

UNITS WITH PHOTOPERIOD

Most areas on Earth, apart from around the equator, are characterised by varying lengths of day and night which has a bearing on how organisms respond to changing amounts of light. There is, for example, a close relationship between the flowering of certain plants, the development of microorganisms and the length of day and night. This phenomenon is called photoperiod. Thanks to our units with the photoperiod option (only available for ST cooled incubators and IL cooled incubators in the SMART version), it is possible to simulate day and night. The basic difference between the FOT and FIT functions is that in the first case, the light can only be turned on and off in the program, and in the second, you can additionally control its intensity.



MAIN STANDARD BENEFITS

- for each segment it is possible to program temperature, duration time, fan and light efficiency (ON / OFF)
- temperature range with light OFF: +3°C... +50°C and -10°C... +50°C (for IL with ILW/T option)
- temperature range with light ON: +10°C...+50°C
- 4000K neutral white LED lighting installed in side walls or ceiling in ST cooled incubators; in door or ceiling in ILW cooled incubators
- with FOT option the equipment operates with time priority (see page 125)
- automatic defrosting function

PHOTOPERIOD (FOT) OPTION

	ST FOT2	ST FOT4	ST FOT6	ST FOT8	ST FOT10	ST FOT15	IL FOT2S	IL FOT3S	IL FOT5D	IL FOT6D	IL FOT8D	IL FOT10D
available for models	ST 1 ST 1/1 ST 1/1/1	ST 2 ST 2/2	ST 2 ST 3 ST 2/3	ST 4 ST 5	ST 500* ST 700*	ST 1200* ST 1450*	ILW 53	ILW 115	ILW 53	ILW 115 ILW 240	ILW 240 ILW 400 ILW 750	ILW 750
temperature range with light ON [°C]	+10 ... +50											
number of LED lighting tubes in door	-	-	-	-	-	-	-	-	5	6	8	10
number of LED lighting tubes in ceiling	2	-	-	-	-	-	2	3	-	-	-	-
number of LED lighting tubes in side walls	-	4	6	8	10	15	-	-	-	-	-	-
adjustable illumination intensity	no											

* only version of ST cooled incubators with compressor cooling system (with FOT option, monoblock (M) units are not used)

UNITS WITH PHYTOTRON

Units with phytotron allow precise control of temperature, humidity (in the case of climatic chambers) and lighting, enabling the simulation of an entire day-night cycle with distinct times of the day such as dawn, midday, evening and night. This is achieved by adjusting the duration and intensity of light, creating optimal environmental conditions. These devices are used in studies on plant growth and development and find broad applications in the pharmaceutical, food, cosmetic and electronics industries, as well as many other fields where maintaining stable and repeatable testing conditions is crucial.

Available with lighting and humidity:

- KK climatic chambers
- KKP constant climatic chambers
- KKS 500/700/1200/1450

Available with lighting:

- ST 500/700/1200/1450 cooled incubators (ST) in SMART PRO version*
- ILW 115/240/400/750 cooled incubators in (ILW) SMART PRO version

* with the FIT version, we use only ST cooled incubators with a compressor cooling system - C, CS, P, PS versions.
Units with a monoblock cooling system (CM, CMS, PM, PMS versions) are not applied here.

MAIN STANDARD BENEFITS

- for each segment, it is possible to program the temperature, time, fan efficiency level and lighting intensity (every 1%). Additionally, in the case of climatic chambers (KK, KKP), the humidity can also be programmed
- chamber with FIT option can operate with priority of time or parameters (temperature or temperature and humidity)
- automatic defrosting function
- thanks to forced air convection, the variation and fluctuation of temperature and humidity are very low



OPERATING TEMPERATURE RANGE OF UNITS WITH PHYTOTRON

	KKS* FIT	KK FIT	KKP FIT	ST with FIT	ILW with FIT
temperature range with light ON	+10°C...+50°C	+10°C...+50°C	+10°C...+50°C (10°C below ambient temp., but not less than +10°C)	+10°C...+50°C	+10°C...+50°C
temperature range with light OFF	+10°C...+60°C with humidity -10°C...+60°C without humidity	0°C...+60°C	+5°C...+70°C with humidity 0°C...+70°C without humidity (max 20°C below ambient temp.)	+3°C...+60°C	0°C...+60°C (for ILW with ILW/T option -10°C...+60°C)

* KKS 500/700/1200/1450

LIGHT SOURCE

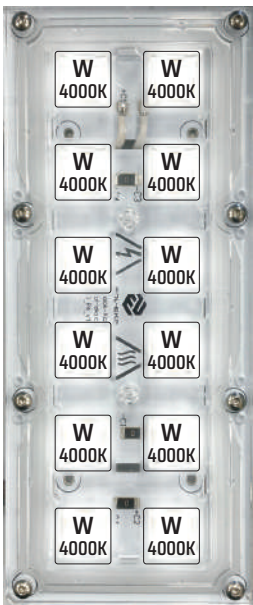
Phytotron chambers are equipped with advanced LED modules, offering users the flexibility to customize light color and intensity for each program segment. These modules can be combined, for example, far-red with blue, to create tailored lighting conditions. Adjustable dimming further ensures precise intensity control to meet the unique requirements of each sample.

