POL-EKO
APARATURA™

TOP+

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2012/2013

products of
POL-EKO-APARATURA

Your partner in laboratory analysis and technological processes

POL-EKO-APARATURA sp.j.

POL-EKO-APARATURA has been present in the scientific market since 1990. In addition to manufacuring and trading activities, the company provides professional advice on selection, operation and maintenance of measuring, analysis and control equipment. We organise seminars on laboratory analysis, waste management and disposal, laboratory management systems and validation of analytical methods.

Since 2006 we have exported our equipment worldwide. Nowadays, our export sale comes up to 40% of all manufactured products that have been delivered to many countries of Europe, Asia, Africa, North and South America, and Australia. Independently of developing the manufacturing activity, we have been an authorized distributor in Poland of measuring and control equipment provided by the following companies: ARCTIKO, AQUALYTIC, EUTECH, HAMILTON, ISTRAN, KNICK, NICKEL-ELECTRO, RODWELL, THERMO SCIENTIFIC, WTW.

In 2005 we moved our headquarters to Wodzisław Śląski. New, modern office buildings and production halls of a total area of 4 000 m^2 provide safe and friendly work environment.

To deliver complex services and quality products to our customers, we implemented an Integrated Management System in compliance to the PN-EN ISO 9001 norm in 2004. We also established a Measurement Laboratory that provides calibration of laboratory equipment and has been accredited since 2008 by the Polish Centre for Accreditation (PCA) a member of ILAC.

Table of contents

January 1990 — POL-EKO-APARATURA founded

1996 — Start of production

1997 — New product launched: waste water receipt station

2001 — New product launched: stationary sampler

1990 — Starting cooperation with WTW Germany; POL-EKO-APARATURA as general distributor in Poland

1996 — New products launched: thermostatic cabinet and laboratory refrigerator

2000 — New product launched: colony counter

2002 — Starting cooperation with foreign laboratory and measuring equipment producers, such as AQUALYTIC, EUTECH

2005 — New products launched: stainless steel drying oven, incubator and cooled incubator

November 2005 — Moving the company to new headquarters in Wodzisław Śląski

2006 — Development of export sale

2007 — New product launched: laboratory sterilizer

March 2005 — Eurolab Trade Fairs Award - CyberScan 6500

2006 — New products launched: instruments in TOP version with Ethernet connection

2006 — Measurement Laboratory founded

2007 — New products launched: climatic chambers and climatic chambers with phytotron system

May 2009 — POL-EKO-APARATURA chosen the 2008 "Local Leader of Enterprise"

June 2009 — Starting building another production hall

March 2010 — Eurolab Trade Fairs Award - Cooled incubator ILW 115 TOP+

2010 — New products launched: laboratory furniture and fume hoods

May 2009 — POL-EKO-APARATURA exhibits at ACHEMA in Frankfurt am Main

March 2010 — Eurolab Trade Fairs Award - Monitoring station PP 2002M

2010 — New product launched: Pass-through drying oven

April 2011 — POL-EKO Laboratorium pomiarowe company founded

development history

2002 — *New products launched:* pH and dissolved oxygen on-line meters

2003 — Eurolab Trade Fairs Award - CyberScan 5500

March 2004 — Eurolab Trade Fairs Award - BOD OxiDirect

2004 — *New products launched:* stainless steel drying oven, incubator and cooled incubator

2003 — *New product launched:* homogenizer

March 2003 — Eurolab Trade Fairs Award - EcaFlow 150 GLP

March 2004 — Eurolab Trade Fairs Award - stationary sampler PP 2002

December 2004 — Implementing ISO 9001 and 18001 systems

April 2008 — Measurement Laboratory receives accreditation from the Polish Centre for Accreditation

May 2008 — POL-EKO-APARATURA exhibits at IFAT expo in Munich

January 2009 — New production hall opened

March 2009 — Eurolab Trade Fairs Award - Orion STAR PLUS

May 2008 — City Mayor of Wodzisław Śląski awards POL-EKO-APARATURA for involvement in cooperation between Polish and Czech enterprises and municipalities

2009 — *New product launched:* laboratory shaker

January 2009 — POL-EKO-APARATURA co-exhibits at ARABLAB Fairs in Dubai

March 2009 — POL-EKO-APARATURA receives an award from Local Chamber of Commerce: "Friendly to the Environment"

2011 — POL-EKO-APARATURA co-exhibits at PITTCON in the USA and ANALITIKA in Moscow

March 2012 — Graphite revolution New design of POL-EKO-APARATURA equipment

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Fairs and exhibitions

Some of the lab exhibitions we have participated in: **EuroLab** - Poland, **IFAT** - Germany, **Achema** - Germany, **ArabLab** - United Arab Emirates, **WodKan** - Poland, **POLEKO** - Poland, **Medicina and Technology** - Croatia, **LabComplEX** - Ukraine, **Rich-Mac** - Italy, **Pittcon** - United States of America, **Analitica Latin America** - Brazil, **Lab Asia** - Malaysia, **A-TESTex/Analitika** - Russia.

EuroLAB 2011

IFAT 2010

ArabLAB 2011

ACHEMA 2009

POL-EKO
APARATURA™

**Laboratory
thermostatic chambers**

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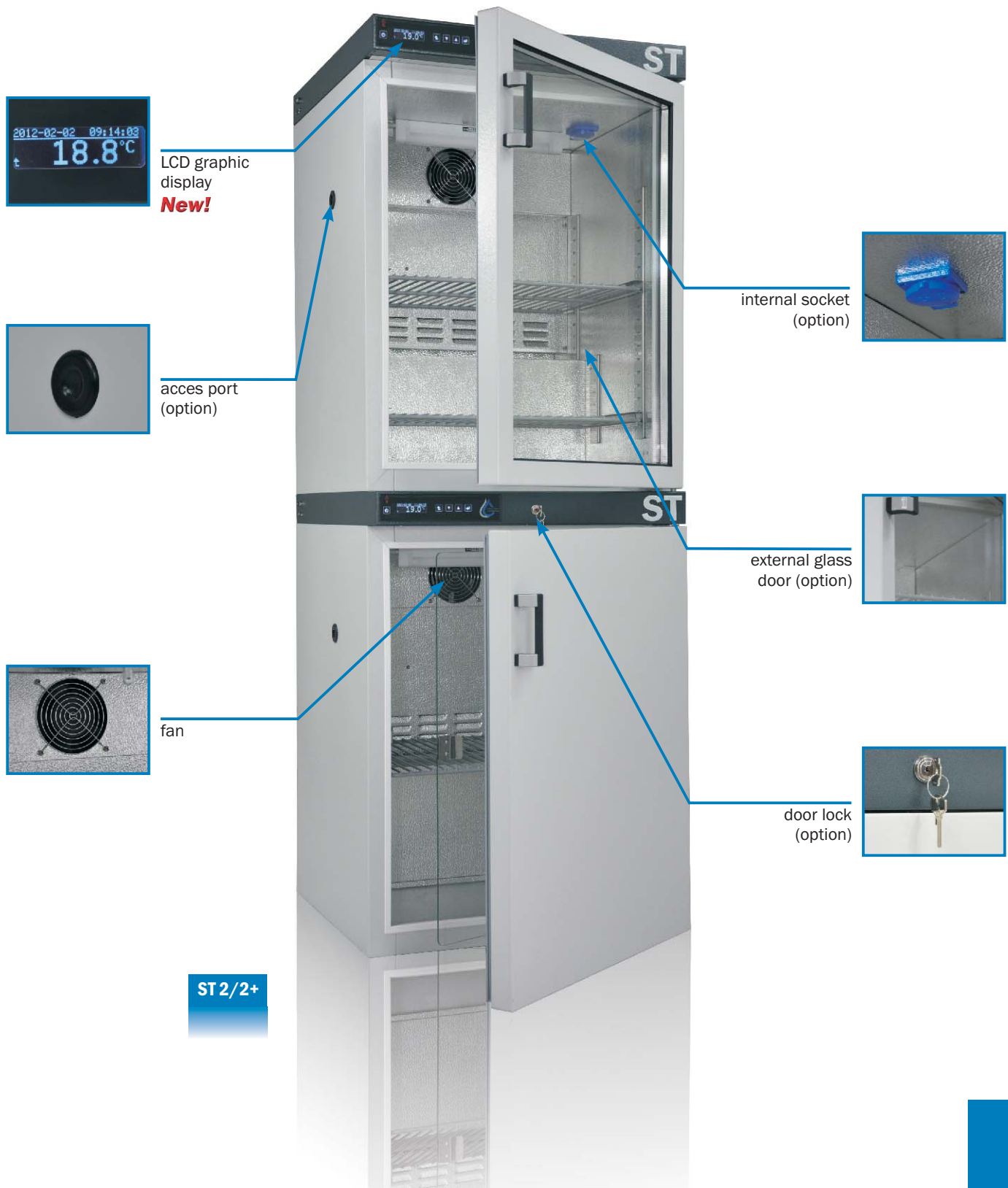
Laboratory thermostatic chambers

Application

- BOD determination
- microbiological research
- plant growing and microorganisms breeding at specified temperature
- storage of liquids and samples for physicochemical analysis

Thermostatic cabinets are equipped with both heating and cooling systems and can provide a stable temperature in a range of +3...+70 °C regardless of ambient conditions.

LCD graphic display
New!

acces port
(option)

fan

ST 2/2+

internal socket
(option)

external glass
door (option)

door lock
(option)

Advantages

- available in two versions - basic and TOP+
- single or double chamber versions
- capacity from 68 to 1460 liters
- aluminum or stainless steel interior (depending on model)
- housing: powder coated sheet, stainless steel linen finish (**INOX/G**) or polished (**INOX/S**) (depending on model)
- thermal insulation - polyurethane foam
- solid, glass (**ST*/A option**) or double (**ST*/C option**) door type
- forced air convection
- heating and cooling systems to hold set temperature regardless of ambient conditions
- defrosting function (see page 56)
- wheels in ST 1200 and 1450 model

- four temperature ranges available
  - +3...+40°C
  - +3...+50°C (**ST/50 option**)
  - +3...+60°C (**ST/60 option**)
  - +3...+70°C (**ST/70 option**) *New!*
- LCD graphic display *New!*
- illuminated touch buttons *New!*
- microprocessor temperature control
- temperature sensor fail alarm (see page 56)
- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- self-check function (auto control)
- automatic fan shut down after completing the program

Program possibilities in basic version

- six segment temperature-time profile
- cycle run of the program
- 3 user programs memory
- adjustable start delay feature (from 1 min to 99:59 h)
- adjustable time of holding the set temperature from 1 min to 31 days, or continuous operating

- recording min, average and max temperature value separately for each segment
- overeview of set parameters during operating time
- over temperature sound alarm
- temperature program priority (see page 56)

Program possibilities in TOP+ version, see page 28.
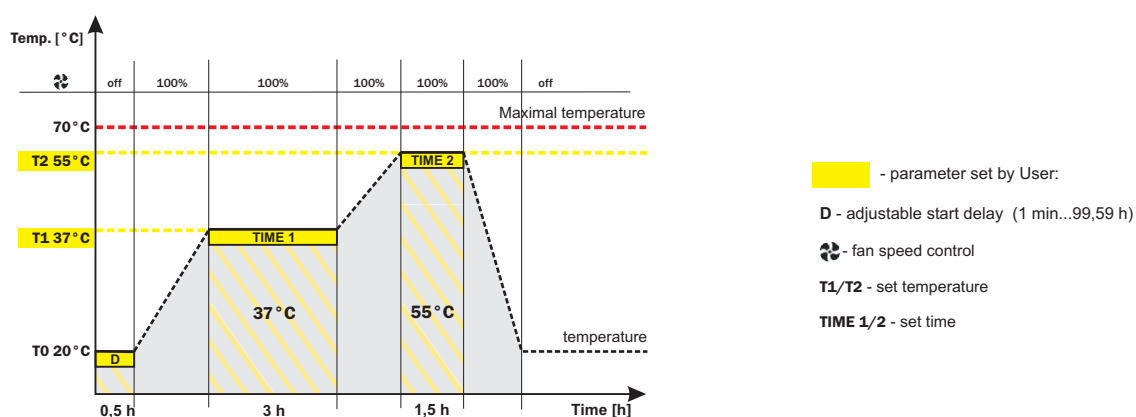
All POL-EKO-APARATURA products can be supplied with a calibration certificate issued by an accredited Measurement Laboratory. Further information is available on pages 87-89 and our website www.pol-eko.eu
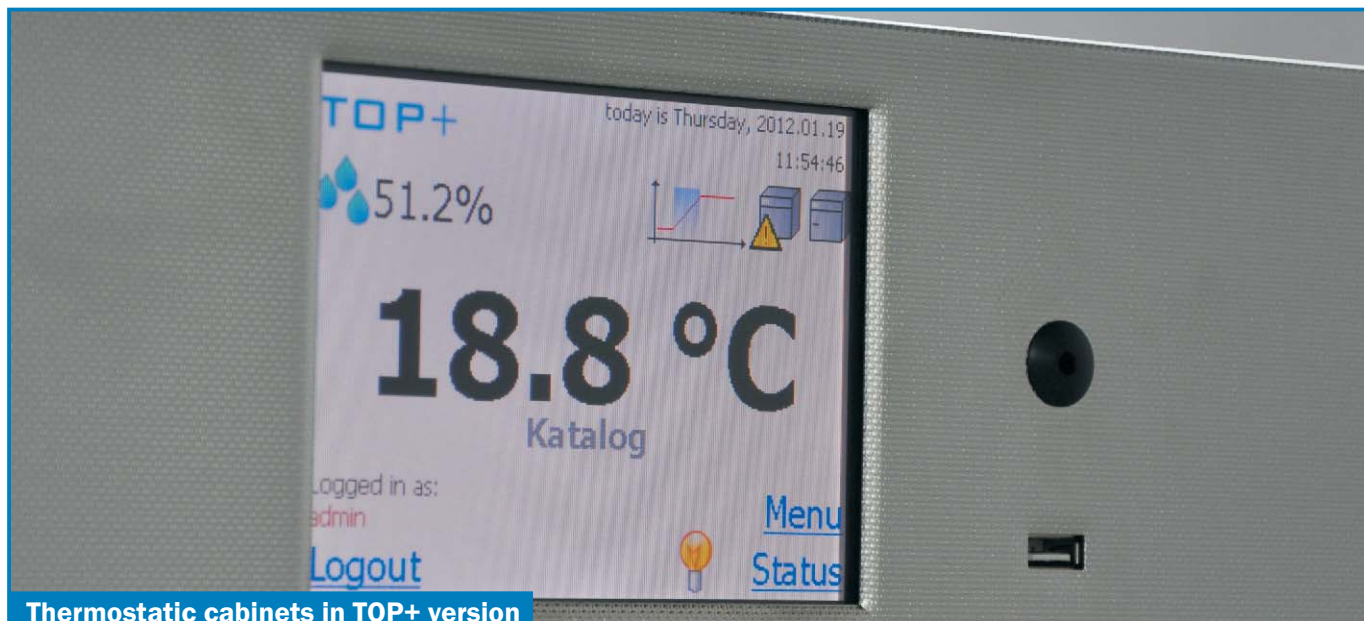
Thermostatic cabinets in TOP+ version

The ST thermostatic cabinets are available in the TOP+ professional version too. The TOP+ version features a full colour 5,7'' touch screen with internal memory to store all measurement data. These are the only thermostatic cabinets which can be controlled from a PC, as they can be connected to an Ethernet network that enables the user to program the equipment virtually from any place in the world.
Details on page 28.

Standard equipment

- solid door
- temperature range +3...+40°C (+3...+60°C in TOP+ version)
- RS 232 interface and USB port *New!*; RS 232 or USB cable must be purchased additionally (RSK or USBK)
- wire shelves (with slides set) in case of aluminum interior
  and stainless steel wire shelves in case of stainless steel interior
- manfacturer's test certificate at +37°C
- operation manual in English and English menu (other languages on request)
- over temperature protection 1.0 class according to DIN 12880
- TOP+ standard equipment see page 28

Options and accesories (icon description see page 51)

- for basic version only
- for basic version and TOP+
- for TOP+ only

Single chamber cabinets

ST 2+ INOX INOX/S with ST 2+/C option

Available options :

ST/50 - extended temperature range to +50°C
ST/60 - extended temperature range to +60°C
ST/70 - extended temperature range to +70°C
ST*/C - internal glass door
ST*/A - external glass door
PLUS - automatic defrosting during operating
FOT - photoperiodic system

Model / Parameter		ST 1+	ST 2+	ST 3+	ST 4+	ST 5+	ST 500	ST 700	ST 1200	ST 1450
air convection		forced								
chamber capacity[1]	[l]	68	150	200	250	300	493	625	1365	1460
	[cu ft]	2,4	5,2	7,0	8,8	10,5	17,4	22,0	48,2	51,6
door type		solid / glass or double[2] (option)								
temperature range	[°C]	+3...+40 / up to +50, +60 or +70 (option) / +3...+60 in TOP+ version								
	[°F]	+37...+104 / up to +122, +140 or +158 (option) / +37...+140 in TOP+ version								
controller		microprocessor with external LCD graphic display								
interior		aluminum / stainless steel								
housing		powder coated sheet / stainless steel linen finish INOX/G or polished INOX/S								
overall dims [mm]**	width	550	600	600	600	600	635	725	1440	1440
	height	600	850	1050	1250	1450	2025	2025	2025	1970
	depth	650	600	600	600	600	810	860	860	890
internal dims[3] [mm]	width	470	520	520	520	520	510	600	1310	1340
	height	430	660	860	1060	1260	1510	1510	1510	1460
	depth	300	420	420	420	420	640	690	690	750
max shelf workload [kg]*	-	10	10	10	10	10	20	30	30	30
	PW version	on request					100	100	100	100
max unit workload [kg]	-	20	30	40	50	60	100	150	300	300
	W version	on request								
nominal power [W]		160	170	170	330	330	400	400	550	550
weight [kg]		30	48	52	61	66	105	115	195	200
temperature resolution [°C]		every 0,1								
temperature fluctuation[4] at +37°C [°C]		±0,2	±0,2	±0,3	±0,3	±0,3	±0,2	±0,2	±0,3	±0,3
over temperature protection		class 1.0 according to DIN 12880 / class 2.0, 3.1, 3.2, 3.3 (option) / class 3.3 in TOP+ version								
voltage 50/60 Hz [V]		110-120/220-240								
shelves fitted / max[6]		2/2	3/4	3/4	4/6	4/7	3/11	3/11	2 x 3/11[5]	2 x 3/11[5]
warranty		24 months								
manufacturer		POL-EKO-APARATURA								

* - at even surface workload
** - dims of door handles, power cable and leveling
    feet or wheels not included
1 - working capacity of chamber can be smaller
2 - additional internal glass door

3 - dims of units with double door can be smaller
4 - fluctuation measured in centre of the chamber
5 - two columns with 3 shelves each
6 - "fitted" number of shelves fitted, included in price
    "max" number of shelves which can be fitted

Double chamber cabinets

Available options

ST/50 - extended temperature range up to +50°C
ST/60 - extended temperature range up to +60°C
ST/70 - extended temperature range up to +70°C
ST*/C - internal glass door
ST*/A - external glass door
PLUS - automatic defrosting during operating
FOT - photoperiodic system

ST 2/2+ with additional options

Example of configuration

To configure a double-chamber thermostatic cabinet, e.g.:
- upper chamber equipped with solid door and temperature up to +60°C
- lower chamber equipped with double door and temperature up to +40°C, you select:

for ST 1/1+: ST 1/1+ and ST/60 option for upper chamber + ST 1/C option for lower chamber

Model		ST 1/1+	ST 1/1/1+	ST 2/2+	ST 2/3+	ST 2/4+	ST 3/3+	ST 350/350
Parameter								
air convection		forced						
chamber capacity[1]	[l]	68/68	68/68/68	150/150	150/200	150/250	200/200	294/294
	[cu ft]	2,4/2,4	2,4/2,4/2,4	5,2/5,2	5,2/7,0	5,2/8,5	7,0/7,0	10,3/10,3
door type		solid / glass or double[2] (option)						
temperature range	[°C]	+3...+40 / up to +50, +60 or +70 (option) / +3...+60 in TOP+ version						
	[°F]	+37...+104 / up to +122, +140 or +158 (option) / +37...+140 in TOP+ version						
controller		microprocessor with external LCD graphic display						
interior		aluminum / stainless steel						
housing		powder coated sheet / stainless steel linen finish INOX/G or polished INOX/S						
overall dims [mm]**	width	550	550	600	600	600	600	720
	height	1170	1740	1670	1870	2070	2070	2025
	depth	650	650	600	600	600	600	860
internal dims[3] [mm]	width	470	470	520	520	520	520	600
	height	430	430	660	660/860	660/1060	860	700
	depth	300	300	420	420	420	420	700
max shelf workload [kg]*	-	10	10	10	10	10	10	30
	PW version	on request						
max unit workload [kg]	-	20/20	20/20/20	30/30	30/40	30/50	40/40	75/75
	W version	on request						
nominal power [W]		320	480	350	350	350	350	800
weight [kg]		65	100	100	105	110	115	162
temperature resolution [°C]		every 0,1						
temperature fluctuation[4] at +37°C [°C]		±0,2	±0,2	±0,3	±0,3	±0,3	±0,3	±0,5
over temperature protection		class 1.0 according to DIN 12880 / class 2.0, 3.1, 3.2, 3.3 (option) / class 3.3 in TOP+ version						
voltage 50/60 Hz [V]		110-120/220-240						
shelves fitted / max[6]		2/2	2/2	3/4	3/4	3/4	3/4	2/6
warranty		24 months						
manufacturer		POL-EKO-APARATURA						

* - at even surface workload
** - dims of door handles, power cable and leveling
    feet or wheels not included
1 - working capacity of chamber can be smaller
2 - additional internal glass door

