



6400



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Table of Contents

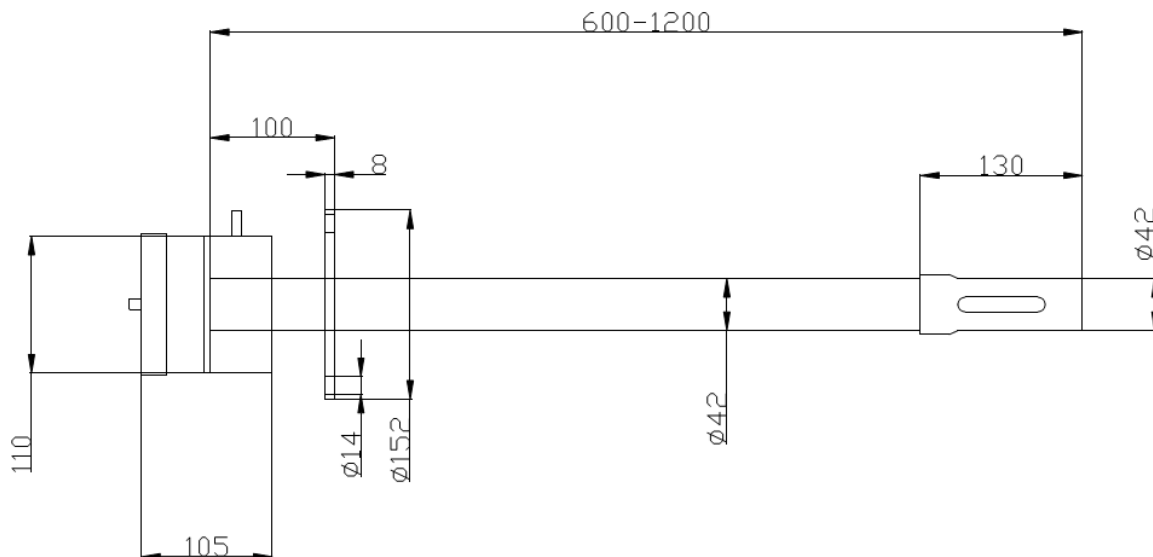
I. Overview	3
II. Working Principle	4
III. Technical Parameters	4
IV. Instrument Instructions	5
V. Instrument Operation	7
VI. Instrument Selection	9
VII. Order Information	9
VIII. Wiring Diagram	10-11

I. Overview

IMR 6400 intelligent oxygen analyzer uses an advanced anti-interference circuit and an anti-volatile data protection function. The display will automatically switch to any range for the set limit concentration on the alarm.

The design of the IMR 6400 series analyzer uses a monolithic intelligent analyzer. It can compare the content of oxygen potential from the probe and it uses the "Nernst" equation to calculate the oxygen content in the flue gas instantly. Additionally, a dual parameter correction technique is used; the oxygen probe has an electric potential adjustment function. This makes up for discrete defects in the oxygen probe, and extending the service life of the oxygen probe. The analyzer has an accurate probe and reliable temperature control. It uses a PID optimization control, and a dual protection circuit. The IMR 6400 oxygen analyzer not only shows oxygen potential, temperature, oxygen percentage, and background electric potential but also has 0-10ma or 4-20ma isolation analog output with high load capacity. For the range 0-10% O₂ or 0-20.6% O₂ the corresponding standard output can be a set.

The IMR 6400 series analyzer is a new kind of intelligent industrial instrument. It can test the oxygen content in the kiln on line, analyze, and do the comparison in order to achieve a low oxygen burning control and ensure a safe and efficiency process. Therefore IMR 6400 series analyzers can be widely adapted to power, chemical industry, metallurgy, petroleum, light industry, and in the field of textile combustion control. It also can be applied in electronic components, magnetic materials, and other high temperature sintering of trace oxygen analysis.



