



V-Sorb 4800P

4 Ports Surface Area & Micropore Size Analyzer

Gold APP Instruments China

Lead You to Particle World Better



UNIQUE FEATURES

Analyzer Scanning

V-Sorb 4800P is Gold APP

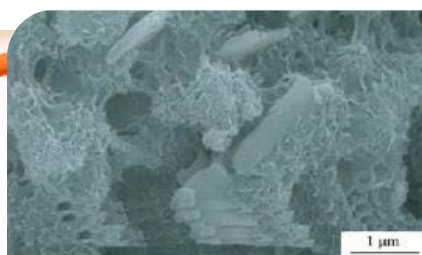
Instruments self-developed surface area and porosity analyzer utilizes static volumetric method.

Multi pioneered techs make instrument's performance much better.

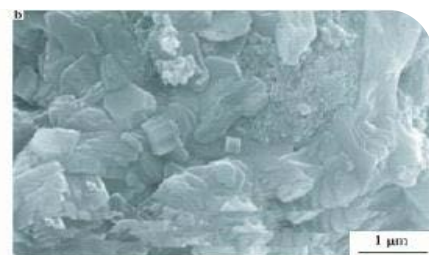
Products designed from the user perspective and equipped with fully automated operation, user-friendly interface makes it easy to learn, imported accessories assure stability and prolong life. Perfect design, sophisticated production and strict testing guarantee to meet customers' real demands.

- ✦ Unique *monolithic manifolds system*, decrease connecting points apparently, reduce leak rate, improve ultimate vacuum.
- ✦ Modularity design can configure as customer requests, benefits future functions extension/upgrade and instrument maintenance.
- ✦ *Atlas Copco brand bipolar vacuum pump*, low noise, stable working, oil-return prevention; ultimate vacuum can reach $4 \times 10^{-2} \text{Pa}$ ($3 \times 10^{-4} \text{Torr}$).
- ✦ *Inficon silicon thin film capacitive pressure transducer*, accuracy can reach 0.1% of real reading, better than 0.1% of F.S. (full-scale).
- ✦ *0-1Torr and 0-1000Torr dual pressure transducers*, sectional measurement in pressure range can reduce errors in low vacuum, 0-1Torr silicon thin film transducer is highly accurate than Pirani resistance vacuum gauge (general error is 10%-15%).
- ✦ Original *stepping coolant level control system with temperature probe*, ensure the coolant level unchanged when compares with sample cells in the whole analysis process, completely eliminate the analysis errors caused by dead volume change.
- ✦ Pioneered gas outlet and inlet control system can efficiently prevent sample splash in evacuation and gas inlet process, guarantee clean manifolds and sample weight unchanged, avoid zero and liner drifting caused by transducer's macro-change.
- ✦ Industry used *programmable pneumatic valve system*, strong anti-interference ability, easy for installation and uninstallation.
- ✦ *Separated analysis and pretreatment manifolds system* can avoid foreign matter to contaminate manifolds during pretreatment.

*pressure transducer's specs are from supplier.



Surface of ME catalyst ($\times 20\,000$)



Surface of IMP catalyst ($\times 20\,000$)



Internal pore of ME catalyst ($\times 10\,000$)



Internal pore of IMP catalyst ($\times 10\,000$)

Analysis Specifications

Versatility

Adsorption and desorption
isothermal curve analysis,
Single and multi-point BET surface
area,
T-plot external surface area,
True density analysis,
BJH mesopore analysis,
BJH total pore volume and porosity,
T-plot micropore analysis,
Langmuir surface area analysis
Average pore size,
Dubinin-Radushkevich (DR)
Dubinin-Astakhov (DA)
micropore surface area,
Horvath-Kawazoe (HK)
Saito-Foley (SF) micropore methods.

Surface area

0.01m²/g to no known upper limit
(nitrogen);
0.005 m²/g to no known upper limit
(krypton).

Pore Size

0.35 to 500nm.

Accuracy

repeatability errors ≤1%.

Vacuum System

V-Sorb unique monolithic manifolds
and pneumatic valve control system,
greatly reduce the dead volume.

Coolant Level Controller

V-Sorb original coolant level sensor
system, ensure the coolant level
unchanged when compares with
sample cells in the whole analysis
process, completely eliminate the
analysis errors caused by dead
volume change.

Analysis Types

N₂ and N₂+He two types available.

Sample Ports

Four samples' analyzing and four
samples' degassing independently
and concurrently.

Partial Pressure

P/P₀ controllable accuracy range is
5x10⁻⁶-0.998.

Ultimate Vacuum

4x10⁻²Pa (3x10⁻⁴Torr).

Vacuum Pump

Built-in bipolar vacuum pump
controlled by patented software
which can auto control pump's
start/stop.

