

Calorimeter

# CWD SPC





Datasheet

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## Outdoor calorimeter with type approval for operation in potentially explosive atmospheres

The combustion calorimeters of the CWD (Calorimetry, Wobbe index, Specific Gravity) series are used to determine gas quality and the associated measured variables:

- Calorific value and heating value
- Wobbe index
- Specific density
- CARI, air requirement

The CWD SPC (System Purge Certified) is an outdoor version of the CWD for use in potentially explosive atmospheres (Class I Division 2 Groups B, C, D, T4).

- NFPA 496, 2013 and
- ANSI/ISA 1212.01

Typical areas of application include flare gas combustion, gas turbine control, and fuel control in refineries or petrochemical plants.

### Typical measuring ranges CWD SPC (others on request)

Application	Wobbe measuring range [MJ/m³] start	Wobbe measuring range [MJ/m³] end	Accuracy [%]
Natural gas	30	60	1 Measured value
Liquid gas air	30	60	1 FSR
Liquid gas air extended measuring range	30	80	1 FSR
Biogas	14,5	25	1 FSR
Mixed gas	Various mixed gases – details available on request		
Coke oven gas	19	29	1 FSR
Refinery gas	25	70	1 FSR
Combustible gas	0 10	30 40	1 FSR
Flare gas	0 0	118 90	2 FSR

The direct and continuous determination of gas quality using combustion calorimeters is a measurement principle that has been proven for more than 60 years and offers a high degree of accuracy (see Table 1). When a defined volume of gas is combusted, all gas components are thermally converted. The energy released in this process is proportional to the Wobbe index. At the same time, the specific density of the gas is measured so that the calorific value can be calculated from these two variables.

The detection of unexpected or unknown gas components enables the CWD SPC to be used particularly in cases where the gas composition changes rapidly, e.g. in residual gases from chemical processes or substitute gases in the steel industry. In addition, the system offers a high level of safety when processes are shut down or the gas supply is interrupted by extinguishing the flame after a maximum of 10 seconds.

The measuring principle is free of cross-sensitivities to individual gas components such as O<sub>2</sub>, H<sub>2</sub> or CO.

### Technical specifications CWD SPC

Weight	up to approx. 250 kg
Dimensions H x W x D (mm)	2450 x 1150 x 600
Protection class	IP64 (Nema4X)
Ex classification	Class I, Div. 2, Group B, C, D, T4
Ambient temperature	-20 °C–45 °C
Ambient humidity	0–95 % relative
External pressure	800–1100 hPa (0.8–1.1 bar)
Gas inlet pressure	30–40 mbar
Process gas inlet	1, additional optional
Test gas inlet	1 per measuring range
Support gas inlet	max. 1
Relative gas humidity	≤ 95 %, condensate-free
Gas inlet temperature	max. 45 °C
Instrument air consumption	30 m³/h (standard condition)
Instrument air pressure	min. 5 bar, max. 10 bar
Voltage	240 VAC, 50/60 Hz; 110 VAC, 60 Hz
Interfaces	8 SPDT Relais 3x 4. 20 mA, additional optional Buses optional
T90 display time	< 15 sec
Certifications/Conformity	NPFA 496, 2013; ANSI/ISA 1212.01
Connection box certification	IECEX PTB 09.0048 PTB ATEX 1108

The central component is the CWD PLUS combustion calorimeter, which is mounted in a protective housing that is pressurised and purged with compressed air. Other components of the CWD SPC are:

- Junction boxes (approval: IECEx, ATEX)
- Ventilation system for the protective housing
- Pressure gauge and pressure switch on the protective housing
- Compressed air supply and ball valve

The control unit comprises the central control components and is connected to two electronic modules via an internal device bus. The measurement technology module collects the measurement data and the I/O module handles external communication.

The software is based on a real-time operating system. It is structured in various menu levels.



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