II. Working Principle

A zirconia analyzer is mainly made up of the zirconia oxygen probe, and transmitter. When the temperature of the zirconia probe is up to 600°C, and both sides of the zirconia probe have oxygen differences, it will produce electric potential on the electrode, according to the Nernst equation.

$$E = \frac{RT}{4F} \ln \frac{P_{O_2}}{P}$$

- (1) R, F refer to gas constant and Faraday constant
- (2) T refers to the absolute zirconia tube temperature (K)
- (3) P_{O_2} is air oxygen content (20.6% O_2) P is the smoke oxygen content

According to the equation above, we just need to get the zirconia probe's working temperature and its output electric potential, then we can obtain the smoke gas oxygen level. The IMR 6400 series analyzer is designed, and made according to the differences of battery principle. The oxygen strong difference electric potential from the zirconia probe will be amplified into standard voltage signal and thermocouple by the operation circuit. The potential of the compensation will make A/D conversion circuit (the voltage/frequency circuit of the machine) to switch into high frequency signals then transmit it into the single chip microcomputer system CPU; collecting and processing the data by computer. In other words; we can get the percentage of oxygen content at the same time; the system can execute oxygen electric potential, probe temperature, show the electric potential, have constant temperature control over the heating furnace, and have the alarm protection once over the limitation.

III. Technical Parameters

1. Range: 0~20.6% O_2
2. Accuracy $\leq 0.5\%$ F.S
3. Temperature of the measured fume $< 600^\circ\text{C}$ (Low temperature type) $600^\circ\text{C} \sim 800^\circ\text{C}$ (Vertical cutting type) $800^\circ\text{C} \sim 1300^\circ\text{C}$ (High temperature type)
4. Air surplus coefficient range of the checked fume: 0.1~99
5. Response time ≤ 3 seconds (90% response)
6. Temperature display range: $0 \sim 800^\circ\text{C}$
7. Current output: $0 \sim 10$ ma or $4 \sim 20$ ma DC
8. Working conditions: environment temperature $0 \sim 50^\circ\text{C}$ relative humidity $< 85\%$
9. Working voltage: AC $220\text{V} \pm 10\%$ 50HZ $\pm 5\%$
10. Warm-up time of the zirconia detector heating furnace: about 20 minutes
11. Heating temperature: PID control $< +3^\circ\text{C}$ (constant temperature can be set)
12. Digital display: LED four digital tube
13. Correction range of background electric potential: -100 mv $\sim +100$ mv
14. Communicative interface RS232 or RS485 (customer specified)

IV. Instrument Instructions




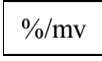
High—high oxygen alarm

Low—low oxygen alarm

Heat—heating display

A-TH high temperature alarm

A-IL low temperature alarm

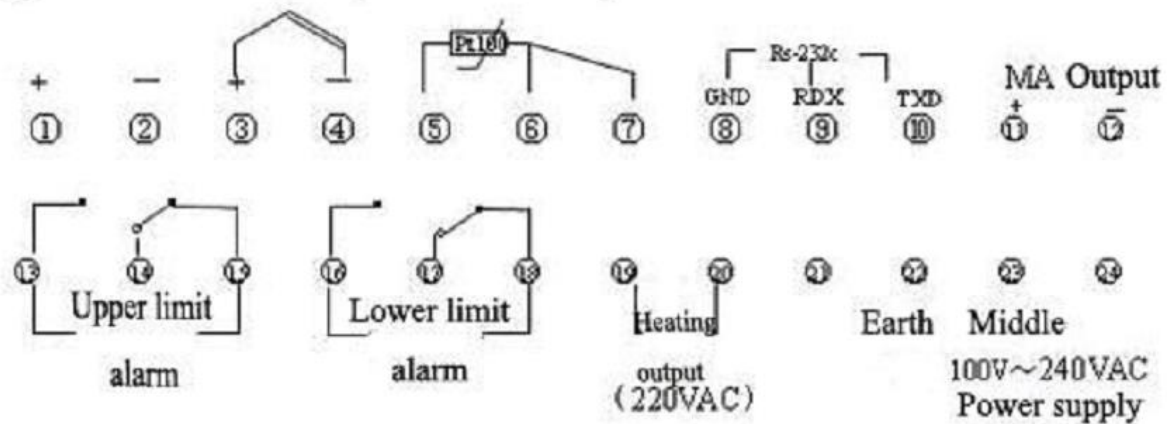
	Set button
	Up button
	Down button
	Alternating button

In the normal working status the instrument displays oxygen value. At the same time the indicating light corresponding to “%” is on. Press the key “%/mv” to display the actual output electric potential of the oxygen electrode while the indicator light corresponding to “mv” is on.

