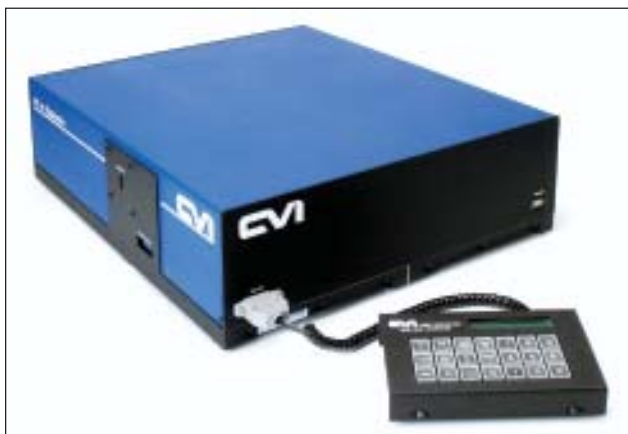


# Digikröm DK242

## 1/4 Meter Computer-Controlled Double Monochromator/Spectrograph

- *Internal controller connects to any computer via RS232 or IEEE-488. Hands-off control of three slit assemblies and two grating turrets.*
- *Scans in both directions and with Constant Spectral Resolution (CSR).*
- *Triple-grating turrets allows high efficiency scanning across a broad spectral range.*
- *Additive dispersion increases resolution and reduces stray light for Raman and fluorescence studies, subtractive dispersion minimizes broadening of pulse sources.*
- *Integrates with SP filter wheel for automatic filter switching.*
- *May be factory configured as a monochromator or spectrograph.*



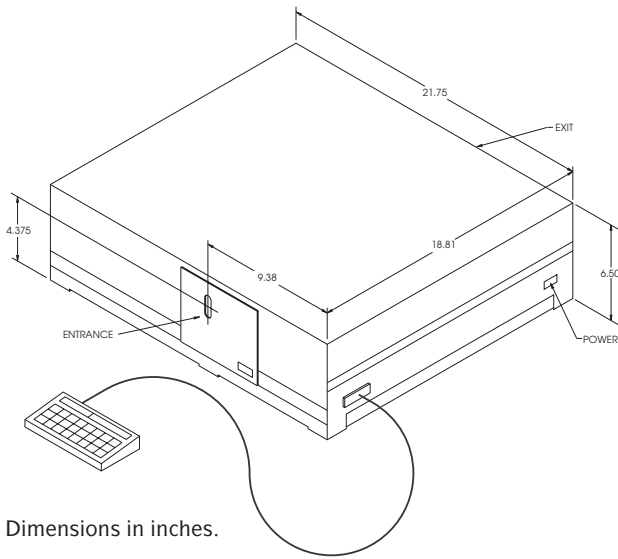
### The Pioneer: Better Resolution, Stray Light Control

The DK242 is two cascaded monochromators, with the exit slit of the first monochromator functioning as the entrance slit of the second. This instrument may be factory configured to operate as either an additive or subtractive dispersion double monochromator. In both modes, the two monochromators act as a double filter with the rejection of stray light being nearly the square of the single monochromator value. In the additive dispersion mode, the DK242 is the equivalent of a half-meter monochromator, but permits greater reduction of stray light. The first grating spreads the spectrum over an angular range; the second grating then doubles this dispersion. The result is twice the resolution of a single 1/4-meter monochromator. In subtractive dispersion mode the first monochromator selects a bandpass. The second monochromator then removes the temporal and angular aberrations introduced by the angular spectral dispersion in the first monochromator.

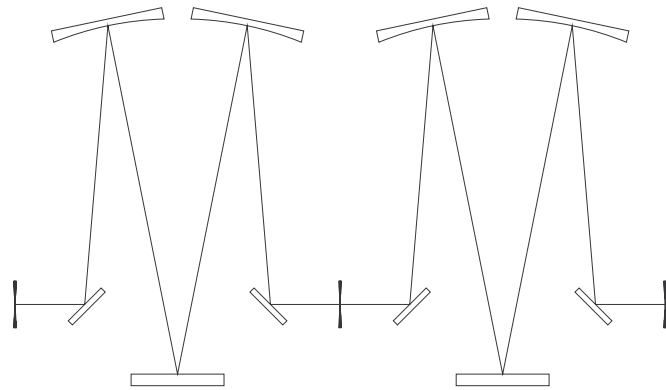
The DK242 offers a unique solution to practical problems in the spectroscopy of pulsed sources. For example, an ordinary monochromator will introduce up to 250 pico second broadening in light pulses that are passed through the monochromator. Operated in the subtractive dispersion mode, the DK242 reduces this broadening to almost zero because the second monochromator equalizes the optical path length of the first.

The DK242 is also a unique solution to the practical problems of Raman spectroscopy because the high stray light rejection of the two monochromators allows observation close to the laser line. CVI's unique CSR scanning technology also improves efficiency in the red and near IR while maintaining resolution. (In the CSR mode, the monochromator's change in dispersion with wavelength is compensated by a change in slit widths while bandpass remains constant. Intensity improvement up to 4x can occur).

rev. 6/03



Dimensions in inches.



Optical Path

## Specifications:

**Design:** Double cascaded Czerny-Turner.  
Triple-grating turrets standard in each section.  
Double-grating turret optional.

**Focal Length:** 240mm each section

**f/#:** 3.9 overall

**Wavelength Drive:** Dual worm and wheel with electronic synchronization and computer control. Programmable in additive or subtractive dispersion with positive or negative grating orders.

