

Ice arena

Facts & figures:

Most professional arenas can host up to 10000 spectators, the largest up to 15000.

The USA and Canada have the largest ice arenas in the world: Chicago and Montreal, respectively the Ball Centre and the United Center: both hosting over 20000 spectators

The largest European Ice arena is located in Cologne, the Lanxess arena, able to host 18500 spectators



Ice Arenas in general

There are thousands of indoor ice rink arenas in the United States, Canada, and Europe. The CO₂-value varies a lot in the stadium whether it is empty or at maximum capacity during a key match.

Some of the arenas have compromised air quality because of high concentration level

of various pollutants. The concentration level within an ice rink facility depends highly on the fuel type of the ice resurface machine, the frequency of re-surfacing, and the degree of ventilation.

This is a health risk to both athletes and spectators.

Why the need to measure CO₂?

The value of carbon dioxide in the air in an arena may vary a lot. When the audience is large the value is higher than if it is in an empty stadium. Therefore we have to ventilate.

Without demand controlled ventilation there is a potential to over ventilate which leads to increased warm air into the arena, the consequence being the ice melts. To avoid this, the stadium then has to cool down the ice, which is energy-consuming.

It is also necessary to ventilate to ensure a healthy indoor environment. Machines in the stadium are polluting the air and there are many people in an arena like this.

How does it work?

The CO₂-concentration in an arena is varying depending of the number of people in it. An empty arena has a concentration about 400 ppm (normal outdoor concentration). Then the CO₂- concentration in the room will increase for each added person.

Therefore using a system of Demand Con-

trolled Ventilation is best for efficiency. This means that sensors are measuring the CO₂-value constantly, and sending a signal to the ventilation system that changes the grade of the ventilation to compensate.

Reduced costs

Thanks to the reduced need of constant ventilation and the reduced need of cooling the ice, a demand controlled ventilation system helps the ice arena building to save energy. This saves money and it's also good for the environment. Estimated there are about 25 000 indoor ice rink arenas in Europe and therefore the savings will be huge.

Well controlled ventilation also makes the air healthier and this also saves money based on not having to send people to hospitals for cases of CO₂ poisoning or other air quality related illnesses such as asthma.

An owner of an arena that starts using this kind of ventilation can expect a return on investment in around 3 months.

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What solution can Rotronic offer?

Rotronic offers a wide range of fix-mounted CO₂ only and CO₂ temperature transmitters. All of them are based on the principle of NDIR technology. They are pre-calibrated and have a life-

time of over 15 years under normal conditions. Multiple analogue outputs like current loop, voltage and relay contact allow for the easy adaptation to every application. A major advantage of the cur-

rent sensor is the stability of the measurement over the entire temperature range, whereas some sensors are temperature dependant, Rotronic remains stable.



CF3 duct mount transmitter

Rotronic products:

Transmitter:

- **CF3 series**
0...2000ppm or 0...5000ppm,
±30ppm, ±3% of reading
Optional display,
IP54
- **CF8 series**
0...2000ppm or 0...4000ppm,
±30ppm, ±3% of reading or
±300ppm, ±3% of reading
Optional display,
IP54,
Optional visual alarm,
Optional relay,
Optional CO measurement,
Optional temperature measurement,

Hand held device:

- **CP11**
Measurement of CO₂, temperature and relative humidity,
-20...60°C,
±0.3K,
0.1...99.9%rh,
±2.5%rh,
0...5000ppm,
±30ppm, ±5% of measured value,
Data logging function (18000 values) with time stamp.

Calibration:

- **CO₂ calibrator**
Neutralises CO₂ from the air,
Cleanness: 20-25ppm CO₂ gas flow out,
Reaction time: 90 seconds to neutralise CO₂
Operating range: 0...45°C,
Delivered with 10 soda lime cartridges.



CF8-W-Disp-GH transmitter

Customer benefits:

Accuracy and long term stability

Choosing Rotronic gives you the best accuracy on the market.

The Rotronic CO₂ sensors can easily be calibrated, to guarantee highest possible precision of the measured concentration.

