TEDOM

technology
... in harmony
with nature

PRODUCT OVERVIEW

CHP UNITS | GAS TREATMENT SYSTEM | GAS HEAT PUMP
GENERATOR SETS | COMBUSTION ENGINES

CHP Units

CHP units are the **equipment for the combined heat and power production**.

50 Hz

CHP Unit type	NATURAL GAS				BIOGAS		
	Electrical output (kW)	Heat output (kW)		Power input in fuel (kW)	Electrical output (kW)	Heat output (kW)	Power input in fuel (kW)
		standard	increased*				
Micro T7 [2]	**7**	17.2	19.8	25.9	–	–	–
Micro T30 [2]	**30**	59.4	69	93.8	**25**	47.5	79.1
Micro T30 [2,4]	–	–	–	–	**30**	61	97.7
Micro T33 [2,3]	**33**	63.7	74.2	101.5	–	–	–
Micro T50 [2]	**48**	91.0	106.8	148	–	–	–
Cento M50 [2]	**50**	79	–	148	–	–	–
Cento M70	**70**	109	–	204	–	–	–
Cento T80	**81**	120	126	231	**83**	121	237
Cento T100	**104**	142	149	282	**106**	143	291
Cento T120	**125**	177	185	343	**124**	165	336
Cento L135	**137**	163	173	332	**137**	156	336
Cento L155	**155**	186	198	377	**155**	178	382
Cento T160	**164**	221	232	434	**166**	217	439
Cento T180	**184**	232	244	469	**182**	224	465
Cento T200	**200**	253	266	510	**200**	245	510
Cento L200	**206**	246	261	495	**206**	235	508
Cento L230	**235**	282	301	567	**235**	269	580
Cento L330	**331**	392	415	789	**331**	375	810
Quanto D400	**400**	456	486	950	**400**	425	935
Cento L410	**410**	511	540	1004	**410**	487	1004
Cento L450	**455**	550	582	1097	**455**	526	1098
Cento L500	**500**	592	626	1191	**500**	566	1193
Quanto D500	**515**	556	595	1192	–	–	–
Quanto D600	**600**	699	743	1433	**600**	645	1405
Quanto D800	**800**	917	976	1891	**800**	858	1868
Quanto D1200	**1200**	1295	1381	2748	**1200**	1344	2852
Quanto D1600	**1560**	1709	1818	3600	**1560**	1771	3734
Quanto D2000	**2000**	2154	2291	4577	**2000**	2157	4667
Quanto D3000	**3333**	3577	3740	7650	–	–	–
Quanto D4000	**4500**	4679	4904	10160	–	–	–
Quanto M10000	**10426**	9825	–	22176	–	–	–

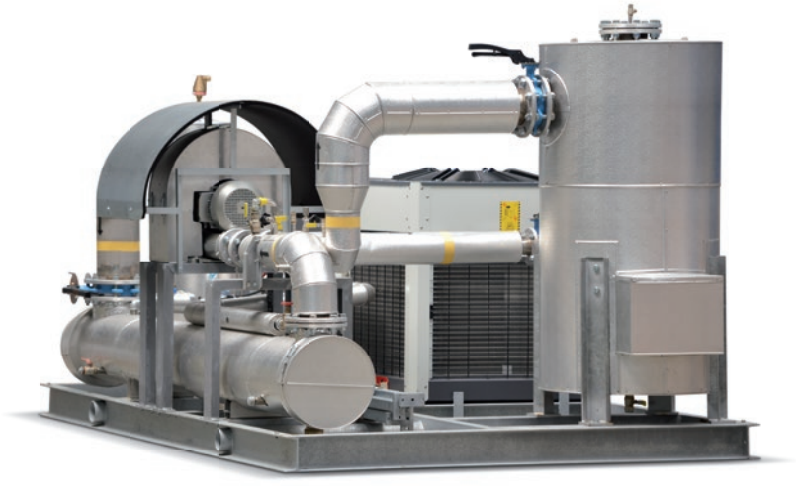
We offer the version with NOx emissions under 100 mg/m3 and the LPG fuel option for the selected CHP units. Parameters on request.

