

# Explosion-Proof Calorimeter

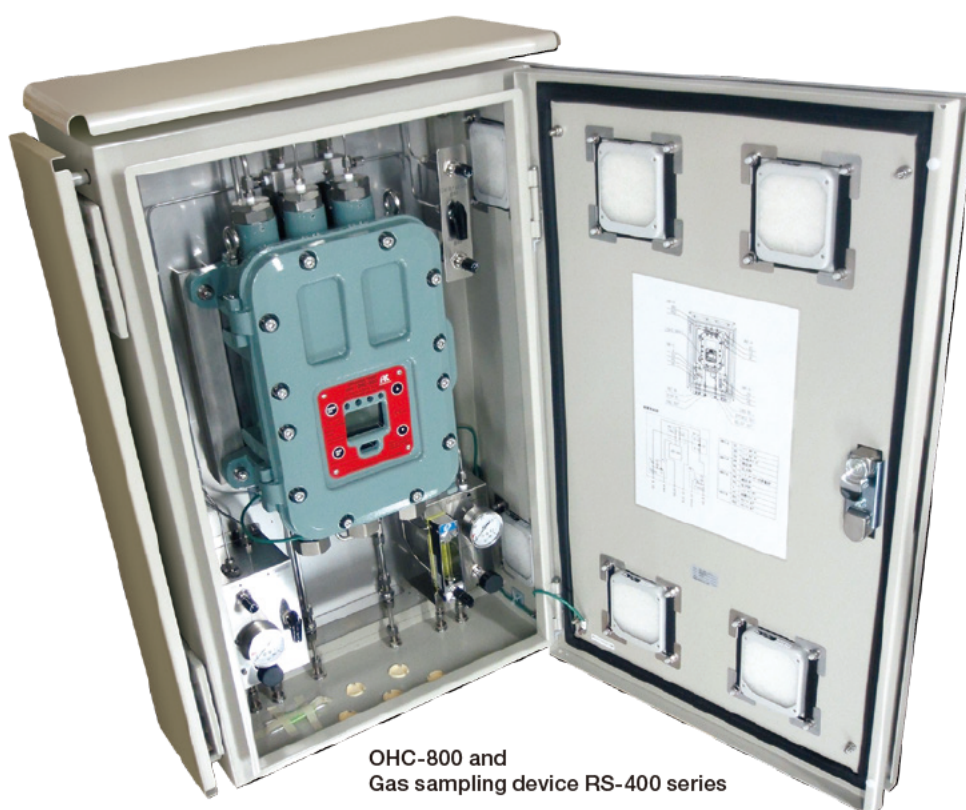
Calorific value

Specific gravity

Model OHC-800

Wobbe Index

Methane number



OHC-800 and  
Gas sampling device RS-400 series

## ■ “Opt-Sonic calculation” is applied by using Optical sensor and Sonic sensor

“Opt-Sonic calculation” is based on the calculation combining 2 measuring results obtained by the 2 sensors. This can minimize the interference effects on the reading caused by interference gases, and enable the high-accuracy and reliable measurement.

\* Opt-Sonic is a term coined by RIKEN KEIKI to describe Optical and Sonic sensors

## ■ Easy to switch the display among “Calorific value”, “Density” and “WOBBE index”

Displayed unit is easily switched by pressing the button. Laborious calculation is not needed.

## ■ Fulfilling self-diagnosis function and running cost

Self-diagnosis function including fault diagnostic prevents the calorimeter from being incapable of measuring the gas.

Few consumables are needed and this saves running cost.

## ■ Body structure that can be installed into all types of location

Structure is robust with Explosion-Proof (Exd IIB+H2 T4) and high ingress protection level (IP66/IP67)  
Both 100VAC~240VAC and 24VDC power supply can be supplied.

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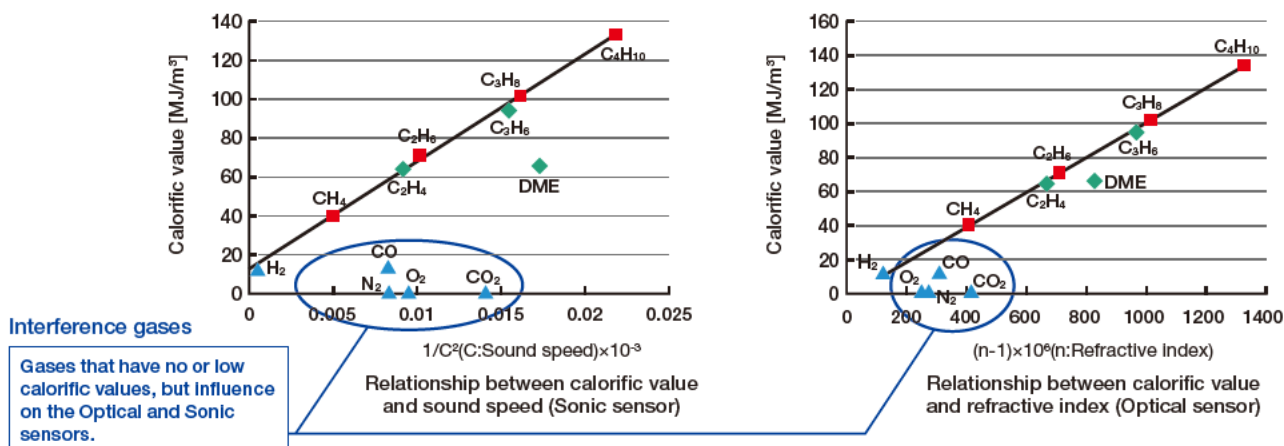
# Features

