

**Compact CHP ready for connection, mainly consisting of**

- serially manufactured Industrial-Gas-Otto-engine
- air-cooled synchronous generator
- waste-gas heat exchanger integrated in primary cooling circuit
- Oxikat integrated in waste-gas heat exchanger (optional)
- oil reservoir with automatic oil feeding
- control cabinet with programmable controller and operating unit
- gas train

**Integrated heat exchanger basket, mainly consisting of**

- expansion tank in motor circuit and mixture circuit
- relief valve in motor circuit, mixture circuit and heater circuit
- filling valves, cleanout valves and exhaust valves
- plate heat exchanger
- pumps for motor circuit, mixture circuit and heater circuit
- 3-way mixing valve for return temperature increase

Water and gas connections are executed with compensators. All water-side connections are directed upwards above the heat exchanger basket.

Motor and generator are connected through a pluggable elastic metal-plastics coupler to compensate radial offset, axial offset or angular offset. It is mounted on a framework vibration-cushionedly.

Furthermore the framework is uncoupled through oscillation decoupling elements.

The control cabinet is executed as a separate unit. All regulation and control functions as well as control elements are part of the control cabinet. Assisted by a menu-navigated touch-screen performance data and state data could be readed and adjusted easily.

The drive of the CHP is caused by a water-cooled, supercharged Otto-Gas-Engine. It is a stationary engine designed for permanent operation. A microprocessor-controlled ignition ensures an optimal adaption of the ignition point and the ignition energy to the gas quality (methane number).

Besides an exceedingly high electrical efficiency, a double-staged mixture cooling, including a low temperature circuit and a high temperature circuit, leads to an ideal usage of thermal power from the mixture heat.

The oil level control is carried out by a sight glass with oil level deficit indication, which is connected with the oilpan.

<b>Engine data</b>		<b>Hz</b>	<b>50</b>	<b>Engine utilities</b>	
Mixture cooling to	°C		50	Lubricate consumption	g/kWh 0,2
RPM	1/min		1.500	Filling capacity lubricant min./max.	l 60 / 90
ISO standard power (mech.)	kW		415		
Air ration (Lambda)	λ		1,47	Filling capacity cooling water	l 23
Arrangement of cylinders			V	Operating pressure (max.)	bar 3
Number of Cylinders			12	Cooling water recirculated quantity	l/min 569
Bore	mm		128	Cooling water temperature min.	°C 80
Stroke	mm		142	Cooling water temperature max.	°C 88
Swept volume	l		21,93	Balance (inflow/exit, max.)	K 6
Direction of rotation (look on balance wheel)			left	Mixture inflow temperature after damper max.	°C 50
body of balance wheel			SAE 1	Mixture cooling water, inflow temperature	°C 45
tooth rim with number of teeth	Z		160	low temperature circuit (max.)	
compression ratio	ε		14,8 : 1	Mixture cooling water recirculated quantity	l/min 111
average effective pressure	bar		15,1	low temperature circuit (max.)	
average piston speed	m/s		8,3	Mixture cooling water inflow temperature	°C 85
				high temperature circuit (max.)	
				Mixture cooling water recirculated quantity	l/min 250
				high temperature circuit (max.)	
<b>Power data</b>		<b>Hz</b>	<b>50</b>	<b>Efficiencies</b>	
Load	%		100	Electrical	% 40,1
Ignition timing	degree		22	Mechanical	% 41,6
ISO standard power (mech.)	kW		415	Thermal	% 44,6
Electrical Power	kW		400	Total (el. + th.)	% 84,7
Cooling water heat	kW		205		
Mixture heat (high temperature circuit)	KW		45	Power number	0,90
Mixture heat (low temperature circuit)	KW		20		
Waste gas heat up to 180 °C	kW		195		
useable thermal power at 180 °C	kW		445	<b>Mass flows and volume flows</b>	
radiant heat of module (max.)	kW		63	Combustion air mass flow	kg/h 1.819
nominal power	kW		998	Combustion air volume flow	m³/h 1.537
Fuel consumption (mech.)	kWh/kWh		2,41	Supply air volume flow	m³/h 15.540
Fuel consumption (el.)	kWh/kWh		2,49		
<b>Temperatures and pressures</b>				Combustible mass flow	kg/h 270
Waste gas temperatur after turbine	°C		475	Combustible volume flow	m³/h 200
exhaust back pressure	mbar		30	Waste gas mass flow, wet	kg/h 2.089
				Waste gas mass flow, dry	kg/h 1.948
Heating water return temperature (max)	°C		70	Waste gas volume flow, wet	m³/h 1.595
Heating water flow temperature (max)	°C		90	Waste gas v olume flow, dry	m³/h 1.406
Pressure decrease heating circuit (max)	mbar		150		
				Heating water volume flow (max.)	m³/h 25
maximum backpressure at the air intake	mbar		15		
<b>Emission value at 5% residual oxygen</b>				<b>Technical basic conditions</b>	
NOx	mg/Nm³	<	500	Power conditions acc. To DIN-ISO-3046	
CO	mg/Nm³	<	1.000	Norm conditions: air pressure: 1000 mbar	
				Air temperature: 25 °C, rel. Humidity: 30%	
				Gasquality accorcng "2G TA 04 Gas"	
				All data are related to full load engine running at denoted media temperatures and are subject to technical advancements.	
				Equipment as well as installation systems have to meet all technical instructions of 2G.	