3 - dims of units with double door can be smaller
4 - fluctuation measured in centre of the chamber
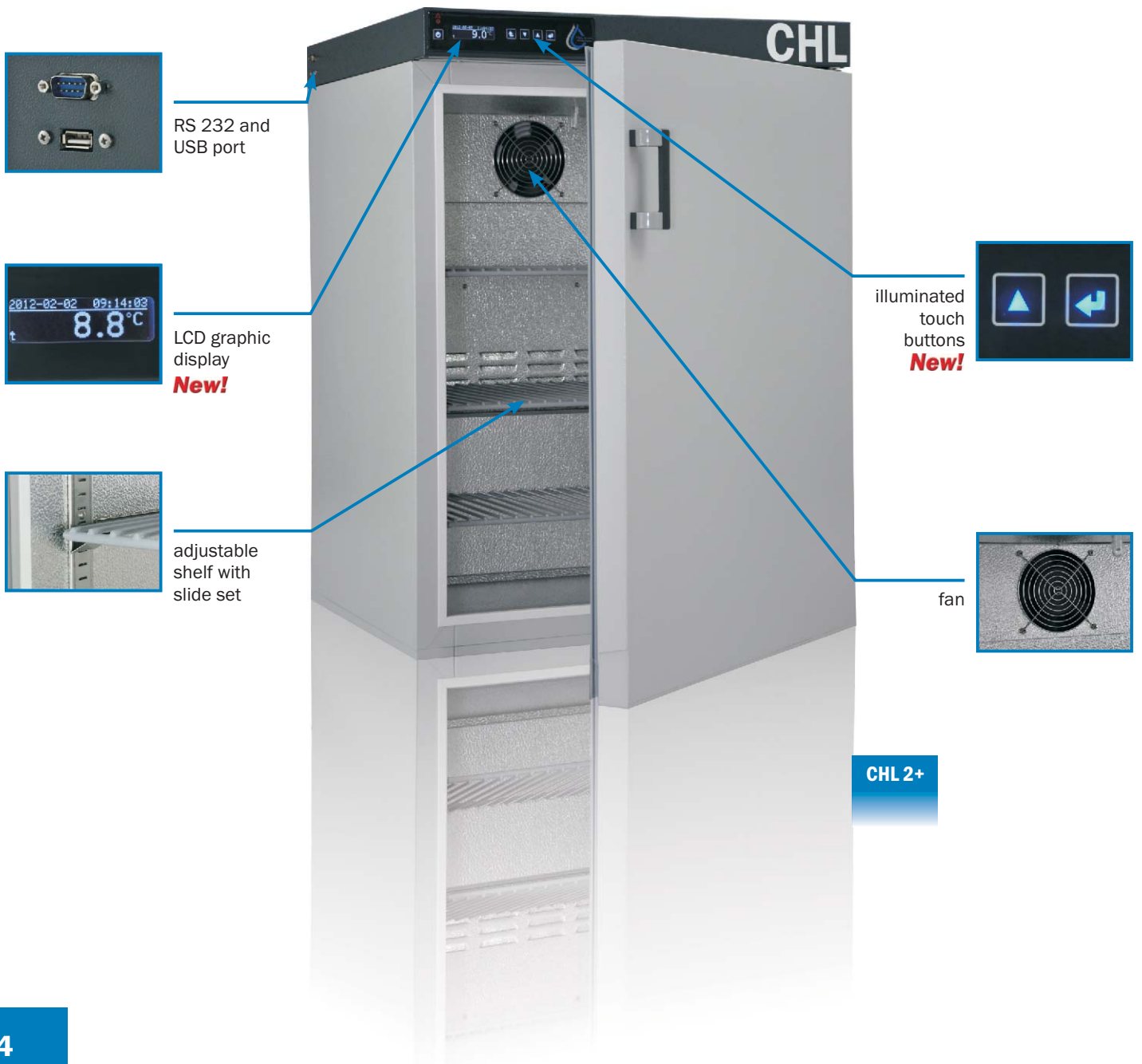5 - two columns with 3 shelves each
6 - "fitted" number of shelves fitted, included in price
    "max" number of shelves which can be fitted

Laboratory refrigerators

Application

- storage of water and sewage samples, piezometer leachate
- storage of ASA, GC or HPLC calibration standards
- storage of reagents
- chemical storage
- general storage

Laboratory refrigerators are equipped with a cooling system and can provide a stable temperature lower than ambient.
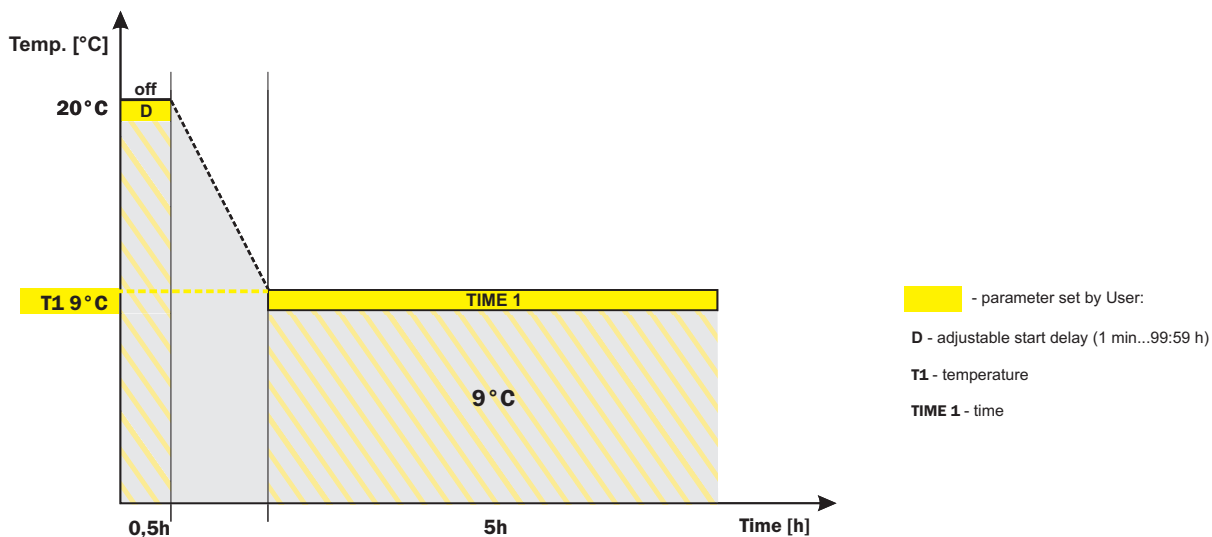
RS 232 and USB port

LCD graphic display
New!

adjustable shelf with slide set

illuminated touch buttons
New!

fan

CHL 2+

Advantages

- single or double chamber versions
- capacity from 68 to 1460 liters
- aluminum or stainless steel interior (depending on model)
- housing: powder coated sheet, stainless steel linen finish (**INOX/G**) or polished (**INOX/S**) (depending on model)
- thermal insulation - polyurethane foam
- solid, glass (**CHL*/A option**) or double (**CHL*/C option**) door type
- forced air convection
- heating and cooling systems to hold set temperature
- regardless of ambient conditions
- defrosting function (see page 56)
- wheels in CHL 1200 and 1450 model

- two temperature ranges available
  - 0...+10°C
  - -10...+10°C (**CHL*/T option**) for CHL 500-1450
- LCD graphic display
- iluminated touch buttons
- microprocessor temperature control
- temperature sensor fail alarm (see page 56)
- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- self-check function (auto control)

Program possibilities

- single segment temperature-time profile
- temperature program priority
- adjustable start delay feature (from 1 min to 99:59 h)
- adjustable time of holding the set temperature from 1 min to 31 days, or continuous operating

- recording min, average and max temperature value separately for each segment
- overeview of set parameters during operating time
- over temperature sound alarm

Temp. [°C]

20°C — off — D

T1 9°C — TIME 1

9°C

0,5h   5h   Time [h]

- parameter set by User:

D - adjustable start delay (1 min...99:59 h)

T1 - temperature

TIME 1 - time

All POL-EKO-APARATURA products can be supplied with a calibration certificate issued by an accredited Measurement Laboratory. Further information is available on pages 87-89 and our website www.pol-eko.eu

Laboratory refrigerators

Laboratory refrigerators CHL

All refrigerators, thermostatic cabinets and cooled incubators can optionally be equipped with an automatic defrosting function (**PLUS option**). It features a countinuous operating without a necessity to defrost, keeping a stable temperature in the chamber. Details on page 65.

Standard equipment

- solid door
- temperature range 0...+10°C
- RS 232 interface and USB port **New!**; RS 232 or USB cable must be purchased additionally (RSK or USBK)
- wire shelves (with slides set) in case of aluminum interior and stainless steel wire shelves in case of stainless steel interior
- manfacturer's test certificate at +4°C
- operation manual in English and English menu (other languages on request)
- over temperature protection 1.0 class according to DIN 12880

Options and accesories (icon description see page 51)

Single chamber refrigerators
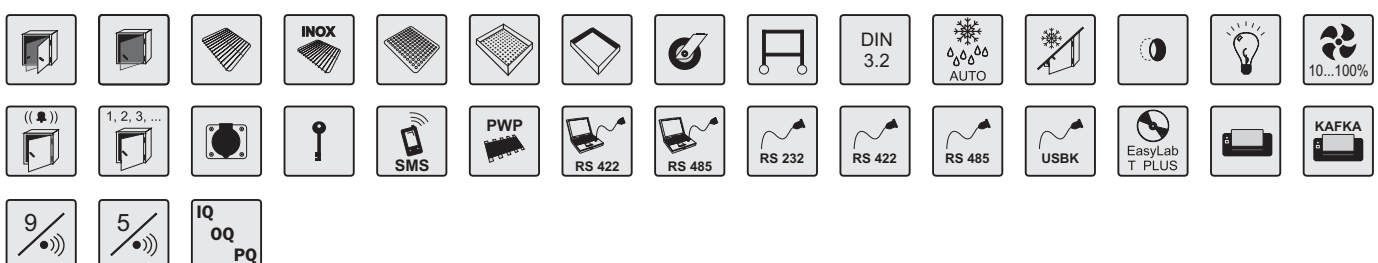
TB 35 INOX

Available options

CHL*/T - extended temperature range to -10°C
CHL*/A - external glass door
PLUS - automatic defrosting function during operating

A mini refrigerator TB 35 INOX with an additional battery power supply guarantees continuous operating in case of power failure.
Details on page 19.

Parameter / Model		CHL 1+	CHL 2+	CHL 3+	CHL4+	CHL 5+	CHL 500	CHL 700	CHL 1200	CHL 1450
air convection		forced								
chamber capacity[1]	[l]	68	150	200	250	300	493	625	1365	1460
	[cu ft]	2,4	5,2	7,0	8,8	10,5	17,4	22,0	48,2	51,6
door type		solid / glass or double[2] (option)								
temperature range	[°C]	+0...+10					+0...+10 / -10...+10 (option)			
	[°F]	+32...+50					+32...+50 / +14...+50 (option)			
controller		microprocessor with external LCD graphic display								
interior		aluminum / stainless steel								
housing		powder coated sheet / stainless steel linen finish INOX/G or polished INOX/S								
overall dims [mm]**	width	550	600	600	600	600	635	725	1440	1440
	height	600	850	1050	1250	1450	2025	2025	2025	1970
	depth	650	600	600	600	600	810	860	860	890
internal dims[3] [mm]	width	470	520	520	520	520	510	600	1310	1340
	height	430	660	860	1060	1260	1510	1510	1510	1460
	depth	300	420	420	420	420	640	690	690	750
max shelf workload [kg]*	-	10	10	10	10	10	20	30	30	30
	PW version	on request					100	100	100	100
max unit workload [kg]	-	20	30	40	50	60	100	150	300	300
	W version	on request								
nominal power [W]		160	170	170	330	330	400	400	550	550
weight [kg]		30	48	52	61	66	105	115	195	200
temperature resolution [°C]		every 0,1								
temperature fluctuation[4] at +4°C [°C]		±0,2	±0,2	±0,3	±0,3	±0,3	±0,2	±0,2	±0,3	±0,3
over temperature protection		class 1.0 according to DIN 12880 / class 3.2 (option)								
voltage 50/60 Hz [V]		110-120/220-240								
shelves fitted / max[6]		2/2	3/4	3/4	4/6	4/7	3/11	3/11	2 x 3/11[5]	2 x 3/11[5]
warranty		24 months								
manufacturer		POL-EKO-APARATURA								

* - at even surface workload
** - dims of door handles, power cable and leveling feet or wheels not included
1 - working capacity of chamber can be smaller
2 - additional internal glass door

3 - dims of units with double door can be smaller
4 - fluctuation measured in centre of the chamber
5 - two columns with 3 shelves each
6 - "fitted" number of shelves fitted, included in price
    "max" number of shelves which can be fitted

Available options for each chamber :

CHL*/T - extended temperature range to -10°C
CHL*/A - external glass door
PLUS - automatic defrosting during operating

There is a possibility to combine different sizes of ST+ and CHL+ chambers between models ST/CHL+ 2-5. (e.g ST 2+/CHL 3+)

CHL 2 / ZLN 85+

Example of configuration

To configure a double chamber laboratory refrigerator, e.g.:
- upper chamber with solid door and temperature range 0...+10°C
- lower chamber with solid door and temperature range -10...+10°C, you select:

for CHL 350/350 model: CHL 350/350 and CHL 350/T option for lower chamber

Parameter		CHL 1/1+	CHL 1/1/1+	CHL 2/2+	CHL 2/3+	CHL 2/4+	CHL 3/3+	CHL 350/350
air convection		forced						
chamber capacity[1]	[l]	68/68	68/68/68	150/150	150/200	150/250	200/200	294/294
	[cu ft]	2,4/2,4	2,4/2,4/2,4	5,2/5,2	5,2/7,0	5,2/8,5	7,0/7,0	10,3/10,3
door type		solid / glass or double[2] (option)						
temperature range	[°C]	0...+10 / -10...+10 (option only for CHL 350/350)						
	[°F]	+32...+50 / +14...+50 (option only for CHL 350/350)						
controller		microprocessor with external LCD graphic display						
interior		aluminum / stainless steel						
housing		powder coated sheet / stainless steel linen finish INOX/G or polished INOX/S						
overall dims [mm]**	width	550	550	600	600	600	600	720
	height	1170	1740	1670	1870	2070	2070	2025
	depth	650	650	600	600	600	600	860
internal dims[3] [mm]	width	470	470	520	520	520	520	600
	height	430	430	660	660/860	660/1060	860	700
	depth	300	300	420	420	420	420	700
max shelf workload [kg]*	-	10	10	10	10	10	10	30
	PW version	on request						
max unit workload [kg]	-	20/20	20/20/20	30/30	30/40	30/50	40/40	75/75
	W version	on request						
nominal power [W]		320	480	350	350	350	350	800
weight [kg]		65	100	100	105	110	115	162
temperature resolution [°C]		every 0,1						
temperature fluctuation[4] at +4°C [°C]		±0,2	±0,2	±0,3	±0,3	±0,3	±0,3	±0,5
over temperature protection		class 1.0 according to DIN 12880 / class 3.2 (option)						
voltage 50/60 Hz [V]		110-120/220-240						
shelves fitted / max[6]		2/2	2/2	3/4	3/4	3/4	3/4	2/6
warranty		24 months						
manufacturer		POL-EKO-APARATURA						

* - at even surface workload
** - dims of door handles, power cable and leveling feet or wheels not included
1 - working capacity of chamber can be smaller
2 - additional internal glass door
3 - dims of units with double door can be smaller
4 - fluctuation measured in centre of the chamber
5 - "fitted" number of shelves fitted, included in price
    "max" number of shelves which can be fitted

Advantages

- chamber capacity from 25 to 106 litres
- transport in stable temperature, e.g. +4°C
- adjustable temperature from
  - -18 to +10°C
  - -10 to +10°C for TB 35 INOX
- stable temperature regardless of ambient conditions
- temperature display
- battery, car socket (not for TB 80A and TB 105A) or standard mains power supply, wireless temperature data loggers available (option)

Application

- transport of:
  - water and sewage samples
  - biological substances, tissues etc.
  - blood and haematoid material according to certain directives

Thermostatic boxes, unlike normal car freezers, guarantee a stable temperature during transport. TB 35 INOX is a solution not only for customers who carry samples. With an additional battery power supply, it features also the functions of a mini refrigerator which is able to hold set temperature in case of power failure.

wide range of wireless temperature data loggers is available

chamber with bottles for samples

Options and accesories

(only for TB 35 INOX)

			Model	TB 32 A	TB 50 A	TB 80 A	TB 105 A	TB 35 INOX
Parameter								
chamber capacity	[l]			25	49	80	106	35
	[cu ft]			0,8	1,7	2,8	3,7	1,2
temperature range	[°C]			-18...+10				-10...+10
	[°F]			0...+50				+14...+50
interior				powder coated aluminium				stainless steel
housing				plastic				powder coated sheet
overall dims [mm]	width			580	630	790	790	600
	height			385	480	455	555	425
	depth			360	360	500	500	440
internal dims [mm]	width			315	315	500	500	340
	height			265	410	365	465	310
	depth			300	265	400	400	340
nominal power [W]				60	45	65	65	90
weight [kg]				20	25	45	50	40
temperature resolution [°C]				every 1,0				
temperature fluctuation [°C]				± 1,0				
voltage [V]				230 AC 50/60 Hz or 12 DC				
warranty				12 months				
manufacturer				POL-EKO-APARATURA				

Application

- long-term storage of samples and biological material for research
- storage of easily decomposing material (e.g. solid state)
- freeze resistance tests (e.g. of building materials: concrete, wood etc.)
- pre-freezing

Laboratory freezers can freeze and store frozen samples.

acces port

LCD graphic display
New!

RS 232
(at the rear)

perforated shelf

door handle with door lock

ZL

ZLN 300

Advantages

- single chamber models, possibility to combine ZLN 85+ with models: CHL 2+ to CHL 5+ and ST 2+ to ST 5+
- capacity from 85 to 299l
- plastic or stainless steel interior (depending on model)
- housing: powder coated sheet, stainless steel linen finish (**INOX/G**) or polished (**INOX/S**) (depending on model)
- two temperature ranges depending on model:
  - -25...0°C
  - -35...0°C
- thermal insulation - polyurethane foam
- cooling system

- natural air convection
- LCD graphic display *New!*
- illuminated touch buttons *New!*
- microprocessor temperature control
- temperature sensor fail alarm (see page 56)
- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- self-check function (auto control)

Program possibilities

- single segment temperature-time profile
- temperature program priority (see page 56)
- adjustable start delay feature (from 1 min to 99:59 h)
- adjustable time of holding the set temperature (from 1 min to 99:59 h), or continuous operating

- overview of set parameters during operating time
- over temperature sound alarm
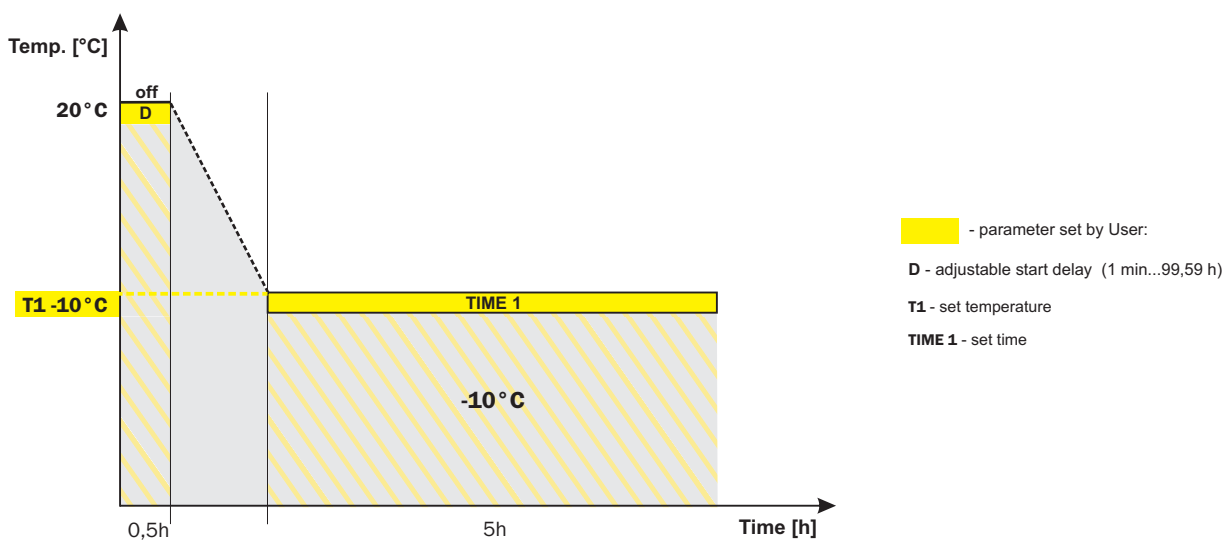
All POL-EKO-APARATURA products can be supplied with a calibration certificate issued by an accredited Measurement Laboratory. Further information is available on pages 87-89 and our website www.pol-eko.eu

Laboratory freezers

ZLN 85 + freezer

ZLN 85+ laboratory freezer can be combined witch laboratory refrigerators CHL 2+, 3+, 4+, 5+ or thermostatic cabinets ST 2+, 3+, 4+, 5+ and delivered as a double chamber model.