Adsorbate Gas

High purity nitrogen (≥99.999%), Ar,
Kr, CO₂, etc. non-corrosive gases.

Physical

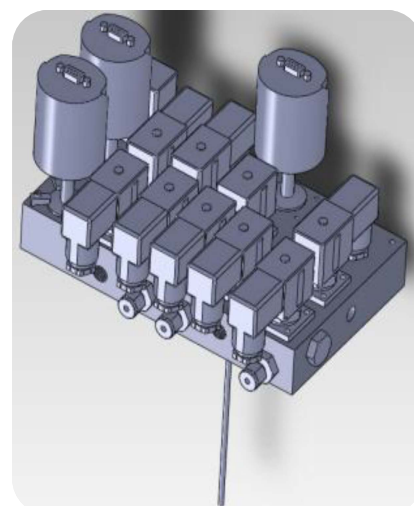
Height 22.05 inches (56cm)
Width 20.87 inches (53cm)
Depth 23.62 inches (60cm)
132 pound (60kg)

Power consumption

Voltage: 100-240 VAC
Frequency: 50 or 60 Hz

Operation environment

Humidity: 90% maximum
Temperature:
10 - 40 °C operating
0-50 °C non operating



Monolithic Manifolds System



Japan Fujikin Pneumatic valve



Sweden Atlas Copco Vacuum Pump



316L Stainless Steel VCR Manifold

4 stations for micropore



Analyzing ports
→ 2 ports of each side

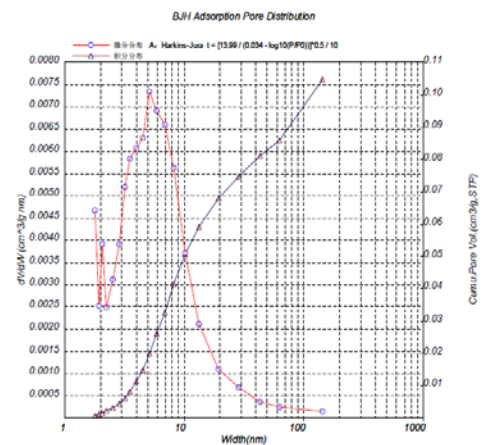
Po cells

Temp. sensor
→ in middle

Quartz sample cells

→ 4L stainless steel bottle neck mode Dewar support ≥ 72 hours

Independent & automated elevator



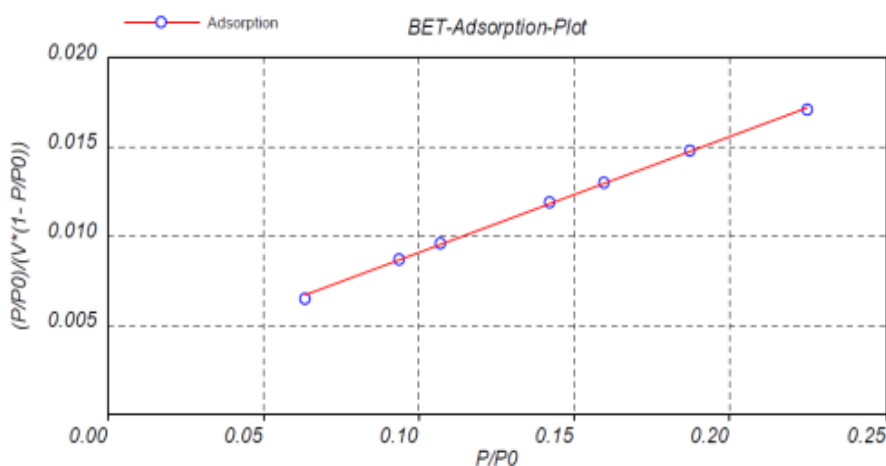
BJH Adsorption Pore Distribution Report

P/P0	Pore range(nm)	Average width(nm)	Incre. Pore Vol.(ml/g)	Cumulative Pore Vol.(cm ³ /g, STP)	Incre. Pore Vol.(ml/g)	Cumulative Pore Vol.(cm ³ /g, STP)	Adsorbed (cm ³ /g, STP)
1.960908	14.4 - 214	214.4	0.000000	0.000000	0.000000	0.000000	64.568016
2.973308	14.4 - 74	144.3	0.010808	0.104609	0.521466	44.436747	53.422246
1.967026	74.1 - 52.6	63.3	0.004864	0.085602	0.307101	43.917281	50.613689
1.908849	52.6 - 33.8	43.7	0.006380	0.090938	0.591979	43.610179	47.050831
1.917275	33.8 - 23.5	28.7	0.008913	0.014548	0.985125	43.016700	43.350831
1.864458	23.5 - 15.5	19.5	0.008686	0.067635	1.783518	42.053075	38.662311
1.814708	15.5 - 11.4	13.5	0.008499	0.026938	2.525101	40.289558	34.892466
2.762762	11.4 - 9.0	10.2	0.009138	0.050440	3.583821	37.744457	30.422336
1.711484	9.0 - 7.4	8.2	0.009010	0.041302	4.417424	34.160536	26.360250
1.889171	7.4 - 6.4	6.9	0.006386	0.032792	3.723100	29.143211	23.516071
1.617837	6.4 - 5.5	5.9	0.006280	0.025897	4.236997	26.019511	20.673120
1.567201	5.5 - 4.8	5.1	0.005119	0.019617	3.996195	21.782514	18.324185
1.518608	4.8 - 4.2	4.5	0.003443	0.014497	3.059623	17.786320	16.607564
1.465516	4.2 - 3.7	4.0	0.003018	0.011054	3.039653	14.726697	15.019426
1.419041	3.7 - 3.4	3.5	0.002155	0.008037	2.432176	11.692044	13.617280
1.375527	3.4 - 3.1	3.2	0.001604	0.005891	2.002375	9.268988	12.627337
1.316846	3.1 - 2.7	2.9	0.001426	0.004277	1.989210	7.258493	11.723248