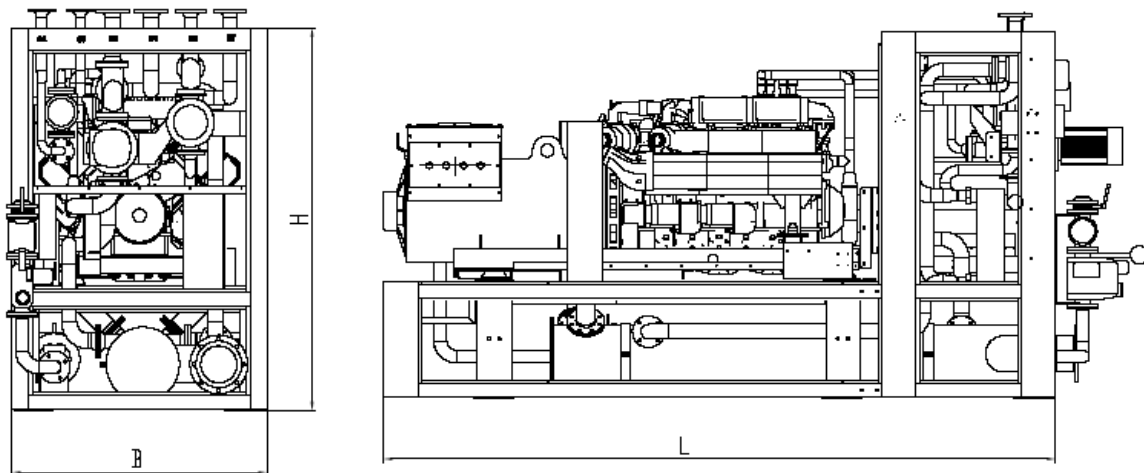
**Generator data**

Manufacturer	Leroy Somer	
Type	LSA 47.2 L9	
Power at Cos φ = 0,8	kVA	500
Voltage	V	400
Frequency	Hz	50
Rated speed	1/min	1500
Nominal current at Cos φ = 0,8	A	722
Cos φ	0,8 - 1	
Efficiency (full load) at Cos φ = 1	%	96,5
Efficiency (full load) at Cos φ = 0,8	%	95,1
Reactance X"d	%	14
Reactance Xi = X2	%	16
Mass moment of inertia	kg m <sup>2</sup>	8,3
Stator circuit	Stern	
Ambient air temperature	°C	40
Protection class	IP 23	
Cos φ has to be between 0,8 and 1,0 within the complete range of capacity.		

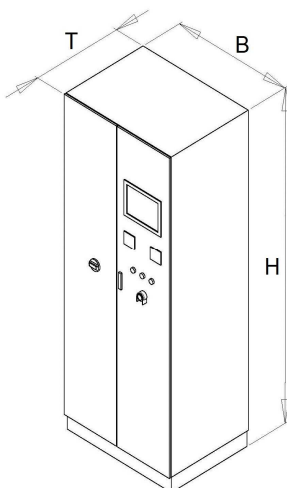
**Main dimensions and weights**

<b>Module:</b>			
Length (L):	mm	3.950	
Height (H):	mm	2.208	
Width (B):	mm	1.500	
Weight (approx.)	kg	6.100	
<b>Control cabinet</b>			
Height (H)	mm	2.000	
Width (B)	mm	800	
Depth (T)	mm	600	
Weight (approx.)	kg	200	
<b>Power switch cabinet</b>			
Height (H)	mm	2.000	
Width (B)	mm	600	
Depth (T)	mm	500	
Weight (approx.)	kg	150	

**Module:**



**Control cabinet:**



**Power cabinet:**

