

PARAMAGNETIC OXYGEN ANALYZER

DATA SHEET

ZAJ

This product is an analyzer which measures oxygen concentration in a sample gas by converting it into pressure, utilizing the magnetic property of oxygen.

When compared with the oxygen analyzers of other measuring systems, this oxygen analyzer features a faster response, and smaller influence by coexisting gas and combustible gas, etc.

Further, this analyzer is easy to use because of abundant functions such as discretionary range setting and interactive operation. It is usable in diverse field including control of various heat treating furnaces, combustion furnaces and other various fields.

FEATURES

1. Because of a pressure detection type, response is quick. 90% response can be reached within 2sec.
2. Measuring range can be set in any range of 0 to 2 ... 100%O₂
3. Combustible gases do not affect measurements.
4. Measurements are scarcely affected by coexisting gases (H₂, CO₂ etc).
5. Suppression range is possible (for example, 21 to 100%, 100 to 95%O₂ etc).
6. Interactive operation is possible by using liquid crystal display.
7. Parts which are brought in contact with gases are made of anticorrosive materials such as stainless steel and teflon.

SPECIFICATIONS

- Measuring range:**
- 1) When reference gas is N₂,
0 to 2 ... 0 to 100%O₂
(freely settable in 1%O₂ steps)
 - 2) When reference gas is air,
21 to 23 ... 21 to 100%O₂ or
21 to 19 ... 0%O₂
(freely settable in 1%O₂ steps)
 - 3) When reference gas is 100%O₂,
100 to 98 ... 100 to 0%O₂
(freely settable in 1%O₂ steps)

Numbers of range:

2 ranges

Measuring system:

Paramagnetic pressure type

Output signal: 4 to 20mA DC
(load 550Ω max.)
0 to 1V DC

Repeatability: Within ± 0.5% of full scale
(in 10% or higher ranges)
Within ± 1% of full scale
(in ranges below 10%)



- Zero drift:** Within ± 1% of full scale/week
(in 10% or higher ranges)
Within ± 1.5% of full scale/week
(in ranges below 10%)
- Span drift:** Within ± 2% of full scale/week
- Flow rate of sample gas:**
0.5L/min. or 1L/min
- Response time (90% response: *Indication start-up time):**
2sec or less (sample gas flow rate 1L/min, range width 5%O₂ or more)
3sec or less (sample gas flow rate 1L/min, range width less than 5%O₂)
3sec or less (sample gas flow rate 0.5L/min)
*The time (= 1sec.) required for gas replacement in the internal piping is not included.
- Linearity:** Within ±2% of full scale
- Compositional variations:**
0.04%O₂ or 1% of full scale, or whichever is larger.
- Sample gas temperature:**
0 to 40°C
- Pressure loss:** Approx. 1.3kPa {about 130mmH₂O}(at sample gas flow rate 0.5L/min)
Approx. 2.8kPa {about 280mmH₂O}(at sample gas flow rate 1L/min)
- Reference gas:** N₂, O₂ gas or air
- Reference gas pressure:**
100kPa (range width: 10%O₂ or more)
Specified pressure: 50 to 150kPa (range width: less than 10%O₂)
*Specified pressure is marked at the reference gas inlet.
*Reference gas is supplied at the above pressure to allow for flow rates of 5 to 20mL/min.
- Purging gas (dry air or N₂) flow rate:**
1L/min
(flowed for purging corrosive ambient gas)
- Gas inlet/outlet dimensions:**
Rc1/4 (PT1/4 female screw) or NPT1/4

Materials of gas-contacting parts:

Teflon and 304 stainless steel

Temperature characteristic:

1.5% of full scale/10°C

Warmup time: Approx. 2 hours**Interference due to coexisting gas:**

(Deviation in O₂ % of zero point caused by flowing interfering gas component at 100%)

Interfering gas	Deviation in O ₂ %	Interfering gas	Deviation in O ₂ %
NO	+43	C ₃ H ₄	-0.44
NO ₂	+28	H ₂ S	-0.39
He	+0.30	HCl	-0.30
H ₂	+0.24	CO ₂	-0.27
Ne	+0.13	NH ₃	-0.26
HF	+0.10	C ₂ H ₂	-0.24
CO	+0.01	Ar	-0.22
n-C ₇ H ₁₆	-2.10	SO ₂	-0.22
Xe	-0.95	N ₂ O	-0.20
C ₃ H ₈	-0.86	CH ₄	-0.20
C ₃ H ₆	-0.55	H ₂ O	-0.02
C ₂ H ₆	-0.46	—	—

Display: Liquid crystal display,
concentration indication (4 digits),
range indication (4 digits)
message indication (24 characters, 2 lines)

Output hold: Output hold is possible during calibration.

