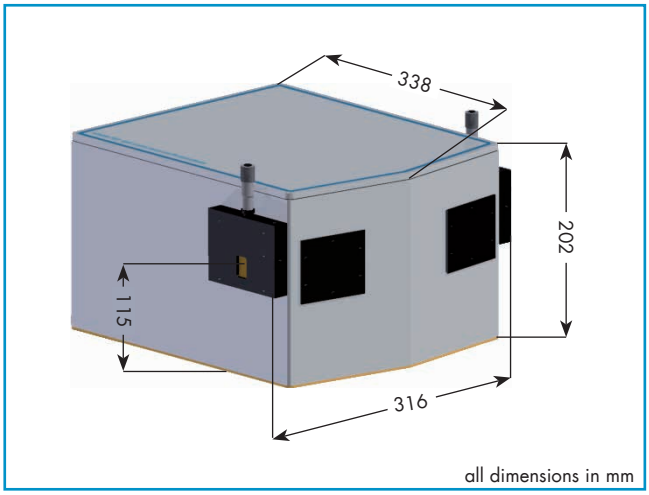
Monochromators

Monochromator MSH-300 with variable slit



Layout MSH-300

- Focal length: 300 mm
- Fully automated
- USB 2.0 interface
- 190 nm - 24 µm (grating dependent)
- Control software
- Software development kit with code examples C, C++, Delphi, VBA and LabView

The MSH-300 monochromator system is a high performance and rugged platform designed for unparalleled wavelength accuracy at all grating angles, very fast wavelength acquisition and zero backlash. It is built in a single casting, providing the highest rigidity and robustness.

Flexible grating options make this monochromator the ideal general purpose unit that covers a wide range of application requirements from UV to IR.

Optical layout

The optical Czerny-Turner layout has been developed to minimize scattered light and maximize throughput. Effective internal baffling reduces general scatter while the novel mirror arrangement avoids rediffracted light which is often a problem at shorter wavelengths.
The use of large rectangular gratings (size 68 mm x 84 mm) improves the light throughput and maintains a constant f/number of 4.1 at all grating angles.

Up to three gratings are mounted on a turret which can be rotated through 360°, allowing the software selection of grating type and position. The optional programmable detector changeover mirror and the detection electronics with software-selectable dual inputs allow spectral scans over a wide wavelength range to be accomplished without manual intervention.

Motorized wavelength drive

The MSH-300 control grating position uses precision gears and a microprocessor-controlled microstepping drive. This enables wavelength acquisition speeds up to 1000 nm/s. The software control allows automated scans with grating and filter change.

Motorized filter wheel

If a detector is sensitive to shorter wavelengths than those diffracted in the first order you'll need to block them before they hit the detector. Also, using the system as monochromatic light source with broadband light at the entrance requires the use of long pass filters. For handling convenience, the MSH-300 can be equipped with a motorized 6-position filter wheel holding standard 25 mm diameter order sorting filters. Its position inside the single casting allows full access to the external slit assemblies for mounting detectors, fibers or other accessories. Position 6 holds a blind plate for dark current measurements.

Find a list of available order sorting filters on www.lot-qd.com/monochromators.

Specifications	
Configuration	Czerny-Turner
Slits	10 µm to 10 mm variable, manual or motorized
Slit height	20 mm
Number of gratings	1, 2 or 3
Grating size	68 mm x 84 mm
Aperture ratio	f/4.1 (at all grating angles)
Resolution	0.1 nm at reduced slit height, 0.3 nm with full slit height of 20 mm, both measured with 1200 l/mm grating
Wavelength acquisition speed	1000 nm/s
Wavelength accuracy	±0.2 nm over full range of 1200 l/mm grating
Wavelength reproducibility	±0.05 nm (1200 l/mm)
Weight	14 kg

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Instrument control and software