**Scan Speed:** > 1 to 1200nm/minute  
(with 1200 g/mm grating)

**Stray Light:** < 10-9

**Slits:** Unilateral, computer controlled,  
Width - 10 $\mu$ m to 3000 $\mu$ m  
Height - 2 $\mu$ m to 20 $\mu$ m

**Gratings:** Two to six gratings  
(68 x 68mm standard,  
68 x 84mm optional)  
must be purchased.  
See Appendix A for options.

	<i>Additive</i>	<i>Subtractive</i>
<b>Wavelength Precision:</b>	0.01nm	0.01nm

<b>Wavelength Accuracy:</b>	$\pm 0.03$ nm	$\pm 0.03$ nm
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<b>Reciprocal Dispersion:</b>	1.60nm/mm	---
	(with 1200 g/mm grating)	

<b>Max Resolution:</b>	0.04nm	0.06nm
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<b>Pulse Broadening:</b>	200 ps max	10 fs max
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**Interface:** RS232 standard.

**Software:** Demonstration control program and LabView driver included.

**Power:** 110 / 120V, 50/60Hz @ 1A standard.  
220/230/240V, 50/60Hz @ 0.5A optional.

**Interface:** RS232 standard (DK24AT)

**Warranty:** One year

**Options:**

- DK24MS - Increased precision (microstep) option now standard
- DKBS - Bi-lateral slits
- DKGPB - IEEE-488 communication interface (internal)
- DK2400 - Hand-held controller for local control
- IR240 - Gold optics

See options and accessories

Ordering Information: Please indicate product number plus description when ordering.

- |                 |  |
|-----------------|--|
| <b>DK242</b>    | Triple Grating Turret,<br>Double 1/4 meter Monochromator   |
| <b>DKSP242</b>  | Specify additive or subtractive<br>TripleGrating Turret,<br>Double 1/4 meter Spectrograph  |
| <b>DKSP242I</b> | Specify additive or subtractive<br>Triple Grating Turret,<br>Imaging Double 1/4 meter<br>Spectrograph<br>Specify additive or subtractive |

# Standard Ruled Gratings

## for installation in Digikröm DK series Monochromators/Spectrographs

### Standard Ruled Gratings Size = 68 x 68 mm

SP Part #	Ruling (g/mm)	Peak (nm)	Range (nm) @ > 30% T	Peak %T
AG2400-00240-686	2400	240	180 - 680	70
AG1800-00500-686	1800	500	300-625	82
AG1200-00200-686	1200	200	180 - 450	65
AG1200-00250-686	1200	250	180 - 460	70
AG1200-00300-686	1200	300	200 - 750	70
AG1200-00500-686	1200	500	330 - 1500	82
AG1200-00600-686	1200	600	400 - 1500	80
AG1200-00750-686	1200	750	480 - 1500	85
AG1200-01000-686	1200	1000	550 - 1500	75
AG0600-00500-686	600	500	350 - 1300	80
AG0600-01250-686	600	1250	800 - 3000	85
AG0600-01600-686	600	1600	950 - 3000	93
AG0300-00500-686	300	500	310 - 1100	80
AG0300-02000-686	300	2000	1200 - 4000	88
AG0300-02500-686	300	2500	1500 - 4500	88
AG0300-03000-686	300	3000	1800 - 6000	80
AG0150-00500-686	150	500	320 - 980	72
AG0150-04000-686	150	4000	2500 - 9000	93
AG0150-06000-686	150	6000	3400-7800	86
AG0100-00800-686	100	800	500-2500	81
AG0075-08000-686	75	8000	5000 - 15000	82
AG0050-00600-686	50	600	400 - 1200	78
AG0050-12000-686	50	12000	7500 - 20000	82

See Appendix A for grating efficiency curves

NOTE: Ruled gratings blazed at different wavelengths and Holographic gratings are available on request - call for prices and availability. Wide gratings (68 x 84mm) are available at 40% above list price, add "W" at the end of the part number. Response curves also available on request.

#### AG-686-KIT

Backplate mounting kit, required for user installation of DK gratings.



# DK Series Options and Accessories

## DKBS

Bi-lateral slit option for DK240/242/480. Both sides of slits are automatically controlled for maintaining image centering when wider slits are necessary (tolerance  $\pm 10\mu\text{m}$ ).

## DKGPB

Internal IEEE-488/GPIB communication interface option for DK240/242/480. Separate output connector from Monochromator.

## IR240

For use with DK240. Infrared (gold) coatings on optics for DK240. Enhances transmission by up to 40% between 600 - 1100nm.

*Not suitable for work below 600nm.*

## IR240SP

Same as above, for use with DKSP240.

## IR242

For use with DK242. Infrared (gold) coatings on optics for DK242. Enhances transmission by up to 80% between 600 - 1100nm.

## IR242SP

Same as above, for use with DKSP242.

## IR480

For use with DK480. Infrared (gold) coatings on optics for DK480. Enhances transmission by up to 40% between 600 - 1100nm.

## IR480SP

Same as above, for use with DKSP480.

## DK2400

Hand-held monochromator controller for DK240/242/480. Allows local control of monochromator when computer is not available or in series with a computer.

## DK24AT

RS232 Cable assembly for AT style computer. Standard with all Digikroms.

## DK24PS

RS232 Cable assembly for PS/2 style computer.

## DK24MA

RS232 Cable assembly for MAC style computer.

## DK24IC

IEEE-488/GPIB universal cable assembly.

## AB300-T

Six position, 1" diameter automatic filter wheel assembly that bolts directly to DK entrance or exit slits. Receives power and commands directly through DK unit. See page 85 for more information.

## DKSP-TO-DK

Attachment to allow DKSP Spectrograph to operate as a monochromator. It includes CM standard 6-fixed slit set (page 20).

## AB200

Single filter carrier that mounts directly between DK unit and accessories.