



Scientific / Metrology Instruments
Mass Spectrometer Dedicated to Dioxin Analysis

Solutions for Innovation

JMS-800D UltraFOCUS

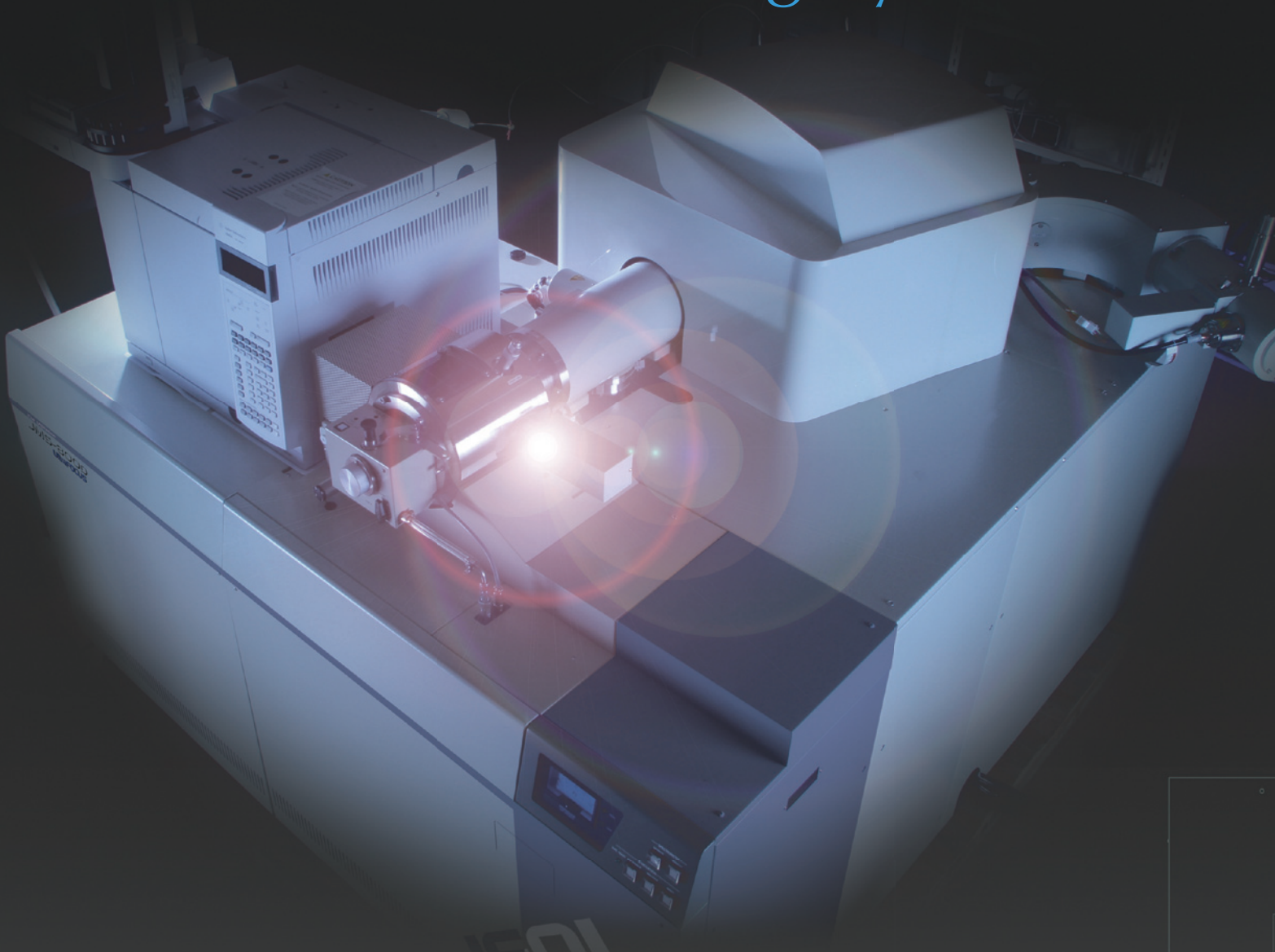
Highly Advanced Dioxins / POPs Analysis System



JEOL Ltd.

