

Gas Analyzers

NDIR / Laser / Zirconia / Paramagnetic / Thermal Conductivity

Dependable analyzers offered through long experience and with advanced technologies



Product Variety to Meet Your Needs

NDIR Gas Analyzer Systems ► P. 4-5

Monitors up to 7 gas components

Long-term superior stability

Applications

Waste incinerators, boilers

NOx SO₂ CO₂ CO O₂ HCl Dust



NDIR Gas Analyzers ► P. 6-7

Simultaneous and continuous measurement of up to 5 components

Long-term stability for wide measurement range

Applications

Steel plants (converter furnaces, blast furnaces), gas manufacturing facilities

NOx SO₂ CO₂ CO CH₄ O₂



NDIR Gas Analyzer for heat treatment furnace ► P. 8

Simultaneously and continuously measures 2 components among CO₂, CO, and CH₄

Applications

Heat treatment furnaces (gas generators, carburizing furnaces)

CO₂ CO CH₄



Compact NDIR Gas Analyzers ► P. 9

Gas sampling devices incorporated

Simultaneous measurement of up to 5 components

Applications

Chemical labs, plant labs

NOx SO₂ CO₂ CO CH₄ O₂



Laser Gas Analyzers ► P. 10-11

Fast measurement with insertion type sensor
Reduced cost of ownership

Applications

Waste incinerators, large industrial boilers, chemical plants

NH₃ HCl O₂ CO CO₂ CH₄



Zirconia Oxygen Analyzers ► P. 12-13

Ideal for combustion management
Fast response with no need for gas sampling devices

Ex-proof

Applications

Boilers, incinerators, industrial furnaces, petrochemical plants

O₂



Paramagnetic Oxygen Analyzers ► P. 14

Non-contact sensor offers long-term superior stability
Fast response ideal for combustible gas measurement

Applications

Incinerators, industrial furnaces

O₂



Thermal Conductivity Gas Analyzer ► P. 15

Reliable and continuous measurement of H₂, He, Ar, etc.

Applications

Semiconductor manufacturing facilities, industrial gas generating facilities, H₂ gas related facilities

He Ar H₂ CH₄ CO₂



NDIR Gas Analyzers (for replacement) ► P. 16

Designed for ease of replacement



Gas Sampling Devices ► P. 17



NDIR Gas Analyzer Systems

Monitors up to 7 gas components
Long-term superior stability

Simultaneous measurement of up to
5 components in flue gas

NO_x SO₂ CO₂ CO O₂

ZSJ

Japanese type approval
SAS131 (SO₂ analyzer)
SAC131 (CO analyzer)
SAN131 (NO_x analyzer)
SE981 (zirconia O₂ analyzer)
SF011 (paramagnetic O₂ analyzer)

Features

- Single-beam NDIR
- Long-term superior stability
- Sample switching system ensures zero-point stability
- Automatic calibration
- Space-saving design that enables the maintenance work from front side



Specifications

| | |
|-----------------------|--|
| Target | Flue gas from incinerators and boilers |
| Measurable components | NO _x , SO ₂ , CO ₂ , CO, O ₂ |
| Principle | Single-beam NDIR + zirconia or paramagnetic O ₂ sensor |
| Measurement range | NO _x : 0 ... 50 ... 5000 ppm SO ₂ : 0 ... 50 ... 5000 ppm CO ₂ : 0 ... 10% / 0 ... 20% CO: 0 ... 50 ... 5000 ppm O ₂ : 0 ... 10 vol% / 0 ... 25 vol% |
| Repeatability | ±0.5% FS |
| Linearity | ±1% FS |
| Zero drift | ±1% FS per week (O ₂ : ±2% FS per month) |
| Span drift | ±2% FS per week (O ₂ : ±2% FS per month) |
| Response time | NO _x , CO ₂ , CO, O ₂ : 2 min, SO ₂ : 4 min (for 90% response, from the analyzer inlet) |
| Output signal | 4–20 mA DC |
| Contact output | During auto calibration, during maintenance, concentration alarm, CO peak count alarm, range identification, etc. |
| Contact input | Auto calibration start, range switchover, pump on/off, etc. |
| Functions | Auto calibration, O ₂ correction, O ₂ corrected average value, concentration alarm, CO peak count alarm, etc. |
| Display | Backlit LCD |
| Recorder | Paperless recorder (option) |
| Standard gas | Six 3.4L cylinders can be housed (option) |
| Power supply voltage | 100, 110, 115, 200, or 230 V AC, 50/60 Hz |
| Dimensions | 815 (W) × 1780 (H) × 700 (D) mm, outdoor use |

Simultaneous measurement of up to
5 components in flue gas

NO_x SO₂ CO₂ CO O₂

ZSU

Japanese type approval
SAS992-1 (SO₂ analyzer)
SAC992-1 (CO analyzer)
SAN991-1 (NO_x analyzer)
SE981 (zirconia O₂ analyzer)
SF011 (paramagnetic O₂ analyzer)

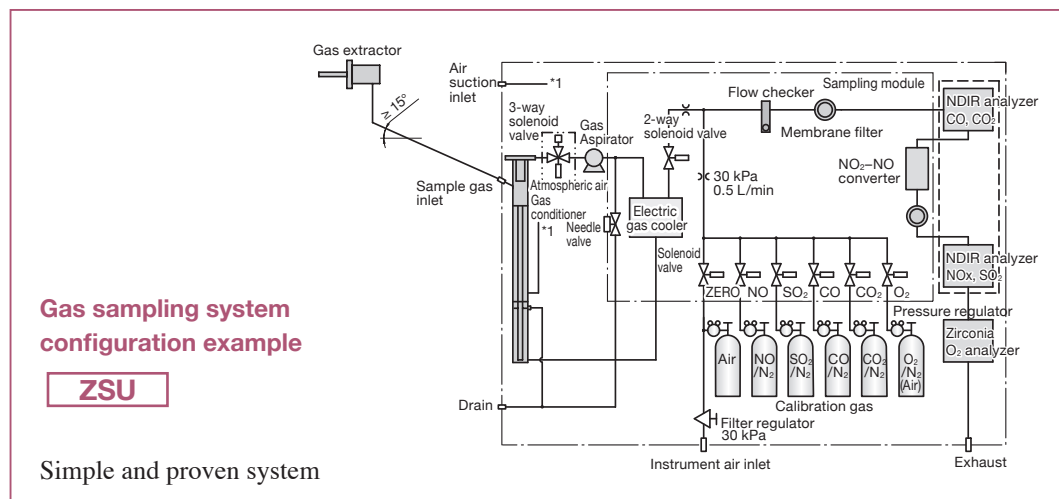
Features

- Double-beam NDIR
- Long-term superior stability
- Twin detectors for interference compensation
- Automatic calibration
- Space-saving design that enables the maintenance work from front side



Specifications

| | |
|-----------------------|--|
| Target | Flue gas from incinerators and boilers |
| Measurable components | NO _x , SO ₂ , CO ₂ , CO, O ₂ |
| Principle | Double-beam NDIR + zirconia or paramagnetic O ₂ sensor |
| Measurement range | NO _x : 0 ... 50 ... 5000 ppm SO ₂ : 0 ... 50 ... 5000 ppm CO ₂ : 0 ... 10% / 0 ... 20% CO: 0 ... 50 ... 5000 ppm O ₂ : 0 ... 10 vol% / 0 ... 25 vol% |
| Repeatability | ±0.5% FS |
| Linearity | ±1% FS |
| Zero drift | ±2% FS per week (O ₂ : ±2% FS per month) |
| Span drift | ±2% FS per week (O ₂ : ±2% FS per month) |
| Response time | NO _x , CO ₂ , CO, O ₂ : 2 min, SO ₂ : 4 min (for 90% response, from the analyzer inlet) |
| Output signal | 4–20 mA DC |
| Contact output | During auto calibration, during maintenance, concentration alarm, CO peak count alarm, range identification, etc. |
| Contact input | Auto calibration start, range switchover, pump on/off, etc. |
| Functions | Auto calibration, O ₂ correction, O ₂ corrected average value, concentration alarm, CO peak count alarm, etc. |
| Display | Backlit LCD |
| Recorder | Paperless recorder (option) |
| Standard gas | Six 3.4L cylinders can be housed (option) |
| Power supply voltage | 100, 110, 115, 200, or 230 V AC, 50/60 Hz |
| Dimensions | 815 (W) × 1780 (H) × 700 (D) mm, outdoor use |



