

## MICROPOLE System



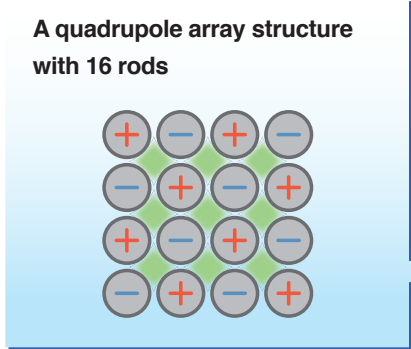
- 01 One of the smallest\* complete mass spectrometer systems
- 02 Unique array design of miniature quadrupole mass filters
- 03 Capable of operating at much higher pressures than traditional systems
- 04 User replaceable sensor

\* Nov. 2022, according to our research

# Micropole System

**One of the smallest\* complete mass spectrometer systems**  
 \* Nov. 2022, according to our research

**High performance of double higher scan speed**  
 \* Comparison with QL-SG01



**PC-less scan operation by external I/O**

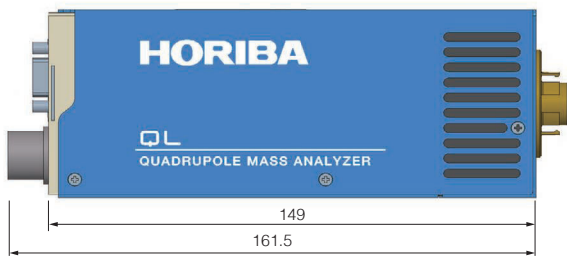
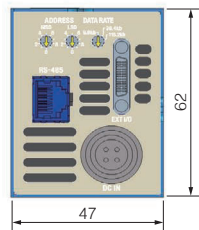
**Spectrum Generator QL-SG02**

**Repeatability improvement between sensors**  
 \* Comparison with QL-SG01

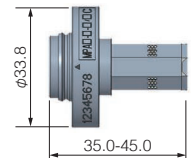
**Already calibrated and plug-in unit typed sensor**

