



# **GC-4500**

## **Transformer Oil Analyzer**



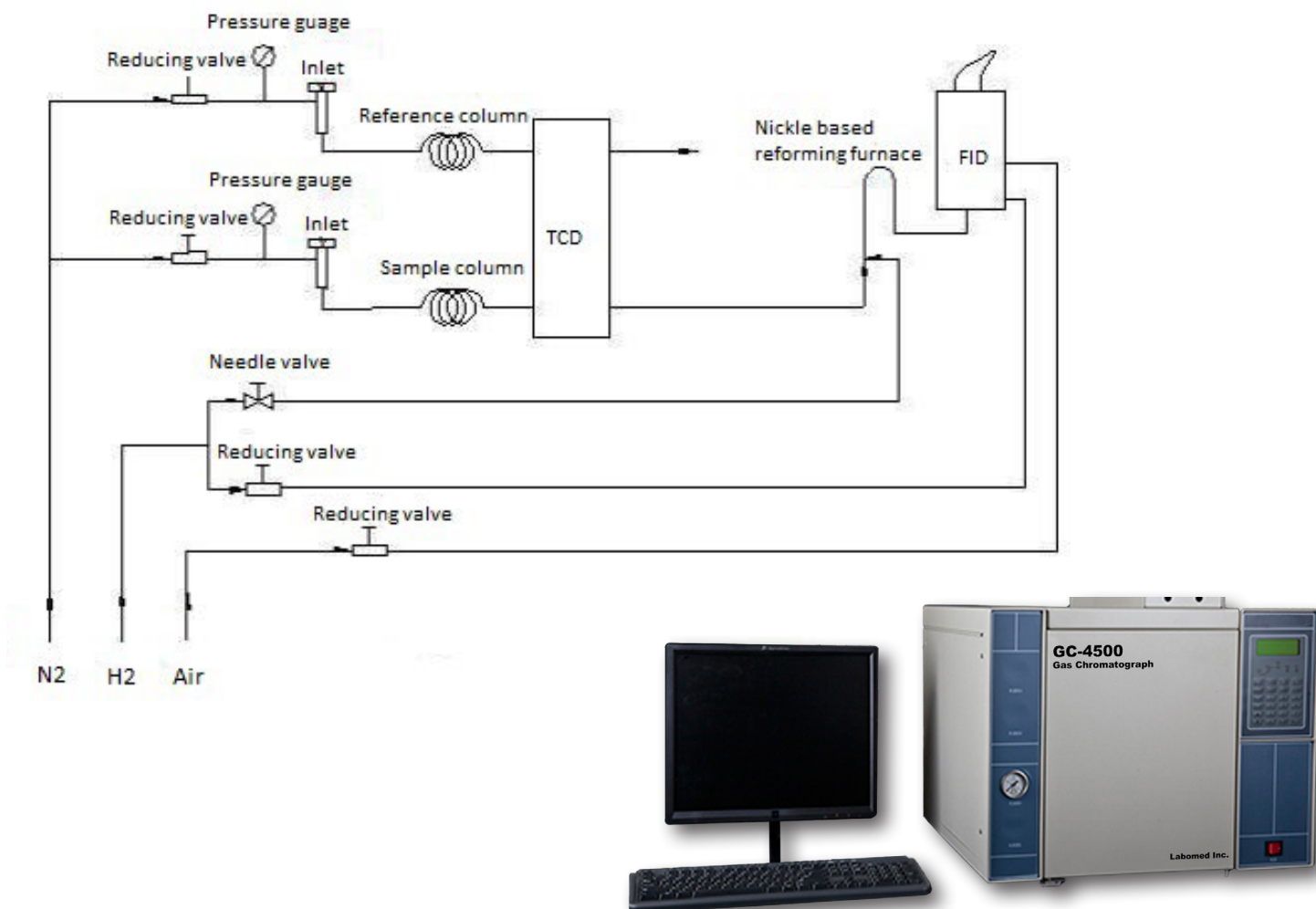
## Introduction

Transformer is an important part in electricity system. In the substation, whether main transformer can operate safely and reliably, will directly relate to the safe operation of the power grid. Transformer Oil plays roles of insulation, cooling and arc suppression in the transformer working. When a fault occurs inside the transformer, will produce such as H<sub>2</sub>, CO, CO<sub>2</sub>, C<sub>2</sub>H<sub>2</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>6</sub> and other soluble gases in transformer oil, and transformer oil under different fault will produce different composition and content of hydrocarbons. So always checking the transformer oil has great significance for reflecting transformer running status.

