



挥发性有机物在线监测系统方案【用于 1 立方米实验舱】

Total VOC Online Analysis System

【For 1 m³ Test Chamber】



2014 年 8 月



图 1、实验系统构成

Figure 1. System Configuration

◆ 方案说明/Introduction

挥发性有机物在线监测系统与 1 立方米实验舱作为主要设备(图 1)共同构成 VDA276/ PV 3942/ GS 97014-2/3 实验系统。

VDA276/ PV 3942/ GS 97014-2/3 实验系统主要用于测试汽车内饰件/零部件在指定温度、湿度、空气交换率等条件下的 VOC 释放量，挥发性有机物在线监测系统用于：

- 监测实验舱背景浓度（总挥发性有机物，TVOC）
- 监测实验舱内样品 VOC 挥发稳定性
- 检测实验舱气密性
- 测试方法开发，确定采样时间

Total VOC Online Analysis System (Figure 1) and 1 m³ Test Chamber are the main equipments of the experiment system fulfilling VDA276/ PV 3942/ GS 97014-3 standard.

VDA276/ PV 3942/ GS 97014-3 experiment system is mainly used to test VOC emissions of automotive interior products at the specified conditions such as the specified temperature, humidity and air change rate etc. Total VOC Online Analysis System is used for

- Chamber background concentration monitoring(Total VOC)
- VOC volatile sample stability monitoring
- Chamber leakage testing
- Testing method development and sampling time determination

◆ **适用标准/Standard**

- VDA 276
- VW PV 3942
- BMW GS 97014-2/3

◆ **TVOC 在线监测系统主要构成**

/ Total VOC Online Analysis System Configuration



- 2000MP 小流量离子火焰分析仪/Low Flow FID Analyzer
- CAP15 零气发生器/ Air Purifier

◆ 系统配置/System Configuration

序号	产品	制造商	型号	数量
No.	Product	Manufacturer	Model	Quantity
1	1.5m 加热采样管线，内径，1.1mm/V2A /1.5m heated sample lines inside diameter1,1mm/V2A	TESTA Germany		1
2	小流量离子火焰 (FID) 分析仪/Low flow FID analyzer	TESTA Germany	2000MP	1
3	内置系统标定电磁阀/ Heated 3-Way- Solenoid valve	TESTA Germany		1
4	非加热过滤器/Unheated Protection Filter	TESTA Germany		1
5	零气发生器/Zero gas generator	TESTA Germany	CAP15	1
6	FID2000MP 耗材包/Maintenance kit of FID 2000MP	TESTA Germany		1
7	CAP15 耗材包/Maintenance kit of CAP 15	TESTA Germany		1
8	威图工业机架系统集成及附件/Rittal rack integration and accessories	RITTAL China		1
9	数据采集和远程控制软件/Data acquisition and remote control software	TESTA Germany		1

以下由用户提供/provided by the customer

10	C3H8 标气 , 25ppm , 8L/Span gas,25ppm,8L	1
11	C3H8 标气 , 80ppm , 8L/Span gas,80ppm,8L	1
12	C3H8 标气 , 800ppm , 8L/Span gas,800ppm,8L	1
13	氢氦混合气瓶 , 40:60 , 40L/Fuel gas H2/He 40:60,40L	1
14	不锈钢双级减压阀/ Stainless steel reducing valve	4
15	气瓶与仪器间不锈钢气路连接管线/Stainless steel pipe	10m

◆ 技术参数/Technical data

测量原理/Principle	火焰离子法/ Flame Ionization Detector (FID)
测量方式/ Measurement method	在线测量/ Online measurement
最小量程/Smallest range	0-30ppm
最大量程/ Largest range	0-100000ppm
量程数量/ Measuring ranges	6
采样流量/ Sampling flow	10-12ml/min
响应时间 (T90) / Response speed	1s
最低检出限/ Detection limit	0.1ppm
采样温度/ Sampling temperature	与样气接触部分采用全加热系统，采样管线及检测器温度 191℃ / Full heated systems. Working temperature of sampling line and detector is 191 °C

采样泵/ Sampling pump	非加热泵，位于检测器下游，避免样气吸附 / Non-heating sampling pump, located below the detector to avoid the contamination of sample gas on the pump membrane
重复度/ Reproducibility	$\leq \pm 1\%$
零点漂移/ Zero point drift	最小满量程 24 小时内不超过 $\pm 2\%$ ，其它量程 24 小时内不超过 $\pm 1\%$ / $\leq \pm 2\%$ in 24 hrs.(minimum full scale)
零气发生器/ Zero gas generator	制取 TVOC < 0.1ppm 的纯净空气 / Air purifier to produce the clean air with TVOC < 0.1ppm
安全性/ Safety	在标定和在线测试过程中，系统能够在必要时自动切断供气 / The system can cut off the fuel gas automatically when necessary during testing and calibration
系统标定/ System Calibration	既能手动标定，也能自动标定，且能实现多量程的自动标定 / Supporting calibration manually and automatically both; Supporting automatic calibration on multi-range.

软件/ Software

具有远程控制和数据采集功能，提供数据记录及表格输出功能；

具有与 1 立方米实验舱的数据接口，测量结果可以集成到实验舱软件中显示

/ Providing functions covering remote control, data acquisition, data recording and datasheet output.

USB Interface for Simpati Software.

Measurement results can be integrated and displayed on the Simpati software.