1.264940	2.7 - 2.4	2.5	0.000898	0.002851	1.414715	5.289283	10.856987
1.211523	2.4 - 2.1	2.3	0.000683	0.001953	1.211684	3.854568	10.024451
1.169942	2.1 - 2.0	2.1	0.000417	0.001270	0.809750	2.642894	9.653522
1.159816	2.0 - 1.9	1.9	0.000368	0.000853	0.761210	1.833134	9.172085
1.138621	1.9 - 1.8	1.8	0.000485	0.000485	1.071923	1.071923	8.773511

BJH Desorption Pore Distribution Report

P/P0	Pore range(nm)	Average width(nm)	Incre. Pore Vol.(ml/g)	Cumulative Pore Vol.(cm ³ /g, STP)	Incre. Pore Vol.(ml/g)	Cumulative Pore Vol.(cm ³ /g, STP)	Adsorbed (cm ³ /g, STP)
1.960908	14.4 - 214	214.4	0.000000	0.000000	0.000000	0.000000	64.568016
2.974613	14.4 - 77	146.0	0.014301	0.114901	0.391721	75.570315	56.068451
1.953078	77.7 - 42.8	60.3	0.007509	0.100800	0.488429	75.178594	51.801164
1.909098	42.9 - 22.7	32.8	0.006430	0.093091	0.784180	74.880165	48.299182
1.806170	22.7 - 10.3	20.5	0.002307	0.006601	0.449617	73.095905	47.076155
1.825748	18.3 - 12.1	15.2	0.005398	0.064354	1.417641	73.446389	44.330850
1.765894	12.1 - 9.0	11.0	0.003748	0.078956	1.358711	72.028728	42.540400
1.731708	9.9 - 7.9	8.9	0.004395	0.075208	1.970850	70.670016	40.478755
1.680032	7.9 - 6.6	7.3	0.004141	0.070813	2.278798	68.600166	38.613587
1.633560	6.6 - 5.7	6.2	0.003173	0.066672	2.053723	66.422369	37.177459
1.577302	5.7 - 4.0	5.3	0.004277	0.063400	3.217518	64.388646	35.345757
1.537321	4.9 - 4.4	4.7	0.003539	0.059222	3.034466	61.151128	33.912665
1.484072	4.4 - 3.0	4.2	0.019289	0.055683	18.526101	58.116662	27.441275
1.440136	3.9 - 3.5	3.7	0.034301	0.036415	37.008843	39.590561	18.620023
1.372930	3.5 - 3.0	3.3	0.002114	0.002114	2.580718	2.580718	14.410344
1.339476	3.0 - 2.8	2.9	0.000000	0.000000	0.000000	0.000000	13.679406
1.283276	2.8 - 2.5	2.7	0.000000	0.000000	0.000000	0.000000	12.624867
1.228341	2.5 - 2.2	2.4	0.000000	0.000000	0.000000	0.000000	11.703371
1.186917	2.2 - 2.0	2.1	0.000000	0.000000	0.000000	0.000000	10.779848
1.107206	2.0 - 0.0	1.0	0.000000	0.000000	0.000000	0.000000	10.255410
1.142914	0.0 - 0.0	0.0	0.000000	0.000000	0.000000	0.000000	9.639662
1.117057	0.0 - 0.0	0.0	0.000000	0.000000	0.000000	0.000000	8.964748

BJH adsorption & desorption
pore distribution



Nickel powder BET adsorption plot

★ ALL report data are no modification!