The analysis method referred to EIC 567 Oil-filled electrical equipment –Sampling of gases and of oil for analysis of free and dissolved gases – Guidance and meets Chinese Standard GB/T 17623-1998 Determination of componental contents of gases dissolved in insulating oil by gas chromatography method.

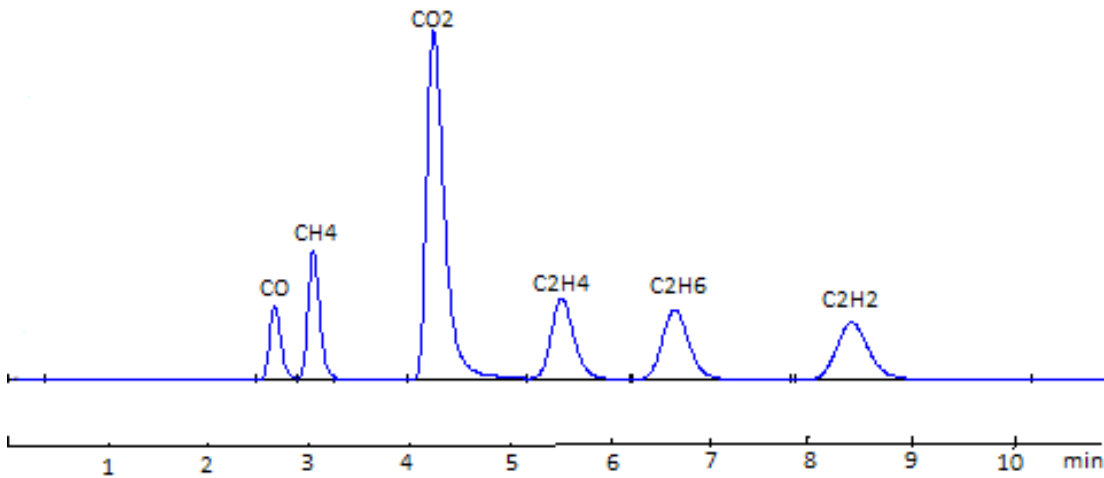
## Instrument Configuration

Dual-packed column inlets, FID and TCD, nicklebased reforming furnace, packed column.

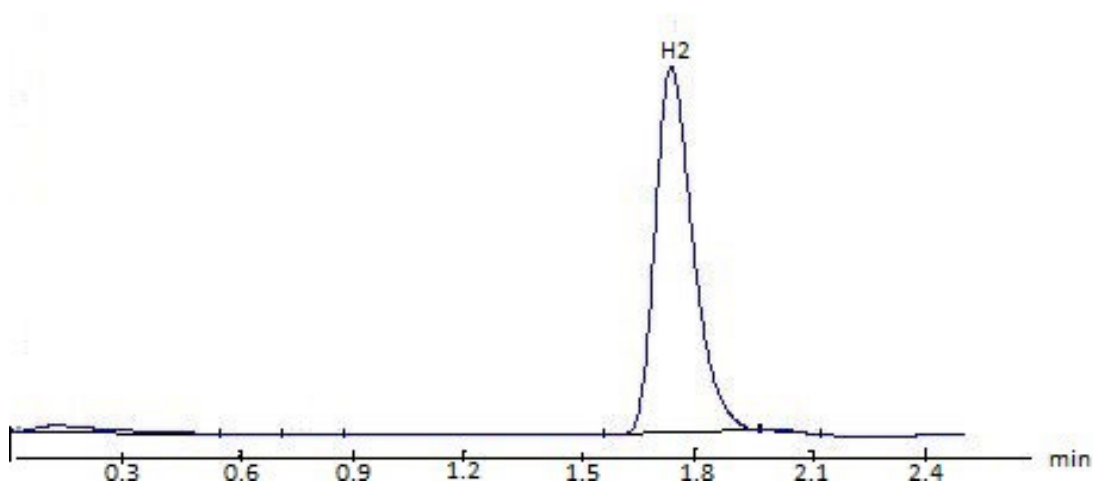


# Analysis chromatograms

FID for CH<sub>4</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, C<sub>2</sub>H<sub>2</sub>, analysis,  
Nickle based reforming furnace for CO  
and CO<sub>2</sub> converting into CH<sub>4</sub>