Standard equipment

- solid door
- RS 232 interface and USB port *New!*; RS 232 or USB cable must be purchased additionally (RSK or USBK)
- glass shelves in models ZLN 75, 145, 180; wire shelves (with slides set) in model ZLN 85+ and perforated shelves in models ZLN 125, 200, 300
- manufacturer's test certificate at -10°C
- operation manual in English and English menu (other languages on request)
- acces port for external sensor in models ZLN 85+, 125, 200, 300

Options and accesories (icon description see page 51)

Laboratory freezers

ZL

Available options

*/W - reinforced version
*/PW - reinforced shelf
QLK/* - wheels

ZLN 85+

Parameter	Model	ZLN 75	ZLN 145	ZLN 180	ZLN 85+	ZLN 125	ZLN 200	ZLN 300
air convection		natural						
chamber capacity[1]	[l]	85	160	196	86	125	200	299
	[cu ft]	3,0	5,6	6,9	3,0	4,4	7,0	10,5
door type		solid						
temperature range	[°C]	-25...0				-35...0		
	[°F]	-13...+32				-31...+32		
controller		microprocessor with external LCD graphic display						
interior		plastic			stainless steel			
housing		powder coated sheet			powder coated sheet / stainless steel (INOX/G or INOX/S)			
overall dims [mm]**	width	560	600	600	600	675	775	775
	height	850	1250	1455	885	1210	1380	1730
	depth	610	650	650	635	785	785	785
internal dims [mm]	width	410	450	450	420	396	496	496
	height	630	970	1160	590	600	770	1120
	depth	390	420	420	395	524	524	524
max shelf workload [kg]*	-	10	10	10	10	10	10	10
	PW version	-	-	-	-	50	50	50
max unit workload [kg]	-	30	40	50	30	50	65	80
	W version	-	-	-	-	100	130	160
nominal power [W]		120	96	100	200	450	450	450
weight [kg]		34	48	55	60	90	120	185
temperature accuracy [°C]		every 0,1						
temperature fluctuation[2] at -10°C [°C]		±0,4	±0,6	±0,7	±0,4	±0,7	±0,7	±1,0
voltage	50 Hz [V]	220-240			110-120/220-240			
	60 Hz [V]	-						
shelves fitted / max[3]		2/2	4/4	5/5	2/4	2/3	2/4	3/6
warranty		24 months						
manufacturer		POL-EKO-APARATURA						

* - at even surface workload
** - dims of door handles, power cable and leveling feet or wheels not included
1 - working capacity of chamber can be smaller
2 - fluctuation measured in centre of the chamber
3 - "fitted" number of shelves fitted, included in price, "max" number of shelves which can be fitted

Laboratory incubators **(CL)** and drying ovens **(SL)** are available in 3 versions: **ECO, STD** and **TOP+**, cooled incubators **(IL)** and climatic chambers **(KK)** in **STD** and **TOP+** versions, and sterilizers **(SR)** in **STD** version only.

ST, CHL, ZLN
New!
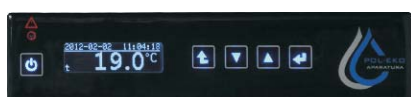
ECO, STD
New!

TOP+

displays
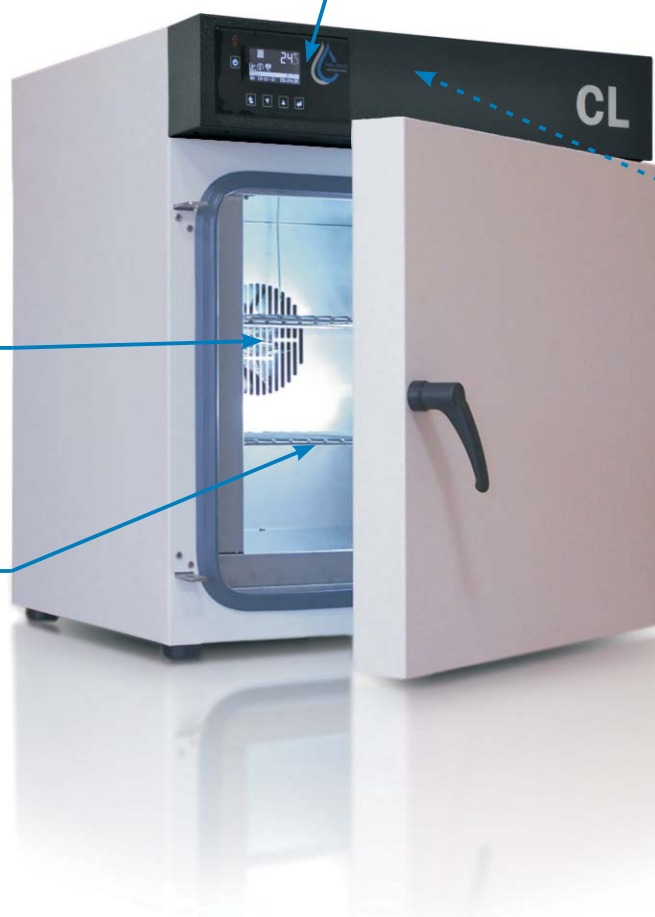
automatic air-flap control (at the rear)
New!

fan

stainless steel interior

CLW 53 STD

Equipment available in ECO version

- Incubators (CL)
- Drying ovens (SL)

ECO - basic version

- combination of basic parameters and indispensable accessories
- designed for simple applications
- very attractive price

Program possibilities

- single segment temperature-time profile
- temperature program priority
- adjustable start delay feature (from 1 min to 99:59 h)
- adjustable time of holding set temperature
  (from 1 min to 99:59 h), or continuous operating

- 1 user program memory
- overview of parameters during operating time
- automatic air-flap control (adjustable) *New!*
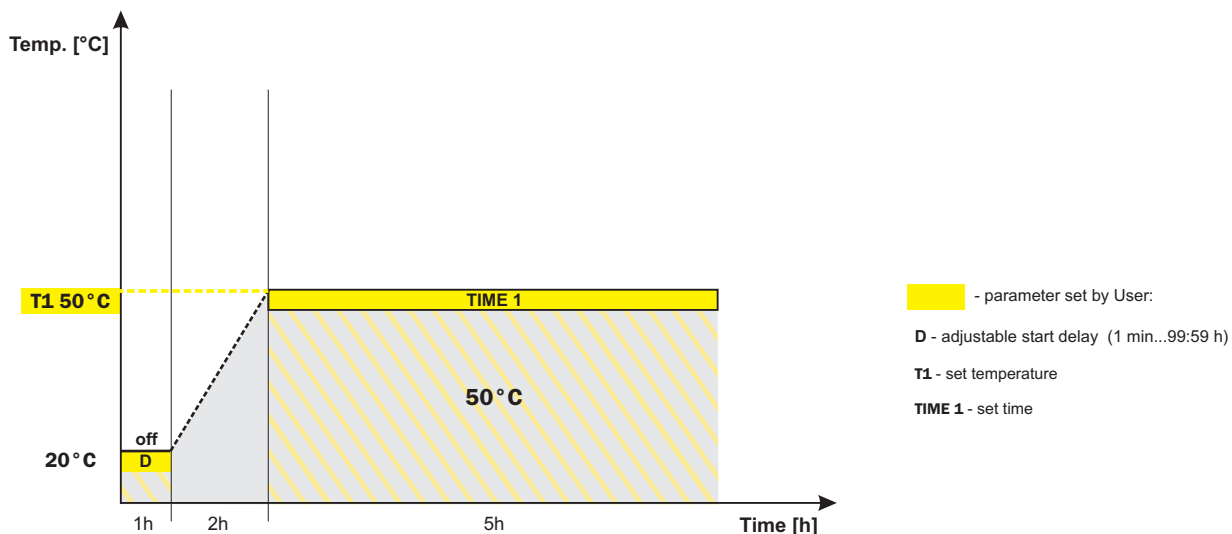
Temp. [°C]

T1 50°C

TIME 1

50°C

off

D

20°C

1h   2h   5h   Time [h]

- parameter set by User:

D - adjustable start delay (1 min...99:59 h)

T1 - set temperature

TIME 1 - set time

Standard equipment

- stainless steel interior
- housing: powder coated sheet or stainless steel
  linen finish (**INOX/G)** (depending on model)
- forced or natural air convection (depending on model)
- automatic fan shut down after completing the program
  (for instruments with forced air convection)
- solid door
- LCD graphic display *New!*
- illuminated touch buttons *New!*
- microprocessor temperature control
- temperature sensor fail alarm (see page 56)

- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- RS 232 interface and USB port *New!* (see page 56)
- self-check function (auto control)
- manufacturer's test certificate
- operation manual in English and English menu
  (other languages on request)
- stainless steel wire shelves (1-6 pieces,
  depending on model) with slides set
- over temperature protection according to DIN 12880:
  1.0 class

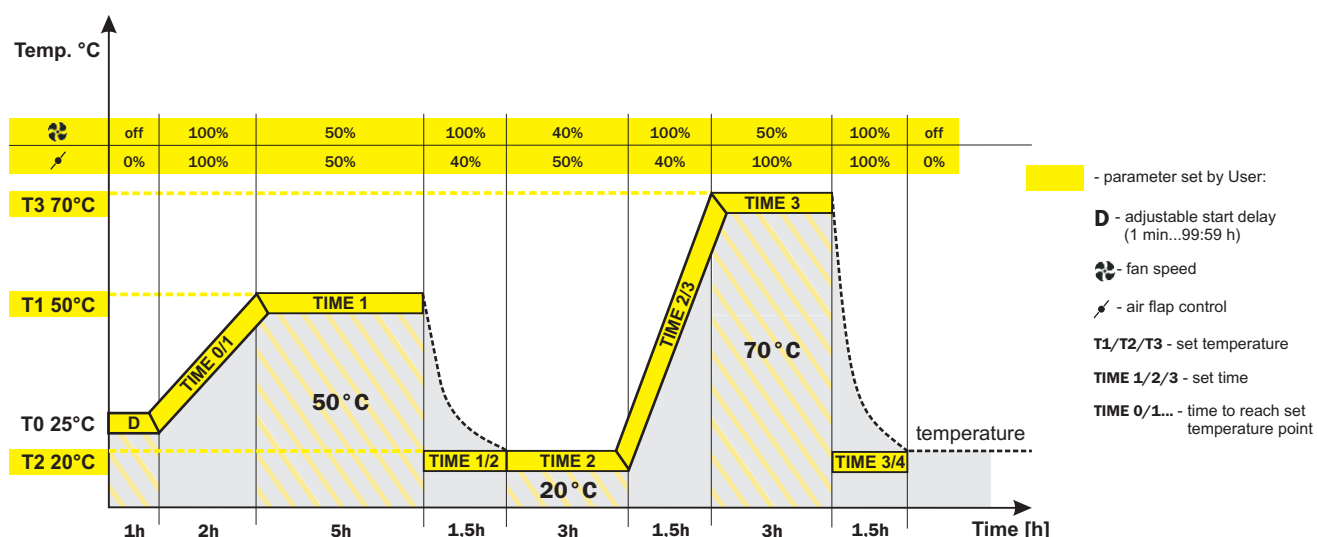## Equipment available in STD version

- Incubators (CL 53-1000)
- Cooled incubators (IL)
- Drying ovens (SL 53-1000)
- Sterilizers (SR)
- Climatic chambers (KK)

STD-standard version

- extended programming possibilities
- wide range of optional equipment
- affordable price

Program possibilities

- six segment temperature-time profile
- program priority: temperature for CL/IL/SL/SR and time for KK
- 3 user programs memory
- cycle run of the program
- adjustable heating up/cooling down system
- adjustable start delay feature (from 1 min to 99:59 h)
- adjustable hold at set point (from 1 min to 999 h), or continuous operating (temperature; humidity in KK; light with FOT and FIT options)

- overview of parameters during operating time
- recording min, average and max temperature (and humidity in KK) value for each segment
- over temperature (and humidity in KK) sound alarm (see page 58)
- fan speed control (for instruments with forced air convection)
- automatic air-flap control (adjustable) *New!*

Standard equipment

- stainless steel interior
- housing: powder coated sheet, stainless steel linen finish (**INOX/G**) or polished (**INOX/S**) (depending on model)
- solid door
- forced or natural air convection (depending on model)
- automatic fan shut down after completing the program (for instruments with forced air convection)
- LCD graphic display *New!*
- illuminated touch buttons *New!*
- microprocessor temperature (and humidity in KK; light with FIT option) control
- temperature (and humidity in KK) sensor fail alarm (see page 56)

- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- RS 232 interface and USB port *New!*
- self-check function (auto control)
- automatic defrosting in KK range
- manufacturer's test certificate
- operation manual in English and English menu (other languages on request)
- stainless steel wire shelves (1-6 pieces, depending on model) with slides set
- over temperature protection according to DIN 12880: 2.0 class in CL/IL/SL/SR; 3.3 class in KK

Equipment available in TOP+ version

- Incubators (CL 53-1000)
- Cooled incubators (IL)
- Drying ovens (SL 53-1000)
- Climatic chambers (KK)
- Thermostatic cabinets (ST)

TOP+ - professional version

World's first full colour touch screen thermostatic equipment with Ethernet network connection!

To meet the expectations of the most demanding customers, POL-EKO-APARATURA has introduced a new professional range of ovens, incubators, cooled incubators and climatic chambers called "TOP+". First in the market to feature Ethernet network connection which allows to connect several units and program, monitor or record their parameters on any computer inside a laboratory or remotely via internet. Equipped with a full colour, clear 5.7" LCD touch screen, easy-to-use intuitive software, USB slot for data transfer make the operating comfortable. The large size of the display enables the user to view the unit's current parameters and program stage with only one touch of the screen. Additionally, the controller has been equipped with a 7-day programming mode and temperature (and humidity for the KK range) calibration feature at 3 points straight from the control panel.

Legend:

- parameter set by User:

D - adjustable start delay (1 min...99:59 h)

- fan speed

- air flap control

T1/T2/T3 - set temperature

TIME 1/2/3 - set time

TIME 0/1... - time to reach set temperature point

Standard equipment

- stainless steel interior
- housing: powder coated sheet, stainless steel linen finish (**INOX/G**) or polished (**INOX/S**) (depending on model)
- solid door
- forced or natural air convection (depending on model)
- automatic fan shut down after completing the program (for instruments with forced air convection)
- automatic air-flap control, adjustable
- full colour, transparent 5.7" LCD touch screen
- microprocessor temperature (and humidity in KK; light with FIT option)
- temperature (and humidity in KK) sensor fail alarm (see page 56)
- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)

- USB slot
- RS 232 interface (see page 56)
- self-check function (auto control)
- automatic defrosting in KK range
- manufacturer's test certificate
- operation manual in English and English menu (other languages on request)
- stainless steel wire shelves (2-6 pieces, depending on model) with slides set
- over temperature protection according to DIN 12880: 3.1 class in CL/SL; 3.3 class in IL/KK/ST
- Ethernet connection
- TOP+ Control software, temperature (and humidity in KK, light with FIT option) control and monitoring via PC
- open door sensor
- fan speed control (for instruments with forced air convection)

TOP+ - professional version

Advanced program possibilities of the "TOP+" range:

- administrator function that allows to manage user accounts
- access control via login
- nine segment temperature-time profile or 7 days programming
- temperature (and humidity in KK) calibration in 3 points
- automatic air-flap control (each 10% regulation)
- cycle run of the program
- adjustable heating up / cooling down system
- adjustable start delay feature (from 1 min to 99:59 h)
- adjustable hold at set point (from 1 min to 999 h),
  or continuous operating (temperature; humidity in KK;
  light with FOT and FIT options)
- overview of parameters during operating time
- recording min, average and max temperature (and humidity in KK)
  value for each segment
- over temperature (and humidity in KK) sound alarm (see page 58)
- fan speed control (for instruments with forced air convection)
- time or temperature priority program

GLP supporting functions:
- password protected settings
- 20 user programs memory
- measurement memory with possibility of displaying the values
  in tabular or graphic form
- measurement data saving on external memory through the USB port
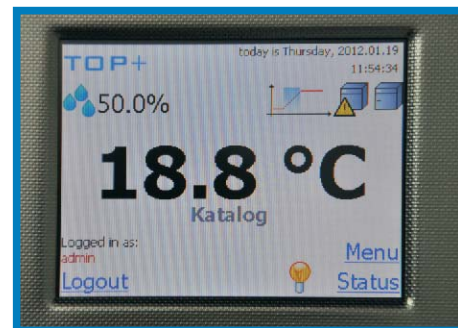
5.7" LCD full colour touch screen panel

Main screen
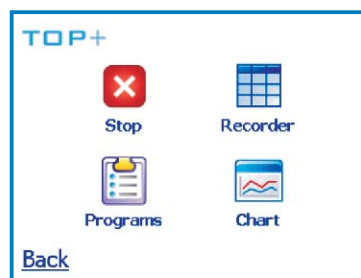
User's menu
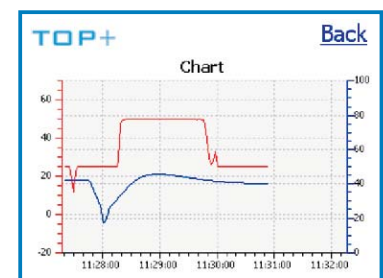
Temperature and humidity chart
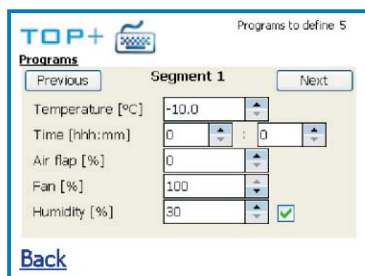
Program settings
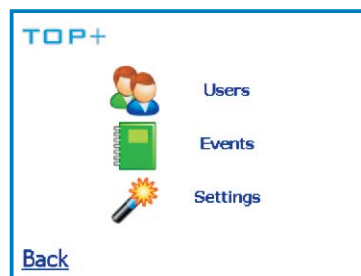
Administrator panel settings
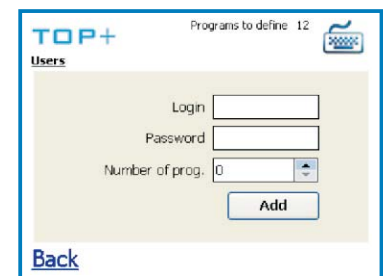
Administrator panel settings
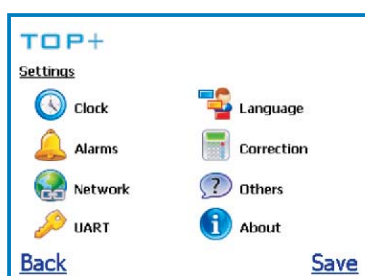
Administrator panel settings

7 days programming

Measurement recording

TOP+ Control

To facilitate the configuration of complex programs, a TOP+ Control software has been introduced. Moreover, the user is able to program and control the "TOP+" equipment with ease from any corner of the world by accessing the unit via Internet!
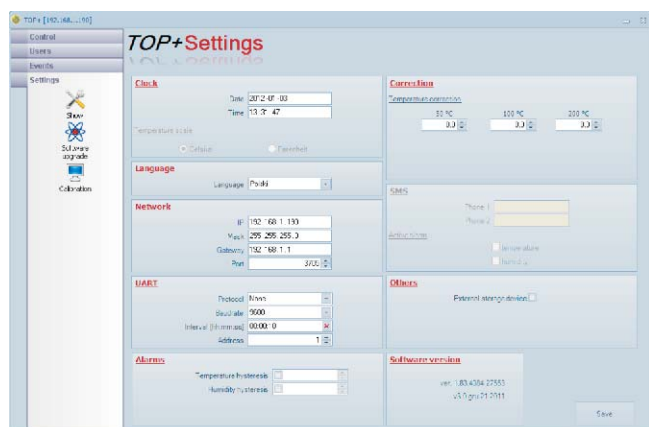
Device manager
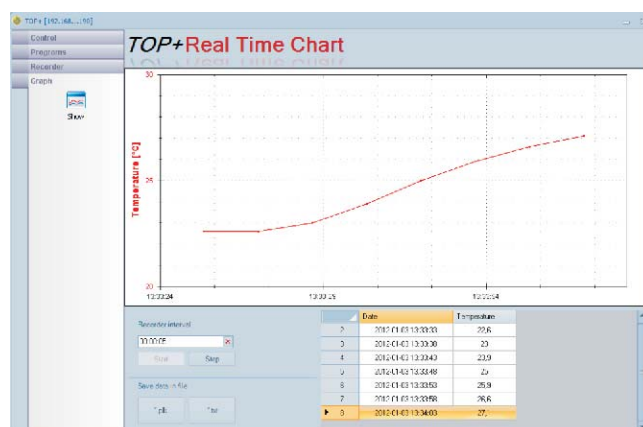
Temperature chart

EasyLab-T PLUS

EasyLab-T PLUS software features temperature and humidity monitoring in all thermostatic equipment manufactured by POL-EKO-APARATURA.

The user may record constant or temporary values, accumulate them and convert into charts. RS 232 or USB port allows the recording process (it is necessary to purchase a connection cable along with the software). If the unit is equipped with an additional Pt 100 temperature sensor, the EasyLab-T PLUS software enables simultaneous recording. Additionally EasyLab-T PLUS software enables programming of devices in TOP+ version, thanks to integrated TOP+ Control application.