1. When using the additional exhaust heat exchanger
2. The CHP unit is classified to the seasonal energy efficiency class A++
3. In the Start program
4. Operation on the stoichiometric mixture

60 Hz

CHP Unit type	NATURAL GAS				BIOGAS			
	Electrical output (kW)	Heat output (kW)		Power input in fuel (BTU/kWe)	Electrical output (kW)	Heat output (kW)		Power input in fuel (BTU/kWe)
		kWh	BTU/h			kWh	BTU/h	
Micro T35	**35**	69.5	237,144	10,724	**27**	50	171,972	10,666
Micro M60	**58**	105	358,275	10,001	**–**	–	–	–
Cento M60	**58**	91	310,505	10,001	**–**	–	–	–
Cento M80	**80**	125	426,518	9,981	**–**	–	–	–
Cento T100	**99**	173	590,301	10,485	**94**	148	504,997	10,164
Cento T150	**147**	227	774,557	9,587	**140**	214	730,199	9,974
Cento T200	**191**	261	890,942	9,247	**191**	261	890,942	9,247
Cento L240	**240**	285	971,722	8,218	**240**	264	901,822	8,644
Cento L270	**–**	–	–	–	**274**	300	1,023,498	8,597
Cento L275	**274**	328	1,119,183	8,253	**–**	–	–	–
Cento L380	**382**	455	1,552,846	8,232	**382**	419	1,431,350	8,619
Cento L470	**470**	588	2,005,001	8,391	**470**	537	1,831,648	8,554
Cento L520	**520**	634	2,164,594	8,286	**520**	579	1,976,011	8,451
Cento L575	**576**	687	2,344,143	8,192	**576**	628	2,143,155	8,368

Gas Treatment System



The gas treatment system is intended mainly **to reduce the moisture content in biogas, landfill gas or mine gas** to the level convenient for its application in CHP unit.

The equipment is designed for the following output series of CHP units – 200 kW, 400 kW, 800 kW and 1200 kW.

Aside from the basic moisture reduction function it is possible to extent the equipment by the desulphurization vessel to **reduce the hydric sulphide content** in the gas and by the supercharger to **increase the gas pressure**.

Trigeneration Units

The trigeneration units are the **equipment for the combined production of power, heat and cold**.
The trigeneration combines a CHP unit with an absorption unit. This combination can be implemented in two ways:

Type A: CHP unit with the exhaust heat exchanger
The unit's thermal energy is utilized to heat the water for heating or to produce cold in the connected absorption unit. The three-way valve allows continuous control of the output of heat intended for heating or cooling.

Type B: CHP unit without the exhaust heat exchanger
Exhaust gases are conveyed directly into the absorption unit wherein the exhaust heat exchanger is integrated. With utilized energy of exhaust gases, the absorption efficiency is higher than when the hot water energy is used.

Unit type	Trigeneration type	Absorption unit type	Electrical output (kW)	Heat output (kW)	Cooling output (kW)
Cento T200	A	BDH 117 – TGA 150	200	265*	196**
Cento T200	B	BE 16 – TGA 120	200	152	173
Quanto D600	A	BDH 42 – TGA 420	600	658*	487**
Quanto D600	B	BE 35 – TGA 240	600	384	402
Quanto D1200	A	BDH 74 – TGA 610	1 200	1 189*	856**
Quanto D1200	B	BE 54 – TGA 410	1 200	746	631
Quanto D2000	A	BDH 122 – TGA 910	2 000	1 977*	1 423**
Quanto D2000	B	BE 91 – TGA 610	2 000	1 236	1 056

* with fully utilized heat output, CHP unit for heating only (so called winter mode)
** with fully utilized heat output, CHP unit for cooling only (so called summer mode)

Gas Heat Pump

The gas heat pump is the equipment for **efficient production of heat and cold**. It is based on the cogeneration principle since it makes purposeful use of the heat from combustion engine. It has a high efficiency owing to the utilization of the engine's „waste" heat.

