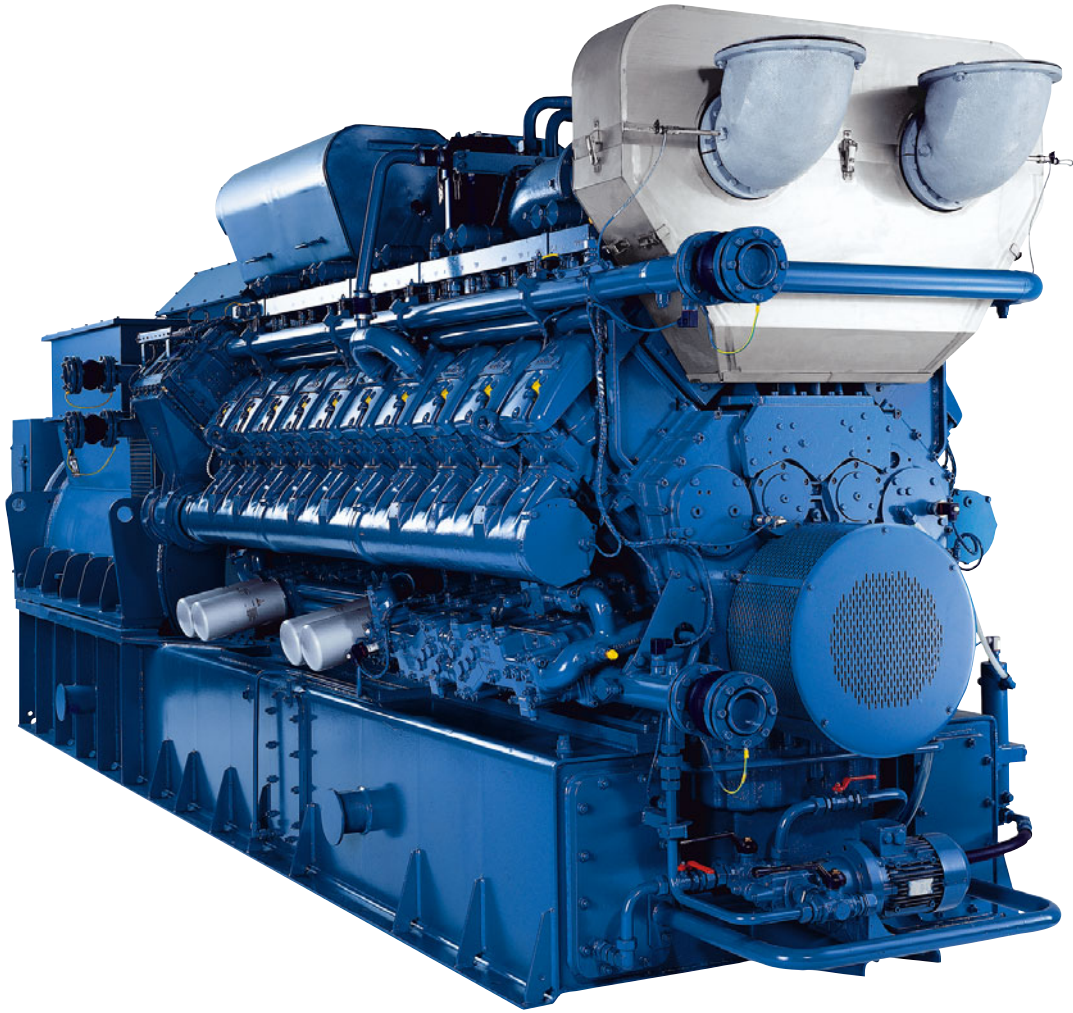


DEUTZ POWER SYSTEMS



TCG 2020

1050–2070 kW at 1500 min⁻¹ (50 Hz)

