PARAMAGNETIC OXYGEN ANALYZER

DATA SHEET ZKG

This product is a dumbbell type paramagnetic oxygen analyzer. Because this analyzer is based on that the magnetic susceptibility of oxygen gas is larger than coexisting gases, stable measurement is ensured unaffected by coexisting gases. The detector does not have a heating part such as heater. Therefore, this analyzer is suited for measuring the oxygen concentration in flammable gas. Further, running cost can be saved since reference gas is not required.

FEATURES

1. Since reference gas is unnecessary due to use of a dumbbell type paramagnetic system, this analyzer will not entail an additional running cost.
2. The principle of measurement is dependent on the strong magnetic property of oxygen molecules. Therefore, measurement is almost unaffected by other molecules weaker in magnetic property than oxygen.
3. Suited for measuring oxygen in flammable gas.
4. Small-sized and easy to handle.
5. Usable with a wide range of power supplies.
6. Output is linear.

SPECIFICATIONS

Measuring range:
0 to 10, 21, 25, 50, 100% O_2

Number of ranges:
1 or 2 ranges (selectable by code symbol)

Measuring system:
Paramagnetic (dumbbell type)

Output signal: One of the following signals (selectable by code symbol)
4 to 20 mA DC (load resistance 550 Ω max.)
0 to 1 V DC (permissible load resistance 100 kΩ max.)
0 to 10 mV DC (permissible load resistance 100 kΩ max.)

Repeatability: Within ±0.5% of full scale

Linearity: Within ±1.0% of full scale

Zero drift: Within ±2.0% of full scale/week

Span drift: Within ±2.0% of full scale/week

Response time: Within 15 sec (90% response)

Flow rate of sample gas:
0.5 L/min ± 0.2 L/min

Pressure loss: Approx. 0.3 kPa (at sample gas flow rate 0.5 L/min)

Flow rate of purge gas (option):
1 L/min, N_2 or air (flowed for purging corrosive ambient gas)

Power supply: 100 to 240 V AC, 50/60 Hz

Power consumption:
Approx. 35 VA

Ambient temperature:
0 to 45˚C

Ambient humidity:
Less than 90% RH

Warm-up time: Approx. 30 minutes

Materials of gas-contacting parts:
SUS304, SUS316, fluororubber, borosilicate glass, Electroless Nickel, platinum, platinum/iridium alloy, PP, Toaron, PVDF (polyvinylidene fluoride), PPS resin

Interference due to coexisting gas:

Interfering gas	Interfering gas concentration	Interfering concentration
NO	2000ppm	0.15vol% O_2 max.
CO	100vol%	0.1vol%O_2 max.
CO_2	100vol%	– 0.35vol%O_2 max.
CH_4	100vol%	– 0.25vol%O_2 max.

Enclosure: Steel casing, for indoor application, flush mounting on panel

Dimensions (H x W x D):
240 x 192 x 234 mm

Weight: Approx. 5 kg

Finish color: Munsell 10Y7.5/0.5 semi-gloss

Measuring gas conditions:

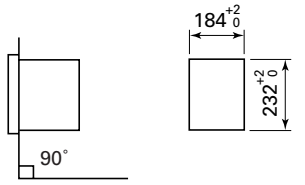
Temperature:	0 to 50˚C
Humidity:	Dew point at least 10˚C lower than ambient temperature
Dust:	Max. 100 μg/Nm³ in particles of max. 0.3 μm each
Mist:	Unallowable
Pressure:	10 kPa or less

Installation conditions:

- 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 rain and wind with a suitable casing or cover.
- The instrument must be installed in a clean atmosphere free from corrosive or flammable gas.
- The instrument must be free from severe external vibrations.

Mounting: Vertical mounting on panel

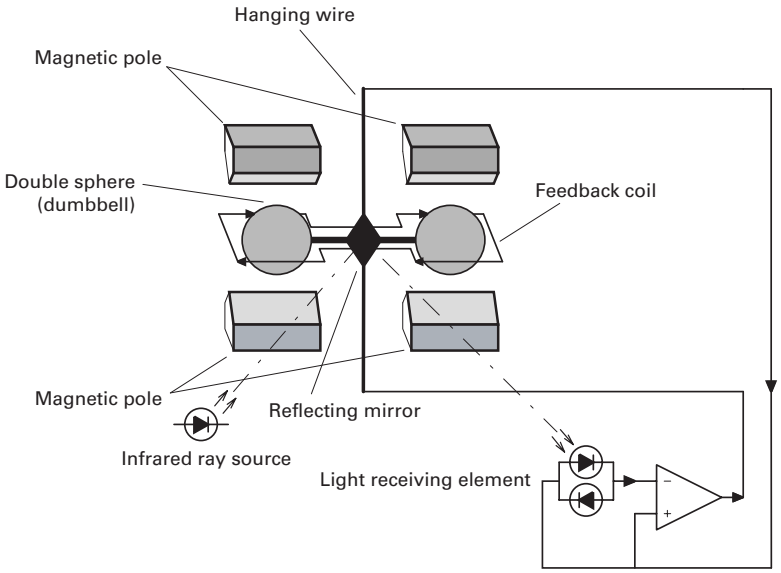
Panel cutout dimensions (mm)