Calibration

The ABC function automatically avoids baseline drift. A calibration and adjustment is carried within a user defined time where the lowest value is automatically calibrated at 400ppm. Optionally

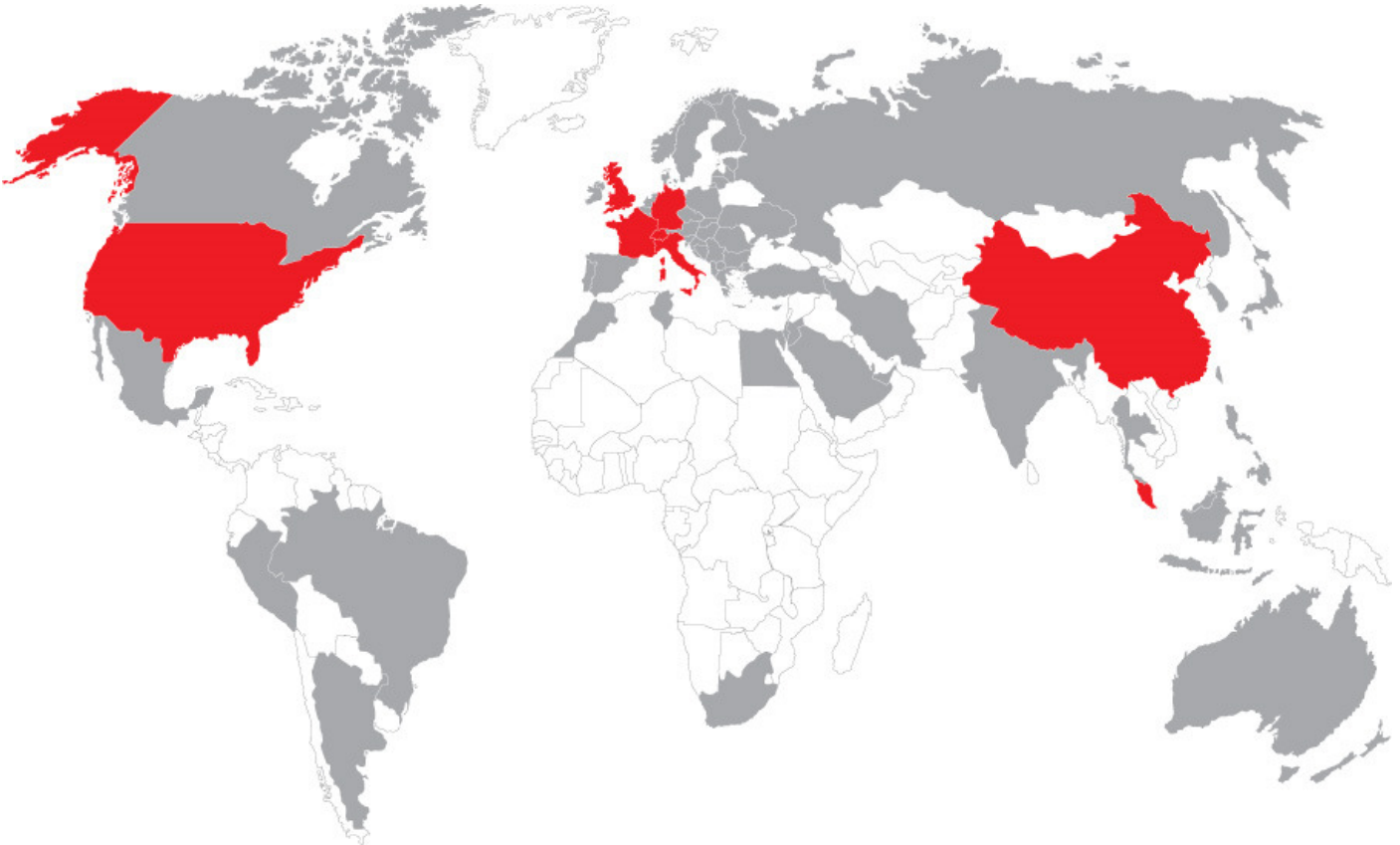
a 0ppm calibration unit is available from Rotronic.



CP11 handheld device with the 0-calibration unit

Contact us:

Rotronic is represented in more than 40 countries around the world. An up to date list of all our partners is available at www.rotronic.com



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