Simultaneous measurement of up to 7 components in flue gas

NOx SO₂ CO₂ CO O₂ HCl Dust

ZSU-7

Japanese type approval
SAS992-1 (SO₂ analyzer)
SAC992-1 (CO analyzer)
SAN991-1 (NOx analyzer)
SE981 (zirconia O₂ analyzer)
SF011 (paramagnetic O₂ analyzer)



Features

- Monitors up to 7 gas concentrations
- All the necessary equipment are housed in a space-saving cabinet
- Less electrical work because signal and power terminals are in one place
- Low-maintenance laser HCl analyzer
- 40% less power consumption compared to conventional models

Specifications

| | |
|-----------------------|--|
| Target | Flue gas from incinerators and boilers |
| Measurable components | NOx, SO ₂ , CO ₂ , CO, O ₂ , HCl, dust |
| Principle | NOx, SO ₂ , CO ₂ , CO: NDIR O ₂ : zirconia HCl: laser Dust: electrostatic induction |
| Measurement range | NOx: 0 ... 50 ... 5000 ppm SO ₂ : 0 ... 50 ... 5000 ppm CO ₂ : 0 ... 10% / 0 ... 20% CO: 0 ... 50 ... 5000 ppm O ₂ : 0 ... 10 vol% / 0 ... 25 vol% HCl: 0 ... 15 ... 5000 ppm Dust: 0.01 ... 1000 mg/m ³ |
| Repeatability | ±0.5% FS (NDIR), ±2% FS (laser) |
| Zero & span drift | ±2% FS per week (NDIR) ±2% FS per 6 months (laser) |
| Response time | 120 s (NDIR), 1 ... 5 s (laser) |
| Output signal | 4–20 mA DC |
| Contact output | 8 points (during maintenance, during auto calibration, analyzer abnormality, etc.) |
| Contact input | Auto calibration start, average value reset, measurement stop, etc. |
| Recorder | Paperless recorder (option) |
| Standard gas | Six 3.4L cylinders can be housed (option) |
| Power supply voltage | 100 V AC, 50/60 Hz |
| Dimensions | 1215 (W) × 1780 (H) × 700 (D) mm, outdoor use |

For CO and O₂ monitoring in flue gas

CO O₂

ZSQ

Japanese type approval certified
SAC984 (CO analyzer)
SE981 (zirconia O₂ analyzer)



Features

- Single-beam NDIR
- Long-term superior stability
- CO peak count alarm
- Automatic calibration
- Space-saving design that enables the maintenance work from front side

Specifications

| | |
|-----------------------|--|
| Target | Flue gas from incinerators |
| Measurable components | CO, O ₂ |
| Principle | Single-beam NDIR + zirconia O ₂ sensor |
| Measurement range | CO: 0 ... 200 ... 2000 ppm O ₂ : 0 ... 25 vol% |
| Repeatability | ±0.5% FS |
| Linearity | ±1% FS |
| Zero & span drift | ±2% FS per week (O ₂ : ±2% FS per month) |
| Response time | ≤ 90 s (for 90% response, from the analyzer inlet) |
| Output signal | 4–20 mA DC |
| Contact output | During calibration, during maintenance, concentration alarm, etc. |
| Functions | Auto calibration, O ₂ correction, O ₂ corrected average value, CO peak count alarm, etc. |
| Display | Backlit LCD |
| Recorder | Paperless recorder (option) |
| Standard gas | Three 3.4L cylinders can be housed (option) |
| Power supply voltage | 100 V AC, 50/60 Hz |
| Dimensions | 615 (W) × 1640 (H) × 765 (D) mm, outdoor use |

NDIR Gas Analyzers

| Single-beam | | | ZPA, ZPB, ZPG | | | |
|-----------------|-----------------|-----------------|---------------|-----------------|----------------|--|
| NO _x | SO ₂ | CO ₂ | CO | CH ₄ | O ₂ | |

From low range (0–5 ppm) to 100%

Low-concentration measurement and drift-less measurement available



ZPA



ZPB



ZPG



Features

- Wide measurement range: from 0–5 ppm to 100%
- Excellent zero-point stability: $\pm 0.5\%$ FS per week (ZPB, ZPG)
- Simultaneous and continuous measurement of up to 5 components (ZPA, ZPB)
- Compact and lightweight: 483 (W) \times 133 (H) \times 382 (D) mm, \leq 13 kg
- Simple structure for ease of maintenance
- Built-in magnetic or galvanic O₂ sensor (optional)

Minimum measurement range

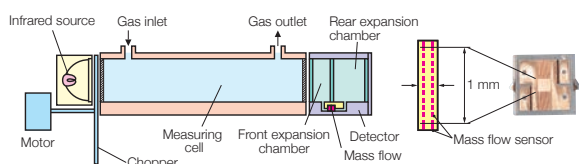
| Compo-nents | Standard type (ZPA) | Drift-less type (ZPB) | Low-concentration measurement type (ZPG) |
|-----------------|---------------------|-----------------------|--|
| NO | 0 ... 200 ppm | 0 ... 50 ppm | 0 ... 10 ppm |
| SO ₂ | 0 ... 200 ppm | 0 ... 50 ppm | 0 ... 10 ppm |
| CO ₂ | 0 ... 100 ppm | 0 ... 50 ppm | 0 ... 5 ppm |
| CO | 0 ... 200 ppm | 0 ... 50 ppm | 0 ... 5 ppm |
| CH ₄ | 0 ... 500 ppm | - | - |
| O ₂ | 0 ... 5% | 0 ... 5% | 0 ... 5% |

Specifications

| Type | Standard type | | Drift-less type | | Low-concentration measurement type | | |
|---|---|-----------------|---|---------------|-------------------------------------|---------------|----------------|
| Model | ZPA | | ZPB | | ZPG | | |
| Principle | NDIR (single beam) O ₂ : magnetic, galvanic, or external zirconia analyzer | | | | | | |
| Number of measurable components | Up to 5 (including O ₂) | | | | Up to 2 (including O ₂) | | |
| Measurable components and ranges | Min | Max | Min | Max | Min | Max | |
| | NO | 0 ... 200 ppm | 0 ... 5000 ppm | 0 ... 50 ppm | 0 ... 5000 ppm | 0 ... 10 ppm | 0 ... 100 ppm |
| | SO ₂ | 0 ... 200 ppm | 0 ... 10 vol% | 0 ... 50 ppm | 0 ... 5000 ppm | 0 ... 10 ppm | 0 ... 100 ppm |
| | CO ₂ | 0 ... 100 ppm | 0 ... 100 vol% | 0 ... 50 ppm | 0 ... 25 vol% | 0 ... 5 ppm | 0 ... 50 ppm |
| | CO | 0 ... 200 ppm | 0 ... 100 vol% | 0 ... 50 ppm | 0 ... 5000 ppm | 0 ... 5 ppm | 0 ... 50 ppm |
| | CH ₄ | 0 ... 500 ppm | 0 ... 100 vol% | - | - | - | - |
| | O ₂ (built-in galvanic analyzer) | 0 ... 10 vol% | 0 ... 25 vol% | 0 ... 10 vol% | 0 ... 25 vol% | 0 ... 10 vol% | 0 ... 25 vol% |
| | O ₂ (built-in magnetic analyzer) | 0 ... 5 vol% | 0 ... 100 vol% | 0 ... 5 vol% | 0 ... 100 vol% | 0 ... 5 vol% | 0 ... 100 vol% |
| | None | 100 ... 95 vol% | - | - | - | - | |
| O ₂ (external zirconia analyzer) | 0 ... 5 vol% | 0 ... 25 vol% | 0 ... 5 vol% | 0 ... 25 vol% | 0 ... 5 vol% | 0 ... 25 vol% | |
| No. of measurement ranges | Up to 2 ranges per component | | | | | | |
| Repeatability | ±0.5% FS | | | | | | |
| Linearity | ±1% FS | | | | | | |
| Zero drift | ±2% FS per week | | ±0.5% FS per week | | | | |
| Span drift | ±2% FS per week | | ±2% FS per week | | | | |
| Response time (for 90%) | 10 s ... 30 s (Depending on measurement range) | | ≤ 30 s Dead time varies within 5–20 seconds according to the setting for the sample switching. | | | | |
| Output signal | 4–20 mA DC or 0–1 V DC (ZPA and ZPB: ≤ 12 points, ZPG: ≤ 4 points) | | | | | | |
| Display | LED-backlit LCD, instantaneous value, O ₂ corrected instantaneous value, O ₂ corrected average value, O ₂ average | | | | | | |
| Range switching | by key operation, automatic, or remotely (option) | | | | | | |
| Contact input (option) | Voltage input: remote range-switching, auto-calibration remote start, remote hold, average reset | | | | | | |
| Contact output (option) | SPDT relay contact: analyzer error, calibration error, range identification, during auto-calibration, solenoid valve operation for auto-calibration, H/L limit alarm, CO peak alarm | | | | | | |
| Atmospheric pressure correction (option) | Provided as needed | | | | | | |
| Standard functions | Output hold, auto/manual range switching | | | | | | |
| Optional functions | Auto calibration, auto calibration remote start, remote output-hold, range identification contact output, H/L limit alarm, O ₂ correction, O ₂ -corrected average values, average resetting contact input, CO peak alarm contact output | | | | | | |
| Communication (option) | RS-485 (Modbus) | | | | | | |
| Sample gas flow checker | Not provided | | Provided | | | | |
| Gas inlet/outlet | Rc 1/4 or NPT 1/4 internal thread | | | | | | |
| Purge gas flow rate | 1 L/min | | | | | | |
| Reference gas | Not required | | Required (dry N ₂ or dry air) | | | | |
| Operating environment | -20°C ... +60°C, RH 90% or lower (no condensation) | | | | | | |
| Mounting | 19-inch rack mount | | | | | | |
| Power supply voltage | 100–240 V AC, 50/60 Hz | | | | | | |
| Power consumption | Approx. 100 VA | | Approx. 120 VA | | Approx. 100 VA | | |
| Dimensions | 483 (W) × 133 (H) × 382 (D) mm | | | | | | |
| Weight | Approx. 11 kg | | Approx. 13 kg | | Approx. 11kg | | |