TCD for hydrogen analysis



# Features

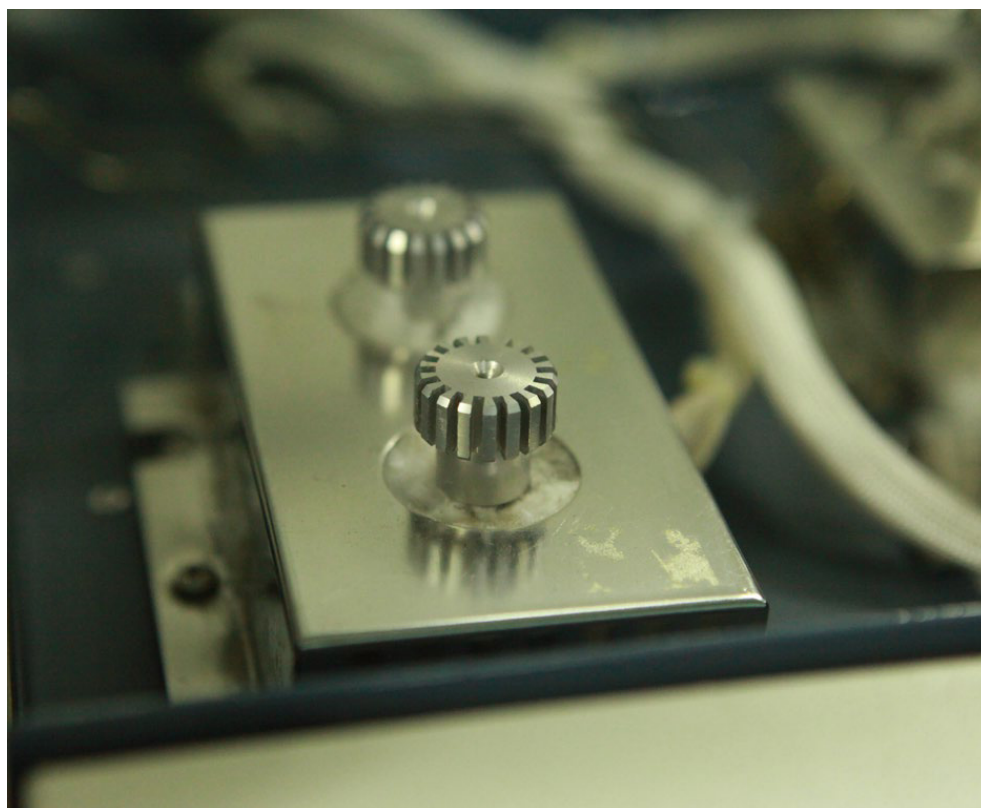
## Main unit

- Cost-effective and practical
- Simple and elegant appearance, simple operation, easy maintenance
- High sensitivity and stability
- Size: 492.5mm × 562mm × 550mm
- Weight: 35kg



## Packed Inlet

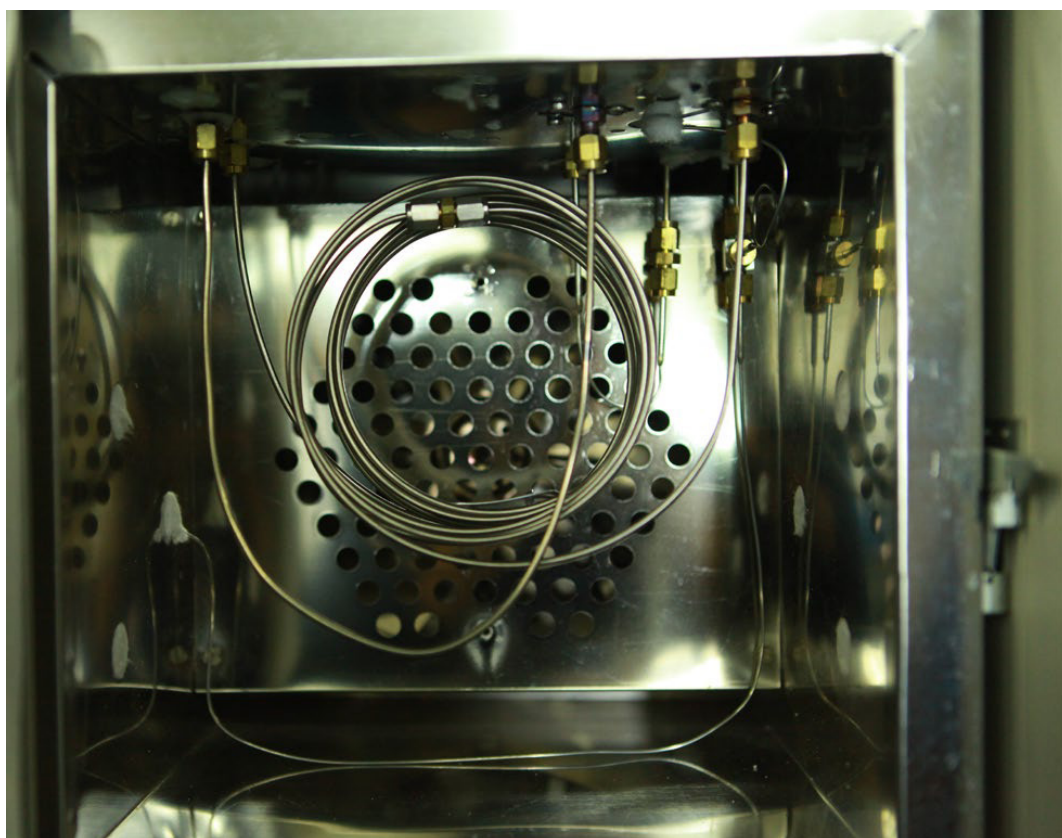
Items	Specifications
Temperature range	Ambient temp.+6℃ ~399℃
Air tightness	≤ 0.01MPa
Gas flow rate stability	≤ 1%



