Specification of Smart MS 5020

Auto microbial rapid identification mass spectrometer system

Principle	Using matrix-assisted laser desorption/ionization time-of-flight mass spectrometry technology for rapid identification and analysis of microorganisms.	
Main unit	Composition	Consists of lasers, ion sources, TOF mass analyzers, detectors, vacuum channel systems, and data system
	Size	460×690×1150 mm
	Net weight	120 kg
	Vacuum pump type	Mechanical vacuum pump and ultra-high pumping speed turbo-molecular pump
	Vacuum speed	300L/s
	Vacuum level	4×10^{-8}mbar
	Vacuum restore time	≤30s
	Target-in time	≤30s
	Noise level	<70dB
	Target Metal Plate	Reusable 96-well stainless steel sample target
	Ion flight length	0.62m
	Laser type	Solid-state laser
	Laser wave length	355 nm
	Laser repetition rate	1-200 Hz adjustable
	Laser shots	200 billion
	Laser life	1 billion samples
	Detection time	5 minutes for 96 samples
	Detector	Large-area high-sensitivity dual Electron multiplier MCP, high-gain preamplifier and dual-channel ultra-high-speed data acquisition card. The acquisition frequency is 1~2G Hz. Equipped with ultra-low noise electron multiplier.
	Humanized design	2 side doors can be open and be easy for maintenance
Performance	Mass range	1-500,000 m/z (Da)
	Mass accuracy	≤30ppm(internal calibration error); ≤60ppm(external calibration error)
	Mass resolution	A) R≥8000 (Human Angiotensin) B) R>6000 (m/z50~1000)
	Sensitivity	100 fmol BSA(m/z 66 447), S/N≥300
	Signal to noise ratio	Signal to noise ratio≥300:1
	Mass repeatability (CV)	≤0.01%
	Mass stability	Mass-to-charge ratio relative deviation ≤±0.03%
	Mass calibration	Mass calibration point coverage range: 3,000 -13,000Da provided by mass spectrometry standards with 6 calibration points
	Data process	Automated collection. Automated analysis. Automated identification. The accuracy rate is provided from score 0-3.

		All test samples are traceable.
	Data base	About 2,700 species(5,000 including RUO).
		The microbial identification database includes pathogenic bacteria, mycobacteria, filamentous fungi, Shigella, Vibrio cholerae, anaerobic etc. It contains highly infectious bacteria Mycobacterium tuberculosis, elis, etc
		Open database that allows users to expand their own databases or build their own databases.
	Operation Software	Sample acquisition and identification software. Data analysis and data self-building software.
		Equipped with the function of multispectrum insertion and simultaneous display, which can make parallel comparison of multiple samples of similar bacteria or the same well.
		Spectrum preview function can preview more than 5 spectrum at the same time, easily choose the best spectrum for retrieval.
		Negative ion detection mode (Optional)
		The software system has the mixed bacteria identification mode, which supports the identification of up to 3 mixed bacteria for the samples that are difficult to isolate
		Morphology picture more than 150 types of species.
		Detection of microbial resistance, like MRSA, cephalosporinases and carbapenemases. RUO
	Test speed	96 samples within 5 minutes and less than 5 seconds for detection of a single sample. The collection, retrieval and identification of sample spectra can be easily done with one click.
Ambient	Temperature	10℃—30℃
	Humidity	≤ 70%
	Power supply	100-240V, 50/60Hz
	Power	500VA
Working Station	PC station	Windows 11, 4.8 GHz CPU, 16GB memory chip, 1TB hard disk; 23.8 inch screen
Function	It adopts pulsed extraction (PE) of ions technology, with vacuum pipeline system.	
	It adopts a net-free linear flight tube with exquisite design. Mechanical pump and molecular pump built-in to save space and for easy installation.	
	Using artificial intelligence fuzzy logic algorithms, combined with multi-level and multi-level search algorithms, not only can provide search scores and sample purity, but also the relative content of mixed bacteria.	
	FPGA+ARM modular circuit control system and fully digital high-voltage power supply, stable voltage and high reliability	
	Integration of spectrum acquisition and analysis and identification software: English operation interface not only can present complete mass spectrum peak information and real-time identification results of the sample, but also can monitor the status of the instrument in real time, generate system logs and display	

	vacuum, high pressure, laser, in and out of warehouse, switch Machine status or progress.	
	The software has advanced map analysis functions such as data processing and statistics, cluster analysis and PCA analysis, which can directly generate genetic clustering diagrams of microbial strains, thereby confirming the genetic relationship of microorganisms and effectively tracking the source of strain contamination.	
	The software can output reports in multiple formats, and support users to set customized report formats.	
	The instrument can be seamlessly connected with LIS/HIS to realize the traceability management function of the whole process of microbiological laboratory test samples to improve the work management process and realize efficient and standardized laboratory management.	
	96-well target plate with 6 quality control points and matching target holders can be provided, which can be reused with low cost, and easy to clean.	
	Scanning acquisition function: the moving speed can be freely set in the software, and the target acquisition performs a circular motion, offering higher sensitivity compared to the fixed acquisition mode	
Configuration	One set of matrix-assisted laser desorption/ionization time-of-flight mass spectrometer.	
	One set of computer workstation(host:Windows 11, 4.8 GHz CPU, 16GB memory chip, 1TB hard disk); monitor:screen size≥23inches, resolution≥1920*1080) with one set of mouse and keyboard.	
	3 pieces of communication wires USB 2.0 or above	
	Barcode scanner	
	1 power cord	
	Reusable target plate: 2 pieces	
	Software and database lifetime free upgrade	
Optional accessory & consumable	96-well disposable target plate	Packaging: 10 plates / box
		Material: Stainless steel
	Vacuum target plate dryer	Capacity: 4 96-well plates at a time maximum
		Drying time: ≤20s
		Used for sample drying, improving spectral repeatability
	MALDI-ToF Smear Pen Kit	Component: 1 magnifier, 1 pen, 96 pcs of disposable tips
		Used for sample smearing on target plate
	Microbial morphology camera	Used for sample morphology photography