Moving average time:
0 to 99.9sec

Contact output: 1a contact calibration signal, instrument
failure, contact capacity 250V AC, 2A (re-
sistance load)

Power supply: 85 to 264V AC, 50/60Hz

Power consumption:
Approx. 45VA

Ambient temperature:
-5 to +45°C

Ambient humidity:
Less than 90% RH

Allowable (max.) external vibration:
1.0m/s²(0.1G)(0 to 30Hz)
0.5m/s²(0.05G)(30 to 100Hz)

External dimension (HxWxD):
Rack mount type 220x483x463mm
Flush mount type 220x443x463mm
Desk-top type 233x443x463mm

Mass: Approx. 16kg

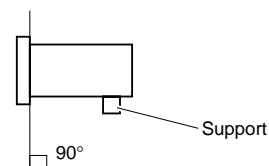
Finish color: Munsell 5Y 8/1

Installation condition:

- The instrument must be protected from direct sunlight and heat radiation from objects at high temperature.
- For installing the instrument outdoors, it must be protected from the elements with a suitable casing or cover.
- The instrument must be installed in a clean atmosphere free from corrosive or combustible gas.
- The instrument must be free from severe external vibrations. When fast response time is required, it should be used in a place free from vibration.

Mounting method:

Mounting on 19-inch rack, flush mount-
ing on panel or desk top mounting



Note: Instrument mass of more than 70% should be supported at the bottom of the case.

* For panel mounting or 19-inch rack mounting, a support should be provided for supporting the rear side of the case.

OPTIONAL SPECIFICATION

Alarm output: Upper limit alarm:
Contact output; 1c contact
Contact capacity; 250 AC, 2A
(resistive load)

Lower limit alarm:
Contact output; 1c contact
Contact capacity; 250 AC, 2A
(resistive load)

Remote range changeover:
Range can be changed with external signal
Signal input for range changeover; 5V DC

Range identification signal output:
Contact output; 1a contact
Contact capacity; 250 AC, 2A
(resistive load)

Output hold: Each output can be held by external in-
put signal
Input signal for external hold; 5V DC (held
by 5V input)

Transmission function:
RS-232C interface
Half-duplex bit serial, start-stop
synchronouse, 9600bps

Automatic calibration:
Zero/span calibration is performed auto-
matically at a preset cycle.

Calibration gas is supplied while driving
the external electromagnetic valve.

Calibration gas density setting range:

Zero gas: 0.00 to 99.99%O₂
(0.01%O₂ step)

Span gas: 0.00 to 99.99%O₂
(0.01%O₂ step)

Calibration start:

Built-in timer or remote start signal
Output hold during calibration: Possible

Calibration gas flow time:

Up to Max. 60min and 59sec

Calibration cycle:

1 to 168 hours (1 hour step)

Contact output:

Calibration: 1a contact
Contact capacity: 250V AC, 2A
(resistance load)

Calibration error: 1a contact
Contact capacity: 250V AC, 2A
(resistance load)

Remote start:

Remote start input signal: 5V DC
(start at more than
100msec of pulse input)

CODE SYMBOLS

1	2	3	4	5	6	7	8	9	10	11	12	Description
Z	A	J					4					
			4	Y								Measuring range 2 range selectable Minimum range 2% O ₂ Maximum range 100% O ₂ Range setting before delivery 5/25 O ₂ range (Refer to "Measuring range" in SPECIFICATION)
							2					Response time Standard type (2sec/90% of full scale) (5% or more O ₂ of full scale)
												Power supply and pipe connection dimension 5 85 to 264V AC 50Hz/Rc1/4 6 85 to 264V AC 60Hz/Rc1/4 7 85 to 264V AC 50Hz/NPT1/4 8 85 to 264V AC 60Hz/NPT1/4
											0	Use For general service
											N	Display Japanese
											E	English
											Y	Option Without
											A	Automatic calibration
											B	Alarm output, remote range, range identification
											C	Transmission function (RS-232C)
											D	A + B
											E	A + C
											F	B + C
											G	A + B + C
											A	Construction Desk-top type
											B	19 inches rack mount type
											C	Panel flush mount type

SCOPE OF DELIVERY

Main unit: Analyzer unit x 1, 2 of fuses, one of instruction manual, one of accessory kit (one of restrictor, six of packings, two of filters, two of spanners)

