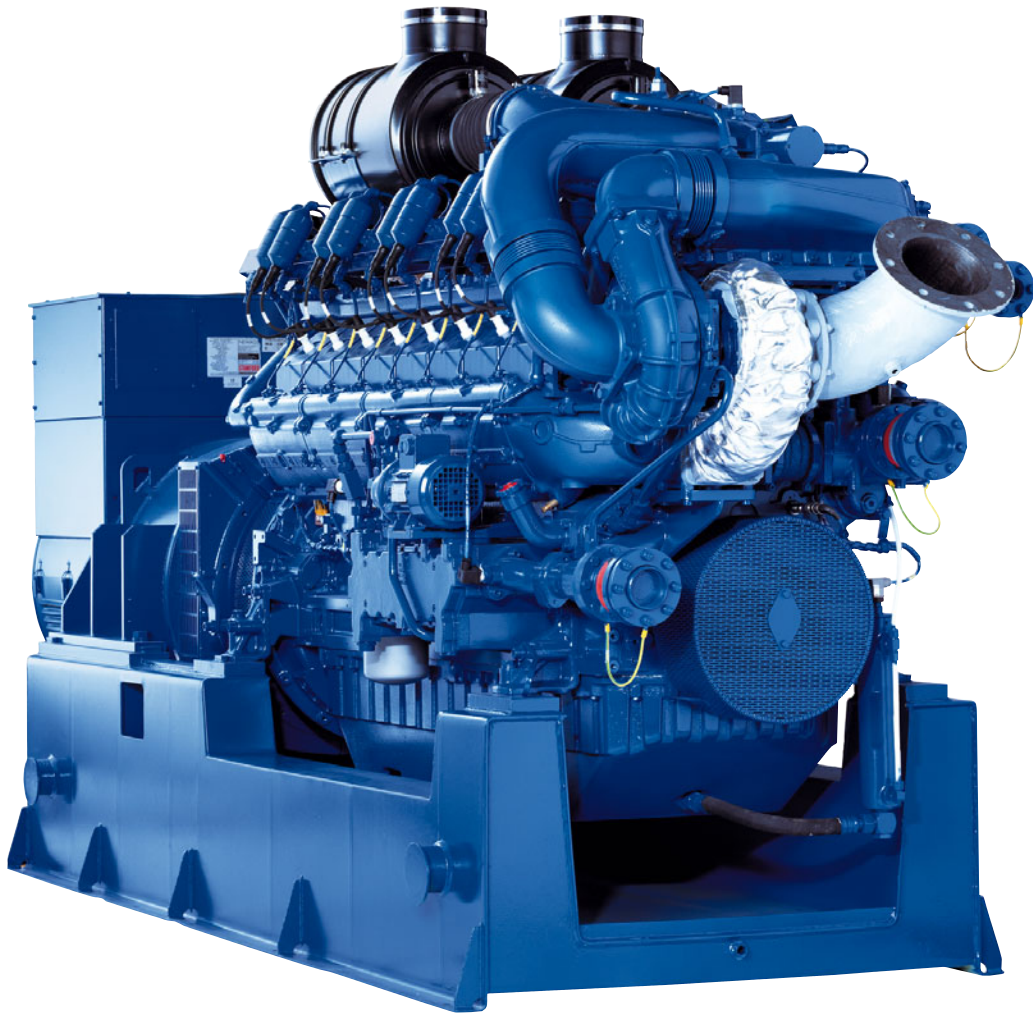


DEUTZ POWER SYSTEMS



TCG 2016 K

323 – 700 kW at 1500 min⁻¹ (50 Hz)

Technical data 50 Hz – Natural gas applications

NO_x ≤ 500 mg/m_n³ ¹⁾

Minimum methane number MZ 70
wet exhaust manifolds with inliner

| Engine type | | TCG 2016 V8 K | TCG 2016 V12 K | TCG 2016 V16 K |
|----------------------------------------------|-------------------|---------------|----------------|----------------|
| Engine power ²⁾ | kW | 350 | 525 | 700 |
| Speed | min ⁻¹ | 1500 | 1500 | 1500 |
| Mean effective pressure | bar | 16.0 | 16.0 | 16.0 |
| Exhaust temperature | approx. °C | 378 | 414 | 420 |
| 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 | 14013 | 18461 |