JMS-800D

Highly Advanced



JEOL

UltraFOCUS

Dioxins / POPs Analysis System

JMS-800D UltraFOCUS is the optimal choice for ultra low-level trace detection applications, such as monitoring for dioxins and related compounds e.g. Polychlorinated Biphenyls (PCBs), Polybrominated Diphenyl Ethers (PBDEs) or drugs of abuse, by high resolution-selected ion monitoring (HRSIM) gas chromatography/ mass spectrometry(GC/MS).

Double Column GC Interface (Option)

The UltraFOCUS has a double column GC interface to allow the simultaneous connection of two GC injectors with separate GC columns. The pumping configuration and capacity allows change of the GC column without venting the instrument, reducing instrument downtime and increasing productivity. The unique double column GC interface enables direct line of sight GC column setting into the source region, as well as giving an improved thermal variation profile.

Ion Chamber

The socket Electron Ionization (EI) chamber allows rapid and convenient change of ion chamber without venting the instrument.

Premier Magnet

The magnet is made of fully laminated rolled grain-oriented steel with high permeability and low hysteresis. The magnet design features an extra-wide gap and so allows use of a wider flight tube, giving higher transmission and reducing any susceptibility to contamination.

Detector

The UltraFOCUS uses a 20KV conversion dynode photomultiplier with 'point detecting' technology, which ensures both stable longevity of the instrument and sensitivity enhancement on compounds with $m/z > 500$.

High Resolution High Sensitivity



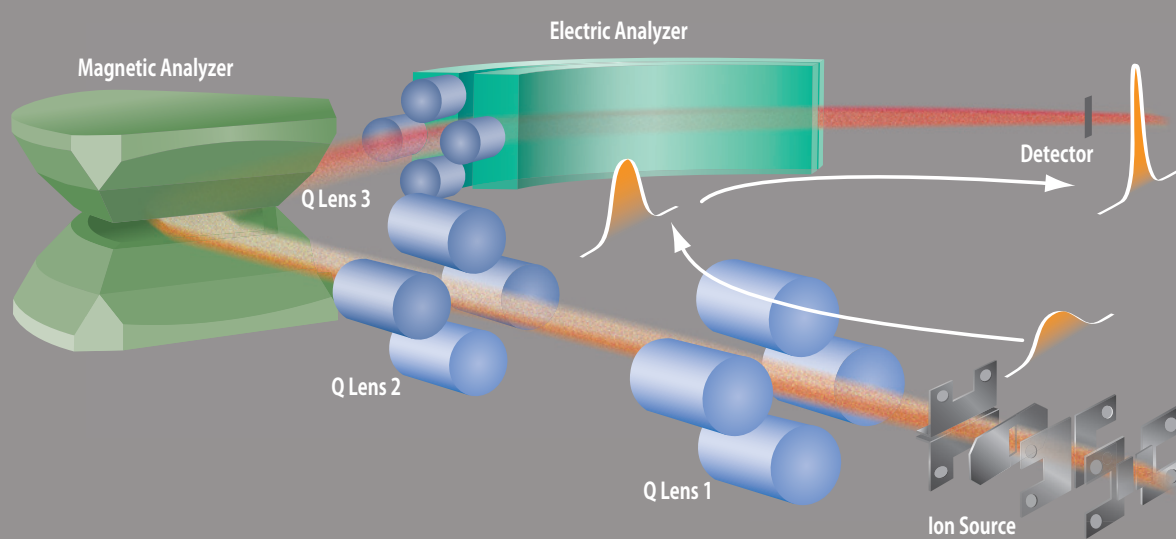
The UltraFOCUS High Performance and Features