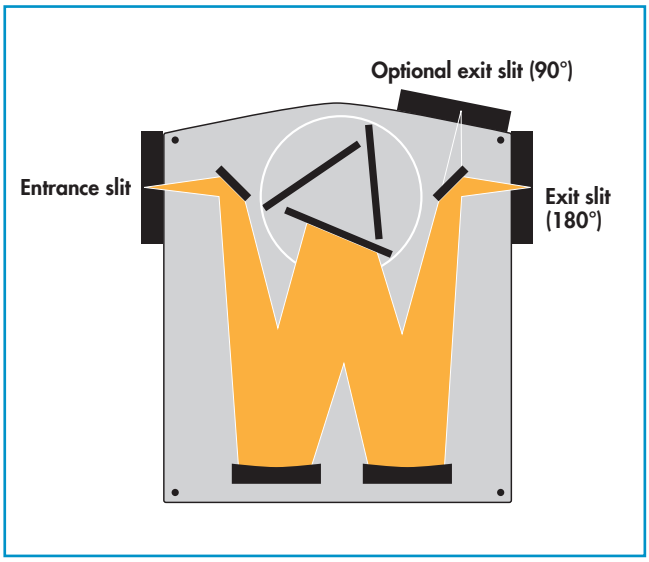
The USB interface uses Windows native drivers providing plug and play connectivity to all Windows computers with either 32 or 64 bit OS systems.
The software offers a user-friendly control of all relevant parameters like center wavelength, grating selection, calibration values, etc. as well as optional slit width, filter position and others.

For those who need to integrate the monochromator in larger setups the software development kit (SDK) features code examples for C, C++, Delphi, VBA and LabView for individual programming needs.

Slit assemblies

Slit assemblies use a precision micrometer drive to adjust the slit width. They are continuously adjustable from 10 µm to 10 mm at a height of 20 mm. An optional computer-controlled motorized version is available for up to three ports.

All slits are equipped with the LOT 35 mm flange system which allows convenient interfacing to our wide range of accessories. The grating table shows theoretical bandwidths for a 1 mm slit.



Optical configuration: MSH-300 monochromator

Ordering information monochromator	
MSH-300	300 mm monochromator, 2 manual variable slit assemblies, USB interface, 180° configuration, software and SDK
MSZ-FW/2	Programmable 6 position filter wheel for diameter 25 mm filters, inside mounted. Position 6 holds a blind plate.
MSZ-SAW	Remote operated swing away mirror with 1 manual variable slit assembly for additional entrance or exit slit. (Order sorting filter wheel MSZ-FW cannot be implemented at the same side.)
MSZ-MVSS-2	Two motorized slit assemblies 10 µm - 10 mm for motorized entrance and exit slit at the MSH 300 monochromator incl. compact micro stepping drive unit (replaces the manual micrometer slits)
MSZ-MVSS-3	Three motorized slit assemblies 10 µm - 10 mm for one entrance and two exit slits at the MSH 300 monochromator incl. compact micro stepping drive unit (replaces the manual micrometer slits) (requires MSZ-SAW to complete)

Ordering information gratings			
Partnumber	**Lines per mm (l/mm)**	**Blaze wavelength (nm)**	**Theoretical resolution for 1 mm slit (nm)**
High-resolution UV gratings			
MSG-T-2400-250	2400	250	1.5
MSG-T-1800-250	1800	250	2
MSG-T-1800-500	1800	500	2
1200 l/mm gratings			
MSG-T-1200-250	1200	250	2.5
MSG-T-1200-300	1200	300	2.5
MSG-T-1200-500	1200	500	2.5
MSG-T-1200-750	1200	750	2.5
830 l/mm gratings			
MSG-T-830-1200	830	1200	4
600 l/mm gratings			
MSG-T-600-300	600	300	5
MSG-T-600-500	600	500	5
MSG-T-600-750	600	750	5
MSG-T-600-1000	600	1000	5
MSG-T-600-1200	600	1200	5
MSG-T-600-1600	600	1600	5
Extended IR gratings			
MSG-T-300-3000	300	3000	10
MSG-T-150-4000	150	4000	20
MSG-T-100-9000	100	9000	30
MSG-T-75-12000	75	12000	40
MSG-T-50-18000	50	18000	50