EasyLab-T PLUS features high quality tools for chart making and approximation.
Standard features of EasyLab-T PLUS software:
- report creator
- data import from external memories
- multilanguage (Polish, Eenglish, German, Spanish, Hungarian, Portuguese, Romanian

Tabular report

Temperature and humidity chart

Laboratory incubators

Application

- incubation of samples for microbiological examinations
- analysis of thermal resistance of samples subjected to higher temperatures (e.g. pigments and lacquers)
- antibody testing
- bacterial research
- chemical storage
- crystallization studies
- cultivating thermophilic bacteria
- denaturalizing tests for food industry
- microbiological determinations
- pharmaceutical stability testing

Laboratory incubators can store samples in a higher temperature of up to 100°C.

acces port
(option)

air flap
(at the rear)

illuminated
touch
buttons
New!

stainless
steel housing
linen finish
(INOX/G)

CLW 115 STD INOX/G

Advantages

- available in ECO, STD and TOP+ versions
- capacity from 15 to 1005 litres
- stainless steel interior
- housing: powder coated sheet or stainless steel linen finish (**INOX/G**) (depending on model)
- forced or natural air convection (depending on model)
- fan speed regulation from 0 to 100% for CLW 15, 32, 53, 115 and 240; from 10 to 100% for CLW 400, 750 and 1000
- heating system (temperature in the chamber cannot be lower than ambient temperature)

- CL 750 and 1000 models equipped with wheels
- LCD graphic display in ECO and STD version *New!* LCD touch screen in TOP+ version
- illuminated touch buttons in ECO and STD version *New!*
- microprocessor temperature control
- temperature sensor fail alarm (see page 56)
- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- self-check function (auto control)

Program possibilities

- ECO version (see page 25)
- STD version (see page 26)
- TOP+ version (see page 27-28)

Standard equipment

- solid door
- RS 232 interface and USB port *New!* ; RS 232 or USB cable must be purchased additionally (RSK or USBK)
- stainless steel wire shelves (1-6 pieces, depending on the model) with slides set
- manufacturer's test certificate at +37°C

- air-flap diameter 37 mm for CL 15, 32, 53 and 115; 60 mm for CL 240, 400, 750 and 1000
- operation manual in English and English menu (other languages on request)
- over temperature protection according to DIN 12880: 1.0 class in ECO version, 2.0 class in STD version, 3.1 class in TOP+ version

Options and accesories (icon description see page 51)
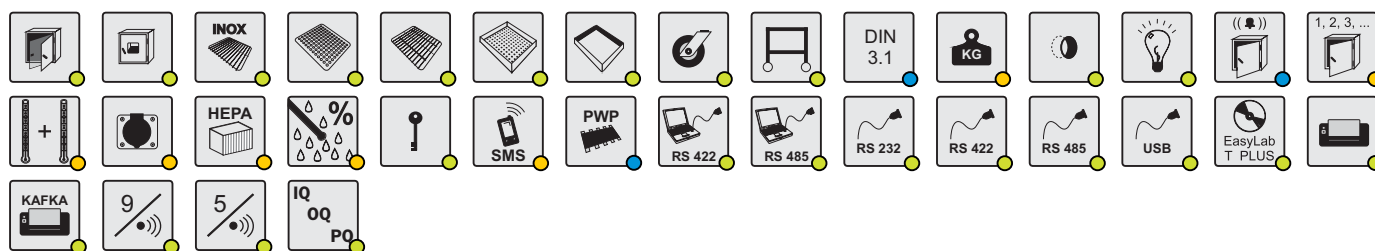
- for ECO, STD and TOP+
- for STD only
- for STD and TOP+

All POL-EKO-APARATURA products can be supplied with a calibration certificate issued by an accredited Measurement Laboratory. Further information is available on pages 87-89 and our website: www.pol-eko.eu

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Laboratory incubators

Available options

CL*/A - door with viewing window
CL*/C - internal glass door
CL*/W - reinforced version
PW - reinforced shelf

Parameter	Model	CL 15	CL 32	CL 53	CL 115	CL 240	CL 400	CL 750	CL 1000
air convection		natural (CLN) / forced (CLW)					forced (CLW)		
chamber capacity[1]	[l]	15	32	56	112	245	424	749	1005
	[cu ft]	0,5	1,1	2	3,9	8,6	15	26,4	35,5
door type		solid			solid / door with viewing window or double[3] (option)				
temperature range	[°C]	5° above ambient temperature...+100° (+70° for ECO version)							
	[°F]	41° above ambient temperature...+212° (+158° for ECO version)							
controller		microprocessor with external LCD graphic display							
interior		acid-proof stainless steel according to DIN 1.4301							
housing		powder coated sheet / stainless steel linen finish (INOX/G)							
overall dims* [mm]	width	440	520	590	650	815	1015	1255	1255
	height	520	600	700	845	1140	1380	1620	2030
	depth	350	435	560	650	710	710	810	810
internal dims [mm]	width	320	400	395	460	600	800	1040	1040
	height	240	320	395	540	800	1040	1200	1610
	depth	180	240	360	450	510	510	600	600
max shelf workload [kg]	-	10	10	10	10	10	10	-	-
	PW version	-	-	50	50	100	100	100	100
max unit workload [kg]	-	20	30	40	60	90	120	140	-
	W version	-	-	80	120	300	300	300	300
nominal power [W]		300	300	400	400	800	1200	1800	1800
weight [kg]		27	35	50	65	126	174	260	330
temperature resolution [°C]		every 0,1							
temperature fluctuation[2] at +37°C [°C]	CLN	±0,5	±0,5	±0,2	±0,2	±0,2	-	-	-
	CLW	±0,5	±0,2	±0,2	±0,2	±0,2	±0,2	±0,2	±0,2
over temperature protection		class 1.0 in ECO/2.0 in STD/3.1 in TOP+							
voltage 50 /60 Hz [V]		110-120/220-240							
shelves fitted / max[4]		1/2	1/3	2/5	2/7	3/10	3/14	5/16	6/22
warranty		24 months							
manufacturer		POL-EKO-APARATURA							

* - dims of door handles, power cable and leveling feet or wheels not included
1 - working capacity of chamber can be smaller
2 - fluctuation measured in centre of the chamber
3 - additional internal glass door
4 - "fitted" - number of shelves fitted, included in price, "max" - number of shelves which can be fitted

Application

- microbiological research
- plant growing, microorganisms and insects breeding at specified temperature
- samples incubation

Cooled incubators can store samples in a stable environment regardless of ambient conditions, as the temperature range is -10...+100°C.

interior
lighting
(option)

door with
viewing window
(option)

stainless
steel interior

stainless steel
wire shelf

ILW 115 STD INOX/G

Advantages

- available in STD and TOP+ versions
- chamber capacity from 56 to 749 litres
- stainless steel interior
- housing: powder coated sheet or stainless steel linen finish (**INOX/G**) (depending on model)
- forced air convection
- fan speed control from 10 to 100%
- heating and cooling systems to hold set temperature regardless of ambient conditions
- thermal insulation - polyurethane foam

- ILW 750 models equipped with wheels
- LCD graphic display in STD version *New!* LCD touch screen in TOP+ version
- illuminated touch buttons in STD version *New!*
- microprocessor temperature controller
- temperature sensor fail alarm (see page 56)
- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- self-check function (auto control)

Program possibilities

- STD version (see page 26)
- TOP+ version (see page 27-28)

Standard equipment

- solid door
- RS 232 interface and USB port *New!*; RS 232 or USB cable must be purchased additionally (RSK or USBK)
- stainless steel wire shelves (2-6 pieces, depending on model) with slides set
- manufacturer's test certificate at +37 °C

- operation manual in English and English menu
- (other languages on request)
- over temperature protection according to DIN 12880: 2.0 class in STD version 3.3 class in TOP+ version
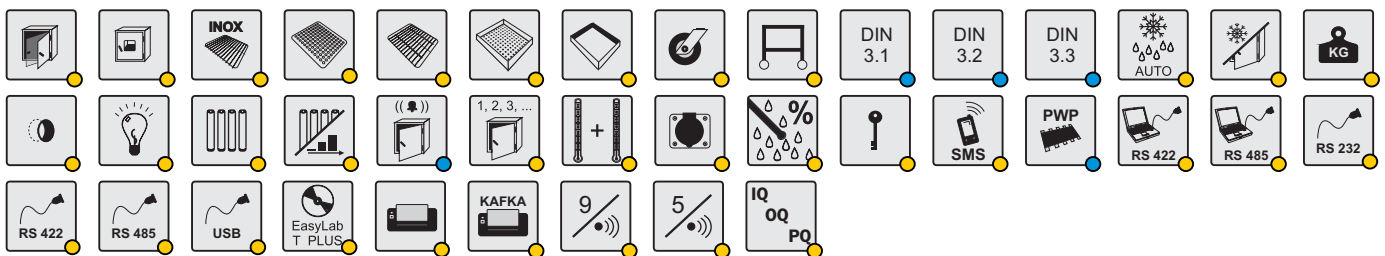
Options and accesories (icon description see page 51)

- ● for STD only
- ● for STD and TOP+

Available options

IL*/A - door with viewing window
IL*/C - internal glass door
IL*/W - reinforced version
PW - reinforced shelf
IL*/T - extended temperature range to -10°C
FOT - photoperiodic system

Parameter	Model	ILW 53	ILW 115	ILW 240	ILW 400	ILW 750
air convection		forced				
chamber capacity[1]	[l]	56	112	245	424	749
	[cu ft]	2	3,9	8,6	15	26,4
door type		solid / door with viewing window or double[3] (option)				
temperature range	[°C]	0...+70 (+100 in TOP+ version) / -10...+70 (+100 in TOP+ version) (option)				
	[°F]	+32...+158 (+212 in TOP+ version) / +14...+158 (+212 in TOP+ version) (option)				
controller		microprocessor with external LCD graphic display				
interior		acid-proof stainless steel according to DIN 1.4301				
housing		powder coated sheet / stainless steel linen finish (INOX/G)				
overall dims* [mm]	width	590	650	815	1015	1255
	height	950	1095	1420	1750	1900
	depth	560	650	710	710	810
internal dims [mm]	width	395	460	600	800	1040
	height	395	540	800	1040	1200
	depth	360	450	510	510	600
max shelf workload [kg]	-	10	10	10	10	10
	PW version	50	50	100	100	100
max unit workload [kg]	-	40	60	90	120	140
	W version	80	120	300	300	300
nominal power [W]		400	400	800	1200	1800
weight [kg]		69	90	140	185	275
temperature resolution [°C]		every 0,1				
temperature fluctuation[2] at +37°C [°C]		±0,2	±0,2	±0,2	±0,2	±0,2
over temperature protection		class 2.0 in STD/3.3 in TOP+				
voltage 50 /60 Hz [V]		110-120/220-240				
shelves fitted / max[4]		2/5	2/7	3/10	3/14	5/16
warranty		24 months				
manufacturer		POL-EKO-APARATURA				

* - dims of door handles, power cable and leveling feet or wheels not included
1 - working capacity of chamber can be smaller
2 - fluctuation measured in centre of the chamber
3 - additional internal glass door
4 - "fitted" - number of shelves fitted, included in price, "max" - number of shelves which can be fitted

Application

- thermal resistance analysis of building materials, electronic and electrotechnical components etc.
- monitoring properties of products subjected to high temperatures
- drying of wires of papermaking machines
- drying of laboratory glass
- general aging and curing
- general heating
- ordnance material testing
- preheating
- vulcanization studies
- agricultural genetic
- conditioning
- digestion of proteins
- drying of plant tissues
- drug metabolism
- life and exposure studies
- paper drying
- serum protein analysis
- suspended solids evaluation

Drying ovens can provide temperatures higher than ambient up to 300°C.

RS 232 and
USB port
(at the rear)
New!

visual
alarm

stainless steel
housing
linen finish
(INOX/G)

SLW 240 STD INOX/G

Advantages

- available in ECO, STD and TOP+ versions
- chamber capacity from 15 to 1005 litres
- stainless steel interior
- housing: powder coated sheet or stainless steel linen finish (**INOX/G**) (depending on model)
- forced or natural air convection (depending on model)
- fan speed regulation from 0 to 100% for SLW 15, 32, 53, 115 and 240 from 10 to 100% for SLW 400, 750 and 1000
- heating system (the temperature in chamber cannot be lower than the ambient temperature)

- SLW 750 and SLW 1000 models equipped with wheels
- LCD graphic display in ECO and STD version *New!* LCD touch screen in TOP+ version
- illuminated touch buttons in ECO and STD version *New!*
- microprocessor temperature controller
- temperature sensor fail alarm (see page 56)
- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- self-check function (auto control)

Program possibilities

- ECO version (see page 25)
- STD version (see page 26)
- TOP+ version (see page 27-28)

Standard equipment

- solid door
- RS 232 interface and USB port *New!*; RS 232 or USB cable must be purchased additionally (RSK or USBK)
- stainless steel wire shelves (1-6 pieces, depending on model) with slides set
- manufacturer's test certificate at +105°C

- air-flap diameter 37 mm for CL 15, 32, 53 and 115; 60 mm for CL 240, 400, 750 and 1000
- operation manual in English and English menu (other languages on request)
- over temperature protection according to DIN 12880:
  1.0 class in ECO version
  2.0 class in STD version
  3.1 class in TOP+ version

Options and accesories (icon description see page 51)

- ● for ECO, STD and TOP+
- ● for STD only
- ● for STD and TOP+

Drying ovens

Available options

SL*/A - door with viewing window
(temperature limited to +250°C)
SL*/W - reinforced version
PW - reinforced shelf

Parameter	Model	SL 15	SL 32	SL 53	SL 115	SL 240	SL 400	SL 750	SL 1000
air convection		natural (SLN) / forced (SLW)					forced (SLW)		
chamber capacity[1]	[l]	15	32	56	112	245	424	749	1005
	[cu ft]	0,5	1,1	2	3,9	8,6	15	26,4	35,5
door type		solid		solid / door with viewing window (option)					
temperature range	[°C]	5° above ambient temperature...+300° (+250° for ECO version)							
	[°F]	41° above ambient temperature...+572° (+482° for ECO version)							
controller		microprocessor with external LCD graphic display							
interior		acid-proof stainless steel according to DIN 1.4301							
housing		powder coated sheet / stainless steel linen finish (INOX/G)							
overall dims* [mm]	width	440	520	590	650	815	1015	1255	1255
	height	520	600	700	845	1140	1380	1620	2030
	depth	350	435	560	650	710	710	810	810
internal dims [mm]	width	320	400	395	460	600	800	1040	1040
	height	240	320	395	540	800	1040	1200	1610
	depth	180	240	360	450	510	510	600	600
max shelf workload [kg]	-	10	10	10	10	10	10	-	-
	PW version	-	-	50	50	100	100	100	100
max unit workload [kg]	-	20	30	40	60	90	120	140	-
	W version	-	-	80	120	300	300	300	300
nominal power [W]		600	1100	1600	2400	3000	3900	5400	5400
weight [kg]		27	35	50	65	126	174	260	330
temperature resolution [°C]		every 0,1							
temperature fluctuation[2] at +105°C [°C]	SLN	±0,7	±0,4	±0,3	±0,5	±0,6	-	-	-
	SLW	±0,7	±0,4	±0,3	±0,5	±0,5	±0,5	±0,5	±0,5
over temperature protection		class 1.0 in ECO/2.0 in STD/3.1 in TOP+							
voltage 50 /60 Hz [V]		110-120/220-240					400/208 3/N		
shelves fitted / max[3]		1/2	1/3	2/5	2/7	3/10	3/14	5/16	6/22
warranty		24 months							
manufacturer		POL-EKO-APARATURA							

* - dims of door handles, power cable and leveling feet or wheels not included
1 - working capacity of chamber can be smaller
2 - fluctuation measured in centre of the chamber
3 - "fitted" - number of shelves fitted, included in price, "max" - number of shelves which can be fitted

Application

- drying of painted and lacquered components
- drying/sterilizing of components between clean and dirty zones
- drying of components on production line

RS 232
and
USB port
New!

function
indications
(at the
rear)

air-flap
(on the top)

reinforced
shelves
(option)

SLWP 115 STD

Pass-through drying ovens

Our main goal is to provide the customer with the highest satisfaction if it comes to flexibility of our offer and individual solutions. Pass-through drying ovens are based on standard models of drying ovens and are available in 2 versions: 112, 245 liters. Each request for such equipment is given professional advice and is discussed in details, therefore we kindly ask you to contact us on this matter.

Model / Parameter		SLWP 115	SLWP 240
air convection		forced	
chamber capacity[1]	[l]	112	245
	[cu ft]	3,9	8,6
door type		solid / door with viewing window (option)	
temperature range	[°C]	5° above ambient temperature...+300°	
	[°F]	41° above ambient temperature...+572°	
controller		microprocessor with external LCD graphic display	
interior		acid-proof stainless steel according to DIN 1.4301	
housing		powder coated sheet / stainless steel linen finish (INOX/G)	
overall dims* [mm]	width	650	815
	height	885	1180
	depth	630	690
internal dims [mm]	width	460	600
	height	540	800
	depth	480	540
max shelf workload [kg]	-	10	10
	PW version	50	100
max unit workload [kg]	-	60	90
	W version	120	300
nominal power [W]		2400	3000
weight [kg]		65	126
temperature resolution [°C]		every 0,1	
temperature fluctuation[2] at +105°C [°C]		±0,5	±0,5
over temperature protection		class 2.0	
voltage 50 /60 Hz [V]		110-120/220-240	
shelves fitted / max[3]		2/7	3/10
warranty		24 months	
manufacturer		POL-EKO-APARATURA	

* - dims of door handles, power cable and leveling feet or wheels not included
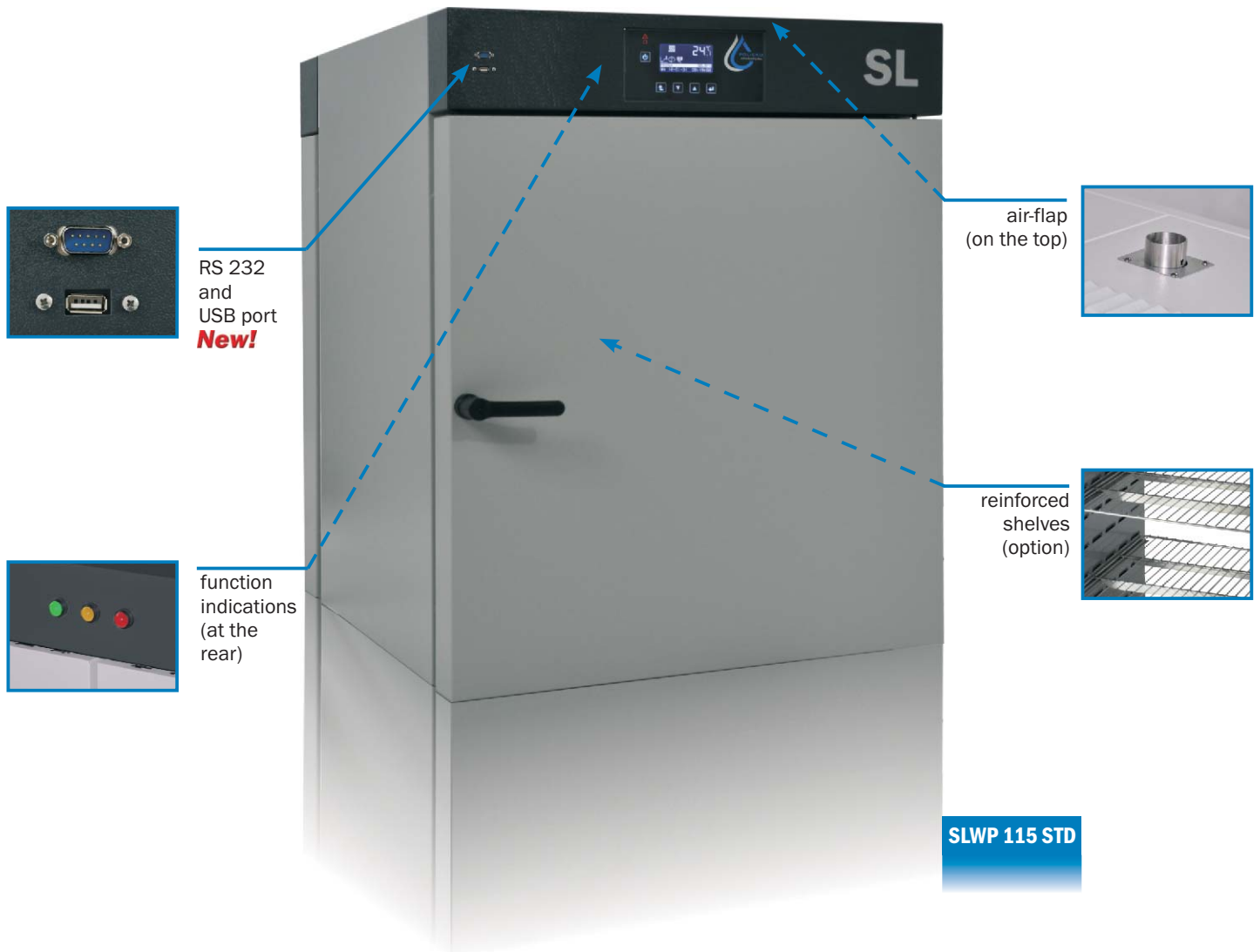1 - working capacity of chamber can be smaller
2 - fluctuation measured in centre of the chamber
3 - "fitted" - number of shelves fitted, included in price, "max" - number of shelves which can be fitted

Application

- drying of laboratory glass
- hot-air sterilization
- required by pharmacies, dentists and prosthetics

Sterilizers have been equipped with a couple of additional functions that protect samples. They can sterilize at temperatures up to 250 °C.