Engine parameters

| | | | | |
|-------------------------------------------------|-----------------|----------|----------|----------|
| Bore/stroke | mm | 132/160 | 132/160 | 132/160 |
| Displacement | dm ³ | 17.5 | 26.3 | 35.0 |
| Compression ratio | | 12.0 : 1 | 12.0 : 1 | 12.0 : 1 |
| Mean piston speed | m/s | 8.0 | 8.0 | 8.0 |
| Lube oil content ⁴⁾ | dm ³ | 70 | 100 | 135 |
| Typical mean lube oil consumption ⁵⁾ | g/kWh | 0.15 | 0.15 | 0.15 |

Generator

| | | | | |
|--------------------------|---|------|------|------|
| Efficiency ⁶⁾ | % | 96.4 | 96.7 | 96.8 |
|--------------------------|---|------|------|------|

Energy balance

| | | | | |
|-----------------------------------|----------|------|------|------|
| Electrical power ⁶⁾ | kW | 337 | 508 | 678 |
| Jacket water heat | ± 8 % kW | 290 | 382 | 509 |
| Intercooler LT heat ⁷⁾ | ± 8 % kW | 21 | 29 | 40 |
| Exhaust cooled to 120 °C | ± 8 % kW | 153 | 261 | 350 |
| Engine radiation heat | kW | 20 | 30 | 40 |
| Generator radiation heat | kW | 13 | 17 | 22 |
| Fuel consumption ⁸⁾ | + 5 % kW | 914 | 1346 | 1795 |
| Electrical efficiency | % | 36.9 | 37.7 | 37.8 |
| Thermal efficiency | % | 48.5 | 47.7 | 47.8 |
| Total efficiency | % | 85.3 | 85.4 | 85.6 |

System parameters

| | | | | |
|------------------------------------------------------------------|-------------------|----------|----------|----------|
| Engine jacket water flow rate min./max. | m ³ /h | 16/30 | 22/36 | 30/45 |
| Engine K _{VS} -value ⁹⁾ | m ³ /h | 30.8 | 37.1 | 40.2 |
| Intercooler coolant flow rate | m ³ /h | 8 | 10 | 10 |
| Intercooler K _{VS} -value ⁹⁾ | 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 max. ¹⁰⁾ | °C | 78/90 | 78/90 | 78/90 |
| – with glycol ¹⁰⁾ | °C | (74/86) | (74/86) | (74/86) |
| Intercooler coolant temperature ¹⁰⁾ | °C | 40/– | 40/– | 40/– |
| Exhaust backpressure min./max. | mbar | 30/50 | 30/50 | 30/50 |
| Maximum pressure loss in front of air cleaner | mbar | 5 | 5 | 5 |
| Gas flow pressure, fixed between (pressure variation +/- 10%) | mbar | 20...100 | 20...100 | 20...100 |
| Starter battery 24 V, capacity required | Ah | 143 | 143 | 286 |

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

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

Sewage gas (65% CH_4 / 35% CO_2)

Bio gas (60% CH_4 / 32% CO_2 , rest N_2)

Landfill gas (50% CH_4 / 27% CO_2 , rest N_2)

Minimum heating value (LHV) = 5.0 kWh/m_n³
wet exhaust manifolds without inliner

| Engine type | | TCG 2016 V8 K | TCG 2016 V12 K | TCG 2016 V16 K |
|-------------------------------------------|-------------------|---------------|----------------|----------------|
| Engine power ²⁾ | kW | 323 | 485 | 647 |
| Speed | min ⁻¹ | 1500 | 1500 | 1500 |
| Mean effective pressure | bar | 14.8 | 14.8 | 14.8 |
| Exhaust temperature | approx. °C | 359 | 381 | 375 |
| Exhaust mass flow wet | approx. kg /h | 1802 | 2655 | 3485 |
| Combustion air mass flow ²⁾ | approx. kg /h | 1594 | 2352 | 3079 |
| Combustion air temperature minimum/design | °C | 20/25 | 20/25 | 20/25 |
| Ventilation air flow ³⁾ | approx. kg /h | 9236 | 13337 | 17646 |

Generator

| | | | | |
|--------------------------|---|------|------|------|
| Efficiency ⁶⁾ | % | 96.4 | 96.7 | 96.8 |
|--------------------------|---|------|------|------|