The LED modules are designed for long-term reliability, while their innovative optics deliver uniform light distribution across all types of loads. Additionally, the low-heat emission of LED technology helps maintain precise temperature control within the chamber, ensuring optimal performance for your research and tests.

AVAILABLE LED MODULES

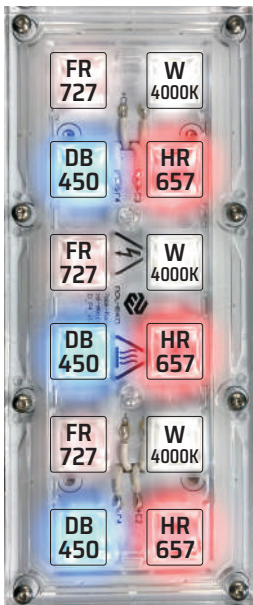
There are two standard LED modules: white (WHITE) and colored (MULTI) - 4 colors (far red, deep blue, white and hyper red) and additional custom LED module. The colors of the CUSTOM LED module and their wavelengths in the phytotron units can be tailored to the individual needs of the customer. It is important to note that the maximum number of custom colors that can be used in these units is four. Thanks to such solutions, our phytotron devices meet even the most demanding requirements of our customers.

FIT LED WHITE



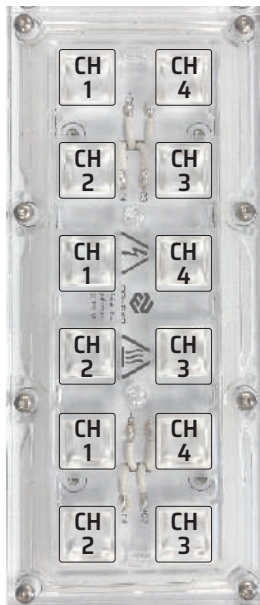
W 4000K White (colour temperature 4000K)

FIT LED MULTI

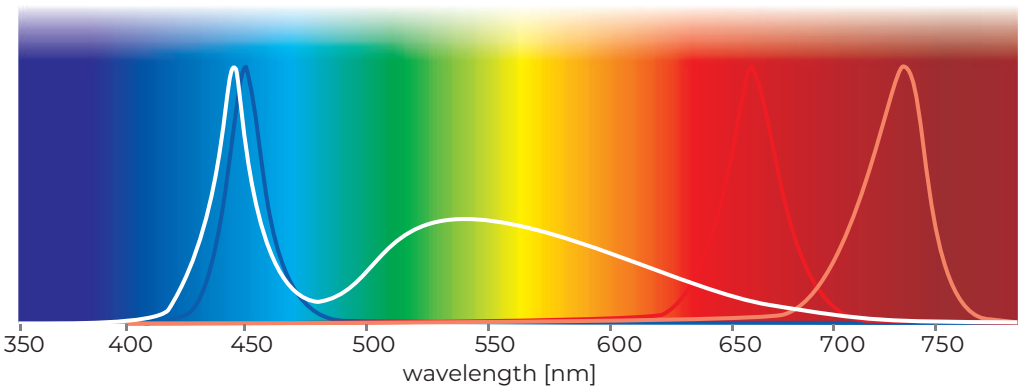






W 4000K White (colour temperature 4000K)
HR 657 Hyper red (wavelength 657 nm)
FR 727 Far red (wavelength 727 nm)
DB 450 Deep blue (wavelength 450 nm)

FIT LED CUSTOM



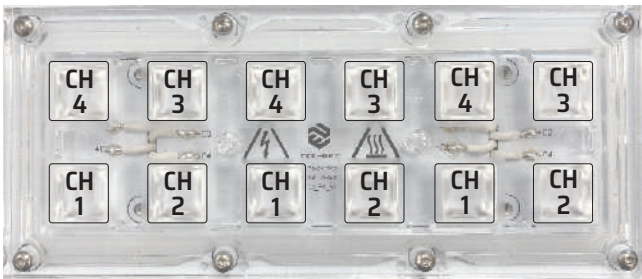
CH 1 All four channels as custom colours.
CH 2 Detailed configuration see page 21.
CH 3
CH 4