Pt 100 connection (option) (at the rear)

additional Pt 100 sensor (option)

fan

stainless steel wire shelves and interior

SRW 240 STD INOX/G

Advantages

- available in STD version
- chamber capacity from 56 to 1005 litres
- stainless steel interior
- housing: powder coated sheet or stainless steel linen finish (**INOX/G**) (depending on model)
- forced or natural air convection
- fan speed regulation from 0 to 100% for SLW 53, 115 and 240 from 10 to 100% for SLW 400, 750 and 1000
- factory configured sterilizing programs
- automatic door locking system during operating time

- air-flap closed automatically after launching the program
- SRW 750 and SRW 1000 models equipped with wheels
- LCD graphic display *New!*
- illuminated touch buttons *New!*
- microprocessor temperature controller
- temperature sensor fail alarm (see page 56)
- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- self-check function (auto control)

Program possibilities

- STD version (see page 26)

Standard equipment

- solid door
- RS 232 interface and USB port *New!* ; RS 232 or USB cable must be purchased additionally (RSK or USBK)
- stainless steel wire shelves (2-6 pieces, depending on model) with slides set

- air-flap diameter 37 mm for SR 53 and 115; 60 mm for SR 240, 400, 750 and 1000
- manufacturer's test certificate at +170°C
- operation manual in English and English menu (other languages on request)
- over temperature protection according to DIN 12880: class 2.0

Options and accesories (icon description see page 53)
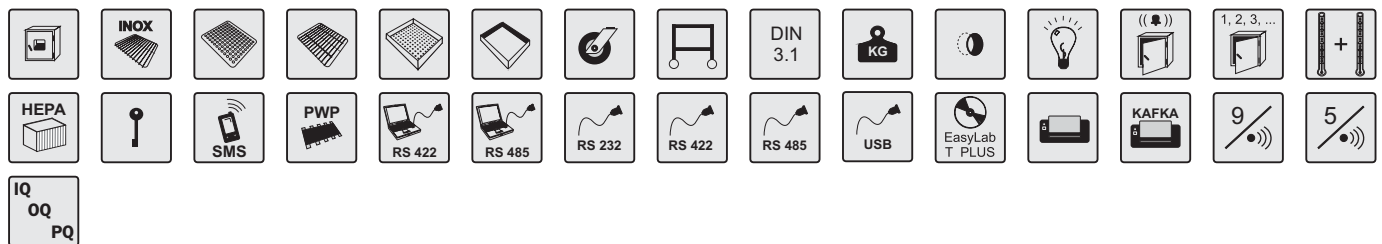
Available options

SR*/A - door with viewing window
SR*/W - reinforced version
PW - reinforced shelf

Model / Parameter		SR 53	SR 115	SR 240	SR 400	SR 750	SR 1000
air convection		natural (SRN) / forced (SRW)			forced (SRW)		
chamber capacity[1]	[l]	56	112	245	424	749	1005
	[cu ft]	2	3,9	8,6	15	26,4	35,5
door		solid / door with viewing window (option)					
temperature range	[°C]	5 above ambient temperature...+250					
	[°F]	41 above ambient temperature...+482					
controller		microprocessor with external LCD graphic display					
interior		acid-proof stainless steel according to DIN 1.4301					
housing		powder coated sheet / stainless steel linen finish (INOX/G)					
overall dims* [mm]	width	590	650	815	1015	1255	1255
	height	700	845	1140	1380	1620	2030
	depth	560	650	710	710	810	810
internal dims [mm]	width	395	460	600	800	1040	1040
	height	395	540	800	1040	1200	1610
	depth	360	450	510	510	600	600
max shelf workload [kg]	-	10	10	10	10	-	-
	PW version	50	50	100	100	100	100
max unit workload [kg]		40	60	90	120	140	-
nominal power [W]		1600	2400	3000	3900	5400	5400
weight [kg]		50	65	126	174	260	330
temperature resolution [°C]		every 0,1					
temperature fluctuation[2] at +170°C [°C]	SRN	±0,4	±0,6	±0,7	-	-	-
	SRW	±0,4	±0,5	±0,5	±0,6	±0,6	±0,6
over temperature protection		class 2.0					
voltage 50 /60 Hz [V]		110-120/220-240			400/208 3/N		
shelves fitted / max[3]		2/5	2/7	3/10	3/14	5/16	6/22
warranty		24 months					
manufacturer		POL-EKO-APARATURA					

* - dims of door handles, power cable and leveling feet or wheels not included
1 - working capacity of chamber can be smaller
2 - fluctuation measured in centre of the chamber
3 - "fitted" - number of shelves fitted, included in price, "max" - number of shelves which can be fitted

Application

- plant and fungus growing
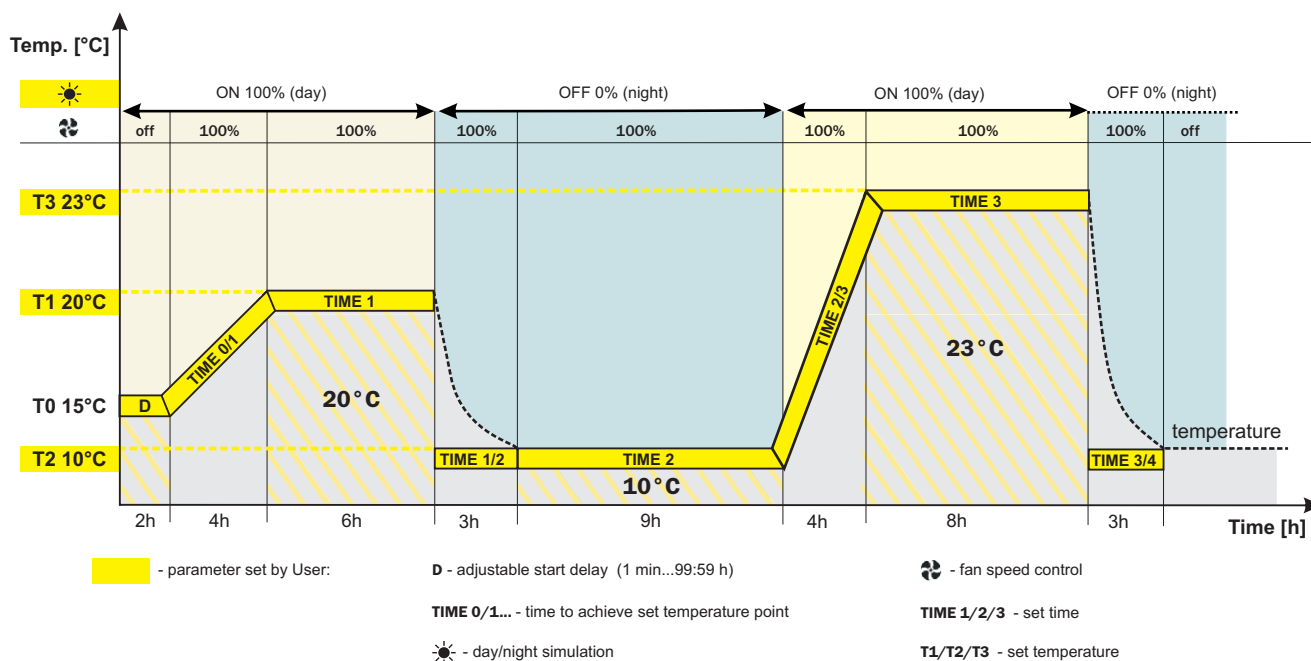- microorganisms and insects breeding

Photoperiodic system is an additional option available for thermostatic cabinets (ST) and cooled incubators (IL). Some applications require day and night simulation. Photoperiodic system consists of illumination system placed in the door, on the side walls or in the ceiling of the unit (depending on model). For each segment of temperature-time profile the user sets either light ON or OFF. Standard light is daylight. Other colours on request.

photoperiodic system (in the door)

photoperiodic system (in the ceiling)

ILW 53 STD INOX/G + IL/FOT

Advantages

- day and night simulation software able to control illumination and temperature
- temperature range for "night" simulation: -10 ... +70°C for IL range and +3 ... +60°C for ST range (depending on the selected temperature option)
- temperature range for "day" simulation: +5 ... +50°C for IL range and +10 ... +50°C for ST range
- selection of light colour, intensity and place of installation of the lamps (door, wall or shelves) - depending on model
- aluminum or stainless steel interior (depending on model)
- "photoperiodic system" option does not feature illumination intensity
- temperature program priority in STD version
- temperature or time program priority in TOP+ version

Program possibilities

	- parameter set by User:	**D** - adjustable start delay (1 min...99:59 h)	- fan speed control
	TIME 0/1... - time to achieve set temperature point	**TIME 1/2/3** - set time	
	- day/night simulation	**T1/T2/T3** - set temperature	

Photoperiodic system

Photoperiodic system (*/FOT option) for single and double chamber thermostatic cabinets (ST)**

Option	ST/FOT2	ST/FOT4	ST/FOT6	ST/FOT8	ST/FOT10	ST/FOT15
available for models	ST 1+ ST 1/1+	ST 2+ ST 2/2+ ST 350/350	ST 2+; ST 3+ ST 2/2+ ST 3/3+ ST 350/350	ST 5+	ST 500 ST 700	ST 1200
temperature range with photoperiod ON [°C]	+10 ... +50					
numbers of lamps on walls	2	4	6	8	10	15 (3 colums with 5 pieces)
adjustable illumination intensivity	no	no	no	no	no	no

** for ST models with */FOT option, inner dims can be narrower by 4 cm on each side., "FOT" and "FIT" options are factory preinstalled.
There is no possibility to order them separately.

Photoperiodic system (*/FOT option) for cooled incubators (IL)**

Option	IL/FOT2S	IL/FOT3S	IL/FOT5D	IL/FOT6D	ST/FOT8D	ST/FOT10D
available for models	ILW 53	ILW 115	ILW 53	ILW 115 ILW 240	ILW 240 ILW 400 ILW 750	ILW 750
temperature range with photoperiod ON [°C]	+5 ... +50°C					
numbers of lamps in door	-	-	5	6	8	10
numbers of lamps in ceiling	2	3	-	-	-	-
adjustable illumination intensivity	no	no	no	no	no	no

** "FOT" and "FIT" options are factory preinstalled. There is no possibility to order them separately.

Phytotron system (/FIT option) features illumination intensity in the day/night simulation. Lighting elements are located in over-shelf panels, side walls or door (depending on the selected model). Option available for thermostatic cabinets (ST 500-1450 in the TOP+ version and INOX interior), cooled incubators (ILW 115-750) and climatic chambers.*

Phytotron system (*/FIT option) for thermostatic cabinets (ST in TOP+ version with INOX interior) and climatic chambers (KK)**

Option***	ST/KK 350/FIT DS	ST/KK 500/700/FIT P	ST/KK 500/700/FIT S	ST/KK 1200/FIT P
temperature range with photoperiod ON [°C]	+10 ... +50°C	+10 ... +50°C	+10 ... +50°C	+10 ... +50°C
numbers of shelves with over-shelf lighting std/max	-	1/3	1/3	1/3
lamps in door	yes	no	no	no
lamps in walls	yes	no	yes	no
adjustable illumination intensivity	yes	yes	yes	yes

*** FIT DS - lamps in door and walls; FIT S - lamps in walls; FIT P - over-shelf panels

Phytotron system (*/FIT option) for cooled incubators (IL) and climatic chambers (KK)**

Option	IL/KK 115/FIT P	IL/KK 240/FIT P	IL/KK 400/FIT P	IL/KK 750/FIT P
temperature range with photoperiod ON [°C]	+10 ... +50°C	+10 ... +50°C	+10 ... +50°C	+10 ... +50°C
numbers of shelves with over-shelf lighting std/max	1/1	1/3	1/3	1/3
adjustable illumination intensivity	yes	yes	yes	yes

** "FOT" and "FIT" options are factory preinstalled. There is no possibility to order them separately.

Application

- plant and fungus growing
- seeds germination
- microorganisms and insects breeding
- photostability tests
- food preservation experiments
- all research and tests that require stable temperature and humidity conditions (optionally light)
- tests of building materials

Climatic chambers can control humidity and temperature to provide a precise environment.

container for deionized water (at the rear)

powder painted housing

light bulbs

wheels

KK 350 STD + KK 350/FIT

Advantages

- available in STD and TOP+ versions
- chamber capacity from 112 to 1460 litres
- stainless steel interior
- housing: powder coated sheet, stainless steel linen finish (**INOX/G**) or polished (**INOX/S**) (depending on model)
- forced air convection
- fan speed control from 10 to 100%
- heating and cooling systems to hold the set temperature regardless of ambient conditions
- thermal insulation - polyurethane foam
- automatic defrosting function (see page 65)

- LCD graphic display in STD version *New!* LCD touch screen in TOP+ version
- illuminated touch buttons in STD version *New!*
- microprocessor temperature and humidity control (illumination intensity control optionally – */FIT option) temperature and humidity sensor fail alarm (see page 56)
- power failure control system (see page 56)
- real time clock
- sound alarm (see page 56)
- self check function (auto control)

Program possibilities

- STD version (see page 26)
- TOP+ version (see page 27-28)
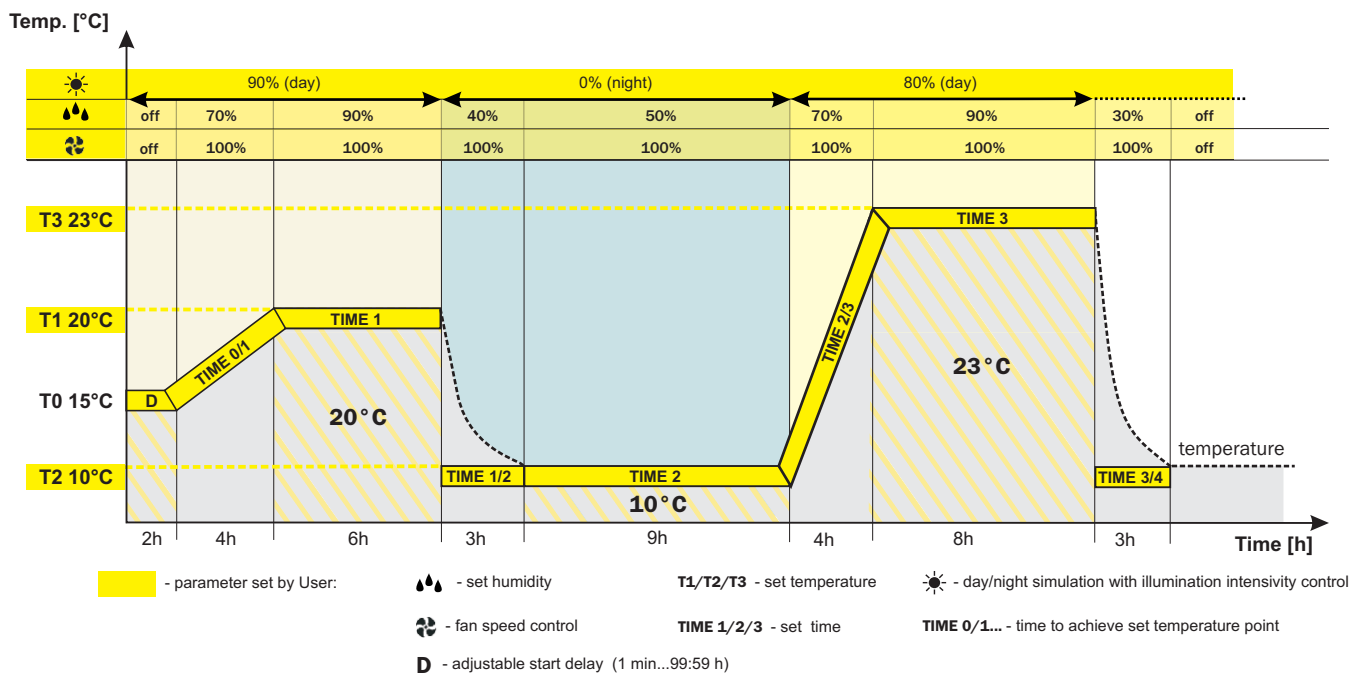
Climatic chambers

- time, temperature and humidity control
- temperature range: -10 to +60°C

Climatic chambers with phytotron system (*/FIT option)

- time, temperature, humidity and illumination intensity control
- illumination system: day and night simulation system with intensity control (every 10%):
  - placed in the door and in the side walls for KK 350 FIT DS
  - placed in the side walls for KK 700 FIT S
  - fixed as over-shelf panel with intensity control for KK 115, 240, 500, 400, 700, 750, 1200, 1450 FIT P
- temperature range - lighting off: -10 to +60°C
- temperature range - lighting on: +10 to +50°C
- light colour selection
- illumination power of up to 15 000 LUX per shelf (measured in geometrical center of the shelf placed 25 cm under illumination panel)
- program priority: temperature or time

KK 350 STD interior

Temperature and humidity sensors in the interior of a climatic chamber.

Standard equipment

- double door (solid outside, glass inside)
- wheels with brakes (except KK 115 and 240)
- RS 232 interface and USB port *New!*; RS 232 or USB cable must be purchased additionally (RSK or USBK)
- stainless steel wire shelves (2-6 pieces, depending on the model) with slides set
- manufacturer's test certificate at 25°C and 60% humidity
- operation manual in English and English menu (other languages on request)
- over temperature protection according to DIN 12880: class 3.3
- container for deionized water
- container for waste water

Options and accesories (icon description see page 51)
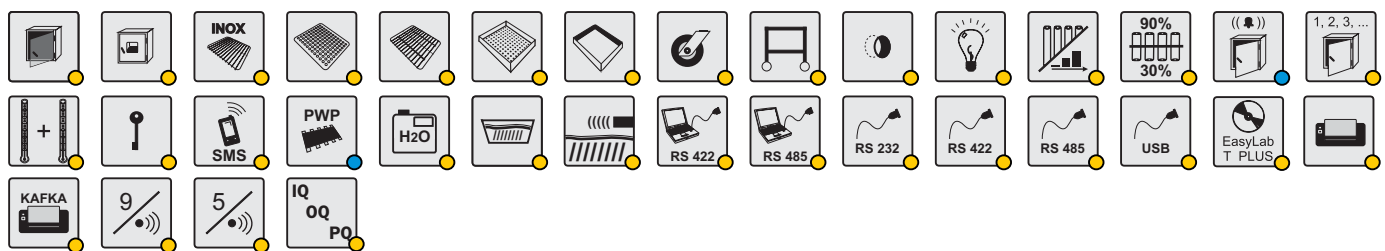
● for STD only   ● for STD and TOP+

POL-EKO Measurement Laboratory provides Qualification procedures are required by pharmaceutical (also by veterinary pharmacy), cosmetic and biotechnology industries.
A complete qualification procedure consists of the following parts: installation qualification (IQ), operational qualification (OQ), and performance qualification (PQ).

All POL-EKO-APARATURA products can be supplied with a calibration certificate issued by an accredited Measurement Laboratory. Further information is available on pages 87-89 and our website: www.pol-eko.eu.

Climatic chambers
Climatic chambers with phytotron system

Chambers of this kind can be also produced according to customer's requirements.

Available options

KK*/A - external glass door
FIT - phytotron system

Model / Parameter		KK 115	KK 240	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
	[cu ft]	3,9	8,6	11,8	15	17,4	22	26,4	48,2	51,6
door type		double (external solid, internal glass) / external glass (option)								
temperature range	[°C]	-10...+60 (with phytotron ON +10...+50)								
	[°F]	+14...+140 (with phytotron ON +50...+122)								
humidity range [%]		30...90 (with temperature range +10...+60)								
phytotron system** (available models)	FIT DS option	-	-	YES	-	-	-	-	-	-
	FIT P option	YES	YES	-	YES	YES	YES	YES	YES	YES
	FIT S option	-	-	-	-	YES	YES	-	-	-
controller		microprocessor with external display								
interior		acid-proof stainless steel according to DIN 1.4301								
housing		powder coated sheet / stainless steel (INOX/G or INOX/S)								
overall dims [mm][2]	width	650	815	710	1015	635	720	1255	1435	1440
	height	1095	1420	2015	1750	2010	2010	1900	2010	1970
	depth	650	710	750	710	925	970	810	970	890
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 [kg]*	-		10	10	10	10	20	30	10	30	30
	PW version	50	100	100	100	100	100	100	100	100
max unit workload [kg]	-		60	90	100	120	100	150	140	300	300
	W 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								
over temperature protection		class 3.3								
voltage 50/60 Hz [V]		110-120/220-240								
wire shelves fitted/max[3]		2/7	3/10	3/11	3/14	3/11	3/11	5/16	2 x 3/11	2 x 3/11
over-shelf illumination panels fitted/max[3]	FIT P option	1/1	1/3	-/-	1/3	1/3	1/3	1/3	1/3	1/3
max illumination power [lux]	FIT version	5000	10000	15000	15000	15000	15000	15000	15000	15000
warranty		24 months								
manufacturer		POL-EKO-APARATURA								

* - at even surface workload
** - FIT DS - lamps in door and walls
    FIT P - over-shelf panel with lamps
    FIT S - lamps in walls
    FIT options can not be combined!

1 - working capacity of chamber can be smaller
2 - dims of door handles, power cable and leveling feet or wheels not included
3 - "fitted" number of shelves/panels fitted, included in price "max" number of shelves/panels which can be fitted

Options and accessories

II

Features		
interior	plastic (ZLN 75, 145, 180)	1.
	aluminum	2.
	stainless steel (ST/CHL INOX; ZLN 85+, 125, 200, 300)	3.
housing	powder coated sheet	4.
	stainless steel (ST/CHL INOX; ZLN 85+, 125, 200, 300 INOX)	5.
air convection	natural	6.
	forced	7.
fan speed regulation	0...100% (CL/SL/SR 15/32/53/115/240)	8.
	10...100% (CL/SL/SR 400/750/1000)	9.
automatic fan shut down after completing the program		10.
air-flap control	automatic	11.
system	heating	12.
	cooling (ST/CHL/IL/KK)	13.
defrosting function		14.
automatic defrosting function		15.
external display	graphic LCD	16.
	5.7" LCD touch screen	17.
microprocessor control of time and temperature (and humidity in KK; light with FIT option)		18.
temperature-time profile (and humidity in KK)	1 segment	19.
	6 segment	20.
	9 segment	21.
program priority	temperature	22.
	time (ST and IL in STD with FOT/FIT option)	23.
cycle run of the program		24.
user programs memory	1	25.
	3	26.
	20	27.
start delay	1 min...99,59 h	28.
	date/time	29.
adjustable heating up time	1 min...99,59 h	30.
adjustable hold at set point (temperature; humidity in KK)	1 min...99,59 h	31.
	1 min...999,59 h	32.
overview of parameters during operating time		33.
recording the min, average and max temperature (and humidity in KK) value for each segment		34.
over/under temperature and humidity sound alarm (humidity in KK)		35.
over temperature protection 1.0 class according to DIN 12880	class:	36.
temperature sensor fail alarm (and humidity sensor fail alarm in KK)		37.
power failure control system		38.
real time clock		39.
sound alarm		40.
interface	RS 232	41.
	USB	42.
Ethernet connection and remote control via Internet		43.
measurement memory		44.
self-check function (auto control)		45.
Administrator function		46.
access control via login		47.
manufacturer's test certificate	at -10°C	48.
	at +4°C	49.
	at +25°C and 60% rH	50.
	at +37°C	51.
	at +105°C	52.
	at +170°C	53.
24 months warranty		54.
CE mark		55.
manufacturer's certificate PN-EN ISO 9001		56.