## External Dimensions (mm)

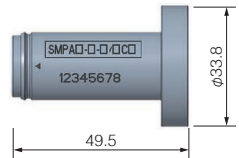
QL-SG02



MPA

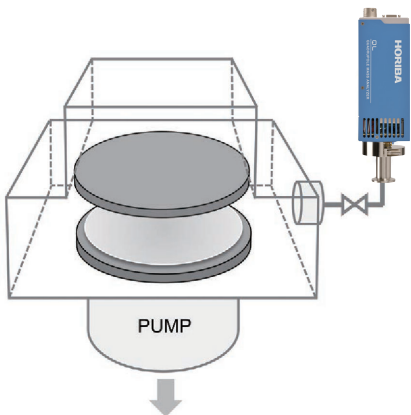


SMPA

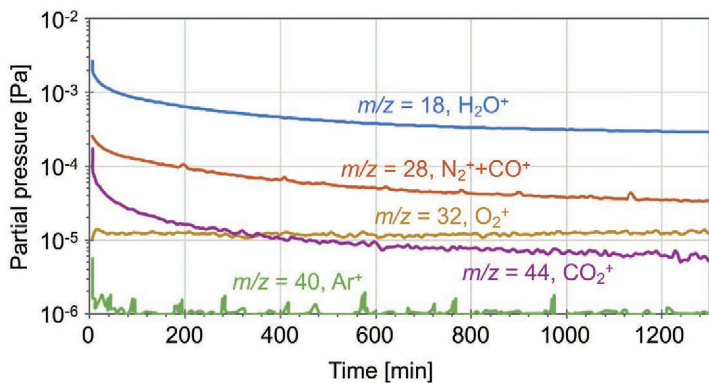


## Application Examples

### Residual gas monitoring during vacuuming a chamber



**QL-SG02 with MPA**



# Product Specifications

## Sensor

Model	MPA8-7-2/65C SMPA8-7-2/65C SMPA8-7-2/65K	MPA8-5-2/100C SMPA8-5-2/100C SMPA8-5-2/100K	MPA8-1-4/300C SMPA8-1-4/300C SMPA8-1-4/300K	SMPA8-5-2/100CR SMPA8-5-2/100KR
Measured Upper Limit Pressure (N <sub>2</sub> ) *1	0.5 Pa	0.2 Pa	0.2 Pa	0.1 Pa
Maximum Operating Pressure (N <sub>2</sub> ) *2	0.9 Pa	0.6 Pa	0.4 Pa	0.1 Pa
Minimum Detectable Partial Pressure (N <sub>2</sub> )	5.0×10 <sup>-8</sup> Pa (70 eV)			
Resolution (FWHM: N <sub>2</sub> )	1.2 ± 0.3 m/z units	1.0± 0.3 m/z units	1.8± 0.3 m/z units	1.5± 0.3 m/z units
Maximum Bake out Temperature (SG removed)	350 °C			
Maximum Operating Temperature (SG installed)	150 °C			
Mounting Flange	ISO-KF16 (NW16), CF34 (ICF34)			
Weight	MPA:CF34 Flange 50 g SMPA:ISO-KF16 Flange 50 g SMPA:CF34 Flange 70 g			SMPA:ISO-KF16 Flange 50 g SMPA:CF34 Flange 70 g
Filament	Y <sub>2</sub> O <sub>3</sub> /Ir 2 pcs			3%Re/W 2 pcs

\* SMPA type sensor is protected by a mesh on the vacuum fitting, designed to extend the lifetime of sensor in harsh environment such as plasma processes.

\*1 A pressure at which the Q-mass signal output is saturated. Beyond this pressure, signal outputs may not correspond to actual pressures.

\*2 An upper limit pressure that can be operated. If an operating pressure exceed the limit one, the measurement may stop to protect the sensor.

## Spectrum Generator

Model	QL-SG02-065-1A	QL-SG02-100-1A	QL-SG02-300-1A
Mass range	m/z 2-65	m/z 2-100	m/z 4-300
Mass filter type	Quadrupole		
Detector	Faraday cup		
Measurement scan speed	50-6400 m/z / m/z unit		
Ionization voltage	43 eV or 70 eV selectable		
Operating temperature	15-45 °C		
Operating humidity	80 % RH or less (not condensing)		
Storage temperature	0-80 °C		
Weight (with special clamp for SMPA type sensor)	575 g		
Dimension	W150 x H62 x D47 (mm)		
RS485 communication baud rate	115.2 k / 38.4 k / 9.6 kbps		
Analog I/O interface	Input: 0-10 V 2ch, Output: 0-10 V 4ch		
Contact I/O	Tool status 3 ch, Control signal input 3 ch, Set point output 5 ch		
Power input	DC 24 V ± 5 %, 100 mVpp, 50 W		
Connector type	Round type connector: PRC03-23A10-4M		

\* The above sensor specifications are based on a scanning speed of 400 ms/m/z unit

\* Configuration and spectrum acquisition software that runs on windows is included.

## Accessories

### Power Supply Unit [QL-PS01-1A]

Input	AC: 100-240 V, 50/60Hz
Output	DC: 24 V
Operating temperature	15-45 °C
Operating humidity	30-80 %RH
Dimension	W70 x D130 x H92 (mm)
Weight	700 g

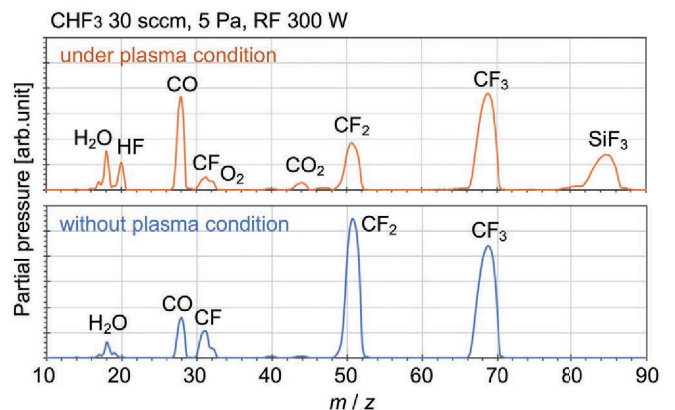
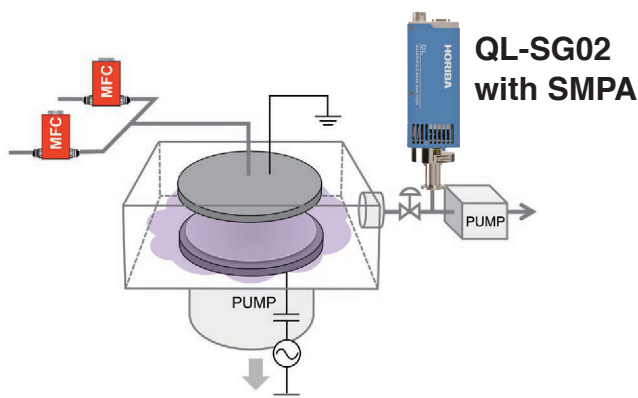
### Special Cables

