

Press release August 2005

CO₂ Engine[®] SenseAir's CO₂-sensor in cars – a low cost product that works!

CO₂ as a refrigerant fulfils the requirements towards lower environmental impact and a better system efficiency in automobile climate control systems.

Large efforts have been made to find an alternative refrigerant in climate control systems for cars. Now the market seems to realize the considerable advantages with CO₂ control;

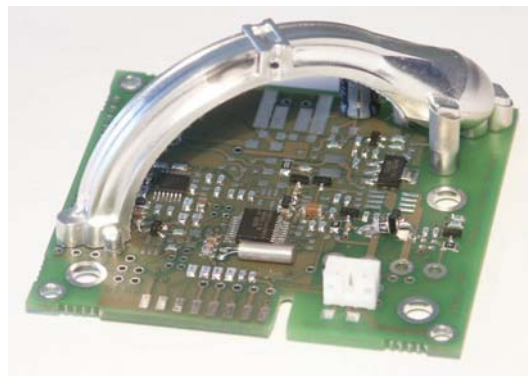
CO₂

- is an excellent **environmentally friendly** substitute for the dangerous freons in automobile climate control systems
- offers good **thermo- dynamic properties**
- allows the system to **cool and to heat**
- is a **natural gas** readily available

Since the operating pressure of a CO₂ climate control system is much higher than in conventional systems and, accordingly, there is **a higher risk of leakage**, you have to control the CO₂-level to prevent that too high levels in the cabin will hurt the passengers.

Besides the risks with system leakage there is an increased CO₂ level when the air is recirculated in the cabin. By using Demand Controlled Ventilation (DCV) you make sure that the CO₂ concentrations are kept low, and other emissions will also be ventilated automatically. DCV also helps to **reduction of fuel consumption**. The best choice for this purpose is to use a CO₂ sensor from **SenseAir[®]**.

SenseAir[®] has a long tradition of developing CO₂ gas sensors using the measuring principle NDIR. The company continuously puts efforts in finding less costly high quality technical solutions to the problem of gas measurement. SenseAir's sensors quickly and reliably detects elevated concentrations of CO₂.



CO₂ Engine[®] from SenseAir is a cost optimized, reliable CO₂ sensor

In OEM products all over the world there is a CO₂ sensor from SenseAir (i.e. Honeywell, Yamatake, Sauter, TAC, Johnson Control, Trend et al.)

General information about CO₂ Engine:

Operating Temperature Range.....	-10 to +70 C
Measurement Range.....	0 to 20 000 ppm
Resolution.....	1 ppm
Step Response Time.....	< 10 seconds
Sensor Life Expectancy.....	> 15 years
Accuracy.....	+ - 5 % of measured value + -0,5 % of measurement range
Maintenance interval.....	no maintenance required

Physiological effects of CO₂

~ 400 ppm	normal outdoor air
1 000 ppm	comfort limit (ASHRAE standard)
2 000 ppm	increase of the breathing rate
5 000 ppm	hygienic limit (labour regulations)
10 000 ppm	short term exposure limit (STEL)
30 000 ppm	mortal danger limit within minutes (TRSK400 and other standards)
100 000 ppm	cramps and unconsciousness within seconds