

Climatic chambers

Application

- growth of plants and fungus
- seeds germination
- microorganisms and insects breeding
- photostability tests
- food preservation tests
- any kind of research that requires a stable temperature and humidity environment (optionally light)
- tests of building materials

Climatic chambers with phytotron system can control temperature, humidity and light to create a stable environment.

-10 °C...+60 °C; 30-90% rH



Calibration



All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation of POL-EKO Laboratorium Pomiarowe is available on website: www.polekolab.pl.

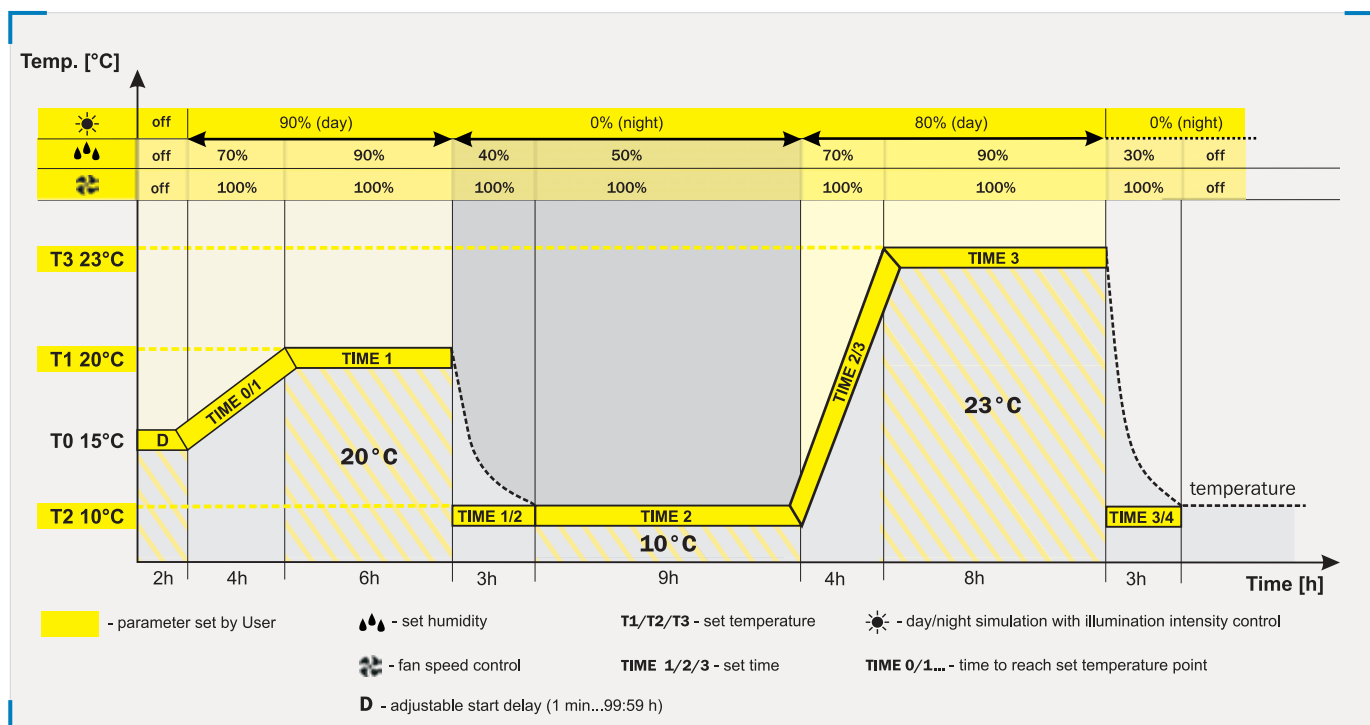
Climatic chambers are equipped with a PID microprocessor temperature and humidity (optionally light - */FIT option) controller with a large (5,7") full colour touch screen, intuitive menu and user friendly software. They can be connected to Ethernet network for remote control from any computer, being one of their greatest advantages. Climatic chambers are available in the TOP+ version exclusively.