- Ultra High Sensitivity S/N 200 or more on 100fg 2,3,7,8-TCDD (R=10,000, HRSIM)
- Ultra High Resolving Power 80,000 (10%Valley)
- Highest Acceleration Voltage 10kV
- Wide Mass Range 1-12,000u
- Socket Type Ion Chamber
The Ion chamber is removable without venting for filament exchange and easy maintenance.
- Standard Sample Inlet System with Automatic On/Off Function
The software controls on/off switching of the inlet valve of the reservoir for the standard compound (PFK). This reduces contamination of the ion source and maintains stable sensitivity for a long time.
- Fully Computer-Controlled System
Incorporating easy operation functions for both automatic tuning of the ion source along with other optics, and automatic resolution optimization of slit conditions. Control of the mass spectrometer by the data system prevents mis-operation and enables inexperienced operators to obtain optimum analysis results with ease.
- Focus Tuning
Automated tuning for ion source lenses and Q poles is performed by one click of the mouse.
- Resolving Power Setting
The mass resolving power is automatically adjustable by entering the target resolution numerically.
- Dioxin Analysis Program (DioK)
※ Option
The dedicated automatic quantitation program is based on the EPA method, JIS standard and EN protocol. The DioK software provides high efficiency in data processing work.
- Auto Sampler
※ Option
150 positions

Ion Optics

The UltraFOCUS incorporates the unique QQHQC geometry ion optics designed to give maximum sensitivity using just a few slits in all modes of high and low resolution. The QQHQC design has two static quadrupole lenses positioned before the magnetic sector and one before the electric sector. The first two quadrupole lenses effect is to give a high dispersion to magnification ratio, allowing high resolutions to be obtained with a wider source slit and hence higher sensitivity.

Ion optics of The UltraFOCUS



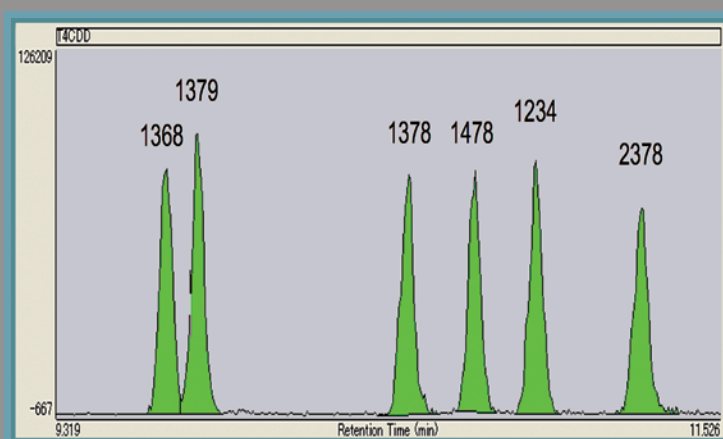
Sensitivity

To achieve the highest sensitivity, high resolution-selected ion monitoring (HRSIM) acquisition mode is used.

In this mode, 100fg of 2,3,7,8-TCDD will give a signal-to-noise ratio of >200:1 at m/z 321.8936u on raw data at 10,000 resolution (10% Valley). In this case, noise is taken to be equivalent to 4 standard deviations ($\pm 4\sigma$).

The instrument sensitivity is demonstrated by a 1 μ L injection of 100fg TCDDs giving S/N ; far beyond 200:1.

The UltraFOCUS therefore makes it possible to detect even a few femtograms dioxins in blood or other biological samples.



“The Age is Changing to Full Computer Control”

The Auto Tuning Dialog window shows the following settings: Ion for Auto Tuning m/z 330.568, Tuning Report checked, Sensitivity checked, Quick Tuning checked, Mass Resolution Setpoint 10000, Definition 10%, Actual resolution field empty. The Start & Stop section has a Start button (a right-pointing arrow) highlighted with a yellow box and a yellow arrow pointing to it, and a STOP button. The Auto Tuning State section has a Start slider. The Tuning Report window shows a graph titled 'Ion Profiles before/after Tuning' with two peaks: a red peak labeled 'Before tune' and a blue peak labeled 'After tune'. The x-axis is m/z (330.502 to 330.634) and the y-axis is Ion Intensity (0 to 95).

Only a click here, tuning protocol starts!

Optimizing Sensitivity

The UltraFOCUS has a high precision auto-tuning function. The auto-optimum tuning mode adjusts all lenses to obtain the highest sensitivity.