Principle

Single-beam



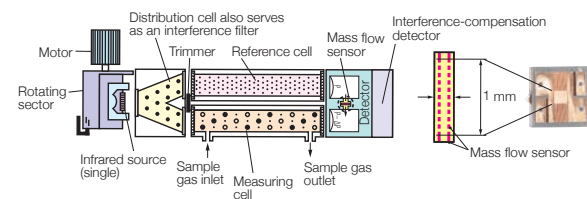
● Mass flow sensor

Converts the infrared absorption into an electrical signal. Excellent noise resistance thanks to the low impedance sensor. The absence of moving parts makes the device resistant to vibration and semi-permanently usable.

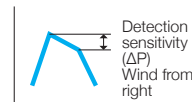
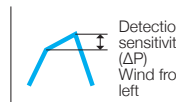
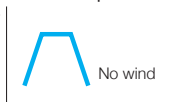
Principle The mass flow sensor measures the amount of infrared absorbed in the measurement cell.

Double-beam

High-sensitivity sensor offers a maximum rangeability of 1 : 25



Hot-wire temperature



Double-beam

ZKJ



NOx

SO₂

CO₂

CO

CH₄

N₂O

O₂

Simultaneous and continuous measurement of up to 5 components

Double-beamed and high-performance model

Features

- Simultaneous and continuous measurement of up to 5 components
- Hardly affected by interference from other gases
- Superior functionality—calibration, alarm, calculation
- Easy-to-see LCD
- Maximum range ratio of 1 : 25
- Excellent zero-point stability: $\pm 1\%$ FS per week

Measurement range

| Component | Minimum range | Maximum range |
|------------------|---------------|----------------|
| NO | 0 ... 50 ppm | 0 ... 5000 ppm |
| SO ₂ | 0 ... 50 ppm | 0 ... 10 vol% |
| CO ₂ | 0 ... 20 ppm | 0 ... 100 vol% |
| CO | 0 ... 50 ppm | 0 ... 100 vol% |
| CH ₄ | 0 ... 200 ppm | 0 ... 100 vol% |
| N ₂ O | 0 ... 200 ppm | 0 ... 2000 ppm |
| O ₂ | 0 ... 5 vol% | 0 ... 25 vol% |

Specifications

| | |
|-------------------------|---|
| Principle | NO, SO ₂ , CO ₂ , CO, CH ₄ , N ₂ O: NDIR (double-beam) O ₂ : built-in paramagnetic sensor or external zirconia analyzer |
| Repeatability | $\pm 0.5\%$ FS ($\pm 1\%$ FS for the ranges below 50 ppm) |
| Linearity | $\pm 1\%$ FS |
| Zero drift | $\pm 1\%$ FS per week ($\pm 2\%$ FS per week for 50–200 ppm range) |
| Span drift | $\pm 2\%$ FS per week ($\pm 2\%$ FS per day for the ranges below 50 ppm) |
| Response time (for 90%) | ≤ 60 s |
| Output signal | 4–20 mA DC or 0–1 V DC, up to 12 points |
| Contact input | Volt-free contact: remote range-switching, auto-calibration remote start, remote hold, average reset, pump on/off |
| Contact output | SPST-NO and SPDT contact: analyzer error, calibration error, range identification, during auto-calibration, pump on/off, CO peak alarm, H/L limit alarm, power interruption |
| Communication (option) | RS-232C (Modbus) |
| Display | LED-backlit LCD, instantaneous value, O ₂ corrected instantaneous value, O ₂ corrected average value, O ₂ average |
| Power supply voltage | 100–240 V AC, 50/60 Hz |
| Power consumption | 250 VA |
| Dimensions and weight | 483 (W) × 177 (H) × 600 (D) mm, approx. 22kg |

NDIR Gas Analyzer for Heat Treatment Furnace

For optimal quality management

ZFG

CO₂

CO

CH₄



Features

- High-accuracy with a repeatability of 0.5% FS
- Single-beam system: long-term stability and low maintenance
- Monitors concentration of CO₂, CO, CH₄ that correlate Carbon Potential (CP)
- CP calculation available (option)
- Simultaneous and continuous monitoring of CO₂ + CO, CH₄ + CO, CO₂ + CH₄
- Compact and lightweight
About one-third volume and half weight of previous models ZAR and ZFU
- Panel mounting with cutout size of 206 (W) × 173 (H) mm

Specifications

| | |
|---------------------|---------------------------------------|
| Components | CO ₂ , CO, CH ₄ |
| Principle | Single-beam NDIR |
| Measurement range | CO ₂ : 0 ... 0.5 ... 100% |
| | CO: 0 ... 0.5 ... 100% |
| | CH ₄ : 0 ... 1 ... 10% |
| No. of components | ≤ 2 |
| No. of ranges | ≤ 2 for each component |
| Repeatability | ±0.5% FS |
| Zero and span drift | ±2% FS per week |

| | |
|-------------------------|--|
| Response time (for 90%) | ≤ 10 s |
| Output signal | 4–20 mA DC, 0–1 V DC, 0–100 mV DC, or 0–10 mV DC |
| Contact output | Analyzer error, range identification |
| Contact input (option) | Remote range-switching, remote hold |
| Standard functions | Output hold, automatic light-off, analyzer error |
| Optional functions | CP calculation, etc. |
| Display | Backlit LCD |
| Power supply voltage | 100–240 V AC, 50/60 Hz |
| Dimensions and weight | 218 (W) × 211 (H) × 257 (D) mm, approx. 5 kg |

NDIR CO₂ Controller

ZFP9

CE

CO₂

Features

- Wall mount type with built-in pump and filter
- Applications: protected horticulture, ventilation systems for buildings, controlled atmosphere storage facilities