Controller advantages

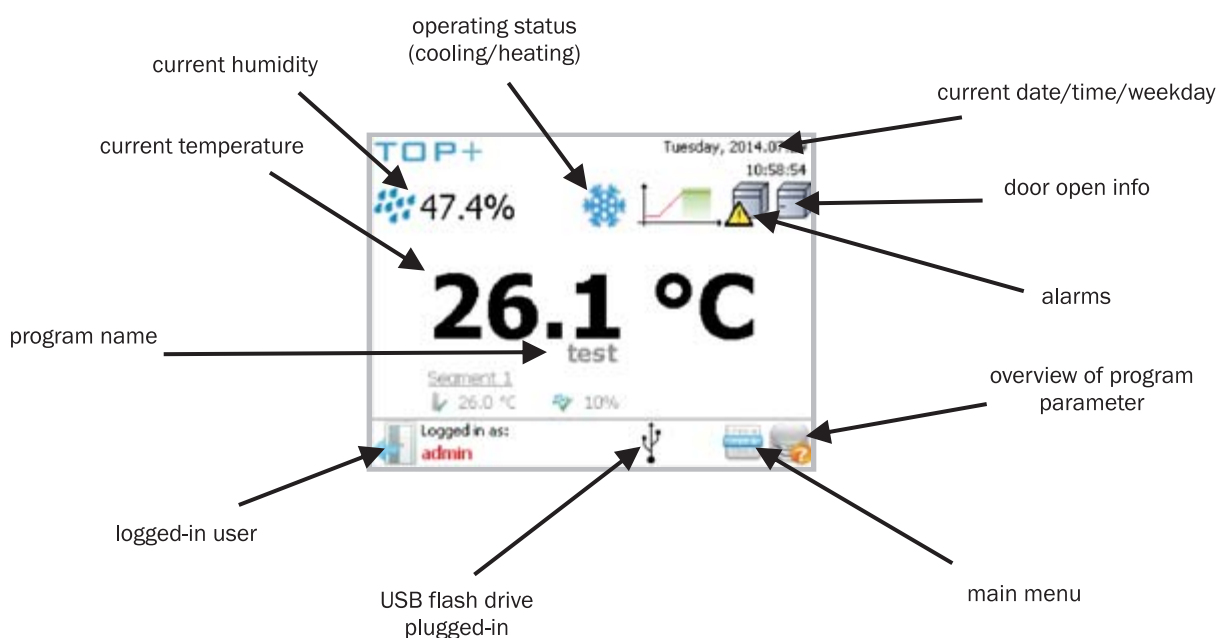
- Administrator function to manage User accounts
- access control via login
- 7 days programming
- multi-segment temperature-time profile (up to 100)
- temperature and humidity calibration
- loop function up to 99 times or endless
- adjustable start delay feature (from 1 min to 99:59 h)
- adjustable hold at set point time for temperature, humidity and lighting (for FIT option) from 1 min to 31 days / 1 min to 999h, or continuous operating
- adjustable ramps
- overview of set and current parameters while operating
- recording of min, average and max temperature and humidity value for each segment
- possibility of temperature and humidity calibration by the User
- audible and visual temperature and humidity alarm
- operating in temperature or time priority mode
- temperature and humidity sensor fail alarm
- power failure control system (program continued after restoring power)
- digital timer
- real time clock
- auto-diagnostic function
- forced air convection with fan speed control from 10 up to 100%
- automatic fan shut-down after completing the program

GLP supporting functions:

- password protected settings
- 20 user programs memory
- internal memory to store up to 4100 data records for each User, possibility to overview the values on the display or a PC computer in tabular or graphic form
- USB port to allow direct data recording or transfer onto a flash drive
- events registry
- TOP+ control software (see page 69)