When the electrode is heating the indicator light “heat” is flashing. The flashing speed indicates the changes of current pulse. If the oxygen value is more than upper limit alarm setting; then the indicator light “High” is on. The upper limit relay closes. If oxygen value is less than lower limit alarm setting; then the indicator light “Low” is on. The lower limit relay closes. If the “A-TH” is on; it means electrode temperature is higher than the setting temperature 5°C. If the “A-TL” is on; it means electrode temperature is lower than the setting temperature 5°C.

Back side instrument wiring

Oxygen electrode Thermocouple Cold end compensation



Pin 1, 2 connect oxygen electrode, pin 1 is positive

Pin 3, 4 connect thermocouple, pin 3 is positive

Pin 5, 6, 7 connect cold end compensating resistance P+100

Output type

Pin 11, 12 mean current output, pin 11 is positive

Pin 19, 20 mean circuit heating output

Pin 13, 14, 15 mean upper limit alarm output, pin 14, 15 mean N.C contact.

Pin 16, 17, 18 mean lower limit alarm output, Pin 17, 18 mean N.C contact.

Pin 9, 10 connect RS-485 communicative interface.

Pin 22, 23, 24 connect 220v AC, Pin 22 means earth wire.

V. Instrument Operation

After instrument wiring successfully connects. In the normal measurement state; the top of the instrument indicates oxygen value and the bottom indicates temperature. Press the “%/mv” key. Then the top displays “mv”, and the bottom displays temperature. Press the “SET” key for 3 seconds. Then the instrument will be in the parameter setting mode, and displaying “LOC”. Repress the “SET” key, and then enter login password.

0	0	8	8
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Press the “SET” key to get into settings

Eo: Background electric potential (mv)

OL: Current output zero-point oxygen demand (%)

OH: Current output full-scale oxygen demand (%)

AL: Lower limit alarm value (%)

AH: Upper limit alarm value (%)

T: Electrode working temperature (°C)

OF: Current output

Add: Communicative address

(1) Eo: Correction of electrode background electric potential: when instrument displays EO press the “SET” key to show the former value of the background electric potential.

Press key “△” “▽” to revise digits.

The range of background electric potential is -100mv~+100mv.