Parameters list

	ST		CHL	ZL	CL			IL		SL			SR	KK	
	P*	TOP+			ECO	STD	TOP+	STD	TOP+	ECO	STD	TOP+	STD	STD	TOP+
1.				•											
2.	•	•	•												
3.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
4.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
5.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
6.				•	•	•	•			•	•	•	•		
7.	•	•	•		•	•	•	•	•	•	•	•	•	•	•
8.						•	•				•	•	•		
9.	o	•	o			•	•	•	•		•	•	•	•	•
10.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
11.					•	•	•			•	•	•	•		
12.	•	•			•	•	•	•	•	•	•	•	•	•	•
13.	•	•	•	•				•	•					•	•
14.	•		•												
15.	o	o	o					o	o					•	•
16.	•		•	•	•	•		•		•	•		•	•	
17.		•					•		•			•			•
18.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
19.			•	•	•					•					
20.	•					•		•			•		•	•	
21.		•					•		•			•			•
22.	•	•	•	•	•	•	•	•	•	•	•	•	•		•
23.	•	•					•	•	•			•		•	•
24.	•	•				•	•	•	•		•	•	•	•	•
25.			•	•	•					•					
26.	•					•		•			•			•	
27.		•					•		•			•	•		•
28.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
29.		•			•	•	•	•	•	•	•	•	•	•	•
30.		•				•	•	•	•		•	•	•	•	•
31.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
32.		•				•	•	•			•	•	•		•
33.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
34.	•	•			•	•	•	•	•	•	•	•	•	•	•
35.	•	•	•	•		•	•	•	•	•		•	•	•	•
36.	1.0	3.3	1.0		1.0	2.0	3.1	2.0	3.3	1.0	2.0	3.1	2.0	3.3	3.3
37.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
38.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
39.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
40.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
41.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
42.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
43.		•					•		•			•			•
44.	o	•	o			o	•	o	•		o	•	o	o	•
45.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
46.		•					•		•			•			•
47.		•					•		•			•			•
48.				•											
49.			•												
50.														•	•
51.	•	•			•	•	•	•	•						
52.										•	•	•			
53.													•		
54.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
55.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
56.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

• - standard equipment
o - option
* - basic version of thermostatic cabinets

Interior

aluminum

Aluminum interior is standard feature of ST/CHL ranges (not in INOX version).

stainless steel

Stainless steel interior is standard feature of CL/IL/SL/SR/KK ranges; ST/CHL INOX versions and ZLN 85+, 125, 200 and 300 models.

Housing
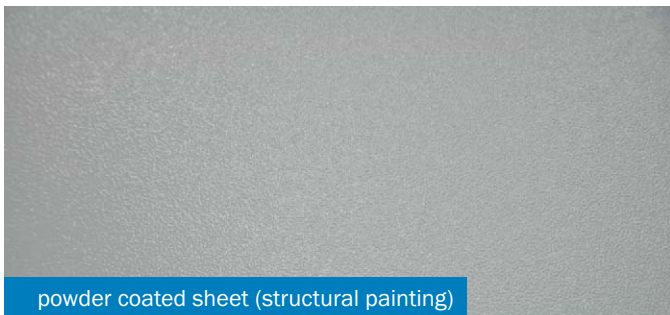
powder coated sheet (structural painting)

Powder coated (structural painting) housing is standard feature of ST/CHL/ZL/CL/IL/SL/SR/KK (not in INOX version). The standard housing is coated with a light grey colour (RAL 7035). The front panel is graphite (RAL 7016).

stainless steel - INOX/G

Stainless steel linen finish (INOX/G) housing is standard feature of ST/CHL/ZL/CL/IL/SL/SR/KK INOX/G models.

INDICATIONS
The type of interior and housing has been stated in product codes of the equipment.

Interior
ALU - aluminum
INOX - stainless steel

Housing:
PAINT - powder coated sheet
INOX/S - stainless steel polished
INOX/G - stainless steel linen finish
In a standard version (for ST/CHL – aluminum interior, powder coated housing; for CL/IL/SL/SR/KK – stainless steel interior, powder coated housing), the indication interior/housing in the product code has been omitted.

stainless steel - INOX/S

Stainless steel polished (INOX/S) housing is standard feature of ST/CHL/ZL/KK INOX/S models.

EXAMPLES:
ST 1+ thermostatic cabinet, aluminum interior, powder coated housing: ST 1+
ST 1+ thermostatic cabinet, stainless steel interior, polished stainless steel housing: ST 1+ INOX INOX/G
CLW 53 STD incubator, powder coated housing: CLW 53 STD
CLW 53 STD incubator, stainless steel linen finish housing: CLW 53 STD INOX/G
(for CL/IL/SL/SR/KK the interior is always made of stainless steel)

Parameter description

Air-flap control

air-flap in STD version

The CL/SL/SR ranges feature an automatic air-flap control
Diameter of the air-flap:
 - for 15, 32, 53, 115 models - 37 mm
 - for 240, 400, 750, 1000 models - 60 mm

External display

LCD graphic display

The ST/CHL/ZL range feature an LCD graphic display with illuminated touch buttons.

5.7" LCD touch screen

The ST/CL/IL/SL/KK ranges in TOP+ version feature a 5,7" LCD touch screen.

LCD graphic display

The CL/IL/SL/SR/KK ranges in ECO and STD versions feature an LCD graphic display with illuminated touch buttons.

Defrosting function

This is standard feature of ST/CHL ranges. Defrosting is performed automatically but is has to be chosen manually by the user at the most suitable time, e.g. when there are no samples in the chamber. It consists in temperature increase in the chamber.

Over/under temperature (and humidity in KK) sound alarm

It is possible to set temperature (and humidity in KK) offset in the program menu. If the temperature or humidity (humidity in KK only) exceeds or falls beyond the set point, the alarm will go off and the "ALARM" message will appear on the display.

Temperature (and humidity in KK) sensor fail alarm

If the sensors are not working correctly, an error message appears on the display.

Sound alarm

This function sounds the alarm at a time specified by the user.

Ethernet connection and remote control via internet

This is standard feature of ST/CL/IL/SL/KK ranges in TOP+ version.
The equipment can be controlled and monitored via internet. It is also possible to connect several units in-line and control them from one PC.

7 days programming

This is standard feature of ST/CL/IL/SL/KK ranges in TOP+ version.
It allows user to set program for each day of the week (e.g. Monday, 9.00-15.00, at 37°C)

Temperature or time program priority

For each program the user is able to choose either temperature or time priority. Temperature priority consists in: the unit achieves set temperature first and then starts time countdown.
Time priority consists in: the unit starts the process of achieving set temperature simultaneously with time being countdown.

Over temperature protection system

All POL-EKO-APARATURA products (except ZL range) are equipped with over temperature protection 1.0 class according to DIN 12880.
Depending on the product range and version, various temperature protections are available. See details in the products parameters tables and on pages 52-53.

Power failure control system

A temporary power failure while running the power is unnoticeable due to autoresume function but the time of power shortage is displayed on the screen.

Administrator function

This is standard feature of ST/CL/IL/SL/KK ranges in TOP+ version. It allows to manage user accounts as support to GLP.

RS 232 interface /USB port (does not concern the TOP+ version)

All POL-EKO-APARATURA products are equipped with RS 232 and USB ports. This feature enables PC connection, data archiving and transmition (e.g. temperature or humidity values). For this, it is necessary to purchase a connection cable (RSK or USBK) and EasyLab-T PLUS software. All the TOP+models are equipped with a USB port to save data on flash drives.

Temperature (and humidity in KK) calibration in 3 points

This is standard feature of ST/CL/IL/SL/KK ranges in TOP+ version. Thanks to this feature the user has got a possibility to calibrate the chamber in 3 points of temperature and additionally in 3 points of humidity in KK range (only TOP+ version).

Options and accessories	ST		CHL	ZL	CL			IL		SL			SR	KK		Order no.
	P[6]	TOP+			ECO	STD	TOP+	STD	TOP+	ECO	STD	TOP+	STD	STD	TOP+	
internal glass door[1,5]	•	•	•		•	•	•	•	•					•	•	*/C
external glass door[1,8]	•	•	•											•	•	*/A
door with viewing window[4,7]					•	•	•	•	•	•	•	•	•	•	•	*/A
internal socket[1,5]	•	•	•			•	•	•	•							GNZ
interior lighting[1,4,5]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	OWW
door lock[1]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	ZKL
wire shelf[1]	•	•	•													*/P
stainless steel wire shelf[1,9]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	*/P INOX
perforated shelf[1]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	*/PP
glass shelf[3]				•												*/PS
reinforced shelf	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	*/PW
extended temperature range to +50°C[1]	•															ST/50
extended temperature range to +60°C[1]	•	s														ST/60
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	s	*PLUS
over temperature protection system according to DIN 12880[1]	2.0 3.1 3.2 3.3		3.2			3.1		3.1 3.2 3.3			3.1		3.1			*/**
stainless steel cuvettes	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	KUW
stainless steel drawers	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	*/SW
access port for external sensor[1,12]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	*OCZ
humidity measurement[5]		•				•	•	•	•							PHR
open door alarm[1]	•	s	•	•		•	s	•	s		•	s	•	•	s	SOD
door openings counter[1]	•	•	•	•		•	•	•	•		•	•	•	•	•	LOD
fan speed control	•	s	•		s	s	s	s			s	s	s	s	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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	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-T PLUS software	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	EasyLab-T PLUS
dot printer	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	EPSON
"Kafka" thermal printer	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	KAFKA
calibration in 9 points[1]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	BRT/9/L
chamber calibration in 5 points on shelf[1]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	BRT/5/L
IQ, OQ, PQ qualification[1]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	IQ/OQ/PQ
SMS Info[1]	•	•	•			•	•	•	•		•	•	•	•	•	SMS INFO
container for deionized water														•	•	KK/Z
container for waste water														•	•	KK/K
water level sensor														•	•	KK/CP
test's results memory[1]	•	s	•			•	s	•	s		•	s	•	•	s	PWP
FIT panels independent control	•	•						•	•					•	•	FIT/R2

* - model (e.g. ST 1+, IL 53, ZL 75)
** - 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 ZL 75, 145, 180
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 - basic version of thermostatic cabinets
7 - for KK 115, 240, 400, 750
8 - for KK 500, 700, 1200
9 - for ZLN 85+
10 - for CHL 500, 700, 1200 i 350/350
11 - thermostatic cabinets ST 500, 700, 1200
12 - except ZL 75, 145, 180
s - standard equipment
● - available option

Internal glass door

This is standard feature of KK models.
This is an additional option available for ST/CHL/CL/IL ranges.
Order number: */C.
In case of CL/IL in TOP+ version, maximum temperature
is reduced to +70ºC.

External glass door

This is an additional option available for ST/CHL ranges and
for KK 500,700, 1200, 1450 models.
Order number: */A (option factory preinstalled).

Door with viewing window

This is an additional option available for CL/IL/SL/SR ranges,
except CL/SL 15, 32 and for KK 115, 240, 400, 750 models.
Order number: */A (option factory preinstalled).
In case of SL range, maximum temperature is reduced to +250°C.

Internal socket

This is an additional option available for ST/CHL/CL/IL
ranges (not available for ECO version). In case of CL/IL
in STD and TOP+ versions, maximum temperature is
reduced to +70°C with internal socket.
Order number: GNZ (option factory preinstalled).
Internal socket allows to plug in additional equipment
inside the chamber, e.g. laboratory shaker.
Max socket peak load 200W.

Interior lighting

This is an additional option available for all product ranges.
Order number: OWW (option factory preinstalled).
Interior lighting features 1 light point. The user switches it
on with enter button located in the front panel.
This option does not allow day/night simulation (see FIT and
FOT options). If a unit is equipped with the open door sensor
the light can switch on when the door opens. Max working
temperature of the unit is reduced to +70°C, for SL/SR
ranges to +250°C.

Door lock

This is an additional option available for
all product ranges .
Order number: ZKL.
Door lock allows to lock the door with a key.

Wire shelf

This is standard equipment – wire shelf in
ST/CHL ranges with slides set.
This is an additional option available for
ST/CHL ranges.
Order number: */P.
Wire shelf is provided with slides set.

Perforated shelf

This is standard equipment in ZLN 125,200,300 models.
This is an additional option available for
ST/CHL/CL/IL/SL/SR/KK ranges.
Order number: */PP.
Perforated shelf is provided with slides set.

Glass shelf

This is standard equipment in ZLN 75, 145, 180 models.
This is an additional option available
for ZLN 75, 145, 180 models.
Order number: */PS.

Stainless steel wire shelf

This is standard equipment in CL/IL/SL/SR/KK
ranges, ZLN 85+ and in ST/CHL ranges with
stainless steel interior. This is an additional option
available for ST/CHL/CL/IL/SL/SR/KK ranges and ZLN 85+.
Order number: */P INOX.
INOX wire shelf is stainless steel wire shelf
with slides set.

Reinforced shelf

This is standard equipment for the CL/IL/SL 750 and 1000 models and all CL/IL/SL models in the reinforced version (order number: */W). This is an additional option available for CL/IL/SL/SR ranges, ST/CHL/KK 500, 700, 1200 models, ZLN 125, 200, 300 models.
Order number: */PW.
Reinforced shelf is provided with slides set. Reinforced shelf allows to store heavy loads on it. For maximum shelf workloads and maximum unit workloads look in the table with parameters for certain ranges of equipment (reinforced shelf - PW; reinforced version of the unit - W).

Reinforced version

This is standard equipment for the CL/SL 1000 models. This is an additional option available for CL/IL/SL ranges (not available for ECO version) and ZLN 200, 300 models.
Order number: */W (option factory preinstalled).
Reinforced version of equipment allows to store heavy loads in the chamber. It consists of reinforced construction of the chamber and reinforced shelves. In this way we prevent damage to the unit caused by heavy loads. For maximum shelf workloads and maximum unit workloads look in the table with parameters for certain ranges of equipment (reinforced shelf - PW; reinforced version of the unit - W).
When a unit in reinforced version is purchased, the reinforced shelves are supplied instead of wire shelves.

Stainless steel drawers

This is an additional option available for ST/CHL/CL/IL/SL/SR/KK ranges and ZLN 85+, 125, 200, 300 models.
Order number: */SW.
Stainless steel drawer is provided with slides set and can be ordered instead of wire shelf. Drawer is perforated and of 3 cm depth.
Different kinds of perforation and depths are available on request.

Stainless steel cuvettes

This is an additional option available for any chamber.
Order number: KUW.
Stainless steel cuvettes can be placed on the shelves.
Different sizes available.

Photoperiodic system

This is an additional option for the ST/IL ranges.
Order number: */FOT (option factory preinstalled).
The illumination system can simulate day and night.
Depending on the model, it is placed either in the door,
or on side walls, or in the ceiling of the chamber.
For the IL equipment, the temperature range when
the illumination is switched off can be -10...+70°C and
+5...+50°C when it is switched on. For the ST equipment,
the temperature range when the illumination is switched off
can be +3...+60°C (depending on selected temperature
option) and +10...+50°C when it is switched on. Standard
light colour: daylight, other colours available on request.

Phytotron system

This is an additional option for the KK/IL ranges and the
following ST models in the TOP+ version: 500, 700, 1200
and 1450.
Order number: */FIT (option factory preinstalled).
The illumination system can simulate day and night and control
illumination smoothly by every 10%. For the KK 350 model,
the system is placed in the door and in the side walls
(FIT DS option). For the KK 700 FIT S model, the system
is placed in the side walls. For all the other equipment,
the system comes as over-shelf panels with illumination (FIT P).
For the KK models, the temperature range when the illumination
is switched off is -10...+60°C and +10...+50°C when
it is switched on. For the ST equipment, the temperature
range when the illumination is switched off can be +3...+60°C
and +3...+50°C when it is switched on. Illumination can
be up to 15000 LUX per shelf (measured centrally 25 cm
under the illumination panel). Standard light colour: daylight,
other colours available on request.

Acces port for external sensor

This is an additional option available for all product ranges
and standard equipment for the ZLN 85+, 125, 200 300 models.
Order number: * OCZ (option factory preinstalled).
There are different access port diameters available:
9, 10, 18, 20, 37, 40 mm; placed in upper part of the
left chamber side. Other locations are available on request.

Additional Pt 100 temperature sensor

This is an additional option available for CL/IL/SL/SR/KK ranges
(not available for ECO version) and ST in top+ version.
Order number: PT 100 (option factory preinstalled).
This option consists of additional temperature sensor, internal
socket, access port and value browse possibility in the display.
The sensor may be supplied with a calibration certificate.
It enables more detailed temperature monitoring during incubation.
Additional Pt 100 sensor also allows to choose in the unit's menu
which sensor should be used as primary and which as secondary.
This way unit can work according to the sample temperature
in which additional Pt 100 sensor is placed.

Wheels

This is standard equipment provided for ST/CHL 1200; and CL/IL/SL/SR 750, 1000; IL 400; and KK models (except KK 115 and 240). This is an additional option available for all product ranges.
Order number: QLK*(option factory preinstalled).
For units of bigger capacities wheels are indispensable equipment. However some users may require wheels in smaller units. This is why we are able to equip each unit with the wheels.
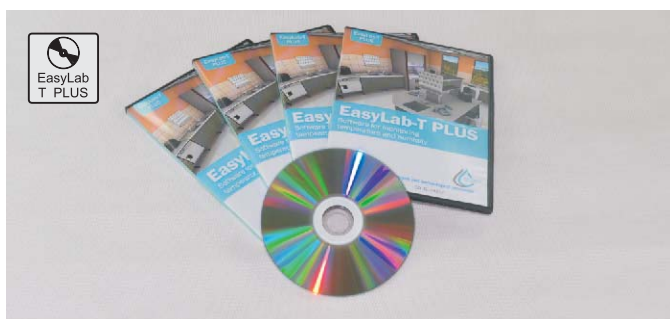
EasyLab-T PLUS software

This is an additional option available for all product ranges.
Order number: EasyLab-T PLUS.
All thermostatic products manufactured by POL-EKO-APARATURA are equipped with an RS232 interface and USB port and can be connected to a PC. The EasyLab-T PLUS software allows to record temperature and/or humidity values. The data (day, time, temperature/humidity values) can be transferred to a PC computer in a tabular form that can be used to generate charts. It can be further stored or exported to the .xls format. It is necessary to purchase an RS232 or USBK interface cable along with the software.

Dot printer

This is an additional option available for all product ranges.
Order number: EPSON.
DOT printer enables current temperature, time and date printing. Printing interval is to be set in the unit's menu. There must be RSK (PC and printer connection cable) purchased along with DOT printer.

"Kafka" thermal printer

This is an additional option available for all product ranges.
Order number: KAFKA. "Kafka" thermal printer enables current temperature, time and date printing.
Printing interval is to be set in the unit's menu.
There must be RSK (PC and printer connection cable) purchased along with "Kafka" printer.

HEPA-fresh air filter

This is an additional option available for CL/SL/SR ranges (not available for ECO version).
Order number: HEPA (option factory preinstalled).
HEPA filter is installed at the air inlet to the chamber.

Options and accessories

Table with wheels

This is an additional option available for ST/CHL 1+, 2+ ,3+ ;
ZLN 75, 85+, SL/CL 15, 32; CL/IL/SL/SR 53, 115, 240 models.
Order number: */S (powder painted) **or */S INOX** (stainless steel).
Table with wheels provides you with the highest comfort of using
our products. We offer a wide range of tables equipped with wheels.
Different sizes of the tables are available on request.
The user can choose the most suitable height.

RS 232 cable

This is an additional option available
for all product ranges.
Order number: RSK.
RS 232 cable is a connection cable for PC or printer.
Standard cable length: 5m.

RS 422 cable

This is an additional option available
for all product ranges.
Order number: RSK/422.
RS 422 is a connection cable for PC.
Standard cable length: 5m.

RS 485 cable

This is an additional option available
for all product ranges.
Order number: RSK/485.
RS 485 is a connection cable for PC.
Standard cable length: 5m.

USB cable

This is an additional option available
for all product ranges.
Order number: USBK.
The cable is useful to connect the unit
to a PC computer.
Standard cable length: 5m.

RS 422 interface / RS 485 interface

These are additional options available for all product ranges.
Order number: RS422 or RS485 (option factory preinstalled).
This option consists of a converter from RS 232
(standard built in the device) to RS 422 or RS 485.
It allows to plug a few pieces of equipment in-line.

Container for waste water

This is standard equipment for KK range.
This is an additional option available for KK range.
Order number: KK/K.
This is a plastic container for waste water.
The container is recommended when it is not possible
to connect the unit to a drain system.

Container for deionized water

This is standard equipment for KK range.
This is an additional option available for KK range.
Order number: KK/Z.
Plastic container for deionized water is standard equipment
for all climatic chambers (KK), however also an additional
container can be ordered. The container is recommended
when it is not possible to connect the unit to a deionizer.

Low water level sensor

This is an additional option available for the KK range.
Order number: KK/CP (option factory preinstalled).
An alarm goes off when the water level is low.

Extended temperature range ST/50

This is an additional option available for ST range.
Order number: ST/50 (option factory preinstalled).
It consists on extended temperature range up
to +50°C (standard temperature range in ST ranges
is +3°C...+40°C).