Only input the resolution

Actual resolving power is displayed in real time

The Analyzer Controller window shows the Mass Resolution section with Setpoint 10000, Actual 11130, and Definition 10%. Below is a schematic diagram of the mass filter with labels for Q3 Lens, Collector Slit, Detector, Beta Slit, Magnetic Field, Alpha Slit, Q2 Lens, Q1 Lens, and Main Slit. The Ion Monitor window shows a graph with a single sharp peak at m/z 330.573. The Max Int is 62.29 and Resolution is 110940. The x-axis ranges from 330.5 to 330.7. The y-axis ranges from 0 to 100. The bottom of the Ion Monitor window shows Center Mass 330.573, m/z, Step 0.001, and Sweep Width 0.030%.

Adjusting Resolving Power

The UltraFOCUS has a full computer control function for automatic optimization of the required resolution. When the desired resolution is entered, slits are automatically adjusted and the required resolving power is obtained. In the real-time monitor, it is easy to confirm that the required resolution has been obtained. The peak monitor displays the m/z peak shape and intensity at the same time.

User-Friendly

DioK-The Dioxin Quantitative Analysis Software

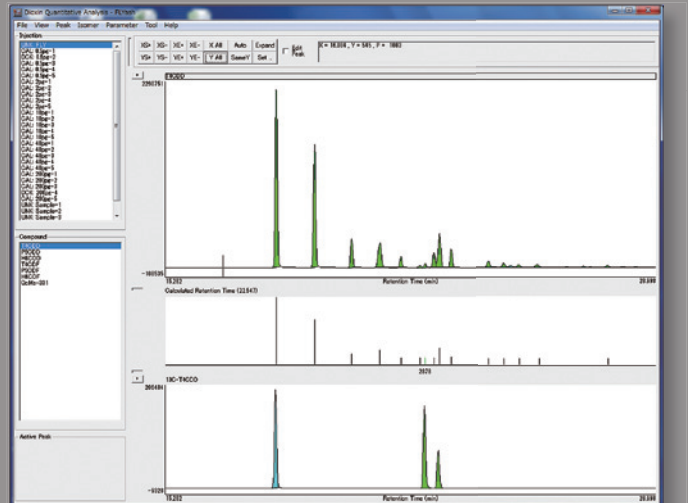
- The Dioxin Quantitative Analysis Software (DioK) operates under Microsoft Windows 7 system.
- DioK is a quick and convenient program which is dedicated to the quantitative analysis of Dioxins and Dioxin like compounds.
- DioK Software is base on US EPA 1613, 23, 8290/ JIS K0311,0312/EN1948. Many new functions have been included, and different printing modes are now available.
- The UltraFOCUS also comes with the latest DioK V4.0 software which provides processing functions :
Automatic assignment, Quantitative Analysis (Patent No. JP11344482) includes PCDDs and PCDFs 210 isomers analysis capability,
Report table combined PCDDs/DFs and PCBs (Patent No.JP2001129), PCB isomers analysis.