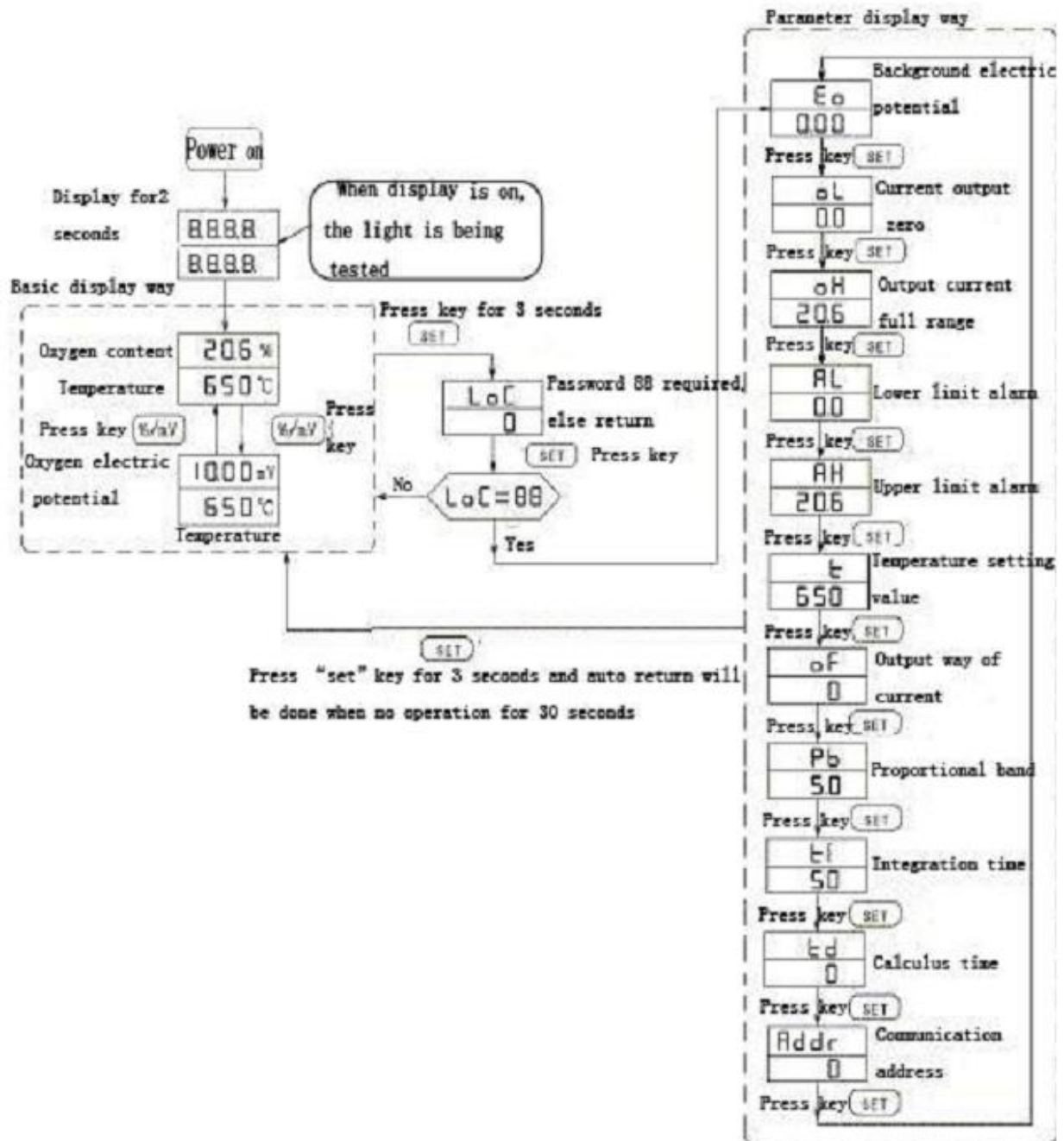
(2) OL/OH: Setting of current output zero point oxygen demand and full scale oxygen demand. Current outputs 0 MA or 4 MA corresponds to OL value. When setting, ensure OH>OL and range with 0~20.6%

(3) AL, AH: the lower and upper limit alarm settings, when setting ensure AH>AL and the range within 0~20.6%

