Compressed-air-and-heat system
CHP CA 570 NA

COMPRESSED-AIR PRODUCTION WITHOUT ELECTRICITY

In most companies, the supplies of compressed air, heating energy and process heat represent a large cost factor. Production halls must be heated, and products dried or heated for manufacture. Compressed air is utilised in many ways in modern industries, and accounts for around 10 % of total energy costs. This causes high operational costs, which depend on energy and gas prices as well as political conditions. Conventional systems are thus becoming increasingly uneconomical.

A COST- AND ENERGY-EFFICIENT SOLUTION

Bosch KWK Systeme has developed the innovative CHP CA 570 NA compressed-air-and-heat system to save on operational costs. It combines an oil-injected screw compressor with a gas engine. To use the energy as efficiently as possible, almost all of the heat produced is transferred to the heating circuit.

EXPERIENCE

Our first compressed-air-and-heat system was installed in an industrial company in 2015. At 90 per cent annual utilisation in the year, a savings of over €50,000 was calculated, the carbon footprint was halved, and after less than 3 years, the investment has paid for itself.

CONCLUSION

The compressed-air-and-heat system is worthwhile in many ways:

- Energy costs are reduced
- Overall efficiency increases
- Carbon footprint shrinks
- Independence on political

Do you want to lease a compressed-air-and-heat system? – Contact us.

VERSATILE APPLICATION POSSIBILITIES

Our combined heat, power and compressed air system meets a variety of requirements:

- The compressor output is continuously variable (above 60 %) via engine speed
- Maximum output pressure: 8.5 bar
- Feed temperature to heating system: constant 90 °C

Image: Combined heat, power and compressed air system at the power station of the Bosch Thermotechnik GmbH in Lollar

TECHNICAL DATA

Compact module (8.5 bar positive pressure and 1800 rpm)

Volume flow rate pursuant to ISO 1217	570 m³/h
Thermal rating (± 8 %)	135 kW
Design	Compact module
Fuel	Natural gas
Energy input (± 8 %)	164 kW
Electrical input rating	3.0 kW
Hot water (return / feed)	70 / 90 °C
Exhaust temperature after heat exchanger	110 °C
Exhaust back pressure after engine (max.)	30 mbar
Exhaust-gas mass flow (wet)	244 kg/h
Dimensions: Length approx.	3 290 mm
Width approx.	960 mm
Height approx.	1 830 mm
Weight approx.	2 400 kg

Compressor (speed regulated)

Operational overpressure	6.0 – 8.5 bar
Heat recovery compressed air	48 kW
Intake power (1 800 / 2 700 rpm) pursuant to ISO 1217	390 / 570 m³/h

Gas engine

Engine manufacturer	MAN
Engine type	E 0834
Gas input pressure	> 20 / < 100 mbar
Specific brake horsepower at 8.5 bar positive operating pressure	0.105 kWh/m³
Thermal efficiency	82.0 %
Engine heat output	48 kW
Speed range	1 200 - 1 800 rpm
Exhaust heat with heat exchanger	39 kW
CO (at 5 % O_2 in dry exhaust)	≤ 300 mg/m³*
NOx (at 5 % O_2 in dry exhaust)	≤ 250 mg/m³*
NMHC (at 5 % O_2 in dry exhaust)	≤ 150 mg/m³*

Installation conditions (Values in accordance with standard reference requirements and at max. operating pressure of 8.5 bar_{gauge}):

- Gas engine:
  absolute air pressure 1 013 mbar; air temperature 25 °C; relative humidity 30 %;
  installation altitude 100 m about sea level; methane number ≥ 80
- Compressor unit:
  absolute intake pressure 1 bar; intake temperature 20 °C; humidity 0 % (dry) installation

Site requirements: Three-phase connection; 16 A, 400 V and 50 Hz

* under standard conditions

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