- Unique measuring principle “Opt-Sonic calculation” is applied.  
This can minimize the interference effects caused by interference gases, and a high-accuracy measuring result can be obtained.
- Fast response time T90 reaction within 5 seconds.
- High repeatability  $\pm 0.02 \text{ MJ/m}^3$
- Wide operation temperature  $-20 \sim +60$  degree C
- Explosion-Proof structure even for Hydrogen II2G Ex db IIB+H<sub>2</sub> T4 Gb <ATEX / IECEx>
- High ingress protection level IP66 / IP67
- Remarkable temperature characteristic  
Below  $0.10 \text{ MJ/m}^3$  fluctuation for the temperature change in a day ( $< 20$  degree C)
- Easy to switch the display among “Calorific value”, “Density” and “WOBBE index” just by the button operation.

**“Opt-Sonic calculation” is applied by using Optical sensor and Sonic sensor. The interference effects on the reading caused by interference gases such as N<sub>2</sub>, O<sub>2</sub>, CO<sub>2</sub> etc. can be minimized.**

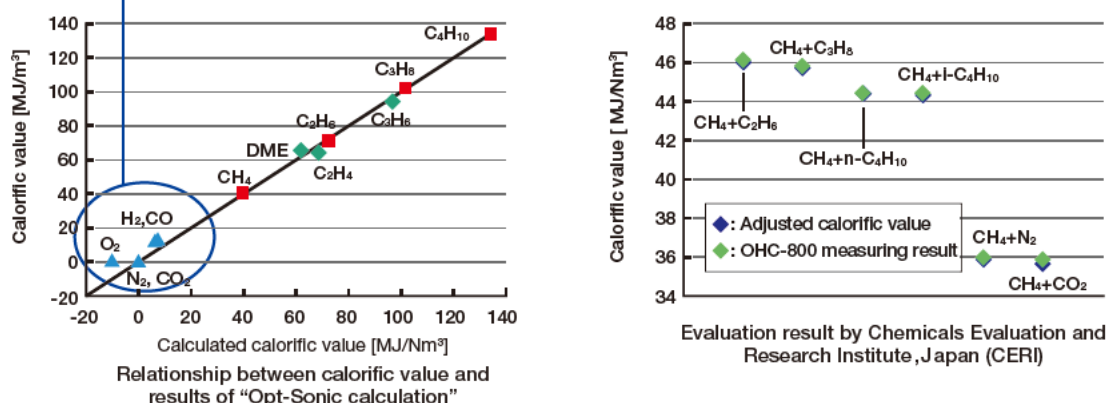
## [What is “Opt-Sonic calculation” ?]

Optical sensor and Sonic sensor are individually used for a calorimeter, but both sensors have the interference effects on the reading caused by interference gases such as N<sub>2</sub>, O<sub>2</sub>, CO<sub>2</sub> etc.



“Opt-Sonic calculation” using measuring results of the Optical sensor and Sonic sensor can minimize the interference effects caused by interference gases, and realize a high-accuracy measurement.