Energy balance

| | | | | |
|-----------------------------------|----------|------|------|------|
| Electrical power ⁶⁾ | kW | 311 | 469 | 626 |
| Jacket water heat | ± 8 % kW | 306 | 411 | 562 |
| Intercooler LT heat ⁷⁾ | ± 8 % kW | 21 | 29 | 35 |
| Exhaust cooled to 150 °C | ± 8 % kW | 116 | 190 | 246 |
| Engine radiation heat | kW | 20 | 30 | 40 |
| Generator radiation heat | kW | 12 | 16 | 21 |
| Fuel consumption ⁸⁾ | + 5 % kW | 878 | 1282 | 1711 |
| Electrical efficiency | % | 35.4 | 36.6 | 36.6 |
| Thermal efficiency | % | 49.9 | 48.7 | 49.0 |
| Total efficiency | % | 85.3 | 85.3 | 86.6 |

System parameters

| | | | | |
|---------------------------------------------------------------|-------------------|----------|----------|----------|
| Engine jacket water flow rate min./max. | m ³ /h | 16/30 | 22/36 | 30/45 |
| Engine K_{VS} -value ⁹⁾ | m ³ /h | 30.8 | 37.1 | 40.2 |
| Intercooler coolant flow rate | m ³ /h | 8 | 10 | 10 |
| Intercooler K_{VS} -value ⁹⁾ | 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 max. ¹⁰⁾ | °C | 78/90 | 78/90 | 78/90 |
| – with glycol ¹⁰⁾ | °C | (78/90) | (78/90) | (78/90) |
| Intercooler coolant temperature ¹⁰⁾ | °C | 40/– | 40/– | 40/– |
| Exhaust backpressure min./max. | mbar | 30/50 | 30/50 | 30/50 |
| Maximum pressure loss in front of air cleaner | mbar | 5 | 5 | 5 |
| Gas flow pressure, fixed between (pressure variation +/- 10%) | mbar | 20...100 | 20...100 | 20...100 |
| Starter battery 24 V, capacity required | Ah | 143 | 143 | 286 |

1) Exhaust emissions with oxidizing catalyst:
 $\text{NO}_x < 0.50 \text{ g NO}_2/\text{m}_n^3$ dry exhaust gas at 5% O_2
 $\text{CO} < 0.30 \text{ g CO}/\text{m}_n^3$ dry exhaust gas at 5% O_2
 Formaldehyde $< 0.06 \text{ g}/\text{m}_n^3$ dry exhaust gas at 5% O_2

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

3) Intake air flow at $\Delta T = 15 \text{ K}$ including combustion air

4) Including pipes and heat exchangers

5) At full load

6) At 50 Hz, $U = 0.4 \text{ kV}$, power factor = 1

7) At 40 °C water inlet

8) With a tolerance of +5%

9) The K_{VS} -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 V8 K | TCG 2016 V12 K | TCG 2016 V16 K |
|-------------------|----|---------------|----------------|----------------|
| Length | mm | 3100 | 4100 | 4400 |
| Width | mm | 1300 | 1400 | 1400 |
| Height | mm | 2100 | 2100 | 2200 |
| Dry weight genset | kg | 4110 | 5650 | 6600 |

Noise emissions* 50 Hz

| Noise frequency band | Hz | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|----------------------|----|----|-----|-----|-----|------|------|------|------|
|----------------------|----|----|-----|-----|-----|------|------|------|------|

Engine type TCG 2016 V8 K

| | | | | | | | | | |
|----------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| Exhaust noise 120.3 dB(A) | dB(lin) | 108.0 | 125.0 | 123.0 | 116.0 | 114.0 | 112.0 | 107.0 | 103.0 |
| Air-borne noise 97.4 dB(A) | dB(lin) | 85.0 | 85.0 | 91.0 | 93.0 | 87.0 | 88.0 | 92.0 | 91.0 |

Engine type TCG 2016 V12 K

| | | | | | | | | | |
|----------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| Exhaust noise 121.7 dB(A) | dB(lin) | 105.0 | 126.0 | 118.0 | 120.0 | 115.0 | 113.0 | 112.0 | 105.0 |
| Air-borne noise 98.3 dB(A) | dB(lin) | 82.0 | 87.0 | 91.0 | 93.0 | 93.0 | 90.0 | 88.0 | 93.0 |

Engine type TCG 2016 V16 K

| | | | | | | | | | |
|----------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| Exhaust noise 124.5 dB(A) | dB(lin) | 108.0 | 119.0 | 123.0 | 120.0 | 119.0 | 118.0 | 115.0 | 107.0 |
| Air-borne noise 98.7 dB(A) | dB(lin) | 85.0 | 93.0 | 92.0 | 94.0 | 93.0 | 91.0 | 89.0 | 92.0 |

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

Characteristics:

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 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.

