

## Specific Surface Area/ Pore Size Distribution Measurement Instrument

# BELSORP<sup>®</sup>-miniX

Specific surface area: 0.01 m<sup>2</sup>/g or more

Pore size distribution: 0.7 to 400 nm

(Optional: 0.35 to 400 nm)



# X's Outstanding Excellence

## Features

**Measures up to 4 specimens simultaneously with the highest level of precision and reproducibility in the world and a drastic reduction in measurement time**

- I High precision measurement at 1.5x throughput** **IMPROVEMENT**  
Simultaneous measurement of up to 4 specimens and high precision simultaneous measurement of 3 specimens.
- II Measurement time is significantly shortened** **IMPROVEMENT**  
The dedicated exhaust valve and improved software greatly reduces measurement time.
- III Equipped with GDO\* functionality** **NEW**  
Speedy measurement with optimum amount of gas dosing based on adsorption isotherm data from previous sample measurement.  
\* Gas Dosing Optimization
- IV Automatically measures adsorption isotherms according to minimum condition settings** **SUCCESSION**  
Capable of measuring adsorption isotherms of the first sample with minimum condition settings.
- V Equipped with AFSM™ for increased measurement precision and reproducibility** **SUCCESSION**  
(Domestic patent: #3756919 / US Patent: 6,595,036)  
The adoption of Advanced Free Space Measurement (AFSM™) has resulted in improved measurement accuracy and reproducibility.
- VI Adsorption isotherm measurement of various gases over a wide range of temperatures** **IMPROVEMENT**  
The gas selector and various temperature devices allow adsorption isotherm measurement of various gases over a wide temperature range.
- VII Progress of measurement can be monitored on software.** **NEW**  
Progress of measurement can be monitored on software.
- VIII Improved operability** **IMPROVEMENT**  
The slide and latch mechanism allows easy attachment/detachment of temperature devices such as Dewar vessels.
- IX Improved maintainability** **IMPROVEMENT**  
Improved maintenance software enables monitoring of the performance of each part.
- X Smallest, most lightweight implementation in the world** **NEW**  
The selection of optimum materials has resulted in the world's smallest and most lightweight instrument.

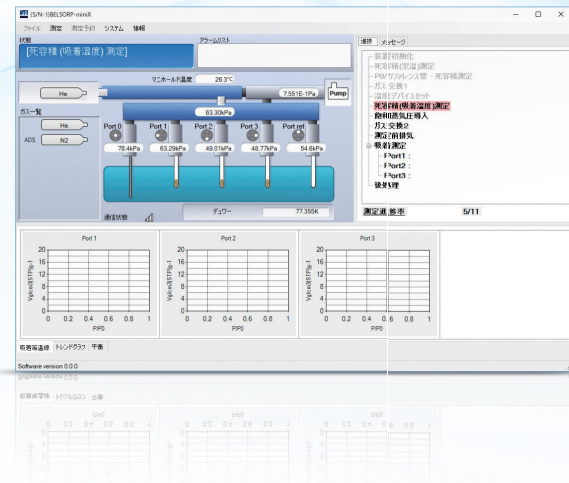
Conforming to JIS Z8830, Z8831-2, K6217-7 and ISO 9277, 15901-2, 18852.

<b>NEW</b>	= New function of BELSORP-miniX
<b>IMPROVEMENT</b>	= Function improved from BELSORP-mini II
<b>SUCCESSION</b>	= Function continued from BELSORP-mini II



## Software

The software was developed with a focus on easy operation. The advanced adsorption technology we have developed over many years can be easily reproduced by users, and the sophisticated analysis theories incorporated in the software assure satisfactory results.



## Applications

The instrument can be used in a wide range of areas including catalysts, fuel cells, batteries, fibers, polymer materials, medicine, pigments, cosmetics, magnetic powder, separation membranes, filters, toner, cement, ceramics and semiconductor materials.



Catalyst



Battery



Carbon



Medicine



Cosmetics



Cement



Toner



Pigments



Ceramic

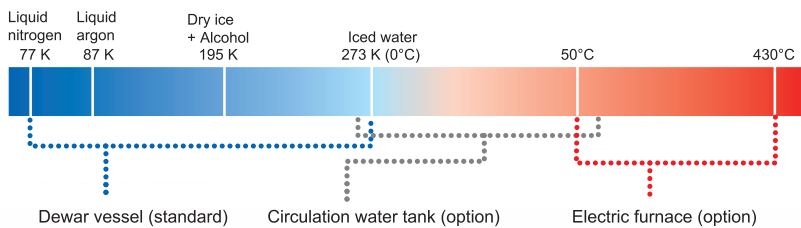


Electronics

## Options and Consumables

In addition to the Dewar vessel provided as standard, various options are available for different measurement temperature ranges. The gas selector and temperature controller can be installed with the instrument in a small space.

### Measurement temperature range



### Consumables, sample tubes






### Gas selector (left) and temperature controller (right)



Example of combination with the instrument

## Pretreatment Instruments

	BELPREP-flow II	BELPREP-vac II	BELPREP-vac III
			
Flow heating process	✓	Option	Option
Vacuum heating process	-	✓	✓
Number of specimens		3	6
Programmed temperature control	✓	✓	✓
Auto purge stop function	-	✓	-
Exhaust speed auto switching function (For sample scatter prevention)	-	✓	-
Dimensions, weight (main unit)	321 (W) × 158 (H) × 363 (D) mm 11 kg	321 (W) × 158 (H) × 363 (D) mm 15 kg	400 (W) × 317 (H) × 383 (D) mm 15 kg
Utility	Gas	N <sub>2</sub> 0.1MPa Joint: 1/8" Swagelok	
	Power	AC100 V/400 W	AC100 V/1000 W (including R.P.)
		AC100 V/1100 W (including R.P.)	

## Specifications

Measurement method	Volumetric gas adsorption + AFSM™	
Adsorption gas	N <sub>2</sub> , Ar, CO <sub>2</sub> , H <sub>2</sub> , CH <sub>4</sub> , butane, and other non-corrosive gas	
Free space	Continuous free space measurement (AFSM™) method. (Free space for each isotherm measured at each measurement point and reflected in adsorption amount calculation.)	
Pressure gauge	Number of units: 6 units in total	Measurement range: 0 to 133.3 kPa Saturation vapor pressure: Measured with dedicated port and pressure gauge at all times.
Sample tube	Standard: Approx. 1.8 cm <sup>3</sup> volume	Option: 1.8 to 5 cm <sup>3</sup> volume
Analysis program BELMaster™7	Adsorption-desorption isotherm BET specific surface area Type I (ISO9277) BET auto analysis Langmuir specific surface area BJH, DH, CI, INNES methods t-plot method NLDFT/GCMC (optional software BELSim™), etc.	MP method Dubinin-Astakhov method Differential adsorption isotherm Molecular probe method α <sub>s</sub> -plot method
Dimensions, weight	280 (W) × 650 (H) × 465 (D) mm 38 kg (Excluding vacuum pump and computer.)	
Utility	Gas	He, N <sub>2</sub> (99.999% or higher purity) 0.1 ± 0.02 MPa, Joint: 1/8" Swagelok
	Exhaust	Rotary pump exhaust port, Φ 11 mm
	Power	Single phase, 100-240 VAC (50-60 Hz) / 750 W (Including R.P.)

\*AFSM, BELMaster, and BELSim are trademarks of MicrotracBEL.

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