



## TILL Polychrome V – Fast Monochromator for Fluorescence Microscopy

### General Information

The TILL Polychrome V is a versatile and ultra-fast switching monochromator for fluorescence microscopy. It provides the flexibility to adjust the excitation wavelength in order to optimize an experiment even under non-standard or unknown conditions. It offers speed, stability and brightness to acquire the best possible data from living cells.

The Polychrome V is particularly suitable for experiments where

- flexible adjustment of the excitation wavelength is needed e. g. to optimize an experiment under non-standard or unknown conditions,
- high-speed changing between wavelengths is required e.g. for ratiometric experiments
- bandwidth must be changeable at a given wavelength or
- a fluorescence light source that is supported by numerous imaging software packages is required.

### Key Benefits

#### Brightness and light efficiency

The Polychrome V uses a quartz fiber-optic light guide with optimized coupling units (epi-fluorescence condensers) especially designed for each microscope system, leading to more light in the object plane where it is needed.

As a result a maximum of the light delivered by the lamp reaches the sample object. This is an essential advantage e. g. when implementing experiments with weakly labeled structures.

#### Variable wavelength selection

Unlike filter-based systems, the monochromator-based Polychrome V system is not limited to a few distinct wavelengths. A flexible selection of any wavelength between 320 nm and 680 nm is possible, so the optimum excitation wavelength in experiments with non-standard or unknown conditions can be achieved.

#### High stability of light source

Only scientific-grade lamps, such as those used in the TILL Polychrome V, warrant a stability with short and long-term p/p fluctuations that are typically < 1%. This leads to the most optimized signal-to-noise ratio.

Compared to Cermax lamp-based systems or consumer-grade lamps, the TILL Polychrome V provides up to ~10 times more stability.

#### Fast wavelength scanning speed

The fully digital galvanometer control in the TILL Polychrome V makes it possible to switch wavelengths in milliseconds.

Switching between the two excitation wavelengths of 340 and 380 nm takes less than 1 ms, and the largest wavelength jump of 400 nm has a transition time of < 1.6 ms.

# TILL Polychrome V

## Low cost-of-ownership and long lamp lifetime

The Xenon lamp used in the Polychrome V lasts 2 times longer than others and costs 2 times less.

Unlike liquid light-guides, the quartz fiber light guide of Polychrome V keeps the light transmission efficiency high over its entire life cycle and does not have to be replaced.

## Intelligent and fast control

The intelligent controller in the TILL Polychrome V is bright enough to run complex experiments by itself. All actuators in the TILL Polychrome V are controlled by this unit. Communication between the controller and the PC is done via RS-232 (a USB adapter for RS-232 is available).

The TILL controller can be triggered or serve as a precise trigger-source within a series of predefined steps in an imaging or photometry experiment.

The TILL Polychrome V intelligent controller can be programmed with TILL Software, as well as major imaging software programs.

Alternatively the wavelength can be controlled by an analog voltage.

## Applications

The Polychrome V is a suitable light source for real-time live cell imaging experiments such as

- high-speed ratio imaging,
- GFP imaging to distinguish a variety of fluorophores,
- FRET to detect faint signals,
- photometry with very high time resolution or
- wide field and laser TIRF.

Product specifications and descriptions in this document are subject to change without notice.

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## Specifications

Parameter	Value
Monochromator	Scanner mounted diffraction grating
Wavelength range	320 nm to 680 nm
Scanning speed	Up to 400 nm/ms
Scanner controller type	Digital
Half-power bandwidth	14 nm
Motorized bandwidth (optional)	2 nm -15 nm, 1 nm resolution
Motorized Intensity (optional)	0% - 100%, 10% resolution
Output power	> 10 mW (@470 nm @ 14 nm BW, with new lamp)
Optical fiber	UV/Vis quartz/quartz fiber, NA 0.22, length 2 m or 3 m
Light source	150 W Xenon high stability lamp
Interfaces	Voltage, RS232, trigger in/out
Control voltage range	-10 V to +10 V
Operating voltage	110 V - 120 V, 220 V - 240 V, 50/60 Hz, 4 A max
Dimensions	42 cm x 24 cm x 21 cm
Operating temperature range	15°C – 30°C
Weight	9.5 kg
Software included	Polycon Software, SDK
SDK language support	C/C++, Java, C#/.NET, LabView

## Features

- Continuous variable bandwidth control (optional)
- Variable intensity control 0 – 100% (optional)
- Long life expectancy for bulb and light guide
- Stand-alone and compact – no external control box needed
- UV/Vis enhanced at no extra charge
- Easy optical coupling to standard microscopes – also fits existing setups

## Fluorescence Microscopy Solutions from TILL Photonics

TILL Photonics offers fully automated, integrated and modular digital microscope solutions for live-cell applications in research and education. For more information call +49 89 895 662-0, or contact your local TILL Distributor.

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