Specifications

| | |
|-------------------------|---|
| Target | CO ₂ in air |
| Principle | Single-beam NDIR |
| Measurement range | 0 ... 0.2 ... 20% |
| Repeatability | ±1% FS |
| Zero drift | ±10% per 6 months |
| Response time (for 90%) | ≤ 10 s |
| Gas sampling | Suction pump and filter |
| Power supply voltage | 100 V, 115 V, 200 V, or 220 V AC, 50/60 Hz |
| Dimensions and weight | 220 (W) × 257 (H) × 85 (D) mm, approx. 3 kg |

Biomass Gas Analyzer

ZPAF

CE

CH₄

CO₂

H₂S

O₂



Components and ranges

| | 1st range | 2nd range | Principle |
|------------------|--------------|-------------------|---------------------------------|
| CH ₄ | 0...20 vol % | 0...100 vol % | Single-beam NDIR |
| CO ₂ | 0...20 vol % | 0...100 vol % | |
| H ₂ S | 0...500 ppm | 0...2000/5000 ppm | Constant-potential electrolytic |
| O ₂ | 0...10 vol % | 0...25 vol % | Galvanic fuel cell |

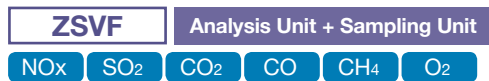
Specifications

| | |
|-------------------------|---|
| Repeatability | ±0.5% FS (H ₂ S: ±2.0% FS) |
| Linearity | ±1.0% FS (H ₂ S: ±2.0% FS) |
| Zero drift | ±2% FS per week |
| Span drift | ±2% FS per week (H ₂ S: ±2.5% FS per week or ±5% FS per day) |
| Response time (for 90%) | 10–30s (H ₂ S: 180s) |
| Output | 4–20mA DC or 0–1V DC |
| Contact input | 12–24V DC, ≤ 9 points |
| Contact output | SPDT, ≤ 15 points |
| Communication (option) | RS-485 (Modbus) |
| Display | Backlit LCD |
| Power supply voltage | 100–240 V AC, 50/60 Hz |
| Dimensions and weight | 483 (W) × 133 (H) × 382 (D) mm, approx. 9 kg |

Compact NDIR Gas Analyzer

With gas sampling devices accommodated

Simultaneously and continuously monitors up to 5 components among NO_x, SO₂, CO₂, CO, CH₄, and O₂



Features

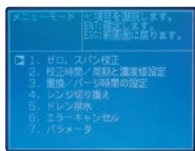
- Analysis unit and sampling unit can be separated for ease of move and installation
- Suited to monitoring of flue gas, combustion gas, biogas, etc.



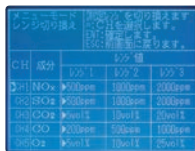
Sampling unit

Analysis unit

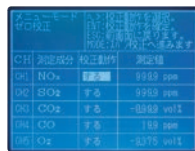
- No installation work
- Interactive interface



Menu screen

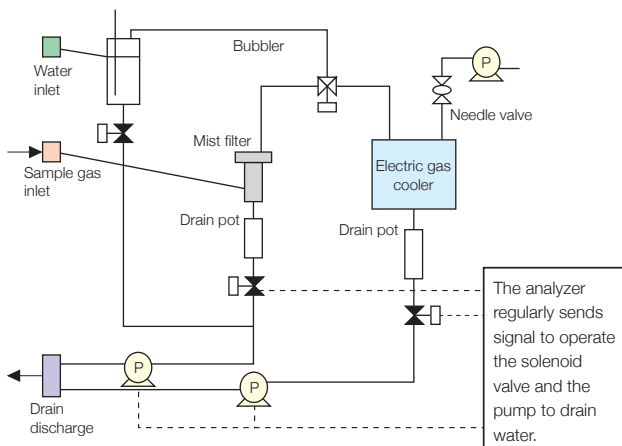


Range switching screen



Zero/span calibration

- CP calculation available
The IR analyzer can ensure higher CP traceability than the zirconia O₂ analyzer because the IR analyzer simultaneously measures CO and CO₂ to calculate CP.
- Easy to maintenance
Automatic water-discharge



Specifications

| | |
|------------------------|--|
| Measurable components | NO _x , SO ₂ , CO ₂ , CO, CH ₄ , O ₂ |
| Principle | Single-beam NDIR + galvanic or paramagnetic O ₂ sensor |
| Measurement range | NO _x : 0 ... 500 ... 5000 ppm SO ₂ : 0 ... 500 ppm ... 1% CO ₂ : 0 ... 200 ppm ... 100% CO: 0 ... 200 ppm ... 100% CH ₄ : 0 ... 1000 ppm ... 100% O ₂ : 0 ... 5/10/25% |
| Repeatability | ±0.5% FS |
| Output signal | 4–20 mA DC or 0–1 V DC Instantaneous value, O ₂ converted instantaneous value, O ₂ converted average value, CP calculation |
| Communication | RS-232C (Modbus) |
| Power supply voltage | 100–115 V AC or 200–240 V AC, 50/60 Hz |
| Dimensions | Analysis unit: 365 (W) × 211 (H) × 514 (D) mm Sampling unit: 365 (W) × 377 (H) × 514 (D) mm |
| Weight | Analysis unit: approx. 12 kg Sampling unit: approx. 18 kg |
| Gas extractor (option) | Fixed type with flange, or unfixed type |

Simultaneously and continuously measures up to 4 components among CO₂, CO, CH₄, and O₂



Features

- Portable type with built-in pump, filter, and flowmeter
- CP calculation, O₂ correction, O₂ corrected average
- Easy-to-see LCD
- Single-beam system: long-term stability and low maintenance

Specifications

| | |
|-------------------------|--|
| Components | CO ₂ , CO, CH ₄ , O ₂ |
| Principle | Single-beam NDIR + Galvanic O ₂ sensor |
| Measurement range | CO ₂ : 0 ... 200 ppm ... 100% CO: 0 ... 200 ppm ... 100% CH ₄ : 0 ... 1000 ppm ... 100% O ₂ : 0 ... 5/10/25% |
| Repeatability | ±0.5% FS |
| Zero drift | ±1% FS per day |
| Span drift | ±1% FS per day |
| Response time (for 90%) | ≤ 50 s |
| Output signal | 4–20 mA DC or 0–1 V DC |
| Communication | RS-232C (Modbus) |
| Standard functions | CP calculation, O ₂ correction, O ₂ corrected average, automatic light-off |
| Display | Backlit LCD |
| Power supply voltage | 100–115 V AC or 200–240 V AC |
| Dimensions | 365 (W) × 211 (H) × 527 (D) mm |

Laser Gas Analyzer

Insertion type offers high-speed measurement
Long-term stability and low maintenance

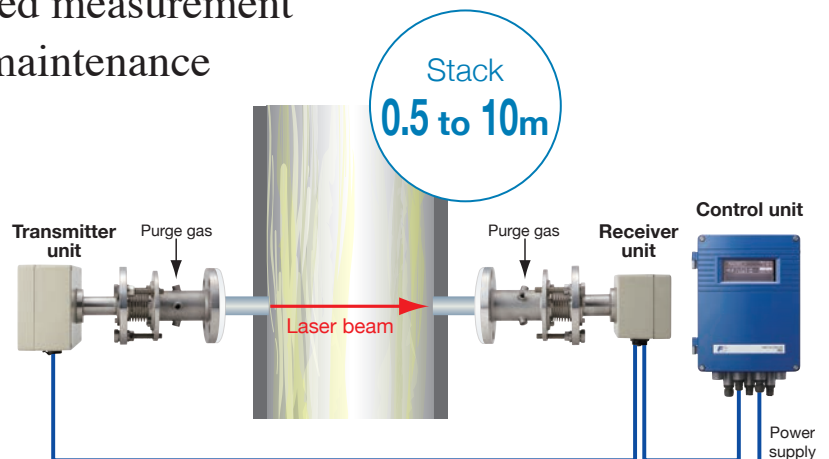
ZSS CE

Features

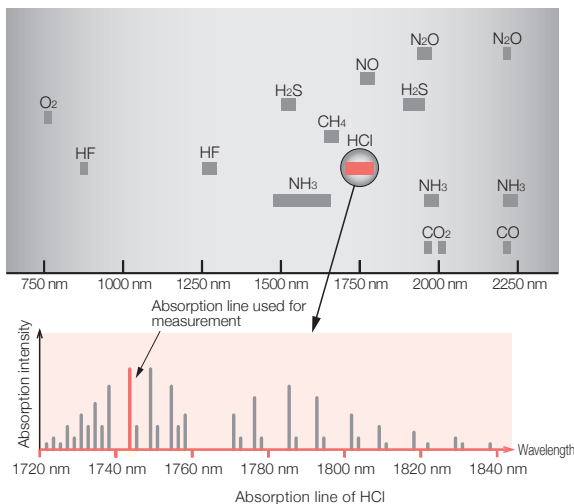
- Fast response with no sampling system
- Semiconductor laser ensures high precision and accuracy