Control panel



Standard features

- double door (external solid, internal glass)
- temperature range: -10 °C ...60 °C; +10 °C ...+50 °C (FIT option with light on)
- RS232 interface, USB port to allow direct recording and data transfer onto a flash drive; data can also be downloaded with the free TOP+ Control software (see page 69) or the EasyLab Professional software (see page 68); cables to be ordered separately (RSK or USBK option)
- Ethernet port for remote control, Ethernet cable
- TOP+ Control software
- wire stainless steel shelves
- quality control protocol
- English instruction manual
- available menu languages: English, Estonian, French, German, Hungarian, Italian, Latvian, Polish, Portuguese, Romanian, Russian, Spanish
- temperature protection class 3.3 to DIN 12880
- door lock
- open door alarm
- access port: Ø30 mm
- wheels with brake
- demineralised water container
- waste water container
- automatic defrosting function



Climatic chambers with phytotron system (* /FIT option)

- temperature, humidity and light control
- day/night simulation with light intensity control:
 - lamps in the door and side walls KK 350, 500 and 700 FIT DS
 - lamps in the side walls KK 350, KK 500 and 700 FIT S
 - lamps in the door KK 115 and KK 750 FIT D
 - lamps in the over-shelf panels KK 115, 240, 400, 500, 700, 750, 1200, 1450 FIT/P (and FIT PANEL)
- temperature range with light OFF: -10°C up to 60°C
- temperature range with light ON: +10°C up to +50°C
- light colour selection
- max light intensity 15000 LUX per panel (measured 25cm under the light source)

FIT P version

Climatic chambers with over-shelf panels with light. Depending on the model, there can be between 1 and 3 panels inside the chamber (standard light colour: 840 daylight). The FIT P 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.



Model		KK 115	KK 240	KK 350	KK 400	KK 500	KK 700	KK 750	KK 1200	KK 1450
Number of light panels										
standard		1	1	-	1	1	1	1	1	1
max*		1	2	-	2	3	3	3	3	3
max light intensity on shelf	FIT version	5000	10000	15000	15000	15000	15000	15000	15000	15000

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

FIT P LED version

LED panels are available for some climatic chambers.

Selection of LED modules:

- deep red – max for wave length 660 nm
- blue – max for wave length 470 nm
- far red – max for wave length 740 nm

Light intensity:

- 50 cm below light source – 165 [$\mu\text{mol}/\text{m}^2\text{s}$]*
- 25 cm below light source – 230 [$\mu\text{mol}/\text{m}^2\text{s}$]*

Optimal distance is 50cm.

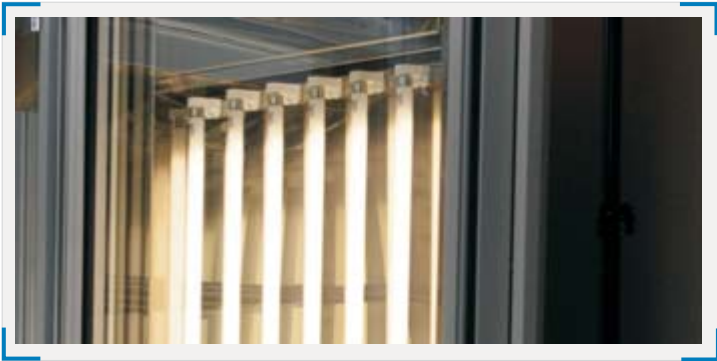
*for multiple configuration 2 modules of far red and 1 blue



The user can choose the light colour and intensity for each program segment. The colour modules can be combined, e.g. far red with blue. Dimming allows to set the required level of intensity. This flexibility provides specific light selection for each plant. The LED modules are long-life – after 25000 operating hours they still feature 90% of the nominal efficiency. The unique optics ensures uniform light distribution for each plant. The LED technology also emits very little heat which helps maintain precise temperature inside the chamber.