The gas heat pump will find its use everywhere any requirements exist for the supply of cold and where heat can be utilized simultaneously. However, it is in numerous places that the gas heat pump can operate solely in the heating mode.

TEDOM Polo 100	Performance parameters	
	Air - water, R507 refrigerant (kW)*	For the recuperation of waste heat, R134a refrigerant (kW)**
Evaporator output	94.9	95.8
Condenser output	137.0	132.0
Engine and exhaust gas output	62.3	53.7
Consumption (LHV)	115.0	99.4

* te = -5 °C, tc = 50 °C, ** te = 12 °C, tc = 65 °C

Exhaust Heat Exchangers

Natural gas

Heat exchanger	Output (kW)	Diameter x length (mm)	Optimized for the engine
SV-N-T12	99	273 x 3039	TEDOM TG 130
SV-N-L23	143	356 x 3673	Liebherr G946
SV-N-T20	150	356 x 3038	TEDOM TG 210
SV-N-D40	226	506 x 4464	MWM 2016 V08
SV-N-L50	300	530 x 4008	Liebherr G9512
SV-N-D58	345	675 x 4976	MWM 2016 V12
SV-N-D77	454	675 x 4944	MWM 2016 V16
SV-N-D120	581	800 x 5509	MWM 2020 V12
SV-N-D160	804	860 x 5776	MWM 2020 V16
SV-N-D200	972	995 x 5718	MWM 2020 V20
SV-N-D300	1 779	1400 x 6350	MWM 2032 V12
SV-N-D400	2 342	1550 x 6500	MWM 2032 V16

Biogas

Heat exchanger	Output (kW)	Diameter x length (mm)	Optimized for the engine
SV-B-T12	80	273 x 3039	TEDOM TB 130
SV-B-T20	117	356 x 3039	TEDOM TB 210
SV-B-L33	183	406 x 3876	Liebherr G9508
SV-B-D40	226	506 x 4464	MWM 2016 V08
SV-B-D58	345	508 x 4400	MWM 2016 V12
SV-B-D77	454	625 x 4500	MWM 2016 V16
SV-B-D120	581	740 x 5509	MWM 2020 V12
SV-B-D160	804	860 x 5776	MWM 2020 V16
SV-B-D200	972	995 x 5718	MWM 2020 V20

- exhaust gas temperature at the outlet: 120 °C natural gas, 150 °C biogas
- material: carbon steel (natural gas), stainless steel (biogas)
- pressure loss on the exhaust gas side up to 10 mbar
- fluid temperature at the inlet: 80 °C

Economizers

The economizers are intended to **improve effectiveness of the CHP units** fuelled on the natural gas. They are designed to ensure higher cooling level of the exhaust gases from CHP unit and, by doing so, to improve its heat output. The economizer can be used as an **after-cooling exchanger** or as a **condensing exchanger**.

Heat exchanger **Natural gas**	Output condensing exchanger (kW)	Output after-cooling exchanger (kW)	Diameter and length (mm)	Heat exchanger width, height and length (mm)	Optimized for the engine
Compact 25 C10	2.6	0.4	–	45 x 125 x 280	Kubota TGE DF 972
Compact 25 C30	9.6	1.6	–	125 x 125 x 300	Kubota TGE V3800
Compact 36 C40	15.8	2.8	–	130 x 210 x 360	MAN E0834 E302
Compact V120	43	7	–	400 x 800 x 850	TEDOM TG 130
Compact V200	64	10.5	–	420 x 850 x 1000	TEDOM TG 210
E-N-D40	122	20	506 x 3964	–	MWM 2016 V08
E-N-L50	157	25	530 x 3990	–	Liebherr G9512
E-N-D58	184	30	675 x 4476	–	MWM 2016 V12
E-N-D77	243	40	675 x 4476	–	MWM 2016 V16
E-N-D120	356	59	800 x 5009	–	MWM 2020 V12
E-N-D160	468	78	860 x 5276	–	MWM 2020 V16
E-N-D200	594	99	995 x 5718	–	MWM 2020 V20