# Column Oven

Large oven, double-door, fast heating and cooling

Items	Specifications
Temperature range	Ambient temp.+ 10°C ~399°C
Ramps	11 (Optional)
Heating rate	0°C /min ~ 30°C /min
Temperature stability	≤ 0.5%
Programing heating reproducibility	≤ 2%



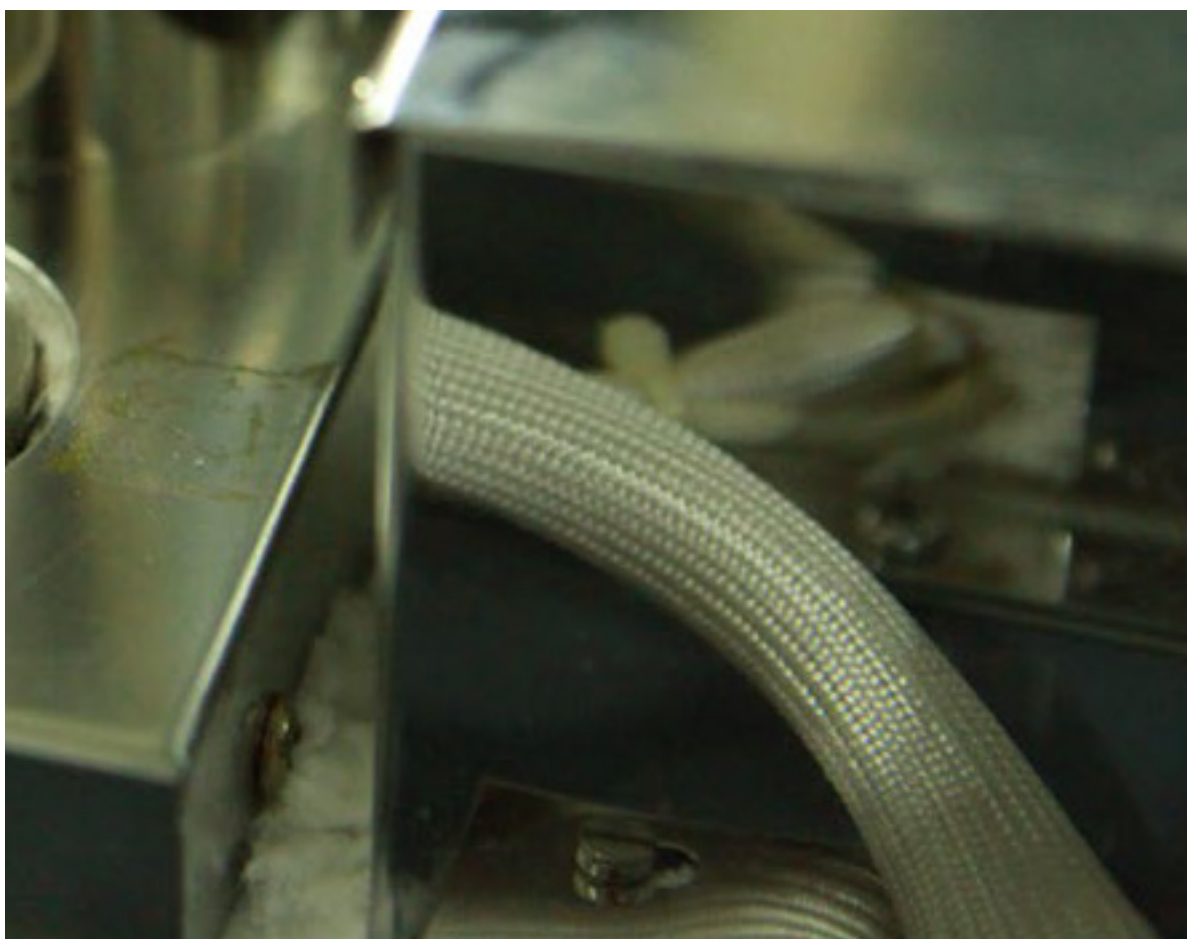
## TCD

Items	Specifications
Baseline noise	$\leq 0.04\text{mV}$
Baseline drift (30min)	$\leq 0.2\text{mV}$
Sensitivity	$\geq 6000\text{mV}\cdot\text{mL}/\text{mg}$
Quantitative reproducibility	$\leq 3.0\%$



# FID

Items	Specifications
Baseline noise	$\leq 2 \times 10^{-14} \text{A}$
Baseline drift (30min)	$\leq 2 \times 10^{-13} \text{A}$