Technical data 50 Hz – Natural gas applications

NO_x ≤ 500 mg/m_n³ ¹⁾

Minimum methane number MN 80
dry exhaust manifolds

Engine type		TCG 2020 V12	TCG 2020 V16	TCG 2020 V20
Engine power ²⁾	kW	1200	1600	2070
Speed	min ⁻¹	1500	1500	1500
Mean effective pressure	bar	18.1	18.1	18.7
Exhaust temperature	approx. °C	440	440	421
Exhaust mass flow wet	approx. kg/h	6425	8575	10958
Combustion air mass flow ²⁾	approx. kg/h	6218	8300	10604
Combustion air temperature minimum/design	°C	20/25	20/25	20/25
Ventilation air flow ³⁾	approx. kg/h	24367	32658	48813
Engine parameters				
Bore/stroke	mm	170/195	170/195	170/195
Displacement	dm ³	53.1	70.8	88.5
Compression ratio		13.5 : 1	13.5 : 1	13.5 : 1
Mean piston speed	m/s	9.8	9.8	9.8
Lube oil content ⁴⁾	dm ³	630	865	1080
Lube oil consumption mineral oil ⁵⁾	+ 20 % g/kWh	0.3	0.3	0.3
Generator				
Efficiency ⁶⁾	%	97.3	97.4	97.3
Energy balance				
Electrical power ⁶⁾	kW	1168	1584	2014
Jacket water heat	± 8 % kW	585	795	1011
Intercooler LT heat ⁷⁾	± 8 % kW	112	148	186
Exhaust cooled to 120 °C	± 8 % kW	579	789	1013
Engine radiation heat	kW	45	60	104
Generator radiation heat	kW	31	42	56
Fuel consumption ⁸⁾	+ 5 % kW	2718	3666	4706
Electrical efficiency	%	43.0	42.5	42.8
Thermal efficiency	%	42.7	43.2	43.0
Total efficiency	%	85.6	85.7	85.8
System parameters				
Engine jacket water flow rate min./max.	m ³ /h	36/56	50/65	65/85
Engine K _{VS} -value ⁹⁾	m ³ /h	44.0	50.0	66.0
Intercooler coolant flow rate	m ³ /h	40	40	40
Intercooler K _{VS} -value ⁹⁾	m ³ /h	42.9	42.9	72.0
Engine jacket water volume	dm ³	111	151	210
Intercooler coolant volume	dm ³	28	28	52
Engine jacket water temperature max. ¹⁰⁾	°C	80/92	80/92	80/92
– with glycol ¹⁰⁾	°C	(80/92)	(80/92)	(80/92)
Intercooler coolant temperature ¹⁰⁾	°C	40/–	40/–	38/–
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	420	420	420
Air bottle, volume/pressure ¹¹⁾	dm ³ / bar	—	—	2000/30

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

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

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
dry exhaust manifolds

Engine type		TCG 2020 V12	TCG 2020 V16	TCG 2020 V20
Engine power ²⁾	kW	1050	1400	1750
Speed	min ⁻¹	1500	1500	1500
Mean effective pressure	bar	15.8	15.8	15.8
Exhaust temperature	approx. °C	479	479	475
Exhaust mass flow wet	approx. kg /h	5592	7457	9303
Combustion air mass flow ²⁾	approx. kg /h	4993	6657	8308
Combustion air temperature minimum/design	°C	20/25	20/25	20/25
Ventilation air flow ³⁾	approx. kg/h	22665	29582	44368
Generator				
Efficiency ⁶⁾	%	97.3	97.4	97.3
Energy balance				
Electrical power ⁶⁾	kW	1022	1364	1703
Jacket water heat	± 8 % kW	536	718	860
Intercooler LT heat ⁷⁾	± 8 % kW	98	130	175
Exhaust cooled to 150 °C	± 8 % kW	534	722	921
Engine radiation heat	kW	45	60	104
Generator radiation heat	kW	29	36	47
Fuel consumption ⁸⁾	+ 5 % kW	2489	3329	4158
Electrical efficiency	%	41.0	41.0	41.0
Thermal efficiency	%	43.0	42.8	42.8
Total efficiency	%	84.0	83.7	83.7
System parameters				
Engine jacket water flow rate min./max.	m ³ /h	36/56	50/65	65/85
Engine K_{VS} -value ⁹⁾	m ³ /h	44.0	50.0	66.0
Intercooler coolant flow rate	m ³ /h	40	40	40
Intercooler K_{VS} -value ⁹⁾	m ³ /h	42.9	42.9	72.0
Engine jacket water volume	dm ³	111	151	210
Intercooler coolant volume	dm ³	28	28	52
Engine jacket water temperature max. ¹⁰⁾	°C	81/92	81/92	81/92
– with glycol ¹⁰⁾	°C	(81/92)	(81/92)	(81/92)
Intercooler coolant temperature ¹⁰⁾	°C	50/–	50/–	50/–
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	420	420	420
Air bottle, volume/pressure ¹¹⁾	dm ³ /bar	—	—	2000/30

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 K including combustion air

4) Including pipes, heat exchangers and base frame oil pan

5) At full load

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

7) At 40 or 38 °C water inlet (50 °C for biogas)

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

11) Option air starter motor for V20

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 2020 V12	TCG 2020 V16	TCG 2020 V20
Length	mm	5500	6300	7300
Width	mm	1800	1800	1800
Height	mm	2500	2500	2600
Dry weight genset	kg	9700	13400	17300

Noise emissions* 50 Hz

Noise frequency band	Hz	63	125	250	500	1000	2000	4000	8000
Engine type TCG 2020 V12									
Exhaust noise 119.2 dB(A)	dB(lin)	116.0	121.5	120.5	118.0	110.0	109.5	108.0	107.0
Air-borne noise 102.9 dB(A)	dB(lin)	102.0	95.2	95.8	95.9	96.5	95.4	94.8	97.4
Engine type TCG 2020 V16									
Exhaust noise 120.1 dB(A)	dB(lin)	117.0	127.0	118.5	116.0	113.5	112.5	110.0	103.0
Air-borne noise 107.6 dB(A)	dB(lin)	102.0	90.4	94.6	94.3	96.5	96.3	98.6	106.8
Engine type TCG 2020 V20									
Exhaust noise 123.9 dB(A)	dB(lin)	120.0	129.0	122.0	119.0	118.0	117.0	114.0	108.0
Air-borne noise 107.1 dB(A)	dB(lin)	103.6	102.2	96.7	99.7	101.4	100.5	98.7	99.9

Exhaust noise in 1 m, $\pm 45^\circ$, ± 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 12, 16 and 20 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.

