

DTMc300 Multiple-Grating Double Monochromator

For those applications where the scattered light performance of a single monochromator is not sufficient, we recommend the DTMc300 double monochromator. These devices are supplied with either additive or subtractive dispersion, or they can be converted from one to the other by changing one of the grating turrets and the controlling software.

A swing away mirror allows instant change from double to single operation - a useful feature in UV-VIS-NIR systems. An order sorting filter wheel, essential for accurate measurement of continuous spectra, motorised slits, light sources and detectors are amongst the wide range of light measurement products available to complement the DTMc300.

The DTMc300 monochromator controls grating position using precision gears and a microprocessor-controlled microstepping drive. Up to three gratings are mounted on a turret which can be rotated through 360° allowing software selection of grating type and position.

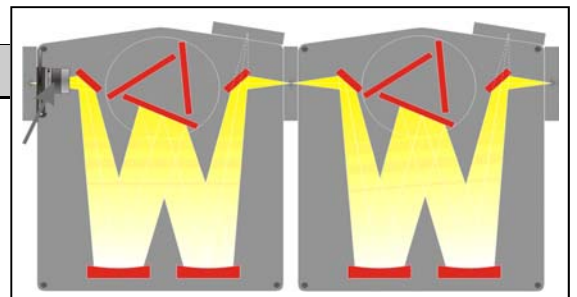
A programmable detector changeover mirror and detection electronics with software selectable dual inputs allow spectral scans over wide wavelength ranges to be accomplished without manual intervention. The advantages of this drive include constant wavelength accuracy at all grating angles, very fast wavelength acquisition and zero backlash.



The optical layout of these instruments has been developed to minimise scattered light and maximise throughput. Effective internal baffling reduces general scatter while the novel mirror arrangement avoids rediffracted light which is often a problem shorter wavelengths. The use of large rectangular gratings enhances light throughput and maintains constant f number at high grating angles. As an option, for use with array detectors, the focusing mirror can be mounted on an externally controllable translation stage which allows fine focusing without disturbing the array.

Specification

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| Configuration: | Czerny-Turner |
| Focal length: | 600mm |
| Slits: | 10µm to 10mm variable, fixed or motorised |
| Slit height: | 20mm |
| Number of gratings: | 1, 2 or 3 |
| Grating size: | 68mm x 84mm |
| Aperture ratio: | f/4.1 (at all grating angles) |
| Resolution - additive | 0.05nm at reduced slit height, 0.15nm with full slit height |
| - subtractive | 0.1nm at reduced slit height, 0.3nm with full slit height, both measured with 1200g/mm grating |
| Dispersion - additive | 1.35nm/mm (1200g/mm) |
| - subtractive | 2.7nm/mm |
| Mechanical resolution of grating drive: | 0.00072 degrees per motor step |
| Wavelength acquisition speed: | 1000nm/sec |
| Wavelength accuracy: | ± 0.2nm over full range of 1200g/mm grating |
| Wavelength reproducibility: | ± 0.05nm (1200g/mm) |



Bentham holds a stock of standard gratings for scanning and array use, as well as order sorting filters to cover up to 20 μ m.

Order Sorting Filters

Array Gratings

| Part No | Grooves/mm | Spectral range with 25mm array |
|---------|------------|--------------------------------|
| T301H | 100 | 810nm |
| T3015H | 150 | 540nm |
| T303H | 300 | 270nm |
| T306H | 600 | 135nm |

Key to Bentham grating part numbers.:

H = holographic
R = ruled

Blaze wavelength follows *H* or *R*, with '*U*' as decimal point, e.g.
T312R0U5 = 0.75 μ m blaze

| Part No. | Insertion Wavelength | Order sorts up to... |
|----------|----------------------|----------------------|
| OS400 | 400 nm | 720 nm |
| OS700 | 700 nm | 1300 nm |
| OS1250 | 1250 nm | 2000 nm |
| OS2000 | 2000 nm | 3900 nm |
| OS3800 | 3800 nm | 7000 nm |
| OS7000 | 7000 nm | 13000 nm |
| OS12000 | 12000 nm | 20000 nm |

Scanning Gratings

| Part No. | Grooves/mm | Recommended wavelength range | Comments |
|-------------|------------|------------------------------|---|
| T324H0U24 | 2400 | 200nm - 675 nm | Optimum resolution in UV |
| T318H0U25 | 1800 | 200nm - 900nm | High resolution - low scatter in UV-VIS |
| T312H0U25 | 1200 | 250nm - 100nm | Low scatter, UV-VIS-NIR |
| T318R0U5 | 1800 | 200nm - 900nm | High resolution, high efficiency in UV-VIS |
| T312R0U5 | 1200 | 250nm - 1200nm | High efficiency in UV-VIS-NIR |
| T309R1U0 | 900 | 500nm - 1.8 μ m | Optimum resolution in 1.1 μ m to 1.8 μ m region |
| T306R1U6 | 600 | 0.8 μ m - 2.5 μ m | Fibre spectral loss |
| T303R3U0 | 300 | 1.5 μ m - 5.5 μ m | General purpose IR |
| T3015R4U0 | 150 | 2.4 μ m - 8 μ m | Recommended 3-5 μ m |
| T301R9U0 | 100 | 4.5 μ m - 16.2 μ m | General purpose IR - 10.6 μ m |
| T30075R12U0 | 75 | 6 μ m - 21 μ m | Recommended 8-14 μ m |
| T3005R18U0 | 50 | 9 μ m - 27 μ m | General purpose IR |

Options

| | |
|------|---|
| 252 | Programmable filter wheel mounted just inside the entrance slit |
| SAM | Remote operated swing-away mirror , can be fitted at entrance or exit (or both) where it can be used with a second slit or, in the case of the exit, with slit and array. Order sorting cannot be implemented at the alternative entrance slit, but the SAM is still useful for light sources not requiring order sorting, eg deuterium |
| MVSS | Motorised slit, allows software control of slit width and hence operating bandwidth |
| FF | Fine focus, puts the focusing mirror on a translation stage and is a must for arrays. The FF option allows you to move the focal plane up to 25mm outside the monochromator housing to fine focus on the array surface |

Dimensions (mm)

