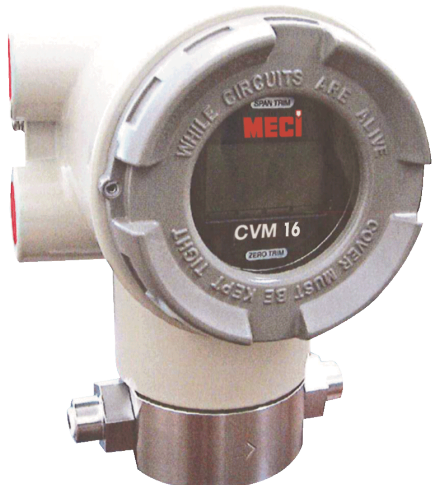
Gas Calorimeter

CVM 16



Flow computers | Measuring sytems | Remote Terminal Unit | Supervisory system

The CVM 16 gas calorimeter measures the thermal conductivity of a mixture of gases at different temperatures in order to determine the calorific value higher or lower or gas wobbe index.

CVM 16 is a compact, lightweight, and high-precision gas calorimeter that complies with international legal metrology standards. CVM 16 can be integrated inside an instrumented box with a second CVM 16.

It is approved for custody transfer measurement of gases according to OIML R140.

OIML R 140 and Welmec compliant device

Approved according to OIML R140 international recommendation and developed according to Welmec guide, CVM 16 can be used as a calorific value determining device (CVDD) for natural gas custody transfer measurement.

Compact and easy to install device

Unlike conventional gas calorimeters, CVM 16 is small and lightweight, allowing a variety of installation site choices. It is ATEX approved and suitable for mounting in zone 1.

Fast response measuring system

CVM 16 represents a revolutionary continuous measurement solution. It is able to follow the evolution of the gas in real time thanks to its measurement every two seconds.
The time constant for 90 % response is within 30 seconds resulting in very fast output of gas calorific value.

High stability measurement

CVM 16 automatic calibration functionality guarantees prolonged measurement stability. The automatic calibration uses pure methane and guarantees long-term stable operation.

A wealth of diagnostic functions

Ambient temperature diagnostic
CVM 16 determines whether the operating environment is suitable, making use of a temperature sensor embedded on the same chip as the thermal conductivity sensor.

Operation time tracker
CVM 16 keeps track of the total operation time for comparison with the recommended replacement period (70 000 hours) for the calorimeter.

Automatic calibration history check
CVM 16 shows up to 5 of the latest automatic calibration records to check changes in the calibration factor.

PC operating software

Measurement principle

The CVM 16 measures the thermal conductivity of natural gas at different temperatures using its TCD.
The calorimeter uses the (SVR) method, commonly used on some differential pressure transmitters, to determine one of the properties of the gas.

Technical data - Gas Calorimeter

Model		CVM 16
Applications		Control of burners, laboratory measurement, field measurement
Functions	Calculated values	Calorific value (superior or inferior), wobbe index
	Number of stream	2
	Analysis time	2 seconds
	Data storage	Up to 5 calibration records

Measured gas specifications

Component	High Natural Gas	Low Natural Gas biomethane	LNG (gaseous)	Biogas
C2H6	0 - 11%	0 - 4%	0 - 14%	0
C3H8	0 - 5%	0 - 1%	0 - 4%	0
C4+	0 - 2%	0 - 0.5%	0 - 2%	0
N2 + O2	0 - 7%	0 - 15%	0 - 1%	0 - 60%
CO2	0 - 2%	1 - 2.5%	0%	0 - 60%
CH4	80 - 100%	77 - 100%	80 - 100%	40 - 100%

Standards & performances	Accuracy	+/- 1 % of reading (OIML R140 compliant model)
	Repeatability and T90	+/- 0.02%, T90 between 5 sec to 22 sec
Equipment	Detector	Micro TCD (Thermal Conductivity Detector)
	Display	LCD, 5 digits
	Enclosure	Aluminum alloy, Window : reinforced glass, Dimensions: 160 x 130 x 120 mm, Weight : 2.5 kg
	Process gas connection	NPT 1/8" female
	Electric connection	Cable gland M20 or ½" NPT
Inputs/Outputs	Analog output	1 output 4-20 mA
	Digital outputs	2 open collectors, 24 VDC +/-10 %, 50 mA max. for status output 1 A max for calibration output
	Serial link	HART Version 7.0 pocket or PC software to connect
Languages		English, French

Operating conditions

Temp ref °C	Units MJ/m3	Output	Natural gas biomethane	LNG	Biogas kWh/m³
15/15 20/20 25/20	SCV	Superior Calorific Value	35 - 45	37 - 47	13.97 - 37.94
	WI_Hs	Wobbe Index with SCV	46 - 56	48 - 58	
	ICV	Inferior Calorific Value	31 - 41	33 - 43	
	WI_Hi	Wobbe Index with ICV	41 - 51	43 - 53	
0/0 25/0 15/0	SCV	Superior Calorific Value	32-42 ; 37-47	39 - 49	15.97 - 39.94
	WI_Hs	Wobbe Index with SCV	41-53 ; 48-58	50 - 60	
	ICV	Inferior Calorific Value	33 - 43	35 - 45	
	WI_Hi	Wobbe Index with ICV	43 - 53	45 - 55	

	Temperature	-10°C à + 50°C with heating
	Humidity, Moisture	95 % RH max. Dew-point temperature -20 °C max.
	Pressure & Flow rate	110 kPa abs max. / 16 PSI abs - at CVM 16 process connection port inlet 50 mL/min +/-10 mL/min
	Dust	Particles size less than 1 µm, 1 mg/m3 max.
	Calibration	Automatic or manual, Pure methane (99.995 purity min.)
Installation conditions	Protection class	IP 66
	Power Supply	24 Vdc +/-10 %, 0.6 A
Certifications	ATEX	Ⓔx II2G / Ex dIIBT6Gb
	Custody transfer approval	According to OIML R140

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