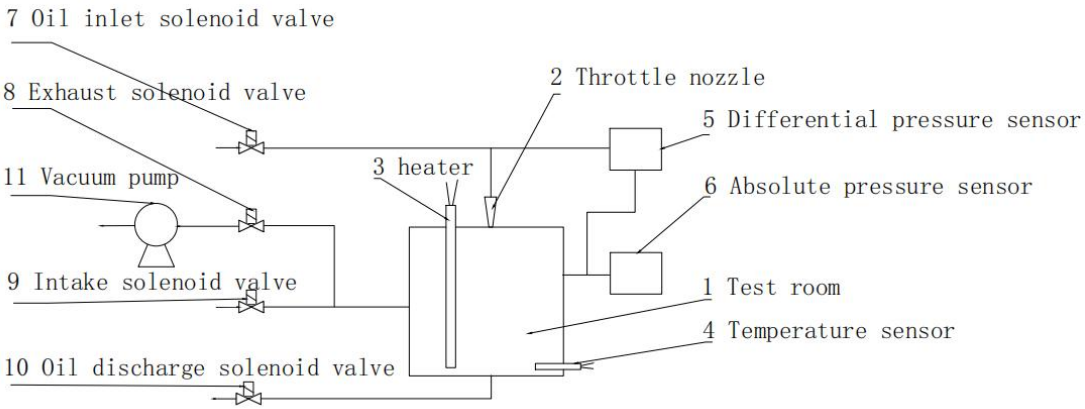
Vapor Pressure Process Analyzer

- ASTM D323 ， GB/T 8017
- Advanced analytical principles: The analyzer employs a fully static vacuum analysis method and incorporates a series of effective techniques throughout the implementation process.
- Use industrial PCs to implement analytical control.
- The analyzer's innovative explosion-proof design features a large 270 mm viewing window and a high-resolution color TFT-LCD display screen.
- The entire design adopts a novel explosion-proof structure featuring the internationally popular large-window spiral-type explosion-proof door.
- Through the window and LCD display screen, establish human-machine interaction with the industrial PC using a remote control.

Introduction

The saturated vapor pressure of gasoline is a key parameter for evaluating petroleum products; it represents the maximum fuel vapor pressure measured when the engine fuel mixture has a volume ratio of 1:4 to fuel vapor in a saturated vapor pressure tester at 37.8°C. The online vapor pressure analyzer is an explosion-proof, real-time quality analysis instrument specifically designed for rapid determination of gasoline's saturated vapor pressure during refining processes.



The constant temperature measurement chamber with specified volume utilizes a miniature vacuum pump to create a vacuum inside the chamber. Once the required vacuum level is achieved, a throttling element equipped with a differential pressure sensor sends a predetermined volume of oil sample into the chamber after computer-based calculation, achieving a gas-to-liquid ratio of 4:1. The pressure within the chamber is then measured by an absolute pressure sensor, which corresponds to the absolute vapor pressure of the tested oil sample; the analyzer's working principle is illustrated in the schematic diagram.

The online steam pressure analyzer operates in a cyclic mode. The procedure is as follows: first, open the inlet and sample discharge solenoid valves; under air pressure, discharge the previously analyzed oil sample from the constant temperature

measurement chamber. Then close both valves, open the vacuum extraction solenoid valve to evacuate the chamber until reaching a specified vacuum level. Once this condition is achieved, close the vacuum extraction valve and open the injection solenoid valve to introduce a predetermined volume of oil sample. After injection, close the injection valve and measure the chamber pressure at 37.8°C.

Repeat this sequence periodically to enable continuous monitoring of the oil sample's steam pressure values.

Technical Features

1. Advanced analytical principles: The analyzer employs a fully static vacuum analysis method and incorporates a series of effective technical measures. Its measurement chamber is robustly designed, with a wide sample injection temperature range, eliminating the need for additional temperature control units in most applications and ensuring compatibility with diverse operational conditions across various process environments.

2. Innovative explosion-proof design: The entire unit adopts the internationally popular large-window spiral-type explosion-proof door structure, featuring an aesthetically pleasing appearance that facilitates operation, maintenance, and inspection. The explosion-proof rating has been upgraded to Exd Ⅱ CT4, making it suitable for all hydrogenation units and fully meeting the safety requirements of refinery sites.

3. Intelligent Electrical Control: Utilizes industrial PCs to achieve intelligent closed-loop control of the entire system, featuring self-diagnostic capabilities, automatic parameter adjustment, and automated fault detection with alarm functionality.

4. Large LCD display: The analyzer's innovative explosion-proof design features a 270 mm-wide viewing window and a color TFT-LCD display system that visually

shows instrument status and curves, with built-in historical data retrieval and parameter adjustment capabilities.

Theanalyzer'sinnovativeexplosion-proof design features a large 270 mm viewing window and a color TFT-LCD display system that providesclearvisualizationoftheinstrument'soperational status and curves.

The sample pretreatment system is subsequently subjected to rapid loopcooling,filtration,dehydration, degassing,impurityremoval,precisionfiltration,pressurestabilization,andflowratestabilization.

Innovativeexplosion-proofdesign:Theentireunitadoptstheinternationallypopularlarge-windowspiral-typeexplosion-proofdoorstructure,featuringanaestheticallypleasingappearancethatfacilitatesoperation,maintenance,andinspection.

Human-machine interaction feature: You can communicate with the industrial PC using a remote control via the window and LCD display without opening the table door.

SPECIFICATIONS

Standards	
ASTM-323 ， GB/T 8017.Association Standard：ASTM D5953（DVP）、ASTM D5482(Atmospheric Pressure Mini Method）、ASTM D1267(LPGas）、ASTM D5191、ASTM D6377(VPCR)、ASTM D6897(LPG expand）	
Technical Details	
measuring range	150Kpa
Repeatability	≤1 Kpa
Reproducibility	Superior to ASTM D5191
measuring period,cycle of measurement	Based on sample composition, 4–6 minutes, non-continuous
Product Flow Path	1 channel
measure the temperature	37.8℃
explosion-proof	ExdIICT4
Electrical	
Power Supply	110-220VAC±10％.50Hz
Maximum Power Consumption	500W
levels of protection	IP54
Sample	
Quality	filtered through 50 μm membrane; maximum water content: 500 ppm
Consumption	15L/h
Sample injection pressure	Pressure between 0.15 MPa and 0.25 MPa
Sample injection temperature	<30℃
Utilities	
Instrument Air Consumption Rate	30L/h
Pressure at the instrument air inlet	0.2 MPa～0.7 MPa
Instrument Air Quality	Complies with Grade 2 or better as specified in ISO 8573-1
Cooling water	Fresh water free of impurities
Cooling Water - Temperature	<30℃
Cooling water inlet pressure	>0.3 MPa
Electrical data of the signal output	

analog output	4～20mA
MODBUS Interface	RS485MODBUS/RTU
Control Unit	
Main Control Unit	industry PC
Operating System	WindosXP
control software	PACS
Use Interface	
Display	800×600 pixel TFT display
Keyboard	Infrared Wireless Keyboard
Connection	
Pipe Fitting	Swagelok 6mm/8mm; other fittings are available upon request.
Operating Enviornment	
Ambient temperature	Operate at 5°C to 40°C; store at-20°C to 60°C.
Ambient Humidity	Operate at relative humidity of 5% – 80% without corrosion; store at relative humidity of 5% – 85% without corrosion.
Product Size	
Dimensions (mm)	1100mm（W)*1735mm(H)*600mm（D)
Weight	250KG