

Basic characteristics

CHP units Micro series are plants for the combined production heat and power in terms of gas combustion. Basic properties of CHP unit of Micro series are: high efficiency, compactness, long life-time of oil filling and service interval. Due to all mentioned characteristics these products are used as modern power sources for heating of small buildings.

According to statement of notified body certificate certifying conformity of series Micro products with requests of directive 2009/142/EC (government regulation no. 22/2003 Col.) was edited. TEDOM company is a holder of certificates QMS and EMS.



Basic technical data

Unit description:

Unit is intended for natural gas combustion, AP – equipped with asynchronous generator working in parallel with mains.

design	standard	with condenser	
nominal electrical output	30	30	kW
maximal heat output ¹⁾	59,4	69	kW
fuel input	93,8	93,8	kW
electrical efficiency	32,0	32,0	%
heat efficiency	63,3	73,6	%
total efficiency (fuel use)	95,3	105,6 ²⁾	%
gas consumption at 100% of output	9,9	9,9	m ³ /h
gas consumption at 75% of output	7,6	7,6	m ³ /h
gas consumption at 50% of output	6,0	6,0	m ³ /h

Basic technical data are valid for standard conditions according to the document „Technical instructions“

Requested min. continuing electric output is 50% of nominal output

Gas consumption is mentioned at invoicing conditions (15°C, 101,325 kPa)

Technical data are specified for temperatures 65/85°C

Gas consumption tolerance, or fuel input tolerance, at 100% load is +5%.

Tolerances of other parameters are mentioned in "Technical Instructions-Validity of Technical Data" document.

1) Maximum heat output is a sum of heat outputs of secondary circuit with exhaust gas cooled to 120°C

2) Valid for return water temperature 35°C

Observance of emission limits

CHP unit satisfies following emission limits:

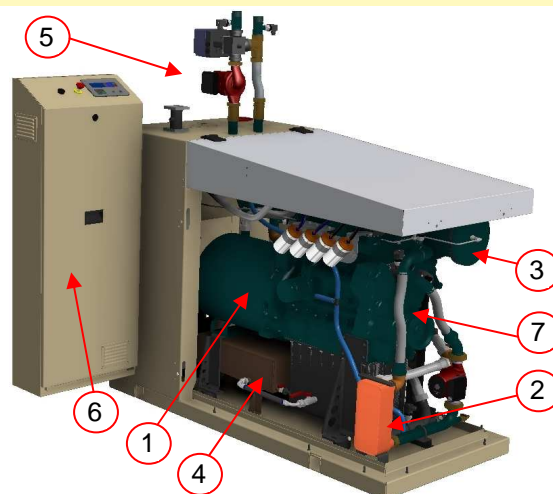
emissions	CO	NOx
at 5%O ₂ in exhaust gas	300mg/Nm ³	250mg/Nm ³



Orientation description of CHP unit

The unit consists of engine-generator set, complete heat equipment, including electro switchboard enabling parallel operation with mains 400V/50Hz. All parts are built in sound silencing enclosure. Warm-water circuits are designed for temperature gradient 20°C.

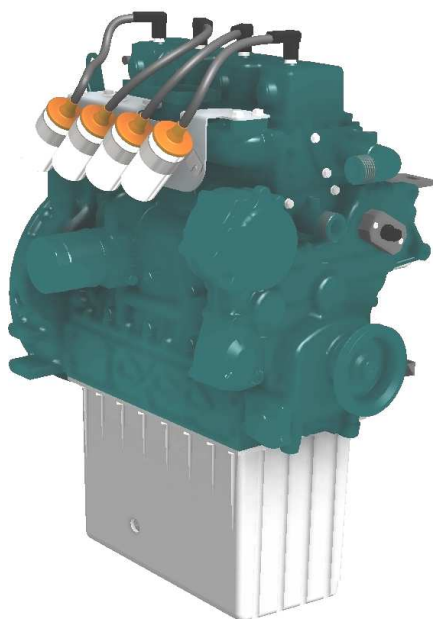
- 1) generator
- 2) plate exchanger
- 3) exhaust gas exchanger
- 4) oil tank
- 5) connecting points (see last page)
- 6) electric switchboard
- 7) combustion engine