Measurable components

NH₃ HCl O₂ CO CO₂ CH₄



Absorption spectrum

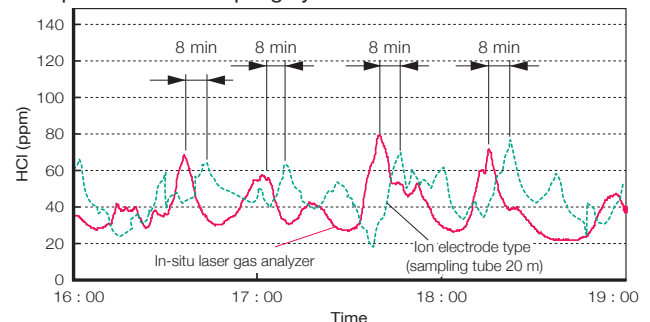


Principle The analyzer uses near infrared semiconductor laser and measures the change in absorption wavelength to determine the gas concentration.

Fast response within 2 seconds

Compared to the ion electrode (sampling) method, the direct measurement provides remarkably faster response.

Comparison with sampling system



CO + O₂ analyzer available

Simultaneous measurement of CO and O₂ enables precise control of air-fuel ratio while reducing the cost of installation and maintenance.

ppm CO + O₂
(high-temperature)

vol% CO + O₂

ppm CO + O₂
(instrument air purge)

CO + CO₂

Zero point stability: $\pm 2.0\%$ FS per 6 months

Purge system reduces the risk of zero drift due to contamination

Energy saving and low maintenance

Energy consumption ≤ 80 VA

Maintenance work \leq twice a year

With no need for sampling devices and preconditioning, consumable parts and maintenance work are greatly reduced.

No sampling involved

No preconditioning

No filter

No catalyst

Instrument air purge available

O₂ analyzer for combustion control accepts instrument air purge.

Specifications

General

| | |
|----------------------------------|--|
| Principle | Non-dispersive infrared (NDIR) |
| Method | Cross-stack |
| Measurable components and ranges | See the table below |
| Light source | Near-infrared semiconductor laser |
| Laser class | CLASS 1 (O ₂ analyzers of high-temperature version and instrument air purge version fall under CLASS 3B) |
| Power supply voltage | 100–240 V AC, 50/60 Hz |
| Power consumption | 80 VA |
| Calibration interval | every 6 months (depending on the operating environment) |
| Display | Backlit LCD |
| Display contents | Component, concentration (instantaneous value, average, O ₂ corrected instantaneous value, O ₂ corrected average value), alarm |
| Weight | Receiver unit and transmitter unit: approx. 10 kg each, control unit: approx. 8 kg |
| Dimensions (D × W × H) | Receiver unit (400 × 180 × 155 mm) Receiver unit (400 × 240 × 160 mm) Control unit (137 × 255 × 440 mm) |
| IP rating | IP65 |

Performance

| | |
|---------------------|--|
| Response | ≤ 4 s (≤ 2 s in high-speed version) |
| Repeatability | ±1.0% FS (depending on components and ranges) CO + O ₂ measurement: ±2% FS |
| Linearity | ±1.0% FS (depending on components and ranges) CO + O ₂ measurement: ±3% FS |
| Zero drift | ±2.0% FS per 6 months (depending on component and range) CO + O ₂ measurement: ±4% FS per 6 months |
| Interference effect | ±2.0% FS |
| Detection limit | 1% of minimum range |

Measurable components and ranges

| | Measurable components | | Min. range* | Max. range* | Gas temperature | Purge gas | 4th code |
|--|---|----------------|-------------|-------------|------------------|----------------|----------|
| Single beam 1-component analyzer | HCl | | 10 ppm | 5000 ppm | ≤ 400°C | Instrument air | C |
| | NH ₃ | | 15 ppm | 5000 ppm | ≤ 450°C | | W |
| | CO (high range) | | 2.0 vol% | 100 vol% | ≤ 300°C | | A |
| | CO (low range) | | 200 ppm | 1 vol% | ≤ 400°C | | M |
| | CO ₂ | | 2.0 vol% | 100 vol% | ≤ 300°C | | G |
| | CH ₄ | | 100 ppm | 100 vol% | ≤ 300°C | | R |
| | O ₂ | | 10 vol% | 100 vol% | ≤ 300°C | N ₂ | P |
| | O ₂ (high temperature) | | 4 vol% | 100 vol% | ≤ 1200°C | | Q |
| | O ₂ (instrument air purge) | | 25 vol% | 100 vol% | 400°C ... 1200°C | Instrument air | T |
| Single beam 2-component analyzer | CO + CO ₂ | | 2.5 vol% | 100 vol% | ≤ 300°C | Instrument air | K |
| Double beam 2-component analyzer | ppm CO + O ₂ (instrument air purge) | CO | 200 ppm | 2 vol% | 400°C ... 1200°C | Instrument air | V |
| | | O ₂ | 25 vol% | 100 vol% | | | |
| | ppm CO + O ₂ (high temperature) | CO | 200 ppm | 2 vol% | ≤ 1200°C | N ₂ | U |
| | | O ₂ | 5 vol% | 50 vol% | | | |
| | vol% CO + O ₂ | CO | 2 vol% | 50 vol% | ≤ 300°C | | S |
| | | O ₂ | 10 vol% | 100 vol% | | | |

*The measurement ranges described above are for the optical path of 1 m.

Input/output signal

| | |
|------------------------|--|
| Analog output | 4–20 mA DC or 1–5 V DC, 2 or 4 points Measured value and O ₂ corrected value. Switchable between instantaneous value and average value |
| Analog input | 4–20 mA DC, 2 points Sample gas pressure, temperature, velocity, O ₂ concentration, water concentration, air purge pressure *Inputs are used for compensating concentration, O ₂ correction, and alarm output. |
| Digital output | Relay contact output, 6 points Low light transmission, H/L limit alarm, analyzer error, during calibration / during hold, power interruption, environmental error |
| Digital input (option) | Voltage input received by photocoupler, 3 points Average value reset, switchover between instantaneous value and moving average value, remote hold |

Installation environment

| | |
|---------------------|---|
| Ambient temperature | –20 to +55°C (Receiver unit, transmitter unit) –5 to +45°C (Control unit) |
| Ambient humidity | ≤ 90% RH |
| Optical path length | 0.5 to 10 m (0.5 to 5 m in CO + O ₂ measurement) |
| Standard flange | JIS10K, 50A or 100A |
| Purge gas | See the table below. Purge gas pressure: ≥ 0.3 MPa |
| Purge gas flow rate | ≥ 20 L/min |
| Gas conditions | See the table below Moisture: ≤ 50 vol% (no condensation) Pressure: ±10 kPa (Consult us for pressure above the limit.) Dust: Standard version: ≤ 5 g/m ³ (N) Dust resistant version: ≤ 20 g/m ³ (N) |

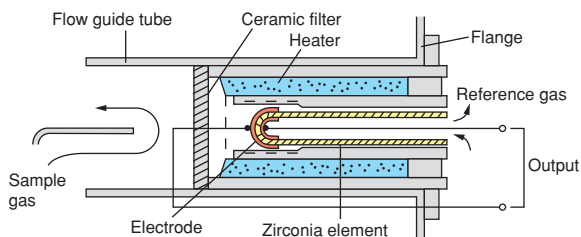
Zirconia Oxygen Analyzers

Fast response with no need for gas sampling devices

Ideal for combustion control in boilers and incinerators

Principle

The analyzer makes use of the property of zirconium oxide that conducts oxygen ion when heated. The analyzer can obtain O₂ concentration by sensing the electromotive force arises from the difference of O₂ concentration between air and the sample gas.