Assignment of dioxin peaks

Upper section : Native TCDDs mass chromatogram

Middle section : Reference isomers pattern

Lower section : Labeled 13C-TCDDs mass chromatogram



Calibration View

Item	APR	Linear	R ²	Y-axis	X-axis	Header													
1	QHT TCDDO	123701	3018104	0.999	708	2.0	712	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
2	QHT TCDDO	123701	3018104	0.999	808	2.0	812	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
3	QHT TCDDO	123701	3018104	0.999	908	2.0	912	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
4	QHT TCDDO	123701	3018104	0.999	1008	2.0	1012	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
5	QHT TCDDO	123701	3018104	0.999	1108	2.0	1112	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
6	QHT TCDDO	123701	3018104	0.999	1208	2.0	1212	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
7	QHT TCDDO	123701	3018104	0.999	1308	2.0	1312	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
8	QHT TCDDO	123701	3018104	0.999	1408	2.0	1412	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
9	QHT TCDDO	123701	3018104	0.999	1508	2.0	1512	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
10	QHT TCDDO	123701	3018104	0.999	1608	2.0	1612	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
11	QHT TCDDO	123701	3018104	0.999	1708	2.0	1712	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
12	QHT TCDDO	123701	3018104	0.999	1808	2.0	1812	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
13	QHT TCDDO	123701	3018104	0.999	1908	2.0	1912	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
14	QHT TCDDO	123701	3018104	0.999	2008	2.0	2012	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
15	QHT TCDDO	123701	3018104	0.999	2108	2.0	2112	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
16	QHT TCDDO	123701	3018104	0.999	2208	2.0	2212	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
17	QHT TCDDO	123701	3018104	0.999	2308	2.0	2312	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
18	QHT TCDDO	123701	3018104	0.999	2408	2.0	2412	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
19	QHT TCDDO	123701	3018104	0.999	2508	2.0	2512	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
20	QHT TCDDO	123701	3018104	0.999	2608	2.0	2612	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
21	QHT TCDDO	123701	3018104	0.999	2708	2.0	2712	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
22	QHT TCDDO	123701	3018104	0.999	2808	2.0	2812	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
23	QHT TCDDO	123701	3018104	0.999	2908	2.0	2912	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
24	QHT TCDDO	123701	3018104	0.999	3008	2.0	3012	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
25	QHT TCDDO	123701	3018104	0.999	3108	2.0	3112	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
26	QHT TCDDO	123701	3018104	0.999	3208	2.0	3212	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
27	QHT TCDDO	123701	3018104	0.999	3308	2.0	3312	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
28	QHT TCDDO	123701	3018104	0.999	3408	2.0	3412	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
29	QHT TCDDO	123701	3018104	0.999	3508	2.0	3512	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
30	QHT TCDDO	123701	3018104	0.999	3608	2.0	3612	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
31	QHT TCDDO	123701	3018104	0.999	3708	2.0	3712	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
32	QHT TCDDO	123701	3018104	0.999	3808	2.0	3812	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
33	QHT TCDDO	123701	3018104	0.999	3908	2.0	3912	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
34	QHT TCDDO	123701	3018104	0.999	4008	2.0	4012	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
35	QHT TCDDO	123701	3018104	0.999	4108	2.0	4112	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
36	QHT TCDDO	123701	3018104	0.999	4208	2.0	4212	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
37	QHT TCDDO	123701	3018104	0.999	4308	2.0	4312	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
38	QHT TCDDO	123701	3018104	0.999	4408	2.0	4412	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
39	QHT TCDDO	123701	3018104	0.999	4508	2.0	4512	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
40	QHT TCDDO	123701	3018104	0.999	4608	2.0	4612	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
41	QHT TCDDO	123701	3018104	0.999	4708	2.0	4712	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
42	QHT TCDDO	123701	3018104	0.999	4808	2.0	4812	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
43	QHT TCDDO	123701	3018104	0.999	4908	2.0	4912	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
44	QHT TCDDO	123701	3018104	0.999	5008	2.0	5012	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
45	QHT TCDDO	123701	3018104	0.999	5108	2.0	5112	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
46	QHT TCDDO	123701	3018104	0.999	5208	2.0	5212	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
47	QHT TCDDO	123701	3018104	0.999	5308	2.0	5312	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
48	QHT TCDDO	123701	3018104	0.999	5408	2.0	5412	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
49	QHT TCDDO	123701	3018104	0.999	5508	2.0	5512	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
50	QHT TCDDO	123701	3018104	0.999	5608	2.0	5612	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
51	QHT TCDDO	123701	3018104	0.999	5708	2.0	5712	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
52	QHT TCDDO	123701	3018104	0.999	5808	2.0	5812	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
53	QHT TCDDO	123701	3018104	0.999	5908	2.0	5912	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
54	QHT TCDDO	123701	3018104	0.999	6008	2.0	6012	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251	0.9160	-1.3	-	-
55	QHT TCDDO	123701	3018104	0.999	6108	2.0	6112	0.765	-62	0.0110	20.388	0.886	0.813	0.882	0.8251				

World Wide Service and Support

At JEOL, our goal is the customer's delight. To satisfy our customers, JEOL has made great efforts to produce a robust, high performance instrument in the UltraFOCUS