Engine

Unit is driven by gas combustion engine V3800 product of company TEDOM, with basic parameters according to table below:

number of cylinders	4
arrangement of cylinders	in line
bore × stroke	100 x 120 mm
displacement	3769 cm ³
compression ratio	13 : 1
speed	1500 min ⁻¹
oil consumption normal/max	0,3/0,6 g/kWh
max. output of engine	36 kW



Illustrative picture

Generator

Source of electric energy is asynchronous generator AS 225, product of company Zanardi, Italy, with basic parameters according to given table:

generator output	32 kW
cos φ	0,81
efficiency in working point	92,9 %
winding connection	switch Y/D
voltage	400 V
frequency	50 Hz

Heating system

Heating system of CHP unit is formed in view of heat output transfer (heat gained by cooling of engine and exhaust gas) by hydraulic circuit, by which is heat from machine transferred to heating system of user. Unit enables operation by different temperatures. Heating system of the unit is equipped by circuit pump.

Parameters of hydraulic circuit:

heating output of circuit	59,4 kW
nominal flow	0,8 kg/s
max. working pressure	600 kPa
water volume of circuit in CHP unit	25 dm ³
pressure loss at nominal flow ¹⁾	30 kPa
pressure reserve at nominal flow ²⁾	50 kPa
maximal temperature of reversible water	70 °C
min. allowed temperature of reversible water	40 °C
nominal temperature gradient	20 °C

1) if the circuit pump is not used

2) if the circuit pump is used

If there is no possibility to consume heat produced by the machine, it is possible to cool part or whole thermal power by cooling unit for emergency cooling, which can be delivered.

Fuel, gas inlet

Technical data mentioned in this specification are valid for natural gas with parameters given below.

heating power	34 MJ/m ³
min. methane number	80
gas pressure	2 ÷ 10 kPa
max. change of gas pressure at changes of consumption	10 %
max. temperature	30 °C

Gas line of the unit is composed acc to TPG 811 01 and contains gas filter, combined gas armature, which fulfil following functions:

- double quick-closing electromagnetic valve for gas inlet closing at unit stop
- gas pressure regulation suitable for mixing
- elastic connection by metal hose with mixer of engine

For correct operation of CHP unit is requested gas connection with proper dimension and accumulative volume as a protection against gas pressure drop in system after abrupt changes in consumption. Gas connection must be equipped with hand valve and manometer.

Combustion air, exhaust gas and condensate outlet

Combustion air is sucked from surrounding through cold space of the unit. The exhaust gases are removed from unit by the exhaust piping (duct system) connected on the CH unit flange. Exhaust piping from unit flange to chimney uptake has to be tight. The piping must be down-grade in the direction from the CHP unit. Eventually, the condensate, which could arise at CHP unit operation is evaporated and blow-off together with exhaust gases. Material of exhaust piping and heat isolation of duct system in machine room must be resistant to temperatures up to 200°C at least. Maximal pressure loss of whole duct system can not exceed 10 mbar. Machine construction does not request any forced ventilation.

quantity of combustion air	94 Nm ³ /h
requested temperature of combustion air	10 to 35°C
exhaust gas temperature nominal / max	110/140 °C
max. back-pressure of exhaust gas behind the flange	10 mbar
quantity of exhaust gas	133,1 kg/h

Fillings

quantity of lubricating oil in engine	30 dm ³
volume of oil tank	20 dm ³
quantity of cooling liquid in primary circuit	9 dm ³

Heating water in hydraulic circuit must be modified, its composition must be according to the document „Technical instructions“.

Noise parameters

Noise parameters specify the level of acoustic pressure, measured in free acoustic field. Specification of measuring places and system of evaluation are according to ČSN 09 0862. The noise contains the tone element with frequency 50 Hz.

sound enclosure of CHP unit in 1 m	60 dB(A)
outlet of exhaust gas in 1m from flange	57 dB(A)

Colour design

engine, generator, internal parts of unit, frame and oil tank	RAL 5001 (blue)
sound enclosure	RAL 1001, 1013 (beige)



Dimensions and weights of unit

length (standard design)	1680 mm
width total	1500 mm
height	1780 mm
transport weight	1100 kg

Consequential documents

- dimension drawing: MICRO T30 drawing number R1462
- obligatory documents according to the document „Technical instructions“

Scope of the delivery

Standard

- complete module of CHP unit

Out of standard scope

- cooling unit for emergency cooling
- additional exhaust silencer

Connecting points