Easily replaceable zirconia element

*Excluding ZSB



Fast response (4–7 seconds)
HART communication available

O₂



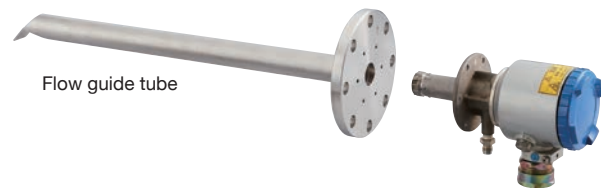
IP66

Converter
ZKMA



IP67

Converter
ZKMB



Flow guide tube

Detector ZFK8



Features

- Easily replaceable zirconia element
- Fast response (4–7 seconds)
- IP66 or IP67 enclosure
- RS-485 or HART communication

Specifications

| | |
|---|---|
| Target | O ₂ in incombustible gas |
| Principle | Insertion type zirconia sensor |
| Range | 0 ... 2 ... 50 vol% O ₂ (user configurable) |
| Repeatability | ±0.5% FS |
| Linearity | ±2% FS |
| Response time (for 90%) | 4 s ... 7 s |
| Output signal | 4–20 mA DC or 0–1 V DC |
| Contact output | 6 points, SPST-NO contact: H/L limit alarm, during maintenance, during blowdown, during calibration, analyzer error |
| Contact input | 3 volt-free contacts: selection from 7 items |
| Display | Backlit LCD |
| Communication | RS-485 (Modbus) or HART |
| Optional functions | Combustion efficiency display, blowdown, auto calibration, cock (selector valve), flowmeter |
| Converter installation | Panel mount or pipe mount |
| Cable length between converter and detector | ≤ 100m |
| Power supply voltage | 100–120 V AC or 200–240 V AC, 50/60 Hz |

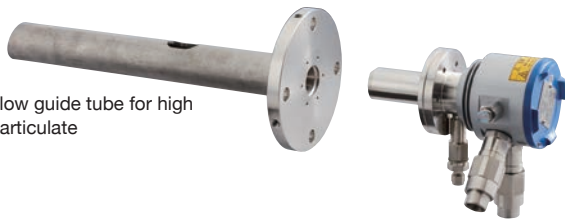
Flameproof type for hazardous applications

O₂

Converter ZKME



Flow guide tube for high particulate



Detector ZFKE

Features

- Easily replaceable zirconia element
- Fast response (4–7 seconds)
- TIIS and NEPSI certified

Specifications

| | |
|---|---|
| Target | O ₂ in incombustible gas |
| Principle | Insertion type zirconia sensor |
| Range | 0 ... 2 ... 50 vol% O ₂ (user configurable) |
| Repeatability | ±0.5% FS |
| Linearity | ±2% FS |
| Response time (for 90%) | 4 s ... 7 s |
| Output signal | 4–20 mA DC or 0–1 V DC |
| Contact output | 6 points, SPST-NO contact: H/L limit alarm, during maintenance, during blowdown, during calibration, analyzer error |
| Contact input | 3 volt-free contacts: selection from 7 items |
| Display | Backlit LCD |
| Communication | RS-485 (Modbus) |
| Optional functions | Combustion efficiency display, blowdown, auto calibration, cock (selector valve), flowmeter |
| Converter installation | Panel mount |
| Cable length between converter and detector | ≤ 100 m |
| Power supply voltage | 100–120 V AC or 200–240 V AC, 50/60 Hz |

Integrated system

O₂



ZSB

Features

- Auto calibration and manual/auto blowdown
Solenoid valve and other necessary equipment are included
- User configurable range within 2 ... 50%
- Incomplete combustion indicator appears when O₂ is deficient

Specifications

| | |
|---|---|
| Target | O ₂ in incombustible gas |
| Principle | Insertion type zirconia sensor |
| Range | 0 ... 2 ... 50 vol% O ₂ (user configurable) |
| Repeatability | ±0.5% FS |
| Linearity | ±2% FS |
| Response time (for 90%) | 4 s ... 7 s |
| Output signal | 4–20 mA DC or 0–1 V DC |
| Contact output | 6 points, SPST-NO contact: H/L limit alarm, during maintenance, during blowdown, during calibration, analyzer error |
| Contact input | 3 volt-free contacts: selection from 7 items |
| Display | Backlit LCD |
| Communication | RS-485 (Modbus) |
| Installation | Self-standing or wall-mounting |
| Cable length between converter and detector | ≤ 20 m |
| Power supply voltage | 100–120 V AC, 50/60 Hz |

Paramagnetic Oxygen Analyzers

Fast response unaffected by combustible gas

Ideal for combustion control in industrial furnaces and incinerators

Fast response within 2 seconds

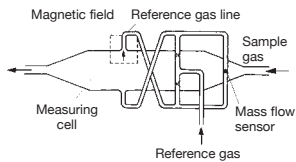
Tolerant to interference

ZAJ CE

O₂



Principle



When the sample gas is placed in a magnetic field, oxygen molecules will be attracted. This gives rise to a pressure, which is detected by a mass flow sensor.

Interference effects (ZAJ)

| Background gas (100%) | Zero drift (%) |
|-----------------------|----------------|
| NO | +43 |
| CO | +0.01 |
| CO ₂ | -0.27 |
| CH ₄ | -0.20 |

| | |
|------------------|-------|
| He | +0.30 |
| H ₂ | +0.24 |
| HCl | -0.30 |
| NH ₃ | -0.26 |
| SO ₂ | -0.22 |
| N ₂ O | -0.02 |
| H ₂ O | -0.02 |

Features

- Fast response within 2 seconds
- Tolerant to interference from other gas (H₂, CO₂, etc.)
- Suppressed ranges available (e.g. 21–100% O₂)
- No moving parts—low maintenance
- Automatic calibration, communication (option)

Specifications

| | |
|-------------------------|---|
| Principle | Paramagnetic (pressure detection) |
| Measurement range | When reference gas is N ₂ : 0 ... 0.5 ... 100% O ₂ (configurable) |
| | When reference gas is air: 21 ... 23 ... 100% O ₂ |
| | When reference gas is 100% O ₂ : 100 ... 98 ... 0% O ₂ (configurable) |
| No. of ranges | 2 |
| Repeatability | ±1% FS |
| Linearity | ±1% FS |
| Response time (for 90%) | ≤ 2 s |
| Output signal | 4–20 mA DC |
| Contact output (option) | 6 SPST-NO contacts: during calibration, etc. 4 SPDT contacts: H/L alarm, etc. |
| Contact input (option) | Remote range-switching, remote hold |
| Display | Backlit LCD |
| Communication (option) | RS-485 (Modbus) |
| Installation | 19" rack or panel mounting, or benchtop |
| Power supply voltage | 85–264 V AC, 50/60 Hz |

Dumbbell type requires no reference gas

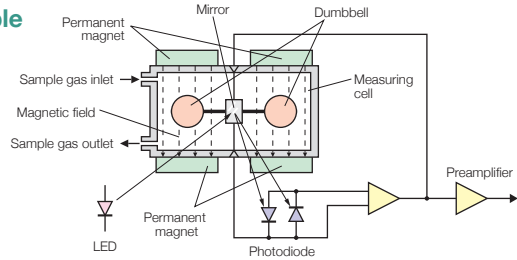
Tolerant to interference

ZKG

O₂



Principle



Oxygen molecules in sample gas are attracted by magnetic fields, and this gives rise to force works on the dumbbell. As the force is proportional to oxygen concentration, the analyzer converts it into an electric signal.