Extended temperature range ST/60

This is an additional option available for ST range.
Order number: ST/60 (option factory preinstalled).
It consists on extended temperature range up to
+60°C (standard temperature range in ST ranges
is +3°C...+40°C).

Extended temperature range ST/70

This is an additional option available for ST range.
Order number: ST/70 (option factory preinstalled).
It consists on extended temperature range up
to +70°C (standard temperature range in ST ranges
is +3°C...+40°C).

Automatic defrosting function

This is standard feature of KK range.
This is an additional option available for ST/CHL/IL ranges.
Order number: * PLUS (option factory preinstalled).
Defrosting in this case is programmable (the user sets
periodicity and duration). This function is carried out while
the unit is working. This advanced technology holds the
temperature stable, allowing only a minor increase in the
chamber (considerably higher temperature rise is caused
by opening the door).

Low temperature version

This is an additional option available for
CHL 500, 700, 1200 and CHL 350/350 models
and IL range.
Order number: */T (option factory preinstalled).
It extends temperature range down to -10°C
(standard temperature range starts from 0°C).

Over temperature protection 2.0 class according to DIN 12880

This is a standard function for the CL/IL/SL/SR
equipment in the STD version, and optional for the
ST range.
Order number: ST/2.0 (option factory preinstalled).
It features a sample protection function: the user can
set the protection temperature and once it has been
exceeded, the program will cut off the heaters.
To resume operating, the user has to switch the unit
off and turn it on again.

Over temperature protection 3.1 class according to DIN 12880

This is a standard function for the CL/SL equipment
in the TOP+ version, and optional for the ST/CL/IL/
SL/SR ranges in the STD version.
Order number: */3.1 (option factory preinstalled).
It features a sample protection function: the user
can set the protection temperature and once it has
been exceeded, the program will cut off the heaters.
When the temperature falls down below the set limit,
the unit will resume operating automatically.

Under temperature protection 3.2 class according to DIN 12880

This is an additional function for the ST/CHL ranges
and the IL range in the STD version.
Order number: */3.2 (option factory preinstalled).
It features a sample protection function: the user
can set the protection temperature and once it has
been exceeded, the program will cut off the compressor.
When the temperature goes above the set limit,
the unit will resume operating automatically.

Over/under temperature protection 3.3 class according to DIN 12880

This is a standard function for the KK, ST and IL
ranges in the TOP+ version, and optional for the
ST/IL in the STD version.
Order number: */3.3 (option factory preinstalled).
It features a sample protection function: the user
can set the over/under protection temperature and
once it has been exceeded, the program will cut off
the heaters or compressor. When the temperature
goes back to the permitted range, the unit will
resume operating automatically.

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Humidity measurement

This is an additional option available for CL/IL ranges (not available for ECO version).
Order number: PHR (option factory preinstalled).
This option is not humidity control but humidity measurement. The user can browse humidity values in the unit's display.

Open door alarm

This is an additional option available for all product ranges (not available for ECO version).
Order number: SOD (option factory preinstalled).
The user sets the time (1 to 5 min) after which the alarm goes off and a message is displayed when the door is open.

Door openings counter

This is an additional option available for all product ranges (not available for ECO version).
Order number: LOD (option factory preinstalled).
This function counts door openings (how many timesthe door was opened during the program run).

Calibration in 9 points in the chamber

This is an additional option available for all product ranges.
Order number: BRT/9/L (option factory preinstalled).
This option consist of measurements performed in 9 points of the chamber (corners + geometric center) at temperature according to customer's specification; ACCREDITATED TEMPERATURE RANGE IS -20°C...+200°C.

Calibration in 5 points on 1 shelf

This is an additional option available for all product ranges.
Order number: BRT/1P/L (option factory preinstalled).
This option consists of measurements performed in 5 points on the unit's shelf (corners + geometric center) at temperature according to customer's specification; ACCREDITATED TEMPERATURE RANGE IS -20°C...+200°C.

IQ, OQ, PQ qualification

This is an additional option available for all product ranges.
Order number: IQ/OQ/PQ (option factory preinstalled).
It consists of: operation, qualification and performance qualification tests performed in our factory; empty installation qualification documentation; enclosed qualification book.
For more information see page 89.

SMS info

This is an additional option available for all product ranges (not available for ECO version).
Order number: SMS INFO (option factory preinstalled).
It consists of SMS notifications about set temperature (and humidity in KK range) values exceedings as well as about power shortages, on max 2 mobile phone numbers.

Tests's results memory

This is standard feature of all models in TOP+ version. This is an additional option available for ST/CHL and CL/IL/SL/SR/KK ranges in STD version.
Order number: PWP (option factory preinstalled).
This option is tests's results memory module that allows to safe data in the internal memory of the unit and brows it any time. To enable logging for units which are not equipped with internal memory, they need to be connected to a PC computer at all times. All data can be sent to a PC though the EasyLab-T PLUS software with an RSK or USBK cable.

FIT panels independent control

This is an additional option available for ST 500-1200 models and KK range with FIT option (in case of phytotron system consisting of 2 over-shelf illumination panels).
Order number: FIT/R2 (option factory preinstalled).
This option consists of possibility to control each of 2 over-shelf illumination panel independently (e.g. one panel intensity can be set at 100%, the other one at 50%).

Fan speed control

It is an option for the ST/CHL range which allows to control the fan speed from 10% up to 100%.
Order number: ST/CHL WENT
It can be set for each program segment separately.

Temperature protection

Over temperature protection class 1.0 and class 2.0 according to DIN 12880

Over temperature protection class 1.0 (TB)
factory set at approx 10°C above
the max temperature.

Over temperature protection class 2.0 (TWB)
- programmable

set temperature

* triac, temperature sensor,
A/D converter, program failure,
unintentional change of set parameters
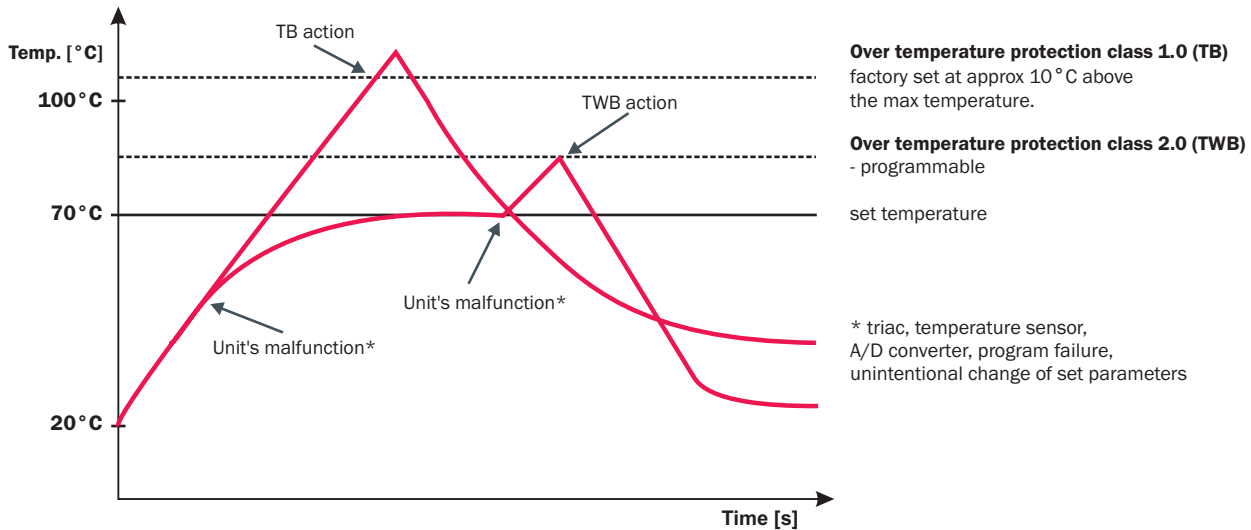
Over temperature protection class. 1.0 to DIN 12880 is a standard function for the ST/CHL/CL/IL/SL/SR/KK equipment.
It is factory set at approx. 10°C above the max temperature.
Over temperature protection class 2.0 to DIN 12880 is a standard function for the CL/IL/SL/SR equipment in the STD version,
and optional for the ST range. **Order number: ST/2.0** (option factory preinstalled). It features a sample protection function:
the user can set the protection temperature and once it has been exceeded, the program will cut off the heaters.
To resume operating, the user has to switch the unit off and turn it on again.

Over temperature protection class 3.1 according to DIN 12880

Over temperature protection class 1.0 (TB)
factory set at approx 10°C above
the max temperature.

Over temperature protection class 2.0 (TWB)
- programmable

set temperature

* triac, temperature sensor,
A/D converter, program failure,
unintentional change of set parameters
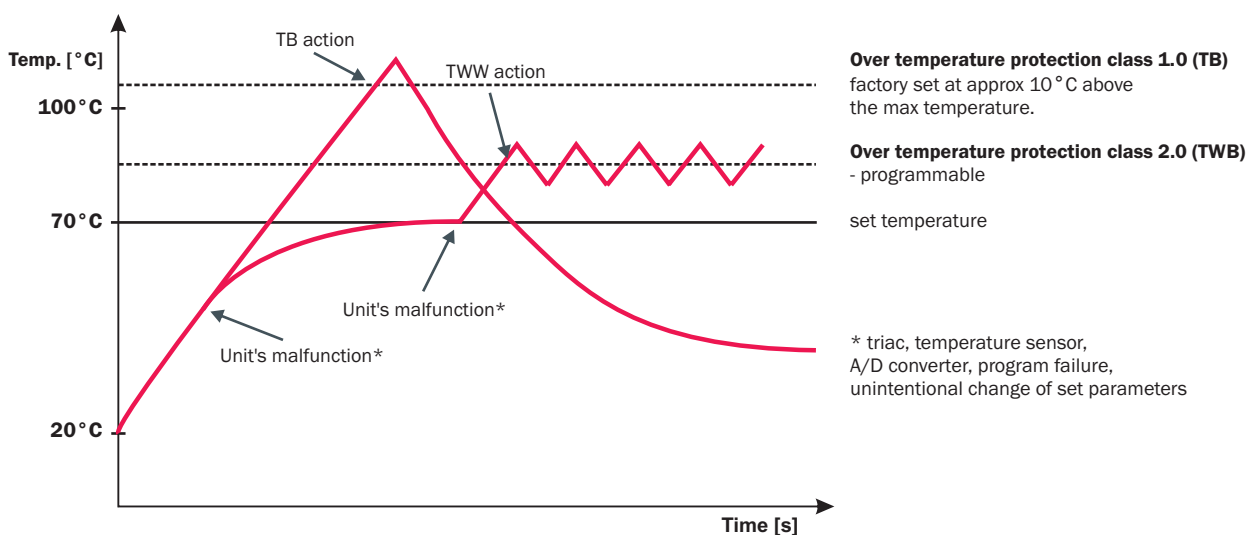
Over temperature protection class 3.1 to DIN 12880 is a standard function for the CL/SL equipment in the TOP+ version,
and optional for the ST/CL/IL/SL/SR ranges in the STD version. **Order number: */3.1** (option factory preinstalled).
It features a sample protection function: the user can set the protection temperature and once it has been exceeded,
the program will cut off the heaters. When the temperature falls down below the set limit, the unit will resume operating
automatically.

Under temperature protection class 3.2 according to DIN 12880

Temp. [°C]

* triac, temperature sensor,
A/D converter, program failure,
unintentional change of set parameters

Unit's malfunction*

TWW action

20°C

15°C

set temperature

Under temperature protection class 3.2 (TWW)
- programmable

Time [s]
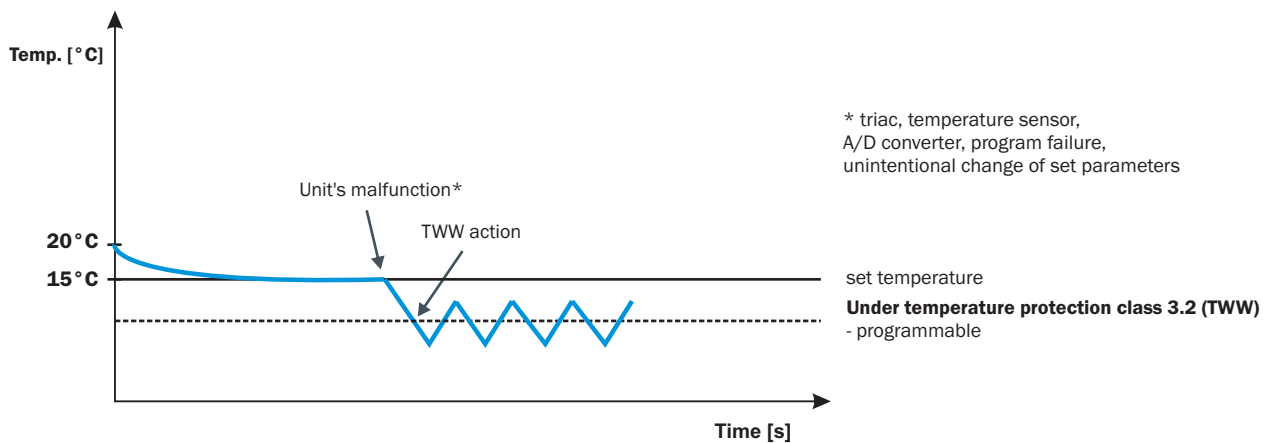
Under temperature protection class 3.2 to DIN 12880 is an additional function for the ST/CHL ranges and the IL range in the STD version. **Order number: */3.2** (option factory preinstalled). It features a sample protection function: the user can set the protection temperature and once it has been exceeded, the program will cut off the compressor. When the temperature goes above the set limit, the unit will resume operating automatically.

Over/under temperature protection class 3.3 according to DIN 12880

Temp. [°C]

TB action

TWW action

Over temperature protection class 1.0 (TB)
factory set at approx 10°C above
the max temperature.

100°C

Over temperature protection class 3.3 (TWW)
- programmable

70°C

set temperature

Unit's malfunction*

Unit's malfunction*

* triac, temperature sensor,
A/D converter, program failure,
unintentional change of set parameters

20°C

TWW action

15°C

set temperature

Under temperature protection class 3.3 (TWW)
- programmable

Time [s]

Over/under temperature protection class 3.3 to DIN 12880 is a standard function for the KK, ST and IL ranges in the TOP+ version, and optional for the ST/IL in the STD version. **Order number: */3.3** (option factory preinstalled). It features a sample protection function: the user can set the over/under protection temperature and once it has been exceeded, the program will cut off the heaters or compressor. When the temperature goes back to the permitted range, the unit will resume operating automatically.

Steel laboratory furniture

Steel laboratory furniture

Advantages

- steel construction
- work safety conformity with PN EN 14175
- AUTO and MANUAL PROTECT functions for window closing – saving the air you breathe

- wide range of working chamber materials
- for use with non-flammable materials

Auto-protect function (option) features a motion sensor, window level sensor and electrical opening/closing system. If the sensor does not detect any motion in front of the fume hood, the system will close the window automatically. Control buttons are also a part of the system, as well as manual sliding window detector and light barrier that stops the motion of the window if an obstacle has been spotted.

Q-DYNAMIC 1200

Q-Flow-Air Flow Sensor (standard equipment):

- controlling functions with alarm status indicated by visual and acoustic signals
- alarm indicating that the sash window exceeds the maximum opening height
- digital LED display showing current airflow in m³/h
- controlled and indicated alarm status
- power failure alarm
- power suspension system
- control of fume cupboard illumination

Laboratory fittings covered with the chemically resistant polyamid 11 coating:
- average coating thickness 250-300 microns
- melting point 184-186°C
- inflammability self-extinguishing
- shore hardness D up to 20°C
- colour grey RAL 7035

The sash window:
- metal
- in an aluminum frame
- in an MDF frame painted with chemically-resistant epoxy paint
- with the system of obstacle detection
- safety at every move

Utilities:
- gas
- compressed air
- vacuum
- demineralised water
- nitrogen
- others at client`s request
- the possibility of revision so as to supply individual valves

Parameter		Model	Q-Dynamic 1200	Q-Dynamic 1500	Q-Dynamic 1800
overall dims [mm]	width		1200	1500	1800
	height		2100…2400	2100…2400	2100…2400
	depth		900	900	900
working space dims [mm]	width		1148	1448	1748
	height		1100	1100	1100
	depth		750	750	750
recommended airflow [m³/h]			450…650	650…850	850…1350
maximum power consumption [kW]			3,5		
voltage 50 Hz [V]			230		
exit air stub pipe dimensions [mm]			Ø 160	Ø 200	Ø 200…250
water supply			G ½"		
sewage connection [mm]			Ø 50		
standard airflow sensor of the Q-Flow type (or Schneider Elektronik of the FM 100 type)			yes, confomity with standards PN-EN 14 175-2,3		
airflow sensor with non-gradual airflow regulation, depending on the extent of sash window opening (Schneider Elektronik of the iCM type)			optional PN-EN 14 175-2,3		
optional motion detector with automatic closing device the window closes automatically when the fume cupboard is not in use (within defined time)			optional auto protect function		
optional motion detector with manual window closing upon time limit acoustic and visual signals indicate that the window should be closed			optional manual protect function		
electrical insulation class			klasa I		
permissble work board load [kPa]			2 kPa	4 kPa	5 kPa
warranty			24 months		

Steel laboratory furniture

The furniture that we offer is remarkable for its mechanical resistance. It has been constructed from highest quality materials. There is a wide selection of standard frames, cupboards, panels and worktops, but customized solutions are available too.

Advantages

- steel construction featuring easy leveling, based on C-type frames
- 2 available versions: 750mm frame height – to assist sitting and 900mm to assist standing work
- large selection of panels, sinks and fittings made of various materials
- wide range of worktops (e.g. laminate, trespa, durcon)
- free configuration of frames to form segments
- work safety according to PN-EN 13150 norm
- professional advice, designing and visualization are a part of the offer

Standard equipment

- made of galvanized steel, epoxy powder coated - chemical resistant, grey colour RAL7035
- underbench cabinets for C-type frames
- BLUM slides and hinges

Indications

- SZ – underbench cabinet
- SZK – underbench cabinet with castors
- SZM – underbench cabinet with service supply
- SZO – octagonal underbench cabinet
- SZW – wall mounted shelves with the door
- SZWR – wall mounted open shelves
- S – frame

- 450-900 – cupboard width – frame height
- 2D – double wing door
- 1DP/1DL – single left/right door
- 1DP1S/1DL1S - single left/right door, one drawer
- 2D1S – double wing door, one drawer
- 2D2S – double wing door, two drawers
- 3S – three drawers
- 4S – four drawers

underbench cabinets for C-type frame of 750 mm height

underbench cabinets for C-type frame of 750 mm height, cabinet height 480 mm, cabinet depth 500 mm				
model	Cabinet 450-750 1D	Cabinet 600-750 1D	Cabinet 900-750 2D	Cabinet 1200-750 2D
width	450 mm	600 mm	900 mm	1200 mm
door	1 Right (P)/Left (L)	1 Right (P)/Left (L)	2	2
drawers	-	-	-	-
order number	MP_SZ 450-750 **1DP** MP_SZ 450-750 **1DL**	MP_SZ 600-750 **1DP** MP_SZ 600-750 **1DL**	MP_SZ 900-750 **2D**	MP_SZ 1200-750 **2D**
model	Cabinet 450-750 3S	Cabinet 600-750 3S	Cabinet 900-750 3S	
width	450 mm	600 mm	900 mm	
door	-	-	-	
drawers	3	3	3	
order number	MP_SZ 450-750 **3S**	MP_SZ 600-750 **3S**	MP_SZ 900-750 **3S**	

underbench cabinets with castors; height 480 mm

underbench cabinets with castors, height 480 mm, depth 500 mm		
model	Cabinet 450-750 1D with castors	Cabinet 600-750 1D with castors
width	450 mm	600 mm
door	1 Right (P)/Left (L)	1 Right (P)/Left (L)
drawers	-	-
order number	MP_SZK 450-750 **1DP** MP_SZK 450-750 **1DL**	MP_SZK 600-750 **1DP** MP_SZK 600-750 **1DL**
model	Cabinet 450-750 3S with castors	Cabinet 600-750 3S with castors
width	450 mm	600 mm
door	-	-
drawers	3	3
order number	MP_SZK 450-750 **3S**	MP_SZK 600-750 **3S**

Underbench cabinet 600-900 4S

underbench cabinets for C-type frame of 900 mm height

Underbench cabinets with service supply for C-type frame of 900 mm height, cabinet height 630 mm, cabinet depth 500 mm				
	Cabinet 450-900 1D	**Cabinet 600-900 1D**	**Cabinet 900-900 2D**	**Cabinet 1200-900 2D**
model				
width	450 mm	600 mm	900 mm	1200 mm
door	1 Right (P)/Left (L)	1 Right (P)/Left (L)	2	2
drawers	-	-	-	-
order number	MP_SZ 450-900 **1DP** MP_SZ 450-900 **1DL**	MP_SZ 600-900 **1DP** MP_SZ 600-900 **1DL**	MP_SZ 900-900 **2D**	MP_SZ 1200-900 **2D**
	Cabinet 450-900 4S	**Cabinet 600-900 4S**	**Cabinet 900-900 4S**	
model				
width	450 mm	600 mm	900 mm	
door	-	-	-	
drawers	4	4	4	
order number	MP_SZ 450-900 **4S**	MP_SZ 600-900 **4S**	MP_SZ 900-900 **4S**	
	Cabinet 450-900 1D1S	**Cabinet 600-900 1D1S**	**Cabinet 900-900 2D1S**	**Cabinet 1200-900 2D1S**
model				
width	450 mm	600 mm	900 mm	1200 mm
door	1 Right (P)/Left (L)	1 Right (P)/Left (L)	2	2
drawers	1	1	1	1
order number	MP_SZ 450-900 **1DP1S** MP_SZ 450-900 **1DL1S**	MP_SZ 600-900 **1DP1S** MP_SZ 600-900 **1DL1S**	MP_SZ 900-900 **2D1S**	MP_SZ 1200-900 **2D1S**