CODE SYMBOLS

1	2	3	4	5	6	7	8		9	10	Description
Z	K	G	3	Y			2	-			
			3								Use (4th digit) With indication
					1						Measuring range (6th digit) 0 to 10 vol%
					2						0 to 25 vol%
					3						0 to 50 vol%
					4						0 to 100 vol%
					5						0 to 21 vol%
						0					Purge inlet (7th digit) Without purge gas inlet
						1					With purge gas inlet
											2nd range (9th digit)
									Y		Without
									2		0 to 25 vol%
									3		0 to 50 vol%
									4		0 to 100 vol%
									5		0 to 21 vol%
											Output signal (10th digit)
										A	DC 4 to 20mA
										B	DC 0 to 1V
										C	DC 0 to 10mV

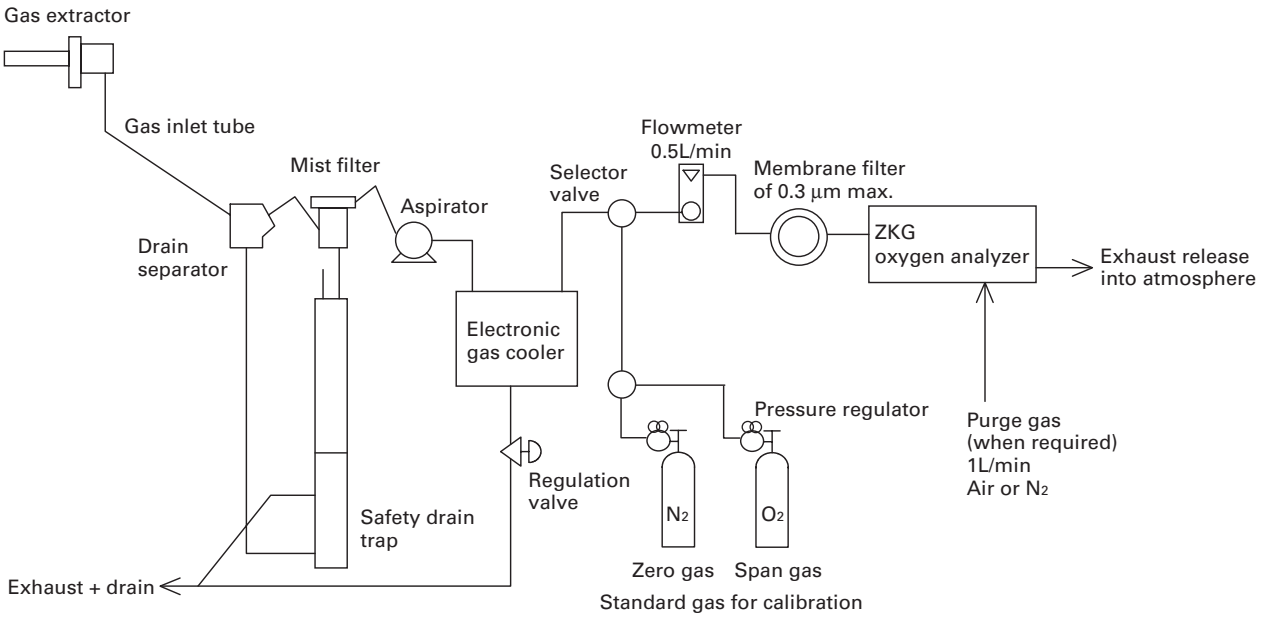
PRINCIPLE OF MEASUREMENT



In the cell, two glass spheres filled with nitrogen gas are suspended with strong metal. At first, the spheres are kept in balance in an inhomogeneous magnetic field. When oxygen molecules having a large magnetic susceptibility flow there, the molecules are pulled toward the stronger magnetic field zone and the spheres are moved away from the zone. The resulting deviation of the spheres is detected with the light source, reflecting mirror and light receiving element, and a current is flowed through the feedback loop to control so that the spheres can return to the initial balanced state. The current flowing through the feedback loop is proportional to oxygen concentration. Thus, oxygen concentration is converted into an electric signal.