Interference effects (ZKG)

| Background gas | Concentration | Zero drift (%) |
|-----------------|---------------|----------------|
| NO | 2000 ppm | +0.15 |
| CO | 100% | +0.1 |
| CO ₂ | 100% | -0.35 |
| CH ₄ | 100% | -0.25 |

Features

- Fast response within 15 seconds
- Hardly affected by interference from other gases (e.g. H₂, CO₂)
- No need for reference gas

Specifications

| | |
|---------------------------|---|
| Principle | Paramagnetic (dumbbell type) |
| Range | 0 ... 10, 21, 25, 50, 100% O ₂ |
| No. of measurement ranges | 1 or 2 |
| Repeatability | ±0.5% FS |
| Linearity | ±1.0% FS |
| Response time (for 90%) | ≤ 15 s |
| Output signal | 4–20 mA DC, 0–1 V DC, or 0–10 mV DC |
| Display | LED (red) |
| Installation | Panel mounting |
| Power supply voltage | 100–240 V AC, 50/60 Hz |
| Dimensions | 190 (W) × 240 (H) × 234 (D) mm |

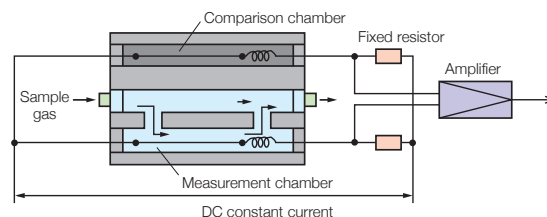
Thermal Conductivity Gas Analyzer

Reliable and continuous measurement of H₂, He, Ar, etc.

Easy-to-see LCD



Principle



Because the thermal conductivity is different among gas components, when there is a change in the concentration of the component under measurement, the thermal conductivity of the sample gas will change to affect the temperature of the platinum wire. The analyzer uses the temperature change to determine the gas concentration.

Features

- Easy-to-see LCD
- RS-232C Modbus (option)
- Auto calibration (option)
- Interference compensation (option)
- Concentration alarm output (option)
- Two switchable ranges (option)

Specifications

| | |
|-------------------------|--|
| Principle | Thermal conductivity |
| Components | He, Ar, H ₂ , CH ₄ , CO ₂ |
| Measurement range | Depends on components and ranges |
| Repeatability | ±1% FS |
| Linearity | ±2% FS |
| Response time (for 90%) | ≤ 60 s (standard), ≤ 10 s (fast response version) |
| Output signal | 4–20 mA DC, 0–1 V DC, or 0–10 mV DC |
| Contact output (option) | 5 SPST-NO contacts: during calibration, H/L alarm, etc. |

| | |
|------------------------|--|
| Contact input (option) | 3 volt-free contacts; output hold, range switching, auto-calibration start |
| Display | Backlit LCD |
| Communication (option) | RS-232C |
| Mounting | Panel mounting |
| Power supply voltage | 100–240 V AC, 50/60 Hz |
| Dimensions | 192 (W) × 240 (H) × 213 (D) mm |
| Weight | Approx. 5 kg |

Measurable components and ranges

| Sample gas | Reference gas*1 | Measurement range | Maximum range ratio |
|-----------------|---|---|---------------------|
| H ₂ | N ₂ , (CO ₂ , Ar, He) | 0 ... 3, 5, 10, 20, 50, 80, 100% 100 ... 90%, 100 ... 80% | 1 : 10 |
| He | N ₂ , (CO ₂ , Ar), O ₂ , Air | 0 ... 5, 10, 20, 30, 40, 50, 80, 100% 100 ... 90%, 100 ... 80% | 1 : 10 |
| Ar | N ₂ , O ₂ , Air, (He) | 0 ... 10, 20, 50, 80, 100% 100 ... 90%, 100 ... 80% | 1 : 5 |
| CH ₄ | N ₂ , (CO ₂ , Ar, He) | 0 ... 20, 40, 50, 60, 80, 100% 100 ... 80% | 1 : 5 |
| CO ₂ | N ₂ , O ₂ , Air, (He) | 0 ... 10, 20, 50, 100% 100 ... 90% | 1 : 5 |

*1: Those in parenthesis need consultation. Measurement of H₂ included in O₂ is not available.

NDIR Gas Analyzers for Replacement

New models with equal size and functionality to predecessors

ZRG



ZKJ7



Features

- Simultaneously and continuously monitors up to 3 components among NO_x, SO₂, CO₂, CO, O₂
- Tolerant to interference
- Easy-to-see backlit LCD

ZRG3



ZPG3

CE



Features

- Sample switching system offers improved zero-stability
- Simultaneously and continuously monitors up to 2 components among NO_x, SO₂, CO₂, CO, O₂
- Tolerant to interference
- Easy-to-see backlit LCD

ZRH



ZPAH

ZPA1



Features

- Vertical and horizontal structures
- Continuously monitors 1 component among SO₂, CO₂, CO, CH₄ or 2 components of CO₂ + CO simultaneously
- Tolerant to interference
- Easy-to-see backlit LCD

ZRJ



ZPAJ



Features

- Simultaneously and continuously monitors up to 4 components among NO_x, SO₂, CO₂, CO, CH₄, and O₂
- Tolerant to interference
- Easy-to-see backlit LCD

Gas Sampling Devices

■ Gas Extractor

ZBA

Samples target gas from stack
Up to 1300°C



■ Gas Filter

ZBB

Removes dust and/or
mist



■ Gas Cooler

ZBC

■ Gas Dryer

ZBJ

Removes moisture and
heat from sample gas



■ Flowmeter and Pressure Regulator

ZBD

Flowmeters is used to check
the flow rate of sample gas.
Pressure regulator controls the
pressure of standard gas.



■ Valves

ZBF

Controls sample gas flow



■ Gas Aspirator

ZBG

Durable and corrosion-
resistant pump that
draws the sample gas
into the analyzer



■ Draining

ZBH

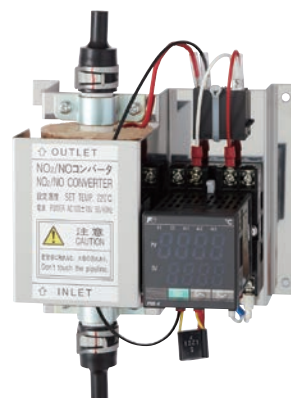
Discharges water



■ Gas Converter

ZDL CE

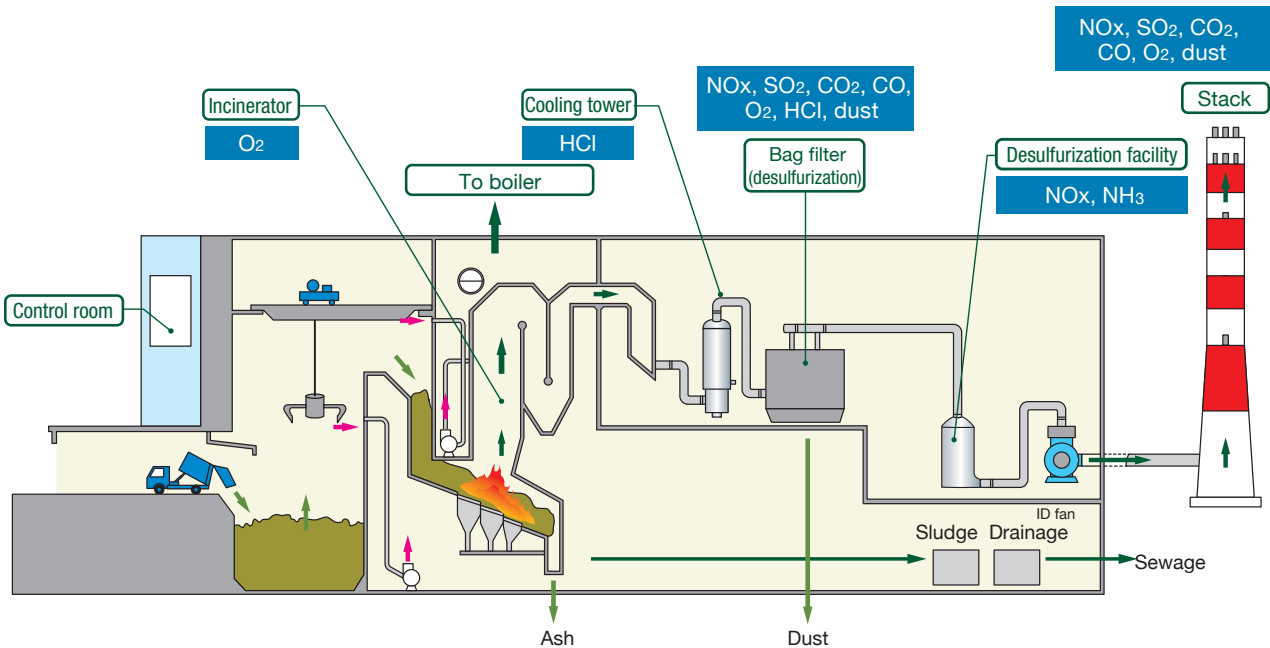
Converts NO_x contained
in sample gas into NO



