azbil

Natural Gas Calorimeter

The model CVM400 is the simple CVDD, which measures the calorific value, Wobbe Index, and Methane number.

1. OIML R140 CVDD Class B compliant device
2. Integral style with IEC Ex/ATEX/TIIS/KCs flame-proof safety approval
3. Innovative small size and light weight
4. Revolutionary continuous measurement with Azbil Corporation original thermal conductivity sensor

Azbil Corporation

Features

1 OIML R 140 compliant device. Can be used as a calorimeter or calorific value determining device (CVDD) for natural gas. (OIML R140: International Organization of Legal Metrology recommendation that includes specifications for CVDDs.)

2 Innovative structure compatible with various installation sites.

- Unlike conventional gas calorimeters, the model CVM400 is small and lightweight, allowing a variety of installation site choices.
- Explosion-proof: compliant with IECEx, ATEX, TIIS and KCs and suitable for Zone 1 use.

3 Revolutionary continuous measurement. Can detect a change of calorific value in processes in near real time by measuring every 2 seconds.

4 Fast response (sample flow rate: 50 ml/min)

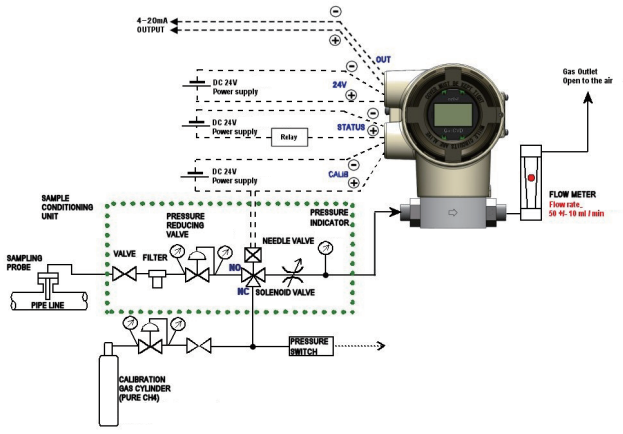
- Natural gas model : 5 seconds (When caloric value changes more than 0.7 MJ/m^3)
- OIML model : 30 seconds
- LNG model : 5 seconds

5 Automatic calibration for prolonged stability. Automatic calibration using pure methane guarantees long-term stable operation.

6 A wealth of diagnostic functions

- Ambient temperature diagnostic function. 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 function. Keeps track of the total operation time for comparison with the recommended replacement period.

  Automatic calibration history check function. Shows up to 5 of the latest automatic calibration records to check changes in the calibration factor.



Example of recommended installation

Measurement principle

The model CVM400 measures the thermal conductivity of natural gas at different temperatures, changing the temperature of the thermal conductivity sensor in multiple stages. The calorimeter uses the support vector regression (SVR) method that is also employed on Azbil Corporation' s differential pressure transmitters. The calorific value is calculated from the measured thermal conductivity values of the process using a characteristics formula created in advance based on thermal conductivities measured at different temperatures of the natural gas.

ITEM	SPECIFICATIONS	
Application	Natural gas calorific value(Gross/Net), Wobbe Index(Gross/Net) and Methane Number measurement	
Output	4 to 20 mA analog output	
Communication	HART protocol (Ver. 7.0)	
Accuracy	± 1% of the measuring point (under OIML test condition)	
Repeatability	± 0.2% of the measuring point (under OIML test condition)	
Measurement range	35.0 to 45.0 MJ/m^3	
Gas specification (For detail, refer to specification sheet;SS2-CVM100-0100)	Component limit	CO2<60 mol%*, N2<60 mol%* (e.g. Bio gas model)
	Temperature	-10 °C to 50 °C
	Maximum process gas pressure	110 kPa (abs)
	Consumption	50 ± 10 mL/min
Response time	Measurement period	2 s
	Response time 90%	5 sec.* at 50mL/min sample flow rate
Level of protection	Enclosure	IP66
Ambient temperature	-10 °C to 50 °C	
Calibration	Automatic adjustment on Pure methane	
Power supply	Device requirements	24 VDC ± 10% 0.3 A max
	Alarm contact	26.4 VDC 50 mA max
	Calibration contact	26.4 VDC 1A max (solenoid valve)
Dimensions / weight	Dimension	W:120, D:130, H:160 (mm)
	Weight	2.5 kg
	Electrical conduit	NPT1/2 or M20
	Gas inlet connection	NPT1/8F or Rc1/8
		*Depends on models of gas type
<Approvals>		
Explosion-proof	IEX Ex	Flame-proof
	ATEX	Flame-proof
	TIIS	Flame-proof
	KCs	Flame-proof
OIML R140	CVDD (calorific value determining device)	
	mpes	Accuracy class B CO_2<2 mol%, N_2<7 mol%, C_4^+<1.2 mol%
	Class (OIML D11)	I (for indoor)
	Temperature	-10 °C to 40 °C

Please read "Terms and Conditions" from the following URL before ordering and use.
https://www.azbil.com/products/factory/order.html

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