CONFIGURATION

Sampling System Diagram (example: Oxygen measurement in boiler exhaust gas)



SCOPE OF DELIVERY

Analyzer main unit x 1
Panel mounting bracket x 2
Fuse 250 V AC/0.5 A delay type x 2 (1 accessory and 1 built in)
Instruction manual x 1

CAUTIONS

(1) Use the analyzer within the specified flow rate. If it is used beyond the specified flow rate for enhancing response, the sensor section may be damaged to cause an instrument trouble.

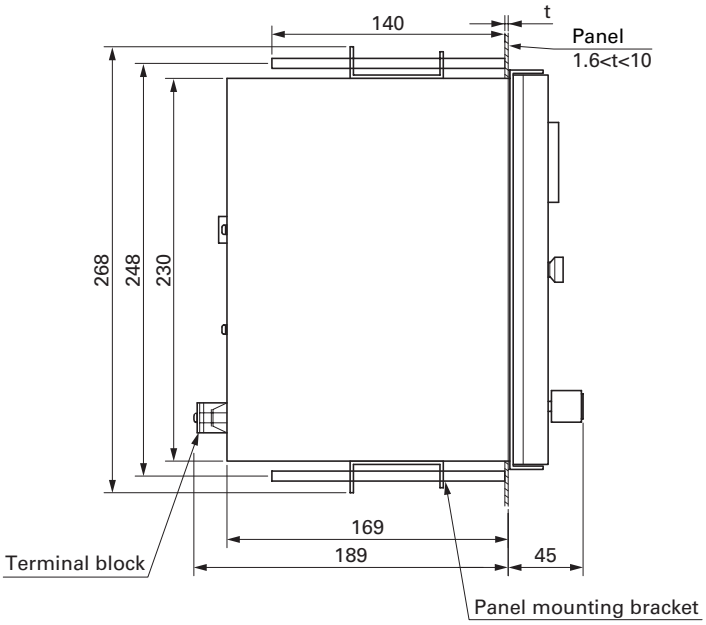
(2) Before the analyzer, be sure to connect a flowmeter and filter (0.3 μm or finer mesh).

(3) Use a shielded wire for signal line connection.

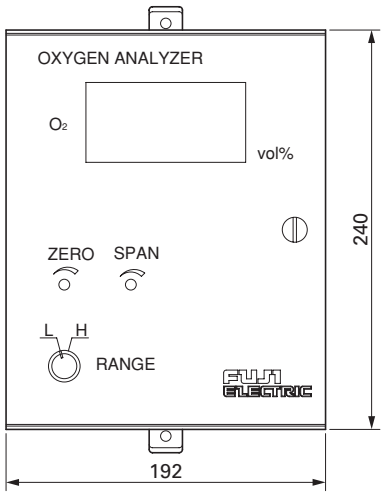
(4) Analyzer exhaust should be released into the atmospheric air.

OUTLINE DIAGRAM (Unit : mm)

Side View

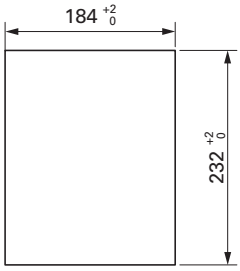


Front View

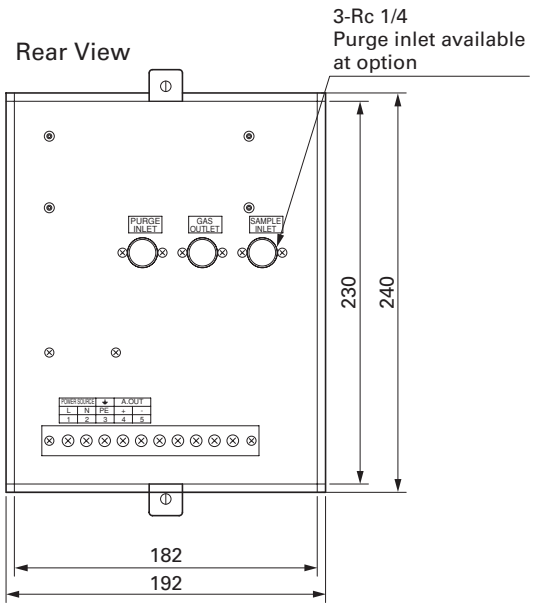


* Change switch is not attached in the case of a single range.

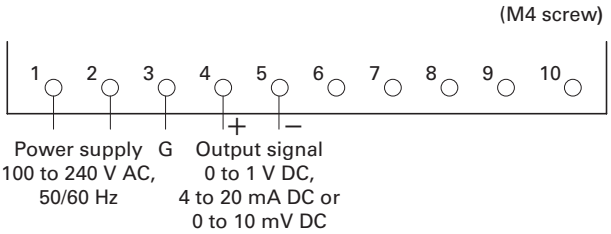
PANEL CUTOUT DIMENSION



Rear View



CONNECTION DIAGRAM



⚠ Caution on Safety

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

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