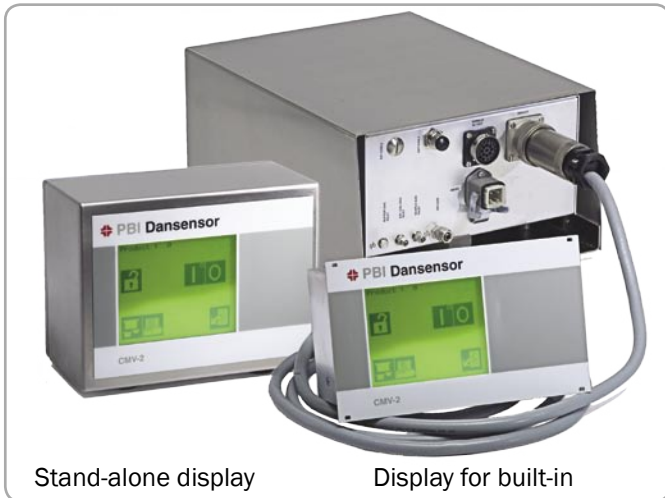


# CMV-2

## Data Sheet

**In-line gas analyser for gas/vacuum packaging machines**  
- prepared for use with electronic gas mixer



### Features

- Clean hygienic touch screen operated control unit with an icon based user interface
- Deep electronic integration with the packaging machine
- Separate sensor and control unit for easy mechanical integration in the operation area of the packaging machine (no need for use of a control unit for those who wish to use the interface of the packaging machine for controlling the CMV-2)
- Direct control/measurement of the protective atmosphere from the vacuum side of the product in less than 1 sec.
- RS 232 included
- Robust industrial design made in stainless steel/ aluminium
- Built-in alarms for high and low gas concentrations - alarms will stop the packaging machine automatically
- Built-in complete self-diagnostics
- 100% data logging of the MAP quality
- 32 set-up programmes, each with 4 alarm levels per gas
- Optional: delivered with a very accurate electronic gas mixer

### Introduction to the CMV-2

The CMV-2 (Combi Module Vacuum) is an in-line oxygen/carbon dioxide analyser designed for use with vacuum gas packaging machines. The gas analyser for oxygen measurement is based on a ceramic O<sub>2</sub> sensor, and for carbon dioxide measurements an infra-red sensor is used, both are developed and manufactured by PBI-Dansensor A/S.

The instrument works in-line by measuring the gas content non-destructively before sealing in each package index. If the residual oxygen or carbon dioxide for a reason or another should not be within the user-defined levels an alarm will be activated and the packaging machine will stop or a alarm light will flash. The system can also detect most malfunctions in the die, leach, vacuum pump, ect. e.g. a worn-out seal between the dies or other parameters.

The CMV-2 can also be controlled and programmed from an external computer. This feature also proposes multiple set-up programmes for individual alarm levels per package type. The programme will at the same time log measured data. A unique feature of the CMV-2 is its capability to perform a direct control measurement of the protection gas from the vacuum side of the products in less than 1 sec.

Finally you have the possibility of integration with an electronic 2 or 3 gas mixer, which can be controlled from the panel of the CMV-2.

### Fast, sensitive and accurate

The CMV-2 is very fast. First of all it is fast to warm up, secondly it is fast because the sensor only needs 2 ml of sample gas to perform a measurement. Thirdly the detector is very sensitive and needs less than 1 sec. to perform a control measurement of the protection gas. Finally, it is accurate because we always use the most optimal measuring point on the die.

### Full integration

The CMV-2 can be installed on virtually all kinds of vacuum gas packaging machines, and is also suitable for retrofitting. It is made for an easy mechanical integration by building it directly into the packaging machine. The sensor module can be placed inside the packaging machine. Hereafter you can place the display on a convenient spot, as there are two different displays available for the CMV-2, a display for built-in (IP52) and a stand-alone display (IP65).

Furthermore PBI-Dansensor offers versions without display. For example these black-box versions are prepared to be fully integrated and completely controlled with/by the packaging machine. For example it allows you to set the alarm levels on the CMV-2 at the same time as setting up a new product on the packaging machine. As well it is possible to connect an electronic gas-mixer to the black-box versions.

### Calibrated and ready to install

The CMV-2 is delivered calibrated with a certificate of calibration and only needs to be re-calibrated once a year. If you wish to re-calibrate the CMV-2 yourself, you can take advantage of the built-in automatic calibration routine. This is a very simple process, just follow the guidelines in the user manual.

## Electronical gas mixer

The CMV-2 is also offered with our MAP Mix 8000 EL, electronic gas mixer. This feature gives you the possibility of controlling an electronic gas mixer directly from the CMV-2. By doing this you will gain an extremely fast and secure controlling of the gas composition used in the MA package. You will have the opportunity of mixing 2 or 3 gases together with the possibility of making an optimized calibration of the mixer unit via the CMV-2 display.