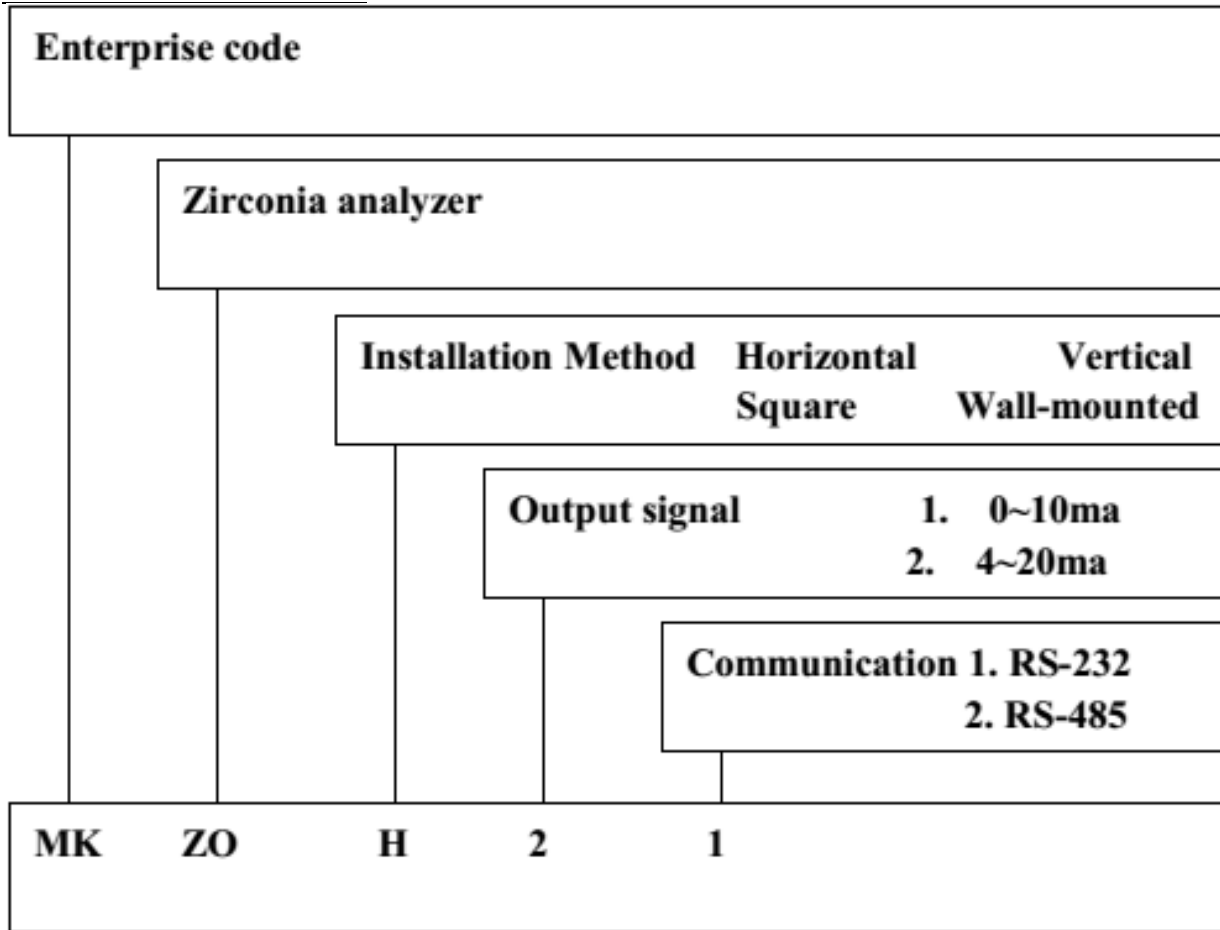
(4) T: Setting of electrode working temperature. This parameter sets the normal working temperature (generally within 500°C~700°C) of the zirconia electrode. For instance, when setting T=650°C, the instrument will be stable within 650°C by PID adjustment.

(5) OF: The setting Output Current. When set to “0”, the instrument output current is 4~20MA. When set to “1”, the output current is 0~10MA.

Usage flow diagram:



VI. Instrument Selection

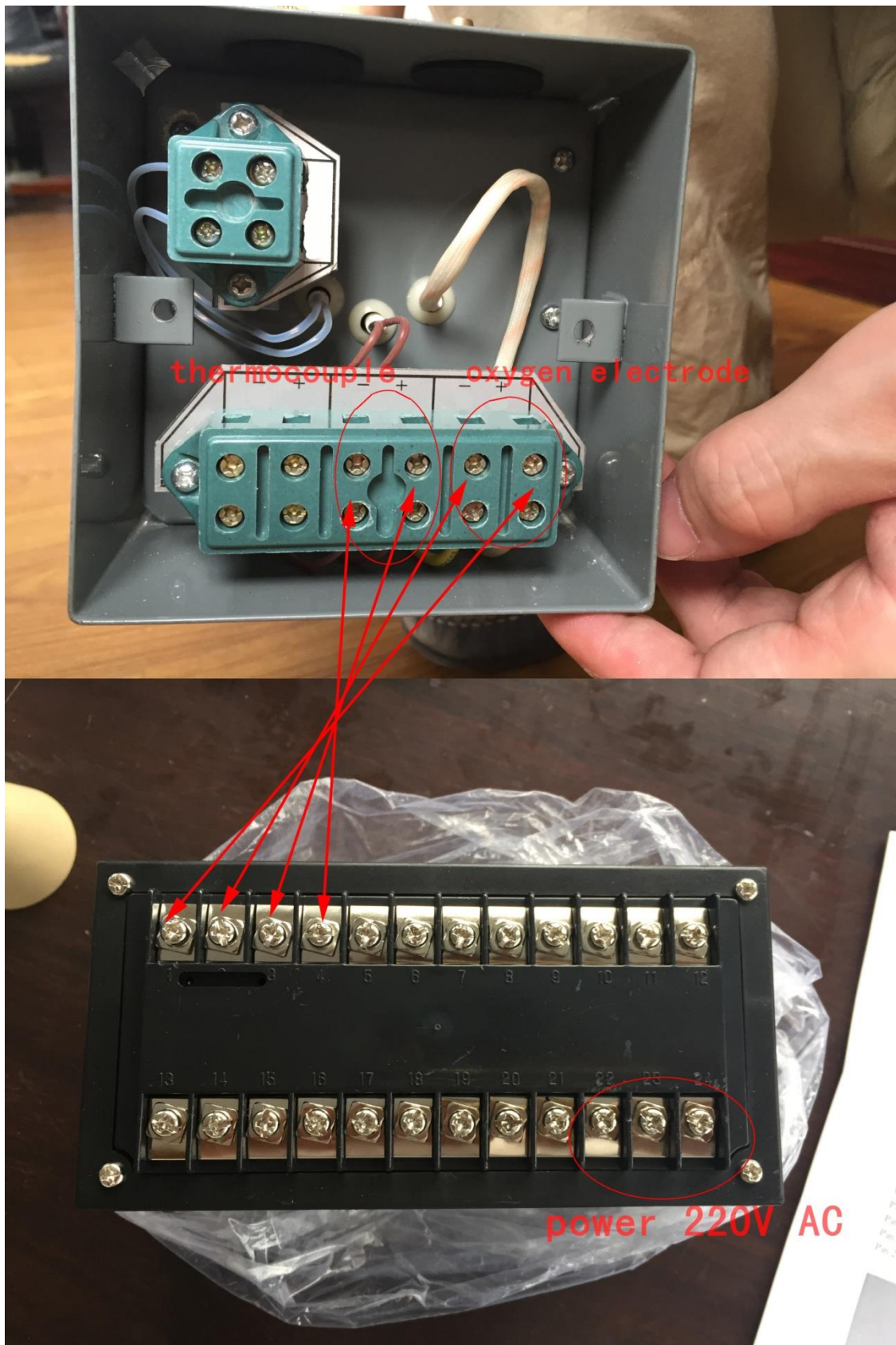


Exterior	(Dimension) mm	(Trepanning size)mm Width*Height
Horizontal	160*80*110	152 ⁺¹ *76 ⁺¹
Vertical	80*160*110	76 ⁺¹ *152 ⁺¹
Square	160*160*110	152 ⁺¹ *152 ⁺¹
Wall-mounted	220*170*75(Height)*(Width)*(Thickness)	

VII. Order Information

1. The lead time of this product is varies. When you make a choice, please contact us, and specify required delivery time in advance.
2. Please specify the length and application if you need the supporting zirconia probe when you order. The service life of zirconia probe is related to usage and media, in general it can be in good condition for 6 months.
3. If you have any special requirements. Please consult the technical department, and specify your company's name, address, and name of destination, contact person, and telephone number.

VII. Wiring Diagram



Pin 1, 2 connect oxygen electrode, pin 1 is positive.
Pin 3, 4 connect a thermocouple, pin 3 is positive.
Pin 22, 23, 24 connect 220v AC, Pin 22 means earth wire.