Sample pretreatment: V-Sorb™ degasser

Surface area and porosity measurement is closely connected with samples' external surface area. Besides, the key of gas sorption is the adsorbate can be efficiently attached onto samples' surface or be filled into pores, thus, no more important than particle surface purity. The purpose for sample pretreatment is to remove atmospheric contaminants on samples' surface and make room for adsorbate. Most samples need pretreatment and ways are changed with samples' characteristics. Normally, water molecule is the item need to be removed, thus, to dry samples in atmospheric pressure and temperature over 100°C (usually 105°C-120°C) is enough which can simplify operation procedures. It is easy to adsorb contaminants in atmospheric pressure and temperature for microporous and strong adsorptive samples, but sometimes need to be degassed under vacuum condition, even to inlet rare gases for better desorption. All in all, pretreatment is to clean and purify sample external surface to ensure more precision results.



Degasser Introduction

Specifications:

- ☞ Up to 4 samples pretreatment currently, independent temp controller;
- ☞ Max temperature is up to 450°C, accuracy $\pm 1^\circ\text{C}$;
- ☞ Programmable heating process, step is 1-10°C;
- ☞ User-defined analysis gases (N₂ or He are more normally used);
- ☞ 48 hours uninterrupted/unattended operation, Surface area analysis less than 30 mins (based on sample property);
- ☞ A dedicated pressure needle can real time show testing pressure;
- ☞ PT100 with resolution 0.01°C, analysis software integrated PID theory.

Features:

- ☞ Adopts stainless steel vacuum system, perfect sealing performance, high vacuum, stable working, long service duration;
- ☞ Speedy heating process, saving time and improving pretreatment efficiency;
- ☞ Easy installation and uninstallation for sample cells;
- ☞ Unique sample splash proof system;
- ☞ Modularity inner structure design, convenient for installation, uninstallation and future upgrade;
- ☞ Each sample station has its own adjustable evacuation/backfill rate control.

Environmental:

- ☞ Ambient temperature: 10 to 50°C ;
- ☞ Maximum relative humidity: 90%.

Electrical:

- ☞ Voltage 100 - 240 VAC;
- ☞ Frequency: 50 or 60 Hz.

Physical:

- ☞ Height 15.7 inches (40 cm)
- ☞ Width 11.8 inches (30 cm)
- ☞ Depth 19.7 inches (50 cm)
- ☞ Weight 33 lbs (20kg)



Sr. No.		Parts	Qty.
1		V-Sorb 4800P Analyzer (with vacuum pump)	1 set
2		Analysis Software (English)	1 set
3		Rubber O-rings for Sample Cells Sealing	10
4		Spherical Sample Cells	10
5		V-shape Sample Funnel	10
6		Reference Material(large surface area)	10 g
7		Reference Material(medium surface area)	10 g
8		Reference Material(small surface area)	10 g
9		Copper Gas Pipe	2 m
10		4L Analysis Dewar	2
11	Manufacturer	Adding Dewar	1
12	Supplied	Fuse	2
13		RJ 45 Cable	2 pcs
14		Protective Gloves	1 pair
15		User Manual (English)	1 copy
16		P _o Cell	4
17		Filling Rod	8
18		Sample Cell Cleaning Brush	1
19		Funnel Cleaning Brush	1
20		Sample Weighting Cup	1
21		Sample Pretreatment Degasser	1 set
22		Computer (Win 2000/07/08/XP/Vista etc)	1 set
23		Printer (not a must)	1 set
24		0.0001 Precision Balance	1 set
25	Customer	Gas Regulator (should fit 1/8" NPT gas pipe, max reading is larger than 0.6Mpa)	2 sets
26	Prepared	Power Cable	1 pc
27		Liquid Nitrogen (purity upper 99.999%)	1 pot
28		He Gas (purity upper 99.999%)	1 cylinder
29		N ₂ Gas (purity upper 99.999%)	1 cylinder

Gold APP Instruments

Static volumetric analyzers:

V-Sorb X800 series

Gas pycnometer density analyzers:

G-DenPyc X900 series

High pressure volumetric analyzers:

H-Sorb X600 series

APPLY TO:

activated carbon, silica gel, active alumina oxide, molecular sieve, sepiolite, zeolite, alumina oxide, silicates, quartz, silicon carbide, lithium cobalt oxide, lithium manganese oxide, black lead, lithium nickel and cobalt, cobaltous oxide, lithium iron phosphate, lithium titanate, polymer, corrosion resister, silica, nano-calcium carbonate, zinc oxide, magnesium oxide, barium oxide, iron oxide, copper oxide, ferroferric oxide, ferrite, silver/ iron/copper/ tungsten/nickel/aluminate powder, filler, inorganic filler, calcium carbonate, silica, deposited matter, suspended matter, titanium dioxide, rare earth, coal, cement, energy storage materials, catalyst, diatomaceous earth, cleansing agent, filter aid, superfine fiber, porous fabric, composite material, methane, coalbed gas etc.

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