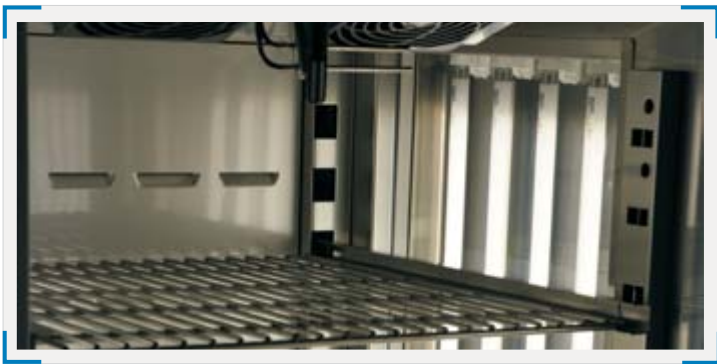
FIT D version

Climatic chambers with lamps installed in the door (standard light colour: 840 daylight)



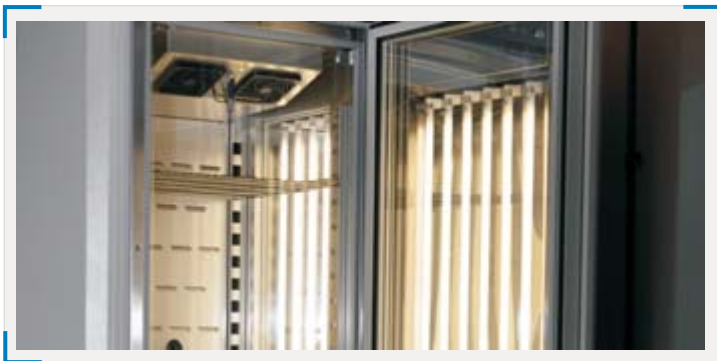
FIT S version

Climatic chambers with lamps installed in the side walls (standard light colour: 840 daylight)



FIT DS version

Climatic chambers with lamps installed in the door and side walls (standard light colour: 840 daylight)



FIT version \ Model	KK 115	KK 240	KK 350	KK 400	KK 500	KK 700	KK 750	KK 1200	KK 1450
									
FIT P	+	+		+	+	+	+	+	+
FIT D	+						+		
FIT S			+		+	+			
FIT DS			+		+	+			

Type		KK 115								
		KK 240								
Parameter		KK 350								
		KK 400								
		KK 500								
		KK 700								
		KK 750								
		KK 1200								
		KK 1450								
air convection		forced								
chamber capacity ¹ [l]		115	245	335	424	493	625	749	1365	1460
door type		double (external solid, internal glass) / external glass (option)								
temperature range [°C]	-	-10...+60°C								
	FIT option	-10...+60°C (with light on +10...+50°C)								
relative humidity range [%]		30...90% (with temperature range +10...+60°C)								
controller		microprocessor with external LCD graphic display								
interior		acid-proof stainless steel to DIN 1.4301								
housing	-	powder coated sheet								
	INOX/G	stainless steel linen finish								
overall dims ² [mm]	width	650	815	645	1015	645	735	1260	1470	1450
	height	1200	1490	2025	1740	2025	2025	1890	2000	1970
	depth	710	770	980	770	1025	1075	870	1075	1175
internal dims [mm]	width	460	600	500	800	510	600	1040	1310	1340
	height	540	800	1340	1040	1525	1510	1200	1510	1460
	depth	450	510	500	510	635	690	600	690	750
max shelf workload ³ [kg]	-	10	10	10	10	20	30	10	30	30
	PW ⁴ version	50	100	100	100	100	100	100	100	100
max unit workload [kg]	-	60	90	100	120	100	150	140	300	300
	W ⁵ version	120	300	on request	300	on request	on request	300	on request	on request
nominal power [W]	-	1000	1500	1400	2000	1600	1600	2500	2200	2200
	FIT version	1200	1800	2600	2300	2000	2000	2900	3000	3000
weight [kg]		90	140	125	185	130	170	275	220	230
temperature resolution [°C]		every 0,1								
fluctuation temperature ⁶ at 25 °C; 60% [°C]		0,2	0,5	0,4	0,4	0,3	0,3	0,3	0,3	0,3
variation temperature ⁷ at 25 °C; 60% [°C]		1,3	1,1	1,3	1	1,1	0,8	1,1	1,1	1,1
fluctuation humidity at 25 °C; 60% [%rH]		2,3	3,1	1,5	3	2,4	2,3	1,3	1,4	1,4
variation humidity at 25 °C; 60% [%rH]		4,2	1,8	4	1,7	3,8	3,5	2,7	1,9	2
over temperature protection		class 3.3 to DIN 12880								
voltage*		230V 50Hz								
shelves fitted		2	3	3	3	3	3	5	2 x 3	2 x 3
warranty		24 months								
manufacturer		POL-EKO-APARATURA								