 - far red LED (727 nm)
 - hyper red LED (657 nm)
 - deep blue LED (450 nm)
 - white LED (4000 K)

CUSTOM LED MODULE CONFIGURATIONS

FIT LED CUSTOM



NON-STANDARD COLOURS CONFIGURATIONS

1 COLOUR	2 COLOURS	3 COLOURS	4 COLOURS
CH 1 colour 1	CH 1 colour 1	CH 1 colour 1	CH 1 colour 1
CH 2 colour 1	CH 2 colour 2	CH 2 colour 2	CH 2 colour 2
CH 3 colour 1	CH 3 colour 1	CH 3 colour 3	CH 3 colour 3
CH 4 colour 1	CH 4 colour 2	CH 4 blank	CH 4 colour 4

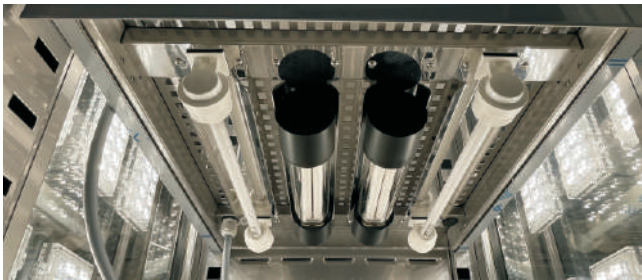
ADDITIONAL LIGHT SOURCE (OPTIONAL)

In the phytotron units, there is also the option to use UV-A, UV-B and UV-C fluorescent lamps.

The UV lamp(s) can be mounted:

- in the ceiling of the working chamber
- as an over-shelf lighting panels

also combined with FIT LED modules.



Example of UV-A and UV-B lamps mounted as an over-shelf panel KK 500 SMART PRO with FIT S 500 LED WH and FIT P 500 UVA+UVB

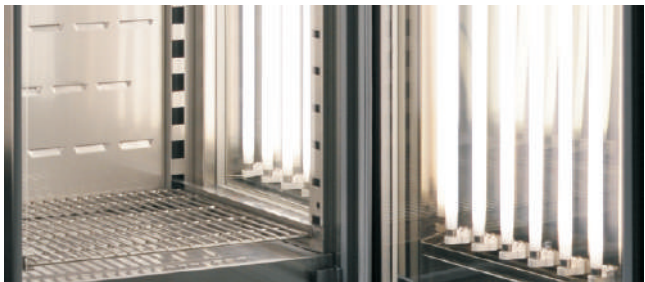


LED LIGHT TUBES

LED tubes as an alternative to LED modules are available only in phytotron units with light sources placed:

- in the side walls (FIT S)
- in the side walls and doors (FIT DS)
- in the doors (FIT D)

Temperature control range with lighting: from +10°C to +45°C.



KK 350 SMART PRO FIT DS with LED tubes

CHOOSING THE RIGHT LIGHT PLACEMENT

The light sources, depending on the choice of unit, can be mounted in the side walls (FIT S LED), door (FIT D LED), in the walls and door (FIT DS LED) or as the over-shelf panels (FIT P LED/PANEL LED):



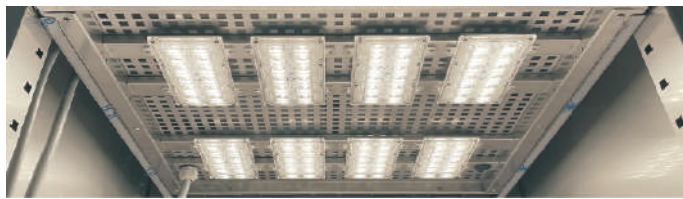
LIGHT IN SIDE WALLS FIT S LED



LIGHT IN DOOR FIT D



LIGHT IN SIDE WALLS AND DOOR FIT DS



OVERSHELF PANEL FIT P

FIT OVER-SHELF PANELS IN CHAMBER

















LED over-shelf panels with adjustable intensity can be equipped with several independently controlled light colors.

Depending on the model, 1 to 3 lighting panels can be placed in the chamber. The FIT P LED version includes 1 over-shelf panel and sockets to allow installation of extra panels if required (to be ordered separately).

The FIT/R3 option allows to control the light intensity separately for each panel.



KK 500 SMART PRO with FIT P 500 LED WH and FIT P 500 MULTI

	 ST	 ST	 ST	 IL	 IL	 IL	 IL	 KK	 KK	 KKP	 KK	 KK	 KK	 KK	 KK	 KK
	500/700	1200	1450	115	240	400	750	115	240	240	400	500	700	750	1200	1450
standard	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
max*	3	3	3	1	2	2	3	1	2	2	2	3	3	3	3	3

*max number of over-shelf panels with illumination inside the chamber