[QL-CR01-M-1A] Between spectrum generator and power supply	Length: 3, 5, 10 m
[SC-EBR] Between spectrum generator and PC (RJ45 connector)	Length: 3, 10 m
[QL-TD02] For external input / output	Length: 3, 5 m

### Special Clamps

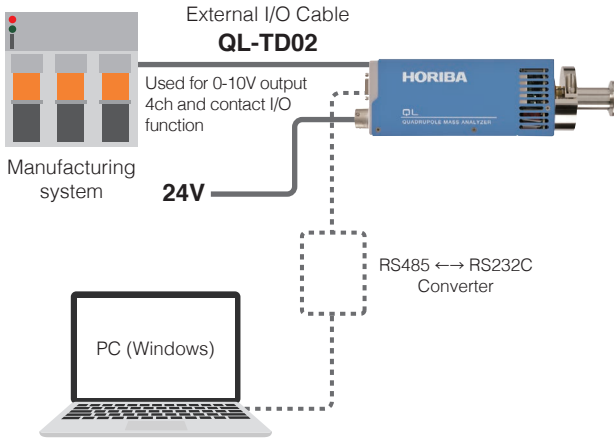
[QL-LC] CF34 (ICF34) flange for MPA sensor	Weight: 140 g
[QL-LS] For SMPA sensor	Weight: 190 g

## Process monitoring in a dielectric etching chamber



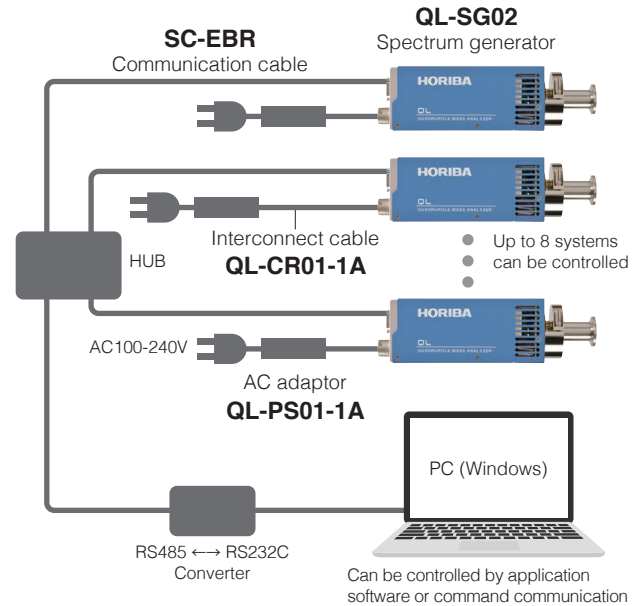
# System Configuration

## Analog Communication



\* When replacing the sensor, it is necessary to connect a PC and set parameters.

## Serial Communication



# Software

## Micropole Scanner 2

- Makes it easy to visualize measured partial pressures in various scan modes.
- Simple and intuitive user interface
- Up to eight spectrum generators can be controlled by a single computer.
- Users can change sensor parameters by themselves when replacing sensors.



## IMS

The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System ISO45001. We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.



Applying to the EU RoHS Directive : This products is compliant with the restriction of the designated 10 hazardous substances(\*).

(\* ) lead , cadmium , mercury , hexavalent chromium , polybrominated biphenyls (PBB) , polybrominated diphenyl ethers (PBDE) , bis (2-ethylhexyl) phthalate (DEHP) , butyl benzyl phthalate (BBP) , dibutyl phthalate (DBP) and diisobutyl phthalate (DIBP)

Using lead-free soldering : Lead-free soldering is used for mounting components of printed circuit boards.

- Many countries consider the reinforcement of regulations concerning the risk caused by lead to human body and the environment

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Please read the operation manual before using this product to ensure safe and proper handling of the product.

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