Applications

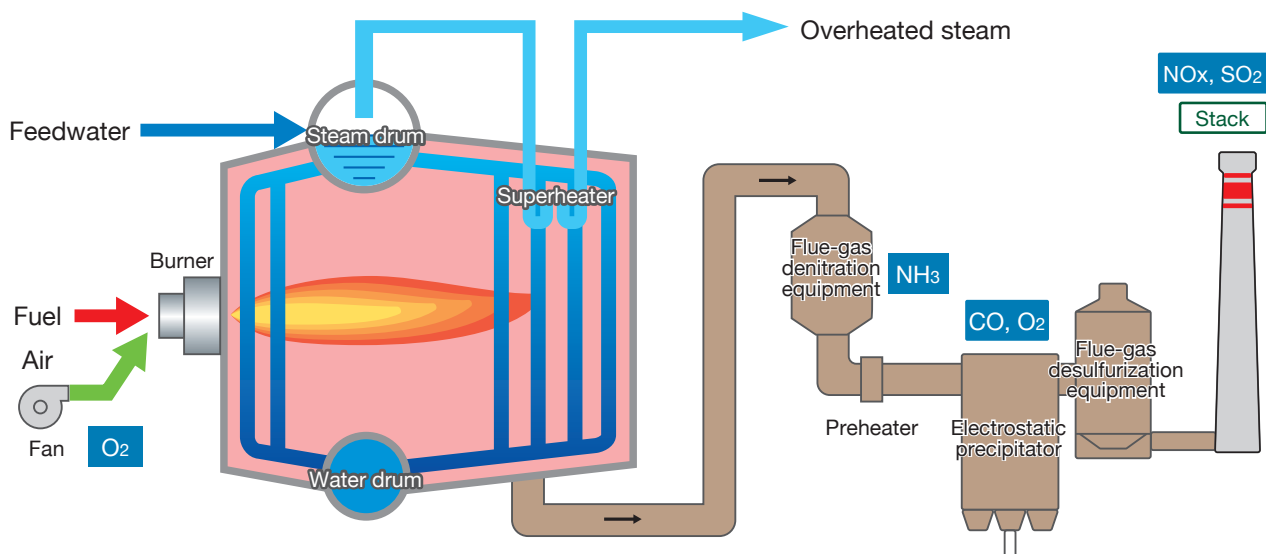
1 Refuse Incineration Plants

Gas analyzers are necessary for continuous emission monitoring required by laws and regulations; furthermore, they enable optimal combustion control.



2 Large Industrial Boilers

Gas analysis enables optimal combustion control of boilers, which leads to reduction of both the fuel cost and pollutant.

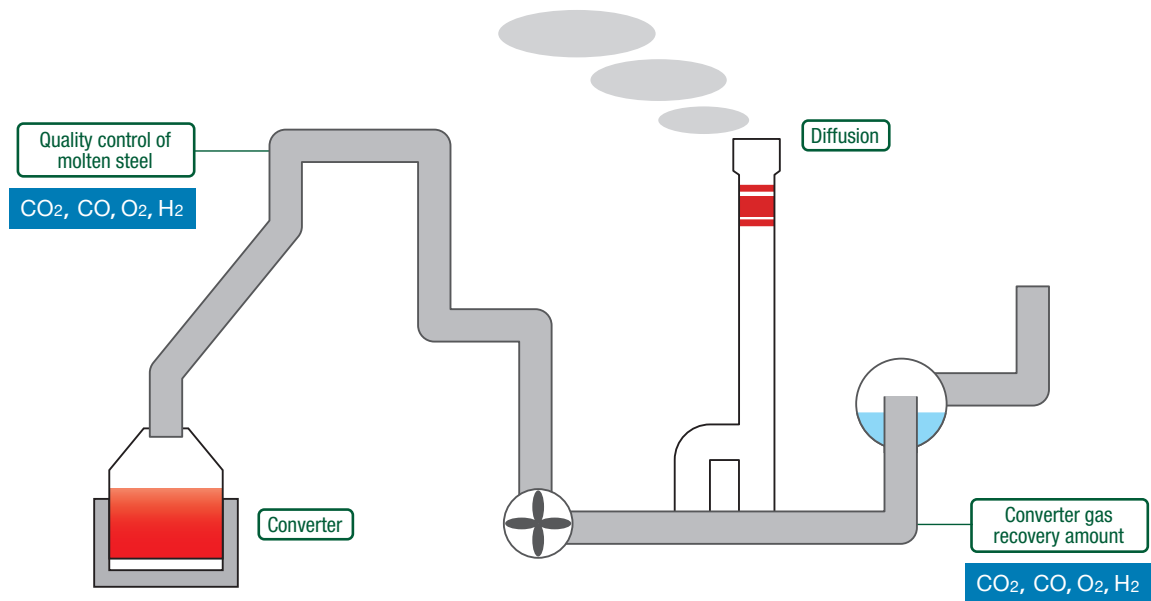


3

Converter Furnaces in Steelmaking Process

Monitoring the concentration of CO_2 , CO , O_2 , and H_2 can ensure the recovery of converter gas that can be reused as fuel.

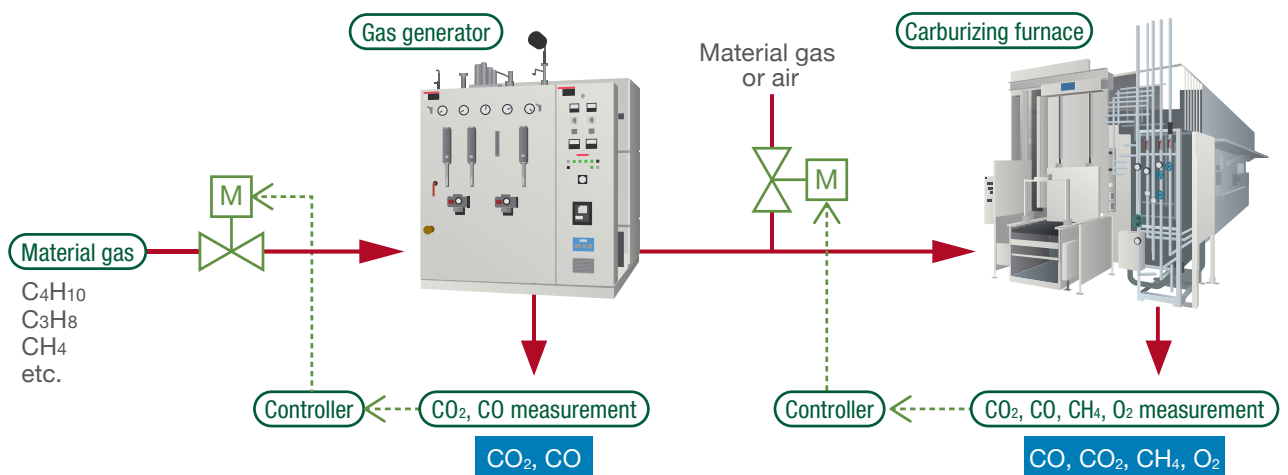
It also enables oxygen amount control and decarburizing status check, which can lead to quality management of molten steel.



4

Heat Treatment Furnaces

Gas analyzers monitor the components relate to CP (carbon potential), such as CO_2 , CO , CH_4 , NH_3 , H_2 , and O_2 , through which reliable quality control is achieved.



Satisfactory products for customers will be delivered under strict quality control.



Japanese Measurement Law:
Designated Manufacturing Business
Operator (No. 391901)

■ ISO 14001
Certificate No. EC97J1059
Tokyo Factory

■ ISO 9001
Certificate No. JMI-0122
Tokyo Factory

Find out more about our gas analyzers.



Gas Analyzers - Fuji Electric

https://www.fujielectric.com/products/instruments/products/anlz_gas/top.html

Information in this catalog is subject to change without notice.
Read the instruction manuals thoroughly before using the products.

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