In the beginning the electronic gas mixers from PBI-Dansensor was developed only for use together with the CMV-2. Because of simplicity in operation combined with newly developed software programme "MixSet" we now offer the MAP Mix 8000 EL as a stand alone product for a lot of applications.

## Principle of operation

### Oxygen

The CMV-2 uses a solid state sensor. The sensor operates like a solid state battery, which produces a small voltage or electro motive force (EMF) in the presence of oxygen. This EMF is directly related to the oxygen concentration of the gas being passed into the sensor. The CMV-2 oxygen sensor is remarkably robust and stable, the readings are high repeatable, and the sensor is very fast (the response time of the sensor is 50 msec.).

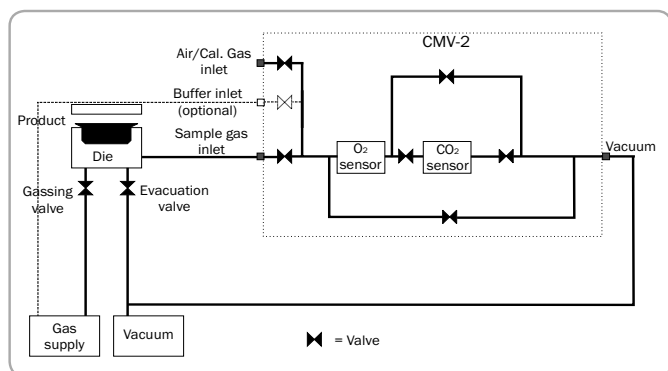
### Carbon dioxide

The CO<sub>2</sub> sensor is a self-contained non-dispersive IR sensor complete with IR source and dual wavelength filter. There are no moving parts and the sensor is very sturdy.

### Gas mixing

The electronic gas mixer is a separate module to the CMV-2. The mixer principle is based on the same principles as used in the world-famed electronic mixer placed in the Dansensor Module TGC-2.

## System configuration and installation



The CMV-2 is electronically integrated with the packaging machine and can cope with even high packaging speeds.

## Technical specifications

Sensors	
O <sub>2</sub> sensor, ceramic, solid state sensor:	Measuring gas: Pure, dry inactive gases or mixtures of such gases Reference gas: Stationary atmospheric air (20.946 % O <sub>2</sub> ) Sensor life: > Five years operation under the conditions given
CO <sub>2</sub> sensor (optional):	Infra-red, dual wavelength sensor Sensor life: > Five years operation under the conditions given
Measuring range	
O <sub>2</sub> sensor:	0.001 - 100%, auto ranging
CO <sub>2</sub> sensor:	0 - 10%, 0 - 30% or 0 - 100%, depending on the version
Accuracy	
O <sub>2</sub> sensor:	±1% of the reading in the calibrated range and ±1 on the last digit shown
CO <sub>2</sub> sensor:	±2% of the full range
Heating time	
O <sub>2</sub> sensor / CO <sub>2</sub> sensor:	10 minutes from cold state (shorter at temporary interruptions)
Operation	
Display:	Menu-controlled touch screen with a large, easy to read, graphic display
Alarm:	Entry of up to 32 products, all with programmable prewarnings and alarm levels for O <sub>2</sub> and CO <sub>2</sub> respectively, if a CO <sub>2</sub> sensor is mounted
Mechanical data	
Dimension: (HxWxD)	Sensor module: 160 x 260 x 340 mm External display: 150 x 200 x 100 mm Display for built-in: 129 x 213 x 76 mm Gas mixer: 190 x 234 x 365 mm (2-gas version)
Cabinet:	Sensor module: Stainless steel, IP63 Stand alone display: Stainless steel, IP65 Display for built-in: Stainless steel IP52 Mixer: Stainless steel, IP52
Weight:	Sensor Module: 10.4 kg External display: 5.5 kg Display for built-in: 4.4 kg Gas mixer: approx. 10 kg (2-gas version)
Electrical connections	
Communication	RS 232C serial port for external printer, PC or gas mixer
Power supply	90-110 VAC, 50-60 Hz, 180 VA 104-127 VAC, 50-60 Hz, 180 VA 194-237 VAC, 50-60 Hz, 180 VA 207-263 VAC, 50-60 Hz, 180 VA
Relay contract	1. "Ready", max 48V/1A 3. User defined alarms, max. 48V/1A

PBI-Dansensor-gasrec-CMV2-UK/3

Distributor:

 **PBI Dansensor**

PBI-Dansensor America Inc. . 139 Harristown Road . Glen Rock, NJ 07452 . USA  
Tel.: (+1) 201 251 6490 . Fax: (+1) 201 251 6491  
e-mail: sales@pbi-dansensor.us . Website: www.pbi-dansensor.us

Headquarter: PBI-Dansensor A/S . DK - 4100 Ringsted . Denmark  
Tel.: (+45) 57 66 00 88 . Fax: (+45) 57 66 00 99  
e-mail: info@pbi-dansensor.com . Website: www.pbi-dansensor.com