Detect limit	$\leq 8 \times 10^{-12} \text{g/s}$
Quantitative reproducibility	$\leq 3.0\%$



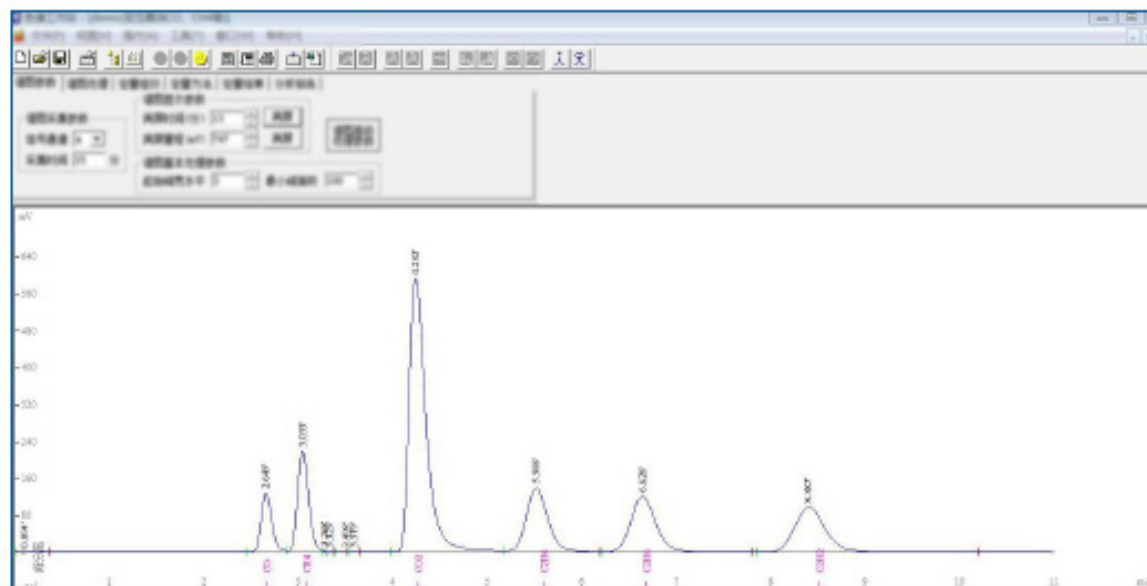
# Nickle based reforming furnace

Convert micro content CO,CO<sub>2</sub> into CH<sub>4</sub>, then use FID to check



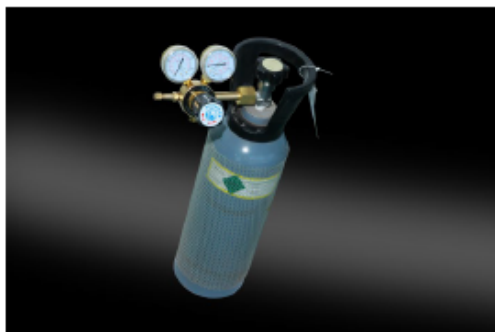
# Special software for transformer oil analysis

Simple data acquisition and easy data processing





# Consumables



Standard gas  
Including  $H_2$ ,  $CO$ ,  $CO_2$ ,  $CH_4$ ,  $C_2H_6$ ,  $C_2H_4$ ,  $C_2H_2$ ,  $N_2$



100ml syringe, Rubber Cap and Two-way needle



5ml syringe



Gas-Tight Syringe

# Other optional accessories



Nitrogen generator



Hydrogen generator



Air source