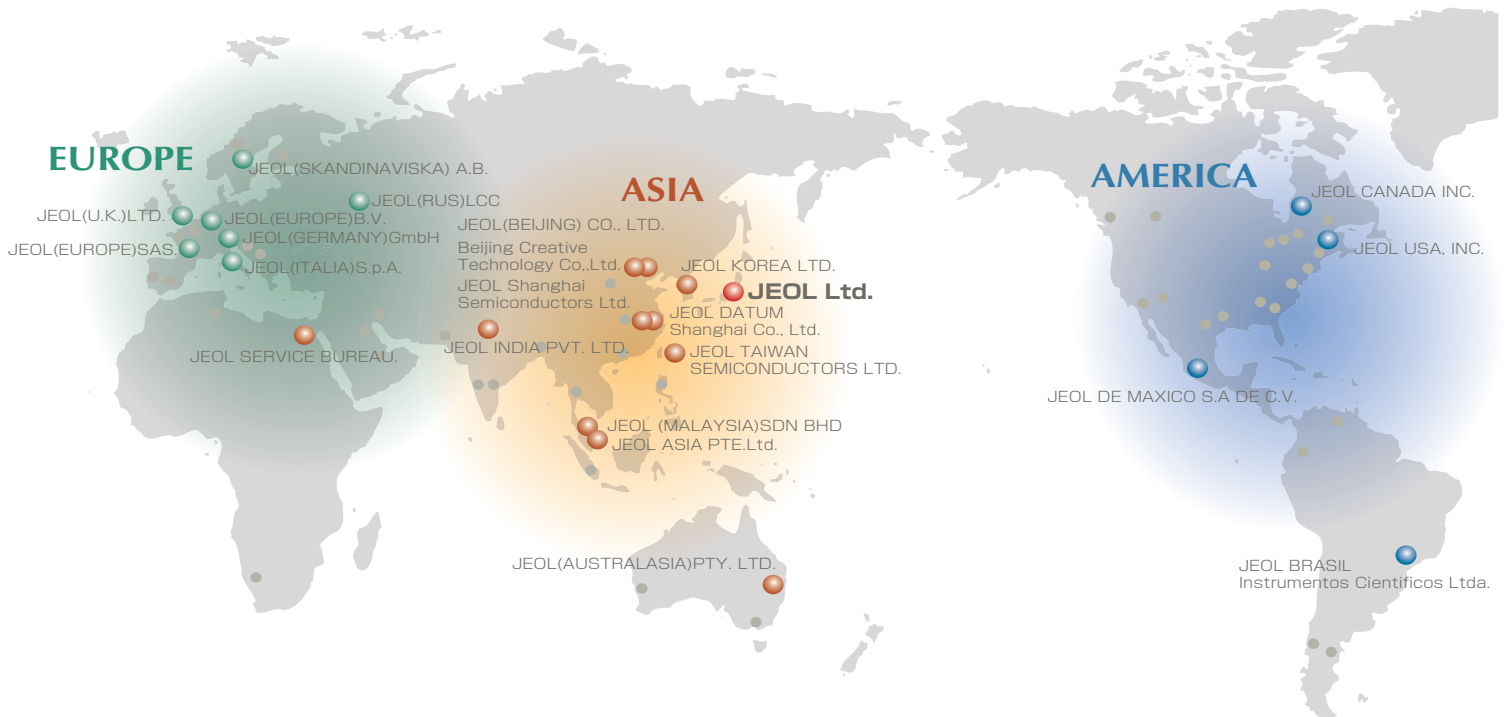
At the same time, JEOL has established skilled back-up teams for you. JEOL has 20 subsidiary companies and additional service support centers all over the world to maximize the up-time of your instrument.

Furthermore, our experts are available to provide you with technical information ranging from basic mass spectrometry to advanced technical solutions required for operation, and maintenance, at international training centers around the world.

JEOL will continue to provide you with technical information, qualified repairs, consumable parts and attachments on a long-term basis.



World Wide Support Network



*Specifications subject to change without notice.

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