## Minimized the interference effects caused by interference gases



## ■ Specification

Model	OHC-800
Measuring principle	Opt-Sonic calculation through measurement of refractive index and sound speed
Measuring gas	CH <sub>4</sub> basis Paraffinic Hydrocarbon gases as represented by Natural Gas <sup>*1</sup>
Measuring targets	Calorific value (Density / WOBBE index selectable)
Measuring range <sup>*2</sup>	Calorific value: 25.00~50.00 MJ/m <sup>3</sup> (Gross, 0 degree C, 101.325kPa converted) Density: 0.500~1.500 (Specific gravity converted)
Measuring method	Constant-flow-rate gas introduction using external sampling devices
Display	Full-dot LCD (with backlight), 3 color LED lamp
External Output	4-20 mA DC (isolated, source current type) maximum load resistance of 300 Ω / RS-485 communication
FAILURE alarm	Low flow, Sensor unit abnormality, Low light amount
FAILURE alarm display	Lamp (red) / Content indication on LCD
FAILURE alarm contact <sup>*3</sup>	No-voltage contact 1a or 1b De-energize (Energize when alarming) or Energize (De-energize when alarming) Contact capacity of 2 A, 30 VDC (resistance load)
Self-diagnostic function	FUNCTION CHECK (warm-up or maintenance mode), MAINTENANCE REQUIRED, OUT OF SPECIFICATION
Self-diagnostic display	FUNCTION CHECK, OUT OF SPECIFICATION: Lamp (orange) / Content indication on LCD MAINTENANCE REQUIRED: Lamp (green) / Content indication on LCD
Self-diagnostic contact	FUNCTION CHECK, OUT OF SPECIFICATION: No-voltage contact 1a or 1b De-energize (Energize when alarming) or Energize (De-energize when alarming) Contact capacity of 2 A, 30 VDC (resistance load) MAINTENANCE REQUIRED: SSR contact, contact capacity of 20 W, 240 VAC (resistance load)
Power supply	100 - 240 VAC ±10%, 50/60 Hz, max. 18 VA or 24 VDC ±10%, max. 5 W (The setting can be changed to either the AC or DC)
Ingress Protection level	Equivalent to IP66 and IP67
Operation temperature	ATEX / IECEx: -20~+60 degree C (no sudden changes) / Japan Ex: -20~+57 degree C (no sudden changes)
Operation humidity	95%RH or less (no condensing)
Outer dimensions / Weight	Approx. 286 (W) x 453 (H) x 150 (D) mm / Approx. 23 kg
Explosion-Proof structure	Flame-proof enclosures (Explosion-proof class: IIB+H <sub>2</sub> T4 Gb <ATEX / IECEx> / Exd IIB+H <sub>2</sub> T4 <Japan Ex>)

<sup>\*1</sup> Total concentration of interference gases such as N<sub>2</sub>, O<sub>2</sub>, CO<sub>2</sub>, CO etc. contained in a target gas is estimated as less than 20%


<sup>\*2</sup> Contact RIKEN KEIKI for the other measuring ranges

<sup>\*3</sup> Contact setting is adjustable

OHC-800 is designed to have it incorporated in the specific sampling device RS-400 series.  
The model of sampling device is selected in accordance with the location where the calorimeter is installed and gas sampling point pressure condition etc.

### Sampling device model

**RS-400-**



- 
- **Enclosure**
- 0: No enclosure
- 1: Enclosure for outdoor (SUS) with shading plate
- 2: Enclosure for indoor (SPCC) with window
- **Use of pressure reducing valve for measuring gas**
- 0: Pressure reducing valve not used
- 1: Pressure reducing valve used
- **Bypass flow rate of measuring gas**
- 0: Not bypassed
- 1: 0.5 - 5 L/min
- 2: 1 - 10 L/min
- 3: 2 - 20 L/min
- \* "0: Not bypassed" is applied for the case without pressure reducing valve.
- **Pressure gauge unit**
- 1: MPa
- 2: MPa/PSI double units
- \* "1: MPa" is selected for the use in Japan because of the Measurement Act.





# Application

## Electric power energy

(Power generation plant, cogeneration power plant)

Calorific value adjustment, Gas turbine control



## Gas energy

(LNG terminal etc.)

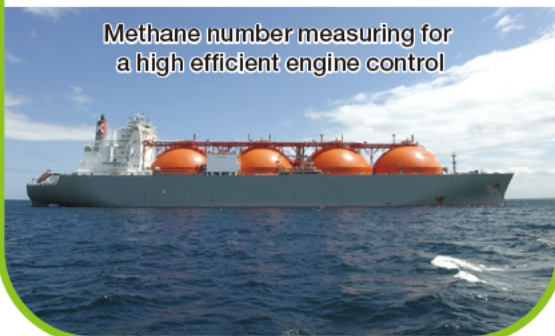
Calorific value adjustment when  
Town gas is supplied



## Gas engine for ship

(LNG ship etc.)

Methane number measuring for  
a high efficient engine control



## Biogas

(Biogas plant, general factory)

Calorific value measurement of biogas  
after removing CO<sub>2</sub> contained in the gas



## Iron steel

(Coke-oven etc.)

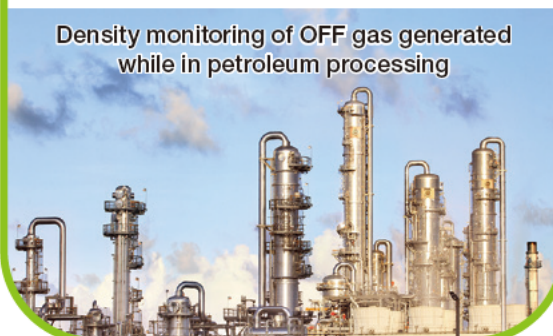
Monitoring of CO<sub>2</sub> and CO contained  
coke-oven gas



## Refinery

(Refinery plant, petro chemical plant)

Density monitoring of OFF gas generated  
while in petroleum processing



- The applications above are just examples. Contact RIKEN KEIKI for the other measuring targets and measuring ranges.

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