* - 230V 60Hz, 115V 60Hz, 3P 230V 60Hz also available

1 - working capacity of chamber can be smaller

2 - external dimensions of units (without FIT option) 50 mm

for power plug and 250 mm for water container are not included

3 - in uniformly loaded surface

4 - reinforced shelf

5 - reinforced version

6 - fluctuation measured in center of chamber

7 - in space

Options and accessories (icon description see page 55)



Options and accessories	KK	Order number
	TOP+	
internal glass door ¹	S	*/C
external glass door ^{1,8}	•	*/A
door with viewing window ^{4,7}	•	*/A
internal socket ^{1,5}	•	GNZ
internal lighting ^{4,5}		OWW/OWW LED
wire shelf ^{1,3}		*/P
stainless steel wire shelf ^{1,9}	•	*/P INOX
perforated shelf ¹	•	*/PP
reinforced shelf	•	*/PW
extended temperature range to +70 °C ¹		ST/70
reinforced version		*/W
low temperature version ^{1,10}		*/T
photoperiodic system - FOT ¹		*/FOT
phytotron system - FIT ¹¹	•	*/FIT
automatic defrosting function	S	*PLUS
over temperature protection system to DIN 12880 ¹	S (3.3)	*/**
stainless steel cuvettes	•	KUW GN */*
aluminum drawer with powder coated slides		*/SWP ALU
stainless steel drawer with powder coated slides		*/SWP INOX
stainless steel drawer with stainless steel slides		*/SWPN INOX
humidity measurement ⁵	•	PHR
door openings counter ¹	•	LOD
fan speed control	S	ST/CHL WENT
additional Pt 100 temperature sensor	•	PT100
HEPA - fresh air filter		HEPA
RS 422 interface (instead of RS 232) ¹	•	RS422
RS 485 interface (instead of RS 232) ¹	•	RS485
wheels	S	QLK*
table with wheels ²		*/S, */INOX
RS 232 cable ¹	•	RSK
RS 422 cable ¹	•	RSK/422
RS 485 cable ¹	•	RSK/485
USB cable ¹		USBK
EasyLab Professional software	•	EasyLab Profess.
dot printer ¹	•	EPSON
thermal printer ¹	•	KAFKA
chamber calibration ¹	•	BRT/L
IQ, OQ, PQ qualification ¹	•	IQ/OQ/PQ
container for deionized water	•	KK/Z
container for waste water	•	KK/K
water level sensor	•	KK/CP
FIT panels independent control ¹¹	•	FIT/R3
magnetic door lock ¹²		*/ZKM
chart recorder ¹²		*/RK

* - model (e.g. ST1, IL 53)

** - over temperature protection system (e.g. 3.1)

1 - for double chamber units, the option available for both chambers separately

2 - unavailable for 400, 500, 700, 750, 1200, 1000 and 350/350 models, ST/CHL 4 and 5

3 - only for BASIC models

4 - in case of SL range, maximum temperature is reduced to +250°C

option unavailable for CL/SL 15/32

5 - in case of CL/IL in TOP+ version, maximum temperature is reduced to +70°C

6 - models BASIC, COMFORT and PREMIUM

7 - for KK 115, 240, 400, 750

8 - for KK 500, 700, 1200, 1450

9 - for ZLN 85

10 - for CHL 500, 700, 1200, 1450, 350/350

11 - thermostatic cabinets ST 500, 700, 1200, 1450

12 - for ST/CHL 500, 700, 1200, 1450

s - standard equipment

• - available option