- the „Compact" version is cuboid in shape, the other cersions are cylindrical
- exhaust gas temperature at the outlet is 120 °C
- pressure loss on the exhaust gas side up to 10 mbar
- fluid temperature at the inlet up to 30 °C (condensing exchanger)
- fluid temperature at the inlet up to 70 °C (after-cooling exchanger)
- material: carbon steel

Generator Sets

Generator sets based on the gas engines are **equipments for the power generation**.

The TEDOM generator sets can make use of a wide spectrum of gaseous fuels - natural gas, biogas, LPG, mine gases, oil well head gases, syngas or pyrolysis gases.

Generator Sets **50 Hz**

Natural gas		Biogas		LPG	
Type	Electrical output kW/kVA	Type	Electrical output kW/kVA	Type	Electrical output kW/kVA
TNGG 80	**81**/101	**TBGG 80**	**83**/107	**TPGG 80**	**80**/100
TNGG 100	**104**/130	**TBGG 100**	**106**/132	**TPGG 90**	**92**/115
TNGG 120	**125**/156	**TBGG 120**	**124**/155	**TPGG 115**	**115**/144
TNGG 160	**164**/205	**TBGG 160**	**166**/207	–	–
TNGG 180	**184**/230	**TBGG 180**	**182**/227	–	–
TNGG 200	**200**/250	**TBGG 200**	**200**/250	–	–
TNGG 230	**235**/294	**TBGG 230**	**235**/293	–	–
TNGG 330	**331**/414	**TBGG 330**	**331**/413	–	–
TNGG 410	**410**/512	**TBGG 410**	**410**/512	–	–
TNGG 450	**455**/569	**TBGG 450**	**455**/568	–	–
TNGG 500	**500**/625	**TBGG 500**	**500**/625	–	–

Generator Sets **60 Hz**

Natural gas		Biogas		LPG	
Type	Electrical output kW/kVA	Type	Electrical output kW/kVA	Type	Electrical output kW/kVA
TNGG 90	**93**/116	**TBGG 90**	**94**/117	**TPGG 90**	**93**/116
TNGG 140	**144**/180	**TBGG 140**	**140**/175	**TPGG 110**	**113**/141
TNGG 190	**192**/240	**TBGG 190**	**191**/239	**TPGG 130**	**132**/165
TNGG 240	**240**/300	**TBGG 240**	**240**/300	–	–
TNGG 270	**274**/342	**TBGG 270**	**274**/342	–	–
TNGG 380	**382**/477	**TBGG 380**	**382**/477	–	–
TNGG 470	**470**/587	**TBGG 470**	**470**/587	–	–
TNGG 520	**520**/650	**TBGG 520**	**520**/650	–	–
TNGG 575	**575**/719	**TBGG 575**	**576**/719	–	–

The specified data are of information character only. For the current parameters please visit **www.tedom.com**

Gas Engines for Power Engineering

Stationary gas engines for power engineering are designed to be used in CHP units and generator sets.

These engines are offered in various configurations and delivery scopes. They are equipped with special Bosch control system that simplifies markedly the engine control and the communication with the master control system.

Stationary Engines **50 Hz**

Natural gas	Output	Efficiency	
		Mechan.	Heat
	kW	%	%
TG 85 G5V NX 86	86.0	37.1	52.2
TG 110 G5V TX 86	110.4	39.0	50.5
TG 130 G5V TX 86	132.4	38.3	51.7
TG 170 G5V TW 86	173.2	39.8	50.9
TG 190 G5V TW 86	192.9	41.0	49.5
TG 210 G5V TW 86	212.7	41.0	49.5
TG 100 G5V NX 88	100.3	35.6	56.3
TG 110 G5V NX 88	110.4	36.7	55.3
TG 120 G5V NX 88	119.7	37.3	54.8
TG 130 G5V NX 88	130.5	38.5	53.6