Items to be prepared separately:

Standard gas for calibration

Code symbol ZBM□SY04-01

Reference gas

• Measuring range 0 to 2 ... 100% O₂

N₂: Code symbol ZBM□NY04-01

• Measuring range 21 to 23 ... 100% O₂
21 to 19 ... 0% O₂

Air: Code symbol ZBM□RY04-01

or instrumentation air

• Measuring range 100 to 98 ... 0% O₂

O₂: Code symbol ZBM□SY04-01

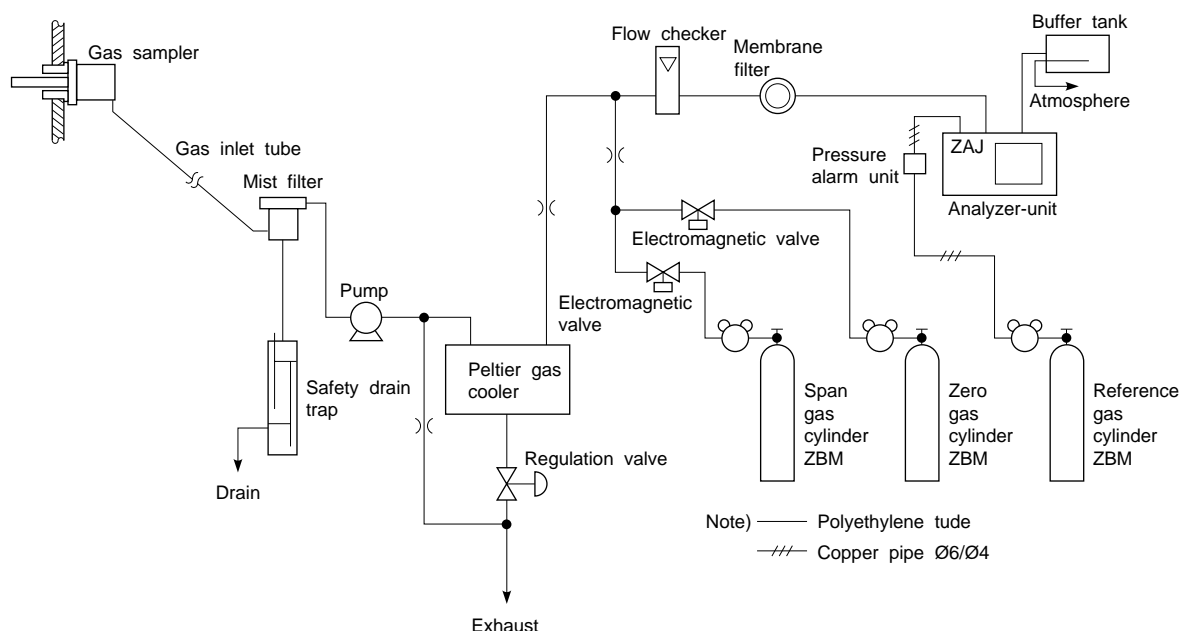
Buffer tank ZBH410□3

Note

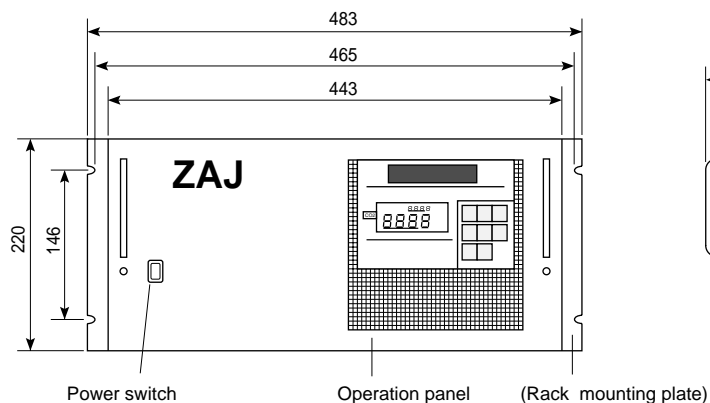
- (1) When using this analyzer, be sure to provide a buffer tank in the exhaust path immediately after the analyzer. This is required for preventing output fluctuation due to disturbances such as large noise and strong wind.
- (2) In case of air-suppletion range, span gas concentration should be ordered by specifying 80 to 100% of the full scale. At this time, clearly describe "manufacture according to weighing method and accuracy within O₂ concentration corresponding to ±1% of full scale." Otherwise, concentration error will increase.
[Example] In case of 21 to 19% O₂ range:
Span gas concentration
19.0 to 19.4% O₂/N₂, manufacture according to weighing method, accuracy within ±0.02% O₂.
- (3) In case of oxygen-suppletion range, use O₂ gas of purity 99.99% or more for zero gas in ranges of 10% or less O₂ full scale, and that of purity 99.9% or more in other ranges.
- (4) Use a copper pipe (6/4 copper pipe) for the reference line. It should be as short as possible from the gas cylinder. If it is long, it takes time until it is stabilized after power ON. Do not use a plastic pipe, as it causes errors in reading due to permeation of oxygen.

