DEUTZ POWER SYSTEMS

TCG 2020 K

970–1400 kW at 1500 min^{-1} (50 Hz)

Technical data 50 Hz – Natural gas applications

NO_X <= 500 mg /m_n^3 [1)]

Minimum methane number MN 70
dry exhaust manifolds

Engine type			TCG 2020 V12 K	TCG 2020 V16 K
Engine power [2)]		kW	1050	1400
Speed		min^{-1}	1500	1500
Mean effective pressure		bar	15.8	15.8
Exhaust temperature	approx.	°C	517	525
Exhaust mass flow wet	approx.	kg/h	5499	7332
Combustion air mass flow [2)]	approx.	kg/h	5311	7082
Combustion air temperature minimum/design		°C	20/25	20/25
Ventilation air flow [3)]	approx.	kg/h	32131	40145
Engine parameters				
Bore/stroke		mm	170/195	170/195
Displacement		dm^3	53.1	70.8
Compression ratio			12.0 : 1	12.0 : 1
Mean piston speed		m/s	9.8	9.8
Lube oil content [4)]		dm^3	205	265
Lube oil consumption mineral oil[5)]		g/kWh	0.2	0.2
Generator				
Efficiency [6)]		%	97.2	97.4
Energy balance				
Electrical power [6)]		kW	1021	1364
Jacket water heat	±8 %	kW	473	622
Intercooler LT heat [7)]	±8 %	kW	86	111
Exhaust cooled to 120 °C	±8 %	kW	681	928
Engine radiation heat		kW	60	72
Generator radiation heat		kW	29	36
Fuel consumption [8)]	±8 %	kW	2545	3393
Electrical efficiency		%	40.1	40.2
Thermal efficiency		%	45.3	45.7
Total efficiency		%	85.4	85.9
System parameters				
Engine jacket water flow rate min./max.		m^3/h	36/56	50/65
Engine K_{VS}-value [9)]		m^3/h	42	46
Intercooler coolant flow rate		m^3/h	30	30
Intercooler K_{VS}-value [9)]		m^3/h	30	30
Engine jacket water volume		dm^3	111	151
Intercooler coolant volume		dm^3	28	28
Engine jacket water temperature max. [10)]		°C	82/92	82/92
– with glycol [10)]		°C	(79/89)	(79/89)
Intercooler coolant temperature [10)]		°C	40/42.5	40/43.3
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	430	430

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

NO_X <= 500 mg/m_n^3
Sewage gas (65 % CH_4 / 35 % CO_2)
Biogas (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_n^3
wet exhaust manifolds

Engine type			**TCG 2020 V12 K**	**TCG 2020 V16 K**
Engine power [2]		kW	970	1294
Speed		min^{-1}	1500	1500
Mean effective pressure		bar	14.6	14.6
Exhaust temperature	approx.	°C	455	456
Exhaust mass flow wet	approx.	kg/h	5116	6800
Combustion air mass flow [2]	approx.	kg/h	4678	6215
Combustion air temperature minimum/design		°C	20/25	20/25
Ventilation air flow [3]	approx.	kg/h	26231	34475
Generator				
Efficiency [6]		%	97.2	97.4
Energy balance				
Electrical power [6]		kW	943	1260
Jacket water heat	±8 %	kW	650	867
Intercooler LT heat [7]	±8 %	kW	79	107
Exhaust cooled to 150 °C	±8 %	kW	487	649
Engine radiation heat		kW	42	56
Generator radiation heat		kW	27	34
Fuel consumption [8]	+5 %	kW	2454	3273
Specific fuel consumption [8]	+5 %	kWh/kWh	2.53	2.53
Electrical efficiency		%	38.4	38.5
Thermal efficiency		%	46.3	46.3
Total efficiency		%	84.7	84.8
System parameters				
Engine jacket water flow rate min./max.		m^3/h	36/56	50/65
Engine K_{VS}-value [9]		m^3/h	41.0	45.0
Intercooler coolant flow rate		m^3/h	30	30
Intercooler K_{VS}-value [9]		m^3/h	30	30
Engine jacket water volume		dm^3	138	187
Intercooler coolant volume		dm^3	28	28
Engine jacket water temperature max. [10]		°C	78/92	78/92
– with glycol [10]		°C	(78/92)	(78/92)
Intercooler coolant temperature [10]		°C	50/52.3	50/53.2
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	430	430

1) Exhaust emissions with oxidizing catalyst:
NO_X < 0.50 g NO_2/m_n^3 dry exhaust gas at 5 % O_2
CO < 0.3 g CO/m_n^3 dry exhaust gas at 5 % O_2
Formaldehyde < 0.06 g/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 and heat exchangers
5) This values are the mean lube oil consumption between maintenance steps which include an E 60 service. Also the procedures defined in the TPI 1111-E-06-02 and the Technical Circular TR 0199-99-2105 are to be carefully followed
6) At 50 Hz, U = 0.4 kV, cosphi = 1
7) At 40 °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

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 K	TCG 2020 V16 K
Length	mm	4700	5500
Width	mm	1800	1800
Height	mm	2500	2650
Dry weight genset	kg	9000	12500

Noise emissions* 50 Hz

Noise frequency band	Hz	63	125	250	500	1000	2000	4000	8000
Engine type TCG 2020 V12 K									
Exhaust noise 119.6 db(A)	dB(lin)	116.0	121.0	120.0	118.0	112.0	111.0	108.0	107.0
Air-borne noise 102.0 dB(A)	dB(lin)	101.7	93.5	94.2	95.0	95.9	94.4	94.7	95.2
Engine type TCG 2020 V16 K									
Exhaust noise 122.0 dB(A)	dB(lin)	119.0	128.0	120.0	117.0	116.0	115.0	112.0	107.0
Air-borne noise 104.4 dB(A)	dB(lin)	92.0	96.0	98.0	97.0	99.0	97.0	96.0	98.0

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.

Characteristics:
State-of-the-art 12 and 16 cylinder V-engines | 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

Version 01/08/E

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.