Biogas	Output	Efficiency	
		Mechan.	Heat
	kW	%	%
TB 90 G5V NX 86	88.2	37.0	50.9
TB 110 G5V TX 86	112.5	38.5	49.2
TB 130 G5V TX 86	130.4	38.8	49.2
TB 170 G5V TW 86	175.9	39.8	49.5
TB 190 G5V TW 86	191.3	40.9	48.1
TB 210 G5V TW 86	213.0	41.0	48.1

LPG	Output	Efficiency	
		Mechan.	Heat
	kW	%	%
TP 90 G5V NX 86	89.0	33.1	57.1
TP 145 G5V TX 86	144.0	36.7	54.8
TP 160 G5V TW 86	158.9	36.7	54.4

Stationary Engines **60 Hz**

Natural gas	Output	Efficiency	
		Mechan.	Heat
	kW	%	%
TG 100 G8V NX 86	98.8	36.0	54.1
TG 150 G8V TX 86	153.2	37.8	52.5
TG 200 G8V TW 86	202.1	39.8	50.5
TG 150 G8V NX 88	156.8	37.9	54.7

Biogas	Output	Efficiency	
		Mechan.	Heat
	kW	%	%
TB 100 G8V NX 86	99.8	35.6	52.9
TB 150 G8V TX 86	148.3	36.2	52.4
TB 200 G8V TW 86	200.7	38.7	50.4

Vehicle Engines

The vehicle gas engines fuelling the compressed natural gas (CNG) are available in both the horizontal and vertical version, thus being suitable for installation into buses, goods vehicles, and further special applications. The engines are fully electronically controlled and they feature OBD II. They are offered in the atmospheric or turbocharged version.

Engine type	Nominal output	Nominal speed	Maximal torque
	kW	rpm	Nm
CITY 180	180	2 200	883
CITY 210	220	2 000	1 146
CITY 250	260	2 000	1 354

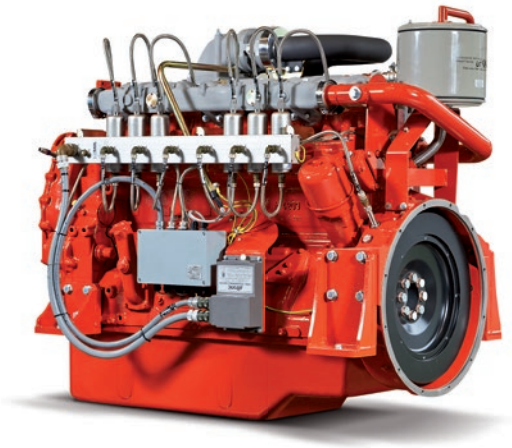
The specified values are valid at the at the external temperature of 5-35 °C, the altitude of 1 000 m and relative humidity of 30-80 %.

Railway Engines

The TRAIN series diesel engines are intended for the application in smaller railway vehicles as the motorized coaches, gang cars, pugs, and further special machines. The engines meet the emission limits of UIC III. B and as one of the few in the market they are available both in the conventional and horizontal version that allows them to be installed under the vehicle floor.

Engine type	Nominal output	Nominal speed	Maximal torque
	kW	rpm	Nm
TRAIN 242	242	1 950	1 600
TRAIN 265	265	1 950	1 600
TRAIN 310	310	1 950	1 600
TRAIN 311	310	1 950	1 900

Stationary Engines for Mechanical Drives



Stationary gas engines for mechanical drives are intended namely for the gas compression as well for further applications, namely in the petroleum and gas mining area. These engines allow operation in variable speeds and they are generally delivered in the configuration fit for installation into the explosive environment (low surface temperatures, pneumatic starting, and spark-proof electrical accessories).

Engine type	Nominal output	Nominal speed	Maximal torque
	kW	rpm	Nm
TG 100 DV NX 86	100	1 200	1 800
TG 170 DV TX 86	170	1 200	1 800

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