

**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
Rated speed	1/min		1500	Filling capacity lubricant	l 70
ISO standard power (mech.)	kW		229,17		0
Air ration (Lambda)	λ		1,45	Filling capacity cooling water	l 16
Arrangement of cylinders			Reihe	Operating pressure (max.)	bar 2
Number of Cylinders			6	Cooling water recirculated quantity	l/min 278
Bore	mm		128	Cooling water temperature min.	°C 80
Stroke	mm		166	Cooling water temperature max.	°C 88
Swept volume	l		12,82	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 83
average effective pressure	bar		14,301	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 111
				high temperature circuit (max.)	
<b>Power data</b>		<b>Hz</b>	<b>50</b>	<b>Efficiencies</b>	
Load	%		100	Electrical	% 40,6
Ignition timing	degree		22	Mechanical	% 42,3
ISO standard power (mech.)	kW		229	Thermal	% 42,8
Electrical Power	kW		220	Total (el. + th.)	% 83,4
Cooling water heat	kW		100	Power number	0,95
Mixture heat (high temperature circuit)	kW		20		
Mixture heat (low temperature circuit)	kW		15	<b>Mass flows and volume flows</b>	
Waste gas heat up to 180 °C	kW		112	Combustion air mass flow	kg/h 975
useable thermal power at 180 °C	kW		232	Combustion air volume flow	m <sup>3</sup> /h 823
radiant heat of module (max.)	kW		37	Supply air volume flow	m <sup>3</sup> /h 8.530
nominal power	kW		542	Combustible mass flow	kg/h 146
Fuel consumption (mech.)	kWh/kWh		2,36	Combustible volume flow	m <sup>3</sup> /h 109
Fuel consumption (el.)	kWh/kWh		2,46	Waste gas mass flow, wet	kg/h 1.121
				Waste gas mass flow, dry	kg/h 1.044
				Waste gas volume flow, wet	m <sup>3</sup> /h 856
				Waste gas volume flow, dry	m <sup>3</sup> /h 753
				Heating water volume flow (max.)	m <sup>3</sup> /h 13
<b>Temperatures and pressures</b>		<b>Technical basic conditions</b>			
Waste gas temperatur after turbine	°C		495	Power conditions acc. To DIN-ISO-3046	
exhaust back pressure	mbar		30	Norm conditions: air pressure: 1000 mbar	
Heating water return temperature (max)	°C		70	Air temperature: 25 °C or 295 K, rel. Humidity: 30%	
Heating water flow temperature (max)	°C		90	Gasquality accorcng "2G TA 04 Gas"	
Pressure decrease heating circuit (max)	mbar		150	All data are related to full load engine running at denoted media temperatures and are subject to technical advancements.	
maximum backpressure at the air intake	mbar		15	Equipment as well as installation systems have to meet all technical instructions of 2G.	
<b>Emission value at 5% residual oxygen</b>					
NOx	mg/Nm <sup>3</sup>	<	500		
CO	mg/Nm <sup>3</sup>	<	1.000		

**Generator data**

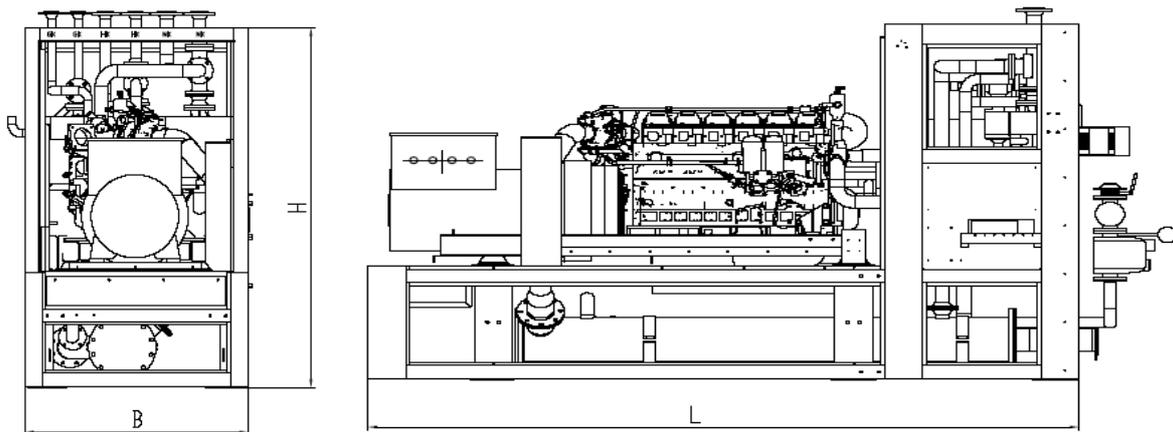
Manufacturer		Leroy Somer
Type		LSA 46.2 VL12
Power at Cos φ = 0,8	kVA	275
Voltage	V	400
Frequency	Hz	50
Rated speed	1/min	1500
Nominal current at Cos φ = 0,8	A	397
Cos φ		0,8 - 1
Efficiency (full load) at Cos φ = 1	%	96,00
Efficiency (full load) at Cos φ = 0,8	%	94,40
Reactance X"d	%	11
Reactance Xi = X2	%	12
Mass moment of inertia	kg m <sup>2</sup>	2,80
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	3.720	
Height (H):	mm	2.208	
Width (B):	mm	1.300	
Weight (approx.):	kg	3.500	
<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	

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**Modul:**



**Control cabinet:**

**Power cabinet:**