	Cabinet 900-900 2D2S	**Cabinet 1200-900 2D2S**
model		
width	900 mm	1200 mm
door	2	2
drawers	2	2
order number	MP_SZ 900-900 **2D2S**	MP_SZ 1200-900 **2D2S**

underbench cabinets with service supply for C-type frame of 900 mm height

underbench cabinets with service supply for C-type frame of 900 mm, cabinet height 630 mm, cabinet depth 500 mm			
	Cabinet 600-900 1D	**Cabinet 900-900 1D**	**Cabinet 1200-900 2D**
model			
width	600 mm	900 mm	1200 mm
door	1 Right (P)/Left (L)	2	2
drawers	-	-	-
order number	MP_SZM 600-900 **1DP** MP_SZM 600-900 **1DL**	MP_SZM 900-900 **2D**	MP_SZM 1200-900 **2D**

underbench cabinets with castors; height 630 mm

underbench cabinets with castors; height 630 mm, depth 500 mm		
	Cabinet 450-900 1D with castors	**Cabinet 600-900 1D with castors**
model		
width	450 mm	600 mm
door	1 Right (P)/Left (L)	1 Right (P)/Left (L)
drawers	-	-
order number	MP_SZK 450-900 **1DP** MP_SZK 450-900 **1DL**	MP_SZK 600-900 **1DP** MP_SZK 600-900 **1DL**
	Cabinet 450-900 4S with castors	**Cabinet 600-900 4S with castors**
model		
width	450 mm	600 mm
door	-	-
drawers	4	4
order number	MP_SZK 450-900 **4S**	MP_SZK 600-900 **4S**
	Cabinet 450-900 1D1S with castors	**Cabinet 600-900 1D1S with castors**
model		
width	450 mm	600 mm
door	1 Right (P)/Left (L)	1 Right (P)/Left (L)
drawers	1	1
order number	MP_SZK 450-900 **1DP1S** MP_SZK 450-900 **1DL1S**	MP_SZK 600-900 **1DP1S** MP_SZK 600-900 **1DL1S**

octagonal underbench cabinet, for C-type frame of 900 mm height
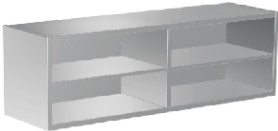
octagonal underbench cabinet, cabinet height 630 mm		
model	Octagonal underbench cabinet 1DP	Octagonal underbench cabinet 1DL
width	1000 mm	1000 mm
door	1 Right (P)	1 Left (L)
drawers	-	-
order number	MP_SZO 1000-900 **1DP**	MP_SZO 1000-900 **1DL**
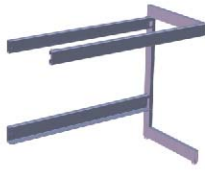
wall mounted cabinet with door

wall mounted shelves with the door, depth 365 mm				
model	Cabinet 450 1D	Cabinet 600 1D	Cabinet 900 2D	Cabinet 1200 2D
width	450 mm	600 mm	900 mm	1200 mm
height	480 / 630 / 780 mm	480 / 630 / 780 mm	480 / 630 / 780 mm	480 / 630 / 780 mm
door	1 Right (P)/Left (L)	1 Right (P)/Left (L)	2	2
order number	MP_SZW 450-**480 1DP**	MP_SZW 600-**480 1DP**	MP_SZW 900-**480 2D**	MP_SZW 1200-**480 2D**
	MP_SZW 450-**480 1DL**	MP_SZW 600-**480 1DL**		
	MP_SZW 450-**630 1DP**	MP_SZW 600-**630 1DP**	MP_SZW 900-**780 2D**	MP_SZW 1200-**780 2D**
	MP_SZW 450-**630 1DL**	MP_SZW 600-**630 1DL**		
	MP_SZW 450-**780 1DP**	MP_SZW 600-**780 1DP**	MP_SZW 900-**630 2D**	MP_SZW 1200-**630 2D**
	MP_SZW 450-**780 1DL**	MP_SZW 600-**780 1DL**		
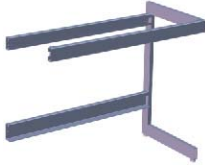
wall mounted open shelves

wall mounted open shelves, depth 320 mm				
model	Open shelf 450	Open shelf 600	Open shelf 900	Open shelf 1200
width	450 mm	600 mm	900 mm	1200 mm
height	480 / 630 / 780 mm	480 / 630 / 780 mm	480 / 630 / 780 mm	480 / 630 / 780 mm
order number	MP_SZWR 450-**480**	MP_SZWR 600-**480**	MP_SZWR 900-**480**	MP_SZWR 1200-**480**
	MP_SZWR 450-**630**	MP_SZWR 600-**630**	MP_SZWR 900-**630**	MP_SZWR 1200-**630**
	MP_SZWR 450-**780**	MP_SZWR 600-**780**	MP_SZWR 900-**780**	MP_SZWR 1200-**780**

C-type frame of 750 mm height

C-type frame of 750 mm height		
model	**basic frame** 	**add-on frame**
width	450 / 600 / 900 / 1200 / 1500 mm	450 / 600 / 900 / 1200 / 1500 mm
order number	MP_S **450**-750 P MP_S **600**-750 P MP_S **900**-750 P MP_S **1200**-750 P MP_S **1500**-750 P	MP_S **450**-750 R MP_S **600**-750 R MP_S **900**-750 R MP_S **1200**-750 R MP_S **1500**-750 R

C-type frame of 900 mm height

C-type frame of 900 mm height			
model	**basic frame** 	**add-on frame** 	**octagonal add-on frame**
width	450 / 600 / 900 / 1200 / 1500 mm	450 / 600 / 900 / 1200 / 1500 mm	-
order number	MP_S **450**-900 P MP_S **600**-900 P MP_S **900**-900 P MP_S **1200**-900 P MP_S **1500**-900 P	MP_S **450**-750 R MP_S **600**-750 R MP_S **900**-750 R MP_S **1200**-750 R MP_S **1500**-750 R	MP_SO 900 R

example of installation

Example of installation before mounting the worktop

Accessories: columns, shelves

columns						
	column	**column with socket**	**column with socket**	**column with socket**	**column with socket**	**column for media**
model						
description	fully covered cassette	1 AC power socket	2 AC power sockets	3 AC power sockets	4 AC power sockets	1 fitting for media
order number	MP_K P	MP_K 1G	MP_K 2G	MP_K 3G	MP_K 4G	MP_K M

	shelf for a column			**cabinet door lock**		
model						
width	825/1000/1070/1075/1100/1125/1200/1225/1230/1275/ 1325/1350/1400/1430/1500/1675/1750/1800/2100 mm			-		
order number	MP_PN **825 ... 2100**			MP_SZ_ZKL		

Columns with shelves

Adjustable shelves every 5 cm.

A mini column with AC power sockets

innovative designing

CATIA

The furniture has been designed with a professional software that supports the whole engineering process. All single parts of the furniture are extremely precise and perfectly dimensioned.
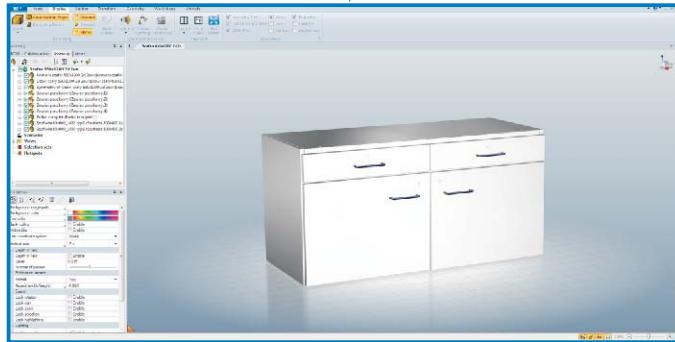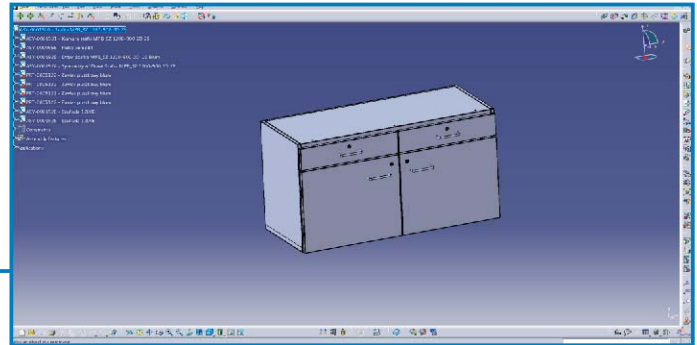
3 DVIA

Projects prepared in the CATIA program can be further exported to the 3DVIA program to prepare screens and 3D animations.

Project

Every offer for furniture is complete with a customized 3DVIA visualization to overview a target configuration in a laboratory. Additional simulations, such as openings of drawers and doors, can be very helpful to guarantee an ideal, trouble free final configuration.

The program allows to prepare professional visualizations and fully dimensioned projections.
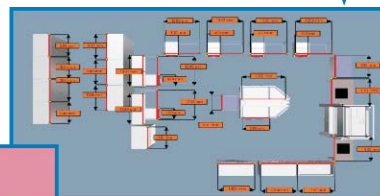
Other laboratory equipment

IV

Other laboratory equipment

Advantages

- automatic weight compensation of Petri plates
- anti-shock counting technology
- ringlight technology enables even illumination of the counting field
- possibility of working with bright or dark background
- mean value calculation function
- standard marker included
- optional marker ZM 2002 for external counting

- Petri plates adapters (diameter < 120mm)
- removable Wolfhuegel scale plate
- adjustable push force
- sound and visual counting control
- adjustable position of the magnifying glass
- affordable price

Standard equipment

- colony counter
- magnifying glass
- standard marker
- bright and dark background
- Petri plates adapters
- Wolfhuegel scale plate

Accessories

- marker ZM 2002 for external counting

Colony counter is invaluable help in every microbiological laboratory since the most time consuming activity is counting the colonies on Petri plates. An easy-to-use device featuring quick and precise counting.

LKB 2002

ZM 2002

Model / Parameter		LKB 2002
counting field diamater [mm]		120
display		LED (0...999)
magnifying glass		2,5 X
illumination		20W ringlight
dims [mm]	width x depth x height	300 x 325 x 90
weight [kg]		4,9
nominal power [W]		22
voltage 50/60 Hz [V]		220-240
warranty		24 months
manufacturer		POL-EKO-APARATURA

Laboratory shakers

Advantages

- orbital movement
- microprocessor control of rotation and time
- orbital diameter: 10...25 mm
- max shaking weight: 10 kg
- variable speed control: 30...300 rpm
- shaking mode: from 1 min to 99 h, or continuous
- LCD digital display
- anti-skid mat (option)
- various shaking tables
- can be located inside cooled incubators

Accessories

- universal shaking table
- separating funnel attachment
- fixing clip support
- dish attachment
- test tube support
- Erlenmeyer flasks (25...2000 ml) attachment

LS 280

ILW 53 with LS 280

Laboratory shakers have been designed to fit inside cooled incubators (IL range)

Parameter \ Model	LS 280	LS 350	LS 500	LS 700
movement	orbital			
controller	microprocessor			
display	LCD display			
speed range [rpm]	30 ... 300			
accuracy [rpm]	10			
amplitude [mm][1]	5	5 or 10		
max load capacity [kg]	10			
shaking mode	1 min...99 h or continuous			
dimensions without / with shaking table [mm] — width	320	390	550	700
dimensions without / with shaking table [mm] — height	120 / 220	120 / 220	120 / 220	120 / 220
dimensions without / with shaking table [mm] — depth	330	400	440	420
fits to cooled incubator	ILW 53	ILW 115	ILW 240	ILW 400
nominal power [W]	60	60	60	60
weight with shaking table [kg]	10	15	22	25
ambient temperature [°C]	+10...+40			
humidity [%]	up to 70			
voltage 50 Hz [V]	220...240			
warranty	24 months			
manufacturer	POL-EKO-APARATURA			

1 - requested amplitude must be specified in the order
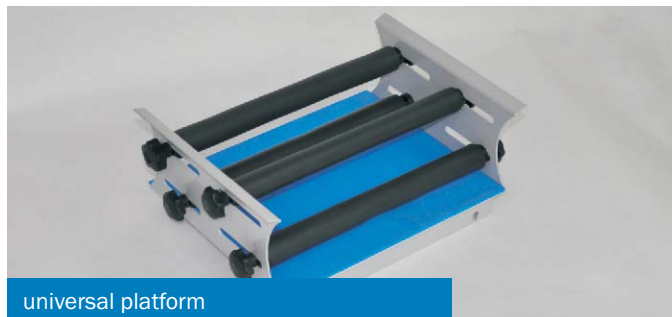
universal platform

Universal platform

Universal platform for various kinds of vessels, with 4 roller clamps (without anti-skid mat).

platform for fixing flasks handles

Platform for fixing flasks handles

Platform for fixing flasks handles, suitable for flasks of the following capacities: 25 ml, 50 ml, 100 ml, 250 ml, 500 ml, the handles shall be ordered separately.

platform for Petri plates shaking

Platform for Petri plates shaking

Platform for shaking Petri plates, bacteria culture flasks and other vessels of low centre of gravity.

platform for separatory funnels

Platform for separatory funnels

Platform for separatory funnels with 3 roller clamps for shaking, salting, extraction and concentration.

anti-skid mat

Anti-skid mat

Anti-skid mat for LS laboratory shakers.

Stationary samplers

Advantages

- representative sample taking according to PN-ISO 5667
- sampling system:
  - vacuum
  - peristaltic pump
- sampling mode:
  - time proportional
  - flow proportional
  - event (e.g.: pH value exceeding)
  - combined
- intuitive menu
- up to 5 configurable sampling programs
- bottle filling overview
- suitable for continuous outdoor use
- can be implemented into a monitoring system
- refrigerated chamber
- SD card recording system: pH, conductivity, redox, dissolved oxygen, flow, chamber temperature etc.

Representative sample taking according to PN-ISO 5667 directive.

PP 2002+/24

Model / Parameter	PP 2002+	PP 2002E	PP 2002M
sampling system	vacuum system	peristaltic pump	peristaltic pump /vacuum system
sample storing	stable temperature +4°C regardless of ambient conditions		
menu language	English, French, Polish, Czech, Romanian, Lithuanian, Italian		
medium	liquid media of min conductivity 20 µS/cm and max temp. 60°C		
hose blowing	before and after sample taking		
sampling mode	automatic time proportional, flow proportional, event or manual		
sampling height [m]	max. 8 / up to 30 (option)		
sample volume [ml]	regulated 30...250/500	regulated 10...9990	regulated 30...250/500 or 10...9990
hose length [m]	8 standard		
hose diameter [mm]	12		
distributor	round		
number of bottles x capacity [l]	24 x 1; 12 x 2,9; 4 x 10; 1 x 25		
overall dims [mm] width	630		630
overall dims [mm] height	1070		1325
overall dims [mm] depth	660		660
weight [kg]	90		100
housing	acid-proof stainless steel with 40 mm insulation		
ambient temperature [°C]	-20...+45		
nominal power [W]	350		450
controller	microprocessor, graphic display bottle filling overview		
programming	5 programs, 8 tasks each		
data logging	SD card (option)		SD card
input signals	8 analogue, 4 binary		
output signals	4 binary		
communication	RS 232 or RS 485 / PROFIBUS, GSM modem (option)		
installation site	indoor or outdoor		
voltage 50/60 Hz [V]	230		
warranty	24 months		
manufacturer	POL-EKO-APARATURA		

POL-EKO Laboratorium Pomiarowe company

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ilac-MRA

POL-EKO Measurement Laboratory is Accredited by the Polish Centre for Accreditation (a member of ILAC) and provides accredited services

- calibration of chambers for **steam sterilization (such as autoclaves, Koch steam sterilizers etc.)**
  - method temperature range: **+60...+130°C**
  - measurement capability: 0,5°C
  - place of calibration: customer's site

- calibration of **lab furnaces**
  - method temperature range: **+100...+1000°C**
  - calibration and measurement capability: 3,0°C
  - place of calibration: Measurement Laboratory or at customer's site

- calibration of **thermostatic and climatic chambers** (ovens, incubators, sterilizers, cooled incubators, thermostatic cabinets, refrigerators, freezers, climatic chambers etc.)
  - method temperature range: **-20...+200°C**
  - calibration and measurement capability 0,15°C
  - place of calibration: Measurement Laboratory or at customer's site

- calibration of **water baths and thermoreactors**
  - method temperature range: **-20...+200°C**
  - calibration and measurement capability: 0,15°C
  - place of calibration: Measurement Laboratory or at customer's site

The **calibration certificate** features:
  - average value in each point
  - uncertainty of the measurement
  - temperature homogenity in chamber or on the surface
  - load effect (optionally)

POL-EKO LAB

- calibration of **electric and electronic thermometers in Measurement Laboratory**
  - method temperature range: **-20...+1000°C**
  - calibration and measurement: 0,05°C in range -20 ... +80°C;
    0,06 in range +80 ... +200°C; 2,5 in range +200 ... +1000°C

- calibration of **electric and electronic thermometers at customer's site**
  - method temperature range: +**30...+200°C**
  - calibration and measurement capability: 0,2°C

- calibration of **data loggers for air temperature measurement**
  - method temperature range: **0...+130°C**
  - calibration and measurement capability: 0,2°C in range 0 ... +60°C; 0,3°C in range +60 ... +130°C
  - place of calibration: Measurement Laboratory

- calibration of **thermohygrometers**
  - method temperature range: **+10...+60°C**
  - relative humidity range: **30...90%**
  - place of calibration: Measurement Laboratory

The **calibration certificate** features:
- average value of temperature (humidity)
- temperature (humidity) correction
- measurement uncertainty

Services beyond accreditation

- calibration of **climatic chambers**
  - relative humidity range: **30...90%**
  - place of calibration: Measurement Laboratory or customer's site

- **IQ, OQ, PQ qualification procedures**
  - place of calibration: Measurement Laboratory or customer's site

- **mapping of room temperatures**

Qualification procedures are required by pharmaceutical (also by veterinary pharmacy), cosmetic and biotechnology industries. A complete qualification procedure consists of the following parts: installation qualification (IQ), operational qualification (OQ), and performance qualification (PQ) The qualification procedure after conducting measurements and completing documentation is followed by issuing the "Qualification book" (full list of conducted measurements and tests is available upon request).

POL-EKO-APARATURA also provides many services concerning various laboratory equipment

- pH-meters
- conductivity meters
- multiparameter metres
- photometers and spectrophotometers
- EcaFlow 150 GLP analyser of trace concentrations of metals
- monometric BOD equipment, e.g. OxiTop, OxiDirect etc.
- checking and cleaning of: pH and redox electrodes; oxygen sensors; conductivity cells
- implementing new photometric methods into photometers and spectrophotometers

The Measurement Laboratory issues a **"Verification Certificate"** after the control.

POL-EKO-APARATURA

manufacturer of laboratory equipment
for laboratory analysis and technological processes,
authorised distributor in Poland of:
ARCTIKO, AQUALYTIC, EUTECH, HAMILTON,
ISTRAN, KNICK, NICKEL-ELECTRO,
RODWELL, THERMO SCIENTIFIC, WTW

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Fax: +48 32/453 91 85
e-mail: export@pol-eko.com.pl
www.pol-eko.eu

Options and accessories

Option	Description
Internal glass door	Order number: */C
External glass door	Order number: */A
Door with viewing window	Order number: */A
Wire shelf	Order number: */P
Stainless steel wire shelf	Order number: */P INOX
Perforated shelf	Order number: */PP
Glass shelf	Order number: */PS
Reinforced shelf	Order number: */PW
Stainless steel drawers	Order number: */SW
Stainless steel cuvettes	Order number: KUW GN */*
Wheels	Order number: QLK*
Table with wheels	Order number: */S or */S INOX
Over temperature protection 2.0 class according to DIN 12880	Order number: ST/2.0
Over temperature protection 3.1 class according to DIN 12880	Order number: */3.1
Under temperature protection 3.2 class according to DIN 12880	Order number: */3.2
Over/under temperature protection 3.3 class according to DIN 12880	Order number: */3.3
Automatic defrosting function	Order number: * PLUS
Low temperature version	Order number: */T
Extended temperature range to +50°C	Order number: ST/50
Extended temperature range to +60°C	Order number: ST/60
Extended temperature range to +70°C	Order number: ST/70
Reinforced version	Order number: */W
Access port for external sensor	Order number: *OCZ
Interior lighting	Order number: OWW
Fan speed control	Order number: ST/CHL WENT
Photoperiodic system	Order number: */FOT
Phytotron system	Order number: */FIT
FIT panels independent control	Order number: FIT/R2
Open door alarm	Order number: SOD
Door openings counter	Order number: LOD
Additional temperature sensor	Order number: PT 100
Internal socket	Order number: GNZ
HEPA-fresh air filter	Order number: HEPA
Humidity measurement	Order number: PHR
Door lock	Order number: ZKL
SMS Info	Order number: SMS INFO
Test's results memory	Order number: PWP
Container for deionized water	Order number: KK/Z
Container for waste water	Order number: KK/K
Low water level sensor	Order number: KK/CP
RS 422 interface (instead of RS 232)	Order number: RS422
RS 485 interface (instead of RS 232)	Order number: RS485
RS 232 cable	Order number: RSK
RS 422 cable	Order number: RSK/422
RS 485 cable	Order number: RSK/485
USB cable	Order number: USBK
Dot printer	Order number: EPSON
„Kafka" thermal printer	Order number: KAFKA
EasyLab-T PLUS software	Order number: EasyLab-T PLUS
Calibration in 5 points on 1 shelf	Order number: BRT/1P/L
Calibration in 9 points in the chamber	Order number: BRT/9/L
IQ, OQ, PQ qualification	Order number: IQ/OQ/PQ