CONSTITUTION

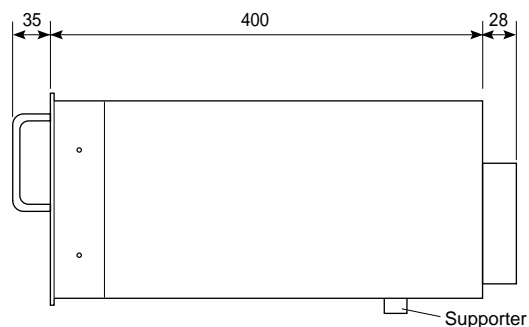
Sampling system diagram (Example)



OUTLINE DIAGRAM (Unit:mm)

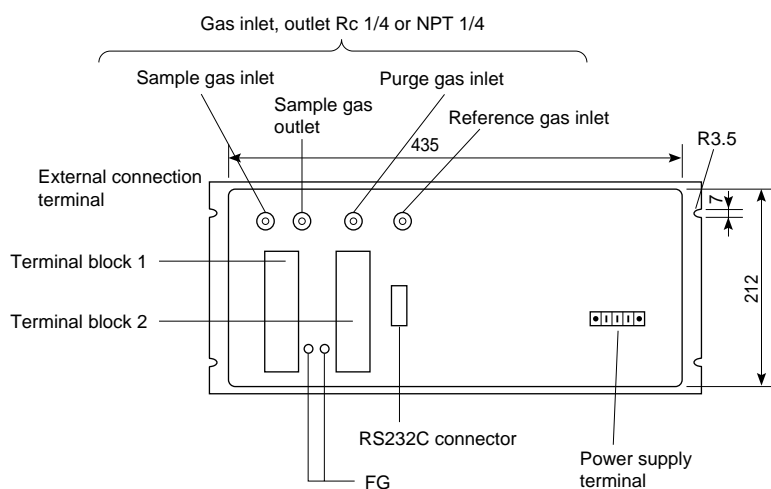


< Front view >



• Supporter more than 70% of the instrument mass at the bottom of the case.

< Side view >

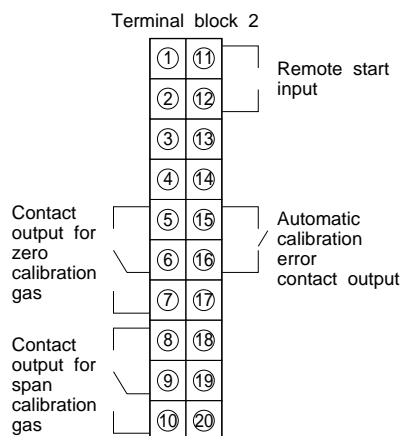
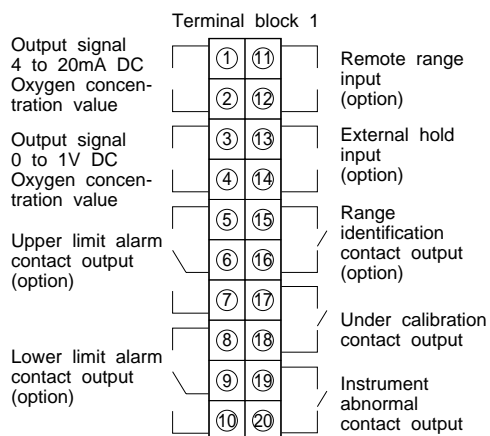


< Rear view >

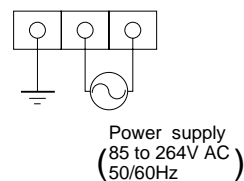
Panel cutout (for flush mounting)



EXTERNAL CONNECTION DIAGRAM



POWER SUPPLY TERMINAL



⚠ Caution on Safety

*Before using this product, be sure to read its instruction manual in advance.

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